DILLON CONSULTING

BUILD NOVA SCOTIA

Phase II Environmental Site Assessment (Final)

Former Country Harbour Mine Site, Guysborough County, Nova Scotia, **Property Identification Designation Numbers: 35091354 and a Portion of 35094366**

March 2024 – 23-6465

March 27, 2023

Build Nova Scotia
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Strategic Infrastructure and Development Division

Phase II Environmental Site Assessment - Final
Former Country Harbour Mine Site, County Harbour Mines, Guysborough County, Nova Scotia, Parcel Identification Designation Nos.: 35091354 and a Portion of 35094366

Dillon Consulting Limited is pleased to provide Build Nova Scotia, on behalf of the Department of Natural Resources and Renewables, this Phase II Environmental Site Assessment of the Former Country Harbour Mine property located in Country Harbour Mines, Guysborough County, Nova Scotia, and identified by Parcel Identification Designation Nos. 35091354 and a portion of 35094366.

Should you have any questions, please do not hesitate to contact us.

Sincerely,

DILLON CONSULTING LIMITED

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Executive Summary

Dillon Consulting Limited (Dillon) was retained by Build Nova Scotia (BNS), on behalf of the Department of Natural Resources and Renewables (DNRR), to complete a Phase I/II Environmental Site Assessment (ESA) at the former Country Harbour Mine (herein referred to as the "subject property" or the "site"), which is located in Guysborough County, Nova Scotia. Mining operations for gold ore occurred at the site between 1862 and 1951. Currently, the site is used for commercial forest harvesting as a primary land use and is also being considered for wind energy development. Dillon completed a Phase I ESA at the site in 2023 that indicated the presence of potentially contaminating activities on-site. Four (4) areas of potential environmental concern (APECs) were identified, along with associated contaminants of potential concern (COPCs), as summarized in the following table.

Table ES-1: Phase I ESA Summary of Identified Relevant APECs and COPCs

APEC No.	APEC	COPCs	Media of Concern	Comments
1	Tailings Area	Metals, General Chemistry*, Sulphur	Soil, GW, Sed, SW	One (1) former waste tailings area with potentially sulphide bearing materials. Surface water discharge location in Johnston Brook, downstream of the cross-culverts along John Fenton Loop Road.
2	Stamp Milling Area	Metals, General Chemistry*, Sulphur, PHCs, PAHs	Soil, GW, Sed, SW	Three former (3) stamp milling areas where potentially sulphide bearing materials may have been processed. Processing of materials, heavy equipment storage, and petroleum storage. Surface water is directed to Johnston Brook.
3	Waste Rock Piles	Metals, General Chemistry*, Sulphur	Soil, Sed, SW	Two (2) waste rock areas with potentially sulphide bearing slates, one (1) of which is located in Johnston Brook.
4	Domestic Waste Dumping Areas	Metals, PHCs, PAHs	Soil	Three (3) locations where domestic waste and discarded fuel drums were identified during the Phase I ESA site visit.

APEC No.	APEC	COPCs	Media of Concern	Comments
Assessment of Naturally Occurring Background Conditions				
	Background Location	Metals, General Chemistry*, Sulphur, PHCs, PAHs	Soil, GW	Based on available topographic data and inferred groundwater flow direction, background conditions were assessed at an upgradient location within the assessment boundary that was safely accessible.
	Upstream Background Location	Metals, General Chemistry*, Sulphur, PHCs, PAHs	Sed, SW	Surface water and sediment conditions were assessed at an upstream location within the assessment boundary that was safely accessible[6].

Notes:

1. *General chemistry analysis only completed on water;
2. GW denotes groundwater, Sed denotes sediment, SW denotes surface water;
3. PHCs denotes petroleum hydrocarbons (i.e., BTEX, modified TPH), PAHs denotes polycyclic aromatic hydrocarbons;
4. Metals analysis included mercury and sulphur;
5. Metals analysis of SW included total metals, while analysis of GW entailed dissolved metals; and
6. Of note, due to difficult terrain, the background SW and SED location had to be adjusted for health and safety considerations.

The Phase II ESA included the advancement of five boreholes, each completed as monitoring wells, and soil, groundwater, surface water and sediment sampling. The generalized groundwater flow direction in the assessment area is interpreted to be southerly towards Country Harbour River. For comparison to the Nova Scotia Contaminated Sites Regulations (NS CSRs) Tier I Environmental Quality Standards (EQS), the site is considered to be commercial, potable with both fine and coarse-grained soil conditions. Findings of the Phase II ESA are as follows:

- Based on the analytical results, the surface water samples collected from Johnston Brook had metal concentrations (i.e., aluminum, arsenic, iron, lead and/or zinc) that exceed the NS Tier I EQS for surface water at each sample location. In addition, lab pH was low at each location. There were no other metals exceedances, nor exceedances for other COPCs (i.e., BTEX, modified TPH or PAHs) reported for the analyzed surface water samples.
- Based on the analytical results, metals concentrations in sediment were generally either below laboratory detection limits, or within the applicable NS Tier I EQS, with the exception of arsenic, iron, lead, manganese and/or mercury. Iron and manganese concentrations were generally of similar magnitude in each of the sediment samples. The highest arsenic and mercury concentrations were reported at SED2. No BTEX or C6-C10 detections[1] were reported for sediment. Although PAH analysis could not be completed due to the stream substrate composition[1], PAH exceedances were not reported in surface water, or in nearby soil samples, therefore, PAHs are not expected to be a concern in the sediment.

[1] Sediment consisted mainly of rock/gravel with little fines, that limited the amount of sample available to the laboratory for analysis. Due to high rock content, only BTEX and C6-C10 analysis could be completed by the laboratory. PAH analysis could not be completed on sediment.

- Sixty-four (64) soil samples (including 5 field duplicate samples) were submitted for metals analysis, including suphur and mercury. Metals exceedances in soil above the NS CSR Tier I EQS (for a commercial, potable site with both coarse and fine-grained soils), and above the Environment Canada (EC) Background Soil Database concentrations (Dillon, 2011) and/or local on-site background concentrations (Dillon, 2022-2023) are present across the site assessment area (i.e., the areas of former mining operations). Notable, widespread exceedances, when looking at the overall data set in comparison to both the Tier I EQS and background, include arsenic, beryllium, iron, lead, and selenium. Although not widespread, mercury exceeded the applicable NS Tier I EQS at four locations, and each of these locations are in the central portion of the study area (at or between MW4 and MW5). The highest arsenic was reported at BH7, highest iron at BH18, highest lead and mercury at BH15, and highest zinc at BH23. One manganese concentration also exceeded both the Tier I EQS and background (i.e., BH28 0-0.15 m). Metals impacts in soil are not delineated laterally. Vertically soil impacts are delineated by the presence of bedrock, which ranged from 0.53 mbgs (APEC #1) to 1.37 mbgs (APEC #2) in the area of former mining operations.
- Ethylbenzene in soil exceeded the Tier I EQS at BH17 (0-0.15 m), which was advanced in an area of refuse (e.g., household waste, plastic and metal (including a drum and lawnmower)) underlain by waste rock. As no other petroleum exceedances were identified on-site, this exceedance is expected to be localized.
- Dissolved metals concentrations in groundwater were generally either below laboratory detection limits or within the applicable NS Tier I EQS, with some exceptions (i.e., arsenic, cobalt, iron, and manganese). It is noted that the turbidity in some of the newly installed monitoring wells was high (up to 109 NTU), and that the presence of turbidity in a sample can lead to higher metals concentrations being reported, as metals tend to adhere to sediment within a sample.

Following the initial Phase I/II Environmental Site Assessment work, Dillon completed a qualitative risk review of the site to identify relevant contaminants of concern (CoCs), media, pathways, receptors and potential risk. Based on the initial data obtained in the Phase II ESA, Dillon recommends further consideration of the remedial approach as presented in Appendix G.

1.0 Introduction

Dillon Consulting Limited (Dillon) was retained by Build Nova Scotia (BNS), on behalf of the Department of Natural Resources and Renewables (DNRR), to complete a Phase I/II Environmental Site Assessment (ESA) at the former Country Harbour Mine (herein referred to as the "subject property" or the "site"), which is located in Country Harbour Mines, Guysborough County, Nova Scotia (see Figure 1, appended, for the site location). The following document has been prepared to summarize the findings of the Phase II ESA activities completed to date. This report presents the Phase II ESA methodology (Section 2.0), results (Section 3.0), conceptual site model (CSM) (Section 4.0), summary and recommendations (Section 5.0).

1.1 Purpose

Prior to initiation of the Phase II ESA, Dillon completed a Phase I ESA (i.e., "Phase I Environmental Site Assessment (Final), Former Country Harbour Mine, Guysborough County, Nova Scotia, Property Identification Designation (PID) Numbers: 35091354 and a Portion of 35094366) for the site. Findings of the Phase I ESA identified four on-site areas of potential environmental concern (APECs) (e.g., tailings area, stamp milling area, waste rock piles, and domestic waste dumping areas) with the following contaminants of potential concern (COPCs): general chemistry, metals, select organic compounds, petroleum hydrocarbons (PHCs), polycyclic aromatic hydrocarbons (PAHs) and energetics. The full Phase I ESA report can be found in Appendix A, and is discussed further in Section 1.2.

The Phase II ESA was completed in accordance with the Canadian Standards Association (CSA) Standard No. Z769-00 (R2023) and the Nova Scotia Contaminated Sites Regulations (NS CSRs) and associated Ministerial Protocols to identify and, where possible, delineate potential environmental contamination that may have resulted from historical activities on the former Country Harbour Mine site.

The findings presented in this report are based on limited visual observations made during Phase II ESA site visits, and an intrusive investigation, which consisted of drilling boreholes completed as monitoring well installations; hand-augering (including the background borehole locations); soil, sediment, and surface water sampling; well development, and groundwater monitoring and sampling.

1.2 Background

Known mining operations for gold ore are reported to have occurred at the site between 1862 and 1951; however, the site is no longer in operation. Mine workings were underground and included drifts and stopes, shafts access, and ramp accesses. Ore processing was reportedly completed by way of mercury amalgam. Approximately 26,301 tons of ore was processed on-site, producing approximately 9,960 ounces of gold, and resulting in an estimated 14,225 tons of tailings remaining on-site (BNS Request for Proposal RFQ BNS-2324-0201, 2023). Several stamp mills operated at the site, including the

Old Antigonish Mill, the Stuart Mill, and the Robertson Mill. In addition to gold stamp mills, buildings and infrastructure were constructed to support mining operations at the site. These buildings and infrastructure have been removed from the site, although portions of some foundations remain. Fencing, barricades, berms, and warning signs have been installed at the site due to the number of abandoned mine openings (as shown on Figure 2, appended). Currently, the site is used for commercial forest harvesting as a primary land use and is also being considered for wind energy development.

Surrounding land uses are primarily resource, with some residential properties located south of the site. The site is not serviced by municipal water and sewer. The topographic gradient suggests that the regional groundwater flow direction is likely south towards Country Harbour River.

A water pipe is present on-site in Johnsons Brook (near 24MW-03) that reportedly may be accessed by a local property owner, possibly for drinking water. This is unconfirmed.

Based on the findings of the Phase I ESA (Dillon, 2024), which included a review of available records, photographs/images and documents associated with the site, and a site visit, Dillon identified APECs and their corresponding COPCs related to the historical mining operations that required assessment, as presented in below in Table 1 and on Figure 2, appended.

Table 1: Summary of Identified Relevant APECs and COPCs

APEC No.	APEC	COPCs	Media of Concern	Comments
1	Tailings Area	Metals, General Chemistry*, Sulphur	Soil, GW, Sed, SW	One (1) former waste tailings area with potentially sulphide bearing materials. Surface water discharge location in Johnston Brook, downstream of the cross-culverts along John Fenton Loop Road.
2	Stamp Milling Area	Metals, General Chemistry*, Sulphur, PHCs, PAHs	Soil, GW, Sed, SW	Three (3) former stamp milling areas where potentially sulphide bearing materials may have been processed. Processing of materials, heavy equipment storage, and petroleum storage. Surface water is directed to Johnston Brook.
3	Waste Rock Piles	Metals, General Chemistry*, Sulphur	Soil, Sed, SW	Two (2) waste rock areas with potentially sulphide bearing slates, one (1) of which is located in Johnston Brook.

APEC No.	APEC	COPCs	Media of Concern	Comments
4	Domestic Waste Dumping Areas	Metals, PHCs, PAHs	Soil	Three (3) locations where domestic waste and discarded fuel drums were identified during the Phase I ESA site visit.
Assessment of Naturally Occurring Background Conditions				
Background Location		Metals, General Chemistry*, Sulphur, PHCs, PAHs	Soil, GW	Based on available topographic data and inferred groundwater flow direction, background conditions were assessed at an upgradient location within the assessment boundary that is safely accessible.
Upstream Background Location		Metals, General Chemistry*, Sulphur, PHCs, PAHs	Sed, SW	Surface water and sediment conditions were assessed at an upstream location within the assessment boundary that is safely accessible.

Notes:

1. *General chemistry analysis is only completed on water;
2. GW denotes groundwater, Sed denotes sediment, SW denotes surface water;
3. PHCs denotes petroleum hydrocarbons (i.e., BTEX, modified TPH), PAHs denotes polycyclic aromatic hydrocarbons;
4. Metals analysis included mercury and sulphur;
5. Metals analysis of SW included total metals, while analysis of GW entailed dissolved metals; and,
6. Of note, due to difficult terrain, the background SW and SED location had to be adjusted for health and safety considerations.

It is noted that several waste rock piles were identified as being on-site. Based on the age of the historical mining operations at the site (1862 to 1951), the potential for acid rock drainage (ARD) (from waste rock piles) to be present at the site is considered to be low, as associated potential leaching has likely already occurred. Further, no visual evidence of leaching related to ARD was observed during the Phase I ESA site visit; however, it is noted that the site is heavily vegetated.

The results of the Phase I ESA indicated that a Phase II ESA was required to characterize the APECs identified.

1.3 Regional Geology and Hydrogeology

To describe the regional physiography and expected hydrogeologic conditions beneath the subject property, the following documents were reviewed:

- Stea, R.R., Conley, H., and Brown, Y. (compilers) 1992: Surficial Geology of the Province of Nova Scotia; Nova Scotia Department of Natural Resources, Map 92-3, Scale 1:500,000.
- 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.

The surficial geology of the subject area is mapped as of Stony Till Plain and drumlins. Till is stony, sandy and consists of material derived from local bedrock sources, ranging in thickness from 2 meters (m) to 20 m. Drumlin facies are siltier due to erosion and incorporation of older till units by glaciers. Soil observed during the Phase II ESA generally consisted of an organic/peat layer at surface, underlain by silty sand or sand and gravel.

The regional bedrock geology of the subject area is primarily mapped as the Goldenville Formation of the Cambrian period, consisting of sandstone, turbidites and slate. Continental rise prism is present in areas metamorphosed to schist and gneiss. Of note, the northern portion of PID 35094366 is mapped as Middle to Late Devonian muscovite biotite monzogranite (from the area of Johnsons Lake northward). Bedrock was encountered during the Phase II ESA drilling program between 0.53 meters below ground surface (mbgs) (at 24MW-05) and 4.27 mbgs (at 24MW-01, background location). On-site bedrock was a mixture of granite and slate, with quartz and pyrite seams periodically observed.

The topography of the site is steep, converging on Johnston's Brook from the east and the west, and also sloping to the south towards Highway 316. Regional topography suggests the regional shallow groundwater flow is likely south towards Country Harbour River. Based on an elevation survey completed for the on-site monitoring wells in January 2024, the interpreted groundwater flow is to the south.

1.3.1 Former Tailings Area: APEC #**1**

Soil stratigraphy in this area generally consisted of a layer of organics with peat, underlain by silty sand or sand with varying amounts of gravel. Granite bedrock was encountered at approximately 2.13 mbgs (24MW-02). A representative soil sample was collected from APEC 1 and was submitted for grain size analysis. Based on the grain-size analysis, the sample was classified as fine-grained soil.

1.3.2 Former Stamp Milling Areas: APEC #**2**

Soil stratigraphy in these areas generally consisted of a layer of organics/peat, underlain by sand and gravel, with slate bedrock encountered at between 0.53 mbgs (24MW-05) and 1.37 mbgs (24MW-03). Granite bedrock was encountered at 0.88 mbgs at one location (24MW-04). A representative soil sample was collected from APEC 2 (Stuart Mill Area) and was submitted for grain size analysis. Based on the grain-size analysis, the sample was classified as coarse-grained soil.

1.3.3 Waste Rock Piles: APEC #**3**

Soil stratigraphy in these areas generally consisted of a thin layer of rootmat and organics underlain by waste rock or silty sand with varying amounts of gravel. Intermittent coal fragments and iron oxides were observed.

1.3.4 Domestic Waste Dumping Area: APEC #4

Soil stratigraphy in this area generally consisted of a thin layer of rootmat and organics underlain by silty sand with varying amounts of gravel. Intermittent waste rock was also observed.

1.3.5 Background Area

The "background" area selected for the site was located approximately 1.5 kilometers (km) north of Highway 316. Soil stratigraphy in this area generally consists of a thin layer of organics/peat underlain with silty sand and gravel with varying amounts of sand atop fractured/weathered slate bedrock and then competent granite bedrock. Minor slate bedrock (approximately 1 m) was encountered in the background area at a depth of approximately 3.2 mbgs, followed by granite bedrock at 4.27 mbgs (24MW-01).

1.4 Regulatory Framework

1.4.1 Nova Scotia Contaminated Sites Regulations and Associated Ministerial Protocols

The Phase II ESA for the site was conducted in accordance with the NS CSRs and associated Ministerial Protocols. The assessment work was conducted in accordance with the Ministerial Protocol PRO-200 (Environmental Site Assessment for Limited Remediation), specifically for an L3 ESA, which applies to the assessment of contamination from a single source or multiple sources with single or multiple contaminants of concern. Specifically, the criteria used to assess impacts at the site were the NS Tier I Environmental Quality Standards (EQS) for soil, sediment, groundwater (October 2022) and surface water (September 2021) for a property having commercial land-use, potable groundwater usage and both fine and coarse-grained soil conditions.

The Nova Scotia Maximum Concentration Background Levels for Nova Scotia, as presented in the Environment Canada's (EC) Background Soil Database (Dillon, 2011), were also used for comparison of metals in soil, along with three on-site background soil samples that were collected as part of the Phase II ESA program (i.e., BH1 (0-0.15 m), BH2 (0-0.15 m) and 24MW-01 SS5 (2.4-3.0 m)). In particular, the highest concentrations from these two sources were used as the maximum background threshold values (Max BTVs).

For petroleum hydrocarbons in soil, when results did not return to baseline and Petroleum Hydrocarbon F4 analysis was requested, the F4 concentrations were compared to the relevant Canadian Council of Ministers of the Environment (CCME) Canada Wide Standards for Petroleum Hydrocarbons in Soil (i.e., commercial – coarse or fine).

As there are no provincial guidelines available for energetics in soil, the Health Canada Draft Guideline Screening Values and Interim Toxicological Reference Values (TRVs) for Energetic Chemicals (November 2022) were used for comparison of this criteria.

The Index of Additive Cancer Risk (IACR) assesses potential threats to potable groundwater from leaching of carcinogenic PAH mixtures from soil. There is no Tier I EQS for IACR as Nova Scotia Environment and Climate Change (NSECC) deemed that specific provincial standards were not warranted in instances where appropriate guidelines were available from the Canadian Council of Ministers of the Environment (CCME) or other Canadian and international jurisdictions. Therefore, for comparison purposes, the CCME criteria for IACR was used.

2.0 Methodology

2.1 General

The Phase II ESA activities completed to date at the Former Country Harbour Mine Site included:

- Surface water sampling at five (5) locations (i.e., SW1 to SW5) for general chemistry, total metals (including mercury), sulphur, petroleum hydrocarbons and/or polycyclic aromatic hydrocarbons (PAH) analysis.
- Sediment sampling at five (5) locations (i.e., SED1 to SED5, noting that the sediment sampling locations correlated to the surface water sampling locations). Of note, the substrate of the on-site portion of Johnson Brook mainly consists of rock with little to no fines/sediment. During the sediment sample collection field staff endeavored to collected as much of the limited fines present as possible; however, the samples mainly consisted of rocky substrate. Although laboratory sample jars were filled for metals, PAH and petroleum hydrocarbon analysis, based on the high rock content in the samples, only metals and partial petroleum hydrocarbon analysis could be undertaken by the laboratory.
- Completion of forty-one (41) planned boreholes, with select soil samples submitted for metals (including mercury), petroleum hydrocarbons, or PAHs analysis.
- Collection of twenty (20) planned step out samples, with eleven (11) of these samples submitted for metals analysis and the remaining archived for potential future analysis to support delineation or characterization of the site to satisfy provincial protocols and be useful when evaluating a potential risk-managed solutions.
- Advancement of five (5) planned boreholes, with soil samples submitted for energetics analysis.
- Installation of a network of five (5) groundwater monitoring wells, one (1) of which is utilized as a background location, while the remaining four (4) were completed to assess shallow groundwater conditions associated with known APECs. Following installation, the monitoring wells were developed and sampled using low flow sampling techniques. The soil and groundwater samples associated with the monitoring wells were submitted for general chemistry (groundwater only), dissolved metals, petroleum hydrocarbons and/or PAHs analysis.

GPS coordinates of sample locations were recorded using a handheld GPS device throughout the field program. Coordinates can be found in Appendix B. An elevation survey of the on-site monitoring wells was completed on January 20, 2024. Coordinates were georeferenced using UTM Zone 20T, NAD 83 and can be found in Table 2 (**Section 3.4.1**).

Locations of surface water and sediment samples, test holes, surface soil samples, and monitoring wells are presented on Figure 3 (appended). Site photographs are presented in Appendix C.

2.2 Utility Locates

Dillon contacted public utilities including Bell Fiber 360, Bell Aliant, Rogers, Guysborough County, and Nova Scotia Power Incorporated (NSPI) to confirm the presence/absence of their services at the site. Underground utilities were reviewed prior to commencing drilling and hand-augering activities.

2.3 Surface Water Sampling

On November 6, 2023, five (5) surface water samples were collected (i.e., SW1 through SW5) from Johnston Brook, which intersects the site from north to the southeast. Two (2) duplicate samples (i.e., SW DUP A and SW DUP B) were also collected. The surface water samples were collected as a grab sample placed directly into laboratory-provided sample bottles containing the appropriate preservatives. Care was taken to collect surface water into the sample bottles at an angle slightly above horizontal such that preservatives were not lost. The sample bottles were placed into a cooler containing ice for transport to ALS Environmental Analytical (ALS) Lab in Dartmouth, Nova Scotia for general chemistry, metals, petroleum hydrocarbons and/or PAH analysis. ALS is accredited by the Canadian Association of Laboratory Accreditation (CALA). The surface water sample locations are presented on Figure 3, appended. Field water quality readings (i.e., conductivity, turbidity, pH, dissolved oxygen, and temperature) and Global Positioning System (GPS) coordinates were recorded at each surface water sampling station.

It Is noted that during this assessment, the SW5 station was proposed as a background station. However, due to physical site constraints, this station was unable to be located up gradient of all historical site operations, and therefore, cannot be considered a background station.

2.4 Sediment Sampling

On November 6, 2023, five (5) representative sediment samples were collected (i.e., SED1 through SED5) from Johnston Brook. Sediment samples were collected at the same location as the surface water samples, with the surface water sampling being completed prior to the sediment sampling. Sediment samples were collected using a trowel. The sample bottles were placed into a cooler containing ice for transport to ALS Lab for metals, petroleum hydrocarbons and/or PAH analysis. The sediment sample locations are also presented on Figure 3, appended.

It is noted that during this assessment, the SED5 station was proposed as a background station. However, due to physical site constraints, this station was unable to be located up gradient of all historical site operations, and therefore, cannot be considered a background station.

2.5 Shallow Surface Soil Sampling

Shallow surface soil sampling was completed between November 7 and 10, 2023 and between January 18 and 20, 2024. Boreholes were completed using a hand auger to a maximum depth of 1 m. Representative samples were collected at surface and at the final borehole depth. Additional step out surface soil samples (0-0.15 m)[2] were collected for potential future analysis following identification of any contamination in the originally analyzed surficial samples. Five (5) soil samples (0-0.15 mbgs) were also collected for energetics screening purposes.

A continuous geological log was recorded during the advancement of each borehole and described the stratigraphy encountered. The presence/absence of evidence of potential contamination (i.e., visual staining and olfactory indications) was documented. Field screening was completed with the collection of VOC headspace measurements where petroleum hydrocarbon (PHC) impacts were suspected based on the summary of Phase I ESA findings. Samples collected for analysis of PHCs were collected using Terra Core™ samplers and placed directly into laboratory supplied containers preserved with methanol. Samples collected for other analyses were collected as a grab sample and placed directly into laboratory supplied containers. Standard industry best practises regarding sample preservation and storage, and the cleaning of sampling apparatus were followed. Select surface soil samples were submitted to ALS Labs for metals, petroleum hydrocarbon, PAH, energetics and/or grain size analysis.

2.6 Monitoring Well Installation

Between January 16 and 18, 2024, Dillon coordinated with Logan Drilling Group (Logan) of Stewiacke, Nova Scotia to advance a total of five (5) boreholes across the site to be completed as monitoring wells. The monitor wells (i.e., 24MW-01 through 24MW-05 were installed to depths ranging from 4.88 mbgs (24MW-02, 24MW-03 and 24MW-05) to 6.4 mbgs (24MW01)). Boreholes were advanced a combination of standard split spoons, auger methods and coring. Soil stratigraphy was recorded along with soil observations such as the presence of debris, odours and staining. During coring, the bedrock core was also logged.

Due to the remoteness of the site, and difficult on-site terrain that presents access challenges, prior to commencing the drilling program, Dillon explored the feasibility of using on-site surface water from Johnston Brook in the event that coring was required during drilling. Dillon reviewed the surface water analytical data for the samples collected by Dillon on November 6, 2023, and concluded that surface water in the vicinity of SW1 would be suitable for coring during the drilling program. Based on the

[2] To the extent possible, surface vegetation and root material were not included in the soil samples.

analytical results, SW1 exhibited the best water quality overall (i.e., less parameter exceedances compared to the other surface water samples collected from Johnston Brook). Additionally, moderate to high flow was observed in the brook at this location and was relatively easy to access. BNS approved this approach.

Prior to the drilling program Dillon reviewed NSECC water course alteration regulations, and based on our interpretation, a permit was not required if the withdrawal was kept to less than 23,000 liters (L) per day and the source was not dewatered. Daily surface water removal from the on-site watercourse was approximately 2000 L on January 16 and 17, 2024, with approximately 4000 L removed on January 18, 2024. The surface water intake pipe was also screened to avoid fish mortality (noting that fish were not observed to be present).

Continuous discrete split-spoon soil samples were collected at 0.6 m intervals when possible. Soil samples proposed for analysis of PHCs were collected using a 10 mL Terracore sampler and stored in two 40 mL vials containing a methanol preservation agent, as well as a 60 mL laboratory-supplied glass sample container and a re-sealable plastic bag. Soil samples proposed for other analysis were collected and placed directly into one or laboratory-supplied 150 mL, 120 mL, and/or 60 mL glass sample container, depending on the proposed analysis. Dillon field personnel logged subsurface conditions encountered in each borehole at the time of sampling. Volatile organic compound (VOC) concentration measurements were obtained from the headspace of appropriate recovered soil samples using an RKI Eagle vapour meter with methane elimination and calibrated to hexane. Select soil samples from the drilling program were submitted to ALS Lab in Dartmouth, Nova Scotia for PHC, metals, and/or PAH analysis.

Upon completion of the drilling, monitoring wells were installed using 50 mm diameter, Schedule 40, PVC screen (0.025 cm slot) and casing with silica sand filter pack and a bentonite seal near surface. Each monitor well was sealed with a J-plug and finished with a steel monument style protective casing. Borehole and monitoring well locations are presented on Figure 3 (appended). Borehole logs describing observations made during the drilling program and monitoring well construction details are presented in Appendix B.

2.7 Monitoring Well Development

Between January 17 and 19, 2024, monitoring wells at the site were developed to remove water that was disturbed during the drilling process, water that was introduced during coring, and to enhance the operation of the screen and sand pack as an effective particulate filter system. Well development involved removal of a minimum of five (5) times the water column volume. At locations where purging five (5) times the water column was not feasible due to recharge conditions, the well was purged dry a minimum of five times. In order to reduce the potential of cross contamination between monitoring wells, each well was equipped with dedicated Waterra tubing and an inertial foot valve. A period of at

least twenty-four (24) hours was left between the initial well development and sampling to allow the wells to recover.

2.8 Groundwater Monitoring and Sampling

Between January 19 and 20, 2024, groundwater monitoring and sampling was completed at the site. To reduce the potential of cross contamination between monitoring wells, each well was equipped with dedicated low-density, HDPE tubing as well as silicone tubing. Prior to purging the well, the depth to groundwater was measured from an established reference point (top of PVC casing) using an oil-water interface probe. Low flow sampling was used to minimize sample turbidity. Sample turbidity has the potential to bias the dissolved phase analytical results, as targeted substances present within or sorbed to soil particles may be released during sample preparation/analysis, resulting in an artificially high measurement.

A battery powered peristaltic pump set at a low pumping rate (e.g., 0.1 L/min) to minimize drawdown was utilized to purge and sample the monitoring wells. Monitoring wells were purged according to Dillon Standard Environmental Field Procedures and industry standards for low-flow groundwater sampling. Groundwater field parameters were measured using a Horiba U-52 multimeter calibrated according to the manufacture's published instructions and a flow-through cell. Field parameters recorded from the instrument included: pH, conductivity, dissolved oxygen, oxidation-reduction potential, turbidity and temperature. Groundwater field parameters and drawdown were monitored and recorded typically every three to five minutes. Once the monitored parameters had stabilized such that successive measurements were within 10%, a groundwater sample was collected.

The collected groundwater samples were directly placed into laboratory supplied containers. Metals and mercury samples were field filtered and preserved. The sample containers were filled, labeled, and stored in a sample cooler containing ice pending delivery to ALS Labs in Dartmouth, Nova Scotia for general chemistry, dissolved metals (including mercury), PHC and PAH analysis.

2.9 Quality Assurance and Quality Control

Quality Assurance/Quality Control (QA/QC) protocols were established and followed throughout the monitoring program. This included the collection of duplicate samples and the use of an equipment blank and a trip blank. As discussed in sections above, non-dedicated equipment, such as the oil-water interface probe, were decontaminated between sampling locations using a phosphate free detergent and distilled water. Methods used during the field work followed Dillon's Standard Environmental Field Procedures which are based on industry standards and described in the respective sections above.

One (1) equipment blank and one trip blank were collected during the groundwater monitoring event completed in January 2024. The equipment blank sample was submitted for analysis of groundwater COCs at the site, and the trip blank was submitted for analysis of PHCs.

Blind field duplicate samples were also collected during the assessment including: one duplicate surface water sample, one duplicated sediment sample, five duplicate soil samples, and one duplicate groundwater sample.

Sample bottles were labelled with sample/location ID, project name and number, company name (Dillon), and time and date of collection. Once collected, samples were immediately placed in coolers containing ice to maintain a temperature of less than 10ºC. To minimize the potential for cross contamination, new nitrile gloves were used to collect each sample, and non-dedicated sampling equipment was decontaminated between each sampling location.

To evaluate the precision associated with sampling and analytical methods, the samples and their duplicates were used to calculate the relative percent difference (RPD). The RPD is defined as the absolute value of the variation between a sample's analytical concentration and its duplicate, when compared to the average concentration of the original and the duplicate in detected samples. The RPD is calculated using the following equation:

$$= \frac{|V_1 - V_2|}{\frac{(V_1+V_2)}{2}} \times 100$$

RPD is used to assess the validity of the field and laboratory analytical procedures for parameters analyzed that are greater than five (5) times the reportable detection limit (RDL). Dillon set a screening-level RPD acceptance criterion of less than 40% for surface water and groundwater, and 60% for soil/sediment. As noted above, field duplicates were collected during the assessment, with RPDs calculated for the parent and duplicate samples.

3.0 Results

3.1 Surface Water Quality

Surface water analytical results are presented in Tables D-1 through D-3, Appendix D and are summarized in the sections below. Laboratory Certificates of Analysis are provided in Appendix E. Surface water sample locations are presented on Figure 4, appended.

3.1.1 General Chemistry and Metals

A total of six (6) surface water samples (i.e., SW1 through SW5), including a field duplicate (i.e., SW DUP A (duplicate of SW3), were submitted for general chemistry and total metals analysis which included total sulphur and total mercury. General chemistry and total metals concentrations in surface water were generally either below laboratory detection limits, or within the applicable NS Tier I EQS, with the following exceptions:

- The pH (lab) values were below the recommended range associated with the on-site watercourse (i.e., Johnston Brook) ranging from 5.18 to 5.51, indicating more acidic conditions.
- Aluminum concentrations ranging from 0.194 mg/L (in SW1) to 0.325 mg/L (in SW2), in each of the analyzed samples exceeded the NS Tier I EQS of 0.005 mg/L.
- Arsenic concentrations ranging from 0.0355 mg/L (in SW1) to 0.0633 mg/L (in SW2), in each of the analyzed samples exceeded the NS Tier I EQS of 0.005 mg/L.
- Iron concentrations ranging from 0.391 mg/L and 0.394 mg/L (in SW3 and its field duplicate) to 0.609 mg/L (in SW5) exceeded the NS Tier I EQS of 0.3 mg/L in each of the analyzed samples, with the exception of SW1.
- The lead concentration of 0.002 mg/L marginally exceeded the NS Tier I EQS of 0.001 mg/L in SW2.
- The zinc concentrations of 0.0088 mg/L exceeded the applicable NS Tier I EQS of 0.007 mg/L in SW4.

While there is potential for some of the above noted exceedances in surface water to be naturally occurring, further background sampling of surface water would be required to confirm.

As noted above, SW1 exhibited the best water quality overall (i.e., less parameter exceedances compared to the other surface water samples collected from Johnston Brook).

Mercury was detected at four (4) of the five (5) surface water sampling locations (i.e., except for SW5). Mercury concentrations, ranging from 0.0054 µg/L (in SW4) to 0.023 µg/L (in SW2), were below the Tier 1 EQS of 0.026 µg/L.

Dissolved sulphur was not detected at SW4 and was reported at the laboratory detection limit of 0.5 mg/L at SW5. For the remaining stations, concentrations ranged from 0.53 mg/L and 0.51 mg/L (in SW3 and its field duplicate) to 0.61 mg/L (in SW1). There is no Tier 1 EQS for sulphur.

3.1.2 Polycyclic Aromatic Hydrocarbons

Three (3) surface water samples (i.e., SW4, the field duplicate sample of SW4 (i.e., SW DUP B), and SW5) were submitted for PAH analysis. PAH concentrations in surface water were below the laboratory detection limits and the applicable NS Tier I EQS.

3.1.3 Petroleum Hydrocarbons

Three (3) surface water samples (i.e., SW4, the field duplicate sample of SW4 (i.e., SW DUP B), and SW5) were submitted for BTEX and modified TPH analysis. BTEX and modified TPH concentrations in surface water were below the laboratory detection limits and the applicable NS Tier I EQS.

3.2 Sediment Quality

Sediment analytical results are presented in Tables D-4 and D-5, Appendix D and are summarized in the sections below. Laboratory Certificates of Analysis are provided in Appendix E. Sediment sample locations are presented on Figure 4, appended.

3.2.1 Metals

A total of six (6) sediment samples (i.e., SED1 to SED5), including one field duplicate (i.e., SED-DUPA), were submitted for metals analysis. Metals concentrations in sediment were generally either below laboratory detection limits or within the applicable NS Tier I EQS, with the following exceptions:

- Arsenic concentrations, ranging from 1,440 mg/kg to 5,640 mg/kg exceeded the Tier I EQS of 17 mg/kg at each sampling location.
- The iron concentration of 58,000 mg/kg at SED4 exceeded the Tier I EQS of 43,466 mg/kg.
- The lead concentrations of 124 mg/kg in the field duplicate sample of SED3 and 110 mg/kg in SED4, respectively, exceeded the Tier I EQS of 91.3 mg/kg. It is noted that SED3 lead concentration in the primary sample was below the Tier I EQS.
- Manganese concentrations ranging from 1,210 mg/kg to 6,270 mg/kg in each of the analyzed sediment samples, with the exception of SED2, exceeded the Tier I EQS.
- Mercury concentrations ranging from 0.616 mg/kg to 3.21 mg/kg exceeded the Tier I EQS of 0.486 mg/kg in SED1, SED2, and the duplicate sample of SED3. It is noted that the SED3 mercury concentration in the primary sample was below the Tier 1 EQS.

It is noted that the highest arsenic and mercury concentrations were reported at the SED2 location.

3.2.2 BTEX and Petroleum Hydrocarbons

A total of six (6) sediment samples, including one field duplicate (i.e., SED DUP-A), were submitted for petroleum hydrocarbon analysis. Due to high rock content, only BTEX and C6-C10 analysis could be completed by the laboratory. The BTEX and C6-C10 concentrations were below laboratory detection limits and below the Tier I EQS.

3.3 Soil Quality

Soil analytical results are presented in Tables D-6 through D-8, Appendix D and are summarized in the sections below. Laboratory Certificates of Analysis are provided in Appendix E. Soil sample locations are presented on Figure 5, appended.

3.3.1 Soil Stratigraphy

As noted previously, soil stratigraphy varies considerably across the site. For clarity purposes, site stratigraphy has been grouped into areas of the site that had previously served similar purposes when the site was operating as a mining and/or milling facility and is provided in Section 1.3.

As noted above, two grain-size samples were collected in different areas of the site and the results indicated one (1) sample was classified as fine-grained and one (1) sample was classified as coarse-grained. As such, the Nova Scotia Tier I EQS for both fine and coarse-grained soils have been included in Tables D-6 through D9 (appended in Appendix D).

3.3.2 Metals

Sixty-four (64) soil samples, including five (5) field duplicate samples (i.e., BH DUPA, BH DUPB, BH DUPC, BH DUPD, and BH DUP E), were submitted for metals analysis. Three (3) additional soil samples were also submitted for background metals analysis (i.e., BH1 (0-0.15 m), BH2 (0-0.15 m) and 24MW-01 SS5 (2.4-3.0 m)).

Metals exceeded the applicable NS Tier I EQS for at least one (1) parameter in each of the sixty-four (64) analyzed samples. When compared to background concentrations, sixty-four (64) samples still exceed; however, the number of parameters exceeding at each location is reduced. Notable, widespread exceedances are summarized below:

- Aluminum concentrations, with exceedances ranging from 15,500 mg/kg to 36,500 mg/kg (the highest concentration at BH56 0-0.15 m), exceeded the applicable NS Tier I EQS (15,400 mg/kg) in thirty-one (31) of the analyzed samples (including two (2) field duplicates). When compared to background (i.e., Max BTV 28,000 mg/kg), exceedances remain at nine (9) locations (i.e., BH11 (0.90 m), BH24 (0-0.15 m), BH27 (0.45 m), BH29 (0-0.15 m and 0.35 m), BH30 (0-0.15 m), BH31 (0-0.15 m and 0.50 m), and BH56 (0-0.15 m)).
- Arsenic concentrations, with exceedances ranging from 46.3 mg/kg to 7,170 mg/kg (the highest concentration at BH7 0-0.15 m) exceeded the applicable NS Tier I EQS (10 mg/kg) in each of the analyzed samples. When compared to background (i.e., Max BTV 1,490 mg/kg), twenty (20) (including one duplicate sample) of the sixty-four (64) analyzed samples still exceed.
- Beryllium concentrations, with exceedances ranging from 1.03 mg/kg to 4.16 mg/kg (the highest concentration at BH6 0-0.15 m), exceeded the applicable NS Tier I EQS and background (Max BTV) of 1 mg/kg in twenty-two (22) (including three (3) duplicate samples) of the analyzed samples.
- Iron concentrations, with exceedances ranging from 13,200 mg/kg to 112,000 mg/kg (the highest concentration at BH18 0-0.15 m) exceeded the applicable NS Tier I EQS of 11,000 mg/kg in fifty-five (55) samples (including four (4) duplicate samples). When compared to background (i.e., Max BTV 52,000 mg/kg), exceedances remain at seven (7) locations (i.e., BH9 (0-0.15 m), BH18 (0-0.15 m), BH27 (0.45 m), BH29 (0-0.15 m and 0.35 m) and BH31 (0-0.15 m and 0.50 m)).
- Lead concentrations, with exceedances ranging from 127 mg/kg to 1,360 mg/kg (the highest concentration at BH15 0-0.15 m) exceeded the applicable NS Tier I EQS of 120 mg/kg in twenty-seven (27) of the analyzed samples (three (3) of which were duplicate samples, noting that one of three (3) had a parent sample that did not exceed the comparison criteria for lead). The same samples exceed the background (Max BTV) value of 84 mg/kg.

- Forty (40) soil samples (including four (4) duplicate samples) exceeded the Tier I EQS for manganese of 360 mg/kg; however, when compared to background (i.e., Max BTV 4,340 mg/kg), one exceedance at one location remains (i.e., BH28 0-0.15m).
- Selenium concentrations, with exceedances ranging from 1.02 mg/kg to 8.28 mg/kg (the highest concentration at BH30 0-0.15 m), exceeded the applicable NS Tier I EQS of 1 mg/kg in twenty-one (21) (including two (2) duplicate) soil samples. When compared to background (i.e., Max BTV 1.4 mg/kg), seventeen (17) exceedances remain.
- Vanadium concentrations in seventeen (17) samples (including one (1) duplicate), with exceedances ranging from 39.5 mg/kg to 72.6 mg/kg (the highest concentration at BH29 0.35 m), exceeded the applicable NS Tier I EQS of 39 mg/kg. When compared to background (i.e., Max BTV 110 mg/kg), no exceedances remain.
- Zinc concentrations in ten (10) samples (including one (1) duplicate), with exceedances ranging from 201 mg/kg to 531 mg/kg (the highest concentration at BH23 0-0.15 m), exceeded the applicable NS Tier I EQS of 200 mg/kg. When compared to background (i.e., Max BTV 270 mg/kg), exceedances remain at four (4) locations (i.e., BH23 (0-0.15 m) and its field duplicate BH DupC (0-0.15 m), and BH31 (0-0.15 m and 0.50 m)).

Although not widespread, it is important to note that mercury exceeded the applicable NS Tier I EQS at seven locations (i.e., BH14 (0-0.15 m), BH15 (0-0.15 m and 0.50 m), BH20 (0-0.15 m), BH21 (0-0.15 m) and the field duplicate BH DupD collected at BH21 (0-0.15 m), BH54 (0-0.15 m)), with concentrations ranging from 28.1 mg/kg (at BH14) to 2,920 mg/kg (at BH15). Each of these locations are in the central portion of the study area (APECs 2, 3 and 4).

Other Tier I EQS exceedances included: antimony (six (6) samples including one (1) field duplicate), cadmium (eight (8) samples including one (1) field duplicate), molybdenum (one (1) sample), and thallium (three (3) samples).

For metals that exceeded both the Tier I EQS and background, and are most likely associated with mining activities and/or sulphide bearing rock, the following are noted:

- The highest arsenic concentration was reported at BH7 (0-0.15 m), with the deeper sample at this location (0.50 m) also exceeding.
- The highest iron concentration was reported at BH18 (0-0.15 m), with the deeper sample at this location (1.0 m) also exceeding the Tier 1 EQS, but below background.
- The highest lead and mercury concentrations were reported at BH15 (0-0.15 m), with the deeper sample at this location (0.50 m) below the comparison criteria for lead, and the mercury concentration, while still exceeding, significantly lower.
- The highest zinc concentration was reported at BH23 (0-0.15 m), with the zinc concentration in the deeper sample (0.95 m) at this location exceeding the Tier I EQS, but below background.

Metals impacts in soil are not laterally delineated. Vertically soil impacts are delineated by the presence of bedrock, which ranged from 0.53 mbgs (APEC #1) to 1.37 mbgs (APEC #2)[3].

3.3.3 Petroleum Hydrocarbons

A total of twenty-six (26) soil samples (i.e., including two (2) field duplicates) were submitted for petroleum hydrocarbon analysis (i.e., initial analysis was Atlantic RBCA, with subsequent CCME Petroleum Hydrocarbon Fraction F4 requested when results did not return to baseline). Findings indicate that BTEX concentrations were below laboratory detection limits and/or below the Tier I EQS in twenty-four (24) of the analyzed samples. The ethylbenzene concentration of 0.079 mg/kg at BH17 (0-0.15 m) exceeded the Tier I EQS of 0.043 mg/kg (for coarse-grained conditions, which are most applicable at this location based on field observations). The detected ethylbenzene concentration of 0.044 mg/kg in sample BH19 (0-0.15 m) is considered to be analytically equivalent to the Tier I EQS of 0.043 mg/kg. The modified TPH results for soil were below the Tier I EQS. Of note, where modified TPH was reported, the most relevant criteria for comparison was lube oil and, in each instance, the sample did not return to baseline. When results did not return to baseline and F4 analysis was requested, the reported values were compared to the relevant CCME Canada Wide Standards for Petroleum Hydrocarbons in Soil and found to be below these values.

It is noted that the Tier I EQS for ethylbenzene in soil is based on the leaching to potable groundwater pathway; however, no PHCs were detected in the groundwater samples collected from on-site monitoring wells.

3.3.4 Polycyclic Aromatic Hydrocarbons

A total of twenty-eight (28) soil samples (including two (2) field duplicate samples), were submitted for PAH analysis. Findings indicate that PAH concentrations were below the Tier 1 EQS in the analyzed samples.

There were no exceedances of the Benzo(a)pyrene Total Potency Equivalents (B(a)P), which is the sum of estimated cancer potency relative to B(a)P for all potentially carcinogenic unsubstituted PAHs.

The Index of Additive Cancer Risk (IACR) assesses potential threats to potable groundwater from leaching of carcinogenic PAH mixtures from soil. There is no Tier I EQS for IACR as NSECC deemed that specific provincial standards were not warranted in instances where appropriate guidelines were available from the CCME or other Canadian and international jurisdictions. Therefore, for comparison purposes, the CCME IACR of 1 mg/kg was used. In comparison to the CCME criteria, twelve (12) samples exceed the IACR suggesting the potential to leach to groundwater. However, results for the groundwater samples collected from on-site monitor wells did not exceed the Tier I EQS, with the

[3] Note bedrock was not encountered in APEC #3 or #4; however, is assumed to be present at similar depths to those observed in APEC #1 and #2.

majority of the PAH parameters below the laboratory detection limits. Therefore, the potential for PAHs to leach to the groundwater on-site is considered low. It is further noted that no potable wells are located on-site.

3.3.5 Energetics

A total of five (5) soil samples were submitted for energetics analysis. Energetics were not detected in any of the analyzed soil samples and, therefore, did not exceed the Health Canada Draft Guideline Screening Values and Interim Toxicological Reference Values (TRVs) for Energetic Chemicals.

3.4 Groundwater Quality

Groundwater analytical results are presented in Table D-10 through D-12, Appendix D and are summarized in the sections below. Laboratory Certificates of Analysis are provided in Appendix E. Monitor well locations and groundwater contours are presented on Figure 6, appended.

3.4.1 Groundwater Elevations

Groundwater was encountered during the January 18-20, 2024 sampling event at depths ranging from 0.62 meters below top of casing (mbtoc) (i.e., in 24MW-05) to 2.78 mbtoc (i.e., in 24MW-04). Based on the measured groundwater elevations, the generalized groundwater flow direction in the assessment area is interpreted to be to the south towards Country Harbour River. Non-aqueous phase liquids (NAPL) were not measured or observed in on-site monitoring wells during the groundwater monitoring event.

Table 2: Groundwater Elevations

Monitoring Well ID	Ground Surface Elevation (mASL)	Top of PVC Casing Elevation (mASL)	Depth to Groundwater (mbtoc)	Groundwater Elevation (mASL)
24MW-01	122.059	122.433	1.25	121.18
24MW-02	57.292	57.837	2.45	55.39
24MW-03	42.729	43.338	1.93	41.41
24MW-04	65.839	66.326	2.78	63.55
24MW-05	70.214	70.620	0.62	70.00

Notes:

1. mbtoc – meters below top of casing
2. masl – meters above sea level
3. The Trimble survey unit uses survey grade GPS with vertical and horizontal accuracy of less then 10 cm based on the active control network coordinates system - 6 degree UTM CSRS 1997 vertical datum (UTM NAD 83, Zone 20).
4. The monitoring wells were surveyed on January 20, 2024.
5. Water levels were collected from 24MW-02 on January 18, 2024; from 24MW-01 and 24MW-05 on January 19, 2024; and from 24MW-03 and 24MW-04 on January 20, 2024.

Groundwater contours have been prepared based on survey and groundwater monitoring data and are presented in Figure 6 (appended).

3.4.2 Metals

A total of six (6) groundwater samples, including one field duplicate, were submitted for dissolved metals analysis, which included dissolved sulphur and dissolved mercury, for each of the analyzed samples. Metals concentrations in groundwater were generally either below laboratory detection limits or within the applicable NS Tier I EQS, with some exceptions:

- The aluminum concentration of 0.167 ug/L at 24MW-02 marginally exceeded the Tier I EQS of 0.1 mg/L. However, the Tier 1 EQS (0.1 mg/L) is based on the Health Canada Canadian Drinking Water Quality Guideline for aluminum, which is an operational guidance value related to the use of aluminum-based coagulants at water treatment plants. Therefore, this guideline is not applicable to monitoring wells. It is noted that the turbidity in this well was high (109 NTU), and that the presence of turbidity in a sample can lead to higher metals concentrations being reported, as metals tend to adhere to sediment within a sample.
- Arsenic concentrations ranging from 0.0272 mg/L to 0.0422 mg/L in monitoring wells 24MW-02, 24MW-03 and 24MW-05, exceeded the Tier I EQS of 0.01 mg/L. As noted above, the turbidity was high in 24MW-02 and in 24MW-05 (35 NTU), which may have biased the metals results high.
- Cobalt concentrations in two monitoring wells ranging from 0.00449 mg/L (in 24MW-01 and its field duplicate) to 0.00650 mg/L (in 24MW-05) exceeded the applicable NS Tier I EQS (0.0038 mg/L), noting turbidity may have elevated the reported concentrations.
- Iron concentrations in two monitoring wells ranging from 0.509 mg/L (in 24MW-05) to 3.84 mg/L (in 24MW-01 and its field duplicate) exceeded the applicable NS Tier I EQS (0.3 mg/L), noting turbidity may have elevated the reported concentrations.
- Manganese concentrations ranging from 0.190 mg/L to 0.556 mg/L, in monitoring wells 24MW-01 and its field duplicate, 24MW-03, and 24MW-05 exceeded the applicable NS Tier I EQS (0.12 mg/L), noting that turbidity may have elevated the reported concentrations at some locations.

Mercury was not detected in the groundwater samples, with the exception of two wells (MW24-04 and MW24-05). When detected, mercury concentrations were low and well below the Tier I EQS.

Dissolved sulphur concentrations ranged from 0.6 mg/L (in 24MW-01 and its field duplicate) to 1.04 mg/L (in MW24-05). There is no Tier 1 EQS for sulphur.

As noted above, turbidity in the newly installed monitoring wells was generally elevated (particularly at 24MW-02 and 24MW-05). Elevated turbidity has the potential to bias the dissolved phase analytical results, as targeted substances present within or sorbed to soil particles may be released during sample preparation/analysis, resulting in an artificially high measurement.

3.4.3 Petroleum Hydrocarbons

A total of six (6) groundwater samples, including one (1) field duplicate, were submitted for analysis of PHCs including BTEX and Modified TPH. Petroleum hydrocarbon concentrations were below laboratory detection limits, as well as the applicable NS Tier I EQS, and as a result bore no hydrocarbon resemblance.

3.4.4 Polycyclic Aromatic Hydrocarbons

A total of six (6) groundwater samples, including one (1) field duplicate, were submitted for analysis of PAHs. PAH concentrations were below laboratory detection limits in the majority of the analyzed samples, with each sample below the applicable NS Tier I EQS.

In 24MW-02, detections of 1-Methylnaphthalene, 2-Methynaphthalene and naphthalene were reported; however, the concentrations were well below the Tier I EQS. In 24-MW-04, detections of fluoranthene and phenanthrene were reported, noting there are no Tier I EQS for these parameters.

There were no exceedances of the Benzo(a)pyrene Total Potency Equivalents (B(a)P), which is the sum of estimated cancer potency relative to B(a)P for all potentially carcinogenic unsubstituted PAHs.

3.5 Quality Assurance and Quality Control

A program to ensure quality assurance and control (QA/QC) was implemented throughout the Phase II ESA. The QA/QC program consisted of a number of elements:

- Collection of samples using protocols consistent with Dillon Standard Environmental Field Procedures and/or industry standards.
- Use of dedicated sampling equipment and/or adherence to established equipment cleaning protocols, where applicable.
- Use of laboratory supplied containers.
- Collection of blind field duplicates.
- Implementation of laboratory QA/QC procedures including analysis of reference standards, laboratory blanks and replicates.

Validation criteria were established that required the analytical data to have an acceptable and documented level of precision, accuracy, representativeness, comparability and completeness (the PARCC criteria). The precision of the data for the samples collected was evaluated by calculating the Relative Percent Difference (RPD) between the original samples and its duplicate when the samples had concentrations greater than 5x the laboratory Reportable Detection Limit (RDL). A summary of the PARCC criteria comparison and calculated RPD values are presented below.

Laboratory QA/QC was performed on the following samples:

- Surface water samples SW3 and SW4 and their field duplicates, SW DUP A and SW DUP B.
- Sediment sample SED3 and its field duplicate SED-DUPA.
- Soil samples BH6, BH11, BH21, BH23, and BH61 and their corresponding field duplicates DUPA, DUPB, DUPD, DUPC, and DUP E, respectively.
- Groundwater sample 24MW-01 and its field duplicate 24MW-Dup A.

In order to assess the precision and accuracy of the laboratory results, the relative percent difference (RPD) was calculated for each parameter, where acceptable limits for field duplicate RPD in sediment and soil is 60%, and for surface water and groundwater it is 40%. RPD values were not calculated for parameters that had concentrations that were less than five (5) times the MDL. Calculated RPD values are presented in Tables D-13 through Table D-16 (see Appendix D) for soil, groundwater, and sediment, respectively. A summary of RPD results, where calculated, is presented below:

- RPDs for surface water were below 40% for each parameter where they were calculated.
- RPDs for sediment were generally below 60% for each parameter where they were calculated, with some exceptions. The RPDs calculated for arsenic, barium, and mercury had RDLs of 112%, 77% and 65%, respectively.
- RPDs for soil were generally below 60% for each parameter where they were calculated, with some exceptions:
    - BH11 – BH DUP B: The calculated RPDs were 63% for benzo(b+j)fluoranthene, 78% for fluoranthene, and 76% for pyrene.
    - BH23 – BH DUP C: The calculated RPDs were 66% for cadmium and 194% for mercury.
    - BH21 – BH DUP D: The calculated RPDs were 71% for antimony and 64% for tin.
- Calculated RPDs for groundwater were well below 40%.

Elevated RPD values for sediment and soil may also be attributed to the heterogeneity of sediment/soil, and of waste rock piles, laydown areas, and infrastructure areas.

A trip blank was also submitted for analysis of petroleum hydrocarbons (i.e., BTEX and modified TPH). An equipment blank was submitted for analysis of general chemistry, metals, petroleum hydrocarbons (i.e., BTEX and modified TPH) and PAHs.

Trip blank concentrations for analyzed parameters were below laboratory detection limits and NS Tier I EQS. There were no detections of general chemistry parameters, with minor metal detections (potassium, silicon and uranium) observed in the equipment blank; however, detected concentrations were well below the applicable NS Tier I EQS. The equipment blank concentrations for petroleum hydrocarbons (i.e., BTEX and modified TPH) and PAHs were below laboratory detection limits and the applicable NS Tier I EQS.

Analytical results for the trip blank and equipment blank samples are presented in Tables D-17 through Table D-19, Appendix D. Laboratory certificates of analysis are presented in Appendix E.

4.0 Phase II Conceptual Site Model

4.1 Description of Contaminants

Surface water concentrations of metals (i.e., aluminum, arsenic, iron, lead, and/or zinc) have been detected above Tier I EQS based on samples collected on-site from Johnston Brook.

Sediment concentrations of metals (i.e., arsenic, iron, lead, manganese, and/or mercury) have been detected above Tier I EQS based on samples collected on-site from Johnston Brook.

Soil concentrations of metals (i.e., aluminum, arsenic, beryllium, iron, lead, manganese, selenium, vanadium, and/or zinc) have been detected above Tier I EQS based on soil samples collected from surface and boreholes at the site. Some of these metals may be attributed to natural background concentrations of till and underlying bedrock. Ethylbenzene in soil at one location (i.e., BH17 (0-0.15 m) exceeded the Tier I EQS. In comparison to the CCME IACR criteria of 1 mg/kg, twelve (12) samples exceed the IACR suggesting the potential to leach to groundwater.

Groundwater concentrations of metals (i.e., arsenic, cobalt, iron, and manganese) have been detected above the Tier I EQS based on groundwater samples collected from monitoring wells located at the site. As noted above, the guideline for aluminum is not considered to be relevant for monitoring wells.

4.2 Receptors

The site is zoned for commercial land use, and neighbouring properties are zoned for residential and commercial land use. The site is currently vacant with no buildings present. Potential receptors for this pathway include workers (should intrusive work be conducted on-site) who may come in contact with metals soil in the subsurface or potential recreational users (on-site).

No potable wells are currently located on site; however, the surrounding properties are serviced by individual potable wells with nearest residential building located approximately 50 m south and down gradient of the south site boundary.

A water pipe is present on-site in Johnsons Brook (near 24MW-03) that reportedly may be accessed by a local property owner, possibly for drinking water. This is unconfirmed.

The closest ecological receptor is Johnston Brook, which intersects the site and flows south to Country Harbour River, which located approximately 250 m south, and downgradient, of the site. Johnston Brook is identified as an ecological habitat of potential concern as it intersects the site.

4.3 Operable Pathways

4.3.1 Surface Water

Results of the Phase II ESA activities conducted for the site indicate that the documented residual metals impacts (i.e., aluminum, arsenic, iron, lead, and/or zinc) pose a potential unacceptable risk to commercial receptors via surface water based on the applicable pathway specific standards (PSS). As noted previously, Johnston Brook intersects the site, therefore this pathway would be considered operable.

4.3.2 Sediment

Results of the Phase II ESA activities conducted for the site indicate that the documented residual metals impacts (i.e., arsenic, iron, lead, manganese, and/or mercury) pose a potential unacceptable risk to commercial receptors via freshwater sediment based on the applicable PSS.

4.3.3 Soil

Results of the Phase II ESA activities conducted for the site indicate that the documented residual metals impacts (i.e., aluminum, arsenic, iron, lead, manganese, and vanadium (noting when screened against background, no vanadium exceedances remain)) pose a potential unacceptable risk to commercial receptors via soil ingestion or direct contact based on the applicable PSS. The site is currently vacant and on-site buildings have been removed; however, the site is not secure and as a result the pathway of soil ingestion or direct contact is operable.

Documented residual metals impacts (i.e., arsenic, beryllium, lead, manganese, selenium, and zinc) also pose a potential unacceptable risk to commercial receptors via soil leaching to potable groundwater based on the applicable PSS. No potable wells are present on-site; therefore this pathway is not operable. If there were to be a potable well installed on-site in the future, this pathway would be considered operable. It is further noted that the majority of the above noted metals impacts were not present in groundwater at concentrations above the Tier I EQS (the exception being arsenic and manganese).

Ethylbenzene in soil (at one location) exceeded the Tier I EQS, which is based on the leaching to potable groundwater pathway; however, no PHCs were detected in the groundwater samples collected from on-site monitoring wells. The concentration of ethylbenzene was well below the applicable soil contact/ ingestion PSS.

Twelve soil (12) samples exceed the CCME IACR, suggesting the potential for PAHs in soil to leach to groundwater. However, the PAH results for the groundwater samples collected from on-site monitor wells did not exceed the Tier I EQS, with the majority of the PAH parameters below the laboratory detection limits. Therefore, the potential for PAHs to leach to the groundwater on-site is considered low. It is further noted that no potable wells are located on-site, making this pathway inoperable.

4.3.4 Groundwater

Results of the Phase II ESA activities conducted for the site indicate that the documented residual metals impacts (i.e., arsenic, cobalt, iron, and manganese) pose an unacceptable risk to commercial receptors via potable groundwater as drinking water based on the applicable PSS. As noted previously, no potable wells are present on-site, therefore this pathway is not operable. If there were to be a potable well installed on-site in the future, this pathway would be considered operable.

A water pipe is present on-site in Johnsons Brook (near 24MW-03) that reportedly may be accessed by a local property owner, possibly for drinking water. This is unconfirmed and should be investigated. Groundwater at 24MW-03 contained arsenic and manganese. Also in the vicinity is SW1, which exhibited the best water quality overall (i.e., less parameter exceedances compared to the other surface water samples collected from Johnston Brook). If this water pipe is being used by a local resident(s), a sign could be posted advising against its use as a potable water source.

5.0 Summary and Conclusions

The Phase II ESA included drilling, with monitoring well installation; shallow test holes; and soil, groundwater, surface water and sediment sampling. Media analysis included: general chemistry (water only), metals (including sulphur and mercury), PHCs, and PAHs. Based on the measured groundwater elevations, the generalized groundwater flow direction in the assessment area is interpreted to be southerly towards Country Harbour River. For comparison to the NS CSRs, the site is considered to be commercial, potable with both fine and coarse-grained soil conditions. Findings of the Phase II ESA are as follows:

- Based on the analytical results, the surface water samples collected from Johnston Brook had metal concentrations (i.e., aluminum, arsenic, iron, lead and/or zinc) that exceed the NS Tier I EQS for surface water at each sample location. In addition, lab pH was low at each location. There were no other metals exceedances, nor exceedances for other COPCs (i.e., BTEX, modified TPH or PAHs) reported for the analyzed surface water samples.

- Based on the analytical results, metals concentrations in sediment were generally either below laboratory detection limits, or within the applicable NS Tier I EQS, with the exception of arsenic, iron, lead, manganese and/or mercury. Iron and manganese concentrations were generally of similar magnitude in each of the sediment samples. The highest arsenic and mercury concentrations were reported at SED2. No BTEX or C6-C10 detections were reported for sediment. Although PAH analysis could not be completed due to the stream substrate composition, PAH exceedances were not reported in surface water, or in nearby soil samples, therefore, PAHs are not expected to be a concern in the sediment.
- Sixty-four (64) soil samples (including 5 field duplicate samples) were submitted for metals analysis, including sulphur and mercury. Metals exceedances in soil above the NS CSR Tier I EQS (for a commercial, potable site with both coarse and fine-grained soils), and above the EC Background Soil Database concentrations (Dillon, 2011) and/or local on-site background concentrations (Dillon, 2022-2023) are present across the site assessment area (i.e., the areas of former mining operations). Notable, widespread exceedances, when looking at the overall data set in comparison to both the Tier I EQS and background, include arsenic, beryllium, iron, lead, and selenium. Although not widespread, mercury exceeded the applicable NS Tier I EQS at four locations, and each of these locations are in the central portion of the study area (at or between MW4 and MW5). The highest arsenic was reported at BH7, highest iron at BH18, highest lead and mercury at BH15, and highest zinc at BH23. One manganese concentration also exceeded both the Tier I EQS and background (i.e., BH28 0-0.15m). Metals impacts in soil are not delineated laterally. Vertically soil impacts are delineated by the presence of bedrock, which ranged from 0.53 mbgs (APEC #1) to 1.37 mbgs (APEC #2) in the area of former mining operations.
- Ethylbenzene in soil exceeded the Tier I EQS at BH17 (0-0.15 m), which advanced in an area of refuse (e.g., household waste, plastic and metal (including a drum and lawnmower)) underlain by waste rock. As no other petroleum exceedances were identified on-site, this exceedance is expected to be localized.
- Dissolved metals concentrations in groundwater were generally either below laboratory detection limits or within the applicable NS Tier I EQS, with some exceptions (i.e., arsenic, cobalt, iron, and manganese). It is noted that the turbidity in some of the newly installed monitoring wells was high (up to 109 NTU), and that the presence of turbidity in a sample can lead to higher metals concentrations being reported, as metals tend to adhere to sediment within a sample.

5.1 Notification of Contamination Protocol

As per the NS CSRs, a FRM-100 Notification of Contamination Form has been prepared for the site (Appendix F).

5.2 Discussion and Recommendations

The site is generally covered with rock and heavy vegetation. Key aspects about the site in considering potential remedies are as follows:

- The site is to remain commercial use.
- The site consists principally of coarse-grained soil (based on visual observations) and is categorized as potable; however, there are no on-site potable water supplies, and none are envisioned in the future [the reported use of a water pipe on Johnsons Brook should be investigated and sign posted as noted above].

Following the initial Phase I/II Environmental Site Assessment work, Dillon completed a qualitative risk review of the site to identify relevant CoCs, media, pathways, receptors and potential risk (see Appendix G).

At this stage of the assessment, we recommend the following supplemental studies be undertaken to better refine this liability estimate:

- Obtain supplemental soil background data.
- Obtain supplemental surface soil data to establish lateral delineation of metals impacts in soil.
- Complete additional surface water and possible sediment sampling (depending on the substrate encountered) to establish background conditions in these media.
- Complete confirmatory groundwater sampling events in the spring and fall (under high and low flow conditions).
- Complete a Human Health and Ecological Risk Assessment (HHERA).

6.0 Limitations

This report was prepared exclusively for the purposes, project and site location(s) outlined in the report. The report is based on information provided to or obtained by Dillon Consulting Limited ("Dillon") as indicated in the report and applies solely to site conditions existing at the time of the site investigation(s). Although a reasonable investigation was conducted by Dillon, Dillon's investigation was by no means exhaustive and cannot be construed as a certification of the absence of any contaminants from the site(s). Rather, Dillon's report represents a reasonable review of available information within an agreed work scope, schedule and budget. It is therefore possible that currently unrecognized contamination or potentially hazardous materials may exist at the site(s), and that the levels of contamination or hazardous materials may vary across the site(s). Further review and updating of the report may be required as local and site conditions, and the regulatory and planning frameworks, change over time.

This report was prepared by Dillon for the sole benefit of our client Build Nova Scotia. The material in the report reflects Dillon's judgment in light of the information available to Dillon at the time of preparation. Any use which a third party (i.e., a party other than our Client or our Client's lending institution) makes of this report, or any reliance on or decisions made based on it, are the responsibilities of such third parties. Dillon accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

Respectfully Submitted,

DILLON CONSULTING LIMITED

Nadine Wambolt, B.Tech, CET
Project Manager

Beverley Smith, P.Geo.
Site Professional

Figures

BUILD NOVA SCOTIA

Former Country Harbour Mine Site Phase II Environmental Site Assessment

Subject Parcels

PROJECT LOCATION

FIGURE 1

DILLON CONSULTING

MAP DRAWING INFORMATION:
DATA PROVIDED BY: GeoNova, ESRI, Build NS

MAP CREATED BY: SCM
MAP CHECKED BY: NJW
MAP PROJECTION: NAD 1983 UTM Zone 20N

N W E S

SCALE 1:30,000

0 200 400 800 m

PROJECT: 236465
STATUS: FINAL
DATE: 2024-03-19

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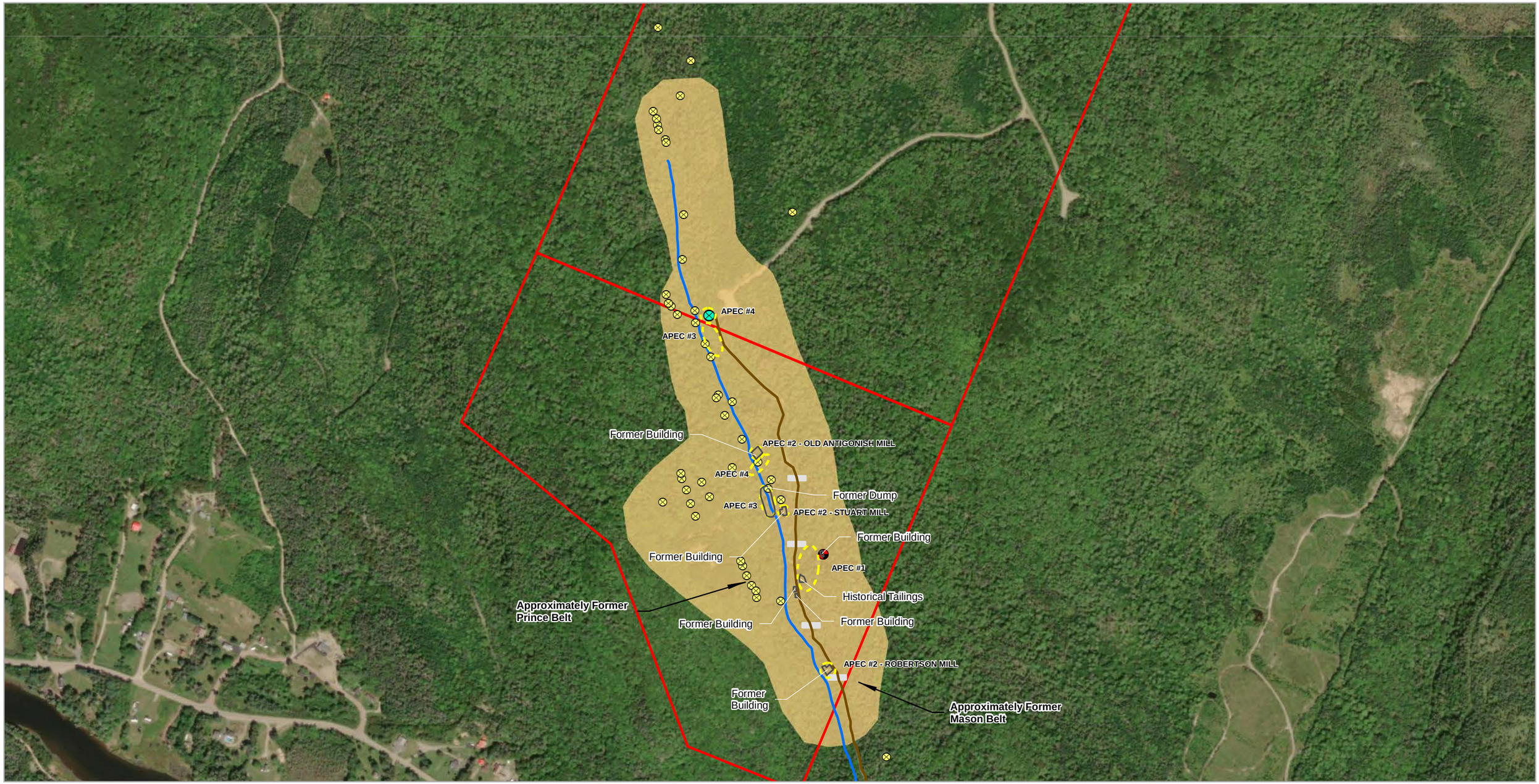

BUILD NOVA SCOTIA
FORMER COUNTRY HARBOUR
PHASE II ENVIRONMENTAL SITE ASSESSMENT

IDENTIFIED APECS

FIGURE 2

APEC
John Fenton Loop Road
Known Abandoned Mine Opening (NSDNRR)
Johnston Brook
Drum
Cross Culvert
Open Pit/Trench or Mine Opening (Field Identified)
Subject Parcel
Assessment Area
Historical Feature

DILLON CONSULTING

MAP DRAWING INFORMATION:
DATA PROVIDED BY GeoNova, NSDNRR

MAP CREATED BY: SCM
MAP CHECKED BY: BT
MAP PROJECTION: NAD 1983 UTM Zone 20N

0 50 100 200 Metres
SCALE 1:6,500

N W E S

PROJECT: 23-6465 STATUS: FINAL Date: 2024-03-25

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BH36
BH36
BH46
BH42
BH29
BH61
BH35
BH32
BH30
BH31
BH45
BH47
BH1(Background)
BH2(Background)
24MW-01 (Background)
SWSED5
SWSED3
BH4
BH39
BH3
BH6
BH5
BH57
24MW-02
BH8
BH43
BH7
BH44
SWSED2
BH38
BH49
BH19
BH17
BH18
BH20
BH21
24MW-05
BH22
BH33
BH59
BH40
BH48
BH34
BH58
BH23
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BH25
BH26
BH13
BH15
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BH27
BH14
BH51
BH28
BH16
BH50
24MW-05
SWSED4
24MW-04
SWSED3
24MW-02
SWSED2
24MW-03
SWSED1
BH56
BH52
BH10
BH9
BH55
24MW-03
BH12
BH11
BH53
BH54
SWSED1
BH37

BUILD NOVA SCOTIA
FORMER COUNTRY HARBOUR
PHASE II ENVIRONMENTAL SITE ASSESSMENT

SAMPLE LOCATIONS
FIGURE 3

Shallow Test Hole Sample

- Shallow Test Hole Sample Dillon 2023-2024
- Step Out Sample
- Energetics Sample

- Monitoring Well (January, 2024)
- Surface Water and Sediment Sample

- Watercourse
- Site Access
- Subject Parcel

DILLON CONSULTING

MAP DRAWING INFORMATION:
DATA PROVIDED BY GeoNova, NSDNRR

MAP CREATED BY: SCM
MAP CHECKED BY: NJW
MAP PROJECTION: NAD 1983 UTM Zone 20N

0 50 100 200 Metres
SCALE 1:1,000

N W E S

PROJECT:23-6465 STATUS: FINAL Date: 2024-03-19

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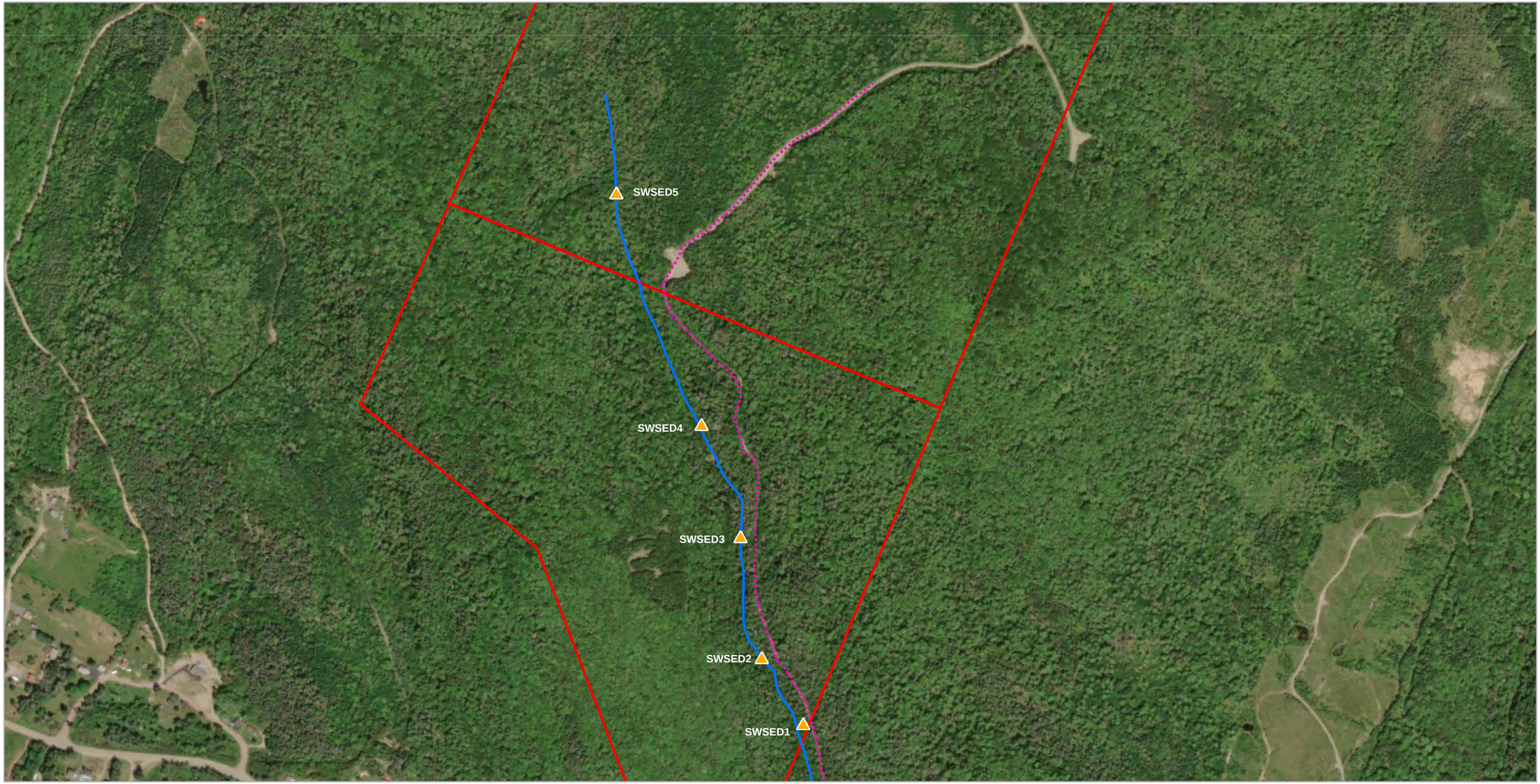

BUILD NOVA SCOTIA
FORMER COUNTRY HARBOUR
PHASE II ENVIRONMENTAL SITE ASSESSMENT

SURFACE WATER AND
SEDIMENT SAMPLE LOCATIONS
FIGURE 4

Build NOVA SCOTIA

Surface Water and Sediment Sample Location

Watercourse

Site Access Road

Subject Parcel

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MAP DRAWING INFORMATION:
DATA PROVIDED BY GeoNova, NSDNRR

MAP CREATED BY: SCM
MAP CHECKED BY: NJW
MAP PROJECTION: NAD 1983 UTM Zone 20N

0 50 100 200 Metres

SCALE 1:5,500

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PROJECT:23-6465 STATUS: FINAL Date: 2024-03-19

Document Path: \\dillon.ca\DILLON_DFS_projects\GIS\2023\236465\product\Client\Phase 2\F4_Surface Water and Sediment Sample Locations.mxd

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BH31
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BH19
BH17
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BH20
BH21
24MW-05
BH22
BH33
BH59
BH40
BH48
BH34
BH58
BH23
BH24
BH25
BH13
BH15
BH26
BH27
BH14
24MW-04
BH51
BH28
BH16
BH50
BH1(Background)
BH2(Background)
24MW-01 (Background)
24MW-05
24MW-04
24MW-02
24MW-03
SWSED3
BH4
BH39
BH3
BH6
BH5
BH57
24MW-02
BH8
BH43
BH7
BH44
SWSED2
BH38
BH56
BH52
BH10
BH9
BH55
24MW-03
BH12
BH11
BH53
BH54
SWSED1
BH37

BUILD NOVA SCOTIA
FORMER COUNTRY HARBOUR
PHASE II ENVIRONMENTAL SITE ASSESSMENT

METALS EXCEEDANCES IN SOIL
FIGURE 5

Build NOVA SCOTIA

Shallow Test Hole Sample

- Shallow Test Hole Sample Dillon 2023-2024
- Step Out Sample
- Energetics Sample

- Monitoring Well (January, 2024)
- Metals Exceedance of Tier I EQS and Background

- Watercourse
- Site Access
- Inferred Aerial Extent of Metals Impacts in Soil (100,000 m^2) *

- Subject Parcel

* Boundary not yet confirmed

DILLON CONSULTING

MAP DRAWING INFORMATION:
DATA PROVIDED BY GeoNova, NSDNRR

MAP CREATED BY: SCM
MAP CHECKED BY: NJW
MAP PROJECTION: NAD 1983 UTM Zone 20N

0 50 100 200 Metres

SCALE 1:6,648

PROJECT:23-6465 STATUS: FINAL Date: 2024-03-19

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BUILD NOVA SCOTIA

Former Country Harbour Mine Site
Phase II Environmental Site Assessment

Monitoring Well Location (Jan 2024)

Groundwater Elevation Contour

Groundwater Flow Direction

Subject Parcels

(41.4) - Groundwater Elevation (masl) (January 18-20, 2024)

GROUNDWATER ELEVATIONS

FIGURE 6

DILLON CONSULTING

MAP DRAWING INFORMATION:
DATA PROVIDED BY: GeoNova, ESRI, Build NS

MAP CREATED BY: SCM
MAP CHECKED BY: NJW
MAP PROJECTION: NAD 1983 UTM Zone 20N

N W E S

SCALE 1:5,000

0 25 50 100 m

PROJECT: 236465
STATUS: FINAL
DATE: 2024-03-19

FILE LOCATION: \\dillon.ca\DILLON_DFS_projects\GIS\2023\236465\product\Client\Phase 2\F6_GroundwaterElevations.mxd

Appendix A

Phase I Environmental Site Assessment

DILLON CONSULTING

BUILD NOVA SCOTIA

Phase I Environmental Site Assessment

Former Country Harbour Mine, Guysborough Country, Nova Scotia, Property Identification Designation Numbers: 35091354 and a Portion of 35094366 (Final Report)

March 2024 - 23-6465

March 27, 2024

Build Nova Scotia
P.O. Box 397, Station Central
Halifax/Kjipuktuk, Nova Scotia
B3J 2P8

Attention: Dan Khan, P.Eng.
Project Manager, Mine Site Reclamation
Strategic Infrastructure and Development Division

Phase I Environmental Site Assessment - Final
Former Country Harbour Mine Site, Country Harbour Mines, Guysborough County, Nova Scotia, Parcel Identification Designation Numbers (PID Nos.): 35091354 and a portion of 35094366

Dillon Consulting Limited is pleased to provide this Phase I Environmental Site Assessment (ESA) of the Former Country Harbour Mine Site located in Country Harbour Mines, Nova Scotia, and identified by PID No. 35091354 and a portion of PID No. 35094366.

Should you have any questions, please do not hesitate to contact us.

Sincerely,

DILLON CONSULTING LIMITED

Nadine Wambolt, B.Tech, CET.
Project Manager

BCT:NJW:jb
Enclosure

Our file: 236465

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D Special Attention Items Descriptions

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Executive Summary

Dillon Consulting Limited (Dillon) was commissioned by Build Nova Scotia (BNS) to complete a Phase I Environmental Site Assessment (ESA) of the Former Country Harbour Mine, located at PID No. 35091354 and a portion of PID No. 35094366, with the objective of assessing whether the site is or may be subject to actual or potential contamination.

The Phase I ESA was conducted in accordance with the Canadian Standard Association (CSA) Standard Z768-01 for Phase I ESAs (CSA, R2022) and included a records review, site visit, interview, and reporting of the findings.

Subject Property	
Site Identifier	PID No. 35091354 and a portion of PID No. 35094366
Property Owner	Her Majesty the Queen in Right of The Province of Nova Scotia, Nova Scotia Department of Natural Resources and Renewables
Site Name	Country Harbour Mine Site
Assessment Area (original)	42 hectares
Revised Assessment Area (area accessible during site visit)	27.2 hectares
Property Zoning	Provincial Forest/Undefined
Current Property Use	Vacant
Former Property Use	Gold mining, milling, and processing
Power Source	No known current on-site power services
Water Source	No known on-site water services; however, a pipe was observed on-site in Johnsons Brook, use unknown.
Located in Protected Wellfield or Watershed Area	Not located in a designated Wellfield/Watershed supply area; however, is located in the Country Harbour Primary Watershed area of Nova Scotia.
Wastewater	No known on-site wastewater services.

Based on the information gathered and observations made during this assessment, the Phase I ESA identified the following areas of potential environmental concern (APECs) and associated contaminants of potential concern (COCPs):

APEC No.	APEC Description	COPCs	Media of Concern	Comments
1	Tailings Area	Metals, General Chemistry*, Sulphur	Soil, GW, Sed, SW	One (1) historical waste tailings area with potentially sulphide bearing materials. Surface water discharge location in Johnston Brook, downstream of the cross-culverts along John Fenton Loop Road.
2	Stamp Milling Areas	Metals, General Chemistry*, Sulphur, PHCs, PAHs	Soil, GW, Sed, SW	Three (3) stamp milling areas where potentially sulphide bearing materials may have been processed. Processing of materials, heavy equipment storage, and petroleum storage. Surface water is directed to Johnston Brook.
3	Waste Rock Piles	Metals, General Chemistry*, Sulphur	Soil, GW, Sed, SW	Two (2) waste rock areas with potentially sulphide bearing slates, one (1) of which is located in Johnston Brook.
4	Domestic Waste Dumping Areas	Metals, PHCs, PAHs	Soil	Three (3) locations where domestic waste and discarded fuel drums were identified during the Phase I ESA site visit.
Assessment of Naturally Occurring Background Conditions				
Background Location		Metals, General Chemistry*, Sulphur, PHCs, PAHs	Soil, GW	Based on available topographic data and inferred groundwater flow direction, background conditions will be assessed at an upgradient location within the assessment boundary that is safely accessible.
Upstream Background Location		Metals, General Chemistry*, Sulphur, PHCs, PAHs	Sed, SW	Surface water and sediment conditions will be assessed at an upstream location within the assessment boundary that is safely accessible.

Notes:
1. *General chemistry analysis is only completed on water.
2. GW denotes groundwater, Sed denotes sediment, SW denotes surface water.
3. PHCs denotes petroleum hydrocarbons (i.e., benzene, toluene, ethylbenzene, and xylenes (BTEX), and modified TPH), PAHs denotes polycyclic aromatic hydrocarbons.
4. Metals analysis in all media to include analysis of mercury and sulphur.
5. Metals analysis of SW to include total metals, while analysis of GW to entail dissolved metals.
6. Inferred groundwater flow direction in the area is to the south.

Historical documents for the site identified the construction of a large storage magazine and a day magazine, as well as costing for explosives intended to be used at the site. The locations of these former magazines are unknown, although it is assumed that they would have been constructed some distance from other buildings and infrastructure previously on-site. Up to five (5) soil samples will be collected across the site in areas that are safely distanced from previous site building locations and analyzed for energetics (i.e., residual products of explosives including nitrotoluenes, glycerines, perchlorates, and bromate).

COPCs from the APECs above include metals (specifically arsenic, barium, lead, mercury, sulphur, and strontium), PHCs, PAHs, energetics, and perchlorates.

The statements made in this Executive Summary are subject to the same disclaimer presented in Section 7.0 and are to be read in conjunction with the remainder of this report.

1.0 Introduction

Dillon Consulting Limited (Dillon) was commissioned by Build Nova Scotia (BNS), on behalf of Nova Scotia Department of Natural Resources and Renewables (NSDNRR), to complete a Phase I Environmental Site Assessment (ESA) of the Former Country Harbour Mine (herein referred to as the "site") located in Country Harbour Mines, Nova Scotia, and identified by PID No. 35091354 and a portion of PID No. 35094366 (presented in Figure 1, attached).

1.1 Objective and Scope of Work

The objective of the Phase I ESA was to assess whether the site is or may be subject to actual or potential contamination. Contamination is defined as "the presence of a substance of concern, or a condition, in concentrations above appropriate pre-established criteria in soil, sediment, surface water, groundwater, air, or structures" (CSA, 2022).

To fulfill the objective of the Phase I ESA, the following scope of work was agreed to:

- Review of historical and current records that were reasonably attainable for the site and surrounding area;
- A site visit to observe the subject property and surrounding properties;
- Interviews of persons knowledgeable with respect to past and current uses of the site and/or adjoining properties; and
- Evaluation of the findings and reporting.

This Phase I ESA was performed following the Phase I ESA guideline document produced by the Canadian Standards Association (CSA Z768-01, R2022). As such, this report is based on review of available historical records, and requests for information filed with government or other regulatory agencies. This ESA did not include sample collection, analysis or measurements, and is not intended to be a definitive investigation of contamination or other environmental concerns at the site.

2.0 Background

The former Country Harbour Mine is located in County Harbour Mines, Guysborough County, Nova Scotia (presented in Figure 1, attached). The former mine property (PID No. 35091354 and a portion of PID No. 35094366) is owned by NSDNRR. The former mine consists of an area of approximately forty-two (42) hectares, with forty-six (46) known abandoned mine openings and one (1) reported tailings area. The site is accessed by John Fenton Loop Road via Highway 316.

Known mining operations are reported to have occurred at the site between 1871 and 1951. Mine workings were underground and included drifts and stopes, shafts access, and ramp accesses. Ore processing was reportedly completed by way of mercury amalgam.

Several mills operated at the site, including the Old Antigonish Mill, the Stuart Mill, and the Robertson Mill. Mapping from 1938 indicates that three (3) stamp mills operated along John Fenton Loop Road to the east and shows a tailings area. In addition to gold stamp mills, buildings and infrastructure were constructed to support mining operations at the site as shown on various mine plans produced during operations. A number of waste rock piles are present at the site.

The site has a number of abandoned mine openings that are classified as hazardous. The abandoned mine openings generally consist of flooded pits, shafts, trenches, and subsidence features. Fencing is and/or signage is used for protection around some of the openings.

3.0 Methodology

3.1 Records Review

The applicable search distance for the records review included properties immediately adjoining the site, and those identified by aerial photographs, historical records and regulatory requests to represent a potential environmental concern. Records reviewed for the subject property included the following:

- Aerial photographs (1939, 1948, 1954, 1970, 1979, and 2021) (noting that aerials were not available (via Environmental Risk Information Services (ERIS)) for the 1920s, 1960s, 1980s, or 1990s) (Appendix A);
- Google Earth satellite imagery (2003 and 2015) (Appendix A);
- Fire Insurance Mapping (none available via local archives (Beaton Institute, Guysborough Historical Society, and St. FX));
- City Directories (none available via local archives);
- Available historical reports/documents:
  - Google Earth kmz files detailing aerial imagery and site features; and
  - Historical documentation provided in the Request for Proposal (RFP) Number RFQ BNS-2324-0201 issued by BNS for the site on May 11, 2023, including mining inspection reports, site plans, correspondence, and other relevant documents.
- Provincial online property database for information regarding the subject and adjoining properties (Property Online GeoNova: https://novascotia.ca/sns/access/land/property-online.asp) (accessed July 2023); and
- Provincial regulatory requests for property-based environmental information (Nova Scotia Environment and Climate Change (NSECC) Environmental Registry Request and Freedom of Information and Protection of Privacy (FOIPOP) *Act*) (Appendix B).

A title search was not completed as part of the assessment. Information gathered during the records review is discussed in subsequent sections of the report. Although a FOIPOP request was submitted, NSECC review of these documents determined that they pertained to the portion of PID No. 35094366 outside of the assessment area and were not relevant to the site, and therefore were not received by Dillon.

3.2 Site Visit

On July 17 and 18, 2023, Jason Marsh, C.E.T., and Manpreet Kaur, B.Tech. of Dillon conducted a site visit. Weather conditions at the time of the visit were sunny (30°C). Activities conducted during the site visit included:

- Observation of infrastructure and surrounding land at the site (to the extent possible); and
- Observation of the properties adjoining to the site (to the extent possible) to assess use, as could be viewed from the subject property and adjoining public lands.

Photographs taken during the site visit are presented in Appendix C.

3.3 Interviews

Ernie Hennick, a planning technician with the NSDNRR, identified by BNS as a person to be knowledgeable about the site was interviewed by telephone on July 6, 2023. Information obtained through the interview has been incorporated in the following report sections.

4.0 Property Description

4.1 Subject Property Description

The site is located at PID No. 35091354 and a portion of PID No. 35094366 in Country Harbour Mines, Nova Scotia, as described in Table 1 and illustrated on Figures 1 and 2 attached.

Table 1: Summary of Property Information

Property Description	
Site Identifier	PID No. 35091354 and a portion of PID No. 35094366
Property Owner	Her Majesty the Queen in Right of The Province of Nova Scotia, Nova Scotia Department of Natural Resources and Renewables
Site Name	Country Harbour Mine Site
Assessment Area	42 hectares (ha)
Revised Assessment Area (area accessible during Phase I ESA site visit)	27.2 ha

Property Description	
Property Zoning	Provincial Forest
Current Property Use	Vacant
Former Property Use	Gold mining, milling, and processing
Power Source	No known current on-site power services
Water Source	No known on-site water services; however, a pipe was observed on-site in Johnsons Brook, use unknown.
Located in Protected Wellfield or Watershed Area	Not located in a designated Wellfield/Watershed supply area; however, is located in the Country Harbour Primary Watershed area of Nova Scotia.
Wastewater	No known on-site wastewater services.

4.1.1 Current On-Site Buildings and Structures

Based on a desktop review of available site information, interview information, and field observations made during the site visit, no known buildings are currently present at the site. Remnants of infrastructure foundations are present in some areas (i.e., Stuart Stamp Mill).

4.1.2 Adjoining and Neighbouring Properties

Based on the desktop review of historical records, current land use for the adjoining and neighbouring properties is presented in Table 2 and Figure 2.

Table 2: Adjoining and Neighbouring Properties – Current Land Use

Boundary of the Site	Distance from Subject Property	Current Land Use	Potential Environmental Concerns
North-northeast (portion of PID No. 35094366 extending northeast)	Adjoining*	Provincial Forest	None found
East (PID No. 35091404)	Adjoining	No designated land use listed	None found
South (PID Nos. 35031152, 35031186, and 35031194)	Adjoining	Resource and Residential	None found
West (PID No. 35031004)	Adjoining	Resource	None found
North-northwest (PID No. 35094366, civic address 2050 Guysborough Country Harbour Road, Forest Hill)	Approximately 8 km north*	Provincial forest	None found

Boundary of the Site	Distance from Subject Property	Current Land Use	Potential Environmental Concerns
Northeast (PID No. 35094366, civic address 15701 Highway 316, Middle Country Harbour)	Approximately 18 km northwest	Provincial forest	None found
East (PID No. 35094366, civic address 4187 Route 276, Ogden)	Approximately 19 km northwest	Provincial forest	None found
South (PID No. 35094366, civic address 570 Goldbrook Road, Goldboro)	Approximately 15 km southeast	Provincial forest	None found
Southeast (PID No. 35094366, civic address 14145 Highway 316, Isaacs Harbour North)	Approximately 11 km southeast	Provincial forest	None found

*Due to the size of PID No. 35904366 (38,172.78 ha, and comprised of 56 different properties), a reasonable portion of this PID north-northeast of the assessment boundary has been considered and assessed as an adjoining property to the site.

Based on the current land use of adjoining properties, the above findings do not represent actual or potential source of environmental concern relative to the site.

4.2 Regional Geology, Hydrogeology and Topography

To describe the regional physiography and expected hydrogeologic conditions beneath the subject property, the following documents were reviewed:

- Stea, R.R., Conley, H., and Brown, Y. (compilers) 1992: Surficial Geology of the Province of Nova Scotia; Nova Scotia Department of Natural Resources, Map 92-3, Scale 1:500,000.
- 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.

The surficial geology of the subject area consists of stony till plain and drumlins. Till is stony, sandy and consists of material derived from local bedrock sources, ranging in thickness from 2 meters (m) to 20 m. Drumlin facies are siltier due to erosion and incorporation of older till units by glaciers.

The regional bedrock geology of the subject area is primarily mapped as the Goldenville formation of the Cambrian period, consisting of sandstone turbidites and slate. Continental rise prism is present in areas metamorphosed to schist and gneiss. Of note, the northern portion of PID No. 35094366 is mapped as Middle to Late Devonian muscovite biotite monzogranite (from the area of Johnsons Lake northward).

The topography of the site is steep, converging on Johnston Brook from the east and the west, and also sloping to the south towards Highway 316. Regional topography suggests the regional shallow groundwater flow is likely south towards Country Harbour River.

5.0 Records Review

5.1 Subject Property

A summary of historical land use information for the subject property is presented in Table 3. The documentation collected to generate Table 3 is listed in Section 3.1.

Table 3: Historical Information for the Assessment Area

Period/Date	Land Use/Historical Information
1862 to 1938	A record of ore material and resulting gold yielded within the Stormont Gold District (Country Harbour Section) documents the earliest record of gold mining activities at the site in 1862. A number of mining inspection reports, correspondence, and site drawings document mining activities at the site intermittently until 1949. A 1938 report on the Mountain Mine Gold Project, dated December 31, 1938, documents the construction of a large storage magazine, a day magazine, oil house, and other mining infrastructure, as well as costing for explosives intended to be used at the site. A 1938 site plan shows three stamp mills: Robertson Mill, the Stuart Mill, and the Old Antigonish Mill, mine workings and belts, a tailings area, several access roads, an office building, and a dump.
1938 to 1970	John Fenton Loop Road is visible in the 1939, 1948, and 1954 aerial photographs. Small areas near the access road appear to be cleared.
1970 to present	In the 1970 aerial photograph, the southwest portion of the site appears to be cleared. In the 2003 aerial photograph, the northeast portion of the site appears to be cleared.

Based on the above, potential or actual environmental concerns were identified, including:

- Former on-site mine operations (e.g., stamp mills, ore processing by mercury amalgam, presence of waste rock piles, use of mining heavy equipment); and
- The construction of a large storage magazine and a day magazine, and explosives intended to be used at the site. The locations of these magazines are unknown, although it is assumed that they would have been constructed some distance from other buildings and infrastructure previously on-site.

5.2 History of Adjoining and Neighbouring Properties

A summary of historical land use information for the adjoining and neighbouring properties based on available aerial images is presented in Table 4. The documentation collected to generate Table 4 is listed in Section 3.1. As noted previously, due to the size of PID No. 35094366, some portions were treated as adjoining property to the assessment site.

Table 4: Historical Information for the Adjoining Properties

Period/Date	Land Use/Historical Information
1939 to 1970	In the 1939 aerial photograph, what is presently Highway 316 is visible approximately 400 m south of the site. Residential and agricultural development is visible to the west, south, and southeast of the site. Properties to the north and east of the site appear forested and undeveloped. John Fenton Loop Road extends off-site to the north. Further north (approximately 130 m) of the site, two small lakes are visible. A roadway is visible approximately 700 m west of the site.
1970 to 2015	In the 1970 aerial photograph, development is visible to the west of the site in the form of several roads and apparent cleared areas. The roadway to the west of the site has been extended to the north.
2015 to present	In the 2015 Google Earth Image, roadways are visible approximately 750 m to the east of the site, extending north.

The above findings are not considered to represent an environmental concern to the site.

5.3 Database and Regulatory Review

Information requests were submitted to the regulatory bodies and databases listed in Section 3.1 for the site, as well as applicable adjoining and neighbouring properties that may represent an environmental concern to the subject property. The regulatory and database information obtained is discussed in the following subsections and included in Appendix C.

5.3.1 Subject Property

Information obtained from regulatory requests and database searches for the subject property is presented in Table 5.

Table 5: Regulatory Request Results – Subject Property

Subject Property	
Petroleum Storage Information	Based on the information obtained through the NSECC Environmental Registry search, the site is not registered as a petroleum storage site; however, historical documents note former on-site petroleum storage.

Subject Property	
Remediation Site Management Program / Environmental Registry Information	Based on the information obtained through the NSECC Environmental Registry search, the site does not have any registered remediation management files.
PCB Storage Site	Based on the information obtained through the NSECC Environmental Registry search, the site is not registered as a PCB storage site.
Former Landfill/Dumpsite	Based on the information obtained through the NSECC Environmental Registry search, the site is not registered as a former landfill/dumpsite.
Other Provincial Regulatory	An environmental registry search completed by NSECC located files with respect to PID No. 35094366. Noting the size of this PID, review of these records determined that they did not pertain to the site and were well outside of the assessment area. Some records have instead been incorporated into findings for neighboring or adjacent properties based on intervening distance from the subject property or assessment area. Similarly, records identified for PID 35094366 subject to the FOIPOP *Act* were determined to be located in areas outside of the assessment boundary of the Phase I ESA.

It is noted that a number of records were received through the NSECC registry search for PID No. 35094366. Review of these documents determined that they pertained to the portion of PID No. 35094366 outside of the assessment area and were not relevant to the site. Records pertaining to areas of PID No. 35094366 considered to be adjoining to the assessment area have been incorporated into Section. 5.3.2.

5.3.2 Adjoining and Neighbouring Properties

It is noted that a number of records were received through the NSECC registry search for PID No. 35094366, including:

- 570 Goldbrook Road, Goldboro (approximately 15 km south of the subject property):
  - A notification receipt for the maintenance of an existing structure in a watercourse (September 2015, issued to Port Hawkesbury Paper Limited Partnership);
  - Two water approvals for a culvert/closed bottom structure (June 2017, issued to the Nova Scotia Department of Transportation and Infrastructure Renewal);
  - Three water withdrawal approvals (300,000 L/day maximum), (January 2020, January 2021, January 2022, issued to Exploration Orex Inc.);
  - An industrial mineral approval for a bulk sample site (July 2018, September 2019, issued to Exploration Orex Inc.);
  - A notification receipt for the replacement of a bridge/concrete span (September 2019, issued to Baxter Trucking Limited);
  - A water approval for a wetland alteration (March 2022, issued to Exploration Orex Inc.) It is noted that this approval was issued for 21 PIDs, and was also issued for several other civic

addresses within PID No. 35094366: 14145 Highway 316, Isaacs Harbour North; 2050 Guysborough Country Harbour Road, Forest Hill; 4187 Route 276, Ogden;
    - A contaminated site file obligations letter, dated October 26, 2022, was identified for the creation of file no. 33000-30-ANT-2022-5115234 and documented metals contamination in soil, groundwater, sediment, and surface water; and
    - An environmental assessment approval was identified for the Goldboro Gold Project. It is noted that no civic address was provided in this approval, however, based on details consistent with other approvals identified for 570 Goldbrook Road, this approval is interpreted to correspond to 570 Goldboro Road, Goldboro.
- 14145 Highway 316, Isaacs Harbour North (approximately 11 km southeast of the subject property):
    - Four water approvals for a culvert/closed bottom structure (two in April 2018, issued to the Nova Scotia Department of Transportation and Infrastructure Renewal; May 2018, September 2018, issued to S.W. Weeks Contracting Incorporated; September 2019, issued to Baxter Trucking Limited).
- 1571 Highway 316, Middle Country Harbour, Isaacs Harbour North (approximately 23 km northwest of the subject property):
    - An approval for an on-site sewage disposal system (January 2023, issued to Jamie Chisholm).

Other records reviewed included the following:

- Several reviews completed by the Department of Fisheries and Oceans were identified in which proposals were reviewed on "serious harm to fish and prohibited effects on listed aquatic species at risk can be avoided or mitigated". Proposal reviews concluded no authorization under the Fisheries Act or the Species at Risk were required, and therefore were not interpreted to represent an environmental concern to the site.

As previously noted, records subject to the FOIPOP *Act* were located for PID No. 35094366. An application to request this file was submitted on June 29, 2023. Based on subsequent discussions and review of these records with NSECC, these records were determined to correspond with a civic address well outside the assessment area, and therefore were not received for further review.

Based on the intervening distance and anticipated groundwater flow direction, the industrial mineral approval and contaminated site file identified above for 570 Goldbrook Road, Goldboro are not considered to represent an environmental concern to the site. Remaining records received for adjoining and neighbouring properties are not considered to represent an environmental concern relative to the site.

5.4 Previous Environmental Site Assessments

No previous environmental assessment reports prepared for the site were available for review. As previously noted, historical documentation provided in the RFP included mining inspection reports, site plans, correspondence, and other relevant documents. These have been reviewed and are discussed in the relevant sections herein.

6.0 Site Visit and Evaluation of Findings

6.1 Site Observations

A summary of site observations and interview(s) related to items specific to the interior and exterior is presented in Table 6.

Table 6: Subject Property Observations

Item		Observations	Environmental Concern?
1.	Chemicals Management	No chemical storage was observed on-site. Previous mining documentation for the site noted fuel oil (for mining equipment) and explosives (i.e., dynamite) being brought to site. Reports and drawings noted tailings and waste rock piles on-site. While waste rock was confirmed on-site during the Phase I ESA site visit, tailings were not observed, noting the site is covered in heavy vegetation.	Yes
2.	Waste Management	Domestic waste was observed in Johnston Brook during the site visit. Rusted fuel drums in forested areas were also observed. It is noted that the drums were observed to be empty, and no staining in the area was noted.	Yes
3.	Hazardous Waste Management	No hazardous waste was observed on the site.	No
4.	Fill Material	The potential for fill of unknown quality and quantity to have been used during development of the mine site is unlikely. Demolition practices associated with the former on-site buildings are unknown.	Low potential
5.	Spill and Stained Areas	No spills or stained areas were observed on the site. It is noted that the site is heavily vegetated, which obscured visual observations of the ground surface.	No
6.	Wastewater Management	No wastewater is generated at the site.	No
7.	Drains, Sumps and Pits	No drains, or sumps were observed on-site. Sinkholes were identified during the site visit. Abandoned mine openings are present throughout the site.	No

Item		Observations	Environmental Concern?
8.	Air Emissions / Quality	No air emissions are generated at the site.	No
9.	Radon	Based on the site geology and available mapping, there is a medium to high risk for radon in indoor air; however, given that there are no buildings present at the subject property, radon is not expected to be a concern. *	No
10.	Electromagnetic Fields (EMFs)	No sources of EMFs were observed on-site.	No
11.	Noise, Odour and Vibration	No significant sources of noise and vibration were noted associated with the site.	No
12.	Pesticides/Herbicides	No sources of pesticides/herbicides used on-site.	No
13.	Pits/Lagoons	No lagoons observed on the subject property. Several abandoned mine openings are present throughout the subject property.	No
14.	Watercourses, Ditches or Standing Water	No ditches were observed on-site. Standing water was observed in forested areas of the site. Johnson Brook intersects the site.	No
15.	On-site Wells	No on-site wells were observed, or are known to be located, on-site.	No

*The presence/absence of significant levels of radon can only be determined through testing, and tests for radon were not conducted during this Phase I ESA.

Based on the above, the following environmental concerns were identified.

- A domestic waste pile was observed during the site visit in and around Johnston Brook.
- Rusted fuel drums in forested areas were observed during the site visit. Drums were observed to be empty and no staining in the areas was noted.

6.1.1 Special Attention Items

A summary of site observations and information obtained through the records review and interview(s) related to special attention items is presented in Table 7. A description of special attention items are included in Appendix D for reference.

Table 7: Special Attention Items

Item		Observations	Environmental Concern?
1.	Lead	Potential sources of lead were not observed	No [1]
2.	Mercury	Based on the reported ore processing method used (i.e., mercury amalgam), there is potential for mercury to be present at the site.	Potential

	Item	Observations	Environmental Concern?
3.	Polychlorinated Biphenyls (PCBs)	PCB containing materials were not observed during the site visit.	No [1]
4.	Asbestos-Containing Materials (ACMs)	ACMs were not observed during the site visit.	No [1]
5.	Urea Formaldehyde Foam Insulation (UFFI)	UFFI was not observed during the site visit.	No [1]
6.	Ozone-Depleting Substances (ODSs)	ODSs were not observed during the site visit.	No

Note:
1. Demolition practices associated with former on-site buildings are unknown. If building debris is buried on-site, there is potential for special attention items to be present.

Based on the above, the following environmental concerns were identified.

- The reported ore processing method used during mining operations at the site was mercury amalgam, therefore there is potential for mercury to be present at the site.

7.0 Conclusions

The identified APECs are illustrated on Figure 3 and presented in Table 8, below:

Table 8: Summary of Identified Relevant APECs and COPCs

APEC No.	APEC Description	COPCs	Media of Concern	Comments
1	Tailings Area	Metals, General Chemistry*, Sulphur	Soil, GW, Sed, SW	One (1) historical waste tailings area with potentially sulfide bearing materials. Surface water discharge location in Johnston Brook, downstream of the cross-culverts along John Fenton Loop Road.
2	Stamp Milling Area	Metals, General Chemistry*, Sulphur, PHCs, PAHs	Soil, GW, Sed, SW	Three (3) stamp milling areas where potentially sulphide bearing materials may have been processed. Processing of materials, heavy equipment storage, and petroleum storage. Surface water is directed to Johnston Brook.

APEC No.	APEC Description	COPCs	Media of Concern	Comments
3	Waste Rock Piles	Metals, General Chemistry*, Sulphur	Soil, Sed, SW	Two (2) waste rock areas with potentially sulphide bearing slates, one (1) of which is located in Johnston Brook.
4	Domestic Waste Dumping Areas	Metals, PHCs, PAHs	Soil	Three (3) locations where domestic waste and discarded fuel drums were identified during the Phase I ESA site visit.
Assessment of Naturally Occurring Background Conditions				
Background Location		Metals, General Chemistry*, Sulphur, PHCs, PAHs	Soil, GW	Based on available topographic data and inferred groundwater flow direction, background conditions will be assessed at an upgradient location within the assessment boundary that is safely accessible.
Upstream Background Location		Metals, General Chemistry*, Sulphur, PHCs, PAHs	Sed, SW	Surface water and sediment conditions will be assessed at an upstream location within the assessment boundary that is safely accessible.

Notes:
1. *General chemistry analysis is only completed on water.
2. GW denotes groundwater, Sed denotes sediment, SW denotes surface water.
3. PHCs denotes petroleum hydrocarbons (i.e., benzene, toluene, ethylbenzene, and xylenes (BTEX), and modified TPH), PAHs denotes polycyclic aromatic hydrocarbons.
4. Metals analysis in all media to include analysis of mercury and sulphur.
5. Metals analysis of SW to include total metals, while analysis of GW to entail dissolved metals.
6. Inferred groundwater flow direction in the area is to the south.

Historical documents for the site identify the construction of a large storage magazine and a day magazine, as well as costing for explosives intended to be used at the site. The locations of these magazines are unknown, although it is assumed that they would have been constructed some distance from other buildings and infrastructure previously on-site. Up to five (5) soil samples will be collected across the site in areas that are safely distanced from previous site building locations and analyzed for energetics (i.e., residual products of explosives including nitrotoluenes, glycerines, perchlorates, and bromate).

COPCs from the APECs above include metals (specifically arsenic, barium, lead, mercury, sulphur, and strontium), PHCs, PAHs, energetics, and perchlorates.

8.0 Disclaimer

This report was prepared exclusively for the purposes, project, and site location(s) outlined in the report. The report is based on information provided to or obtained by Dillon Consulting Limited ("Dillon") as indicated in the report and applies solely to site conditions existing at the time of the site investigation(s). Although a reasonable investigation was conducted by Dillon, Dillon's investigation was by no means exhaustive and cannot be construed as a certification of the absence of any contaminants from the site(s). Rather, Dillon's report represents a reasonable review of available information within an agreed work scope, schedule and budget. It is therefore possible that currently unrecognized contamination or potentially hazardous materials may exist at the site(s), and that the levels of contamination or hazardous materials may vary across the site(s). Further review and updating of the report may be required as local and site conditions, and the regulatory and planning frameworks, change over time.

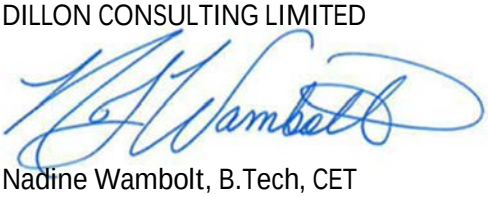
This report was prepared by Dillon for the sole benefit of Build Nova Scotia. The material in the report reflects Dillon's best judgment in light of the information available to Dillon at the time of preparation. Any use which a third party (i.e., a party other than Build Nova Scotia) makes of this report, or any reliance on or decisions made based on it, are the responsibilities of such third parties. Dillon accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

9.0 Closing Remarks

This report was prepared by Breagh Thomas, EIT and reviewed by Nadine Wambolt, CET and Andrew Thalheimer, P.Eng.

Dillon has prepared this report for the exclusive use of Build Nova Scotia for specific application to the site. The Dillon investigation was conducted in accordance with Dillon’s scope of work and accepted environmental assessment practices. Limitations to this report are included in the Disclaimer presented in Section 7.0. No other warranty, expressed or implied, is made.

