Attachment F

Remedial Action Plan

PUBLIC SERVICES AND PROCUREMENT CANADA
ENVIRONMENT AND CLIMATE CHANGE CANADA

UPDATED REMEDIAL ACTION PLAN (RAP) AT THE EUREKA HIGH ARCTIC WEATHER STATION, NUNAVUT

PSPC Project R.117995.002

Final Report

Directory of Federal Real Property #:	07573
Federal Contaminated Site Inventory #:	

- 00002747 Eureka High Arctic Weather Station
- 70069001 Eureka - Main Camp "The Fort"

March 2023

Commercial Confidentiality Statement

March 21, 2023

Environmental Services and Contaminated Management
Public Services and Procurement Canada
220 4th Ave SE, Floor 7 Rm 759
Calgary, Alberta T2G 4X3
Attention: Claudia Simonato
Senior Environmental Specialist

Dear Ms. Simonato:

Dillon Consulting Limited and Outcome Consultants in joint venture (Dillon-Outcome) are pleased to provide Public Services and Procurement Canada with the attached report for the Updated Remedial Action Plan (RAP) for the Environment and Climate Change Canada's Eureka High Arctic Weather Station. We trust that this updated RAP will greatly assist with the contaminated soil aspects of the on-going and soon to be implemented infrastructure projects at Eureka.

Sincerely,

DILLON-OUTCOME JOINT VENTURE

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Executive Summary

Dillon Consulting Limited and Outcome Consultants in joint venture (Dillon-Outcome) have completed this updated Remedial Action Plan (RAP) for the Eureka High Arctic Weather Station (HAWS) using the additional data-gap filling sample points at the Temporary Stockpile (DOJV 2023) with reference to revised site-specific target levels (SSTLs) which are an output of the Site-Specific Human Health and Ecological Risk Assessment (SSHHERA) at the site (DOJV, 2022b).

A remedial options analysis (ROA) was completed as the first step of the RAP. Contaminated soil management options assessed were: i) Long-term monitoring, ii) *In situ* treatment of contaminated soil without removal, iii) Removal of soil and hauling it to a landfarm to be built, and iv) Removal of soil and directing it off-site for disposal. Excavation and removal of contaminated soil to a landfarm treatment unit (LTU or "landfarm") is the most favourable in that it removes the risk in the source area in a favourable timeframe and consolidates the soil in one place where hydrocarbon impacts can be treated using an appropriate technology for such a remote location. The construction of the LTU has commenced to manage contaminated soils at Eureka.

The schedule for excavation of some of the areas discussed in this RAP will precede the date at which the LTU is expected to be constructed and ready to accept soils for treatment. For this reason, an interim soil management area will need to be used to hold the soil and sediment until the LTU is ready. Sediments being stored in this location must be dewatered in advance of being stockpiled.

A second location is required for storage of soils and sediments with contaminants over generic CCME guidelines but under SSTLs. A pre-determined location referred to as "Johnny's Hole" has been designated, the location is shown on Figure 2. Sediments should be dewatered prior to being transferred. Dewatering activities should be completed in such a way that water can be contained and tested prior to discharge.

Another use for treated soil which has achieved SSTLs, subject to it passing a leachate test such as the O.Reg 558 test, is to use it as daily or permanent cover at any future engineered waste disposal facility at Eureka.

Table EX-1 presents the anticipated volumes of contaminated soil requiring excavation, backfill volumes and the anticipated timing of the work relative to the upcoming Eureka improvement projects. The backfill quantity is the estimated volume to supplement the volume of engineered fill that is already planned as part of each improvement project.

Table EX-1 - Summary of Contaminated Soil by Capital Projects

Capital Project	Area	Contaminants	Approximate Volume (m^3)	Approximate Backfill ($m^{3)}$	Timing	Notes
Runway Recapitalization	Temporary Soil Stockpile	None	0	0	Completed in 2022	No impacts were noted above soil SSTLs. PHC, BTEX and Boron noted above generic guidelines but deemed low risk. Soil should be sent to the "over generic, under SSTLs" area (Johnny's Hole), or left in place pending regulatory approval".
Water and Sewer Upgrades	Proposed New Reservoir	None	0	0	Started Summer 2022	No impacts were noted above soil SSTLs. Arsenic, naphthalene and nickel noted above generic guidelines but deemed low risk. If any soil must be removed in preparation of the base of the reservoir it could be sent to the "over generic, under SSTLs" area (Johnny's Hole).
	North Drainage Pond	PHC, PAHs, Arsenic	1,250 - sediment/soil	1,250 and new cap		Sediments with PHC concentrations above generic soil guidelines but below soils SSTLs are present. Due to proximity to the new drinking water reservoir and its upgradient position to the existing raw water

Capital Project	Area	Contaminants	Approximate Volume (m^3)	Approximate Backfill ($m^{3)}$	Timing	Notes
						reservoir, remediation is proposed. Sediment/Soils would be removed and allowed to dewater before going to the "over generic, under SSTL" area (Johnny's Hole). A clean soil cap above grade should be constructed to prevent water accumulation.
	South Drainage Pond	PHC, PAHs, Zinc	375 - sediment/soil	375 and new cap		Removal of sediments/soil down to permafrost recommended. After dewatering, this material is expected to remain impacted above soil SSTLs, so will require treatment at the landfarm
	West side of Powerhouse	PHC	360 - soil	Up to 360 (or partial + clean cap)		Due to the steep embankment, proximity to an above ground pipeline and proximity to the building, it may only be possible to remove partial soil volume and place clean 0.5m cap over top. Removed soil will require treatment at the landfarm

Capital Project	Area	Contaminants	Approximate Volume (m^3)	Approximate Backfill (m^3)	Timing	Notes
	Sewage Lagoon	PHC	315 - sediments	n/a		Lagoon to be re-worked (reshape, banks stabilized, gravel added. Additional samples should be collected during excavation to confirm impacts are below the soil SSTLs, which would be applicable once it has been dewatered. Assuming this is confirmed, these sediments would be managed in a similar manner to those from the North Drainage Pond: dewatered and managed at the "over generic, under SSTLs" area (Johnny's Hole).
Priority Remediation (Upgradient of Water/Sewer Upgrades)	In-situ Landfarm	PHC	5,250 - soil	5,250	Starting Summer 2023	This area is showing no signs of improvement. Remove soil and backfill to grade. Hold at the interim soil management area until LTU ready, then actively treat at the LTU.
	Old Tank Farm (CANDAC trailers)	PHC	1,475 - soil	1,475		Same as in-situ landfarm.
Building Decommissioning	Area around Building #9 following	PHC	900 - soil	900	On-Hold	Additional delineation sampling around Building #9 for greater

Capital Project	Area	Contaminants	Approximate Volume (m^3)	Approximate Backfill (m^3)	Timing	Notes
	demolition (adjacent to In-situ Landfarm)					accuracy of volumes. Requires treatment at LTU.
	Buildings #5, #13 and #23 (may require excavation during demo)	PHC (suspected near building #13 based on sample LTM-5)	450 - soil	450		Additional sampling could help delineate area prior to demo. Requires treatment at LTU.
Total			**~8,435 – soil, 1,940 - sediments**	**Up to 10,060 + new caps**		

Table EX-2 presents the anticipated volume of contaminated soil at Areas of Environmental Concern (AEC) outside or adjacent to upcoming Eureka improvement projects. These areas are known to be contaminated and remediation is proposed when it would be efficient to do so.

Table EX-2 - Summary of Contaminated Soil in other AECs outside of Capital Project Footprints

AEC	Proximity to	Contaminants	Approximate Volume (m^3)	Approximate Backfill (m^3)	Notes
First Air Lease	Runway Recapitalization	PHC	~75 - soil	~75	Additional sampling could help delineate area further
Biocell			~275 - soil	~275	
Delta Area Hot Spots	Building Decommissioning	PHC	~850 - soil	~850	Additional sampling could help delineate various hot spot areas further should remediation be pursued
Total			**1,200 - soil**	**1,200**	

The following recommendations are made:

- Additional sampling would be beneficial to improve the delineation around building #9 adjacent to in-situ landfarm, delta area hot spots, at the biocell and former first air lease.
- The remediation scheduling should be closely integrated with the requirements of the infrastructure projects so as to minimize double handling of soils.

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1.0 Introduction

Dillon Consulting Limited and Outcome Consultants in joint venture (Dillon-Outcome) have completed an updated Remedial Action Plan (RAP) for Public Services and Procurement Canada (PSPC) at Environment and Climate Change Canada's (ECCC) Eureka High Arctic Weather Station (HAWS).

The updated RAP was developed using the additional data-gap filling sample points at the Temporary Stockpile (DOJV 2023a) with reference to revised site-specific target levels (SSTLs) which are an output of the Site-Specific Human Health and Ecological Risk Assessment (SSHHERA) at the site (DOJV, 2022b).

The purpose of the RAP is to help plan and guide the contaminated soil management requirements of four infrastructure projects at Eureka, while including the recommended remedial actions from previous RAPs at Eureka. This RAP includes:

- A remedial option analysis (ROA), to consider and select the most favourable means of managing the contaminated soil that will need to be removed from these project footprints and other areas.
- Estimates of volumes of contaminated soil and sediments within each project footprint which exceed the SSTLs or generic CCME PHC guidelines (for areas in proximity to the new and existing raw water reservoirs) and will require excavation and removal. These areas and volumes have been updated based on the additional soil sampling information as documented in the report: *2023 Supplemental Site Assessment – Stockpile Characterization at Eureka High Arctic Weather Station, Eureka, Nunavut (PSPC Project R.117995.002), March 2023* (DOJV, 2023).
- Inclusion of other contaminated soil and sediment areas that had previously been prioritized for remediation.

The Eureka HAWS (referred to herein as the "Site") has a Directory of Federal Real Property number of 07573. It has two active Federal Contaminated Site Inventory numbers: 00002747 for the Eureka High Arctic Weather Station, which is at Step 8 (Implement Remediation/Risk Management Strategy), and 70069001 for the Eureka – Main Camp "The Fort", which is at Step 7 (Develop Remediation/Risk Management Strategy), of the 10-Step Federal Contaminated Site Management Process under the Federal Contaminated Sites Action Plan (FCSAP).

2.0 Objectives

The objectives of this report are to:

1. Complete an Updated Remedial Options Analysis (ROA) using information from the Supplemental Site Assessment – Stockpile Characterization completed in the 2022-2023 fiscal year (DOJV 2023) and the previously updated SSHHERA (DOJV 2022b), as well as considerations of the current and upcoming construction projects. An earlier remedial option that had been previously favoured was Long-term monitoring (LTM), which is not suitable for the current contaminated soil management needs within the areas of the infrastructure projects.
2. Provide direction to the four infrastructure projects that are on-going or soon to commence, as to where contaminated soil is expected to occur within their project boundaries. It is understood that none of the infrastructure projects have provisions for managing contaminated soil except for the Water and Sewer upgrade project which currently includes in its specifications moving contaminated soil to a stockpile outside of the project areas.
3. Include remedial actions in the RAP for the areas previously recommended for remediation.
4. Incorporate the long-term monitoring requirements for the identified contaminated areas which will not be remediated in the near-term.

2.1 Linkages and Project Boundaries

A landfarm design for treatment of the anticipated impacted soils above SSTLs has been developed and is out for tender under separate project/contract by others. Construction is anticipated to commence in Summer 2024.

A Biodegradation study has been completed by the National Research Council in 2021, using soil collected in July 2021 during the supplementary site assessment. The results of the Biodegradation Study are summarized in the Remedial Options Analysis (Section 8).

This RAP contains a section of Landfarm Considerations, wherein the known and anticipated characteristics of the contaminated soil are brough forward into considerations for designing and operating the landfarm.

3.0 Environmental History

The Eureka HAWS has been an operational weather station since April 1947 and is a remote site located on the north side of the Slidre Fjord, at the north-western tip of Fosheim Peninsula on Ellesmere Island, Nunavut (Figure 1 and 2). It was the first of five "Joint Arctic Weather Stations" established under a joint project between Canada the United States Weather Bureau. Four other HAWS were established: Mould Bay, Isachsen, Alert and Resolute Bay. Support from the US was withdrawn in 1970, and Eureka came under the control of the Canadian Government. The Site is owned by ECCC and includes the Main Station Area and a Runway. The Land Use Permit (#1021) defines a total area of 1125 hectares of land that is allocated to Eureka. The Site serves as a hub for a number of different agencies carrying out different activities; the Department of National Defence (DND) and the Natural Resources Canada's Polar Continental Shelf Project (NRCan-PSPC) also conduct activities on site.

Environmental investigations have been conducted at the Eureka HAWS from 1995 through 2012. These investigations have identified the presence of contaminants of concern, identified areas of potential concern, and evaluated the risks for human health and ecological receptors. A Long-Term Monitoring Program has been undertaken at the Eureka HAWS since 2013 and there have been 4 rounds of monitoring thus far (2013, 2015, 2017 and 2019). A Remedial Action Plan (RAP) and Human Health and Ecological Risk Assessment (HHERA) were conducted in 2021 and it was determined that several AECs identified at the site had impacts above Site Specific Target Levels (SSTLs) developed for the site. Remedial options assessed during the RAP recommended the construction of a Landfarm Treatment Unit (LTU) for ongoing remediation activities at the site. A data gap analysis completed in conjunction with the 2021 RAP identified areas at the Site in need of additional sample coverage to improve the quality of zone delineation and contaminated soil volume estimates. The sampling recommended in the data gap analysis was completed in the summer of 2021 and reported as the Supplemental Site Assessment (DOJV 2022b).

3.1 Main Station Area

The Main Station area is east of Station Creek and includes a number of buildings and infrastructure including an operations/residence complex, garages, powerhouse, warehouses, electrical building, carpentry shop, transient quarters, miscellaneous small buildings, sealift landing area, active *in situ* landfill; closed landfills; contaminated soil treatment facilities; roads; water reservoir; sewage lagoon; tank farm and fuel pipeline.

During the operation of the HAWS there have been several petroleum hydrocarbon spills. The following major spills are reported to have occurred on the Site:

1. Approximately 145,000 L of diesel was spilled in 1973/74 at the former tank farm;
2. Between 37,000 L to 40,000 L of diesel was spilled in 1990 at the former tank farm;

3. A spill of petroleum fuel of unknown quantity was reported in 1996/1997 at the day tank north of the Powerhouse, and;

4. A spill of petroleum fuel in June 2014 on the east side of the landfarm from a valve in the pipeline which runs from the shore to the current tank farm (Senes, 2014).

Spills #1 and #2 above were at the former tank farm (CANDAC trailers now) which was located to the west of the current tank farm which replaced the former tank farm in 1992. The spills at the former tank farm are likely the main contributor to the contaminated soil areas present down-slope of the former tank farm. There are also demolished buildings, waste disposal sites, fuel barrels, abandoned vehicles and sewage at the site. Building 17 (Plumbing Building) in the Delta Area burned to the ground in July 2019 and soil sampling following the fire revealed some contaminated soil (QM-LP, 2020).

3.2 Runway Area

At the runway there are a number of areas that have been identified as areas of environmental concern including the landfills, the ex-situ Biotreatment Cell and the former First Air Lease. There is a barrel crushing area controlled by DND in this area as well as Fort Eureka operated by DND. Recent work by the contractor engaged in improvements to the Runway encountered suspected petroleum hydrocarbons in the excavated soil. A temporary soil stockpile was constructed during the 2020 construction season for the contaminated soil at the Runway. The facility was designed for a capacity of approximately 6,000 m^3 of soil. The stockpiled volume of suspected contaminated soil placed within it was surveyed as 2,800 m^3 as of August 2021. In 2022, a Supplemental Site Assessment – Stockpile Characterization was completed. The sampling program found no samples exceeding SSTLs (DOJV 2023).

4.0 2021 Supplemental Site Assessment

The goal of the Supplemental Site Assessment (DOJV, 2022a) was to collect additional samples at the Site to aid in the characterization and delineation of impacted soils within the footprint of anticipated capital projects and also other areas of environmental concern (AEC) at the Site. The areas included in the Supplementary Site Assessment were:

1. Runway area - Temporary soil stockpile
2. New Reservoir Area
3. Drainage Pond
4. Embankment by Powerhouse Building
5. In-situ Landfarm and Old Tank Farm - Historic spill area
6. Delta Area - Building #23 (Refrigeration Building)
7. Sewage Lagoon

Outcome completed 39 test pits dug manually or using a small rubber-tired backhoe between July 27 and August 2, 2021. Soil and sediment samples were collected and analyzed for BTEX, PHC Fractions F1-F4, PAHs, Metals, Salinity, FOC, grain size, texture and Class II Landfill Suitability. Additional details regarding the program are discussed in the associated report (DOJV 2022a).

The temporary soil stockpile could not be investigated in 2021 because the HDPE top liner was well keyed-in to the soil around the stockpile so it could not be peeled back, and perforating the top liner to sample the soil required appropriate tools and equipment to properly repair the liner.

The results from the Supplemental Site Assessment (DOJV, 2022a) were used to update the Site-Specific Human Health and Environmental Risk Assessment (SSHHERA) (DOJV, 2022b) and this RAP.

5.0 2021 Updated Site Specific Human Health and Ecological Risk Assessment

To aid in defining the areas requiring remediation at the Eureka HAWS, a SSHHERA was completed in 2021 (DOJV, 2022b), a list of Contaminants of Concern (COC) was established for Eureka and site-specific target levels (SSTLs) for soils and sediments were developed. The SSHHERA, COCs and SSTLs were updated in 2021 on the basis of additional data collected in the Supplemental Site Assessment. The soil SSTLs developed for the Eureka HAWS were based on the protection of human health and wildlife. Sediment SSTLs were developed to be protective of organisms present in the sediments within the on-site waterbodies. These are considered to be protective of both these organisms as well as any human contact with sediments.

Soils that are within the work areas of the infrastructure projects and exceed the soil SSTLs will be removed and treated on-site in a Landfarm Treatment Unit (LTU) to reduce their levels of contamination. Soils that exceed generic guidelines but are under SSTLs for PHC will be removed due to proximity to the drinking water components and stockpiled at a pre-determined location referred to as "Johnny's Hole."

Sediments that exceed sediment SSTLs are expected to be removed and dewatered separately, whereupon they can be classified as soil and tested and compared to the soil SSTLs and after testing follow appropriate treatment or stockpiling.

A summary of the updated SSTLs for Soil and Sediment is provided below.

Table 1: Site Specific Target Levels for Soil (Station Area)

Contaminant of Concern	SSTL (mg/kg)	Rationale
BTEX, PHC		
Benzene	2	Based on human health component of the guideline
Toluene	120	Based on ecological component of the guideline
Ethylbenzene	110	Based on ecological component of the guideline
Xylenes	65	Based on ecological component of the guideline
PHC F1 (C_6-C_{10})	7,800	Based on human health risk-based value. Due to the disturbed nature of the site, the plant benchmark is not appropriate

Contaminant of Concern	SSTL (mg/kg)	Rationale
PHC F2 (C_{10}-C_{16})	4,100	Based on human health risk-based value. Due to the disturbed nature of the site, the plant benchmark is not appropriate
PHC F3 (C_{16}-C_{34})	15,000	Human Health component of PHC F3 guideline. Due to the disturbed soils, the plant benchmark is not appropriate
Metals		
Arsenic	40	Based on human health risk-based value. Due to the disturbed nature of the site, the plant benchmark is not appropriate
Boron	30	Based on site-specific considerations. Maximum measured concentration plus 20% for sample variability
Boron, hot water soluble	6	Based on site-specific considerations. Represents maximum measured plus 20% for sample variability, which is higher than the benchmark
Copper	1,100	Human Health component of copper guideline. Due to the disturbed nature of the site, the plant benchmark is not appropriate
Lead	360	Based on ecological risk-based value. Due to the disturbed nature of the site, the plant benchmark is not appropriate
Nickel	78	Based on site-specific considerations. Maximum measured concentration plus 20% for sample variability
Zinc	10,000	Based on protection of human health
PAHs		
Acenaphthylene	8	Based on human health risk-based value. Due to the disturbed nature of the site, the plant benchmark is not appropriate
Acridine	3	Based on CCME guideline for similar structure- anthracene
1-Methylnaphthalene	70	Based on human health risk-based value. Due to the disturbed nature of the site, the plant benchmark is not appropriate

Contaminant of Concern	SSTL (mg/kg)	Rationale
2-Methylnaphthalene	110	Based on human health risk-based value. Due to the disturbed nature of the site, the plant benchmark is not appropriate
Naphthalene	60	Human health component of the guideline
Perylene	10	Based on CCME guideline for similar structure- pyrene

Table 2: Site Specific Target Levels for Sediment

Contaminant of Concern	SSTL (mg/kg)
BTEX, PHC	
Benzene	1.2
Ethylbenzene	1.2
Xylenes	1.3
PHC F1	21
PHC F2	57
PHC F3	99
Metals	
Arsenic	25
Chromium	58
Copper	84
Manganese	711
Zinc	197
PAHs	
Acenaphthene	0.02
Acenaphthylene	0.03
Acridine	0.05
Anthracene	0.11
Benzo(a)pyrene	0.16
Benzo(b&j)fluoranthene	0.16
Benzo(g,h,i)perylene	0.16
Fluorene	0.05
1-Methylnaphthalene	0.06
2-Methylnaphthalene	0.06
Naphthalene	0.12
Perylene	0.05
Phenanthrene	0.15
Pyrene	0.22

Additional details on the rationale for the development of the SSTLs are provided in the associated report (DOJV 2022b).