Sincerely,
DILLON CONSULTING LIMITED



Nadine Wambolt, B.Tech, CET
Project Manager

Figures

BUILD NOVA SCOTIA

Former Country Harbour Mine Site
Phase 1 ESA

Subject Parcels

PROJECT LOCATION

FIGURE 1

DILLON CONSULTING

MAP DRAWING INFORMATION:
DATA PROVIDED BY: GeoNova, ESRI, Build NS

MAP CREATED BY: SCM
MAP CHECKED BY: BT
MAP PROJECTION: NAD 1983 UTM Zone 20N

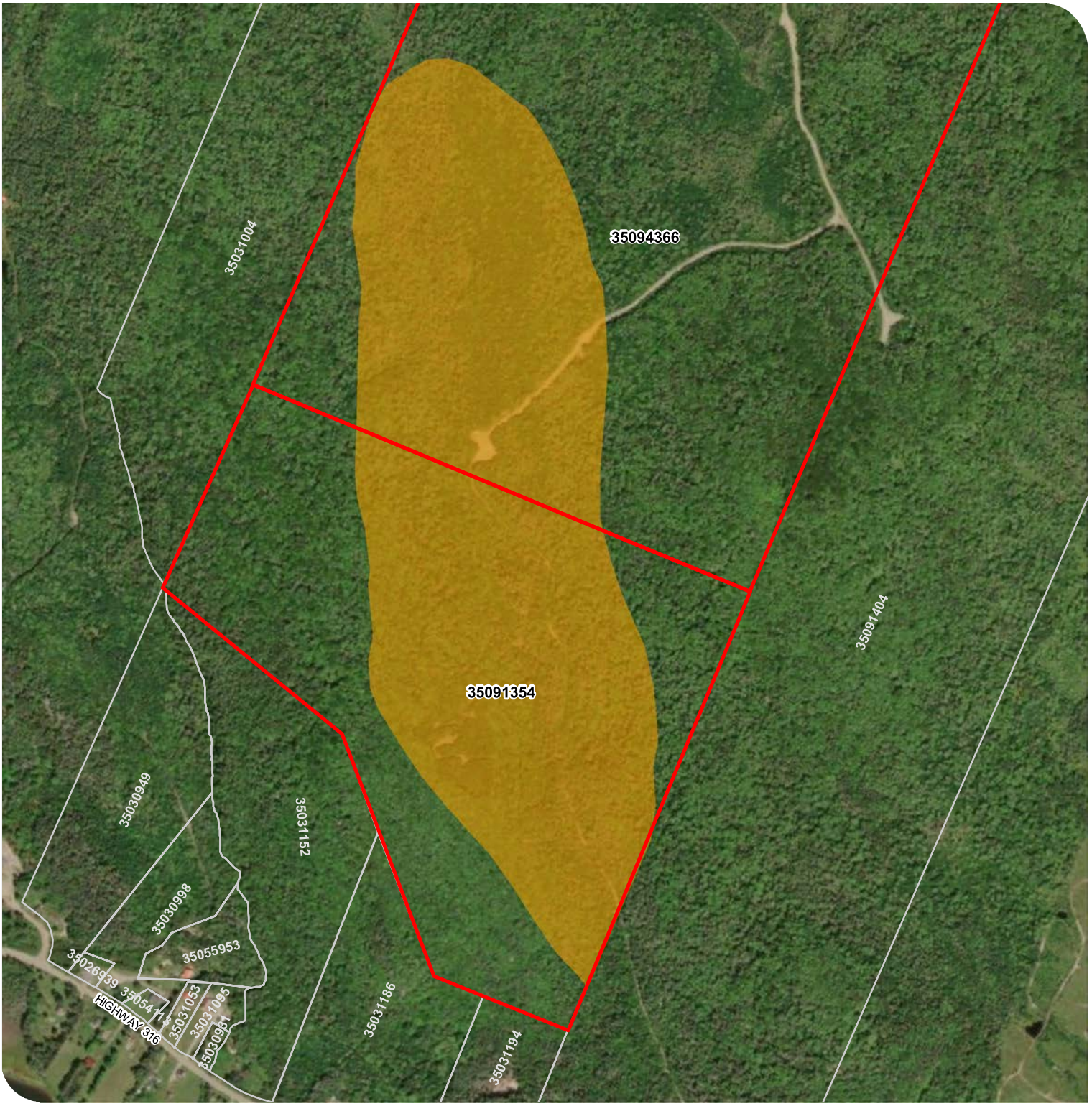
N W E S

SCALE 1:30,000

0 200 400 800 m

PROJECT: 236465
STATUS: FINAL
DATE: 2023-10-13

FILE LOCATION: \\dillon.ca\DILLON_DFS_projects\GIS\2023\236465\product\Client\Phase 1\F1_ProjectLocation.mxd



BUILD NOVA SCOTIA

Former Country Harbour
Mine Site
Phase 1 ESA

Subject Parcels

Adjacent Parcel

Assessment Area

ASSESSMENT AREA AND SURROUNDING PROPERTIES

FIGURE 2

DILLON CONSULTING

MAP DRAWING INFORMATION:
DATA PROVIDED BY: GeoNova, ESRI, Build NS

MAP CREATED BY: SCM
MAP CHECKED BY: BT
MAP PROJECTION: NAD 1983 UTM Zone 20N

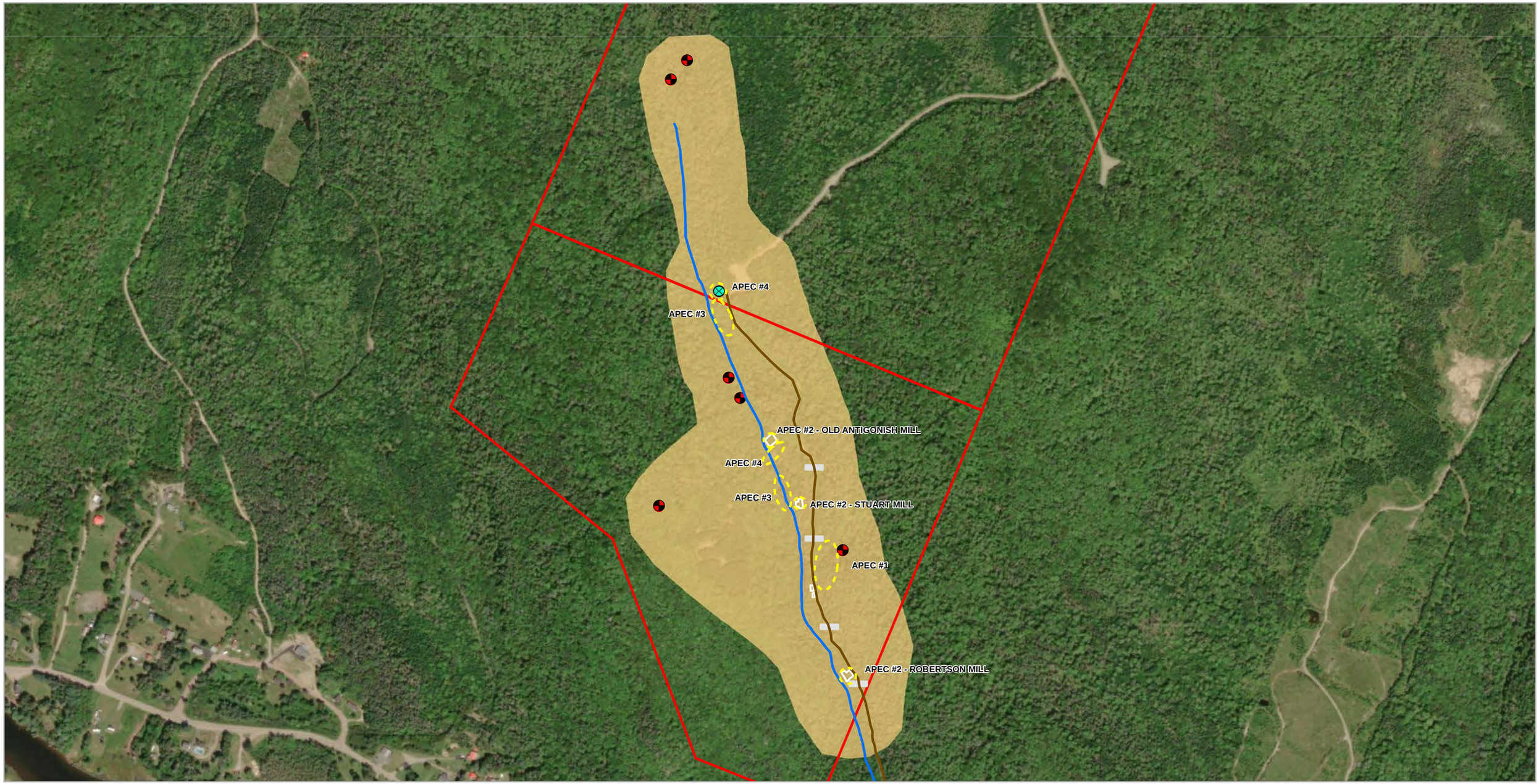
N
W E
S

SCALE 1:8,000

0 50 100 200 m

PROJECT: 236465
STATUS: FINAL
DATE: 2023-10-13

FILE LOCATION: K:\2023\236465\product\Client\Phase 1\F2_AssessmentArea_and_SurroundingProperties.mxd



BUILD NOVA SCOTIA

FORMER COUNTRY HARBOUR MINE SITE
PHASE 1 ESA

IDENTIFIED APECS

FIGURE 3

APEC
John Fenton Loop Road
Johnston Brook
Drum
Cross Culvert
Open Pit/Trench or Sinkhole
Subject Parcel
Assessment Area

DILLON CONSULTING

MAP DRAWING INFORMATION:
DATA PROVIDED BY GeoNova, NSDNRR

MAP CREATED BY: SCM
MAP CHECKED BY: BT
MAP PROJECTION: NAD 1983 UTM Zone 20N

0 50 100 200 Metres

SCALE 1:6,000

N
W E
S

PROJECT: 23-6465

Date: 2023-10-13

Document Path: K:\2023\236465\product\Client\Phase 1\F3_IdentifiedAPECs.mxd

Appendix A

Aerial Photographs and Images

HISTORICAL AERIALS

Project Property: Former Country Harbour Mine
Site
Country Harbour Mine
Country Harbour Mines NS B0H 1J0

Project No: Country Harbour Mine Site

Requested By: Dillon Consulting Limited

Order No: 23062100279

Date Completed: July 14,2023

Aerial Maps included in this report are produced by the sources listed above and are to be used for research purposes including a phase I report. Maps are not to be resold as commercial property. ERIS provides no warranty of accuracy or liability. The information contained in this report has been produced using aerial photos listed in above sources by ERIS Information Inc. (in the US) and ERIS Information Limited Partnership (in Canada), both doing business as 'ERIS'. The maps contained in this report do not purport to be and do not constitute a guarantee of the accuracy of the information contained herein. Although ERIS has endeavored to present information that is accurate, ERIS disclaims, any and all liability for any errors, omissions, or inaccuracies in such information and data, whether attributable to inadvertence, negligence or otherwise, and for any consequences arising therefrom. Liability on the part of ERIS is limited to the monetary value paid for this report.

Environmental Risk Information Services
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1.866.517.5204 | info@erisinfo.com | erisinfo.com

Date	Source	Scale	Comments
2021	MAXAR TECHNOLOGIES	18,000	
1990	Missing Coverage		
1980	Missing Coverage		
1979	National Air Photo Library	18,000	Best Adjacent Decade Available
1970	National Air Photo Library	18,000	
1960	Missing Coverage		
1954	National Air Photo Library	18,000	
1948	National Air Photo Library	18,000	
1939	National Air Photo Library	18,000	
1920	Missing Coverage		

Year: 2021
Source: MAXAR
Scale: 18,000
Comment:

Address: Country Harbour Mine, Country Harbour Mines, NS
Approx Center: -61.81066452,45.26248318

Order No: 23062100279

ERIS

2015

Country Hbr Gun Club

Country Harbour Property - Pine Ridge...

Ehs country harbour

316

LOT ONE

Image © 2023 Maxar Technologies

Country Harbour Mines

Google Earth

Imagery Date: 9/17/2015 45°15'30.49" N 61°48'24.53" W elev 107 m eye alt 3.30 km

2003

316

Country Hbr Gun Club

Country Harbour Property - Pine Ridge...

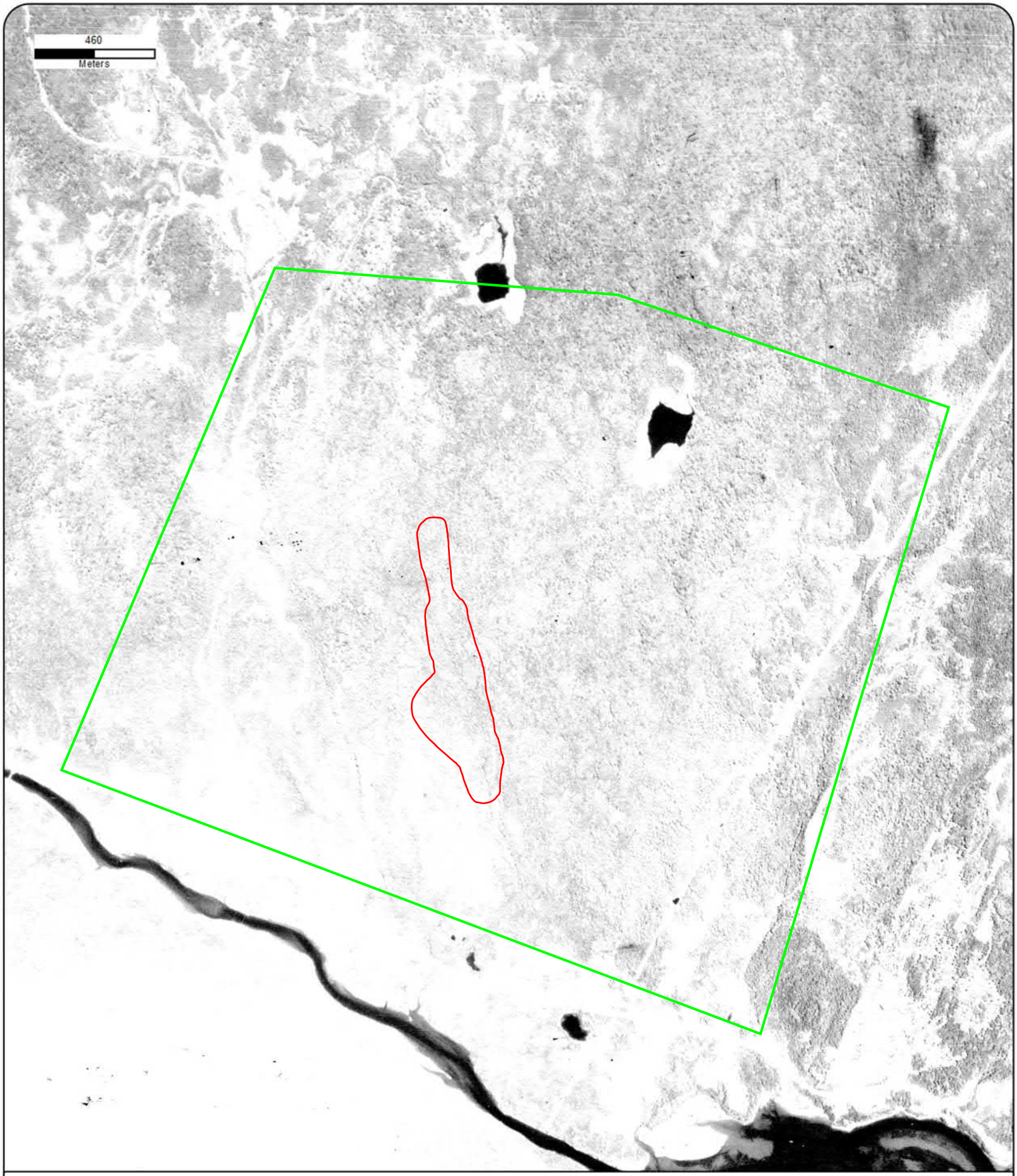
Ehs country harbour

316

Image © 2023 Maxar Technologies
Image Landsat / Copernicus
LOT ONE

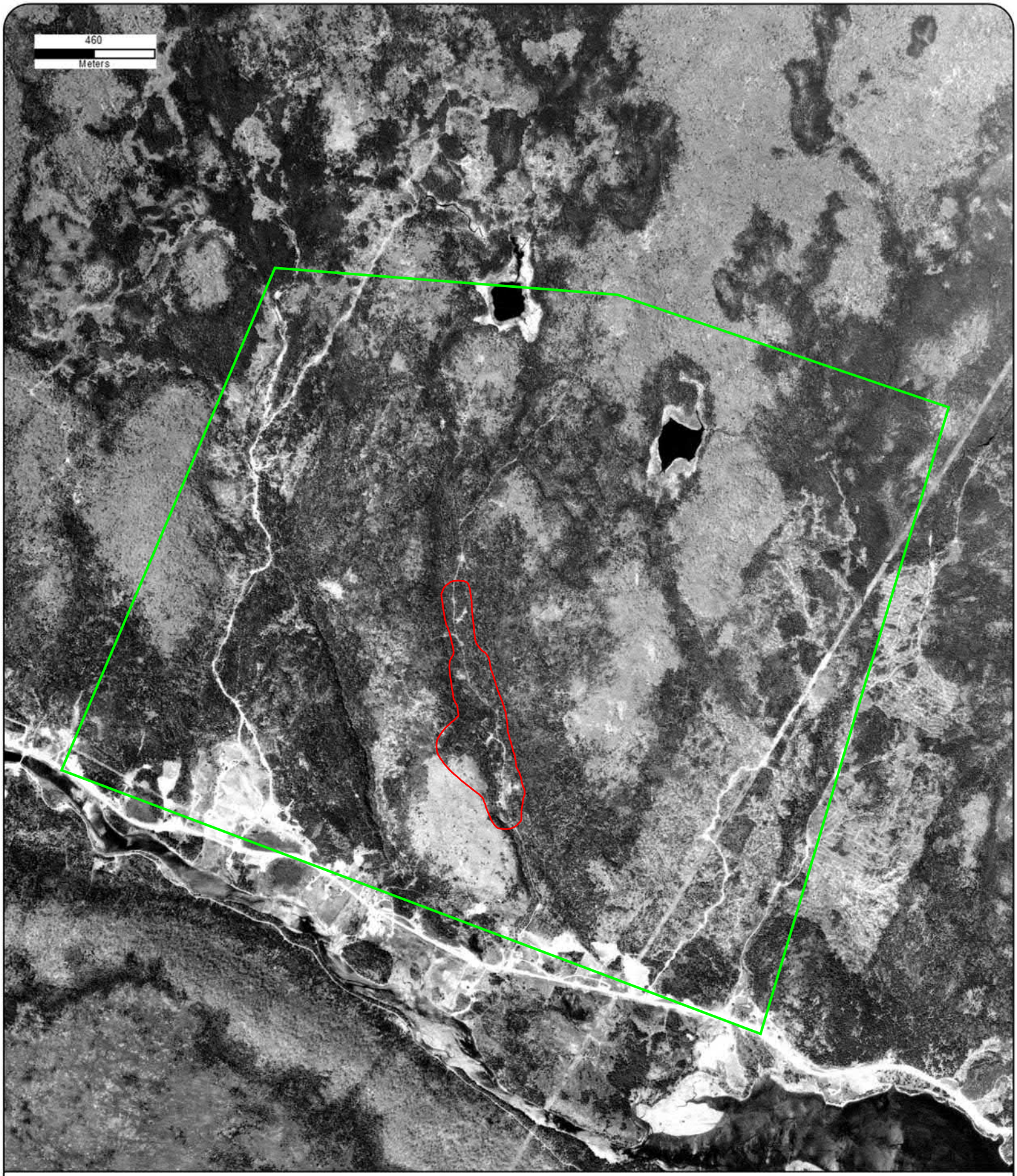
1985

Imagery Date: 7/9/2003 45°15'20.15" N 61°4



Year: 1979
Source: NAPL
Scale: 18,000
Address: Country Harbour Mine, Country Harbour Mines, NS
Approx Center: -61.81066452,45.26248318
Order No: 23062100279
Comment: Best Adjacent Decade Available

ERIS



Year: 1970
Source: NAPL
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Comment:

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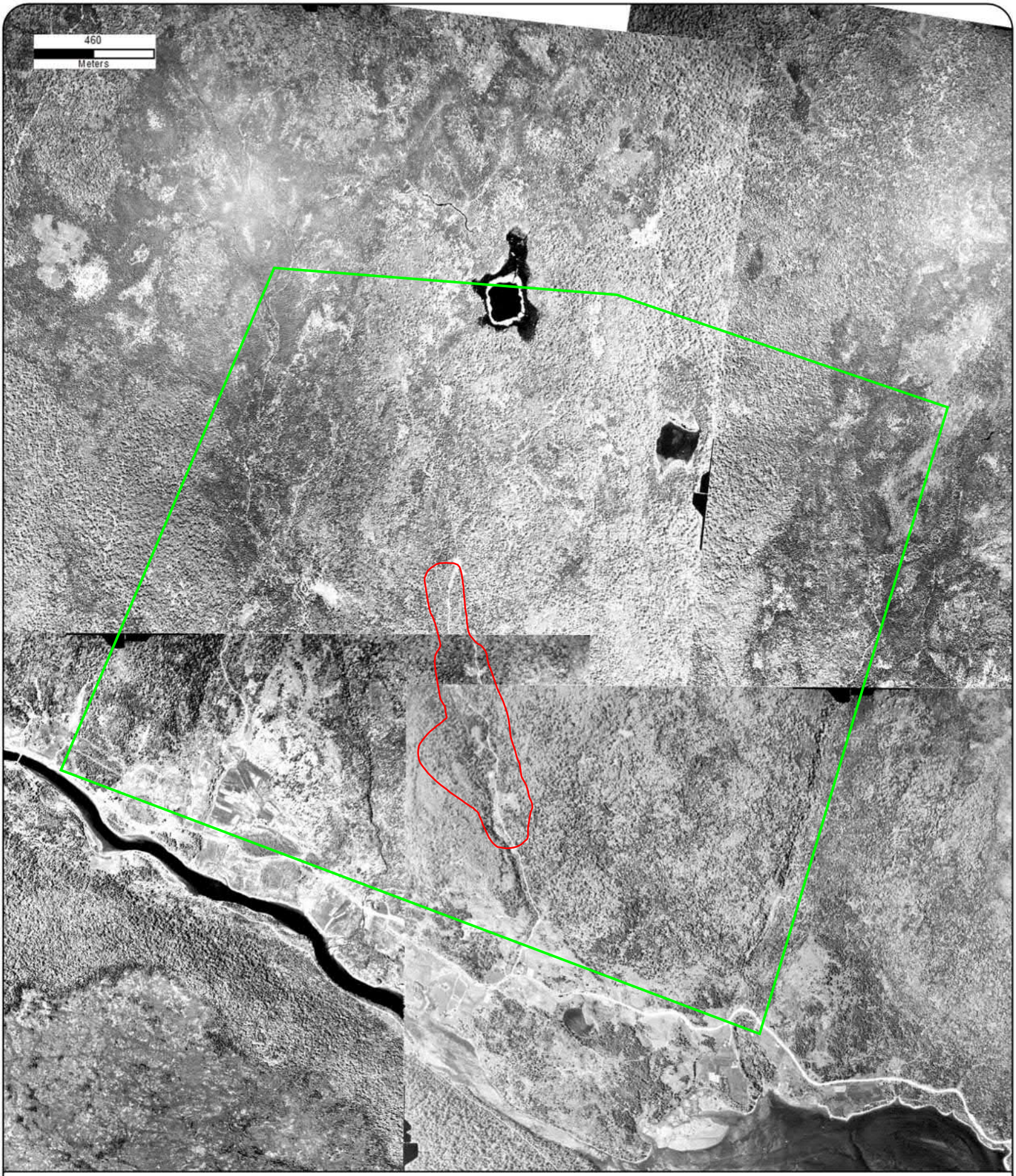
Approx Center: -61.81066452,45.26248318

Order No: 23062100279

ERIS

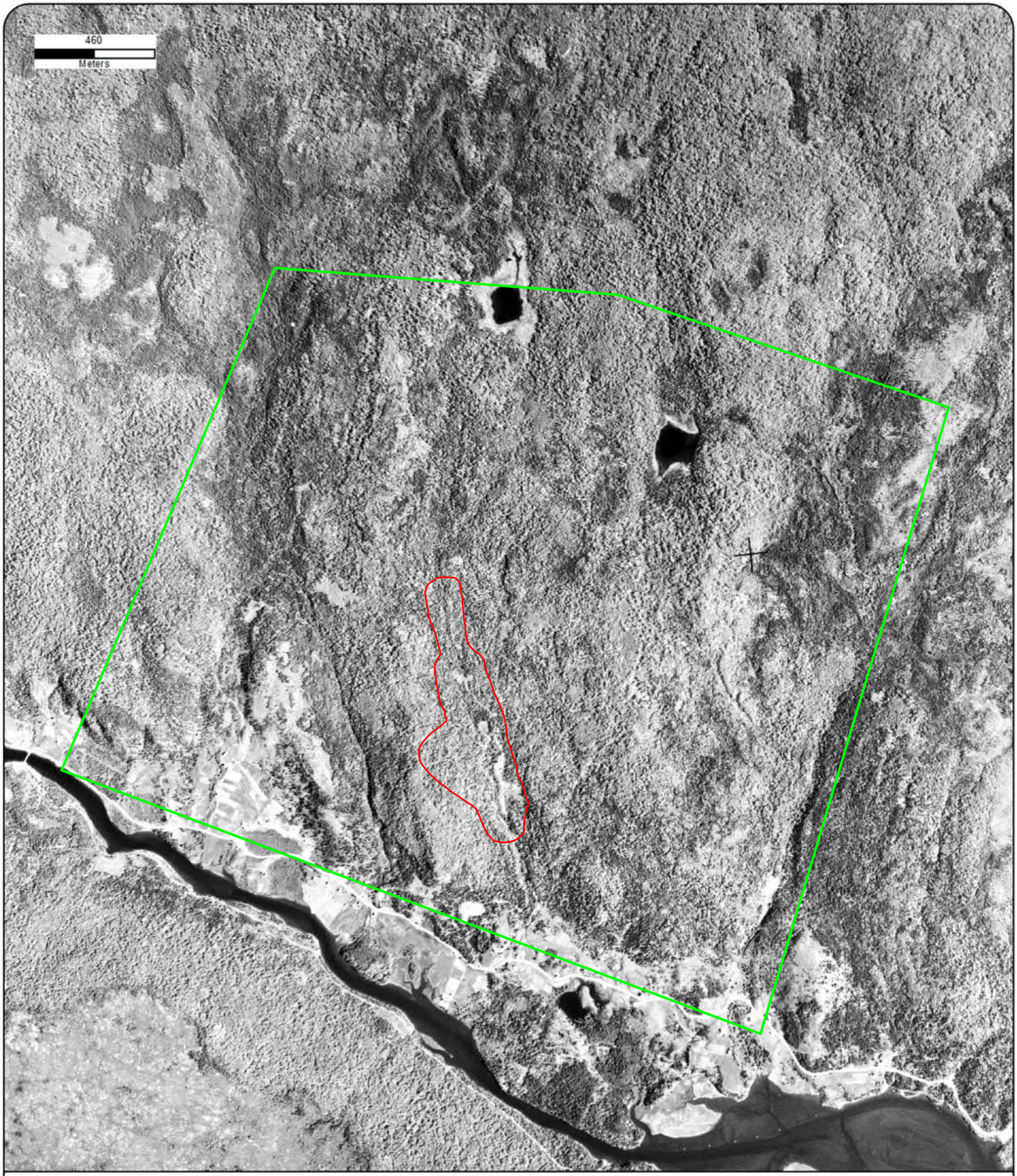


Year: 1954
Source: NAPL
Scale: 18,000
Comment:

Address: Country Harbour Mine, Country Harbour Mines, NS
Approx Center: -61.81066452,45.26248318

Order No: 23062100279

ERIS



Year: 1948
Source: NAPL
Scale: 18,000
Comment:

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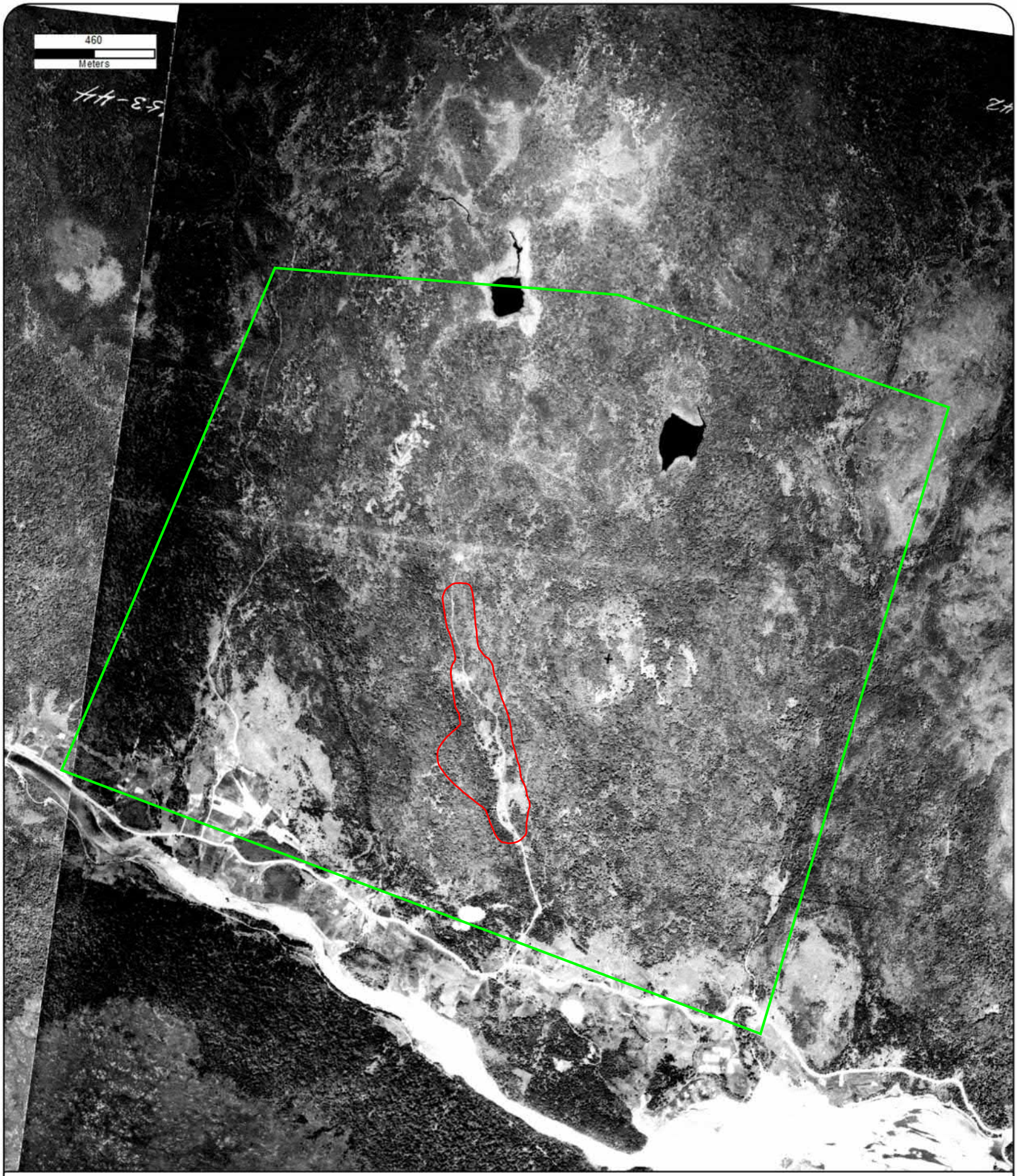
Approx Center: -61.81066452,45.26248318

Order No: 23062100279

ERIS



Year: 1939
Source: NAPL
Scale: 18,000
Comment:

Address: Country Harbour Mine, Country Harbour Mines, NS
Approx Center: -61.81066452,45.26248318

Order No: 23062100279

ERIS

Appendix B

Site Photographs

Photo 1. View of 1938 tailings area situated in Johnston Brook (July 17, 2023).

Photo 2. Edge of Robertson Mill, facing Johnston Brook (July 17, 2023).

Photo 3. Area of former pump house and forge (July 17, 2023).

Photo 4. Inferred remnant of forge foundation (July 17, 2023).

Photo 5. Rusted drums in area of former pump house and forge (July 17, 2023).

Photo 6. Metal debris identified in area of former pump house and forge (July 17, 2023).

Photo 7. Pipe observed in on-site area of Johnston Brook (July 17, 2023).

Photo 8. Fencing and signage around abandoned mine opening (July 17, 2023).

Photo 9. Waste rock identified in Johnston Brook (July 17, 2023).

Photo 10. Domestic waste identified in area of former Old Antigonish Mill (July 17, 2023).

Photo 11. Remnants of Stuart Mill foundation (July 17, 2023).

Photo 12. Possible waste rock pile (July 18, 2023).

Appendix C

Regulatory Requests

NOVA SCOTIA
Environment and Climate Change

Information Access and Privacy

PO Box 442
Halifax, Nova Scotia
B3J 2P8

ph: (902) 424-2549
fax: (902) 424-6925

June 28, 2023 Our file # ENV-2023-2146/2151

Email: nwambolt@dillon.ca

Nadine Wambolt
Dillon Consulting
275 Charlotte Street
Sydney NS B1P 1C6

RE: Highway 316 (PID 35091354); 2050 Guysborough Country Harbour Rd. (PID 35094366); 15701 Highway 316 (PID 35094366); 4187 route 276 (PID 35094366); 14145 Highway 316 (PID 35094366); and 570 Goldbrook Rd. (PID 35094366), Guysborough County

I refer to your enquiry of the Environmental Registry received on June 19, 2023. We acknowledge receipt of payment for 6 properties.

Enclosed is the information that was located through the Environmental Registry with regards to PID 35094366 Guysborough Country.

No information was located through the Environmental Registry with regards to the remaining above referenced properties.

An industrial file (file# 92100-30-ANT-101367 11vols) containing inspection reports, annual reports, photos, correspondence certificate of analysis, bulk sample final report, applications, maps, hydrology report, site plans, hydrology study, water quality data, spill contingency plan, bulk sample plan, closure plan, monitoring results, and audit; an industrial client request file (file# 92100-01-3652485); four water resources files (file# 95100-30-ANT-2017-105488, 95100-30-ANT-2021-2850383, 95100-30-ANT-2018-100304, 95100-30-ANT-2496232) containing applications, approvals, photos, inspection reports, checklists, note to file, emails, correspondence, maps, and reports; water resources client request file (file# 95100-01-4306187); two water resources complaint files (file# 95100-40-ANT-4817507, 95100-40-ANT-4768878); a contaminated sites file (file# 33000-30-ANT-2022-5115234); and an environmental assessment file (file# 40100-30-289) pertaining to PID 35094366 Guysborough Country 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 or online https://beta.novascotia.ca/apply-access-information-under-freedom-information-and-protection-privacy-foipop-act-form-1. 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

Tina Skeir
Information Access Office

NOVA SCOTIA
Environment
Environmental Monitoring and Compliance

155 Main Street
Antigonish, Nova Scotia
Canada B2G 2B6

902-863-7411
www.gov.ns.ca

BRIDGE OR OTHER OPEN BOTTOM STRUCTURE NOTIFICATION RECEIPT

Province of Nova Scotia
Environment Act, S.N.S. 1994-95, c.1

NOTIFIER: **Port Hawkesbury Paper Limited Partnership**

SITE: **Unknown**
Goldboro, Guysborough County
Grid Reference E597277 N5013165
PID # 35094366

NOTIFICATION NO: **2015-094559**

EFFECTIVE DATE: **September 22, 2015**

EXPIRY DATE: **September 30, 2015**

DETAILS: **Construction of a New Bridge/Concrete Span (Not Exceeding 15 Meters)**

Pursuant to Part V of the *Environment Act*, S.N.S. 1994-95, c.1 as amended from time to time, notification from the Notifier is acknowledged. The work done under this activity must follow the Nova Scotia Watercourse Alterations Standard.

This Notification Receipt or a copy must be kept on-site at all times while work is being done as required under Section 22(3) of the Approval and Notification Procedures Regulations.

All personnel involved in the activity must be made fully aware of the Standard associated with this notification. It is the Notifier's responsibility to ensure that the Standard is followed. Failure to comply with the Standard is an offence under the *Environment Act*.

The Notifier must advise the Department of any new and relevant information respecting any adverse effect that results or may result from the activity, which comes to the Notifier's attention after the issuance of the Notification Receipt. This is required under Section 60 of the *Environment Act*.

If the activity is altered, extended or modified beyond the description given in this Notification, please reapply as a new Notification is required.

Despite the issuance of this Notification Receipt, the Notifier is still responsible for obtaining any other authorization which may be required to carry out the activity, including those which may be necessary under provincial, federal or municipal law.

This Notification or a copy is to be kept on-site at all times as required under Section 22(3) of the Approval and Notification Procedures Regulations. All personnel involved in the project must be made fully aware of the standards associated with this notification. It is the Notifier's responsibility to ensure that they are followed. Failure to comply with the standards is an offence under the *Environment Act*.

It is the Notifier's duty to advise the Department of any new and relevant information respecting any adverse effect that results or may result from the activity, which comes to the Notifier's attention after the issuance of the Notification. This is required under Section 60 of the *Environment Act*.

If the activity is altered, extended or modified beyond the description given in this Notification, please reapply as a new Notification is required.

Despite the issuance of this Notification, the Notifier is still responsible for obtaining any other authorization which may be required to carry out the activity, including those which may be necessary under provincial, federal or municipal law.

NOVA SCOTIA

155 Main Street, Suite 205
Antigonish, NS
Canada B2G 2B6

902-863-7389 T
902-863-7411 F
www.novascotia.ca

Our File Number: 95100-30-ANT-2017-105491

June 12, 2017

COPY

DEPARTMENT OF TRANSPORTATION AND INFRASTRUCTURE RE
9840 Trunk 16 Po Box 244
Guysborough, NS
B0H 1N0

Maintenance of an Existing Structure in a Watercourse
NOTIFICATION RECEIPT

Province of Nova Scotia
Environment Act, S.N.S. 1994-95, c.1

NOTIFIER: DEPARTMENT OF TRANSPORTATION AND INFRASTRUCTURE RE

NOTIFICATION #: 2017-105491

SITE: Unknown , Seal Harbour
570 Goldbrook Rd.
Goldboro, Guysborough County
PID 35094366, E - 611834, N - 5001841

EFFECTIVE DATE: June 12, 2017

EXPIRY DATE: September 30, 2017

DETAILS: Maintenance of an Existing Structure in a Watercourse

Pursuant to Part V of the *Environment Act*, S.N.S. 1994-95, c.1 as amended from time to time, notification from the Notifier is acknowledged. The work done under this notification must follow the Nova Scotia Watercourse Alteration Activity Standards.

NOVA SCOTIA

155 Main Street, Suite 205
Antigonish NS
Canada B2G 2B6

902-863-7389 P
902-863-7411 F
www.novascotia.ca

APPROVAL

Province of Nova Scotia
Environment Act, S.N.S. 1994-95, c.1 s.1

APPROVAL HOLDER: S.W. WEEKS CONTRACTING INCORPORATED

SITE PID: 35094366

APPROVAL NO: 2017-105512-01

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 - Culvert / Closed Bottom Structure

Administrator: Sean Gillis

Effective Date: July 26, 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: S.W. WEEKS CONTRACTING INCORPORATED

Project: 3+015

Site:

PID	Civic #	Street Name	Street Type	Community	County
35094366	570	Goldbrook	Rd.	Goldboro	Guysborough

Approval No: 2017-105512-01

File No: 95100-30-ANT-2017-105512

Grid Reference: Easting - 611883, Northing - 5001884

Reference Documents

- Application submitted July 25, 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. 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
Eastern Region, Antigonish Office
155 Main Street, Suite 205
Antigonish, Nova Scotia B2G 2B6

Phone: (902) 863-7389
Fax: (902) 863-7411

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 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 Culvert / Closed Bottom Structure on Unknown situated at or near 570 GOLDBROOK 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

   iii. Nova Scotia Watercourse Alteration Specifications

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. 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.

6. 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.

NOVA SCOTIA

File No:95100-30-ANT-2017-105512

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
Environmental Monitoring and Compliance Division
Eastern Region, Antigonish Office
155 Main Street, Suite 205
Antigonish, NS, B2G 2B6

Phone: 902-863-7389
Fax: 902-863-7411
NSE Contact: Sean Gillis

APPROVAL NUMBER: 2017-105512-01

NAME OF APPROVAL HOLDER: S.W. WEEKS CONTRACTING INCORPORATED

WORK AUTHORIZED: Culvert / Closed Bottom Structure

DATE WORK WAS COMPLETED: _____

NAME OF CONTRACTOR: _____

COMMENTS: _____

_____

_____

_____

_____

_____ _____

Signature Date

NOVA SCOTIA

155 Main Street, Suite 205
Antigonish NS
Canada B2G 2B6

902-863-7389 P
902-863-7411 F
www.novascotia.ca

APPROVAL

Province of Nova Scotia
Environment Act, S.N.S. 1994-95, c.1 s.1

APPROVAL HOLDER: DEPARTMENT OF TRANSPORTATION AND INFRASTRUCTURE RE

SITE PID: 35094366

APPROVAL NO: 2017-105512

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 - Culvert / Closed Bottom Structure

Administrator: Sean Gillis

Effective Date: June 20, 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: DEPARTMENT OF TRANSPORTATION AND INFRASTRUCTURE RE

Project: 3+015

Site:

PID	Civic #	Street Name	Street Type	Community	County
35094366	570	Goldbrook	Rd.	Goldboro	Guysborough

Approval No: 2017-105512

File No: 95100-30-ANT-2017-105512

Grid Reference: Easting - 611883, Northing - 5001884

Reference Documents:

- Application submitted June 12, 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. 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
Eastern Region, Antigonish Office
155 Main Street, Suite 205
Antigonish, Nova Scotia B2G 2B6

Phone: (902) 863-7389
Fax: (902) 863-7411

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 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 Culvert / Closed Bottom Structure on Unknown situated at or near 570 GOLDBROOK 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

   iii. Nova Scotia Watercourse Alteration Specifications

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. 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.

6. 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.

NOVA SCOTIA

File No:95100-30-ANT-2017-105512

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
Environmental Monitoring and Compliance Division
Eastern Region, Antigonish Office
155 Main Street, Suite 205
Antigonish, NS, B2G 2B6

Phone: 902-863-7389
Fax: 902-863-7411
NSE Contact: Sean Gillis

APPROVAL NUMBER:

NAME OF APPROVAL HOLDER: DEPARTMENT OF TRANSPORTATION AND INFRASTRUCTURE RE

WORK AUTHORIZED: Culvert / Closed Bottom Structure

DATE WORK WAS COMPLETED: _____

NAME OF CONTRACTOR: _____

COMMENTS: _____
_____
_____
_____
_____

_____ _____
Signature Date

Fisheries and Oceans Canada | Pêches et Océans Canada

Bedford Institute of Oceanography
1 Challenger Drive,
P.O. Box 1006
Station P410
Dartmouth, N.S.
B2Y 4A2

Your file *Votre référence*
2017-105512

June 19, 2017

Our file *Notre référence*
17-W-227

Sean Gillis
Nova Scotia Environment
155 Main St., Suite 205
Antigonish, NS
B2G 2C1

Dear Sean:

Subject: Serious harm to fish can be avoided or mitigated
Unnamed Trib to Coddles Harbour, Culvert Replacement (STN 3+015) – Coddles Harbour, Guysborough County, N.S.

The Fisheries Protection Program (the Program) of Fisheries and Oceans Canada received a proposal on June 13, 2017.

Based on the information provided, the proposal has been identified as a project where a *Fisheries Act* authorization is not required given that serious harm to fish can be avoided by following standard measures. Proposals in this category are not considered to need an authorization from the Program under the *Fisheries Act* in order to proceed. In order to comply with the Act, it is recommended that the guidance tools, which can be found at the website (http://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures/index-eng.html), be followed.

Should the plans change or if there is omitted information in the proposal such that the proposal meets the criteria for a site specific review, as described on our website (http://www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html), the request for review form that is also available on the website should be completed and submitted.

Should the proponent have any questions or concerns about the compliance of their proposal with the *Fisheries Act* (and/or those prohibitions of the *Species at Risk Act* that

*Those sections most relevant to the review of development proposals include 20 and 35 of the *Fisheries Act* and sections 32, 33 and 58 of the *Species at Risk Act*. For more information please visit www.dfo-mpo.gc.ca.

apply to listed aquatic species)* they may wish to engage an environmental professional familiar with measures to avoid impacts to fish and fish habitat (http://www.dfo-mpo.gc.ca/pnw-ppe/env-pro-eng.html).

Yours sincerely,

Craig Reynolds

Craig Reynolds
Fisheries Protection Biologist
Fisheries Protection Program

NOVA SCOTIA

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APPROVAL

Province of Nova Scotia
Environment Act, S.N.S. 1994-95, c.1 s.1

APPROVAL HOLDER: EXPLORATION OREX INC.

SITE PID: 35094366, 35151208

APPROVAL NO: 2018-100304-03

EXPIRY DATE: December 31, 2024

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 - Water Withdrawal

Administrator: Marc Theriault

Effective Date: January 1, 2022

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 Department of Environment and Climate Change

Approval Holder: EXPLORATION OREX INC.

Project: Goldbrook Lake - Pid 35094366

Site:

PID	Civic #	Street Name	Street Type	Community	County
35094366 35151208	570	GOLDBROOK	RD.	GOLDBORO	GUYSBOROUGH COUNTY

Approval No: 2018-100304-03

File No: 95100-30-ANT-2018-100304

Grid Reference: Easting - 607050, Northing - 5006323

Reference Documents

- Application submitted December 14, 2021 and attachments.

1. Definitions

a. Act means Environment Act. 1994-95, c.1, s.1, and includes, unless the context otherwise requires, the regulations made pursuant to the Act, as amended from time to time.

b. Department means the Nova Scotia Department of Environment and Climate Change, and the contact for the Department for this approval is:
Nova Scotia Department of Environment and Climate Change
Eastern Region, Antigonish Office
155 Main Street, Suite 205
Antigonish, Nova Scotia B2G 2B6

Phone: (902) 863-7389
Fax: (902) 863-7411

c. Minister means the Minister of Environment and Climate Change and includes any person delegated the authority of the Minister.

d. Site means a place where a designated activity and/or undertaking is occurring or may occur.

2. Scope

a. This Approval (the "Approval") relates to the Approval Holder(s) and their application and all documentation submitted to the Department prior to the issuance of this approval for the Water Withdrawal situated at or near Goldbrook Lake - Pid 35094366.

b. The Approval Holder(s) shall ensure the designated activity is carried out in accordance with this Approval and reference documents, including the application and supporting documentation.

c. This approval authorizes only the activities outlined in the Scope section. All other watercourse alterations require additional Approvals or Notifications.

d. This approval does not authorize the alteration of a wetland, including the flooding or dewatering of wetlands as a result of this activity. If the activity is found to be causing an adverse effect, the Department shall be notified within 48 hours of discovery.

3. General

a. The Approval Holder(s) shall conduct the Designated Activity in accordance with the following provisions:

   i. The 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, provincial or federal legislation, or other organizations. 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 commence or continue the designated activity 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 Holder(s) 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. Any request for renewal or amendment of this Approval is to be made in writing, to the Department, at least ninety (90) days prior to the Approval expiry.

f. The Approval Holder(s) shall advise the Department in writing prior to any proposed extensions or modifications to the Activity and/or the Site. An amendment to this Approval may be required before implementing any extension or modification.

g. The Approval Holder(s) shall immediately notify the Department of any incidents of non-compliance with this Approval.

h. The Approval Holder(s) shall bear all expenses incurred in carrying out the environmental monitoring required under the terms and conditions of this Approval.

i. 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 that are all deemed acceptable to the Department.

j. Unless written authorization is received otherwise from the Minister, all samples required by this Approval shall be analyzed by a laboratory that meets the requirements of the Department's "Policy on Acceptable Certification of Laboratories" as amended from time to time.

k. The Approval Holder(s) shall ensure that this Approval, or a copy, is present on Site while personnel are on Site.

l. The Approval Holder(s) shall ensure that personnel directly involved in the designated activity are made fully aware of the terms and conditions of this Approval.

m. Upon any changes to the Registry of Joint Stock Companies information, the Approval Holder(s) shall provide a copy to the Department within five business days.

n. The Approval Holder shall, upon receipt of an invoice from the Minister of Nova Scotia Environment stating the amount owing, pay to the Minister of Finance the amount stipulated in said invoice. Said amount shall be in accordance with the schedule of fees established by the Minister of Nova Scotia Environment, as may be revised from time to time.

o. The failure of the Minister to insist upon a strict performance of a Term and Condition 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 of the Terms and Conditions of this Approval.

p. The Approval Holder may not alter or use the watercourse or water resource so as to:

i) prejudice any riparian or other rights, should any such rights exist, of a person lawfully in possession lands abutting the watercourse or water resource;
ii) cause damage or nuisance to adjacent or abutting lands.

q. The Approval Holder shall not place a pecuniary value on or claim any pecuniary value for the rights granted by this Approval, over and above the amounts, if any, paid to the Minister by the Approval Holder for the rights.

r. The Approval Holder shall maintain a culvert, bridge, dam, sluice, flume, conduit, well or other structure built or used in or on the watercourse or water resources so that it does not cause an adverse effect. This condition survives the expiry or cancellation of this Approval.

s. The Approval Holder shall indemnify and save harmless the Minister and an employee, servant or agent of the Department against any loss, cost or damage resulting from the activities performed pursuant to this Approval. 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 water resource 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 water resource, or by any trespass, negligence or wilful act of the Approval Holder or any employees, agents, contractors or guests of the Approval Holder.

t. The Minister and all persons designated as Inspectors pursuant to the Environment Act shall have free access at all times to the Activity and to land under control of the Approval Holder to ensure these Terms and Conditions are being fulfilled.

4. Covenant Conditions

a. The Approval does not authorize any activity that would:

   i. prejudice any riparian rights of any owner or of any person lawfully in possession of or holding any lands abutting the watercourse;

   ii. cause any damage or nuisance to adjacent or abutting land; or

   iii. discharge surface water onto adjoining lands without the authorization of the affected landowner(s).

b. The Approval Holder(s) is responsible to construct and maintain any culvert, bridge, dam, sluice, flume, conduit, or other approved structure built or used in or on the watercourse so that the structure(s) operates as originally designed and intended, and so that risks related to potential failure of the structure(s) are effectively mitigated.

c. The Approval Holder(s) shall rehabilitate the site to the satisfaction of the Minister and pay all expenses and costs of such rehabilitation in any of the following circumstances:

   i. upon the expiry or termination of this Approval; or

   ii. if the culvert, bridge, dam, sluice, flume, conduit, or other approved structure built or used in or on the watercourse is not appropriately maintained to mitigate risks related to potential failure of the structure(s).

d. By granting this Approval, the Department is not responsible for any damages as a result of the approved activities, including any water quality or quantity problems that may be encountered by the Approval Holder(s) or other parties.

e. By issuing this approval, the department is not providing any assurance(s) as to sufficient water quantity and/or quality to meet any requirements of the Approval Holder(s).

5. Fees

a. The Approval Holder(s) shall, upon receipt of an invoice from the Department stating the amount owing in accordance with the Fees Regulations, as amended from time to time, pay to the Minister of Finance the amount stipulated.

6. Specific Requirements

a. Water withdrawn from Goldbrook Lake shall not exceed 300,000 liters per day.

b. Prior to withdrawing any water from Goldbrook Lake the approval holder shall submit to the Department an up-to-date copy of Nova Scotia Natural Resources' - Permit For Mineral Exploration on Crown Land.

7. Monitoring and Recording

a. The Approval Holder shall accurately measure all water withdrawn from Goldbrook Lake. A daily record of volume withdrawn shall be documented. The records shall be in spreadsheet table format.

8. Reporting

a. The Approval Holder shall provide an annual report summarizing the water usage for each day of operation. The report shall be submitted to the Department by December 31st of each year.

Surface Water Withdrawal Limits			
Name of Watercourse	**Withdrawal Scenario**	**Parameter**	**Value**
Goldbrook Lake	intake hose with screen	Withdrawal Location (UTM Easting)	607050
		Withdrawal Location (UTM Northing)	5006323
		Withdrawal Location (UTM Zone)	20
		Period of Withdrawal (mm/dd - mm/dd)	01/01 - 12/31
		Withdrawal Start Date (mm/dd/yy)	01/10/22
		Average Daily Withdrawal Volume (averaged over 30 days; L/day)	300000
		Daily Duration of Withdrawal (Hours)	24
		Frequency of Withdrawal (text, e.g., 'Daily', '3 x a week')	daily
		Maximum Instantaneous Withdrawal Rate (L/s)	-
		Maximum Withdrawal Rate Based on Averaging Period (L/day)	300000
		Maximum Withdrawal Rate Averaging Period (days)	30
		Additional Comments	Withdrawal is from a hose attached to a drill rig pump. Sreen as per DFO requirements.

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APPROVAL

Province of Nova Scotia
Environment Act, S.N.S. 1994-95, c.1 s.1

APPROVAL HOLDER: EXPLORATION OREX INC.

SITE PID: 35094366

APPROVAL NO: 2018-100304-02

EXPIRY DATE: December 31, 2021

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 - Water Withdrawal

Administrator: Marc Theriault

Effective Date: January 6, 2021

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: EXPLORATION OREX INC.

Project: Goldbrook Lake - Pid 35094366

Site:

PID	Civic #	Street Name	Street Type	Community	County
35094366	570	GOLDBROOK	RD.	GOLDBORO	GUYSBOROUGH COUNTY

Approval No: 2018-100304-02

File No: 95100-30-ANT-2018-100304

Grid Reference: Easting - 607050, Northing - 5006323

Reference Documents

- Application submitted January 4, 2021 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. Associated Works means any building, machinery, equipment, device, tank, system, stockpile, or other related infrastructure.

e. Department means the Department of Environment, and the contact for the Department for this approval is:
Nova Scotia Environment
Eastern Region, Antigonish Office
155 Main Street, Suite 205
Antigonish, Nova Scotia B2G 2B6

Phone: (902) 863-7389
Fax: (902) 863-7411

f. Facility means the Water Withdrawal and associated works.

g. Minister means the Minister of Environment and includes any person appointed as a designate of the Minister.

h. Site means the lands where an activity or proposed activity will take place.

i. Standard means a standard, policy, code, guideline, protocol or other rule in relation to a designated activity that, by reason of its establishment or adoption by regulation or as a condition of an approval or certificate of qualification, becomes a mandatory requirement for participation in that designated activity.

j. Water Resource means all fresh and marine waters comprising all surface water, groundwater, and coastal water.

k. 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.

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, operate and/or reclaim the Facility, situated at or near Goldbrook Lake - Pid 35094366 (the "Site").

b The Site and/or Facility shall not exceed the area as outlined in the application and supporting documentation.

c. It is the Approval Holder(s)'s responsibility to ensure applicable legislation, approvals and codes of practice are met for all other aspects of the operation of the Facility.

3. General

a. The Approval Holder(s) shall construct, operate and reclaim the Facility in accordance with the following provisions:

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. 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.

c. Any request for renewal or extension of this Approval is to be made in writing, to the Department, at least ninety (90) days prior to the Approval expiry.

d. This Approval is not transferable without the consent of the Minister.

e. The Minister may modify, amend or add conditions to this Approval at any time pursuant to Section 58 of the Act.

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

i. If the Minister cancels or suspends this Approval, the Approval Holder(s) remains subject to the penalty provisions of the Act and regulations

f. 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.

g. The Approval Holder(s) shall immediately notify the Department of any incidents of non-compliance with this Approval.

h. 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 Facility operation are made fully aware of the terms and conditions which pertain to this Approval.

i. Upon any changes to the Registry of Joint Stock Companies information, the Approval Holder(s) shall provide a copy to the Department.

j. The Approval Holder shall, upon receipt of an invoice from the Minister of Nova Scotia Environment stating the amount owing, pay to the Minister of Finance the amount stipulated in said invoice. Said amount shall be in accordance with the schedule of fees established by the Minister of Nova Scotia Environment, as may be revised from time to time.

k. The failure of the Minister to insist upon a strict performance of a Term and Condition 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 of the Terms and Conditions of this Approval.

l. The Approval Holder may not alter or use the watercourse or water resource so as to:

i) prejudice any riparian or other rights, should any such rights exist, of a person lawfully in possession lands abutting the watercourse or water resource;
ii) cause damage or nuisance to adjacent or abutting lands.

m. The Approval Holder shall not place a pecuniary value on or claim any pecuniary value for the rights granted by this Approval, over and above the amounts, if any, paid to the Minister by the Approval Holder for the rights.

n. The Approval Holder shall maintain a culvert, bridge, dam, sluice, flume, conduit, well or other structure built or used in or on the watercourse or water resources so that it does not cause an adverse effect. This condition survives the expiry or cancellation of this Approval.

o. The Approval Holder shall indemnify and save harmless the Minister and an employee, servant or agent of the Department against any loss, cost or damage resulting from the activities performed pursuant to this Approval. 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 water resource 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 water resource, or by any trespass, negligence or wilful act of the Approval Holder or any employees, agents, contractors or guests of the Approval Holder.

p. The Minister and all persons designated as Inspectors pursuant to the Environment Act shall have free access at all times to the Activity and to land under control of the Approval Holder to ensure these Terms and Conditions are being fulfilled.

4. Specific Requirements

a. Water withdrawn from Goldbrook Lake shall not exceed 300,000 liters per day.

b. Prior to withdrawing any water from Goldbrook Lake the approval holder shall submit to the Department an up-to-date copy of Nova Scotia Natural Resources' - Permit For Mineral Exploration on Crown Land.

5. Monitoring and Recording

a. The Approval Holder shall accurately measure all water withdrawn from Goldbrook Lake. A daily record of volume withdrawn shall be documented. The records shall be in spreadsheet table format.

6. Reporting

a. The Approval Holder shall provide an annual report summarizing the water usage for each day of operation. The report shall be submitted to the Department by December 31st of each year.

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APPROVAL

Province of Nova Scotia
Environment Act, S.N.S. 1994-95, c.1 s.1

APPROVAL HOLDER: EXPLORATION OREX INC.

SITE PID: 35094366

APPROVAL NO: 2018-100304-01

EXPIRY DATE: December 31, 2021

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 - Water Withdrawal

Administrator: Marc Theriault

Effective Date: January 1, 2020

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: EXPLORATION OREX INC.

Project: Goldbrook Lake - Pid 35094366

Site:

PID	Civic #	Street Name	Street Type	Community	County
35094366	570	GOLDBROOK	RD.	GOLDBORO	GUYSBOROUGH COUNTY

Approval No: 2018-100304-01

File No: 95100-30-ANT-2018-100304

Grid Reference: Easting - 607050, Northing - 5006323

Reference Documents

- Application submitted October 17, 2019 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. Associated Works means any building, machinery, equipment, device, tank, system, stockpile, or other related infrastructure.

e. Department means the Department of Environment, and the contact for the Department for this approval is:
Nova Scotia Environment
Eastern Region, Antigonish Office
155 Main Street, Suite 205
Antigonish, Nova Scotia B2G 2B6

Phone: (902) 863-7389
Fax: (902) 863-7411

f. Facility means the Water Withdrawal and associated works.

g. Minister means the Minister of Environment and includes any person appointed as a designate of the Minister.

h. Site means the lands where an activity or proposed activity will take place.

i. Standard means a standard, policy, code, guideline, protocol or other rule in relation to a designated activity that, by reason of its establishment or adoption by regulation or as a condition of an approval or certificate of qualification, becomes a mandatory requirement for participation in that designated activity.

j. Water Resource means all fresh and marine waters comprising all surface water, groundwater, and coastal water.

k. 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.

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, operate and/or reclaim the Facility, situated at or near Goldbrook Lake - Pid 35094366 (the "Site").

b. The Site and/or Facility shall not exceed the area as outlined in the application and supporting documentation.

c. It is the Approval Holder(s)'s responsibility to ensure applicable legislation, approvals and codes of practice are met for all other aspects of the operation of the Facility.

3. General

a. The Approval Holder(s) shall construct, operate and reclaim the Facility in accordance with the following provisions:

   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. 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.

c. Any request for renewal or extension of this Approval is to be made in writing, to the Department, at least ninety (90) days prior to the Approval expiry.

d. This Approval is not transferable without the consent of the Minister.

e. The Minister may modify, amend or add conditions to this Approval at any time pursuant to Section 58 of the Act.

   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

   i. If the Minister cancels or suspends this Approval, the Approval Holder(s) remains subject to the penalty provisions of the Act and regulations

f. 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.

g. The Approval Holder(s) shall immediately notify the Department of any incidents of non-compliance with this Approval.

h. 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 Facility operation are made fully aware of the terms and conditions which pertain to this Approval.

i. Upon any changes to the Registry of Joint Stock Companies information, the Approval Holder(s) shall provide a copy to the Department.

j. The Approval Holder shall, upon receipt of an invoice from the Minister of Nova Scotia Environment stating the amount owing, pay to the Minister of Finance the amount stipulated in said invoice. Said amount shall be in accordance with the schedule of fees established by the Minister of Nova Scotia Environment, as may be revised from time to time.

k. The failure of the Minister to insist upon a strict performance of a Term and Condition 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 of the Terms and Conditions of this Approval.

l. The Approval Holder may not alter or use the watercourse or water resource so as to:

i) prejudice any riparian or other rights, should any such rights exist, of a person

lawfully in possession lands abutting the watercourse or water resource;
ii) cause damage or nuisance to adjacent or abutting lands.

m. The Approval Holder shall not place a pecuniary value on or claim any pecuniary value for the rights granted by this Approval, over and above the amounts, if any, paid to the Minister by the Approval Holder for the rights.

n. The Approval Holder shall maintain a culvert, bridge, dam, sluice, flume, conduit, well or other structure built or used in or on the watercourse or water resources so that it does not cause an adverse effect. This condition survives the expiry or cancellation of this Approval.

o. The Approval Holder shall indemnify and save harmless the Minister and an employee, servant or agent of the Department against any loss, cost or damage resulting from the activities performed pursuant to this Approval. 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 water resource 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 water resource, or by any trespass, negligence or wilful act of the Approval Holder or any employees, agents, contractors or guests of the Approval Holder.

p. The Minister and all persons designated as Inspectors pursuant to the Environment Act shall have free access at all times to the Activity and to land under control of the Approval Holder to ensure these Terms and Conditions are being fulfilled.

4. Specific Requirements

a. Water withdrawn from Goldbrook Lake shall not exceed 160,000 liters per day.

b. Prior to withdrawing any water from Goldbrook Lake the approval holder shall submit to the Department an up-to-date copy of Nova Scotia Natural Resources' - Permit For Mineral Exploration on Crown Land.

5. Monitoring and Recording

a. The Approval Holder shall accurately measure all water withdrawn from Goldbrook Lake. A daily record of volume withdrawn shall be documented. The records shall be in spreadsheet table format.

6. Reporting

a. The Approval Holder shall provide an annual report summarizing the water usage for each day of operation. The report shall be submitted to the Department by December 31st of each year.

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APPROVAL

Province of Nova Scotia
Environment Act, S.N.S. 1994-95, c.1 s.1

APPROVAL HOLDER: EXPLORATION OREX INC.

SITE PID: 35094366

APPROVAL NO: 2018-101368-00

EXPIRY DATE: May 17, 2019

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:

Industrial - Minerals - Bulk Sample Site

Tanya MacKenzie

Administrator: Tanya MacKenzie

Effective Date: July 23, 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: EXPLORATION OREX INC.

Project: 570 Goldbrook Rd., Goldboro, Guysborough County - PID 35094366

Site:

PID	Civic #	Street Name	Street Type	Community	County
35094366	570	GOLDBROOK	RD.	GOLDBORO	GUYSBOROUGH COUNTY

Approval No: 2018-101368-00

File No: 92100-30-BED-2018-101368

Grid Reference: Easting - 606923, Northing - 5006342

Reference Documents

- Application submitted February 21, 2018 and attachments.
- Letter from NSE to Paq'tnkek First Nation dated June 5, 2018
- Correpondence (e-mail) from Orex dated May 22, 2018
- Letter of Authority for Crown Lands Access dated May 16 ,2018
- Correspondence (e-mail) from Orex dated May 22, 2018
- Letter from NSE to KMKNO dated July 12, 2018
- Letter from Anaconda Mining to KMKNO dated July 6, 2018
- Letter from KMKNO to NSE dated June 28, 2018
- Correpondence (e-mail) from NSDNR of June 28,2018 confirming acceptable reclamation security
- Correspondence (e-mail) from Orex dated June 18, 2018 revising monitoring plans
- Submission of WSP Technical Note and Preliminary Hydrology Study dated June 6, 2018
- Submission of reclamtion plan by e-mail dated May 23, 2018
- Correspondence (e-mail) from M&NPipeline dated June 5, 2018
- Letter from Anaconda Mining on corporate relationship dated May 18, 2018

- Correspondence (e-mail) from Orex dated May 22, 2018
- Letter of Authority for Crown Lands Access dated May 16, 2018
- Letter from Nova Scotia Labour - Occupational Health and Safety Division on Code of Practise dated May 15, 2018
- Letter from NSE dated March 20, 2018
- Correspondence (e-mail) from NSE to Orex on inspection dated April 26 ,2018

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. Active Area means the area occupied by the mine portal, disturbed areas, rehabilitated areas, any structure, processing facility, pollution abatement system, settling ponds, aggregate stockpile and/or overburden associated with the activity. The active area excludes the scale, scale house, and access roads.

c. Administrator means a person appointed by the Minister for the purpose of this Act, and includes an acting administrator.

d. Approval means an Approval issued pursuant to this Act with respect to an activity.

e. Associated Works means any building, machinery, equipment, device, tank, system, stockpile, or other related infrastructure.

f. 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

g. Disturbed Area means any area on the site of the approved designated activity that has been stripped of vegetation and is susceptible to erosion.

h. Extension means an increase in size, volume or other physical dimensions of an activity such that the increase may cause an adverse effect if not properly mitigated.

i. Facility means the Bulk Sample Site and associated works.

j. Grab sample means an individual sample collected in less than 30 minutes and which is representative of the substance sampled.

k. Minister means the Minister of Environment and includes any person appointed as a designate of the Minister.

l. Modification means a change to an activity that may cause an adverse effect if not properly mitigated and includes, but is not limited to, the expansion of the same process, addition of product lines and replacement of equipment with different technology other than that presently in use.

m. Reclamation means work performed or to be performed in accordance with an authorized plan, and includes rehabilitation of a site or facility.

n. Site means the lands where an activity or proposed activity will take place.

o. Standard means a standard, policy, code, guideline, protocol or other rule in relation to a designated activity that, by reason of its establishment or adoption by regulation or as a condition of an approval or certificate of qualification, becomes a mandatory requirement for participation in that designated activity.

p. Structure includes but is not limited to a private home, a cottage, an apartment building, a school, a church, a commercial building or a treatment facility associated with the treatment of municipal sewage, industrial or landfill effluent, an industrial building, infrastructure or construction, a hospital, and a nursing home, etc.

q. Water Resource means all fresh and marine waters comprising all surface water, groundwater, and coastal water.

r. 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.

s. 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 all documentation submitted to the Department prior to the issuance of this approval for the Bulk Sample Site situated at or near 570 GOLDBROOK RD. - PID 35094366.

b. The Site and/or Facility shall not exceed the area as outlined in the application

and supporting documentation.

c. It is the Approval Holder(s)'s responsibility to ensure applicable legislation, approvals and codes of practice are met for all other aspects of the operation of the Facility.

d. The bulk sample shall not exceed 10,000 tonnes of ore derived from existing underground workings.

3. General

a. The Approval Holder(s) shall construct, operate and reclaim the Facility in accordance with the following provisions:

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

iii. Any standard adopted by the Department, as amended from time to time.

b. No authority is granted by this Approval to enable the Approval Holder(s) to construct or operate the Facility 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.

c. 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.

d. Any request for renewal or extension of this Approval is to be made in writing, to the Department, at least ninety (90) days prior to the Approval expiry.

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 to the Facility, including, but not limited to, the active area, operating area, processing changes or waste disposal practices which are not granted under this Approval. An amendment to this Approval may be required

before implementing any change.

h. Extensions or modifications to the Facility may be subject to the Environmental Assessment Regulations. Written approval from the Minister may be required before implementing a change.

i. 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.

j. The Approval Holder(s) shall immediately notify the Department of any incidents of non-compliance with this Approval.

k. The Approval Holder(s) shall bear all expenses incurred in carrying out the environmental monitoring required under the terms and conditions of this Approval.

l. 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.

m. 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.

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 Facility operation are made fully aware of the terms and conditions which pertain to this Approval.

o. Upon any changes to the Registry of Joint Stock Companies information, the Approval Holder(s) shall provide a copy to the Department.

4. Sound Levels

a. Sound levels measured at the Site property boundaries shall not exceed the following equivalent sound levels (Leq):

   i. 65 dBA 0700-1900 hours

   ii. 60 dBA 1900-2300 hours

   iii. 55 dBA 2300-0700 hours

b. Monitoring of sound levels shall be conducted at the request of the Department. The location of the monitoring station(s) for sound will be established by a qualified person retained by the Approval Holder(s) and submitted to the

Department for approval, this may include point(s) beyond the property boundary of the Site.

5. Separation Distances

a. The Approval Holder(s) shall not locate the Active Area of the Site within the following separation distances unless otherwise exempted or varied by conditions of this approval:

i. 30 m of the boundary of a public or common highway

ii. 30 m of the property boundary that does not form part of the Site Active Area

6. Storage Tank Systems

a. The Approval Holder(s) shall ensure that all petroleum storage systems and related infrastructures are constructed, operated and maintained in accordance with the Petroleum Management Regulations and the Nova Scotia Standards for the Construction and Installation for Petroleum Storage Tank Systems (1997 edition or most recent version).

7. Particulate Emissions (Dust)

a. Particulate emissions shall not contribute to an ambient concentration of total suspended particulate matter that exceed the following limits (in micrograms per cubic metre of air) at or beyond the Site property boundaries:

i. Daily Average (24 hr.) 120 µg/m3

ii. Annual Geometric Mean 70 µg/m3

b. The use of oil as a dust suppressant is prohibited.

c. Monitoring of ambient total suspended particulate matter shall be conducted at the request of the Department. The location of the monitoring station(s) for suspended particulate matter will be established by a qualified person retained by the Approval Holder(s) and submitted to the Department for approval; this may include point(s) beyond the property boundary of the Site.

d. When requested, ambient total suspended particulate matter shall be measured in accordance with EPA standard; EPA/625/R-96/010a; Sampling of Ambient Air for Total Suspended Particulate Matter (SPM) and PM10 shall be done using a High Volume (HV) Sampler.

8. Surface Water

a. The Site shall be developed and maintained to prevent surface water contaminants from being discharged into a watercourse, wetland, water resource,

or beyond the property boundary, in excess of the following criteria:

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 hour 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) Maximum increase of 10% over background levels when background is >250 mg/l.

iii. pH (Outfall):

(a) Maximum 5 to 9 in grab sample;

(b) Maximum 6 to 9 as a Monthly Arithmetic Mean.

iv. Petroleum Hydrocarbon:

(a) Nova Scotia Environment Tier 1 Environmental Quality Standards for Surface Water - Petroleum Hydrocarbons (PHC) Parameters.

b. Erosion and sedimentation control devices shall be installed prior to construction at the Site and shall remain in place and be maintained until disturbed areas are stabilized.

c. The Department reserves the right to require modifications including, but not limited to, monitoring locations, monitoring frequency, contaminants of concern, and surface water criteria.

d. No authority is granted by this Approval to enable the Approval Holder(s) to discharge surface water onto adjoining lands without the authorization of the affected landowner(s). It is the responsibility of the Approval Holder(s) to ensure authorizations are current and valid.

e. The Approval Holder(s) shall immediately contact the Department should sulphide bearing material be encountered on the Site and shall include planned remedial measures in conformance with the Sulfide Bearing Material Disposal Regulations.

f. Surface water compliance stations for in stream total suspended solids shall include:

Upstream Stations: #2 Beaver Pond Inlet and #4 Southern Gold Brook Lake
Downstream Stations: #3 Beaver Pond Outlet and #7 Gold Brook Creek

g. The Approval Holder shall comply with the surface water discharge limits established in Table 2 at the settling pond outfall identified as Station # 6.

h. i)The Approval Holder(s) shall ensure surface water is monitored at the stations and frequencies listed in the appended Table 1 for Surface Water and Groundwater Monitoring at the Stations identified in the appended plan entitled Anaconda Mining, Goldboro gold Bulk Sample Plan, Water Monitoring Stations, dated June 14, 2018. This includes Station #9 (Drainage from the Ore Stockpile).

ii)The Approval Holder shall monitor liquid effluent for toxicity at the request of the Department.

i. The Approval Holder shall be required to limit or cease blasting and/or mine dewatering, at the direction of the Department, if results of monitoring indicate adverse impacts on surface water.

9. Groundwater

a. The Approval Holder(s) shall replace at their expense any water supply which has been lost or damaged as a result of extracting aggregate.

b. The Approval Holder shall conduct groundwater monitoring as described in appended Table 1 and as identified at the groundwater stations identified in the appended Map 1, Bulk Sampling Hydrogeological Measurement Location Plan, by WSP dated May 24, 2018.

c. The Approval Holder shall conduct additional groundwater monitoring if so directed by the Department.

10. Blasting

a. i)The Approval Holder(s) shall have a technical blast design prepared by a qualified person which ensures the ground vibration and air concussion limits in this Approval can be achieved.

ii)At the request of the Department, the Approval Holder(s) shall submit a copy of the blast design.

iii)At the direction of the Department, the Approval Holder(s) shall modify or cease blasting.

b. The Approval Holder(s) shall conduct a pre-blast survey of all structures within 800 metres of the point of blast including a water quality analysis of any wells serving these structures. The survey shall be conducted in accordance with the

Department's "Procedure For Conducting a Pre-Blast Survey" and the results of this survey sent to the Department prior to blasting on the Site. Additional water quality parameters may be required by the Department staff.

c. i)The Approval Holder shall monitor all blasts for ground vibration at the nearest location to the Maritimes and Northeast Pipeline, unless otherwise directed by the Department.

ii) Blast ground vibration at the nearest structure shall be less than 12.5 mm/sec or 0.5 inch per second.

d. The Approval Holder(s) shall submit a record of individual blast results if so directed by the Department

11. Reporting

a. The Approval Holder shall immediately notify the Department of any non-comliance with terms and conditions of the Approval.

b. The Approval Holder(s) shall provide a final report within 60 days of completion of work summarizing the following information, as required by the terms and conditions of this Approval, for the activity:

i)summary of all bulk sample activities,
ii) documeantation of any incidents of non-compliance with the terms and conditions of Approval,
iii) a record of all complaints and the company response to the complaints,
iv)submission of all monitoring results, including blasting, surface water, and groundwater results with an interpretation of the data by an experienced independent professional engineer or hydrogeologist.

12. 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.

13. Records

a. i)The Approval Holder shall maintain records of all monitoring reports on Site for inspection by the Department, including:

a)blast vibration and date and times of blasting,
b)surface water monitoring and date of monitoring,
c)groundwater monitoring and date of monitoring,
d)volumes,dates and rate of mine dewatering,

e)dates of effluent discharge from settling ponds,
f)mass of ore sample stockpiled on Site and mass transported off Site,
g)records of complaints and company response to complaints.

ii)records of all on-going project reviews conducted by the experienced independent professional engineer or hydrogelogist.

iii) Results of monitoring shall be made available to the Department upon request.

14. Reclamation

a. The Approval Holder(s) shall reclaim the Site within twelve (12) months of abandonment and in accordance with the latest reclamation plan submitted by the Approval Holder unless an alternate time frame is provided by the Department.

b. The Department shall release the security to the Approval Holder(s) after final reclamation of the Site has been completed to the satisfaction of the Minister. The Approval Holder(s) shall notify the Department when reclamation has been completed.

15. Engineer of Record

a. i)The Approval Holder shall retain an experienced independent professional engineer or hydrogeologist(Engineer of Record)to conduct weekly envronmental reviews of all bulk sample monitoring program activities, including a review and interpretation of all monitoring results conducted and any mitigative actions recommended to reduce environmental impact.

ii) The Approval Holder shall have the Engineer of Record mantain weekly records of these reviews and make them available to the Department upon request.

Table 1: Surface Water and Groundwater Monitoring Program

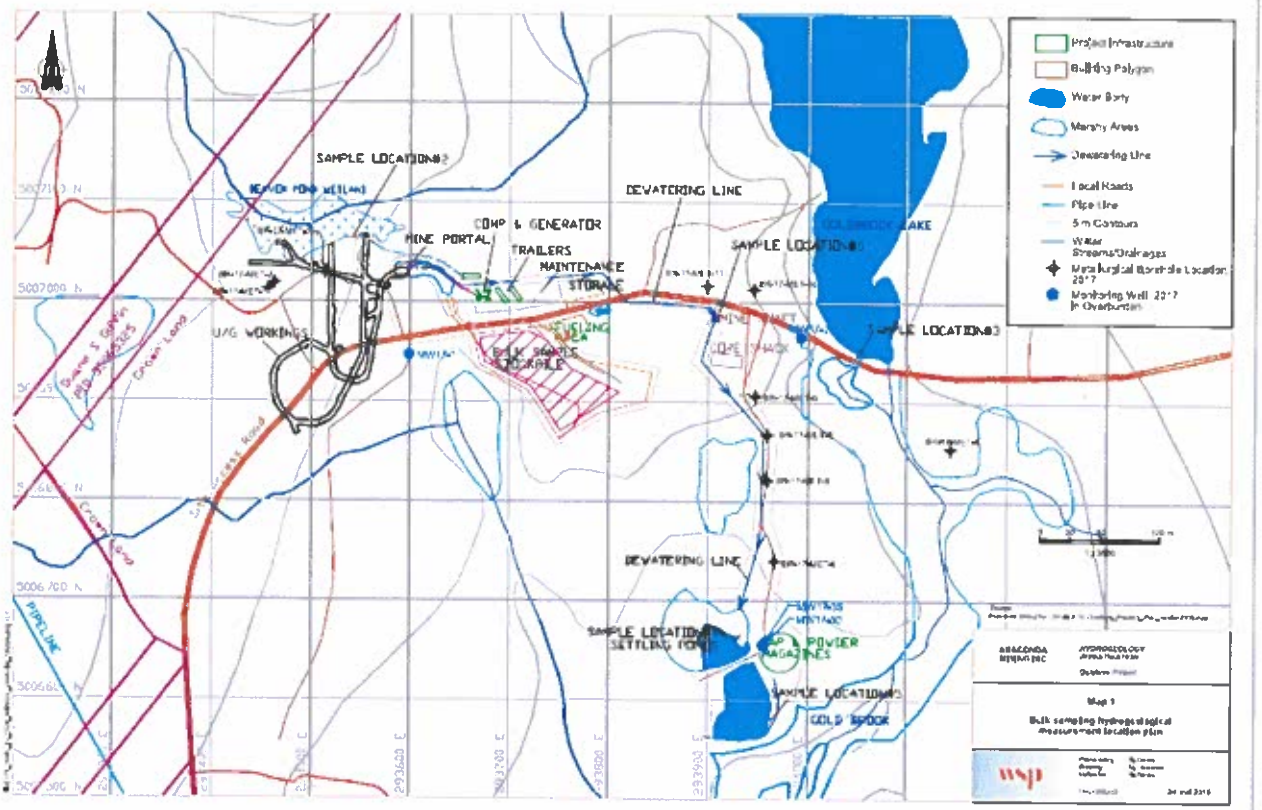
Monitoring Station	Station Description	Static Water Level	Flow Measure	General Chemistry (RCAP)	Metal Scan	TSS	pH
#1	Mine Extraction Point	Daily	Continuous	weekly	weekly	weekly	weekly
#2	Beaver Pond-Inflow	Daily		monthly	monthly	weekly	weekly
#3	Beaver Pond - Outflow	Daily		monthly	monthly	weekly	weekly
#4	Goldbrook Lake South	Daily		monthly	monthly	weekly	weekly
#5	Boston-Richardson Shaft	Daily		weekly	weekly	weekly	weekly
#6	Settling Pond Outflow	Daily	Daily	weekly	weekly	weekly	weekly
#7	Gold Brook Creek	Daily		weekly	weekly	weekly	weekly
#8	Domestic Well	Weekly		monthly	monthly	monthly	monthly
#9	Drainage from Ore Stockpile	N/A		monthly	monthly	weekly	weekly
MW 17-1, MW 17-2, MW17-3	Monitoring Well	Weekly		Baseline and as requested	Baseline and as requested	Baseline as requested	Baseline and as requested

TABLE 2

Liquid Effluent Discharge Limits

Settling Pond Station # 6

Parameter	Maximum in a Grab Sample
Arsenic (mg/l)	1.0
Copper (mg/l)	0.6
Lead (mg/l)	0.4
Nickel (mg/l)	1.0
Zinc (mg/l)	1.0
Total Suspended Solids (mg/l)	30.0
pH (range of units)	5.0 - 9.0
Toxicity	Non-Acutely Lethal


SAMPLE LOCATIONS
DEWATERING LINE
COMP & GENERATOR
MINE PORTAL
TRAILERS
MAINTENANCE
STORAGE
U/G WORKINGS
SAMPLE LOCATIONS
DEWATERING LINE
SAMPLE LOCATIONS
SETTLING POND
POWER
MAGAZINES
SAMPLE LOCATIONS
COLD BROOK
PIPELINE
Project Infrastructure
Building Polygon
Water Body
Marshy Areas
Dewatering Line
Local Roads
Pipe Line
5 m Contours
Water Streams/Drainages
Monitoring Well 2017
In Overburden

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APPROVAL

Province of Nova Scotia
Environment Act, S.N.S. 1994-95, c.1 s.1

APPROVAL HOLDER: TRANSPORTATION AND INFRASTRUCTURE RENEWAL

SITE PID: 35094366

APPROVAL NO: 2018-102309-00

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 - Culvert / Closed Bottom Structure

Administrator: Sean Gillis

Effective Date: April 4, 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: TRANSPORTATION AND INFRASTRUCTURE RENEWAL

Project: Station 2+080 Route 316

Site:

PID	Civic #	Street Name	Street Type	Community	County
35094366	14145	HIGHWAY 316	HWY.	ISAACS HARBOUR NORTH	GUYSBOROUGH COUNTY

Approval No: 2018-102309-00

File No: 95100-30-ANT-2018-102309

Grid Reference: Easting - 600701, Northing - 5007711

Reference Documents

- Application submitted March 21, 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
Eastern Region, Antigonish Office
155 Main Street, Suite 205
Antigonish, Nova Scotia B2G 2B6

Phone: (902) 863-7389
Fax: (902) 863-7411

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 Culvert / Closed Bottom Structure on unknown situated at or near 14145 HIGHWAY 316 HWY.

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

   iii. Nova Scotia Watercourse Alteration Specifications

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.

NOVA SCOTIA

File No:95100-30-ANT-2018-102309

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
Eastern Region, Antigonish Office
155 Main Street, Suite 205
Antigonish, NS, B2G 2B6

Phone: 902-863-7389
Fax: 902-863-7411
NSE Contact: Sean Gillis

APPROVAL NUMBER:	2018-102309-00
NAME OF APPROVAL HOLDER:	TRANSPORTATION AND INFRASTRUCTURE RENEWAL
WORK AUTHORIZED:	Culvert / Closed Bottom Structure
DATE WORK WAS COMPLETED:	_____
NAME OF CONTRACTOR:	_____

COMMENTS: _____

_____

_____

_____

_____

_____ _____

Signature Date

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

April 4, 2018

Your file *Votre référence*
2018-102309

Our file *Notre référence*
18-W-078

Sean Gillis
Nova Scotia Environment
155 Main Street, Suite 205
Antigonish, NS
B2G 2B6

Subject: Unnamed Trib to Country Harbour, Culvert at Station 2+080 Route 316 Stormont, Guysborough County – Serious Harm to Fish and Prohibited Effects on Listed Aquatic Species at Risk Can Be Avoided or Mitigated

Dear Mr. Gillis:

The Fisheries Protection Program (the Program) of Fisheries and Oceans Canada (DFO) received the proposal on March 21, 2018. We understand that the proponent proposes to:

- Replace the existing culvert with a 750mm precast concrete pipe. The total length will be 15m and the watercourse slope is 2.4%. The stream has been assessed as not to constitute fish habitat and fish passage is not required.

Our review considered the following information:

- Nova Scotia Environment Application for Approval and all supporting documents and plans – Watercourse alteration file #2018-102309 received on March 21, 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 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 the plans change or if the proponent has omitted some information in the proposal, further review by the Program may be required. Consult our website (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 the responsibility of the proponent 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*.

The proponent also has the *Duty to Notify* DFO if they 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 the responsibility of the proponent 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 Craig Reynolds at our Dartmouth office at 902-789-5832 or by email at craig.reynolds@dfo-mpo.gc.ca. Please refer to the file number referenced above when corresponding with the Program.

Yours sincerely,

Craig Reynolds

Craig Reynolds
Fisheries Protection Biologist
Fisheries Protection Program

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APPROVAL

Province of Nova Scotia
Environment Act, S.N.S. 1994-95, c.1 s.1

APPROVAL HOLDER: S.W. WEEKS CONTRACTING INCORPORATED

SITE PID: 35094366

APPROVAL NO: 2018-102314-01

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 - Culvert / Closed Bottom Structure

Administrator: Sean Gillis

Effective Date: May 3, 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: S.W. WEEKS CONTRACTING INCORPORATED

Project: Station 5+370 Route 316

Site:

PID	Civic #	Street Name	Street Type	Community	County
35094366	14145	HIGHWAY 316	HWY.	ISAACS HARBOUR NORTH	GUYSBOROUGH COUNTY

Approval No: 2018-102314-01

File No: 95100-30-ANT-2018-102314

Grid Reference: Easting - 600947, Northing - 5007582

Reference Documents

- Application submitted May 2, 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
Eastern Region, Antigonish Office
155 Main Street, Suite 205
Antigonish, Nova Scotia B2G 2B6

Phone: (902) 863-7389
Fax: (902) 863-7411

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 Culvert / Closed Bottom Structure on unknown situated at or near 14145 HIGHWAY 316 HWY.

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

iii. Nova Scotia Watercourse Alteration Specifications

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.

NOVA SCOTIA

File No:95100-30-ANT-2018-102314

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
Eastern Region, Antigonish Office
155 Main Street, Suite 205
Antigonish, NS, B2G 2B6

Phone: 902-863-7389
Fax: 902-863-7411
NSE Contact: Sean Gillis

APPROVAL NUMBER: 2018-102314-01

NAME OF APPROVAL HOLDER: S.W. WEEKS CONTRACTING INCORPORATED

WORK AUTHORIZED: Culvert / Closed Bottom Structure

DATE WORK WAS COMPLETED: _____

NAME OF CONTRACTOR: _____

COMMENTS: _____

_____

_____

_____

_____

_____ _____

Signature Date

NOVA SCOTIA

155 Main Street, Suite 205
Antigonish NS
Canada B2G 2B6

902-863-7389 P
902-863-7411 F
www.novascotia.ca

APPROVAL

Province of Nova Scotia
Environment Act, S.N.S. 1994-95, c.1 s.1

APPROVAL HOLDER: TRANSPORTATION AND INFRASTRUCTURE RENEWAL

SITE PID: 35094366

APPROVAL NO: 2018-102314-00

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 - Culvert / Closed Bottom Structure

Administrator: Sean Gillis

Effective Date: April 5, 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: TRANSPORTATION AND INFRASTRUCTURE RENEWAL

Project: Station 2+370 Route 316

Site:

PID	Civic #	Street Name	Street Type	Community	County
35094366	14145	HIGHWAY 316	HWY.	ISAACS HARBOUR NORTH	GUYSBOROUGH COUNTY

Approval No: 2018-102314-00

File No: 95100-30-ANT-2018-102314

Grid Reference: Easting - 600947, Northing - 5007582

Reference Documents

- Application submitted March 21, 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
Eastern Region, Antigonish Office
155 Main Street, Suite 205
Antigonish, Nova Scotia B2G 2B6

Phone: (902) 863-7389
Fax: (902) 863-7411

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 Culvert / Closed Bottom Structure on unknown situated at or near 14145 HIGHWAY 316 HWY.

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

   iii. Nova Scotia Watercourse Alteration Specifications

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.

NOVA SCOTIA

File No:95100-30-ANT-2018-102314

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
Eastern Region, Antigonish Office
155 Main Street, Suite 205
Antigonish, NS, B2G 2B6

Phone: 902-863-7389
Fax: 902-863-7411
NSE Contact: Sean Gillis

APPROVAL NUMBER:	2018-102314-00
NAME OF APPROVAL HOLDER:	TRANSPORTATION AND INFRASTRUCTURE RENEWAL
WORK AUTHORIZED:	Culvert / Closed Bottom Structure
DATE WORK WAS COMPLETED:	_____
NAME OF CONTRACTOR:	_____

COMMENTS: _____

_____

_____

_____

_____

_____ _____

Signature Date

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

April 4, 2018

Your file *Votre référence*
2018-102314

Our file *Notre référence*
18-W-079

Sean Gillis
Nova Scotia Environment
155 Main Street, Suite 205
Antigonish, NS
B2G 2B6

Subject: Unnamed Trib to Country Harbour, Culvert at Station 2+370 Route 316 Stormont, Guysborough County – Serious Harm to Fish and Prohibited Effects on Listed Aquatic Species at Risk Can Be Avoided or Mitigated

Dear Mr. Gillis:

The Fisheries Protection Program (the Program) of Fisheries and Oceans Canada (DFO) received the proposal on March 21, 2018. We understand that the proponent proposes to:

- Replace the existing culvert with a 750mm precast concrete pipe. The total length will be 15m and the watercourse slope is 1.35%. The stream has been assessed as not to constitute fish habitat and fish passage is not required.

Our review considered the following information:

- Nova Scotia Environment Application for Approval and all supporting documents and plans – Watercourse alteration file #2018-102314 received on March 21, 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 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 the plans change or if the proponent has omitted some information in the proposal, further review by the Program may be required. Consult our website (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 the responsibility of the proponent 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*.

The proponent also has the *Duty to Notify* DFO if they 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 the responsibility of the proponent 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 Craig Reynolds at our Dartmouth office at 902-789-5832 or by email at craig.reynolds@dfo-mpo.gc.ca. Please refer to the file number referenced above when corresponding with the Program.

Yours sincerely,

Craig Reynolds

Craig Reynolds
Fisheries Protection Biologist
Fisheries Protection Program

NOVA SCOTIA

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APPROVAL

Province of Nova Scotia
Environment Act, S.N.S. 1994-95, c.1 s.1

APPROVAL HOLDER: Orex Exploration

SITE PID: 35094366

APPROVAL NO: 2018-101368-01

EXPIRY DATE: September 16, 2024

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:

Industrial - Minerals - Bulk Sample Site

Administrator: Kevin G Garroway

Effective Date: September 16, 2019

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: Orex Exploration

Project: 570 Goldbrook Rd., Goldboro, Guysborough County - PID 35094366

Site:

PID	Civic #	Street Name	Street Type	Community	County
35094366	570	GOLDBROOK	RD.	GOLDBORO	GUYSBOROUGH COUNTY

Approval No: 2018-101368-01

File No: 92100-30-BED-2018-101368

Grid Reference: Easting - 606923, Northing - 5006342

Reference Documents

- Application submitted May 9, 2019 and attachments.
- Letter from NSE to Paq'tnkek First Nation dated June 5, 2018
- Correpondence (e-mail) from Orex dated May 22, 2018
- Letter of Authority for Crown Lands Access dated May 16 ,2018
- Correspondence (e-mail) from Orex dated May 22, 2018
- Letter from NSE to KMKNO dated July 12, 2018
- Letter from Anaconda Mining to KMKNO dated July 6, 2018
- Letter from KMKNO to NSE dated June 28, 2018
- Correpondence (e-mail) from NSDNR of June 28,2018 confirming acceptable reclamation security
- Correspondence (e-mail) from Orex dated June 18, 2018 revising monitoring plans
- Submission of WSP Technical Note and Preliminary Hydrology Study dated June 6, 2018
- Submission of reclamtion plan by e-mail dated May 23, 2018
- Correspondence (e-mail) from M&NPipeline dated June 5, 2018
- Letter from Anaconda Mining on corporate relationship dated May 18, 2018

- Correspondence (e-mail) from Orex dated May 22, 2018
- Letter of Authority for Crown Lands Access dated May 16, 2018
- Letter from Nova Scotia Labour - Occupational Health and Safety Division on Code of Practise dated May 15, 2018
- Letter from NSE dated March 20, 2018
- Correspondence (e-mail) from NSE to Orex on inspection dated April 26 ,2018
- Letter of Authority for Crown Land Access dated June 14, 2019
- Letter of Authority for Bulks Sample from Energy and Mines dated August 29, 2019
- Email from Department of Lands and Forestry stating Letter of Authority is not required to remove the remaining 6,100 tonne bulk sample but LOA is required for storage of the 3,100 tonne bulk sample dated September 19, 2019

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. Active Area means the area occupied by the mine portal, disturbed areas, rehabilitated areas, any structure, processing facility, pollution abatement system, settling ponds, aggregate stockpile and/or overburden associated with the activity. The active area excludes the scale, scale house, and access roads.

c. Administrator means a person appointed by the Minister for the purpose of this Act, and includes an acting administrator.

d. Approval means an Approval issued pursuant to this Act with respect to an activity.

e. Associated Works means any building, machinery, equipment, device, tank, system, stockpile, or other related infrastructure.

f. Department means the Department of Environment, and the contact for the Department for this approval is:
Nova Scotia Environment
Eastern Region, Antigonish Office
155 Main Street, Suite 205
Antigonish, Nova Scotia B2G 2B6

Phone: (902) 863-7389
Fax: (902) 863-7411

g. Disturbed Area means any area on the site of the approved designated activity that has been stripped of vegetation and is susceptible to erosion.

h. Extension means an increase in size, volume or other physical dimensions of an activity such that the increase may cause an adverse effect if not properly mitigated.

i. Facility means the Bulk Sample Site and associated works.

j. Grab sample means an individual sample collected in less than 30 minutes and which is representative of the substance sampled.

k. Minister means the Minister of Environment and includes any person appointed as a designate of the Minister.

l. Modification means a change to an activity that may cause an adverse effect if not properly mitigated and includes, but is not limited to, the expansion of the same process, addition of product lines and replacement of equipment with different technology other than that presently in use.

m. Reclamation means work performed or to be performed in accordance with an authorized plan, and includes rehabilitation of a site or facility.

n. Site means the lands where an activity or proposed activity will take place.

o. Standard means a standard, policy, code, guideline, protocol or other rule in relation to a designated activity that, by reason of its establishment or adoption by regulation or as a condition of an approval or certificate of qualification, becomes a mandatory requirement for participation in that designated activity.

p. Structure includes but is not limited to a private home, a cottage, an apartment building, a school, a church, a commercial building or a treatment facility associated with the treatment of municipal sewage, industrial or landfill effluent, an industrial building, infrastructure or construction, a hospital, and a nursing home, etc.

q. Water Resource means all fresh and marine waters comprising all surface water, groundwater, and coastal water.

r. 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.

s. 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. The scope of the Approval is limited to the following:

   i. This Approval (the Approval) relates to the Approval Holder(s) and their application and all documentation submitted to the Department prior to the issuance of this approval for the Bulk Sample Site situated at or near 570 Goldbrook Rd., Goldboro, Guysborough County - PID 35094366, dated February 1, 2018.

   ii. This Approval (the Approval) relates to the Approval Holder(s) and their application and all documentation submitted May 9, 2019 situated at or near 570 Goldbrook Rd., Goldboro, Guysborough County - PID 35094366.

   iii. This application is limited to transferring 6,100 tonnes of the stockpiled bulk sample mined from the underground workings between December 4, 2018 to January 27, 2019, reclaiming and monitoring the bulk sample and Site.

b. The Site and/or Facility shall not exceed the area as outlined in the application and supporting documentation.

c. Property access agreements and leases for use of property shall be kept in good standing and shall remain in effect during the construction, operation and reclamation of the Site. Failure to maintain these agreements may result in suspension or cancellation of this Approval.

   i. Letter of Authority for the Bulk Sample from Department of Energy and Mines is required prior to the expiry of the current agreement (December 2, 2019), if required.

d. It is the Approval Holder(s)'s responsibility to ensure applicable legislation, approvals and codes of practice are met for all other aspects of the operation of the Facility.

e. The bulk sample transfer offsite shall not exceed a total of 10,000 tonnes.

3. General

a. The Approval Holder(s) shall construct, operate and reclaim the Facility in accordance with the following provisions:

   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

   iii. Any standard adopted by the Department, as amended from time to time.

b. No authority is granted by this Approval to enable the Approval Holder(s) to construct or operate the Facility 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.

c. 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.

d. Any request for renewal or extension of this Approval is to be made in writing, to the Department, at least ninety (90) days prior to the Approval expiry.

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 to the Facility, including, but not limited to, the active area, operating area, processing changes or waste disposal practices which are not granted under this Approval. An amendment to this Approval may be required before implementing any change.

h. Extensions or modifications to the Facility may be subject to the Environmental Assessment Regulations. Written approval from the Minister may be required before implementing a change.

i. 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.

j. The Approval Holder(s) shall immediately notify the Department of any incidents of non-compliance with this Approval.

k. The Approval Holder(s) shall bear all expenses incurred in carrying out the environmental monitoring required under the terms and conditions of this Approval.

l. 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.

m. 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.

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 Facility operation are made fully aware of the terms and conditions which pertain to this Approval.

o. Upon any changes to the Registry of Joint Stock Companies information, the Approval Holder(s) shall provide a copy to the Department.

p. This Approval does not override any monitoring required pursuant to the Federal Metal and Diamond Mining Effluent Regulations (MDMER).

4. Sound Levels

a. Sound levels measured at the Site property boundaries shall not exceed the following equivalent sound levels (Leq):

i. 65 dBA 0700-1900 hours

ii. 60 dBA 1900-2300 hours

iii. 55 dBA 2300-0700 hours

b. Monitoring of sound levels shall be conducted at the request of the Department. The location of the monitoring station(s) for sound will be established by a qualified person retained by the Approval Holder(s) and submitted to the Department for approval, this may include point(s) beyond the property boundary of the Site.

5. Separation Distances

a. The Approval Holder(s) shall not locate the Active Area of the Site within the following separation distances unless otherwise exempted or varied by conditions of this approval:

i. 30 m of the boundary of a public or common highway

ii. 30 m of the property boundary that does not form part of the Site Active Area

6. Storage Tank Systems

a. The Approval Holder(s) shall ensure that all petroleum storage systems and related infrastructures are constructed, operated and maintained in accordance

with the Petroleum Management Regulations and the Nova Scotia Standards for the Construction and Installation for Petroleum Storage Tank Systems (1997 edition or most recent version).

7. Particulate Emissions (Dust)

a. Particulate emissions shall not contribute to an ambient concentration of total suspended particulate matter that exceed the following limits (in micrograms per cubic metre of air) at or beyond the Site property boundaries:

i. Daily Average (24 hr.) 120 µg/m3

ii. Annual Geometric Mean 70 µg/m3

b. The use of oil as a dust suppressant is prohibited.

c. Monitoring of ambient total suspended particulate matter shall be conducted at the request of the Department. The location of the monitoring station(s) for suspended particulate matter will be established by a qualified person retained by the Approval Holder(s) and submitted to the Department for approval; this may include point(s) beyond the property boundary of the Site.

d. When requested, ambient total suspended particulate matter shall be measured in accordance with EPA standard; EPA/625/R-96/010a; Sampling of Ambient Air for Total Suspended Particulate Matter (SPM) and PM10 shall be done using a High Volume (HV) Sampler.

8. Surface Water

a. The Approval Holder(s) shall direct all wastewater and surface water runoff associated with the bulk sample stockpile to the Settling Ponds by means of a ditch system with an impermeable layer, pumping system or alternate plan that is approved by the Department. The water shall be directed to the Settling Ponds by October 16, 2019.

b. The Site shall be developed and maintained to prevent surface water contaminants from being discharged into a watercourse, wetland, water resource, or beyond the property boundary, in excess of the following criteria:

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 hour 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) Maximum increase of 10% over background levels when background is >250 mg/l.

iii. pH (Outfall):

(a) Maximum 5 to 9 in grab sample;

(b) Maximum 6 to 9 as a Monthly Arithmetic Mean.

iv. Petroleum Hydrocarbon:

(a) Nova Scotia Environment Tier 1 Environmental Quality Standards for Surface Water - Petroleum Hydrocarbons (PHC) Parameters.

c. Erosion and sedimentation control devices shall remain in place and be maintained until disturbed areas are stabilized.

d. The Department reserves the right to require modifications including, but not limited to, monitoring locations, monitoring frequency, contaminants of concern, and surface water criteria.

e. No authority is granted by this Approval to enable the Approval Holder(s) to discharge surface water onto adjoining lands without the authorization of the affected landowner(s). It is the responsibility of the Approval Holder(s) to ensure authorizations are current and valid.

f. The Approval Holder(s) shall immediately contact the Department should sulphide bearing material be encountered on the Site and shall include planned remedial measures in conformance with the Sulfide Bearing Material Disposal Regulations.

g. Surface water compliance stations for in stream total suspended solids shall include:

i. Upstream Stations: #2 Beaver Pond Inlet and #4 Southern Gold Brook Lake
Downstream Stations: #3 Beaver Pond Outlet and #7 Gold Brook Creek.

ii. Sampling locations at the time of a release should be undertaken from within the watercourse/wetland, at the closest point possible to where the substance is entering the watercourse/wetland.

h. The Approval Holder(s) shall comply with the surface water discharge limits established in Table 2 at the settling pond outfall identified as Station # 6.

i. The Approval Holder(s) shall:

i. Ensure surface water is monitored at the stations and frequencies listed in the appended Table 1 for Surface Water and Groundwater Monitoring at the Stations identified in the appended plan entitled Anaconda Mining, Goldboro gold Bulk Sample Plan, Water Monitoring Stations, dated June 14, 2018.

ii. Station #9 (drainage from the bulk sample stockpile) monitoring is required for the remainder of this Approval.

iii. The Approval Holder(s) shall monitor liquid effluent for toxicity at the request of the Department.

9. Groundwater

a. The Approval Holder(s) shall ensure the following criteria are met with groundwater quality monitoring for all wells downgradient of the Site:

i. Guidelines for Canadian Drinking Water Quality; or

ii. For areas where discharge of groundwater to surface water as defined by upward hydraulic gradients is occurring or may occur seasonally, the criteria is Canadian Council of the Ministers of Environment Canadian Environmental Guidelines for the Protection of Aquatic Life (CCME CEQGFAL); or

iii. Background, defined as 95th percentile of the statistically analysed baseline data, if this value exceeds the above listed criteria.

iv. The Approval Holder(s) shall ensure that any replacement water supplied for potable water use, to address the plan, shall meet the quantity and quality requirements of Health Canada drinking water, health and aesthetics objectives and be supplied in accordance with provincial regulations and guidelines.

b. The monitoring well locations listed will be the project compliance monitoring points for groundwater for which the above listed criteria shall apply.

c. The Approval Holder(s) shall replace at their expense any water supply which has been lost or damaged as a result of extracting aggregate.

d. The Approval Holder(s) shall conduct groundwater monitoring as described in appended Table 1 and as identified at the groundwater stations identified in the appended Map 1, Bulk Sampling Hydrogeological Measurement Location Plan, by WSP dated May 24, 2018.

e. The Approval Holder(s) shall conduct additional groundwater monitoring if so directed by the Department.

f. The Approval Holder(s) shall submit the Groundwater Hydrogeology Report

referenced in in the "Bulk Sample Final Report for Nova Scotia Environment" (dated June 2019) by October 30, 2019.

10. Construction

a. All work operations shall be conducted in a manner to protect the watercourses/wetlands and groundwater from siltation and disturbance to the adjacent and downstream areas. Silted water is not to be released directly into a watercourse/wetland.

b. Separate watercourse/wetland alteration Approval(s) shall be obtained by the Approval Holder(s) from the Department prior to causing alteration or disturbance of a watercourse/wetland.

11. Blasting

a. The Approval Holder(s) shall secure an approval amendment from the Department prior to blasting.

12. Reporting

a. The Approval Holder(s) shall immediately notify the Department of any non-compliance with terms and conditions of the Approval.

b. The Approval Holder(s) shall provide a Final Report within 30 days of the 6,100 tonne bulk sample removal from Site. Two copies of the report, plus an electronic copy, shall be provided to the Department. The Final Report shall summarize the following:

i. Summary of bulk sample tonnages trucked to the loading facility;

ii. Total volume of bulk sample remaining on Site; and

iii. Details of the surface water, groundwater and effluent monitoring listed in Condition 12.c).ii).

c. The Approval Holder(s) shall prepare and submit an Annual Report to the Department by April 30 of each year. The first Annual Report will cover the period from the end of the 6,100 tonne bulk sample removal date to the end of that calendar year. Subsequent Annual Reports will cover the calendar year. Two copies of the report, plus an electronic copy, shall be provided. The Annual Report shall:

i. Contain an Executive Summary with a general description of on the status of operations and environmental compliance.

ii. Details of the surface water, groundwater and effluent monitoring program. This section of the report shall be prepared by, or under the direction of, an independent qualified professional licensed to practice in Nova Scotia by

Engineers of Nova Scotia (ENS) or Geoscientists Nova Scotia (GNS). This section shall include, but is not limited to, the following details:

(a) A review of field methodologies, including sampling techniques;

(b) A description of the monitoring networks;

(c) A review of the current monitoring programs and recommendations for modifications, as applicable;

(d) Current and historical water quality data in chronological tabular Excel spreadsheet format; in comparison to relevant criteria and background results, with exceedances highlighted;

(e) Current and historic groundwater elevation data in chronological tabular format;

(f) A detailed interpretation of the water quality data including an analysis of spatial and temporal trends, graphical representation of relevant parameters in relation to background and baseline data and relevant criteria;

(g) A detailed interpretation of the groundwater elevation data including graphical representation and an analysis of trends;

(h) The identification of any adverse impacts and developing risks to water resources (quality and quantity), including watercourses, wetlands, and aquatic life, third party properties, or human health as a result of site activities and associated recommendations, as applicable; and

(i) Laboratory certificates of analysis.

13. Spills or Releases

a. Spills or releases shall be reported in accordance with the Act.

b. Spills or releases shall be cleaned up in accordance with the Act.

14. Records

a. The Approval Holder(s) shall maintain records of all monitoring reports for inspection by the Department, including:

i. Blast vibration and date and times of blasting.

ii. Surface water monitoring and date of monitoring.

iii. Groundwater monitoring and date of monitoring.

iv. Volumes, dates and rate of mine dewatering.

v. Dates of effluent discharge from settling ponds.

vi. Volume of ore sample stockpiled on Site and volume transported off Site.

vii. Records of complaints and company response to complaints.

b. Records of all on-going project reviews conducted by the independent qualified professional licensed to practice in Nova Scotia by Engineers of Nova Scotia (ENS) or Geoscientists Nova Scotia (GNS).

c. Results of monitoring shall be made available to the Department upon request.

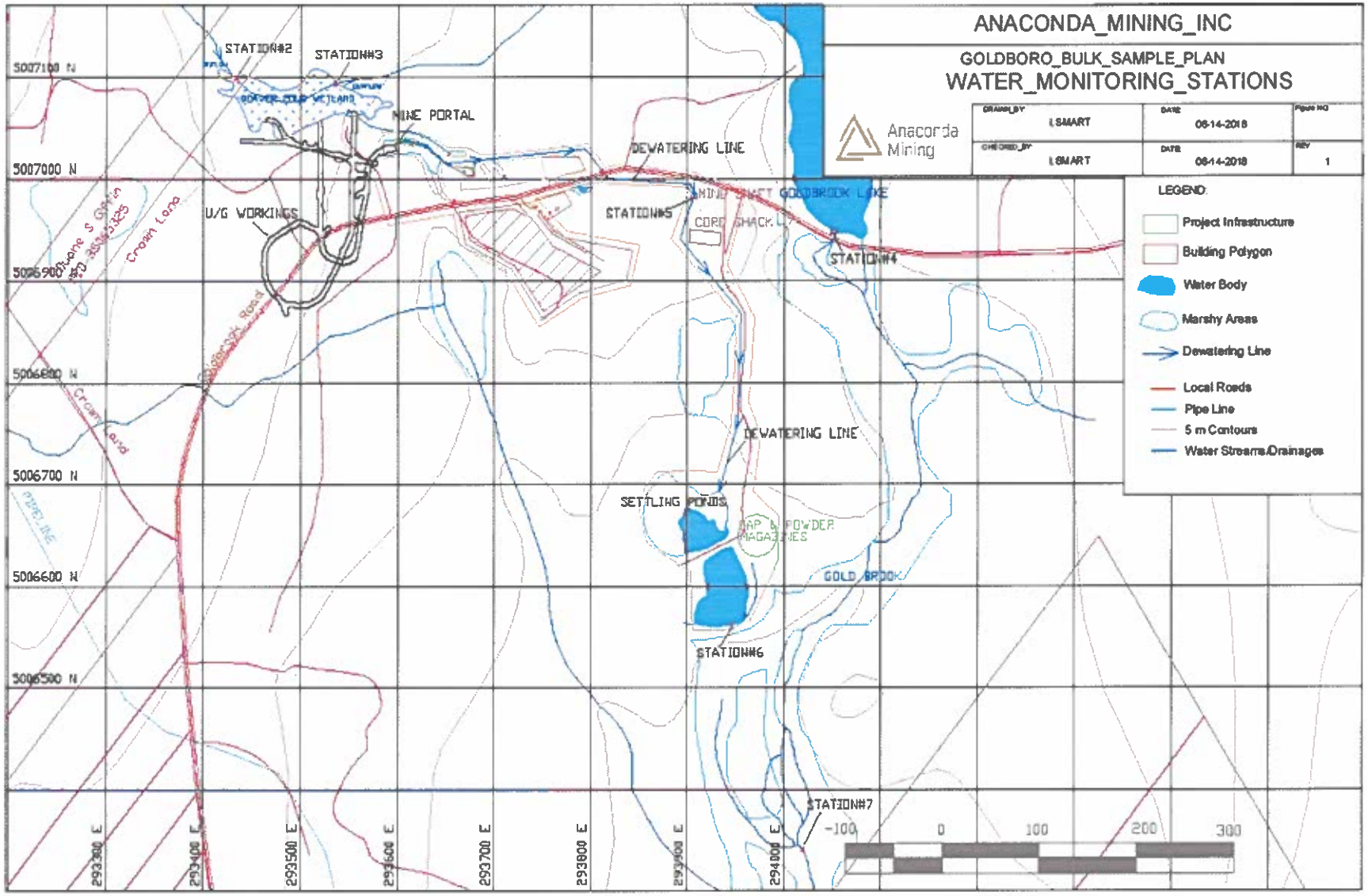
15. Reclamation

a. Notification is required upon change/activation of the Reclamation Plan.

b. The Approval Holder(s) shall reclaim the Site in accordance with the latest reclamation plan as per direction of the Department.

c. The Approval Holder(s) shall submit and maintain a financial reclamation security with the Province in an amount and form acceptable to the Department.

d. The Department shall release the security to the Approval Holder(s) after final reclamation of the Site has been completed to the satisfaction of the Minister. The Approval Holder(s) shall notify the Department when reclamation has been completed.


ANACONDA_MINING_INC
GOLDBORO_BULK_SAMPLE_PLAN
WATER_MONITORING_STATIONS
Anaconda Mining
DRAWN_BY
LSMART
DATE
06-14-2018
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LSMART
DATE
06-14-2018
REV
1
LEGEND
Project Infrastructure
Building Polygon
Water Body
Marshy Areas
Dewatering Line
Local Roads
Pipe Line
5 m Contours
Water Streams/Drainages
STATION#2
STATION#3
MINE PORTAL
DEWATERING LINE
U/G WORKINGS
STATION#5
CORE SHACK
STATION#4
DEWATERING LINE
SETTLING PONDS
GOLD BROOK
STATION#6
STATION#7
5007100 N
5007000 N
5006900 N
5006800 N
5006700 N
5006600 N
5006500 N
293300 E
293400 E
293500 E
293600 E
293700 E
293800 E
293900 E
294000 E
-100
0
100
200
300

TABLE 1

Surface Water and Groundwater Monitoring Program

Monitoring Station	Station Description	Static Water Level	Flow Measure	General Chemistry (RCAP)	Metal Scan	TSS	pH
#1	Mine Extraction Point	Monthly	Monthly	Quarterly	Quarterly	Quarterly	Quarterly
#2	Beaver Pond-Inflow	Monthly		Quarterly	Quarterly	Quarterly	Quarterly
#3	Beaver Pond - Outflow	Monthly		Quarterly	Quarterly	Quarterly	Quarterly
#4	Goldbrook Lake South	Monthly		Quarterly	Quarterly	Quarterly	Quarterly
#5	Boston-Richardson Shaft	Monthly		Quarterly	Quarterly	Quarterly	Quarterly
#6	Settling Pond Outflow	Monthly	Monthly	Monthly	Monthly	Monthly	Monthly
#7	Gold Brook Creek	Monthly		Quarterly	Quarterly	Quarterly	Quarterly
#8	Domestic Well	Monthly		Quarterly	Quarterly	Quarterly	Quarterly
#9	Drainage from Ore Stockpile	Monthly		Quarterly	Quarterly	Quarterly	Quarterly
MW 17-1, MW 17-2, MW17-3	Monitoring Well	Monthly		Quarterly	Quarterly	Quarterly	Quarterly

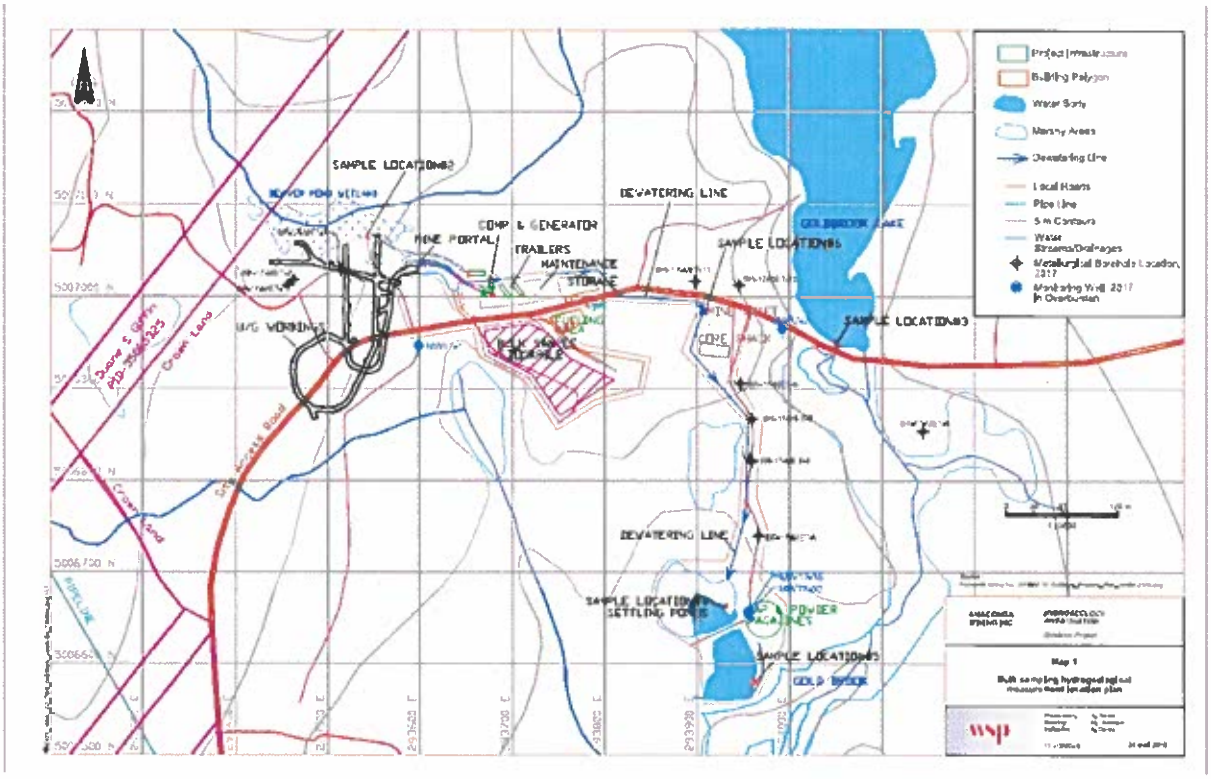
TABLE 2

Liquid Effluent Discharge Limits

Settling Pond Station # 6

Parameter	Maximum in a Grab Sample
Arsenic (mg/l)	1.0
Copper (mg/l)	0.6
Lead (mg/l)	0.4
Nickel (mg/l)	1.0
Zinc (mg/l)	1.0
Total Suspended Solids (mg/l)	30.0
pH (range of units)	5.0 - 9.0
Toxicity	Non-Acutely Lethal

MAP 1


SAMPLE LOCATION#2
COMP & GENERATOR
MINE PORTAL
TRAILERS
MAINTENANCE
STORAGE
DEWATERING LINE
SAMPLE LOCATION#6
SAMPLE LOCATION#3
U/G WORKINGS
ROCK STORAGE
STOCKPILE
CORE
DEWATERING LINE
SAMPLE LOCATION#5
SETTLING POND
POWER
CABINET
SAMPLE LOCATION#4
COLD BROOK
Project Infrastructure
Building Polygon
Water Body
Marshy Areas
Dewatering Line
Local Roads
Pipe Line
5 m Contours
Water
Streams/Drainages
Monitoring Well 2017
In Overburden

NOVA SCOTIA

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APPROVAL

Province of Nova Scotia
Environment Act, S.N.S. 1994-95, c.1 s.1

APPROVAL HOLDER: S.W. WEEKS CONTRACTING INCORPORATED

SITE PID: 35094366

APPROVAL NO: 2018-102309-01

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 - Culvert / Closed Bottom Structure

Administrator: Sean Gillis

Effective Date: May 3, 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: S.W. WEEKS CONTRACTING INCORPORATED

Project: Station 5+080 Route 316

Site:

PID	Civic #	Street Name	Street Type	Community	County
35094366	14145	HIGHWAY 316	HWY.	ISAACS HARBOUR NORTH	GUYSBOROUGH COUNTY

Approval No: 2018-102309-01

File No: 95100-30-ANT-2018-102309

Grid Reference: Easting - 600701, Northing - 5007711

Reference Documents

- Application submitted May 2, 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
Eastern Region, Antigonish Office
155 Main Street, Suite 205
Antigonish, Nova Scotia B2G 2B6

Phone: (902) 863-7389
Fax: (902) 863-7411

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 Culvert / Closed Bottom Structure on unknown situated at or near 14145 HIGHWAY 316 HWY.

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

   iii. Nova Scotia Watercourse Alteration Specifications

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.

NOVA SCOTIA

File No:95100-30-ANT-2018-102309

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
Eastern Region, Antigonish Office
155 Main Street, Suite 205
Antigonish, NS, B2G 2B6

Phone: 902-863-7389
Fax: 902-863-7411
NSE Contact: Sean Gillis

APPROVAL NUMBER: 2018-102309-01

NAME OF APPROVAL HOLDER: S.W. WEEKS CONTRACTING INCORPORATED

WORK AUTHORIZED: Culvert / Closed Bottom Structure

DATE WORK WAS COMPLETED: _____

NAME OF CONTRACTOR: _____

COMMENTS: _____

_____

_____

_____

_____

_____ _____

Signature Date

NOVA SCOTIA

155 Main Street, Suite 205
Antigonish NS
Canada B2G 2B6

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902-863-7411 F
www.novascotia.ca

APPROVAL

Province of Nova Scotia
Environment Act, S.N.S. 1994-95, c.1 s.1

APPROVAL HOLDER: BAXTER TRUCKING LIMITED

SITE PID: 35094366

APPROVAL NO: 2018-2496232-00

EXPIRY DATE: September 30, 2019

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 - Bridge / Open Bottom Structure

Administrator: Sean Gillis

Effective Date: September 14, 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: BAXTER TRUCKING LIMITED

Project: Middle County Harbour

Site:

PID	Civic #	Street Name	Street Type	Community	County
35094366	14145	HIGHWAY 316	HWY.	ISAACS HARBOUR NORTH	GUYSBOROUGH COUNTY

Approval No: 2018-2496232-00

File No: 95100-30-ANT-2018-2496232

Grid Reference: Easting - 603603, Northing - 5015675

Reference Documents

- Application submitted August 31, 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. Department means the Department of Environment, and the contact for the Department for this approval is:
Nova Scotia Environment
Eastern Region, Antigonish Office
155 Main Street, Suite 205
Antigonish, Nova Scotia B2G 2B6

Phone: (902) 863-7389

Fax: (902) 863-7411

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. Site means a place where a designated activity and/or undertaking is occurring or may occur

h. 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.

2. Scope

a. 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.

b. 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, operate and reclaim the Facility in accordance with the following provisions:

   i. Nova Scotia Watercourse Alteration Standard

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. 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.

i. If the Minister cancels or suspends this Approval, the Approval Holder(s) remains subject to the penalty provisions of the Act and regulations

d. The Approval Holder(s) shall immediately notify the Department of any incidents of non-compliance with this Approval.

e. The Approval Holder(s) shall bear all expenses incurred in carrying out the environmental monitoring required under the terms and conditions of this Approval.

f. 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.

g. 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.

h. Failure to comply with the terms and conditions is an offence under the Environment Act.

i. 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.

j. 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 provided that the authorized alteration or storage of water does not:

i. prejudice any riparian rights of any owner or of any person lawfully in possession of or holding any lands abutting the watercourse; or

ii. cause any damage or nuisance to adjacent or abutting lands.

b. This Approval grants no further rights over the watercourse other than what is expressly authorized.

c. 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 to the satisfaction of the Minister and rehabilitate same as directed by the

Minister.

d. The Approval Holder(s) shall be responsible for losses, costs or damages that results from 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 wilful act of the Approval Holder(s) or any employees, agents, contractors, or guests of the Approval Holder(s).

e. 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.

f. 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 on termination of the Approval or at the end of the useful life of the structure, to the satisfaction of the Minister. In the event that 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. This condition remains in effect after the expiration or termination of the Approval.

g. 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.

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.

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 are 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.

7. Site Specific Conditions

a. The old unapproved bridge that is lying in the river downstream of the crossing site must be removed from the river and disposed of accordingly. This must be completed during the time of the new bridge installation.

NOVA SCOTIA

File No:95100-30-ANT-2018-2496232

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
Eastern Region, Antigonish Office
155 Main Street, Suite 205
Antigonish, NS, B2G 2B6

Phone: 902-863-7389
Fax: 902-863-7411
NSE Contact: Sean Gillis

APPROVAL NUMBER: 2018-2496232-00

NAME OF APPROVAL HOLDER: BAXTER TRUCKING LIMITED

WORK AUTHORIZED: Bridge / Open Bottom Structure

DATE WORK WAS COMPLETED: _____

NAME OF CONTRACTOR: _____

COMMENTS: _____

_____

_____

_____

_____

_____ _____

Signature Date

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

NSDOE
SEP 13 2018

September 13, 2018

Your file *Votre référence*
2018-2496232

Our file *Notre référence*
18-W-418

Sean Gillis
Nova Scotia Environment
155 Main Street, Suite 205
Antigonish, NS
B2G 2B6

Subject: Isaac Harbour River - Bridge – Guysborough County-Serious Harm to Fish and Prohibited Effects on Listed Aquatic Species at Risk Can Be Avoided or Mitigated

Dear Sean Gillis:

The Fisheries Protection Program (the Program) of Fisheries and Oceans Canada (DFO) received the proposal on August 31, 2018. We understand that the proponent proposes to:

- Install a single span bridge, length, 18.5m x width 2.5m. Abutments will not encroach in the watercourse.

Our review considered the following information:

- Nova Scotia Environment Application for Approval and all supporting documents and plans – Watercourse alteration file #2018-2496232 received on August 31, 2018.
- Emails from Nova Scotia Environment on September 11 & 12.

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 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 the plans change or if the proponent has omitted some information in the proposal, further review by the Program may be required. Consult our website (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 the responsibility of the proponent 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*.

The proponent also has the *Duty to Notify* DFO if they 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 the responsibility of the proponent 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 Jack MacNeil at our Dartmouth office at 902-401-3934 or by email at jack.macneil@dfo-mpo.gc.ca. Please refer to the file number referenced above when corresponding with the Program.

Yours sincerely,

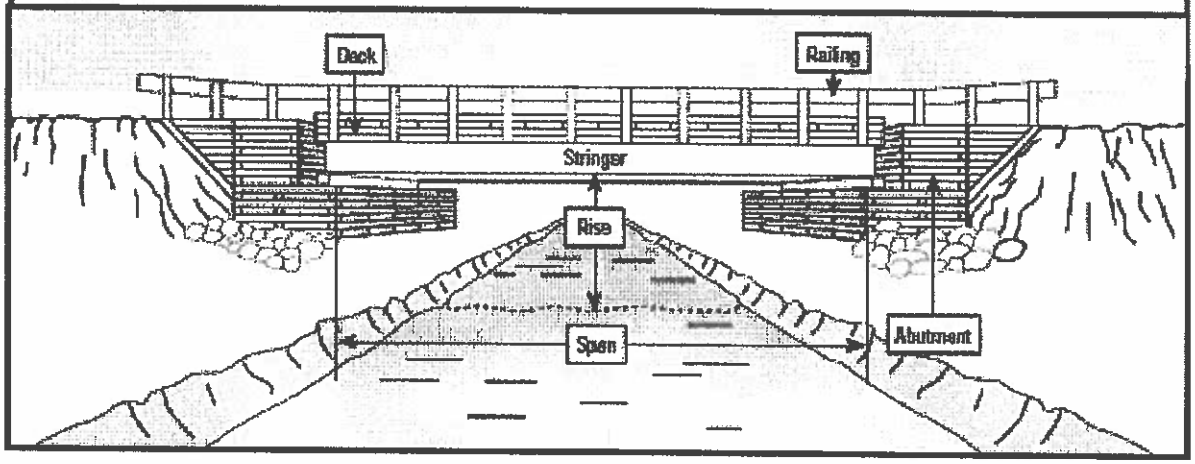
Jack MacNeil
Fisheries Protection Biologist
Fisheries Protection Program

NSDOE
R SEP 12 2018
ANTIGONISH, N.S.

Name of watercourse and watercourse it is a tributary to
Isaac Harbour River
Community and County name
Isaac Harbour Community in Guysborough County
1:50,000 Topographic map with alteration location marked
Guysborough map 11f/05
1:50,000 Topographic map number with grid reference (easting and northing)
eastings 603603 northing 5015675
Preconstruction site photos (colour or electronically)
Previously submitted
Work plan for in-the-dry installation (water control)
We a planning to install a bridge that is 18.5 m long. Using steel beams 2.47 m wide & 2.5 meters above the stream bed, the bridge opening is 14.5 meter long & 1.7 meter high ,we will dig out side the channel as to work in the dry & use sand bags & pumps when necessary will use environmental rock at stream faces & banks to stop erosion & hay & seed the rest of the disturbed area, the abutments are cement blocks. The cement blocks will be placed outside 14.5 meter stream bed
Description of channel bottom (ie. rock (size, quantity), muck, etc.)
Erosion and sedimentation control plan

Table 3-2 3 -6 clear stone
Plan and profile drawing of proposed alteration (including dimensions)

Figure 4-5 Parameters for Calculating Waterway Opening of Permanent Bridges



The design of the structure meets, and the installation will be in accordance with, the requirements of the NS Watercourse Alteration Specifications, latest edition. Yes

SECTION B (INCLUDE FOR FLOWING WATERCOURSES) :

SECTION C (INCLUDE FOR EROSION PROTECTION):
Calculations for erosion protection material sizing table 3-2 page 3-17

NOVA SCOTIA

20 Pumphouse Road
Granton, NS
Canada B2H 5C6

902-396-4194 T
902-396-4765 F
www.novascotia.ca

Our File Number: 95100-30-PIC-2019-2594779

August 08, 2019

BAXTER TRUCKING LIMITED
514 RIPLEY RD
TRUEMANVILLE, NS
B4H 3Y2

COPY

Bridge/Concrete Span
NOTIFICATION RECEIPT

Province of Nova Scotia
Environment Act, S.N.S. 1994-95, c.1

NOTIFIER: BAXTER TRUCKING LIMITED

NOTIFICATION #: 2019-2594779-00

SITE: Northwest Cove , New Harbour River
570 GOLDBROOK RD.
GOLDBORO, GUYSBOROUGH COUNTY
PID 35094366, E - 610038, N - 5011814

EFFECTIVE DATE: August 7, 2019

EXPIRY DATE: September 30, 2019

DETAILS: Replacement of a Bridge/Concrete Span
15mm by 0 metres by

Pursuant to Part V of the *Environment Act*, S.N.S. 1994-95, c.1 as amended from time to time, notification from the Notifier is acknowledged. The work done under this notification must follow the Nova Scotia Watercourse Alteration Activity Standards.

This Notification or a copy is to be kept on-site at all times as required under Section 22(3) of the Approval and Notification Procedures Regulations. All personnel involved in the project must be made fully aware of the standards associated with this notification. It is the Notifier's responsibility to ensure that they are followed. Failure to comply with the standards is an offence under the *Environment Act*.

It is the Notifier's duty to advise the Department of any new and relevant information respecting any adverse effect that results or may result from the activity, which comes to the Notifier's attention after the issuance of the Notification. This is required under Section 60 of the *Environment Act*.

If the activity is altered, extended or modified beyond the description given in this Notification, please reapply as a new Notification is required.

Nothing in this Notification relieves the property owner or person responsible 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 Notification which may be required by municipal by-laws, provincial or federal legislation, or other organizations. The Minister does not warrant that such licenses, permits, approvals or other authorizations will be issued.

NOVA SCOTIA

20 Pumphouse Road
Granton NS
Canada B2H 5C6

902-396-4194 P
902-396-4765 F
www.novascotia.ca

APPROVAL

Province of Nova Scotia
Environment Act, S.N.S. 1994-95, c.1 s.1

APPROVAL HOLDER: EXPLORATION OREX INC.

SITE PID: 35065259, 35065267, 35065275, 35065283, 35065291, 35065309, 35065317, 35065325, 35065366, 35065853, 35065929, 35065960, 35065986, 35066000, 35078658, 35082775, 35094325, 35094366, 35097138, 35153899, 35232958

APPROVAL NO: 2021-2850383-00

EXPIRY DATE: March 29, 2030

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 - Wetland Alteration

Administrator: Marc Theriault

Effective Date: March 29, 2022

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 Department of Environment and Climate Change

Approval Holder: EXPLORATION OREX INC.

Project: Goldboro Geotechnical Site

Site:

PID	Civic #	Street Name	Street Type	Community	County
35065259					
35065267	13208	HIGHWAY 316	HWY.	GOLDBORO	GUYSBOROUGH COUNTY
35065275					
35065283					
35065291					
35065309	13114	HIGHWAY 316	HWY.	GOLDBORO	GUYSBOROUGH COUNTY
35065317	13094	HIGHWAY 316	HWY.	GOLDBORO	GUYSBOROUGH COUNTY
35065325	13086	HIGHWAY 316	HWY.	GOLDBORO	GUYSBOROUGH COUNTY
35065366					
35065853					
35065929					
35065960					
35065986					
35066000					
35078658	13132	HIGHWAY 316	HWY.	GOLDBORO	GUYSBOROUGH COUNTY
35082775					
35094325					
35094366	14145	HIGHWAY 316	HWY.	ISAACS HARBOUR NORTH	GUYSBOROUGH COUNTY
35094366	2050	GUYSBOROUGH COUNTRY HARBOUR	RD.	FOREST HILL	GUYSBOROUGH COUNTY
35094366	4187	ROUTE 276		OGDEN	GUYSBOROUGH COUNTY
35094366	570	GOLDBROOK	RD.	GOLDBORO	GUYSBOROUGH COUNTY
35097138					
35153899					
35232958					

Approval No: 2021-2850383-00

File No: 95100-30-ANT-2021-2850383

Grid Reference: Easting - 606959, Northing - 5006201

Reference Documents

- Application submitted September 1, 2021 and attachments.

1. Definitions

a. Act means Environment Act. 1994-95, c.1, s.1, and includes, unless the context otherwise requires, the regulations made pursuant to the Act, as amended from time to time.

b. Department means the Nova Scotia Department of Environment and Climate Change, and the contact for the Department for this approval is:
Nova Scotia Department of Environment and Climate Change
Eastern Region, Antigonish Office
155 Main Street, Suite 205
Antigonish, Nova Scotia B2G 2B6

Phone: (902) 863-7389
Fax: (902) 863-7411

c. Minister means the Minister of Environment and Climate Change and includes any person delegated the authority of the Minister.

d. Site means a place where a designated activity and/or undertaking is occurring or may occur.

e. Surface Watercourse means a watercourse as defined in the Environment Act, excluding groundwater.

2. Scope

a. This Approval (the "Approval") relates to the Approval Holder(s) and their application and all documentation submitted to the Department prior to the issuance of this approval for the Wetland Alteration situated at or near Goldboro Geotechnical Site.

b. The Approval Holder(s) shall ensure the designated activity is carried out in accordance with this Approval and reference documents, including the application and supporting documentation.

3. General

a. The Approval Holder(s) shall conduct the Designated Activity in accordance with the following provisions:

   i. The Act, as amended from time to time;

   ii. Any standard adopted by the Department, as amended from time to time, which includes but is not limited to the following:

      Nova Scotia Watercourse Alteration Standard

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, provincial or federal legislation, or other organizations. 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 commence or continue the designated activity 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 Holder(s) 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. Any request for renewal or amendment of this Approval is to be made in writing, to the Department, at least ninety (90) days prior to the Approval expiry.

f. The Approval Holder(s) shall not transfer, sell, lease, assign or otherwise dispose of this Approval without the written consent of the Minister. The sale of a controlling interest of a business or a transfer of the approval from a parent company to a subsidiary or an affiliate is deemed to be a transfer requiring consent.

g. If the Minister cancels or suspends this Approval, the Approval Holder(s) remains subject to the penalty provisions of the Act.

h. The Approval Holder(s) shall advise the Department in writing prior to any proposed extensions or modifications to the Activity and/or the Site. An amendment to this Approval may be required before implementing any extension or modification.

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 that are all deemed acceptable to the Department.

l. The Approval Holder(s) shall ensure that this Approval, or a copy, is present on Site while personnel are on Site.

m. The Approval Holder(s) shall ensure that personnel directly involved in the designated activity are made fully aware of the terms and conditions of this Approval.

n. 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.

o. 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 does not authorize any activity that would:

i. prejudice any riparian rights of any owner or of any person lawfully in possession of or holding any lands abutting the watercourse;

ii. cause any damage or nuisance to adjacent or abutting land; or

iii. discharge surface water onto adjoining lands without the authorization of the affected landowner(s).

b. By granting this Approval, the Department is not responsible for any damages as a result of the approved activities, including any water quality or quantity problems that may be encountered by the Approval Holder(s) or other parties.

5. Surface Water

a. Monitoring during construction: The Approval Holder(s) shall ensure that the following water quality limits are met in the water resource downstream of construction activities:

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 hour 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) Maximum increase of 10% over background levels when background is >250 mg/l;

b. Additional surface water monitoring may be required at the request of the Department.

c. If directed by the Department, the Approval Holder(s) shall install erosion and sedimentation controls prior to the commencement of the construction activities.

d. If directed by the Department, the Approval Holder(s) shall install and maintain erosion and sedimentation controls in line with industry best practices (e.g., Nova Scotia Environment Erosion and Sediment Control Handbook for Construction Sites) as work progresses. The controls shall remain in place until areas disturbed by construction activities are stabilized so that the risk of release of sediment to a water resource has been mitigated.

e. The Approval Holder(s) shall immediately contact the Department should sulphide bearing material be encountered on the Site.

f. Any silted water pumped from work areas shall be directed to vegetated areas, settling ponds, or other treatment devices that mitigate the risk of release of sediment to a water resource.

g. The Approval Holder(s) shall ensure that the following activities take place at a distance of a minimum of 30 metres from a surface watercourse or wetland in an area such that a release will not enter a surface watercourse or wetland:

i. Fuel storage, refueling, and/or lubrication of equipment;

ii. Washing of machinery or equipment; and

iii. Storage of equipment, excavated/stockpiled materials, and potential contaminants.

6. Releases

a. Releases shall be reported in accordance with the Act.

b. Spills or releases shall be cleaned up in accordance with the Act.

7. Construction

a. The Approval Holder(s) shall limit the size of the disturbed area to the approved area for the alteration.

b. Once the soils in the approved area of alteration have been exposed, the approved activity shall commence immediately.

c. Any equipment used for work within a watercourse or wetland shall be mechanically sound, with no fuel or oil leaks.

d. The Approval Holder(s) shall notify the Department in the event new information relating to identification of wetland boundary(ies) or functional assessment(s) are encountered during any phase of construction activities associated with the approved activity.

e. An emergency spill-kit must be kept on site when vehicles (including machinery) or equipment is used in a watercourse.

f. Upon completion of construction, modification, or maintenance work all debris resulting from the work must be removed from the work site.

8. Contingency Plan

a. The Approval Holder(s) shall develop a contingency plan. This plan is to meet the requirements of the Department's "Contingency Planning Guidelines", as amended from time to time. The plan is to include, but is not limited to:

i. general procedures for routine or major emergencies (e.g. equipment break-down, upset conditions, maintenance, etc.);

ii. a plan for dealing with emergency issues including but not limited to fires, explosions, and releases;

iii. a procedure for notifying the Department in the case of unforeseen changes to wetland boundaries and function during construction activities and proposed mitigation, which includes but is not limited to: changes or impacts associated with hydrological/hydrogeological conditions, biological conditions or discovery of species of conservation concern.

b. The Approval Holder(s) shall ensure that the Contingency Plan is reviewed and updated whenever equipment or products change. The Contingency Plan is to be dated to reflect the most recent update.

c. A copy of the Contingency Plan is to be maintained on Site at all times and is to be available for review immediately upon request by the Department.

d. The Approval Holder(s) shall ensure that all employees are trained in accordance with the contingency plan and shall keep a record of training at the facility for a minimum period of five (5) years.

9. Site Specific

a. All references to the word "watercourse, watercourses or water bodies" throughout this approval shall also be deemed to include wetland(s).

b. This authorization is for the potential alteration of 6230 m^2 of wetland as per supporting application information.

c. All minimization and mitigation measures shall be implemented and adhered to, as stated in the Application under Section 5.0 and Section 6.0.

d. Pre-alteration baseline water quality samples (e.g. total suspended solids) will be collected, by a qualified person, upstream and downstream of any watercourses potentially impacted by project activities.

e. Post-construction monitoring shall be completed by Qualified Person for a period of two (2) years following completion of the program and will be completed in accordance with the Application.

f. Post-construction monitoring reports shall be forwarded to the Department by no later than December 31 of each year. The monitoring reports shall reference the approval number (2021-2850383-00).

g. In the event of a wetland alteration, the Approval Holder shall be responsible for wetland restoration and/or compensation at the discretion and directive of the Department. Additional post-construction monitoring may be required.

h. Vegetation clearing within wetland areas shall be completed by hand (no machinery). Shrubs and trees shall be left in place wherever possible. Woody vegetation within the wetland is not permitted to be uprooted.

i. In the event that swamp mat material is being reused from a different site, the mats shall be clear of debris and soil to prevent introduction of invasive species.

j. Install all erosion and sediment control (ESC) measures prior to project commencement. All ESC measures are to be properly maintained and monitored throughout the project. Install adequate erosion and sediment controls at approaches to swamp mats to minimize sediment tracking onto the swamp mats.

k. All wetland edges and riparian buffers shall be flagged (visually delineated).

l. All work shall be completed in accordance with the Department of Natural Resources and Renewable's, "Endangered Mainland Moose Special Management Practices" referenced in Section 6.3 of the application.

NOVA SCOTIA

File No:95100-30-ANT-2021-2850383

COMPLETION OF THE APPROVED WORK

A condition of this Approval requires that the Approval Holder notify Nova Scotia Department of Environment and Climate Change that the work authorized is complete.

Please enter the information on this sheet and return it to Nova Scotia Department of Environment and Climate Change at the following address:

Nova Scotia Department of Environment and Climate Change
Inspection, Enforcement, and Compliance Division
Eastern Region, Antigonish Office
155 Main Street, Suite 205
Antigonish, NS, B2G 2B6

Phone: 902-863-7389
Fax: 902-863-7411
ECC Contact: Sean Gillis

APPROVAL NUMBER: 2021-2850383-00

NAME OF APPROVAL HOLDER: EXPLORATION OREX INC.

WORK AUTHORIZED: Wetland Alteration

DATE WORK WAS COMPLETED: _____

NAME OF CONTRACTOR: _____

COMMENTS: _____

_____

_____

_____

_____

_____ _____

Signature Date

NOVA SCOTIA

155 Main Street, Suite 205
Antigonish NS
Canada B2G 2B6

902-863-7389 P
902-863-7411 F
www.novascotia.ca

APPROVAL

Province of Nova Scotia
Environment Act, S.N.S. 1994-95, c.1 s.1

APPROVAL HOLDER: JAMIE CHISHOLM

SITE PID: 35094366

APPROVAL NO: 2023-3180831-00

EXPIRY DATE: January 18, 2026

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:

On-site Sewage Disposal Systems - On-site Sewage Disposal Systems

Administrator: Sarah Jadot

Effective Date: January 18, 2023

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.

a. The Approval Holder(s) shall conduct the Designated Activity in accordance with the following provisions:

i. The Act, as amended from time to time;

ii. Any standard adopted by the Department, as amended from time to time; and

iii. On-Site Sewage Disposal Systems Standard.

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, provincial or federal legislation, or other organizations. The Minister does not warrant that such licenses, permits, approvals or other authorizations will be issued.

c. 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.

d. The Approval Holder(s) shall ensure that this Approval, or a copy, is present on Site while personnel are on Site.

e. The Approval Holder(s) shall ensure that personnel directly involved in the designated activity are made fully aware of the terms and conditions of this Approval.

4. Specific Requirements

a. Certificate of Installation: The Approval Holder(s) is responsible to complete a certificate of installation when installation is finished. Completion of the system includes final cover and seeding or sodding. Copies of the certificate of installation must be submitted to the following within 15 days after completion of the system:

i. the Minister;

ii. the local building official appointed under the Building Code Act;

iii. the owner of the lot.

b. Notification: The Approval Holder(s) shall notify the Department at least 24 hours before the system is installed. Notification can be forwarded to:
155 Main Street, Suite 205
Antigonish, Nova Scotia B2G 2B6

Phone: (902) 863-7389
Fax: (902) 863-7411

5. Site Specific Conditions

a. The system is to meet the following clearance distances, as shown in the application documents:

Evergreen Engineering Limited
267 Cape Jack Road
Havre Boucher, NS
B0H 1P0
902-623-1972
Evergreen.eng@outlook.com

January 16, 2023

Sarah Jadot
Regional Environment Engineer
NS Department of Environment and Climate Change
155 Main Street, Suite 205
Antigonish, NS
B2G 2B6

RE: OSSDS Application, Municipality of District of Guysborough Marina, Middle Country Harbour, Guys. Co. NS PID: 35094366

Dear Sarah,

Enclosed you will find an application for an on-site sewage disposal system for the Municipality of the District of Guysborough (MODG) for a Marina that they are developing in Country Harbour.

Background: I was asked by Glen Avery, Director of Public Works for MODG, to design an on-site sewage disposal system for their utility building at the above-mentioned property. The property is owned by the Department of Natural Resources however MODG has leased approximately 1.5 ha. (former Salsman Day Park) to construct and operate a Marina on site.
The Marina will have 11 berths and up to two summer students working on site during the summer boating season. The on-site system will service a 24'x24'utility building which will have a single toilet and sink as well as storage for equipment. The site has a 5m wide concrete slipway as well as a 3m wide wharf c/w floating berths.

Investigation: A test pit was dug on the property on December 21, 2022. The depth of the test pit was dug to 1300mm. The material consisted of rootmat to 100mm, reddish brown loose to compact gravel to 350mm and compact light brown gravelly sand to 1300mm. There was no evidence of groundwater or bedrock in the test pit.

Conclusion: The location available for the on-site system falls within the 30.5m setback from a watercourse (Country Harbour). This is due to the north of the utility building having been developed into a parking lot and the limiting terrain to the east of the utility building.

Based on having up to two students working on site and occasional use by boaters, the design flow was estimated to be 320L/day however 500L/day was used for the design. Design calculations indicated that a 7m long C1 system with a 1m wide trench would be required. The actual design is based on a 2800L septic tank, 15m C1 fully trenched system with a 1.2m wide trench to help mitigate effects of falling within the 30.5m setback. As shown in Schedule B – Site Plan, it is anticipated that the septic tank will be 21m from OHWM and the septic field will be 20m from the OHWM. During installation, all effort will be made to increase the offset from OHWM if possible.

Attachments:

- Application for Approval
- Submission Details
- Schedule B – Site Layout
- Schedule C – Design Cross Section
- Proof of Ownership/Legal Right to Conduct Activity

Should you have any further questions, please do not hesitate to contact me at your convenience.

With Best Regards,

Jamie Chisholm, P. Eng.
Evergreen Engineering Ltd.

NOVA SCOTIA

APPLICATION FOR APPROVAL

OFFICE USE ONLY	
Date Received: (yyyy/mm/dd) 2023/01/17	Application # 2023-318083

NOTE: ALL APPLICABLE APPLICATION FEES MUST BE SUBMITTED WITH APPLICATION for applicable fees go to: (https://novascotia.ca/just/regulations/regs/envfees.htm

Type of Application:

(●) New Application ( ) Renewal ( ) Amendment ( ) Transfer Previous Approval_____

Applicant contact information:

Jamie	Alexander	Chisholm
First Name	**Middle Name**	**Last Name**

902-623-1972			
Primary Phone Number	**Ext**	**Secondary Phone Number**	**Ext**

	evergreen.eng@outlook.com
Fax Number	**Email address**

P. Eng.	7329
Professional designation (P. Eng)	**P. Eng #**

Applicant mailing address:

267 Cape Jack Road
Street name and type, PO Box, RR #, Site #, etc

Havre Boucher	Antigonish	Nova Scotia	Can	B0H 1P0
City/Town	**County**	**Province**	**Country**	**Postal Code**

Property details/location of activity

15701	Highway 316
Civic Number	**Street name and Type**

Middle Country Harbour	Guysborough
Community	**County**

35094366
PID

Preferred Method to Return Correspondence: (●) **Email** **OR** ( ) **Paper**

Property Details:

Water Supply: (●) Existing ( ) Proposed
( ) Other Please specify_____

Water Supply Type: ( ) Drilled Well (●) Dug Well
( ) Other Please specify_____

Development Type: ( ) Multiple Dwelling ( ) Residential Single Family
(●) Other Please specify Marina office/utility shed

Number of Bedrooms: N/A

System Details:

Disposal Field Length (m) 15
System Selection or Design (●) Design ( ) Selection
Design Capacity (L/Day) 500
Depth of Soil >1300
Type of Permeable Soil, please specify fine sandy gravel

Depth to Bedrock, Water Table, or too Permeable Soil(m) (●) greater than ( ) equal to 1300mm

Disposal Field Layout:
( ) Area Bed, at grade ( ) Area Bed, fully Trenched ( ) Area Bed, partially trenched
(●) C1 ( ) C1 Raised ( ) C2
( ) C2 Raised ( ) C3 ( ) Holding Tank
( ) Multiple Trench, at grade ( ) Multiple Trench, fully trenched
( ) Multiple Trench, partially trenched ( ) other_____
( ) Sand Filter

Malfunction Replacement ( ) Yes (Malfunction Inspection Form Required) (●) No

All clearance distances required by the Standard will be maintained ( ) Yes (●) No

Supporting Documentation

- All supporting documentation is to be submitted in accordance with the Approvals and Notification Procedure Regulations.
- A completed Submission Details Form must be submitted with this approval application.

Attach for ALL applications:

- [x] Proof of Ownership/Agreement/Legal Right to Conduct Activity
- [x] System Selection/Design Plan (Included on Submission Detail Form)
- [x] Drawing of Proposal (Included on Submission Details Form or separate attachment)
- [x] Test Pit Assessment (Included on Submission Detail Form)
- [ ] Malfunction inspection form (if system is replacing a malfunction)
- [x] If submission does not meet Standard, must provide an explanation why Standard cannot be met including statement regarding relative risk to environment and human health, and design/mitigative measures.

Jamie Chisholm	Jamie Chisholm Digitally signed by Jamie Chisholm Date: 2023.01.11 13:32:08 -04'00'	2022/01/11
Name (please print)	Signature	Date (yyyy/mm/dd)

Declarations must be completed for each submission

Information in this application package which the applicant considers to be confidential business information should be clearly identified. Are you making this request? (●) Yes ( ) No

If yes, please indicate which information in the Supporting Documentation is considered confidential.

_____

_____

_____

I acknowledge it is an offense under Section 158 of the Environment Act to provide false or misleading information, and confirm to the best of my knowledge and belief the information provided in this form and supporting documentation is true and accurate and complies with the relevant provisions of the Environment Act and Regulations. [x]

Applicant's Signature _____

Name (Please print or type) _____

OR

I certify that I am acting with the applicant's full consent. [x]

Signature Jamie Chisholm Digitally signed by Jamie Chisholm Date: 2023.01.11 13:31:48 -04'00' Date (yyyy/mm/dd) 2023/01/11

Name (Please print or type) Jamie Chisholm

NOVA SCOTIA

In keeping with the privacy provisions of the *Nova Scotia Freedom of Information & Protection of Privacy Act*, Nova Scotia Environment will only use the personal information for the purpose for which the information was obtained or compiled, or for a use compatible with that purpose.

SUBMISSION DETAILS

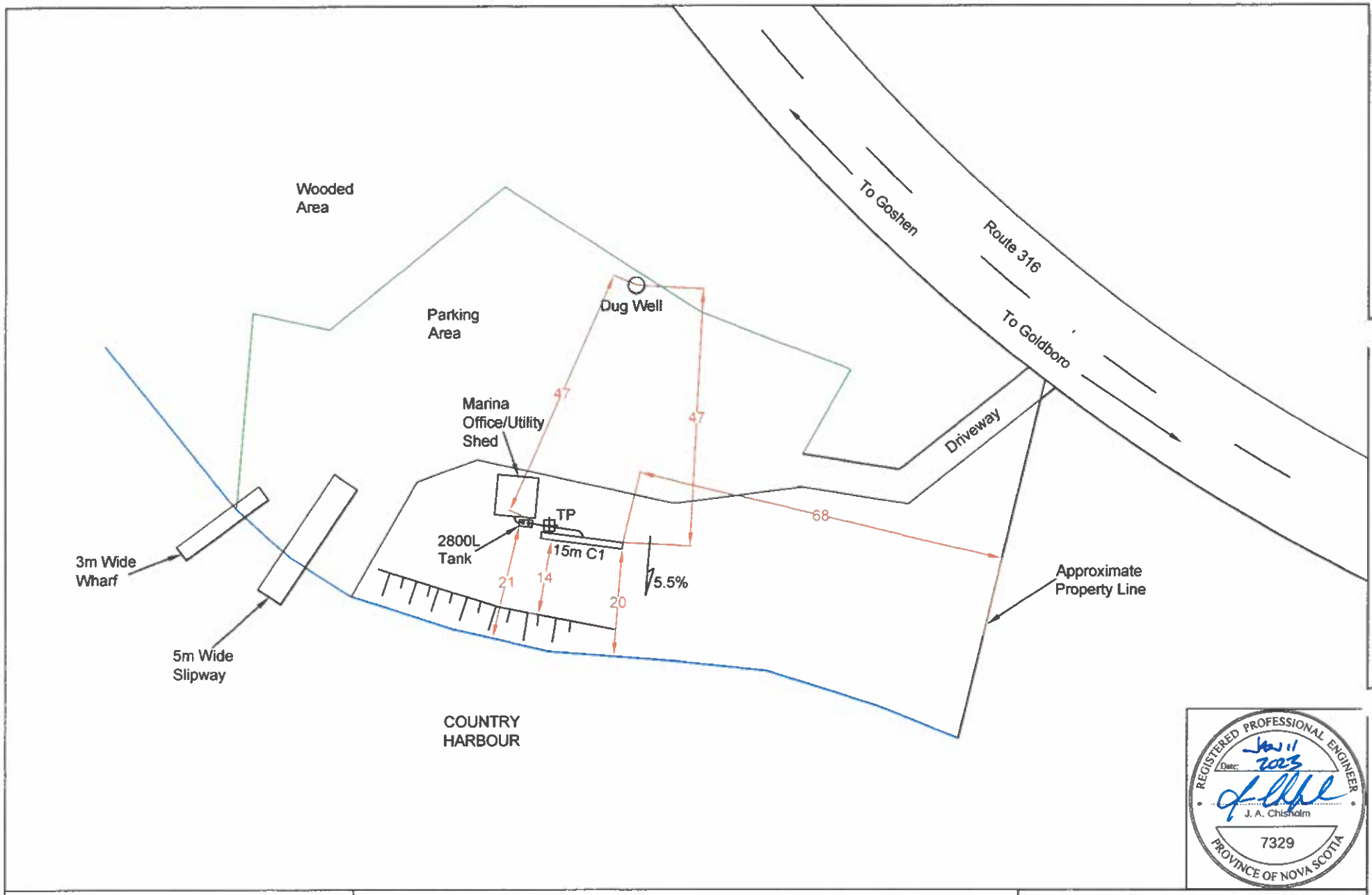
On-site sewage system application for approval required attachment

QP/P.Eng. NAME: Jamie Chisholm, P. Eng. **PID:** 35094366

Test pit profile (m)		Soil evaluation results				
Total depth:	1.3 m	**soil layers**	**soil type**	**depth of soil (mm)**	**density**	**moisture**
bedrock at:	>1.3 m	**ORGANIC**	organic mat	100 mm	loose	moist
water table at:	>1.3 m	**first**	reddish brown s	350 mm	loose-compa	dry-moist
slope:	5.5 %	**second**	light brown sand	1300 mm	compact	moist
roots to:	.1 m	**third**				
mottling at:	N/A m	**fourth**				

System selection or design specifications			
Type of Disposal Field:	C1	**Imported sand fill required**	☐ YES ☒ NO
Distribution Trench Dimensions:	Length: 15 m Width: 1.2 m	**Minimum permeability of imported sand**	m/sec
Cut at Toe of Trench:	600 mm	**Width of Buffer** - downslope - upslope	m m
Interceptor Trench **Liner:**	☐ YES ☒ NO depth: mm ☐ YES ☒ NO thickness:	**Depth of Buffer** (at 5 m from trench)	mm
Pump or Siphon Capacity **Watertight Testing:**	litres ☐ YES ☒ NO	**Septic Tank Capacity** **Watertight Testing:**	2800L +Filter litres ☐ YES ☒ NO

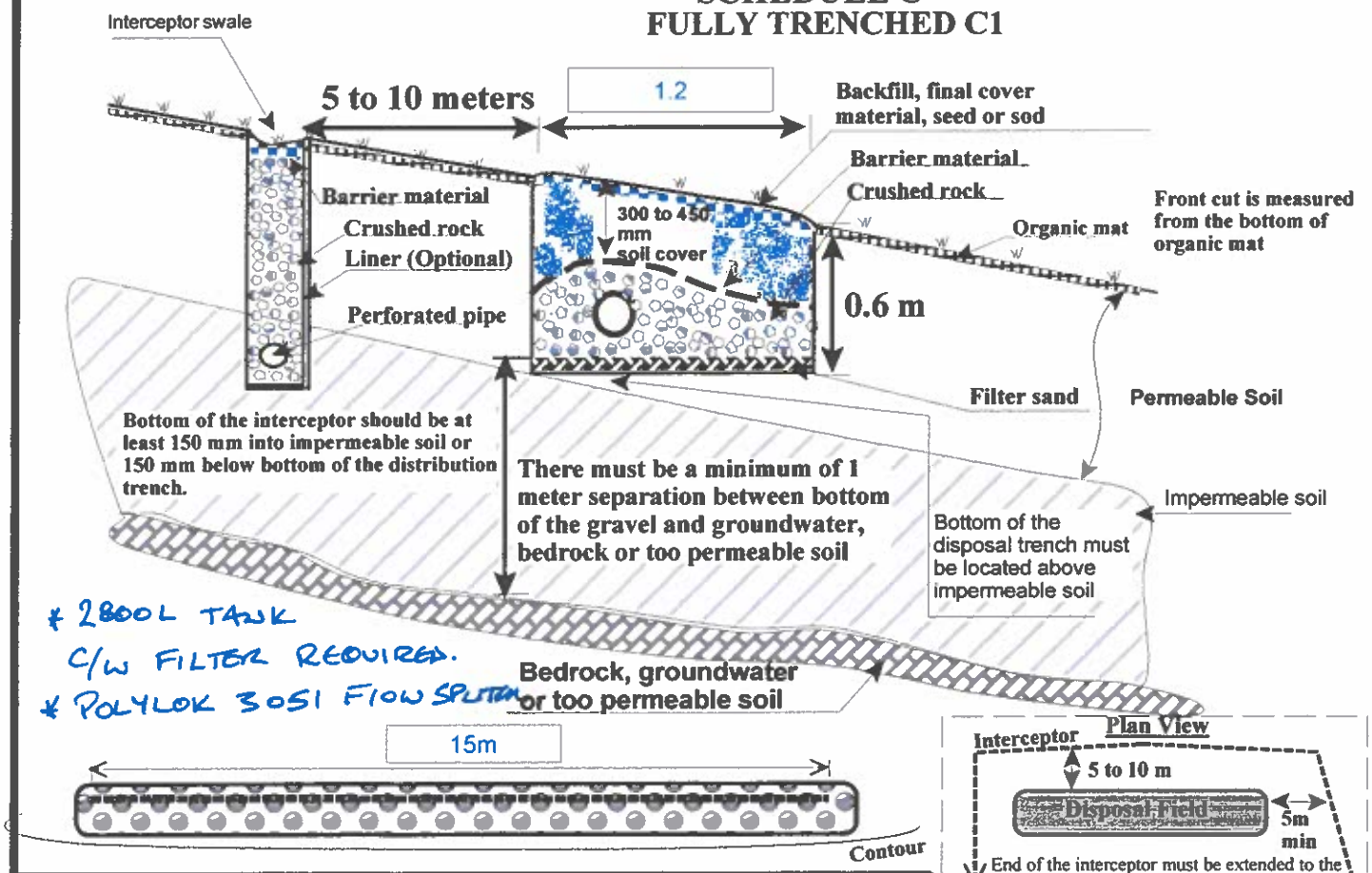
Minimum clearance distances as illustrated on attached site plan								
From Nearest	**To Field**	**To Tanks**	**From Nearest**	**To Field**	**To Tanks**	**From Nearest**	**To Field**	**To Tanks**
Lot Boundary	68 m	85 m	**Cistern**	N/A m	N/A m	**Water Distribution**	N/A m	N/A m
Downslope Boundary	20 m	21 m	**Watercourse**	20 m	21 m	**Foundation Drain**	N/A m	N/A m
Drilled Well	N/A m	N/A m	**Wetland**	N/A m	N/A m	**Other**	m	m
Dug Well	47 m	47 m	**Intermittent Drain**	N/A m	N/A m	**Other**	m	m

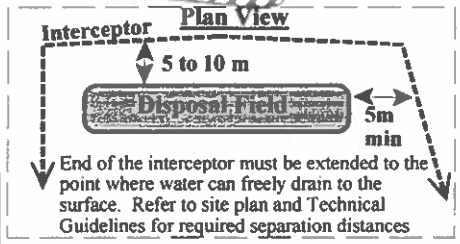


REGISTERED PROFESSIONAL ENGINEER
Date: Jan 11 2023
J. A. Chisholm
7329
PROVINCE OF NOVA SCOTIA

Evergreen Engineering Ltd. 267 Cape Jack Road Havre Boucher, NS B0H 1P0	Proposed OSSDS - MODG Marina Middle Country Harbour, Guys. Co., NS PID: 35094366 Lot Size: Approx. 1.5 ha.	January 11, 2023 Units: Meters N.T.S

SCHEDULE C
FULLY TRENCHED C1





General Conditions

Contractor shall verify location of all wells, watercourses, lot boundaries and all elevations prior to construction (within 30.5 m from the location of disposal system)

Backwash water from water treatment devices must not be discharged to the on-site sewage disposal system unless the system is designed by a professional engineer.

Roof, foundation and lot drainage must be directed away from the disposal field, septic tank and pump (siphon) chamber.

Steps must be taken to ensure that the proposed disposal field area is not subject to vehicular traffic or any other disturbance such as excavation or stockpiling of excavated material etc., Installation of physical barrier is recommended.

It is the applicants responsibility to assure that the construction of foundations, driveway, well or any other development on the lot will not impact on the feasibility of on site sewage disposal field installation.

Disposal System must be installed by a contractor licensed to install on-site sewage disposal systems in Nova Scotia.

All work must be completed in accordance with the Nova Scotia On-Site Sewage Disposal Systems Regulations, On-Site Sewage Systems Technical Guidelines, and conditions of the Approval.

DISPOSAL FIELD REQUIREMENTS						
100	mm	Final cover material, seed or sod				
200 to 350	mm	Clean local permeable backfill				
Required over crushed rock		Barrier material				
75	mm	Crushed rock above pipe				
100	mm	Perforated pipe diameter				
15m	m	Perforated pipe length				
125	mm	Crushed rock below pipe				
75	mm	Filter sand	Permeability m/s:	0.0001 to 0.0005	Minutes at 20°C	2 to 8
0.3 Swale	m	Interceptor/Swale depth		Liner	Yes ☐	No ☒

Selection Criteria:		NOT TO SCALE
Flow (l/d):	500	Applicant: Jamie Chisholm for Municipality of Guysborough
Slope (%):	5.5%	Approval No.:
Soil type:	fine sandy gravel	Location: MIDDLE COUNTRY Hse, Guys. Co.
Soil depth (mm):	>1300mm	Qualified Person: Jamie Chisholm, P. Eng.

Letter of Authorization

To: Jamie Chisholm, P. Eng.
Evergreen Engineering Ltd.
267 Cape Jack Road
Havre Boucher, NS
B0H 1P0

RE: Application for an On-Site Sewage Disposal System – 15701 Highway 316, Middle Country Harbour

From:
Municipality of District of Guysborough
Country Harbour Marina

PID: 35094366

Dear Mr. Chisholm,

This letter is to advise you that I/we are the lessees of the above-mentioned property and have authorization from Department of Natural Resources and Renewables to install and on-site sewage disposal system on this property. I/we authorize you to make an application for approval to Department of Environment and Climate Change for an on-site sewage disposal system on my/our behalf.

Property Owner/Rep

Jan 16/23
Date

NOVA SCOTIA

155 Main Street, Suite 205
Antigonish, NS
Canada B2G 2B6

902-863-7389 T
902-863-7411 F
www.novascotia.ca

Our File Number: 33000-30-ANT-2022-5115234

October 26, 2022

PETER GEDDES
1701 HOLLIS STREET (FOUNDERS SQUARE)
HALIFAX, NS B3J 2T9

Dear PETER GEDDES

RE: Contaminated Sites Obligations

PID	Civic #	Street Name	Street Type	Community	County
35094366	570	GOLDBROOK	RD.	GOLDBORO	GUYSBOROUGH COUNTY

Based on receipt of FRM-100, Notification of Free Product or Contamination on October 13, 2022 for the above noted property(ies), a contaminated site has been identified. Pursuant to the *Environment Act* and the *Contaminated Sites Regulations*, you are responsible to ensure that the contamination is properly addressed.

You are required to obtain the services of a Site Professional, as defined within the *Contaminated Sites Regulations* to ensure contamination at the above noted property(ies) is addressed. Your timely contact with a Site Professional may be key to reducing the overall time and cost of remediation and may result in the avoidance of unnecessary work.

Section 11(a)(iii) requires you to remediate the contaminated site in accordance with the regulations. To achieve compliance, the regulations require you to:

1. Complete the required Environmental Site Assessment(s) in accordance with Ministerial Protocol(s) and submit to the Department by April 11, 2023.
2. Complete a Remedial Action Plan report in accordance with Ministerial Protocol(s) and submit to the Department by October 15, 2024.
3. Complete a Confirmation of Remediation Report in accordance with Ministerial Protocol(s) and submit to the Department by October 15, 2024.
4. Complete a Record of Site Condition or a Declaration of Property Condition, as applicable, in accordance with Ministerial Protocol(s) and submit to the Department by October 15, 2024.

Yours truly,
Nova Scotia Department of Environment and Climate Change

Notification of Free Product or Contamination

This form is for all sites with contamination or free product requiring written notification.

NOVA SCOTIA

☑ New submission ☐ Updated form NSE file number (mandatory for updated form) 33000-

Nova Scotia Environment
OCT 13 2022
Received

Instructions for completing this form

- All relevant sections of this form are to be completed
- Signatures on this form are required from the managing site professional or any other person providing the notice.
- All regulatory protocols must be followed, and all forms/checklists must be completed separately for each property. This means that a source property and an impacted third-party property must have all documents filed separately. Once the source property or impacted third-party property is identified by the check box below, all subsequent reference on this form/checklist are to that site owner.
- If cleanup is being completed following the 30-day verification exemption, this form will not be required.
- Forms/checklists must be complete before filing

1 - Site Location and Contact Information

Details provided on this form are applicable to ☑ Source Property **or** ☐ Impacted Third Party Property

Site Location
Mandatory must be completed

Site Address: Gold Brook Lake and Seal Harbour
City: Goldboro
Parcel Identification Number (PID): 35094366
Postal Code:
GPS (NAD83 UTM coordinates, source central point) Easting: 606983 / 611278 Northing: 5005984 / 5001738
Zone (select one) ☐ 19 ☑ 20 ☐ 21
Description (optional): Two historical mining sites located within PID 35094366

Property Owner
Mandatory must be completed

Name: Karen Gatien, Deputy Minister, Dept. of Natural Resources and Rene
Phone: (902) 424-4450
Email: Karen.Gatien@novascotia.ca
Fax:
Recognized Agent (if applicable): Donnie Burke, Executive Director (donnie.burke@novascotia.ca)
Company Name (if applicable): Nova Scotia Lands Inc.
City: Sydney
Mailing Address: 45 Wabana Court, P.O. Box 430, Station A
Postal Code: B1P 6H2
Preferred method of correspondence (select one) ☐ Letter **or** ☑ Email

Contact for Correspondence
If different than above

Name: Peter Geddes, Executive Director
Phone: (902) 424-4988
Email: peter.geddes@novascotia.ca
Fax:
Recognized Agent (if applicable):
Company Name (if applicable): Dept. of Natural Resources and Renewables
City: Halifax
Mailing Address: 1701 Hollis Street, P.O. Box 608
Postal Code: B3J 2T9
Preferred method of correspondence (select one) ☐ Letter **or** ☑ Email

Site Professional
Mandatory must be completed

Name: Derek Heath
Phone: (902) 334-2752
Email: derek.heath@aecom.com
Fax:
Company Name: AECOM Canada Ltd.
City: Halifax
Mailing Address: 1701 Hollis Street, SH400
Postal Code: B3J 3M8
Professional Registration Number: APGNS: 0029
Preferred method of correspondence (select one) ☐ Letter **or** ☑ Email

Notification of Free Product or Contamination

This form is for all sites with contamination or free product requiring written notification.

NOVA SCOTIA

Type of free product Check all applicable.	**Observed in Soil**	**Measured in Groundwater**
Mineral oil	☐	☐
Glycols	☐	☐
DNAPL and Chlorinated Solvent	☐	☐
Other (describe)	☐	☐

3 - Type of Contamination in Soil, Sediment, Surface Water or Groundwater

Type of Contamination Check all applicable.	**Soil**	**Sediment**	**Surface Water**	**Groundwater**	**Volume of release** (not vol. of media impacted)
Inorganic Parameters (metals)	☑	☑	☑	☑	Unknown
Petroleum Hydrocarbon Parameters	☐	☐	☐	☐	
Polycyclic Aromatic Hydrocarbon (PAH) Parameters	☐	☐	☐	☐	
Volatile Organic Compound (VOC) Parameters	☐	☐	☐	☐	
Pesticides	☐	☐	☐	☐	
PCBs	☐	☐	☐	☐	
Dioxins and Furans	☐	☐	☐	☐	
Pentachlorophenol	☐	☐	☐	☐	
Organotins	☐	☐	☐	☐	
Glycols	☐	☐	☐	☐	
Phenol	☐	☐	☐	☐	
PFAS compounds	☐	☐	☐	☐	
Other (describe)	☐	☐	☐	☐	

Add Row | Delete Row

4 - Site Characterization

Cause of Release Other (discharge, historical, unknown)

Most Sensitive land use

☐ Agricultural ☐ Commercial
☑ Residential/Parkland ☐ Industrial

Groundwater potability of site (potable or non-potable according to Appendix 1, Figure 3 of Notification Protocol)

☑ Potable ☐ Non-potable

Environmental Assessment Approval

Approval Date: August 2, 2022

Goldboro Gold Project

Signal Gold Inc.

Goldboro, Guysborough County, Nova Scotia

Terms and Conditions for Environmental Assessment Approval

1 Definitions

1.1 *Environment Act* means Environment Act 1994-95, c.1, s.1, and includes, unless the context otherwise requires, the regulations made pursuant to the Act, as amended from time to time.

1.2 Department means the Department of Environment and Climate Change, and the contact for the Department for this Approval is:

Nova Scotia Environment
Eastern Region, Antigonish Office
155 Main Street, Suite 205, Nova Scotia B2G 2B6
Phone: 902-863-7389 Fax: 902-863-7411

1.3 Minister means the Minister of Environment and Climate Change.

1.4 Commencement means the same as to commence work, as defined in the Environmental Assessment Regulations.

1.5 EA means Environmental Assessment.

2 Scope

2.1 This Approval (the "Approval") relates to the Approval Holder(s) and their Registration Document, and all documentation submitted to the Department prior to the issuance of this approval for the Goldboro Gold Project, situated at or near Goldboro, Guysborough County, Nova Scotia, hereafter referred to as the "Project."

2.2 The Approval Holder(s) shall ensure the Project is carried out in accordance with this Approval and reference documents, including the Registration Documents and supporting documentation.

3 General

3.1 The Approval Holder shall conduct the Project in accordance with the Environment Act, as amended from time to time.

3.2 The Approval Holder shall, within two years of the date of issuance of this Approval, commence work on the Project unless granted a written extension by the Minister.

3.3 The Approval Holder shall provide written notification to the Department of the commencement date of the Project, at a minimum 30 days prior to the commencement.

3.4 The Approval Holder shall provide to the Department a concordance table detailing the status of the EA terms and conditions on January 31 of each year until released in writing by the Department.

3.5 Prior to any proposed expansion, modification, or relocation of any aspect of the Project from that proposed in the Registration Document, the Approval Holder must submit the proposal to the EA Branch for review and may require an EA or amendment.

3.6 Nothing in this Approval relieves the Approval Holder of the responsibility for obtaining and paying for all other licenses, permits, approvals or authorizations necessary for carrying out the Project which may be required by municipal by-laws or provincial or federal legislation. The Minister does not warrant that such licenses, permits, approvals or authorizations will be issued.

3.7 No authority is granted by this Approval to enable the Approval Holder(s) to commence or continue the Project 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. Failure to retain said authorization may result in this Approval being cancelled or suspended.

3.8 The Approval Holder shall not transfer, sell, lease, assign or otherwise dispose of this Approval without the written consent of the Minister. The sale of a controlling interest of a business or a transfer of this Approval from a parent company to a subsidiary or an affiliate is deemed to be a transfer requiring consent.

3.9 Upon any changes to the Registry of Joint Stock Companies information related to the Approval Holder, the Approval Holder shall provide a copy to the Department within 5 days of the changes.

3.10 If there is a discrepancy between the Registration Documentation and the terms and conditions of this Approval, the terms and conditions of this Approval shall apply.

3.11 Where a timeline is associated with a condition(s) of the Approval, the Approval Holder shall fulfil the requirements of the condition(s) within the prescribed timeline, unless otherwise authorized in writing by the Department.

3.12 The Approval Holder shall notify the Department of any incidents of non-compliance with this Approval immediately and in accordance with the Act and Regulations.

3.13 The Approval Holder shall bear all expenses incurred in carrying out the environmental management and monitoring required under the terms and conditions of this Approval, the Act or the Regulations.

3.14 Unless specified otherwise in this Approval, all samples required to be collected by this Approval, the Act or the Regulations shall be collected, preserved, and analysed, by qualified personnel, in accordance with recognized industry standards and procedures and in accordance with any Standard under the Act or Regulations.

3.15 The Approval Holder shall ensure that this Approval, or a copy, is present at the Project site while personnel are on site and that personnel directly involved in the Project are made fully aware of the terms and conditions which pertain to this Approval.

3.16 The Approval Holder shall update and/or revise any of the plans, programs or other documents required in this Approval to reflect the progressive development of the Project, and at any time at the request of the Department and make them available to the Department upon request.

3.17 Based on the results of the monitoring required in this Approval or otherwise completed for the Project, or at any time as determined by the Department, the Approval Holder shall make necessary modifications to mitigation plans and/or changes to Project operations to prevent unacceptable environmental effects, as required by the Department.

3.18 The Approval Holder shall provide to the Department a summary table detailing the results of the monitoring required in this Approval, or otherwise completed for the Project, on January 31 of each year until released in writing by the Department. The results shall clearly identify and summarize any exceedances.

3.19 Where a condition of this Approval requires the Approval Holder to consult a particular party or parties, the condition will be considered complete once the Approval Holder provides a written confirmation letter from the party or parties that the consultation is complete.

If there is a conflict between the Approval Holder and a party or parties regarding the consultation, the Department will determine if suitable consultation has been completed and/or if further action is required.

4 Historical Mining Contamination

4.1 Using the results of the Phase 1 Environmental Site Assessment, the Approval Holder shall retain a Site Professional to conduct a Phase 2 Environmental Site Assessment, as defined by the Contaminated Sites Regulations, for all suspected or known contaminated areas that could be disturbed by construction, operation or reclamation of the Project. Prior to commencement, unless otherwise authorized by the Department, the Phase 2 Environmental Site Assessment shall be submitted to the Department.

4.2 The Approval Holder shall retain a Site Professional to prepare a Remedial Action Plan (RAP), as defined by the Contaminated Sites Regulations, for historic contamination impacts within all areas that could be disturbed by construction, operation or reclamation of the Project. The Approval Holder shall submit the RAP to the Department with the Part V Industrial Approval application.

5 Project Design and Operations

5.1 At the request of the Department, the Approval Holder shall reimburse the Department for the additional cost of all resources required to ensure environmental compliance for this Project, up to $200,000 annually. This amount will include the cost and time of staff persons dedicated to the Project and will be due by January 1 of each year throughout the life of the Project, until released in writing by the Department.

5.2 The Approval Holder shall submit to the Department with the Part V Industrial Approval application information identifying potentially acid generating (PAG) material (PAG1, PAG2) and non potentially acid generating (NPAG) material for the Project using the Neutralization Potential Ratio (NPR) value rather than the operational NPR.

5.3 The Approval Holder shall submit to the Department with the Part V Industrial Approval application further evaluation by a qualified professional geochemist supporting the use of NPAG rock for construction in areas where surface water runoff will not be captured and sent to the Tailings Management Facility for treatment. This shall evaluate the suitability of a 100 mg/kg cut-off for arsenic leaching material and the sequencing of NPAG and low arsenic leaching mine rock, confirming sufficient volumes are available on site, when required.

5.4 The Approval Holder shall be responsible for the costs of any third-party review of plans, reports, or monitoring results deemed necessary by the Department over the life of the Project.

6 Surface Water Resources

6.1 The Approval Holder shall submit additional information to the Department with the Part V Industrial Approval application to support determination of regulatory discharge limits to surface water (e.g., establishment of baseline concentrations for contaminants of concern), preventing adverse effects to surface water resources and aquatic life. This information shall be developed in consultation with the Department.

6.2 As part of the Part V Wetland Alteration Approval application submitted to the Department, the Approval Holder shall demonstrate that wetlands, particularly wetlands of special significance, have been avoided to the extent possible, and risks to indirect alteration of wetland area have been mitigated. The application shall include a monitoring plan to demonstrate the effectiveness of avoidance and mitigation of indirect impacts in both partially altered and avoided wetlands. This monitoring shall include sufficient pre-construction data from wetlands for comparison to Project effects, including at a minimum, WESP-AC assessments, representative vegetation monitoring plots on transects perpendicular to wetland boundaries and hydrological monitoring in each wetland.

6.3 Prior to commencement of the Project, the Approval Holder shall submit a Part V Watercourse Alteration Approval for Gold Brook for the alteration of flows in a watercourse. As a part of the application, the Approval Holder shall demonstrate that watercourse alteration has been minimized to the extent possible, and risks to, and arising from the alteration of flow have been mitigated. The application shall include a monitoring plan to demonstrate the effectiveness of mitigations to the alteration of flow. This shall include sufficient pre-construction monitoring data from Gold Brook to allow effective comparison of Project effects, including, at a minimum, sufficient data to support characterization of seasonal and annual variability, as well as in characterizing low-flow regimes where the addition of pumped flows will represent the largest change from natural conditions.

6.4 The Approval Holder shall submit a detailed surface water management plan to the Department with the Part V Industrial Approval application. This plan shall be developed by a qualified professional engineer licensed to practice in the Province of Nova Scotia.

6.5 The Approval Holder shall submit a detailed surface water quality and quantity monitoring plan to the Department with the Part V Industrial Approval application. This plan shall be developed in consultation with the Department.

6.6 Throughout the life of the Project, the Approval Holder shall conduct any additional effluent or surface water monitoring or studies, as required by the Department.

7 Groundwater Resources

7.1 The Approval Holder shall submit additional information to the Department with the Part V Industrial Approval application to support determination of regulatory discharge limits to groundwater (e.g., establishment of baseline concentrations for contaminants of concern), preventing adverse effects to groundwater resources. This information shall be determined in consultation with the Department.

7.2 The Approval Holder shall submit a detailed groundwater quality and quantity monitoring plan to the Department with the Part V Industrial Approval application. This plan shall be designed by a professional hydrogeologist licensed to practice in Nova Scotia.

7.3 The Approval Holder shall conduct any additional effluent or groundwater monitoring or studies, as required by the Department.

7.4 The Approval Holder shall submit a blasting plan to the Department with the Part V Industrial Approval. The plan shall consist of a completed pre-blast survey for structures within 800 m of the point of the blast. A blast monitoring plan and a blast damage response shall also be prepared.

8 Flora and Fauna

8.1 The Approval Holder shall provide the Wildlife Division, Department of Natural Resources and Renewables (NS NRR) with digital way points and shape files showing precise locations for species listed under the Species at Risk Act (SARA) and/or Endangered Species Act (ESA), as well as of Species of Conservation Concern identified during field work. Data should adhere to the format prescribed in the NRR Template for Species Submissions for EAs. Data are to be provided within two months of their collection.

8.2 Prior to commencement, the Approval Holder shall develop a Wildlife Management Plan in consultation with NS NRR and Environment and Climate Change Canada. The plan shall include:

- a lighting management plan
- appropriate noise and dust mitigation measures
- a process to manage exposure to spills/hazardous chemicals
- appropriate mitigation to prevent wildlife from entering the tailings management facility and open pits
- measures to reduce the spread of invasive species on and off site
- an avian monitoring plan
- appropriate setbacks from common loon and greater yellow legs nests if located during their respective breeding seasons
- avoidance/minimization/mitigation measures that are consistent with Recovery Strategies, Action Plans or Management Plans
- details to educate Project personnel on wildlife and species at risk that may be present on site
- details of monitoring and inspections to ensure effectiveness of the plan
- a contingency plan outlining measures that will be taken if unexpected effects to vegetation and wildlife are detected
- a communication protocol including points of contact, as appropriate depending on the particular situation and species, if wildlife are encountered onsite

8.3 Revegetation must be undertaken using native species following consultation with NS NRR.

8.4 Prior to commencement, the Approval Holder shall undertake surveys to identify the extent of Blue Felt Lichen in areas surrounding the Project. Surveys must be undertaken within a 10 km radius of the Project in relevant habitats. Data will be provided to NS NRR in accordance with Condition 8.1 of this Approval and used in the development of the mitigation plan (Condition 8.6 of this Approval).

8.5 The Approval Holder must undertake research related to the indirect impacts of Project mining activity on lichens by monitoring Blue Felt Lichen thalli retained on the site (as outlined in the Registration Document) relative to those transplanted off site and provide a report to NS NRR. Monitoring of transplanted individuals should continue for 5 years.

8.6 Prior to commencement, the Approval Holder shall develop and implement a mitigation plan in consultation with NS NRR that prevents adverse effects to species at risk, and/or that supports species at risk recovery in Nova Scotia through financial contributions, research or conservation. The plan shall also include a program for biodiversity offsets after consulting with a knowledgeable land conservation organization. The plan shall be made available to the Department. The Approval Holder shall monitor the plan to determine its effectiveness. Monitoring reports shall be available to the Department upon request.

9 Light

9.1 At the request of the Department, the Approval Holder shall develop and implement a plan to monitor light levels, ensuring the Institution of Lighting Engineers illuminance limits included in the Registration Documents are not exceeded. The plan shall include, but not be limited to, sampling locations, parameters, monitoring methods, protocols, and frequency.

10 Traffic

10.1 Prior to commencement, the Approval Holder shall develop and implement a traffic management plan that meets the Nova Scotia Temporary Workplace Traffic Control Manual in consultation with Nova Scotia Department of Public Works. The plan should be updated regularly and be available to the Department upon request.

11 Archaeological and Heritage Resources

11.1 The Approval Holder shall cease work and contact the Special Places Coordinator, Nova Scotia Department of Communities, Culture, Tourism and Heritage (CCTH) immediately upon discovery of an archaeological, or paleontological site, artifact or fossil specimen unearthed during any phase of the Project. If the find is of certain or possible Mi'kmaq origin, the Approval Holder shall also contact the appropriate Mi'kmaq representatives as advised by CCTH.

12 Public Engagement

12.1 The Approval Holder shall develop and implement a comprehensive complaint resolution plan for receiving and responding to complaints related to the Project, including a reporting system which records, and documents steps taken to determine the cause of complaint, timeline for responding to complaints and implementing corrective measures that will be taken to alleviate the cause and prevent its recurrence. The plan shall be made available to the Department upon request.

12.2 The Approval Holder shall appoint a contact person designated to deal with complaints and shall provide the contact information to the Department.

12.3 Prior to commencement of the Project, the Approval Holder shall develop and implement a plan for the formation and operation of a Community Liaison Committee (CLC) including terms of reference, which meet the Department's Guide for the Formation and Operation of a Community Liaison Committee, as amended from time to time. The Approval Holder shall operate the CLC for the duration of the Project or until released in writing by the Department.

13 Engagement with the Mi'kmaq of Nova Scotia

13.1 The Approval Holder shall develop and implement a Mi'kmaq Communication Plan, which will include but not be limited to a process for communicating Project details and seeking input from all thirteen Mi'kmaq communities on the development and implementation of Project mitigation and monitoring plans. The plan shall be updated regularly and be available to the Department upon request.

13.2 The Approval Holder shall complete the update to the Mi'kmaq Ecological Knowledge Study (MEKS) for the Project, as described in the Registration Document. The study shall be made available to the Department upon request.

14 Contingency Plan

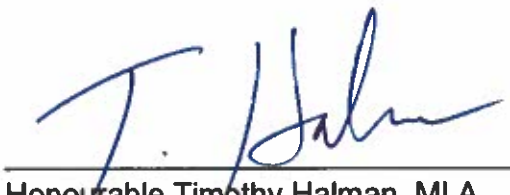
14.1 The Approval Holder submit a comprehensive contingency plan to the Department with the Part V Industrial Approval application which meets the Department's Contingency Planning Guidelines. The plan shall provide prevention measures and address plans for dealing with accidental occurrences including but not limited to spills of hydrocarbons or other hazardous materials (e.g., sodium cyanide and hydrogen cyanide), failure of tailings/wastewater management facilities and erosion and sediment control measures, fires, and vehicular collisions.

14.2 The Contingency Plan shall include a specific acid rock drainage contingency plan, outlining a timeline and the measures to be taken if unacceptable effects to groundwater or surface water are occurring.

14.3 The Contingency Plan shall include specific surface water and groundwater contingency plans, outlining a timeline and the measures to be taken if unacceptable effects to surface water or groundwater quality or quantity are detected.

15 Bonding

15.1 The Approval Holder shall submit sufficient security for activities identified in Division IV of the Activities Designation Regulations to the Department with the Part V Industrial Approval application.



Honourable Timothy Halman, MLA
Minister of Environment and Climate Change

NOVA SCOTIA

Environment and Climate Change
Office of the Minister

PO Box 442, Halifax, Nova Scotia, Canada B3J 2P8 • Telephone 902-424-3726 • novascotia.ca

File number: 10700-40-58259
40100-30-320

August 2, 2022

President and CEO
Signal Gold Inc.
20 Adelaide Street East, Suite 915
Toronto ON M5C 2T6

RE: Environmental Assessment – Signal Gold Inc.
Goldboro Gold Project, Guysborough County, Nova Scotia

Our review of the environmental assessment registration documents for the proposed Goldboro Gold Project in Guysborough County, Nova Scotia has been completed.

This letter is to advise that I have approved the above project in accordance with Section 40 of the Nova Scotia *Environment Act*, S.N.S., 1994-95 and subsection 13(1)(b) of the *Environmental Assessment Regulations*, N.S. Reg. 348/2008, made under the Act. There was significant interest in the project with many perspectives expressed throughout the process. I have considered the information provided by Signal Gold Inc. (Signal), and the information provided by the government, the Mi'kmaq of Nova Scotia, and the public during consultation on the environmental assessment. I have also considered the public interest in this proposed project, the proposed location, and the nature and sensitivity of the surrounding area, and the potential and known adverse effects or environmental effects of the proposed project, including to species at risk or of concern and their habitats. I have also considered the steps proposed by Signal to address the concerns expressed by the other parties. In coming to this decision, I have also considered the other factors as required under Section 12 of the *Environmental Assessment Regulations.*

After considering all of the above, I am satisfied that any adverse effects or significant environmental effects of the undertaking can be adequately mitigated through compliance with the attached terms and conditions as well as through compliance to the other licenses, certificates, permits and approvals that will be required for operation.

This approval is subject to any other approvals required by statute or regulation, including but not limited to, approval under Part V of the *Environment Act* (Approvals and Certificates section).

.../2

If you have any questions regarding the approval of this project, please contact Helen MacPhail, Supervisor, Environmental Assessment Branch, at (902) 483-2696 or via email at Helen.MacPhail@novascotia.ca.

Sincerely,

Honourable Timothy Halman, MLA
Minister of Environment and Climate Change

Encl.

c: Helen MacPhail, Environment and Climate Change, Supervisor, Environment and Climate Change

NOVA SCOTIA
Service Nova Scotia
Information Access and
Privacy (IAP) Services

1505 Barrington Street, 6th Floor
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Halifax, NS B3J 2L4
902-424-2985 T 1-844-424-2985 TF
iapservices@novascotia.ca

June 29, 2023

Nadine Wambolt
Sent via email: nwambolt@dillon.ca

Dear Nadine Wambolt:

Re: We have received your application - 2023-01115-ECC

Your application for access under the *Freedom of Information and Protection of Privacy Act (FOIPOP)*, was received on June 29, 2023. In your application you requested:

> *Requesting industrial file 92100-30-ANT-101367 11vols containing inspection reports, annual reports, photos, correspondence certificate of analysis, bulk sample final report, applications, maps, hydrology report, site plans, hydrology study, water quality data, spill contingency plan, bulk sample plan, closure plan, monitoring results, and audit; industrial file# 92100-01-3652485); four water resources file #s 95100-30-ANT-2017-105488, 95100-30-ANT-2021-2850383, 95100-30-ANT-2018-100304, 95100-30-ANT-2496232 containing applications, approvals, photos, inspection reports, checklists, note to file, emails, correspondence, maps, and reports; water resources client request file # 95100-01-4306187); two water resources complaint files # 95100-40-ANT-4817507, 95100-40-ANT-4768878); a contaminated sites file # 33000-30-ANT-2022-5115234); and an environmental assessment file# 40100-30-289) pertaining to PID 35094366 Guysborough Country and as identified through ENV-2023-2146/2151.*

Pursuant to FOIPOP subsection 7(2), Environment and Climate Change has thirty days to respond to your application. You may expect a response by July 31, 2023 unless we determine that an extension is required for consultations with third parties or other public bodies. We may also require an extension if we determine that there is a large number of records involved. If we require an extension, we will advise you.

Thank you for the $5.00 application fee. Service fees may be charged for processing the application, and a fee estimate may be forthcoming.

If you have any questions about this notice of acknowledgment or would like to discuss your application in detail,

NOVA SCOTIA
Service Nova Scotia
Information Access and
Privacy (IAP) Services

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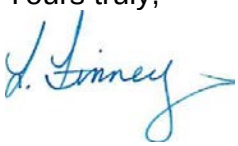
iapservices@novascotia.ca

please contact Sandra Mitchell at 902 424 3386 or email her at sandra.mitchell@novascotia.ca

Yours truly,



Lisa Finney *on behalf of*
Sandra Mitchell
IAP Administrator

Appendix D

Special Attention Items Descriptions

Lead

Paint manufacturers historically added lead to paint as a pigment and to accelerate drying times. . In 1976, Canadian regulators established the Hazardous Materials Product Act - Liquid Coating that limited the amount of lead in interior paint to 0.5%. In 1990, an industry agreement ceased the use of lead in exterior paint. Subsequent to this, the Surface Coating Materials Regulations were promulgated (in 2005), reducing the allowable lead content of interior paints to 0.06% (600 ppm). This value was reduced from 600 ppm to 90 ppm in October 2010; however, it is important to note that there is not a direct correlation between the concentrations of lead in a material to the potential occupational exposure if the material is disturbed. Other historical uses of lead in buildings include, but are not limited to, water pipes, pipe fitting solder, cable trays, roof flashings, batteries used in emergency lighting.

Mercury

Mercury is commonly found in buildings as mercury vapour lighting, in thermometers, thermostats, and some electrical switches. Mercury can also be found in minor amounts in fluorescent lamp tubes, compact fluorescent lights (CFLs) and in paints and adhesives.

Mercury or mercury vapour within light fixtures, thermometers, and electrical switches poses no risk to workers or occupants provided the mercury containers remain intact and undisturbed. Canadian Council of Ministers of the Environment (CCME) has developed Canada-Wide Standards for mercury-containing lights and mercury emissions. The goal of the standards is to reduce release of mercury into the environment.

PCBs

PCBs are a man-made compound first manufactured in 1929 and used extensively until the late 1970s as a dielectric fluid in transformers, motor capacitors and lighting ballasts. Current legislation prohibits the manufacture and sale of new equipment containing PCBs (effective 1980) and that existing PCB containing equipment must be removed from service prior to specific dates. Ballasts manufactured prior to the early 1980s are assumed to contain PCBs unless markings indicate otherwise.

Asbestos Containing Materials (ACMs)

Asbestos is a family of naturally occurring fibrous minerals with similar chemical and physical properties. Known for its durability, tensile strength, insulating characteristics, chemical and fire resistance properties, asbestos was mined and used extensively in construction materials from the late 1800s until the 1970s. Materials that may contain asbestos fibres includes (but are not limited to) mechanical insulation, sprayed-on fireproofing and building materials used in walls, flooring and ceiling construction. Between the 1970s and late 1980s, the use of asbestos was generally discontinued in Canada voluntarily or through legislation. Vermiculite, typically used in attic insulation and sometimes in masonry block wall construction, may also be contaminated with asbestos fibres. The health risk associated with asbestos occurs when asbestos fibres are released from asbestos containing materials (ACMs) into the ambient air.

The manufacture, import, sale, and use of asbestos-containing products was not banned in Canada until December 30, 2018, therefore, asbestos fibres may still be present in some roofing products, tars and cement based products (e.g. drainage piping in high rise building) that have been imported into Canada prior to the 2018 ban.

Urea Foam Formaldehyde Insulation (UFFI)

UFFI was developed in Europe in the 1950s. It was used in Canada primarily in residential buildings between 1977 and 1980, after which time it was banned from use.

Ozone Depleting Substances (ODS)

Ozone depleting substances (ODS) are manufactured chemical compounds (refrigerants) that contain chlorine and/or bromine that can deplete the stratospheric ozone layer. They include chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs) that are used in a variety of applications such as in air-conditioning units, heat pumps, industrial solvents, foam products, and fire suppressants. Each province in Canada has passed legislation requiring mandatory recovery and reclamation of refrigerants during the maintenance of air-conditioning equipment.

References

Canadian Standards Associated (CSA). (2022). Phase I Environmental Site Assessment Z768-01 (reaffirmed 2022).

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.

Service Nova Scotia Property Online Database (accessed July 2023).

Stea, R.R., Conley, H., and Brown, Y. (compilers) 1992: Surficial Geology of the Province of Nova Scotia; Nova Scotia Department of Natural Resources, Map 92-3, Scale 1:500,000.

https://fletcher.novascotia.ca/DNRViewer/?viewer=Radon

https://www.novascotia.ca/nse/water/docs/waterstrategy_nswatershedmap.pdf

https://novascotia.ca/nse/water/docs/Protected.Water.Areas.Map.pdf

Appendix B

Test Pit, Borehole and Monitor Well Logs

Test Hole Logs

Sample Location[1]	Depth (mbgs)	Arsenic Concentration (mg/kg)	UTM Northing	UTM Easting	Color	Description	Stains Y/N	Odours Y/N	VOC Reading (PPM)	Comments
BH1 (Background Sample)										
BH1 0-0.15m	0 - 0.15	22	5012914	593382	Grey to Reddish Brown	Organics underlain with silty sand, transitioning to sandy silt with depth, damp; trace mica/quartz observed from 0.05 to 0.10 metres	N	N	5	
No sample collected	0.15 - 0.45	-			Brown	Silty sand, damp; iron oxides observed	N	N	-	
BH1 0.60m	0.45 - 0.60	-			Brown	Silty sand, damp; traces quartz fragments observed	N	N	20	
BH2 (Background Sample)										
BH2 0-0.15m	0 - 0.15	1,490	5012826	593245	Dark Brown to Reddish Brown	Rootmat underlain with sandy silt, damp	N	N	15	
No sample collected	0.15 - 0.35	-			Reddish Brown	Silty gravelly sand	N	N	-	
BH2 0.50m	0.35 - 0.50	-			Reddish Brown	Gravelly sand, damp to wet; trace iron oxides observed	N	N	10	
BH3										
BH3 0-0.15m	0 - 0.15	4,300	5012164	593241	Dark Brown to Brown	Rootmat underlain with silty gravelly sand, damp to wet	N	N	-	
No sample collected	0.15 - 0.45	-			Dark Brown	Clayey silt	N	N	-	
BH3 0.60m	0.45 - 0.6	315			Dark Brown	Silty sand with gravel, wet	N	N	-	
BH4										
BH4 0-0.15m	0 - 0.15	78.9	5012182	593255	Dark brown	Soil with organics, damp to wet	N	N	-	Decay-like odour
BH4 0.70m	0.15 - 0.70	-			Dark brown	Soil with organics, wet	N	N	-	Decay-like odour

Test Hole Logs

Sample Location[1]	Depth (mbgs)	Arsenic Concentration (mg/kg)	UTM Northing	UTM Easting	Color	Description	Stains Y/N	Odours Y/N	VOC Reading (PPM)	Comments
BH5										
BH5 0-0.15m	0 - 0.15	152	5012154	593277	Dark Brown	Rootmat underlain with gravelly sand and organics, damp	N	N	-	
No sample collected	0.15 - 0.5	-			Dark Brown	Sandy silt; iron oxides observed	N	N	-	
BH5 0.65m	0.5 - 0.65	-			Brown	Gravelly silty sand with rounded stones throughout, damp to wet; iron oxides observed	N	N	-	
BH6										
BH6 0-0.15m	0 - 0.15	51.9	5012151	593254	Dark Brown	Rootmat and organics underlain with peat, wet	N	N	-	
BH6 0.75m	0.15 - 0.75	-			Dark Brown	Peat, wet	N	N	-	
BH7										
BH7 0-0.15m	0 - 0.15	7,170	5012117	593246	Dark Brown to Grey Brown	Organics underlain with silty sand, transitioning to sand with depth	N	N	-	
BH7 0.50m	0.15 - 0.50	4,870			Grey	Sandy silt with some organics, trace grey sand, saturated	N	N	-	
BH8										
BH8 0-0.15m	0 - 0.15	1,270	5012130	593242	Brown	Organics underlain with brown silt, trace sand, wet	N	N	-	
BH8 0.50m	0.15 - 0.50	-			Grey	Sand, damp to wet	N	N	-	
BH9										
BH9 0-0.15m	0 - 0.15	3,170	5011985	593282	Dark Brown	Rootmat underlain with silty clayey sand, damp. Coal fragments observed.	N	N	15	
No sample collected	0.15 - 0.70	-			Dark Brown	Silty sand; iron oxides observed	N	N	-	
BH9 0.85m	0.70 - 0.85	647			Dark Brown	Sandy silt.; fragments of coal and sandy quartz observed.	N	N	30	

Test Hole Logs

Sample Location[1]	Depth (mbgs)	Arsenic Concentration (mg/kg)	UTM Northing	UTM Easting	Color	Description	Stains Y/N	Odours Y/N	VOC Reading (PPM)	Comments
BH10										
BH10 0-0.15m	0 - 0.15	383	5011987	593287	Dark Brown	Rootmat underlain with silty gravelly sand, damp	N	N	20	
No sample collected	0.15 - 0.57	-			Grey Brown	Silty sand and gravel; coal fragments observed	N	N	-	
BH10 0.72m	0.57 - 0.72	-			Brown to Grey	Clayey sand and gravel, damp; iron oxides observed	N	N	15	
BH11										
BH11 0-0.15m	0 - 0.15	808	5011962	593293	Dark Brown to Brown	Rootmat underlain with silty sand, some gravel	N	N	10	
No sample collected	0.15 - 0.45	-			Brown	Rootmat underlain with silty sand, some gravel	N	N	-	
No sample collected	0.45 - 0.75	-			Brown	Silty sand; iron oxides observed	N	N	-	
BH11 0.90m	0.75 - 090	459			Brown	Silty sand with gravel, saturated	N	N	20	
BH12										
BH12 0-0.15m	0 - 0.15	1,110	5011963	593285	Dark Brown to Brown	Rootmat underlain with silty sand and gravel	N	N	10	
No sample collected	0.15 - 0.45	-			Brown	Silty sand with gravel, damp; coal fragments observed	N	N	-	
BH12 0.60m	0.45 - 0.60	-			Brown	Silty sand with gravel	N	N	15	
BH13										
BH13 0-0.15m	0 - 0.15	998	5012246	593222	Brown	Rootmat underlain with silty gravelly sand	N	N	-	
BH13 0.41m	0.15 - 0.41	-			Reddish Brown	Silty gravelly sand	N	N	-	

Test Hole Logs

Sample Location[1]	Depth (mbgs)	Arsenic Concentration (mg/kg)	UTM Northing	UTM Easting	Color	Description	Stains Y/N	Odours Y/N	VOC Reading (PPM)	Comments
BH14										
BH14 0-0.15m	0 - 0.15	340	5012244	593202	Brown	Organics underlain with silty sand with gravel, damp	N	N	10	
BH14 0.65m	0.15 - 0.65	-			Brown to Reddish Brown	Silty gravelly sand, damp	N	N	10	
BH15										
BH15 0-0.15m	0 - 0.15	1,240	5012244	593222	Dark Brown	Organics underlain with sandy silt with trace gravel, damp	N	N	15	
BH15 0.50m	0.15 - 0.50	135			Brown	Sandy silt with trace gravel, damp	N	N	20	
BH16										
BH16 0-0.15m	0 - 0.15	463	5012233	593210	Dark Brown	Organics	N	N	15	
No sample collected	0.15 - 0.25	-			Dark Brown	Organics	N	N	-	
No sample collected	0.25 - 0.30	-			Yellow Brown	Sand	N	N	-	
BH16 0.5m	0.3 - 0.5	-			Dark Brown	Sandy silt with organics, some gravel	N	N	10	
BH17										
BH17 0-0.15m	0 - 0.15	694	5012358	593168	Brown	Organics underlain with silty sand, damp; coarse coal and wood fragments throughout	N	N	10	
BH17 0.37m	0.15 - 0.37	-			Brown	Silty sand with coarse waste rock, damp; coarse coal and wood fragments throughout	N	N	15	
BH18										
BH18 0-0.15m	0 - 0.15	194	5012349	593158	Brown to Black	Rootmat underlain with coarse rock with sand and organics, damp	N	N	15	
No sample collected	0.15 - 0.3	-			Brown to Black	Coarse rock with sand and organics, damp	N	N	-	
BH18 1.0m	0.3 - 1.0	2,690			Light Brown	Sand with trace gravel, damp	N	N	20	

Test Hole Logs

Sample Location[1]	Depth (mbgs)	Arsenic Concentration (mg/kg)	UTM Northing	UTM Easting	Color	Description	Stains Y/N	Odours Y/N	VOC Reading (PPM)	Comments
BH19										
BH19 0-0.15m	0 - 0.15	620	5012364	593172	Brown to Dark Brown	Rootmat underlain with silty sand with gravel and organics, damp	N	N	15	Borehole located in domestic waste area
No sample collected	0.15 - 0.25	-			Brown to Dark Brown				-	
BH19 0.85m	0.25 - 0.85	-			Brown to Dark Brown	Silty sand with some gravel; trace coal fragments observed	N	N	15	
BH20										
BH20 0-0.15m	0 - 0.15	2,260	5012347	593181	Dark Brown	Rootmat underlain with silty sand with gravel and organics, damp; trace glass fragments observed	N	N	15	
No sample collected		-			Dark Brown	Silty sand with gravel and organics, damp; trace glass fragments observed	N	N	-	
BH20 0.4m	0.15 - 0.3	-			Brown	Coarse waste rock with silty sand	N	N	20	
BH21										
BH21 0-0.15m	0 - 0.15	2,500	5012347	593168	Dark Brown	Rootmat underlain with silty sand with gravel and organics, damp	N	N	15	
No sample collected	0.15 - 0.25	-			Dark Brown	Silty sand with gravel and organics, damp	N	N	-	
BH21 0.85m	0.25 - 0.85	-			Dark Brown to Brown	Sand with trace gravel, damp; iron oxides observed from 0.8 to 0.85 metres	N	N	20	
No sample collected	0.85 - 1.0	-			Unknown	No recovery; auger response appeared to be from coarse rock	N	N	-	No recovery in hand auger
BH22										
BH22 0-0.15m	0 - 0.15	1,620	5012338	593161	Brown	Rootmat underlain with silty sand with gravel, trace waste rock, trace organics, damp	N	N	20	
No sample collected	0.15 - 0.3	-			Brown	Silty sand with gravel, trace waste rock, trace organics, damp	N	N	-	
BH22 0.78m	0.3 - 0.78	-			Brown	Silty sand with coarse rock at depth; trace coal fragments observed	N	N	20	

Test Hole Logs

Sample Location[1]	Depth (mbgs)	Arsenic Concentration (mg/kg)	UTM Northing	UTM Easting	Color	Description	Stains Y/N	Odours Y/N	VOC Reading (PPM)	Comments
BH23										
BH23 0-0.15m	0 - 0.15	922	5012290	593182	Brown	Rootmat underlain with clayey silt and sand, trace coarse waste rock; fragments of coal and glass observed	N	N	-	
No sample collected	0.25 - 0.5	-			Brown	Clayey silt and sand, trace coarse waste rock; fragments of coal and glass observed	N	N	-	
BH23 0.95m	0.5 - 0.95	4,130			Brown	Silty sand with gravel, damp	N	N	-	
BH24										
BH24 0-0.15m	0 - 0.15	2,090	5012270	593195	Dark Brown to Black	Coarse waste rock with silty sand and organics, damp	N	N	-	
BH24 0.35m	0.15 - 0.35	-			Grey to black	Silty clayey sand with coarse waste rock (sandstone), damp; iron oxides observed	Y	N	-	Orange staining observed on larger rock
BH25										
BH25 0-0.15m	0 - 0.15	1,490	5012265	593199	Dark Brown	Silty organics underlain with medium coarse grained sand, waste rocks throughout, damp; coal fragments observed	N	N	-	
No sample collected	0.15 - 0.3	-			Dark Brown	Medium coarse grained sand, waste rocks throughout, damp; coal fragments observed	N	N	-	
BH25 0.45m	0.3 - 0.45	-			Dark Brown	Silty sand with waste rock, saturated; coal fragments observed	N	N	-	
BH26										
BH26 0-0.15m	0 - 0.15	2,290	5012251	593184	Dark Brown to Black	Organics, wet	N	Y	-	
No sample collected	0.15 - 0.55	-			Dark Brown to Black	Organics, wet	N	N	-	
BH26 0.65m	0.55 - 0.65	-			Dark Brown	Sandy silt with some organics, saturated	N	N	-	
BH27										
BH27 0-0.15m	0 - 0.15	2,330	5012243	593196	Dark Brown to Black	Coarse waste rock with some silt and organics; iron oxides observed	N	N	-	
BH27 0.45m	0.15 - 0.45	4,370			Grey to Black	Waste rock with some silt and sand; orange staining observed on waste rock	Y	N	-	Orange staining observed on waste rock

Test Hole Logs

Sample Location[1]	Depth (mbgs)	Arsenic Concentration (mg/kg)	UTM Northing	UTM Easting	Color	Description	Stains Y/N	Odours Y/N	VOC Reading (PPM)	Comments
BH28										
BH28 0-0.15m	0 - 0.15	2,680	5012230	593189	Dark Brown	Organics	N	N	-	
BH28 0.38m	0.15 - 0.38	-			Dark Brown	Organics with sand and gravel	Y	N	-	
BH29										
BH29 0-0.15m	0 - 0.15	4,210	5012575	593064	Greyish Brown	Coarse waste rock with sand and silt; orange staining observed	Y	N	-	Orange staining observed
BH29 0.35m	0.15 - 0.35	4,950			Brownish Grey	Coarse waste rock with sand and silt; orange staining observed	Y	N	-	Orange staining observed
BH30										
BH30 0-0.15m	0 - 0.15	88.9	5012545	593073	Dark Brown	Organics underlain with silty sand, wet	N	N	-	
No sample collected	0.15 - 0.75	-			Dark Brown	Silty sand with organics, wet	N	N	-	
BH30 0.9m	0.75 - 0.9	-			Dark Brown	Clayey silty sand with gravel, wet to saturated; suspected stones based on poor recovery and auger response	N	N	-	
BH31										
BH31 0-0.15m	0 - 0.15	2,230	5012532	593085	Brownish Grey	Rootmat underlain with coarse waste rock and silty sand; iron oxides overserved	N	N	-	
BH31 0.50m	0.15-0.5	2,480			Brownish Grey	Coarse waste rock and silty sand; iron oxides overserved	N	N	-	
BH32										
BH32 0-0.15m	0 - 0.15	296	5012562	593076	Dark Brown to Black to Grey	Rootmat and organics underlain with silty clayey sand, wet	N	N	-	
No sample collected	0.15 - 0.40	-			Brown	Silty gravelly sand, wet	N	N	-	
BH32 0.70m	0.40 - 0.70	-			Brown	Silty sand with gravel, wet	N	N	-	

Test Hole Logs

Sample Location[1]	Depth (mbgs)	Arsenic Concentration (mg/kg)	UTM Northing	UTM Easting	Color	Description	Stains Y/N	Odours Y/N	VOC Reading (PPM)	Comments
BH33										
BH33 0-0.15m	0 - 0.15	399	5012335	593184	Greyish Brown	Organics underlain with sand and waste rock	N	N	15	
No sample collected	0.15 - 0.40	-			Greyish Brown	Sand and waste rock	N	N	-	
BH33 0.72m	0.40 - 0.72	-			Dark Brown to Brown	Silty gravelly coarse grained sand, damp	N	N	15	
BH34										
BH13 0-0.15m	0 - 0.15	1,010	5012309	593185	Brown to Dark Brown	Organics underlain with coarse waste rock with and sand silt	N	N	10	
No sample collected	0.15 - 0.28	-			Dark Brown	Coarse waste rock with and sand silt	N	N	-	
BH34 0.65m	0.28 - 0.65	-			Brown	Coarse grained sand with silt and gravel, damp	N	N	10	
BH35										
BH35 0-0.15m	0 - 0.15	46.3	5012560	593082	Dark Brown	Organics underlain with silty sand with gravel, saturated	N	N	15	Groundwater encountered at surface
BH35 0.40m	0.15 - 0.40	-			Dark Brown	Silty sand with gravel, saturated	N	N	20	
BH36										
BH36 0-0.15m	0 - 0.15	844	5012594	593083	Brown	Organics underlain with silty sand and gravel, damp to wet	N	N	10	
BH36 0.35m	0.15 - 0.35	-			Brown to Light Brown	Gravelly sand with some silt, damp	N	N	15	
BH37										
BH37 0-0.15m	0 - 0.15	-	5011906	593314	Dark brown	Organics	N	N	-	
BH37 0.35m	0.15-0.35	-			Brown	Silty sand and trace gravel, wet.	N	N	-	

Test Hole Logs

Sample Location[1]	Depth (mbgs)	Arsenic Concentration (mg/kg)	UTM Northing	UTM Easting	Color	Description	Stains Y/N	Odours Y/N	VOC Reading (PPM)	Comments
BH38										
BH38 0-0.15m	0 - 0.15	-	5012026	593251	Dark brown	Silty sand and trace gravel, wet.	N	N	-	
BH38 0.45m	0.15-0.45	-			Reddish brown	Silty sand with trace gravel, wet.	N	N	-	
BH39										
BH39 0-0.15m	0 - 0.15	-	5012166	593230	Dark brown to black	Organics underlain with silt with sand and gravel, glass pieces, damp to wet.	N	N	-	Glass pieces were observed
No sample collected	0.15-0.35	-			White to Reddish brown	Silty sand, possible iron precipitation	N	N		Possible iron precipitation
BH39 0.55m	0.35-0.55	-			Dark brown	Silty sand and gravel, mica pieces, iron staining, wet.	N	N	-	mica pieces, iron staining was observed.
BH40										
BH40 0-0.15m	0 - 0.20	-	5012321	593208	Dark brown to white	Organics underlain with sand and trace gravel, damp to wet	N	N	-	
No sample collected	0.20-0.40	-			Reddish brown to yellow	Silty sand	N	N	-	
BH19 0.50m	0.40-0.50	-			Dark brown to brown	Silty sand, wet	N	N	-	
BH41										
BH41 0-0.15m	0 - 0.15	-	5012464	593174	Gray to brown	silty sand with trace gravel	N	N	-	
BH41 0.45m	0.15-0.45	-			Greyish brown	Silty sand and gravel	N	N	-	
Step-out Sample Locations										
BH42										
BH42 0-0.15m	0 - 0.15	-	5012581	593076		Organics underlain silty gravelly sand, damp to wet	N	N	-	Step-out location
BH43										
BH43 0-0.15m	0 - 0.15	-	5012125	593241	Dark Brown	Rootmat underlain with silty sand, trace organics; glass fragment observed	N	N	-	Step-out location

Test Hole Logs

Sample Location[1]	Depth (mbgs)	Arsenic Concentration (mg/kg)	UTM Northing	UTM Easting	Color	Description	Stains Y/N	Odours Y/N	VOC Reading (PPM)	Comments
BH44										
BH44 0-0.15m	0 - 0.15	48	5012113	593249	Dark Brown	Rootmat underlain with clayey sand, some silt	N	N	-	Step-out location
BH45										
BH45 0-0.15m	0 - 0.15	989	5012521	593071	Brownish Grey	Organics underlain with clayey sand and silt	N	N	-	Step-out location
BH46										
BH15 0-0.15m	0 - 0.15	-	5012590	593074	Dark Brown	Organics underlain with silty sand and gravel, damp	N	N	-	
BH47										
BH47 0-0.15m	0 - 0.15	70.3	5012501	593105	Brown	Organics and moss underlain with gravelly sandy silt, wet	N	N	-	Located at inferred south boundary of waste rock pile
BH48										
BH48 0-0.15m	0 - 0.15	-	5012311	593169	Dark Brown	Organics and moss underlain with silty sand and gravel with coarse waste rock, damp	N	N	-	
BH49										
BH49 0-0.15m	0 - 0.15	-	5012362	593161	Dark Brown	Organics underlain with coarse waste rock with some silt and sand	N	N	-	Step-out location
BH50										
BH50 0-0.15m	0 - 0.15	-	5012245	593218	Dark Brown	Organics underlain with silty sand and gravel	N	N	-	Step-out location
BH51										
BH51 0-0.15m	0 - 0.15	-	5012245	593219	Dark Brown	Organics underlain with silty sand and gravel	N	N	-	
BH52										
BH52 0-0.15m	0 - 0.15	-	5011984	593274	Dark Brown	Organics underlain with silty gravelly sand, larger rocks throughout, gravel at depth	N	N	-	Step-out location
BH53										
BH53 0-0.15m	0 - 0.15	-	5011954	593291	Brown	Organics underlain with silty sand and gravel, some rock fragments, damp	N	N	-	

Test Hole Logs

Sample Location[1]	Depth (mbgs)	Arsenic Concentration (mg/kg)	UTM Northing	UTM Easting	Color	Description	Stains Y/N	Odours Y/N	VOC Reading (PPM)	Comments
BH54										
BH54 0-0.15m	0 - 0.15	1,010	5011948	593295	Dark Brown	Organics underlain with sandy silt and trace gravel, wet.	N	N	-	Step-out location
BH55										
BH55 0-0.15m	0 - 0.15	1,590	5011971	593275	Brown	Organics underlain with silty sand and gravel,damp to wet.	N	N	-	Step-out location
BH56										
BH56 0-0.15m	0 - 0.15	480	5011989	593299	Brown	Organics underlain with silt and sand, wet.	N	N	-	Step-out location
BH57										
BH57 0-0.15m	0 - 0.15	810	5012133.94	593227.26	Brown	Organics underlain with silty sand and trace gravel, small glass pieces observed, damp to wet.	N	N	-	Step-out location
BH58										
BH57 0-0.15m	0 - 0.15	105	5012307.22	593247.52	Dark brown/black to white	Organics underlain with silty sand, damp.	N	N	-	Step-out location
BH59										
BH59 0-0.15m	0 - 0.15	496	5012321	593149	Dark Brown	Organics underlain with silty sand and gravel, damp to wet.	N	N	-	Step-out location
BH60										
BH60 0-0.15m	0 - 0.15	148	5012642	593110	Gray to brown	Organics underlain with silty sand and gravel.	N	N	-	Step-out location
BH61										
BH61 0-0.15m	0 - 0.15	1,250	5012567	593048	Dark brown	Organics underlain with silty sand, wet.	N	N	-	Step-out location

Note: 1) The boreholes were planned to be completed to a maximum depth of 1 m, with representative samples collected at surface and at the final borehole depth. “No sample collected” is representative of the portion of the borehole located beneath the planned surface soil sample depth of 0-0.15 m and the final borehole depth sample.

24MW-01

DILLON CONSULTING

Client: Build Nova Scotia
Project No.: 23-6465
Drilling Co.: Logan Geotech
Supervised by: J.Marsh

Project: Former Country Mine Phase II ESA
Location: Country Harbour, Guysborough County
Drilling Method: Hollow Stem Auger/Standard Split Spoon/Coring
Date Started: 1/17/24 Date Completed: 1/17/24

Depth Scale (m)	Stratigraphic Description	Depth (m)	Well Construction	Sample Method	Number	N Value	RQD	Rec %	VOC(ppm or %LEL)	Depth Scale (m)
0.5	**Peat**	0.03	Solid PVC with Bentonite		SS1	4		54	15	0.5
	Granite Stone Grey granite stone.	0.1								
	Silt and Sand Brown to reddish brown silty sand.									
1.0	**Silt and Sand** Brown to light brown sand with silt and fractured slate.	0.79	Solid PVC with Silica Sand		SS2	37		75	5	1.0
1.5	**Silt and Sand** Brown coarse sand with fractured slate, wet.	1.22			SS3	39		70	190	1.5
2.0					SS4	56		70	65	2.0
2.5					SS5*	-		100	240	2.5
3.0										3.0
3.5	**Sand and Gravel** Grey brown sand and gravel, with fractured/weathered slate.	3.2	Screened PVC with Silica Sand		SS6	66		100	110	3.5
4.0					SS7	41		66	30	4.0
4.5	**Bedrock** Fractured granite bedrock.	4.27			SS8	Refusal		0	-	4.5
5.0					-					5.0
5.5					-		29	91		5.5
6.0		6.4	End Cap							6.0

DILLON MW - ROCK CORE 23-6465 BNS FORMER COUNTRY MINE PHASE II ESA.GPJ DILLON TEMPLATE.GDT 3/5/24

▼ Static Water Level

LITHOLOGY SYMBOLS: Peat; Silty Sand; Boulders and cobbles; Sandy Silt; Coarse Granite

SAMPLE TYPE: Split Spoon; Rock Core

* Indicates sample submitted for analysis

24MW-02

Client: Build Nova Scotia
Project No.: 23-6465
Drilling Co.: Logan Geotech
Supervised by: J.Marsh

Project: Former Country Mine Phase II ESA
Location: Country Harbour, Guysborough County
Drilling Method: Hollow Stem Auger/Standard Split Spoon/Coring
Date Started: 1/16/24 Date Completed: 1/16/24

Depth Scale (m)	Stratigraphic Description	Depth (m)	Sample Method	Sample Number	N Value	RQD	Rec %	VOC(ppm or %LEL)
0.5	**Sand and Gravel** Frozen peat.			SS1	10		4	0
1.0	**Sand and Gravel** Grey brown sand and gravel, wet.	0.61		SS2	48		50	0
1.5	**Sand and Gravel** Light brown to brown coarse sand becoming grey sand at depth.	1.22		SS3*			58	0
	Cobbles Granite cobbles with slate and possible waste rock.	1.52					40	
2.0							3	
2.5	**Bedrock** Pink/Black/white granite bedrock.	2.13				80	83	
3.0								
3.5								
4.0						63	96	
4.5		4.88						

Well Construction: Solid PVC with Bentonite; Solid PVC with Silica Sand; Screened PVC with Silica Sand; End Cap

Static Water Level

LITHOLOGY SYMBOLS: Peat; Boulders and cobbles; Sandy Gravel; Coarse Granite

SAMPLE TYPE: Split Spoon; Rock Core

* Indicates sample submitted for analysis

DILLON MW - ROCK CORE 23-6465 BNS FORMER COUNTRY MINE PHASE II ESA.GPJ DILLON TEMPLATE.GDT 3/5/24

24MW-03

Client: Build Nova Scotia
Project No.: 23-6465
Drilling Co.: Logan Geotech
Supervised by: J.Marsh

Project: Former Country Mine Phase II ESA
Location: Country Harbour, Guysborough County
Drilling Method: Hollow Stem Auger/Standard Split Spoon/Coring
Date Started: 1/18/24 Date Completed: 1/18/24

Depth Scale (m)	Stratigraphic Description	Depth (m)	Well Construction	Sample Method	Sample Number	N Value	RQD	Rec %	VOC(ppm or %LEL)	Depth Scale (m)
0.5	**Peat** Frozen peat.	0.03	Solid PVC with Bentonite		SS1*	2		41	20	0.5
1.0	**Silt and Sand** Reddish brown silty sand and gravel.		Solid PVC with Silica Sand		SS2*	9		37	20	1.0
1.5	**Sand and Gravel** Brown coarse sand and gravel, saturated with bedrock clasts.	1.22 1.37			SS3*	Refusal			45	1.5
2.0	**Bedrock** Fractured weathered slate bedrock with broken stones and weathered rocks at intial depth.									2.0
2.5							16	100		2.5
3.0			Screened PVC with Silica Sand							3.0
3.5										3.5
4.0										4.0
4.5		4.88	End Cap							4.5

DILLON MW - ROCK CORE 23-6465 BNS FORMER COUNTRY MINE PHASE II ESA.GPJ DILLON TEMPLATE.GDT 3/5/24

▼ Static Water Level

LITHOLOGY SYMBOLS: Peat; Silty Sand; Slate

SAMPLE TYPE: Split Spoon; Rock Core

* Indicates sample submitted for analysis

24MW-04

Client: Build Nova Scotia
Project No.: 23-6465
Drilling Co.: Logan Geotech
Supervised by: J.Marsh

Project: Former Country Mine Phase II ESA
Location: Country Harbour, Guysborough County
Drilling Method: Hollow Stem Auger/Standard Split Spoon/Coring
Date Started: 1/18/24 Date Completed: 1/18/24

Depth Scale (m)	Stratigraphic Description	Lithology	Depth (m)	Well Construction	Sample Method	Sample Number	N Value	RQD	Rec %	VOC(ppm or %LEL)	Depth Scale (m)
0.5	**Peat**		0.03	Solid PVC with Bentonite		SS1*	9		33	20	0.5
	Sand and Gravel Brown sand and gravel with trace silt.										
	Sand and Gravel Grey brown sand and gravel.		0.61			SS2*	Refusal			20	
1.0	**Bedrock** Grey and white granite with vertical fractures at depth.		0.88					25	60		1.0
1.5											1.5
2.0											2.0
2.5	**Bedrock** Grey granite with red quartz. Vertical fractures present at depth.		2.13	Screened PVC with Silica Sand				40	100		2.5
3.0											3.0
3.5											3.5
4.0	**Bedrock** Grey/pink granite to light blue quartz.		3.66					55	93		4.0
4.5											4.5
5.0											5.0
			5.18	End Cap							

DILLON MW - ROCK CORE 23-6465 BNS FORMER COUNTRY MINE PHASE II ESA.GPJ DILLON TEMPLATE.GDT 3/5/24

Static Water Level

LITHOLOGY SYMBOLS: Peat; Coarse Granite

SAMPLE TYPE: Split Spoon; Rock Core

* Indicates sample submitted for analysis

24MW-05

Client: Build Nova Scotia
Project No.: 23-6465
Drilling Co.: Logan Geotech
Supervised by: J.Marsh

Project: Former Country Mine Phase II ESA
Location: Country Harbour, Guysborough County
Drilling Method: Hollow Stem Auger/Standard Split Spoon/Coring
Date Started: 1/16/24 Date Completed: 1/16/24

Depth Scale (m)	Stratigraphic Description	Depth (m)	Well Construction	Sample Method	Sample Number	N Value	RQD	Rec %	VOC(ppm or %LEL)	Depth Scale (m)
0	**Organics** Dark brown organics.	0.05								0
0.5	**Sand and Gravel** Dark grey with some brown sand with gravel and silt.	0.53	Solid PVC with Bentonite		SS1*	33		37		0.5
1.0	**Bedrock** Possible slate bedrock with fractures, pyrite and iron staining. White quartz and slate fractures at increased depth		Solid PVC with Silica Sand				50	40		1.0
1.5										1.5
2.0										2.0
2.5							54	80		2.5
3.0			Screened PVC with Silica Sand							3.0
3.5										3.5
4.0							64	83		4.0
4.5		4.88	End Cap							4.5

DILLON MW - ROCK CORE 23-6465 BNS FORMER COUNTRY MINE PHASE II ESA.GPJ DILLON TEMPLATE.GDT 3/5/24

▼ Static Water Level

LITHOLOGY SYMBOLS: Organics, Slate

SAMPLE TYPE: Split Spoon, Rock Core

* Indicates sample submitted for analysis

Appendix C

Site Photographs

Photo 1: View of Johnson Brook at samples SW1 and SED1 (November 6, 2023).

Photo 2: View of Johnson Brook at samples SW5 and SED5 (November 6, 2023).

Photo 3: Overview of the general site conditions looking northeast in APEC #3 (November 8, 2023).

Photo 4: Overview of the general site conditions looking east (open shaft) (November 8, 2023).

Photo 5: Overview of site conditions looking west near the historical Mason Belt (January 19, 2024).

Photo 6: Overview of site conditions looking southeast near APEC #4 (November 10, 2023).

Photo 7: Overview of site conditions looking northwest near BH40 (January 19, 2024).

Photo 8: Stagnant water near observed near waste rock piles (APEC #3) (November 8, 2023).

Photo 9: View of a drum looking west near APEC #3 (November 9, 2023).

Photo 10: View looking north at debris present near APEC #2 (July 17, 2023).

Photo 11: Concrete foundation remnants present in stamp milling areas (APEC #2) (July 17, 2023).

Photo 12: Overview of tree clearing for drilling of monitoring well 24MW-04, near stamp milling areas (APEC #2) (November 9, 2023).

Photo 13: View looking west at a waste rock piles area (APEC #3) (November 9, 2023).

Photo 14: Test hole BH29 completed on top of a waste rock pile near APEC #3 (November 9, 2023).

Photo 15: Test hole BH29 completed on a waste rock pile near APEC #3 (November 9, 2023).

Photo 16: Test hole BH31 completed near APEC #3 (November 9, 2023).

Photo 17: Overview of monitoring well 24MW-01 (background monitoring well), looking northwest (January 20, 2024).

Photo 18: Overview of monitoring well 24MW-02, looking southwest (January 20, 2024).

Photo 19: Overview of monitoring well 24MW-03, looking south (January 20, 2024).

Photo 20: Overview of monitoring well 24MW-04, looking north (January 20, 2024).

Photo 21: Overview of monitoring well 24MW-05, looking north (January 20, 2024).