6.0 2022 Supplemental Site Assessment – Stockpile Characterization

The 2022 Supplemental Site Assessment – Stockpile Characterization (DOJV, 2023) at the Eureka HAWS consisted of collecting soil samples from within the lined Temporary Soil Stockpile near the Runway as identified in the soil sampling workplan. Fifteen (15) boreholes were advanced using a hand auger and soil samples were collected from two depths at each location.

Soil samples were analyzed for BTEXs, PHC Fractions F1-F4 and Metals. No exceedances were noted above SSTLs. As such, soils from this temporary stockpile can be categorized as "over generic, under SSTL" within this document and moved to a pre-determined location referred to as "Johnny's Hole". This material subject to it passing a leachate test such at the O.Reg 558 test, could be use as daily or permanent cover at any future engineered waste disposal facility at Eureka.

The updated volume of contaminated soil above SSTLs requiring treatment in the LTU at the Temporary Stockpile is therefore considered 0 m^3.

7.0 Infrastructure Projects

There are four infrastructure projects underway, or soon to be started at Eureka. A description of the projects as this relates to the estimated contaminated soil and backfill volumes used in this RAP is as follows:

7.1 Runway Recapitalization

During excavation work in July 2020 the contractor used visual and olfactory means to identify a zone of potential petroleum hydrocarbon impacts in the soil being excavated from the apron on the side of the runway. There were no environmental personnel on site at the time to perform soil sampling and testing. The potentially contaminated soil was reportedly removed using a grader and segregated. The means of addressing this potentially impacted soil was to construct a lined temporary stockpile to contain the potentially contaminated soil for an estimated six-year duration until a long-term management plan for the soil could be devised. The territorial regulator, Nunavut Department of Environment, required that the contaminated soil be managed actively rather than just stockpiled. For this reason, the stockpile was designed as a temporary measure until active treatment could be planned and implemented. The temporary stockpile measuring 2,800 m^3 was sampled in 2022 and results indicate the soils are "over generic but under SSTLs" (DOJV, 2023). An intended use for the 2,800 m^3 of soil at the temporary stockpile has not yet been devised. The Runway Recapitalization project was completed in 2022.

7.2 Water and Sewer Upgrades

Planning and mobilization for a water and sewer upgrade project started in the 2021 field season, with construction of the new reservoir starting in the Summer of 2022. The water and sewer upgrade project is anticipated to be completed by Fall 2025. The water and sewer upgrade project includes constructing a new drinking water reservoir (with lined sides and bottom) to the north of the Drainage Pond Area and improvements with the wastewater treatment.

The current reservoir will be used up-stream (in a process sense) of the new one as a settling pond and will continue to be filled by pumping water from Station Creek during spring runoff. Water would then be pumped into the new reservoir. The footprint of the new reservoir was investigated in the 2021 Supplemental Site Assessment (DOJV, 2022a) and the findings were that the soil in the footprint is not impacted compared to any soil SSTLs. There were no PHC concentrations above generic guidelines. Arsenic, naphthalene and nickel were noted above generic guidelines at random locations but deemed low risk.

The project also calls for filling in the Drainage Pond Area. The new reservoir will be constructed immediately to the west and down gradient of an *in situ* contaminated soil landfarm where contaminated soil from fuel leaks at the former tank farm has been worked and monitored since

2013 under an *in-situ* treatment plan. Tillage of the soil has been infrequent. The findings in 2020 (DOJV, 2020), after seven years of long-term monitoring were that no substantial changes in contaminant concentrations have been observed. An assessment of the risk to the new reservoir from the adjacent contaminated soil in-situ landfarm is presented in the memo titled "New Reservoir Soil Investigation at Eureka HAWS" (CanNorth 2022). The assessment concluded that it is unlikely that PHC contamination in the soil adjacent to the proposed new drinking water reservoir would migrate and contaminate the water in the new reservoir. However, the soils within in-situ landfarm are proposed to be excavated for treatment at the new LTU as a measure of protection for the new reservoir. Preliminary design of options for addressing the contamination in the drainage pond, upgrading the existing raw water reservoir and stabilizing the escarpments immediately east of the draining pond is currently underway.

Wastewater treatment for the Eureka HAWS is proposed to change from a single cell lagoon to a mechanical biological treatment system. As part of this work, the existing lagoon will be cleaned out and reworked (reshaped, banks stabilized, and traffic gravel added) to serve as a retention basin for the new system outflow.

7.3 Building Decommissioning

Ten buildings at the Main Station Area are slated for decommissioning. The Building Decommissioning project is currently on hold and a start date has not been confirmed at this time. All decommissioned building materials (both hazardous and not) will require disposal. The buildings to be demolished include:

i. Building 5 – Old Operations Complex
ii. Building 9 – Electrical Storage
iii. Building 12 –Salt Shack
iv. Building 13 – Carpentry Shop
v. Building 14 – Greenhouse
vi. Building 16 – Bunkhouse
vii. Building 18 – Transient Barracks
viii. Building 19 – Canadian Wildlife Service Storage Hut
ix. Building 23 – Refrigeration Shack
x. Shed in the Beach Area

An eleventh building (#17 Plumbing Building) burned to the ground in July 2019. Soil was excavated from around its footprint to a depth of 0.3 m below grade and removed and stockpiled on a liner

near the barrel crushing area. Although soil sampling at the base of the excavation indicated that one of the three base samples (Bldg17-SB) had exceedances of SSTLs, this is similar to the surrounding area and will not have any further remedial action in the near-term.

Three of the ten buildings planned for decommissioning require some excavation work that may generate contaminated soil:

- Building 5 (Old Operations Building) requires the removal of a sewage tank which may generate a limited amount of contaminated soil.
- Building 13 (Carpentry Shop) has a concrete pad that will be removed which may generate some contaminated soil. A sample (LTM-5) 15-20 m to the southwest has PHC F2 concentrations above soil SSTLs;
- Building 23 (Refrigeration Shack) requires some soil excavation for removal of its subgrade foundations. Four samples were collected around the building during the Supplemental Site Assessment and no issues were found, no contaminated soil is expected.

Figures 3 and 4 show the buildings slated for decommissioning and the soil sample locations with exceedances of SSTLs highlighted.

7.4 Fuel Storage Tank Repairs

To comply with regulatory requirements for storage tank systems under federal jurisdiction, the fuel storage tanks at the Eureka HAWS are inspected periodically. The most recent audit of the entire bulk plant tank system (tanks, valves, dispensing, piping, documentation, etc.) was conducted in 2019. As a result of the audit some internal and external inspections and minor repairs will be conducted in the future and audits of the smaller individual tanks at various locations around the Eureka HAWS will also be completed.

There are nine 60,000 litre factory-fabricated storage tanks and one 770,000 litre field-erected above-storage tank contained in the new tank farm.

Currently, no subsurface work is planned for this project, however if this changes, a provision for any contaminated soil from this location may be needed in the overall contaminated soil management plan.

8.0 Regulatory Requirements

8.1 Federal Regime

The Eureka HAWS is located on federal crown land and operates as a Research Facility under Land Use Permit (LUP) N2017N0017 issued in 2017 by Indigenous and Northern Affairs Canada (now Crown-Indigenous and Northern Affairs Canada) to ECCC. The LUP was amended in 2018 and acquisition of a new LUP and Quarrying Permit is currently underway as of March 2023, including submission to the Nunavut Planning Commission (NPC) and potentially the Nunavut Impact Review Board (NIRB). Two conditions of importance to the RAP are:

27. The Permittee shall only treat petroleum and hydrocarbon contaminated soils at the landfarm facility. Materials contaminated with other substances must not be stored at the landfarm and must be disposed of at an authorized facility.

28. The Permittee shall ensure that all equipment used for aeration in the landfarm has been cleaned off within the landfarm facilities prior to exiting.

Implications of Condition 27 of the LUP are discussed in the next section.

The federal government has jurisdiction over contaminated sites located on federally owned land. Statutes that apply to the management of contaminated sites include the Fisheries Act, Canadian Environmental Protection Act, Migratory Birds Conservation Act, Arctic Waters Pollution Prevention Act, and Species at Risk Act. The Treasury Board Directive on the Management of Real Property (2021) provides the framework for the management of contaminated sites. The policy includes instructions to federal departments to ensure that:

- Real property is managed in a manner that enables operational outcomes, demonstrates sound stewardship and provides best value, consistent with the Government of Canada's socio-economic and environmental objectives (section 3.2.1);
- Assessing suspected and known contaminated sites to determine the most appropriate, sustainable, and cost-effective action (section 4.2.17.3); and
- Taking immediate and reasonable action to mitigate risk to human health and to the environment in the event of contamination, before assessing a future course of action (section 4.2.16).

ECCC's current policy is to revisit all its contaminated sites after five years of inactivity; therefore, LTM as a means of managing a contaminated site must be revisited. LTM has been the risk management option in effect at Eureka for the past nine years (Franz/Senes, 2013).

8.2 Territorial Regime

The Eureka HAWS is also subject to the conditions of its Water License No. 8BC-EUR1621 issued by the Nunavut Water Board to ECCC. The terms and conditions of the Water Licence related to the site's water use and waste disposal. The Water License was last amended in 2016. However, an amendment to the Type B Water License is currently underway as of March 2023 and is anticipated to be in place by July or August 2023. The Type A Water License application process was initiated in early December 2022; where NPC referred the project to NIRB, whose decisions are anticipated by March 31, 2023. The Type A Water License in expected to be in place by March 2024, if not sooner. Of importance to the RAP is that the Water License recognizes the only "Landfarm Facility" as the facility for the petroleum hydrocarbon contaminated *in situ* soil treatment situated adjacent to the main complex area [as referenced in document Appendix B - Maps of Undertaking, October 21, 2010]. Thus, only the *in situ* landfarm that is adjacent to the future reservoir is currently accepted for long-term PHC impacted soil management.

The *Environmental Guideline for Contaminated Site Remediation*, Department of the Environment, Government of Nunavut (2009) document outlines Nunavut's approach to contaminated sites. The Government of Nunavut has the authority to ensure the preservation, protection, and enhancement of the environment on Commissioner's land (lands that have been transferred by Order-in-Council to the Government of Nunavut, including roadways and land subject to block land transfer); Crown Indigenous Relations and Northern Affairs Canada (CIRNAC) retains management of inland waters including surface water and groundwater.

A remediation project may require review by the Nunavut Impact Review Board (NIRB), Nunavut Planning Commission, and the Nunavut Water Board, if applicable. The timeframe for approval varies between 45 to 100 days, dependant on the complexity of the project.

9.0 Remedial Options Analysis

9.1 Evaluation Method

The process used to assess and select remedial options is a qualitative, multi-variant criteria decision matrix. This process is useful for arriving at an optimal decision when multiple criteria must be considered. The outcome of such an analysis is a solution which may not satisfy all evaluation criteria perfectly but is the best compromise solution for balancing the degree of satisfaction of multiple (and sometimes competing) considerations. The process was implemented by developing a set of potential options for managing contaminated soil, including the status quo (long-term monitoring) option, and evaluating the degree to which each option satisfied each evaluation criterion.

The evaluation criteria were evenly weighted in the comparison, i.e., no evaluation criterion was afforded more importance than another. Each management option was scored either favourable, neutral or unfavourable under each evaluation criterion to indicate its degree of satisfaction of the individual criterion. A favourable score was assigned if the evaluation criterion was well, or very well satisfied. A neutral score was given if an option somewhat satisfied the criterion or was neither the best nor worst at satisfying the evaluation criteria. An unfavourable score was assigned if the evaluation criterion was poorly or very poorly satisfied.

To determine the most favourable option, a numeric value was given for the favorability score as follows: each favourable score was given a value of +1, each neutral score was given a numerical value of 0, and each unfavourable score was given a value of -1. The overall score for each option was tallied and expressed as *favourable* if the numeric tally is greater than zero, *neutral* if the numeric tally is zero, and *unfavourable* if the numeric tally is less than zero. The numerical score was also given to highlight the most favourable option in the event that more than one received an overall favourable score.

9.2 Evaluation Criteria

Eight independent evaluation criteria were used to assess the acceptability of each of the considered contaminated soil management options. They were:

1. **Applicability to Site Conditions:** This criterion rates the applicability of the options to the Site's far Northern location at 80° north latitude, with its short construction seasons, continuous permafrost and expensive mobilization of equipment and personnel.

2. **Risk Reduction to Human and Environmental Health:** This criterion is used to score the effectiveness of the various options at reducing the risk to human and environmental health of the contamination in the source zones.

3. **Ease of Implementation:** Ease of implementation is evaluated from the constructor's perspective for their constructability and minimizing the delay for the construction projects. Options that are

relatively quick and straightforward to implement in the contaminated areas affected by construction will score favourably. Remedial options that involve removal will score favourably whereas *in situ* soil management (LTM) will score unfavourably.

4. **Effectiveness in Meeting Remedial Targets:** This criterion registers the effectiveness and timeliness of the remedial option for treating the soil. Options that have a reasonable expectation of achieving SSTL as remediation target levels in the contaminated soil are scored favourably and those techniques which are less likely of achieving reduction of contaminant levels will score unfavourably.

5. **Expected Regulator Acceptance:** This criterion considers the regulatory aspects associated with obtaining licenses or permits for the option. Experience with the contaminated soil at the runway has shown that the Nunavut Department of Environment wishes to see active remediation of contaminated soil. Stockpiling without a commitment to remediate is considered unfavourable. Environmental sustainability is also a factor under the environmental criterion with low CO_2 production considered favourable.

   It is also noted that Condition 27 of the LUP restricts the use of a landfarm to hydrocarbon contaminated soil only. Therefore, regulator acceptance of using SSTLs in place of the CCME guidelines as a threshold for establishing contamination levels for non-PHC contaminants will need to be done.

6. **Expected Community Acceptance:** This criterion considers the acceptability to the user community at Eureka: ECCC as owners of Eureka, the other user departments, and the Property Managers.

7. **Capital Cost:** This criterion is a qualitative comparison of capital cost of each option. As a qualitative score, the evaluation it is not proportional to actual costs. The lowest cost option(s) are scored as favourable and the most expensive score as unfavourable. A neutral ranking indicates an option that is in between the high and low-cost options under consideration.

8. **On-going Costs:** This criterion compares the on-going costs of the management options including landfarm operation, if the option requires it, and longer-term monitoring of soil that is treated *in situ*.

9.3 Remedial Options

Four potential remedial options were identified for comparative analysis:

Continuation of Long-term Monitoring - No contaminated soil excavation: In this option contaminated soil would not be excavated from the *in situ* landfarm adjacent to the new reservoir or the drainage pond, or the temporary stockpile at the runway. It would remain in place and continue to be monitored, where possible. LTM would continue with the prescribed interval between monitoring events. This is the risk management option that has been most often employed at Eureka, and is the least costly, however the results have shown that petroleum hydrocarbon concentrations have not decreased appreciably over the seven-years to-date of monitoring.

***In situ* treatment of contaminated soil, without removal**. In this option the contaminated soil would not be excavated from its source areas but would be treated *in situ* by physical means such as aeration by tilling, and chemical means by adding amendments to foster the biodegradation of organic compounds. This is a step more active remediation than LTM yet less involved than actual removal of contaminated soil.

Removal of contaminated soil to a Landfarm and operation of the landfarm with periodic tilling for aeration of the soil and the addition of nutrients and monitoring of concentrations. In this option, contaminated soil would be removed from the areas affected by the construction projects where soil concentrations exceed the SSTLs, including the drainage pond, and transported to a yet-to-be-constructed landfarm area. Contaminated soil targeted for removal would include what is within the project's footprint and equipment access around the area, i.e., haul roads for the construction projects.

Landfarm design and site selection has been completed by others. A completed set of specs is available.

To test the potential for biodegradation of the petroleum hydrocarbon contaminated soil at Eureka, six samples of contaminated soil were sent to the National Research Council and the results are contained in the draft report to be finalized by March 31, 2022 entitled *Eureka Biodegradation Feasibility Study, NRC, 2021*. The samples were assessed for naturally occurring bacteria able to consume or transform the petroleum hydrocarbons and reduce the PHC concentration. The PHC breakdown was assessed in unamended soil (control case) and soil which was dosed with two different sources of nitrogen: Monoammonium phosphate (MAP) and 20:8:20 fertilizer. Based on the results obtained in the lab the results were the following:

- The indigenous microbial community demonstrated an inherent ability to biodegrade PHCs in these soils.
- The addition of the nutrient amendments increased the overall extents of mineralization and biodegradation in all soils tested.
- MAP and 20:8:20 were very similar in their ability to stimulate the mineralization of the surrogate compounds hexadecane and naphthalene, with a slight increase in overall extent of mineralization with higher concentrations.
- The overall recommendation is that a biodegradation-based treatment system would be capable of degrading the PHCs present in the soils and that the nutrient amendment of choice would be a slow-release nutrient applied at an annual rate of approximately 750 mg nutrient/kg soil, with passive aeration of the system achieved through annual mixing and windrowing of the soil.

Given that the soil volumes are not well defined at some locations, the landfarming option provides a greater degree of flexibility for soil management with respect to volumes undergoing remediation than

off-site disposal. The incremental cost for a moderate increase in volume (still within the capacity of the LTU) is much less than if the soil is being sent off-site, as in the next option.

Remove contaminated soil, send off-site via sealift for disposal in the South. In this option, the contaminated soil would be stockpiled on site and sent off-site by sealift for disposal outside of the territory. This option is often used at Northern contaminated sites when the volumes in question are substantially lower, but it is the costliest of the options defined and would generate more CO_2 emissions than any of the on-site options due to transportation.

9.4 Evaluation

The remedial options have been scored for their degree of satisfaction of the evaluation criteria and are compared in the following matrix (Table 3).

Table 3 - Evaluation of Options for Contaminated Soil

Evaluation Criteria / Remedial Options	EVALUATION CRITERIA								Overall Score*
	Applicability to Site Conditions	**Risk Reduction at Source Areas**	**Ease of Implemen-tation**	**Effectiveness in Meeting Remedial Targets**	**Expected Regulator Acceptance**	**Expected Community Acceptance**	**Capital Cost**	**On-going Cost**	
Long-term monitoring, no soil removal	Unfavourable (-1)	Unfavourable (-1)	Favourable (+1)	Unfavourable (-1)	Unfavourable (-1)	Neutral (0)	Favourable (+1)	Neutral (0)	**Unfavourable (-2)**
In situ soil treatment	Neutral (0)	Neutral (0)	Favourable (+1)	Neutral (0)	Neutral (0)	Neutral (0)	Favourable (+1)	Neutral (0)	**Favourable (+2)**
Soil Removal to Land Treatment Unit, with active management	Neutral (0)	Favourable (+1)	Favourable (+1)	Favourable (+1)	Favourable (+1)	Favourable (+1)	Neutral (0)	Unfavourable (-1)	**Favourable (+4)**
Send off-site (South) for disposal	Unfavourable (-1)	Favourable (+1)	Neutral (0)	Neutral (0)	Neutral (0)	Neutral (0)	Unfavourable (-1)	Favourable (+1)	**Neutral (0)**

*Favourable scores are assigned +1; Neutral scores are assigned zero; and Unfavourable scores are assigned -1. The overall score is favourable if the tally is greater than zero, neutral if the tally is zero and unfavourable if the tally is less than zero.

9.5 Recommended Option and Rationale

The formerly recommended option of LTM does not remove the environmental or human health risks from the contaminated areas that will be affected by construction. LTM without active *in situ* treatment has been ineffective in meeting remedial targets at Eureka and would not garner regulator acceptance. It scores favourably on Capital Costs but is neutral for on-going costs due to its perpetual requirement for monitoring. This option presents an overall unfavourable (-2) ranking.

In situ treatment of contaminated soil without removal scores more favourably than simply long-term monitoring in terms of reduction of risk, and its ease of implementation. This option is favourable (+2) but less so than removal to a landfarm because *in situ* management has less likelihood of achieving the remedial target levels (SSTLs). It would not be applicable for the contaminated areas which will be overlain by constructed areas such as the new reservoir and the drainage pond. In-situ treatment only has merit for contaminated soil zones which are not in construction zones.

Excavation and removal of contaminated soil to a land treatment unit is favourable in that it removes the risk in the source areas in a favourable timeframe, is relatively easy to implement (considerations for landfarm operation discussed below). Furthermore, the results of the biodegradation study show a good potential for PHC reduction. Landfarms can be designed to allow some relative flexibility for the soil volume received. Segregating the contaminated soil into specific locations at the landfarm by degree of contamination (highly contaminated vs. lightly contaminated) opens the potential for modes of treatment and different areas of reuse after treatment. Upon treatment to SSTL levels, the soil would no longer be a risk to human or environmental health and could be reused as industrial fill at the Site. Soil that does not meet the SSTLs could potentially be drawn from the landfarm and, subject to passing a leachate test such at the O. Reg 558 test, be used as daily or permanent cover at a yet-to-be-constructed engineered waste disposal facility at Eureka. Management of contaminated soil at a Landfarm receives the most favourable ranking (+4). The construction of a LTU, and the yearly treatment costs for an as yet undetermined number of years, are the current Environmental liability. The liability would be considered extinguished once all of the soil in the LTU meets SSTLs.

Excavation and off-site disposal have some favourable characteristics in that it reduces risk at the source areas and, once the soil is off-site it has no ongoing Liability. The complexity of sending an immense volume south counteracts the ease of implementation however, and transportation to the South would have to be done over several years so it would require temporary stockpiling, which is unfavourable to the territorial regulator. The high carbon footprint of this option renders it the least sustainable and for this reason would likely be viewed unfavourably by the regulator and the Eureka community. This option presents an overall neutral (0) ranking.

The recommended soil management option is excavation and removal to a land treatment unit.

10.0 Updated Remedial Action Plan

10.1 Summary of Project Areas and Volume Estimates and Backfill Requirements

10.1.1 Runway Recapitalization

Soil sampling results from the 2022 Supplemental Site Assessment – Stockpile Characterization show no exceedances above the SSTLs from within Temporary Soil Stockpile. BTEXs and/or PHC concentrations were noted above generic guidelines in 29 samples. Boron concentrations were noted above generic guidelines in 16 sample locations. All soil from the Runway Recapitalization Temporary Soil Stockpile is classified as "over generic but under SSTLs.". The soils do not require treatment in the LTU but must be managed in a controlled fashion and placed at a pre-determined location referred to as "Johnny's Hole" as shown on Figure 2. Another option is to leave the soils in place pending regulatory approval.

10.1.2 Water and Sewer Upgrades

Figure 3 shows the project areas of the Water and Sewer Upgrade project superimposed on the soil sample locations with exceedances of SSTLs highlighted. Tables 1a,b and 2a,b in Appendix A provide soil and sediments analytical results respectively.

10.1.2.1 New Reservoir

Historical soil sampling results and results from the 2021 Supplemental Site Assessment show no exceedances above the revised SSTLs from within the new reservoir footprint. There were no PHC concentrations above generic guidelines. Arsenic, naphthalene and nickel noted above generic guidelines at a few locations but deemed low risk. Any soil removed as part of the new reservoir construction should be classified as intermediate quality soil, i.e., that which is not impacted over SSTLs but exceeds some generic criteria. It does not require treatment in the LTU but should be managed in a controlled fashion, and placed at a pre-determined location referred to as "Johnny's Hole" as shown on Figure 2.

10.1.2.2 Drainage Pond and West side of Powerhouse Building

Water and Sewer Upgrade project includes capping of the Drainage Pond; however, the project also presents an opportunity to remove the contaminated sediments as recommended in the previous RAP and Risk Review (DOJV, 2020). The Drainage Pond covers approximately 2,800 m^2.

Soil on the embankment between the Powerhouse and the Drainage Pond has been sampled repeatedly in the LTM program. The sample locations LTM-16, 17 and 19 at the edge of the Drainage Pond have PHC F2 exceedances above the SSTLs, however samples collected up-slope in 2021 (EMB21-1 through 5), along the embankment had PHC concentrations all below the soil SSTLs. The Embankment therefore does not require remediation.

The area requiring remediation on the west side of the Powerhouse is approximately 239 m^2 as shown on Figure 3, with an assumed depth of 1.5 m for a total volume of 360 m^3 of soil requiring excavation and treatment at the LTU. However, due to the proximity to the steep embankment, an above ground pipeline and the proximity to the building, full excavation may not be feasible and other remedial options such as a combination of partial removal of soils and the addition of a clean soil cap should be considered in this area.

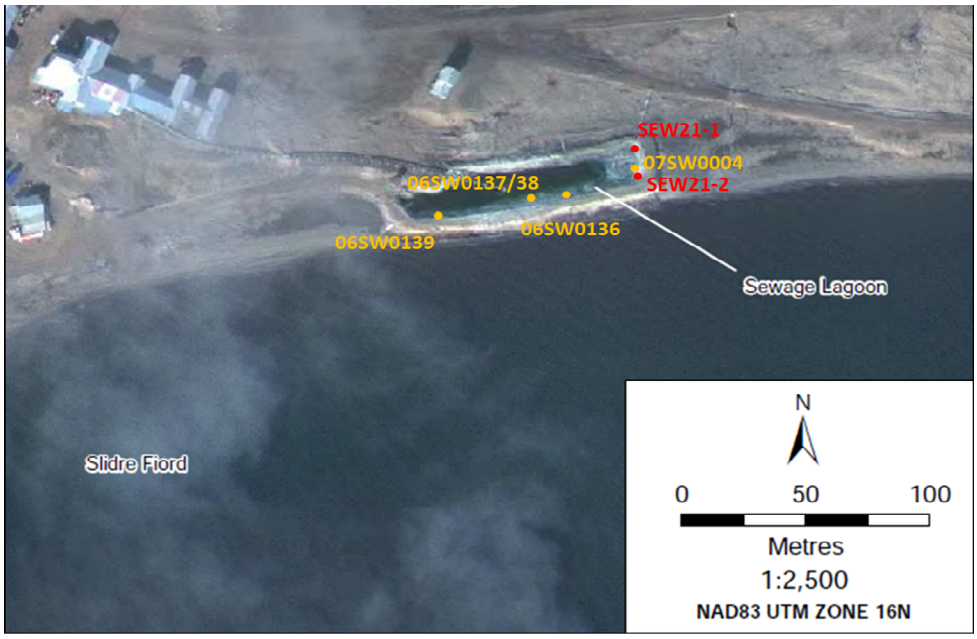
Sediments in the Drainage Pond exceed sediment SSTLs and/or generic CCME guidelines for BTEXs, PHCs, PAHs and/or metals. The highest concentrations in contaminants are at the south end of the Drainage Pond. However, due to the overall Drainage Pond's proximity to the new drinking reservoir and its upgradient position to the existing raw water reservoir, there is an issue with leaving any PHC impacted soils (above generic CCME guidelines) in place. It is therefore proposed to excavate the north portion and dewater it so that it can be managed as intermediate soil. The volume of sediments in the North Drainage Pond was calculated using a conservative depth of 0.5 m for an approximate volume of 1,250 m^3. Once dewatered, this material would be placed and managed at the "over generic, under SSTLs" predetermined location referred to as "Johnny's Hole."

The south area of the Drainage Pond has sediments with elevated PHC F2 concentrations above soil SSTLs. Elevated PHC F2 concentrations were noted in 2013 at LTM-SD5 (4,300 mg/kg) and in 2015 at LTM-SD7 (19,000mg/kg). As well, soil sample location LTM-19 immediately adjacent to the area has a maximum recorded PHC F2 concentration of 51,000 mg/kg (the highest noted across the site). An approximate area of 375 m^2 requires excavation with an assumed depth of 1.0 m for a total volume of approximately 375 m^3 of soil. However, the area should be excavated to permafrost refusal to remove as much impacted soil as feasible. Sediments/Soil from this area would have to be excavated, transported and segregated/dewatered and sent to the LTU for treatment. Preliminary design of options for addressing the contamination issues in the drainage pond are underway; including, upgrading the existing raw water reservoir, and stabilizing the escarpment immediately east of the drainage pond

10.1.2.3 Sewage Lagoon

The wastewater treatment process for the Eureka HAWS is proposed to change from a single cell lagoon to a mechanical biological treatment system. As part of this work, the existing lagoon will be cleaned out and reworked (reshaped, banks stabilized, and traffic gravel added) to serve as a retention basin for the new system outflow. The Sewage Lagoon is quite small at approximately 75 m by 14 m (1,050 m^2) and is separated from the Slidre Fjord by a 3 m wide berm. The results of limited sediment/soil sampling and testing showed PHC concentrations which are over generic guidelines but under SSTLs. Sample locations at the sewage lagoon are shown below in Text Figure 1. Samples in red are from 2021 and samples in orange are historical from 2006/2007.

Text Figure 1 Approximate locations of Sewage Lagoon sludge/sediment samples



An assumed depth of 0.3 m for total volume of 315 m^3 of sediments are planned for removal and segregation/dewatering. The sediment samples taken from the sewage lagoon to date have limited spatial distribution, so additional samples should be collected during excavation to confirm impacts are below the soil SSTLs, which would be applicable once it has been dewatered. Assuming this is confirmed, these sediments would be managed in a similar manner to those from the North Drainage Pond: dewatered and managed at the "over generic, under SSTLs" predetermined location referred to as "Johnny's Hole."

10.1.3 Priority Remediation Areas (Upgradient of Water/Sewer Upgrades)

10.1.3.1 In-situ Landfarm

The *in situ* landfarm presents some concern to the Eureka community because of its close proximity to the planned new reservoir. LTM soil samples results from the landfarm show little improvement in PHC concentrations over the years, with several over SSTLs. The area of the *in situ* landfarm is approximately 3,500 m^2, and the depth of expected contaminated soil (PHC F2) based on recent depth of refusal on permafrost is 1.5 metre. A volume of 5,250 m^3 of contaminated soil is estimated to require removal from this location. Management of this material will be by active soil treatment at the LTU (to be constructed) until values meet soil SSTLs.

10.1.3.2 Old Tank Farm (CANDAC trailers)

During the Supplemental Site Assessment in 2021, a total of 8 soil samples (including a duplicate) were collected from the old tank farm area where multiple historical large-scale spills have occurred. PHCs are present, with PHC F2 concentrations exceeding the soil SSTL ranging from 4,700 – 10,000 mg/kg. As shown on Figure 3, this area is approximately 975 m^2 with an assumed depth of 1.5 m resulting in an

excavation of approximately 1,475 m^3 of soil. Tables 1a/b in Appendix A present the soil analytical results. Soils from this area would be actively treated at the LTU (to be constructed) until values meet soil SSTLs.

10.1.4 Building Decommissioning

The overlay of soil samples exceeding SSTLs with the buildings slated for decommissioning is shown on Figures 3 and 4.

Adjacent to the In-situ landfarm, soils around Building #9 have PHC F2 concentrations above the soil SSTLs. This area is approximately 700 m^2. However, it should be noted that lateral delineation of the area has not been achieved. Assuming a depth of 1.25 m results in an excavation of approximately 900 m^3 of soil.

Only Buildings 5, 13 and 23 will require any removal of subgrade infrastructure. No immediate samples have been completed near Buildings 5 and 13. Sample LTM-5 located approximately 15 -20 m southwest of Building 5 has PHC F2 concentrations above soil SSTLs. An approximate area of 450 m^2 with an assumed depth of 1.0 m or a volume of 450 m^3 of contaminated soil has been carried forward for this project. Soil samples collected around Building 23 during the Supplemental Site Assessment (DOJV, 2022a) found no issues. No contaminated soil is expected during the demolition of this building.

Management of this material will be by active soil treatment at the LTU (to be constructed) until values meet soil SSTLs.

10.2 Summary of other Areas of Environmental Concern (AEC) and Volume Estimates

10.2.1 Biocell and Former First Air Lease

The Biocell and Former First Air Lease are located near the runway and have historic samples with PHC F2 concentrations above the SSTLs. Figure 6 and 7 shows the soil sample locations with exceedances of SSTLs highlighted for the Biocell and Former First Air Lease respectively. Tables 1a in Appendix A present the soil analytical results. Both sites could benefit from additional sampling to help delineate the areas further. For now, a conservative volume of 275 m^3 and 75 m^3 for the Biocell and Former First Air lease respectively are proposed for remediation in the LTU to be constructed.

10.2.2 Delta Area Hot Spots

Multiple soil exceedances above PHC F2 SSTL have been recorded in the Delta area near buildings scheduled for demolition. Although the demolition of these buildings doesn't include planned excavation, there is potential to address the areas at the same time. However, additional sampling ahead of time would help delineate the hot spots should excavation be pursued. A conservative volume of 850 m^3 of impacted soil has been calculated. Locations are illustrated on Figure 4 and soil analytical

results are presented in Table 1a in Appendix A. The proposed management of this soil is remediation in the LTU to be constructed.

10.3 Soil Management and Landfarm Considerations

Landfarm location and design has been completed under separate project/cover and is currently out for tender. In light of the contaminated soil accounting in the preceding sections, the following considerations are provided:

- Amendments to the LUP and Water License are required to approve of a new Landfarm. The Type B Water Licence Amendment application is anticipated to be submitted to NWB by March 31, 2023. An application for the new LUP and Quarry Permit is currently underway, including submissions to the NPC and potentially the NIRB.
- The schedule for excavation of some of the areas discussed in this RAP will precede the date at which the LTU is expected to be constructed and ready to accept soils for treatment. For this reason, an interim soil management area will need to be used to hold the soil and sediment until the LTU is ready. Sediments being stored in this location must be dewatered in advance of being stockpiled.
- A second location is required for storage of soils and sediments with contaminants over generic CCME guidelines but under SSTLs. A pre-determined location referred to as “Johnny’s Hole” has been designated, the location is shown on Figure 2. Sediments should be dewatered prior to being transferred. Dewatering activities should be completed in such a way that water can be contained and tested prior to discharge.
- Once the sediments are removed from the North & South Drainage Ponds and Sewage Lagoon and dewatered, the applicable SSTLs are no longer those for sediments; soil SSTLs apply. Applying soils SSTLs to the now-soil, the metals exceedances all disappear but some PHC exceedances still remain for the material taken from the South Drainage Pond.
- Another use for treated soil which has achieved the SSTLs, subject to it passing a leachate test such as the O.Reg 558 test, is to use it as daily or permanent cover at any future engineered waste disposal facility at Eureka.
- Landfarm planning must determine the party who will manage its operation. If ECCC site operations will be responsible, their earthmoving equipment is limited to a front-end loader, grader, bulldozer and excavator. Or, landfarm operation could be tendered as a separate contract designed for contractors specializing in soil treatment who would be responsible for providing their own equipment, personnel and products to enhance the treatment of the contaminated soil.

11.0 Conclusions and Recommendations

The contaminated soil volumes in areas that will be affected by the upcoming and on-going construction projects at Eureka HAWS have been evaluated using newly revised site-specific target levels and additional delineation sample points.

Table 4 presents the anticipated volume of contaminated soil excavation and backfill and the anticipated timing of the work relative to the upcoming Eureka improvement projects.

Table 4 - Summary of Contaminated Soil by Capital Projects

Capital Project	Area	Contaminants	Approximate Volume (m^3)	Approximate Backfill ($m^{3)}$	Timing	Notes
Runway Recapitalization	Temporary Soil Stockpile	None	0	0	Completed in 2022	No impacts were noted above soil SSTLs. PHC, BTEX and Boron noted above generic guidelines but deemed low risk. Soil should be sent to the "over generic, under SSTLs" area (Johnny's Hole), or left in place pending regulatory approval".
Water and Sewer Upgrades	Proposed New Reservoir	None	0	0	Started Summer 2022	No impacts were noted above soil SSTLs. Arsenic, naphthalene and nickel noted above generic guidelines but deemed low risk. If any soil must be removed in preparation of the base of the reservoir it could be sent to the "over generic, under SSTLs" area (Johnny's Hole).

Capital Project	Area	Contaminants	Approximate Volume (m^3)	Approximate Backfill (m^3)	Timing	Notes
	North Drainage Pond	PHC, PAHs, Arsenic	1,250 - sediment/soil	1,250 and new cap		Sediments with PHC concentrations above generic soil guidelines but below soils SSTLs are present. Due to proximity to the new drinking water reservoir and its upgradient position to the existing raw water reservoir, remediation is proposed. Sediment/Soils would be removed and allowed to dewater before going to the "over generic, under SSTL" area (Johnny's Hole). A clean soil cap above grade should be constructed to prevent water accumulation.
	South Drainage Pond	PHC, PAHs, Zinc	375 - sediment/soil	375 and new cap		Removal of sediments/soil down to permafrost recommended. After dewatering, this material is expected to remain impacted above soil SSTLs, so will require treatment at the landfarm
	West side of Powerhouse	PHC	360 - soil	Up to 360 (or partial + clean cap)		Due to the steep embankment, proximity to an above ground pipeline and

Capital Project	Area	Contaminants	Approximate Volume (m^3)	Approximate Backfill (m^3)	Timing	Notes
						proximity to the building, it may only be possible to remove partial soil volume and place clean 0.5m cap over top. Removed soil will require treatment at the landfarm
	Sewage Lagoon	PHC	315 - sediments	n/a		Lagoon to be re-worked (reshape, banks stabilized, gravel added. Additional samples should be collected during excavation to confirm impacts are below the soil SSTLs, which would be applicable once it has been dewatered. Assuming this is confirmed, these sediments would be managed in a similar manner to those from the North Drainage Pond: dewatered and managed at the "over generic, under SSTLs" area (Johnny's Hole).
Priority Remediation (Upgradient of Water/Sewer Upgrades)	In-situ Landfarm	PHC	5,250 - soil	5,250	Starting Summer 2023	This area is showing no signs of improvement. Remove soil and backfill to grade. Hold at the interim soil management area until LTU ready, then

Capital Project	Area	Contaminants	Approximate Volume (m^3)	Approximate Backfill (m^3)	Timing	Notes
						actively treat at the LTU.
	Old Tank Farm (CANDAC trailers)	PHC	1,475 - soil	1,475		Same as in-situ landfarm.
Building Decommissioning	Area around Building #9 following demolition (adjacent to In-situ Landfarm)	PHC	900 - soil	900	On-Hold	Additional delineation sampling around Building #9 for greater accuracy of volumes. Requires treatment at LTU.
	Buildings #5, #13 and #23 (may require excavation during demo)	PHC (suspected near building #13 based on sample LTM-5)	450 - soil	450		Additional sampling could help delineate area prior to demo. Requires treatment at LTU.
Total			**~8,435 – soil, 1,940 - sediments**	**Up to 10,060 + new caps**		

Table 5 presents the anticipated volume of contaminated soil at Areas of Environmental Concern (AEC) outside or adjacent to upcoming Eureka improvement projects. These areas are known to be contaminated and remediation is proposed when it would be efficient to do so.

Table 5 - Summary of Contaminated Soil in other AECs outside of Capital Project Footprints

AEC	Proximity to	Contaminants	Approximate Volume (m^3)	Approximate Backfill (m^3)	Notes
First Air Lease	Runway Recapitalization	PHC	~75 - soil	~75	Additional sampling could help delineate area further
Biocell			~275 - soil	~275	
Delta Area Hot Spots	Building Decommissioning	PHC	~850 - soil	~850	Additional sampling could help delineate various hot spot

AEC	Proximity to	Contaminants	Approximate Volume (m^3)	Approximate Backfill ($m^{3)}$	Notes
					areas further should remediation be pursued
Total			**1,200 - soil**	**1,200**	

Recommendations:

- Additional sampling would be beneficial to improve the delineation around building #9 adjacent to in-situ landfarm, delta area hot spots, at the biocell and former first air lease.
- The remediation scheduling should be closely integrated with the requirements of the infrastructure projects so as to minimize double handling of soils.