Appendix D

Tables

DILLON CONSULTING

TABLE D-1

			Sample ID	SW1	SW2	SW3	SW DUP A	SW4	SW5
			Sample Type	Normal	Normal	Normal	Duplicate (SW3)	Normal	Normal
			Date	06 Nov 2023	06 Nov 2023	06 Nov 2023	06 Nov 2023	06 Nov 2023	06 Nov 2023
	Unit	EQL	NS Tier I EQS Freshwater Surface Water						
Calculated Parameters									
Anions Total	meq/L	0.1	-	0.2	0.17	0.16	0.17	0.16	0.16
Cations Total	meq/L	0.1	-	0.24	0.26	0.26	0.26	0.25	0.27
Ionic Balance	%	0.01	-	120	153	162	153	156	169
Langelier Index (@ 20C)	N/A	0.01	-	-5.61	Incalculable	Incalculable	Incalculable	Incalculable	Incalculable
Langelier Index (@ 4C)	N/A	0.01	-	-5.87	Incalculable	Incalculable	Incalculable	Incalculable	Incalculable
Saturation @ 4c	-	0.01	-	11.6	Incalculable	Incalculable	Incalculable	Incalculable	Incalculable
Saturation pH (@ 20C)	N/A	0.01	-	11.3	Incalculable	Incalculable	Incalculable	Incalculable	Incalculable
General Chemistry									
Carbonate	mg/L	1	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity (total)	mg/L	1	-	1.4	<1.0	<1.0	<1.0	<1.0	<1.0
Bicarbonate	mg/L	1	-	1.7	<1.0	<1.0	<1.0	<1.0	<1.0
Hardness as CaCO3 (Measured)	mg/L	0.5	-	3	2.35	3.1	3.12	2.52	2.81
Ammonia as N	mg/L	0.005	Calculated Value [2]	<0.0050	<0.0050	0.0084	0.005	0.0086	0.0126
Total Organic Carbon (TOC)	mg/L	0.5	-	7.01	7.15	9.42	9.5	9.24	10.3
Ortho Phosphate as P (filtered)	mg/L	0.001	-	0.0013	0.002	0.002	0.0035	0.0064	0.002
Phosphorus	mg/L	0.05	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Fluoride	mg/L	0.02	-	0.02	0.022	<0.020	<0.020	<0.020	<0.020
Chloride (filtered)	mg/L	0.5	120	4.58	4.64	4.59	4.64	4.58	4.62
Electrical Conductivity (Lab)	µS/cm	1	-	27.1	26.5	28.1	28.2	27.8	28.4
Hydroxide	mg/L	1	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Nitrate (as N)	mg/L	0.02	13	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Nitrite (as N)	mg/L	0.01	60	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Nitrite + Nitrate as N	mg/L	0.0224	-	<0.0224	<0.0224	<0.0224	<0.0224	<0.0224	<0.0224
pH (Lab)	pH Units	0.1	6.5-9	5.73	5.51	5.36	5.38	5.3	5.18
Sulphate (filtered)	mg/L	0.3	128	1.92	1.78	1.73	1.76	1.67	1.57
Total Dissolved Solids (TDS) - Measured	mg/L	10	-	28	28	32	36	29	27
Turbidity	NTU	0.1	-	0.18	1.38	0.17	0.19	0.47	1.25
Metals									
Aluminium	mg/L	0.003	0.005	0.194	0.325	0.227	0.228	0.226	0.218
Antimony	mg/L	0.0001	0.009	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Arsenic	mg/L	0.0001	0.005	0.0355	0.0633	0.0467	0.0473	0.0505	0.0558
Barium	mg/L	0.0001	1	0.00392	0.00484	0.00419	0.00414	0.00359	0.00392
Beryllium	mg/L	0.00002	0.00015	0.00004	0.000067	0.000037	0.000042	0.000034	0.000032
Bismuth	mg/L	0.00005	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Boron	mg/L	0.01	1.5	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Cadmium	mg/L	0.000005	0.00009	0.0000289	0.0000341	0.000034	0.0000314	0.0000255	0.0000269
Calcium	mg/L	0.1	-	0.586	0.368	0.58	0.584	0.43	0.503
Chromium (Total, III+VI)	mg/L	0.0005	0.0089	<0.00050	0.00159	<0.00050	<0.00050	<0.00050	<0.00050
Cobalt	mg/L	0.0001	0.001	0.00025	0.00034	0.00044	0.00047	0.00132 [1]	0.00092
Copper	mg/L	0.0005	0.002	0.00059	<0.00050	0.00086	0.00084	<0.00050	0.00083
Iron	mg/L	0.01	0.3	0.252	0.609	0.391	0.394	0.562	0.621
Lead	mg/L	0.00005	0.001	0.000539	0.00208	0.000722	0.000722	0.00132 [1]	0.00109 [1]
Magnesium	mg/L	0.005	-	0.373	0.347	0.402	0.403	0.352	0.377
Manganese	mg/L	0.0001	0.43	0.0284	0.0447	0.0454	0.0462	0.105	0.0811
Mercury	mg/L	0.000005	0.000026	0.0000141	0.000023	0.0000177	0.0000195	0.0000054	<0.0000050
Molybdenum	mg/L	0.00005	0.073	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Nickel	mg/L	0.0005	0.025	0.0009	<0.00050	0.00115	0.00114	<0.00050	0.00051
Silica (SiO2)	mg/L	0.21	-	5.3	5.86	5.26	5.3	5.58	5.73
Potassium	mg/L	0.05	-	0.319	0.323	0.339	0.34	0.317	0.366
Selenium	mg/L	0.00005	0.001	0.000086	0.000118	0.000092	0.000098	0.000091	0.000108
Cesium	mg/L	0.00001	-	0.000108	0.000131	0.000124	0.000121	0.000092	0.000083
Rubidium	mg/L	0.0002	-	0.00158	0.00175	0.0016	0.00166	0.00161	0.00177
Tellurium	mg/L	0.0002	-	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Thorium	mg/L	0.0001	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Tungsten	mg/L	0.0001	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Lithium	mg/L	0.001	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Silver	mg/L	0.00001	0.00025	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010

TABLE D-1

			Sample ID	SW1	SW2	SW3	SW DUP A	SW4	SW5
			Sample Type	Normal	Normal	Normal	Duplicate (SW3)	Normal	Normal
			Date	06 Nov 2023	06 Nov 2023	06 Nov 2023	06 Nov 2023	06 Nov 2023	06 Nov 2023
	Unit	EQL	NS Tier I EQS Freshwater Surface Water						
Calculated Parameters									
Silicon	**mg/L**	0.1	-	2.48	2.74	2.46	2.48	2.61	2.68
Sodium	**mg/L**	0.05	-	3.26	3.35	3.21	3.33	3.2	3.33
Strontium	**mg/L**	0.0002	21	0.0056	0.00462	0.00562	0.00568	0.00462	0.00535
Sulphur as S	**mg/L**	0.5	-	0.61	0.56	0.53	0.51	<0.50	0.5
Titanium	**mg/L**	0.0003	-	0.00156	0.0115	0.00211	0.00187	0.00437	0.0035
Thallium	**mg/L**	0.00001	0.0008	<0.000010	<0.000010	0.000011	0.000012	0.000011	<0.000010
Tin	**mg/L**	0.0001	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Uranium	**mg/L**	0.00001	0.015	0.000123	0.000261	0.000043	0.000044	0.000038	0.000039
Vanadium	**mg/L**	0.0005	0.12	<0.00050	0.0005	<0.00050	<0.00050	<0.00050	<0.00050
Zinc	**mg/L**	0.003	0.007	0.0063	0.005	0.0073 [1]	0.0075 [1]	0.0045	0.0088
Zirconium	**mg/L**	0.0002	-	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020

Environmental Standards

Nova Scotia Environment, September 2021, NS Tier I EQS Freshwater Surface Water

1 Sample considered analytically equilivant to the guideline.

2 Calculated guideline dependant on pH and temperature.

Exceeds the NS Tier I EQS

TABLE D-2

			Sample ID	SW4	SW DUP B	SW5
			Sample Type	Normal	Duplicate (SW4)	Normal
			Date	06 Nov 2023	06 Nov 2023	06 Nov 2023
	Unit	EQL	NS Tier I EQS Freshwater Surface Water			
Polycyclic Aromatic Hydrocarbons (PAHs)						
1-Methylnaphthalene	**mg/L**	0.00001	0.002	<0.000010	<0.000010	<0.000010
2-methylnaphthalene	**mg/L**	0.00001	0.002	<0.000010	<0.000010	<0.000010
1 & 2 Methylnaphthalene	**mg/L**	0.000015	-	<0.000015	<0.000015	<0.000015
Acenaphthene	**mg/L**	0.00001	0.0058	<0.000010	<0.000010	<0.000010
Acenaphthylene	**mg/L**	0.00001	-	<0.000010	<0.000010	<0.000010
Acridine	**mg/L**	0.00001	-	<0.000010	<0.000010	<0.000010
Anthracene	**mg/L**	0.00001	0.000012	<0.000010	<0.000010	<0.000010
Benz(a)anthracene	**mg/L**	0.00001	0.000018	<0.000010	<0.000010	<0.000010
Benzo(a)pyrene	**mg/L**	0.000005	0.000015	<0.0000050	<0.0000050	<0.0000050
Benzo(b+j)fluoranthene	**mg/L**	0.00001	-	<0.000010	<0.000010	<0.000010
Benzo(b+j+k)fluoranthene	**mg/L**	0.000015	-	<0.000015	<0.000015	<0.000015
Benzo(g,h,i)perylene	**mg/L**	0.00001	-	<0.000010	<0.000010	<0.000010
Benzo(k)fluoranthene	**mg/L**	0.00001	-	<0.000010	<0.000010	<0.000010
Chrysene	**mg/L**	0.00001	0.0001	<0.000010	<0.000010	<0.000010
Dibenz(a,h)anthracene	**mg/L**	0.000005	-	<0.0000050	<0.0000050	<0.0000050
Fluorene	**mg/L**	0.00001	0.003	<0.000010	<0.000010	<0.000010
Fluoranthene	**mg/L**	0.00001	0.00004	<0.000010	<0.000010	<0.000010
Indeno(1,2,3-c,d)pyrene	**mg/L**	0.00001	-	<0.000010	<0.000010	<0.000010
Naphthalene	**mg/L**	0.00001	0.0011	<0.000010	<0.000010	<0.000010
Perylene	**mg/L**	0.00001	-	<0.000010	<0.000010	<0.000010
Phenanthrene	**mg/L**	0.00001	0.0004	<0.000010	<0.000010	<0.000010
Pyrene	**mg/L**	0.00001	0.000025	<0.000010	<0.000010	<0.000010
Quinoline	**mg/L**	0.00001	-	<0.000010	<0.000010	<0.000010
B(A)P TPE	**mg/L**	0.00001	-	<0.000010	<0.000010	<0.000010

Environmental Standards

Nova Scotia Environment, September 2021, NS Tier I EQS Freshwater Surface Water

TABLE D-3

			Sample ID	SW4	SW DUP B	SW5
			Sample Type	Normal	Duplicate (SW4)	Normal
			Date	06 Nov 2023	06 Nov 2023	06 Nov 2023
	Unit	EQL	NS Tier I EQS Freshwater Surface Water			
BTEX						
Benzene	**mg/L**	0.0005	2.1	<0.00050	<0.00050	<0.00050
Toluene	**mg/L**	0.0005	0.77	<0.00050	<0.00050	<0.00050
Ethylbenzene	**mg/L**	0.0005	0.32	<0.00050	<0.00050	<0.00050
Xylene (o)	**mg/L**	0.0003	-	<0.00030	<0.00030	<0.00030
Xylene (m & p)	**mg/L**	0.0004	-	<0.00040	<0.00040	<0.00040
Xylene Total	**mg/L**	0.0005	0.33	<0.00050	<0.00050	<0.00050
Petroleum Hydrocarbons (PHCs)						
>C10-C16 fraction of mTPH	**%**	1	-	<1	<1	<1
>C16-C21 fraction of mTPH	**%**	1	-	<1	<1	<1
C6-C10 fraction of mTPH	**%**	1	-	<1	<1	<1
VPH (C6-C10 - BTEX)	**mg/L**	0.025	-	<0.025	<0.025	<0.025
EPH >C10-C16	**mg/L**	0.05	-	<0.050	<0.050	<0.050
EPH >C16-C21	**mg/L**	0.05	-	<0.050	<0.050	<0.050
EPH >C21-C32	**mg/L**	0.05	-	<0.050	<0.050	<0.050
Modified TPH (Tier 1)	**mg/L**	0.09	1.5* 0.1** 0.1***	<0.090	<0.090	<0.090
Reached Baseline at C32	-		-	Yes	Yes	Yes

Environmental Standards

Nova Scotia Environment, September 2021, NS Tier I EQS Freshwater Surface Water

Notes

*Gasoline

**Fuel Oil

***Lube Oil

TABLE D-4

			Location	SED1	SED2	SED3		SED4	SED5
			Sample ID	SED1	SED2	SED3	SED-DUPA	SED4	SED5
			Sample Type	Normal	Normal	Normal	Duplicate	Normal	Normal
			Date	06 Nov 2023	06 Nov 2023	06 Nov 2023	06 Nov 2023	06 Nov 2023	06 Nov 2023
	Unit	EQL	NS Tier I EQS Freshwater Sediment						
Metals									
Aluminium	mg/kg	50	-	11,400	9,720	19,300	18,900	22,600	12,400
Antimony	mg/kg	0.1	25	1.8	4.68	0.44	1.6	1.18	0.33
Arsenic	mg/kg	2	17	2,050	5,640	1,440	5,120	4,410	1,490
Barium	mg/kg	0.5	-	63.3	82	113	254	285	85.8
Beryllium	mg/kg	0.1	-	0.71	0.5	1.1	1.11	1.39	0.49
Boron	mg/kg	5	-	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Cadmium	mg/kg	0.02	3.5	0.088	0.064	0.098	0.186	0.218	0.054
Chromium (Total, III+VI)	mg/kg	0.5	90	19.6	20.9	38.7	34.1	38.3	26.7
Cobalt	mg/kg	0.1	-	15.3	5.76	67.3	120	93.5	53.5
Copper	mg/kg	0.5	197	7.51	4.61	10.3	11.8	26.5	5.19
Iron	mg/kg	50	43,766	28,200	25,100	37,800	42,700	58,000	35,900
Lead	mg/kg	0.5	91.3	57.3	60.4	74.4	124	110	78.8
Manganese	mg/kg	1	1,100	1,210	403	3,950	6,270	4,550	2,410
Mercury	mg/kg	0.005	0.486	2.38	3.21	0.314	0.616	0.24	0.0233
Molybdenum	mg/kg	0.1	-	0.69	0.45	0.91	1.41	5.87	1.33
Nickel	mg/kg	0.5	75	10.6	8.88	17.1	16.3	18	10.7
Selenium	mg/kg	0.2	2	0.2	0.28	0.28	0.41	1.07	0.38
Silver	mg/kg	0.1	0.5	<0.10	0.2	<0.10	0.12	0.2	<0.10
Strontium	mg/kg	0.5	-	1.88	2.84	2.65	3.91	11.6	2.44
Sulphur as S	mg/kg	1,000	-	<1,000	1,600	<1,000	<1,000	<1,000	<1,000
Thallium	mg/kg	0.05	-	0.213	0.174	0.377	0.593	0.548	0.232
Tin	mg/kg	2	-	<2.0	3	<2.0	6.7	<2.0	<2.0
Uranium	mg/kg	0.05	-	0.901	0.958	1.23	1.26	1.49	0.791
Vanadium	mg/kg	0.2	-	26.3	23.3	49.9	47.6	53.2	37
Zinc	mg/kg	2	315	53.9	45.7	88.7	89.6	109	62.4

Environmental Standards

Nova Scotia Environment, October 2022, NS Tier I EQS Freshwater Sediment

Exceedance of the Tier I EQS Freshwater Sediment

TABLE D-5

			Location	SED1	SED2	SED3		SED4	SED5
			Sample ID	SED1	SED2	SED3	SED-DUPA	SED4	SED5
			Sample Type	Normal	Normal	Normal	Duplicate	Normal	Normal
			Date	06 Nov 2023	06 Nov 2023	06 Nov 2023	06 Nov 2023	06 Nov 2023	06 Nov 2023
	Unit	EQL	NS Tier I EQS Freshwater Sediment						
BTEX									
Benzene	mg/kg	0.005	1.2	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Toluene	mg/kg	0.05	1.4	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Ethylbenzene	mg/kg	0.015	1.2	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015
Xylene (o)	mg/kg	0.03	-	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030
Xylene (m & p)	mg/kg	0.03	-	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030
Xylene Total	mg/kg	0.05	1.3	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Petroleum Hydrocarbons (PHCs)									
VPH (C6-C10 - BTEX)	mg/kg	5	-	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0

Environmental Standards

Nova Scotia Environment, October 2022, NS Tier I EQS Freshwater Sediment

TABLE D-6

	Location	BH 1	BH 2	24 MW-01	Site/Regional Maximum Background Threshold Values (BTVs)[2]	BH 3	BH 3	BH 4	BH 5	BH 6		BH 7		BH 8	BH 9		BH10	
	Sample ID	BH1 0-0.15m	BH2 0-0.15m	24 MW-01-SS5 (2.4-3.0 m)[1]		BH3 0-0.15m	BH 3 0.60m	BH4 0-0.15m	BH5 0-0.15m	BH6 0-0.15m	BH DUPA 0-0.15m	BH7 0-0.15m	BH 7 0.50m	BH8 0-0.15m	BH9 0-0.15m	BH 9 0.85m	BH10 0-0.15m	BH11 0-0.15m
	Sample Type	Local Background				Normal	Normal	Normal	Normal	Normal	Duplicate	Normal	Normal	Normal	Normal	Normal	Normal	Normal
	Date	07 Nov 2023	07 Nov 2023	17 Jan 2024		07 Nov 2023	07 Nov 2023	07 Nov 2023	07 Nov 2023	07 Nov 2023	07 Nov 2023	07 Nov 2023	07 Nov 2023	07 Nov 2023	07 Nov 2023	07 Nov 2023	07 Nov 2023	07 Nov 2023
	Unit	EQL	EC Background Soil Database Maximum Concentration	NS Tier I EQS Soil Commercial Potable Fine/Coarse														
Physical Properties					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
% >75um	%	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sieve Analysis - 75 Âµm (passing)	%	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Texture	N/A		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals																			
Aluminium	mg/kg	50	28,000	15,400	4,630	8,180	9,420	28,000	15,600	8,340	9,710	9,370	6,610	6,940	14,700	14,300	12,800	18,100	14,400	14,000	16,000
Antimony	mg/kg	0.1	2.0	7.5	0.14	0.3	0.10	2.0	2.53	0.51	0.22	0.17	0.32	0.35	12.2	8.49	1.25	3.14	<2.00	0.5	1.5
Arsenic	mg/kg	0.1	19	10	22	1,490	79.2	1,490	4,300	315	78.9	152	51.9	52.9	7,170	4,870	1,270	3,170	647	383	808
Barium	mg/kg	0.5	160	350	10.7	25.8	46.6	160	98.3	31.6	70.2	18.2	175	177	51.9	60.0	41	145	63.2	44.4	49
Beryllium	mg/kg	0.1	1.0	1.0	<0.10	0.18	0.36	1.0	0.65	0.38	3.5	0.58	4.16	3.38	0.55	*<2.00*	0.97	1.45	*<2.00*	0.62	0.92
Boron	mg/kg	5	0.62	4,300	<5.0	<5.0	<5.0	0.62	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<100	<5.0	<5.0	<100	<5.0	<5.0
Cadmium	mg/kg	0.02	0.40	1.0	0.058	0.089	0.037	0.40	0.073	0.046	2.21	0.112	2.63	1.75	0.5	0.533	0.065	0.481	<0.400	0.116	0.108
Chromium (Total, III+VI)	mg/kg	0.5	81	630	8.13	12.4	29.7	81	32.4	13.2	6.28	8.4	3.08	3.23	20.5	20.4	21.3	36	22.1	21.7	22.7
Cobalt	mg/kg	0.1	26	22	0.66	0.58	5.34	26	1.04	2.32	1.83	2.15	2.01	1.96	4.36	4.96	1.92	16.7	10.6	4.87	6.69
Copper	mg/kg	0.5	54	250	3.19	4.86	13.1	54	4.02	8.46	19.7	9.18	12.3	13.1	31.5	25.2	5.15	32	73.3	14.8	24
Iron	mg/kg	50	52,000	11,000	22,400	29,000	17,100	52,000	30,100	13,200	3,590	11,000	3,700	3,240	21,800	27,200	17,500	73,800	40,100	27,200	24,900
Lead	mg/kg	0.5	84	120	13.3	44.5	18.3	84	118	55.6	98.1	39.6	99.1	118	127	87.5	54.8	164	96.9	87.8	107
Manganese	mg/kg	1	4,340	360	60.4	65.4	342	4,340	472	154	102	173	313	257	157	168	309	1,010	446	517	532
Mercury	mg/kg	0.005	0.14	24	0.0877	0.0842	0.0060	0.14	4.19	0.684	0.404	0.108	0.204	0.317	4.03	3.90	1.96	11.9	1.12	0.699	6.15
Molybdenum	mg/kg	0.1	3.0	15	0.52	0.67	3.87	3.87	0.23	0.39	1.05	0.52	1.07	0.81	1.18	<2.00	0.41	7.43	4.08	0.79	1.11
Nickel	mg/kg	0.5	48	70	2.52	2.36	12.1	48	5.12	6.64	4.11	4.3	5.27	4.79	9.67	10.5	6.29	21.2	20.5	8.68	11.8
Selenium	mg/kg	0.2	1.4	1	1	1.07	<0.20	1.4	0.31	<0.20	4.61	0.58	3.97	3.4	1.48	*<4.00*	0.75	2.2	*<4.00*	0.77	0.68
Silver	mg/kg	0.1	0.5	77	0.1	0.41	<0.10	0.5	0.2	<0.10	0.52	0.11	0.22	0.26	0.25	<2.00	0.14	0.8	<2.00	0.26	0.19
Strontium	mg/kg	0.5	5.3	9,400	2.55	1.99	2.15	5.3	3.15	2.37	25.2	2.54	73.4	69.6	5.22	<10.0	2.41	16.3	<10.0	2.72	4.22
Sulphur as S	mg/kg	1,000	-	-	<1,000	<1,000	<1,000	-	<1,000	<1,000	3,600	<1,000	3,900	3,500	3,300	<20,000	<1,000	1,900	<20,000	<1,000	<1,000
Thallium	mg/kg	0.05	0.40	1	0.075	0.092	0.158	0.40	0.294	0.133	0.179	0.124	<0.050	<0.050	0.192	<1.00	0.165	0.439	<1.00	0.228	0.235
Tin	mg/kg	2	3.0	9,400	<2.0	<2.0	<2.0	3.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	4.4	<40.0	<2.0	3.3	<40.0	2.9	5
Uranium	mg/kg	0.05	3.5	30	0.949	1.14	1.56	3.5	1.13	1.74	24.4	4.46	27.7	20.6	5.31	4.61	2.71	2.62	5.95	1.87	2.45
Vanadium	mg/kg	0.2	110	39	24.9	52.6	16.2	110	36.2	14.1	7.6	9.97	3.45	3.94	27.1	25.6	23.4	48.4	27.2	38.7	29.4
Zinc	mg/kg	2	270	200	10.3	11.2	39.0	270	52.8	85.7	74.6	67.8	109	108	126	201	49	104	115	52.5	82.2

Environmental Standards

Nova Scotia Environment, October 2022, NS Tier I EQS Soil Commercial Potable Coarse

Nova Scotia Environment, October 2022, NS Tier I EQS Soil Commercial Potable Fine

Environment Canada's Background Soil Database (2004-2009) Maximum Concentration Nova Scotia

Notes:

1) Sample depths reported in Imperial units on the lab certificates; however, depths have been converted to meters for consistency.
2) Background concentrations were only used if a concentration exceeded the Tier I EQS value.

Highlight	Exceeds the NS Tier I EQS
Highlight	Exceeds the NS Tier I EQS and Background
Italics	Laboratory Detection Limit exceeds the Tier I EQS

TABLE D-6

					Location	BH 1	BH 2	24 MW-01	Site/Regional Maximum Background Threshold Values (BTVs)[2]	BH11		BH12	BH13	BH14	BH15		BH16	BH17	BH18		BH19	BH20
					Sample ID	BH1 0-0.15m	BH2 0-0.15m	24 MW-01-SS5 (2.4-3.0 m)[1]		BH DUPB 0-0.15m	BH 11 0.90m	BH12 0-0.15m	BH13 0-0.015m	BH14 0-0.15m	BH15 0-0.15m	BH 15 0.50m	BH16 0-0.15m	BH17 0-0.15m	BH18 0-0.15m	BH 18 1.0m	BH19 0-0.15m	BH20 0-0.15m
					Sample Type	Local Background				Duplicate	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
					Date	07 Nov 2023	07 Nov 2023	17 Jan 2024		07 Nov 2023	07 Nov 2023	07 Nov 2023	10 Nov 2023	09 Nov 2023	08 Nov 2023	08 Nov 2023	08 Nov 2023	09 Nov 2023	08 Nov 2023	08 Nov 2023	08 Nov 2023	08 Nov 2023
	Unit	EQL	EC Background Soil Database Maximum Concentration	NS Tier I EQS Soil Commercial Potable Fine/Coarse																		
Physical Properties					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
% >75um	%	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sieve Analysis - 75 Âµm (passing)	%	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Texture	N/A		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals																						
Aluminium	mg/kg	50	28,000	15,400	4,630	8,180	9,420	28,000	21,300	29,200	20,100	17,300	14,000	23,200	12,200	27,500	9,580	7,900	14,800	17,700	15,000
Antimony	mg/kg	0.1	2.0	7.5	0.14	0.3	0.10	2.0	1.92	1.10	4.38	1.48	1.11	2.72	0.37	15.8	2.86	1.46	<2.00	0.89	7.14
Arsenic	mg/kg	0.1	19	10	22	1,490	79.2	1,490	1,270	459	1,110	998	340	1,240	135	463	694	194	2,690	620	2,260
Barium	mg/kg	0.5	160	350	10.7	25.8	46.6	160	72.7	108	78.2	73.4	53.7	52.3	35.9	31.6	161	52.1	142	51.4	57.1
Beryllium	mg/kg	0.1	1.0	1.0	<0.10	0.18	0.36	1.0	1.22	1.14	1.3	0.6	0.58	1.24	0.65	0.86	0.54	1.18	*<2.00*	0.56	0.64
Boron	mg/kg	5	0.62	4,300	<5.0	<5.0	<5.0	0.62	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<100	<5.0	<5.0
Cadmium	mg/kg	0.02	0.40	1.0	0.058	0.089	0.037	0.40	0.153	0.150	0.378	0.223	0.139	0.079	0.031	0.166	0.35	0.478	<0.400	0.283	0.114
Chromium (Total, III+VI)	mg/kg	0.5	81	630	8.13	12.4	29.7	81	29	28.8	24.6	22.1	16.2	22.3	13.6	18.2	58	15.3	37.9	21.5	28.6
Cobalt	mg/kg	0.1	26	22	0.66	0.58	5.34	26	8.7	5.66	12.2	4.36	2.73	6.45	4.80	2.05	8.07	13.2	4.44	3.87	4.44
Copper	mg/kg	0.5	54	250	3.19	4.86	13.1	54	33.3	25.5	99.6	20.4	19.9	14.5	6.07	14.7	30	56.7	<10.0	13	31.3
Iron	mg/kg	50	52,000	11,000	22,400	29,000	17,100	52,000	31,800	30,900	26,600	21,600	23,200	23,600	14,400	28,700	39,500	112,000	30,600	28,900	39,400
Lead	mg/kg	0.5	84	120	13.3	44.5	18.3	84	138	69.8	791	140	229	1,360	57.1	428	349	35.9	35.3	55.3	193
Manganese	mg/kg	1	4,340	360	60.4	65.4	342	4,340	690	348	763	517	292	433	335	170	411	927	505	278	449
Mercury	mg/kg	0.005	0.14	24	0.0877	0.0842	0.0060	0.14	7.84	2.81	8.09	22.9	28.1	2,920	30.9	2.25	6.39	1.19	8.67	0.962	46.4
Molybdenum	mg/kg	0.1	3.0	15	0.52	0.67	3.87	3.87	1.43	1.02	1.2	0.39	0.83	0.45	0.40	0.61	5.22	29.5	<2.00	1.62	1.6
Nickel	mg/kg	0.5	48	70	2.52	2.36	12.1	48	15.5	15.0	19.1	9.99	6.86	15.2	9.52	6.57	14.7	30.9	<10.0	10.6	11.1
Selenium	mg/kg	0.2	1.4	1	1	1.07	<0.20	1.4	0.79	0.96	0.55	0.71	1.76	0.57	<0.20	1.97	1.69	2.34	*<4.00*	1.52	1.54
Silver	mg/kg	0.1	0.5	77	0.1	0.41	<0.10	0.5	0.39	0.10	0.19	0.48	0.2	0.41	<0.10	0.28	0.22	0.15	<2.00	0.26	0.33
Strontium	mg/kg	0.5	5.3	9,400	2.55	1.99	2.15	5.3	4.36	2.91	5.34	10.6	6.72	3.3	1.30	7.64	21.5	36.3	<10.0	7.8	3.17
Sulphur as S	mg/kg	1,000	-	-	<1,000	<1,000	<1,000	-	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	3,200	1,200	<20,000	<1,000	<1,000
Thallium	mg/kg	0.05	0.40	1	0.075	0.092	0.158	0.40	0.27	0.294	0.3	0.184	0.194	0.192	0.148	0.151	1.21	1.14	<1.00	0.225	0.319
Tin	mg/kg	2	3.0	9,400	<2.0	<2.0	<2.0	3.0	5.7	3.8	9	3.6	7.4	3.9	<2.0	27.2	3.1	<2.0	<40.0	<2.0	11.3
Uranium	mg/kg	0.05	3.5	30	0.949	1.14	1.56	3.5	3.14	3.89	6.21	1.06	1.43	1.43	1.20	1.48	0.807	1.02	<1.00	1.09	0.99
Vanadium	mg/kg	0.2	110	39	24.9	52.6	16.2	110	36.5	36.5	28.4	30.5	25.1	25.2	16.3	32.5	26.7	32.7	46.7	33	37.6
Zinc	mg/kg	2	270	200	10.3	11.2	39.0	270	108	155	240	125	59.1	105	62.2	55.7	150	30.4	46.6	101	52.7

Environmental Standards

Nova Scotia Environment, October 2022, NS Tier I EQS Soil Commercial Potable Coarse

Nova Scotia Environment, October 2022, NS Tier I EQS Soil Commercial Potable Fine

Environment Canada's Background Soil Database (2004-2009) Maximum Concentration Nova Scotia

Notes:

1) Sample depths reported in Imperial units on the lab certificates; however, depths have been converted to meters for consistency.
2) Background concentrations were only used if a concentration exceeded the Tier I EQS value.

Highlight	Exceeds the NS Tier I EQS
Highlight	Exceeds the NS Tier I EQS and Background
Italics	Laboratory Detection Limit exceeds the Tier I EQS

TABLE D-6

					Location	BH 1	BH 2	24 MW-01	Site/Regional Maximum Background Threshold Values (BTVs)[2]	BH21		BH22	BH23			BH24	BH25	BH26	BH27		BH28	BH
					Sample ID	BH1 0-0.15m	BH2 0-0.15m	24 MW-01-SS5 (2.4-3.0 m)[1]		BH21 0-0.15m	BH DUPD 0-0.15m	BH22 0-0.15m	BH23 0-0.15m	BH DUPC 0-0.15m	BH23-0.95m	BH24 0-0.15m	BH25 0-0.15m	BH26 0-0.15m	BH27 0-0.15m	BH 27 0.45m	BH28 0-0.15m	BH29 0-0.15m
					Sample Type	Local Background				Normal	Duplicate	Normal	Normal	Duplicate	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
					Date	07 Nov 2023	07 Nov 2023	17 Jan 2024		08 Nov 2023	08 Nov 2023	08 Nov 2023	08 Nov 2023	08 Nov 2023	08 Nov 2023	08 Nov 2023	08 Nov 2023	08 Nov 2023	08 Nov 2023	08 Nov 2023	08 Nov 2023	09 Nov 2023
	Unit	EQL	EC Background Soil Database Maximum Concentration	NS Tier I EQS Soil Commercial Potable Fine/Coarse																		
Physical Properties					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
% >75um	%	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sieve Analysis - 75 Âµm (passing)	%	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Texture	N/A		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals																						
Aluminium	mg/kg	50	28,000	15,400	4,630	8,180	9,420	28,000	12,600	12,000	15,200	11,200	13,600	16,900	29,100	13,300	15,500	26,800	29,600	17,700	30,200
Antimony	mg/kg	0.1	2.0	7.5	0.14	0.3	0.10	2.0	23	48.1	1.15	2.96	4.37	2.75	10.9	6.12	0.65	0.86	<2.00	1.73	1.77
Arsenic	mg/kg	0.1	19	10	22	1,490	79.2	1,490	2,500	2,750	1,620	922	1,200	4,130	2,090	1,490	2,290	2,330	4,370	2,680	4,210
Barium	mg/kg	0.5	160	350	10.7	25.8	46.6	160	114	120	120	119	106	117	94.1	63	64.2	109	148	64.8	158
Beryllium	mg/kg	0.1	1.0	1.0	<0.10	0.18	0.36	1.0	0.5	0.5	0.5	0.65	0.74	*<2.00*	1.91	0.85	1.07	1.86	*<2.00*	1.5	2.44
Boron	mg/kg	5	0.62	4,300	<5.0	<5.0	<5.0	0.62	<5.0	<5.0	<5.0	<5.0	<5.0	<100	<5.0	<5.0	<5.0	<5.0	<100	<5.0	<5.0
Cadmium	mg/kg	0.02	0.40	1.0	0.058	0.089	0.037	0.40	0.25	0.293	0.094	1.91	0.964	0.540	0.127	0.133	0.338	0.086	<0.400	0.501	0.124
Chromium (Total, III+VI)	mg/kg	0.5	81	630	8.13	12.4	29.7	81	28.9	27.6	32.7	22.2	27.2	29.9	49.4	23.1	23	50.8	54.6	23.1	52
Cobalt	mg/kg	0.1	26	22	0.66	0.58	5.34	26	7.66	9.27	6.74	7.5	6.56	9.85	6.45	12.9	58.1	10.5	15.6	162	18
Copper	mg/kg	0.5	54	250	3.19	4.86	13.1	54	35.3	39	18.4	33	28.7	38.5	25.2	11.5	19.5	40.3	28.5	34.1	35.8
Iron	mg/kg	50	52,000	11,000	22,400	29,000	17,100	52,000	40,000	39,400	28,800	33,000	35,100	39,000	50,700	35,800	41,200	51,800	53,500	41,800	55,100
Lead	mg/kg	0.5	84	120	13.3	44.5	18.3	84	505	591	53.3	138	133	53.6	132	86.7	147	102	51.3	258	391
Manganese	mg/kg	1	4,340	360	60.4	65.4	342	4,340	573	604	622	792	704	647	1,130	940	3,290	1,200	1,080	7,510	1,340
Mercury	mg/kg	0.005	0.14	24	0.0877	0.0842	0.0060	0.14	77.8	83.6	6.83	6.9	0.0989	1.38	0.334	13	2	0.321	0.0509	3.15	0.178
Molybdenum	mg/kg	0.1	3.0	15	0.52	0.67	3.87	3.87	2.45	2.52	1.47	2.95	2.43	<2.00	0.44	2.42	2.21	0.39	<2.00	1.99	0.44
Nickel	mg/kg	0.5	48	70	2.52	2.36	12.1	48	11.6	12.1	10.8	15.3	15	19.7	16.1	13.1	14.5	16.4	25.2	16.6	21.1
Selenium	mg/kg	0.2	1.4	1	1	1.07	<0.20	1.4	1.04	1.17	0.49	0.97	0.86	*<4.00*	0.44	0.95	2.34	0.55	*<4.00*	2.47	0.29
Silver	mg/kg	0.1	0.5	77	0.1	0.41	<0.10	0.5	0.75	0.61	0.12	0.14	0.14	<2.00	0.18	0.21	0.29	0.18	<2.00	0.47	0.24
Strontium	mg/kg	0.5	5.3	9,400	2.55	1.99	2.15	5.3	5.08	5.68	3.72	23.2	17	15.9	3.81	5.2	11.4	6.3	<10.0	12.1	3.9
Sulphur as S	mg/kg	1,000	-	-	<1,000	<1,000	<1,000	-	<1,000	<1,000	<1,000	<1,000	<1,000	<20,000	<1,000	<1,000	<1,000	<1,000	<20,000	<1,000	<1,000
Thallium	mg/kg	0.05	0.40	1	0.075	0.092	0.158	0.40	0.472	0.491	0.311	0.249	0.253	<1.00	0.354	0.178	0.254	0.446	<1.00	0.459	0.526
Tin	mg/kg	2	3.0	9,400	<2.0	<2.0	<2.0	3.0	31.4	60.7	<2.0	26.8	17.9	<40.0	28.5	6.3	<2.0	<2.0	<40.0	7.6	<2.0
Uranium	mg/kg	0.05	3.5	30	0.949	1.14	1.56	3.5	0.73	0.812	0.733	0.574	0.731	<1.00	1.05	1.36	1.91	1.17	<1.00	2.77	1.59
Vanadium	mg/kg	0.2	110	39	24.9	52.6	16.2	110	35.5	33.6	39.5	32.2	36.8	40.5	56.8	34.8	40.9	61.7	63.8	37	62.9
Zinc	mg/kg	2	270	200	10.3	11.2	39.0	270	82	84.7	53.4	531	310	213	81.4	60	71	89.1	97.3	76.4	152

Environmental Standards

Nova Scotia Environment, October 2022, NS Tier I EQS Soil Commercial Potable Coarse

Nova Scotia Environment, October 2022, NS Tier I EQS Soil Commercial Potable Fine

Environment Canada's Background Soil Database (2004-2009) Maximum Concentration Nova Scotia

Notes:

1) Sample depths reported in Imperial units on the lab certificates; however, depths have been converted to meters for consistency.

2) Background concentrations were only used if a concentration exceeded the Tier I EQS value.

Highlight	Exceeds the NS Tier I EQS
Highlight	Exceeds the NS Tier I EQS and Background
Italics	Laboratory Detection Limit exceeds the Tier I EQS

TABLE D-6

	Location			BH 1	BH 2	24 MW-01	Site/Regional Maximum Background Threshold Values (BTVs)[2]	29	BH30	BH31		BH32	BH33	BH34	BH35	BH36	BH43	BH44	BH45	BH47
	Sample ID			BH1 0-0.15m	BH2 0-0.15m	24 MW-01-SS5 (2.4-3.0 m)[1]		BH 29 0.35m	BH30 0-0.15m	BH31 0-0.15m	BH 31 0.50m	BH32 0-0.15m	BH33 0-0.15m	BH34 0-0.15m	BH35 0-0.15m	BH36 0-0.15m	BH 43 0-0.15m	BH 44 0-0.15m	BH 45 0-0.15m	BH 47 0-0.15m
	Sample Type			Local Background				Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
	Date			07 Nov 2023	07 Nov 2023	17 Jan 2024		09 Nov 2023	09 Nov 2023	09 Nov 2023	09 Nov 2023	09 Nov 2023	09 Nov 2023	09 Nov 2023	09 Nov 2023	09 Nov 2023	07 Nov 2023	07 Nov 2023	09 Nov 2023	10 Nov 2023
	Unit	EQL	EC Background Soil Database Maximum Concentration	NS Tier I EQS Soil Commercial Potable Fine/Coarse																
Physical Properties					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
% >75um	%	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	36.6	-	-	-
Sieve Analysis - 75 Âµm (passing)	%	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	63.4	-	-	-
Texture	N/A		-	-	-	-	-	-	-	-	-	-	-	-	-	-	Fine	-	-	-
Metals																				
Aluminium	mg/kg	50	28,000	15,400	4,630	8,180	9,420	28,000	36,300	31,300	34,100	29,600	10,400	11,600	15,300	17,900	16,900	-	13,900	17,300	9,170
Antimony	mg/kg	0.1	2.0	7.5	0.14	0.3	0.10	2.0	<2.00	0.75	1.36	<2.00	0.84	0.98	0.47	0.31	0.99	-	0.54	<2.00	0.11
Arsenic	mg/kg	0.1	19	10	22	1,490	79.2	1,490	4,950	88.9	2,230	2,480	296	399	1,010	46.3	844	-	48.0	989	70.3
Barium	mg/kg	0.5	160	350	10.7	25.8	46.6	160	198	48.4	163	174	79.8	80.8	76.3	31.8	64.7	-	79.5	55.2	37.8
Beryllium	mg/kg	0.1	1.0	1.0	<0.10	0.18	0.36	1.0	2.20	1.79	2.83	*<2.00*	1.36	0.31	0.67	1.03	0.63	-	3.09	*<2.00*	0.39
Boron	mg/kg	5	0.62	4,300	<5.0	<5.0	<5.0	0.62	<100	<5.0	<5.0	<100	<5.0	<5.0	<5.0	<5.0	<5.0	-	<5.0	<100	<5.0
Cadmium	mg/kg	0.02	0.40	1.0	0.058	0.089	0.037	0.40	<0.400	1.47	0.456	<0.400	0.779	0.04	0.229	0.192	0.18	-	1.79	<0.400	0.278
Chromium (Total, III+VI)	mg/kg	0.5	81	630	8.13	12.4	29.7	81	61.3	11	57.8	52.6	16.6	26.5	28.6	12.1	24.9	-	15.8	29.3	14.8
Cobalt	mg/kg	0.1	26	22	0.66	0.58	5.34	26	19.7	2.75	32.7	33.5	54.9	2.57	7.29	2.44	3.8	-	1.36	11.5	1.38
Copper	mg/kg	0.5	54	250	3.19	4.86	13.1	54	40.0	63	61.6	46.5	51.4	7.8	19.3	17	48.4	-	42.0	16.4	5.97
Iron	mg/kg	50	52,000	11,000	22,400	29,000	17,100	52,000	67,700	2,640	60,500	53,600	15,000	21,000	28,300	5,580	31,200	-	7,210	35,100	8,700
Lead	mg/kg	0.5	84	120	13.3	44.5	18.3	84	238	232	715	475	130	24.9	52.3	104	120	-	142	142	81.1
Manganese	mg/kg	1	4,340	360	60.4	65.4	342	4,340	1,290	85	1,520	1,210	1,390	313	376	89	277	-	149	587	131
Mercury	mg/kg	0.005	0.14	24	0.0877	0.0842	0.0060	0.14	0.116	0.778	0.148	0.0751	0.52	14.1	3.8	0.232	0.809	-	1.20	2.34	0.140
Molybdenum	mg/kg	0.1	3.0	15	0.52	0.67	3.87	3.87	<2.00	0.53	0.42	<2.00	0.29	0.43	1.01	0.38	0.65	-	2.02	<2.00	0.29
Nickel	mg/kg	0.5	48	70	2.52	2.36	12.1	48	29.3	33.4	43.9	48.5	31.7	8.08	17.9	6.09	11.5	-	5.96	11.9	4.61
Selenium	mg/kg	0.2	1.4	1	1	1.07	<0.20	1.4	*<4.00*	8.28	0.33	*<4.00*	0.67	0.36	1.02	3.38	0.97	-	5.15	*<4.00*	0.95
Silver	mg/kg	0.1	0.5	77	0.1	0.41	<0.10	0.5	<2.00	1.27	0.27	<2.00	0.16	0.1	0.13	0.23	0.21	-	0.37	<2.00	<0.10
Strontium	mg/kg	0.5	5.3	9,400	2.55	1.99	2.15	5.3	<10.0	13.7	3.8	<10.0	6.47	2.3	11	2.39	6.21	-	16.6	<10.0	2.20
Sulphur as S	mg/kg	1,000	-	-	<1,000	<1,000	<1,000	-	<20,000	4,500	<1,000	<20,000	<1,000	<1,000	<1,000	<1,000	<1,000	-	3,000	<20,000	<1,000
Thallium	mg/kg	0.05	0.40	1	0.075	0.092	0.158	0.40	<1.00	0.104	0.479	<1.00	0.291	0.225	0.293	0.126	0.166	-	0.124	<1.00	0.130
Tin	mg/kg	2	3.0	9,400	<2.0	<2.0	<2.0	3.0	<40.0	<2.0	2.1	<40.0	<2.0	<2.0	<2.0	<2.0	4.1	-	3.8	<40.0	<2.0
Uranium	mg/kg	0.05	3.5	30	0.949	1.14	1.56	3.5	1.06	4.06	2.86	1.85	1.61	0.77	0.977	2.67	1.19	-	55.6	1.97	1.78
Vanadium	mg/kg	0.2	110	39	24.9	52.6	16.2	110	72.6	7.35	68.3	61.6	21.5	34.6	35.6	15.3	39.7	-	14.8	45.6	15.8
Zinc	mg/kg	2	270	200	10.3	11.2	39.0	270	129	257	367	316	226	39.1	70	35.9	99.5	-	87.6	83.7	43.9

Environmental Standards

Nova Scotia Environment, October 2022, NS Tier I EQS Soil Commercial Potable Coarse

Nova Scotia Environment, October 2022, NS Tier I EQS Soil Commercial Potable Fine

Environment Canada's Background Soil Database (2004-2009) Maximum Concentration Nova Scotia

Notes:

1) Sample depths reported in Imperial units on the lab certificates; however, depths have been converted to meters for consistency.
2) Background concentrations were only used if a concentration exceeded the Tier I EQS value.

Highlight	Exceeds the NS Tier I EQS
Highlight	Exceeds the NS Tier I EQS and Background
Italics	Laboratory Detection Limit exceeds the Tier I EQS

TABLE D-6

					Location	BH 1	BH 2	24 MW-01	Site/Regional Maximum Background Threshold Values (BTVs)[2]	BH51	BH54	BH55	BH56	BH57	BH58	BH59	BH60	BH61		24 MW-02	24MW-03	24MW-04
					Sample ID	BH1 0-0.15m	BH2 0-0.15m	24 MW-01-SS5 (2.4-3.0 m)[1]		BH 51 0-0.15m	BH 54 0-0.15m	BH 55 0-0.15m	BH 56 0-0.15m	BH 57 0-0.15m	BH 58 0-0.15m	BH 59 0-0.15m	BH 60 0-0.15m	BH 61 0-0.15m	BH DUP E 0-0.15m	24 MW-02-SS3 (1.2-1.6m)[1]	24MW-03 SS1-SS2 (0-1.2m)	24MW-04 SS2 (0-0.64m)
					Sample Type	Local Background				Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Duplicate	Normal	Normal	Normal
					Date	07 Nov 2023	07 Nov 2023	17 Jan 2024		10 Nov 2023	18 Jan 2024	19 Jan 2024	19 Jan 2024	19 Jan 2024	19 Jan 2024	19 Jan 2024	19 Jan 2024	20 Jan 2024	20 Jan 2024	16 Jan 2024	18 Jan 2024	18 Jan 2024
	Unit	EQL	EC Background Soil Database Maximum Concentration	NS Tier I EQS Soil Commercial Potable Fine/Coarse																		
Physical Properties					-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
% >75um	%	1	-	-	-	-	-	-	56.4	-	-	-	-	-	-	-	-	-	-	-	-	-
Sieve Analysis - 75 Âµm (passing)	%	1	-	-	-	-	-	-	43.6	-	-	-	-	-	-	-	-	-	-	-	-	-
Texture	N/A		-	-	-	-	-	-	Coarse	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals																						
Aluminium	mg/kg	50	28,000	15,400	4,630	8,180	9,420	28,000	-	19,500	14,800	36,500	12,600	12,600	6,610	21,800	25,600	26,200	10,800	23,700	14,300
Antimony	mg/kg	0.1	2.0	7.5	0.14	0.3	0.10	2.0	-	2.31	3.06	<2.00	<2.00	<0.10	<2.00	0.15	0.68	0.56	<0.10	0.54	0.20
Arsenic	mg/kg	0.1	19	10	22	1,490	79.2	1,490	-	1,010	1,590	480	810	105	496	148	1,250	1,020	75.7	441	250
Barium	mg/kg	0.5	160	350	10.7	25.8	46.6	160	-	65.0	114	34.0	29.9	18.0	28.5	21.5	172	171	50.6	59.6	61.1
Beryllium	mg/kg	0.1	1.0	1.0	<0.10	0.18	0.36	1.0	-	*<2.00*	*<2.00*	*<2.00*	*<2.00*	0.49	*<2.00*	0.40	1.67	1.83	0.38	0.96	0.80
Boron	mg/kg	5	0.62	4,300	<5.0	<5.0	<5.0	0.62	-	<100	<100	<100	<100	<5.0	<100	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Cadmium	mg/kg	0.02	0.40	1.0	0.058	0.089	0.037	0.40	-	<0.400	1.77	0.545	<0.400	0.092	<0.400	0.086	0.122	0.127	0.043	0.282	0.058
Chromium (Total, III+VI)	mg/kg	0.5	81	630	8.13	12.4	29.7	81	-	25.2	21.0	26.3	12.8	10.7	11.4	18.3	48.9	49.2	19.7	23.0	12.9
Cobalt	mg/kg	0.1	26	22	0.66	0.58	5.34	26	-	10.8	8.92	3.77	2.79	1.45	4.93	2.40	6.53	7.16	6.09	7.06	8.30
Copper	mg/kg	0.5	54	250	3.19	4.86	13.1	54	-	39.4	40.6	11.3	<10.0	4.79	<10.0	6.18	9.30	8.58	10.6	31.7	7.06
Iron	mg/kg	50	52,000	11,000	22,400	29,000	17,100	52,000	-	32,500	41,300	27,500	17,900	17,200	13,600	23,100	42,400	43,000	17,900	22,300	19,900
Lead	mg/kg	0.5	84	120	13.3	44.5	18.3	84	-	140	124	39.2	38.3	26.6	21.7	18.3	96.8	87.5	20.4	104	21.8
Manganese	mg/kg	1	4,340	360	60.4	65.4	342	4,340	-	830	801	139	240	70.1	345	131	989	1,040	471	436	699
Mercury	mg/kg	0.005	0.14	24	0.0877	0.0842	0.0060	0.14	-	104	14.9	0.359	0.605	0.143	0.228	0.193	0.642	0.492	0.0086	1.05	1.14
Molybdenum	mg/kg	0.1	3.0	15	0.52	0.67	3.87	3.87	-	<2.00	5.34	<2.00	<2.00	0.38	<2.00	0.55	0.24	0.24	1.29	0.89	0.75
Nickel	mg/kg	0.5	48	70	2.52	2.36	12.1	48	-	15.2	21.7	10.4	<10.0	3.43	<10.0	6.89	16.3	16.4	12.6	17.2	9.15
Selenium	mg/kg	0.2	1.4	1	1	1.07	<0.20	1.4	-	*<4.00*	*<4.00*	*<4.00*	*<4.00*	1.04	*<4.00*	1.42	<0.20	<0.20	<0.20	0.53	<0.20
Silver	mg/kg	0.1	0.5	77	0.1	0.41	<0.10	0.5	-	<2.00	<2.00	<2.00	<2.00	0.15	<2.00	0.13	0.24	0.20	<0.10	<0.10	<0.10
Strontium	mg/kg	0.5	5.3	9,400	2.55	1.99	2.15	5.3	-	<10.0	16.2	<10.0	<10.0	1.59	<10.0	2.50	4.30	4.14	2.06	4.22	1.74
Sulphur as S	mg/kg	1,000	-	-	<1,000	<1,000	<1,000	-	-	<20,000	<20,000	<20,000	<20,000	<1,000	<20,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000
Thallium	mg/kg	0.05	0.40	1	0.075	0.092	0.158	0.40	-	<1.00	1.47	<1.00	<1.00	0.086	<1.00	0.099	0.336	0.334	0.166	0.260	0.496
Tin	mg/kg	2	3.0	9,400	<2.0	<2.0	<2.0	3.0	-	<40.0	<40.0	<40.0	<40.0	<2.0	<40.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.3
Uranium	mg/kg	0.05	3.5	30	0.949	1.14	1.56	3.5	-	5.52	2.17	1.28	1.28	1.63	<1.00	0.877	1.22	1.41	1.58	3.02	1.74
Vanadium	mg/kg	0.2	110	39	24.9	52.6	16.2	110	-	31.4	29.2	28.5	19.2	19.1	13.4	22.5	60.9	61.4	19.2	23.8	24.5
Zinc	mg/kg	2	270	200	10.3	11.2	39.0	270	-	106	268	65.6	<40.0	25.9	<40.0	28.4	95.0	95.8	40.1	152	98.0

Environmental Standards

Nova Scotia Environment, October 2022, NS Tier I EQS Soil Commercial Potable Coarse

Nova Scotia Environment, October 2022, NS Tier I EQS Soil Commercial Potable Fine

Environment Canada's Background Soil Database (2004-2009) Maximum Concentration Nova Scotia

Notes:

1) Sample depths reported in Imperial units on the lab certificates; however, depths have been converted to meters for consistency.

2) Background concentrations were only used if a concentration exceeded the Tier I EQS value.

Highlight	Exceeds the NS Tier I EQS
Highlight	Exceeds the NS Tier I EQS and Background
Italics	Laboratory Detection Limit exceeds the Tier I EQS

TABLE D-6

	Location				BH 1	BH 2	24 MW-01	Site/Regional Maximum Background Threshold Values (BTVs)[2]	24 MW-05
	Sample ID				BH1 0-0.15m	BH2 0-0.15m	24 MW-01-SS5 (2.4-3.0 m)[1]		24 MW-05-SS1 (0-0.58m)[1]
	Sample Type				Local Background				Normal
	Date				07 Nov 2023	07 Nov 2023	17 Jan 2024		16 Jan 2024
	Unit	EQL	EC Background Soil Database Maximum Concentration	NS Tier I EQS Soil Commercial Potable Fine/Coarse					
Physical Properties					-	-	-	-	-
% >75um	%	1	-	-	-	-	-	-	-
Sieve Analysis - 75 Âµm (passing)	%	1	-	-	-	-	-	-	-
Texture	N/A		-	-	-	-	-	-	-
Metals									
Aluminium	mg/kg	50	28,000	15,400	4,630	8,180	9,420	28,000	20,100
Antimony	mg/kg	0.1	2.0	7.5	0.14	0.3	0.10	2.0	1.12
Arsenic	mg/kg	0.1	19	10	22	1,490	79.2	1,490	593
Barium	mg/kg	0.5	160	350	10.7	25.8	46.6	160	167
Beryllium	mg/kg	0.1	1.0	1.0	<0.10	0.18	0.36	1.0	0.79
Boron	mg/kg	5	0.62	4,300	<5.0	<5.0	<5.0	0.62	<5.0
Cadmium	mg/kg	0.02	0.40	1.0	0.058	0.089	0.037	0.40	0.093
Chromium (Total, III+VI)	mg/kg	0.5	81	630	8.13	12.4	29.7	81	46.1
Cobalt	mg/kg	0.1	26	22	0.66	0.58	5.34	26	14.2
Copper	mg/kg	0.5	54	250	3.19	4.86	13.1	54	36.4
Iron	mg/kg	50	52,000	11,000	22,400	29,000	17,100	52,000	30,900
Lead	mg/kg	0.5	84	120	13.3	44.5	18.3	84	60.4
Manganese	mg/kg	1	4,340	360	60.4	65.4	342	4,340	743
Mercury	mg/kg	0.005	0.14	24	0.0877	0.0842	0.0060	0.14	2.52
Molybdenum	mg/kg	0.1	3.0	15	0.52	0.67	3.87	3.87	2.28
Nickel	mg/kg	0.5	48	70	2.52	2.36	12.1	48	26.2
Selenium	mg/kg	0.2	1.4	1	1	1.07	<0.20	1.4	0.24
Silver	mg/kg	0.1	0.5	77	0.1	0.41	<0.10	0.5	<0.10
Strontium	mg/kg	0.5	5.3	9,400	2.55	1.99	2.15	5.3	5.23
Sulphur as S	mg/kg	1,000	-	-	<1,000	<1,000	<1,000	-	<1,000
Thallium	mg/kg	0.05	0.40	1	0.075	0.092	0.158	0.40	0.342
Tin	mg/kg	2	3.0	9,400	<2.0	<2.0	<2.0	3.0	<2.0
Uranium	mg/kg	0.05	3.5	30	0.949	1.14	1.56	3.5	2.00
Vanadium	mg/kg	0.2	110	39	24.9	52.6	16.2	110	47.8
Zinc	mg/kg	2	270	200	10.3	11.2	39.0	270	114

Environmental Standards

Nova Scotia Environment, October 2022, NS Tier I EQS Soil Commercial Potable Coarse

Nova Scotia Environment, October 2022, NS Tier I EQS Soil Commercial Potable Fine

Environment Canada's Background Soil Database (2004-2009) Maximum Concentration Nova Scotia

Notes:

1) Sample depths reported in Imperial units on the lab certificates; however, depths have been converted to meters for consistency.

2) Background concentrations were only used if a concentration exceeded the Tier I EQS value.

Highlight	Exceeds the NS Tier I EQS
Highlight	Exceeds the NS Tier I EQS and Background
Italics	Laboratory Detection Limit exceeds the Tier I EQS

TABLE D-7

Location							BH 1	BH 2	24 MW-01		BH 9	BH10
Sample ID							BH1 0-0.15m	BH2 0-0.15m	24 MW-01-SS5 (2.4-3.1m)[2]	24 MW-Dup E	BH9 0-0.15m	BH10 0-0.15m
Sample Type							Local Background				Normal	Normal
Date							07 Nov 2023	07 Nov 2023	17 Jan 2024	17 Jan 2024	07 Nov 2023	07 Nov 2023
	Unit	EQL	NS Tier I EQS Soil Commercial Potable Coarse	NS Tier I EQS Soil Commercial Potable Fine	CCME Canada Wide Standards for Petroleum Hydrocarbon Fraction F4 Commercial Coarse	CCME Canada Wide Standards for Petroleum Hydrocarbon Fraction F4 Commercial Fine						
BTEX					-	-						
Benzene	mg/kg	0.005	0.042	0.094	-	-	<0.0057	<0.0050	<0.0050	<0.0050	<0.0072	<0.0050
Toluene	mg/kg	0.05	0.35	0.74	-	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Ethylbenzene	mg/kg	0.015	0.043	0.089	-	-	<0.015	<0.015	<0.015	<0.015	<0.018	<0.015
Xylene (o)	mg/kg	0.03	-	-	-	-	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030
Xylene (m & p)	mg/kg	0.03	-	-	-	-	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030
Xylene Total	mg/kg	0.05	0.73	1.5	-	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Petroleum Hydrocarbons (PHCs)					-	-						
VPH (C6-C10 - BTEX)	mg/kg	5	-	-	-	-	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
EPH >C10-C16	mg/kg	5	-	-	-	-	11.0	<5.0	<5.0	<5.0	11.8	<5.0
EPH >C16-C21	mg/kg	5	-	-	-	-	25.0	7.4	<5.0	<5.0	21.9	6.9
EPH >C21-C32	mg/kg	5	-	-	-	-	365	111	<5.0	<5.0	196	94.3
Modified TPH (Tier 1)	mg/kg	10	940* 1,800** 10,000***	1,900* 4,700** 10,000***	-	-	401***	118***	<10	<10	230***	101***
EPH >C34-C50	mg/kg	20	-	-	3,300	6,600	532	132	<20	<20	248	190
Reached Baseline at C32	-		-	-	-	-	No	No	Yes	Yes	No	No
Hydrocarbon Resemblance	none		-	-	-	-	LOF	LOF	N/A	N/A	LOF	LOF

Environmental Standards

Nova Scotia Environment, October 2022, NS Tier I EQS Soil Commercial Potable Coarse

Nova Scotia Environment, October 2022, NS Tier I EQS Soil Commercial Potable Fine

CCME Canada Wide Standards for Petroleum Hydrocarbon Fraction F4 for a Commercial Property with Coarse-Grained Soils

CCME Canada Wide Standards for Petroleum Hydrocarbon Fraction F4 for a Commercial Property with Fine-Grained Soils

Notes:

LOF - Lube Oil Fraction

*Modified TPH (Gasoline)

**Modified TPH (Fuel Oil)

***Modified TPH (Lube Oil)

1 Concentration considered analytically equilivant to the guidelines.

2 Sample depths reported in Imperial units on the lab certificates; however, depths have been converted to meters for consistency.

Highlight	Indicates concentration exceedes Tier I EQS - corase grained.
Highlight	Indicates concentration exceedes Tier I EQS - fine grained.

TABLE D-7

Location							BH11		BH12	BH 13	BH14	BH15	BH16
Sample ID							BH11 0-0.15m	BHDUPB 0-0.15m	BH12 0-0.15m	BH13 0-0.015m	BH14 0-0.15m	BH15 0-0.15m	BH16 0-0.15m
Sample Type							Normal	Field_D	Normal	Normal	Normal	Normal	Normal
Date							07 Nov 2023	07 Nov 2023	07 Nov 2023	10 Nov 2023	09 Nov 2023	08 Nov 2023	08 Nov 2023
	Unit	EQL	NS Tier I EQS Soil Commercial Potable Coarse	NS Tier I EQS Soil Commercial Potable Fine	CCME Canada Wide Standards for Petroleum Hydrocarbon Fraction F4 Commercial Coarse	CCME Canada Wide Standards for Petroleum Hydrocarbon Fraction F4 Commercial Fine							
BTEX					-	-							
Benzene	mg/kg	0.005	0.042	0.094	-	-	<0.0056	<0.0050	<0.0050	<0.0054	<0.0050	<0.0050	<0.0053
Toluene	mg/kg	0.05	0.35	0.74	-	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Ethylbenzene	mg/kg	0.015	0.043	0.089	-	-	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015
Xylene (o)	mg/kg	0.03	-	-	-	-	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030
Xylene (m & p)	mg/kg	0.03	-	-	-	-	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030
Xylene Total	mg/kg	0.05	0.73	1.5	-	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Petroleum Hydrocarbons (PHCs)					-	-							
VPH (C6-C10 - BTEX)	mg/kg	5	-	-	-	-	5.4	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
EPH >C10-C16	mg/kg	5	-	-	-	-	<5.0	<5.0	29.4	8.8	12.4	5.7	<5.0
EPH >C16-C21	mg/kg	5	-	-	-	-	12.2	12.1	345	128	15.9	11.5	18.9
EPH >C21-C32	mg/kg	5	-	-	-	-	231	205	993	1,620	231	119	257
Modified TPH (Tier 1)	mg/kg	10	940* 1,800** 10,000***	1,900* 4,700** 10,000***	-	-	249***	217***	1,370***	1,760***	259***	136***	276***
EPH >C34-C50	mg/kg	20	-	-	3,300	6,600	285	272	638	1,030	343	185	559
Reached Baseline at C32	-		-	-	-	-	No	No	No	No	No	No	No
Hydrocarbon Resemblance	none		-	-	-	-	LOF	LOF	LOF	LOF	LOF	LOF	LOF

Environmental Standards

Nova Scotia Environment, October 2022, NS Tier I EQS Soil Commercial Potable Coarse

Nova Scotia Environment, October 2022, NS Tier I EQS Soil Commercial Potable Fine

CCME Canada Wide Standards for Petroleum Hydrocarbon Fraction F4 for a Commercial Property with Coarse-Grained Soils

CCME Canada Wide Standards for Petroleum Hydrocarbon Fraction F4 for a Commercial Property with Fine-Grained Soils

Notes:

LOF - Lube Oil Fraction

*Modified TPH (Gasoline)

**Modified TPH (Fuel Oil)

***Modified TPH (Lube Oil)

1 Concentration considered analytically equilivant to the guidelines.

2 Sample depths reported in Imperial units on the lab certificates; however, depths have been converted to meters for consistency.

Highlight	Indicates concentration exceedes Tier I EQS - corase grained.
Highlight	Indicates concentration exceedes Tier I EQS - fine grained.

TABLE D-7

Location							BH17	BH18	BH19	BH20	BH21	BH22	BH23	BH33
Sample ID							BH17 0-0.15m	BH18 0-0.15m	BH19 0-0.15m	BH20 0-0.15m	BH21 0-0.15m	BH22 0-0.15m	BH DUPC 0-0.15m	BH33 0-0.15m
Sample Type							Normal	Normal	Normal	Normal	Normal	Normal	Field_D	Normal
Date							09 Nov 2023	08 Nov 2023	08 Nov 2023	08 Nov 2023	08 Nov 2023	08 Nov 2023	08 Nov 2023	09 Nov 2023
	Unit	EQL	NS Tier I EQS Soil Commercial Potable Coarse	NS Tier I EQS Soil Commercial Potable Fine	CCME Canada Wide Standards for Petroleum Hydrocarbon Fraction F4 Commercial Coarse	CCME Canada Wide Standards for Petroleum Hydrocarbon Fraction F4 Commercial Fine								
BTEX					-	-								
Benzene	mg/kg	0.005	0.042	0.094	-	-	0.0344	<0.0059	0.0150	<0.0050	<0.0051	<0.0050	<0.0050	<0.0050
Toluene	mg/kg	0.05	0.35	0.74	-	-	0.217	<0.050	0.120	<0.050	<0.050	<0.050	<0.050	<0.050
Ethylbenzene	mg/kg	0.015	0.043	0.089	-	-	0.079	<0.015	0.044 [1]	<0.015	<0.015	<0.015	<0.015	<0.015
Xylene (o)	mg/kg	0.03	-	-	-	-	0.107	<0.030	0.061	<0.030	<0.030	<0.030	<0.030	<0.030
Xylene (m & p)	mg/kg	0.03	-	-	-	-	0.156	<0.030	0.098	<0.030	<0.030	<0.030	<0.030	<0.030
Xylene Total	mg/kg	0.05	0.73	1.5	-	-	0.263	<0.050	0.159	<0.050	<0.050	<0.050	<0.050	<0.050
Petroleum Hydrocarbons (PHCs)					-	-								
VPH (C6-C10 - BTEX)	mg/kg	5	-	-	-	-	10.6	22.7	7.4	<5.0	6.3	<5.0	<5.0	<5.0
EPH >C10-C16	mg/kg	5	-	-	-	-	73.2	12.0	19.9	13.6	17.9	<5.0	8.2	<5.0
EPH >C16-C21	mg/kg	5	-	-	-	-	101	39.2	40.7	29.0	66.6	<5.0	21.6	8.7
EPH >C21-C32	mg/kg	5	-	-	-	-	476	222	297	249	1,530	16.4	174	132
Modified TPH (Tier 1)	mg/kg	10	940* 1,800** 10,000***	1,900* 4,700** 10,000***	-	-	661***	296***	365***	292***	1,620***	16***	204***	141***
EPH >C34-C50	mg/kg	20	-	-	3,300	6,600	567	410	340	600	2,230	54	332	284
Reached Baseline at C32	-		-	-	-	-	No	No	No	No	No	No	No	No
Hydrocarbon Resemblance	none		-	-	-	-	LOF	LOF	LOF	LOF	LOF	LOF	LOF	LOF

Environmental Standards

Nova Scotia Environment, October 2022, NS Tier I EQS Soil Commercial Potable Coarse

Nova Scotia Environment, October 2022, NS Tier I EQS Soil Commercial Potable Fine

CCME Canada Wide Standards for Petroleum Hydrocarbon Fraction F4 for a Commercial Property with Coarse-Grained Soils

CCME Canada Wide Standards for Petroleum Hydrocarbon Fraction F4 for a Commercial Property with Fine-Grained Soils

Notes:

LOF - Lube Oil Fraction

*Modified TPH (Gasoline)

**Modified TPH (Fuel Oil)

***Modified TPH (Lube Oil)

1 Concentration considered analytically equilivant to the guidelines.

2 Sample depths reported in Imperial units on the lab certificates; however, depths have been converted to meters for consistency.

Highlight Indicates concentration exceedes Tier I EQS - corase grained.

Highlight Indicates concentration exceedes Tier I EQS - fine grained.

TABLE D-7

Location							BH34	BH35	BH36	24 MW-02	24MW-03	24MW-04	24 MW-05
Sample ID							BH34 0-0.15m	BH35 0-0.15m	BH36 0-0.15m	24 MW-02-SS3 (1.2-1.6m)[2]	24MW-03 SS3	24MW-04 SS1 (0-0.61m)[2]	24 MW-05-SS1 (0-0.58m)[2]
Sample Type							Normal	Normal	Normal	Normal	Normal	Normal	Normal
Date							09 Nov 2023	09 Nov 2023	09 Nov 2023	16 Jan 2024	18 Jan 2024	18 Jan 2024	16 Jan 2024
	Unit	EQL	NS Tier I EQS Soil Commercial Potable Coarse	NS Tier I EQS Soil Commercial Potable Fine	CCME Canada Wide Standards for Petroleum Hydrocarbon Fraction F4 Commercial Coarse	CCME Canada Wide Standards for Petroleum Hydrocarbon Fraction F4 Commercial Fine							
BTEX					-	-							
Benzene	mg/kg	0.005	0.042	0.094	-	-	<0.0079	<0.0075	<0.0057	<0.0050	<0.0050	<0.0050	<0.0050
Toluene	mg/kg	0.05	0.35	0.74	-	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Ethylbenzene	mg/kg	0.015	0.043	0.089	-	-	<0.020	<0.019	<0.015	<0.015	<0.015	<0.015	<0.015
Xylene (o)	mg/kg	0.03	-	-	-	-	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030
Xylene (m & p)	mg/kg	0.03	-	-	-	-	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030
Xylene Total	mg/kg	0.05	0.73	1.5	-	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Petroleum Hydrocarbons (PHCs)					-	-							
VPH (C6-C10 - BTEX)	mg/kg	5	-	-	-	-	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
EPH >C10-C16	mg/kg	5	-	-	-	-	6.8	<5.0	9.6	<5.0	<5.0	<5.0	-
EPH >C16-C21	mg/kg	5	-	-	-	-	27.0	12.8	51.4	<5.0	<5.0	<5.0	-
EPH >C21-C32	mg/kg	5	-	-	-	-	311	152	378	<5.0	<5.0	<5.0	-
Modified TPH (Tier 1)	mg/kg	10	940* 1,800** 10,000***	1,900* 4,700** 10,000***	-	-	345***	165***	439***	<10	<10	<10	-
EPH >C34-C50	mg/kg	20	-	-	3,300	6,600	695	305	482	<20	<20	<20	-
Reached Baseline at C32	-		-	-	-	-	No	No	No	Yes	Yes	Yes	-
Hydrocarbon Resemblance	none		-	-	-	-	LOF	LOF	LOF	N/A	N/A	N/A	-

Environmental Standards

Nova Scotia Environment, October 2022, NS Tier I EQS Soil Commercial Potable Coarse

Nova Scotia Environment, October 2022, NS Tier I EQS Soil Commercial Potable Fine

CCME Canada Wide Standards for Petroleum Hydrocarbon Fraction F4 for a Commercial Property with Coarse-Grained Soils

CCME Canada Wide Standards for Petroleum Hydrocarbon Fraction F4 for a Commercial Property with Fine-Grained Soils

Notes:

LOF - Lube Oil Fraction

*Modified TPH (Gasoline)

**Modified TPH (Fuel Oil)

***Modified TPH (Lube Oil)

1 Concentration considered analytically equilivant to the guidelines.

2 Sample depths reported in Imperial units on the lab certificates; however, depths have been converted to meters for consistency.

Highlight Indicates concentration exceedes Tier I EQS - corase grained.

Highlight Indicates concentration exceedes Tier I EQS - fine grained.

TABLE D-8

	Location	BH 1	BH 2	24 MW-01	BH 9	BH10	BH11		BH12	BH 13	BH14
	Sample ID	BH1 0-0.15m	BH2 0-0.15m	24 MW-01-SS5 (2.4-3.1m)[2]	BH9 0-0.15m	BH10 0-0.15m	BH11 0-0.15m	BH DUPB 0-0.15m	BH12 0-0.15m	BH13 0-0.015m	BH14 0-0.15m
	Sample Type	Local Background			Normal	Normal	Normal	Duplicate	Normal	Normal	Normal
	Date	07 Nov 2023	07 Nov 2023	17 Jan 2024	07 Nov 2023	07 Nov 2023	07 Nov 2023	07 Nov 2023	07 Nov 2023	10 Nov 2023	09 Nov 2023
Unit		EQL	NS Tier I EQS Soil Commercial Potable Coarse	NS Tier I EQS Soil Commercial Potable Fine							
Polycyclic Aromatic Hydrocarbons (PAHs)											
1-Methylnaphthalene	mg/kg	0.01	30	42	<0.010	<0.010	<0.010	0.04	0.014	<0.010	<0.010	<0.010	<0.010	<0.010
2-Methylnaphthalene	mg/kg	0.01	30	42	<0.010	<0.010	<0.010	0.036	0.015	<0.010	<0.010	<0.010	<0.010	<0.010
1 & 2 Methylnaphthalene	mg/kg	0.015	-	-	<0.015	<0.015	<0.015	0.076	0.029	<0.015	<0.015	<0.015	<0.015	<0.015
Acenaphthene	mg/kg	0.005	8,000	8,000	<0.0052	<0.0054	<0.0050	<0.0078	<0.0051	<0.0060	<0.0058	<0.0050	<0.0063	<0.0056
Acenaphthylene	mg/kg	0.005	23	32	<0.0052	<0.0054	<0.0050	0.0171	<0.0051	<0.0060	0.0091	0.0084	0.0342	0.0833
Acridine	mg/kg	0.01	-	-	<0.051	<0.050	<0.010	<0.136	<0.047	<0.052	<0.054	<0.046	<0.014	<0.052
Anthracene	mg/kg	0.004	37,000	37,000	<0.0052	<0.0054	<0.0040	0.0243	0.0108	<0.0104	0.018	0.0069	0.0423	0.0724
Benz(a)anthracene	mg/kg	0.01	12	6.4	<0.010	<0.010	<0.010	0.066	0.033	0.037	0.082	0.013	0.216	0.152
Benzo(a)pyrene	mg/kg	0.01	14	7	<0.010	<0.010	<0.010	0.058	0.028	0.036	0.07	0.014	0.211	0.134
Benzo(b+j)fluoranthene	mg/kg	0.01	-	-	<0.010	<0.010	<0.010	0.09	0.042	0.051	0.098	0.035	0.417	0.356
Benzo(b+j+k)fluoranthene	mg/kg	0.015	1.2	0.64	<0.015	<0.015	<0.015	0.121	0.056	0.072	0.137	0.047	0.588	0.48
Benzo(g,h,i)perylene	mg/kg	0.01	250	130	<0.010	<0.010	<0.010	0.029	0.018	0.02	0.039	0.03	0.099	0.109
Benzo(k)fluoranthene	mg/kg	0.01	-	-	<0.010	<0.010	<0.010	0.031	0.014	0.021	0.039	0.012	0.171	0.124
Chrysene	mg/kg	0.01	78	40	<0.010	<0.010	<0.010	0.066	0.031	0.031	0.067	<0.034	<0.619	0.216
Dibenz(a,h)anthracene	mg/kg	0.005	8.8	4.4	<0.0052	<0.0054	<0.0050	<0.0100	<0.0051	<0.0065	0.0142	0.0055	0.041	0.0343
Fluorene	mg/kg	0.01	4,100	4,100	<0.010	<0.010	<0.010	<0.022	<0.010	<0.017	<0.019	<0.010	0.012	<0.014
Fluoranthene	mg/kg	0.01	5,300	5,300	<0.010	<0.010	<0.010	0.099	0.058	0.06	0.136	0.02	0.551	0.325
Indeno(1,2,3-c,d)pyrene	mg/kg	0.01	98	51	<0.010	<0.010	<0.010	0.035	0.018	0.023	0.046	0.024	0.142	0.149
Naphthalene	mg/kg	0.01	25	28	<0.010	<0.010	<0.010	0.019	0.012	<0.010	<0.010	<0.010	<0.010	<0.010
Perylene	mg/kg	0.01	-	-	<0.010	<0.010	<0.010	0.016	<0.010	0.011	0.02	<0.010	0.048	0.034
Phenanthrene	mg/kg	0.01	17	24	<0.010	<0.010	<0.010	0.065	0.043	0.021	0.029	<0.016	0.202	0.09
Pyrene	mg/kg	0.01	3,200	3,200	<0.010	<0.010	<0.010	0.104	0.056	0.057	0.127	0.023	0.408	0.253
Quinoline	mg/kg	0.01	-	-	<0.068	<0.075	<0.010	<0.090	<0.047	<0.052	<0.091	<0.046	<0.033	<0.055
Index of Additive Cancer Risk (CCME)	-	0.15	1[1]	1[1]	<0.150	<0.150	<0.150	1.18	0.561	0.7	1.41	0.416	5.29	4.14
B(a)P TPE[2]	mg/kg	0.02	5.3	5.3	<0.020	<0.020	<0.020	0.086	0.042	0.053	0.112	0.028	0.351	0.25

Environmental Standards

Nova Scotia Environment, October 2022, NS Tier I EQS Soil Commercial Potable Coarse

Nova Scotia Environment, October 2022, NS Tier I EQS Soil Commercial Potable Fine

Notes:

1) IACR (CCME) - Index of Additive Cancer Risk (as reported by the lab). As no Tier I EQS is available, for comparison purposes, the CCME CEQG has been applied.

2) Sample depths reported in Imperial units on the lab certificates, however, depths have been converted to meters for consistency.

3) B(a)P TPE - Benzo(a)pyrene Total Potency Equivalent (as reported by the lab)

Highlight	Indicates concentration exceedes Tier I EQS - corase grained.
Highlight	Indicates concentration exceedes Tier I EQS - fine grained.
Highlight	Indicates concentration exceedes Tier I EQS - coarse and fine grained.

TABLE D-8

	Location	BH15	BH16	BH17	BH18	BH19	BH20	BH21	BH22	BH23	BH33
	Sample ID	BH15 0-0.15m	BH16 0-0.15m	BH17 0-0.15m	BH18 0-0.15m	BH19 0-0.15m	BH20 0-0.15m	BH21 0-0.15m	BH22 0-0.15m	BH DUPC 0-0.15m	BH33 0-0.15m
	Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
	Date	08 Nov 2023	08 Nov 2023	09 Nov 2023	08 Nov 2023	08 Nov 2023	08 Nov 2023	08 Nov 2023	08 Nov 2023	08 Nov 2023	09 Nov 2023
	Unit	EQL	NS Tier I EQS Soil Commercial Potable Coarse	NS Tier I EQS Soil Commercial Potable Fine							
Polycyclic Aromatic Hydrocarbons (PAHs)											
1-Methylnaphthalene	mg/kg	0.01	30	42	<0.010	<0.010	0.373	0.027	0.082	<0.010	0.014	<0.010	0.086	<0.010
2-Methylnaphthalene	mg/kg	0.01	30	42	<0.010	<0.010	0.411	0.03	0.084	0.01	0.014	<0.010	0.117	<0.010
1 & 2 Methylnaphthalene	mg/kg	0.015	-	-	<0.015	<0.015	0.784	0.057	0.166	<0.015	0.028	<0.015	0.203	<0.015
Acenaphthene	mg/kg	0.005	8,000	8,000	<0.0050	<0.0065	0.0958	<0.0051	0.0167	0.0085	<0.0052	0.0065	<0.0057	<0.0050
Acenaphthylene	mg/kg	0.005	23	32	0.0101	0.043	0.0996	<0.0051	0.021	0.372	0.0571	0.018	<0.0057	0.0079
Acridine	mg/kg	0.01	-	-	<0.031	<0.069	<0.081	<0.052	<0.052	<0.053	<0.055	<0.010	<0.029	<0.053
Anthracene	mg/kg	0.004	37,000	37,000	0.0161	0.0474	0.146	0.0095	0.0463	0.196	0.0577	0.0472	0.0076	0.0086
Benz(a)anthracene	mg/kg	0.01	12	6.4	0.031	0.123	0.524	0.026	0.172	1.2	0.495	0.189	0.034	0.037
Benzo(a)pyrene	mg/kg	0.01	14	7	0.034	0.101	0.343	0.016	0.118	1.16	0.449	0.16	0.047	0.036
Benzo(b+j)fluoranthene	mg/kg	0.01	-	-	0.066	0.174	0.615	0.028	0.244	2.07	1.03	0.254	0.144	0.059
Benzo(b+j+k)fluoranthene	mg/kg	0.015	1.2	0.64	0.091	0.244	0.811	0.028	0.322	2.81	1.33	0.343	0.188	0.083
Benzo(g,h,i)perylene	mg/kg	0.01	250	130	0.022	0.047	0.185	0.011	0.081	0.779	0.54	0.114	0.086	0.029
Benzo(k)fluoranthene	mg/kg	0.01	-	-	0.025	0.07	0.196	<0.010	0.078	0.74	0.304	0.089	0.044	0.024
Chrysene	mg/kg	0.01	78	40	0.04	0.123	0.558	0.023	0.177	1.26	<0.663	0.165	0.067	0.038
Dibenz(a,h)anthracene	mg/kg	0.005	8.8	4.4	0.006	0.018	0.0617	<0.0051	0.025	0.21	0.202	0.0338	0.0154	0.0085
Fluorene	mg/kg	0.01	4,100	4,100	<0.010	<0.025	0.06	<0.010	0.013	<0.041	<0.014	<0.010	<0.010	<0.010
Fluoranthene	mg/kg	0.01	5,300	5,300	0.084	0.27	0.867	0.044	0.314	2.3	1.04	0.315	0.067	0.067
Indeno(1,2,3-c,d)pyrene	mg/kg	0.01	98	51	0.028	0.068	0.227	0.01	0.095	1.02	0.508	0.135	0.092	0.033
Naphthalene	mg/kg	0.01	25	28	<0.010	<0.010	0.267	0.021	0.05	0.043	0.016	<0.010	0.074	<0.010
Perylene	mg/kg	0.01	-	-	<0.010	0.027	0.08	<0.010	0.03	0.348	0.129	0.046	0.011	0.011
Phenanthrene	mg/kg	0.01	17	24	0.034	0.043	0.714	0.069	0.135	0.313	0.13	0.133	0.089	0.02
Pyrene	mg/kg	0.01	3,200	3,200	0.066	0.199	0.853	0.045	0.267	1.97	0.93	0.283	0.058	0.058
Quinoline	mg/kg	0.01	-	-	<0.031	<0.090	<0.081	<0.052	<0.052	<0.053	<0.055	<0.010	<0.061	<0.010
Index of Additive Cancer Risk (CCME)	-	0.15	1[1]	1[1]	0.813	2.34	8.23	0.356	3.09	26.3	12.4	3.44	1.55	0.8
B(a)P TPE[2]	mg/kg	0.02	5.3	5.3	0.056	0.164	0.568	0.026	0.204	1.89	0.893	0.263	0.095	0.06

Environmental Standards

Nova Scotia Environment, October 2022, NS Tier I EQS Soil Commercial Potable Coarse

Nova Scotia Environment, October 2022, NS Tier I EQS Soil Commercial Potable Fine

Notes:

1) IACR (CCME) - Index of Additive Cancer Risk (as reported by the lab). As no Tier I EQS is available, for comparison purposes, the CCME CEQG has been applied.

2) Sample depths reported in Imperial units on the lab certificates, however, depths have been converted to meters for consistency.

3) B(a)P TPE - Benzo(a)pyrene Total Potency Equivalent (as reported by the lab)

Highlight	Indicates concentration exceedes Tier I EQS - corase grained.
Highlight	Indicates concentration exceedes Tier I EQS - fine grained.
Highlight	Indicates concentration exceedes Tier I EQS - coarse and fine grained.

TABLE D-8

			Location	BH34	BH35	BH36	24 MW-02	24MW-03		24MW-04
			Sample ID	BH34 0-0.15m	BH35 0-0.15m	BH36 0-0.15m	24 MW-02-SS3 (1.2-1.6m)[2]	24MW-03 SS1-SS2 (0-1.2m)	24MW-DUP C	24MW-04 SS2 (0-0.64m)
			Sample Type	Normal	Normal	Normal	Normal	Normal	Field_D	Normal
			Date	09 Nov 2023	09 Nov 2023	09 Nov 2023	16 Jan 2024	18 Jan 2024	18 Jan 2024	18 Jan 2024
	Unit	EQL	NS Tier I EQS Soil Commercial Potable Coarse	NS Tier I EQS Soil Commercial Potable Fine						
Polycyclic Aromatic Hydrocarbons (PAHs)										
1-Methylnaphthalene	mg/kg	0.01	30	42	<0.010	<0.010	0.01	<0.010	<0.010	<0.010	<0.010
2-Methylnaphthalene	mg/kg	0.01	30	42	<0.010	<0.010	0.012	<0.010	<0.010	<0.010	<0.010
1 & 2 Methylnaphthalene	mg/kg	0.015	-	-	<0.015	<0.015	0.022	<0.015	<0.015	<0.015	<0.015
Acenaphthene	mg/kg	0.005	8,000	8,000	<0.0069	<0.0086	0.0135	<0.0050	<0.0081	<0.0050	<0.0068
Acenaphthylene	mg/kg	0.005	23	32	<0.0069	0.0086	0.392	<0.0050	<0.0081	<0.0050	<0.0068
Acridine	mg/kg	0.01	-	-	<0.072	<0.010	0.068	<0.010	<0.010	<0.010	<0.010
Anthracene	mg/kg	0.004	37,000	37,000	0.0157	0.0122	0.661	<0.0040	<0.0081	<0.0045	<0.0068
Benz(a)anthracene	mg/kg	0.01	12	6.4	0.045	0.026	2.47	<0.010	<0.010	<0.010	<0.010
Benzo(a)pyrene	mg/kg	0.01	14	7	0.035	0.029	2.37	<0.010	<0.010	<0.010	<0.010
Benzo(b+j)fluoranthene	mg/kg	0.01	-	-	0.073	0.058	4.3	<0.010	<0.010	<0.010	<0.010
Benzo(b+j+k)fluoranthene	mg/kg	0.015	1.2	0.64	0.101	0.079	5.89	<0.015	<0.015	<0.015	<0.015
Benzo(g,h,i)perylene	mg/kg	0.01	250	130	0.033	0.023	1.31	<0.010	<0.010	<0.010	<0.010
Benzo(k)fluoranthene	mg/kg	0.01	-	-	0.028	0.021	1.59	<0.010	<0.010	<0.010	<0.010
Chrysene	mg/kg	0.01	78	40	0.043	0.032	2.9	<0.010	<0.010	<0.010	<0.010
Dibenz(a,h)anthracene	mg/kg	0.005	8.8	4.4	0.0089	<0.0086	0.43	<0.0050	<0.0081	<0.0050	<0.0068
Fluorene	mg/kg	0.01	4,100	4,100	<0.022	<0.030	0.061	<0.010	<0.010	<0.010	<0.010
Fluoranthene	mg/kg	0.01	5,300	5,300	0.076	0.068	5.92	<0.010	<0.010	<0.010	<0.010
Indeno(1,2,3-c,d)pyrene	mg/kg	0.01	98	51	0.036	0.026	1.81	<0.010	<0.010	<0.010	<0.010
Naphthalene	mg/kg	0.01	25	28	<0.010	<0.010	0.02	<0.010	<0.010	<0.010	<0.010
Perylene	mg/kg	0.01	-	-	<0.010	<0.010	0.561	<0.010	<0.010	<0.010	<0.010
Phenanthrene	mg/kg	0.01	17	24	0.045	0.03	1.39	<0.010	<0.010	<0.010	<0.010
Pyrene	mg/kg	0.01	3,200	3,200	0.066	0.051	4.43	<0.010	0.011	<0.010	<0.010
Quinoline	mg/kg	0.01	-	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Index of Additive Cancer Risk (CCME)	-	0.15	1[1]	1[1]	0.94	0.698	54.8	<0.150	<0.150	<0.150	<0.150
B(a)P TPE[2]	mg/kg	0.02	5.3	5.3	0.063	0.047	3.86	<0.020	<0.020	<0.020	<0.020

Environmental Standards

Nova Scotia Environment, October 2022, NS Tier I EQS Soil Commercial Potable Coarse

Nova Scotia Environment, October 2022, NS Tier I EQS Soil Commercial Potable Fine

Notes:

1) IACR (CCME) - Index of Additive Cancer Risk (as reported by the lab). As no Tier I EQS is available, for comparison purposes, the CCME CEQG has been applied.

2) Sample depths reported in Imperial units on the lab certificates, however, depths have been converted to meters for consistency.

3) B(a)P TPE - Benzo(a)pyrene Total Potency Equivalent (as reported by the lab)

Highlight	Indicates concentration exceedes Tier I EQS - corase grained.
Highlight	Indicates concentration exceedes Tier I EQS - fine grained.
Highlight	Indicates concentration exceedes Tier I EQS - coarse and fine grained.

Table D-9

				BH 37	BH 38	BH 39	BH 40	BH 41
				BH 37 0-0.15M	BH 38 0-0.15M	BH 39 0-0.15M	BH 40 0-0.15M	BH 41 0-0.15M
				Normal	Normal	Normal	Normal	Normal
				0-0.15m	0-0.15m	0-0.15m	0-0.15m	0-0.15m
				19 Jan 2024	19 Jan 2024	19 Jan 2024	19 Jan 2024	20 Jan 2024
	Unit	EQL	Health Canada Draft Guidelines, Screening Values and Interim Toxicological Reference Values (TRVs) for Energetic Chemicals and Perchlorate, Commercial SSV (2022)					
Energetics								
1,3,5-Trinitrobenzene	**mg/kg**	0.05	**1800**	<0.050	<0.050	<0.120	<0.750	<0.050
1,3-Dinitrobenzene	**mg/kg**	0.05	-	<0.050	<0.050	<0.050	<0.050	<0.050
2,4,6-Trinitrotoluene (TNT)	**mg/kg**	0.05	**10**	<0.050	<0.050	<0.050	<0.050	<0.050
2,4-Dinitrotoluene	**mg/kg**	0.05	**55**	<0.050	<0.050	<0.050	<0.050	<0.050
2,6-Dinitrotoluene	**mg/kg**	0.05	**10**	<0.050	<0.050	<0.050	<0.050	<0.050
2-Amino-4,6-Dinitrotoluene	**mg/kg**	0.05	-	<0.050	<0.050	<0.050	<0.050	<0.050
2-Nitrotoluene	**mg/kg**	0.05	-	<0.050	<0.050	<0.050	<0.050	<0.050
4-Amino-2,6-Dinitrotoluene	**mg/kg**	0.05	-	<0.050	<0.050	<0.050	<0.050	<0.050
4-Nitrotoluene	**mg/kg**	0.05	-	<0.050	<0.050	<0.050	<0.050	<0.050
HMX	**mg/kg**	0.05	**3,100**	<0.050	<0.050	<0.050	<0.050	<0.050
m-Nitrotoluene	**mg/kg**	0.05	-	<0.050	<0.050	<0.050	<0.050	<0.050
Nitrobenzene	**mg/kg**	0.05	**76**	<0.050	<0.050	<0.050	<0.050	<0.050
Nitroglycerine	**mg/kg**	0.1	-	<0.10	<0.10	<0.10	<0.10	<0.10
PETN	**mg/kg**	0.1	**430**	<0.10	<0.10	<0.10	<0.10	<0.10
RDX	**mg/kg**	0.05	**250**	<0.050	<0.050	<0.050	<0.050	<0.050
Tetryl	**mg/kg**	0.05	-	<0.050	<0.050	<0.050	<0.050	<0.050
3,5-Dinitroaniline	**mg/kg**	0.05	-	<0.050	<0.050	<0.050	<0.050	<0.050

Environmental Standards
Health Canada Draft Guidelines, Screening Values and Interim Toxicological Reference Values (TRVs) for Energetic Chemicals and Perchlorate, Commercial Soil Screening Values (SSVs) (2022)

TABLE D-10

23-6465

Field ID				24MW-01 Background		24MW-02	24MW-03	24MW-04	24MW-05
Sample Type				Normal	Duplicate	Normal	Normal	Normal	Normal
Date				19 Jan 2024	19 Jan 2024	18 Jan 2024	20 Jan 2024	20 Jan 2024	19 Jan 2024
	Unit	EQL	2022 NS Tier I EQS (Commercial, Potable, Fine/Coarse)						
Calculated Parameters									
Anions Total (filtered)	meq/L	0.1	-	0.28	0.29	0.43	0.48	0.39	0.42
Cations Total (filtered)	meq/L	0.1	-	0.39	0.39	0.41	0.45	0.37	0.42
Ionic Balance (filtered)	%	0.01	-	139	134	95.3	93.8	94.9	100
Langelier Index (@ 20C)	N/A	0.01	-	-4.33	-4.43	Incalculable	-2.78	-2.78	-3.99
Langelier Index (@ 4C)	N/A	0.01	-	-4.58	-4.68	Incalculable	-3.03	-3.03	-4.25
Saturation pH (@ 4C)	N/A	0.01	-	11.0	11.0	Incalculable	10.0	10.2	10.5
Saturation pH (@ 20C)	N/A	0.01	-	10.7	10.7	Incalculable	9.76	9.93	10.3
General Chemistry									
Carbonate	mg/L	1	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity (total)	mg/L	1	-	5.0	5.4	10.8	11.9	8.9	10.7
Bicarbonate	mg/L	1	-	6.1	6.6	13.2	14.5	10.9	13.0
Hardness as CaCO3 (Measured)	mg/L	0.5	-	-	-	-	-	-	-
Ammonia as N	mg/L	0.005	-	0.0066	0.0054	0.0328	0.0113	0.0296	0.0230
Total Organic Carbon (TOC)	mg/L	0.5	-	2.14	1.82	4.65	2.27	2.55	2.04
Ortho Phosphate as P (filtered)	mg/L	0.001	-	<0.0010	<0.0010	0.0299	<0.0010	<0.0010	<0.0010
Phosphorus (filtered)	mg/L	0.05	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Fluoride	mg/L	0.02	-	<0.020	<0.020	0.100	0.026	0.026	0.024
Chloride (filtered)	mg/L	0.5	250	5.26	5.24	5.12	7.11	5.46	5.34
Color	CU	2.0	-	112	117	258	30.8	13.9	302
Electrical Conductivity (Lab)	µS/cm	1	-	33.5	34.6	49.1	53.3	45.3	48.6
Hydroxide	mg/L	1	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Nitrate (as N)	mg/L	0.02	-	<0.020	<0.020	0.025	<0.020	<0.020	<0.020
Nitrite (as N)	mg/L	0.01	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Nitrite + Nitrate as N	mg/L	0.0224	-	<0.0224	<0.0224	0.0250	<0.0224	<0.0224	<0.0224
pH (Lab)	pH Units	0.1	-	6.40	6.28	6.36	6.98	7.15	6.29
Sulphate (filtered)	mg/L	0.3	-	1.68	1.65	2.88	1.84	2.54	2.82
Total Dissolved Solids (TDS) - Measured	mg/L	10	-	26	27	85	31	31	44
Turbidity	NTU	0.1	-	6.38	6.33	109	3.62	2.25	35.0
Metals									
Aluminium (filtered) [1]	mg/L	0.001	0.1	0.0564	0.0558	0.167	0.0458	0.0826	0.0312
Antimony (filtered)	mg/L	0.0001	0.006	<0.00010	<0.00010	<0.00010	<0.00010	0.00040	<0.00010
Arsenic (filtered)	mg/L	0.0001	0.01	0.00013	0.00014	0.0422	0.0296	0.00173	0.0272
Barium (filtered)	mg/L	0.0001	1	0.00698	0.00714	0.00023	0.0100	0.0144	0.00367
Beryllium (filtered)	mg/L	0.00002	0.004	0.000036	0.000035	0.000038	0.000033	0.000064	0.000059
Bismuth (filtered)	mg/L	0.00005	-	<0.000050	<0.000050	<0.000050	0.000320	<0.000050	<0.000050
Boron (filtered)	mg/L	0.01	5	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Cadmium (filtered)	mg/L	0.000005	0.005	0.0000317	0.0000334	<0.0000050	0.000176	0.0000941	0.0000559
Calcium (filtered)	mg/L	0.05	-	0.725	0.702	<0.050	2.86	2.60	0.978
Chromium (Total, III+VI) (filtered)	mg/L	0.0005	0.05	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Cobalt (filtered)	mg/L	0.0001	0.0038	0.00453	0.00449	<0.00010	0.00336	0.00090	0.00650
Copper (filtered)	mg/L	0.0002	2	0.0102	0.0104	0.00428	0.00695	0.00262	0.00162
Iron (filtered)	mg/L	0.01	0.3	3.79	3.84	0.063	0.245	0.080	0.509
Lead (filtered)	mg/L	0.00005	0.005	<0.000050	<0.000050	0.00222	0.000674	0.000099	0.000219
Magnesium (filtered)	mg/L	0.005	-	0.429	0.418	0.0171	1.01	0.682	0.294
Manganese (filtered)	mg/L	0.0001	0.12	0.556	0.543	0.00138	0.315	0.0452	0.190
Mercury (filtered)	mg/L	0.000005	0.001	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.0000110	0.0000357
Molybdenum (filtered)	mg/L	0.00005	0.07	0.000294	0.000270	0.000382	0.000730	0.000062	0.000809
Nickel (filtered)	mg/L	0.0005	0.1	0.00334	0.00332	<0.00050	0.00322	0.00258	0.00405
Silica (SiO2) (filtered)	mg/L	0.11	-	3.74	3.70	7.68	4.38	3.72	5.07
Potassium (filtered)	mg/L	0.05	-	0.616	0.612	0.247	0.885	1.30	0.727
Selenium (filtered)	mg/L	0.00005	0.05	0.000056	0.000053	0.000163	<0.000050	0.000066	0.000060
Cesium (filtered)	mg/L	0.00001	-	0.000023	0.000021	0.000014	0.000177	0.000176	0.000035
Rubidium (filtered)	mg/L	0.0002	-	0.00212	0.00208	0.00058	0.00303	0.00413	0.00192
Tellurium (filtered)	mg/L	0.0002	-	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Thorium (filtered)	mg/L	0.0001	-	<0.00010	<0.00010	0.00012	<0.00010	<0.00010	<0.00010
Tungsten (filtered)	mg/L	0.0001	-	0.0103	0.0100	0.00631	0.00619	0.0186	0.00418
Lithium (filtered)	mg/L	0.001	-	0.0014	0.0013	0.0030	0.0035	0.0016	0.0017
Silver (filtered)	mg/L	0.00001	-	<0.000010	<0.000010	0.000017	<0.000010	<0.000010	<0.000010
Silicon (filtered)	mg/L	0.05	-	1.75	1.73	3.59	2.05	1.74	2.37
Sodium (filtered)	mg/L	0.05	200	3.29	3.24	8.81	3.93	3.07	6.76
Strontium (filtered)	mg/L	0.0002	2.4	0.00782	0.00745	0.00036	0.0102	0.0195	0.00972
Sulphur as S (filtered)	mg/L	0.5	-	0.60	0.60	1.00	0.64	0.90	1.04
Titanium (filtered)	mg/L	0.0003	-	<0.00030	<0.00030	0.00115	0.00051	0.00057	<0.00030

23-6465

TABLE D-10

				Field ID	**24MW-01 Background**		**24MW-02**	**24MW-03**	**24MW-04**	**24MW-05**
				Sample Type	**Normal**	**Duplicate**	**Normal**	**Normal**	**Normal**	**Normal**
				Date	**19 Jan 2024**	**19 Jan 2024**	**18 Jan 2024**	**20 Jan 2024**	**20 Jan 2024**	**19 Jan 2024**
	Unit	EQL	2022 NS Tier I EQS (Commercial, Potable, Fine/Coarse)							
Calculated Parameters										
Anions Total (filtered)	**meq/L**	0.1	-		0.28	0.29	0.43	0.48	0.39	0.42
Cations Total (filtered)	**meq/L**	0.1	-		0.39	0.39	0.41	0.45	0.37	0.42
Thallium (filtered)	**mg/L**	0.00001	0.002		0.000013	0.000012	<0.000010	0.000015	0.000014	0.000016
Tin (filtered)	**mg/L**	0.0001	2.4		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Uranium (filtered)	**mg/L**	0.00001	0.02		0.000082	0.000076	0.00417	0.000214	0.000150	0.000176
Vanadium (filtered)	**mg/L**	0.0005	0.0062		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Zinc (filtered)	**mg/L**	0.001	5		0.0237	0.0238	0.0016	0.0255	0.0125	0.0099
Zirconium (filtered)	**mg/L**	0.0002	-		<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020

Environmental Standards

Nova Scotia Environment and Climate Change, October 2022, NS Tier I EQS Commercial Potable Fine/Coarse

Notes

Highlight Indicates concentration exceeds Tier I EQS

1 The Tier 1 EQS (0.1 mg/L) is based on the Health Canada Canadian Drinking Water Quality Guideline for aluminum, which is an operational guidance value related to the use of aluminum-based coagulants at water treatment plants. Therefore, this guideline is not applicable to monitoring wells. However, has been included for comparison purposes only.

TABLE D-11

			Sample ID	24MW-01 Local Background		24MW-02	24MW-03	24MW-04	24MW-05
			Sample Type	Normal	Duplicate 24MW-DUPA	Normal	Normal	Normal	Normal
			Date	19 Jan 2024	19 Jan 2024	18 Jan 2024	20 Jan 2024	20 Jan 2024	19 Jan 2024
	Unit	EQL	NS Tier I EQS Commercial (potable,Fine/Coarse grained)						
BTEX									
Benzene	mg/L	0.0005	**0.005**	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Toluene	mg/L	0.0005	**0.024**	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Ethylbenzene	mg/L	0.0005	**0.0016**	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Xylene (o)	mg/L	0.0003	-	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Xylene (m & p)	mg/L	0.0004	-	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene Total	mg/L	0.0005	**0.02**	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Petroleum Hydrocarbons (PHCs)									
VPH (C6-C10 - BTEX)	mg/L	0.025	-	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
EPH >C10-C16	mg/L	0.05	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
EPH >C16-C21	mg/L	0.05	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
EPH >C21-C32	mg/L	0.05	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
EPH >C34-C50	mg/L	0.10	-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Modified TPH (Tier 1)	mg/L	0.09	**4.4*** **3.2**** **7.8*****	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090
Reached Baseline at C32	-		-	Yes	Yes	Yes	Yes	Yes	Yes
Hydrocarbon Resemblance	none		-	N/A	N/A	N/A	N/A	N/A	N/A

Environmental Standards

Nova Scotia Environment and Climate Change, October 2022, NS Tier I EQS Commercial Potable Fine/Coarse

Notes

* Modified TPH (Gasoline)

** Modified TPH (Fuel Oil)

** Modified TPH (Lube Oil)

Highlight Indicates concentration exceeds Tier I EQS

TABLE D-12

			Sample ID	24MW-01	24MW-DUPA	24MW-02	24MW-03	24MW-04	24MW-05
			Sample Type	Normal	Duplicate of 24MW-01	Normal	Normal	Normal	Normal
			Date	19 Jan 2024	19 Jan 2024	18 Jan 2024	20 Jan 2024	20 Jan 2024	19 Jan 2024
	Unit	EQL	2022 NS Tier I EQS (Commercial, Potable,						
Polycyclic Aromatic Hydrocarbons (PAHs)									
1-Methylnaphthalene	mg/L	0.00001	0.012	<0.000010	<0.000010	0.000013	<0.000010	<0.000010	<0.000010
2-Methylnaphthalene	mg/L	0.00001	0.012	<0.000010	<0.000010	0.000020	<0.000010	<0.000010	<0.000010
1 & 2 Methylnaphthalene	mg/L	0.000015	-	<0.000015	<0.000015	0.000033	<0.000015	<0.000015	<0.000015
Acenaphthene	mg/L	0.00001	1.4	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Acenaphthylene	mg/L	0.00001	0.0045	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Acridine	mg/L	0.00001	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Anthracene	mg/L	0.00001	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Benz(a)anthracene	mg/L	0.00001	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Benzo(a)pyrene	mg/L	0.000005	0.00004	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000080	<0.0000050
Benzo(b+j)fluoranthene	mg/L	0.00001	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Benzo(b+j+k)fluoranthene	mg/L	0.000015	-	<0.000015	<0.000015	<0.000015	<0.000015	<0.000015	<0.000015
Benzo(g,h,i)perylene	mg/L	0.00001	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Benzo(k)fluoranthene	mg/L	0.00001	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Chrysene	mg/L	0.00001	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Dibenz(a,h)anthracene	mg/L	0.000005	-	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Fluorene	mg/L	0.00001	0.94	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Fluoranthene	mg/L	0.00001	-	<0.000010	<0.000010	<0.000010	<0.000010	0.000014	<0.000010
Indeno(1,2,3-c,d)pyrene	mg/L	0.00001	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Naphthalene	mg/L	0.00001	0.47	<0.000010	<0.000010	0.000015	<0.000010	<0.000010	<0.000010
Perylene	mg/L	0.00001	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Phenanthrene	mg/L	0.00001	-	<0.000010	<0.000010	<0.000010	<0.000010	0.000019	<0.000010
Pyrene	mg/L	0.00001	0.71	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Quinoline	mg/L	0.00001	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
B(A)P TPE	mg/L	0.00001	0.00004	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010

Environmental Standards

Nova Scotia Environment and Climate Change, October 2022, NS Tier Commercial, Potable, Fine/Coarse

Notes

Highlight	Indicates concentration exceeds Tier I EQS

Table D-13

		Sample ID	SW4	SW DUP B					
		Sample Type	Normal	Field Duplicate	5 x the RDL	Absolute Difference b/w Parent and Duplicate	2 x the RDL	Relative Percent Difference	QC Result
		Date	06 Nov 2023	06 Nov 2023					
	Unit	RDL							
Polycyclic Aromatic Hydrocarbons (PAHs)									
1-Methylnaphthalene	mg/L	0.000010	<0.000010	<0.000010	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
2-methylnaphthalene	mg/L	0.000010	<0.000010	<0.000010	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
1 & 2 Methylnaphthalene	mg/L	0.000015	<0.000015	<0.000015	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Acenaphthene	mg/L	0.000010	<0.000010	<0.000010	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Acenaphthylene	mg/L	0.000010	<0.000010	<0.000010	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Acridine	mg/L	0.000010	<0.000010	<0.000010	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Anthracene	mg/L	0.000010	<0.000010	<0.000010	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Benz(a)anthracene	mg/L	0.000010	<0.000010	<0.000010	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Benzo(a)pyrene	mg/L	0.000005	<0.0000050	<0.0000050	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Benzo(b+j)fluoranthene	mg/L	0.000010	<0.000010	<0.000010	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Benzo(b+j+k)fluoranthene	mg/L	0.000015	<0.000015	<0.000015	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Benzo(g,h,i)perylene	mg/L	0.000010	<0.000010	<0.000010	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Benzo(k)fluoranthene	mg/L	0.000010	<0.000010	<0.000010	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Chrysene	mg/L	0.000010	<0.000010	<0.000010	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Dibenz(a,h)anthracene	mg/L	0.000005	<0.0000050	<0.0000050	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Fluorene	mg/L	0.000010	<0.000010	<0.000010	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Fluoranthene	mg/L	0.000010	<0.000010	<0.000010	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Indeno(1,2,3-c,d)pyrene	mg/L	0.000010	<0.000010	<0.000010	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Naphthalene	mg/L	0.000010	<0.000010	<0.000010	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Perylene	mg/L	0.000010	<0.000010	<0.000010	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Phenanthrene	mg/L	0.000010	<0.000010	<0.000010	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Pyrene	mg/L	0.000010	<0.000010	<0.000010	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Quinoline	mg/L	0.000010	<0.000010	<0.000010	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
B(A)P TPE	mg/L	0.000010	<0.000010	<0.000010	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated

Comments:
Where either parent and field duplicate sample concentrations are less than 5X the RDL, then the absolute difference in values is shown. The difference is acceptable if it is less than 2X the RDL.
Relative percent difference (RPD) is only considered where parent and duplicate sample concentrations are both greater than 5X the RDL. The RPD is considered acceptable if it is within the industry accepted ranges for metals in soil (as detailed in
RPD = ((parent result - duplicate result)/((parent result + duplicate result)/2)) *100
QC calculations and results have been evaulated in accordance of the Guidance Manual for Environmental Site Characterization in Support of Environmental and Human Health Risk Assessment (CCME, 2016).
BOLD value indicates the value which the acceptance criteria is based on (i.e. absolute difference or RPD).

Table D-14

	Sample ID	SED3	SED-DUPA					
	Sample Type	Normal	Field Duplicate	5 x the RDL	Absolute Difference b/w Parent and Duplicate	2 x the RDL	Relative Percent Difference	QC Result
	Date	06 Nov 2023	06 Nov 2023					
	Unit	RDL						
Metals								
Aluminium	mg/kg	50	19,300	18,900	250	Both Samples >5x RDL	Not Calculated	2%	Acceptable
Antimony	mg/kg	0.1	0.44	1.6	0.5	1.16	0.2	Not Calculated	Unacceptable
Arsenic	mg/kg	2	1,440	5,120	10	Both Samples >5x RDL	Not Calculated	112%	Unacceptable
Barium	mg/kg	0.5	113	254	2.5	Both Samples >5x RDL	Not Calculated	77%	Unacceptable
Beryllium	mg/kg	0.1	1.1	1.11	0.5	Both Samples >5x RDL	Not Calculated	1%	Acceptable
Boron	mg/kg	5.0	<5.0	<5.0	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Cadmium	mg/kg	0.02	0.098	0.186	0.1	0.088	0.04	Not Calculated	Unacceptable
Chromium (Total, III+VI)	mg/kg	0.5	38.7	34.1	2.5	Both Samples >5x RDL	Not Calculated	13%	Acceptable
Cobalt	mg/kg	0.1	67.3	120	0.5	Both Samples >5x RDL	Not Calculated	56%	Acceptable
Copper	mg/kg	0.5	10.3	11.8	2.5	Both Samples >5x RDL	Not Calculated	14%	Acceptable
Iron	mg/kg	50	37,800	42,700	250	Both Samples >5x RDL	Not Calculated	12%	Acceptable
Lead	mg/kg	0.5	74.4	124	2.5	Both Samples >5x RDL	Not Calculated	50%	Acceptable
Manganese	mg/kg	1.0	3,950	6,270	5	Both Samples >5x RDL	Not Calculated	45%	Acceptable
Mercury	mg/kg	0.005	0.314	0.616	0.025	Both Samples >5x RDL	Not Calculated	65%	Unacceptable
Molybdenum	mg/kg	0.1	0.91	1.41	0.5	Both Samples >5x RDL	Not Calculated	43%	Acceptable
Nickel	mg/kg	0.5	17.1	16.3	2.5	Both Samples >5x RDL	Not Calculated	5%	Acceptable
Selenium	mg/kg	0.2	0.28	0.41	1	0.13	0.4	Not Calculated	Acceptable
Silver	mg/kg	0.1	<0.10	0.12	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Strontium	mg/kg	0.5	2.65	3.91	2.5	Both Samples >5x RDL	Not Calculated	38%	Acceptable
Sulphur as S	mg/kg	1,000	<1,000	<1,000	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Thallium	mg/kg	0.05	0.377	0.593	0.25	Both Samples >5x RDL	Not Calculated	45%	Acceptable
Tin	mg/kg	2	<2.0	6.7	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Uranium	mg/kg	0.05	1.23	1.26	0.25	Both Samples >5x RDL	Not Calculated	2%	Acceptable
Vanadium	mg/kg	0.2	49.9	47.6	1	Both Samples >5x RDL	Not Calculated	5%	Acceptable
Zinc	mg/kg	2	88.7	89.6	10	Both Samples >5x RDL	Not Calculated	1%	Acceptable

Comments:
Where either parent and field duplicate sample concentrations are less than 5X the RDL, then the absolute difference in values is shown. The difference is acceptable if it is less than 2X the RDL.

Relative percent difference (RPD) is only considered where parent and duplicate sample concentrations are both greater than 5X the RDL. The RPD is considered acceptable if it is within the industry accepted ranges for metals in soil (as detailed in the report).
RPD = ((parent result - duplicate result)/((parent result + duplicate result)/2)) *100
QC calculations and results have been evaulated in accordance of the Guidance Manual for Environmental Site Characterization in Support of Environmental and Human Health Risk Assessment (CCME, 2016).
BOLD value indicates the value which the acceptance criteria is based on (i.e. absolute difference or RPD).

Table D-15

		Sample ID	BH11 0-0.15m	BHDUPB 0-0.15m					
		Sample Type	Normal	Field Duplicate	5 x the RDL	Absolute Difference b/w Parent and Duplicate	2 x the RDL	Relative Percent Difference	QC Result
		Date	07 Nov 2023	07 Nov 2023					
	Unit	RDL							
Reached Baseline at C50	-		1*	1*					
BTEX									
Benzene	mg/kg	0.005	<0.0056	<0.0050	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Toluene	mg/kg	0.050	<0.050	<0.050	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Ethylbenzene	mg/kg	0.015	<0.015	<0.015	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Xylene (o)	mg/kg	0.030	<0.030	<0.030	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Xylene (m & p)	mg/kg	0.030	<0.030	<0.030	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Xylene Total	mg/kg	0.050	<0.050	<0.050	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Petroleum Hydrocarbons (PHCs)									
VPH (C6-C10 - BTEX)	mg/kg	5	5.4	<5.0	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
EPH >C10-C16	mg/kg	5	<5.0	<5.0	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
EPH >C16-C21	mg/kg	5	12.2	12.1	25	0.1	10	Not Calculated	Acceptable
EPH >C21-C32	mg/kg	5	231	205	25	Both Samples >5x RDL	Not Calculated	12%	Acceptable
Modified TPH (Tier 1)	mg/kg	10	249.00	217.00	50	Both Samples >5x RDL	Not Calculated	14%	Acceptable
EPH >C34-C50	mg/kg	20	285	272	100	Both Samples >5x RDL	Not Calculated	5%	Acceptable

Comments:

Where either parent and field duplicate sample concentrations are less than 5X the RDL, then the absolute difference in values is shown. The difference is acceptable if it is less than 2X the RDL.

the report).

RPD = ((parent result - duplicate result)/((parent result + duplicate result)/2)) *100

QC calculations and results have been evaulated in accordance of the Guidance Manual for Environmental Site Characterization in Support of Environmental and Human Health Risk Assessment (CCME, 2016).

BOLD value indicates the value which the acceptance criteria is based on (i.e. absolute difference or RPD).

1* No

Table D-15

			Sample ID	BH11 0-0.15m	BHDUPB 0-0.15m					
			Sample Type	Normal	Field Duplicate	5 x the RDL	Absolute Difference b/w Parent and Duplicate	2 x the RDL	Relative Percent Difference	QC Result
			Date	07 Nov 2023	07 Nov 2023					
		Unit	RDL							
	Reached Baseline at C50	-		1[#]	1[#]					
BTEX										
	Benzene	**mg/kg**	0.005	<0.0050	<0.0050	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
	Toluene	**mg/kg**	0.050	<0.050	<0.050	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
	Ethylbenzene	**mg/kg**	0.015	<0.015	<0.015	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
	Xylene (o)	**mg/kg**	0.030	<0.030	<0.030	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
	Xylene (m & p)	**mg/kg**	0.030	<0.030	<0.030	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
	Xylene Total	**mg/kg**	0.050	<0.050	<0.050	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Petroleum Hydrocarbons (PHCs)										
	VPH (C6-C10 - BTEX)	**mg/kg**	5	<5.0	<5.0	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
	EPH >C10-C16	**mg/kg**	5	<5.0	<5.0	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
	EPH >C16-C21	**mg/kg**	5	<5.0	<5.0	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
	EPH >C21-C32	**mg/kg**	5	<5.0	<5.0	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
	Modified TPH (Tier 1)	**mg/kg**	10	<10	<10	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
	EPH >C34-C50	**mg/kg**	20	<20	<20	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated

Comments:

Where either parent and field duplicate sample concentrations are less than 5X the RDL, then the absolute difference in values is shown. The difference is acceptable if it is less than 2X the RDL.

Relative percent difference (RPD) is only considered where parent and duplicate sample concentrations are both greater than 5X the RDL. The RPD is considered acceptable if it is within the industry accepted ranges for metals in soil (as detailed in the report).

RPD = ((parent result - duplicate result)/((parent result + duplicate result)/2)) *100

QC calculations and results have been evaulated in accordance of the Guidance Manual for Environmental Site Characterization in Support of Environmental and Human Health Risk Assessment (CCME, 2016).

BOLD value indicates the value which the acceptance criteria is based on (i.e. absolute difference or RPD).

1[#] Yes

Table D - 15

	Unit	RDL	Sample ID: BH6 0-0.15m Sample Type: Normal Date: 07 Nov 2023	Sample ID: BH DUPA 0-0.15m Sample Type: Field Duplicate Date: 07 Nov 2023	5 x the RDL	Absolute Difference b/w Parent and Duplicate	2 x the RDL	Relative Percent Difference	QC Result
Metals									
Aluminium	**mg/kg**	50	6610	6940	250	Both Samples >5x RDL	Not Calculated	5%	Acceptable
Antimony	**mg/kg**	0.1	0.3	0.4	0.5	0.03	0.2	Not Calculated	Acceptable
Arsenic	**mg/kg**	0.1	51.9	52.9	0.5	Both Samples >5x RDL	Not Calculated	2%	Acceptable
Barium	**mg/kg**	0.5	175	177	2.5	Both Samples >5x RDL	Not Calculated	1%	Acceptable
Beryllium	**mg/kg**	0.1	4.2	3.4	0.5	Both Samples >5x RDL	Not Calculated	21%	Acceptable
Boron	**mg/kg**	5.0	<5.0	<5.0	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Cadmium	**mg/kg**	0.02	2.6	1.8	0.1	Both Samples >5x RDL	Not Calculated	40%	Acceptable
Chromium (Total, III+VI)	**mg/kg**	0.5	3.1	3.2	2.5	Both Samples >5x RDL	Not Calculated	5%	Acceptable
Cobalt	**mg/kg**	0.1	2.0	2.0	0.5	Both Samples >5x RDL	Not Calculated	3%	Acceptable
Copper	**mg/kg**	0.5	12.3	13.1	2.5	Both Samples >5x RDL	Not Calculated	6%	Acceptable
Iron	**mg/kg**	50.0	3700	3240	250	Both Samples >5x RDL	Not Calculated	13%	Acceptable
Lead	**mg/kg**	0.5	99	118	2.5	Both Samples >5x RDL	Not Calculated	17%	Acceptable
Manganese	**mg/kg**	1.0	313	257	5	Both Samples >5x RDL	Not Calculated	20%	Acceptable
Mercury	**mg/kg**	0.005	0.2	0.3	0.025	Both Samples >5x RDL	Not Calculated	43%	Acceptable
Molybdenum	**mg/kg**	0.1	1.1	0.8	0.5	Both Samples >5x RDL	Not Calculated	28%	Acceptable
Nickel	**mg/kg**	0.5	5.3	4.8	2.5	Both Samples >5x RDL	Not Calculated	10%	Acceptable
Selenium	**mg/kg**	0.2	4.0	3.4	1	Both Samples >5x RDL	Not Calculated	15%	Acceptable
Silver	**mg/kg**	0.1	0.2	0.3	0.5	0.04	0.2	Not Calculated	Acceptable
Strontium	**mg/kg**	0.5	73.4	69.6	2.5	Both Samples >5x RDL	Not Calculated	5%	Acceptable
Sulphur as S	**mg/kg**	1,000	3900	3500	5000	400	2000	Not Calculated	Acceptable
Thallium	**mg/kg**	0.05	<0.050	<0.050	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Tin	**mg/kg**	2	<2.0	<2.0	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Uranium	**mg/kg**	0.05	27.7	20.6	0.25	Both Samples >5x RDL	Not Calculated	29%	Acceptable
Vanadium	**mg/kg**	0.20	3.5	3.9	1	Both Samples >5x RDL	Not Calculated	13%	Acceptable
Zinc	**mg/kg**	2	109	108	10	Both Samples >5x RDL	Not Calculated	1%	Acceptable

Comments:
Where either parent and field duplicate sample concentrations are less than 5X the RDL, then the absolute difference in values is shown. The difference is acceptable if it is less than 2X the RDL.

Relative percent difference (RPD) is only considered where parent and duplicate sample concentrations are both greater than 5X the RDL. The RPD is considered acceptable if it is within the industry accepted ranges for metals in soil (as detailed in the report).
RPD = ((parent result - duplicate result)/((parent result + duplicate result)/2)) *100
QC calculations and results have been evaulated in accordance of the Guidance Manual for Environmental Site Characterization in Support of Environmental and Human Health Risk Assessment (CCME, 2016).
BOLD value indicates the value which the acceptance criteria is based on (i.e. absolute difference or RPD).

Table D-15

		Sample ID	BH11 0-0.15m	BH DUPB 0-0.15m					
		Sample Type	Normal	Field Duplicate	5 x the RDL	Absolute Difference b/w	2 x the RDL	Relative Percent Difference	QC Result
		Date	07 Nov 2023	07 Nov 2023					
	Unit	RDL							
Metals									
Aluminium	mg/kg	50	16000	21300	250	Both Samples >5x RD	Not Calculated	28%	Acceptable
Antimony	mg/kg	0.1	1.5	1.9	0.5	Both Samples >5x RD	Not Calculated	25%	Acceptable
Arsenic	mg/kg	0.1	808	1270	0.5	Both Samples >5x RD	Not Calculated	44%	Acceptable
Barium	mg/kg	0.5	49	73	2.5	Both Samples >5x RD	Not Calculated	39%	Acceptable
Beryllium	mg/kg	0.1	0.9	1.2	0.5	Both Samples >5x RD	Not Calculated	28%	Acceptable
Boron	mg/kg	5.0	<5.0	<5.0	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Cadmium	mg/kg	0.02	0.108	0.153	0.1	Both Samples >5x RD	Not Calculated	34%	Acceptable
Chromium (Total, III+VI	mg/kg	0.5	23	29	2.5	Both Samples >5x RD	Not Calculated	24%	Acceptable
Cobalt	mg/kg	0.1	6.7	8.7	0.5	Both Samples >5x RD	Not Calculated	26%	Acceptable
Copper	mg/kg	0.5	24	33	2.5	Both Samples >5x RD	Not Calculated	32%	Acceptable
Iron	mg/kg	50.0	24900	31800	250	Both Samples >5x RD	Not Calculated	24%	Acceptable
Lead	mg/kg	0.5	107	138	2.5	Both Samples >5x RD	Not Calculated	25%	Acceptable
Manganese	mg/kg	1.0	532	690	5	Both Samples >5x RD	Not Calculated	26%	Acceptable
Mercury	mg/kg	0.005	6.2	7.8	0.025	Both Samples >5x RD	Not Calculated	24%	Acceptable
Molybdenum	mg/kg	0.1	1.1	1.4	0.5	Both Samples >5x RD	Not Calculated	25%	Acceptable
Nickel	mg/kg	0.5	12	16	2.5	Both Samples >5x RD	Not Calculated	27%	Acceptable
Selenium	mg/kg	0.2	0.7	0.8	1	0.11	0.4	Not Calculated	Acceptable
Silver	mg/kg	0.1	0.19	0.39	0.5	0.2	0.2	Not Calculated	Unacceptable
Strontium	mg/kg	0.5	4.2	4.4	2.5	Both Samples >5x RD	Not Calculated	3%	Acceptable
Sulphur as S	mg/kg	1,000	<1,000	<1,000	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Thallium	mg/kg	0.05	0.235	0.270	0.25	0.035	0.1	Not Calculated	Acceptable
Tin	mg/kg	2	5.0	5.7	10	0.7	4	Not Calculated	Acceptable
Uranium	mg/kg	0.05	2.5	3.1	0.25	Both Samples >5x RD	Not Calculated	25%	Acceptable
Vanadium	mg/kg	0.20	29	37	1	Both Samples >5x RD	Not Calculated	22%	Acceptable
Zinc	mg/kg	2	82	108	10	Both Samples >5x RD	Not Calculated	27%	Acceptable

Comments:

Where either parent and field duplicate sample concentrations are less than 5X the RDL, then the absolute difference in values is shown. The difference is acceptable if it is less than 2X the RDL.

Relative percent difference (RPD) is only considered where parent and duplicate sample concentrations are both greater than 5X the RDL. The RPD is considered acceptable if it is within the industry accepted ranges

RPD = ((parent result - duplicate result)/((parent result + duplicate result)/2)) *100

QC calculations and results have been evaulated in accordance of the Guidance Manual for Environmental Site Characterization in Support of Environmental and Human Health Risk Assessment

BOLD value indicates the value which the acceptance criteria is based on (i.e. absolute difference or RPD).

Table D-15

		Unit	RDL	Sample ID: BH23 0-0.15m Sample Type: Normal Date: 08 Nov 2023	Sample ID: BH DUPC 0-0.15m Sample Type: Field Duplicate Date: 08 Nov 2023	5 x the RDL	Absolute Difference b/w Parent and	2 x the RDL	Relative Percent Difference	QC Result
Metals										
	Aluminium	**mg/kg**	50	11200	13600	250	Both Samples >5x RDL	Not Calculated	19%	Acceptable
	Antimony	**mg/kg**	0.1	3.0	4.4	0.5	Both Samples >5x RDL	Not Calculated	38%	Acceptable
	Arsenic	**mg/kg**	0.1	922	1200	0.5	Both Samples >5x RDL	Not Calculated	26%	Acceptable
	Barium	**mg/kg**	0.5	119	106	2.5	Both Samples >5x RDL	Not Calculated	12%	Acceptable
	Beryllium	**mg/kg**	0.1	0.65	0.74	0.5	Both Samples >5x RDL	Not Calculated	13%	Acceptable
	Boron	**mg/kg**	5.0	<5.0	<5.0	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
	Cadmium	**mg/kg**	0.02	1.9	1.0	0.1	Both Samples >5x RDL	Not Calculated	66%	Unacceptable
	Chromium (Total, III+	**mg/kg**	0.5	22.2	27.2	2.5	Both Samples >5x RDL	Not Calculated	20%	Acceptable
	Cobalt	**mg/kg**	0.1	7.5	6.6	0.5	Both Samples >5x RDL	Not Calculated	13%	Acceptable
	Copper	**mg/kg**	0.5	33.0	28.7	2.5	Both Samples >5x RDL	Not Calculated	14%	Acceptable
	Iron	**mg/kg**	50.0	33000	35100	250	Both Samples >5x RDL	Not Calculated	6%	Acceptable
	Lead	**mg/kg**	0.5	138	133	2.5	Both Samples >5x RDL	Not Calculated	4%	Acceptable
	Manganese	**mg/kg**	1.0	792	704	5	Both Samples >5x RDL	Not Calculated	12%	Acceptable
	Mercury	**mg/kg**	0.005	6.9	0.0989	0.025	Both Samples >5x RDL	Not Calculated	194%	Unacceptable
	Molybdenum	**mg/kg**	0.1	3.0	2.4	0.5	Both Samples >5x RDL	Not Calculated	19%	Acceptable
	Nickel	**mg/kg**	0.5	15.3	15.0	2.5	Both Samples >5x RDL	Not Calculated	2%	Acceptable
	Selenium	**mg/kg**	0.2	1.0	0.9	1	0.11	0.4	Not Calculated	Acceptable
	Silver	**mg/kg**	0.1	0.14	0.14	0.5	0	0.2	Not Calculated	Acceptable
	Strontium	**mg/kg**	0.5	23	17	2.5	Both Samples >5x RDL	Not Calculated	31%	Acceptable
	Sulphur as S	**mg/kg**	1,000	<1,000	<1,000	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
	Thallium	**mg/kg**	0.05	0.249	0.253	0.25	0.004	0.1	Not Calculated	Acceptable
	Tin	**mg/kg**	2	27	18	10	Both Samples >5x RDL	Not Calculated	40%	Acceptable
	Uranium	**mg/kg**	0.05	0.6	0.7	0.25	Both Samples >5x RDL	Not Calculated	24%	Acceptable
	Vanadium	**mg/kg**	0.20	32	37	1	Both Samples >5x RDL	Not Calculated	13%	Acceptable
	Zinc	**mg/kg**	2	531	310	10	Both Samples >5x RDL	Not Calculated	53%	Acceptable

Comments:

Where either parent and field duplicate sample concentrations are less than 5X the RDL, then the absolute difference in values is shown. The difference is acceptable if it is less than 2X the RDL.

Relative percent difference (RPD) is only considered where parent and duplicate sample concentrations are both greater than 5X the RDL. The RPD is considered acceptable if it is within the industry accepted ranges for metals in soil

RPD = ((parent result - duplicate result)/((parent result + duplicate result)/2)) *100

QC calculations and results have been evaulated in accordance of the Guidance Manual for Environmental Site Characterization in Support of Environmental and Human Health Risk Assessment (CCME, 2016).

BOLD value indicates the value which the acceptance criteria is based on (i.e. absolute difference or RPD).

Table D-15

		Sample ID	BH21 0-0.15m	BH DUPD 0-0.15m					
		Sample Type	Normal	Field Duplicate	5 x the RDL	Absolute Difference b/w Parent and Duplicate	2 x the RDL	Relative Percent Difference	QC Result
		Date	08 Nov 2023	08 Nov 2023					
	Unit	RDL							
Metals									
Aluminium	mg/kg	50	12600	12000	250	Both Samples >5x RDL	Not Calculated	5%	Acceptable
Antimony	mg/kg	0.1	23	48	0.5	Both Samples >5x RDL	Not Calculated	71%	Unacceptable
Arsenic	mg/kg	0.1	2500	2750	0.5	Both Samples >5x RDL	Not Calculated	10%	Acceptable
Barium	mg/kg	0.5	114	120	2.5	Both Samples >5x RDL	Not Calculated	5%	Acceptable
Beryllium	mg/kg	0.1	0.5	0.5	0.5	0	0.2	Not Calculated	Acceptable
Boron	mg/kg	5.0	<5.0	<5.0	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Cadmium	mg/kg	0.02	0.25	0.29	0.1	Both Samples >5x RDL	Not Calculated	16%	Acceptable
Chromium (Total, III-	mg/kg	0.5	29	28	2.5	Both Samples >5x RDL	Not Calculated	5%	Acceptable
Cobalt	mg/kg	0.1	7.7	9.3	0.5	Both Samples >5x RDL	Not Calculated	19%	Acceptable
Copper	mg/kg	0.5	35	39	2.5	Both Samples >5x RDL	Not Calculated	10%	Acceptable
Iron	mg/kg	50.0	40000	39400	250	Both Samples >5x RDL	Not Calculated	2%	Acceptable
Lead	mg/kg	0.5	505	591	2.5	Both Samples >5x RDL	Not Calculated	16%	Acceptable
Manganese	mg/kg	1.0	573	604	5	Both Samples >5x RDL	Not Calculated	5%	Acceptable
Mercury	mg/kg	0.005	78	84	0.025	Both Samples >5x RDL	Not Calculated	7%	Acceptable
Molybdenum	mg/kg	0.1	2.5	2.5	0.5	Both Samples >5x RDL	Not Calculated	3%	Acceptable
Nickel	mg/kg	0.5	12	12	2.5	Both Samples >5x RDL	Not Calculated	4%	Acceptable
Selenium	mg/kg	0.2	1.0	1.2	1	Both Samples >5x RDL	Not Calculated	12%	Acceptable
Silver	mg/kg	0.1	0.8	0.6	0.5	Both Samples >5x RDL	Not Calculated	21%	Acceptable
Strontium	mg/kg	0.5	5.1	5.7	2.5	Both Samples >5x RDL	Not Calculated	11%	Acceptable
Sulphur as S	mg/kg	1,000	<1,000	<1,000	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Thallium	mg/kg	0.05	0.472	0.491	0.25	Both Samples >5x RDL	Not Calculated	4%	Acceptable
Tin	mg/kg	2	31	61	10	Both Samples >5x RDL	Not Calculated	64%	Unacceptable
Uranium	mg/kg	0.05	0.7	0.8	0.25	Both Samples >5x RDL	Not Calculated	11%	Acceptable
Vanadium	mg/kg	0.20	36	34	1	Both Samples >5x RDL	Not Calculated	5%	Acceptable
Zinc	mg/kg	2	82	85	10	Both Samples >5x RDL	Not Calculated	3%	Acceptable

Comments:

Where either parent and field duplicate sample concentrations are less than 5X the RDL, then the absolute difference in values is shown. The difference is acceptable if it is less than 2X the RDL.

Relative percent difference (RPD) is only considered where parent and duplicate sample concentrations are both greater than 5X the RDL. The RPD is considered acceptable if it is within the industry accepted ranges for metals in soil (as detailed in the report).

RPD = ((parent result - duplicate result)/((parent result + duplicate result)/2)) *100

QC calculations and results have been evaulated in accordance of the Guidance Manual for Environmental Site Characterization in Support of Environmental and Human Health Risk Assessment (CCME, 2016).

BOLD value indicates the value which the acceptance criteria is based on (i.e. absolute difference or RPD).

Table D-15

			Sample ID	BH 61 0-0.15m	BH DUP E 0-0.15m					
			Sample Type	Normal	Field Duplicate	5 x the RDL	Absolute Difference b/w Parent and Duplicate	2 x the RDL	Relative Percent Difference	QC Result
			Date	20 Jan 2024	20 Jan 2024					
		Unit	RDL							
Metals										
	Aluminium	**mg/kg**	50	25,600	26,200	250	Both Samples >5x RDL	Not Calculated	2%	Acceptable
	Antimony	**mg/kg**	0.1	0.68	0.56	0.5	Both Samples >5x RDL	Not Calculated	19%	Acceptable
	Arsenic	**mg/kg**	0.1	1,250	1,020	0.5	Both Samples >5x RDL	Not Calculated	20%	Acceptable
	Barium	**mg/kg**	0.5	172	171	2.5	Both Samples >5x RDL	Not Calculated	1%	Acceptable
	Beryllium	**mg/kg**	0.1	1.67	1.83	0.5	Both Samples >5x RDL	Not Calculated	9%	Acceptable
	Boron	**mg/kg**	5.0	<5.0	<5.0	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
	Cadmium	**mg/kg**	0.02	0.122	0.127	0.1	Both Samples >5x RDL	Not Calculated	4%	Acceptable
	Chromium (Total, III+VI)	**mg/kg**	0.5	48.9	49.2	2.5	Both Samples >5x RDL	Not Calculated	1%	Acceptable
	Cobalt	**mg/kg**	0.1	6.53	7.16	0.5	Both Samples >5x RDL	Not Calculated	9%	Acceptable
	Copper	**mg/kg**	0.5	9.3	8.58	2.5	Both Samples >5x RDL	Not Calculated	8%	Acceptable
	Iron	**mg/kg**	50.0	42,400	43,000	250	Both Samples >5x RDL	Not Calculated	1%	Acceptable
	Lead	**mg/kg**	0.5	96.8	87.5	2.5	Both Samples >5x RDL	Not Calculated	10%	Acceptable
	Manganese	**mg/kg**	1.0	989	1,040	5	Both Samples >5x RDL	Not Calculated	5%	Acceptable
	Mercury	**mg/kg**	0.005	0.642	0.492	0.025	Both Samples >5x RDL	Not Calculated	26%	Acceptable
	Molybdenum	**mg/kg**	0.1	0.24	0.24	0.5	0	0.2	Not Calculated	Acceptable
	Nickel	**mg/kg**	0.5	16.3	16.4	2.5	Both Samples >5x RDL	Not Calculated	1%	Acceptable
	Selenium	**mg/kg**	0.2	<0.20	<0.20	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
	Silver	**mg/kg**	0.1	0.24	0.2	0.5	0.04	0.2	Not Calculated	Acceptable
	Strontium	**mg/kg**	0.5	4.3	4.14	2.5	Both Samples >5x RDL	Not Calculated	4%	Acceptable
	Sulphur as S	**mg/kg**	1,000	<1,000	<1,000	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
	Thallium	**mg/kg**	0.05	0.336	0.334	0.25	Both Samples >5x RDL	Not Calculated	1%	Acceptable
	Tin	**mg/kg**	2	<2.0	<2.0	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
	Uranium	**mg/kg**	0.05	1.22	1.41	0.25	Both Samples >5x RDL	Not Calculated	14%	Acceptable
	Vanadium	**mg/kg**	0.20	60.9	61.4	1	Both Samples >5x RDL	Not Calculated	1%	Acceptable
	Zinc	**mg/kg**	2	95	95.8	10	Both Samples >5x RDL	Not Calculated	1%	Acceptable

Comments:

Where either parent and field duplicate sample concentrations are less than 5X the RDL, then the absolute difference in values is shown. The difference is acceptable if it is less than 2X the RDL.

Relative percent difference (RPD) is only considered where parent and duplicate sample concentrations are both greater than 5X the RDL. The RPD is considered acceptable if it is within the industry accepted ranges for metals in soil (as detailed in the report).

RPD = ((parent result - duplicate result)/((parent result + duplicate result)/2)) *100

QC calculations and results have been evaulated in accordance of the Guidance Manual for Environmental Site Characterization in Support of Environmental and Human Health Risk Assessment (CCME, 2016).

BOLD value indicates the value which the acceptance criteria is based on (i.e. absolute difference or RPD).

Table D-15

			Sample ID	BH11 0-0.15m	BH DUPB 0-0.15m				
			Sample Type	Normal	Field Duplicate	5 x the RDL	Absolute Difference b/w Parent and Duplicate	2 x the RDL	Relative Percent Difference	QC Result
			Date	07 Nov 2023	07 Nov 2023					
		Unit	RDL							
Polycyclic Aromatic Hydrocarbons (PAHs)										
1-Methylnaphthalene		**mg/kg**	0.01	<0.010	<0.010	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
2-Methylnaphthalene		**mg/kg**	0.01	<0.010	<0.010	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
1 & 2 Methylnaphthalene		**mg/kg**	0.015	<0.015	<0.015	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Acenaphthene		**mg/kg**	0.01	<0.0060	<0.0058	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Acenaphthylene		**mg/kg**	0.01	<0.0060	0.01	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Acridine		**mg/kg**	0.01	<0.052	<0.054	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Anthracene		**mg/kg**	0.004	<0.0104	0.018	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Benz(a)anthracene		**mg/kg**	0.01	0.037	0.082	0.05	0.045	0.02	Not Calculated	Unacceptable
Benzo(a)pyrene		**mg/kg**	0.01	0.036	0.070	0.05	0.034	0.02	Not Calculated	Unacceptable
Benzo(b+j)fluoranthene		**mg/kg**	0.01	0.051	0.098	0.05	Both Samples >5x RDL	Not Calculated	63%	Unacceptable
Benzo(b+j+k)fluoranthene		**mg/kg**	0.015	0.072	0.137	0.075	0.065	0.03	Not Calculated	Unacceptable
Benzo(g,h,i)perylene		**mg/kg**	0.01	0.020	0.039	0.05	0.019	0.02	Not Calculated	Acceptable
Benzo(k)fluoranthene		**mg/kg**	0.01	0.021	0.039	0.05	0.018	0.02	Not Calculated	Acceptable
Chrysene		**mg/kg**	0.01	0.031	0.067	0.05	0.036	0.02	Not Calculated	Unacceptable
Dibenz(a,h)anthracene		**mg/kg**	0.005	<0.0065	0.014	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Fluorene		**mg/kg**	0.01	<0.017	<0.019	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Fluoranthene		**mg/kg**	0.01	0.060	0.136	0.05	Both Samples >5x RDL	Not Calculated	78%	Unacceptable
Indeno(1,2,3-c,d)pyrene		**mg/kg**	0.01	0.023	0.046	0.05	0.023	0.02	Not Calculated	Unacceptable
Naphthalene		**mg/kg**	0.01	<0.010	<0.010	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Perylene		**mg/kg**	0.01	0.011	0.020	0.05	0.009	0.02	Not Calculated	Acceptable
Phenanthrene		**mg/kg**	0.01	0.021	0.029	0.05	0.008	0.02	Not Calculated	Acceptable
Pyrene		**mg/kg**	0.01	0.057	0.127	0.05	Both Samples >5x RDL	Not Calculated	76%	Unacceptable
Quinoline		**mg/kg**	0.01	<0.052	<0.091	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Index of Additive Cancer Risk (CCME)		**-**	0.15	0.700	1.410	0.75	0.71	0.3	Not Calculated	Unacceptable
B(a)P TPE	[-]	**mg/kg**	0.02	0.053	0.112	0.1	0.059	0.04	Not Calculated	Unacceptable

Comments:
Where either parent and field duplicate sample concentrations are less than 5X the RDL, then the absolute difference in values is shown. The difference is acceptable if it is less than 2X the RDL.
Relative percent difference (RPD) is only considered where parent and duplicate sample concentrations are both greater than 5X the RDL. The RPD is considered acceptable if it is within the industry accepted ranges for metals in soil (as detailed in the report).
RPD = ((parent result - duplicate result)/((parent result + duplicate result)/2)) *100
QC calculations and results have been evaulated in accordance of the Guidance Manual for Environmental Site Characterization in Support of Environmental and Human Health Risk Assessment (CCME, 2016).
BOLD value indicates the value which the acceptance criteria is based on (i.e. absolute difference or RPD).

Table D-16

		Sample ID	24MW-01	24MW-DUPA					
		Sample Type	Normal	Field Duplicate	5 x the RDL	Absolute Difference b/w Parent and Duplicate	2 x the RDL	Relative Percent Difference	QC Result
		Date	19 Jan 2024	19 Jan 2024					
	Unit	RDL							
Metals									
Aluminium (filtered)	mg/L	0.001	0.0564	0.0558	0.005	Both Samples >5x RDL	Not Calculated	1%	Acceptable
Antimony (filtered)	mg/L	0.0001	<0.00010	<0.00010	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Arsenic (filtered)	mg/L	0.0001	0.00013	0.00014	0.0005	0.00001	0.0002	Not Calculated	Acceptable
Barium (filtered)	mg/L	0.0001	0.00698	0.00714	0.0005	Both Samples >5x RDL	Not Calculated	2%	Acceptable
Beryllium (filtered)	mg/L	0.00002	0.000036	0.000035	0.0001	0.000001	0.00004	Not Calculated	Acceptable
Bismuth (filtered)	mg/L	0.00005	<0.000050	<0.000050	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Boron (filtered)	mg/L	0.01	<0.010	<0.010	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Cadmium (filtered)	mg/L	0.000005	0.0000317	0.0000334	0.000025	Both Samples >5x RDL	Not Calculated	5%	Acceptable
Calcium (filtered)	mg/L	0.05	0.725	0.702	0.25	Both Samples >5x RDL	Not Calculated	3%	Acceptable
Chromium (Total, III+VI) (filtered)	mg/L	0.0005	<0.00050	<0.00050	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Cobalt (filtered)	mg/L	0.0001	0.00453	0.00449	0.0005	Both Samples >5x RDL	Not Calculated	1%	Acceptable
Copper (filtered)	mg/L	0.0002	0.0102	0.0104	0.001	Both Samples >5x RDL	Not Calculated	2%	Acceptable
Iron (filtered)	mg/L	0.01	3.79	3.84	0.05	Both Samples >5x RDL	Not Calculated	1%	Acceptable
Lead (filtered)	mg/L	0.00005	<0.000050	<0.000050	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Magnesium (filtered)	mg/L	0.005	0.429	0.418	0.025	Both Samples >5x RDL	Not Calculated	3%	Acceptable
Manganese (filtered)	mg/L	0.0001	0.556	0.543	0.0005	Both Samples >5x RDL	Not Calculated	2%	Acceptable
Mercury (filtered)	mg/L	0.000005	<0.0000050	<0.0000050	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Molybdenum (filtered)	mg/L	0.00005	0.000294	0.00027	0.00025	Both Samples >5x RDL	Not Calculated	9%	Acceptable
Nickel (filtered)	mg/L	0.0005	0.00334	0.00332	0.0025	Both Samples >5x RDL	Not Calculated	1%	Acceptable
Silica (SiO2) (filtered)	mg/L	0.11	3.74	3.7	0.55	Both Samples >5x RDL	Not Calculated	1%	Acceptable
Potassium (filtered)	mg/L	0.05	0.616	0.612	0.25	Both Samples >5x RDL	Not Calculated	1%	Acceptable
Selenium (filtered)	mg/L	0.00005	0.000056	0.000053	0.00025	0.000003	0.0001	Not Calculated	Acceptable
Cesium (filtered)	mg/L	0.00001	0.000023	0.000021	0.00005	0.000002	0.00002	Not Calculated	Acceptable
Rubidium (filtered)	mg/L	0.0002	0.00212	0.00208	0.001	Both Samples >5x RDL	Not Calculated	2%	Acceptable
Tellurium (filtered)	mg/L	0.0002	<0.00020	<0.00020	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Thorium (filtered)	mg/L	0.0001	<0.00010	<0.00010	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Tungsten (filtered)	mg/L	0.0001	0.0103	0.01	0.0005	Both Samples >5x RDL	Not Calculated	3%	Acceptable
Lithium (filtered)	mg/L	0.001	0.0014	0.0013	0.005	0.0001	0.002	Not Calculated	Acceptable
Silver (filtered)	mg/L	0.00001	<0.000010	<0.000010	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Silicon (filtered)	mg/L	0.05	1.75	1.73	0.25	Both Samples >5x RDL	Not Calculated	1%	Acceptable
Sodium (filtered)	mg/L	0.05	3.29	3.24	0.25	Both Samples >5x RDL	Not Calculated	2%	Acceptable
Strontium (filtered)	mg/L	0.0002	0.00782	0.00745	0.001	Both Samples >5x RDL	Not Calculated	5%	Acceptable
Sulphur as S (filtered)	mg/L	0.5	0.6	0.6	2.5	0	1	Not Calculated	Acceptable
Titanium (filtered)	mg/L	0.0003	<0.00030	<0.00030	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Thallium (filtered)	mg/L	0.00001	0.000013	0.000012	0.00005	1E-06	0.00002	Not Calculated	Acceptable
Tin (filtered)	mg/L	0.0001	<0.00010	<0.00010	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Uranium (filtered)	mg/L	0.00001	0.000082	0.000076	0.00005	Both Samples >5x RDL	Not Calculated	8%	Acceptable
Vanadium (filtered)	mg/L	0.0005	<0.00050	<0.00050	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Zinc (filtered)	mg/L	0.001	0.0237	0.0238	0.005	Both Samples >5x RDL	Not Calculated	0%	Acceptable
Zirconium (filtered)	mg/L	0.0002	<0.00020	<0.00020	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated

Comments:

Where either parent and field duplicate sample concentrations are less than 5X the RDL, then the absolute difference in values is shown. The difference is acceptable if it is less than 2X the RDL.

Relative percent difference (RPD) is only considered where parent and duplicate sample concentrations are both greater than 5X the RDL. The RPD is considered acceptable if it is within the industry accepted ranges for metals in soil (as detailed in the report).

RPD = ((parent result - duplicate result)/((parent result + duplicate result)/2)) *100

QC calculations and results have been evaulated in accordance of the Guidance Manual for Environmental Site Characterization in Support of Environmental and Human Health Risk Assessment (CCME, 2016).

BOLD value indicates the value which the acceptance criteria is based on (i.e. absolute difference or RPD).

Table D-16

		Sample ID	24MW-01	24MW-DUPA					
		Sample Type	Normal	Field Duplicate	5 x the RDL	Absolute Difference b/w Parent and Duplicate	2 x the RDL	Relative Percent Difference	QC Result
		Date	19 Jan 2024	19 Jan 2024					
	Unit	RDL							
Polycyclic Aromatic Hydrocarbons (PAHs)									
1-Methylnaphthalene	mg/L	0.00001	<0.000010	<0.000010	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
2-methylnaphthalene	mg/L	0.00001	<0.000010	<0.000010	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
1 & 2 Methylnaphthalene	mg/L	0.000015	<0.000015	<0.000015	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Acenaphthene	mg/L	0.00001	<0.000010	<0.000010	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Acenaphthylene	mg/L	0.00001	<0.000010	<0.000010	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Acridine	mg/L	0.00001	<0.000010	<0.000010	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Anthracene	mg/L	0.00001	<0.000010	<0.000010	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Benz(a)anthracene	mg/L	0.00001	<0.000010	<0.000010	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Benzo(a)pyrene	mg/L	0.000005	<0.0000050	<0.0000050	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Benzo(b+j)fluoranthene	mg/L	0.00001	<0.000010	<0.000010	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Benzo(b+j+k)fluoranthene	mg/L	0.000015	<0.000015	<0.000015	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Benzo(g,h,i)perylene	mg/L	0.00001	<0.000010	<0.000010	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Benzo(k)fluoranthene	mg/L	0.00001	<0.000010	<0.000010	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Chrysene	mg/L	0.00001	<0.000010	<0.000010	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Dibenz(a,h)anthracene	mg/L	0.000005	<0.0000050	<0.0000050	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Fluorene	mg/L	0.00001	<0.000010	<0.000010	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Fluoranthene	mg/L	0.00001	<0.000010	<0.000010	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Indeno(1,2,3-c,d)pyrene	mg/L	0.00001	<0.000010	<0.000010	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Naphthalene	mg/L	0.00001	<0.000010	<0.000010	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Perylene	mg/L	0.00001	<0.000010	<0.000010	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Phenanthrene	mg/L	0.00001	<0.000010	<0.000010	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Pyrene	mg/L	0.00001	<0.000010	<0.000010	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
Quinoline	mg/L	0.00001	<0.000010	<0.000010	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated
B(A)P TPE	mg/L	0.00001	<0.000010	<0.000010	Not Calculated	Not Calculated	Not Calculated	Not Calculated	Not Calculated

Comments:
Where either parent and field duplicate sample concentrations are less than 5X the RDL, then the absolute difference in values is shown. The difference is acceptable if it is less than 2X the RDL.
Relative percent difference (RPD) is only considered where parent and duplicate sample concentrations are both greater than 5X the RDL. The RPD is considered acceptable if it is within the industry accepted ranges for metals in soil (as RPD = ((parent result - duplicate result)/(((parent result + duplicate result)/2)) *100
QC calculations and results have been evaulated in accordance of the Guidance Manual for Environmental Site Characterization in Support of Environmental and Human Health Risk Assessment (CCME, 2016).
BOLD value indicates the value which the acceptance criteria is based on (i.e. absolute difference or RPD).

Table D-17

			Field ID	24MW-EB1
			Sample Type	Equipment Blank
			Date	20 Jan 2024
	Unit	EQL	2022 NS Tier I EQS (Commercial, Potable, Fine/Coarse)	
Calculated Parameters				
Anions Total	**meq/L**	0.1	-	<0.10
Cations Total	**meq/L**	0.1	-	<0.10
Ionic Balance	**%**	0.01	-	100
Langelier Index (@ 20C)	**N/A**	0.01	-	Incalculable
Langelier Index (@ 4C)	**N/A**	0.01	-	Incalculable
Saturation pH (@ 4C)	**N/A**	0.01	-	Incalculable
Saturation pH (@ 20C)	**N/A**	0.01	-	Incalculable
General Chemistry				
Carbonate	**mg/L**	1	-	<1.0
Alkalinity (total)	**mg/L**	1	-	<1.0
Bicarbonate	**mg/L**	1	-	<1.0
Hardness as CaCO3 (Measured)	**mg/L**	0.5	-	<0.50
Ammonia as N	**mg/L**	0.005	-	<0.0050
Total Organic Carbon (TOC)	**mg/L**	0.5	-	<0.50
Ortho Phosphate as P (filtered)	**mg/L**	0.001	-	<0.0010
Phosphorus	**mg/L**	0.05	-	<0.050
Fluoride	**mg/L**	0.02	-	<0.020
Chloride (filtered)	**mg/L**	0.5	250	<0.50
Electrical Conductivity (Lab)	**µS/cm**	1	-	<1.0
Color	**CU**	2.0	-	<2.0
Hydroxide	**mg/L**	1	-	<1.0
Nitrate (as N)	**mg/L**	0.02	-	<0.020
Nitrite (as N)	**mg/L**	0.01	-	<0.010
Nitrite + Nitrate as N	**mg/L**	0.0224	-	<0.0224
pH (Lab)	**pH Units**	0.1	-	5.82
Sulphate (filtered)	**mg/L**	0.3	-	<0.30
Total Dissolved Solids (TDS) - Measured	**mg/L**	10	-	<10
Turbidity	**NTU**	0.1	-	<0.10
Metals				
Aluminium	**mg/L**	0.001	0.1	<0.0030
Antimony	**mg/L**	0.0001	0.006	<0.00010
Arsenic	**mg/L**	0.0001	0.01	<0.00010
Barium	**mg/L**	0.0001	1	<0.00010
Beryllium	**mg/L**	0.00002	0.004	<0.000020
Bismuth	**mg/L**	0.00005	-	<0.000050
Boron	**mg/L**	0.01	5	<0.010
Cadmium	**mg/L**	0.000005	0.005	<0.0000050
Calcium	**mg/L**	0.05	-	<0.100
Chromium (Total, III+VI)	**mg/L**	0.0005	0.05	<0.00050
Cobalt	**mg/L**	0.0001	0.0038	<0.00010
Copper	**mg/L**	0.0002	2	<0.00050
Iron	**mg/L**	0.01	0.3	<0.010
Lead	**mg/L**	0.00005	0.005	<0.000050
Magnesium	**mg/L**	0.005	-	<0.0050
Manganese	**mg/L**	0.0001	0.12	<0.00010
Mercury	**mg/L**	0.000005	0.001	<0.0000050
Molybdenum	**mg/L**	0.00005	0.07	<0.000050
Nickel	**mg/L**	0.0005	0.1	<0.00050
Silica (SiO2)	**mg/L**	0.11	-	0.24
Potassium	**mg/L**	0.05	-	<0.050
Selenium	**mg/L**	0.00005	0.05	<0.000050
Cesium	**mg/L**	0.00001	-	<0.000010
Rubidium	**mg/L**	0.0002	-	<0.00020
Tellurium	**mg/L**	0.0002	-	<0.00020
Thorium	**mg/L**	0.0001	-	<0.00010
Tungsten	**mg/L**	0.0001	-	<0.00010
Lithium	**mg/L**	0.001	-	<0.0010
Silver	**mg/L**	0.00001	-	<0.000010
Silicon	**mg/L**	0.05	-	0.11
Sodium	**mg/L**	0.05	250	<0.050
Strontium	**mg/L**	0.0002	2.4	<0.00020
Sulphur as S	**mg/L**	0.5	-	<0.50
Titanium	**mg/L**	0.0003	-	<0.00030
Thallium	**mg/L**	0.00001	0.002	<0.000010
Tin	**mg/L**	0.0001	2.4	0.00127
Uranium	**mg/L**	0.00001	0.02	<0.000010
Vanadium	**mg/L**	0.0005	0.0062	<0.00050
Zinc	**mg/L**	0.001	5	<0.0030
Zirconium	**mg/L**	0.0002	-	<0.00020

Environmental Standards

Nova Scotia Environment and Climate Change, October 2022, NS Tier I EQS Commercial Potable Fine/Coarse

Notes

Highlight	Indicates concentration exceeds Tier I EQS

TABLE D-18

				Sample ID	24MW-EB1	24MW-TB1
				Sample Type	Equipment Blank	Trip Blank
				Date	20 Jan 2024	20 Jan 2024
		Unit	EQL	NS Tier I EQS Commercial (potable,Fine/Coarse grained)		
BTEX						
	Benzene	**mg/L**	0.0005	**0.005**	<0.00050	<0.00050
	Toluene	**mg/L**	0.0005	**0.024**	<0.00050	<0.00050
	Ethylbenzene	**mg/L**	0.0005	**0.0016**	<0.00050	<0.00050
	Xylene (o)	**mg/L**	0.0003	-	<0.00030	<0.00030
	Xylene (m & p)	**mg/L**	0.0004	-	<0.00040	<0.00040
	Xylene Total	**mg/L**	0.0005	**0.02**	<0.00050	<0.00050
Petroleum Hydrocarbons (PHCs)						
	>C10-C16 fraction of mTPH	**%**	1	-	<1	<1
	>C16-C21 fraction of mTPH	**%**	1	-	<1	<1
	>C21-C32_frac	**%**	1	-	<1	<1
	C6-C10 fraction of mTPH	**%**	1	-	<1	<1
	VPH (C6-C10 - BTEX)	**mg/L**	0.025	-	<0.025	<0.025
	EPH >C10-C16	**mg/L**	0.05	-	<0.050	<0.050
	EPH >C16-C21	**mg/L**	0.05	-	<0.050	<0.050
	EPH >C21-C32	**mg/L**	0.05	-	<0.050	<0.050
	EPH >C34-C50	**mg/L**	0.10	-	<0.10	<0.10
	Modified TPH (Tier 1)	**mg/L**	0.09	**4.4*** **3.2**** **7.8*****	<0.090	<0.090
	Reached Baseline at C32	-		-	Yes	Yes
	Hydrocarbon Resemblance	**none**		-	N/A	N/A

Environmental Standards

Nova Scotia Environment and Climate Change, October 2022, NS Tier I EQS Commercial Potable Fine/Coarse

Notes

* Modified TPH (Gasoline)

** Modified TPH (Fuel Oil)

*** Modified TPH (Lube Oil)

Highlight Indicates concentration exceeds Tier I EQS

TABLE D-19

			Sample ID	**24MW-EB1**
			Sample Type	**Field_B**
			Date	**20 Jan 2024**
	Unit	EQL	2022 NS Tier I EQS (Commercial, Potable, Fine/Coarse)	
Polycyclic Aromatic Hydrocarbons (PAHs)				
1-Methylnaphthalene	**mg/L**	0.00001	0.012	<0.000010
2-Methylnaphthalene	**mg/L**	0.00001	0.012	<0.000010
1 & 2 Methylnaphthalene	**mg/L**	0.000015	-	<0.000015
Acenaphthene	**mg/L**	0.00001	1.4	<0.000010
Acenaphthylene	**mg/L**	0.00001	0.0045	<0.000010
Acridine	**mg/L**	0.00001	-	<0.000010
Anthracene	**mg/L**	0.00001	-	<0.000010
Benz(a)anthracene	**mg/L**	0.00001	-	<0.000010
Benzo(a)pyrene	**mg/L**	0.000005	0.00004	<0.0000050
Benzo(b+j)fluoranthene	**mg/L**	0.00001	-	<0.000010
Benzo(b+j+k)fluoranthene	**mg/L**	0.000015	-	<0.000015
Benzo(g,h,i)perylene	**mg/L**	0.00001	-	<0.000010
Benzo(k)fluoranthene	**mg/L**	0.00001	-	<0.000010
Chrysene	**mg/L**	0.00001	-	<0.000010
Dibenz(a,h)anthracene	**mg/L**	0.000005	-	<0.0000050
Fluorene	**mg/L**	0.00001	0.94	<0.000010
Fluoranthene	**mg/L**	0.00001	-	<0.000010
Indeno(1,2,3-c,d)pyrene	**mg/L**	0.00001	-	<0.000010
Naphthalene	**mg/L**	0.00001	0.47	<0.000010
Perylene	**mg/L**	0.00001	-	<0.000010
Phenanthrene	**mg/L**	0.00001	-	<0.000010
Pyrene	**mg/L**	0.00001	0.71	<0.000010
Quinoline	**mg/L**	0.00001	-	<0.000010
B(A)P TPE	**mg/L**	0.00001	0.00004	<0.000010

Environmental Standards

Nova Scotia Environment and Climate Change, October 2022, NS Tier Commercial, Potable, Fine/Coarse

Notes

Highlight	Indicates concentration exceeds Tier I EQS

Appendix E

Laboratory Certificates

CERTIFICATE OF ANALYSIS

Work Order	: **HA2301016**	Page	: 1 of 13
Client	: **Dillon Consulting Limited**	Laboratory	: ALS Environmental - Halifax
Contact	: Shauna Gallant	Account Manager	: Andrew Martin
Address	: 137 Chain Lake Drive Halifax NS Canada B3S 1B3	Address	: 13-100 Wright Ave Dartmouth NS Canada B3B 1L2
Telephone	: 902-450-4000 ext 5039	Telephone	: +1 902 707 4888
Project	: 23-6465	Date Samples Received	: 07-Nov-2023 15:35
PO	: ----	Date Analysis Commenced	: 09-Nov-2023
C-O-C number	: ----	Issue Date	: 17-Nov-2023 17:41
Sampler	: ----		
Site	: Build NS (Country Harbour)		
Quote number	: HA23-DICL100-12 - Lump Sum Rate - Build NS (Country Harbour)		
No. of samples received	: 7		
No. of samples analysed	: 7		

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Laboratory Department*
Greg Pokocky	Manager - Inorganics	Inorganics, Waterloo, Ontario
Jeremy Gingras	Supervisor - Semi-Volatile Instrumentation	Organics, Waterloo, Ontario
Jocelyn Kennedy	Department Manager - Semi-Volatile Organics	Organics, Waterloo, Ontario
Jon Fisher	Production Manager, Environmental	Inorganics, Waterloo, Ontario
Jon Fisher	Production Manager, Environmental	Metals, Waterloo, Ontario
Nik Perkio	Inorganics Analyst	Inorganics, Waterloo, Ontario
Robyn Edwards	Supervisor - Water Chemistry	Inorganics, Dartmouth, Nova Scotia
Sarah Birch	VOC Section Supervisor	VOC, Waterloo, Ontario

General Comments

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

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

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

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

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances

LOR: Limit of Reporting (detection limit).

Unit	*Description*
-	no units
%	percent
µg/L	micrograms per litre
µS/cm	microsiemens per centimetre
CU	colour units (1 cu = 1 mg/l pt)
meq/L	milliequivalents per litre
mg/L	milligrams per litre
none	none
NTU	nephelometric turbidity units
pH units	pH units

<: less than.

>: greater than.

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

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

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

Sample Comments

Sample	Client Id	*Comment*
HA2301016-004	SW4	N/A: Resemblance Not Applicable (mTPH < LOR)
HA2301016-005	SW5	N/A: Resemblance Not Applicable (mTPH < LOR)
HA2301016-007	SW DUP B	N/A: Resemblance Not Applicable (mTPH < LOR)

Qualifiers

Qualifier	*Description*

DLM	*Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).*

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	SW1	SW2	SW3	SW4	SW5
					Client sampling date / time	06-Nov-2023 12:30	06-Nov-2023 12:58	06-Nov-2023 13:45	06-Nov-2023 14:55	06-Nov-2023 15:35
						HA2301016-001	HA2301016-002	HA2301016-003	HA2301016-004	HA2301016-005
						Result	Result	Result	Result	Result
Physical Tests										
Alkalinity, bicarbonate (as HCO3)	71-52-3	E290/WT	1.0	mg/L		1.7	<1.0	<1.0	<1.0	<1.0
Alkalinity, carbonate (as CO3)	3812-32-6	E290/WT	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, hydroxide (as OH)	14280-30-9	E290/WT	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, total (as CaCO3)	----	E290/WT	1.0	mg/L		1.4	<1.0	<1.0	<1.0	<1.0
Colour, apparent	----	E330/WT	2.0	CU		56.6	154 DLM	70.0	74.5	122 DLM
Conductivity	----	E100/WT	1.0	µS/cm		27.1	26.5	28.1	27.8	28.4
Hardness (as CaCO3), from total Ca/Mg	----	EC100A/WT	0.50	mg/L		3.00	2.35	3.10	2.52	2.81
Langelier index (@ 20°C)	----	EC105A/WT	0.01	-		----	Incalculable	Incalculable	Incalculable	Incalculable
Langelier index (@ 20°C)	----	EC105A/WT	0.010	-		-5.61	----	----	----	----
Langelier index (@ 4°C)	----	EC105A/WT	0.01	-		----	Incalculable	Incalculable	Incalculable	Incalculable
Langelier index (@ 4°C)	----	EC105A/WT	0.010	-		-5.87	----	----	----	----
pH	----	E108/WT	0.10	pH units		5.73	5.51	5.36	5.30	5.18
pH, saturation (@ 20°C)	----	EC105A/WT	0.01	pH units		----	Incalculable	Incalculable	Incalculable	Incalculable
pH, saturation (@ 20°C)	----	EC105A/WT	0.010	pH units		11.3	----	----	----	----
pH, saturation (@ 4°C)	----	EC105A/WT	0.01	pH units		----	Incalculable	Incalculable	Incalculable	Incalculable
pH, saturation (@ 4°C)	----	EC105A/WT	0.010	pH units		11.6	----	----	----	----
Solids, total dissolved [TDS]	----	E162/HA	10	mg/L		28	28	32	29	27
Turbidity	----	E121/WT	0.10	NTU		0.18	1.38	0.17	0.47	1.25
Anions and Nutrients										
Ammonia, total (as N)	7664-41-7	E298/WT	0.0050	mg/L		<0.0050	<0.0050	0.0084	0.0086	0.0126
Chloride	16887-00-6	E235.Cl/WT	0.50	mg/L		4.58	4.64	4.59	4.58	4.62
Fluoride	16984-48-8	E235.F/WT	0.020	mg/L		0.020	0.022	<0.020	<0.020	<0.020
Nitrate (as N)	14797-55-8	E235.NO3/WT	0.020	mg/L		<0.020	<0.020	<0.020	<0.020	<0.020
Nitrate + Nitrite (as N)	----	EC235.N+N/WT	0.0032	mg/L		<0.0224	<0.0224	<0.0224	<0.0224	<0.0224
Nitrite (as N)	14797-65-0	E235.NO2/WT	0.010	mg/L		<0.010	<0.010	<0.010	<0.010	<0.010
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U/WT	0.0010	mg/L		0.0013	0.0020	0.0020	0.0064	0.0020
Sulfate (as SO4)	14808-79-8	E235.SO4/WT	0.30	mg/L		1.92	1.78	1.73	1.67	1.57
Organic / Inorganic Carbon										

Analytical Results

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

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	SW1	SW2	SW3	SW4	SW5
					Client sampling date / time	06-Nov-2023 12:30	06-Nov-2023 12:58	06-Nov-2023 13:45	06-Nov-2023 14:55	06-Nov-2023 15:35
						HA2301016-001	HA2301016-002	HA2301016-003	HA2301016-004	HA2301016-005
						Result	Result	Result	Result	Result
Organic / Inorganic Carbon										
Carbon, total organic [TOC]	----	E355-L/WT	0.50	mg/L		7.01	7.15	9.42	9.24	10.3
Ion Balance										
Anion sum	----	EC101A/WT	0.10	meq/L		0.20	0.17	0.16	0.16	0.16
Cation sum (total)	----	EC101A/WT	0.10	meq/L		0.24	0.26	0.26	0.25	0.27
Ion balance (cations/anions)	----	EC101A/WT	0.01	%		120	153	162	156	169
Total Metals										
Aluminum, total	7429-90-5	E420/WT	0.0030	mg/L		0.194	0.325	0.227	0.226	0.218
Antimony, total	7440-36-0	E420/WT	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Arsenic, total	7440-38-2	E420/WT	0.00010	mg/L		0.0355	0.0633	0.0467	0.0505	0.0558
Barium, total	7440-39-3	E420/WT	0.00010	mg/L		0.00392	0.00484	0.00419	0.00359	0.00392
Beryllium, total	7440-41-7	E420/WT	0.000020	mg/L		0.000040	0.000067	0.000037	0.000034	0.000032
Bismuth, total	7440-69-9	E420/WT	0.000050	mg/L		<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Boron, total	7440-42-8	E420/WT	0.010	mg/L		<0.010	<0.010	<0.010	<0.010	<0.010
Cadmium, total	7440-43-9	E420/WT	0.0000050	mg/L		0.0000289	0.0000341	0.0000340	0.0000255	0.0000269
Calcium, total	7440-70-2	E420/WT	0.100	mg/L		0.586	0.368	0.580	0.430	0.503
Cesium, total	7440-46-2	E420/WT	0.000010	mg/L		0.000108	0.000131	0.000124	0.000092	0.000083
Chromium, total	7440-47-3	E420/WT	0.00050	mg/L		<0.00050	0.00159	<0.00050	<0.00050	<0.00050
Cobalt, total	7440-48-4	E420/WT	0.00010	mg/L		0.00025	0.00034	0.00044	0.00132	0.00092
Copper, total	7440-50-8	E420/WT	0.00050	mg/L		0.00059	<0.00050	0.00086	<0.00050	0.00083
Iron, total	7439-89-6	E420/WT	0.010	mg/L		0.252	0.609	0.391	0.562	0.621
Lead, total	7439-92-1	E420/WT	0.000050	mg/L		0.000539	0.00208	0.000722	0.00132	0.00109
Lithium, total	7439-93-2	E420/WT	0.0010	mg/L		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Magnesium, total	7439-95-4	E420/WT	0.0050	mg/L		0.373	0.347	0.402	0.352	0.377
Manganese, total	7439-96-5	E420/WT	0.00010	mg/L		0.0284	0.0447	0.0454	0.105	0.0811
Mercury, total	7439-97-6	E508/WT	0.0000050	mg/L		0.0000141	0.0000230	0.0000177	0.0000054	<0.0000050
Molybdenum, total	7439-98-7	E420/WT	0.000050	mg/L		<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Nickel, total	7440-02-0	E420/WT	0.00050	mg/L		0.00090	<0.00050	0.00115	<0.00050	0.00051
Phosphorus, total	7723-14-0	E420/WT	0.050	mg/L		<0.050	<0.050	<0.050	<0.050	<0.050
Potassium, total	7440-09-7	E420/WT	0.050	mg/L		0.319	0.323	0.339	0.317	0.366
Rubidium, total	7440-17-7	E420/WT	0.00020	mg/L		0.00158	0.00175	0.00160	0.00161	0.00177

Analytical Results

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

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	SW1	SW2	SW3	SW4	SW5
					Client sampling date / time	06-Nov-2023 12:30	06-Nov-2023 12:58	06-Nov-2023 13:45	06-Nov-2023 14:55	06-Nov-2023 15:35
						HA2301016-001	HA2301016-002	HA2301016-003	HA2301016-004	HA2301016-005
						Result	Result	Result	Result	Result
Total Metals										
Selenium, total	7782-49-2	E420/WT	0.000050	mg/L		0.000086	0.000118	0.000092	0.000091	0.000108
Silicon (as SiO2), total	7631-86-9	EC420.SiO2/WT	0.25	mg/L		5.30	5.86	5.26	5.58	5.73
Silicon, total	7440-21-3	E420/WT	0.10	mg/L		2.48	2.74	2.46	2.61	2.68
Silver, total	7440-22-4	E420/WT	0.000010	mg/L		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Sodium, total	7440-23-5	E420/WT	0.050	mg/L		3.26	3.35	3.21	3.20	3.33
Strontium, total	7440-24-6	E420/WT	0.00020	mg/L		0.00560	0.00462	0.00562	0.00462	0.00535
Sulfur, total	7704-34-9	E420/WT	0.50	mg/L		0.61	0.56	0.53	<0.50	0.50
Tellurium, total	13494-80-9	E420/WT	0.00020	mg/L		<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Thallium, total	7440-28-0	E420/WT	0.000010	mg/L		<0.000010	<0.000010	0.000011	0.000011	<0.000010
Thorium, total	7440-29-1	E420/WT	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Tin, total	7440-31-5	E420/WT	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium, total	7440-32-6	E420/WT	0.00030	mg/L		0.00156	0.0115	0.00211	0.00437	0.00350
Tungsten, total	7440-33-7	E420/WT	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Uranium, total	7440-61-1	E420/WT	0.000010	mg/L		0.000123	0.000261	0.000043	0.000038	0.000039
Vanadium, total	7440-62-2	E420/WT	0.00050	mg/L		<0.00050	0.00050	<0.00050	<0.00050	<0.00050
Zinc, total	7440-66-6	E420/WT	0.0030	mg/L		0.0063	0.0050	0.0073	0.0045	0.0088
Zirconium, total	7440-67-7	E420/WT	0.00020	mg/L		<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Hydrocarbon Distribution of RBCA mTPH (Tier I) Fractions										
C6-C10 fraction of mTPH	n/a	EC581D/WT	1	%		----	----	----	<1	<1
>C10-C16 fraction of mTPH	n/a	EC581D/WT	1	%		----	----	----	<1	<1
>C16-C21 fraction of mTPH	n/a	EC581D/WT	1	%		----	----	----	<1	<1
>C21-C32 fraction of mTPH	n/a	EC581D/WT	1	%		----	----	----	<1	<1
Hydrocarbons										
Benzene	71-43-2	E611A/WT	0.00050	mg/L		----	----	----	<0.00050	<0.00050
Toluene	108-88-3	E611A/WT	0.00050	mg/L		----	----	----	<0.00050	<0.00050
Ethylbenzene	100-41-4	E611A/WT	0.00050	mg/L		----	----	----	<0.00050	<0.00050
Xylenes, total	1330-20-7	E611A/WT	0.00050	mg/L		----	----	----	<0.00050	<0.00050
Xylene, o-	95-47-6	E611A/WT	0.00030	mg/L		----	----	----	<0.00030	<0.00030
Xylene, m+p-	179601-23-1	E611A/WT	0.00040	mg/L		----	----	----	<0.00040	<0.00040

Analytical Results

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

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	SW1	SW2	SW3	SW4	SW5
					Client sampling date / time	06-Nov-2023 12:30	06-Nov-2023 12:58	06-Nov-2023 13:45	06-Nov-2023 14:55	06-Nov-2023 15:35
						HA2301016-001	HA2301016-002	HA2301016-003	HA2301016-004	HA2301016-005
						Result	Result	Result	Result	Result
Hydrocarbons										
VPH C6-C10	n/a	E581.VPH/WT	0.025	mg/L		----	----	----	<0.025	<0.025
VPH C6-C10 (less BTEX)	n/a	EC580C/WT	0.025	mg/L		----	----	----	<0.025	<0.025
EPH >C10-C16	n/a	E601F/WT	0.050	mg/L		----	----	----	<0.050	<0.050
EPH >C16-C21	n/a	E601F/WT	0.050	mg/L		----	----	----	<0.050	<0.050
EPH >C21-C32	n/a	E601F/WT	0.050	mg/L		----	----	----	<0.050	<0.050
EPH >C34-C50	n/a	E601F/WT	0.10	mg/L		----	----	----	<0.10	<0.10
hydrocarbon resemblance	n/a	E601F/WT	-	none		----	----	----	N/A	N/A
mTPH (Tier I)	n/a	EC581D/WT	0.090	mg/L		----	----	----	<0.090	<0.090
return to baseline at C32	n/a	E601F/WT	-	-		----	----	----	Yes	Yes
TEH >C10-C32	n/a	E601F/WT	0.100	mg/L		----	----	----	<0.100	<0.100
Hydrocarbons Surrogates										
dotriacontane, n- (EPH)	n/a	E601F/WT	1.0	%		----	----	----	74.9	76.1
isobutylbenzene (EPH)	538-93-2	E601F/WT	1.0	%		----	----	----	79.4	61.6
isobutylbenzene (VPH)	538-93-2	E581.VPH/WT	1.0	%		----	----	----	97.6	62.7
Volatile Organic Compounds Surrogates										
Bromofluorobenzene, 4-	460-00-4	E611A/WT	1.0	%		----	----	----	102	84.2
Difluorobenzene, 1,4-	540-36-3	E611A/WT	1.0	%		----	----	----	98.3	98.2
Polycyclic Aromatic Hydrocarbons										
Acenaphthene	83-32-9	E641A-L/WT	0.010	µg/L		----	----	----	<0.010	<0.010
Acenaphthylene	208-96-8	E641A-L/WT	0.010	µg/L		----	----	----	<0.010	<0.010
Acridine	260-94-6	E641A-L/WT	0.010	µg/L		----	----	----	<0.010	<0.010
Anthracene	120-12-7	E641A-L/WT	0.010	µg/L		----	----	----	<0.010	<0.010
Benz(a)anthracene	56-55-3	E641A-L/WT	0.010	µg/L		----	----	----	<0.010	<0.010
Benzo(a)pyrene	50-32-8	E641A-L/WT	0.0050	µg/L		----	----	----	<0.0050	<0.0050
Benzo(b+j)fluoranthene	n/a	E641A-L/WT	0.010	µg/L		----	----	----	<0.010	<0.010
Benzo(b+j+k)fluoranthene	n/a	E641A-L/WT	0.015	µg/L		----	----	----	<0.015	<0.015
Benzo(g,h,i)perylene	191-24-2	E641A-L/WT	0.010	µg/L		----	----	----	<0.010	<0.010
Benzo(k)fluoranthene	207-08-9	E641A-L/WT	0.010	µg/L		----	----	----	<0.010	<0.010
Chrysene	218-01-9	E641A-L/WT	0.010	µg/L		----	----	----	<0.010	<0.010
Dibenz(a,h)anthracene	53-70-3	E641A-L/WT	0.0050	µg/L		----	----	----	<0.0050	<0.0050

Analytical Results

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

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	SW1	SW2	SW3	SW4	SW5
					Client sampling date / time	06-Nov-2023 12:30	06-Nov-2023 12:58	06-Nov-2023 13:45	06-Nov-2023 14:55	06-Nov-2023 15:35
						HA2301016-001	HA2301016-002	HA2301016-003	HA2301016-004	HA2301016-005
						Result	Result	Result	Result	Result
Polycyclic Aromatic Hydrocarbons										
Fluoranthene	206-44-0	E641A-L/WT	0.010	µg/L		----	----	----	<0.010	<0.010
Fluorene	86-73-7	E641A-L/WT	0.010	µg/L		----	----	----	<0.010	<0.010
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A-L/WT	0.010	µg/L		----	----	----	<0.010	<0.010
Methylnaphthalene, 1-	90-12-0	E641A-L/WT	0.010	µg/L		----	----	----	<0.010	<0.010
Methylnaphthalene, 1+2-	----	E641A-L/WT	0.015	µg/L		----	----	----	<0.015	<0.015
Methylnaphthalene, 2-	91-57-6	E641A-L/WT	0.010	µg/L		----	----	----	<0.010	<0.010
Naphthalene	91-20-3	E641A-L/WT	0.010	µg/L		----	----	----	<0.010	<0.010
Perylene	198-55-0	E641A-L/WT	0.010	µg/L		----	----	----	<0.010	<0.010
Phenanthrene	85-01-8	E641A-L/WT	0.010	µg/L		----	----	----	<0.010	<0.010
Pyrene	129-00-0	E641A-L/WT	0.010	µg/L		----	----	----	<0.010	<0.010
Quinoline	91-22-5	E641A-L/WT	0.010	µg/L		----	----	----	<0.010	<0.010
B(a)P total potency equivalents [B(a)P TPE]	----	E641A-L/WT	0.010	µg/L		----	----	----	<0.010	<0.010
Polycyclic Aromatic Hydrocarbons Surrogates										
Chrysene-d12	1719-03-5	E641A-L/WT	0.1	%		----	----	----	113	119
Naphthalene-d8	1146-65-2	E641A-L/WT	0.1	%		----	----	----	110	111
Phenanthrene-d10	1517-22-2	E641A-L/WT	0.1	%		----	----	----	105	107

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

Please refer to the Accreditation section for an explanation of analyte accreditations.

Analytical Results

Sub-Matrix: Water (Matrix: Water)				Client sample ID	SW DUP A	SW DUP B	----	----	----
				Client sampling date / time	06-Nov-2023 00:00	06-Nov-2023 00:00	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit	HA2301016-006	HA2301016-007	--------	--------	--------
					Result	Result	----	----	----
Physical Tests									
Alkalinity, bicarbonate (as HCO3)	71-52-3	E290/WT	1.0	mg/L	<1.0	----	----	----	----
Alkalinity, carbonate (as CO3)	3812-32-6	E290/WT	1.0	mg/L	<1.0	----	----	----	----
Alkalinity, hydroxide (as OH)	14280-30-9	E290/WT	1.0	mg/L	<1.0	----	----	----	----
Alkalinity, total (as CaCO3)	----	E290/WT	1.0	mg/L	<1.0	----	----	----	----
Colour, apparent	----	E330/WT	2.0	CU	89.9 DLM	----	----	----	----
Conductivity	----	E100/WT	1.0	µS/cm	28.2	----	----	----	----
Hardness (as CaCO3), from total Ca/Mg	----	EC100A/WT	0.50	mg/L	3.12	----	----	----	----
Langelier index (@ 20°C)	----	EC105A/WT	0.01	-	Incalculable	----	----	----	----
Langelier index (@ 4°C)	----	EC105A/WT	0.01	-	Incalculable	----	----	----	----
pH	----	E108/WT	0.10	pH units	5.38	----	----	----	----
pH, saturation (@ 20°C)	----	EC105A/WT	0.01	pH units	Incalculable	----	----	----	----
pH, saturation (@ 4°C)	----	EC105A/WT	0.01	pH units	Incalculable	----	----	----	----
Solids, total dissolved [TDS]	----	E162/HA	10	mg/L	36	----	----	----	----
Turbidity	----	E121/WT	0.10	NTU	0.19	----	----	----	----
Anions and Nutrients									
Ammonia, total (as N)	7664-41-7	E298/WT	0.0050	mg/L	0.0050	----	----	----	----
Chloride	16887-00-6	E235.Cl/WT	0.50	mg/L	4.64	----	----	----	----
Fluoride	16984-48-8	E235.F/WT	0.020	mg/L	<0.020	----	----	----	----
Nitrate (as N)	14797-55-8	E235.NO3/WT	0.020	mg/L	<0.020	----	----	----	----
Nitrate + Nitrite (as N)	----	EC235.N+N/WT	0.0032	mg/L	<0.0224	----	----	----	----
Nitrite (as N)	14797-65-0	E235.NO2/WT	0.010	mg/L	<0.010	----	----	----	----
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U/WT	0.0010	mg/L	0.0035	----	----	----	----
Sulfate (as SO4)	14808-79-8	E235.SO4/WT	0.30	mg/L	1.76	----	----	----	----
Organic / Inorganic Carbon									
Carbon, total organic [TOC]	----	E355-L/WT	0.50	mg/L	9.50	----	----	----	----
Ion Balance									
Anion sum	----	EC101A/WT	0.10	meq/L	0.17	----	----	----	----
Cation sum (total)	----	EC101A/WT	0.10	meq/L	0.26	----	----	----	----
Ion balance (cations/anions)	----	EC101A/WT	0.01	%	153	----	----	----	----

Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	SW DUP A	SW DUP B	----	----	----
					Client sampling date / time	06-Nov-2023 00:00	06-Nov-2023 00:00	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit		HA2301016-006	HA2301016-007	--------	--------	--------
						Result	Result	----	----	----
Total Metals										
Aluminum, total	7429-90-5	E420/WT	0.0030	mg/L		0.228	----	----	----	----
Antimony, total	7440-36-0	E420/WT	0.00010	mg/L		<0.00010	----	----	----	----
Arsenic, total	7440-38-2	E420/WT	0.00010	mg/L		0.0473	----	----	----	----
Barium, total	7440-39-3	E420/WT	0.00010	mg/L		0.00414	----	----	----	----
Beryllium, total	7440-41-7	E420/WT	0.000020	mg/L		0.000042	----	----	----	----
Bismuth, total	7440-69-9	E420/WT	0.000050	mg/L		<0.000050	----	----	----	----
Boron, total	7440-42-8	E420/WT	0.010	mg/L		<0.010	----	----	----	----
Cadmium, total	7440-43-9	E420/WT	0.0000050	mg/L		0.0000314	----	----	----	----
Calcium, total	7440-70-2	E420/WT	0.100	mg/L		0.584	----	----	----	----
Cesium, total	7440-46-2	E420/WT	0.000010	mg/L		0.000121	----	----	----	----
Chromium, total	7440-47-3	E420/WT	0.00050	mg/L		<0.00050	----	----	----	----
Cobalt, total	7440-48-4	E420/WT	0.00010	mg/L		0.00047	----	----	----	----
Copper, total	7440-50-8	E420/WT	0.00050	mg/L		0.00084	----	----	----	----
Iron, total	7439-89-6	E420/WT	0.010	mg/L		0.394	----	----	----	----
Lead, total	7439-92-1	E420/WT	0.000050	mg/L		0.000722	----	----	----	----
Lithium, total	7439-93-2	E420/WT	0.0010	mg/L		<0.0010	----	----	----	----
Magnesium, total	7439-95-4	E420/WT	0.0050	mg/L		0.403	----	----	----	----
Manganese, total	7439-96-5	E420/WT	0.00010	mg/L		0.0462	----	----	----	----
Mercury, total	7439-97-6	E508/WT	0.0000050	mg/L		0.0000195	----	----	----	----
Molybdenum, total	7439-98-7	E420/WT	0.000050	mg/L		<0.000050	----	----	----	----
Nickel, total	7440-02-0	E420/WT	0.00050	mg/L		0.00114	----	----	----	----
Phosphorus, total	7723-14-0	E420/WT	0.050	mg/L		<0.050	----	----	----	----
Potassium, total	7440-09-7	E420/WT	0.050	mg/L		0.340	----	----	----	----
Rubidium, total	7440-17-7	E420/WT	0.00020	mg/L		0.00166	----	----	----	----
Selenium, total	7782-49-2	E420/WT	0.000050	mg/L		0.000098	----	----	----	----
Silicon (as SiO2), total	7631-86-9	EC420.SiO2/WT	0.25	mg/L		5.30	----	----	----	----
Silicon, total	7440-21-3	E420/WT	0.10	mg/L		2.48	----	----	----	----
Silver, total	7440-22-4	E420/WT	0.000010	mg/L		<0.000010	----	----	----	----
Sodium, total	7440-23-5	E420/WT	0.050	mg/L		3.33	----	----	----	----

Analytical Results

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

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	SW DUP A	SW DUP B	----	----	----
					Client sampling date / time	06-Nov-2023 00:00	06-Nov-2023 00:00	----	----	----
						HA2301016-006	HA2301016-007	--------	--------	--------
						Result	Result	----	----	----
Total Metals										
Strontium, total	7440-24-6	E420/WT	0.00020	mg/L		0.00568	----	----	----	----
Sulfur, total	7704-34-9	E420/WT	0.50	mg/L		0.51	----	----	----	----
Tellurium, total	13494-80-9	E420/WT	0.00020	mg/L		<0.00020	----	----	----	----
Thallium, total	7440-28-0	E420/WT	0.000010	mg/L		0.000012	----	----	----	----
Thorium, total	7440-29-1	E420/WT	0.00010	mg/L		<0.00010	----	----	----	----
Tin, total	7440-31-5	E420/WT	0.00010	mg/L		<0.00010	----	----	----	----
Titanium, total	7440-32-6	E420/WT	0.00030	mg/L		0.00187	----	----	----	----
Tungsten, total	7440-33-7	E420/WT	0.00010	mg/L		<0.00010	----	----	----	----
Uranium, total	7440-61-1	E420/WT	0.000010	mg/L		0.000044	----	----	----	----
Vanadium, total	7440-62-2	E420/WT	0.00050	mg/L		<0.00050	----	----	----	----
Zinc, total	7440-66-6	E420/WT	0.0030	mg/L		0.0075	----	----	----	----
Zirconium, total	7440-67-7	E420/WT	0.00020	mg/L		<0.00020	----	----	----	----
Hydrocarbon Distribution of RBCA mTPH (Tier I) Fractions										
C6-C10 fraction of mTPH	n/a	EC581D/WT	1	%		----	<1	----	----	----
>C10-C16 fraction of mTPH	n/a	EC581D/WT	1	%		----	<1	----	----	----
>C16-C21 fraction of mTPH	n/a	EC581D/WT	1	%		----	<1	----	----	----
>C21-C32 fraction of mTPH	n/a	EC581D/WT	1	%		----	<1	----	----	----
Hydrocarbons										
Benzene	71-43-2	E611A/WT	0.00050	mg/L		----	<0.00050	----	----	----
Toluene	108-88-3	E611A/WT	0.00050	mg/L		----	<0.00050	----	----	----
Ethylbenzene	100-41-4	E611A/WT	0.00050	mg/L		----	<0.00050	----	----	----
Xylenes, total	1330-20-7	E611A/WT	0.00050	mg/L		----	<0.00050	----	----	----
Xylene, o-	95-47-6	E611A/WT	0.00030	mg/L		----	<0.00030	----	----	----
Xylene, m+p-	179601-23-1	E611A/WT	0.00040	mg/L		----	<0.00040	----	----	----
VPH C6-C10	n/a	E581.VPH/WT	0.025	mg/L		----	<0.025	----	----	----
VPH C6-C10 (less BTEX)	n/a	EC580C/WT	0.025	mg/L		----	<0.025	----	----	----
EPH >C10-C16	n/a	E601F/WT	0.050	mg/L		----	<0.050	----	----	----
EPH >C16-C21	n/a	E601F/WT	0.050	mg/L		----	<0.050	----	----	----
EPH >C21-C32	n/a	E601F/WT	0.050	mg/L		----	<0.050	----	----	----
EPH >C34-C50	n/a	E601F/WT	0.10	mg/L		----	<0.10	----	----	----

Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	SW DUP A	SW DUP B	----	----	----
					Client sampling date / time	06-Nov-2023 00:00	06-Nov-2023 00:00	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit		HA2301016-006	HA2301016-007	--------	--------	--------
						Result	Result	----	----	----
Hydrocarbons										
hydrocarbon resemblance	n/a	E601F/WT	-	none		----	N/A	----	----	----
mTPH (Tier I)	n/a	EC581D/WT	0.090	mg/L		----	<0.090	----	----	----
return to baseline at C32	n/a	E601F/WT	-	-		----	Yes	----	----	----
TEH >C10-C32	n/a	E601F/WT	0.100	mg/L		----	<0.100	----	----	----
Hydrocarbons Surrogates										
dotriacontane, n- (EPH)	n/a	E601F/WT	1.0	%		----	78.8	----	----	----
isobutylbenzene (EPH)	538-93-2	E601F/WT	1.0	%		----	85.0	----	----	----
isobutylbenzene (VPH)	538-93-2	E581.VPH/WT	1.0	%		----	85.5	----	----	----
Volatile Organic Compounds Surrogates										
Bromofluorobenzene, 4-	460-00-4	E611A/WT	1.0	%		----	99.7	----	----	----
Difluorobenzene, 1,4-	540-36-3	E611A/WT	1.0	%		----	98.1	----	----	----
Polycyclic Aromatic Hydrocarbons										
Acenaphthene	83-32-9	E641A-L/WT	0.010	µg/L		----	<0.010	----	----	----
Acenaphthylene	208-96-8	E641A-L/WT	0.010	µg/L		----	<0.010	----	----	----
Acridine	260-94-6	E641A-L/WT	0.010	µg/L		----	<0.010	----	----	----
Anthracene	120-12-7	E641A-L/WT	0.010	µg/L		----	<0.010	----	----	----
Benz(a)anthracene	56-55-3	E641A-L/WT	0.010	µg/L		----	<0.010	----	----	----
Benzo(a)pyrene	50-32-8	E641A-L/WT	0.0050	µg/L		----	<0.0050	----	----	----
Benzo(b+j)fluoranthene	n/a	E641A-L/WT	0.010	µg/L		----	<0.010	----	----	----
Benzo(b+j+k)fluoranthene	n/a	E641A-L/WT	0.015	µg/L		----	<0.015	----	----	----
Benzo(g,h,i)perylene	191-24-2	E641A-L/WT	0.010	µg/L		----	<0.010	----	----	----
Benzo(k)fluoranthene	207-08-9	E641A-L/WT	0.010	µg/L		----	<0.010	----	----	----
Chrysene	218-01-9	E641A-L/WT	0.010	µg/L		----	<0.010	----	----	----
Dibenz(a,h)anthracene	53-70-3	E641A-L/WT	0.0050	µg/L		----	<0.0050	----	----	----
Fluoranthene	206-44-0	E641A-L/WT	0.010	µg/L		----	<0.010	----	----	----
Fluorene	86-73-7	E641A-L/WT	0.010	µg/L		----	<0.010	----	----	----
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A-L/WT	0.010	µg/L		----	<0.010	----	----	----
Methylnaphthalene, 1-	90-12-0	E641A-L/WT	0.010	µg/L		----	<0.010	----	----	----
Methylnaphthalene, 1+2-	----	E641A-L/WT	0.015	µg/L		----	<0.015	----	----	----
Methylnaphthalene, 2-	91-57-6	E641A-L/WT	0.010	µg/L		----	<0.010	----	----	----

Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	SW DUP A	SW DUP B	----	----	----
					Client sampling date / time	06-Nov-2023 00:00	06-Nov-2023 00:00	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit		HA2301016-006	HA2301016-007	--------	--------	--------
						Result	Result	----	----	----
Polycyclic Aromatic Hydrocarbons										
Naphthalene	91-20-3	E641A-L/WT	0.010	µg/L		----	<0.010	----	----	----
Perylene	198-55-0	E641A-L/WT	0.010	µg/L		----	<0.010	----	----	----
Phenanthrene	85-01-8	E641A-L/WT	0.010	µg/L		----	<0.010	----	----	----
Pyrene	129-00-0	E641A-L/WT	0.010	µg/L		----	<0.010	----	----	----
Quinoline	91-22-5	E641A-L/WT	0.010	µg/L		----	<0.010	----	----	----
B(a)P total potency equivalents [B(a)P TPE]	----	E641A-L/WT	0.010	µg/L		----	<0.010	----	----	----
Polycyclic Aromatic Hydrocarbons Surrogates										
Chrysene-d12	1719-03-5	E641A-L/WT	0.1	%		----	79.6	----	----	----
Naphthalene-d8	1146-65-2	E641A-L/WT	0.1	%		----	74.7	----	----	----
Phenanthrene-d10	1517-22-2	E641A-L/WT	0.1	%		----	74.1	----	----	----

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

Please refer to the Accreditation section for an explanation of analyte accreditations.

ALS Canada Ltd.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **HA2301016**	Page	: 1 of 22
Client	: **Dillon Consulting Limited**	Laboratory	: ALS Environmental - Halifax
Contact	: Shauna Gallant	Account Manager	: Andrew Martin
Address	: 137 Chain Lake Drive Halifax NS Canada B3S 1B3	Address	: 13-100 Wright Ave Dartmouth, Nova Scotia Canada B3B 1L2
Telephone	: 902-450-4000 ext 5039	Telephone	: +1 902 707 4888
Project	: 23-6465	Date Samples Received	: 07-Nov-2023 15:35
PO	: ----	Issue Date	: 17-Nov-2023 17:41
C-O-C number	: ----		
Sampler	: ----		
Site	: Build NS (Country Harbour)		
Quote number	: HA23-DICL100-12 - Lump Sum Rate - Build NS (Country Harbour)		
No. of samples received	: 7		
No. of samples analysed	: 7		

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

Key

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

Workorder Comments

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

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Matrix Spike outliers occur.
- Laboratory Control Sample (LCS) outliers occur - please see following pages for full details.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

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

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **Water**

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Method	Result	Limits	Comment
Laboratory Control Sample (LCS) Recoveries								
Hydrocarbons	QC-1233875-002	----	VPH C6-C10	n/a	E581.VPH	79.3 % LCS-L	80.0-120%	Recovery less than lower control limit

Result Qualifiers

Qualifier	Description
LCS-L	*Lab Control Sample recovery was below ALS DQO. Reference Material and/or Matrix Spike results were acceptable. Non-detected sample results are considered reliable. Other results, if reported, have been qualified.*

Analysis Holding Time Compliance

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

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

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

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

Matrix: **Water**

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

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) SW1	E298	06-Nov-2023	09-Nov-2023	28 days	3 days	✓	10-Nov-2023	28 days	4 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) SW2	E298	06-Nov-2023	09-Nov-2023	28 days	3 days	✓	10-Nov-2023	28 days	4 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) SW3	E298	06-Nov-2023	09-Nov-2023	28 days	3 days	✓	10-Nov-2023	28 days	4 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) SW4	E298	06-Nov-2023	09-Nov-2023	28 days	3 days	✓	10-Nov-2023	28 days	4 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) SW5	E298	06-Nov-2023	09-Nov-2023	28 days	3 days	✓	10-Nov-2023	28 days	4 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) SW DUP A	E298	06-Nov-2023	09-Nov-2023	28 days	4 days	✓	10-Nov-2023	28 days	4 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE SW1	E235.Cl	06-Nov-2023	09-Nov-2023	28 days	3 days	✓	09-Nov-2023	28 days	3 days	✓

Matrix: **Water**

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

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Chloride in Water by IC										
HDPE SW2	E235.Cl	06-Nov-2023	09-Nov-2023	28 days	3 days	✓	09-Nov-2023	28 days	3 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE SW3	E235.Cl	06-Nov-2023	09-Nov-2023	28 days	3 days	✓	09-Nov-2023	28 days	3 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE SW4	E235.Cl	06-Nov-2023	09-Nov-2023	28 days	3 days	✓	09-Nov-2023	28 days	3 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE SW5	E235.Cl	06-Nov-2023	09-Nov-2023	28 days	3 days	✓	09-Nov-2023	28 days	3 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE SW DUP A	E235.Cl	06-Nov-2023	09-Nov-2023	28 days	4 days	✓	09-Nov-2023	28 days	4 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)										
HDPE SW DUP A	E378-U	06-Nov-2023	09-Nov-2023	3 days	3 days	✓	09-Nov-2023	3 days	3 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)										
HDPE SW1	E378-U	06-Nov-2023	09-Nov-2023	3 days	3 days	✓	09-Nov-2023	3 days	3 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)										
HDPE SW2	E378-U	06-Nov-2023	09-Nov-2023	3 days	3 days	✓	09-Nov-2023	3 days	3 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)										
HDPE SW3	E378-U	06-Nov-2023	09-Nov-2023	3 days	3 days	✓	09-Nov-2023	3 days	3 days	✓

Matrix: **Water**

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

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)										
HDPE SW4	E378-U	06-Nov-2023	09-Nov-2023	3 days	3 days	✓	09-Nov-2023	3 days	3 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)										
HDPE SW5	E378-U	06-Nov-2023	09-Nov-2023	3 days	3 days	✓	09-Nov-2023	3 days	3 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE SW1	E235.F	06-Nov-2023	09-Nov-2023	28 days	3 days	✓	09-Nov-2023	28 days	3 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE SW2	E235.F	06-Nov-2023	09-Nov-2023	28 days	3 days	✓	09-Nov-2023	28 days	3 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE SW3	E235.F	06-Nov-2023	09-Nov-2023	28 days	3 days	✓	09-Nov-2023	28 days	3 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE SW4	E235.F	06-Nov-2023	09-Nov-2023	28 days	3 days	✓	09-Nov-2023	28 days	3 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE SW5	E235.F	06-Nov-2023	09-Nov-2023	28 days	3 days	✓	09-Nov-2023	28 days	3 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE SW DUP A	E235.F	06-Nov-2023	09-Nov-2023	28 days	4 days	✓	09-Nov-2023	28 days	4 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE SW1	E235.NO3	06-Nov-2023	09-Nov-2023	3 days	3 days	✓	09-Nov-2023	3 days	3 days	✓

Matrix: **Water**

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

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Nitrate in Water by IC										
HDPE SW2	E235.NO3	06-Nov-2023	09-Nov-2023	3 days	3 days	✓	09-Nov-2023	3 days	3 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE SW3	E235.NO3	06-Nov-2023	09-Nov-2023	3 days	3 days	✓	09-Nov-2023	3 days	3 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE SW4	E235.NO3	06-Nov-2023	09-Nov-2023	3 days	3 days	✓	09-Nov-2023	3 days	3 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE SW5	E235.NO3	06-Nov-2023	09-Nov-2023	3 days	3 days	✓	09-Nov-2023	3 days	3 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE SW DUP A	E235.NO3	06-Nov-2023	09-Nov-2023	3 days	3 days	✓	09-Nov-2023	3 days	4 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE SW1	E235.NO2	06-Nov-2023	09-Nov-2023	3 days	3 days	✓	09-Nov-2023	3 days	3 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE SW2	E235.NO2	06-Nov-2023	09-Nov-2023	3 days	3 days	✓	09-Nov-2023	3 days	3 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE SW3	E235.NO2	06-Nov-2023	09-Nov-2023	3 days	3 days	✓	09-Nov-2023	3 days	3 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE SW4	E235.NO2	06-Nov-2023	09-Nov-2023	3 days	3 days	✓	09-Nov-2023	3 days	3 days	✓

Matrix: **Water**

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

Analyte Group : Analytical Method / Container / Client Sample ID(s)	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
			Preparation Date	*Holding Times* Rec	*Holding Times* Actual	*Eval*	*Analysis Date*	*Holding Times* Rec	*Holding Times* Actual	*Eval*
Anions and Nutrients : Nitrite in Water by IC										
HDPE SW5	E235.NO2	06-Nov-2023	09-Nov-2023	3 days	3 days	✓	09-Nov-2023	3 days	3 days	✓
Anions and Nutrients : Nitrite in Water by IC										
HDPE SW DUP A	E235.NO2	06-Nov-2023	09-Nov-2023	3 days	3 days	✓	09-Nov-2023	3 days	4 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE SW1	E235.SO4	06-Nov-2023	09-Nov-2023	28 days	3 days	✓	09-Nov-2023	28 days	3 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE SW2	E235.SO4	06-Nov-2023	09-Nov-2023	28 days	3 days	✓	09-Nov-2023	28 days	3 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE SW3	E235.SO4	06-Nov-2023	09-Nov-2023	28 days	3 days	✓	09-Nov-2023	28 days	3 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE SW4	E235.SO4	06-Nov-2023	09-Nov-2023	28 days	3 days	✓	09-Nov-2023	28 days	3 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE SW5	E235.SO4	06-Nov-2023	09-Nov-2023	28 days	3 days	✓	09-Nov-2023	28 days	3 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE SW DUP A	E235.SO4	06-Nov-2023	09-Nov-2023	28 days	4 days	✓	09-Nov-2023	28 days	4 days	✓
Hydrocarbons : EPH in Water by GC-FID (RBCA)										
Amber glass/Teflon lined cap (sodium bisulfate) SW4	E601F	06-Nov-2023	10-Nov-2023	14 days	4 days	✓	14-Nov-2023	40 days	4 days	✓

Matrix: **Water**

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

Analyte Group : Analytical Method / Container / Client Sample ID(s)	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
			Preparation Date	*Holding Times* Rec	*Holding Times* Actual	*Eval*	*Analysis Date*	*Holding Times* Rec	*Holding Times* Actual	*Eval*
Hydrocarbons : EPH in Water by GC-FID (RBCA)										
Amber glass/Teflon lined cap (sodium bisulfate) SW5	E601F	06-Nov-2023	10-Nov-2023	14 days	4 days	✓	14-Nov-2023	40 days	4 days	✓
Hydrocarbons : EPH in Water by GC-FID (RBCA)										
Amber glass/Teflon lined cap (sodium bisulfate) SW DUP B	E601F	06-Nov-2023	10-Nov-2023	14 days	5 days	✓	14-Nov-2023	40 days	4 days	✓
Hydrocarbons : VPH by Headspace GC-FID (RBCA)										
Glass vial (sodium bisulfate) SW4	E581.VPH	06-Nov-2023	11-Nov-2023	14 days	5 days	✓	11-Nov-2023	14 days	5 days	✓
Hydrocarbons : VPH by Headspace GC-FID (RBCA)										
Glass vial (sodium bisulfate) SW5	E581.VPH	06-Nov-2023	11-Nov-2023	14 days	5 days	✓	11-Nov-2023	14 days	5 days	✓
Hydrocarbons : VPH by Headspace GC-FID (RBCA)										
Glass vial (sodium bisulfate) SW DUP B	E581.VPH	06-Nov-2023	11-Nov-2023	14 days	6 days	✓	11-Nov-2023	14 days	6 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) SW1	E355-L	06-Nov-2023	09-Nov-2023	28 days	3 days	✓	13-Nov-2023	28 days	7 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) SW2	E355-L	06-Nov-2023	09-Nov-2023	28 days	3 days	✓	13-Nov-2023	28 days	7 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) SW3	E355-L	06-Nov-2023	09-Nov-2023	28 days	3 days	✓	13-Nov-2023	28 days	7 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) SW4	E355-L	06-Nov-2023	09-Nov-2023	28 days	3 days	✓	13-Nov-2023	28 days	7 days	✓

Matrix: **Water**

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

Analyte Group : Analytical Method / Container / Client Sample ID(s)	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
			Preparation Date	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) SW5	E355-L	06-Nov-2023	09-Nov-2023	28 days	3 days	✓	13-Nov-2023	28 days	7 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) SW DUP A	E355-L	06-Nov-2023	09-Nov-2023	28 days	4 days	✓	13-Nov-2023	28 days	7 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE SW1	E290	06-Nov-2023	09-Nov-2023	14 days	3 days	✓	09-Nov-2023	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE SW2	E290	06-Nov-2023	09-Nov-2023	14 days	3 days	✓	09-Nov-2023	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE SW3	E290	06-Nov-2023	09-Nov-2023	14 days	3 days	✓	09-Nov-2023	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE SW4	E290	06-Nov-2023	09-Nov-2023	14 days	3 days	✓	09-Nov-2023	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE SW5	E290	06-Nov-2023	09-Nov-2023	14 days	3 days	✓	09-Nov-2023	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE SW DUP A	E290	06-Nov-2023	09-Nov-2023	14 days	4 days	✓	09-Nov-2023	14 days	4 days	✓
Physical Tests : Colour (Apparent) by Spectrometer										
HDPE SW5	E330	06-Nov-2023	----	----	----		09-Nov-2023	48 hrs	74 hrs	× EHT

Matrix: **Water**

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

Analyte Group : Analytical Method / Container / Client Sample ID(s)	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
			Preparation Date	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Physical Tests : Colour (Apparent) by Spectrometer										
HDPE SW4	E330	06-Nov-2023	----	----	----		09-Nov-2023	48 hrs	75 hrs	× EHTL
Physical Tests : Colour (Apparent) by Spectrometer										
HDPE SW3	E330	06-Nov-2023	----	----	----		09-Nov-2023	48 hrs	76 hrs	× EHTL
Physical Tests : Colour (Apparent) by Spectrometer										
HDPE SW1	E330	06-Nov-2023	----	----	----		09-Nov-2023	48 hrs	77 hrs	× EHTL
Physical Tests : Colour (Apparent) by Spectrometer										
HDPE SW2	E330	06-Nov-2023	----	----	----		09-Nov-2023	48 hrs	77 hrs	× EHTL
Physical Tests : Colour (Apparent) by Spectrometer										
HDPE SW DUP A	E330	06-Nov-2023	----	----	----		09-Nov-2023	48 hrs	89 hrs	× EHTL
Physical Tests : Conductivity in Water										
HDPE SW1	E100	06-Nov-2023	09-Nov-2023	28 days	3 days	✓	09-Nov-2023	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE SW2	E100	06-Nov-2023	09-Nov-2023	28 days	3 days	✓	09-Nov-2023	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE SW3	E100	06-Nov-2023	09-Nov-2023	28 days	3 days	✓	09-Nov-2023	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE SW4	E100	06-Nov-2023	09-Nov-2023	28 days	3 days	✓	09-Nov-2023	28 days	3 days	✓

Matrix: **Water**

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

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Conductivity in Water										
HDPE SW5	E100	06-Nov-2023	09-Nov-2023	28 days	3 days	✓	09-Nov-2023	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE SW DUP A	E100	06-Nov-2023	09-Nov-2023	28 days	4 days	✓	09-Nov-2023	28 days	4 days	✓
Physical Tests : pH by Meter										
HDPE SW5	E108	06-Nov-2023	09-Nov-2023	0.25 hrs	71 hrs	× EHTR-FM	09-Nov-2023	0.25 hrs	75 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE SW4	E108	06-Nov-2023	09-Nov-2023	0.25 hrs	72 hrs	× EHTR-FM	09-Nov-2023	0.25 hrs	75 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE SW3	E108	06-Nov-2023	09-Nov-2023	0.25 hrs	73 hrs	× EHTR-FM	09-Nov-2023	0.25 hrs	76 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE SW2	E108	06-Nov-2023	09-Nov-2023	0.25 hrs	74 hrs	× EHTR-FM	09-Nov-2023	0.25 hrs	77 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE SW1	E108	06-Nov-2023	09-Nov-2023	0.25 hrs	74 hrs	× EHTR-FM	09-Nov-2023	0.25 hrs	78 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE SW DUP A	E108	06-Nov-2023	09-Nov-2023	0.25 hrs	87 hrs	× EHTR-FM	09-Nov-2023	0.25 hrs	90 hrs	× EHTR-FM
Physical Tests : TDS by Gravimetry										
HDPE SW1	E162	06-Nov-2023	----	----	----		09-Nov-2023	7 days	3 days	✓

Matrix: **Water**

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

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : TDS by Gravimetry										
HDPE SW2	E162	06-Nov-2023	----	----	----		09-Nov-2023	7 days	3 days	✓
Physical Tests : TDS by Gravimetry										
HDPE SW3	E162	06-Nov-2023	----	----	----		09-Nov-2023	7 days	3 days	✓
Physical Tests : TDS by Gravimetry										
HDPE SW4	E162	06-Nov-2023	----	----	----		09-Nov-2023	7 days	3 days	✓
Physical Tests : TDS by Gravimetry										
HDPE SW5	E162	06-Nov-2023	----	----	----		09-Nov-2023	7 days	3 days	✓
Physical Tests : TDS by Gravimetry										
HDPE SW DUP A	E162	06-Nov-2023	----	----	----		09-Nov-2023	7 days	4 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE SW1	E121	06-Nov-2023	----	----	----		09-Nov-2023	3 days	3 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE SW2	E121	06-Nov-2023	----	----	----		09-Nov-2023	3 days	3 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE SW3	E121	06-Nov-2023	----	----	----		09-Nov-2023	3 days	3 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE SW4	E121	06-Nov-2023	----	----	----		09-Nov-2023	3 days	3 days	✓

Matrix: **Water**

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

Analyte Group : Analytical Method / Container / Client Sample ID(s)	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
			Preparation Date	*Holding Times* Rec	*Holding Times* Actual	*Eval*	*Analysis Date*	*Holding Times* Rec	*Holding Times* Actual	*Eval*
Physical Tests : Turbidity by Nephelometry										
HDPE SW5	E121	06-Nov-2023	----	----	----		09-Nov-2023	3 days	3 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE SW DUP A	E121	06-Nov-2023	----	----	----		09-Nov-2023	3 days	4 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hexane LVI GC-MS (Low Level)										
Amber glass/Teflon lined cap (sodium bisulfate) SW4	E641A-L	06-Nov-2023	09-Nov-2023	14 days	3 days	✓	17-Nov-2023	40 days	8 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hexane LVI GC-MS (Low Level)										
Amber glass/Teflon lined cap (sodium bisulfate) SW5	E641A-L	06-Nov-2023	09-Nov-2023	14 days	3 days	✓	17-Nov-2023	40 days	8 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hexane LVI GC-MS (Low Level)										
Amber glass/Teflon lined cap (sodium bisulfate) SW DUP B	E641A-L	06-Nov-2023	09-Nov-2023	14 days	4 days	✓	17-Nov-2023	40 days	8 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) SW DUP A	E508	06-Nov-2023	10-Nov-2023	28 days	4 days	✓	10-Nov-2023	24 days	0 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) SW1	E508	06-Nov-2023	10-Nov-2023	28 days	4 days	✓	10-Nov-2023	24 days	0 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) SW2	E508	06-Nov-2023	10-Nov-2023	28 days	4 days	✓	10-Nov-2023	24 days	0 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) SW3	E508	06-Nov-2023	10-Nov-2023	28 days	4 days	✓	10-Nov-2023	24 days	0 days	✓

Matrix: **Water**

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

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) SW4	E508	06-Nov-2023	10-Nov-2023	28 days	4 days	✓	10-Nov-2023	24 days	0 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) SW5	E508	06-Nov-2023	10-Nov-2023	28 days	4 days	✓	10-Nov-2023	24 days	0 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) SW1	E420	06-Nov-2023	10-Nov-2023	180 days	3 days	✓	10-Nov-2023	180 days	4 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) SW2	E420	06-Nov-2023	10-Nov-2023	180 days	3 days	✓	10-Nov-2023	180 days	4 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) SW3	E420	06-Nov-2023	10-Nov-2023	180 days	3 days	✓	10-Nov-2023	180 days	4 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) SW4	E420	06-Nov-2023	10-Nov-2023	180 days	3 days	✓	10-Nov-2023	180 days	4 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) SW5	E420	06-Nov-2023	10-Nov-2023	180 days	3 days	✓	10-Nov-2023	180 days	4 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) SW DUP A	E420	06-Nov-2023	10-Nov-2023	180 days	4 days	✓	10-Nov-2023	180 days	4 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) SW4	E611A	06-Nov-2023	11-Nov-2023	14 days	5 days	✓	11-Nov-2023	14 days	5 days	✓

Matrix: **Water**

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

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) SW5	E611A	06-Nov-2023	11-Nov-2023	14 days	5 days	✓	11-Nov-2023	14 days	5 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) SW DUP B	E611A	06-Nov-2023	11-Nov-2023	14 days	6 days	✓	11-Nov-2023	14 days	6 days	✓

Legend & Qualifier Definitions

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

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

EHT: Exceeded ALS recommended hold time prior to analysis.

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

Quality Control Parameter Frequency Compliance

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

Matrix: **Water**

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

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Alkalinity Species by Titration	E290	1230235	1	18	5.5	5.0	✓
Ammonia by Fluorescence	E298	1230631	1	18	5.5	5.0	✓
BTEX by Headspace GC-MS	E611A	1233876	1	12	8.3	5.0	✓
Chloride in Water by IC	E235.Cl	1230241	1	12	8.3	5.0	✓
Colour (Apparent) by Spectrometer	E330	1231051	1	14	7.1	5.0	✓
Conductivity in Water	E100	1230236	1	13	7.6	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	1230308	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	1230238	1	16	6.2	5.0	✓
Nitrate in Water by IC	E235.NO3	1230239	1	19	5.2	5.0	✓
Nitrite in Water by IC	E235.NO2	1230240	1	15	6.6	5.0	✓
pH by Meter	E108	1230237	1	18	5.5	5.0	✓
Sulfate in Water by IC	E235.SO4	1230242	1	12	8.3	5.0	✓
TDS by Gravimetry	E162	1229771	1	11	9.0	5.2	✓
Total Mercury in Water by CVAAS	E508	1231886	1	19	5.2	5.0	✓
Total Metals in Water by CRC ICPMS	E420	1231557	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	1230630	1	10	10.0	5.0	✓
Turbidity by Nephelometry	E121	1230636	1	8	12.5	5.0	✓
VPH by Headspace GC-FID (RBCA)	E581.VPH	1233875	1	12	8.3	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	1230235	1	18	5.5	5.0	✓
Ammonia by Fluorescence	E298	1230631	1	18	5.5	5.0	✓
BTEX by Headspace GC-MS	E611A	1233876	1	12	8.3	5.0	✓
Chloride in Water by IC	E235.Cl	1230241	1	12	8.3	5.0	✓
Colour (Apparent) by Spectrometer	E330	1231051	1	14	7.1	5.0	✓
Conductivity in Water	E100	1230236	1	13	7.6	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	1230308	1	20	5.0	5.0	✓
EPH in Water by GC-FID (RBCA)	E601F	1232639	1	3	33.3	5.0	✓
Fluoride in Water by IC	E235.F	1230238	1	16	6.2	5.0	✓
Nitrate in Water by IC	E235.NO3	1230239	1	19	5.2	5.0	✓
Nitrite in Water by IC	E235.NO2	1230240	1	15	6.6	5.0	✓
PAHs by Hexane LVI GC-MS (Low Level)	E641A-L	1230915	1	3	33.3	5.0	✓
pH by Meter	E108	1230237	1	18	5.5	5.0	✓
Sulfate in Water by IC	E235.SO4	1230242	1	12	8.3	5.0	✓
TDS by Gravimetry	E162	1229771	1	11	9.0	5.2	✓
Total Mercury in Water by CVAAS	E508	1231886	1	19	5.2	5.0	✓
Total Metals in Water by CRC ICPMS	E420	1231557	1	20	5.0	5.0	✓

Matrix: **Water**

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

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Control Samples (LCS) - Continued							
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	1230630	1	10	10.0	5.0	✓
Turbidity by Nephelometry	E121	1230636	1	8	12.5	5.0	✓
VPH by Headspace GC-FID (RBCA)	E581.VPH	1233875	1	12	8.3	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	1230235	1	18	5.5	5.0	✓
Ammonia by Fluorescence	E298	1230631	1	18	5.5	5.0	✓
BTEX by Headspace GC-MS	E611A	1233876	1	12	8.3	5.0	✓
Chloride in Water by IC	E235.Cl	1230241	1	12	8.3	5.0	✓
Colour (Apparent) by Spectrometer	E330	1231051	1	14	7.1	5.0	✓
Conductivity in Water	E100	1230236	1	13	7.6	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	1230308	1	20	5.0	5.0	✓
EPH in Water by GC-FID (RBCA)	E601F	1232639	1	3	33.3	5.0	✓
Fluoride in Water by IC	E235.F	1230238	1	16	6.2	5.0	✓
Nitrate in Water by IC	E235.NO3	1230239	1	19	5.2	5.0	✓
Nitrite in Water by IC	E235.NO2	1230240	1	15	6.6	5.0	✓
PAHs by Hexane LVI GC-MS (Low Level)	E641A-L	1230915	1	3	33.3	5.0	✓
Sulfate in Water by IC	E235.SO4	1230242	1	12	8.3	5.0	✓
TDS by Gravimetry	E162	1229771	1	11	9.0	5.2	✓
Total Mercury in Water by CVAAS	E508	1231886	1	19	5.2	5.0	✓
Total Metals in Water by CRC ICPMS	E420	1231557	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	1230630	1	10	10.0	5.0	✓
Turbidity by Nephelometry	E121	1230636	1	8	12.5	5.0	✓
VPH by Headspace GC-FID (RBCA)	E581.VPH	1233875	1	12	8.3	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	1230631	1	18	5.5	5.0	✓
BTEX by Headspace GC-MS	E611A	1233876	1	12	8.3	5.0	✓
Chloride in Water by IC	E235.Cl	1230241	1	12	8.3	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	1230308	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	1230238	1	16	6.2	5.0	✓
Nitrate in Water by IC	E235.NO3	1230239	1	19	5.2	5.0	✓
Nitrite in Water by IC	E235.NO2	1230240	1	15	6.6	5.0	✓
Sulfate in Water by IC	E235.SO4	1230242	1	12	8.3	5.0	✓
Total Mercury in Water by CVAAS	E508	1231886	1	19	5.2	5.0	✓
Total Metals in Water by CRC ICPMS	E420	1231557	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	1230630	1	10	10.0	5.0	✓
VPH by Headspace GC-FID (RBCA)	E581.VPH	1233875	1	12	8.3	5.0	✓

Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 ALS Environmental - Waterloo	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 ALS Environmental - Waterloo	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
Turbidity by Nephelometry	E121 ALS Environmental - Waterloo	Water	APHA 2130 B (mod)	Turbidity is measured by the nephelometric method, by measuring the intensity of light scatter under defined conditions.
TDS by Gravimetry	E162 ALS Environmental - Halifax	Water	APHA 2540 C (mod)	Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, with evaporation of the filtrate at 180 ± 2°C for 16 hours or to constant weight, with gravimetric measurement of the residue.
Chloride in Water by IC	E235.Cl ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235.F ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC	E235.NO2 ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC	E235.NO3 ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 ALS Environmental - Waterloo	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Ammonia by Fluorescence	E298 ALS Environmental - Waterloo	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Colour (Apparent) by Spectrometer	E330 ALS Environmental - Waterloo	Water	APHA 2120 C (mod)	Colour (Apparent) is measured in an unfiltered sample spectrophotometrically using the single wavelength method. The colour contribution of settleable solids are not included in the result. This method is intended for potable waters. Colour measurements can be highly pH dependent, and apply to the pH of the sample as received (at time of testing), without pH adjustment.
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L ALS Environmental - Waterloo	Water	APHA 5310 B (mod)	Total Organic Carbon (Non-Purgeable), also known as NPOC (total), is a direct measurement of TOC after an acidified sample has been purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO_2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of total carbon (TC) is comprised of IC (which is common), this method is more accurate and more reliable than the TOC by subtraction method (i.e. TC minus TIC).
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U ALS Environmental - Waterloo	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.
Total Metals in Water by CRC ICPMS	E420 ALS Environmental - Waterloo	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Total Mercury in Water by CVAAS	E508 ALS Environmental - Waterloo	Water	EPA 1631E (mod)	Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS
VPH by Headspace GC-FID (RBCA)	E581.VPH ALS Environmental - Waterloo	Water	Atlantic RBCA Version 3.1	VPH (Volatile Petroleum Hydrocarbons) is analyzed by static headspace GC-FID. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
EPH in Water by GC-FID (RBCA)	E601F ALS Environmental - Waterloo	Water	Atlantic RBCA Version 3.1	Sample Extracts are analyzed by GC-FID for RBCA Tier I hydrocarbon fractions C10-C16, C16-C21, C21-C32.
BTEX by Headspace GC-MS	E611A ALS Environmental - Waterloo	Water	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
PAHs by Hexane LVI GC-MS (Low Level)	E641A-L ALS Environmental - Waterloo	Water	EPA 8270E (mod)	Polycyclic Aromatic Hydrocarbons (PAHs) are analyzed by large volume injection (LVI) GC-MS.
Hardness (Calculated) from Total Ca/Mg	EC100A ALS Environmental - Waterloo	Water	APHA 2340B	"Hardness (as CaCO3), from total Ca/Mg" is calculated from the sum of total Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations. Hardness from total Ca/Mg is normally comparable to Dissolved Hardness in non-turbid waters.
Ion Balance using Total Metals	EC101A ALS Environmental - Waterloo	Water	APHA 1030E	Cation Sum (using total metals), Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).
Saturation Index using Laboratory pH (Ca-T)	EC105A ALS Environmental - Waterloo	Water	APHA 2330B	Langelier Index provides an indication of scale formation potential at a given pH and temperature, and is calculated as per APHA 2330B Saturation Index. Positive values indicate oversaturation with respect to CaCO3. Negative values indicate undersaturation of CaCO3. This calculation uses laboratory pH measurements and provides estimates of Langelier Index at temperatures of 4, 15, 20, 25, 66, and 77°C. Ryznar Stability Index is an alternative index used for scale formation and corrosion potential.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N ALS Environmental - Waterloo	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).
Total Silicon as Silica (Calculation)	EC420.SiO2 ALS Environmental - Waterloo	Water	N/A	Total Silicon (as SiO2) is a calculated parameter. Total Silicon (as SiO2 mg/L) = 2.139 x Total Silicon (mg/L).
VPH C6-C10 (less BTEX) [RBCA]	EC580C ALS Environmental - Waterloo	Water	Atlantic RBCA Version 3.1	VPH C6-C10 (less BTEX) is calculated as follows: VPH (C6-C10) minus benzene, toluene, ethylbenzene and xylenes (BTEX).
Modified TPH (RBCA) Tier I	EC581D ALS Environmental - Waterloo	Water	Atlantic RBCA Version 3.1	Modified TPH (PIRI), Tier I is the sum of PIRI Fraction (C6 - C10 - BTEX) + (>C10 - C16) + (>C16 – C21) + (>C21 - C32).

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 ALS Environmental - Waterloo	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Total Organic Carbon by Combustion	EP355 ALS Environmental - Waterloo	Water		Preparation for Total Organic Carbon by Combustion
VOCs Preparation for Headspace Analysis	EP581 ALS Environmental - Waterloo	Water	EPA 5021A (mod)	Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler. An aliquot of the headspace is then injected into the GC/MS-FID system.
PHCs and PAHs Hexane Extraction	EP601 ALS Environmental - Waterloo	Water	EPA 3511 (mod)	Petroleum Hydrocarbons (PHCs) and Polycyclic Aromatic Hydrocarbons (PAHs) are extracted using a hexane liquid-liquid extraction.
PHCs Hexane Extraction (RBCA)	EP601F ALS Environmental - Waterloo	Water	EPA 3511 (mod)	Petroleum Hydrocarbons (PHCs) are extracted using a hexane liquid-liquid extraction.

ALS Canada Ltd.