12.0 Closure

This report was prepared exclusively for the purposes, project, and site location outlined in the report. The report is based on information provided to, or obtained by Dillon-Outcome as indicated in the report, and applies solely to site conditions and the regulatory and planning frameworks existing at the time of the site supervision Dillon-Outcome's report represents a reasonable review of available information and environmental monitoring efforts within an established work scope and schedule.

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

We trust that this updated Remedial Action Plan will prove useful in planning the upcoming infrastructure projects at Eureka.

Sincerely,

DILLON-OUTCOME JOINT VENTURE

Keelan Veitch, B.Sc.
Intermediate Professional

Don Plenderleith, P.Eng (NU/NT)
Senior Professional

13.0 References

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Figures

GENERAL NOTES

1. ALL MEASUREMENTS IN METRES UNLESS OTHERWISE NOTED
2. COORDINATE SYSTEM IS UTM 16N NAD 83.

LEGEND

	LOCATION OF WORK SITE

STAMP/SEAL

outcome CONSULTANTS
151 HOLLAND AVE SUITE 200
OTTAWA, ONTARIO
K1Y 0Y2
t:613.729.2402

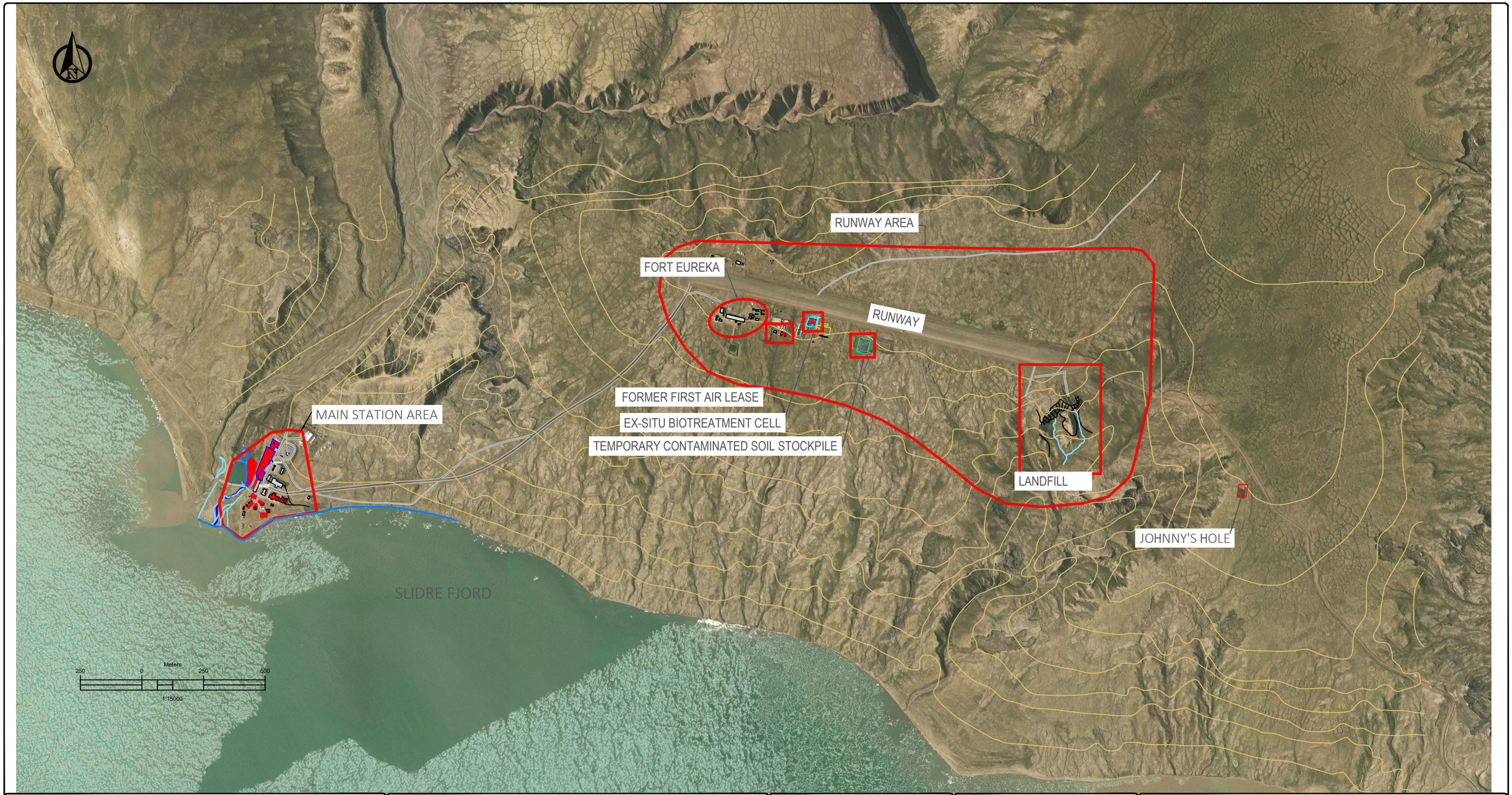
EUREKA HIGH ARCTIC WEATHER STATION

2023 REMEDIAL ACTION PLAN

EUREKA, NUNAVUT

KEYMAP

OUTCOME PROJECT NUMBER:	DRAWN BY:	SCALE:
P2021-16	J.MILLS	N.T.S.
CLIENT PROJECT NUMBER:	CHECKED BY:	PUBLISH DATE:
----	K.VEITCH	2023-03-14
DRAWING NAME:	SHEET NUMBER:	REV:
P2021-16 PSPC 2022 REMEDIAL ACTION PLAN (230314).dwg	01 OF 07	02



GENERAL NOTES

1. ALL MEASUREMENTS IN METRES UNLESS OTHERWISE NOTED
2. COORDINATE SYSTEM IS UTM 16N NAD 83.

LEGEND

	LONG TERM MONITORING WORK AREAS

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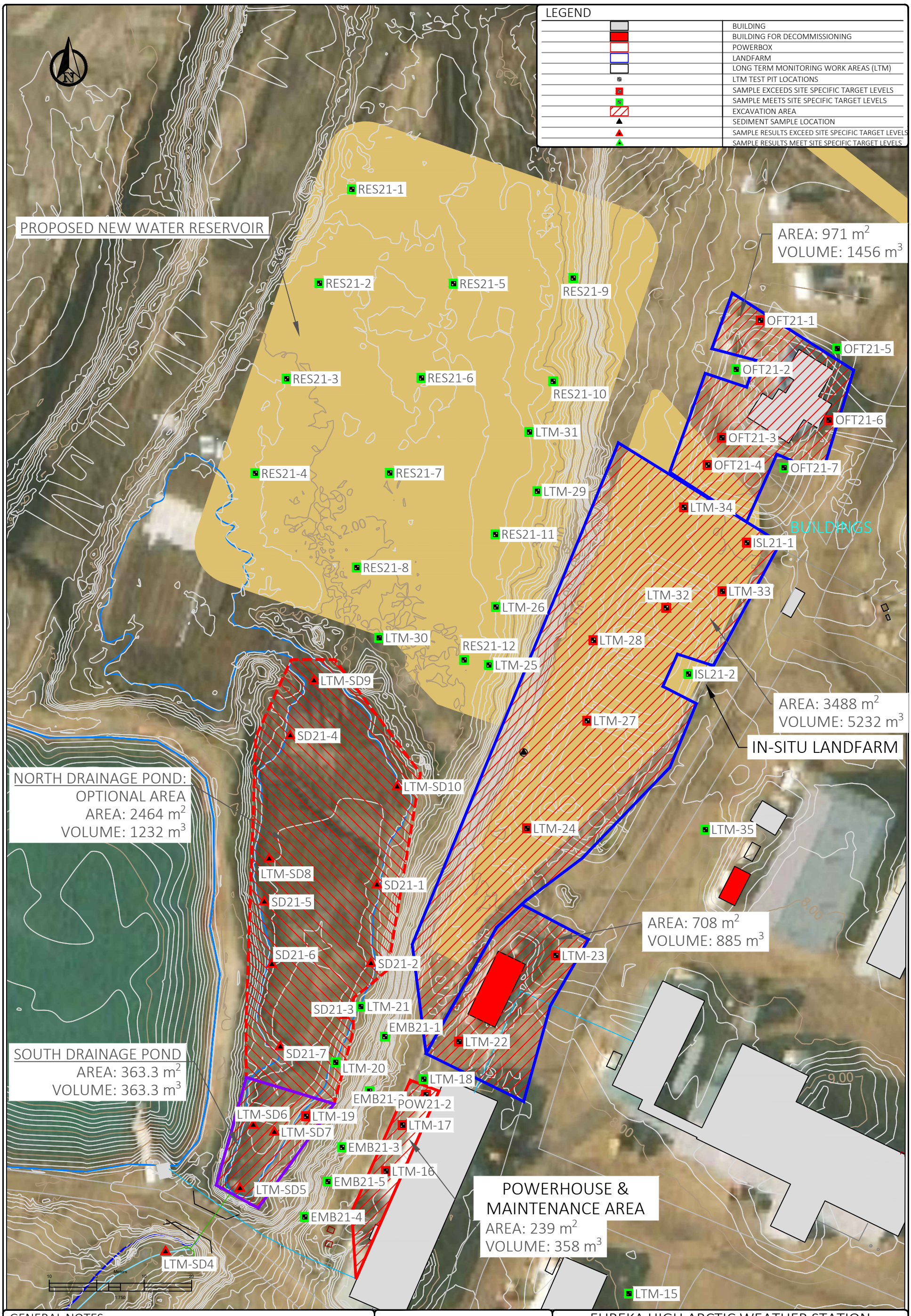
EUREKA HIGH ARCTIC WEATHER STATION

2023 REMEDIAL ACTION PLAN

EUREKA, NUNAVUT

SITE OVERVIEW

OUTCOME PROJECT NUMBER:	DRAWN BY:	SCALE:
P2021-16	J.MILLS	1:15000
CLIENT PROJECT NUMBER:	CHECKED BY:	PUBLISH DATE:
----	K.VEITCH	2023-03-14
DRAWING NAME:	SHEET NUMBER:	REV:
P2021-16 PSPC 2022 REMEDIAL ACTION PLAN (230314).dwg	02 OF 07	02



GENERAL NOTES

1. ALL MEASUREMENTS IN METRES UNLESS OTHERWISE NOTED
2. COORDINATE SYSTEM IS UTM 16N NAD 83.

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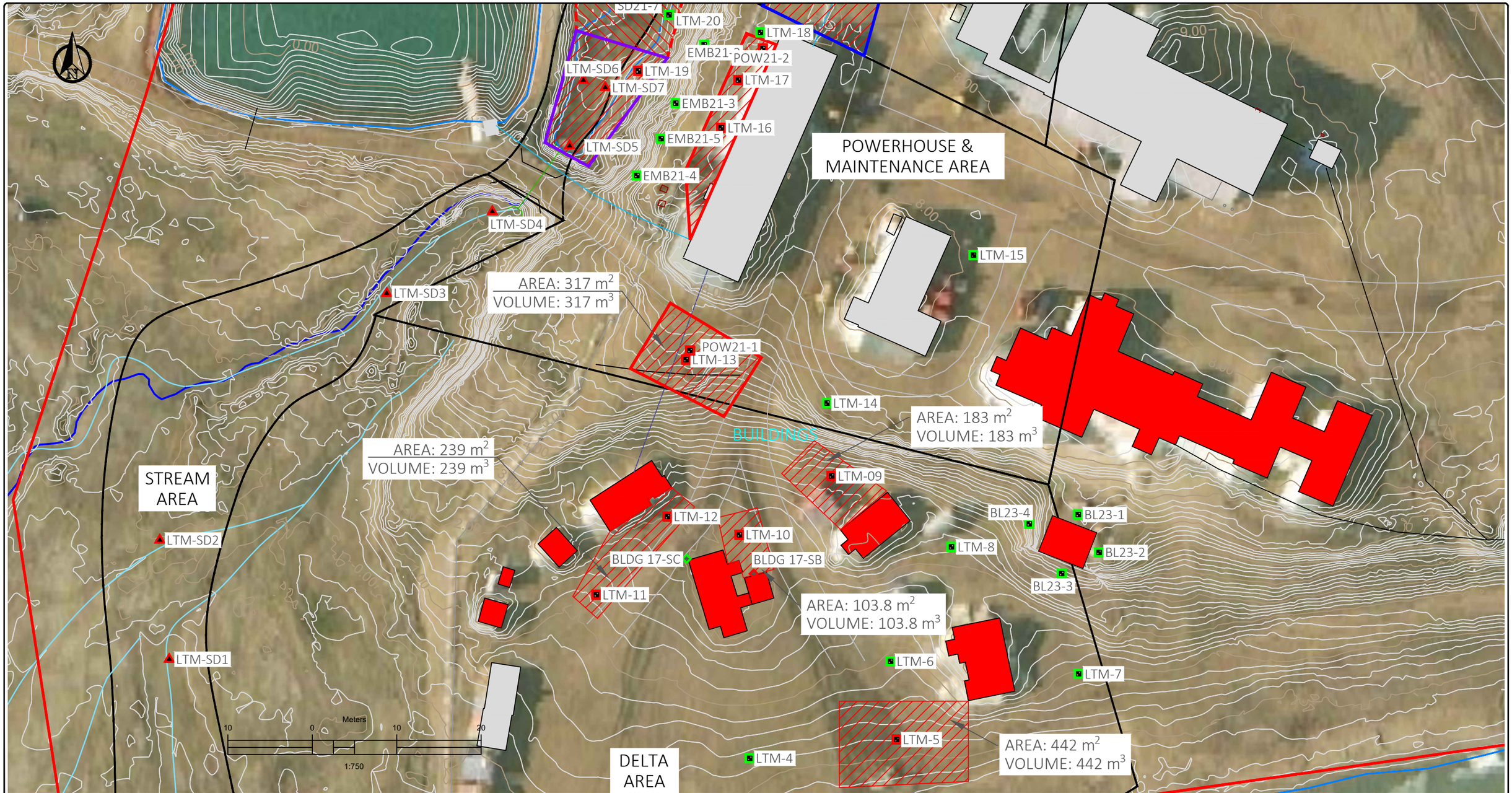
EUREKA HIGH ARCTIC WEATHER STATION

2023 REMEDIAL ACTION PLAN

EUREKA, NUNAVUT

SOIL AND SEDIMENT LOCATIONS (MAIN STATION)

OUTCOME PROJECT NUMBER:	DRAWN BY:	SCALE:
P2021-16	J.MILLS	1:750
CLIENT PROJECT NUMBER:	CHECKED BY:	PUBLISH DATE:
----	K.VEITCH	2023-03-14
DRAWING NAME:	SHEET NUMBER:	REV:
P2021-16 PSPC 2022 REMEDIAL ACTION PLAN (230314).dwg	03 OF 07	02



GENERAL NOTES

1. ALL MEASUREMENTS IN METRES UNLESS OTHERWISE NOTED
2. COORDINATE SYSTEM IS UTM 16N NAD 83.

LEGEND

	BUILDING
	BUILDING FOR DECOMMISSIONING
	POWERBOX
	LANDFARM
	LONG TERM MONITORING WORK AREAS (LTM)
	LTM TEST PIT LOCATIONS
	SAMPLE EXCEEDS SITE SPECIFIC TARGET LEVELS
	SAMPLE MEETS SITE SPECIFIC TARGET LEVELS
	EXCAVATION AREA
	SEDIMENT SAMPLE LOCATION
	SAMPLE RESULTS EXCEED SITE SPECIFIC TARGET LEVELS
	SAMPLE RESULTS MEET SITE SPECIFIC TARGET LEVELS

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EUREKA HIGH ARCTIC WEATHER STATION

2023 REMEDIAL ACTION PLAN

EUREKA, NUNAVUT

SOIL AND SEDIMENT LOCATIONS (DELTA AREA)

OUTCOME PROJECT NUMBER: P2021-16	DRAWN BY: J.MILLS	SCALE: 1:750
CLIENT PROJECT NUMBER: ----	CHECKED BY: K.VEITCH	PUBLISH DATE: 2023-03-14
DRAWING NAME: P2021-16 PSPC 2022 REMEDIAL ACTION PLAN (230314).dwg	SHEET NUMBER: 04 OF 07	REV: 02

GENERAL NOTES

1. ALL MEASUREMENTS IN METRES UNLESS OTHERWISE NOTED
2. COORDINATE SYSTEM IS UTM 16N NAD 83.

LEGEND

	BUILDING
	BUILDING FOR DECOMMISSIONING
	POWERBOX
	LANDFARM
	LONG TERM MONITORING WORK AREAS (LTM)
	LTM TEST PIT LOCATIONS
	SAMPLE EXCEEDS SITE SPECIFIC TARGET LEVELS
	SAMPLE MEETS SITE SPECIFIC TARGET LEVELS
	PROPOSED SAMPLE LOCATION
	SEDIMENT SAMPLE LOCATION
	SAMPLE RESULTS EXCEED SITE SPECIFIC TARGET LEVELS
	SAMPLE RESULTS MEET SITE SPECIFIC TARGET LEVELS

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EUREKA HIGH ARCTIC WEATHER STATION

2023 REMEDIAL ACTION PLAN

EUREKA, NUNAVUT

TEMPORARY CONTAMINATED STOCKPILE SOIL SAMPLING LOCATIONS

OUTCOME PROJECT NUMBER:	DRAWN BY:	SCALE:
P2021-16	J.MILLS	1:500
CLIENT PROJECT NUMBER:	**CHECKED BY:**	**PUBLISH DATE:**
----	K.VEITCH	2023-03-14
DRAWING NAME:	**SHEET NUMBER:**	**REV:**
P2021-16 PSPC 2022 REMEDIAL ACTION PLAN (230314).dwg	05 OF 07	02

GENERAL NOTES

1. ALL MEASUREMENTS IN METRES UNLESS OTHERWISE NOTED
2. COORDINATE SYSTEM IS UTM 16N NAD 83.

LEGEND

	BUILDING
	BUILDING FOR DECOMMISSIONING
	LANDFARM
	LONG TERM MONITORING WORK AREAS (LTM)
	LTM TEST PIT LOCATIONS
	SAMPLE EXCEEDS SITE SPECIFIC TARGET LEVELS
	SAMPLE MEETS SITE SPECIFIC TARGET LEVELS
	PROPOSED SAMPLE LOCATION
	EXCAVATION AREA
	SEDIMENT SAMPLE LOCATION
	SAMPLE RESULTS EXCEED SITE SPECIFIC TARGET LEVELS
	SAMPLE RESULTS MEET SITE SPECIFIC TARGET LEVELS