QUALITY CONTROL REPORT

Work Order	: **HA2301016**	Page	: 1 of 16
Client	: Dillon Consulting Limited	Laboratory	: ALS Environmental - Halifax
Contact	: Shauna Gallant	Account Manager	: Andrew Martin
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Project	: 23-6465	Date Samples Received	: 07-Nov-2023 15:35
PO	: ----	Date Analysis Commenced	: 09-Nov-2023
C-O-C number	: ----	Issue Date	: 17-Nov-2023 17:41
Sampler	: ---- 902-450-4000 ext 5039		
Site	: Build NS (Country Harbour)		
Quote number	: HA23-DICL100-12 - Lump Sum Rate - Build NS (Country Harbour)		
No. of samples received	: 7		
No. of samples analysed	: 7		

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Laboratory Department*
Greg Pokocky	Manager - Inorganics	Waterloo Inorganics, Waterloo, Ontario
Jeremy Gingras	Supervisor - Semi-Volatile Instrumentation	Waterloo Organics, Waterloo, Ontario
Jocelyn Kennedy	Department Manager - Semi-Volatile Organics	Waterloo Organics, Waterloo, Ontario
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Sarah Birch	VOC Section Supervisor	Waterloo VOC, Waterloo, Ontario

General Comments

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

Key :

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

Workorder Comments

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 1229771)											
HA2301016-001	SW1	Solids, total dissolved [TDS]	----	E162	10	mg/L	28	25	3	Diff <2x LOR	----
Physical Tests (QC Lot: 1230235)											
HA2301016-001	SW1	Alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	1.4	<1.0	0.4	Diff <2x LOR	----
Physical Tests (QC Lot: 1230236)											
HA2301016-001	SW1	Conductivity	----	E100	1.0	µS/cm	27.1	26.7	1.49%	10%	----
Physical Tests (QC Lot: 1230237)											
HA2301016-001	SW1	pH	----	E108	0.10	pH units	5.73	5.75	0.348%	4%	----
Physical Tests (QC Lot: 1230636)											
HA2301016-004	SW4	Turbidity	----	E121	0.10	NTU	0.47	0.48	0.009	Diff <2x LOR	----
Physical Tests (QC Lot: 1231051)											
HA2300996-001	Anonymous	Colour, apparent	----	E330	2.0	CU	9.1	10.6	1.5	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1230238)											
WT2336462-001	Anonymous	Fluoride	16984-48-8	E235.F	0.020	mg/L	0.422	0.415	1.68%	20%	----
Anions and Nutrients (QC Lot: 1230239)											
WT2336462-001	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	<0.020	<0.020	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1230240)											
WT2336462-001	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1230241)											
WT2336462-001	Anonymous	Chloride	16887-00-6	E235.Cl	0.50	mg/L	5.45	5.43	0.364%	20%	----
Anions and Nutrients (QC Lot: 1230242)											
WT2336462-001	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	3.64	3.64	0.0926%	20%	----
Anions and Nutrients (QC Lot: 1230308)											
HA2301016-001	SW1	Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	0.0013	0.0012	0.00001	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1230631)											
HA2301016-001	SW1	Ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 1230630)											
HA2301016-001	SW1	Carbon, total organic [TOC]	----	E355-L	0.50	mg/L	7.01	7.39	5.24%	20%	----
Total Metals (QC Lot: 1231557)											
HA2301015-001	Anonymous	Aluminum, total	7429-90-5	E420	0.0030	mg/L	0.0657	0.0631	4.08%	20%	----
		Antimony, total	7440-36-0	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Total Metals (QC Lot: 1231557) - continued											
HA2301015-001	Anonymous	Arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00054	0.00052	0.00002	Diff <2x LOR	----
		Barium, total	7440-39-3	E420	0.00010	mg/L	0.00909	0.00891	1.94%	20%	----
		Beryllium, total	7440-41-7	E420	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		Bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Boron, total	7440-42-8	E420	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		Cadmium, total	7440-43-9	E420	0.0000050	mg/L	<0.0000050	0.0000050	0	Diff <2x LOR	----
		Calcium, total	7440-70-2	E420	0.050	mg/L	16.1	16.4	1.96%	20%	----
		Cesium, total	7440-46-2	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Chromium, total	7440-47-3	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Cobalt, total	7440-48-4	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Copper, total	7440-50-8	E420	0.00050	mg/L	0.00493	0.00501	0.00008	Diff <2x LOR	----
		Iron, total	7439-89-6	E420	0.010	mg/L	0.202	0.203	0.712%	20%	----
		Lead, total	7439-92-1	E420	0.000050	mg/L	0.000077	0.000091	0.000014	Diff <2x LOR	----
		Lithium, total	7439-93-2	E420	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		Magnesium, total	7439-95-4	E420	0.0050	mg/L	2.15	2.14	0.433%	20%	----
		Manganese, total	7439-96-5	E420	0.00010	mg/L	0.0258	0.0258	0.147%	20%	----
		Molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.000144	0.000137	0.000008	Diff <2x LOR	----
		Nickel, total	7440-02-0	E420	0.00050	mg/L	0.00058	0.00054	0.00004	Diff <2x LOR	----
		Phosphorus, total	7723-14-0	E420	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		Potassium, total	7440-09-7	E420	0.050	mg/L	0.640	0.632	1.24%	20%	----
		Rubidium, total	7440-17-7	E420	0.00020	mg/L	0.00068	0.00063	0.00005	Diff <2x LOR	----
		Selenium, total	7782-49-2	E420	0.000050	mg/L	0.000069	0.000065	0.000004	Diff <2x LOR	----
		Silicon, total	7440-21-3	E420	0.10	mg/L	2.34	2.29	2.42%	20%	----
		Silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Sodium, total	7440-23-5	E420	0.050	mg/L	3.47	3.49	0.782%	20%	----
		Strontium, total	7440-24-6	E420	0.00020	mg/L	0.109	0.108	1.01%	20%	----
		Sulfur, total	7704-34-9	E420	0.50	mg/L	1.46	1.49	0.03	Diff <2x LOR	----
		Tellurium, total	13494-80-9	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		Thallium, total	7440-28-0	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Thorium, total	7440-29-1	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Titanium, total	7440-32-6	E420	0.00030	mg/L	0.00108	0.00121	0.00013	Diff <2x LOR	----
		Tungsten, total	7440-33-7	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Uranium, total	7440-61-1	E420	0.000010	mg/L	0.000089	0.000086	0.000003	Diff <2x LOR	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Total Metals (QC Lot: 1231557) - continued											
HA2301015-001	Anonymous	Vanadium, total	7440-62-2	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Zinc, total	7440-66-6	E420	0.0030	mg/L	0.0041	0.0042	0.0002	Diff <2x LOR	----
		Zirconium, total	7440-67-7	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
Total Metals (QC Lot: 1231886)											
HA2301015-001	Anonymous	Mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 1233876)											
HA2301016-004	SW4	Benzene	71-43-2	E611A	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		Ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		Toluene	108-88-3	E611A	0.50	µg/L	<0.00050 mg/L	<0.50	0	Diff <2x LOR	----
		Xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.00040 mg/L	<0.40	0	Diff <2x LOR	----
		Xylene, o-	95-47-6	E611A	0.30	µg/L	<0.00030 mg/L	<0.30	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 1233875)											
HA2301016-004	SW4	VPH C6-C10	n/a	E581.VPH	25	µg/L	<0.025 mg/L	<25	0	Diff <2x LOR	----

Method Blank (MB) Report

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

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 1229771)						
Solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Physical Tests (QCLot: 1230235)						
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Physical Tests (QCLot: 1230236)						
Conductivity	----	E100	1	µS/cm	1.1	----
Physical Tests (QCLot: 1230636)						
Turbidity	----	E121	0.1	NTU	<0.10	----
Physical Tests (QCLot: 1231051)						
Colour, apparent	----	E330	2	CU	<2.0	----
Anions and Nutrients (QCLot: 1230238)						
Fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 1230239)						
Nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 1230240)						
Nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 1230241)						
Chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 1230242)						
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 1230308)						
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 1230631)						
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Organic / Inorganic Carbon (QCLot: 1230630)						
Carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----
Total Metals (QCLot: 1231557)						
Aluminum, total	7429-90-5	E420	0.003	mg/L	<0.0030	----
Antimony, total	7440-36-0	E420	0.0001	mg/L	<0.00010	----
Arsenic, total	7440-38-2	E420	0.0001	mg/L	<0.00010	----
Barium, total	7440-39-3	E420	0.0001	mg/L	<0.00010	----
Beryllium, total	7440-41-7	E420	0.00002	mg/L	<0.000020	----
Bismuth, total	7440-69-9	E420	0.00005	mg/L	<0.000050	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 1231557) - continued						
Boron, total	7440-42-8	E420	0.01	mg/L	<0.010	----
Cadmium, total	7440-43-9	E420	0.000005	mg/L	<0.0000050	----
Calcium, total	7440-70-2	E420	0.05	mg/L	<0.050	----
Cesium, total	7440-46-2	E420	0.00001	mg/L	<0.000010	----
Chromium, total	7440-47-3	E420	0.0005	mg/L	<0.00050	----
Cobalt, total	7440-48-4	E420	0.0001	mg/L	<0.00010	----
Copper, total	7440-50-8	E420	0.0005	mg/L	<0.00050	----
Iron, total	7439-89-6	E420	0.01	mg/L	<0.010	----
Lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	----
Lithium, total	7439-93-2	E420	0.001	mg/L	<0.0010	----
Magnesium, total	7439-95-4	E420	0.005	mg/L	<0.0050	----
Manganese, total	7439-96-5	E420	0.0001	mg/L	<0.00010	----
Molybdenum, total	7439-98-7	E420	0.00005	mg/L	<0.000050	----
Nickel, total	7440-02-0	E420	0.0005	mg/L	<0.00050	----
Phosphorus, total	7723-14-0	E420	0.05	mg/L	<0.050	----
Potassium, total	7440-09-7	E420	0.05	mg/L	<0.050	----
Rubidium, total	7440-17-7	E420	0.0002	mg/L	<0.00020	----
Selenium, total	7782-49-2	E420	0.00005	mg/L	<0.000050	----
Silicon, total	7440-21-3	E420	0.1	mg/L	<0.10	----
Silver, total	7440-22-4	E420	0.00001	mg/L	<0.000010	----
Sodium, total	7440-23-5	E420	0.05	mg/L	<0.050	----
Strontium, total	7440-24-6	E420	0.0002	mg/L	<0.00020	----
Sulfur, total	7704-34-9	E420	0.5	mg/L	<0.50	----
Tellurium, total	13494-80-9	E420	0.0002	mg/L	<0.00020	----
Thallium, total	7440-28-0	E420	0.00001	mg/L	<0.000010	----
Thorium, total	7440-29-1	E420	0.0001	mg/L	<0.00010	----
Tin, total	7440-31-5	E420	0.0001	mg/L	<0.00010	----
Titanium, total	7440-32-6	E420	0.0003	mg/L	<0.00030	----
Tungsten, total	7440-33-7	E420	0.0001	mg/L	<0.00010	----
Uranium, total	7440-61-1	E420	0.00001	mg/L	<0.000010	----
Vanadium, total	7440-62-2	E420	0.0005	mg/L	<0.00050	----
Zinc, total	7440-66-6	E420	0.003	mg/L	<0.0030	----
Zirconium, total	7440-67-7	E420	0.0002	mg/L	<0.00020	----
Total Metals (QCLot: 1231886)						
Mercury, total	7439-97-6	E508	0.000005	mg/L	<0.0000050	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Volatile Organic Compounds (QCLot: 1233876)						
Benzene	71-43-2	E611A	0.5	µg/L	<0.50	----
Ethylbenzene	100-41-4	E611A	0.5	µg/L	<0.50	----
Toluene	108-88-3	E611A	0.5	µg/L	<0.50	----
Xylene, m+p-	179601-23-1	E611A	0.4	µg/L	<0.40	----
Xylene, o-	95-47-6	E611A	0.3	µg/L	<0.30	----
Hydrocarbons (QCLot: 1232639)						
EPH >C10-C16	n/a	E601F	50	µg/L	<50	----
EPH >C16-C21	n/a	E601F	50	µg/L	<50	----
EPH >C21-C32	n/a	E601F	50	µg/L	<50	----
EPH >C34-C50	n/a	E601F	100	µg/L	<100	----
Hydrocarbons (QCLot: 1233875)						
VPH C6-C10	n/a	E581.VPH	25	µg/L	<25	----
Polycyclic Aromatic Hydrocarbons (QCLot: 1230915)						
Acenaphthene	83-32-9	E641A-L	0.01	µg/L	<0.010	----
Acenaphthylene	208-96-8	E641A-L	0.01	µg/L	<0.010	----
Acridine	260-94-6	E641A-L	0.01	µg/L	<0.010	----
Anthracene	120-12-7	E641A-L	0.01	µg/L	<0.010	----
Benz(a)anthracene	56-55-3	E641A-L	0.01	µg/L	<0.010	----
Benzo(a)pyrene	50-32-8	E641A-L	0.005	µg/L	<0.0050	----
Benzo(b+j)fluoranthene	n/a	E641A-L	0.01	µg/L	<0.010	----
Benzo(g,h,i)perylene	191-24-2	E641A-L	0.01	µg/L	<0.010	----
Benzo(k)fluoranthene	207-08-9	E641A-L	0.01	µg/L	<0.010	----
Chrysene	218-01-9	E641A-L	0.01	µg/L	<0.010	----
Dibenz(a,h)anthracene	53-70-3	E641A-L	0.005	µg/L	<0.0050	----
Fluoranthene	206-44-0	E641A-L	0.01	µg/L	<0.010	----
Fluorene	86-73-7	E641A-L	0.01	µg/L	<0.010	----
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A-L	0.01	µg/L	<0.010	----
Methylnaphthalene, 1-	90-12-0	E641A-L	0.01	µg/L	<0.010	----
Methylnaphthalene, 2-	91-57-6	E641A-L	0.01	µg/L	<0.010	----
Naphthalene	91-20-3	E641A-L	0.01	µg/L	<0.010	----
Perylene	198-55-0	E641A-L	0.01	µg/L	<0.010	----
Phenanthrene	85-01-8	E641A-L	0.01	µg/L	<0.010	----
Pyrene	129-00-0	E641A-L	0.01	µg/L	<0.010	----
Quinoline	91-22-5	E641A-L	0.01	µg/L	<0.010	----

Laboratory Control Sample (LCS) Report

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

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 1229771)									
Solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	94.9	85.0	115	----
Physical Tests (QCLot: 1230235)									
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	150 mg/L	102	85.0	115	----
Physical Tests (QCLot: 1230236)									
Conductivity	----	E100	1	µS/cm	1409 µS/cm	101	90.0	110	----
Physical Tests (QCLot: 1230237)									
pH	----	E108	----	pH units	7 pH units	101	98.0	102	----
Physical Tests (QCLot: 1230636)									
Turbidity	----	E121	0.1	NTU	200 NTU	98.5	85.0	115	----
Physical Tests (QCLot: 1231051)									
Colour, apparent	----	E330	2	CU	25 CU	93.0	70.0	130	----
Anions and Nutrients (QCLot: 1230238)									
Fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 1230239)									
Nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	99.5	90.0	110	----
Anions and Nutrients (QCLot: 1230240)									
Nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	98.1	90.0	110	----
Anions and Nutrients (QCLot: 1230241)									
Chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	99.4	90.0	110	----
Anions and Nutrients (QCLot: 1230242)									
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 1230308)									
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.0212 mg/L	108	80.0	120	----
Anions and Nutrients (QCLot: 1230631)									
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	105	85.0	115	----
Organic / Inorganic Carbon (QCLot: 1230630)									
Carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	102	80.0	120	----
Total Metals (QCLot: 1231557)									
Aluminum, total	7429-90-5	E420	0.003	mg/L	0.1 mg/L	99.8	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Concentration	LCS	Low	High	Qualifier
Total Metals (QCLot: 1231557) - continued									
Antimony, total	7440-36-0	E420	0.0001	mg/L	0.05 mg/L	104	80.0	120	----
Arsenic, total	7440-38-2	E420	0.0001	mg/L	0.05 mg/L	108	80.0	120	----
Barium, total	7440-39-3	E420	0.0001	mg/L	0.0125 mg/L	107	80.0	120	----
Beryllium, total	7440-41-7	E420	0.00002	mg/L	0.005 mg/L	97.2	80.0	120	----
Bismuth, total	7440-69-9	E420	0.00005	mg/L	0.05 mg/L	101	80.0	120	----
Boron, total	7440-42-8	E420	0.01	mg/L	0.05 mg/L	96.8	80.0	120	----
Cadmium, total	7440-43-9	E420	0.000005	mg/L	0.005 mg/L	103	80.0	120	----
Calcium, total	7440-70-2	E420	0.05	mg/L	2.5 mg/L	102	80.0	120	----
Cesium, total	7440-46-2	E420	0.00001	mg/L	0.0025 mg/L	104	80.0	120	----
Chromium, total	7440-47-3	E420	0.0005	mg/L	0.0125 mg/L	103	80.0	120	----
Cobalt, total	7440-48-4	E420	0.0001	mg/L	0.0125 mg/L	103	80.0	120	----
Copper, total	7440-50-8	E420	0.0005	mg/L	0.0125 mg/L	104	80.0	120	----
Iron, total	7439-89-6	E420	0.01	mg/L	0.05 mg/L	106	80.0	120	----
Lead, total	7439-92-1	E420	0.00005	mg/L	0.025 mg/L	103	80.0	120	----
Lithium, total	7439-93-2	E420	0.001	mg/L	0.0125 mg/L	94.0	80.0	120	----
Magnesium, total	7439-95-4	E420	0.005	mg/L	2.5 mg/L	108	80.0	120	----
Manganese, total	7439-96-5	E420	0.0001	mg/L	0.0125 mg/L	101	80.0	120	----
Molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.0125 mg/L	103	80.0	120	----
Nickel, total	7440-02-0	E420	0.0005	mg/L	0.025 mg/L	103	80.0	120	----
Phosphorus, total	7723-14-0	E420	0.05	mg/L	0.5 mg/L	111	80.0	120	----
Potassium, total	7440-09-7	E420	0.05	mg/L	2.5 mg/L	98.1	80.0	120	----
Rubidium, total	7440-17-7	E420	0.0002	mg/L	0.005 mg/L	105	80.0	120	----
Selenium, total	7782-49-2	E420	0.00005	mg/L	0.05 mg/L	106	80.0	120	----
Silicon, total	7440-21-3	E420	0.1	mg/L	0.5 mg/L	99.1	80.0	120	----
Silver, total	7440-22-4	E420	0.00001	mg/L	0.005 mg/L	96.9	80.0	120	----
Sodium, total	7440-23-5	E420	0.05	mg/L	2.5 mg/L	104	80.0	120	----
Strontium, total	7440-24-6	E420	0.0002	mg/L	0.0125 mg/L	104	80.0	120	----
Sulfur, total	7704-34-9	E420	0.5	mg/L	2.5 mg/L	96.2	80.0	120	----
Tellurium, total	13494-80-9	E420	0.0002	mg/L	0.005 mg/L	104	80.0	120	----
Thallium, total	7440-28-0	E420	0.00001	mg/L	0.05 mg/L	105	80.0	120	----
Thorium, total	7440-29-1	E420	0.0001	mg/L	0.005 mg/L	99.7	80.0	120	----
Tin, total	7440-31-5	E420	0.0001	mg/L	0.025 mg/L	99.4	80.0	120	----
Titanium, total	7440-32-6	E420	0.0003	mg/L	0.0125 mg/L	99.8	80.0	120	----
Tungsten, total	7440-33-7	E420	0.0001	mg/L	0.005 mg/L	102	80.0	120	----
Uranium, total	7440-61-1	E420	0.00001	mg/L	0.00025 mg/L	107	80.0	120	----
Vanadium, total	7440-62-2	E420	0.0005	mg/L	0.025 mg/L	105	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Concentration	LCS	Low	High	Qualifier
Total Metals (QCLot: 1231557) - continued									
Zinc, total	7440-66-6	E420	0.003	mg/L	0.025 mg/L	103	80.0	120	----
Zirconium, total	7440-67-7	E420	0.0002	mg/L	0.005 mg/L	101	80.0	120	----
Total Metals (QCLot: 1231886)									
Mercury, total	7439-97-6	E508	0.000005	mg/L	0.0001 mg/L	107	80.0	120	----
Volatile Organic Compounds (QCLot: 1233876)									
Benzene	71-43-2	E611A	0.5	µg/L	100 µg/L	104	70.0	130	----
Ethylbenzene	100-41-4	E611A	0.5	µg/L	100 µg/L	102	70.0	130	----
Toluene	108-88-3	E611A	0.5	µg/L	100 µg/L	106	70.0	130	----
Xylene, m+p-	179601-23-1	E611A	0.4	µg/L	200 µg/L	102	70.0	130	----
Xylene, o-	95-47-6	E611A	0.3	µg/L	100 µg/L	103	70.0	130	----
Hydrocarbons (QCLot: 1232639)									
EPH >C10-C16	n/a	E601F	50	µg/L	4487.684 µg/L	79.8	70.0	130	----
EPH >C16-C21	n/a	E601F	50	µg/L	2454.789 µg/L	97.9	70.0	130	----
EPH >C21-C32	n/a	E601F	50	µg/L	3172.105 µg/L	86.3	70.0	130	----
EPH >C34-C50	n/a	E601F	100	µg/L	3237.526 µg/L	110	70.0	130	----
Hydrocarbons (QCLot: 1233875)									
VPH C6-C10	n/a	E581.VPH	25	µg/L	2000 µg/L	# 79.3	80.0	120	LCS-L
Polycyclic Aromatic Hydrocarbons (QCLot: 1230915)									
Acenaphthene	83-32-9	E641A-L	0.01	µg/L	0.5263 µg/L	117	50.0	140	----
Acenaphthylene	208-96-8	E641A-L	0.01	µg/L	0.5263 µg/L	111	50.0	140	----
Acridine	260-94-6	E641A-L	0.01	µg/L	0.5263 µg/L	112	50.0	140	----
Anthracene	120-12-7	E641A-L	0.01	µg/L	0.5263 µg/L	116	50.0	140	----
Benz(a)anthracene	56-55-3	E641A-L	0.01	µg/L	0.5263 µg/L	125	50.0	140	----
Benzo(a)pyrene	50-32-8	E641A-L	0.005	µg/L	0.5263 µg/L	134	50.0	140	----
Benzo(b+j)fluoranthene	n/a	E641A-L	0.01	µg/L	0.5263 µg/L	109	50.0	140	----
Benzo(g,h,i)perylene	191-24-2	E641A-L	0.01	µg/L	0.5263 µg/L	114	50.0	140	----
Benzo(k)fluoranthene	207-08-9	E641A-L	0.01	µg/L	0.5263 µg/L	126	50.0	140	----
Chrysene	218-01-9	E641A-L	0.01	µg/L	0.5263 µg/L	136	50.0	140	----
Dibenz(a,h)anthracene	53-70-3	E641A-L	0.005	µg/L	0.5263 µg/L	126	50.0	140	----
Fluoranthene	206-44-0	E641A-L	0.01	µg/L	0.5263 µg/L	127	50.0	140	----
Fluorene	86-73-7	E641A-L	0.01	µg/L	0.5263 µg/L	120	50.0	140	----
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A-L	0.01	µg/L	0.5263 µg/L	137	50.0	140	----
Methylnaphthalene, 1-	90-12-0	E641A-L	0.01	µg/L	0.5263 µg/L	108	50.0	140	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Concentration	LCS	Low	High	Qualifier
Polycyclic Aromatic Hydrocarbons (QCLot: 1230915) - continued									
Methylnaphthalene, 2-	91-57-6	E641A-L	0.01	µg/L	0.5263 µg/L	114	50.0	140	----
Naphthalene	91-20-3	E641A-L	0.01	µg/L	0.5263 µg/L	115	50.0	140	----
Perylene	198-55-0	E641A-L	0.01	µg/L	0.5263 µg/L	123	50.0	140	----
Phenanthrene	85-01-8	E641A-L	0.01	µg/L	0.5263 µg/L	120	50.0	140	----
Pyrene	129-00-0	E641A-L	0.01	µg/L	0.5263 µg/L	127	50.0	140	----
Quinoline	91-22-5	E641A-L	0.01	µg/L	0.5263 µg/L	113	50.0	140	----

Qualifiers

Qualifier	Description
LCS-L	*Lab Control Sample recovery was below ALS DQO. Reference Material and/or Matrix Spike results were acceptable. Non-detected sample results are considered reliable. Other results, if reported, have been qualified.*

Matrix Spike (MS) Report

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

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 1230238)										
WT2336462-001	Anonymous	Fluoride	16984-48-8	E235.F	1.02 mg/L	1 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 1230239)										
WT2336462-001	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3	2.42 mg/L	2.5 mg/L	96.6	75.0	125	----
Anions and Nutrients (QCLot: 1230240)										
WT2336462-001	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2	0.504 mg/L	0.5 mg/L	101	75.0	125	----
Anions and Nutrients (QCLot: 1230241)										
WT2336462-001	Anonymous	Chloride	16887-00-6	E235.Cl	101 mg/L	100 mg/L	101	75.0	125	----
Anions and Nutrients (QCLot: 1230242)										
WT2336462-001	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	103 mg/L	100 mg/L	103	75.0	125	----
Anions and Nutrients (QCLot: 1230308)										
HA2301016-001	SW1	Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0209 mg/L	0.0196 mg/L	107	70.0	130	----
Anions and Nutrients (QCLot: 1230631)										
HA2301016-001	SW1	Ammonia, total (as N)	7664-41-7	E298	0.107 mg/L	0.1 mg/L	107	75.0	125	----
Organic / Inorganic Carbon (QCLot: 1230630)										
HA2301016-001	SW1	Carbon, total organic [TOC]	----	E355-L	ND mg/L	5 mg/L	ND	70.0	130	----
Total Metals (QCLot: 1231557)										
HA2301015-002	Anonymous	Aluminum, total	7429-90-5	E420	0.0919 mg/L	0.1 mg/L	91.9	70.0	130	----
		Antimony, total	7440-36-0	E420	0.0530 mg/L	0.05 mg/L	106	70.0	130	----
		Arsenic, total	7440-38-2	E420	0.0542 mg/L	0.05 mg/L	108	70.0	130	----
		Barium, total	7440-39-3	E420	0.0122 mg/L	0.0125 mg/L	97.3	70.0	130	----
		Beryllium, total	7440-41-7	E420	0.00473 mg/L	0.005 mg/L	94.7	70.0	130	----
		Bismuth, total	7440-69-9	E420	0.0497 mg/L	0.05 mg/L	99.4	70.0	130	----
		Boron, total	7440-42-8	E420	0.048 mg/L	0.05 mg/L	97.0	70.0	130	----
		Cadmium, total	7440-43-9	E420	0.00510 mg/L	0.005 mg/L	102	70.0	130	----
		Calcium, total	7440-70-2	E420	ND mg/L	2.5 mg/L	ND	70.0	130	----
		Cesium, total	7440-46-2	E420	0.00257 mg/L	0.0025 mg/L	103	70.0	130	----
		Chromium, total	7440-47-3	E420	0.0128 mg/L	0.0125 mg/L	103	70.0	130	----
		Cobalt, total	7440-48-4	E420	0.0128 mg/L	0.0125 mg/L	103	70.0	130	----
		Copper, total	7440-50-8	E420	0.0122 mg/L	0.0125 mg/L	98.0	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Total Metals (QCLot: 1231557) - continued										
HA2301015-002	Anonymous	Iron, total	7439-89-6	E420	0.050 mg/L	0.05 mg/L	99.4	70.0	130	----
		Lead, total	7439-92-1	E420	0.0249 mg/L	0.025 mg/L	99.7	70.0	130	----
		Lithium, total	7439-93-2	E420	0.0116 mg/L	0.0125 mg/L	92.4	70.0	130	----
		Magnesium, total	7439-95-4	E420	2.67 mg/L	2.5 mg/L	107	70.0	130	----
		Manganese, total	7439-96-5	E420	0.0126 mg/L	0.0125 mg/L	100	70.0	130	----
		Molybdenum, total	7439-98-7	E420	0.0128 mg/L	0.0125 mg/L	103	70.0	130	----
		Nickel, total	7440-02-0	E420	0.0254 mg/L	0.025 mg/L	102	70.0	130	----
		Phosphorus, total	7723-14-0	E420	ND mg/L	0.5 mg/L	ND	70.0	130	----
		Potassium, total	7440-09-7	E420	2.37 mg/L	2.5 mg/L	94.9	70.0	130	----
		Rubidium, total	7440-17-7	E420	0.00490 mg/L	0.005 mg/L	98.0	70.0	130	----
		Selenium, total	7782-49-2	E420	0.0521 mg/L	0.05 mg/L	104	70.0	130	----
		Silicon, total	7440-21-3	E420	ND mg/L	0.5 mg/L	ND	70.0	130	----
		Silver, total	7440-22-4	E420	0.00468 mg/L	0.005 mg/L	93.6	70.0	130	----
		Sodium, total	7440-23-5	E420	ND mg/L	2.5 mg/L	ND	70.0	130	----
		Strontium, total	7440-24-6	E420	ND mg/L	0.0125 mg/L	ND	70.0	130	----
		Sulfur, total	7704-34-9	E420	ND mg/L	2.5 mg/L	ND	70.0	130	----
		Tellurium, total	13494-80-9	E420	0.00476 mg/L	0.005 mg/L	95.1	70.0	130	----
		Thallium, total	7440-28-0	E420	0.0511 mg/L	0.05 mg/L	102	70.0	130	----
		Thorium, total	7440-29-1	E420	0.00503 mg/L	0.005 mg/L	101	70.0	130	----
		Tin, total	7440-31-5	E420	0.0248 mg/L	0.025 mg/L	99.4	70.0	130	----
		Titanium, total	7440-32-6	E420	0.0127 mg/L	0.0125 mg/L	101	70.0	130	----
		Tungsten, total	7440-33-7	E420	0.00509 mg/L	0.005 mg/L	102	70.0	130	----
		Uranium, total	7440-61-1	E420	0.000261 mg/L	0.00025 mg/L	104	70.0	130	----
		Vanadium, total	7440-62-2	E420	0.0259 mg/L	0.025 mg/L	104	70.0	130	----
		Zinc, total	7440-66-6	E420	ND mg/L	0.025 mg/L	ND	70.0	130	----
		Zirconium, total	7440-67-7	E420	0.00505 mg/L	0.005 mg/L	101	70.0	130	----
Total Metals (QCLot: 1231886)										
HA2301015-002	Anonymous	Mercury, total	7439-97-6	E508	0.000106 mg/L	0.0001 mg/L	106	70.0	130	----
Volatile Organic Compounds (QCLot: 1233876)										
HA2301016-004	SW4	Benzene	71-43-2	E611A	107 µg/L	100 µg/L	107	60.0	140	----
		Ethylbenzene	100-41-4	E611A	104 µg/L	100 µg/L	104	60.0	140	----
		Toluene	108-88-3	E611A	106 µg/L	100 µg/L	106	60.0	140	----
		Xylene, m+p-	179601-23-1	E611A	208 µg/L	200 µg/L	104	60.0	140	----
		Xylene, o-	95-47-6	E611A	106 µg/L	100 µg/L	106	60.0	140	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Hydrocarbons (QCLot: 1233875)										
HA2301016-004	SW4	VPH C6-C10	n/a	E581.VPH	1520 µg/L	2000 µg/L	76.1	60.0	140	----

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CERTIFICATE OF ANALYSIS

Work Order	: **HA2301014**	Page	: 1 of 6
Client	: **Dillon Consulting Limited**	Laboratory	: ALS Environmental - Halifax
Contact	: Shauna Gallant	Account Manager	: Andrew Martin
Address	: 137 Chain Lake Drive Halifax NS Canada B3S 1B3	Address	: 13-100 Wright Ave Dartmouth NS Canada B3B 1L2
Telephone	: 902-450-4000 ext 5039	Telephone	: +1 902 707 4888
Project	: 23-6465	Date Samples Received	: 07-Nov-2023 16:36
PO	: ----	Date Analysis Commenced	: 09-Nov-2023
C-O-C number	: ----	Issue Date	: 14-Nov-2023 15:46
Sampler	: ----		
Site	: Build NS (Country Harbour)		
Quote number	: HA23-DICL100-12 - Lump Sum Rate - Build NS (Country Harbour)		
No. of samples received	: 6		
No. of samples analysed	: 6		

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Laboratory Department*
Amanda Ganouri-Lumsden	Department Manager - Microbiology and Prep	Centralized Prep, Waterloo, Ontario
Nik Perkio	Inorganics Analyst	Metals, Waterloo, Ontario
Sarah Birch	VOC Section Supervisor	VOC, Waterloo, Ontario

General Comments

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

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

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

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

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances

LOR: Limit of Reporting (detection limit).

Unit	*Description*
%	percent
mg/kg	milligrams per kilogram

<: less than.

>: greater than.

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

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

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

Workorder Comments

PSA: Sample 004: Limited sample was available for PSA (100g minimum is standard). Measurement Uncertainty for PSA results may be higher than usual.

Qualifiers

Qualifier	*Description*
DLHC	*Detection Limit Raised: Dilution required due to high concentration of test analyte(s).*

Analytical Results

Sub-Matrix: **Soil/Solid**
(Matrix: **Soil/Solid**)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	SED1	SED2	SED3	SED4	SED5
					Client sampling date / time	06-Nov-2023 12:30	06-Nov-2023 12:58	06-Nov-2023 13:45	06-Nov-2023 14:55	06-Nov-2023 15:35
						HA2301014-001	HA2301014-002	HA2301014-003	HA2301014-004	HA2301014-005
						Result	Result	Result	Result	Result
Physical Tests										
Moisture	----	E144/WT	0.25	%		7.57	22.0	17.4	17.5	9.12
Metals										
Aluminum	7429-90-5	E440/WT	50	mg/kg		11400	9720	19300	22600	12400
Antimony	7440-36-0	E440/WT	0.10	mg/kg		1.80	4.68	0.44	1.18	0.33
Arsenic	7440-38-2	E440/WT	0.10	mg/kg		2050	5640 DLHC	1440 DLHC	4410 DLHC	1490 DLHC
Barium	7440-39-3	E440/WT	0.50	mg/kg		63.3	82.0	113	285	85.8
Beryllium	7440-41-7	E440/WT	0.10	mg/kg		0.71	0.50	1.10	1.39	0.49
Boron	7440-42-8	E440/WT	5.0	mg/kg		<5.0	<5.0	<5.0	<5.0	<5.0
Cadmium	7440-43-9	E440/WT	0.020	mg/kg		0.088	0.064	0.098	0.218	0.054
Chromium	7440-47-3	E440/WT	0.50	mg/kg		19.6	20.9	38.7	38.3	26.7
Cobalt	7440-48-4	E440/WT	0.10	mg/kg		15.3	5.76	67.3	93.5	53.5
Copper	7440-50-8	E440/WT	0.50	mg/kg		7.51	4.61	10.3	26.5	5.19
Iron	7439-89-6	E440/WT	50	mg/kg		28200	25100	37800	58000	35900
Lead	7439-92-1	E440/WT	0.50	mg/kg		57.3	60.4	74.4	110	78.8
Manganese	7439-96-5	E440/WT	1.0	mg/kg		1210	403	3950 DLHC	4550 DLHC	2410 DLHC
Mercury	7439-97-6	E510/WT	0.0050	mg/kg		2.38	3.21 DLHC	0.314	0.240	0.0233
Molybdenum	7439-98-7	E440/WT	0.10	mg/kg		0.69	0.45	0.91	5.87	1.33
Nickel	7440-02-0	E440/WT	0.50	mg/kg		10.6	8.88	17.1	18.0	10.7
Selenium	7782-49-2	E440/WT	0.20	mg/kg		0.20	0.28	0.28	1.07	0.38
Silver	7440-22-4	E440/WT	0.10	mg/kg		<0.10	0.20	<0.10	0.20	<0.10
Strontium	7440-24-6	E440/WT	0.50	mg/kg		1.88	2.84	2.65	11.6	2.44
Sulfur	7704-34-9	E440/WT	1000	mg/kg		<1000	1600	<1000	<1000	<1000
Thallium	7440-28-0	E440/WT	0.050	mg/kg		0.213	0.174	0.377	0.548	0.232
Tin	7440-31-5	E440/WT	2.0	mg/kg		<2.0	3.0	<2.0	<2.0	<2.0
Uranium	7440-61-1	E440/WT	0.050	mg/kg		0.901	0.958	1.23	1.49	0.791
Vanadium	7440-62-2	E440/WT	0.20	mg/kg		26.3	23.3	49.9	53.2	37.0
Zinc	7440-66-6	E440/WT	2.0	mg/kg		53.9	45.7	88.7	109	62.4
Hydrocarbons										
Benzene	71-43-2	E611A/WT	0.0050	mg/kg		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050

Analytical Results

Sub-Matrix: **Soil/Solid**
(Matrix: **Soil/Solid**)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	SED1	SED2	SED3	SED4	SED5
					Client sampling date / time	06-Nov-2023 12:30	06-Nov-2023 12:58	06-Nov-2023 13:45	06-Nov-2023 14:55	06-Nov-2023 15:35
						HA2301014-001	HA2301014-002	HA2301014-003	HA2301014-004	HA2301014-005
						Result	Result	Result	Result	Result
Hydrocarbons										
Toluene	108-88-3	E611A/WT	0.050	mg/kg		<0.050	<0.050	<0.050	<0.050	<0.050
Ethylbenzene	100-41-4	E611A/WT	0.015	mg/kg		<0.015	<0.015	<0.015	<0.015	<0.015
Xylenes, total	1330-20-7	E611A/WT	0.050	mg/kg		<0.050	<0.050	<0.050	<0.050	<0.050
Xylene, o-	95-47-6	E611A/WT	0.030	mg/kg		<0.030	<0.030	<0.030	<0.030	<0.030
Xylene, m+p-	179601-23-1	E611A/WT	0.030	mg/kg		<0.030	<0.030	<0.030	<0.030	<0.030
VPH C6-C10	n/a	E581.VPH/WT	5.0	mg/kg		<5.0	<5.0	<5.0	<5.0	<5.0
VPH C6-C10 (less BTEX)	n/a	EC580C/WT	5.0	mg/kg		<5.0	<5.0	<5.0	<5.0	<5.0
Hydrocarbons Surrogates										
isobutylbenzene (VPH)	538-93-2	E581.VPH/WT	1.0	%		96.2	93.4	95.4	85.4	96.8
Volatile Organic Compounds Surrogates										
Bromofluorobenzene, 4-	460-00-4	E611A/WT	0.10	%		73.1	65.3	71.1	63.7	72.0
Difluorobenzene, 1,4-	540-36-3	E611A/WT	0.10	%		93.9	92.1	96.9	87.8	99.7

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

Please refer to the Accreditation section for an explanation of analyte accreditations.

Analytical Results

Sub-Matrix: Soil/Solid (Matrix: Soil/Solid)					Client sample ID	SED-DUPA	----	----	----	----
					Client sampling date / time	06-Nov-2023 00:00	----	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit	HA2301014-006	--------	--------	--------	--------	
					Result	----	----	----	----	
Physical Tests										
Moisture	----	E144/WT	0.25	%	6.73	----	----	----	----	
Metals										
Aluminum	7429-90-5	E440/WT	50	mg/kg	18900	----	----	----	----	
Antimony	7440-36-0	E440/WT	0.10	mg/kg	1.60	----	----	----	----	
Arsenic	7440-38-2	E440/WT	0.10	mg/kg	5120 DLHC	----	----	----	----	
Barium	7440-39-3	E440/WT	0.50	mg/kg	254	----	----	----	----	
Beryllium	7440-41-7	E440/WT	0.10	mg/kg	1.11	----	----	----	----	
Boron	7440-42-8	E440/WT	5.0	mg/kg	<5.0	----	----	----	----	
Cadmium	7440-43-9	E440/WT	0.020	mg/kg	0.186	----	----	----	----	
Chromium	7440-47-3	E440/WT	0.50	mg/kg	34.1	----	----	----	----	
Cobalt	7440-48-4	E440/WT	0.10	mg/kg	120	----	----	----	----	
Copper	7440-50-8	E440/WT	0.50	mg/kg	11.8	----	----	----	----	
Iron	7439-89-6	E440/WT	50	mg/kg	42700	----	----	----	----	
Lead	7439-92-1	E440/WT	0.50	mg/kg	124	----	----	----	----	
Manganese	7439-96-5	E440/WT	1.0	mg/kg	6270 DLHC	----	----	----	----	
Mercury	7439-97-6	E510/WT	0.0050	mg/kg	0.616 DLHC	----	----	----	----	
Molybdenum	7439-98-7	E440/WT	0.10	mg/kg	1.41	----	----	----	----	
Nickel	7440-02-0	E440/WT	0.50	mg/kg	16.3	----	----	----	----	
Selenium	7782-49-2	E440/WT	0.20	mg/kg	0.41	----	----	----	----	
Silver	7440-22-4	E440/WT	0.10	mg/kg	0.12	----	----	----	----	
Strontium	7440-24-6	E440/WT	0.50	mg/kg	3.91	----	----	----	----	
Sulfur	7704-34-9	E440/WT	1000	mg/kg	<1000	----	----	----	----	
Thallium	7440-28-0	E440/WT	0.050	mg/kg	0.593	----	----	----	----	
Tin	7440-31-5	E440/WT	2.0	mg/kg	6.7	----	----	----	----	
Uranium	7440-61-1	E440/WT	0.050	mg/kg	1.26	----	----	----	----	
Vanadium	7440-62-2	E440/WT	0.20	mg/kg	47.6	----	----	----	----	
Zinc	7440-66-6	E440/WT	2.0	mg/kg	89.6	----	----	----	----	
Hydrocarbons										
Benzene	71-43-2	E611A/WT	0.0050	mg/kg	<0.0050	----	----	----	----	
Toluene	108-88-3	E611A/WT	0.050	mg/kg	<0.050	----	----	----	----	

Analytical Results

Sub-Matrix: Soil/Solid (Matrix: Soil/Solid)					Client sample ID	SED-DUPA	----	----	----	----
					Client sampling date / time	06-Nov-2023 00:00	----	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit		HA2301014-006	--------	--------	--------	--------
						Result	----	----	----	----
Hydrocarbons										
Ethylbenzene	100-41-4	E611A/WT	0.015	mg/kg		<0.015	----	----	----	----
Xylenes, total	1330-20-7	E611A/WT	0.050	mg/kg		<0.050	----	----	----	----
Xylene, o-	95-47-6	E611A/WT	0.030	mg/kg		<0.030	----	----	----	----
Xylene, m+p-	179601-23-1	E611A/WT	0.030	mg/kg		<0.030	----	----	----	----
VPH C6-C10	n/a	E581.VPH/WT	5.0	mg/kg		<5.0	----	----	----	----
VPH C6-C10 (less BTEX)	n/a	EC580C/WT	5.0	mg/kg		<5.0	----	----	----	----
Hydrocarbons Surrogates										
isobutylbenzene (VPH)	538-93-2	E581.VPH/WT	1.0	%		90.4	----	----	----	----
Volatile Organic Compounds Surrogates										
Bromofluorobenzene, 4-	460-00-4	E611A/WT	0.10	%		72.9	----	----	----	----
Difluorobenzene, 1,4-	540-36-3	E611A/WT	0.10	%		93.8	----	----	----	----

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

Please refer to the Accreditation section for an explanation of analyte accreditations.

ALS Canada Ltd.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **HA2301014**	Page	: 1 of 10
Client	: **Dillon Consulting Limited**	Laboratory	: ALS Environmental - Halifax
Contact	: Shauna Gallant	Account Manager	: Andrew Martin
Address	: 137 Chain Lake Drive Halifax NS Canada B3S 1B3	Address	: 13-100 Wright Ave Dartmouth, Nova Scotia Canada B3B 1L2
Telephone	: 902-450-4000 ext 5039	Telephone	: +1 902 707 4888
Project	: 23-6465	Date Samples Received	: 07-Nov-2023 16:36
PO	: ----	Issue Date	: 14-Nov-2023 15:47
C-O-C number	: ----		
Sampler	: ----		
Site	: Build NS (Country Harbour)		
Quote number	: HA23-DICL100-12 - Lump Sum Rate - Build NS (Country Harbour)		
No. of samples received	: 6		
No. of samples analysed	: 6		

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

Key

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

Workorder Comments

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

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Matrix Spike outliers occur.
- Duplicate outliers occur - please see following pages for full details.
- Laboratory Control Sample (LCS) outliers occur - please see following pages for full details.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- No Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **Soil/Solid**

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Method	Result	Limits	Comment
Duplicate (DUP) RPDs								
Metals	HA2301014-001	SED1	Antimony	7440-36-0	E440	36.2 % DUP-H	30%	Duplicate RPD does not meet the DQO for this test.
Metals	HA2301014-001	SED1	Copper	7440-50-8	E440	34.3 % DUP-H	30%	Duplicate RPD does not meet the DQO for this test.
Metals	HA2301014-001	SED1	Molybdenum	7439-98-7	E440	45.3 % DUP-H	40%	Duplicate RPD does not meet the DQO for this test.
Metals	HA2301014-001	SED1	Uranium	7440-61-1	E440	38.0 % DUP-H	30%	Duplicate RPD does not meet the DQO for this test.
Metals	HA2301014-001	SED1	Mercury	7439-97-6	E510	147 % DUP-H	40%	Duplicate RPD does not meet the DQO for this test.

Result Qualifiers

Qualifier	Description
DUP-H	*Duplicate results outside ALS DQO, due to sample heterogeneity.*

Laboratory Control Sample (LCS) Recoveries								
Metals	QC-MRG2-1230585 002	----	Silver	7440-22-4	E440	123 % MES	80.0-120%	Recovery greater than upper control limit

Result Qualifiers

Qualifier	Description
MES	*Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).*

Analysis Holding Time Compliance

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

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

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

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

Matrix: **Soil/Solid**

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

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Hydrocarbons : VPH by Headspace GC-FID (Tier I RBCA)										
Glass soil methanol vial SED1	E581.VPH	06-Nov-2023	09-Nov-2023	40 days	3 days	✓	09-Nov-2023	40 days	3 days	✓
Hydrocarbons : VPH by Headspace GC-FID (Tier I RBCA)										
Glass soil methanol vial SED2	E581.VPH	06-Nov-2023	09-Nov-2023	40 days	3 days	✓	09-Nov-2023	40 days	3 days	✓
Hydrocarbons : VPH by Headspace GC-FID (Tier I RBCA)										
Glass soil methanol vial SED3	E581.VPH	06-Nov-2023	09-Nov-2023	40 days	3 days	✓	09-Nov-2023	40 days	3 days	✓
Hydrocarbons : VPH by Headspace GC-FID (Tier I RBCA)										
Glass soil methanol vial SED4	E581.VPH	06-Nov-2023	09-Nov-2023	40 days	3 days	✓	09-Nov-2023	40 days	3 days	✓
Hydrocarbons : VPH by Headspace GC-FID (Tier I RBCA)										
Glass soil methanol vial SED5	E581.VPH	06-Nov-2023	09-Nov-2023	40 days	3 days	✓	09-Nov-2023	40 days	3 days	✓
Hydrocarbons : VPH by Headspace GC-FID (Tier I RBCA)										
Glass soil methanol vial SED-DUPA	E581.VPH	06-Nov-2023	09-Nov-2023	40 days	4 days	✓	09-Nov-2023	40 days	4 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap SED1	E510	06-Nov-2023	10-Nov-2023	28 days	3 days	✓	10-Nov-2023	28 days	4 days	✓

Matrix: **Soil/Solid**

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

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap										
SED2	E510	06-Nov-2023	11-Nov-2023	28 days	5 days	✓	13-Nov-2023	28 days	7 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap										
SED3	E510	06-Nov-2023	11-Nov-2023	28 days	5 days	✓	13-Nov-2023	28 days	7 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap										
SED4	E510	06-Nov-2023	11-Nov-2023	28 days	5 days	✓	13-Nov-2023	28 days	7 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap										
SED5	E510	06-Nov-2023	11-Nov-2023	28 days	5 days	✓	13-Nov-2023	28 days	7 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap										
SED-DUPA	E510	06-Nov-2023	11-Nov-2023	28 days	6 days	✓	13-Nov-2023	28 days	7 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap										
SED1	E440	06-Nov-2023	10-Nov-2023	180 days	3 days	✓	10-Nov-2023	180 days	4 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap										
SED2	E440	06-Nov-2023	11-Nov-2023	180 days	5 days	✓	13-Nov-2023	180 days	7 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap										
SED3	E440	06-Nov-2023	11-Nov-2023	180 days	5 days	✓	13-Nov-2023	180 days	7 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap										
SED4	E440	06-Nov-2023	11-Nov-2023	180 days	5 days	✓	13-Nov-2023	180 days	7 days	✓

Matrix: **Soil/Solid**

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

Analyte Group : Analytical Method / Container / Client Sample ID(s)	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
			Preparation Date	*Holding Times* Rec	*Holding Times* Actual	*Eval*	*Analysis Date*	*Holding Times* Rec	*Holding Times* Actual	*Eval*
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap										
SED5	E440	06-Nov-2023	11-Nov-2023	180 days	5 days	✓	13-Nov-2023	180 days	7 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap										
SED-DUPA	E440	06-Nov-2023	11-Nov-2023	180 days	6 days	✓	13-Nov-2023	180 days	8 days	✓
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap										
SED1	E144	06-Nov-2023	----	----	----		09-Nov-2023	----	3 days	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap										
SED2	E144	06-Nov-2023	----	----	----		09-Nov-2023	----	3 days	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap										
SED3	E144	06-Nov-2023	----	----	----		09-Nov-2023	----	3 days	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap										
SED4	E144	06-Nov-2023	----	----	----		09-Nov-2023	----	3 days	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap										
SED5	E144	06-Nov-2023	----	----	----		09-Nov-2023	----	3 days	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap										
SED-DUPA	E144	06-Nov-2023	----	----	----		09-Nov-2023	----	4 days	
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass soil methanol vial										
SED1	E611A	06-Nov-2023	09-Nov-2023	40 days	3 days	✓	09-Nov-2023	40 days	3 days	✓

Matrix: **Soil/Solid**

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

Analyte Group : Analytical Method / Container / Client Sample ID(s)	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
			Preparation Date	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass soil methanol vial SED2	E611A	06-Nov-2023	09-Nov-2023	40 days	3 days	✓	09-Nov-2023	40 days	3 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass soil methanol vial SED3	E611A	06-Nov-2023	09-Nov-2023	40 days	3 days	✓	09-Nov-2023	40 days	3 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass soil methanol vial SED4	E611A	06-Nov-2023	09-Nov-2023	40 days	3 days	✓	09-Nov-2023	40 days	3 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass soil methanol vial SED5	E611A	06-Nov-2023	09-Nov-2023	40 days	3 days	✓	09-Nov-2023	40 days	3 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass soil methanol vial SED-DUPA	E611A	06-Nov-2023	09-Nov-2023	40 days	4 days	✓	09-Nov-2023	40 days	4 days	✓

Legend & Qualifier Definitions

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

Quality Control Parameter Frequency Compliance

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

Matrix: **Soil/Solid**

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

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
BTEX by Headspace GC-MS	E611A	1231040	1	6	16.6	5.0	✓
Mercury in Soil/Solid by CVAAS	E510	1230323	2	6	33.3	5.0	✓
Metals in Soil/Solid by CRC ICPMS	E440	1230586	2	7	28.5	5.0	✓
Moisture Content by Gravimetry	E144	1231496	1	19	5.2	5.0	✓
VPH by Headspace GC-FID (Tier I RBCA)	E581.VPH	1231041	1	6	16.6	5.0	✓
Laboratory Control Samples (LCS)							
BTEX by Headspace GC-MS	E611A	1231040	1	6	16.6	5.0	✓
Mercury in Soil/Solid by CVAAS	E510	1230323	4	6	66.6	10.0	✓
Metals in Soil/Solid by CRC ICPMS	E440	1230586	4	7	57.1	10.0	✓
Moisture Content by Gravimetry	E144	1231496	1	19	5.2	5.0	✓
VPH by Headspace GC-FID (Tier I RBCA)	E581.VPH	1231041	1	6	16.6	5.0	✓
Method Blanks (MB)							
BTEX by Headspace GC-MS	E611A	1231040	1	6	16.6	5.0	✓
Mercury in Soil/Solid by CVAAS	E510	1230323	2	6	33.3	5.0	✓
Metals in Soil/Solid by CRC ICPMS	E440	1230586	2	7	28.5	5.0	✓
Moisture Content by Gravimetry	E144	1231496	1	19	5.2	5.0	✓
VPH by Headspace GC-FID (Tier I RBCA)	E581.VPH	1231041	1	6	16.6	5.0	✓
Matrix Spikes (MS)							
BTEX by Headspace GC-MS	E611A	1231040	1	6	16.6	5.0	✓
VPH by Headspace GC-FID (Tier I RBCA)	E581.VPH	1231041	1	6	16.6	5.0	✓

Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Moisture Content by Gravimetry	E144 ALS Environmental - Waterloo	Soil/Solid	CCME PHC in Soil - Tier 1	Moisture is measured gravimetrically by drying the sample at 105°C. Moisture content is calculated as the weight loss (due to water) divided by the wet weight of the sample, expressed as a percentage.
Metals in Soil/Solid by CRC ICPMS	E440 ALS Environmental - Waterloo	Soil/Solid	EPA 6020B (mod)	This method is intended to liberate metals that may be environmentally available. Samples are dried, then sieved through a 2 mm sieve, and digested with HNO3 and HCl. Dependent on sample matrix, some metals may be only partially recovered, including Al, Ba, Be, Cr, Sr, Ti, Tl, V, W, and Zr. Silicate minerals are not solubilized. Volatile forms of sulfur (including sulfide) may not be captured, as they may be lost during sampling, storage, or digestion. This method does not adequately recover elemental sulfur, and is unsuitable for assessment of elemental sulfur standards or guidelines. Analysis is by Collision/Reaction Cell ICPMS.
Mercury in Soil/Solid by CVAAS	E510 ALS Environmental - Waterloo	Soil/Solid	EPA 200.2/1631 Appendix (mod)	Samples are dried, then sieved through a 2 mm sieve, and digested with HNO3 and HCl, followed by CVAAS analysis.
VPH by Headspace GC-FID (Tier I RBCA)	E581.VPH ALS Environmental - Waterloo	Soil/Solid	Atlantic RBCA Version 3.1	VPH (Volatile Petroleum Hydrocarbons) is analyzed by static headspace GC-FID. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
BTEX by Headspace GC-MS	E611A ALS Environmental - Waterloo	Soil/Solid	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
VPH C6-C10 (less BTEX) [RBCA]	EC580C ALS Environmental - Waterloo	Soil/Solid	Atlantic RBCA Version 3.1	VPH C6-C10 (less BTEX) is calculated as follows: VPH (C6-C10) minus benzene, toluene, ethylbenzene and xylenes (BTEX).

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Digestion for Metals and Mercury	EP440 ALS Environmental - Waterloo	Soil/Solid	EPA 200.2 (mod)	Samples are dried, then sieved through a 2 mm sieve, and digested with HNO3 and HCl. This method is intended to liberate metals that may be environmentally available.
VOCs Methanol Extraction for Headspace Analysis	EP581 ALS Environmental - Waterloo	Soil/Solid	EPA 5035A (mod)	VOCs in samples are extracted with methanol. Extracts are then prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
PHCs Hexane-Acetone Tumbler Extraction (RBCA)	EP601F ALS Environmental - Waterloo	Soil/Solid	CCME PHC in Soil - Tier 1 (mod)	Samples are subsampled and Petroleum Hydrocarbons (PHC) are extracted with 1:1 hexane:acetone using a rotary extractor.
Dry and Grind in Soil/Solid <60°C	EPP442 ALS Environmental - Saskatoon	Soil/Solid	Soil Sampling and Methods of Analysis, Carter 2008	After removal of any coarse fragments and reservation of wet subsamples a portion of homogenized sample is set in a tray and dried at less than 60°C until dry. The sample is then particle size reduced with an automated crusher or mortar and pestle, typically to <2 mm. Further size reduction may be needed for particular tests.

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QUALITY CONTROL REPORT

Work Order	: **HA2301014**	Page	: 1 of 12
Client	: Dillon Consulting Limited	Laboratory	: ALS Environmental - Halifax
Contact	: Shauna Gallant	Account Manager	: Andrew Martin
Address	: 137 Chain Lake Drive Halifax NS Canada B3S 1B3	Address	: 13-100 Wright Ave Dartmouth, Nova Scotia Canada B3B 1L2
Telephone	:	Telephone	: +1 902 707 4888
Project	: 23-6465	Date Samples Received	: 07-Nov-2023 16:36
PO	: ----	Date Analysis Commenced	: 09-Nov-2023
C-O-C number	: ----	Issue Date	: 14-Nov-2023 15:47
Sampler	: ---- 902-450-4000 ext 5039		
Site	: Build NS (Country Harbour)		
Quote number	: HA23-DICL100-12 - Lump Sum Rate - Build NS (Country Harbour)		
No. of samples received	: 6		
No. of samples analysed	: 6		

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Laboratory Department*
Amanda Ganouri-Lumsden	Department Manager - Microbiology and Prep	Waterloo Centralized Prep, Waterloo, Ontario
Nik Perkio	Inorganics Analyst	Waterloo Metals, Waterloo, Ontario
Sarah Birch	VOC Section Supervisor	Waterloo VOC, Waterloo, Ontario

General Comments

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

Key :

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

Workorder Comments

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **Soil/Solid**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 1231496)											
WT2336605-001	Anonymous	Moisture	----	E144	0.25	%	15.6	14.1	10.6%	20%	----
Metals (QC Lot: 1230323)											
HA2301014-001	SED1	Mercury	7439-97-6	E510	0.0050	mg/kg	2.38	0.363	147%	40%	DUP-H
Metals (QC Lot: 1230324)											
HA2301014-001	SED1	Aluminum	7429-90-5	E440	50	mg/kg	11400	10600	7.28%	40%	----
		Antimony	7440-36-0	E440	0.10	mg/kg	1.80	1.25	36.2%	30%	DUP-H
		Arsenic	7440-38-2	E440	2.00	mg/kg	2050	2750	29.2%	30%	----
		Barium	7440-39-3	E440	0.50	mg/kg	63.3	58.5	7.95%	40%	----
		Beryllium	7440-41-7	E440	0.10	mg/kg	0.71	0.64	9.50%	30%	----
		Boron	7440-42-8	E440	5.0	mg/kg	<5.0	<5.0	0	Diff <2x LOR	----
		Cadmium	7440-43-9	E440	0.020	mg/kg	0.088	0.075	0.013	Diff <2x LOR	----
		Chromium	7440-47-3	E440	0.50	mg/kg	19.6	19.6	0.0473%	30%	----
		Cobalt	7440-48-4	E440	0.10	mg/kg	15.3	13.5	12.1%	30%	----
		Copper	7440-50-8	E440	0.50	mg/kg	7.51	10.6	34.3%	30%	DUP-H
		Iron	7439-89-6	E440	50	mg/kg	28200	30200	7.05%	30%	----
		Lead	7439-92-1	E440	0.50	mg/kg	57.3	54.4	5.22%	40%	----
		Manganese	7439-96-5	E440	1.0	mg/kg	1210	984	20.5%	30%	----
		Molybdenum	7439-98-7	E440	0.10	mg/kg	0.69	1.09	45.3%	40%	DUP-H
		Nickel	7440-02-0	E440	0.50	mg/kg	10.6	12.0	12.6%	30%	----
		Selenium	7782-49-2	E440	0.20	mg/kg	0.20	<0.20	0.004	Diff <2x LOR	----
		Silver	7440-22-4	E440	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----
		Strontium	7440-24-6	E440	0.50	mg/kg	1.88	2.25	0.38	Diff <2x LOR	----
		Sulfur	7704-34-9	E440	1000	mg/kg	<1000	<1000	0	Diff <2x LOR	----
		Thallium	7440-28-0	E440	0.050	mg/kg	0.213	0.202	0.010	Diff <2x LOR	----
		Tin	7440-31-5	E440	2.0	mg/kg	<2.0	<2.0	0	Diff <2x LOR	----
		Uranium	7440-61-1	E440	0.050	mg/kg	0.901	1.32	38.0%	30%	DUP-H
		Vanadium	7440-62-2	E440	0.20	mg/kg	26.3	25.4	3.45%	30%	----
		Zinc	7440-66-6	E440	2.0	mg/kg	53.9	55.2	2.23%	30%	----
Metals (QC Lot: 1230585)											
HA2301014-002	SED2	Mercury	7439-97-6	E510	0.0375	mg/kg	3.21	3.54	9.62%	40%	----

Sub-Matrix: **Soil/Solid**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Metals (QC Lot: 1230586)											
HA2301014-002	SED2	Aluminum	7429-90-5	E440	50	mg/kg	9720	11000	12.8%	40%	----
		Antimony	7440-36-0	E440	0.10	mg/kg	4.68	5.31	12.7%	30%	----
		Arsenic	7440-38-2	E440	2.00	mg/kg	5640	5610	0.640%	30%	----
		Barium	7440-39-3	E440	0.50	mg/kg	82.0	99.6	19.4%	40%	----
		Beryllium	7440-41-7	E440	0.10	mg/kg	0.50	0.53	0.02	Diff <2x LOR	----
		Boron	7440-42-8	E440	5.0	mg/kg	<5.0	<5.0	0	Diff <2x LOR	----
		Cadmium	7440-43-9	E440	0.020	mg/kg	0.064	0.077	0.013	Diff <2x LOR	----
		Chromium	7440-47-3	E440	0.50	mg/kg	20.9	24.1	14.1%	30%	----
		Cobalt	7440-48-4	E440	0.10	mg/kg	5.76	6.81	16.6%	30%	----
		Copper	7440-50-8	E440	0.50	mg/kg	4.61	5.06	9.31%	30%	----
		Iron	7439-89-6	E440	50	mg/kg	25100	29000	14.3%	30%	----
		Lead	7439-92-1	E440	0.50	mg/kg	60.4	68.1	12.0%	40%	----
		Manganese	7439-96-5	E440	1.0	mg/kg	403	459	12.9%	30%	----
		Molybdenum	7439-98-7	E440	0.10	mg/kg	0.45	0.52	0.07	Diff <2x LOR	----
		Nickel	7440-02-0	E440	0.50	mg/kg	8.88	10.3	15.0%	30%	----
		Selenium	7782-49-2	E440	0.20	mg/kg	0.28	0.35	0.07	Diff <2x LOR	----
		Silver	7440-22-4	E440	0.10	mg/kg	0.20	0.14	0.06	Diff <2x LOR	----
		Strontium	7440-24-6	E440	0.50	mg/kg	2.84	3.18	11.4%	40%	----
		Sulfur	7704-34-9	E440	1000	mg/kg	1600	1700	200	Diff <2x LOR	----
		Thallium	7440-28-0	E440	0.050	mg/kg	0.174	0.197	0.023	Diff <2x LOR	----
		Tin	7440-31-5	E440	2.0	mg/kg	3.0	3.8	0.7	Diff <2x LOR	----
		Uranium	7440-61-1	E440	0.050	mg/kg	0.958	1.14	17.4%	30%	----
		Vanadium	7440-62-2	E440	0.20	mg/kg	23.3	26.6	13.0%	30%	----
		Zinc	7440-66-6	E440	2.0	mg/kg	45.7	54.4	17.4%	30%	----
Volatile Organic Compounds (QC Lot: 1231040)											
HA2301014-001	SED1	Benzene	71-43-2	E611A	0.0050	mg/kg	<0.0050	<0.0050	0	Diff <2x LOR	----
		Ethylbenzene	100-41-4	E611A	0.015	mg/kg	<0.015	<0.015	0	Diff <2x LOR	----
		Toluene	108-88-3	E611A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Xylene, m+p-	179601-23-1	E611A	0.030	mg/kg	<0.030	<0.030	0	Diff <2x LOR	----
		Xylene, o-	95-47-6	E611A	0.030	mg/kg	<0.030	<0.030	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 1231041)											
HA2301014-001	SED1	VPH C6-C10	n/a	E581.VPH	5.0	mg/kg	<5.0	<5.0	0	Diff <2x LOR	----

Qualifiers

Qualifier	Description
DUP-H	Duplicate results outside ALS DQO, due to sample heterogeneity.

Method Blank (MB) Report

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

Sub-Matrix: **Soil/Solid**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 1231496)						
Moisture	----	E144	0.25	%	<0.25	----
Metals (QCLot: 1230323)						
Mercury	7439-97-6	E510	0.005	mg/kg	<0.0050	----
Metals (QCLot: 1230324)						
Aluminum	7429-90-5	E440	50	mg/kg	<50	----
Antimony	7440-36-0	E440	0.1	mg/kg	<0.10	----
Arsenic	7440-38-2	E440	0.1	mg/kg	<0.10	----
Barium	7440-39-3	E440	0.5	mg/kg	<0.50	----
Beryllium	7440-41-7	E440	0.1	mg/kg	<0.10	----
Boron	7440-42-8	E440	5	mg/kg	<5.0	----
Cadmium	7440-43-9	E440	0.02	mg/kg	<0.020	----
Chromium	7440-47-3	E440	0.5	mg/kg	<0.50	----
Cobalt	7440-48-4	E440	0.1	mg/kg	<0.10	----
Copper	7440-50-8	E440	0.5	mg/kg	<0.50	----
Iron	7439-89-6	E440	50	mg/kg	<50	----
Lead	7439-92-1	E440	0.5	mg/kg	<0.50	----
Manganese	7439-96-5	E440	1	mg/kg	<1.0	----
Molybdenum	7439-98-7	E440	0.1	mg/kg	<0.10	----
Nickel	7440-02-0	E440	0.5	mg/kg	<0.50	----
Selenium	7782-49-2	E440	0.2	mg/kg	<0.20	----
Silver	7440-22-4	E440	0.1	mg/kg	<0.10	----
Strontium	7440-24-6	E440	0.5	mg/kg	<0.50	----
Sulfur	7704-34-9	E440	1000	mg/kg	<1000	----
Thallium	7440-28-0	E440	0.05	mg/kg	<0.050	----
Tin	7440-31-5	E440	2	mg/kg	<2.0	----
Uranium	7440-61-1	E440	0.05	mg/kg	<0.050	----
Vanadium	7440-62-2	E440	0.2	mg/kg	<0.20	----
Zinc	7440-66-6	E440	2	mg/kg	<2.0	----
Metals (QCLot: 1230585)						
Mercury	7439-97-6	E510	0.005	mg/kg	<0.0050	----
Metals (QCLot: 1230586)						
Aluminum	7429-90-5	E440	50	mg/kg	<50	----

Sub-Matrix: **Soil/Solid**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Metals (QCLot: 1230586) - continued						
Antimony	7440-36-0	E440	0.1	mg/kg	<0.10	----
Arsenic	7440-38-2	E440	0.1	mg/kg	<0.10	----
Barium	7440-39-3	E440	0.5	mg/kg	<0.50	----
Beryllium	7440-41-7	E440	0.1	mg/kg	<0.10	----
Boron	7440-42-8	E440	5	mg/kg	<5.0	----
Cadmium	7440-43-9	E440	0.02	mg/kg	<0.020	----
Chromium	7440-47-3	E440	0.5	mg/kg	<0.50	----
Cobalt	7440-48-4	E440	0.1	mg/kg	<0.10	----
Copper	7440-50-8	E440	0.5	mg/kg	<0.50	----
Iron	7439-89-6	E440	50	mg/kg	<50	----
Lead	7439-92-1	E440	0.5	mg/kg	<0.50	----
Manganese	7439-96-5	E440	1	mg/kg	<1.0	----
Molybdenum	7439-98-7	E440	0.1	mg/kg	<0.10	----
Nickel	7440-02-0	E440	0.5	mg/kg	<0.50	----
Selenium	7782-49-2	E440	0.2	mg/kg	<0.20	----
Silver	7440-22-4	E440	0.1	mg/kg	<0.10	----
Strontium	7440-24-6	E440	0.5	mg/kg	<0.50	----
Sulfur	7704-34-9	E440	1000	mg/kg	<1000	----
Thallium	7440-28-0	E440	0.05	mg/kg	<0.050	----
Tin	7440-31-5	E440	2	mg/kg	<2.0	----
Uranium	7440-61-1	E440	0.05	mg/kg	<0.050	----
Vanadium	7440-62-2	E440	0.2	mg/kg	<0.20	----
Zinc	7440-66-6	E440	2	mg/kg	<2.0	----
Volatile Organic Compounds (QCLot: 1231040)						
Benzene	71-43-2	E611A	0.005	mg/kg	<0.0050	----
Ethylbenzene	100-41-4	E611A	0.015	mg/kg	<0.015	----
Toluene	108-88-3	E611A	0.05	mg/kg	<0.050	----
Xylene, m+p-	179601-23-1	E611A	0.03	mg/kg	<0.030	----
Xylene, o-	95-47-6	E611A	0.03	mg/kg	<0.030	----
Hydrocarbons (QCLot: 1231041)						
VPH C6-C10	n/a	E581.VPH	5	mg/kg	<5.0	----

Laboratory Control Sample (LCS) Report

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

Sub-Matrix: **Soil/Solid**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 1231496)									
Moisture	----	E144	0.25	%	50 %	98.7	90.0	110	----
Metals (QCLot: 1230323)									
Mercury	7439-97-6	E510	0.005	mg/kg	0.1 mg/kg	95.5	80.0	120	----
Metals (QCLot: 1230324)									
Aluminum	7429-90-5	E440	50	mg/kg	200 mg/kg	90.6	80.0	120	----
Antimony	7440-36-0	E440	0.1	mg/kg	100 mg/kg	98.8	80.0	120	----
Arsenic	7440-38-2	E440	0.1	mg/kg	100 mg/kg	99.6	80.0	120	----
Barium	7440-39-3	E440	0.5	mg/kg	25 mg/kg	92.4	80.0	120	----
Beryllium	7440-41-7	E440	0.1	mg/kg	10 mg/kg	95.5	80.0	120	----
Boron	7440-42-8	E440	5	mg/kg	100 mg/kg	97.3	80.0	120	----
Cadmium	7440-43-9	E440	0.02	mg/kg	10 mg/kg	93.1	80.0	120	----
Chromium	7440-47-3	E440	0.5	mg/kg	25 mg/kg	93.5	80.0	120	----
Cobalt	7440-48-4	E440	0.1	mg/kg	25 mg/kg	91.9	80.0	120	----
Copper	7440-50-8	E440	0.5	mg/kg	25 mg/kg	90.5	80.0	120	----
Iron	7439-89-6	E440	50	mg/kg	100 mg/kg	90.7	80.0	120	----
Lead	7439-92-1	E440	0.5	mg/kg	50 mg/kg	93.2	80.0	120	----
Manganese	7439-96-5	E440	1	mg/kg	25 mg/kg	93.3	80.0	120	----
Molybdenum	7439-98-7	E440	0.1	mg/kg	25 mg/kg	91.9	80.0	120	----
Nickel	7440-02-0	E440	0.5	mg/kg	50 mg/kg	90.6	80.0	120	----
Selenium	7782-49-2	E440	0.2	mg/kg	100 mg/kg	95.2	80.0	120	----
Silver	7440-22-4	E440	0.1	mg/kg	10 mg/kg	81.0	80.0	120	----
Strontium	7440-24-6	E440	0.5	mg/kg	25 mg/kg	85.3	80.0	120	----
Sulfur	7704-34-9	E440	1000	mg/kg	5000 mg/kg	95.5	80.0	120	----
Thallium	7440-28-0	E440	0.05	mg/kg	100 mg/kg	94.2	80.0	120	----
Tin	7440-31-5	E440	2	mg/kg	50 mg/kg	92.4	80.0	120	----
Uranium	7440-61-1	E440	0.05	mg/kg	0.5 mg/kg	83.1	80.0	120	----
Vanadium	7440-62-2	E440	0.2	mg/kg	50 mg/kg	95.2	80.0	120	----
Zinc	7440-66-6	E440	2	mg/kg	50 mg/kg	90.1	80.0	120	----
Metals (QCLot: 1230585)									
Mercury	7439-97-6	E510	0.005	mg/kg	0.1 mg/kg	104	80.0	120	----
Metals (QCLot: 1230586)									
Aluminum	7429-90-5	E440	50	mg/kg	200 mg/kg	104	80.0	120	----

Sub-Matrix: **Soil/Solid**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Metals (QCLot: 1230586) - continued									
Antimony	7440-36-0	E440	0.1	mg/kg	100 mg/kg	111	80.0	120	----
Arsenic	7440-38-2	E440	0.1	mg/kg	100 mg/kg	118	80.0	120	----
Barium	7440-39-3	E440	0.5	mg/kg	25 mg/kg	115	80.0	120	----
Beryllium	7440-41-7	E440	0.1	mg/kg	10 mg/kg	107	80.0	120	----
Boron	7440-42-8	E440	5	mg/kg	100 mg/kg	108	80.0	120	----
Cadmium	7440-43-9	E440	0.02	mg/kg	10 mg/kg	110	80.0	120	----
Chromium	7440-47-3	E440	0.5	mg/kg	25 mg/kg	108	80.0	120	----
Cobalt	7440-48-4	E440	0.1	mg/kg	25 mg/kg	106	80.0	120	----
Copper	7440-50-8	E440	0.5	mg/kg	25 mg/kg	106	80.0	120	----
Iron	7439-89-6	E440	50	mg/kg	100 mg/kg	114	80.0	120	----
Lead	7439-92-1	E440	0.5	mg/kg	50 mg/kg	109	80.0	120	----
Manganese	7439-96-5	E440	1	mg/kg	25 mg/kg	108	80.0	120	----
Molybdenum	7439-98-7	E440	0.1	mg/kg	25 mg/kg	116	80.0	120	----
Nickel	7440-02-0	E440	0.5	mg/kg	50 mg/kg	107	80.0	120	----
Selenium	7782-49-2	E440	0.2	mg/kg	100 mg/kg	110	80.0	120	----
Silver	7440-22-4	E440	0.1	mg/kg	10 mg/kg	# 123	80.0	120	MES
Strontium	7440-24-6	E440	0.5	mg/kg	25 mg/kg	115	80.0	120	----
Sulfur	7704-34-9	E440	1000	mg/kg	5000 mg/kg	105	80.0	120	----
Thallium	7440-28-0	E440	0.05	mg/kg	100 mg/kg	109	80.0	120	----
Tin	7440-31-5	E440	2	mg/kg	50 mg/kg	114	80.0	120	----
Uranium	7440-61-1	E440	0.05	mg/kg	0.5 mg/kg	109	80.0	120	----
Vanadium	7440-62-2	E440	0.2	mg/kg	50 mg/kg	111	80.0	120	----
Zinc	7440-66-6	E440	2	mg/kg	50 mg/kg	107	80.0	120	----
Volatile Organic Compounds (QCLot: 1231040)									
Benzene	71-43-2	E611A	0.005	mg/kg	3.475 mg/kg	105	70.0	130	----
Ethylbenzene	100-41-4	E611A	0.015	mg/kg	3.475 mg/kg	89.3	70.0	130	----
Toluene	108-88-3	E611A	0.05	mg/kg	3.475 mg/kg	87.1	70.0	130	----
Xylene, m+p-	179601-23-1	E611A	0.03	mg/kg	6.95 mg/kg	98.2	70.0	130	----
Xylene, o-	95-47-6	E611A	0.03	mg/kg	3.475 mg/kg	96.5	70.0	130	----
Hydrocarbons (QCLot: 1231041)									
VPH C6-C10	n/a	E581.VPH	5	mg/kg	69.1875 mg/kg	98.3	80.0	120	----

Qualifiers

Qualifier	Description
MES	Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).

Matrix Spike (MS) Report

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

Sub-Matrix: **Soil/Solid**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Volatile Organic Compounds (QCLot: 1231040)										
HA2301014-001	SED1	Benzene	71-43-2	E611A	2.43 mg/kg	3.125 mg/kg	105	60.0	140	----
		Ethylbenzene	100-41-4	E611A	1.99 mg/kg	3.125 mg/kg	85.4	60.0	140	----
		Toluene	108-88-3	E611A	2.02 mg/kg	3.125 mg/kg	86.7	60.0	140	----
		Xylene, m+p-	179601-23-1	E611A	4.34 mg/kg	6.25 mg/kg	93.4	60.0	140	----
		Xylene, o-	95-47-6	E611A	2.13 mg/kg	3.125 mg/kg	91.8	60.0	140	----
Hydrocarbons (QCLot: 1231041)										
HA2301014-001	SED1	VPH C6-C10	n/a	E581.VPH	45.0 mg/kg	62.5 mg/kg	96.7	60.0	140	----

Reference Material (RM) Report

A Reference Material (RM) is a homogenous material with known and well-established analyte concentrations. RMs are processed in an identical manner to test samples, and are used to monitor and control the accuracy and precision of a test method for a typical sample matrix. RM results are expressed as percent recovery of the target analyte concentration. RM targets may be certified target concentrations provided by the RM supplier, or may be ALS long-term mean values (for empirical test methods).

Sub-Matrix:

					Reference Material (RM) Report				
					RM Target	Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Reference Material ID	Analyte	CAS Number	Method	Concentration	RM	Low	High	Qualifier
Metals (QCLot: 1230323)									
	RM	Mercury	7439-97-6	E510	0.0585 mg/kg	106	70.0	130	----
Metals (QCLot: 1230324)									
	RM	Aluminum	7429-90-5	E440	9817 mg/kg	104	70.0	130	----
	RM	Antimony	7440-36-0	E440	3.99 mg/kg	122	70.0	130	----
	RM	Arsenic	7440-38-2	E440	3.73 mg/kg	102	70.0	130	----
	RM	Barium	7440-39-3	E440	105 mg/kg	98.4	70.0	130	----
	RM	Beryllium	7440-41-7	E440	0.349 mg/kg	102	70.0	130	----
	RM	Boron	7440-42-8	E440	8.5 mg/kg	110	70.0	130	----
	RM	Cadmium	7440-43-9	E440	0.91 mg/kg	93.6	70.0	130	----
	RM	Chromium	7440-47-3	E440	101 mg/kg	98.3	70.0	130	----
	RM	Cobalt	7440-48-4	E440	6.9 mg/kg	97.8	70.0	130	----
	RM	Copper	7440-50-8	E440	123 mg/kg	101	70.0	130	----
	RM	Iron	7439-89-6	E440	23558 mg/kg	96.8	70.0	130	----
	RM	Lead	7439-92-1	E440	267 mg/kg	102	70.0	130	----
	RM	Manganese	7439-96-5	E440	269 mg/kg	100.0	70.0	130	----
	RM	Molybdenum	7439-98-7	E440	1.03 mg/kg	105	70.0	130	----
	RM	Nickel	7440-02-0	E440	26.7 mg/kg	100	70.0	130	----
	RM	Silver	7440-22-4	E440	4.06 mg/kg	94.9	70.0	130	----
	RM	Strontium	7440-24-6	E440	86.1 mg/kg	101	70.0	130	----
	RM	Thallium	7440-28-0	E440	0.0786 mg/kg	114	70.0	130	----
	RM	Tin	7440-31-5	E440	10.6 mg/kg	112	70.0	130	----
	RM	Uranium	7440-61-1	E440	0.52 mg/kg	93.3	70.0	130	----
	RM	Vanadium	7440-62-2	E440	32.7 mg/kg	102	70.0	130	----
	RM	Zinc	7440-66-6	E440	297 mg/kg	94.7	70.0	130	----
Metals (QCLot: 1230585)									
	RM	Mercury	7439-97-6	E510	0.0585 mg/kg	114	70.0	130	----
Metals (QCLot: 1230586)									
	RM	Aluminum	7429-90-5	E440	9817 mg/kg	93.0	70.0	130	----

Sub-Matrix:

Laboratory sample ID	Reference Material ID	Analyte	CAS Number	Method	Reference Material (RM) Report: RM Target Concentration	Recovery (%): RM	Recovery Limits (%): Low	Recovery Limits (%): High	Qualifier
Metals (QCLot: 1230586) - continued									
	RM	Antimony	7440-36-0	E440	3.99 mg/kg	101	70.0	130	----
	RM	Arsenic	7440-38-2	E440	3.73 mg/kg	102	70.0	130	----
	RM	Barium	7440-39-3	E440	105 mg/kg	102	70.0	130	----
	RM	Beryllium	7440-41-7	E440	0.349 mg/kg	92.6	70.0	130	----
	RM	Boron	7440-42-8	E440	8.5 mg/kg	102	70.0	130	----
	RM	Cadmium	7440-43-9	E440	0.91 mg/kg	100	70.0	130	----
	RM	Chromium	7440-47-3	E440	101 mg/kg	96.0	70.0	130	----
	RM	Cobalt	7440-48-4	E440	6.9 mg/kg	94.9	70.0	130	----
	RM	Copper	7440-50-8	E440	123 mg/kg	102	70.0	130	----
	RM	Iron	7439-89-6	E440	23558 mg/kg	96.3	70.0	130	----
	RM	Lead	7439-92-1	E440	267 mg/kg	94.6	70.0	130	----
	RM	Manganese	7439-96-5	E440	269 mg/kg	104	70.0	130	----
	RM	Molybdenum	7439-98-7	E440	1.03 mg/kg	96.1	70.0	130	----
	RM	Nickel	7440-02-0	E440	26.7 mg/kg	95.9	70.0	130	----
	RM	Silver	7440-22-4	E440	4.06 mg/kg	83.1	70.0	130	----
	RM	Strontium	7440-24-6	E440	86.1 mg/kg	94.3	70.0	130	----
	RM	Thallium	7440-28-0	E440	0.0786 mg/kg	93.8	70.0	130	----
	RM	Tin	7440-31-5	E440	10.6 mg/kg	89.8	70.0	130	----
	RM	Uranium	7440-61-1	E440	0.52 mg/kg	95.7	70.0	130	----
	RM	Vanadium	7440-62-2	E440	32.7 mg/kg	96.3	70.0	130	----
	RM	Zinc	7440-66-6	E440	297 mg/kg	98.0	70.0	130	----

ALS Canada Ltd.

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CERTIFICATE OF ANALYSIS

Work Order	: **HA2301055**	Page	: 1 of 25
Client	: **Dillon Consulting Limited**	Laboratory	: ALS Environmental - Halifax
Contact	: Nadine Wambolt	Account Manager	: Andrew Martin
Address	: 137 Chain Lake Drive Halifax NS Canada B3S 1B3	Address	: 13-100 Wright Ave Dartmouth NS Canada B3B 1L2
Telephone	: 902.562.9880 ext. 5206	Telephone	: +1 902 707 4888
Project	: 23-6465	Date Samples Received	: 10-Nov-2023 16:50
PO	: ----	Date Analysis Commenced	: 15-Nov-2023
C-O-C number	: ----	Issue Date	: 21-Nov-2023 20:27
Sampler	: MK/EJM		
Site	: Build NS (Country Harbour)		
Quote number	: HA23-DICL100-12 - Lump Sum Rate - Build NS (Country Harbour)		
No. of samples received	: 39		
No. of samples analysed	: 39		

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Descriptive Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Laboratory Department*
Amaninder Dhillon	Team Lead - Semi-Volatile Instrumentation	Organics, Waterloo, Ontario
Josphin Masihi	Analyst	Centralized Prep, Waterloo, Ontario
Nik Perkio	Inorganics Analyst	Metals, Waterloo, Ontario
Niral Patel		Centralized Prep, Waterloo, Ontario
Sarah Birch	VOC Section Supervisor	VOC, Waterloo, Ontario

General Comments

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

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

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

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

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances

LOR: Limit of Reporting (detection limit).

Unit	*Description*
-	no units
%	percent
mg/kg	milligrams per kilogram
none	none

<: less than.

>: greater than.

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

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

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

Sample Comments

Sample	Client Id	*Comment*
HA2301055-001	BH1 0-0.15m	LOF: Lube oil fraction
HA2301055-002	BH2 0-0.15m	LOF: Lube oil fraction
HA2301055-009	BH9 0-0.15m	LOF: Lube oil fraction
HA2301055-009	BH9 0-0.15m	RRR: Detection limit raised due to low recovery of associated surrogate standard.
HA2301055-010	BH10 0-0.15m	LOF: Lube oil fraction
HA2301055-011	BH11 0-0.15m	LOF: Lube oil fraction
HA2301055-012	BH12 0-0.15m	LOF: Lube oil fraction
HA2301055-014	BH DUPB 0-0.15m	LOF: Lube oil fraction
HA2301055-015	BH DUPC 0-0.15m	LOF: Lube oil fraction
HA2301055-015	BH DUPC 0-0.15m	RRR: Quinoline detection limit raised due to low recovery in associated matrix spike.
HA2301055-015	BH DUPC 0-0.15m	**Sample BH DUPC 0-0.15m: 1 Container was received at laboratory, but mentioned 4 containers on Chain of Custody / analytical request form.**
HA2301055-015	BH DUPC 0-0.15m	**Sample BH DUPD 0-0.15m: 4 Container received at laboratory, but mentioned 1 container on Chain of Custody / analytical request form.**

HA2301055-016	BH DUPD 0-0.15m	LOF: Lube oil fraction
HA2301055-017	BH14 0-0.15m	LOF: Lube oil fraction
HA2301055-018	BH15 0-0.15m	LOF: Lube oil fraction
HA2301055-019	BH16 0-0.15m	LOF: Lube oil fraction
HA2301055-020	BH17 0-0.15m	LOF: Lube oil fraction
HA2301055-021	BH18 0-0.15m	LOF: Lube oil fraction
HA2301055-022	BH19 0-0.15m	LOF: Lube oil fraction
HA2301055-023	BH20 0-0.15m	LOF: Lube oil fraction
HA2301055-024	BH21 0-0.15m	LOF: Lube oil fraction
HA2301055-025	BH22 0-0.15m	LOF: Lube oil fraction
HA2301055-036	BH33 0-0.15m	LOF: Lube oil fraction
HA2301055-037	BH34 0-0.15m	LOF: Lube oil fraction
HA2301055-038	BH35 0-0.15m	LOF: Lube oil fraction
HA2301055-039	BH36 0-0.15m	LOF: Lube oil fraction

Qualifiers

Qualifier	*Description*
DLHC	*Detection Limit Raised: Dilution required due to high concentration of test analyte(s).*
DLHM	*Detection Limit Adjusted: Sample has high moisture content.*
DLM	*Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).*
DLR	*Detection Limit Raised due to required dilution, limited sample amount, and/or high moisture content (soil samples).*
DUPH	*Duplicate results outside ALS DQO, due to sample heterogeneity.*
EMPC	*Estimated Maximum Possible Concentration. Parameter detected but didn't meet all criteria for positive identification.*
PEHT	*Parameter exceeded recommended holding time prior to analysis.*
RRR	*Refer to report comments for issues regarding this analysis.*
SLMI	*Surrogate recovery was outside ALS DQO (Low) due to Matrix Interference*
SMI	*Surrogate recovery could not be measured due to sample matrix interference.*
SUR-ND	*Surrogate recovery marginally exceeded ALS DQO. Reported non-detect results for associated samples were deemed to be unaffected.*
VOCJ	*Soil jar was submitted as VOC sample container. VOC results may be biased low, and do not meet federal (CCME) or provincial requirements (for BC, AB-Tier1, MB, ON, SK).*

Analytical Results

Sub-Matrix: **Soil/Solid**
(Matrix: **Soil/Solid**)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	BH1 0-0.15m	BH2 0-0.15m	BH3 0-0.15m	BH4 0-0.15m	BH5 0-0.15m
					Client sampling date / time	07-Nov-2023 00:00	07-Nov-2023 00:00	07-Nov-2023 00:00	07-Nov-2023 00:00	07-Nov-2023 00:00
						HA2301055-001	HA2301055-002	HA2301055-003	HA2301055-004	HA2301055-005
						Result	Result	Result	Result	Result
Physical Tests										
Moisture	----	E144/WT	0.25	%		40.7	42.6	----	----	----
Metals										
Aluminum	7429-90-5	E440/WT	50	mg/kg		4630	8180	15600	9710	9370
Antimony	7440-36-0	E440/WT	0.10	mg/kg		0.14	0.30	2.53	0.22	0.17
Arsenic	7440-38-2	E440/WT	0.10	mg/kg		22.0	1490	4300	78.9	152
Barium	7440-39-3	E440/WT	0.50	mg/kg		10.7	25.8	98.3	70.2	18.2
Beryllium	7440-41-7	E440/WT	0.10	mg/kg		<0.10	0.18	0.65	3.50	0.58
Boron	7440-42-8	E440/WT	5.0	mg/kg		<5.0	<5.0	<5.0	<5.0	<5.0
Cadmium	7440-43-9	E440/WT	0.020	mg/kg		0.058	0.089	0.073	2.21	0.112
Chromium	7440-47-3	E440/WT	0.50	mg/kg		8.13	12.4	32.4	6.28	8.40
Cobalt	7440-48-4	E440/WT	0.10	mg/kg		0.66	0.58	1.04	1.83	2.15
Copper	7440-50-8	E440/WT	0.50	mg/kg		3.19	4.86	4.02	19.7	9.18
Iron	7439-89-6	E440/WT	50	mg/kg		22400	29000	30100	3590	11000
Lead	7439-92-1	E440/WT	0.50	mg/kg		13.3	44.5	118	98.1	39.6
Manganese	7439-96-5	E440/WT	1.0	mg/kg		60.4	65.4	472	102	173
Mercury	7439-97-6	E510/WT	0.0050	mg/kg		0.0877	0.0842	4.19 DLHC	0.404	0.108
Molybdenum	7439-98-7	E440/WT	0.10	mg/kg		0.52	0.67	0.23	1.05	0.52
Nickel	7440-02-0	E440/WT	0.50	mg/kg		2.52	2.36	5.12	4.11	4.30
Selenium	7782-49-2	E440/WT	0.20	mg/kg		1.00	1.07	0.31	4.61	0.58
Silver	7440-22-4	E440/WT	0.10	mg/kg		0.10	0.41	0.20	0.52	0.11
Strontium	7440-24-6	E440/WT	0.50	mg/kg		2.55	1.99	3.15	25.2	2.54
Sulfur	7704-34-9	E440/WT	1000	mg/kg		<1000	<1000	<1000	3600	<1000
Thallium	7440-28-0	E440/WT	0.050	mg/kg		0.075	0.092	0.294	0.179	0.124
Tin	7440-31-5	E440/WT	2.0	mg/kg		<2.0	<2.0	<2.0	<2.0	<2.0
Uranium	7440-61-1	E440/WT	0.050	mg/kg		0.949	1.14	1.13	24.4	4.46
Vanadium	7440-62-2	E440/WT	0.20	mg/kg		24.9	52.6	36.2	7.60	9.97
Zinc	7440-66-6	E440/WT	2.0	mg/kg		10.3	11.2	52.8	74.6	67.8
Hydrocarbon Distribution of RBCA mTPH (Tier I) Fractions										
C6-C10 fraction of mTPH	n/a	EC581D/WT	1	%		<1	<1	----	----	----

Analytical Results

Sub-Matrix: Soil/Solid
(Matrix: Soil/Solid)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	BH1 0-0.15m	BH2 0-0.15m	BH3 0-0.15m	BH4 0-0.15m	BH5 0-0.15m
					Client sampling date / time	07-Nov-2023 00:00	07-Nov-2023 00:00	07-Nov-2023 00:00	07-Nov-2023 00:00	07-Nov-2023 00:00
						HA2301055-001	HA2301055-002	HA2301055-003	HA2301055-004	HA2301055-005
						Result	Result	Result	Result	Result
Hydrocarbon Distribution of RBCA mTPH (Tier I) Fractions										
>C10-C16 fraction of mTPH	n/a	EC581D/WT	1	%		3	<1	----	----	----
>C16-C21 fraction of mTPH	n/a	EC581D/WT	1	%		6	6	----	----	----
>C21-C32 fraction of mTPH	n/a	EC581D/WT	1	%		91	94	----	----	----
Hydrocarbons										
Benzene	71-43-2	E611A/WT	0.0050	mg/kg		<0.0057 DLR	<0.0050	----	----	----
Toluene	108-88-3	E611A/WT	0.050	mg/kg		<0.050	<0.050	----	----	----
Ethylbenzene	100-41-4	E611A/WT	0.015	mg/kg		<0.015	<0.015	----	----	----
Xylenes, total	1330-20-7	E611A/WT	0.050	mg/kg		<0.050	<0.050	----	----	----
Xylene, o-	95-47-6	E611A/WT	0.030	mg/kg		<0.030	<0.030	----	----	----
Xylene, m+p-	179601-23-1	E611A/WT	0.030	mg/kg		<0.030	<0.030	----	----	----
VPH C6-C10	n/a	E581.VPH/WT	5.0	mg/kg		<5.0	<5.0	----	----	----
VPH C6-C10 (less BTEX)	n/a	EC580C/WT	5.0	mg/kg		<5.0	<5.0	----	----	----
EPH >C10-C16	n/a	E601F/WT	5.0	mg/kg		11.0	<5.0	----	----	----
EPH >C16-C21	n/a	E601F/WT	5.0	mg/kg		25.0	7.4	----	----	----
EPH >C21-C32	n/a	E601F/WT	5.0	mg/kg		365 DUPH	111	----	----	----
EPH >C34-C50	n/a	E601F/WT	20	mg/kg		532 DUPH	132	----	----	----
hydrocarbon resemblance	n/a	E601F/WT	-	none		LOF	LOF	----	----	----
mTPH (Tier I)	n/a	EC581D/WT	10	mg/kg		401	118	----	----	----
return to baseline at C32	n/a	E601F/WT	-	-		No	No	----	----	----
TEH >C10-C32	n/a	E601F/WT	10	mg/kg		401	118	----	----	----
Hydrocarbons Surrogates										
dotriacontane, n- (EPH)	n/a	E601F/WT	1.0	%		72.2	60.2	----	----	----
isobutylbenzene (EPH)	538-93-2	E601F/WT	1.0	%		111	95.6	----	----	----
isobutylbenzene (VPH)	538-93-2	E581.VPH/WT	1.0	%		87.4	82.8	----	----	----
Volatile Organic Compounds Surrogates										
Bromofluorobenzene, 4-	460-00-4	E611A/WT	0.10	%		84.3	80.2	----	----	----
Difluorobenzene, 1,4-	540-36-3	E611A/WT	0.10	%		86.5	82.2	----	----	----
Polycyclic Aromatic Hydrocarbons										
Acenaphthene	83-32-9	E641A-L/WT	0.0050	mg/kg		<0.0052 DLHM	<0.0054 DLHM	----	----	----
Acenaphthylene	208-96-8	E641A-L/WT	0.0050	mg/kg		<0.0052 DLHM	<0.0054 DLHM	----	----	----

Analytical Results

Sub-Matrix: Soil/Solid
(Matrix: Soil/Solid)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	BH1 0-0.15m	BH2 0-0.15m	BH3 0-0.15m	BH4 0-0.15m	BH5 0-0.15m
					Client sampling date / time	07-Nov-2023 00:00	07-Nov-2023 00:00	07-Nov-2023 00:00	07-Nov-2023 00:00	07-Nov-2023 00:00
						HA2301055-001	HA2301055-002	HA2301055-003	HA2301055-004	HA2301055-005
						Result	Result	Result	Result	Result
Polycyclic Aromatic Hydrocarbons										
Acridine	260-94-6	E641A-L/WT	0.010	mg/kg		<0.051 DLM	<0.050 DLM	----	----	----
Anthracene	120-12-7	E641A-L/WT	0.0040	mg/kg		<0.0052 DLHM	<0.0054 DLHM	----	----	----
Benz(a)anthracene	56-55-3	E641A-L/WT	0.010	mg/kg		<0.010	<0.010	----	----	----
Benzo(a)pyrene	50-32-8	E641A-L/WT	0.010	mg/kg		<0.010	<0.010	----	----	----
Benzo(b+j)fluoranthene	n/a	E641A-L/WT	0.010	mg/kg		<0.010	<0.010	----	----	----
Benzo(b+j+k)fluoranthene	n/a	E641A-L/WT	0.015	mg/kg		<0.015	<0.015	----	----	----
Benzo(g,h,i)perylene	191-24-2	E641A-L/WT	0.010	mg/kg		<0.010	<0.010	----	----	----
Benzo(k)fluoranthene	207-08-9	E641A-L/WT	0.010	mg/kg		<0.010	<0.010	----	----	----
Chrysene	218-01-9	E641A-L/WT	0.010	mg/kg		<0.010	<0.010	----	----	----
Dibenz(a,h)anthracene	53-70-3	E641A-L/WT	0.0050	mg/kg		<0.0052 DLHM	<0.0054 DLHM	----	----	----
Fluoranthene	206-44-0	E641A-L/WT	0.010	mg/kg		<0.010	<0.010	----	----	----
Fluorene	86-73-7	E641A-L/WT	0.010	mg/kg		<0.010	<0.010	----	----	----
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A-L/WT	0.010	mg/kg		<0.010	<0.010	----	----	----
Methylnaphthalene, 1-	90-12-0	E641A-L/WT	0.010	mg/kg		<0.010	<0.010	----	----	----
Methylnaphthalene, 1+2-	----	E641A-L/WT	0.015	mg/kg		<0.015	<0.015	----	----	----
Methylnaphthalene, 2-	91-57-6	E641A-L/WT	0.010	mg/kg		<0.010	<0.010	----	----	----
Naphthalene	91-20-3	E641A-L/WT	0.010	mg/kg		<0.010	<0.010	----	----	----
Perylene	198-55-0	E641A-L/WT	0.010	mg/kg		<0.010	<0.010	----	----	----
Phenanthrene	85-01-8	E641A-L/WT	0.010	mg/kg		<0.010	<0.010	----	----	----
Pyrene	129-00-0	E641A-L/WT	0.010	mg/kg		<0.010	<0.010	----	----	----
Quinoline	91-22-5	E641A-L/WT	0.010	mg/kg		<0.068 DLM	<0.075 DLM	----	----	----
B(a)P total potency equivalents [B(a)P TPE]	----	E641A-L/WT	0.020	mg/kg		<0.020	<0.020	----	----	----
IACR (CCME)	----	E641A-L/WT	0.150	-		<0.150	<0.150	----	----	----
Polycyclic Aromatic Hydrocarbons Surrogates										
Acridine-d9	34749-75-2	E641A-L/WT	0.1	%		54.8 SUR-ND	67.3	----	----	----
Chrysene-d12	1719-03-5	E641A-L/WT	0.1	%		85.9	87.9	----	----	----
Naphthalene-d8	1146-65-2	E641A-L/WT	0.1	%		101	99.7	----	----	----
Phenanthrene-d10	1517-22-2	E641A-L/WT	0.1	%		101	101	----	----	----

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

Please refer to the Accreditation section for an explanation of analyte accreditations.

Analytical Results

Sub-Matrix: Soil/Solid
(Matrix: Soil/Solid)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	BH6 0-0.15m	BH7 0-0.15m	BH8 0-0.15m	BH9 0-0.15m	BH10 0-0.15m
					Client sampling date / time	07-Nov-2023 00:00	07-Nov-2023 00:00	07-Nov-2023 00:00	07-Nov-2023 00:00	07-Nov-2023 00:00
						HA2301055-006	HA2301055-007	HA2301055-008	HA2301055-009	HA2301055-010
						Result	Result	Result	Result	Result
Physical Tests										
Moisture	----	E144/WT	0.25	%		----	----	----	60.0	38.1
Metals										
Aluminum	7429-90-5	E440/WT	50	mg/kg		6610	14700	12800	18100	14000
Antimony	7440-36-0	E440/WT	0.10	mg/kg		0.32	12.2	1.25	3.14	0.50
Arsenic	7440-38-2	E440/WT	0.10	mg/kg		51.9	7170	1270	3170	383
Barium	7440-39-3	E440/WT	0.50	mg/kg		175	51.9	41.0	145	44.4
Beryllium	7440-41-7	E440/WT	0.10	mg/kg		4.16	0.55	0.97	1.45	0.62
Boron	7440-42-8	E440/WT	5.0	mg/kg		<5.0	<5.0	<5.0	<5.0	<5.0
Cadmium	7440-43-9	E440/WT	0.020	mg/kg		2.63	0.500	0.065	0.481	0.116
Chromium	7440-47-3	E440/WT	0.50	mg/kg		3.08	20.5	21.3	36.0	21.7
Cobalt	7440-48-4	E440/WT	0.10	mg/kg		2.01	4.36	1.92	16.7	4.87
Copper	7440-50-8	E440/WT	0.50	mg/kg		12.3	31.5	5.15	32.0	14.8
Iron	7439-89-6	E440/WT	50	mg/kg		3700	21800	17500	73800	27200
Lead	7439-92-1	E440/WT	0.50	mg/kg		99.1	127	54.8	164	87.8
Manganese	7439-96-5	E440/WT	1.0	mg/kg		313	157	309	1010	517
Mercury	7439-97-6	E510/WT	0.0050	mg/kg		0.204	4.03 DLHC	1.96 DLHC	11.9 DLHC	0.699
Molybdenum	7439-98-7	E440/WT	0.10	mg/kg		1.07	1.18	0.41	7.43	0.79
Nickel	7440-02-0	E440/WT	0.50	mg/kg		5.27	9.67	6.29	21.2	8.68
Selenium	7782-49-2	E440/WT	0.20	mg/kg		3.97	1.48	0.75	2.20	0.77
Silver	7440-22-4	E440/WT	0.10	mg/kg		0.22	0.25	0.14	0.80	0.26
Strontium	7440-24-6	E440/WT	0.50	mg/kg		73.4	5.22	2.41	16.3	2.72
Sulfur	7704-34-9	E440/WT	1000	mg/kg		3900	3300	<1000	1900	<1000
Thallium	7440-28-0	E440/WT	0.050	mg/kg		<0.050	0.192	0.165	0.439	0.228
Tin	7440-31-5	E440/WT	2.0	mg/kg		<2.0	4.4	<2.0	3.3	2.9
Uranium	7440-61-1	E440/WT	0.050	mg/kg		27.7	5.31	2.71	2.62	1.87
Vanadium	7440-62-2	E440/WT	0.20	mg/kg		3.45	27.1	23.4	48.4	38.7
Zinc	7440-66-6	E440/WT	2.0	mg/kg		109	126	49.0	104	52.5
Hydrocarbon Distribution of RBCA mTPH (Tier I) Fractions										
C6-C10 fraction of mTPH	n/a	EC581D/WT	1	%		----	----	----	<1	<1
>C10-C16 fraction of mTPH	n/a	EC581D/WT	1	%		----	----	----	5	<1

Analytical Results

Sub-Matrix: Soil/Solid
(Matrix: Soil/Solid)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	BH6 0-0.15m	BH7 0-0.15m	BH8 0-0.15m	BH9 0-0.15m	BH10 0-0.15m
					Client sampling date / time	07-Nov-2023 00:00	07-Nov-2023 00:00	07-Nov-2023 00:00	07-Nov-2023 00:00	07-Nov-2023 00:00
						HA2301055-006	HA2301055-007	HA2301055-008	HA2301055-009	HA2301055-010
						Result	Result	Result	Result	Result
Hydrocarbon Distribution of RBCA mTPH (Tier I) Fractions										
>C16-C21 fraction of mTPH	n/a	EC581D/WT	1	%		----	----	----	10	7
>C21-C32 fraction of mTPH	n/a	EC581D/WT	1	%		----	----	----	85	93
Hydrocarbons										
Benzene	71-43-2	E611A/WT	0.0050	mg/kg		----	----	----	<0.0072 DLHM	<0.0050
Toluene	108-88-3	E611A/WT	0.050	mg/kg		----	----	----	<0.050	<0.050
Ethylbenzene	100-41-4	E611A/WT	0.015	mg/kg		----	----	----	<0.018 DLHM	<0.015
Xylenes, total	1330-20-7	E611A/WT	0.050	mg/kg		----	----	----	<0.050	<0.050
Xylene, o-	95-47-6	E611A/WT	0.030	mg/kg		----	----	----	<0.030	<0.030
Xylene, m+p-	179601-23-1	E611A/WT	0.030	mg/kg		----	----	----	<0.030	<0.030
VPH C6-C10	n/a	E581.VPH/WT	5.0	mg/kg		----	----	----	<5.0	<5.0
VPH C6-C10 (less BTEX)	n/a	EC580C/WT	5.0	mg/kg		----	----	----	<5.0	<5.0
EPH >C10-C16	n/a	E601F/WT	5.0	mg/kg		----	----	----	11.8	<5.0
EPH >C16-C21	n/a	E601F/WT	5.0	mg/kg		----	----	----	21.9	6.9
EPH >C21-C32	n/a	E601F/WT	5.0	mg/kg		----	----	----	196	94.3
EPH >C34-C50	n/a	E601F/WT	20	mg/kg		----	----	----	248	190
hydrocarbon resemblance	n/a	E601F/WT	-	none		----	----	----	LOF	LOF
mTPH (Tier I)	n/a	EC581D/WT	10	mg/kg		----	----	----	230	101
return to baseline at C32	n/a	E601F/WT	-	-		----	----	----	No	No
TEH >C10-C32	n/a	E601F/WT	10	mg/kg		----	----	----	230	101
Hydrocarbons Surrogates										
dotriacontane, n- (EPH)	n/a	E601F/WT	1.0	%		----	----	----	64.2	67.8
isobutylbenzene (EPH)	538-93-2	E601F/WT	1.0	%		----	----	----	85.6	109
isobutylbenzene (VPH)	538-93-2	E581.VPH/WT	1.0	%		----	----	----	97.2	90.2
Volatile Organic Compounds Surrogates										
Bromofluorobenzene, 4-	460-00-4	E611A/WT	0.10	%		----	----	----	91.5	95.8
Difluorobenzene, 1,4-	540-36-3	E611A/WT	0.10	%		----	----	----	93.1	90.2
Polycyclic Aromatic Hydrocarbons										
Acenaphthene	83-32-9	E641A-L/WT	0.0050	mg/kg		----	----	----	<0.0078 DLHM	<0.0051 DLHM
Acenaphthylene	208-96-8	E641A-L/WT	0.0050	mg/kg		----	----	----	0.0171	<0.0051 DLHM
Acridine	260-94-6	E641A-L/WT	0.010	mg/kg		----	----	----	<0.136 RRR	<0.047 DLM

Analytical Results

Sub-Matrix: **Soil/Solid**
(Matrix: **Soil/Solid**)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	BH6 0-0.15m	BH7 0-0.15m	BH8 0-0.15m	BH9 0-0.15m	BH10 0-0.15m
					Client sampling date / time	07-Nov-2023 00:00	07-Nov-2023 00:00	07-Nov-2023 00:00	07-Nov-2023 00:00	07-Nov-2023 00:00
						HA2301055-006	HA2301055-007	HA2301055-008	HA2301055-009	HA2301055-010
						Result	Result	Result	Result	Result
Polycyclic Aromatic Hydrocarbons										
Anthracene	120-12-7	E641A-L/WT	0.0040	mg/kg		----	----	----	0.0243	0.0108
Benz(a)anthracene	56-55-3	E641A-L/WT	0.010	mg/kg		----	----	----	0.066	0.033
Benzo(a)pyrene	50-32-8	E641A-L/WT	0.010	mg/kg		----	----	----	0.058	0.028
Benzo(b+j)fluoranthene	n/a	E641A-L/WT	0.010	mg/kg		----	----	----	0.090	0.042
Benzo(b+j+k)fluoranthene	n/a	E641A-L/WT	0.015	mg/kg		----	----	----	0.121	0.056
Benzo(g,h,i)perylene	191-24-2	E641A-L/WT	0.010	mg/kg		----	----	----	0.029	0.018
Benzo(k)fluoranthene	207-08-9	E641A-L/WT	0.010	mg/kg		----	----	----	0.031	0.014
Chrysene	218-01-9	E641A-L/WT	0.010	mg/kg		----	----	----	0.066	0.031
Dibenz(a,h)anthracene	53-70-3	E641A-L/WT	0.0050	mg/kg		----	----	----	<0.0100 DLM	<0.0051 DLHM
Fluoranthene	206-44-0	E641A-L/WT	0.010	mg/kg		----	----	----	0.099	0.058
Fluorene	86-73-7	E641A-L/WT	0.010	mg/kg		----	----	----	<0.022 DLM	<0.010
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A-L/WT	0.010	mg/kg		----	----	----	0.035	0.018
Methylnaphthalene, 1-	90-12-0	E641A-L/WT	0.010	mg/kg		----	----	----	0.040	0.014
Methylnaphthalene, 1+2-	----	E641A-L/WT	0.015	mg/kg		----	----	----	0.076	0.029
Methylnaphthalene, 2-	91-57-6	E641A-L/WT	0.010	mg/kg		----	----	----	0.036	0.015
Naphthalene	91-20-3	E641A-L/WT	0.010	mg/kg		----	----	----	0.019	0.012
Perylene	198-55-0	E641A-L/WT	0.010	mg/kg		----	----	----	0.016	<0.010
Phenanthrene	85-01-8	E641A-L/WT	0.010	mg/kg		----	----	----	0.065	0.043
Pyrene	129-00-0	E641A-L/WT	0.010	mg/kg		----	----	----	0.104	0.056
Quinoline	91-22-5	E641A-L/WT	0.010	mg/kg		----	----	----	<0.090 DLM	<0.047 DLM
B(a)P total potency equivalents [B(a)P TPE]	----	E641A-L/WT	0.020	mg/kg		----	----	----	0.086	0.042
IACR (CCME)	----	E641A-L/WT	0.150	-		----	----	----	1.18	0.561
Polycyclic Aromatic Hydrocarbons Surrogates										
Acridine-d9	34749-75-2	E641A-L/WT	0.1	%		----	----	----	47.9 SLMI	69.7
Chrysene-d12	1719-03-5	E641A-L/WT	0.1	%		----	----	----	77.8	86.8
Naphthalene-d8	1146-65-2	E641A-L/WT	0.1	%		----	----	----	97.1	100
Phenanthrene-d10	1517-22-2	E641A-L/WT	0.1	%		----	----	----	94.1	99.4

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

Please refer to the Accreditation section for an explanation of analyte accreditations.

Analytical Results

Sub-Matrix: **Soil/Solid**
(Matrix: **Soil/Solid**)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	BH11 0-0.15m	BH12 0-0.15m	BH DUPA 0-0.15m	BH DUPB 0-0.15m	BH DUPC 0-0.15m
					Client sampling date / time	07-Nov-2023 00:00	07-Nov-2023 00:00	07-Nov-2023 00:00	07-Nov-2023 00:00	08-Nov-2023 00:00
						HA2301055-011	HA2301055-012	HA2301055-013	HA2301055-014	HA2301055-015
						Result	Result	Result	Result	Result
Physical Tests										
Moisture	----	E144/WT	0.25	%		49.5	32.2	----	50.7	46.5
Metals										
Aluminum	7429-90-5	E440/WT	50	mg/kg		16000	20100	6940	21300	13600
Antimony	7440-36-0	E440/WT	0.10	mg/kg		1.50	4.38	0.35	1.92	4.37
Arsenic	7440-38-2	E440/WT	0.10	mg/kg		808	1110	52.9	1270	1200
Barium	7440-39-3	E440/WT	0.50	mg/kg		49.0	78.2	177	72.7	106
Beryllium	7440-41-7	E440/WT	0.10	mg/kg		0.92	1.30	3.38	1.22	0.74
Boron	7440-42-8	E440/WT	5.0	mg/kg		<5.0	<5.0	<5.0	<5.0	<5.0
Cadmium	7440-43-9	E440/WT	0.020	mg/kg		0.108	0.378	1.75	0.153	0.964
Chromium	7440-47-3	E440/WT	0.50	mg/kg		22.7	24.6	3.23	29.0	27.2
Cobalt	7440-48-4	E440/WT	0.10	mg/kg		6.69	12.2	1.96	8.70	6.56
Copper	7440-50-8	E440/WT	0.50	mg/kg		24.0	99.6	13.1	33.3	28.7
Iron	7439-89-6	E440/WT	50	mg/kg		24900	26600	3240	31800	35100
Lead	7439-92-1	E440/WT	0.50	mg/kg		107	791	118	138	133
Manganese	7439-96-5	E440/WT	1.0	mg/kg		532	763	257	690	704
Mercury	7439-97-6	E510/WT	0.0050	mg/kg		6.15 DLHC	8.09 DLHC	0.317	7.84 DLHC	0.0989
Molybdenum	7439-98-7	E440/WT	0.10	mg/kg		1.11	1.20	0.81	1.43	2.43
Nickel	7440-02-0	E440/WT	0.50	mg/kg		11.8	19.1	4.79	15.5	15.0
Selenium	7782-49-2	E440/WT	0.20	mg/kg		0.68	0.55	3.40	0.79	0.86
Silver	7440-22-4	E440/WT	0.10	mg/kg		0.19	0.19	0.26	0.39	0.14
Strontium	7440-24-6	E440/WT	0.50	mg/kg		4.22	5.34	69.6	4.36	17.0
Sulfur	7704-34-9	E440/WT	1000	mg/kg		<1000	<1000	3500	<1000	<1000
Thallium	7440-28-0	E440/WT	0.050	mg/kg		0.235	0.300	<0.050	0.270	0.253
Tin	7440-31-5	E440/WT	2.0	mg/kg		5.0	9.0	<2.0	5.7	17.9
Uranium	7440-61-1	E440/WT	0.050	mg/kg		2.45	6.21	20.6	3.14	0.731
Vanadium	7440-62-2	E440/WT	0.20	mg/kg		29.4	28.4	3.94	36.5	36.8
Zinc	7440-66-6	E440/WT	2.0	mg/kg		82.2	240	108	108	310
Hydrocarbon Distribution of RBCA mTPH (Tier I) Fractions										
C6-C10 fraction of mTPH	n/a	EC581D/WT	1	%		2	<1	----	<1	<1
>C10-C16 fraction of mTPH	n/a	EC581D/WT	1	%		<1	2	----	<1	4

Analytical Results

Sub-Matrix: Soil/Solid
(Matrix: Soil/Solid)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	BH11 0-0.15m	BH12 0-0.15m	BH DUPA 0-0.15m	BH DUPB 0-0.15m	BH DUPC 0-0.15m
					Client sampling date / time	07-Nov-2023 00:00	07-Nov-2023 00:00	07-Nov-2023 00:00	07-Nov-2023 00:00	08-Nov-2023 00:00
						HA2301055-011	HA2301055-012	HA2301055-013	HA2301055-014	HA2301055-015
						Result	Result	Result	Result	Result
Hydrocarbon Distribution of RBCA mTPH (Tier I) Fractions										
>C16-C21 fraction of mTPH	n/a	EC581D/WT	1	%		5	25	----	6	10
>C21-C32 fraction of mTPH	n/a	EC581D/WT	1	%		93	73	----	94	85
Hydrocarbons										
Benzene	71-43-2	E611A/WT	0.0050	mg/kg		<0.0056 DLHM	<0.0050	----	<0.0050	<0.0050 PEHT, VOCJ
Toluene	108-88-3	E611A/WT	0.050	mg/kg		<0.050	<0.050	----	<0.050	<0.050 PEHT, VOCJ
Ethylbenzene	100-41-4	E611A/WT	0.015	mg/kg		<0.015	<0.015	----	<0.015	<0.015 PEHT, VOCJ
Xylenes, total	1330-20-7	E611A/WT	0.050	mg/kg		<0.050	<0.050	----	<0.050	<0.050
Xylene, o-	95-47-6	E611A/WT	0.030	mg/kg		<0.030	<0.030	----	<0.030	<0.030 PEHT, VOCJ
Xylene, m+p-	179601-23-1	E611A/WT	0.030	mg/kg		<0.030	<0.030	----	<0.030	<0.030 PEHT, VOCJ
VPH C6-C10	n/a	E581.VPH/WT	5.0	mg/kg		5.4	<5.0	----	<5.0	<5.0 PEHT, VOCJ
VPH C6-C10 (less BTEX)	n/a	EC580C/WT	5.0	mg/kg		5.4	<5.0	----	<5.0	<5.0
EPH >C10-C16	n/a	E601F/WT	5.0	mg/kg		<5.0	29.4	----	<5.0	8.2
EPH >C16-C21	n/a	E601F/WT	5.0	mg/kg		12.2	345	----	12.1	21.6
EPH >C21-C32	n/a	E601F/WT	5.0	mg/kg		231	993	----	205	174
EPH >C34-C50	n/a	E601F/WT	20	mg/kg		285	638	----	272	332
hydrocarbon resemblance	n/a	E601F/WT	-	none		LOF	LOF	----	LOF	LOF
mTPH (Tier I)	n/a	EC581D/WT	10	mg/kg		249	1370	----	217	204
return to baseline at C32	n/a	E601F/WT	-	-		No	No	----	No	No
TEH >C10-C32	n/a	E601F/WT	10	mg/kg		243	1370	----	217	204
Hydrocarbons Surrogates										
dotriacontane, n- (EPH)	n/a	E601F/WT	1.0	%		69.7	74.5	----	62.7	62.1
isobutylbenzene (EPH)	538-93-2	E601F/WT	1.0	%		81.5	110	----	87.3	115
isobutylbenzene (VPH)	538-93-2	E581.VPH/WT	1.0	%		79.4	72.8	----	87.4	75.9
Volatile Organic Compounds Surrogates										
Bromofluorobenzene, 4-	460-00-4	E611A/WT	0.10	%		88.5	86.9	----	96.6	76.8
Difluorobenzene, 1,4-	540-36-3	E611A/WT	0.10	%		87.1	91.5	----	94.0	78.7
Polycyclic Aromatic Hydrocarbons										
Acenaphthene	83-32-9	E641A-L/WT	0.0050	mg/kg		<0.0060 DLHM	<0.0050	----	<0.0058 DLHM	<0.0057 DLHM
Acenaphthylene	208-96-8	E641A-L/WT	0.0050	mg/kg		<0.0060 DLHM	0.0084 EMPC	----	0.0091	<0.0057 DLHM
Acridine	260-94-6	E641A-L/WT	0.010	mg/kg		<0.052 DLM	<0.046 DLM	----	<0.054 DLM	<0.029 DLM

Analytical Results

Sub-Matrix: Soil/Solid
(Matrix: Soil/Solid)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	BH11 0-0.15m	BH12 0-0.15m	BH DUPA 0-0.15m	BH DUPB 0-0.15m	BH DUPC 0-0.15m
					Client sampling date / time	07-Nov-2023 00:00	07-Nov-2023 00:00	07-Nov-2023 00:00	07-Nov-2023 00:00	08-Nov-2023 00:00
						HA2301055-011	HA2301055-012	HA2301055-013	HA2301055-014	HA2301055-015
						Result	Result	Result	Result	Result
Polycyclic Aromatic Hydrocarbons										
Anthracene	120-12-7	E641A-L/WT	0.0040	mg/kg		<0.0104 DLM	0.0069 EMPC	----	0.0180 EMPC	0.0076
Benz(a)anthracene	56-55-3	E641A-L/WT	0.010	mg/kg		0.037	0.013	----	0.082	0.034
Benzo(a)pyrene	50-32-8	E641A-L/WT	0.010	mg/kg		0.036	0.014	----	0.070	0.047
Benzo(b+j)fluoranthene	n/a	E641A-L/WT	0.010	mg/kg		0.051	0.035	----	0.098	0.144
Benzo(b+j+k)fluoranthene	n/a	E641A-L/WT	0.015	mg/kg		0.072	0.047	----	0.137	0.188
Benzo(g,h,i)perylene	191-24-2	E641A-L/WT	0.010	mg/kg		0.020	0.030	----	0.039	0.086
Benzo(k)fluoranthene	207-08-9	E641A-L/WT	0.010	mg/kg		0.021	0.012	----	0.039	0.044
Chrysene	218-01-9	E641A-L/WT	0.010	mg/kg		0.031	<0.034 DLM	----	0.067	0.067
Dibenz(a,h)anthracene	53-70-3	E641A-L/WT	0.0050	mg/kg		<0.0065 DLM	0.0055	----	0.0142	0.0154
Fluoranthene	206-44-0	E641A-L/WT	0.010	mg/kg		0.060	0.020	----	0.136	0.067
Fluorene	86-73-7	E641A-L/WT	0.010	mg/kg		<0.017 DLM	<0.010	----	<0.019 DLM	<0.010
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A-L/WT	0.010	mg/kg		0.023	0.024	----	0.046	0.092
Methylnaphthalene, 1-	90-12-0	E641A-L/WT	0.010	mg/kg		<0.010	<0.010	----	<0.010	0.086
Methylnaphthalene, 1+2-	----	E641A-L/WT	0.015	mg/kg		<0.015	<0.015	----	<0.015	0.203
Methylnaphthalene, 2-	91-57-6	E641A-L/WT	0.010	mg/kg		<0.010	<0.010	----	<0.010	0.117
Naphthalene	91-20-3	E641A-L/WT	0.010	mg/kg		<0.010	<0.010	----	<0.010	0.074
Perylene	198-55-0	E641A-L/WT	0.010	mg/kg		0.011	<0.010	----	0.020	0.011
Phenanthrene	85-01-8	E641A-L/WT	0.010	mg/kg		0.021	<0.016 DLM	----	0.029	0.089
Pyrene	129-00-0	E641A-L/WT	0.010	mg/kg		0.057	0.023	----	0.127	0.058
Quinoline	91-22-5	E641A-L/WT	0.010	mg/kg		<0.052 DLM	<0.046 DLM	----	<0.091 DLM	<0.061 RRR
B(a)P total potency equivalents [B(a)P TPE]	----	E641A-L/WT	0.020	mg/kg		0.053	0.028	----	0.112	0.095
IACR (CCME)	----	E641A-L/WT	0.150	-		0.700	0.416	----	1.41	1.55
Polycyclic Aromatic Hydrocarbons Surrogates										
Acridine-d9	34749-75-2	E641A-L/WT	0.1	%		68.9	80.9	----	73.2	80.8
Chrysene-d12	1719-03-5	E641A-L/WT	0.1	%		82.5	89.2	----	94.5	78.0
Naphthalene-d8	1146-65-2	E641A-L/WT	0.1	%		97.4	100	----	103	89.6
Phenanthrene-d10	1517-22-2	E641A-L/WT	0.1	%		96.9	99.1	----	103	87.9

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

Please refer to the Accreditation section for an explanation of analyte accreditations.

Analytical Results

Sub-Matrix: Soil/Solid
(Matrix: Soil/Solid)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	BH DUPD 0-0.15m	BH14 0-0.15m	BH15 0-0.15m	BH16 0-0.15m	BH17 0-0.15m
					Client sampling date / time	08-Nov-2023 00:00	09-Nov-2023 00:00	08-Nov-2023 00:00	08-Nov-2023 00:00	09-Nov-2023 00:00
						HA2301055-016	HA2301055-017	HA2301055-018	HA2301055-019	HA2301055-020
						Result	Result	Result	Result	Result
Physical Tests										
Moisture	----	E144/WT	0.25	%		----	44.5	15.6	52.8	60.5
Metals										
Aluminum	7429-90-5	E440/WT	50	mg/kg		12000	14000	23200	27500	9580
Antimony	7440-36-0	E440/WT	0.10	mg/kg		48.1	1.11	2.72	15.8	2.86
Arsenic	7440-38-2	E440/WT	0.10	mg/kg		2750	340	1240	463	694
Barium	7440-39-3	E440/WT	0.50	mg/kg		120	53.7	52.3	31.6	161
Beryllium	7440-41-7	E440/WT	0.10	mg/kg		0.50	0.58	1.24	0.86	0.54
Boron	7440-42-8	E440/WT	5.0	mg/kg		<5.0	<5.0	<5.0	<5.0	<5.0
Cadmium	7440-43-9	E440/WT	0.020	mg/kg		0.293	0.139	0.079	0.166	0.350
Chromium	7440-47-3	E440/WT	0.50	mg/kg		27.6	16.2	22.3	18.2	58.0
Cobalt	7440-48-4	E440/WT	0.10	mg/kg		9.27	2.73	6.45	2.05	8.07
Copper	7440-50-8	E440/WT	0.50	mg/kg		39.0	19.9	14.5	14.7	30.0
Iron	7439-89-6	E440/WT	50	mg/kg		39400	23200	23600	28700	39500
Lead	7439-92-1	E440/WT	0.50	mg/kg		591	229	1360	428	349
Manganese	7439-96-5	E440/WT	1.0	mg/kg		604	292	433	170	411
Mercury	7439-97-6	E510/WT	0.0050	mg/kg		83.6 DLHC	28.1 DLHC	2920 DLHC	2.25 DLHC	6.39 DLHC
Molybdenum	7439-98-7	E440/WT	0.10	mg/kg		2.52	0.83	0.45	0.61	5.22
Nickel	7440-02-0	E440/WT	0.50	mg/kg		12.1	6.86	15.2	6.57	14.7
Selenium	7782-49-2	E440/WT	0.20	mg/kg		1.17	1.76	0.57	1.97	1.69
Silver	7440-22-4	E440/WT	0.10	mg/kg		0.61	0.20	0.41	0.28	0.22
Strontium	7440-24-6	E440/WT	0.50	mg/kg		5.68	6.72	3.30	7.64	21.5
Sulfur	7704-34-9	E440/WT	1000	mg/kg		<1000	<1000	<1000	<1000	3200
Thallium	7440-28-0	E440/WT	0.050	mg/kg		0.491	0.194	0.192	0.151	1.21
Tin	7440-31-5	E440/WT	2.0	mg/kg		60.7	7.4	3.9	27.2	3.1
Uranium	7440-61-1	E440/WT	0.050	mg/kg		0.812	1.43	1.43	1.48	0.807
Vanadium	7440-62-2	E440/WT	0.20	mg/kg		33.6	25.1	25.2	32.5	26.7
Zinc	7440-66-6	E440/WT	2.0	mg/kg		84.7	59.1	105	55.7	150
Hydrocarbon Distribution of RBCA mTPH (Tier I) Fractions										
C6-C10 fraction of mTPH	n/a	EC581D/WT	1	%		----	<1	<1	<1	2
>C10-C16 fraction of mTPH	n/a	EC581D/WT	1	%		----	5	4	<1	11

Analytical Results

Sub-Matrix: Soil/Solid
(Matrix: Soil/Solid)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	BH DUPD 0-0.15m	BH14 0-0.15m	BH15 0-0.15m	BH16 0-0.15m	BH17 0-0.15m
					Client sampling date / time	08-Nov-2023 00:00	09-Nov-2023 00:00	08-Nov-2023 00:00	08-Nov-2023 00:00	09-Nov-2023 00:00
						HA2301055-016	HA2301055-017	HA2301055-018	HA2301055-019	HA2301055-020
						Result	Result	Result	Result	Result
Hydrocarbon Distribution of RBCA mTPH (Tier I) Fractions										
>C16-C21 fraction of mTPH	n/a	EC581D/WT	1	%		----	6	8	7	15
>C21-C32 fraction of mTPH	n/a	EC581D/WT	1	%		----	89	87	93	72
Hydrocarbons										
Benzene	71-43-2	E611A/WT	0.0050	mg/kg		----	<0.0050	<0.0050	<0.0053 DLHM	0.0344
Toluene	108-88-3	E611A/WT	0.050	mg/kg		----	<0.050	<0.050	<0.050	0.217
Ethylbenzene	100-41-4	E611A/WT	0.015	mg/kg		----	<0.015	<0.015	<0.015	0.079
Xylenes, total	1330-20-7	E611A/WT	0.050	mg/kg		----	<0.050	<0.050	<0.050	0.263
Xylene, o-	95-47-6	E611A/WT	0.030	mg/kg		----	<0.030	<0.030	<0.030	0.107
Xylene, m+p-	179601-23-1	E611A/WT	0.030	mg/kg		----	<0.030	<0.030	<0.030	0.156
VPH C6-C10	n/a	E581.VPH/WT	5.0	mg/kg		----	<5.0	<5.0	<5.0	11.2
VPH C6-C10 (less BTEX)	n/a	EC580C/WT	5.0	mg/kg		----	<5.0	<5.0	<5.0	10.6
EPH >C10-C16	n/a	E601F/WT	5.0	mg/kg		----	12.4	5.7	<5.0	73.2
EPH >C16-C21	n/a	E601F/WT	5.0	mg/kg		----	15.9	11.5	18.9	101
EPH >C21-C32	n/a	E601F/WT	5.0	mg/kg		----	231	119	257	476
EPH >C34-C50	n/a	E601F/WT	20	mg/kg		----	343	185	559	567
hydrocarbon resemblance	n/a	E601F/WT	-	none		----	LOF	LOF	LOF	LOF
mTPH (Tier I)	n/a	EC581D/WT	10	mg/kg		----	259	136	276	661
return to baseline at C32	n/a	E601F/WT	-	-		----	No	No	No	No
TEH >C10-C32	n/a	E601F/WT	10	mg/kg		----	259	136	276	650
Hydrocarbons Surrogates										
dotriacontane, n- (EPH)	n/a	E601F/WT	1.0	%		----	73.0	94.2	64.6	63.7
isobutylbenzene (EPH)	538-93-2	E601F/WT	1.0	%		66.5	108	80.9	103	90.0
isobutylbenzene (VPH)	538-93-2	E581.VPH/WT	1.0	%		----	70.0	96.8	76.1	76.2
Volatile Organic Compounds Surrogates										
Bromofluorobenzene, 4-	460-00-4	E611A/WT	0.10	%		----	75.9	98.6	80.7	78.2
Difluorobenzene, 1,4-	540-36-3	E611A/WT	0.10	%		----	74.6	101	79.9	80.4
Polycyclic Aromatic Hydrocarbons										
Acenaphthene	83-32-9	E641A-L/WT	0.0050	mg/kg		----	<0.0056 DLHM	<0.0050	<0.0065 DLHM	0.0958
Acenaphthylene	208-96-8	E641A-L/WT	0.0050	mg/kg		----	0.0833	0.0101	0.0430	0.0996
Acridine	260-94-6	E641A-L/WT	0.010	mg/kg		----	<0.052 DLM	<0.031 DLM	<0.069 DLM	<0.081 DLM

Analytical Results

Sub-Matrix: Soil/Solid
(Matrix: Soil/Solid)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	BH DUPD 0-0.15m	BH14 0-0.15m	BH15 0-0.15m	BH16 0-0.15m	BH17 0-0.15m
					Client sampling date / time	08-Nov-2023 00:00	09-Nov-2023 00:00	08-Nov-2023 00:00	08-Nov-2023 00:00	09-Nov-2023 00:00
						HA2301055-016	HA2301055-017	HA2301055-018	HA2301055-019	HA2301055-020
						Result	Result	Result	Result	Result
Polycyclic Aromatic Hydrocarbons										
Anthracene	120-12-7	E641A-L/WT	0.0040	mg/kg	----	0.0724	0.0161	0.0474	0.146 EMPC
Benz(a)anthracene	56-55-3	E641A-L/WT	0.010	mg/kg	----	0.152	0.031	0.123	0.524
Benzo(a)pyrene	50-32-8	E641A-L/WT	0.010	mg/kg	----	0.134	0.034	0.101	0.343
Benzo(b+j)fluoranthene	n/a	E641A-L/WT	0.010	mg/kg	----	0.356	0.066	0.174	0.615
Benzo(b+j+k)fluoranthene	n/a	E641A-L/WT	0.015	mg/kg	----	0.480	0.091	0.244	0.811
Benzo(g,h,i)perylene	191-24-2	E641A-L/WT	0.010	mg/kg	----	0.109	0.022	0.047	0.185
Benzo(k)fluoranthene	207-08-9	E641A-L/WT	0.010	mg/kg	----	0.124	0.025	0.070	0.196
Chrysene	218-01-9	E641A-L/WT	0.010	mg/kg	----	0.216	0.040	0.123	0.558
Dibenz(a,h)anthracene	53-70-3	E641A-L/WT	0.0050	mg/kg	----	0.0343	0.0060	0.0180	0.0617
Fluoranthene	206-44-0	E641A-L/WT	0.010	mg/kg	----	0.325	0.084	0.270	0.867
Fluorene	86-73-7	E641A-L/WT	0.010	mg/kg	----	<0.014 DLM	<0.010	<0.025 DLM	0.060
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A-L/WT	0.010	mg/kg	----	0.149	0.028	0.068	0.227
Methylnaphthalene, 1-	90-12-0	E641A-L/WT	0.010	mg/kg	----	<0.010	<0.010	<0.010	0.373
Methylnaphthalene, 1+2-	----	E641A-L/WT	0.015	mg/kg	----	<0.015	<0.015	<0.015	0.784
Methylnaphthalene, 2-	91-57-6	E641A-L/WT	0.010	mg/kg	----	<0.010	<0.010	<0.010	0.411
Naphthalene	91-20-3	E641A-L/WT	0.010	mg/kg	----	<0.010	<0.010	<0.010	0.267
Perylene	198-55-0	E641A-L/WT	0.010	mg/kg	----	0.034	<0.010	0.027	0.080
Phenanthrene	85-01-8	E641A-L/WT	0.010	mg/kg	----	0.090	0.034	0.043	0.714
Pyrene	129-00-0	E641A-L/WT	0.010	mg/kg	----	0.253	0.066	0.199	0.853
Quinoline	91-22-5	E641A-L/WT	0.010	mg/kg	----	<0.055 DLM	<0.031 DLM	<0.090 DLM	<0.081 DLM
B(a)P total potency equivalents [B(a)P TPE]	----	E641A-L/WT	0.020	mg/kg	----	0.250	0.056	0.164	0.568
IACR (CCME)	----	E641A-L/WT	0.150	-	----	4.14	0.813	2.34	8.23
Polycyclic Aromatic Hydrocarbons Surrogates										
Acridine-d9	34749-75-2	E641A-L/WT	0.1	%	----	70.6	84.3	64.4	76.7
Chrysene-d12	1719-03-5	E641A-L/WT	0.1	%	----	86.5	86.6	82.9	78.7
Naphthalene-d8	1146-65-2	E641A-L/WT	0.1	%	----	104	96.2	99.1	99.8
Phenanthrene-d10	1517-22-2	E641A-L/WT	0.1	%	----	98.7	99.5	99.4	96.2

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

Please refer to the Accreditation section for an explanation of analyte accreditations.

Analytical Results

Sub-Matrix: Soil/Solid
(Matrix: Soil/Solid)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	BH18 0-0.15m	BH19 0-0.15m	BH20 0-0.15m	BH21 0-0.15m	BH22 0-0.15m
					Client sampling date / time	08-Nov-2023 00:00	08-Nov-2023 00:00	08-Nov-2023 00:00	08-Nov-2023 00:00	08-Nov-2023 00:00
						HA2301055-021	HA2301055-022	HA2301055-023	HA2301055-024	HA2301055-025
						Result	Result	Result	Result	Result
Physical Tests										
Moisture	----	E144/WT	0.25	%		40.7	42.6	45.7	42.0	34.9
Metals										
Aluminum	7429-90-5	E440/WT	50	mg/kg		7900	17700	15000	12600	15200
Antimony	7440-36-0	E440/WT	0.10	mg/kg		1.46	0.89	7.14	23.0	1.15
Arsenic	7440-38-2	E440/WT	0.10	mg/kg		194	620	2260	2500	1620
Barium	7440-39-3	E440/WT	0.50	mg/kg		52.1	51.4	57.1	114	120
Beryllium	7440-41-7	E440/WT	0.10	mg/kg		1.18	0.56	0.64	0.50	0.50
Boron	7440-42-8	E440/WT	5.0	mg/kg		<5.0	<5.0	<5.0	<5.0	<5.0
Cadmium	7440-43-9	E440/WT	0.020	mg/kg		0.478	0.283	0.114	0.250	0.094
Chromium	7440-47-3	E440/WT	0.50	mg/kg		15.3	21.5	28.6	28.9	32.7
Cobalt	7440-48-4	E440/WT	0.10	mg/kg		13.2	3.87	4.44	7.66	6.74
Copper	7440-50-8	E440/WT	0.50	mg/kg		56.7	13.0	31.3	35.3	18.4
Iron	7439-89-6	E440/WT	50	mg/kg		112000	28900	39400	40000	28800
Lead	7439-92-1	E440/WT	0.50	mg/kg		35.9	55.3	193	505	53.3
Manganese	7439-96-5	E440/WT	1.0	mg/kg		927	278	449	573	622
Mercury	7439-97-6	E510/WT	0.0050	mg/kg		1.19 DLHC	0.962	46.4 DLHC	77.8 DLHC	6.83 DLHC
Molybdenum	7439-98-7	E440/WT	0.10	mg/kg		29.5	1.62	1.60	2.45	1.47
Nickel	7440-02-0	E440/WT	0.50	mg/kg		30.9	10.6	11.1	11.6	10.8
Selenium	7782-49-2	E440/WT	0.20	mg/kg		2.34	1.52	1.54	1.04	0.49
Silver	7440-22-4	E440/WT	0.10	mg/kg		0.15	0.26	0.33	0.75	0.12
Strontium	7440-24-6	E440/WT	0.50	mg/kg		36.3	7.80	3.17	5.08	3.72
Sulfur	7704-34-9	E440/WT	1000	mg/kg		1200	<1000	<1000	<1000	<1000
Thallium	7440-28-0	E440/WT	0.050	mg/kg		1.14	0.225	0.319	0.472	0.311
Tin	7440-31-5	E440/WT	2.0	mg/kg		<2.0	<2.0	11.3	31.4	<2.0
Uranium	7440-61-1	E440/WT	0.050	mg/kg		1.02	1.09	0.990	0.730	0.733
Vanadium	7440-62-2	E440/WT	0.20	mg/kg		32.7	33.0	37.6	35.5	39.5
Zinc	7440-66-6	E440/WT	2.0	mg/kg		30.4	101	52.7	82.0	53.4
Hydrocarbon Distribution of RBCA mTPH (Tier I) Fractions										
C6-C10 fraction of mTPH	n/a	EC581D/WT	1	%		8	2	<1	<1	<1
>C10-C16 fraction of mTPH	n/a	EC581D/WT	1	%		4	5	5	1	<1

Analytical Results

Sub-Matrix: **Soil/Solid**
(Matrix: **Soil/Solid**)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	BH18 0-0.15m	BH19 0-0.15m	BH20 0-0.15m	BH21 0-0.15m	BH22 0-0.15m
					Client sampling date / time	08-Nov-2023 00:00	08-Nov-2023 00:00	08-Nov-2023 00:00	08-Nov-2023 00:00	08-Nov-2023 00:00
						HA2301055-021	HA2301055-022	HA2301055-023	HA2301055-024	HA2301055-025
						Result	Result	Result	Result	Result
Hydrocarbon Distribution of RBCA mTPH (Tier I) Fractions										
>C16-C21 fraction of mTPH	n/a	EC581D/WT	1	%		13	11	10	4	<1
>C21-C32 fraction of mTPH	n/a	EC581D/WT	1	%		75	81	85	94	100
Hydrocarbons										
Benzene	71-43-2	E611A/WT	0.0050	mg/kg		<0.0059 DLR	0.0150	<0.0050	<0.0051 DLHM	<0.0050
Toluene	108-88-3	E611A/WT	0.050	mg/kg		<0.050	0.120	<0.050	<0.050	<0.050
Ethylbenzene	100-41-4	E611A/WT	0.015	mg/kg		<0.015	0.044	<0.015	<0.015	<0.015
Xylenes, total	1330-20-7	E611A/WT	0.050	mg/kg		<0.050	0.159	<0.050	<0.050	<0.050
Xylene, o-	95-47-6	E611A/WT	0.030	mg/kg		<0.030	0.061	<0.030	<0.030	<0.030
Xylene, m+p-	179601-23-1	E611A/WT	0.030	mg/kg		<0.030	0.098	<0.030	<0.030	<0.030
VPH C6-C10	n/a	E581.VPH/WT	5.0	mg/kg		22.7	7.7	<5.0	6.3	<5.0
VPH C6-C10 (less BTEX)	n/a	EC580C/WT	5.0	mg/kg		22.7	7.4	<5.0	6.3	<5.0
EPH >C10-C16	n/a	E601F/WT	5.0	mg/kg		12.0	19.9	13.6	17.9	<5.0
EPH >C16-C21	n/a	E601F/WT	5.0	mg/kg		39.2	40.7	29.0	66.6	<5.0
EPH >C21-C32	n/a	E601F/WT	5.0	mg/kg		222	297	249	1530	16.4
EPH >C34-C50	n/a	E601F/WT	20	mg/kg		410	340	600	2230	54
hydrocarbon resemblance	n/a	E601F/WT	-	none		LOF	LOF	LOF	LOF	LOF
mTPH (Tier I)	n/a	EC581D/WT	10	mg/kg		296	365	292	1620	16
return to baseline at C32	n/a	E601F/WT	-	-		No	No	No	No	No
TEH >C10-C32	n/a	E601F/WT	10	mg/kg		273	358	292	1610	16
Hydrocarbons Surrogates										
dotriacontane, n- (EPH)	n/a	E601F/WT	1.0	%		72.7	63.4	90.4	----	94.1
isobutylbenzene (EPH)	538-93-2	E601F/WT	1.0	%		105	82.7	102	65.5	102
isobutylbenzene (VPH)	538-93-2	E581.VPH/WT	1.0	%		55.2 SLMI	94.5	84.2	77.2	97.3
Volatile Organic Compounds Surrogates										
Bromofluorobenzene, 4-	460-00-4	E611A/WT	0.10	%		83.7	95.8	92.5	90.3	104
Difluorobenzene, 1,4-	540-36-3	E611A/WT	0.10	%		77.0	95.4	90.9	87.5	105
Polycyclic Aromatic Hydrocarbons										
Acenaphthene	83-32-9	E641A-L/WT	0.0050	mg/kg		<0.0051 DLHM	0.0167	0.0085	<0.0052 DLHM	0.0065
Acenaphthylene	208-96-8	E641A-L/WT	0.0050	mg/kg		<0.0051 DLHM	0.0210	0.372	0.0571	0.0180 DUPH
Acridine	260-94-6	E641A-L/WT	0.010	mg/kg		<0.052 DLM	<0.052 DLM	<0.053 DLM	<0.055 DLM	<0.010 DUPH

Analytical Results

Sub-Matrix: Soil/Solid
(Matrix: Soil/Solid)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	BH18 0-0.15m	BH19 0-0.15m	BH20 0-0.15m	BH21 0-0.15m	BH22 0-0.15m
					Client sampling date / time	08-Nov-2023 00:00	08-Nov-2023 00:00	08-Nov-2023 00:00	08-Nov-2023 00:00	08-Nov-2023 00:00
						HA2301055-021	HA2301055-022	HA2301055-023	HA2301055-024	HA2301055-025
						Result	Result	Result	Result	Result
Polycyclic Aromatic Hydrocarbons										
Anthracene	120-12-7	E641A-L/WT	0.0040	mg/kg		0.0095 EMPC	0.0463 EMPC	0.196	0.0577	0.0472 DUPH
Benz(a)anthracene	56-55-3	E641A-L/WT	0.010	mg/kg		0.026	0.172	1.20	0.495	0.189 DUPH
Benzo(a)pyrene	50-32-8	E641A-L/WT	0.010	mg/kg		0.016	0.118	1.16	0.449	0.160 DUPH
Benzo(b+j)fluoranthene	n/a	E641A-L/WT	0.010	mg/kg		0.028	0.244	2.07	1.03	0.254 DUPH
Benzo(b+j+k)fluoranthene	n/a	E641A-L/WT	0.015	mg/kg		0.028	0.322	2.81	1.33	0.343
Benzo(g,h,i)perylene	191-24-2	E641A-L/WT	0.010	mg/kg		0.011	0.081	0.779	0.540	0.114 DUPH
Benzo(k)fluoranthene	207-08-9	E641A-L/WT	0.010	mg/kg		<0.010	0.078	0.740	0.304	0.089 DUPH
Chrysene	218-01-9	E641A-L/WT	0.010	mg/kg		0.023	0.177	1.26	<0.663 DLM	0.165 DUPH
Dibenz(a,h)anthracene	53-70-3	E641A-L/WT	0.0050	mg/kg		<0.0051 DLHM	0.0250	0.210	0.202	0.0338 DUPH
Fluoranthene	206-44-0	E641A-L/WT	0.010	mg/kg		0.044	0.314	2.30	1.04	0.315 DUPH
Fluorene	86-73-7	E641A-L/WT	0.010	mg/kg		<0.010	0.013	<0.041 DLM	<0.014 DLM	<0.010
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A-L/WT	0.010	mg/kg		0.010	0.095	1.02	0.508	0.135 DUPH
Methylnaphthalene, 1-	90-12-0	E641A-L/WT	0.010	mg/kg		0.027	0.082	<0.010	0.014	<0.010
Methylnaphthalene, 1+2-	----	E641A-L/WT	0.015	mg/kg		0.057	0.166	<0.015	0.028	<0.015
Methylnaphthalene, 2-	91-57-6	E641A-L/WT	0.010	mg/kg		0.030	0.084	0.010	0.014	<0.010
Naphthalene	91-20-3	E641A-L/WT	0.010	mg/kg		0.021	0.050	0.043	0.016	<0.010
Perylene	198-55-0	E641A-L/WT	0.010	mg/kg		<0.010	0.030	0.348	0.129	0.046 DUPH
Phenanthrene	85-01-8	E641A-L/WT	0.010	mg/kg		0.069	0.135	0.313	0.130	0.133 DUPH
Pyrene	129-00-0	E641A-L/WT	0.010	mg/kg		0.045	0.267	1.97	0.930	0.283 DUPH
Quinoline	91-22-5	E641A-L/WT	0.010	mg/kg		<0.052 DLM	<0.052 DLM	<0.053 DLM	<0.055 DLM	<0.010
B(a)P total potency equivalents [B(a)P TPE]	----	E641A-L/WT	0.020	mg/kg		0.026	0.204	1.89	0.893	0.263
IACR (CCME)	----	E641A-L/WT	0.150	-		0.356	3.09	26.3	12.4	3.44
Polycyclic Aromatic Hydrocarbons Surrogates										
Acridine-d9	34749-75-2	E641A-L/WT	0.1	%		76.9	80.6	71.3	76.4	86.3
Chrysene-d12	1719-03-5	E641A-L/WT	0.1	%		77.5	84.9	92.7	103	87.2
Naphthalene-d8	1146-65-2	E641A-L/WT	0.1	%		102	99.5	107	117	96.7
Phenanthrene-d10	1517-22-2	E641A-L/WT	0.1	%		96.0	99.8	108	120	98.2

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

Please refer to the Accreditation section for an explanation of analyte accreditations.

Analytical Results

Sub-Matrix: **Soil/Solid**
(Matrix: **Soil/Solid**)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	BH23 0-0.15m	BH24 0-0.15m	BH25 0-0.15m	BH26 0-0.15m	BH27 0-0.15m
					Client sampling date / time	08-Nov-2023 00:00	08-Nov-2023 00:00	08-Nov-2023 00:00	08-Nov-2023 00:00	08-Nov-2023 00:00
						HA2301055-026	HA2301055-027	HA2301055-028	HA2301055-029	HA2301055-030
						Result	Result	Result	Result	Result
Metals										
Aluminum	7429-90-5	E440/WT	50	mg/kg		11200	29100	13300	15500	26800
Antimony	7440-36-0	E440/WT	0.10	mg/kg		2.96	10.9	6.12	0.65	0.86
Arsenic	7440-38-2	E440/WT	0.10	mg/kg		922	2090	1490	2290	2330
Barium	7440-39-3	E440/WT	0.50	mg/kg		119	94.1	63.0	64.2	109
Beryllium	7440-41-7	E440/WT	0.10	mg/kg		0.65	1.91	0.85	1.07	1.86
Boron	7440-42-8	E440/WT	5.0	mg/kg		<5.0	<5.0	<5.0	<5.0	<5.0
Cadmium	7440-43-9	E440/WT	0.020	mg/kg		1.91	0.127	0.133	0.338	0.086
Chromium	7440-47-3	E440/WT	0.50	mg/kg		22.2	49.4	23.1	23.0	50.8
Cobalt	7440-48-4	E440/WT	0.10	mg/kg		7.50	6.45	12.9	58.1	10.5
Copper	7440-50-8	E440/WT	0.50	mg/kg		33.0	25.2	11.5	19.5	40.3
Iron	7439-89-6	E440/WT	50	mg/kg		33000	50700	35800	41200	51800
Lead	7439-92-1	E440/WT	0.50	mg/kg		138	132	86.7	147	102
Manganese	7439-96-5	E440/WT	1.0	mg/kg		792	1130	940	3290	1200
Mercury	7439-97-6	E510/WT	0.0050	mg/kg		6.90 DLHC	0.334	13.0 DLHC	2.00 DLHC	0.321
Molybdenum	7439-98-7	E440/WT	0.10	mg/kg		2.95	0.44	2.42	2.21	0.39
Nickel	7440-02-0	E440/WT	0.50	mg/kg		15.3	16.1	13.1	14.5	16.4
Selenium	7782-49-2	E440/WT	0.20	mg/kg		0.97	0.44	0.95	2.34	0.55
Silver	7440-22-4	E440/WT	0.10	mg/kg		0.14	0.18	0.21	0.29	0.18
Strontium	7440-24-6	E440/WT	0.50	mg/kg		23.2	3.81	5.20	11.4	6.30
Sulfur	7704-34-9	E440/WT	1000	mg/kg		<1000	<1000	<1000	<1000	<1000
Thallium	7440-28-0	E440/WT	0.050	mg/kg		0.249	0.354	0.178	0.254	0.446
Tin	7440-31-5	E440/WT	2.0	mg/kg		26.8	28.5	6.3	<2.0	<2.0
Uranium	7440-61-1	E440/WT	0.050	mg/kg		0.574	1.05	1.36	1.91	1.17
Vanadium	7440-62-2	E440/WT	0.20	mg/kg		32.2	56.8	34.8	40.9	61.7
Zinc	7440-66-6	E440/WT	2.0	mg/kg		531	81.4	60.0	71.0	89.1

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

Please refer to the Accreditation section for an explanation of analyte accreditations.

Analytical Results

Sub-Matrix: **Soil/Solid**
(Matrix: **Soil/Solid**)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	BH28 0-0.15m	BH29 0-0.15m	BH30 0-0.15m	BH31 0-0.15m	BH32 0-0.15m
					Client sampling date / time	08-Nov-2023 00:00	09-Nov-2023 00:00	09-Nov-2023 00:00	09-Nov-2023 00:00	09-Nov-2023 00:00
						HA2301055-031	HA2301055-032	HA2301055-033	HA2301055-034	HA2301055-035
						Result	Result	Result	Result	Result
Metals										
Aluminum	7429-90-5	E440/WT	50	mg/kg		17700	30200	31300	34100	10400
Antimony	7440-36-0	E440/WT	0.10	mg/kg		1.73	1.77	0.75	1.36	0.84
Arsenic	7440-38-2	E440/WT	0.10	mg/kg		2680	4210	88.9	2230	296
Barium	7440-39-3	E440/WT	0.50	mg/kg		64.8	158	48.4	163	79.8
Beryllium	7440-41-7	E440/WT	0.10	mg/kg		1.50	2.44	1.79	2.83	1.36
Boron	7440-42-8	E440/WT	5.0	mg/kg		<5.0	<5.0	<5.0	<5.0	<5.0
Cadmium	7440-43-9	E440/WT	0.020	mg/kg		0.501	0.124	1.47	0.456	0.779
Chromium	7440-47-3	E440/WT	0.50	mg/kg		23.1	52.0	11.0	57.8	16.6
Cobalt	7440-48-4	E440/WT	0.10	mg/kg		162	18.0	2.75	32.7	54.9
Copper	7440-50-8	E440/WT	0.50	mg/kg		34.1	35.8	63.0	61.6	51.4
Iron	7439-89-6	E440/WT	50	mg/kg		41800	55100	2640	60500	15000
Lead	7439-92-1	E440/WT	0.50	mg/kg		258	391	232	715	130
Manganese	7439-96-5	E440/WT	1.0	mg/kg		7510	1340	85.0	1520	1390
Mercury	7439-97-6	E510/WT	0.0050	mg/kg		3.15 DLHC	0.178	0.778	0.148	0.520
Molybdenum	7439-98-7	E440/WT	0.10	mg/kg		1.99	0.44	0.53	0.42	0.29
Nickel	7440-02-0	E440/WT	0.50	mg/kg		16.6	21.1	33.4	43.9	31.7
Selenium	7782-49-2	E440/WT	0.20	mg/kg		2.47	0.29	8.28	0.33	0.67
Silver	7440-22-4	E440/WT	0.10	mg/kg		0.47	0.24	1.27	0.27	0.16
Strontium	7440-24-6	E440/WT	0.50	mg/kg		12.1	3.90	13.7	3.80	6.47
Sulfur	7704-34-9	E440/WT	1000	mg/kg		<1000	<1000	4500	<1000	<1000
Thallium	7440-28-0	E440/WT	0.050	mg/kg		0.459	0.526	0.104	0.479	0.291
Tin	7440-31-5	E440/WT	2.0	mg/kg		7.6	<2.0	<2.0	2.1	<2.0
Uranium	7440-61-1	E440/WT	0.050	mg/kg		2.77	1.59	4.06	2.86	1.61
Vanadium	7440-62-2	E440/WT	0.20	mg/kg		37.0	62.9	7.35	68.3	21.5
Zinc	7440-66-6	E440/WT	2.0	mg/kg		76.4	152	257	367	226

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

Please refer to the Accreditation section for an explanation of analyte accreditations.

Analytical Results

Sub-Matrix: Soil/Solid
(Matrix: Soil/Solid)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	BH33 0-0.15m	BH34 0-0.15m	BH35 0-0.15m	BH36 0-0.15m	----
					Client sampling date / time	09-Nov-2023 00:00	09-Nov-2023 00:00	09-Nov-2023 00:00	09-Nov-2023 00:00	----
						HA2301055-036	HA2301055-037	HA2301055-038	HA2301055-039	--------
						Result	Result	Result	Result	----
Physical Tests										
Moisture	----	E144/WT	0.25	%		41.9	56.6	64.0	53.6	----
Metals										
Aluminum	7429-90-5	E440/WT	50	mg/kg		11600	15300	17900	16900	----
Antimony	7440-36-0	E440/WT	0.10	mg/kg		0.98	0.47	0.31	0.99	----
Arsenic	7440-38-2	E440/WT	0.10	mg/kg		399	1010	46.3	844	----
Barium	7440-39-3	E440/WT	0.50	mg/kg		80.8	76.3	31.8	64.7	----
Beryllium	7440-41-7	E440/WT	0.10	mg/kg		0.31	0.67	1.03	0.63	----
Boron	7440-42-8	E440/WT	5.0	mg/kg		<5.0	<5.0	<5.0	<5.0	----
Cadmium	7440-43-9	E440/WT	0.020	mg/kg		0.040	0.229	0.192	0.180	----
Chromium	7440-47-3	E440/WT	0.50	mg/kg		26.5	28.6	12.1	24.9	----
Cobalt	7440-48-4	E440/WT	0.10	mg/kg		2.57	7.29	2.44	3.80	----
Copper	7440-50-8	E440/WT	0.50	mg/kg		7.80	19.3	17.0	48.4	----
Iron	7439-89-6	E440/WT	50	mg/kg		21000	28300	5580	31200	----
Lead	7439-92-1	E440/WT	0.50	mg/kg		24.9	52.3	104	120	----
Manganese	7439-96-5	E440/WT	1.0	mg/kg		313	376	89.0	277	----
Mercury	7439-97-6	E510/WT	0.0050	mg/kg		14.1 DLHC	3.80 DLHC	0.232	0.809	----
Molybdenum	7439-98-7	E440/WT	0.10	mg/kg		0.43	1.01	0.38	0.65	----
Nickel	7440-02-0	E440/WT	0.50	mg/kg		8.08	17.9	6.09	11.5	----
Selenium	7782-49-2	E440/WT	0.20	mg/kg		0.36	1.02	3.38	0.97	----
Silver	7440-22-4	E440/WT	0.10	mg/kg		0.10	0.13	0.23	0.21	----
Strontium	7440-24-6	E440/WT	0.50	mg/kg		2.30	11.0	2.39	6.21	----
Sulfur	7704-34-9	E440/WT	1000	mg/kg		<1000	<1000	<1000	<1000	----
Thallium	7440-28-0	E440/WT	0.050	mg/kg		0.225	0.293	0.126	0.166	----
Tin	7440-31-5	E440/WT	2.0	mg/kg		<2.0	<2.0	<2.0	4.1	----
Uranium	7440-61-1	E440/WT	0.050	mg/kg		0.770	0.977	2.67	1.19	----
Vanadium	7440-62-2	E440/WT	0.20	mg/kg		34.6	35.6	15.3	39.7	----
Zinc	7440-66-6	E440/WT	2.0	mg/kg		39.1	70.0	35.9	99.5	----
Hydrocarbon Distribution of RBCA mTPH (Tier I) Fractions										
C6-C10 fraction of mTPH	n/a	EC581D/WT	1	%		<1	<1	<1	<1	----
>C10-C16 fraction of mTPH	n/a	EC581D/WT	1	%		<1	2	<1	2	----

Analytical Results

Sub-Matrix: Soil/Solid
(Matrix: Soil/Solid)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	BH33 0-0.15m	BH34 0-0.15m	BH35 0-0.15m	BH36 0-0.15m	----
					Client sampling date / time	09-Nov-2023 00:00	09-Nov-2023 00:00	09-Nov-2023 00:00	09-Nov-2023 00:00	----
						HA2301055-036	HA2301055-037	HA2301055-038	HA2301055-039	--------
						Result	Result	Result	Result	----
Hydrocarbon Distribution of RBCA mTPH (Tier I) Fractions										
>C16-C21 fraction of mTPH	n/a	EC581D/WT	1	%		6	8	8	12	----
>C21-C32 fraction of mTPH	n/a	EC581D/WT	1	%		94	90	92	86	----
Hydrocarbons										
Benzene	71-43-2	E611A/WT	0.0050	mg/kg		<0.0050	<0.0079 DLHM	<0.0075 DLHM	<0.0057 DLHM	----
Toluene	108-88-3	E611A/WT	0.050	mg/kg		<0.050	<0.050	<0.050	<0.050	----
Ethylbenzene	100-41-4	E611A/WT	0.015	mg/kg		<0.015	<0.020 DLHM	<0.019 DLHM	<0.015	----
Xylenes, total	1330-20-7	E611A/WT	0.050	mg/kg		<0.050	<0.050	<0.050	<0.050	----
Xylene, o-	95-47-6	E611A/WT	0.030	mg/kg		<0.030	<0.030	<0.030	<0.030	----
Xylene, m+p-	179601-23-1	E611A/WT	0.030	mg/kg		<0.030	<0.030	<0.030	<0.030	----
VPH C6-C10	n/a	E581.VPH/WT	5.0	mg/kg		<5.0	<5.0	<5.0	<5.0	----
VPH C6-C10 (less BTEX)	n/a	EC580C/WT	5.0	mg/kg		<5.0	<5.0	<5.0	<5.0	----
EPH >C10-C16	n/a	E601F/WT	5.0	mg/kg		<5.0	6.8	<5.0	9.6	----
EPH >C16-C21	n/a	E601F/WT	5.0	mg/kg		8.7	27.0	12.8	51.4	----
EPH >C21-C32	n/a	E601F/WT	5.0	mg/kg		132	311	152	378	----
EPH >C34-C50	n/a	E601F/WT	20	mg/kg		284	695	305	482	----
hydrocarbon resemblance	n/a	E601F/WT	-	none		LOF	LOF	LOF	LOF	----
mTPH (Tier I)	n/a	EC581D/WT	10	mg/kg		141	345	165	439	----
return to baseline at C32	n/a	E601F/WT	-	-		No	No	No	No	----
TEH >C10-C32	n/a	E601F/WT	10	mg/kg		141	345	165	439	----
Hydrocarbons Surrogates										
dotriacontane, n- (EPH)	n/a	E601F/WT	1.0	%		75.6	99.6	63.8	110	----
isobutylbenzene (EPH)	538-93-2	E601F/WT	1.0	%		79.5	113	109	108	----
isobutylbenzene (VPH)	538-93-2	E581.VPH/WT	1.0	%		75.3	74.2	72.4	93.2	----
Volatile Organic Compounds Surrogates										
Bromofluorobenzene, 4-	460-00-4	E611A/WT	0.10	%		83.1	82.6	79.4	95.8	----
Difluorobenzene, 1,4-	540-36-3	E611A/WT	0.10	%		85.6	83.0	85.5	95.8	----
Polycyclic Aromatic Hydrocarbons										
Acenaphthene	83-32-9	E641A-L/WT	0.0050	mg/kg		<0.0050	<0.0069 DLHM	<0.0086 DLHM	0.0135	----
Acenaphthylene	208-96-8	E641A-L/WT	0.0050	mg/kg		0.0079	<0.0069 DLHM	0.0086	0.392	----
Acridine	260-94-6	E641A-L/WT	0.010	mg/kg		<0.053 DLM	<0.072 DLM	<0.010	0.068	----

Analytical Results

Sub-Matrix: **Soil/Solid**
(Matrix: **Soil/Solid**)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	BH33 0-0.15m	BH34 0-0.15m	BH35 0-0.15m	BH36 0-0.15m	----
					Client sampling date / time	09-Nov-2023 00:00	09-Nov-2023 00:00	09-Nov-2023 00:00	09-Nov-2023 00:00	----
						HA2301055-036	HA2301055-037	HA2301055-038	HA2301055-039	--------
						Result	Result	Result	Result	----
Polycyclic Aromatic Hydrocarbons										
Anthracene	120-12-7	E641A-L/WT	0.0040	mg/kg		0.0086	0.0157	0.0122 EMPC	0.661	----
Benz(a)anthracene	56-55-3	E641A-L/WT	0.010	mg/kg		0.037	0.045	0.026	2.47	----
Benzo(a)pyrene	50-32-8	E641A-L/WT	0.010	mg/kg		0.036	0.035	0.029	2.37	----
Benzo(b+j)fluoranthene	n/a	E641A-L/WT	0.010	mg/kg		0.059	0.073	0.058	4.30	----
Benzo(b+j+k)fluoranthene	n/a	E641A-L/WT	0.015	mg/kg		0.083	0.101	0.079	5.89	----
Benzo(g,h,i)perylene	191-24-2	E641A-L/WT	0.010	mg/kg		0.029	0.033	0.023	1.31	----
Benzo(k)fluoranthene	207-08-9	E641A-L/WT	0.010	mg/kg		0.024	0.028	0.021	1.59	----
Chrysene	218-01-9	E641A-L/WT	0.010	mg/kg		0.038	0.043	0.032	2.90	----
Dibenz(a,h)anthracene	53-70-3	E641A-L/WT	0.0050	mg/kg		0.0085	0.0089	<0.0086 DLHM	0.430	----
Fluoranthene	206-44-0	E641A-L/WT	0.010	mg/kg		0.067	0.076	0.068	5.92	----
Fluorene	86-73-7	E641A-L/WT	0.010	mg/kg		<0.010	<0.022 DLM	<0.030 DLM	0.061	----
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A-L/WT	0.010	mg/kg		0.033	0.036	0.026	1.81	----
Methylnaphthalene, 1-	90-12-0	E641A-L/WT	0.010	mg/kg		<0.010	<0.010	<0.010	0.010	----
Methylnaphthalene, 1+2-	----	E641A-L/WT	0.015	mg/kg		<0.015	<0.015	<0.015	0.022	----
Methylnaphthalene, 2-	91-57-6	E641A-L/WT	0.010	mg/kg		<0.010	<0.010	<0.010	0.012	----
Naphthalene	91-20-3	E641A-L/WT	0.010	mg/kg		<0.010	<0.010	<0.010	0.020	----
Perylene	198-55-0	E641A-L/WT	0.010	mg/kg		0.011	<0.010	<0.010	0.561	----
Phenanthrene	85-01-8	E641A-L/WT	0.010	mg/kg		0.020	0.045	0.030	1.39	----
Pyrene	129-00-0	E641A-L/WT	0.010	mg/kg		0.058	0.066	0.051	4.43	----
Quinoline	91-22-5	E641A-L/WT	0.010	mg/kg		<0.010	<0.010	<0.010	<0.010	----
B(a)P total potency equivalents [B(a)P TPE]	----	E641A-L/WT	0.020	mg/kg		0.060	0.063	0.047	3.86	----
IACR (CCME)	----	E641A-L/WT	0.150	-		0.800	0.940	0.698	54.8	----
Polycyclic Aromatic Hydrocarbons Surrogates										
Acridine-d9	34749-75-2	E641A-L/WT	0.1	%		84.5	62.0	90.2	75.8	----
Chrysene-d12	1719-03-5	E641A-L/WT	0.1	%		87.0	76.6	94.0	86.1	----
Naphthalene-d8	1146-65-2	E641A-L/WT	0.1	%		99.7	96.2	99.7	97.2	----
Phenanthrene-d10	1517-22-2	E641A-L/WT	0.1	%		99.6	92.7	105	101	----

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

Please refer to the Accreditation section for an explanation of analyte accreditations.

Descriptive Results

Sub-Matrix: **Soil/Solid**

Method: Compound	Client sample ID - Client sampling date / time	Analytical Results
Hydrocarbons Surrogates		
E601F: dotriacontane, n- (EPH)	BH DUPD 0-0.15m - 08-Nov-2023 00:00	Surrogate recovery could not be measured due to sample matrix interference.
E601F: dotriacontane, n- (EPH)	BH21 0-0.15m - 08-Nov-2023 00:00	Surrogate recovery could not be measured due to sample matrix interference.

ALS Canada Ltd.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **HA2301055**	Page	: 1 of 29
Client	: **Dillon Consulting Limited**	Laboratory	: ALS Environmental - Halifax
Contact	: Nadine Wambolt	Account Manager	: Andrew Martin
Address	: 137 Chain Lake Drive Halifax NS Canada B3S 1B3	Address	: 13-100 Wright Ave Dartmouth, Nova Scotia Canada B3B 1L2
Telephone	: 902.562.9880 ext. 5206	Telephone	: +1 902 707 4888
Project	: 23-6465	Date Samples Received	: 10-Nov-2023 16:50
PO	: ----	Issue Date	: 21-Nov-2023 20:28
C-O-C number	: ----		
Sampler	: MK/EJM		
Site	: Build NS (Country Harbour)		
Quote number	: HA23-DICL100-12 - Lump Sum Rate - Build NS (Country Harbour)		
No. of samples received	: 39		
No. of samples analysed	: 39		

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

Key

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

Workorder Comments

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

Summary of Outliers

Outliers : Quality Control Samples

- Method Blank value outliers occur - please see following pages for full details.
- Duplicate outliers occur - please see following pages for full details.
- Laboratory Control Sample (LCS) outliers occur - please see following pages for full details.
- Matrix Spike outliers occur - please see following pages for full details.
- Test sample Surrogate recovery outliers exist for all regular sample matrices - please see following pages for full details.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

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

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **Soil/Solid**

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Method	Result	Limits	Comment
Method Blank (MB) Values								
Metals	QC-MRG2-1239082001	----	Arsenic	7440-38-2	E440	0.14 mg/kg B	0.1 mg/kg	Blank result exceeds permitted value

Result Qualifiers

Qualifier	Description
B	*Method Blank exceeds ALS DQO. Associated sample results which are < Limit of Reporting or > 5 times blank level are considered reliable.*

Duplicate (DUP) RPDs								
Hydrocarbons	HA2301055-001	BH1 0-0.15m	EPH >C21-C32	n/a	E601F	51.8 % DUP-H	40%	Duplicate RPD does not meet the DQO for this test.
Hydrocarbons	HA2301055-001	BH1 0-0.15m	EPH >C34-C50	n/a	E601F	46.1 % DUP-H	40%	Duplicate RPD does not meet the DQO for this test.
Polycyclic Aromatic Hydrocarbons	HA2301055-025	BH22 0-0.15m	Acenaphthylene	208-96-8	E641A-L	121 % DUP-H	50%	Duplicate RPD does not meet the DQO for this test.
Polycyclic Aromatic Hydrocarbons	HA2301055-025	BH22 0-0.15m	Acridine	260-94-6	E641A-L	0.021 % DUP-H, J	Diff <2x LOR	Low Level DUP DQO exceeded (difference > 2 LOR).
Polycyclic Aromatic Hydrocarbons	HA2301055-025	BH22 0-0.15m	Anthracene	120-12-7	E641A-L	121 % DUP-H	50%	Duplicate RPD does not meet the DQO for this test.
Polycyclic Aromatic Hydrocarbons	HA2301055-025	BH22 0-0.15m	Benz(a)anthracene	56-55-3	E641A-L	114 % DUP-H	50%	Duplicate RPD does not meet the DQO for this test.
Polycyclic Aromatic Hydrocarbons	HA2301055-025	BH22 0-0.15m	Benzo(a)pyrene	50-32-8	E641A-L	114 % DUP-H	50%	Duplicate RPD does not meet the DQO for this test.
Polycyclic Aromatic Hydrocarbons	HA2301055-025	BH22 0-0.15m	Benzo(b+j)fluoranthene	n/a	E641A-L	104 % DUP-H	50%	Duplicate RPD does not meet the DQO for this test.
Polycyclic Aromatic Hydrocarbons	HA2301055-025	BH22 0-0.15m	Benzo(g,h,i)perylene	191-24-2	E641A-L	93.4 % DUP-H	50%	Duplicate RPD does not meet the DQO for this test.
Polycyclic Aromatic Hydrocarbons	HA2301055-025	BH22 0-0.15m	Benzo(k)fluoranthene	207-08-9	E641A-L	107 % DUP-H	50%	Duplicate RPD does not meet the DQO for this test.
Polycyclic Aromatic Hydrocarbons	HA2301055-025	BH22 0-0.15m	Chrysene	218-01-9	E641A-L	108 % DUP-H	50%	Duplicate RPD does not meet the DQO for this test.
Polycyclic Aromatic Hydrocarbons	HA2301055-025	BH22 0-0.15m	Dibenz(a,h)anthracene	53-70-3	E641A-L	90.0 % DUP-H	50%	Duplicate RPD does not meet the DQO for this test.
Polycyclic Aromatic Hydrocarbons	HA2301055-025	BH22 0-0.15m	Fluoranthene	206-44-0	E641A-L	123 % DUP-H	50%	Duplicate RPD does not meet the DQO for this test.

Matrix: **Soil/Solid**

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Method	Result	Limits	Comment
Duplicate (DUP) RPDs - Continued								
Polycyclic Aromatic Hydrocarbons	HA2301055-025	BH22 0-0.15m	Indeno(1,2,3-c,d)pyrene	193-39-5	E641A-L	98.5 % DUP-H	50%	Duplicate RPD does not meet the DQO for this test.
Polycyclic Aromatic Hydrocarbons	HA2301055-025	BH22 0-0.15m	Perylene	198-55-0	E641A-L	113 % DUP-H	50%	Duplicate RPD does not meet the DQO for this test.
Polycyclic Aromatic Hydrocarbons	HA2301055-025	BH22 0-0.15m	Phenanthrene	85-01-8	E641A-L	103 % DUP-H	50%	Duplicate RPD does not meet the DQO for this test.
Polycyclic Aromatic Hydrocarbons	HA2301055-025	BH22 0-0.15m	Pyrene	129-00-0	E641A-L	122 % DUP-H	50%	Duplicate RPD does not meet the DQO for this test.

Result Qualifiers

Qualifier	Description
DUP-H	*Duplicate results outside ALS DQO, due to sample heterogeneity.*
J	*Duplicate results and limits are expressed in terms of absolute difference.*

Laboratory Control Sample (LCS) Recoveries								
Hydrocarbons	QC-1238594-002	----	VPH C6-C10	n/a	E581.VPH	79.6 % LCS-L	80.0-120%	Recovery less than lower control limit

Result Qualifiers

Qualifier	Description
LCS-L	*Lab Control Sample recovery was below ALS DQO. Reference Material and/or Matrix Spike results were acceptable. Non-detected sample results are considered reliable. Other results, if reported, have been qualified.*

Matrix Spike (MS) Recoveries								
Polycyclic Aromatic Hydrocarbons	HA2301055-015	BH DUPC 0-0.15m	Quinoline	91-22-5	E641A-L	24.1 % K	50.0-140%	Recovery less than lower data quality objective

Result Qualifiers

Qualifier	Description
K	*Matrix Spike recovery outside ALS DQO due to sample matrix effects.*

Regular Sample Surrogates

Sub-Matrix: **Soil/Solid**

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Result	Limits	Comment
Samples Submitted							
Hydrocarbons Surrogates	HA2301055-021	BH18 0-0.15m	isobutylbenzene (VPH)	538-93-2	55.2 %	60.0-140 %	Recovery less than lower data quality objective
Polycyclic Aromatic Hydrocarbons Surrogates	HA2301055-001	BH1 0-0.15m	Acridine-d9	34749-75-2	54.8 %	60.0-130 %	Recovery less than lower data quality objective
Polycyclic Aromatic Hydrocarbons Surrogates	HA2301055-009	BH9 0-0.15m	Acridine-d9	34749-75-2	47.9 %	60.0-130 %	Recovery less than lower data quality objective

Analysis Holding Time Compliance

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

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

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

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

Matrix: **Soil/Solid**

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

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Hydrocarbons : EPH in Soil/Solid by GC-FID (RBCA)										
Glass soil jar/Teflon lined cap										
BH DUPB 0-0.15m	E601F	07-Nov-2023	17-Nov-2023	14 days	10 days	✓	21-Nov-2023	40 days	4 days	✓
Hydrocarbons : EPH in Soil/Solid by GC-FID (RBCA)										
Glass soil jar/Teflon lined cap										
BH10 0-0.15m	E601F	07-Nov-2023	17-Nov-2023	14 days	10 days	✓	21-Nov-2023	40 days	4 days	✓
Hydrocarbons : EPH in Soil/Solid by GC-FID (RBCA)										
Glass soil jar/Teflon lined cap										
BH11 0-0.15m	E601F	07-Nov-2023	17-Nov-2023	14 days	10 days	✓	21-Nov-2023	40 days	4 days	✓
Hydrocarbons : EPH in Soil/Solid by GC-FID (RBCA)										
Glass soil jar/Teflon lined cap										
BH12 0-0.15m	E601F	07-Nov-2023	17-Nov-2023	14 days	10 days	✓	21-Nov-2023	40 days	4 days	✓
Hydrocarbons : EPH in Soil/Solid by GC-FID (RBCA)										
Glass soil jar/Teflon lined cap										
BH9 0-0.15m	E601F	07-Nov-2023	17-Nov-2023	14 days	10 days	✓	21-Nov-2023	40 days	4 days	✓
Hydrocarbons : EPH in Soil/Solid by GC-FID (RBCA)										
Glass soil jar/Teflon lined cap										
BH35 0-0.15m	E601F	09-Nov-2023	20-Nov-2023	14 days	11 days	✓	21-Nov-2023	40 days	1 days	✓
Hydrocarbons : EPH in Soil/Solid by GC-FID (RBCA)										
Glass soil jar/Teflon lined cap										
BH36 0-0.15m	E601F	09-Nov-2023	20-Nov-2023	14 days	11 days	✓	21-Nov-2023	40 days	1 days	✓

Matrix: **Soil/Solid**

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

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Hydrocarbons : EPH in Soil/Solid by GC-FID (RBCA)										
Glass soil jar/Teflon lined cap BH1 0-0.15m	E601F	07-Nov-2023	20-Nov-2023	14 days	13 days	✓	21-Nov-2023	40 days	1 days	✓
Hydrocarbons : EPH in Soil/Solid by GC-FID (RBCA)										
Glass soil jar/Teflon lined cap BH2 0-0.15m	E601F	07-Nov-2023	20-Nov-2023	14 days	13 days	✓	21-Nov-2023	40 days	1 days	✓
Hydrocarbons : EPH in Soil/Solid by GC-FID (RBCA)										
Glass soil jar/Teflon lined cap BH14 0-0.15m	E601F	09-Nov-2023	17-Nov-2023	14 days	8 days	✓	21-Nov-2023	40 days	4 days	✓
Hydrocarbons : EPH in Soil/Solid by GC-FID (RBCA)										
Glass soil jar/Teflon lined cap BH17 0-0.15m	E601F	09-Nov-2023	17-Nov-2023	14 days	8 days	✓	21-Nov-2023	40 days	4 days	✓
Hydrocarbons : EPH in Soil/Solid by GC-FID (RBCA)										
Glass soil jar/Teflon lined cap BH33 0-0.15m	E601F	09-Nov-2023	17-Nov-2023	14 days	8 days	✓	21-Nov-2023	40 days	4 days	✓
Hydrocarbons : EPH in Soil/Solid by GC-FID (RBCA)										
Glass soil jar/Teflon lined cap BH34 0-0.15m	E601F	09-Nov-2023	17-Nov-2023	14 days	8 days	✓	21-Nov-2023	40 days	4 days	✓
Hydrocarbons : EPH in Soil/Solid by GC-FID (RBCA)										
Glass soil jar/Teflon lined cap BH DUPC 0-0.15m	E601F	08-Nov-2023	17-Nov-2023	14 days	9 days	✓	21-Nov-2023	40 days	4 days	✓
Hydrocarbons : EPH in Soil/Solid by GC-FID (RBCA)										
Glass soil jar/Teflon lined cap BH15 0-0.15m	E601F	08-Nov-2023	17-Nov-2023	14 days	9 days	✓	21-Nov-2023	40 days	4 days	✓
Hydrocarbons : EPH in Soil/Solid by GC-FID (RBCA)										
Glass soil jar/Teflon lined cap BH16 0-0.15m	E601F	08-Nov-2023	17-Nov-2023	14 days	9 days	✓	21-Nov-2023	40 days	4 days	✓

Matrix: **Soil/Solid**

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

Analyte Group : Analytical Method / Container / Client Sample ID(s)	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
			Preparation Date	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Hydrocarbons : EPH in Soil/Solid by GC-FID (RBCA)										
Glass soil jar/Teflon lined cap										
BH18 0-0.15m	E601F	08-Nov-2023	17-Nov-2023	14 days	9 days	✓	21-Nov-2023	40 days	4 days	✓
Hydrocarbons : EPH in Soil/Solid by GC-FID (RBCA)										
Glass soil jar/Teflon lined cap										
BH19 0-0.15m	E601F	08-Nov-2023	17-Nov-2023	14 days	9 days	✓	21-Nov-2023	40 days	4 days	✓
Hydrocarbons : EPH in Soil/Solid by GC-FID (RBCA)										
Glass soil jar/Teflon lined cap										
BH20 0-0.15m	E601F	08-Nov-2023	17-Nov-2023	14 days	9 days	✓	21-Nov-2023	40 days	4 days	✓
Hydrocarbons : EPH in Soil/Solid by GC-FID (RBCA)										
Glass soil jar/Teflon lined cap										
BH21 0-0.15m	E601F	08-Nov-2023	17-Nov-2023	14 days	9 days	✓	21-Nov-2023	40 days	4 days	✓
Hydrocarbons : EPH in Soil/Solid by GC-FID (RBCA)										
Glass soil jar/Teflon lined cap										
BH22 0-0.15m	E601F	08-Nov-2023	17-Nov-2023	14 days	9 days	✓	21-Nov-2023	40 days	4 days	✓
Hydrocarbons : VPH by Headspace GC-FID (Tier I RBCA)										
Glass soil jar/Teflon lined cap										
BH DUPC 0-0.15m	E581.VPH	08-Nov-2023	17-Nov-2023	0 days	9 days	× UCP	17-Nov-2023	0 days	0 days	✓
Hydrocarbons : VPH by Headspace GC-FID (Tier I RBCA)										
Glass soil methanol vial										
BH33 0-0.15m	E581.VPH	09-Nov-2023	15-Nov-2023	40 days	7 days	✓	16-Nov-2023	40 days	7 days	✓
Hydrocarbons : VPH by Headspace GC-FID (Tier I RBCA)										
Glass soil methanol vial										
BH34 0-0.15m	E581.VPH	09-Nov-2023	15-Nov-2023	40 days	7 days	✓	16-Nov-2023	40 days	7 days	✓
Hydrocarbons : VPH by Headspace GC-FID (Tier I RBCA)										
Glass soil methanol vial										
BH35 0-0.15m	E581.VPH	09-Nov-2023	15-Nov-2023	40 days	7 days	✓	16-Nov-2023	40 days	7 days	✓

Matrix: **Soil/Solid**

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

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Hydrocarbons : VPH by Headspace GC-FID (Tier I RBCA)										
Glass soil methanol vial BH36 0-0.15m	E581.VPH	09-Nov-2023	15-Nov-2023	40 days	7 days	✓	16-Nov-2023	40 days	7 days	✓
Hydrocarbons : VPH by Headspace GC-FID (Tier I RBCA)										
Glass soil methanol vial BH14 0-0.15m	E581.VPH	09-Nov-2023	15-Nov-2023	40 days	7 days	✓	16-Nov-2023	40 days	8 days	✓
Hydrocarbons : VPH by Headspace GC-FID (Tier I RBCA)										
Glass soil methanol vial BH17 0-0.15m	E581.VPH	09-Nov-2023	15-Nov-2023	40 days	7 days	✓	16-Nov-2023	40 days	8 days	✓
Hydrocarbons : VPH by Headspace GC-FID (Tier I RBCA)										
Glass soil methanol vial BH15 0-0.15m	E581.VPH	08-Nov-2023	15-Nov-2023	40 days	8 days	✓	16-Nov-2023	40 days	9 days	✓
Hydrocarbons : VPH by Headspace GC-FID (Tier I RBCA)										
Glass soil methanol vial BH16 0-0.15m	E581.VPH	08-Nov-2023	15-Nov-2023	40 days	8 days	✓	16-Nov-2023	40 days	9 days	✓
Hydrocarbons : VPH by Headspace GC-FID (Tier I RBCA)										
Glass soil methanol vial BH18 0-0.15m	E581.VPH	08-Nov-2023	15-Nov-2023	40 days	8 days	✓	16-Nov-2023	40 days	9 days	✓
Hydrocarbons : VPH by Headspace GC-FID (Tier I RBCA)										
Glass soil methanol vial BH19 0-0.15m	E581.VPH	08-Nov-2023	15-Nov-2023	40 days	8 days	✓	16-Nov-2023	40 days	9 days	✓
Hydrocarbons : VPH by Headspace GC-FID (Tier I RBCA)										
Glass soil methanol vial BH20 0-0.15m	E581.VPH	08-Nov-2023	15-Nov-2023	40 days	8 days	✓	16-Nov-2023	40 days	9 days	✓
Hydrocarbons : VPH by Headspace GC-FID (Tier I RBCA)										
Glass soil methanol vial BH21 0-0.15m	E581.VPH	08-Nov-2023	15-Nov-2023	40 days	8 days	✓	16-Nov-2023	40 days	9 days	✓

Matrix: **Soil/Solid**

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

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Hydrocarbons : VPH by Headspace GC-FID (Tier I RBCA)										
Glass soil methanol vial										
BH22 0-0.15m	E581.VPH	08-Nov-2023	15-Nov-2023	40 days	8 days	✓	16-Nov-2023	40 days	9 days	✓
Hydrocarbons : VPH by Headspace GC-FID (Tier I RBCA)										
Glass soil methanol vial										
BH DUPB 0-0.15m	E581.VPH	07-Nov-2023	15-Nov-2023	40 days	9 days	✓	16-Nov-2023	40 days	10 days	✓
Hydrocarbons : VPH by Headspace GC-FID (Tier I RBCA)										
Glass soil methanol vial										
BH1 0-0.15m	E581.VPH	07-Nov-2023	15-Nov-2023	40 days	9 days	✓	16-Nov-2023	40 days	10 days	✓
Hydrocarbons : VPH by Headspace GC-FID (Tier I RBCA)										
Glass soil methanol vial										
BH10 0-0.15m	E581.VPH	07-Nov-2023	15-Nov-2023	40 days	9 days	✓	16-Nov-2023	40 days	10 days	✓
Hydrocarbons : VPH by Headspace GC-FID (Tier I RBCA)										
Glass soil methanol vial										
BH11 0-0.15m	E581.VPH	07-Nov-2023	15-Nov-2023	40 days	9 days	✓	16-Nov-2023	40 days	10 days	✓
Hydrocarbons : VPH by Headspace GC-FID (Tier I RBCA)										
Glass soil methanol vial										
BH12 0-0.15m	E581.VPH	07-Nov-2023	15-Nov-2023	40 days	9 days	✓	16-Nov-2023	40 days	10 days	✓
Hydrocarbons : VPH by Headspace GC-FID (Tier I RBCA)										
Glass soil methanol vial										
BH2 0-0.15m	E581.VPH	07-Nov-2023	15-Nov-2023	40 days	9 days	✓	16-Nov-2023	40 days	10 days	✓
Hydrocarbons : VPH by Headspace GC-FID (Tier I RBCA)										
Glass soil methanol vial										
BH9 0-0.15m	E581.VPH	07-Nov-2023	15-Nov-2023	40 days	9 days	✓	16-Nov-2023	40 days	10 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap										
BH14 0-0.15m	E510	09-Nov-2023	18-Nov-2023	28 days	10 days	✓	20-Nov-2023	28 days	11 days	✓

Matrix: **Soil/Solid**

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

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap										
BH17 0-0.15m	E510	09-Nov-2023	18-Nov-2023	28 days	10 days	✓	20-Nov-2023	28 days	11 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap										
BH29 0-0.15m	E510	09-Nov-2023	18-Nov-2023	28 days	10 days	✓	20-Nov-2023	28 days	11 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap										
BH30 0-0.15m	E510	09-Nov-2023	18-Nov-2023	28 days	10 days	✓	20-Nov-2023	28 days	11 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap										
BH31 0-0.15m	E510	09-Nov-2023	18-Nov-2023	28 days	10 days	✓	20-Nov-2023	28 days	11 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap										
BH32 0-0.15m	E510	09-Nov-2023	18-Nov-2023	28 days	10 days	✓	20-Nov-2023	28 days	11 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap										
BH33 0-0.15m	E510	09-Nov-2023	18-Nov-2023	28 days	10 days	✓	20-Nov-2023	28 days	11 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap										
BH34 0-0.15m	E510	09-Nov-2023	18-Nov-2023	28 days	10 days	✓	20-Nov-2023	28 days	11 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap										
BH35 0-0.15m	E510	09-Nov-2023	18-Nov-2023	28 days	10 days	✓	20-Nov-2023	28 days	11 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap										
BH36 0-0.15m	E510	09-Nov-2023	18-Nov-2023	28 days	10 days	✓	20-Nov-2023	28 days	11 days	✓

Matrix: **Soil/Solid**

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

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap										
BH DUPC 0-0.15m	E510	08-Nov-2023	18-Nov-2023	28 days	11 days	✓	20-Nov-2023	28 days	12 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap										
BH DUPD 0-0.15m	E510	08-Nov-2023	18-Nov-2023	28 days	11 days	✓	20-Nov-2023	28 days	12 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap										
BH15 0-0.15m	E510	08-Nov-2023	18-Nov-2023	28 days	11 days	✓	20-Nov-2023	28 days	12 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap										
BH16 0-0.15m	E510	08-Nov-2023	18-Nov-2023	28 days	11 days	✓	20-Nov-2023	28 days	12 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap										
BH18 0-0.15m	E510	08-Nov-2023	18-Nov-2023	28 days	11 days	✓	20-Nov-2023	28 days	12 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap										
BH19 0-0.15m	E510	08-Nov-2023	18-Nov-2023	28 days	11 days	✓	20-Nov-2023	28 days	12 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap										
BH20 0-0.15m	E510	08-Nov-2023	18-Nov-2023	28 days	11 days	✓	20-Nov-2023	28 days	12 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap										
BH21 0-0.15m	E510	08-Nov-2023	18-Nov-2023	28 days	11 days	✓	20-Nov-2023	28 days	12 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap										
BH22 0-0.15m	E510	08-Nov-2023	18-Nov-2023	28 days	11 days	✓	20-Nov-2023	28 days	12 days	✓

Matrix: **Soil/Solid**

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

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap										
BH23 0-0.15m	E510	08-Nov-2023	18-Nov-2023	28 days	11 days	✓	20-Nov-2023	28 days	12 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap										
BH24 0-0.15m	E510	08-Nov-2023	18-Nov-2023	28 days	11 days	✓	20-Nov-2023	28 days	12 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap										
BH25 0-0.15m	E510	08-Nov-2023	18-Nov-2023	28 days	11 days	✓	20-Nov-2023	28 days	12 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap										
BH26 0-0.15m	E510	08-Nov-2023	18-Nov-2023	28 days	11 days	✓	20-Nov-2023	28 days	12 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap										
BH27 0-0.15m	E510	08-Nov-2023	18-Nov-2023	28 days	11 days	✓	20-Nov-2023	28 days	12 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap										
BH28 0-0.15m	E510	08-Nov-2023	18-Nov-2023	28 days	11 days	✓	20-Nov-2023	28 days	12 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap										
BH DUPA 0-0.15m	E510	07-Nov-2023	18-Nov-2023	28 days	12 days	✓	20-Nov-2023	28 days	13 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap										
BH DUPB 0-0.15m	E510	07-Nov-2023	18-Nov-2023	28 days	12 days	✓	20-Nov-2023	28 days	13 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap										
BH1 0-0.15m	E510	07-Nov-2023	18-Nov-2023	28 days	12 days	✓	20-Nov-2023	28 days	13 days	✓

Matrix: **Soil/Solid**

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

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap										
BH10 0-0.15m	E510	07-Nov-2023	18-Nov-2023	28 days	12 days	✓	20-Nov-2023	28 days	13 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap										
BH11 0-0.15m	E510	07-Nov-2023	18-Nov-2023	28 days	12 days	✓	20-Nov-2023	28 days	13 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap										
BH12 0-0.15m	E510	07-Nov-2023	18-Nov-2023	28 days	12 days	✓	20-Nov-2023	28 days	13 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap										
BH2 0-0.15m	E510	07-Nov-2023	18-Nov-2023	28 days	12 days	✓	20-Nov-2023	28 days	13 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap										
BH3 0-0.15m	E510	07-Nov-2023	18-Nov-2023	28 days	12 days	✓	20-Nov-2023	28 days	13 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap										
BH4 0-0.15m	E510	07-Nov-2023	18-Nov-2023	28 days	12 days	✓	20-Nov-2023	28 days	13 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap										
BH5 0-0.15m	E510	07-Nov-2023	18-Nov-2023	28 days	12 days	✓	20-Nov-2023	28 days	13 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap										
BH6 0-0.15m	E510	07-Nov-2023	18-Nov-2023	28 days	12 days	✓	20-Nov-2023	28 days	13 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap										
BH7 0-0.15m	E510	07-Nov-2023	18-Nov-2023	28 days	12 days	✓	20-Nov-2023	28 days	13 days	✓

Matrix: **Soil/Solid**

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

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap										
BH8 0-0.15m	E510	07-Nov-2023	18-Nov-2023	28 days	12 days	✓	20-Nov-2023	28 days	13 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap										
BH9 0-0.15m	E510	07-Nov-2023	18-Nov-2023	28 days	12 days	✓	20-Nov-2023	28 days	13 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap										
BH14 0-0.15m	E440	09-Nov-2023	18-Nov-2023	180 days	10 days	✓	20-Nov-2023	180 days	12 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap										
BH17 0-0.15m	E440	09-Nov-2023	18-Nov-2023	180 days	10 days	✓	20-Nov-2023	180 days	12 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap										
BH29 0-0.15m	E440	09-Nov-2023	18-Nov-2023	180 days	10 days	✓	20-Nov-2023	180 days	12 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap										
BH30 0-0.15m	E440	09-Nov-2023	18-Nov-2023	180 days	10 days	✓	20-Nov-2023	180 days	12 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap										
BH31 0-0.15m	E440	09-Nov-2023	18-Nov-2023	180 days	10 days	✓	20-Nov-2023	180 days	12 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap										
BH32 0-0.15m	E440	09-Nov-2023	18-Nov-2023	180 days	10 days	✓	20-Nov-2023	180 days	12 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap										
BH33 0-0.15m	E440	09-Nov-2023	18-Nov-2023	180 days	10 days	✓	20-Nov-2023	180 days	12 days	✓

Matrix: **Soil/Solid**

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

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap										
BH34 0-0.15m	E440	09-Nov-2023	18-Nov-2023	180 days	10 days	✓	20-Nov-2023	180 days	12 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap										
BH35 0-0.15m	E440	09-Nov-2023	18-Nov-2023	180 days	10 days	✓	20-Nov-2023	180 days	12 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap										
BH36 0-0.15m	E440	09-Nov-2023	18-Nov-2023	180 days	10 days	✓	20-Nov-2023	180 days	12 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap										
BH DUPC 0-0.15m	E440	08-Nov-2023	18-Nov-2023	180 days	11 days	✓	20-Nov-2023	180 days	13 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap										
BH DUPD 0-0.15m	E440	08-Nov-2023	18-Nov-2023	180 days	11 days	✓	20-Nov-2023	180 days	13 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap										
BH15 0-0.15m	E440	08-Nov-2023	18-Nov-2023	180 days	11 days	✓	20-Nov-2023	180 days	13 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap										
BH16 0-0.15m	E440	08-Nov-2023	18-Nov-2023	180 days	11 days	✓	20-Nov-2023	180 days	13 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap										
BH18 0-0.15m	E440	08-Nov-2023	18-Nov-2023	180 days	11 days	✓	20-Nov-2023	180 days	13 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap										
BH19 0-0.15m	E440	08-Nov-2023	18-Nov-2023	180 days	11 days	✓	20-Nov-2023	180 days	13 days	✓

Matrix: **Soil/Solid**

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

Analyte Group : Analytical Method / Container / Client Sample ID(s)	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
			Preparation Date	*Holding Times* Rec	*Holding Times* Actual	*Eval*	*Analysis Date*	*Holding Times* Rec	*Holding Times* Actual	*Eval*
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap BH20 0-0.15m	E440	08-Nov-2023	18-Nov-2023	180 days	11 days	✓	20-Nov-2023	180 days	13 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap BH21 0-0.15m	E440	08-Nov-2023	18-Nov-2023	180 days	11 days	✓	20-Nov-2023	180 days	13 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap BH22 0-0.15m	E440	08-Nov-2023	18-Nov-2023	180 days	11 days	✓	20-Nov-2023	180 days	13 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap BH23 0-0.15m	E440	08-Nov-2023	18-Nov-2023	180 days	11 days	✓	20-Nov-2023	180 days	13 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap BH24 0-0.15m	E440	08-Nov-2023	18-Nov-2023	180 days	11 days	✓	20-Nov-2023	180 days	13 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap BH25 0-0.15m	E440	08-Nov-2023	18-Nov-2023	180 days	11 days	✓	20-Nov-2023	180 days	13 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap BH26 0-0.15m	E440	08-Nov-2023	18-Nov-2023	180 days	11 days	✓	20-Nov-2023	180 days	13 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap BH27 0-0.15m	E440	08-Nov-2023	18-Nov-2023	180 days	11 days	✓	20-Nov-2023	180 days	13 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap BH28 0-0.15m	E440	08-Nov-2023	18-Nov-2023	180 days	11 days	✓	20-Nov-2023	180 days	13 days	✓

Matrix: **Soil/Solid**

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

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap										
BH DUPA 0-0.15m	E440	07-Nov-2023	18-Nov-2023	180 days	12 days	✓	20-Nov-2023	180 days	14 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap										
BH DUPB 0-0.15m	E440	07-Nov-2023	18-Nov-2023	180 days	12 days	✓	20-Nov-2023	180 days	14 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap										
BH1 0-0.15m	E440	07-Nov-2023	18-Nov-2023	180 days	12 days	✓	20-Nov-2023	180 days	14 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap										
BH10 0-0.15m	E440	07-Nov-2023	18-Nov-2023	180 days	12 days	✓	20-Nov-2023	180 days	14 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap										
BH11 0-0.15m	E440	07-Nov-2023	18-Nov-2023	180 days	12 days	✓	20-Nov-2023	180 days	14 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap										
BH12 0-0.15m	E440	07-Nov-2023	18-Nov-2023	180 days	12 days	✓	20-Nov-2023	180 days	14 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap										
BH2 0-0.15m	E440	07-Nov-2023	18-Nov-2023	180 days	12 days	✓	20-Nov-2023	180 days	14 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap										
BH3 0-0.15m	E440	07-Nov-2023	18-Nov-2023	180 days	12 days	✓	20-Nov-2023	180 days	14 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap										
BH4 0-0.15m	E440	07-Nov-2023	18-Nov-2023	180 days	12 days	✓	20-Nov-2023	180 days	14 days	✓

Matrix: **Soil/Solid**

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

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap										
BH5 0-0.15m	E440	07-Nov-2023	18-Nov-2023	180 days	12 days	✓	20-Nov-2023	180 days	14 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap										
BH6 0-0.15m	E440	07-Nov-2023	18-Nov-2023	180 days	12 days	✓	20-Nov-2023	180 days	14 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap										
BH7 0-0.15m	E440	07-Nov-2023	18-Nov-2023	180 days	12 days	✓	20-Nov-2023	180 days	14 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap										
BH8 0-0.15m	E440	07-Nov-2023	18-Nov-2023	180 days	12 days	✓	20-Nov-2023	180 days	14 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap										
BH9 0-0.15m	E440	07-Nov-2023	18-Nov-2023	180 days	12 days	✓	20-Nov-2023	180 days	14 days	✓
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap										
BH14 0-0.15m	E144	09-Nov-2023	----	----	----		16-Nov-2023	----	7 days	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap										
BH17 0-0.15m	E144	09-Nov-2023	----	----	----		16-Nov-2023	----	7 days	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap										
BH33 0-0.15m	E144	09-Nov-2023	----	----	----		16-Nov-2023	----	7 days	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap										
BH34 0-0.15m	E144	09-Nov-2023	----	----	----		16-Nov-2023	----	7 days	

Matrix: **Soil/Solid**

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

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap										
BH35 0-0.15m	E144	09-Nov-2023	----	----	----		16-Nov-2023	----	7 days	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap										
BH36 0-0.15m	E144	09-Nov-2023	----	----	----		16-Nov-2023	----	7 days	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap										
BH15 0-0.15m	E144	08-Nov-2023	----	----	----		16-Nov-2023	----	8 days	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap										
BH16 0-0.15m	E144	08-Nov-2023	----	----	----		16-Nov-2023	----	8 days	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap										
BH18 0-0.15m	E144	08-Nov-2023	----	----	----		16-Nov-2023	----	8 days	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap										
BH19 0-0.15m	E144	08-Nov-2023	----	----	----		16-Nov-2023	----	8 days	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap										
BH20 0-0.15m	E144	08-Nov-2023	----	----	----		16-Nov-2023	----	8 days	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap										
BH21 0-0.15m	E144	08-Nov-2023	----	----	----		16-Nov-2023	----	8 days	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap										
BH22 0-0.15m	E144	08-Nov-2023	----	----	----		16-Nov-2023	----	8 days	

Matrix: **Soil/Solid**

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

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap										
BH DUPB 0-0.15m	E144	07-Nov-2023	----	----	----		16-Nov-2023	----	9 days	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap										
BH DUPC 0-0.15m	E144	08-Nov-2023	----	----	----		16-Nov-2023	----	9 days	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap										
BH1 0-0.15m	E144	07-Nov-2023	----	----	----		16-Nov-2023	----	9 days	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap										
BH10 0-0.15m	E144	07-Nov-2023	----	----	----		16-Nov-2023	----	9 days	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap										
BH11 0-0.15m	E144	07-Nov-2023	----	----	----		16-Nov-2023	----	9 days	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap										
BH12 0-0.15m	E144	07-Nov-2023	----	----	----		16-Nov-2023	----	9 days	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap										
BH2 0-0.15m	E144	07-Nov-2023	----	----	----		16-Nov-2023	----	9 days	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap										
BH9 0-0.15m	E144	07-Nov-2023	----	----	----		16-Nov-2023	----	9 days	
Polycyclic Aromatic Hydrocarbons : PAHs by Hex:Ace GC-MS (Low Level CCME)										
Glass soil jar/Teflon lined cap										
BH DUPB 0-0.15m	E641A-L	07-Nov-2023	16-Nov-2023	14 days	10 days	✓	17-Nov-2023	40 days	1 days	✓

Matrix: **Soil/Solid**

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

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Polycyclic Aromatic Hydrocarbons : PAHs by Hex:Ace GC-MS (Low Level CCME)										
Glass soil jar/Teflon lined cap BH1 0-0.15m	E641A-L	07-Nov-2023	16-Nov-2023	14 days	10 days	✓	17-Nov-2023	40 days	1 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hex:Ace GC-MS (Low Level CCME)										
Glass soil jar/Teflon lined cap BH10 0-0.15m	E641A-L	07-Nov-2023	16-Nov-2023	14 days	10 days	✓	17-Nov-2023	40 days	1 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hex:Ace GC-MS (Low Level CCME)										
Glass soil jar/Teflon lined cap BH11 0-0.15m	E641A-L	07-Nov-2023	16-Nov-2023	14 days	10 days	✓	17-Nov-2023	40 days	1 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hex:Ace GC-MS (Low Level CCME)										
Glass soil jar/Teflon lined cap BH12 0-0.15m	E641A-L	07-Nov-2023	16-Nov-2023	14 days	10 days	✓	17-Nov-2023	40 days	1 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hex:Ace GC-MS (Low Level CCME)										
Glass soil jar/Teflon lined cap BH2 0-0.15m	E641A-L	07-Nov-2023	16-Nov-2023	14 days	10 days	✓	17-Nov-2023	40 days	1 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hex:Ace GC-MS (Low Level CCME)										
Glass soil jar/Teflon lined cap BH9 0-0.15m	E641A-L	07-Nov-2023	16-Nov-2023	14 days	10 days	✓	17-Nov-2023	40 days	1 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hex:Ace GC-MS (Low Level CCME)										
Glass soil jar/Teflon lined cap BH DUPC 0-0.15m	E641A-L	08-Nov-2023	20-Nov-2023	14 days	12 days	✓	20-Nov-2023	40 days	1 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hex:Ace GC-MS (Low Level CCME)										
Glass soil jar/Teflon lined cap BH33 0-0.15m	E641A-L	09-Nov-2023	16-Nov-2023	14 days	7 days	✓	17-Nov-2023	40 days	1 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hex:Ace GC-MS (Low Level CCME)										
Glass soil jar/Teflon lined cap BH34 0-0.15m	E641A-L	09-Nov-2023	16-Nov-2023	14 days	7 days	✓	17-Nov-2023	40 days	1 days	✓

Matrix: **Soil/Solid**

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

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Polycyclic Aromatic Hydrocarbons : PAHs by Hex:Ace GC-MS (Low Level CCME)										
Glass soil jar/Teflon lined cap										
BH35 0-0.15m	E641A-L	09-Nov-2023	16-Nov-2023	14 days	7 days	✓	17-Nov-2023	40 days	1 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hex:Ace GC-MS (Low Level CCME)										
Glass soil jar/Teflon lined cap										
BH36 0-0.15m	E641A-L	09-Nov-2023	16-Nov-2023	14 days	7 days	✓	17-Nov-2023	40 days	1 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hex:Ace GC-MS (Low Level CCME)										
Glass soil jar/Teflon lined cap										
BH14 0-0.15m	E641A-L	09-Nov-2023	16-Nov-2023	14 days	8 days	✓	17-Nov-2023	40 days	1 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hex:Ace GC-MS (Low Level CCME)										
Glass soil jar/Teflon lined cap										
BH17 0-0.15m	E641A-L	09-Nov-2023	16-Nov-2023	14 days	8 days	✓	17-Nov-2023	40 days	1 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hex:Ace GC-MS (Low Level CCME)										
Glass soil jar/Teflon lined cap										
BH22 0-0.15m	E641A-L	08-Nov-2023	16-Nov-2023	14 days	8 days	✓	17-Nov-2023	40 days	1 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hex:Ace GC-MS (Low Level CCME)										
Glass soil jar/Teflon lined cap										
BH15 0-0.15m	E641A-L	08-Nov-2023	16-Nov-2023	14 days	9 days	✓	17-Nov-2023	40 days	1 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hex:Ace GC-MS (Low Level CCME)										
Glass soil jar/Teflon lined cap										
BH16 0-0.15m	E641A-L	08-Nov-2023	16-Nov-2023	14 days	9 days	✓	17-Nov-2023	40 days	1 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hex:Ace GC-MS (Low Level CCME)										
Glass soil jar/Teflon lined cap										
BH18 0-0.15m	E641A-L	08-Nov-2023	16-Nov-2023	14 days	9 days	✓	17-Nov-2023	40 days	1 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hex:Ace GC-MS (Low Level CCME)										
Glass soil jar/Teflon lined cap										
BH19 0-0.15m	E641A-L	08-Nov-2023	16-Nov-2023	14 days	9 days	✓	17-Nov-2023	40 days	1 days	✓

Matrix: **Soil/Solid**

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

Analyte Group : Analytical Method / Container / Client Sample ID(s)	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
			Preparation Date	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Polycyclic Aromatic Hydrocarbons : PAHs by Hex:Ace GC-MS (Low Level CCME)										
Glass soil jar/Teflon lined cap										
BH20 0-0.15m	E641A-L	08-Nov-2023	16-Nov-2023	14 days	9 days	✓	17-Nov-2023	40 days	1 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hex:Ace GC-MS (Low Level CCME)										
Glass soil jar/Teflon lined cap										
BH21 0-0.15m	E641A-L	08-Nov-2023	16-Nov-2023	14 days	9 days	✓	17-Nov-2023	40 days	1 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass soil jar/Teflon lined cap										
BH DUPC 0-0.15m	E611A	08-Nov-2023	17-Nov-2023	0 days	9 days	× UCP	17-Nov-2023	0 days	0 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass soil methanol vial										
BH33 0-0.15m	E611A	09-Nov-2023	15-Nov-2023	40 days	7 days	✓	16-Nov-2023	40 days	7 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass soil methanol vial										
BH34 0-0.15m	E611A	09-Nov-2023	15-Nov-2023	40 days	7 days	✓	16-Nov-2023	40 days	7 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass soil methanol vial										
BH35 0-0.15m	E611A	09-Nov-2023	15-Nov-2023	40 days	7 days	✓	16-Nov-2023	40 days	7 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass soil methanol vial										
BH36 0-0.15m	E611A	09-Nov-2023	15-Nov-2023	40 days	7 days	✓	16-Nov-2023	40 days	7 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass soil methanol vial										
BH14 0-0.15m	E611A	09-Nov-2023	15-Nov-2023	40 days	7 days	✓	16-Nov-2023	40 days	8 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass soil methanol vial										
BH17 0-0.15m	E611A	09-Nov-2023	15-Nov-2023	40 days	7 days	✓	16-Nov-2023	40 days	8 days	✓

Matrix: **Soil/Solid**

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

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass soil methanol vial BH15 0-0.15m	E611A	08-Nov-2023	15-Nov-2023	40 days	8 days	✓	16-Nov-2023	40 days	9 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass soil methanol vial BH16 0-0.15m	E611A	08-Nov-2023	15-Nov-2023	40 days	8 days	✓	16-Nov-2023	40 days	9 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass soil methanol vial BH18 0-0.15m	E611A	08-Nov-2023	15-Nov-2023	40 days	8 days	✓	16-Nov-2023	40 days	9 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass soil methanol vial BH19 0-0.15m	E611A	08-Nov-2023	15-Nov-2023	40 days	8 days	✓	16-Nov-2023	40 days	9 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass soil methanol vial BH20 0-0.15m	E611A	08-Nov-2023	15-Nov-2023	40 days	8 days	✓	16-Nov-2023	40 days	9 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass soil methanol vial BH21 0-0.15m	E611A	08-Nov-2023	15-Nov-2023	40 days	8 days	✓	16-Nov-2023	40 days	9 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass soil methanol vial BH22 0-0.15m	E611A	08-Nov-2023	15-Nov-2023	40 days	8 days	✓	16-Nov-2023	40 days	9 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass soil methanol vial BH DUPB 0-0.15m	E611A	07-Nov-2023	15-Nov-2023	40 days	9 days	✓	16-Nov-2023	40 days	10 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass soil methanol vial BH1 0-0.15m	E611A	07-Nov-2023	15-Nov-2023	40 days	9 days	✓	16-Nov-2023	40 days	10 days	✓

Matrix: **Soil/Solid**

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

Analyte Group : Analytical Method / Container / Client Sample ID(s)	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
			Preparation Date	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass soil methanol vial BH10 0-0.15m	E611A	07-Nov-2023	15-Nov-2023	40 days	9 days	✓	16-Nov-2023	40 days	10 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass soil methanol vial BH11 0-0.15m	E611A	07-Nov-2023	15-Nov-2023	40 days	9 days	✓	16-Nov-2023	40 days	10 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass soil methanol vial BH12 0-0.15m	E611A	07-Nov-2023	15-Nov-2023	40 days	9 days	✓	16-Nov-2023	40 days	10 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass soil methanol vial BH2 0-0.15m	E611A	07-Nov-2023	15-Nov-2023	40 days	9 days	✓	16-Nov-2023	40 days	10 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass soil methanol vial BH9 0-0.15m	E611A	07-Nov-2023	15-Nov-2023	40 days	9 days	✓	16-Nov-2023	40 days	10 days	✓

Legend & Qualifier Definitions

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

Quality Control Parameter Frequency Compliance

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

Matrix: **Soil/Solid**

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

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
BTEX by Headspace GC-MS	E611A	1238590	3	25	12.0	5.0	✓
EPH in Soil/Solid by GC-FID (RBCA)	E601F	1240871	2	27	7.4	5.0	✓
Mercury in Soil/Solid by CVAAS	E510	1239065	2	40	5.0	5.0	✓
Metals in Soil/Solid by CRC ICPMS	E440	1239064	2	40	5.0	5.0	✓
Moisture Content by Gravimetry	E144	1239068	3	56	5.3	5.0	✓
PAHs by Hex:Ace GC-MS (Low Level CCME)	E641A-L	1238807	6	33	18.1	5.0	✓
VPH by Headspace GC-FID (Tier I RBCA)	E581.VPH	1238591	3	25	12.0	5.0	✓
Laboratory Control Samples (LCS)							
BTEX by Headspace GC-MS	E611A	1238590	3	25	12.0	5.0	✓
EPH in Soil/Solid by GC-FID (RBCA)	E601F	1240871	2	27	7.4	5.0	✓
Mercury in Soil/Solid by CVAAS	E510	1239065	4	40	10.0	10.0	✓
Metals in Soil/Solid by CRC ICPMS	E440	1239064	4	40	10.0	10.0	✓
Moisture Content by Gravimetry	E144	1239068	3	56	5.3	5.0	✓
PAHs by Hex:Ace GC-MS (Low Level CCME)	E641A-L	1238807	6	33	18.1	5.0	✓
VPH by Headspace GC-FID (Tier I RBCA)	E581.VPH	1238591	3	25	12.0	5.0	✓
Method Blanks (MB)							
BTEX by Headspace GC-MS	E611A	1238590	3	25	12.0	5.0	✓
EPH in Soil/Solid by GC-FID (RBCA)	E601F	1240871	2	27	7.4	5.0	✓
Mercury in Soil/Solid by CVAAS	E510	1239065	2	40	5.0	5.0	✓
Metals in Soil/Solid by CRC ICPMS	E440	1239064	2	40	5.0	5.0	✓
Moisture Content by Gravimetry	E144	1239068	3	56	5.3	5.0	✓
PAHs by Hex:Ace GC-MS (Low Level CCME)	E641A-L	1238807	6	33	18.1	5.0	✓
VPH by Headspace GC-FID (Tier I RBCA)	E581.VPH	1238591	3	25	12.0	5.0	✓
Matrix Spikes (MS)							
BTEX by Headspace GC-MS	E611A	1238590	3	25	12.0	5.0	✓
EPH in Soil/Solid by GC-FID (RBCA)	E601F	1240871	2	27	7.4	5.0	✓
PAHs by Hex:Ace GC-MS (Low Level CCME)	E641A-L	1238807	6	33	18.1	5.0	✓
VPH by Headspace GC-FID (Tier I RBCA)	E581.VPH	1238591	3	25	12.0	5.0	✓

Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Moisture Content by Gravimetry	E144 ALS Environmental - Waterloo	Soil/Solid	CCME PHC in Soil - Tier 1	Moisture is measured gravimetrically by drying the sample at 105°C. Moisture content is calculated as the weight loss (due to water) divided by the wet weight of the sample, expressed as a percentage.
Metals in Soil/Solid by CRC ICPMS	E440 ALS Environmental - Waterloo	Soil/Solid	EPA 6020B (mod)	This method is intended to liberate metals that may be environmentally available. Samples are dried, then sieved through a 2 mm sieve, and digested with HNO3 and HCl. Dependent on sample matrix, some metals may be only partially recovered, including Al, Ba, Be, Cr, Sr, Ti, Tl, V, W, and Zr. Silicate minerals are not solubilized. Volatile forms of sulfur (including sulfide) may not be captured, as they may be lost during sampling, storage, or digestion. This method does not adequately recover elemental sulfur, and is unsuitable for assessment of elemental sulfur standards or guidelines. Analysis is by Collision/Reaction Cell ICPMS.
Mercury in Soil/Solid by CVAAS	E510 ALS Environmental - Waterloo	Soil/Solid	EPA 200.2/1631 Appendix (mod)	Samples are dried, then sieved through a 2 mm sieve, and digested with HNO3 and HCl, followed by CVAAS analysis.
VPH by Headspace GC-FID (Tier I RBCA)	E581.VPH ALS Environmental - Waterloo	Soil/Solid	Atlantic RBCA Version 3.1	VPH (Volatile Petroleum Hydrocarbons) is analyzed by static headspace GC-FID. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
EPH in Soil/Solid by GC-FID (RBCA)	E601F ALS Environmental - Waterloo	Soil/Solid	Atlantic RBCA Version 3.1	Sample Extracts are analyzed by GC-FID for RBCA Tier I hydrocarbon fractions C10-C16, C16-C21, C21-C32.
BTEX by Headspace GC-MS	E611A ALS Environmental - Waterloo	Soil/Solid	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
PAHs by Hex:Ace GC-MS (Low Level CCME)	E641A-L ALS Environmental - Waterloo	Soil/Solid	EPA 8270E (mod)	Polycyclic Aromatic Hydrocarbons (PAHs) are extracted with hexane/acetone and analyzed by GC-MS. If reported, IACR (index of additive cancer risk, unitless) and B(a)P toxic potency equivalent (in soil concentration units) are calculated as per CCME PAH Soil Quality Guidelines fact sheet (2010) or ABT1.
VPH C6-C10 (less BTEX) [RBCA]	EC580C ALS Environmental - Waterloo	Soil/Solid	Atlantic RBCA Version 3.1	VPH C6-C10 (less BTEX) is calculated as follows: VPH (C6-C10) minus benzene, toluene, ethylbenzene and xylenes (BTEX).

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Modified TPH (RBCA) Tier I	EC581D ALS Environmental - Waterloo	Soil/Solid	Atlantic RBCA Version 3.1	Modified TPH (RBCA), Tier I is the sum of PIRI Fraction (C6 - C10 - BTEX) + (>C10 - C16) +(>C16 – C21) + (>C21 - C32).

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Digestion for Metals and Mercury	EP440 ALS Environmental - Waterloo	Soil/Solid	EPA 200.2 (mod)	Samples are dried, then sieved through a 2 mm sieve, and digested with HNO_3 and HCl. This method is intended to liberate metals that may be environmentally available.
VOCs Methanol Extraction for Headspace Analysis	EP581 ALS Environmental - Waterloo	Soil/Solid	EPA 5035A (mod)	VOCs in samples are extracted with methanol. Extracts are then prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
PHCs and PAHs Hexane-Acetone Tumbler Extraction	EP601 ALS Environmental - Waterloo	Soil/Solid	CCME PHC in Soil - Tier 1 (mod)	Samples are subsampled and Petroleum Hydrocarbons (PHC) and PAHs are extracted with 1:1 hexane:acetone using a rotary extractor.
PHCs Hexane-Acetone Tumbler Extraction (RBCA)	EP601F ALS Environmental - Waterloo	Soil/Solid	CCME PHC in Soil - Tier 1 (mod)	Samples are subsampled and Petroleum Hydrocarbons (PHC) are extracted with 1:1 hexane:acetone using a rotary extractor.

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QUALITY CONTROL REPORT

Work Order	: **HA2301055**	Page	: 1 of 26
Client	: Dillon Consulting Limited	Laboratory	: ALS Environmental - Halifax
Contact	: Nadine Wambolt	Account Manager	: Andrew Martin
Address	: 137 Chain Lake Drive Halifax NS Canada B3S 1B3	Address	: 13-100 Wright Ave Dartmouth, Nova Scotia Canada B3B 1L2
Telephone	:	Telephone	: +1 902 707 4888
Project	: 23-6465	Date Samples Received	: 10-Nov-2023 16:50
PO	: ----	Date Analysis Commenced	: 15-Nov-2023
C-O-C number	: ----	Issue Date	: 21-Nov-2023 20:28
Sampler	: MK/EJM 902.562.9880 ext. 5206		
Site	: Build NS (Country Harbour)		
Quote number	: HA23-DICL100-12 - Lump Sum Rate - Build NS (Country Harbour)		
No. of samples received	: 39		
No. of samples analysed	: 39		

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Laboratory Department*
Amaninder Dhillon	Team Lead - Semi-Volatile Instrumentation	Waterloo Organics, Waterloo, Ontario
Josphin Masihi	Analyst	Waterloo Centralized Prep, Waterloo, Ontario
Nik Perkio	Inorganics Analyst	Waterloo Metals, Waterloo, Ontario
Niral Patel		Waterloo Centralized Prep, Waterloo, Ontario
Sarah Birch	VOC Section Supervisor	Waterloo VOC, Waterloo, Ontario

General Comments

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

Key :

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

Workorder Comments

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **Soil/Solid**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 1239068)											
HA2301055-001	BH1 0-0.15m	Moisture	----	E144	0.25	%	40.7	40.8	0.319%	20%	----
Physical Tests (QC Lot: 1239170)											
HA2301055-038	BH35 0-0.15m	Moisture	----	E144	0.25	%	64.0	66.4	3.58%	20%	----
Physical Tests (QC Lot: 1240825)											
HA2301055-015	BH DUPC 0-0.15m	Moisture	----	E144	0.25	%	46.5	53.1	13.2%	20%	----
Metals (QC Lot: 1239064)											
HA2301055-001	BH1 0-0.15m	Aluminum	7429-90-5	E440	50	mg/kg	4630	4720	1.90%	40%	----
		Antimony	7440-36-0	E440	0.10	mg/kg	0.14	0.14	0.007	Diff <2x LOR	----
		Arsenic	7440-38-2	E440	0.10	mg/kg	22.0	23.5	6.44%	30%	----
		Barium	7440-39-3	E440	0.50	mg/kg	10.7	10.9	1.79%	40%	----
		Beryllium	7440-41-7	E440	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----
		Boron	7440-42-8	E440	5.0	mg/kg	<5.0	<5.0	0	Diff <2x LOR	----
		Cadmium	7440-43-9	E440	0.020	mg/kg	0.058	0.064	0.006	Diff <2x LOR	----
		Chromium	7440-47-3	E440	0.50	mg/kg	8.13	8.61	5.67%	30%	----
		Cobalt	7440-48-4	E440	0.10	mg/kg	0.66	0.67	0.01	Diff <2x LOR	----
		Copper	7440-50-8	E440	0.50	mg/kg	3.19	3.50	9.39%	30%	----
		Iron	7439-89-6	E440	50	mg/kg	22400	23800	5.95%	30%	----
		Lead	7439-92-1	E440	0.50	mg/kg	13.3	13.9	4.31%	40%	----
		Manganese	7439-96-5	E440	1.0	mg/kg	60.4	64.0	5.88%	30%	----
		Molybdenum	7439-98-7	E440	0.10	mg/kg	0.52	0.58	9.73%	40%	----
		Nickel	7440-02-0	E440	0.50	mg/kg	2.52	2.70	0.19	Diff <2x LOR	----
		Selenium	7782-49-2	E440	0.20	mg/kg	1.00	1.08	0.08	Diff <2x LOR	----
		Silver	7440-22-4	E440	0.10	mg/kg	0.10	0.11	0.010	Diff <2x LOR	----
		Strontium	7440-24-6	E440	0.50	mg/kg	2.55	2.74	7.25%	40%	----
		Sulfur	7704-34-9	E440	1000	mg/kg	<1000	<1000	0	Diff <2x LOR	----
		Thallium	7440-28-0	E440	0.050	mg/kg	0.075	0.075	0.0002	Diff <2x LOR	----
		Tin	7440-31-5	E440	2.0	mg/kg	<2.0	<2.0	0	Diff <2x LOR	----
		Uranium	7440-61-1	E440	0.050	mg/kg	0.949	0.971	2.25%	30%	----
		Vanadium	7440-62-2	E440	0.20	mg/kg	24.9	26.6	6.83%	30%	----
		Zinc	7440-66-6	E440	2.0	mg/kg	10.3	10.7	0.4	Diff <2x LOR	----

Sub-Matrix: **Soil/Solid**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Metals (QC Lot: 1239065)											
HA2301055-001	BH1 0-0.15m	Mercury	7439-97-6	E510	0.0050	mg/kg	0.0877	0.0802	9.00%	40%	----
Metals (QC Lot: 1239082)											
HA2301055-021	BH18 0-0.15m	Aluminum	7429-90-5	E440	50	mg/kg	7900	7520	4.99%	40%	----
		Antimony	7440-36-0	E440	0.10	mg/kg	1.46	1.52	3.90%	30%	----
		Arsenic	7440-38-2	E440	0.10	mg/kg	194	196	1.12%	30%	----
		Barium	7440-39-3	E440	0.50	mg/kg	52.1	49.1	5.92%	40%	----
		Beryllium	7440-41-7	E440	0.10	mg/kg	1.18	1.19	0.462%	30%	----
		Boron	7440-42-8	E440	5.0	mg/kg	<5.0	<5.0	0	Diff <2x LOR	----
		Cadmium	7440-43-9	E440	0.020	mg/kg	0.478	0.430	10.6%	30%	----
		Chromium	7440-47-3	E440	0.50	mg/kg	15.3	15.4	0.606%	30%	----
		Cobalt	7440-48-4	E440	0.10	mg/kg	13.2	12.8	2.54%	30%	----
		Copper	7440-50-8	E440	0.50	mg/kg	56.7	54.0	4.89%	30%	----
		Iron	7439-89-6	E440	50	mg/kg	112000	111000	1.75%	30%	----
		Lead	7439-92-1	E440	0.50	mg/kg	35.9	36.5	1.52%	40%	----
		Manganese	7439-96-5	E440	1.0	mg/kg	927	886	4.56%	30%	----
		Molybdenum	7439-98-7	E440	0.10	mg/kg	29.5	30.0	1.62%	40%	----
		Nickel	7440-02-0	E440	0.50	mg/kg	30.9	30.2	2.24%	30%	----
		Selenium	7782-49-2	E440	0.20	mg/kg	2.34	2.28	2.77%	30%	----
		Silver	7440-22-4	E440	0.10	mg/kg	0.15	0.14	0.01	Diff <2x LOR	----
		Strontium	7440-24-6	E440	0.50	mg/kg	36.3	34.4	5.52%	40%	----
		Sulfur	7704-34-9	E440	1000	mg/kg	1200	1200	20	Diff <2x LOR	----
		Thallium	7440-28-0	E440	0.050	mg/kg	1.14	1.16	1.99%	30%	----
		Tin	7440-31-5	E440	2.0	mg/kg	<2.0	<2.0	0	Diff <2x LOR	----
		Uranium	7440-61-1	E440	0.050	mg/kg	1.02	1.04	1.17%	30%	----
		Vanadium	7440-62-2	E440	0.20	mg/kg	32.7	32.1	1.77%	30%	----
		Zinc	7440-66-6	E440	2.0	mg/kg	30.4	28.8	5.22%	30%	----
Metals (QC Lot: 1239083)											
HA2301055-021	BH18 0-0.15m	Mercury	7439-97-6	E510	0.0374	mg/kg	1.19	1.31	9.70%	40%	----
Volatile Organic Compounds (QC Lot: 1238590)											
HA2301055-001	BH1 0-0.15m	Benzene	71-43-2	E611A	0.0057	mg/kg	<0.0057	<0.0057	0	Diff <2x LOR	----
		Ethylbenzene	100-41-4	E611A	0.015	mg/kg	<0.015	<0.015	0	Diff <2x LOR	----
		Toluene	108-88-3	E611A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Xylene, m+p-	179601-23-1	E611A	0.030	mg/kg	<0.030	<0.030	0	Diff <2x LOR	----
		Xylene, o-	95-47-6	E611A	0.030	mg/kg	<0.030	<0.030	0	Diff <2x LOR	----

Sub-Matrix: **Soil/Solid**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Volatile Organic Compounds (QC Lot: 1238593)											
HA2301055-036	BH33 0-0.15m	Benzene	71-43-2	E611A	0.0050	mg/kg	<0.0050	<0.0050	0	Diff <2x LOR	----
		Ethylbenzene	100-41-4	E611A	0.015	mg/kg	<0.015	<0.015	0	Diff <2x LOR	----
		Toluene	108-88-3	E611A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Xylene, m+p-	179601-23-1	E611A	0.030	mg/kg	<0.030	<0.030	0	Diff <2x LOR	----
		Xylene, o-	95-47-6	E611A	0.030	mg/kg	<0.030	<0.030	0	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 1241797)											
HA2301055-015	BH DUPC 0-0.15m	Benzene	71-43-2	E611A	0.0050	mg/kg	<0.0050	<0.0050	0	Diff <2x LOR	----
		Ethylbenzene	100-41-4	E611A	0.015	mg/kg	<0.015	<0.015	0	Diff <2x LOR	----
		Toluene	108-88-3	E611A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Xylene, m+p-	179601-23-1	E611A	0.030	mg/kg	<0.030	<0.030	0	Diff <2x LOR	----
		Xylene, o-	95-47-6	E611A	0.030	mg/kg	<0.030	<0.030	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 1238591)											
HA2301055-001	BH1 0-0.15m	VPH C6-C10	n/a	E581.VPH	5.0	mg/kg	<5.0	<5.0	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 1238594)											
HA2301055-036	BH33 0-0.15m	VPH C6-C10	n/a	E581.VPH	5.0	mg/kg	<5.0	<5.0	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 1240871)											
HA2301055-037	BH34 0-0.15m	EPH >C10-C16	n/a	E601F	5.0	mg/kg	6.8	10.7	3.9	Diff <2x LOR	----
		EPH >C16-C21	n/a	E601F	5.0	mg/kg	27.0	19.4	7.6	Diff <2x LOR	----
		EPH >C21-C32	n/a	E601F	5.0	mg/kg	311	305	1.73%	40%	----
		EPH >C34-C50	n/a	E601F	20	mg/kg	695	494	33.8%	40%	----
Hydrocarbons (QC Lot: 1241798)											
HA2301055-015	BH DUPC 0-0.15m	VPH C6-C10	n/a	E581.VPH	5.0	mg/kg	<5.0	<5.0	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 1244077)											
HA2301055-001	BH1 0-0.15m	EPH >C10-C16	n/a	E601F	5.0	mg/kg	11.0	6.0	5.0	Diff <2x LOR	----
		EPH >C16-C21	n/a	E601F	5.0	mg/kg	25.0	15.4	9.6	Diff <2x LOR	----
		EPH >C21-C32	n/a	E601F	5.0	mg/kg	365	215	51.8%	40%	DUP-H
		EPH >C34-C50	n/a	E601F	20	mg/kg	532	332	46.1%	40%	DUP-H
Polycyclic Aromatic Hydrocarbons (QC Lot: 1238807)											
HA2301055-001	BH1 0-0.15m	Acenaphthene	83-32-9	E641A-L	0.0052	mg/kg	<0.0052	<0.0052	0	Diff <2x LOR	----
		Acenaphthylene	208-96-8	E641A-L	0.0052	mg/kg	<0.0052	<0.0052	0	Diff <2x LOR	----
		Anthracene	120-12-7	E641A-L	0.0052	mg/kg	<0.0052	<0.0052	0	Diff <2x LOR	----
		Benz(a)anthracene	56-55-3	E641A-L	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----
		Benzo(a)pyrene	50-32-8	E641A-L	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----
		Benzo(b+j)fluoranthene	n/a	E641A-L	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----

Sub-Matrix: **Soil/Solid**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Polycyclic Aromatic Hydrocarbons (QC Lot: 1238807) - continued											
HA2301055-001	BH1 0-0.15m	Benzo(g,h,i)perylene	191-24-2	E641A-L	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----
		Benzo(k)fluoranthene	207-08-9	E641A-L	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----
		Chrysene	218-01-9	E641A-L	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----
		Dibenz(a,h)anthracene	53-70-3	E641A-L	0.0052	mg/kg	<0.0052	<0.0052	0	Diff <2x LOR	----
		Fluoranthene	206-44-0	E641A-L	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----
		Fluorene	86-73-7	E641A-L	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----
		Indeno(1,2,3-c,d)pyrene	193-39-5	E641A-L	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----
		Methylnaphthalene, 1-	90-12-0	E641A-L	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----
		Methylnaphthalene, 2-	91-57-6	E641A-L	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----
		Naphthalene	91-20-3	E641A-L	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----
		Perylene	198-55-0	E641A-L	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----
		Phenanthrene	85-01-8	E641A-L	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----
		Pyrene	129-00-0	E641A-L	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----
Polycyclic Aromatic Hydrocarbons (QC Lot: 1238810)											
HA2301055-025	BH22 0-0.15m	Acenaphthene	83-32-9	E641A-L	0.0050	mg/kg	0.0065	0.0144	0.0079	Diff <2x LOR	J
		Acenaphthylene	208-96-8	E641A-L	0.0050	mg/kg	0.0180	0.0738	121%	50%	DUP-H
		Acridine	260-94-6	E641A-L	0.010	mg/kg	<0.010	# 0.031	0.021	Diff <2x LOR	DUP-H,J
		Anthracene	120-12-7	E641A-L	0.0046	mg/kg	0.0472	0.192	121%	50%	DUP-H
		Benz(a)anthracene	56-55-3	E641A-L	0.010	mg/kg	0.189	0.696	114%	50%	DUP-H
		Benzo(a)pyrene	50-32-8	E641A-L	0.010	mg/kg	0.160	0.586	114%	50%	DUP-H
		Benzo(b+j)fluoranthene	n/a	E641A-L	0.010	mg/kg	0.254	0.800	104%	50%	DUP-H
		Benzo(g,h,i)perylene	191-24-2	E641A-L	0.010	mg/kg	0.114	0.315	93.4%	50%	DUP-H
		Benzo(k)fluoranthene	207-08-9	E641A-L	0.010	mg/kg	0.089	0.295	107%	50%	DUP-H
		Chrysene	218-01-9	E641A-L	0.010	mg/kg	0.165	0.557	108%	50%	DUP-H
		Dibenz(a,h)anthracene	53-70-3	E641A-L	0.0050	mg/kg	0.0338	0.0890	90.0%	50%	DUP-H
		Fluoranthene	206-44-0	E641A-L	0.010	mg/kg	0.315	1.33	123%	50%	DUP-H
		Fluorene	86-73-7	E641A-L	0.010	mg/kg	<0.010	0.024	0.014	Diff <2x LOR	J
		Indeno(1,2,3-c,d)pyrene	193-39-5	E641A-L	0.010	mg/kg	0.135	0.397	98.5%	50%	DUP-H
		Methylnaphthalene, 1-	90-12-0	E641A-L	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----
		Methylnaphthalene, 2-	91-57-6	E641A-L	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----
		Naphthalene	91-20-3	E641A-L	0.010	mg/kg	<0.010	0.014	0.004	Diff <2x LOR	J
		Perylene	198-55-0	E641A-L	0.010	mg/kg	0.046	0.168	113%	50%	DUP-H
		Phenanthrene	85-01-8	E641A-L	0.010	mg/kg	0.133	0.414	103%	50%	DUP-H
		Pyrene	129-00-0	E641A-L	0.010	mg/kg	0.283	1.16	122%	50%	DUP-H

Sub-Matrix: **Soil/Solid**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Polycyclic Aromatic Hydrocarbons (QC Lot: 1238810) - continued											
HA2301055-025	BH22 0-0.15m	Quinoline	91-22-5	E641A-L	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----
Polycyclic Aromatic Hydrocarbons (QC Lot: 1242418)											
HA2301055-001	BH1 0-0.15m	Acridine	260-94-6	E641A-L	0.052	mg/kg	<0.051	<0.052	0.0008	Diff <2x LOR	----
		Quinoline	91-22-5	E641A-L	0.068	mg/kg	<0.068	<0.068	0	Diff <2x LOR	----
Polycyclic Aromatic Hydrocarbons (QC Lot: 1242675)											
HA2301055-015	BH DUPC 0-0.15m	Acenaphthene	83-32-9	E641A-L	0.0057	mg/kg	<0.0057	<0.0057	0.0057	Diff <2x LOR	J
		Acenaphthylene	208-96-8	E641A-L	0.0057	mg/kg	<0.0057	<0.0057	0.0057	Diff <2x LOR	J
		Anthracene	120-12-7	E641A-L	0.0057	mg/kg	0.0076	0.0126	0.0050	Diff <2x LOR	J
		Benz(a)anthracene	56-55-3	E641A-L	0.010	mg/kg	0.034	0.055	46.0%	50%	----
		Benzo(a)pyrene	50-32-8	E641A-L	0.010	mg/kg	0.047	0.053	12.3%	50%	----
		Benzo(b+j)fluoranthene	n/a	E641A-L	0.010	mg/kg	0.144	0.163	12.3%	50%	----
		Benzo(g,h,i)perylene	191-24-2	E641A-L	0.010	mg/kg	0.086	0.088	1.77%	50%	----
		Benzo(k)fluoranthene	207-08-9	E641A-L	0.010	mg/kg	0.044	0.049	10.8%	50%	----
		Chrysene	218-01-9	E641A-L	0.010	mg/kg	0.067	0.092	30.6%	50%	----
		Dibenz(a,h)anthracene	53-70-3	E641A-L	0.0057	mg/kg	0.0154	0.0145	0.0009	Diff <2x LOR	J
		Fluoranthene	206-44-0	E641A-L	0.010	mg/kg	0.067	0.073	8.15%	50%	----
		Fluorene	86-73-7	E641A-L	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----
		Indeno(1,2,3-c,d)pyrene	193-39-5	E641A-L	0.010	mg/kg	0.092	0.084	9.02%	50%	----
		Methylnaphthalene, 1-	90-12-0	E641A-L	0.010	mg/kg	0.086	0.097	11.7%	50%	----
		Methylnaphthalene, 2-	91-57-6	E641A-L	0.010	mg/kg	0.117	0.158	29.8%	50%	----
		Naphthalene	91-20-3	E641A-L	0.010	mg/kg	0.074	0.102	32.3%	50%	----
		Perylene	198-55-0	E641A-L	0.010	mg/kg	0.011	0.011	0.00003	Diff <2x LOR	J
		Phenanthrene	85-01-8	E641A-L	0.010	mg/kg	0.089	0.116	26.6%	50%	----
		Pyrene	129-00-0	E641A-L	0.010	mg/kg	0.058	0.067	15.5%	50%	----
		Quinoline	91-22-5	E641A-L	0.061	mg/kg	<0.061	<0.061	0	Diff <2x LOR	RRQC
Polycyclic Aromatic Hydrocarbons (QC Lot: 1243130)											
HA2301055-036	BH33 0-0.15m	Acridine	260-94-6	E641A-L	0.052	mg/kg	<0.053	<0.052	0.0008	Diff <2x LOR	J
Polycyclic Aromatic Hydrocarbons (QC Lot: 1246254)											
HA2301055-015	BH DUPC 0-0.15m	Acridine	260-94-6	E641A-L	0.029	mg/kg	<0.029	<0.029	0.00009	Diff <2x LOR	J

Qualifiers

Qualifier	Description
DUP-H	Duplicate results outside ALS DQO, due to sample heterogeneity.
J	Duplicate results and limits are expressed in terms of absolute difference.
RRQC	Refer to report comments for information regarding this QC result.