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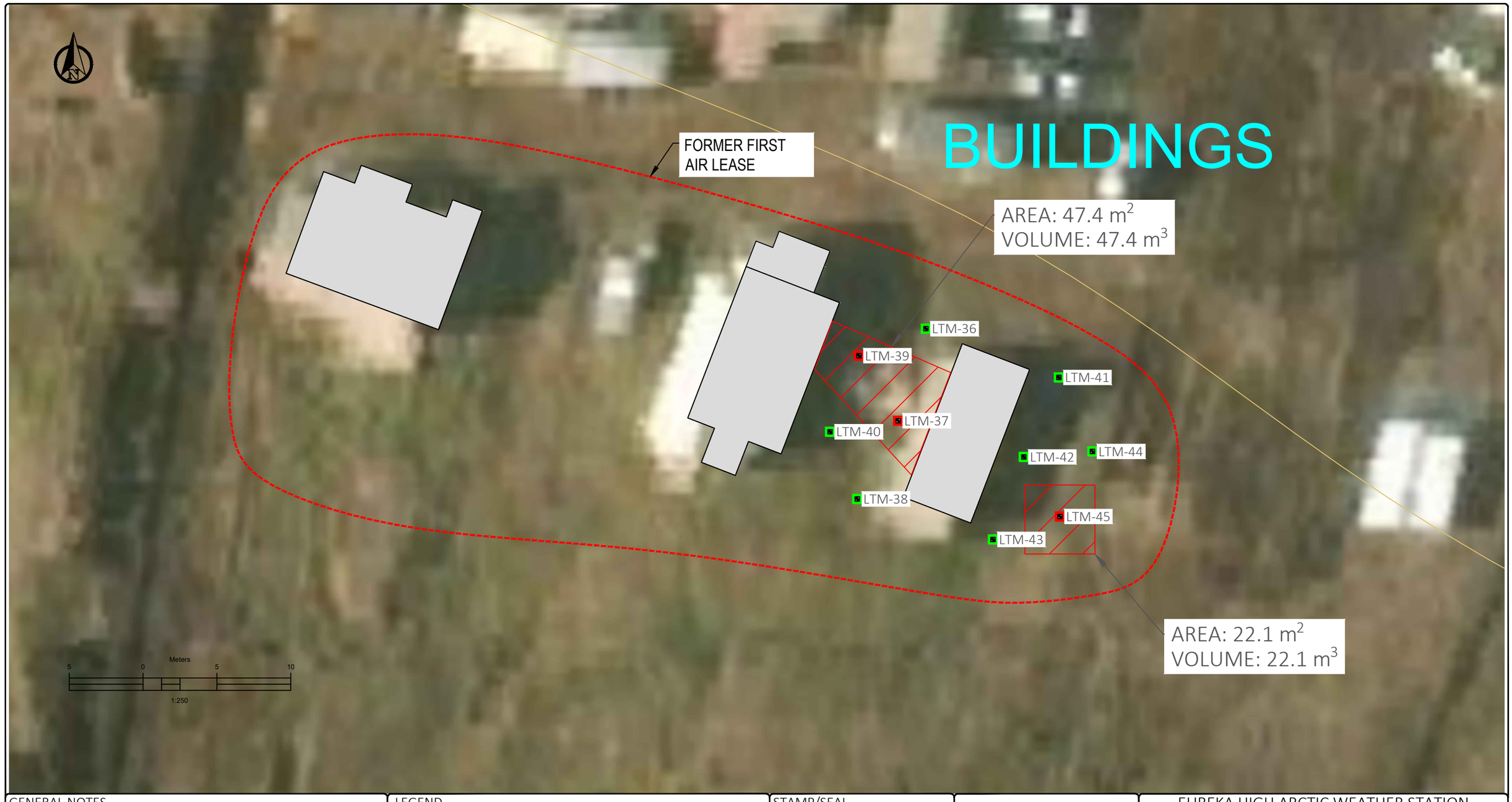
EUREKA HIGH ARCTIC WEATHER STATION

2023 REMEDIAL ACTION PLAN

EUREKA, NUNAVUT

EX-SITU BIOTREATMENT CELL SOIL SAMPLING LOCATIONS

OUTCOME PROJECT NUMBER:	DRAWN BY:	SCALE:
P2021-16	J.MILLS	1:250
CLIENT PROJECT NUMBER:	**CHECKED BY:**	**PUBLISH DATE:**
----	K.VEITCH	2023-03-14
DRAWING NAME:	**SHEET NUMBER:**	**REV:**
P2021-16 PSPC 2022 REMEDIAL ACTION PLAN (230314).dwg	06 OF 07	02



GENERAL NOTES

1. ALL MEASUREMENTS IN METRES UNLESS OTHERWISE NOTED
2. COORDINATE SYSTEM IS UTM 16N NAD 83.

LEGEND

	BUILDING
	BUILDING FOR DECOMMISSIONING
	LANDFARM
	LONG TERM MONITORING WORK AREAS (LTM)
	LTM TEST PIT LOCATIONS
	SAMPLE EXCEEDS SITE SPECIFIC TARGET LEVELS
	SAMPLE MEETS SITE SPECIFIC TARGET LEVELS
	PROPOSED SAMPLE LOCATION
	EXCAVATION AREA
	SEDIMENT SAMPLE LOCATION
	SAMPLE RESULTS EXCEED SITE SPECIFIC TARGET LEVELS
	SAMPLE RESULTS MEET SITE SPECIFIC TARGET LEVELS

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EUREKA HIGH ARCTIC WEATHER STATION

2023 REMEDIAL ACTION PLAN

EUREKA, NUNAVUT

FORMER FIRST AIR LEASE SOIL SAMPLING LOCATIONS

OUTCOME PROJECT NUMBER:	DRAWN BY:	SCALE:
P2021-16	J.MILLS	1:250
CLIENT PROJECT NUMBER:	**CHECKED BY:**	**PUBLISH DATE:**
----	K.VEITCH	2023-03-14
DRAWING NAME:	**SHEET NUMBER:**	**REV:**
P2021-16 PSPC 2022 REMEDIAL ACTION PLAN (230314).dwg	07 OF 07	02

Appendix A

Soil and Sediment Analytical Results

Table 1a Soil Results
Eureka HAWS, Nunavut
BTEXs, PHCs, Metals and Salinity Analysis

				Eureka HAWS RAP					
				New Reservoir					
Sample ID Laboratory ID Units Sampling Date Sample Depth (m)	Guideline	Guideline	Reportable Detection Limit (RDL) mg/g	RES21-1 ADJ464 mg/kg 31-Jul-2021 0.0 - 0.3	RES21-1 ADJ465 mg/kg 31-Jul-2021 0.3 - 0.65	RES21-2 ADJ466 mg/kg 31-Jul-2021 0 - 0.25	RES21-2 ADJ467 mg/kg 31-Jul-2021 0.25 - 0.55	RES21-3 ADJ468 mg/kg 31-Jul-2021 0.0 - 0.3	RES21-4 ADJ469 mg/kg 31-Jul-2021 0.0 - 0.2
PARAMETERS	**(1)**	**(3)**							
BTEX									
Benzene	0.0068	**2**	0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Toluene	0.08	**120**	0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Ethylbenzene	0.018	**110**	0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
m-Xylene & p-Xylene	NV	NV	0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
o-Xylene	NV	NV	0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Total Xylenes	2.4	**65**	0.045	<0.045	<0.045	<0.045	<0.045	<0.045	<0.045
Petroleum Hydrocarbons	**(2)**	**(3)**							
F1 (C6-C10)	30	**7,800**	10	<10	<10	<10	<10	<10	<10
F1 (C6-C10) - BTEX	30	**7,800**	10	<10	<10	<10	<10	<10	<10
F2 (C10-C16)	150	**4,100**	10	<10	<10	<10	<10	<10	<10
F3 (C16-C34)	300	**15,000**	50	<50	<50	<50	<50	<50	<50
F4 (C34-C50)	**2,800**	NV	50	<50	<50	<50	<50	<50	<50
Reached Baseline at C50	NV	NV	NV	Yes	Yes	Yes	Yes	Yes	Yes
F4G-SG (Heavy Hydrocarbons-Grav.)	NV	NV	500	-	-	-	-	-	-
Metals	**(1)**	**(3)**							
Antimony	**20**	NV	0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Arsenic	12	**40**	1	**19**	**15**	**24**	**14**	**32**	**18**
Barium	**500**	NV	1	27	36	34	29	39	38
Beryllium	**4**	NV	0.4	0.45	0.56	<0.40	0.54	0.51	0.51
Boron (Total)	NV	**30**	5	-	-	-	-	-	-
Boron (hws)	1.5 [4]	**6**	0.1	0.38	0.47	0.59	0.58	0.91	0.65
Cadmium	**10**	NV	0.1	0.058	0.092	0.058	0.078	0.083	0.08
Chromium	**64**	NV	1	41	49	19	26	40	40
Chromium VI	**0.4**	NV	0.08	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080
Cobalt	**50**	NV	0.1	12	13	9.7	12	13	13
Copper	63	**1,100**	0.5	29	20	27	21	37	27
Lead	140	**360**	1	11	9.7	11	7.3	17	10
Mercury	**6.6**	NV	0.05	0.17	0.067	0.15	0.072	0.25	0.13
Molybdenum	**10**	NV	0.5	3.1	1.9	2.3	1.5	3.2	2.3
Nickel	45	**78**	0.5	40	**47**	25	36	42	41
Selenium	**1**	NV	0.5	0.74	0.52	0.68	0.51	0.8	0.67
Silver	**20**	NV	0.2	<0.20	<0.20	<0.20	<0.20	0.2	<0.20
Thallium	**1**	NV	0.1	0.16	0.12	0.13	0.11	0.2	0.14
Uranium	**23**	NV	0.20	0.42	0.64	0.46	0.5	0.57	0.58
Vanadium	**130**	NV	1	41	48	54	40	50	41
Zinc	250	**10,000**	10	45	60	49	50	58	54
Salinity	**(1)**	**(3)**							
pH	6.0 - 8.5	NV	N/A	7.07	7.25	6.52	6.87	7.57	7.03
Electrical Conductivity (EC)	2	NV	0.1	1.7	1.8	**7.9**	**2.5**	**7.8**	**11**
Sodium Adsorption Ratio (SAR)	5	NV	0.1	2.1	2.1	4.7	2.9	**5.2**	**8.1**
Percent Saturation	NV	NV	NA	27	26	25	25	28	30
Calcium	NV	NV	0.60	45	46	160	62	200	180
Magnesium	NV	NV	0.40	18	15	130	21	95	160
Potassium	NV	NV	0.52	3.5	2.8	6.5	3.6	7.9	7.9
Sodium	NV	NV	1.0	34	32	170	52	190	340
Chloride	NV	NV	40	41	53	310	99	480	920
Sulphate	NV	NV	2.0	200	170	810	190	610	570
Soluble Cations and Anions (mg/L)	**(1)**	**(3)**							
Calcium (mg/L)	NV	NV	1.5	160	170	640	240	710	600
Magnesium (mg/L)	NV	NV	1	66	56	500	84	340	520
Potassium (mg/L)	NV	NV	1.3	13	11	26	14	28	26
Sodium (mg/L)	NV	NV	2.5	120	120	660	200	670	1100
Chloride (mg/L)	NV	NV	100	150	200	1200	390	1700	3100
Sulphate (mg/L)	NV	NV	5	740	630	3200	760	2200	1900

RDL exceeds guideline value
Applied Guideline Exceedance

BOLD - Generic Guideline Exceedance
Guideline 1 CCME Soil Quality Guideline Residential Land Use, fine grained, shallow soil (<1.5m)
Guideline 2 Canada Wide Standards for Petroleum Hydrocarbons Tier 1 Residential Eco Soil Contact
Guideline 3 Site Specific Target Levels
Guideline 4 Ontario Ministry of the Environment 2011 Soil, Groundwater, and Sediment Standards for use under Part X.V.1 of the Environmental Protection Act (MECP, 2011). Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Condition
GUIDELINE USED IS BOLD IN TABLE
QAQC Notes:
RDL - Reportable detection limit
RPD - Relative percent difference calculated as (abs(C1-C2)/average(C1+C2))*100
"-" Indicates RPD not calculated. RPD cannot be calculated if one or more of the analytical results are less than detection limits or within 5 times the detection limits.
BOLD - RPD value greater than 60%

Table 1a Soil Results
Eureka HAWS, Nunavut
BTEXs, PHCs, Metals and Salinity Analysis

				Eureka HAWS RAP						
				New Reservoir						
Sample ID Laboratory ID Units Sampling Date Sample Depth (m)	Guideline	Guideline	Reportable Detection Limit (RDL) mg/g	RES21-5 ADJ470 mg/kg 31-Jul-2021 0.0 - 0.2	RES21-5 ADJ471 mg/kg 31-Jul-2021 0.2 - 0.55	RES21-6 ADJ472 mg/kg 31-Jul-2021 0.0 - 0.25	RES21-6 ADJ473 mg/kg 31-Jul-2021 0.25 - 0.65	RES21-7 ADJ517 mg/kg 2-Aug-2021 0.0 - 0.2	RES21-7 ADJ518 mg/kg 2-Aug-2021 0.2 - 0.5	RES21-8 ADJ519 mg/kg 2-Aug-2021 0.0 - 0.35
PARAMETERS	**(1)**	**(3)**								
BTEX										
Benzene	0.0068	**2**	0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Toluene	0.08	**120**	0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Ethylbenzene	0.018	**110**	0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
m-Xylene & p-Xylene	NV	NV	0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
o-Xylene	NV	NV	0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Total Xylenes	2.4	**65**	0.045	<0.045	<0.045	<0.045	<0.045	<0.045	<0.045	<0.045
Petroleum Hydrocarbons	**(2)**	**(3)**								
F1 (C6-C10)	30	**7,800**	10	<10	<10	<10	<10	<10	<10	<10
F1 (C6-C10) - BTEX	30	**7,800**	10	<10	<10	<10	<10	<10	<10	<10
F2 (C10-C16)	150	**4,100**	10	16	<10	<10	<10	<10	<10	<10
F3 (C16-C34)	300	**15,000**	50	61	<50	<50	<50	67	<50	<50
F4 (C34-C50)	**2,800**	NV	50	<50	<50	<50	<50	<50	<50	<50
Reached Baseline at C50	NV	NV	NV	Yes	Yes	Yes	Yes	Yes	Yes	Yes
F4G-SG (Heavy Hydrocarbons-Grav.)	NV	NV	500	-	-	-	-	-	-	-
Metals	**(1)**	**(3)**								
Antimony	**20**	NV	0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Arsenic	12	**40**	1	**13**	**22**	**18**	**14**	**14**	**14**	11
Barium	**500**	NV	1	57	23	27	22	40	28	43
Beryllium	**4**	NV	0.4	0.74	0.55	<0.40	0.45	0.62	0.52	0.53
Boron (Total)	NV	**30**	5	-	-	-	-	-	-	-
Boron (hws)	1.5 [4]	**6**	0.1	1	0.54	0.44	0.44	0.72	0.55	0.87
Cadmium	**10**	NV	0.1	0.083	0.1	<0.050	0.067	0.08	0.064	0.059
Chromium	**64**	NV	1	24	12	11	12	18	55	17
Chromium VI	**0.4**	NV	0.08	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080
Cobalt	**50**	NV	0.1	10	11	9.5	9.8	12	12	9.1
Copper	63	**1,100**	0.5	21	27	24	23	21	23	17
Lead	140	**360**	1	13	12	8.9	8.3	10	7.4	11
Mercury	**6.6**	NV	0.05	0.073	0.11	0.14	0.11	0.079	0.068	0.064
Molybdenum	**10**	NV	0.5	1.2	2.2	2	1.7	1.1	1.9	1.1
Nickel	45	**78**	0.5	28	27	21	25	29	45	23
Selenium	**1**	NV	0.5	<0.50	0.77	0.6	0.61	0.59	<0.50	<0.50
Silver	**20**	NV	0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Thallium	**1**	NV	0.1	0.12	0.12	0.11	0.13	0.1	0.1	<0.10
Uranium	**23**	NV	0.20	0.66	0.64	0.44	0.47	0.69	0.4	0.63
Vanadium	**130**	NV	1	39	46	48	37	37	42	29
Zinc	250	**10,000**	10	64	66	45	48	58	51	48
Salinity	**(1)**	**(3)**								
pH	6.0 - 8.5	NV	N/A	7.35	6.83	6.91	6.94	7.08	7.15	6.77
Electrical Conductivity (EC)	2	NV	0.1	**38**	**12**	**3.4**	**3.2**	**2.8**	**2.6**	**7**
Sodium Adsorption Ratio (SAR)	5	NV	0.1	**18**	**11**	4.8	4.9	3.3	**5.2**	**6.2**
Percent Saturation	NV	NV	NA	45	24	26	27	35	25	40
Calcium	NV	NV	0.60	540	140	68	68	77	39	170
Magnesium	NV	NV	0.40	1100	120	35	32	40	17	140
Potassium	NV	NV	0.52	34	5.7	3.1	3.1	6.8	3.7	13
Sodium	NV	NV	1.0	2100	350	100	100	85	77	290
Chloride	NV	NV	40	5900	910	99	100	150	140	740
Sulphate	NV	NV	2.0	1300	340	340	320	260	100	430
Soluble Cations and Anions (mg/L)	**(1)**	**(3)**								
Calcium (mg/L)	NV	NV	1.5	1200	610	270	250	220	160	430
Magnesium (mg/L)	NV	NV	1	2400	510	130	120	110	70	360
Potassium (mg/L)	NV	NV	1.3	75	24	12	11	19	15	33
Sodium (mg/L)	NV	NV	2.5	4700	1500	390	370	240	310	720
Chloride (mg/L)	NV	NV	100	13000	3800	380	390	420	560	1900
Sulphate (mg/L)	NV	NV	5	2800	1400	1300	1200	730	420	1100

RDL exceeds guideline value
Applied Guideline Exceedance

BOLD - Generic Guideline Exceedance
Guideline 1 CCME Soil Quality Guideline Residential Land Use, fine grained, shallow soil (<1.5m)
Guideline 2 Canada Wide Standards for Petroleum Hydrocarbons Tier 1 Residential Eco Soil Contact
Guideline 3 Site Specific Target Levels
Guideline 4 Ontario Ministry of the Environment 2011 Soil, Groundwater, and Sediment Standards for use under Part X.V.1 of the Environmental Protection Act (MECP, 2011). Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Condition
GUIDELINE USED IS BOLD IN TABLE
QAQC Notes:
RDL - Reportable detection limit
RPD - Relative percent difference calculated as (abs(C1-C2)/average(C1+C2))*100
"-" Indicates RPD not calculated. RPD cannot be calculated if one or more of the analytical results are less than detection limits or within 5 times the detection limits.
BOLD - RPD value greater than 60%

Table 1a Soil Results
Eureka HAWS, Nunavut
BTEXs, PHCs, Metals and Salinity Analysis