Method Blank (MB) Report

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

Sub-Matrix: **Soil/Solid**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 1239068)						
Moisture	----	E144	0.25	%	<0.25	----
Physical Tests (QCLot: 1239170)						
Moisture	----	E144	0.25	%	<0.25	----
Physical Tests (QCLot: 1240825)						
Moisture	----	E144	0.25	%	<0.25	----
Metals (QCLot: 1239064)						
Aluminum	7429-90-5	E440	50	mg/kg	<50	----
Antimony	7440-36-0	E440	0.1	mg/kg	<0.10	----
Arsenic	7440-38-2	E440	0.1	mg/kg	<0.10	----
Barium	7440-39-3	E440	0.5	mg/kg	<0.50	----
Beryllium	7440-41-7	E440	0.1	mg/kg	<0.10	----
Boron	7440-42-8	E440	5	mg/kg	<5.0	----
Cadmium	7440-43-9	E440	0.02	mg/kg	<0.020	----
Chromium	7440-47-3	E440	0.5	mg/kg	<0.50	----
Cobalt	7440-48-4	E440	0.1	mg/kg	<0.10	----
Copper	7440-50-8	E440	0.5	mg/kg	<0.50	----
Iron	7439-89-6	E440	50	mg/kg	<50	----
Lead	7439-92-1	E440	0.5	mg/kg	<0.50	----
Manganese	7439-96-5	E440	1	mg/kg	<1.0	----
Molybdenum	7439-98-7	E440	0.1	mg/kg	<0.10	----
Nickel	7440-02-0	E440	0.5	mg/kg	<0.50	----
Selenium	7782-49-2	E440	0.2	mg/kg	<0.20	----
Silver	7440-22-4	E440	0.1	mg/kg	<0.10	----
Strontium	7440-24-6	E440	0.5	mg/kg	<0.50	----
Sulfur	7704-34-9	E440	1000	mg/kg	<1000	----
Thallium	7440-28-0	E440	0.05	mg/kg	<0.050	----
Tin	7440-31-5	E440	2	mg/kg	<2.0	----
Uranium	7440-61-1	E440	0.05	mg/kg	<0.050	----
Vanadium	7440-62-2	E440	0.2	mg/kg	<0.20	----
Zinc	7440-66-6	E440	2	mg/kg	<2.0	----
Metals (QCLot: 1239065)						
Mercury	7439-97-6	E510	0.005	mg/kg	<0.0050	----

Sub-Matrix: **Soil/Solid**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Metals (QCLot: 1239082)						
Aluminum	7429-90-5	E440	50	mg/kg	<50	----
Antimony	7440-36-0	E440	0.1	mg/kg	<0.10	----
Arsenic	7440-38-2	E440	0.1	mg/kg	# 0.14	B
Barium	7440-39-3	E440	0.5	mg/kg	<0.50	----
Beryllium	7440-41-7	E440	0.1	mg/kg	<0.10	----
Boron	7440-42-8	E440	5	mg/kg	<5.0	----
Cadmium	7440-43-9	E440	0.02	mg/kg	<0.020	----
Chromium	7440-47-3	E440	0.5	mg/kg	<0.50	----
Cobalt	7440-48-4	E440	0.1	mg/kg	<0.10	----
Copper	7440-50-8	E440	0.5	mg/kg	<0.50	----
Iron	7439-89-6	E440	50	mg/kg	<50	----
Lead	7439-92-1	E440	0.5	mg/kg	<0.50	----
Manganese	7439-96-5	E440	1	mg/kg	<1.0	----
Molybdenum	7439-98-7	E440	0.1	mg/kg	<0.10	----
Nickel	7440-02-0	E440	0.5	mg/kg	<0.50	----
Selenium	7782-49-2	E440	0.2	mg/kg	<0.20	----
Silver	7440-22-4	E440	0.1	mg/kg	<0.10	----
Strontium	7440-24-6	E440	0.5	mg/kg	<0.50	----
Sulfur	7704-34-9	E440	1000	mg/kg	<1000	----
Thallium	7440-28-0	E440	0.05	mg/kg	<0.050	----
Tin	7440-31-5	E440	2	mg/kg	<2.0	----
Uranium	7440-61-1	E440	0.05	mg/kg	<0.050	----
Vanadium	7440-62-2	E440	0.2	mg/kg	<0.20	----
Zinc	7440-66-6	E440	2	mg/kg	<2.0	----
Metals (QCLot: 1239083)						
Mercury	7439-97-6	E510	0.005	mg/kg	<0.0050	----
Volatile Organic Compounds (QCLot: 1238590)						
Benzene	71-43-2	E611A	0.005	mg/kg	<0.0050	----
Ethylbenzene	100-41-4	E611A	0.015	mg/kg	<0.015	----
Toluene	108-88-3	E611A	0.05	mg/kg	<0.050	----
Xylene, m+p-	179601-23-1	E611A	0.03	mg/kg	<0.030	----
Xylene, o-	95-47-6	E611A	0.03	mg/kg	<0.030	----
Volatile Organic Compounds (QCLot: 1238593)						
Benzene	71-43-2	E611A	0.005	mg/kg	<0.0050	----
Ethylbenzene	100-41-4	E611A	0.015	mg/kg	<0.015	----

Sub-Matrix: **Soil/Solid**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Volatile Organic Compounds (QCLot: 1238593) - continued						
Toluene	108-88-3	E611A	0.05	mg/kg	<0.050	----
Xylene, m+p-	179601-23-1	E611A	0.03	mg/kg	<0.030	----
Xylene, o-	95-47-6	E611A	0.03	mg/kg	<0.030	----
Volatile Organic Compounds (QCLot: 1241797)						
Benzene	71-43-2	E611A	0.005	mg/kg	<0.0050	----
Ethylbenzene	100-41-4	E611A	0.015	mg/kg	<0.015	----
Toluene	108-88-3	E611A	0.05	mg/kg	<0.050	----
Xylene, m+p-	179601-23-1	E611A	0.03	mg/kg	<0.030	----
Xylene, o-	95-47-6	E611A	0.03	mg/kg	<0.030	----
Hydrocarbons (QCLot: 1238591)						
VPH C6-C10	n/a	E581.VPH	5	mg/kg	<5.0	----
Hydrocarbons (QCLot: 1238594)						
VPH C6-C10	n/a	E581.VPH	5	mg/kg	<5.0	----
Hydrocarbons (QCLot: 1240871)						
EPH >C10-C16	n/a	E601F	5	mg/kg	<5.0	----
EPH >C16-C21	n/a	E601F	5	mg/kg	<5.0	----
EPH >C21-C32	n/a	E601F	5	mg/kg	<5.0	----
EPH >C34-C50	n/a	E601F	20	mg/kg	<20	----
Hydrocarbons (QCLot: 1241798)						
VPH C6-C10	n/a	E581.VPH	5	mg/kg	<5.0	----
Hydrocarbons (QCLot: 1244077)						
EPH >C10-C16	n/a	E601F	5	mg/kg	<5.0	----
EPH >C16-C21	n/a	E601F	5	mg/kg	<5.0	----
EPH >C21-C32	n/a	E601F	5	mg/kg	<5.0	----
EPH >C34-C50	n/a	E601F	20	mg/kg	<20	----
Polycyclic Aromatic Hydrocarbons (QCLot: 1238807)						
Acenaphthene	83-32-9	E641A-L	0.005	mg/kg	<0.0050	----
Acenaphthylene	208-96-8	E641A-L	0.005	mg/kg	<0.0050	----
Anthracene	120-12-7	E641A-L	0.004	mg/kg	<0.0040	----
Benz(a)anthracene	56-55-3	E641A-L	0.01	mg/kg	<0.010	----
Benzo(a)pyrene	50-32-8	E641A-L	0.01	mg/kg	<0.010	----
Benzo(b+j)fluoranthene	n/a	E641A-L	0.01	mg/kg	<0.010	----
Benzo(g,h,i)perylene	191-24-2	E641A-L	0.01	mg/kg	<0.010	----
Benzo(k)fluoranthene	207-08-9	E641A-L	0.01	mg/kg	<0.010	----
Chrysene	218-01-9	E641A-L	0.01	mg/kg	<0.010	----

Sub-Matrix: **Soil/Solid**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Polycyclic Aromatic Hydrocarbons (QCLot: 1238807) - continued						
Dibenz(a,h)anthracene	53-70-3	E641A-L	0.005	mg/kg	<0.0050	----
Fluoranthene	206-44-0	E641A-L	0.01	mg/kg	<0.010	----
Fluorene	86-73-7	E641A-L	0.01	mg/kg	<0.010	----
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A-L	0.01	mg/kg	<0.010	----
Methylnaphthalene, 1-	90-12-0	E641A-L	0.01	mg/kg	<0.010	----
Methylnaphthalene, 2-	91-57-6	E641A-L	0.01	mg/kg	<0.010	----
Naphthalene	91-20-3	E641A-L	0.01	mg/kg	<0.010	----
Perylene	198-55-0	E641A-L	0.01	mg/kg	<0.010	----
Phenanthrene	85-01-8	E641A-L	0.01	mg/kg	<0.010	----
Pyrene	129-00-0	E641A-L	0.01	mg/kg	<0.010	----
Polycyclic Aromatic Hydrocarbons (QCLot: 1238810)						
Acenaphthene	83-32-9	E641A-L	0.005	mg/kg	<0.0050	----
Acenaphthylene	208-96-8	E641A-L	0.005	mg/kg	<0.0050	----
Acridine	260-94-6	E641A-L	0.01	mg/kg	<0.010	----
Anthracene	120-12-7	E641A-L	0.004	mg/kg	<0.0040	----
Benz(a)anthracene	56-55-3	E641A-L	0.01	mg/kg	<0.010	----
Benzo(a)pyrene	50-32-8	E641A-L	0.01	mg/kg	<0.010	----
Benzo(b+j)fluoranthene	n/a	E641A-L	0.01	mg/kg	<0.010	----
Benzo(g,h,i)perylene	191-24-2	E641A-L	0.01	mg/kg	<0.010	----
Benzo(k)fluoranthene	207-08-9	E641A-L	0.01	mg/kg	<0.010	----
Chrysene	218-01-9	E641A-L	0.01	mg/kg	<0.010	----
Dibenz(a,h)anthracene	53-70-3	E641A-L	0.005	mg/kg	<0.0050	----
Fluoranthene	206-44-0	E641A-L	0.01	mg/kg	<0.010	----
Fluorene	86-73-7	E641A-L	0.01	mg/kg	<0.010	----
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A-L	0.01	mg/kg	<0.010	----
Methylnaphthalene, 1-	90-12-0	E641A-L	0.01	mg/kg	<0.010	----
Methylnaphthalene, 2-	91-57-6	E641A-L	0.01	mg/kg	<0.010	----
Naphthalene	91-20-3	E641A-L	0.01	mg/kg	<0.010	----
Perylene	198-55-0	E641A-L	0.01	mg/kg	<0.010	----
Phenanthrene	85-01-8	E641A-L	0.01	mg/kg	<0.010	----
Pyrene	129-00-0	E641A-L	0.01	mg/kg	<0.010	----
Quinoline	91-22-5	E641A-L	0.01	mg/kg	<0.010	----
Polycyclic Aromatic Hydrocarbons (QCLot: 1242418)						
Acridine	260-94-6	E641A-L	0.01	mg/kg	<0.010	----
Quinoline	91-22-5	E641A-L	0.01	mg/kg	<0.010	----

Sub-Matrix: **Soil/Solid**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Polycyclic Aromatic Hydrocarbons (QCLot: 1242675)						
Acenaphthene	83-32-9	E641A-L	0.005	mg/kg	<0.0050	----
Acenaphthylene	208-96-8	E641A-L	0.005	mg/kg	<0.0050	----
Acridine	260-94-6	E641A-L	0.01	mg/kg	<0.010	----
Anthracene	120-12-7	E641A-L	0.004	mg/kg	<0.0040	----
Benz(a)anthracene	56-55-3	E641A-L	0.01	mg/kg	<0.010	----
Benzo(a)pyrene	50-32-8	E641A-L	0.01	mg/kg	<0.010	----
Benzo(b+j)fluoranthene	n/a	E641A-L	0.01	mg/kg	<0.010	----
Benzo(g,h,i)perylene	191-24-2	E641A-L	0.01	mg/kg	<0.010	----
Benzo(k)fluoranthene	207-08-9	E641A-L	0.01	mg/kg	<0.010	----
Chrysene	218-01-9	E641A-L	0.01	mg/kg	<0.010	----
Dibenz(a,h)anthracene	53-70-3	E641A-L	0.005	mg/kg	<0.0050	----
Fluoranthene	206-44-0	E641A-L	0.01	mg/kg	<0.010	----
Fluorene	86-73-7	E641A-L	0.01	mg/kg	<0.010	----
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A-L	0.01	mg/kg	<0.010	----
Methylnaphthalene, 1-	90-12-0	E641A-L	0.01	mg/kg	<0.010	----
Methylnaphthalene, 2-	91-57-6	E641A-L	0.01	mg/kg	<0.010	----
Naphthalene	91-20-3	E641A-L	0.01	mg/kg	<0.010	----
Perylene	198-55-0	E641A-L	0.01	mg/kg	<0.010	----
Phenanthrene	85-01-8	E641A-L	0.01	mg/kg	<0.010	----
Pyrene	129-00-0	E641A-L	0.01	mg/kg	<0.010	----
Quinoline	91-22-5	E641A-L	0.01	mg/kg	<0.010	----
Polycyclic Aromatic Hydrocarbons (QCLot: 1243130)						
Acenaphthene	83-32-9	E641A-L	0.005	mg/kg	<0.0050	----
Acenaphthylene	208-96-8	E641A-L	0.005	mg/kg	<0.0050	----
Acridine	260-94-6	E641A-L	0.01	mg/kg	<0.010	----
Anthracene	120-12-7	E641A-L	0.004	mg/kg	<0.0040	----
Benz(a)anthracene	56-55-3	E641A-L	0.01	mg/kg	<0.010	----
Benzo(a)pyrene	50-32-8	E641A-L	0.01	mg/kg	<0.010	----
Benzo(b+j)fluoranthene	n/a	E641A-L	0.01	mg/kg	<0.010	----
Benzo(g,h,i)perylene	191-24-2	E641A-L	0.01	mg/kg	<0.010	----
Benzo(k)fluoranthene	207-08-9	E641A-L	0.01	mg/kg	<0.010	----
Chrysene	218-01-9	E641A-L	0.01	mg/kg	<0.010	----
Dibenz(a,h)anthracene	53-70-3	E641A-L	0.005	mg/kg	<0.0050	----
Fluoranthene	206-44-0	E641A-L	0.01	mg/kg	<0.010	----
Fluorene	86-73-7	E641A-L	0.01	mg/kg	<0.010	----

Sub-Matrix: **Soil/Solid**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Polycyclic Aromatic Hydrocarbons (QCLot: 1243130) - continued						
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A-L	0.01	mg/kg	<0.010	----
Methylnaphthalene, 1-	90-12-0	E641A-L	0.01	mg/kg	<0.010	----
Methylnaphthalene, 2-	91-57-6	E641A-L	0.01	mg/kg	<0.010	----
Naphthalene	91-20-3	E641A-L	0.01	mg/kg	<0.010	----
Perylene	198-55-0	E641A-L	0.01	mg/kg	<0.010	----
Phenanthrene	85-01-8	E641A-L	0.01	mg/kg	<0.010	----
Pyrene	129-00-0	E641A-L	0.01	mg/kg	<0.010	----
Quinoline	91-22-5	E641A-L	0.01	mg/kg	<0.010	----
Polycyclic Aromatic Hydrocarbons (QCLot: 1246254)						
Acridine	260-94-6	E641A-L	0.01	mg/kg	<0.010	----

Qualifiers

Qualifier	Description
B	*Method Blank exceeds ALS DQO. Associated sample results which are < Limit of Reporting or > 5 times blank level are considered reliable.*

Laboratory Control Sample (LCS) Report

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

Sub-Matrix: **Soil/Solid**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 1239068)									
Moisture	----	E144	0.25	%	50 %	100	90.0	110	----
Physical Tests (QCLot: 1239170)									
Moisture	----	E144	0.25	%	50 %	98.7	90.0	110	----
Physical Tests (QCLot: 1240825)									
Moisture	----	E144	0.25	%	50 %	100	90.0	110	----
Metals (QCLot: 1239064)									
Aluminum	7429-90-5	E440	50	mg/kg	200 mg/kg	99.4	80.0	120	----
Antimony	7440-36-0	E440	0.1	mg/kg	100 mg/kg	104	80.0	120	----
Arsenic	7440-38-2	E440	0.1	mg/kg	100 mg/kg	108	80.0	120	----
Barium	7440-39-3	E440	0.5	mg/kg	25 mg/kg	103	80.0	120	----
Beryllium	7440-41-7	E440	0.1	mg/kg	10 mg/kg	104	80.0	120	----
Boron	7440-42-8	E440	5	mg/kg	100 mg/kg	102	80.0	120	----
Cadmium	7440-43-9	E440	0.02	mg/kg	10 mg/kg	101	80.0	120	----
Chromium	7440-47-3	E440	0.5	mg/kg	25 mg/kg	105	80.0	120	----
Cobalt	7440-48-4	E440	0.1	mg/kg	25 mg/kg	101	80.0	120	----
Copper	7440-50-8	E440	0.5	mg/kg	25 mg/kg	102	80.0	120	----
Iron	7439-89-6	E440	50	mg/kg	100 mg/kg	101	80.0	120	----
Lead	7439-92-1	E440	0.5	mg/kg	50 mg/kg	103	80.0	120	----
Manganese	7439-96-5	E440	1	mg/kg	25 mg/kg	103	80.0	120	----
Molybdenum	7439-98-7	E440	0.1	mg/kg	25 mg/kg	104	80.0	120	----
Nickel	7440-02-0	E440	0.5	mg/kg	50 mg/kg	102	80.0	120	----
Selenium	7782-49-2	E440	0.2	mg/kg	100 mg/kg	104	80.0	120	----
Silver	7440-22-4	E440	0.1	mg/kg	10 mg/kg	100	80.0	120	----
Strontium	7440-24-6	E440	0.5	mg/kg	25 mg/kg	110	80.0	120	----
Sulfur	7704-34-9	E440	1000	mg/kg	5000 mg/kg	104	80.0	120	----
Thallium	7440-28-0	E440	0.05	mg/kg	100 mg/kg	100	80.0	120	----
Tin	7440-31-5	E440	2	mg/kg	50 mg/kg	103	80.0	120	----
Uranium	7440-61-1	E440	0.05	mg/kg	0.5 mg/kg	101	80.0	120	----
Vanadium	7440-62-2	E440	0.2	mg/kg	50 mg/kg	106	80.0	120	----
Zinc	7440-66-6	E440	2	mg/kg	50 mg/kg	98.8	80.0	120	----
Metals (QCLot: 1239065)									
Mercury	7439-97-6	E510	0.005	mg/kg	0.1 mg/kg	100	80.0	120	----

Sub-Matrix: **Soil/Solid**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Concentration	LCS	Low	High	Qualifier
Metals (QCLot: 1239082)									
Aluminum	7429-90-5	E440	50	mg/kg	200 mg/kg	98.1	80.0	120	----
Antimony	7440-36-0	E440	0.1	mg/kg	100 mg/kg	105	80.0	120	----
Arsenic	7440-38-2	E440	0.1	mg/kg	100 mg/kg	108	80.0	120	----
Barium	7440-39-3	E440	0.5	mg/kg	25 mg/kg	100	80.0	120	----
Beryllium	7440-41-7	E440	0.1	mg/kg	10 mg/kg	98.8	80.0	120	----
Boron	7440-42-8	E440	5	mg/kg	100 mg/kg	98.2	80.0	120	----
Cadmium	7440-43-9	E440	0.02	mg/kg	10 mg/kg	103	80.0	120	----
Chromium	7440-47-3	E440	0.5	mg/kg	25 mg/kg	104	80.0	120	----
Cobalt	7440-48-4	E440	0.1	mg/kg	25 mg/kg	101	80.0	120	----
Copper	7440-50-8	E440	0.5	mg/kg	25 mg/kg	101	80.0	120	----
Iron	7439-89-6	E440	50	mg/kg	100 mg/kg	102	80.0	120	----
Lead	7439-92-1	E440	0.5	mg/kg	50 mg/kg	104	80.0	120	----
Manganese	7439-96-5	E440	1	mg/kg	25 mg/kg	104	80.0	120	----
Molybdenum	7439-98-7	E440	0.1	mg/kg	25 mg/kg	106	80.0	120	----
Nickel	7440-02-0	E440	0.5	mg/kg	50 mg/kg	102	80.0	120	----
Selenium	7782-49-2	E440	0.2	mg/kg	100 mg/kg	102	80.0	120	----
Silver	7440-22-4	E440	0.1	mg/kg	10 mg/kg	102	80.0	120	----
Strontium	7440-24-6	E440	0.5	mg/kg	25 mg/kg	116	80.0	120	----
Sulfur	7704-34-9	E440	1000	mg/kg	5000 mg/kg	95.1	80.0	120	----
Thallium	7440-28-0	E440	0.05	mg/kg	100 mg/kg	102	80.0	120	----
Tin	7440-31-5	E440	2	mg/kg	50 mg/kg	99.5	80.0	120	----
Uranium	7440-61-1	E440	0.05	mg/kg	0.5 mg/kg	101	80.0	120	----
Vanadium	7440-62-2	E440	0.2	mg/kg	50 mg/kg	106	80.0	120	----
Zinc	7440-66-6	E440	2	mg/kg	50 mg/kg	99.6	80.0	120	----
Metals (QCLot: 1239083)									
Mercury	7439-97-6	E510	0.005	mg/kg	0.1 mg/kg	112	80.0	120	----
Volatile Organic Compounds (QCLot: 1238590)									
Benzene	71-43-2	E611A	0.005	mg/kg	3.475 mg/kg	93.2	70.0	130	----
Ethylbenzene	100-41-4	E611A	0.015	mg/kg	3.475 mg/kg	98.5	70.0	130	----
Toluene	108-88-3	E611A	0.05	mg/kg	3.475 mg/kg	93.0	70.0	130	----
Xylene, m+p-	179601-23-1	E611A	0.03	mg/kg	6.95 mg/kg	102	70.0	130	----
Xylene, o-	95-47-6	E611A	0.03	mg/kg	3.475 mg/kg	103	70.0	130	----
Volatile Organic Compounds (QCLot: 1238593)									
Benzene	71-43-2	E611A	0.005	mg/kg	3.475 mg/kg	87.8	70.0	130	----
Ethylbenzene	100-41-4	E611A	0.015	mg/kg	3.475 mg/kg	86.6	70.0	130	----

Sub-Matrix: **Soil/Solid**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Volatile Organic Compounds (QCLot: 1238593) - continued									
Toluene	108-88-3	E611A	0.05	mg/kg	3.475 mg/kg	82.6	70.0	130	----
Xylene, m+p-	179601-23-1	E611A	0.03	mg/kg	6.95 mg/kg	90.7	70.0	130	----
Xylene, o-	95-47-6	E611A	0.03	mg/kg	3.475 mg/kg	93.8	70.0	130	----
Volatile Organic Compounds (QCLot: 1241797)									
Benzene	71-43-2	E611A	0.005	mg/kg	3.475 mg/kg	85.2	70.0	130	----
Ethylbenzene	100-41-4	E611A	0.015	mg/kg	3.475 mg/kg	95.3	70.0	130	----
Toluene	108-88-3	E611A	0.05	mg/kg	3.475 mg/kg	89.6	70.0	130	----
Xylene, m+p-	179601-23-1	E611A	0.03	mg/kg	6.95 mg/kg	96.7	70.0	130	----
Xylene, o-	95-47-6	E611A	0.03	mg/kg	3.475 mg/kg	98.5	70.0	130	----
Hydrocarbons (QCLot: 1238591)									
VPH C6-C10	n/a	E581.VPH	5	mg/kg	69.1875 mg/kg	99.4	80.0	120	----
Hydrocarbons (QCLot: 1238594)									
VPH C6-C10	n/a	E581.VPH	5	mg/kg	69.1875 mg/kg	# 79.6	80.0	120	LCS-L
Hydrocarbons (QCLot: 1240871)									
EPH >C10-C16	n/a	E601F	5	mg/kg	631.725 mg/kg	123	70.0	130	----
EPH >C16-C21	n/a	E601F	5	mg/kg	601.7625 mg/kg	79.6	70.0	130	----
EPH >C21-C32	n/a	E601F	5	mg/kg	439.9125 mg/kg	117	70.0	130	----
EPH >C34-C50	n/a	E601F	20	mg/kg	724.5 mg/kg	104	70.0	130	----
Hydrocarbons (QCLot: 1241798)									
VPH C6-C10	n/a	E581.VPH	5	mg/kg	69.1875 mg/kg	91.7	80.0	120	----
Hydrocarbons (QCLot: 1244077)									
EPH >C10-C16	n/a	E601F	5	mg/kg	799.3688 mg/kg	89.0	70.0	130	----
EPH >C16-C21	n/a	E601F	5	mg/kg	437.2594 mg/kg	114	70.0	130	----
EPH >C21-C32	n/a	E601F	5	mg/kg	565.0313 mg/kg	100	70.0	130	----
EPH >C34-C50	n/a	E601F	20	mg/kg	576.6844 mg/kg	118	70.0	130	----
Polycyclic Aromatic Hydrocarbons (QCLot: 1238807)									
Acenaphthene	83-32-9	E641A-L	0.005	mg/kg	0.5 mg/kg	86.9	60.0	130	----
Acenaphthylene	208-96-8	E641A-L	0.005	mg/kg	0.5 mg/kg	89.9	60.0	130	----
Anthracene	120-12-7	E641A-L	0.004	mg/kg	0.5 mg/kg	89.9	60.0	130	----
Benz(a)anthracene	56-55-3	E641A-L	0.01	mg/kg	0.5 mg/kg	89.8	60.0	130	----
Benzo(a)pyrene	50-32-8	E641A-L	0.01	mg/kg	0.5 mg/kg	83.9	60.0	130	----
Benzo(b+j)fluoranthene	n/a	E641A-L	0.01	mg/kg	0.5 mg/kg	91.9	60.0	130	----
Benzo(g,h,i)perylene	191-24-2	E641A-L	0.01	mg/kg	0.5 mg/kg	85.3	60.0	130	----
Benzo(k)fluoranthene	207-08-9	E641A-L	0.01	mg/kg	0.5 mg/kg	89.2	60.0	130	----

Sub-Matrix: **Soil/Solid**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Polycyclic Aromatic Hydrocarbons (QCLot: 1238807) - continued									
Chrysene	218-01-9	E641A-L	0.01	mg/kg	0.5 mg/kg	76.8	60.0	130	----
Dibenz(a,h)anthracene	53-70-3	E641A-L	0.005	mg/kg	0.5 mg/kg	77.3	60.0	130	----
Fluoranthene	206-44-0	E641A-L	0.01	mg/kg	0.5 mg/kg	91.9	60.0	130	----
Fluorene	86-73-7	E641A-L	0.01	mg/kg	0.5 mg/kg	92.4	60.0	130	----
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A-L	0.01	mg/kg	0.5 mg/kg	91.5	60.0	130	----
Methylnaphthalene, 1-	90-12-0	E641A-L	0.01	mg/kg	0.5 mg/kg	79.7	60.0	130	----
Methylnaphthalene, 2-	91-57-6	E641A-L	0.01	mg/kg	0.5 mg/kg	86.4	60.0	130	----
Naphthalene	91-20-3	E641A-L	0.01	mg/kg	0.5 mg/kg	78.0	60.0	130	----
Perylene	198-55-0	E641A-L	0.01	mg/kg	0.5 mg/kg	98.4	60.0	130	----
Phenanthrene	85-01-8	E641A-L	0.01	mg/kg	0.5 mg/kg	88.9	60.0	130	----
Pyrene	129-00-0	E641A-L	0.01	mg/kg	0.5 mg/kg	89.6	60.0	130	----
Polycyclic Aromatic Hydrocarbons (QCLot: 1238810)									
Acenaphthene	83-32-9	E641A-L	0.005	mg/kg	0.5 mg/kg	85.7	60.0	130	----
Acenaphthylene	208-96-8	E641A-L	0.005	mg/kg	0.5 mg/kg	89.2	60.0	130	----
Acridine	260-94-6	E641A-L	0.01	mg/kg	0.5 mg/kg	92.1	60.0	130	----
Anthracene	120-12-7	E641A-L	0.004	mg/kg	0.5 mg/kg	89.8	60.0	130	----
Benz(a)anthracene	56-55-3	E641A-L	0.01	mg/kg	0.5 mg/kg	92.4	60.0	130	----
Benzo(a)pyrene	50-32-8	E641A-L	0.01	mg/kg	0.5 mg/kg	82.7	60.0	130	----
Benzo(b+j)fluoranthene	n/a	E641A-L	0.01	mg/kg	0.5 mg/kg	93.3	60.0	130	----
Benzo(g,h,i)perylene	191-24-2	E641A-L	0.01	mg/kg	0.5 mg/kg	93.1	60.0	130	----
Benzo(k)fluoranthene	207-08-9	E641A-L	0.01	mg/kg	0.5 mg/kg	90.3	60.0	130	----
Chrysene	218-01-9	E641A-L	0.01	mg/kg	0.5 mg/kg	74.7	60.0	130	----
Dibenz(a,h)anthracene	53-70-3	E641A-L	0.005	mg/kg	0.5 mg/kg	73.3	60.0	130	----
Fluoranthene	206-44-0	E641A-L	0.01	mg/kg	0.5 mg/kg	89.0	60.0	130	----
Fluorene	86-73-7	E641A-L	0.01	mg/kg	0.5 mg/kg	90.4	60.0	130	----
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A-L	0.01	mg/kg	0.5 mg/kg	98.9	60.0	130	----
Methylnaphthalene, 1-	90-12-0	E641A-L	0.01	mg/kg	0.5 mg/kg	78.7	60.0	130	----
Methylnaphthalene, 2-	91-57-6	E641A-L	0.01	mg/kg	0.5 mg/kg	87.5	60.0	130	----
Naphthalene	91-20-3	E641A-L	0.01	mg/kg	0.5 mg/kg	80.2	60.0	130	----
Perylene	198-55-0	E641A-L	0.01	mg/kg	0.5 mg/kg	92.8	60.0	130	----
Phenanthrene	85-01-8	E641A-L	0.01	mg/kg	0.5 mg/kg	87.5	60.0	130	----
Pyrene	129-00-0	E641A-L	0.01	mg/kg	0.5 mg/kg	87.6	60.0	130	----
Quinoline	91-22-5	E641A-L	0.01	mg/kg	0.5 mg/kg	84.0	60.0	130	----
Polycyclic Aromatic Hydrocarbons (QCLot: 1242418)									
Acridine	260-94-6	E641A-L	0.01	mg/kg	0.5 mg/kg	74.8	60.0	130	----
Quinoline	91-22-5	E641A-L	0.01	mg/kg	0.5 mg/kg	75.2	60.0	130	----

Sub-Matrix: **Soil/Solid**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Polycyclic Aromatic Hydrocarbons (QCLot: 1242675)									
Acenaphthene	83-32-9	E641A-L	0.005	mg/kg	0.5 mg/kg	85.7	60.0	130	----
Acenaphthylene	208-96-8	E641A-L	0.005	mg/kg	0.5 mg/kg	86.1	60.0	130	----
Acridine	260-94-6	E641A-L	0.01	mg/kg	0.5 mg/kg	78.4	60.0	130	----
Anthracene	120-12-7	E641A-L	0.004	mg/kg	0.5 mg/kg	86.2	60.0	130	----
Benz(a)anthracene	56-55-3	E641A-L	0.01	mg/kg	0.5 mg/kg	91.4	60.0	130	----
Benzo(a)pyrene	50-32-8	E641A-L	0.01	mg/kg	0.5 mg/kg	80.3	60.0	130	----
Benzo(b+j)fluoranthene	n/a	E641A-L	0.01	mg/kg	0.5 mg/kg	86.3	60.0	130	----
Benzo(g,h,i)perylene	191-24-2	E641A-L	0.01	mg/kg	0.5 mg/kg	87.7	60.0	130	----
Benzo(k)fluoranthene	207-08-9	E641A-L	0.01	mg/kg	0.5 mg/kg	86.4	60.0	130	----
Chrysene	218-01-9	E641A-L	0.01	mg/kg	0.5 mg/kg	83.0	60.0	130	----
Dibenz(a,h)anthracene	53-70-3	E641A-L	0.005	mg/kg	0.5 mg/kg	74.2	60.0	130	----
Fluoranthene	206-44-0	E641A-L	0.01	mg/kg	0.5 mg/kg	87.3	60.0	130	----
Fluorene	86-73-7	E641A-L	0.01	mg/kg	0.5 mg/kg	88.1	60.0	130	----
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A-L	0.01	mg/kg	0.5 mg/kg	93.5	60.0	130	----
Methylnaphthalene, 1-	90-12-0	E641A-L	0.01	mg/kg	0.5 mg/kg	75.7	60.0	130	----
Methylnaphthalene, 2-	91-57-6	E641A-L	0.01	mg/kg	0.5 mg/kg	82.8	60.0	130	----
Naphthalene	91-20-3	E641A-L	0.01	mg/kg	0.5 mg/kg	65.6	60.0	130	----
Perylene	198-55-0	E641A-L	0.01	mg/kg	0.5 mg/kg	93.6	60.0	130	----
Phenanthrene	85-01-8	E641A-L	0.01	mg/kg	0.5 mg/kg	85.2	60.0	130	----
Pyrene	129-00-0	E641A-L	0.01	mg/kg	0.5 mg/kg	84.6	60.0	130	----
Quinoline	91-22-5	E641A-L	0.01	mg/kg	0.5 mg/kg	79.0	60.0	130	----
Polycyclic Aromatic Hydrocarbons (QCLot: 1243130)									
Acenaphthene	83-32-9	E641A-L	0.005	mg/kg	0.5 mg/kg	93.3	60.0	130	----
Acenaphthylene	208-96-8	E641A-L	0.005	mg/kg	0.5 mg/kg	94.0	60.0	130	----
Acridine	260-94-6	E641A-L	0.01	mg/kg	0.5 mg/kg	86.8	60.0	130	----
Anthracene	120-12-7	E641A-L	0.004	mg/kg	0.5 mg/kg	89.1	60.0	130	----
Benz(a)anthracene	56-55-3	E641A-L	0.01	mg/kg	0.5 mg/kg	91.5	60.0	130	----
Benzo(a)pyrene	50-32-8	E641A-L	0.01	mg/kg	0.5 mg/kg	88.7	60.0	130	----
Benzo(b+j)fluoranthene	n/a	E641A-L	0.01	mg/kg	0.5 mg/kg	94.4	60.0	130	----
Benzo(g,h,i)perylene	191-24-2	E641A-L	0.01	mg/kg	0.5 mg/kg	94.0	60.0	130	----
Benzo(k)fluoranthene	207-08-9	E641A-L	0.01	mg/kg	0.5 mg/kg	94.7	60.0	130	----
Chrysene	218-01-9	E641A-L	0.01	mg/kg	0.5 mg/kg	81.8	60.0	130	----
Dibenz(a,h)anthracene	53-70-3	E641A-L	0.005	mg/kg	0.5 mg/kg	79.1	60.0	130	----
Fluoranthene	206-44-0	E641A-L	0.01	mg/kg	0.5 mg/kg	93.0	60.0	130	----
Fluorene	86-73-7	E641A-L	0.01	mg/kg	0.5 mg/kg	94.2	60.0	130	----
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A-L	0.01	mg/kg	0.5 mg/kg	94.1	60.0	130	----

Sub-Matrix: **Soil/Solid**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Polycyclic Aromatic Hydrocarbons (QCLot: 1243130) - continued									
Methylnaphthalene, 1-	90-12-0	E641A-L	0.01	mg/kg	0.5 mg/kg	87.8	60.0	130	----
Methylnaphthalene, 2-	91-57-6	E641A-L	0.01	mg/kg	0.5 mg/kg	96.5	60.0	130	----
Naphthalene	91-20-3	E641A-L	0.01	mg/kg	0.5 mg/kg	86.8	60.0	130	----
Perylene	198-55-0	E641A-L	0.01	mg/kg	0.5 mg/kg	101	60.0	130	----
Phenanthrene	85-01-8	E641A-L	0.01	mg/kg	0.5 mg/kg	89.6	60.0	130	----
Pyrene	129-00-0	E641A-L	0.01	mg/kg	0.5 mg/kg	90.9	60.0	130	----
Quinoline	91-22-5	E641A-L	0.01	mg/kg	0.5 mg/kg	84.3	60.0	130	----
Polycyclic Aromatic Hydrocarbons (QCLot: 1246254)									
Acridine	260-94-6	E641A-L	0.01	mg/kg	0.5 mg/kg	81.5	60.0	130	----

Qualifiers

Qualifier	Description
LCS-L	*Lab Control Sample recovery was below ALS DQO. Reference Material and/or Matrix Spike results were acceptable. Non-detected sample results are considered reliable. Other results, if reported, have been qualified.*

Matrix Spike (MS) Report

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

Sub-Matrix: **Soil/Solid**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Volatile Organic Compounds (QCLot: 1238590)										
HA2301055-001	BH1 0-0.15m	Benzene	71-43-2	E611A	3.38 mg/kg	3.125 mg/kg	91.2	60.0	140	----
		Ethylbenzene	100-41-4	E611A	3.43 mg/kg	3.125 mg/kg	92.4	60.0	140	----
		Toluene	108-88-3	E611A	3.31 mg/kg	3.125 mg/kg	89.1	60.0	140	----
		Xylene, m+p-	179601-23-1	E611A	7.10 mg/kg	6.25 mg/kg	95.6	60.0	140	----
		Xylene, o-	95-47-6	E611A	3.57 mg/kg	3.125 mg/kg	96.0	60.0	140	----
Volatile Organic Compounds (QCLot: 1238593)										
HA2301055-036	BH33 0-0.15m	Benzene	71-43-2	E611A	2.08 mg/kg	3.125 mg/kg	94.3	60.0	140	----
		Ethylbenzene	100-41-4	E611A	2.18 mg/kg	3.125 mg/kg	98.7	60.0	140	----
		Toluene	108-88-3	E611A	1.98 mg/kg	3.125 mg/kg	89.6	60.0	140	----
		Xylene, m+p-	179601-23-1	E611A	4.46 mg/kg	6.25 mg/kg	101	60.0	140	----
		Xylene, o-	95-47-6	E611A	2.24 mg/kg	3.125 mg/kg	101	60.0	140	----
Volatile Organic Compounds (QCLot: 1241797)										
HA2301055-015	BH DUPC 0-0.15m	Benzene	71-43-2	E611A	2.16 mg/kg	3.125 mg/kg	93.6	60.0	140	----
		Ethylbenzene	100-41-4	E611A	2.35 mg/kg	3.125 mg/kg	102	60.0	140	----
		Toluene	108-88-3	E611A	2.22 mg/kg	3.125 mg/kg	96.2	60.0	140	----
		Xylene, m+p-	179601-23-1	E611A	4.74 mg/kg	6.25 mg/kg	103	60.0	140	----
		Xylene, o-	95-47-6	E611A	2.40 mg/kg	3.125 mg/kg	104	60.0	140	----
Hydrocarbons (QCLot: 1238591)										
HA2301055-001	BH1 0-0.15m	VPH C6-C10	n/a	E581.VPH	70.9 mg/kg	62.5 mg/kg	95.5	60.0	140	----
Hydrocarbons (QCLot: 1238594)										
HA2301055-036	BH33 0-0.15m	VPH C6-C10	n/a	E581.VPH	37.8 mg/kg	62.5 mg/kg	85.6	60.0	140	----
Hydrocarbons (QCLot: 1240871)										
HA2301055-037	BH34 0-0.15m	EPH >C10-C16	n/a	E601F	558 mg/kg	631.725 mg/kg	112	60.0	140	----
		EPH >C16-C21	n/a	E601F	516 mg/kg	601.7625 mg/kg	109	60.0	140	----
		EPH >C21-C32	n/a	E601F	351 mg/kg	439.9125 mg/kg	102	60.0	140	----
		EPH >C34-C50	n/a	E601F	557 mg/kg	724.5 mg/kg	97.8	60.0	140	----
Hydrocarbons (QCLot: 1241798)										
HA2301055-015	BH DUPC 0-0.15m	VPH C6-C10	n/a	E581.VPH	45.2 mg/kg	62.5 mg/kg	98.0	60.0	140	----
Hydrocarbons (QCLot: 1244077)										

Sub-Matrix: **Soil/Solid**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Hydrocarbons (QCLot: 1244077) - continued										
HA2301055-001	BH1 0-0.15m	EPH >C10-C16	n/a	E601F	507 mg/kg	799.3688 mg/kg	76.7	60.0	140	----
		EPH >C16-C21	n/a	E601F	434 mg/kg	437.2594 mg/kg	120	60.0	140	----
		EPH >C21-C32	n/a	E601F	341 mg/kg	565.0313 mg/kg	73.0	60.0	140	----
		EPH >C34-C50	n/a	E601F	459 mg/kg	576.6844 mg/kg	96.3	60.0	140	----
Polycyclic Aromatic Hydrocarbons (QCLot: 1238807)										
HA2301055-001	BH1 0-0.15m	Acenaphthene	83-32-9	E641A-L	0.362 mg/kg	0.5 mg/kg	85.9	50.0	140	----
		Acenaphthylene	208-96-8	E641A-L	0.376 mg/kg	0.5 mg/kg	89.3	50.0	140	----
		Anthracene	120-12-7	E641A-L	0.389 mg/kg	0.5 mg/kg	92.4	50.0	140	----
		Benz(a)anthracene	56-55-3	E641A-L	0.364 mg/kg	0.5 mg/kg	86.5	50.0	140	----
		Benzo(a)pyrene	50-32-8	E641A-L	0.330 mg/kg	0.5 mg/kg	78.4	50.0	140	----
		Benzo(b+j)fluoranthene	n/a	E641A-L	0.362 mg/kg	0.5 mg/kg	85.9	50.0	140	----
		Benzo(g,h,i)perylene	191-24-2	E641A-L	0.285 mg/kg	0.5 mg/kg	67.8	50.0	140	----
		Benzo(k)fluoranthene	207-08-9	E641A-L	0.361 mg/kg	0.5 mg/kg	85.7	50.0	140	----
		Chrysene	218-01-9	E641A-L	0.298 mg/kg	0.5 mg/kg	70.7	50.0	140	----
		Dibenz(a,h)anthracene	53-70-3	E641A-L	0.284 mg/kg	0.5 mg/kg	67.4	50.0	140	----
		Fluoranthene	206-44-0	E641A-L	0.370 mg/kg	0.5 mg/kg	88.0	50.0	140	----
		Fluorene	86-73-7	E641A-L	0.387 mg/kg	0.5 mg/kg	91.9	50.0	140	----
		Indeno(1,2,3-c,d)pyrene	193-39-5	E641A-L	0.330 mg/kg	0.5 mg/kg	78.5	50.0	140	----
		Methylnaphthalene, 1-	90-12-0	E641A-L	0.340 mg/kg	0.5 mg/kg	80.8	50.0	140	----
		Methylnaphthalene, 2-	91-57-6	E641A-L	0.388 mg/kg	0.5 mg/kg	92.0	50.0	140	----
		Naphthalene	91-20-3	E641A-L	0.368 mg/kg	0.5 mg/kg	87.4	50.0	140	----
		Perylene	198-55-0	E641A-L	0.357 mg/kg	0.5 mg/kg	84.8	50.0	140	----
		Phenanthrene	85-01-8	E641A-L	0.382 mg/kg	0.5 mg/kg	90.7	50.0	140	----
		Pyrene	129-00-0	E641A-L	0.364 mg/kg	0.5 mg/kg	86.4	50.0	140	----
Polycyclic Aromatic Hydrocarbons (QCLot: 1238810)										
HA2301055-025	BH22 0-0.15m	Acenaphthene	83-32-9	E641A-L	0.340 mg/kg	0.5 mg/kg	86.9	50.0	140	----
		Acenaphthylene	208-96-8	E641A-L	0.354 mg/kg	0.5 mg/kg	90.2	50.0	140	----
		Acridine	260-94-6	E641A-L	0.308 mg/kg	0.5 mg/kg	78.5	50.0	140	----
		Anthracene	120-12-7	E641A-L	0.346 mg/kg	0.5 mg/kg	88.2	50.0	140	----
		Benz(a)anthracene	56-55-3	E641A-L	0.297 mg/kg	0.5 mg/kg	75.8	50.0	140	----
		Benzo(a)pyrene	50-32-8	E641A-L	0.273 mg/kg	0.5 mg/kg	69.7	50.0	140	----
		Benzo(b+j)fluoranthene	n/a	E641A-L	0.286 mg/kg	0.5 mg/kg	73.0	50.0	140	----
		Benzo(g,h,i)perylene	191-24-2	E641A-L	0.296 mg/kg	0.5 mg/kg	75.6	50.0	140	----
		Benzo(k)fluoranthene	207-08-9	E641A-L	0.328 mg/kg	0.5 mg/kg	83.7	50.0	140	----
		Chrysene	218-01-9	E641A-L	0.235 mg/kg	0.5 mg/kg	59.9	50.0	140	----

Sub-Matrix: **Soil/Solid**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Polycyclic Aromatic Hydrocarbons (QCLot: 1238810) - continued										
HA2301055-025	BH22 0-0.15m	Dibenz(a,h)anthracene	53-70-3	E641A-L	0.271 mg/kg	0.5 mg/kg	69.1	50.0	140	----
		Fluoranthene	206-44-0	E641A-L	0.257 mg/kg	0.5 mg/kg	65.6	50.0	140	----
		Fluorene	86-73-7	E641A-L	0.361 mg/kg	0.5 mg/kg	92.1	50.0	140	----
		Indeno(1,2,3-c,d)pyrene	193-39-5	E641A-L	0.327 mg/kg	0.5 mg/kg	83.5	50.0	140	----
		Methylnaphthalene, 1-	90-12-0	E641A-L	0.324 mg/kg	0.5 mg/kg	82.7	50.0	140	----
		Methylnaphthalene, 2-	91-57-6	E641A-L	0.364 mg/kg	0.5 mg/kg	93.0	50.0	140	----
		Naphthalene	91-20-3	E641A-L	0.346 mg/kg	0.5 mg/kg	88.1	50.0	140	----
		Perylene	198-55-0	E641A-L	0.337 mg/kg	0.5 mg/kg	86.0	50.0	140	----
		Phenanthrene	85-01-8	E641A-L	0.304 mg/kg	0.5 mg/kg	77.5	50.0	140	----
		Pyrene	129-00-0	E641A-L	0.268 mg/kg	0.5 mg/kg	68.5	50.0	140	----
		Quinoline	91-22-5	E641A-L	0.313 mg/kg	0.5 mg/kg	79.8	50.0	140	----
Polycyclic Aromatic Hydrocarbons (QCLot: 1242418)										
HA2301055-001	BH1 0-0.15m	Acridine	260-94-6	E641A-L	8.34 mg/kg	1.5 mg/kg	67.7	50.0	140	----
		Quinoline	91-22-5	E641A-L	9.39 mg/kg	1.5 mg/kg	76.2	50.0	140	----
Polycyclic Aromatic Hydrocarbons (QCLot: 1242675)										
HA2301055-015	BH DUPC 0-0.15m	Acenaphthene	83-32-9	E641A-L	0.336 mg/kg	0.5 mg/kg	82.7	50.0	140	----
		Acenaphthylene	208-96-8	E641A-L	0.339 mg/kg	0.5 mg/kg	83.3	50.0	140	----
		Anthracene	120-12-7	E641A-L	0.328 mg/kg	0.5 mg/kg	80.8	50.0	140	----
		Benz(a)anthracene	56-55-3	E641A-L	0.310 mg/kg	0.5 mg/kg	76.4	50.0	140	----
		Benzo(a)pyrene	50-32-8	E641A-L	0.243 mg/kg	0.5 mg/kg	59.7	50.0	140	----
		Benzo(b+j)fluoranthene	n/a	E641A-L	0.288 mg/kg	0.5 mg/kg	70.9	50.0	140	----
		Benzo(g,h,i)perylene	191-24-2	E641A-L	0.208 mg/kg	0.5 mg/kg	51.2	50.0	140	----
		Benzo(k)fluoranthene	207-08-9	E641A-L	0.289 mg/kg	0.5 mg/kg	71.1	50.0	140	----
		Chrysene	218-01-9	E641A-L	0.253 mg/kg	0.5 mg/kg	62.1	50.0	140	----
		Dibenz(a,h)anthracene	53-70-3	E641A-L	0.216 mg/kg	0.5 mg/kg	53.2	50.0	140	----
		Fluoranthene	206-44-0	E641A-L	0.313 mg/kg	0.5 mg/kg	77.0	50.0	140	----
		Fluorene	86-73-7	E641A-L	0.349 mg/kg	0.5 mg/kg	85.8	50.0	140	----
		Indeno(1,2,3-c,d)pyrene	193-39-5	E641A-L	0.226 mg/kg	0.5 mg/kg	55.5	50.0	140	----
		Methylnaphthalene, 1-	90-12-0	E641A-L	0.304 mg/kg	0.5 mg/kg	74.7	50.0	140	----
		Methylnaphthalene, 2-	91-57-6	E641A-L	0.338 mg/kg	0.5 mg/kg	83.2	50.0	140	----
		Naphthalene	91-20-3	E641A-L	0.328 mg/kg	0.5 mg/kg	80.6	50.0	140	----
		Perylene	198-55-0	E641A-L	0.266 mg/kg	0.5 mg/kg	65.4	50.0	140	----
		Phenanthrene	85-01-8	E641A-L	0.314 mg/kg	0.5 mg/kg	77.2	50.0	140	----
		Pyrene	129-00-0	E641A-L	0.310 mg/kg	0.5 mg/kg	76.3	50.0	140	----
		Quinoline	91-22-5	E641A-L	0.098 mg/kg	0.5 mg/kg	24.1	50.0	140	K

Sub-Matrix: **Soil/Solid**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Polycyclic Aromatic Hydrocarbons (QCLot: 1243130)										
HA2301055-036	BH33 0-0.15m	Acridine	260-94-6	E641A-L	10.9 mg/kg	1.5 mg/kg	88.0	50.0	140	----
Polycyclic Aromatic Hydrocarbons (QCLot: 1246254)										
HA2301055-015	BH DUPC 0-0.15m	Acridine	260-94-6	E641A-L	2.11 mg/kg	0.5 mg/kg	104	50.0	140	----

Qualifiers

Qualifier	Description
K	*Matrix Spike recovery outside ALS DQO due to sample matrix effects.*

Reference Material (RM) Report

A Reference Material (RM) is a homogenous material with known and well-established analyte concentrations. RMs are processed in an identical manner to test samples, and are used to monitor and control the accuracy and precision of a test method for a typical sample matrix. RM results are expressed as percent recovery of the target analyte concentration. RM targets may be certified target concentrations provided by the RM supplier, or may be ALS long-term mean values (for empirical test methods).

Sub-Matrix:

					Reference Material (RM) Report				
					RM Target	Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Reference Material ID	Analyte	CAS Number	Method	Concentration	RM	Low	High	Qualifier
Metals (QCLot: 1239064)									
	RM	Aluminum	7429-90-5	E440	9817 mg/kg	109	70.0	130	----
	RM	Antimony	7440-36-0	E440	3.99 mg/kg	102	70.0	130	----
	RM	Arsenic	7440-38-2	E440	3.73 mg/kg	103	70.0	130	----
	RM	Barium	7440-39-3	E440	105 mg/kg	108	70.0	130	----
	RM	Beryllium	7440-41-7	E440	0.349 mg/kg	110	70.0	130	----
	RM	Boron	7440-42-8	E440	8.5 mg/kg	125	70.0	130	----
	RM	Cadmium	7440-43-9	E440	0.91 mg/kg	108	70.0	130	----
	RM	Chromium	7440-47-3	E440	101 mg/kg	109	70.0	130	----
	RM	Cobalt	7440-48-4	E440	6.9 mg/kg	106	70.0	130	----
	RM	Copper	7440-50-8	E440	123 mg/kg	107	70.0	130	----
	RM	Iron	7439-89-6	E440	23558 mg/kg	104	70.0	130	----
	RM	Lead	7439-92-1	E440	267 mg/kg	104	70.0	130	----
	RM	Manganese	7439-96-5	E440	269 mg/kg	114	70.0	130	----
	RM	Molybdenum	7439-98-7	E440	1.03 mg/kg	108	70.0	130	----
	RM	Nickel	7440-02-0	E440	26.7 mg/kg	109	70.0	130	----
	RM	Silver	7440-22-4	E440	4.06 mg/kg	92.1	70.0	130	----
	RM	Strontium	7440-24-6	E440	86.1 mg/kg	104	70.0	130	----
	RM	Thallium	7440-28-0	E440	0.0786 mg/kg	103	70.0	130	----
	RM	Tin	7440-31-5	E440	10.6 mg/kg	95.0	70.0	130	----
	RM	Uranium	7440-61-1	E440	0.52 mg/kg	107	70.0	130	----
	RM	Vanadium	7440-62-2	E440	32.7 mg/kg	108	70.0	130	----
	RM	Zinc	7440-66-6	E440	297 mg/kg	99.8	70.0	130	----
Metals (QCLot: 1239065)									
	RM	Mercury	7439-97-6	E510	0.0585 mg/kg	110	70.0	130	----
Metals (QCLot: 1239082)									
	RM	Aluminum	7429-90-5	E440	9817 mg/kg	102	70.0	130	----
	RM	Antimony	7440-36-0	E440	3.99 mg/kg	94.9	70.0	130	----
	RM	Arsenic	7440-38-2	E440	3.73 mg/kg	102	70.0	130	----

Sub-Matrix:

					Reference Material (RM) Report				
					RM Target	Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Reference Material ID	Analyte	CAS Number	Method	Concentration	RM	Low	High	Qualifier
Metals (QCLot: 1239082) - continued									
	RM	Barium	7440-39-3	E440	105 mg/kg	105	70.0	130	----
	RM	Beryllium	7440-41-7	E440	0.349 mg/kg	94.9	70.0	130	----
	RM	Boron	7440-42-8	E440	8.5 mg/kg	106	70.0	130	----
	RM	Cadmium	7440-43-9	E440	0.91 mg/kg	120	70.0	130	----
	RM	Chromium	7440-47-3	E440	101 mg/kg	101	70.0	130	----
	RM	Cobalt	7440-48-4	E440	6.9 mg/kg	102	70.0	130	----
	RM	Copper	7440-50-8	E440	123 mg/kg	104	70.0	130	----
	RM	Iron	7439-89-6	E440	23558 mg/kg	104	70.0	130	----
	RM	Lead	7439-92-1	E440	267 mg/kg	102	70.0	130	----
	RM	Manganese	7439-96-5	E440	269 mg/kg	106	70.0	130	----
	RM	Molybdenum	7439-98-7	E440	1.03 mg/kg	104	70.0	130	----
	RM	Nickel	7440-02-0	E440	26.7 mg/kg	105	70.0	130	----
	RM	Silver	7440-22-4	E440	4.06 mg/kg	85.8	70.0	130	----
	RM	Strontium	7440-24-6	E440	86.1 mg/kg	104	70.0	130	----
	RM	Thallium	7440-28-0	E440	0.0786 mg/kg	99.3	70.0	130	----
	RM	Tin	7440-31-5	E440	10.6 mg/kg	96.2	70.0	130	----
	RM	Uranium	7440-61-1	E440	0.52 mg/kg	97.7	70.0	130	----
	RM	Vanadium	7440-62-2	E440	32.7 mg/kg	102	70.0	130	----
	RM	Zinc	7440-66-6	E440	297 mg/kg	100	70.0	130	----
Metals (QCLot: 1239083)									
	RM	Mercury	7439-97-6	E510	0.0585 mg/kg	109	70.0	130	----

ALS Canada Ltd.

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CERTIFICATE OF ANALYSIS

Work Order	: **HA2301063**	Page	: 1 of 6
Client	: **Dillon Consulting Limited**	Laboratory	: ALS Environmental - Halifax
Contact	: Shauna Gallant	Account Manager	: Andrew Martin
Address	: 137 Chain Lake Drive Halifax NS Canada B3S 1B3	Address	: 13-100 Wright Ave Dartmouth NS Canada B3B 1L2
Telephone	: 902-450-4000 ext 5039	Telephone	: +1 902 707 4888
Project	: 236465	Date Samples Received	: 15-Nov-2023 10:00
PO	: ----	Date Analysis Commenced	: 16-Nov-2023
C-O-C number	: ----	Issue Date	: 22-Nov-2023 17:40
Sampler	: MK/EJM		
Site	: Build NS (Country Harbour)		
Quote number	: HA23-DICL100-12 - Lump Sum Rate - Build NS (Country Harbour)		
No. of samples received	: 1		
No. of samples analysed	: 1		

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Laboratory Department*
Jeremy Gingras	Supervisor - Semi-Volatile Instrumentation	Organics, Waterloo, Ontario
Jon Fisher	Production Manager, Environmental	Metals, Waterloo, Ontario
Niral Patel		Centralized Prep, Waterloo, Ontario
Sarah Birch	VOC Section Supervisor	VOC, Waterloo, Ontario

General Comments

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

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

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

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

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances

LOR: Limit of Reporting (detection limit).

Unit	*Description*
-	no units
%	percent
mg/kg	milligrams per kilogram
none	none

<: less than.

>: greater than.

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

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

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

Sample Comments

Sample	Client Id	*Comment*
HA2301063-001	BH13 0-0.015m	LOF: Lube oil fraction

Qualifiers

Qualifier	*Description*
DLHC	*Detection Limit Raised: Dilution required due to high concentration of test analyte(s).*
DLHM	*Detection Limit Adjusted: Sample has high moisture content.*
DLM	*Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).*
EMPC	*Estimated Maximum Possible Concentration. Parameter detected but didn't meet all criteria for positive identification.*

Analytical Results

Sub-Matrix: **Soil**
(Matrix: **Soil/Solid**)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID: BH13 0-0.015m	----	----	----	----
					Client sampling date / time: 10-Nov-2023 00:00	----	----	----	----
					HA2301063-001	--------	--------	--------	--------
					Result	----	----	----	----
Physical Tests									
Moisture	----	E144/WT	0.25	%	52.2	----	----	----	----
Metals									
Aluminum	7429-90-5	E440/WT	50	mg/kg	17300	----	----	----	----
Antimony	7440-36-0	E440/WT	0.10	mg/kg	1.48	----	----	----	----
Arsenic	7440-38-2	E440/WT	0.10	mg/kg	998 DLHC	----	----	----	----
Barium	7440-39-3	E440/WT	0.50	mg/kg	73.4	----	----	----	----
Beryllium	7440-41-7	E440/WT	0.10	mg/kg	0.60	----	----	----	----
Boron	7440-42-8	E440/WT	5.0	mg/kg	<5.0	----	----	----	----
Cadmium	7440-43-9	E440/WT	0.020	mg/kg	0.223	----	----	----	----
Chromium	7440-47-3	E440/WT	0.50	mg/kg	22.1	----	----	----	----
Cobalt	7440-48-4	E440/WT	0.10	mg/kg	4.36	----	----	----	----
Copper	7440-50-8	E440/WT	0.50	mg/kg	20.4	----	----	----	----
Iron	7439-89-6	E440/WT	50	mg/kg	21600	----	----	----	----
Lead	7439-92-1	E440/WT	0.50	mg/kg	140	----	----	----	----
Manganese	7439-96-5	E440/WT	1.0	mg/kg	517	----	----	----	----
Mercury	7439-97-6	E510/WT	0.0050	mg/kg	22.9 DLHC	----	----	----	----
Molybdenum	7439-98-7	E440/WT	0.10	mg/kg	0.39	----	----	----	----
Nickel	7440-02-0	E440/WT	0.50	mg/kg	9.99	----	----	----	----
Selenium	7782-49-2	E440/WT	0.20	mg/kg	0.71	----	----	----	----
Silver	7440-22-4	E440/WT	0.10	mg/kg	0.48	----	----	----	----
Strontium	7440-24-6	E440/WT	0.50	mg/kg	10.6	----	----	----	----
Sulfur	7704-34-9	E440/WT	1000	mg/kg	<1000	----	----	----	----
Thallium	7440-28-0	E440/WT	0.050	mg/kg	0.184	----	----	----	----
Tin	7440-31-5	E440/WT	2.0	mg/kg	3.6	----	----	----	----
Uranium	7440-61-1	E440/WT	0.050	mg/kg	1.06	----	----	----	----
Vanadium	7440-62-2	E440/WT	0.20	mg/kg	30.5	----	----	----	----
Zinc	7440-66-6	E440/WT	2.0	mg/kg	125	----	----	----	----
Hydrocarbon Distribution of RBCA mTPH (Tier I) Fractions									
C6-C10 fraction of mTPH	n/a	EC581D/WT	1	%	<1	----	----	----	----

Analytical Results

Sub-Matrix: Soil (Matrix: Soil/Solid)					Client sample ID	BH13 0-0.015m	----	----	----	----
					Client sampling date / time	10-Nov-2023 00:00	----	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit		HA2301063-001	--------	--------	--------	--------
						Result	----	----	----	----
Hydrocarbon Distribution of RBCA mTPH (Tier I) Fractions										
>C10-C16 fraction of mTPH	n/a	EC581D/WT	1	%		<1	----	----	----	----
>C16-C21 fraction of mTPH	n/a	EC581D/WT	1	%		7	----	----	----	----
>C21-C32 fraction of mTPH	n/a	EC581D/WT	1	%		92	----	----	----	----
Hydrocarbons										
Benzene	71-43-2	E611A/WT	0.0050	mg/kg		<0.0054 DLHM	----	----	----	----
Toluene	108-88-3	E611A/WT	0.050	mg/kg		<0.050	----	----	----	----
Ethylbenzene	100-41-4	E611A/WT	0.015	mg/kg		<0.015	----	----	----	----
Xylenes, total	1330-20-7	E611A/WT	0.050	mg/kg		<0.050	----	----	----	----
Xylene, o-	95-47-6	E611A/WT	0.030	mg/kg		<0.030	----	----	----	----
Xylene, m+p-	179601-23-1	E611A/WT	0.030	mg/kg		<0.030	----	----	----	----
VPH C6-C10	n/a	E581.VPH/WT	5.0	mg/kg		<5.0	----	----	----	----
VPH C6-C10 (less BTEX)	n/a	EC580C/WT	5.0	mg/kg		<5.0	----	----	----	----
EPH >C10-C16	n/a	E601F/WT	5.0	mg/kg		8.8	----	----	----	----
EPH >C16-C21	n/a	E601F/WT	5.0	mg/kg		128	----	----	----	----
EPH >C21-C32	n/a	E601F/WT	5.0	mg/kg		1620	----	----	----	----
EPH >C34-C50	n/a	E601F/WT	20	mg/kg		1030	----	----	----	----
hydrocarbon resemblance	n/a	E601F/WT	-	none		LOF	----	----	----	----
mTPH (Tier I)	n/a	EC581D/WT	10	mg/kg		1760	----	----	----	----
return to baseline at C32	n/a	E601F/WT	-	-		No	----	----	----	----
TEH >C10-C32	n/a	E601F/WT	10	mg/kg		1760	----	----	----	----
Hydrocarbons Surrogates										
dotriacontane, n- (EPH)	n/a	E601F/WT	1.0	%		63.3	----	----	----	----
isobutylbenzene (EPH)	538-93-2	E601F/WT	1.0	%		107	----	----	----	----
isobutylbenzene (VPH)	538-93-2	E581.VPH/WT	1.0	%		94.2	----	----	----	----
Volatile Organic Compounds Surrogates										
Bromofluorobenzene, 4-	460-00-4	E611A/WT	0.10	%		88.6	----	----	----	----
Difluorobenzene, 1,4-	540-36-3	E611A/WT	0.10	%		92.7	----	----	----	----
Polycyclic Aromatic Hydrocarbons										
Acenaphthene	83-32-9	E641A-L/WT	0.0050	mg/kg		<0.0063 DLHM	----	----	----	----
Acenaphthylene	208-96-8	E641A-L/WT	0.0050	mg/kg		0.0342	----	----	----	----

Analytical Results

Sub-Matrix: Soil (Matrix: Soil/Solid)					Client sample ID	BH13 0-0.015m	----	----	----	----
					Client sampling date / time	10-Nov-2023 00:00	----	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit		HA2301063-001	--------	--------	--------	--------
						Result	----	----	----	----
Polycyclic Aromatic Hydrocarbons										
Acridine	260-94-6	E641A-L/WT	0.010	mg/kg		<0.014 DLM	----	----	----	----
Anthracene	120-12-7	E641A-L/WT	0.0040	mg/kg		0.0423 EMPC	----	----	----	----
Benz(a)anthracene	56-55-3	E641A-L/WT	0.010	mg/kg		0.216	----	----	----	----
Benzo(a)pyrene	50-32-8	E641A-L/WT	0.010	mg/kg		0.211	----	----	----	----
Benzo(b+j)fluoranthene	n/a	E641A-L/WT	0.010	mg/kg		0.417	----	----	----	----
Benzo(b+j+k)fluoranthene	n/a	E641A-L/WT	0.015	mg/kg		0.588	----	----	----	----
Benzo(g,h,i)perylene	191-24-2	E641A-L/WT	0.010	mg/kg		0.099	----	----	----	----
Benzo(k)fluoranthene	207-08-9	E641A-L/WT	0.010	mg/kg		0.171	----	----	----	----
Chrysene	218-01-9	E641A-L/WT	0.010	mg/kg		<0.619 DLM	----	----	----	----
Dibenz(a,h)anthracene	53-70-3	E641A-L/WT	0.0050	mg/kg		0.0410	----	----	----	----
Fluoranthene	206-44-0	E641A-L/WT	0.010	mg/kg		0.551	----	----	----	----
Fluorene	86-73-7	E641A-L/WT	0.010	mg/kg		0.012	----	----	----	----
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A-L/WT	0.010	mg/kg		0.142	----	----	----	----
Methylnaphthalene, 1-	90-12-0	E641A-L/WT	0.010	mg/kg		<0.010	----	----	----	----
Methylnaphthalene, 1+2-	----	E641A-L/WT	0.015	mg/kg		<0.015	----	----	----	----
Methylnaphthalene, 2-	91-57-6	E641A-L/WT	0.010	mg/kg		<0.010	----	----	----	----
Naphthalene	91-20-3	E641A-L/WT	0.010	mg/kg		<0.010	----	----	----	----
Perylene	198-55-0	E641A-L/WT	0.010	mg/kg		0.048	----	----	----	----
Phenanthrene	85-01-8	E641A-L/WT	0.010	mg/kg		0.202	----	----	----	----
Pyrene	129-00-0	E641A-L/WT	0.010	mg/kg		0.408	----	----	----	----
Quinoline	91-22-5	E641A-L/WT	0.010	mg/kg		<0.033 DLM	----	----	----	----
B(a)P total potency equivalents [B(a)P TPE]	----	E641A-L/WT	0.020	mg/kg		0.351	----	----	----	----
IACR (CCME)	----	E641A-L/WT	0.150	-		5.29	----	----	----	----
Polycyclic Aromatic Hydrocarbons Surrogates										
Acridine-d9	34749-75-2	E641A-L/WT	0.1	%		61.7	----	----	----	----
Chrysene-d12	1719-03-5	E641A-L/WT	0.1	%		119	----	----	----	----
Naphthalene-d8	1146-65-2	E641A-L/WT	0.1	%		119	----	----	----	----
Phenanthrene-d10	1517-22-2	E641A-L/WT	0.1	%		106	----	----	----	----

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

Please refer to the Accreditation section for an explanation of analyte accreditations.

ALS Canada Ltd.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **HA2301063**	Page	: 1 of 8
Client	: **Dillon Consulting Limited**	Laboratory	: ALS Environmental - Halifax
Contact	: Shauna Gallant	Account Manager	: Andrew Martin
Address	: 137 Chain Lake Drive Halifax NS Canada B3S 1B3	Address	: 13-100 Wright Ave Dartmouth, Nova Scotia Canada B3B 1L2
Telephone	: 902-450-4000 ext 5039	Telephone	: +1 902 707 4888
Project	: 236465	Date Samples Received	: 15-Nov-2023 10:00
PO	: ----	Issue Date	: 22-Nov-2023 17:41
C-O-C number	: ----		
Sampler	: MK/EJM		
Site	: Build NS (Country Harbour)		
Quote number	: HA23-DICL100-12 - Lump Sum Rate - Build NS (Country Harbour)		
No. of samples received	: 1		
No. of samples analysed	: 1		

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

Key

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

Workorder Comments

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

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- Duplicate outliers occur - please see following pages for full details.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- No Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **Soil/Solid**

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Method	Result	Limits	Comment
Duplicate (DUP) RPDs								
Hydrocarbons	Anonymous	Anonymous	EPH >C21-C32	n/a	E601F	51.8 % DUP-H	40%	Duplicate RPD does not meet the DQO for this test.
Hydrocarbons	Anonymous	Anonymous	EPH >C34-C50	n/a	E601F	46.1 % DUP-H	40%	Duplicate RPD does not meet the DQO for this test.

Result Qualifiers

Qualifier	Description
DUP-H	*Duplicate results outside ALS DQO, due to sample heterogeneity.*

Analysis Holding Time Compliance

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

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

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

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

Matrix: **Soil/Solid**

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

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Hydrocarbons : EPH in Soil/Solid by GC-FID (RBCA)										
Glass soil jar/Teflon lined cap										
BH13 0-0.015m	E601F	10-Nov-2023	20-Nov-2023	14 days	10 days	✓	21-Nov-2023	40 days	1 days	✓
Hydrocarbons : VPH by Headspace GC-FID (Tier I RBCA)										
Glass soil methanol vial										
BH13 0-0.015m	E581.VPH	10-Nov-2023	16-Nov-2023	40 days	7 days	✓	16-Nov-2023	40 days	7 days	✓
Metals : Mercury in Soil/Solid by CVAAS										
Glass soil jar/Teflon lined cap										
BH13 0-0.015m	E510	10-Nov-2023	17-Nov-2023	28 days	8 days	✓	20-Nov-2023	28 days	10 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
Glass soil jar/Teflon lined cap										
BH13 0-0.015m	E440	10-Nov-2023	17-Nov-2023	180 days	8 days	✓	20-Nov-2023	180 days	11 days	✓
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap										
BH13 0-0.015m	E144	10-Nov-2023	----	----	----		17-Nov-2023	----	8 days	
Polycyclic Aromatic Hydrocarbons : PAHs by Hex:Ace GC-MS (Low Level CCME)										
Glass soil jar/Teflon lined cap										
BH13 0-0.015m	E641A-L	10-Nov-2023	20-Nov-2023	14 days	10 days	✓	20-Nov-2023	40 days	1 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass soil methanol vial										
BH13 0-0.015m	E611A	10-Nov-2023	16-Nov-2023	40 days	7 days	✓	16-Nov-2023	40 days	7 days	✓

Legend & Qualifier Definitions

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

Quality Control Parameter Frequency Compliance

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

Matrix: **Soil/Solid**

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

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
BTEX by Headspace GC-MS	E611A	1240347	1	2	50.0	5.0	✓
EPH in Soil/Solid by GC-FID (RBCA)	E601F	1244077	1	9	11.1	5.0	✓
Mercury in Soil/Solid by CVAAS	E510	1239896	1	3	33.3	5.0	✓
Metals in Soil/Solid by CRC ICPMS	E440	1239897	1	6	16.6	5.0	✓
Moisture Content by Gravimetry	E144	1241928	1	18	5.5	5.0	✓
PAHs by Hex:Ace GC-MS (Low Level CCME)	E641A-L	1243194	1	1	100.0	5.0	✓
VPH by Headspace GC-FID (Tier I RBCA)	E581.VPH	1240348	1	2	50.0	5.0	✓
Laboratory Control Samples (LCS)							
BTEX by Headspace GC-MS	E611A	1240347	1	2	50.0	5.0	✓
EPH in Soil/Solid by GC-FID (RBCA)	E601F	1244077	1	9	11.1	5.0	✓
Mercury in Soil/Solid by CVAAS	E510	1239896	2	3	66.6	10.0	✓
Metals in Soil/Solid by CRC ICPMS	E440	1239897	2	6	33.3	10.0	✓
Moisture Content by Gravimetry	E144	1241928	1	18	5.5	5.0	✓
PAHs by Hex:Ace GC-MS (Low Level CCME)	E641A-L	1243194	1	1	100.0	5.0	✓
VPH by Headspace GC-FID (Tier I RBCA)	E581.VPH	1240348	1	2	50.0	5.0	✓
Method Blanks (MB)							
BTEX by Headspace GC-MS	E611A	1240347	1	2	50.0	5.0	✓
EPH in Soil/Solid by GC-FID (RBCA)	E601F	1244077	1	9	11.1	5.0	✓
Mercury in Soil/Solid by CVAAS	E510	1239896	1	3	33.3	5.0	✓
Metals in Soil/Solid by CRC ICPMS	E440	1239897	1	6	16.6	5.0	✓
Moisture Content by Gravimetry	E144	1241928	1	18	5.5	5.0	✓
PAHs by Hex:Ace GC-MS (Low Level CCME)	E641A-L	1243194	1	1	100.0	5.0	✓
VPH by Headspace GC-FID (Tier I RBCA)	E581.VPH	1240348	1	2	50.0	5.0	✓
Matrix Spikes (MS)							
BTEX by Headspace GC-MS	E611A	1240347	1	2	50.0	5.0	✓
EPH in Soil/Solid by GC-FID (RBCA)	E601F	1244077	1	9	11.1	5.0	✓
PAHs by Hex:Ace GC-MS (Low Level CCME)	E641A-L	1243194	1	1	100.0	5.0	✓
VPH by Headspace GC-FID (Tier I RBCA)	E581.VPH	1240348	1	2	50.0	5.0	✓

Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Moisture Content by Gravimetry	E144 ALS Environmental - Waterloo	Soil/Solid	CCME PHC in Soil - Tier 1	Moisture is measured gravimetrically by drying the sample at 105°C. Moisture content is calculated as the weight loss (due to water) divided by the wet weight of the sample, expressed as a percentage.
Metals in Soil/Solid by CRC ICPMS	E440 ALS Environmental - Waterloo	Soil/Solid	EPA 6020B (mod)	This method is intended to liberate metals that may be environmentally available. Samples are dried, then sieved through a 2 mm sieve, and digested with HNO3 and HCl. Dependent on sample matrix, some metals may be only partially recovered, including Al, Ba, Be, Cr, Sr, Ti, Tl, V, W, and Zr. Silicate minerals are not solubilized. Volatile forms of sulfur (including sulfide) may not be captured, as they may be lost during sampling, storage, or digestion. This method does not adequately recover elemental sulfur, and is unsuitable for assessment of elemental sulfur standards or guidelines. Analysis is by Collision/Reaction Cell ICPMS.
Mercury in Soil/Solid by CVAAS	E510 ALS Environmental - Waterloo	Soil/Solid	EPA 200.2/1631 Appendix (mod)	Samples are dried, then sieved through a 2 mm sieve, and digested with HNO3 and HCl, followed by CVAAS analysis.
VPH by Headspace GC-FID (Tier I RBCA)	E581.VPH ALS Environmental - Waterloo	Soil/Solid	Atlantic RBCA Version 3.1	VPH (Volatile Petroleum Hydrocarbons) is analyzed by static headspace GC-FID. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
EPH in Soil/Solid by GC-FID (RBCA)	E601F ALS Environmental - Waterloo	Soil/Solid	Atlantic RBCA Version 3.1	Sample Extracts are analyzed by GC-FID for RBCA Tier I hydrocarbon fractions C10-C16, C16-C21, C21-C32.
BTEX by Headspace GC-MS	E611A ALS Environmental - Waterloo	Soil/Solid	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
PAHs by Hex:Ace GC-MS (Low Level CCME)	E641A-L ALS Environmental - Waterloo	Soil/Solid	EPA 8270E (mod)	Polycyclic Aromatic Hydrocarbons (PAHs) are extracted with hexane/acetone and analyzed by GC-MS. If reported, IACR (index of additive cancer risk, unitless) and B(a)P toxic potency equivalent (in soil concentration units) are calculated as per CCME PAH Soil Quality Guidelines fact sheet (2010) or ABT1.
VPH C6-C10 (less BTEX) [RBCA]	EC580C ALS Environmental - Waterloo	Soil/Solid	Atlantic RBCA Version 3.1	VPH C6-C10 (less BTEX) is calculated as follows: VPH (C6-C10) minus benzene, toluene, ethylbenzene and xylenes (BTEX).

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Modified TPH (RBCA) Tier I	EC581D ALS Environmental - Waterloo	Soil/Solid	Atlantic RBCA Version 3.1	Modified TPH (RBCA), Tier I is the sum of PIRI Fraction (C6 - C10 - BTEX) + (>C10 - C16) +(>C16 – C21) + (>C21 - C32).

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Digestion for Metals and Mercury	EP440 ALS Environmental - Waterloo	Soil/Solid	EPA 200.2 (mod)	Samples are dried, then sieved through a 2 mm sieve, and digested with HNO_3 and HCl. This method is intended to liberate metals that may be environmentally available.
VOCs Methanol Extraction for Headspace Analysis	EP581 ALS Environmental - Waterloo	Soil/Solid	EPA 5035A (mod)	VOCs in samples are extracted with methanol. Extracts are then prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
PHCs and PAHs Hexane-Acetone Tumbler Extraction	EP601 ALS Environmental - Waterloo	Soil/Solid	CCME PHC in Soil - Tier 1 (mod)	Samples are subsampled and Petroleum Hydrocarbons (PHC) and PAHs are extracted with 1:1 hexane:acetone using a rotary extractor.
PHCs Hexane-Acetone Tumbler Extraction (RBCA)	EP601F ALS Environmental - Waterloo	Soil/Solid	CCME PHC in Soil - Tier 1 (mod)	Samples are subsampled and Petroleum Hydrocarbons (PHC) are extracted with 1:1 hexane:acetone using a rotary extractor.

ALS Canada Ltd.

QUALITY CONTROL REPORT

Work Order	: **HA2301063**	Page	: 1 of 12
Client	: Dillon Consulting Limited	Laboratory	: ALS Environmental - Halifax
Contact	: Shauna Gallant	Account Manager	: Andrew Martin
Address	: 137 Chain Lake Drive Halifax NS Canada B3S 1B3	Address	: 13-100 Wright Ave Dartmouth, Nova Scotia Canada B3B 1L2
Telephone	:	Telephone	: +1 902 707 4888
Project	: 236465	Date Samples Received	: 15-Nov-2023 10:00
PO	: ----	Date Analysis Commenced	: 16-Nov-2023
C-O-C number	: ----	Issue Date	: 22-Nov-2023 17:41
Sampler	: MK/EJM 902-450-4000 ext 5039		
Site	: Build NS (Country Harbour)		
Quote number	: HA23-DICL100-12 - Lump Sum Rate - Build NS (Country Harbour)		
No. of samples received	: 1		
No. of samples analysed	: 1		

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Laboratory Department*
Jeremy Gingras	Supervisor - Semi-Volatile Instrumentation	Waterloo Organics, Waterloo, Ontario
Jon Fisher	Production Manager, Environmental	Waterloo Metals, Waterloo, Ontario
Niral Patel		Waterloo Centralized Prep, Waterloo, Ontario
Sarah Birch	VOC Section Supervisor	Waterloo VOC, Waterloo, Ontario

General Comments

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

Key :

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

Workorder Comments

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **Soil/Solid**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Physical Tests (QC Lot: 1241928)											
HA2301063-001	BH13 0-0.015m	Moisture	----	E144	0.25	%	52.2	52.4	0.215%	20%	----
Metals (QC Lot: 1239896)											
HA2301058-026	Anonymous	Mercury	7439-97-6	E510	0.0050	mg/kg	0.0599	0.0578	3.49%	40%	----
Metals (QC Lot: 1239897)											
HA2301058-026	Anonymous	Aluminum	7429-90-5	E440	50	mg/kg	18800	19600	4.66%	40%	----
		Antimony	7440-36-0	E440	0.10	mg/kg	0.17	0.18	0.006	Diff <2x LOR	----
		Arsenic	7440-38-2	E440	0.10	mg/kg	132	135	1.96%	30%	----
		Barium	7440-39-3	E440	0.50	mg/kg	23.1	24.1	4.25%	40%	----
		Beryllium	7440-41-7	E440	0.10	mg/kg	0.19	0.19	0.002	Diff <2x LOR	----
		Boron	7440-42-8	E440	5.0	mg/kg	<5.0	<5.0	0	Diff <2x LOR	----
		Cadmium	7440-43-9	E440	0.020	mg/kg	0.057	0.055	0.001	Diff <2x LOR	----
		Chromium	7440-47-3	E440	0.50	mg/kg	17.1	17.7	3.52%	30%	----
		Cobalt	7440-48-4	E440	0.10	mg/kg	1.36	1.46	7.17%	30%	----
		Copper	7440-50-8	E440	0.50	mg/kg	5.45	5.38	1.35%	30%	----
		Iron	7439-89-6	E440	50	mg/kg	24900	25400	1.99%	30%	----
		Lead	7439-92-1	E440	0.50	mg/kg	9.73	9.84	1.06%	40%	----
		Manganese	7439-96-5	E440	1.0	mg/kg	102	104	1.82%	30%	----
		Molybdenum	7439-98-7	E440	0.10	mg/kg	0.45	0.49	0.04	Diff <2x LOR	----
		Nickel	7440-02-0	E440	0.50	mg/kg	5.10	5.32	4.12%	30%	----
		Selenium	7782-49-2	E440	0.20	mg/kg	0.76	0.74	0.02	Diff <2x LOR	----
		Silver	7440-22-4	E440	0.10	mg/kg	0.16	0.16	0.004	Diff <2x LOR	----
		Strontium	7440-24-6	E440	0.50	mg/kg	3.20	3.34	4.20%	40%	----
		Sulfur	7704-34-9	E440	1000	mg/kg	<1000	<1000	0	Diff <2x LOR	----
		Thallium	7440-28-0	E440	0.050	mg/kg	0.162	0.167	0.004	Diff <2x LOR	----
		Tin	7440-31-5	E440	2.0	mg/kg	<2.0	<2.0	0	Diff <2x LOR	----
		Uranium	7440-61-1	E440	0.050	mg/kg	0.317	0.323	0.006	Diff <2x LOR	----
		Vanadium	7440-62-2	E440	0.20	mg/kg	30.9	31.5	2.11%	30%	----
		Zinc	7440-66-6	E440	2.0	mg/kg	19.6	20.0	2.36%	30%	----
Volatile Organic Compounds (QC Lot: 1240347)											
HA2301063-001	BH13 0-0.015m	Benzene	71-43-2	E611A	0.0054	mg/kg	<0.0054	<0.0054	0	Diff <2x LOR	----

Sub-Matrix: **Soil/Solid**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Volatile Organic Compounds (QC Lot: 1240347) - continued											
HA2301063-001	BH13 0-0.015m	Ethylbenzene	100-41-4	E611A	0.015	mg/kg	<0.015	<0.015	0	Diff <2x LOR	----
		Toluene	108-88-3	E611A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Xylene, m+p-	179601-23-1	E611A	0.030	mg/kg	<0.030	<0.030	0	Diff <2x LOR	----
		Xylene, o-	95-47-6	E611A	0.030	mg/kg	<0.030	<0.030	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 1240348)											
HA2301063-001	BH13 0-0.015m	VPH C6-C10	n/a	E581.VPH	5.0	mg/kg	<5.0	<5.0	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 1244077)											
HA2301055-001	Anonymous	EPH >C10-C16	n/a	E601F	5.0	mg/kg	11.0	6.0	5.0	Diff <2x LOR	----
		EPH >C16-C21	n/a	E601F	5.0	mg/kg	25.0	15.4	9.6	Diff <2x LOR	----
		EPH >C21-C32	n/a	E601F	5.0	mg/kg	365	215	51.8%	40%	DUP-H
		EPH >C34-C50	n/a	E601F	20	mg/kg	532	332	46.1%	40%	DUP-H
Polycyclic Aromatic Hydrocarbons (QC Lot: 1243194)											
HA2301063-001	BH13 0-0.015m	Acenaphthene	83-32-9	E641A-L	0.0063	mg/kg	<0.0063	0.0093	0.0030	Diff <2x LOR	J
		Acenaphthylene	208-96-8	E641A-L	0.0063	mg/kg	0.0342	0.0285	17.9%	50%	----
		Acridine	260-94-6	E641A-L	0.014	mg/kg	<0.014	<0.014	0	Diff <2x LOR	----
		Anthracene	120-12-7	E641A-L	0.0063	mg/kg	0.0423	0.0527	21.9%	50%	----
		Benz(a)anthracene	56-55-3	E641A-L	0.010	mg/kg	0.216	0.241	11.1%	50%	----
		Benzo(a)pyrene	50-32-8	E641A-L	0.010	mg/kg	0.211	0.216	2.66%	50%	----
		Benzo(b+j)fluoranthene	n/a	E641A-L	0.010	mg/kg	0.417	0.414	0.819%	50%	----
		Benzo(g,h,i)perylene	191-24-2	E641A-L	0.010	mg/kg	0.099	0.096	2.86%	50%	----
		Benzo(k)fluoranthene	207-08-9	E641A-L	0.010	mg/kg	0.171	0.159	7.36%	50%	----
		Chrysene	218-01-9	E641A-L	0.619	mg/kg	<0.619	<0.619	0	Diff <2x LOR	----
		Dibenz(a,h)anthracene	53-70-3	E641A-L	0.0063	mg/kg	0.0410	0.0390	4.92%	50%	----
		Fluoranthene	206-44-0	E641A-L	0.010	mg/kg	0.551	0.528	4.23%	50%	----
		Fluorene	86-73-7	E641A-L	0.010	mg/kg	0.012	0.016	0.003	Diff <2x LOR	J
		Indeno(1,2,3-c,d)pyrene	193-39-5	E641A-L	0.010	mg/kg	0.142	0.141	0.643%	50%	----
		Methylnaphthalene, 1-	90-12-0	E641A-L	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----
		Methylnaphthalene, 2-	91-57-6	E641A-L	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----
		Naphthalene	91-20-3	E641A-L	0.010	mg/kg	<0.010	<0.010	0	Diff <2x LOR	----
		Perylene	198-55-0	E641A-L	0.010	mg/kg	0.048	0.056	15.1%	50%	----
		Phenanthrene	85-01-8	E641A-L	0.010	mg/kg	0.202	0.208	2.78%	50%	----
		Pyrene	129-00-0	E641A-L	0.010	mg/kg	0.408	0.404	1.20%	50%	----
		Quinoline	91-22-5	E641A-L	0.033	mg/kg	<0.033	<0.033	0	Diff <2x LOR	----

Qualifiers

Qualifier	Description
DUP-H	Duplicate results outside ALS DQO, due to sample heterogeneity.
J	Duplicate results and limits are expressed in terms of absolute difference.

Method Blank (MB) Report

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

Sub-Matrix: **Soil/Solid**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 1241928)						
Moisture	----	E144	0.25	%	<0.25	----
Metals (QCLot: 1239896)						
Mercury	7439-97-6	E510	0.005	mg/kg	<0.0050	----
Metals (QCLot: 1239897)						
Aluminum	7429-90-5	E440	50	mg/kg	<50	----
Antimony	7440-36-0	E440	0.1	mg/kg	<0.10	----
Arsenic	7440-38-2	E440	0.1	mg/kg	<0.10	----
Barium	7440-39-3	E440	0.5	mg/kg	<0.50	----
Beryllium	7440-41-7	E440	0.1	mg/kg	<0.10	----
Boron	7440-42-8	E440	5	mg/kg	<5.0	----
Cadmium	7440-43-9	E440	0.02	mg/kg	<0.020	----
Chromium	7440-47-3	E440	0.5	mg/kg	<0.50	----
Cobalt	7440-48-4	E440	0.1	mg/kg	<0.10	----
Copper	7440-50-8	E440	0.5	mg/kg	<0.50	----
Iron	7439-89-6	E440	50	mg/kg	<50	----
Lead	7439-92-1	E440	0.5	mg/kg	<0.50	----
Manganese	7439-96-5	E440	1	mg/kg	<1.0	----
Molybdenum	7439-98-7	E440	0.1	mg/kg	<0.10	----
Nickel	7440-02-0	E440	0.5	mg/kg	<0.50	----
Selenium	7782-49-2	E440	0.2	mg/kg	<0.20	----
Silver	7440-22-4	E440	0.1	mg/kg	<0.10	----
Strontium	7440-24-6	E440	0.5	mg/kg	<0.50	----
Sulfur	7704-34-9	E440	1000	mg/kg	<1000	----
Thallium	7440-28-0	E440	0.05	mg/kg	<0.050	----
Tin	7440-31-5	E440	2	mg/kg	<2.0	----
Uranium	7440-61-1	E440	0.05	mg/kg	<0.050	----
Vanadium	7440-62-2	E440	0.2	mg/kg	<0.20	----
Zinc	7440-66-6	E440	2	mg/kg	<2.0	----
Volatile Organic Compounds (QCLot: 1240347)						
Benzene	71-43-2	E611A	0.005	mg/kg	<0.0050	----
Ethylbenzene	100-41-4	E611A	0.015	mg/kg	<0.015	----
Toluene	108-88-3	E611A	0.05	mg/kg	<0.050	----

Sub-Matrix: **Soil/Solid**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Volatile Organic Compounds (QCLot: 1240347) - continued						
Xylene, m+p-	179601-23-1	E611A	0.03	mg/kg	<0.030	----
Xylene, o-	95-47-6	E611A	0.03	mg/kg	<0.030	----
Hydrocarbons (QCLot: 1240348)						
VPH C6-C10	n/a	E581.VPH	5	mg/kg	<5.0	----
Hydrocarbons (QCLot: 1244077)						
EPH >C10-C16	n/a	E601F	5	mg/kg	<5.0	----
EPH >C16-C21	n/a	E601F	5	mg/kg	<5.0	----
EPH >C21-C32	n/a	E601F	5	mg/kg	<5.0	----
EPH >C34-C50	n/a	E601F	20	mg/kg	<20	----
Polycyclic Aromatic Hydrocarbons (QCLot: 1243194)						
Acenaphthene	83-32-9	E641A-L	0.005	mg/kg	<0.0050	----
Acenaphthylene	208-96-8	E641A-L	0.005	mg/kg	<0.0050	----
Acridine	260-94-6	E641A-L	0.01	mg/kg	<0.010	----
Anthracene	120-12-7	E641A-L	0.004	mg/kg	<0.0040	----
Benz(a)anthracene	56-55-3	E641A-L	0.01	mg/kg	<0.010	----
Benzo(a)pyrene	50-32-8	E641A-L	0.01	mg/kg	<0.010	----
Benzo(b+j)fluoranthene	n/a	E641A-L	0.01	mg/kg	<0.010	----
Benzo(g,h,i)perylene	191-24-2	E641A-L	0.01	mg/kg	<0.010	----
Benzo(k)fluoranthene	207-08-9	E641A-L	0.01	mg/kg	<0.010	----
Chrysene	218-01-9	E641A-L	0.01	mg/kg	<0.010	----
Dibenz(a,h)anthracene	53-70-3	E641A-L	0.005	mg/kg	<0.0050	----
Fluoranthene	206-44-0	E641A-L	0.01	mg/kg	<0.010	----
Fluorene	86-73-7	E641A-L	0.01	mg/kg	<0.010	----
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A-L	0.01	mg/kg	<0.010	----
Methylnaphthalene, 1-	90-12-0	E641A-L	0.01	mg/kg	<0.010	----
Methylnaphthalene, 2-	91-57-6	E641A-L	0.01	mg/kg	<0.010	----
Naphthalene	91-20-3	E641A-L	0.01	mg/kg	<0.010	----
Perylene	198-55-0	E641A-L	0.01	mg/kg	<0.010	----
Phenanthrene	85-01-8	E641A-L	0.01	mg/kg	<0.010	----
Pyrene	129-00-0	E641A-L	0.01	mg/kg	<0.010	----
Quinoline	91-22-5	E641A-L	0.01	mg/kg	<0.010	----

Laboratory Control Sample (LCS) Report

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

Sub-Matrix: **Soil/Solid**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 1241928)									
Moisture	----	E144	0.25	%	50 %	98.7	90.0	110	----
Metals (QCLot: 1239896)									
Mercury	7439-97-6	E510	0.005	mg/kg	0.1 mg/kg	107	80.0	120	----
Metals (QCLot: 1239897)									
Aluminum	7429-90-5	E440	50	mg/kg	200 mg/kg	98.8	80.0	120	----
Antimony	7440-36-0	E440	0.1	mg/kg	100 mg/kg	103	80.0	120	----
Arsenic	7440-38-2	E440	0.1	mg/kg	100 mg/kg	110	80.0	120	----
Barium	7440-39-3	E440	0.5	mg/kg	25 mg/kg	102	80.0	120	----
Beryllium	7440-41-7	E440	0.1	mg/kg	10 mg/kg	98.7	80.0	120	----
Boron	7440-42-8	E440	5	mg/kg	100 mg/kg	97.6	80.0	120	----
Cadmium	7440-43-9	E440	0.02	mg/kg	10 mg/kg	98.3	80.0	120	----
Chromium	7440-47-3	E440	0.5	mg/kg	25 mg/kg	104	80.0	120	----
Cobalt	7440-48-4	E440	0.1	mg/kg	25 mg/kg	102	80.0	120	----
Copper	7440-50-8	E440	0.5	mg/kg	25 mg/kg	103	80.0	120	----
Iron	7439-89-6	E440	50	mg/kg	100 mg/kg	102	80.0	120	----
Lead	7439-92-1	E440	0.5	mg/kg	50 mg/kg	104	80.0	120	----
Manganese	7439-96-5	E440	1	mg/kg	25 mg/kg	104	80.0	120	----
Molybdenum	7439-98-7	E440	0.1	mg/kg	25 mg/kg	101	80.0	120	----
Nickel	7440-02-0	E440	0.5	mg/kg	50 mg/kg	103	80.0	120	----
Selenium	7782-49-2	E440	0.2	mg/kg	100 mg/kg	106	80.0	120	----
Silver	7440-22-4	E440	0.1	mg/kg	10 mg/kg	97.0	80.0	120	----
Strontium	7440-24-6	E440	0.5	mg/kg	25 mg/kg	107	80.0	120	----
Sulfur	7704-34-9	E440	1000	mg/kg	5000 mg/kg	96.0	80.0	120	----
Thallium	7440-28-0	E440	0.05	mg/kg	100 mg/kg	101	80.0	120	----
Tin	7440-31-5	E440	2	mg/kg	50 mg/kg	103	80.0	120	----
Uranium	7440-61-1	E440	0.05	mg/kg	0.5 mg/kg	99.4	80.0	120	----
Vanadium	7440-62-2	E440	0.2	mg/kg	50 mg/kg	107	80.0	120	----
Zinc	7440-66-6	E440	2	mg/kg	50 mg/kg	100	80.0	120	----
Volatile Organic Compounds (QCLot: 1240347)									
Benzene	71-43-2	E611A	0.005	mg/kg	3.475 mg/kg	84.7	70.0	130	----
Ethylbenzene	100-41-4	E611A	0.015	mg/kg	3.475 mg/kg	92.9	70.0	130	----

Sub-Matrix: **Soil/Solid**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Volatile Organic Compounds (QCLot: 1240347) - continued									
Toluene	108-88-3	E611A	0.05	mg/kg	3.475 mg/kg	87.8	70.0	130	----
Xylene, m+p-	179601-23-1	E611A	0.03	mg/kg	6.95 mg/kg	94.1	70.0	130	----
Xylene, o-	95-47-6	E611A	0.03	mg/kg	3.475 mg/kg	96.4	70.0	130	----
Hydrocarbons (QCLot: 1240348)									
VPH C6-C10	n/a	E581.VPH	5	mg/kg	69.1875 mg/kg	95.3	80.0	120	----
Hydrocarbons (QCLot: 1244077)									
EPH >C10-C16	n/a	E601F	5	mg/kg	799.3688 mg/kg	89.0	70.0	130	----
EPH >C16-C21	n/a	E601F	5	mg/kg	437.2594 mg/kg	114	70.0	130	----
EPH >C21-C32	n/a	E601F	5	mg/kg	565.0313 mg/kg	100	70.0	130	----
EPH >C34-C50	n/a	E601F	20	mg/kg	576.6844 mg/kg	118	70.0	130	----
Polycyclic Aromatic Hydrocarbons (QCLot: 1243194)									
Acenaphthene	83-32-9	E641A-L	0.005	mg/kg	0.5 mg/kg	97.0	60.0	130	----
Acenaphthylene	208-96-8	E641A-L	0.005	mg/kg	0.5 mg/kg	98.2	60.0	130	----
Acridine	260-94-6	E641A-L	0.01	mg/kg	0.5 mg/kg	91.2	60.0	130	----
Anthracene	120-12-7	E641A-L	0.004	mg/kg	0.5 mg/kg	98.2	60.0	130	----
Benz(a)anthracene	56-55-3	E641A-L	0.01	mg/kg	0.5 mg/kg	106	60.0	130	----
Benzo(a)pyrene	50-32-8	E641A-L	0.01	mg/kg	0.5 mg/kg	91.4	60.0	130	----
Benzo(b+j)fluoranthene	n/a	E641A-L	0.01	mg/kg	0.5 mg/kg	100	60.0	130	----
Benzo(g,h,i)perylene	191-24-2	E641A-L	0.01	mg/kg	0.5 mg/kg	89.3	60.0	130	----
Benzo(k)fluoranthene	207-08-9	E641A-L	0.01	mg/kg	0.5 mg/kg	98.3	60.0	130	----
Chrysene	218-01-9	E641A-L	0.01	mg/kg	0.5 mg/kg	96.9	60.0	130	----
Dibenz(a,h)anthracene	53-70-3	E641A-L	0.005	mg/kg	0.5 mg/kg	82.7	60.0	130	----
Fluoranthene	206-44-0	E641A-L	0.01	mg/kg	0.5 mg/kg	98.4	60.0	130	----
Fluorene	86-73-7	E641A-L	0.01	mg/kg	0.5 mg/kg	99.1	60.0	130	----
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A-L	0.01	mg/kg	0.5 mg/kg	100	60.0	130	----
Methylnaphthalene, 1-	90-12-0	E641A-L	0.01	mg/kg	0.5 mg/kg	92.6	60.0	130	----
Methylnaphthalene, 2-	91-57-6	E641A-L	0.01	mg/kg	0.5 mg/kg	100	60.0	130	----
Naphthalene	91-20-3	E641A-L	0.01	mg/kg	0.5 mg/kg	90.0	60.0	130	----
Perylene	198-55-0	E641A-L	0.01	mg/kg	0.5 mg/kg	104	60.0	130	----
Phenanthrene	85-01-8	E641A-L	0.01	mg/kg	0.5 mg/kg	97.0	60.0	130	----
Pyrene	129-00-0	E641A-L	0.01	mg/kg	0.5 mg/kg	96.0	60.0	130	----
Quinoline	91-22-5	E641A-L	0.01	mg/kg	0.5 mg/kg	90.6	60.0	130	----

Matrix Spike (MS) Report

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

Sub-Matrix: **Soil/Solid**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Volatile Organic Compounds (QCLot: 1240347)										
HA2301063-001	BH13 0-0.015m	Benzene	71-43-2	E611A	2.28 mg/kg	3.125 mg/kg	88.3	60.0	140	----
		Ethylbenzene	100-41-4	E611A	2.41 mg/kg	3.125 mg/kg	93.6	60.0	140	----
		Toluene	108-88-3	E611A	2.29 mg/kg	3.125 mg/kg	88.9	60.0	140	----
		Xylene, m+p-	179601-23-1	E611A	4.85 mg/kg	6.25 mg/kg	94.0	60.0	140	----
		Xylene, o-	95-47-6	E611A	2.50 mg/kg	3.125 mg/kg	97.0	60.0	140	----
Hydrocarbons (QCLot: 1240348)										
HA2301063-001	BH13 0-0.015m	VPH C6-C10	n/a	E581.VPH	45.1 mg/kg	62.5 mg/kg	87.5	60.0	140	----
Hydrocarbons (QCLot: 1244077)										
HA2301055-001	Anonymous	EPH >C10-C16	n/a	E601F	507 mg/kg	799.3688 mg/kg	76.7	60.0	140	----
		EPH >C16-C21	n/a	E601F	434 mg/kg	437.2594 mg/kg	120	60.0	140	----
		EPH >C21-C32	n/a	E601F	341 mg/kg	565.0313 mg/kg	73.0	60.0	140	----
		EPH >C34-C50	n/a	E601F	459 mg/kg	576.6844 mg/kg	96.3	60.0	140	----
Polycyclic Aromatic Hydrocarbons (QCLot: 1243194)										
HA2301063-001	BH13 0-0.015m	Acenaphthene	83-32-9	E641A-L	0.376 mg/kg	0.5 mg/kg	93.3	50.0	140	----
		Acenaphthylene	208-96-8	E641A-L	0.364 mg/kg	0.5 mg/kg	90.4	50.0	140	----
		Acridine	260-94-6	E641A-L	0.241 mg/kg	0.5 mg/kg	59.8	50.0	140	----
		Anthracene	120-12-7	E641A-L	0.358 mg/kg	0.5 mg/kg	88.7	50.0	140	----
		Benz(a)anthracene	56-55-3	E641A-L	0.365 mg/kg	0.5 mg/kg	90.6	50.0	140	----
		Benzo(a)pyrene	50-32-8	E641A-L	0.318 mg/kg	0.5 mg/kg	79.0	50.0	140	----
		Benzo(b+j)fluoranthene	n/a	E641A-L	0.340 mg/kg	0.5 mg/kg	84.4	50.0	140	----
		Benzo(g,h,i)perylene	191-24-2	E641A-L	0.364 mg/kg	0.5 mg/kg	90.4	50.0	140	----
		Benzo(k)fluoranthene	207-08-9	E641A-L	0.374 mg/kg	0.5 mg/kg	92.8	50.0	140	----
		Chrysene	218-01-9	E641A-L	0.311 mg/kg	0.5 mg/kg	77.2	50.0	140	----
		Dibenz(a,h)anthracene	53-70-3	E641A-L	0.315 mg/kg	0.5 mg/kg	78.0	50.0	140	----
		Fluoranthene	206-44-0	E641A-L	0.317 mg/kg	0.5 mg/kg	78.7	50.0	140	----
		Fluorene	86-73-7	E641A-L	0.374 mg/kg	0.5 mg/kg	92.8	50.0	140	----
		Indeno(1,2,3-c,d)pyrene	193-39-5	E641A-L	0.332 mg/kg	0.5 mg/kg	82.5	50.0	140	----
		Methylnaphthalene, 1-	90-12-0	E641A-L	0.354 mg/kg	0.5 mg/kg	87.8	50.0	140	----
		Methylnaphthalene, 2-	91-57-6	E641A-L	0.396 mg/kg	0.5 mg/kg	98.3	50.0	140	----
		Naphthalene	91-20-3	E641A-L	0.368 mg/kg	0.5 mg/kg	91.2	50.0	140	----

Sub-Matrix: **Soil/Solid**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Polycyclic Aromatic Hydrocarbons (QCLot: 1243194) - continued										
HA2301063-001	BH13 0-0.015m	Perylene	198-55-0	E641A-L	0.398 mg/kg	0.5 mg/kg	98.7	50.0	140	----
		Phenanthrene	85-01-8	E641A-L	0.351 mg/kg	0.5 mg/kg	87.0	50.0	140	----
		Pyrene	129-00-0	E641A-L	0.320 mg/kg	0.5 mg/kg	79.4	50.0	140	----
		Quinoline	91-22-5	E641A-L	0.282 mg/kg	0.5 mg/kg	69.8	50.0	140	----

Reference Material (RM) Report

A Reference Material (RM) is a homogenous material with known and well-established analyte concentrations. RMs are processed in an identical manner to test samples, and are used to monitor and control the accuracy and precision of a test method for a typical sample matrix. RM results are expressed as percent recovery of the target analyte concentration. RM targets may be certified target concentrations provided by the RM supplier, or may be ALS long-term mean values (for empirical test methods).

Sub-Matrix:

					Reference Material (RM) Report				
					RM Target	Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Reference Material ID	Analyte	CAS Number	Method	Concentration	RM	Low	High	Qualifier
Metals (QCLot: 1239896)									
	RM	Mercury	7439-97-6	E510	0.0585 mg/kg	103	70.0	130	----
Metals (QCLot: 1239897)									
	RM	Aluminum	7429-90-5	E440	9817 mg/kg	106	70.0	130	----
	RM	Antimony	7440-36-0	E440	3.99 mg/kg	102	70.0	130	----
	RM	Arsenic	7440-38-2	E440	3.73 mg/kg	108	70.0	130	----
	RM	Barium	7440-39-3	E440	105 mg/kg	104	70.0	130	----
	RM	Beryllium	7440-41-7	E440	0.349 mg/kg	96.9	70.0	130	----
	RM	Boron	7440-42-8	E440	8.5 mg/kg	113	70.0	130	----
	RM	Cadmium	7440-43-9	E440	0.91 mg/kg	105	70.0	130	----
	RM	Chromium	7440-47-3	E440	101 mg/kg	106	70.0	130	----
	RM	Cobalt	7440-48-4	E440	6.9 mg/kg	106	70.0	130	----
	RM	Copper	7440-50-8	E440	123 mg/kg	107	70.0	130	----
	RM	Iron	7439-89-6	E440	23558 mg/kg	107	70.0	130	----
	RM	Lead	7439-92-1	E440	267 mg/kg	104	70.0	130	----
	RM	Manganese	7439-96-5	E440	269 mg/kg	114	70.0	130	----
	RM	Molybdenum	7439-98-7	E440	1.03 mg/kg	107	70.0	130	----
	RM	Nickel	7440-02-0	E440	26.7 mg/kg	106	70.0	130	----
	RM	Silver	7440-22-4	E440	4.06 mg/kg	94.1	70.0	130	----
	RM	Strontium	7440-24-6	E440	86.1 mg/kg	107	70.0	130	----
	RM	Thallium	7440-28-0	E440	0.0786 mg/kg	102	70.0	130	----
	RM	Tin	7440-31-5	E440	10.6 mg/kg	99.9	70.0	130	----
	RM	Uranium	7440-61-1	E440	0.52 mg/kg	104	70.0	130	----
	RM	Vanadium	7440-62-2	E440	32.7 mg/kg	105	70.0	130	----
	RM	Zinc	7440-66-6	E440	297 mg/kg	102	70.0	130	----

Appendix F

NSECC Notification Form

Notification of Free Product or Contamination

This form is for all sites with contamination or free product requiring written notification.

NOVA SCOTIA

☑ New submission ☐ Updated form NSE file number (mandatory for updated form) **33000-**_____

Instructions for completing this form

- All relevant sections of this form are to be completed.
- Signatures on this form are required from the managing site professional or any other person providing the notice.
- All regulatory protocols must be followed, and all forms/checklists must be completed separately for each property. This means that a source property and an impacted third-party property must have all documents filed separately. Once the source property or impacted third-party property is identified by the check box below, all subsequent reference on this form/checklist are to that site owner.
- If cleanup is being completed following the 30-day verification exemption, this form will not be required.
- Forms/checklists must be complete before filing.

1 - Site Location and Contact Information

Details provided on this form are applicable to ☑ Source Property **or** ☐ Impacted Third Party Property

Site Location
Mandatory must be completed.

Site Address: Country Harbour Mine, Guysborough County
City: Country Harbour, NS
Parcel Identification Number (PID): 35091354 & Portion of 35094366
Postal Code: B0H 1L0
GPS (NAD83 UTM coordinates, source central point) Easting: 593228.84
Northing: 5012184.95
Zone (select one) ☐ 19 ☑ 20 ☐ 21
Description (optional): Former Country Harbour Mine Site

Property Owner
Mandatory must be completed.

Name: Karen Gatien Deputy Minister Dept of Natural Resources&Renewables
Phone: (902) 424-4450
Email: Karen.Gatien@novascotia.ca
Fax: (902) 564-6137
Recognized Agent (if applicable): Donnie Burke, Executive Director (donnie.burke@novascotia.ca)
Company Name (if applicable): Build Nova Scotia Inc.
City: Sydney, NS
Mailing Address: 45 Wabana Court, P.O. Box 430, Station A
Postal Code: B1P 6H2
Preferred method of correspondence (select one) ☐ Letter **or** ☑ Email

Contact for Correspondence
If different than above.

Name: Peter Geddes, Executive Director
Phone: (902) 424-4988
Email: Peter.Geddes@novascotia.ca
Fax:
Recognized Agent (if applicable):
Company Name (if applicable): Dept of Natural Resources and Renewables
City: Halifax, NS
Mailing Address: 1701 Hollis Street, P.O. Box 698
Postal Code: B1P 0B9
Preferred method of correspondence (select one) ☐ Letter **or** ☑ Email

Site Professional
Mandatory must be completed.

Name: Beverley Smith
Phone: (902) 450-5015
Email: bsmith@dillon.ca
Fax: (902) 450-2008
Company Name: Dillon Consulting Limited
City: Halifax, NS
Mailing Address: 137 Chain Lake Drive
Postal Code: B3S 1B3
Professional Registration Number: 119
Preferred method of correspondence (select one) ☐ Letter **or** ☑ Email

Notification of Free Product or Contamination

This form is for all sites with contamination or free product requiring written notification.

NOVA SCOTIA

Person Providing Notice If different than above.

Name _____ Phone _____

Email _____ Fax _____

Recognized Agent (if applicable) _____

Company Name (if applicable) _____ City _____

Mailing Address _____ Postal Code _____

Preferred method of correspondence (select one) ☐ Letter **or** ☐ Email

Are there any impacted third-party properties? ☐ Yes ☑ No

Impacted Third-Party Property Information

Applicable to Source Property Notifications only.

Site Location Mandatory must be completed.

Site Address _____ City _____

Parcel Identification Number (PID) _____ Postal Code _____

GPS (NAD83 UTM coordinates, source central point) Easting _____ Northing _____

Zone (select one) ☐ 19 ☐ 20 ☐ 21

Description (optional) _____

Source Property Information

Applicable to Third-Party Property Notifications

Site Location Mandatory must be completed.

Site Address _____ City _____

Parcel Identification Number (PID) _____ Postal Code _____

NSE Source File Number 33000-_____ ☐ Unknown Source Property

GPS (NAD83 UTM coordinates, source central point) Easting _____ Northing _____

Zone (select one) ☐ 19 ☐ 20 ☐ 21

Description (optional) _____

2 - Notification of Free Product in Soil or Groundwater

This section is not applicable if no Free Product has been identified as defined in PRO-100, Notification of Contamination Protocol.

Type of free product Check all applicable.	**Observed in Soil**	**Measured in Groundwater**
Type of free product Check all applicable.	**Observed in Soil**	**Measured in Groundwater**
Gasoline	☐	☐
Fuel Oil (No. 2)	☐	☐
Lube Oil	☐	☐
Hydrocarbon mixture	☐	☐
Mineral oil	☐	☐
Glycols	☐	☐
DNAPL and Chlorinated Solvent	☐	☐

Type of free product Check all applicable.	**Observed in Soil**	**Measured in Groundwater**
Other (describe)	☐	☐

3 - Type of Contamination in Soil, Sediment, Surface Water or Groundwater

Type of Contamination Check all applicable.	**Soil**	**Sediment**	**Surface Water**	**Groundwater**	**Volume of release** (not vol. of media impacted)
Inorganic Parameters (metals)	☑	☑	☑	☑	Unknown
Petroleum Hydrocarbon Parameters	☑	☐	☐	☐	Unknown
Polycyclic Aromatic Hydrocarbon (PAH) Parameters	☐	☐	☐	☐	
Volatile Organic Compound (VOC) Parameters	☐	☐	☐	☐	
Pesticides	☐	☐	☐	☐	
PCBs	☐	☐	☐	☐	
Dioxins and Furans	☐	☐	☐	☐	
Pentachlorophenol	☐	☐	☐	☐	
Organotins	☐	☐	☐	☐	
Glycols	☐	☐	☐	☐	
Phenol	☐	☐	☐	☐	
PFAS compounds	☐	☐	☐	☐	
Other (describe)	☐	☐	☐	☐	

Add Row Delete Row

4 - Site Characterization

Cause of Release Other (discharge, historical, unknown)

Most Sensitive land use

☐ Agricultural ☑ Commercial
☐ Residential/Parkland ☐ Industrial

Groundwater potability of site (potable or non-potable according to Appendix 1, Figure 3 of Notification Protocol)

☑ Potable ☐ Non-potable

Notification of Free Product or Contamination

This form is for all sites with contamination or free product requiring written notification.

NOVA SCOTIA

Check all that apply.

- ☐ Yes ☑ No **Property is a Registered Public Drinking Water Supply**
- ☐ Yes ☑ No **Property is within Municipal drinking water source protection area**
- ☑ Yes ☐ No **Is contamination known or suspected to directly impact surface water or sediment?**
- ☐ Yes ☑ No **Is contamination known or suspected to directly impact a drinking water supply on or off the site?**
- ☐ Yes ☑ No **Are volatile contaminants known or suspected to affect indoor building spaces requiring immediate or short-term actions for the protection of health or safety on or off the site?**
- ☐ Yes ☑ No **Is contaminated soil at ground surface in an area where receptors could be exposed?**
- ☐ Yes ☑ No **Are immediate actions necessary to protect people or the environment from known contamination at the site?**
  - ☐ Yes ☐ No If yes, are maintenance of any exposure management controls required?
  - ☐ Yes ☐ No If yes, conditions associated with the maintenance of any exposure management controls and monitoring have been documented, provided and explained to the applicable site owner, and are attached to this form.

5 - Signatures

Confirmation that notifications have been made in accordance with Section 8 and 9 of the Contaminated Sites Regulations.

☑ **All known impacted property owners** (source and third party)

Name (print) Beverley Smith
Site Professional

Professional Registration Number/Stamp 119

THE ASSOCIATION OF PROFESSIONAL GEOSCIENTISTS OF NOVA SCOTIA EST. 1987 0119

Signature Beverley Smith
Site Professional

Date 2024/03/28
YYYY/MM/DD

Name of Person Providing Notice (if different than above) (print) _____

Signature _____

Date _____
YYYY/MM/DD

Return completed form and associated documents to your local Nova Scotia Environment Office.
Find office locations online novascotia.ca/nse/dept/regional-office-locations.asp **or call** 1-877-936-8476

Appendix G

Remedial Options

Technical Memo

To: Dan Khan, P.Eng.

From: Nadine Wambolt

cc: Noah Booth

Date: March 27, 2024

Subject: Former Country Harbour Mine Site, Preliminary Remedial Options

Our File: 23-6465

Dillon has prepared the following preliminary remedial options review and recommended approach for the former Country Harbour Mine Site. The report focuses on reviewing remedial options for impacted media (i.e., soil, sediment, groundwater, and surface water) and miscellaneous debris, and does not include remedies for addressing existing mine shafts and underground mine network, which is being completed by Nova Scotia Department of Natural Resources and Renewables (NSDNRR) under their existing abandoned mine openings remediation program.

It is recommended that the preliminary remedial options conceptualized herein be re-evaluated upon the completion of additional sampling, as recommended in the Phase II Environmental Site Assessment (ESA) report for the Site (Dillon, March 2024), and a quantitative risk assessment (for the purpose of developing site specific target levels (SSTLs) for soil, sediment, groundwater and surface water).

Summary of Site Conditions

The site is generally heavily forested with uneven terrain and a mix of soil and exposed bedrock. Key aspects about the site in considering potential remedies are as follows:

- The site is accessed from Highway 316 to the south by a logging road (John Fenton Loop Road).
- The site is used for commercial forest harvesting as a primary land use and is also being considered for wind energy development.
- Johnston Brook intersects the site and flows into Fraser Brook off-site. Fraser Brook is connected to the ocean and is brackish water.
- The site consists principally of coarse-grained soil (based on site observations, noting grainsize analysis completed during the Phase II ESA indicated both coarse and fine-grained conditions on-site) and is categorized as potable. While there are no current on-site potable water supplies, and none are envisioned in the future; a water pipe was observed on-site in Johnsons Brook (near 24MW-03) that reportedly may be accessed by a local property owner, possibly for drinking water. This is unconfirmed and should be investigated. Signage could be posted advising against use of on-site surface water as a potable water source.
- As noted above, the site is heavily forested, and is considered a productive ecological habitat, with no major signs of stressed vegetation.

As part of the Phase I/II ESA, Dillon completed a preliminary risk review of the data collected to date at the site to identify relevant contaminants of potential concern (COPCs), media, potential exposure pathways and receptors. The review was based on assessing soil, sediment, groundwater, and surface water data to provincial Nova Scotia Contaminated Sites Regulations (NS CSRs) Tier I Environmental Quality Standards (EQS). A summary of the assessment is presented in Table 1.

Table 1: Summary of Site Risks

Environmental Media	Contaminants of Potential Concern	Potential Active Pathway	Receptor
Groundwater	• Arsenic • Cobalt • Iron • Manganese	• Ingestion	• Worker (Potable Drinking Water Well)
Surface Water	• pH • Aluminum • Arsenic • Iron • Lead • Zinc	• Runoff to Fraser Brook • Ingestion	• Freshwater aquatic life • Recreational User • Nearby Resident[1]
Sediment	• Arsenic • Iron • Lead • Manganese • Mercury	• Direct contact • Ingestion	• Freshwater aquatic life • Recreational User
Soil	• Arsenic • Beryllium • Iron • Lead • Selenium • Ethylbenzene	• Direct contact • Ingestion	• Recreational User • Worker • Ecological

Notes:
Parameters were compared to NS CSR Tier I EQS. Soil was also compared to the Background Soil Database
1) A water pipe was observed on-site in Johnsons Brook (near 24MW-03) that reportedly may be accessed by a local property owner.

A quantitative risk assessment is required to better define the COPCs through SSTLs for soil, sediment, groundwater, and surface water.

Based on the Phase II ESA data, select metals in surface water, sediment, and soil, as well as pH in surface water, and ethylbenzene in soil, should be carried forward for a quantitative risk assessment. However, supplementary environmental site assessment activities are recommended prior to the work as follows:

- Background sediment, surface water, and soil samples (i.e., SW/SED5 and BH1, BH2 and 24MW-01, respectively) were collected during the Phase II ESA; however, further assessment would be required to determine if they are representative background due to elevated metal concentrations. It is

recommended that additional background sample location(s) be characterized to confirm naturally occurring metal concentrations in sediment, surface water, and soil prior to additional risk screening.

- Metals concentrations in soil above the applicable NS CSRs Tier I EQS, are present across Areas of Potential Environmental Concern (APECs) 1 through 4 (i.e., Tailings Area, Stamp Mill Areas, Waste Rock Piles and Domestic Waste Dumping Areas, respectively) and have not been laterally delineated. Additional soil sampling is recommended to confirm the lateral extent of metal impacts in APECs 1 through 4 prior to additional risk screening.

In addition to chemical risks, physical hazards such as a domestic waste pile in the vicinity of Johnston's Brook, and miscellaneous rusted fuel drums in forested areas, may need to be addressed (e.g., debris removal to an approved facility).

Remedial Option Considerations

Based on the known site conditions, conservatively the following parameters in each media may require remedial action due to their presence in concentrations exceeding the NS Tier I EQS and/or background levels: pH and metals (i.e., aluminum, arsenic, iron, lead and/or zinc) in surface water, metals (arsenic, iron, lead, manganese and/or mercury) in sediment, and metals (arsenic, beryllium, iron, lead, and/or selenium) and petroleum hydrocarbons (i.e., ethylbenzene) in soil. For the purposes of developing remedial costs for the site, Dillon's estimate of the soil area potentially requiring remedial action is based on a conservative buffer around current soil analytical data, which equates to approximately 100,000 square meters (m^2), as presented in Figure 5 appended in the Phase II ESA report for the site (Dillon, March 2024).

Based on the distribution of soil impacts and the likelihood that soil has been placed, reworked and possibly moved on several occasions over the site history, rock and soils with metal impacts are likely present above Tier I standards throughout. Based on soil data, the impacted soil extends to the inferred bedrock interface, which ranged from 0.53 mbgs (APEC #1) to 1.37 mbgs (APEC #2), and 4.27 mbgs in the "background" location during the 2024 Phase II ESA activities. For the purpose of this report, it is assumed that bedrock is approximately 2 mbgs, which equates to a total volume in the order of 200,000 cubic meters (m^3). Potential remedies that were considered but subsequently dismissed from further consideration as follows:

1. No further action: this option would assume the site is left as is and assumes that the current conditions of the site do not represent a chemical or physical hazard or otherwise an unacceptable risk. This option was not carried forward as surface soils in some areas have very high metal concentrations (e.g., up to 7,170 mg/kg for arsenic in APEC #1 at 0.15 mbgs), which present a potential risk to both human and ecological receptors.
2. Excavation, transport and off-site disposal of metal impacted soil and sediment. This option could create a greater environmental risk during execution of work due to likely loss or redistribution of contaminated material, as well as would be extremely expensive given the volume of contaminated

media and waste rock (~200,000 m^3). Further, a new receiving facility would likely need to be built and permitted to accept the material.

3. Construction of an on-site landfill to contain excavated impacted rock, soil, and sediment. In addition, remaining tailings would need to be excavated and impacted material placed in the landfill. This option would require a new landfill to be constructed to contain the large volume of impacted rock and soil. Waste rock and tailings would be placed within the landfill. This option would be expensive and would require perpetual monitoring, care and maintenance.

Based on the data obtained in the Phase II ESA, Dillon recommends further consideration of the following remedial approach:

1. Additional environmental sampling to delineate the extent of soil impacts laterally, and confirm background sediment, soil and surface water general chemistry and/or metal concentrations.
2. Completion of a quantitative risk assessment to develop SSTLs for soil, sediment, groundwater and surface water, allowing for a targeted remedial approach (focused on where contamination presents an unacceptable risk).
3. Removal of the domestic waste pile in the vicinity of Johnstons Brook in APEC #4, and miscellaneous rusted fuel drums in forested areas. As part of the Phase I ESA site visit, it was noted that rusted fuel drums were empty and there was no observed staining. For the purpose of budgeting costs at this conceptual stage, we have assumed there are little to no buried drums. It is noted that if additional drums are found, the remedial approach should consider the benefit of an electro magnetic survey.
4. Preparation of the site to accommodate heavy equipment to access APECs. This includes access road upgrades, tree clearing and/or removal of steep embankments, as required. It is noted that tree clearing shall not include grubbing or root removal as it could create a greater environmental risk during execution of work due to a likely loss or re-distribution of contaminated soil. As such, trees shall be removed at ground level and the roots shall remain in place.
5. Shaping and grading APECs, capping with a minimum 350 mm thick common fill cover followed by placement of 150 mm topsoil and hydroseed. After completing the additional recommended sampling and a site-specific risk assessment activity, the remedial approach should consider the benefits of consolidation of contamination within one area at the site to optimize the capping design.
6. No requirements for capping areas exhibiting COCs with concentrations below the site-specific target levels developed as part of the recommended quantitative risk assessment.
7. Long-term monitoring over 25 years using a graduated frequency.

Depending on the outcomes of recommended additional sampling, and risk assessment activities, this option may include a hydrologic and sediment transport study to determine if contaminated sediments and fines are being transported off site to Fraser Brook, as well as a natural cap study to assess alternative capping options of contaminated soil. Dillon understands the site is heavily forested and is considered a productive ecological habitat. Clearing an extensive plot of forested land for the purpose of

traditional capping would negatively effective the ecological habitat and/or would be expensive and take a long time to restore the site to a productive ecological habitat.

At this stage of the assessment, we recommend the following supplemental studies be undertaken to better refine this liability estimate, as discussed in Section 5.0 of the Phase II ESA report. Specifically,

- Obtain supplemental surface soil background data to help inform the risk assessment.
- Obtain supplemental surface soil data to establish lateral delineation of metals impacts in soil.
- Complete additional surface water and possible sediment sampling (depending on the substrate encountered) to establish background conditions in these media.
- Complete confirmatory groundwater sampling events in the spring and fall (under high and low flow conditions).
- Complete a Human Health and Ecological Risk Assessment (HHERA).

A proposed remedial option schedule presented in Attachment 1.

Attachment 1

Proposed Schedule

Former Country Harbour Mine Site - Proposed Remedial Option Schedule

Task/Milestone	Month																																	
	2024												2025												2026											
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Supplemental Environmental Sampling																																				
Supplemental Environmental Reporting																																				
Quantitative Risk Assessment																																				
Detailed Engineering Design and Procurement																																				
Access Road Upgrades																																				
Site Preparation																																				
Removal of Inert Surface Waste Debris																																				
Capping APECs																																				
Site Cover																																				

Notes:

Field Activities

Milestone

1 Assumes sufficient information has been attained in supplemental sampling and risk assessments to proceed with remediation

2 Assumes no regulatory delays

3 Long Term Monitoring to occur following completion of site construction as follows: Annually Years 1 to 5; Annually years 7 and 10; Annually in years 15, 20 and 25.

References

Canadian Council of Ministers of the Environment (CCME) Canadian Soil Quality Guidelines for the Protect of Environment Human Health (2010).

Health Canada Draft Guideline Screening Values and Interim Toxicological Reference Values (TRVs) for Energetic Chemicals (November 2022).

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.

Nova Scotia Department of Environment July 2013. Nova Scotia Contaminated Sites Regulations and Protocols.

Nova Scotia Maximum Concentration Background Levels for the Nova Scotia as presented in the Environment Canada's (EC) Background Soil Database (Version No. 1) (March 2011).

Stea, R.R., Conley, H., and Brown, Y. (compilers) 1992: Surficial Geology of the Province of Nova Scotia; Nova Scotia Department of Natural Resources, Map 92-3, Scale 1:500,000.

The Canadian Standard Association (CSA) Standard Z769-00 for Phase II ESAs CSA, (reaffirmed in 2023).