				Eureka HAWS RAP								
				New Reservoir						Duplicates		
Sample ID Laboratory ID Units Sampling Date Sample Depth (m)	Guideline	Guideline	Reportable Detection Limit (RDL) mg/g	RES21-9 ADJ520 mg/kg 30-Jul-2021 0.0 - 0.5	RES21-9 ADJ521 mg/kg 30-Jul-2021 0.5 - 0.8	RES21-10 ADJ522 mg/kg 30-Jul-2021 0.0 - 0.5	RES21-10 ADJ523 mg/kg 30-Jul-2021 0.5 - 0.8	RES21-11 ADJ524 mg/kg 2-Aug-2021 0.0 - 0.3	RES21-11 ADJ525 mg/kg 2-Aug-2021 0.3 - 0.7	RES21-12 ADJ526 mg/kg 2-Aug-2021 0.0 - 0.35	DUP-004 ADJ632 mg/kg 2-Aug-2021 0.0 - 0.35	RPD (%)
PARAMETERS	**(1)**	**(3)**										
BTEX												
Benzene	0.0068	**2**	0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	-
Toluene	0.08	**120**	0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	-
Ethylbenzene	0.018	**110**	0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	-
m-Xylene & p-Xylene	NV	NV	0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	-
o-Xylene	NV	NV	0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	-
Total Xylenes	2.4	**65**	0.045	<0.045	<0.045	<0.045	<0.045	<0.045	<0.045	<0.045	<0.045	-
Petroleum Hydrocarbons	**(2)**	**(3)**										
F1 (C6-C10)	30	**7,800**	10	<10	<10	<10	<10	<10	<10	<10	<10	-
F1 (C6-C10) - BTEX	30	**7,800**	10	<10	<10	<10	<10	<10	<10	<10	<10	-
F2 (C10-C16)	150	**4,100**	10	<10	<10	<10	<10	24	<10	15	13	14
F3 (C16-C34)	300	**15,000**	50	<50	<50	52	<50	98	<50	<50	56	-
F4 (C34-C50)	**2,800**	NV	50	<50	<50	<50	<50	<50	<50	<50	<50	-
Reached Baseline at C50	NV	NV	NV	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
F4G-SG (Heavy Hydrocarbons-Grav.)	NV	NV	500	-	-	-	-	-	-	-	-	-
Metals	**(1)**	**(3)**										
Antimony	**20**	NV	0.5	<0.50	<0.50	<0.50	<0.50	<0.50	0.65	<0.50	<0.50	-
Arsenic	12	**40**	1	9.7	9.7	6.8	7	8.3	**22**	**14**	**13**	7
Barium	**500**	NV	1	31	27	31	37	33	25	59	35	51
Beryllium	**4**	NV	0.4	0.42	<0.40	<0.40	<0.40	0.41	0.52	0.73	0.46	-
Boron (Total)	NV	**30**	5	-	-	-	-	-	-	-	-	-
Boron (hws)	1.5 [4]	**6**	0.1	1	1.4	0.54	1.3	1	0.79	1.5	0.49	-
Cadmium	**10**	NV	0.1	0.062	<0.050	0.062	0.05	<0.050	0.076	0.082	0.065	-
Chromium	**64**	NV	1	12	13	18	11	12	11	29	31	7
Chromium VI	**0.4**	NV	0.08	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	-
Cobalt	**50**	NV	0.1	8	7.1	4.8	5.9	6.6	11	11	9.4	16
Copper	63	**1,100**	0.5	14	15	10	11	12	22	22	20	10
Lead	140	**360**	1	7.5	6.5	5.8	7	6.9	11	15	9.3	47
Mercury	**6.6**	NV	0.05	<0.050	<0.050	<0.050	<0.050	<0.050	0.14	0.079	0.073	-
Molybdenum	**10**	NV	0.5	0.95	1.1	1	0.59	0.77	1.7	1.2	1.6	29
Nickel	45	**78**	0.5	18	18	15	14	15	25	31	29	7
Selenium	**1**	NV	0.5	<0.50	<0.50	<0.50	<0.50	<0.50	0.7	0.56	<0.50	-
Silver	**20**	NV	0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	-
Thallium	**1**	NV	0.1	<0.10	<0.10	<0.10	<0.10	<0.10	0.15	0.12	<0.10	-
Uranium	**23**	NV	0.20	0.48	0.41	0.3	0.46	0.51	0.5	0.98	0.53	-
Vanadium	**130**	NV	1	31	27	23	24	24	40	39	44	12
Zinc	250	**10,000**	10	40	36	30	34	44	45	63	50	23
Salinity	**(1)**	**(3)**										
pH	6.0 - 8.5	NV	N/A	6.86	7	7.75	7.22	7.13	7.16	6.66	7.38	10
Electrical Conductivity (EC)	2	NV	0.1	**2.6**	**4.3**	0.61	3	**4.3**	1.5	**3**	1.4	**73**
Sodium Adsorption Ratio (SAR)	5	NV	0.1	**6.7**	**7.6**	4	**6.6**	**5.4**	4.8	**5.2**	0.9	**141**
Percent Saturation	NV	NV	NA	32	31	25	33	35	24	56	28	-
Calcium	NV	NV	0.60	35	71	5.8	41	78	19	87	58	40
Magnesium	NV	NV	0.40	19	39	3	23	75	8	55	21	**89**
Potassium	NV	NV	0.52	3.8	6.8	3.1	11	13	4	13	3.4	**117**
Sodium	NV	NV	1.0	110	180	24	120	160	49	190	16	**169**
Chloride	NV	NV	40	140	290	21	230	270	49	210	7.7	-
Sulphate	NV	NV	2.0	190	240	26	130	390	130	550	240	78
Soluble Cations and Anions (mg/L)	**(1)**	**(3)**										
Calcium (mg/L)	NV	NV	1.5	110	230	23	120	230	77	150	210	33
Magnesium (mg/L)	NV	NV	1	59	130	12	70	220	33	98	75	27
Potassium (mg/L)	NV	NV	1.3	12	22	12	32	38	16	23	12	63
Sodium (mg/L)	NV	NV	2.5	350	580	95	370	480	200	330	60	**138**
Chloride (mg/L)	NV	NV	100	440	940	85	670	780	200	380	28	-
Sulphate (mg/L)	NV	NV	5	590	790	100	390	1100	550	980	880	11

RDL exceeds guideline value
Applied Guideline Exceedance

BOLD - Generic Guideline Exceedance
Guideline 1 CCME Soil Quality Guideline Residential Land Use, fine grained, shallow soil (<1.5m)
Guideline 2 Canada Wide Standards for Petroleum Hydrocarbons Tier 1 Residential Eco Soil Contact
Guideline 3 Site Specific Target Levels
Guideline 4 Ontario Ministry of the Environment 2011 Soil, Groundwater, and Sediment Standards for use under Part X.V.1 of the Environmental Protection Act (MECP, 2011). Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Condition
GUIDELINE USED IS BOLD IN TABLE
QAQC Notes:
RDL - Reportable detection limit
RPD - Relative percent difference calculated as (abs(C1-C2)/average(C1+C2))*100
"-" Indicates RPD not calculated. RPD cannot be calculated if one or more of the analytical results are less than detection limits or within 5 times the detection limits.
BOLD - RPD value greater than 60%

Table 1a Soil Results
Eureka HAWS, Nunavut
BTEXs, PHCs, Metals and Salinity Analysis

				Eureka HAWS RAP										
				New Reservoir Area (Adjacent)					In-situ Landfarm					
Sample ID Laboratory ID Units Sampling Date Sample Depth (m)	Guideline	Guideline	Reportable Detection Limit (RDL) mg/g	LTM-25 mg/kg 2013 - 2019 0.2 - 0.75	LTM-26 mg/kg 2008 - 2019 0.1 - 0.8	LTM-29 mg/kg 2013 - 2019 0.15 - 0.6	LTM-30 mg/kg 2013 - 2019 0.1 - 0.45	LTM-31 mg/kg 2008 - 2019 0.4 - 0.75	LTM-24 mg/kg 2008 - 2019 0.6 - 1.3	LTM-27 mg/kg 2008 - 2019 0.2 - 1.1	LTM-28 mg/kg 2013 - 2019 0.2 - 0.7	LTM-32 mg/kg 2013 - 2019 0.2 - 1.0	LTM-33 mg/kg 2008 - 2019 0.2 - 1.2	LTM-34 mg/kg 2013 - 2019 0.2 - 1.4
PARAMETERS	**(1)**	**(3)**												
BTEX														
Benzene	0.0068	**2**	0.0050	-	-	-	-	-	-	-	-	-	-	-
Toluene	0.08	**120**	0.050	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	0.018	**110**	0.010	-	-	-	-	-	-	-	-	-	-	-
m-Xylene & p-Xylene	NV	NV	0.040	-	-	-	-	-	-	-	-	-	-	-
o-Xylene	NV	NV	0.020	-	-	-	-	-	-	-	-	-	-	-
Total Xylenes	2.4	**65**	0.045	-	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons	**(2)**	**(3)**												
F1 (C6-C10)	30	**7,800**	10	-	-	-	-	-	-	-	-	-	-	-
F1 (C6-C10) - BTEX	30	**7,800**	10	-	-	-	-	-	-	-	-	-	-	-
F2 (C10-C16)	150	**4,100**	10	<10	<10 - **550**	<10 - 33	<10	<5 - <10	**380 - 12,000**	**2,600 - 12,000**	**510 - 14,000**	**43 - 10,000**	**650 - 8,700**	**260 - 5,600**
F3 (C16-C34)	300	**15,000**	50	<50 - 51	24 - <50	<50 - 60	<50 - 60	24 - <50	140 - **930**	99 - **420**	67 - **380**	<50 - **1,100**	110 - **840**	53 - **850**
F4 (C34-C50)	**2,800**	NV	50	<50	6 - <50	<50	<50	8 - <50	<5 - <50	<5 - <50	<50	<50	<5 - <50	<5 - <50
Reached Baseline at C50	NV	NV	NV	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
F4G-SG (Heavy Hydrocarbons-Grav.)	NV	NV	500											
Metals	**(1)**	**(3)**												
Antimony	**20**	NV	0.5	<0.2 - <1	-	-	-	-	-	0.22 - <1.0	<0.2 - <1.0	-	-	-
Arsenic	12	**40**	1	7.7 - 10	-	-	-	-	-	10 -**16**	9.2 - **18**	-	-	-
Barium	**500**	NV	1	33 - 42	-	-	-	-	-	37 - 46	30 - 47	-	-	-
Beryllium	**4**	NV	0.4	0.37 - 0.49	-	-	-	-	-	0.36 - 0.47	0.41 - 0.45	-	-	-
Boron (Total)	NV	**30**	5	8.9 - 13	-	-	-	-	-	5.6 - 9.2	5.8 - 8.3	-	-	-
Boron (hws)	1.5 [4]	**6**	0.1		-	-	-	-	-	-	-	-	-	-
Cadmium	**10**	NV	0.1	<0.10	-	-	-	-	-	<0.10	<0.1 - 0.11	-	-	-
Chromium	**64**	NV	1	10 - 13	-	-	-	-	-	11 - 18	11 - 13	-	-	-
Chromium VI	**0.4**	NV	0.08		-	-	-	-	-	-	-	-	-	-
Cobalt	**50**	NV	0.1	6.4 - 7.6	-	-	-	-	-	7.6 - 11	7.8 - 12	-	-	-
Copper	63	**1,100**	0.5	11 - 18	-	-	-	-	-	16 - 24	15 - 20	-	-	-
Lead	140	**360**	1	7.8 - 9.3	-	-	-	-	-	8.6 - 11	8.4 - 10	-	-	-
Mercury	**6.6**	NV	0.05	<0.05	-	-	-	-	-	0.05 - 0.1	<0.05 - 0.09	-	-	-
Molybdenum	**10**	NV	0.5	0.62 - 0.98	-	-	-	-	-	0.93 - 1.5	0.96 - 1.5	-	-	-
Nickel	45	**78**	0.5	15 - 19	-	-	-	-	-	18 - 26	19 - 26	-	-	-
Selenium	**1**	NV	0.5	<0.5	-	-	-	-	-	<0.5 - 0.66	<0.5 - 0.58	-	-	-
Silver	**20**	NV	0.2	<0.2 - <1.0	-	-	-	-	-	<0.2 - <1.0	<0.2 - <1.0	-	-	-
Thallium	**1**	NV	0.1	0.057 - <0.3	-	-	-	-	-	0.11 - <0.3	0.09 - <0.3	-	-	-
Uranium	**23**	NV	0.20	0.46 - <1.0	-	-	-	-	-	0.48 - <1.0	0.49 - <1.0	-	-	-
Vanadium	**130**	NV	1	20 - 31	-	-	-	-	-	38 - 68	33 - 42	-	-	-
Zinc	250	**10,000**	10	38 - 48	-	-	-	-	-	43 - 61	44 - 60	-	-	-
Salinity	**(1)**	**(3)**												
pH	6.0 - 8.5	NV	N/A	-	-	-	-	-	-	-	-	-	-	-
Electrical Conductivity (EC)	2	NV	0.1	-	-	-	-	-	-	-	-	-	-	-
Sodium Adsorption Ratio (SAR)	5	NV	0.1	-	-	-	-	-	-	-	-	-	-	-
Percent Saturation	NV	NV	NA	-	-	-	-	-	-	-	-	-	-	-
Calcium	NV	NV	0.60	-	-	-	-	-	-	-	-	-	-	-
Magnesium	NV	NV	0.40	-	-	-	-	-	-	-	-	-	-	-
Potassium	NV	NV	0.52	-	-	-	-	-	-	-	-	-	-	-
Sodium	NV	NV	1.0	-	-	-	-	-	-	-	-	-	-	-
Chloride	NV	NV	40	-	-	-	-	-	-	-	-	-	-	-
Sulphate	NV	NV	2.0	-	-	-	-	-	-	-	-	-	-	-
Soluble Cations and Anions (mg/L)	**(1)**	**(3)**												
Calcium (mg/L)	NV	NV	1.5	-	-	-	-	-	-	-	-	-	-	-
Magnesium (mg/L)	NV	NV	1	-	-	-	-	-	-	-	-	-	-	-
Potassium (mg/L)	NV	NV	1.3	-	-	-	-	-	-	-	-	-	-	-
Sodium (mg/L)	NV	NV	2.5	-	-	-	-	-	-	-	-	-	-	-
Chloride (mg/L)	NV	NV	100	-	-	-	-	-	-	-	-	-	-	-
Sulphate (mg/L)	NV	NV	5	-	-	-	-	-	-	-	-	-	-	-

RDL exceeds guideline value
Applied Guideline Exceedance

BOLD - Generic Guideline Exceedance
Guideline 1 CCME Soil Quality Guideline Residential Land Use, fine grained, shallow soil (<1.5m)
Guideline 2 Canada Wide Standards for Petroleum Hydrocarbons Tier 1 Residential Eco Soil Contact
Guideline 3 Site Specific Target Levels
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GUIDELINE USED IS BOLD IN TABLE
QAQC Notes:
RDL - Reportable detection limit
RPD - Relative percent difference calculated as (abs(C1-C2)/average(C1+C2))*100
"-" Indicates RPD not calculated. RPD cannot be calculated if one or more of the analytical results are less than detection limits or within 5 times the detection limits.
BOLD - RPD value greater than 60%

Table 1a Soil Results
Eureka HAWS, Nunavut
BTEXs, PHCs, Metals and Salinity Analysis

				Eureka HAWS RAP								
				In-situ Landfarm						Near In-situ Landfarm		
						Duplicates						
Sample ID Laboratory ID Units Sampling Date Sample Depth (m)	Guideline	Guideline	Reportable Detection Limit (RDL) mg/g	ISL21-1 ADJ610 mg/kg 29-Jul-2021 0.1 - 0.45	ISL21-1 ADJ611 mg/kg 29-Jul-2021 0.45 - 1.0	ISL21-2 ADJ612 mg/kg 29-Jul-2021 0.0 - 0.5	ISL21-2 ADJ622 mg/kg 29-Jul-2021 0.5 - 0.8	DUP-001 ADJ629 mg/kg 29-Jul-2021 0.5 - 0.8	RPD (%)	LTM-22 mg/kg 2008 - 2019 0.2 - 0.53	LTM-23 mg/kg 2008 - 2019 0.5 - 1	LTM-35 mg/kg 2008 - 2019 0.2 - 1.3
PARAMETERS	**(1)**	**(3)**										
BTEX												
Benzene	0.0068	**2**	0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	-	-	-	-
Toluene	0.08	**120**	0.050	<0.050	<0.050	<0.050	<0.050	<0.050	-	-	-	-
Ethylbenzene	0.018	**110**	0.010	<0.010	0.014	<0.010	<0.010	<0.010	-	-	-	-
m-Xylene & p-Xylene	NV	NV	0.040	<0.040	0.059	<0.040	<0.040	<0.040	-	-	-	-
o-Xylene	NV	NV	0.020	<0.020	0.024 (1)	<0.020	<0.020	<0.020	-	-	-	-
Total Xylenes	2.4	**65**	0.045	<0.045	0.083	<0.045	<0.045	<0.045	-	-	-	-
Petroleum Hydrocarbons	**(2)**	**(3)**										
F1 (C6-C10)	30	**7,800**	10	<10	**66**	<10	<10	<10	-	-	-	-
F1 (C6-C10) - BTEX	30	**7,800**	10	<10	**65**	<10	<10	<10	-	-	-	-
F2 (C10-C16)	150	**4,100**	10	**380**	**6,200**	<10	<10	<10	-	110 - **21,000**	**1,800** - **20,000**	<10 - 11
F3 (C16-C34)	300	**15,000**	50	280	**830**	<50	<50	<50	-	<50 - **2,500**	180 - **1,000**	<50 - 66
F4 (C34-C50)	**2,800**	NV	50	<50	<50	<50	<50	<50	-	<5 - <50	<5 - <50	21 - <50
Reached Baseline at C50	NV	NV	NV	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
F4G-SG (Heavy Hydrocarbons-Grav.)	NV	NV	500	-	-	-	-	-	-	-		
Metals	**(1)**	**(3)**										
Antimony	**20**	NV	0.5	<0.50	<0.50	<0.50	<0.50	<0.50	-	0.23 - <1.0	-	-
Arsenic	12	**40**	1	**18**	11	**17**	11	12	9	12 - **16**	-	-
Barium	**500**	NV	1	32	36	27	20	27	30	31 - 53	-	-
Beryllium	**4**	NV	0.4	0.43	0.53	0.55	0.55	0.49	-	0.39 - 0.5	-	-
Boron (Total)	NV	**30**	5	-	-	-	-	-	-	5.0 - 11	-	-
Boron (hws)	1.5 [a]	**6**	0.1	**1.6**	1.1	0.8	1	0.9	11	-	-	-
Cadmium	**10**	NV	0.1	0.082	0.1	0.082	0.061	0.076	-	<0.10	-	-
Chromium	**64**	NV	1	12	34	64	17	62	**114**	11 - 18	-	-
Chromium VI	**0.4**	NV	0.08	<0.080	<0.080	<0.080	<0.080	<0.080	-		-	-
Cobalt	**50**	NV	0.1	10	12	15	12	15	22	8.8 - 11	-	-
Copper	63	**1,100**	0.5	21	23	26	18	27	40	18 - 24	-	-
Lead	140	**360**	1	10	10	12	6.2	8.1	27	8.8 - 13	-	-
Mercury	**6.6**	NV	0.05	0.063	0.054	0.071	0.12	0.067	-	<0.05 - 0.092	-	-
Molybdenum	**10**	NV	0.5	1.3	1.8	2.5	1.4	2.2	-	0.83 - 1.5	-	-
Nickel	45	**78**	0.5	24	36	**57**	29	**51**	55	20 - 25	-	-
Selenium	**1**	NV	0.5	<0.50	<0.50	<0.50	<0.50	<0.50	-	<0.50 - 0.59	-	-
Silver	**20**	NV	0.2	<0.20	<0.20	<0.20	<0.20	<0.20	-	<0.20 - <1.0	-	-
Thallium	**1**	NV	0.1	<0.10	0.1	<0.10	<0.10	<0.10	-	0.099 - 0.12	-	-
Uranium	**23**	NV	0.20	0.53	0.57	0.6	0.56	0.45	-	0.5 - <1.0	-	-
Vanadium	**130**	NV	1	37	51	51	40	42	5	40 - 59	-	-
Zinc	250	**10,000**	10	54	57	62	57	62	8	49 - 57	-	-
Salinity	**(1)**	**(3)**										
pH	6.0 - 8.5	NV	N/A	7.47	7.39	7.41	7.62	7.34	4	-	-	-
Electrical Conductivity (EC)	2	NV	0.1	1	1	1.1	1.2	1.2	0	-	-	-
Sodium Adsorption Ratio (SAR)	5	NV	0.1	4.2	4.4	12	**9.6**	**10**	4	-	-	-
Percent Saturation	NV	NV	NA	34	30	22	23	21	9	-	-	-
Calcium	NV	NV	0.60	14	11	2.9	5.6	3.9	36	-	-	-
Magnesium	NV	NV	0.40	8	6	1.5	2.3	2	14	-	-	-
Potassium	NV	NV	0.52	4.3	2.8	1.7	2.1	1.9	-	-	-	-
Sodium	NV	NV	1.0	47	40	48	51	46	10	-	-	-
Chloride	NV	NV	40	25	21	24	21	21	-	-	-	-
Sulphate	NV	NV	2.0	110	81	71	82	74	10	-	-	-
Soluble Cations and Anions (mg/L)	**(1)**	**(3)**										
Calcium (mg/L)	NV	NV	1.5	43	35	13	24	18	29	-	-	-
Magnesium (mg/L)	NV	NV	1	24	20	7	10	9.5	5	-	-	-
Potassium (mg/L)	NV	NV	1.3	13	9.2	7.8	9.1	9	1	-	-	-
Sodium (mg/L)	NV	NV	2.5	140	130	220	220	220	0	-	-	-
Chloride (mg/L)	NV	NV	100	75	70	110	93	100	-	-	-	-
Sulphate (mg/L)	NV	NV	5	320	270	320	360	350	3	-	-	-

RDL exceeds guideline value
Applied Guideline Exceedance

BOLD - Generic Guideline Exceedance
Guideline 1 CCME Soil Quality Guideline Residential Land Use, fine grained, shallow soil (<1.5m)
Guideline 2 Canada Wide Standards for Petroleum Hydrocarbons Tier 1 Residential Eco Soil Contact
Guideline 3 Site Specific Target Levels
Guideline 4 Ontario Ministry of the Environment 2011 Soil, Groundwater, and Sediment Standards for use under Part X.V.1 of the Environmental Protection Act (MECP, 2011). Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Condition
GUIDELINE USED IS BOLD IN TABLE
QAQC Notes:
RDL - Reportable detection limit
RPD - Relative percent difference calculated as (abs(C1-C2)/average(C1+C2))*100
"-" Indicates RPD not calculated. RPD cannot be calculated if one or more of the analytical results are less than detection limits or within 5 times the detection limits.
BOLD - RPD value greater than 60%

Table 1a Soil Results
Eureka HAWS, Nunavut
BTEXs, PHCs, Metals and Salinity Analysis

				Eureka HAWS RAP								
				Old Tank Farm								
									Duplicates			
Sample ID Laboratory ID Units Sampling Date Sample Depth (m)	Guideline	Guideline	Reportable Detection Limit (RDL) mg/g	OFT21-1 ADJ603 mg/kg 29-Jul-2021 0.8 - 1.15	OFT21-2 ADJ604 mg/kg 29-Jul-2021 0.0 - 1.05	OFT21-3 ADJ605 mg/kg 29-Jul-2021 0.0 - 1.2	OFT21-4 ADJ606 mg/kg 29-Jul-2021 0.0 - 1.05	OFT21-5 ADJ607 mg/kg 29-Jul-2021 0.0 - 0.8	OFT21-6 ADJ608 mg/kg 30-Jul-2021 0.0 - 1.0	DUP-002 ADJ630 mg/kg 31-Jul-2021 0.0 - 1.0	RPD (%)	OFT21-7 ADJ609 mg/kg 30-Jul-2021 0.0 - 1.1
PARAMETERS	**(1)**	**(3)**										
BTEX												
Benzene	0.0068	**2**	0.0050	**0.13**	<0.0050	**0.06**	0.025	**0.0079 (1)**	**0.095**	**0.041**	**79**	**0.028**
Toluene	0.08	**120**	0.050	**2.1**	<0.050	**0.45**	**0.16**	<0.050	**3.5**	**0.88**	**120**	**0.1**
Ethylbenzene	0.018	**110**	0.010	**3.2**	0.014	**0.48**	**0.12**	**0.076**	**3.6**	**1**	**113**	**0.14**
m-Xylene & p-Xylene	NV	NV	0.040	16	<0.040	6.7	0.64	0.44	20	7.6	**90**	1.4
o-Xylene	NV	NV	0.020	9.4	0.054 (1)	5.5	0.81	0.25	12	4.6	**89**	1.2
Total Xylenes	2.4	**65**	0.045	**25**	0.054	**12**	1.4	0.69	**32**	**12**	**91**	**2.7**
Petroleum Hydrocarbons	**(2)**	**(3)**										
F1 (C6-C10)	30	**7,800**	10	**890**	<10	**760**	**400**	21	**1,300**	**540**	**83**	**290**
F1 (C6-C10) - BTEX	30	**7,800**	10	**860**	<10	**750**	**400**	20	**1,200**	**520**	**79**	**280**
F2 (C10-C16)	150	**4,100**	10	**6,900**	**390**	**10,000**	**4,700**	100	**10,000**	**7,300**	31	**4,000**
F3 (C16-C34)	300	**15,000**	50	240	59	550	260	82	450	290	43	210
F4 (C34-C50)	**2,800**	NV	50	<50	<50	<50	<50	<50	<50	<50	-	<50
Reached Baseline at C50	NV	NV	NV	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes
F4G-SG (Heavy Hydrocarbons-Grav.)	NV	NV	500	-	-	-	-	-	-	-	-	-
Metals	**(1)**	**(3)**										
Antimony	**20**	NV	0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	-	<0.50
Arsenic	12	**40**	1	6.4	12	**13**	12	10	12	**17**	34	**16**
Barium	**500**	NV	1	25	37	33	45	38	26	40	42	36
Beryllium	**4**	NV	0.4	0.46	0.5	0.58	0.74	0.67	0.53	0.68	-	0.86
Boron (Total)	NV	**30**	5	-	-	-	-	-	-	-	-	-
Boron (hws)	1.5 [4]	**6**	0.1	**3.6**	**2.4**	**1.8**	**2.7**	**3.9**	1.4	1.5	7	**2.5**
Cadmium	**10**	NV	0.1	<0.050	0.064	0.075	0.082	0.077	0.068	0.076	11	0.098
Chromium	**64**	NV	1	20	18	42	33	22	21	24	13	63
Chromium VI	**0.4**	NV	0.08	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	-	<0.080
Cobalt	**50**	NV	0.1	6.8	8.8	12	11	9.5	10	13	26	12
Copper	63	**1,100**	0.5	13	17	22	23	18	20	20	0	22
Lead	140	**360**	1	12	11	9	12	10	7.4	11	39	17
Mercury	**6.6**	NV	0.05	<0.050	0.053	0.058	0.058	0.054	0.067	0.09	-	0.13
Molybdenum	**10**	NV	0.5	0.96	1.2	1.7	1.5	1.4	1.3	1.7	-	2.1
Nickel	45	**78**	0.5	20	22	40	33	25	28	33	16	**48**
Selenium	**1**	NV	0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	-	<0.50
Silver	**20**	NV	0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	-	<0.20
Thallium	**1**	NV	0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.11	-	0.39
Uranium	**23**	NV	0.20	0.45	0.67	0.59	0.76	0.68	0.52	0.73	-	0.58
Vanadium	**130**	NV	1	23	28	41	43	34	36	41	13	37
Zinc	250	**10,000**	10	34	50	52	62	52	49	57	15	51
Salinity	**(1)**	**(3)**										
pH	6.0 - 8.5	NV	N/A	7.06	7.12	7.43	7.2	7.41	7.46	7.2	4	7.48
Electrical Conductivity (EC)	2	NV	0.1	**8.6**	**4.6**	**3**	**2.6**	**6.8**	0.33	0.4	-	**3.3**
Sodium Adsorption Ratio (SAR)	5	NV	0.1	**15**	**9.8**	**13**	**13**	**12**	4.5	**5.6**	22	**12**
Percent Saturation	NV	NV	NA	40	39	35	33	41	29	26	11	35
Calcium	NV	NV	0.60	99	77	22	16	99	2.2	2	-	27
Magnesium	NV	NV	0.40	90	48	13	11	89	0.98	1	-	17
Potassium	NV	NV	0.52	32	15	8.1	12	33	2.3	1.6	-	15
Sodium	NV	NV	1.0	560	280	190	160	450	17	20	16	200
Chloride	NV	NV	40	890	250	210	130	680	7.5	7.9	-	270
Sulphate	NV	NV	2.0	440	590	220	230	470	28	33	16	130
Soluble Cations and Anions (mg/L)	**(1)**	**(3)**										
Calcium (mg/L)	NV	NV	1.5	250	200	62	49	240	7.7	7.9	3	75
Magnesium (mg/L)	NV	NV	1	220	120	37	33	210	3.4	3.9	-	48
Potassium (mg/L)	NV	NV	1.3	80	39	23	35	80	8.1	6.4	-	43
Sodium (mg/L)	NV	NV	2.5	1400	710	530	480	1100	60	77	25	560
Chloride (mg/L)	NV	NV	100	2200	630	600	390	1600	26	31	-	780
Sulphate (mg/L)	NV	NV	5	1100	1500	620	700	1100	99	130	27	360

RDL exceeds guideline value
Applied Guideline Exceedance

BOLD - Generic Guideline Exceedance
Guideline 1 CCME Soil Quality Guideline Residential Land Use, fine grained, shallow soil (<1.5m)
Guideline 2 Canada Wide Standards for Petroleum Hydrocarbons Tier 1 Residential Eco Soil Contact
Guideline 3 Site Specific Target Levels
Guideline 4 Ontario Ministry of the Environment 2011 Soil, Groundwater, and Sediment Standards for use under Part X.V.1 of the Environmental Protection Act (MECP, 2011). Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Condition
GUIDELINE USED IS BOLD IN TABLE
QA/QC Notes:
RDL - Reportable detection limit
RPD - Relative percent difference calculated as (abs(C1-C2)/average(C1+C2))*100
"-" Indicates RPD not calculated. RPD cannot be calculated if one or more of the analytical results are less than detection limits or within 5 times the detection limits.
BOLD - RPD value greater than 60%

Table 1a Soil Results
Eureka HAWS, Nunavut
BTEXs, PHCs, Metals and Salinity Analysis

				Eureka HAWS RAP					
				Powerhouse & Maintenance Area/Embankment Area					
Sample ID Laboratory ID Units Sampling Date Sample Depth (m)	Guideline	Guideline	Reportable Detection Limit (RDL) mg/g	LTM-16 mg/kg 2008 - 2019 0.1 - 1.0	LTM-17 mg/kg 2008 - 2019 0.2 - 1.2	LTM-18 mg/kg 2013 - 2019 0.2 - 1.1	LTM-19 mg/kg 2012 - 2019 0.2 - 1.0	LTM-20 mg/kg 2012 - 2019 0.1 - 0.7	LTM-21 mg/kg 2008 - 2019 0.2 - 0.53
PARAMETERS	**(1)**	**(3)**							
BTEX									
Benzene	0.0068	**2**	0.0050	-	-	-	-	-	-
Toluene	0.08	**120**	0.050	-	-	-	-	-	-
Ethylbenzene	0.018	**110**	0.010	-	-	-	-	-	-
m-Xylene & p-Xylene	NV	NV	0.040	-	-	-	-	-	-
o-Xylene	NV	NV	0.020	-	-	-	-	-	-
Total Xylenes	2.4	**65**	0.045	-	-	-	-	-	-
Petroleum Hydrocarbons	**(2)**	**(3)**							
F1 (C6-C10)	30	**7,800**	10	-	-	-	-	-	-
F1 (C6-C10) - BTEX	30	**7,800**	10	-	-	-	-	-	-
F2 (C10-C16)	150	**4,100**	10	<10 - **23,000**	<10 - **5,900**	<10 - 55	**3,300 - 51,000**	<10 - **1,400**	<10 - **520**
F3 (C16-C34)	300	**15,000**	50	<50 - **2,400**	<50 - 110	<50 - 77	220 - **3,300**	<50 - **340**	<50 - 60
F4 (C34-C50)	**2,800**	NV	50	<5 - 170	<5 - <50	<50	<50 - 290	<50 - 64	<5 - <50
Reached Baseline at C50	NV	NV	NV	Yes	Yes	Yes	Yes	Yes	Yes
F4G-SG (Heavy Hydrocarbons-Grav.)	NV	NV	500	-	-	-	-	-	-
Metals	**(1)**	**(3)**							
Antimony	**20**	NV	0.5	<0.20 - 0.23	-	<0.20 - <1.0	<0.20 - <1.0	-	-
Arsenic	12	**40**	1	6.2 - 12	-	5.4 - 8.3	9.2 - **15**	-	-
Barium	**500**	NV	1	31 - 42	-	26 - 42	33 - 41	-	-
Beryllium	**4**	NV	0.4	0.26 - 0.61	-	0.29 - <0.40	0.41 - 0.58	-	-
Boron (Total)	NV	**30**	5	<5 - 16	-	5.6 - 9.9	5.6 - 13	-	-
Boron (hws)	1.5 [4]	**6**	0.1	-	-	-	-	-	-
Cadmium	**10**	NV	0.1	<0.10	-	<0.10	<0.10	-	-
Chromium	**64**	NV	1	7.3 - 16	-	7.3 - 11	12 - 16	-	-
Chromium VI	**0.4**	NV	0.08		-			-	-
Cobalt	**50**	NV	0.1	5.7 - 8.1	-	5.2 - 6.9	7 - 10	-	-
Copper	63	**1,100**	0.5	9.1 - 16	-	7.8 - 14	17 - 25	-	-
Lead	140	**360**	1	4.9 - 11	-	5.6 - 9.8	8.5 - 17	-	-
Mercury	**6.6**	NV	0.05	<0.05 - 0.06	-	<0.05	<0.05 - 0.052	-	-
Molybdenum	**10**	NV	0.5	<0.50 - 1.2	-	<0.50 - 0.73	0.79 - 1.6	-	-
Nickel	45	**78**	0.5	12 -20	-	11 - 17	18 - 27	-	-
Selenium	**1**	NV	0.5	<0.50	-	<0.50	<0.50 - 0.6	-	-
Silver	**20**	NV	0.2	<0.20	-	<0.20 - <1.0	<0.20 - <1.0	-	-
Thallium	**1**	NV	0.1	<0.050 - 0.096	-	<0.050 - <0.30	0.08 - 0.11	-	-
Uranium	**23**	NV	0.20	0.31 - 0.8	-	0.33 - <1.0	0.44 - <1.0	-	-
Vanadium	**130**	NV	1	29 - 37	-	21 - 30	28 - 41	-	-
Zinc	250	**10,000**	10	30 - 53	-	28 - 42	50 - 66	-	-
Salinity	**(1)**	**(3)**							
pH	6.0 - 8.5	NV	N/A	-	-	-	-	-	-
Electrical Conductivity (EC)	2	NV	0.1	-	-	-	-	-	-
Sodium Adsorption Ratio (SAR)	5	NV	0.1	-	-	-	-	-	-
Percent Saturation	NV	NV	NA	-	-	-	-	-	-
Calcium	NV	NV	0.60	-	-	-	-	-	-
Magnesium	NV	NV	0.40	-	-	-	-	-	-
Potassium	NV	NV	0.52	-	-	-	-	-	-
Sodium	NV	NV	1.0	-	-	-	-	-	-
Chloride	NV	NV	40	-	-	-	-	-	-
Sulphate	NV	NV	2.0	-	-	-	-	-	-
Soluble Cations and Anions (mg/L)	**(1)**	**(3)**							
Calcium (mg/L)	NV	NV	1.5	-	-	-	-	-	-
Magnesium (mg/L)	NV	NV	1	-	-	-	-	-	-
Potassium (mg/L)	NV	NV	1.3	-	-	-	-	-	-
Sodium (mg/L)	NV	NV	2.5	-	-	-	-	-	-
Chloride (mg/L)	NV	NV	100	-	-	-	-	-	-
Sulphate (mg/L)	NV	NV	5	-	-	-	-	-	-

RDL exceeds guideline value
Applied Guideline Exceedance

BOLD - Generic Guideline Exceedance
Guideline 1 CCME Soil Quality Guideline Residential Land Use, fine grained, shallow soil (<1.5m)
Guideline 2 Canada Wide Standards for Petroleum Hydrocarbons Tier 1 Residential Eco Soil Contact
Guideline 3 Site Specific Target Levels
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GUIDELINE USED IS BOLD IN TABLE
QAQC Notes:
RDL - Reportable detection limit
RPD - Relative percent difference calculated as (abs(C1-C2)/average(C1+C2))*100
"-" Indicates RPD not calculated. RPD cannot be calculated if one or more of the analytical results are less than detection limits or within 5 times the detection limits.
BOLD - RPD value greater than 60%

Table 1a Soil Results
Eureka HAWS, Nunavut
BTEXs, PHCs, Metals and Salinity Analysis

				Eureka HAWS RAP				
				Powerhouse & Maintenance Area/Embankment Area				
Sample ID **Laboratory ID** **Units** **Sampling Date** **Sample Depth (m)**	**Guideline**	**Guideline**	**Reportable Detection Limit (RDL) mg/g**	**EMB21-1 ADJ584 mg/kg 28-Jul-2021 0.0 - 0.5**	**EMB21-2 ADJ585 mg/kg 31-Jul-2021 0.0 - 0.5**	**EMB21-3 ADJ586 mg/kg 31-Jul-2021 0.0 - 0.5**	**EMB21-4 ADJ587 mg/kg 31-Jul-2021 0.0 - 0.6**	**EMB21-5 ADJ701 mg/kg 1-Aug-2021 0.0 - 0.6**
PARAMETERS	**(1)**	**(3)**						
BTEX								
Benzene	0.0068	**2**	0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Toluene	0.08	**120**	0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Ethylbenzene	0.018	**110**	0.010	<0.010	<0.010	<0.010	<0.010	<0.010
m-Xylene & p-Xylene	NV	NV	0.040	<0.040	<0.040	<0.040	<0.040	<0.040
o-Xylene	NV	NV	0.020	<0.020	<0.020	0.042	<0.020	<0.020
Total Xylenes	2.4	**65**	0.045	<0.045	<0.045	<0.045	<0.045	<0.045
Petroleum Hydrocarbons	**(2)**	**(3)**						
F1 (C6-C10)	30	**7,800**	10	<10	<10	<10	<23	<10
F1 (C6-C10) - BTEX	30	**7,800**	10	<10	<10	<10	<23	<10
F2 (C10-C16)	150	**4,100**	10	<10	95	**600**	24	13
F3 (C16-C34)	300	**15,000**	50	<50	110	160	<50	<50
F4 (C34-C50)	**2,800**	NV	50	<50	58	<50	<50	<50
Reached Baseline at C50	NV	NV	NV	Yes	Yes	Yes	Yes	Yes
F4G-SG (Heavy Hydrocarbons-Grav.)	NV	NV	500	-	-	-	-	-
Metals	**(1)**	**(3)**						
Antimony	**20**	NV	0.5	<0.50	<0.50	<0.50	<0.50	<0.50
Arsenic	12	**40**	1	12	**18**	3.4	**13**	**14**
Barium	**500**	NV	1	29	39	29	42	44
Beryllium	**4**	NV	0.4	0.46	0.57	<0.40	0.51	0.58
Boron (Total)	NV	**30**	5	-	-	-	-	-
Boron (hws)	1.5 [4]	**6**	0.1	0.39	0.4	0.52	0.88	0.91
Cadmium	**10**	NV	0.1	0.07	0.076	0.056	0.09	0.09
Chromium	**64**	NV	1	21	29	19	43	27
Chromium VI	**0.4**	NV	0.08	<0.080	<0.080	<0.080	<0.080	<0.080
Cobalt	**50**	NV	0.1	9.2	10	3.6	12	9.6
Copper	63	**1,100**	0.5	18	19	6.3	28	21
Lead	140	**360**	1	7.1	9.8	3.2	9.6	11
Mercury	**6.6**	NV	0.05	0.059	0.083	<0.050	0.063	0.06
Molybdenum	**10**	NV	0.5	1.5	1.7	0.72	1.8	1.6
Nickel	45	**78**	0.5	25	30	17	38	32
Selenium	**1**	NV	0.5	<0.50	0.58	<0.50	<0.50	0.57
Silver	**20**	NV	0.2	<0.20	<0.20	<0.20	<0.20	<0.20
Thallium	**1**	NV	0.1	<0.10	0.11	<0.10	<0.10	<0.10
Uranium	**23**	NV	0.20	0.48	0.54	0.25	0.49	0.66
Vanadium	**130**	NV	1	36	46	11	50	41
Zinc	250	**10,000**	10	44	53	25	63	78
Salinity	**(1)**	**(3)**						
pH	6.0 - 8.5	NV	N/A	7.36	7.23	7.6	7.41	-
Electrical Conductivity (EC)	2	NV	0.1	0.63	0.86	0.38	**3**	-
Sodium Adsorption Ratio (SAR)	5	NV	0.1	2.7	1.2	2	1	-
Percent Saturation	NV	NV	NA	25	33	33	34	-
Calcium	NV	NV	0.60	6.4	28	6.8	170	-
Magnesium	NV	NV	0.40	5.5	10	3.4	65	-
Potassium	NV	NV	0.52	2	3.1	2.3	8.5	-
Sodium	NV	NV	1.0	19	17	15	36	-
Chloride	NV	NV	40	14	5.1	19	35	-
Sulphate	NV	NV	2.0	54	130	23	630	-
Soluble Cations and Anions (mg/L)	**(1)**	**(3)**						
Calcium (mg/L)	NV	NV	1.5	26	85	21	500	-
Magnesium (mg/L)	NV	NV	1	22	31	10	190	-
Potassium (mg/L)	NV	NV	1.3	8.2	9.3	6.9	25	-
Sodium (mg/L)	NV	NV	2.5	78	51	44	100	-
Chloride (mg/L)	NV	NV	100	56	15	57	100	-
Sulphate (mg/L)	NV	NV	5	220	400	69	1800	-

RDL exceeds guideline value
Applied Guideline Exceedance

BOLD - Generic Guideline Exceedance
Guideline 1 CCME Soil Quality Guideline Residential Land Use, fine grained, shallow soil (<1.5m)
Guideline 2 Canada Wide Standards for Petroleum Hydrocarbons Tier 1 Residential Eco Soil Contact
Guideline 3 Site Specific Target Levels
Guideline 4 Ontario Ministry of the Environment 2011 Soil, Groundwater, and Sediment Standards for use under Part X.V.1 of the Environmental Protection Act (MECP, 2011). Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Condition
GUIDELINE USED IS BOLD IN TABLE
QAQC Notes:
RDL - Reportable detection limit
RPD - Relative percent difference calculated as (abs(C1-C2)/average(C1+C2))*100
"-" indicates RPD not calculated. RPD cannot be calculated if one or more of the analytical results are less than detection limits or within 5 times the detection limits.
BOLD - RPD value greater than 60%

Table 1a Soil Results
Eureka HAWS, Nunavut
BTEXs, PHCs, Metals and Salinity Analysis

				Eureka HAWS RAP									
				Delta Area									
Sample ID Laboratory ID Units Sampling Date Sample Depth (m)	Guideline	Guideline	Reportable Detection Limit (RDL) mg/g	LTM-1 mg/kg 2013 - 2019 0.2 - 0.6	LTM-2 mg/kg 2013 - 2019 0.3 - 0.7	LTM-3 mg/kg 2012 - 2019 0.5 - 1.6	LTM-4 mg/kg 2013 - 2019 0.4 - 0.6	LTM-5 mg/kg 2012 - 2019 0.0 - 1.0	LTM-6 mg/kg 2013 - 2019 0.4 - 0.95	LTM-7 mg/kg 2013 - 2019 0.2 - 1.3	LTM-8 mg/kg 2013 - 2019 0.5 - 1.1	LTM-9 mg/kg 2010 - 2019 0.45 - 1.1	LTM-10 mg/kg 2010 - 2019 0.5 - 0.82
PARAMETERS	**(1)**	**(3)**											
BTEX													
Benzene	0.0068	**2**	0.0050	-	-	-	-	-	-	-	-	-	-
Toluene	0.08	**120**	0.050	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	0.018	**110**	0.010	-	-	-	-	-	-	-	-	-	-
m-Xylene & p-Xylene	NV	NV	0.040	-	-	-	-	-	-	-	-	-	-
o-Xylene	NV	NV	0.020	-	-	-	-	-	-	-	-	-	-
Total Xylenes	2.4	**65**	0.045	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons	**(2)**	**(3)**											
F1 (C6-C10)	30	**7,800**	10	-	-	-	-	-	-	-	-	-	-
F1 (C6-C10) - BTEX	30	**7,800**	10	-	-	-	-	-	-	-	-	-	-
F2 (C10-C16)	150	**4,100**	10	69 - **160**	78 - **370**	<10 - 44	<10	55 - **5,900**	<10 - **440**	<10 - **3,200**	<10 - **1,800**	**5,800 - 9,300**	**<10 - 8,900**
F3 (C16-C34)	300	**15,000**	50	<50 - 78	<50 - 150	<50 - 76	<50	<50 - 280	<50 - 57	<50 - **410**	<50 - **800**	110 - **470**	110 - **1,200**
F4 (C34-C50)	**2,800**	NV	50	<50	<50	<10 - <50	<50	<10 - <50	<50	<50 - 77	<50 - 110	<50 - 57	<50 - 74
Reached Baseline at C50	NV	NV	NV	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
F4G-SG (Heavy Hydrocarbons-Grav.)	NV	NV	500	-	-	-	-	-	-	-	-	-	-
Metals	**(1)**	**(3)**											
Antimony	**20**	NV	0.5	-	-	-	<0.20 - <1.0	-	-	-	0.23 - <1.0	-	-
Arsenic	12	**40**	1	-	-	-	8.4 - **16**	-	-	-	11 - **14**	-	-
Barium	**500**	NV	1	-	-	-	19 - 40	-	-	-	14 - 41	-	-
Beryllium	**4**	NV	0.4	-	-	-	0.42 - 0.55	-	-	-	<0.4 - 0.47	-	-
Boron (Total)	NV	**30**	5	-	-	-	5.9 - 26	-	-	-	3.6 - 11	-	-
Boron (hws)	1.5 [a]	**6**	0.1	-	-	-	-	-	-	-	-	-	-
Cadmium	**10**	NV	0.1	-	-	-	<0.10	-	-	-	<0.10 - 0.15	-	-
Chromium	**64**	NV	1	-	-	-	7.5 - 16	-	-	-	6.3 - 14	-	-
Chromium VI	**0.4**	NV	0.08	-	-	-		-	-	-		-	-
Cobalt	**50**	NV	0.1	-	-	-	7.1 - 9.5	-	-	-	6.4 - 10	-	-
Copper	63	**1,100**	0.5	-	-	-	13 - 18	-	-	-	12 - 23	-	-
Lead	140	**360**	1	-	-	-	06 - 16	-	-	-	4.9 - 26	-	-
Mercury	**6.6**	NV	0.05	-	-	-	<0.05 - 0.067	-	-	-	<0.05 - 0.071	-	-
Molybdenum	**10**	NV	0.5	-	-	-	0.84 - 1.6	-	-	-	1.2 - 2.4	-	-
Nickel	45	**78**	0.5	-	-	-	17 - 24	-	-	-	15 - 25	-	-
Selenium	**1**	NV	0.5	-	-	-	<0.50	-	-	-	<0.50	-	-
Silver	**20**	NV	0.2	-	-	-	<0.20 - <1.0	-	-	-	<0.20 - <1.0	-	-
Thallium	**1**	NV	0.1	-	-	-	0.06 - <0.30	-	-	-	0.085 - <0.30	-	-
Uranium	**23**	NV	0.20	-	-	-	0.6 - <1.0	-	-	-	0.46 - <1.0	-	-
Vanadium	**130**	NV	1	-	-	-	23 - 36	-	-	-	23 - 44	-	-
Zinc	250	**10,000**	10	-	-	-	43 - 54	-	-	-	33 - 63	-	-
Salinity	**(1)**	**(3)**											
pH	6.0 - 8.5	NV	N/A	-	-	-	-	-	-	-	-	-	-
Electrical Conductivity (EC)	2	NV	0.1	-	-	-	-	-	-	-	-	-	-
Sodium Adsorption Ratio (SAR)	5	NV	0.1	-	-	-	-	-	-	-	-	-	-
Percent Saturation	NV	NV	NA	-	-	-	-	-	-	-	-	-	-
Calcium	NV	NV	0.60	-	-	-	-	-	-	-	-	-	-
Magnesium	NV	NV	0.40	-	-	-	-	-	-	-	-	-	-
Potassium	NV	NV	0.52	-	-	-	-	-	-	-	-	-	-
Sodium	NV	NV	1.0	-	-	-	-	-	-	-	-	-	-
Chloride	NV	NV	40	-	-	-	-	-	-	-	-	-	-
Sulphate	NV	NV	2.0	-	-	-	-	-	-	-	-	-	-
Soluble Cations and Anions (mg/L)	**(1)**	**(3)**											
Calcium (mg/L)	NV	NV	1.5	-	-	-	-	-	-	-	-	-	-
Magnesium (mg/L)	NV	NV	1	-	-	-	-	-	-	-	-	-	-
Potassium (mg/L)	NV	NV	1.3	-	-	-	-	-	-	-	-	-	-
Sodium (mg/L)	NV	NV	2.5	-	-	-	-	-	-	-	-	-	-
Chloride (mg/L)	NV	NV	100	-	-	-	-	-	-	-	-	-	-
Sulphate (mg/L)	NV	NV	5	-	-	-	-	-	-	-	-	-	-

RDL exceeds guideline value
Applied Guideline Exceedance

BOLD - Generic Guideline Exceedance
Guideline 1 CCME Soil Quality Guideline Residential Land Use, fine grained, shallow soil (<1.5m)
Guideline 2 Canada Wide Standards for Petroleum Hydrocarbons Tier 1 Residential Eco Soil Contact
Guideline 3 Site Specific Target Levels
Guideline 4 Ontario Ministry of the Environment 2011 Soil, Groundwater, and Sediment Standards for use under Part X.V.1 of the Environmental Protection Act (MECP, 2011). Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Condition
GUIDELINE USED IS BOLD IN TABLE
QAQC Notes:
RDL - Reportable detection limit
RPD - Relative percent difference calculated as (abs(C1-C2)/average(C1+C2))*100
"-" Indicates RPD not calculated. RPD cannot be calculated if one or more of the analytical results are less than detection limits or within 5 times the detection limits.
BOLD - RPD value greater than 60%

Table 1a Soil Results
Eureka HAWS, Nunavut
BTEXs, PHCs, Metals and Salinity Analysis

				Eureka HAWS RAP											
									Delta Area						
										Duplicates					
Sample ID Laboratory ID Units Sampling Date Sample Depth (m)	Guideline	Guideline	Reportable Detection Limit (RDL) mg/g	LTM-11 mg/kg 2009 - 2019 0.1 - 1.0	LTM-12 mg/kg 2012 - 2019 0.1 - 0.7	LTM-13 mg/kg 2012 - 2019 0.3 - 0.7	LTM-14 mg/kg 2009 - 2019 0.2 - 1.2	LTM-15 mg/kg 2009 - 2019 0.2 - 0.9	BL23-1 ADJ623 mg/kg 30-Jul-2021 0.0 - 1.1	DUP-003 ADJ631 mg/kg 30-Jul-2021 0.0 - 1.1	RPD (%)	BL23-2 ADJ624 mg/kg 30-Jul-2021 0.0 - 1.1	BL23-3 ADJ625 mg/kg 30-Jul-2021 0.0 - 1.4	BL23-4 ADJ626 mg/kg 30-Jul-2021 0.0 - 0.9
PARAMETERS	**(1)**	**(3)**													
BTEX															
Benzene	0.0068	**2**	0.0050	-	-	-	-	-	<0.0050	<0.0050	-	<0.0050	<0.0050	<0.0050
Toluene	0.08	**120**	0.050	-	-	-	-	-	<0.050	<0.050	-	<0.050	<0.050	<0.050
Ethylbenzene	0.018	**110**	0.010	-	-	-	-	-	<0.010	<0.010	-	<0.010	<0.010	<0.010
m-Xylene & p-Xylene	NV	NV	0.040	-	-	-	-	-	<0.040	<0.040	-	<0.040	<0.040	<0.040
o-Xylene	NV	NV	0.020	-	-	-	-	-	<0.020	<0.020	-	<0.020	<0.020	<0.020
Total Xylenes	2.4	**65**	0.045	-	-	-	-	-	<0.045	<0.045	-	<0.045	<0.045	<0.045
Petroleum Hydrocarbons	**(2)**	**(3)**													
F1 (C6-C10)	30	**7,800**	10	-	-	-	-	-	<10	<10	-	<10	<10	<10
F1 (C6-C10) - BTEX	30	**7,800**	10	-	-	-	-	-	<10	<10	-	<10	<10	<10
F2 (C10-C16)	150	**4,100**	10	**<10 - 19,000**	**<10 - 7,300**	<10 - **11,000**	37 - **4,050**	<10 - **2,900**	<10	16	-	<10	11	21
F3 (C16-C34)	300	**15,000**	50	<10 - 98	61 - **580**	<50 - **380**	<50 - **651**	170 - **5,500**	<50	<50	-	<50	<50	110
F4 (C34-C50)	**2,800**	NV	50	<10 - <50	11 - <50	<10 - <50	<20 - 180	<50 - 1,200	<50	<50	-	<50	<50	<50
Reached Baseline at C50	NV	NV	NV	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
F4G-SG (Heavy Hydrocarbons-Grav.)	NV	NV	500	-	-	-	-	-	-	-	-	-	-	-
Metals	**(1)**	**(3)**													
Antimony	**20**	NV	0.5	-	<1.0	<0.20 - <1.0	-	-	<0.50	<0.50	-	<0.50	<0.50	<0.50
Arsenic	12	**40**	1	-	11-Jan	9.2 - **14**	-	-	**13**	11	17	12	9.7	**13**
Barium	**500**	NV	1	-	28	28 - 33	-	-	19	17	11	28	16	32
Beryllium	**4**	NV	0.4	-	<0.40	0.38 - 0.53	-	-	<0.40	<0.40	-	<0.40	<0.40	0.46
Boron (Total)	NV	**30**	5	-	6.3	8.2 - 13	-	-	-	-	-	-	-	-
Boron (hws)	1.5 [4]	**6**	0.1	-	-	-	-	-	1.2	1.2	0	**1.6**	1.2	1.2
Cadmium	**10**	NV	0.1	-	<0.10	<0.10	-	-	<0.050	<0.050	-	0.061	<0.050	0.09
Chromium	**64**	NV	1	-	11	9.9 - 13	-	-	6.7	7.8	15	18	5.8	72
Chromium VI	**0.4**	NV	0.08	-			-	-	<0.080	<0.080	-	<0.080	<0.080	<0.080
Cobalt	**50**	NV	0.1	-	7.4	6.6 - 10	-	-	6.6	8.2	22	8	5.5	12
Copper	63	**1,100**	0.5	-	16	11 - 19	-	-	13	13	0	26	9.8	25
Lead	140	**360**	1	-	11	7.2 - 20	-	-	6.7	6.3	6	12	4.9	9.9
Mercury	**6.6**	NV	0.05	-	<0.05	<0.05 - 0.074	-	-	<0.050	0.058	-	0.06	<0.050	<0.050
Molybdenum	**10**	NV	0.5	-	1.2	0.74 - 1.4	-	-	1.7	1.5	-	1.4	1.4	2.6
Nickel	45	**78**	0.5	-	18	15 - 24	-	-	14	15	7	21	12	**52**
Selenium	**1**	NV	0.5	-	<0.50	<0.50	-	-	<0.50	<0.50	-	<0.50	<0.50	<0.50
Silver	**20**	NV	0.2	-	<1.0	<0.20 - <1.0	-	-	<0.20	<0.20	-	<0.20	<0.20	<0.20
Thallium	**1**	NV	0.1	-	<0.30	0.055 - <0.30	-	-	<0.10	<0.10	-	<0.10	<0.10	<0.10
Uranium	**23**	NV	0.20	-	<1.0	0.46 - <1.0	-	-	0.36	0.44	-	0.46	0.42	0.53
Vanadium	**130**	NV	1	-	35	23 - 47	-	-	30	28	7	31	22	42
Zinc	250	**10,000**	10	-	47	38 - 56	-	-	31	33	-	43	26	48
Salinity	**(1)**	**(3)**													
pH	6.0 - 8.5	NV	N/A	-	-	-	-	-	6.85	6.96	2	6.99	7.11	7.26
Electrical Conductivity (EC)	2	NV	0.1	-	-	-	-	-	1.2	0.64	**61**	0.8	1.2	0.44
Sodium Adsorption Ratio (SAR)	5	NV	0.1	-	-	-	-	-	4.8	4.5	6	**11**	**5.3**	3.8
Percent Saturation	NV	NV	NA	-	-	-	-	-	23	24	-	19	23	21
Calcium	NV	NV	0.60	-	-	-	-	-	10	5.6	56	1.8	9.8	2.9
Magnesium	NV	NV	0.40	-	-	-	-	-	6.2	2.8	**76**	0.94	6.1	1.5
Potassium	NV	NV	0.52	-	-	-	-	-	4.5	3.2	34	2.5	4.5	2.1
Sodium	NV	NV	1.0	-	-	-	-	-	38	25	41	32	41	15
Chloride	NV	NV	40	-	-	-	-	-	21	11	-	11	31	5.8
Sulphate	NV	NV	2.0	-	-	-	-	-	130	53	**84**	50	73	32
Soluble Cations and Anions (mg/L)	**(1)**	**(3)**													
Calcium (mg/L)	NV	NV	1.5	-	-	-	-	-	45	24	**61**	9.3	43	14
Magnesium (mg/L)	NV	NV	1	-	-	-	-	-	27	12	**77**	4.8	27	7.1
Potassium (mg/L)	NV	NV	1.3	-	-	-	-	-	20	14	35	13	20	9.6
Sodium (mg/L)	NV	NV	2.5	-	-	-	-	-	160	110	37	160	180	69
Chloride (mg/L)	NV	NV	100	-	-	-	-	-	91	44	-	59	140	27
Sulphate (mg/L)	NV	NV	5	-	-	-	-	-	580	220	**90**	260	320	150

RDL exceeds guideline value
Applied Guideline Exceedance

BOLD - Generic Guideline Exceedance
Guideline 1 CCME Soil Quality Guideline Residential Land Use, fine grained, shallow soil (<1.5m)
Guideline 2 Canada Wide Standards for Petroleum Hydrocarbons Tier 1 Residential Eco Soil Contact
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QAQC Notes:
RDL - Reportable detection limit
RPD - Relative percent difference calculated as (abs(C1-C2)/average(C1+C2))*100
"-" Indicates RPD not calculated. RPD cannot be calculated if one or more of the analytical results are less than detection limits or within 5 times the detection limits.
BOLD - RPD value greater than 60%

Table 1a Soil Results
Eureka HAWS, Nunavut
BTEXs, PHCs, Metals and Salinity Analysis

				Eureka HAWS RAP						
				Sewage Lagoon						
					Duplicates					
Sample ID Laboratory ID Units Sampling Date Sample Depth (m)	Guideline	Guideline	Reportable Detection Limit (RDL) mg/g	06SW0136 mg/kg 1-Jun-2006 Surface	06SW0137 mg/kg 1-Jun-2006 Surface	06SW0138 (Duplicate of 0137) mg/kg 1-Jun-2006 Surface	06SW0139 mg/kg 1-Jun-2006 Surface	07SW0004 mg/kg 26-Jul-2007 0.0 - 0.10	SEW21-1 ADJ627 mg/kg 30-Jul-2021 0.0 - 0.5	SEW21-2 ADJ628 mg/kg 30-Jul-2021 0.0 - 0.5
PARAMETERS	**(1)**	**(3)**								
BTEX										
Benzene	0.0068	**2**	0.0050	<0.0050	<0.0050	<0.0050	<0.0050	-	<0.0050	<0.0050
Toluene	0.08	**120**	0.050	<0.050	<0.050	<0.050	<0.050	-	<0.050	<0.050
Ethylbenzene	0.018	**110**	0.010	<0.010	<0.010	<0.010	<0.010	-	<0.010	<0.010
m-Xylene & p-Xylene	NV	NV	0.040	<0.040	<0.040	<0.040	<0.040	-	<0.040	<0.040
o-Xylene	NV	NV	0.020	<0.020	<0.020	<0.020	<0.020	-	<0.020	<0.020
Total Xylenes	2.4	**65**	0.045	<0.045	<0.045	<0.045	<0.045	-	<0.045	<0.045
Petroleum Hydrocarbons	**(2)**	**(3)**								
F1 (C6-C10)	30	**7,800**	10	<10	<10	<10	<10	6.4	<10	23
F1 (C6-C10) - BTEX	30	**7,800**	10	<10	<10	<10	<10	6.4	<10	23
F2 (C10-C16)	150	**4,100**	10	<10	82	26	<10	24.1	**440**	**710**
F3 (C16-C34)	300	**15,000**	50	130	**2,000**	**900**	230	**323**	**5,500**	**1,900**
F4 (C34-C50)	**2,800**	NV	50	<50	440	190	41	81.5	1,200	640
Reached Baseline at C50	NV	NV	NV	Yes	No	No	Yes	Yes	No	No
F4G-SG (Heavy Hydrocarbons-Grav.)	NV	NV	500		2,000	700			8,900	4,500
Metals	**(1)**	**(3)**								
Antimony	**20**	NV	0.5	-	-	-	-	-	0.94	0.72
Arsenic	12	**40**	1	**20.3**	5.7	**13.8**	**24**	7.3	7.5	8.6
Barium	**500**	NV	1	39	59	23	31	84	46	38
Beryllium	**4**	NV	0.4	-	-	-	-	-	0.46	0.62
Boron (Total)	NV	**30**	5	-	-	-	-	-	-	-
Boron (hws)	1.5 [4]	**6**	0.1	-	-	-	-	-	**4.8**	3
Cadmium	**10**	NV	0.1	<1	<1	<1	<1	<0.9	0.67	0.68
Chromium	**64**	NV	1	16	28	16	15	22	21	21
Chromium VI	**0.4**	NV	0.08	-	-	-	-	-	<0.080	<0.080
Cobalt	**50**	NV	0.1	11	10	12	9	10	6	8.3
Copper	63	**1,100**	0.5	**82**	**303**	39	48	**121**	**770**	**220**
Lead	140	**360**	1	11	12	<10	14	14	15	25
Mercury	**6.6**	NV	0.05	-	-	-	-		0.13	0.16
Molybdenum	**10**	NV	0.5	<2	<2	<2	<2	<2	1.6	1.5
Nickel	45	**78**	0.5	28	24	26	28	22	16	22
Selenium	**1**	NV	0.5	**1.1**	**1.8**	**1.3**	0.9	0.9	0.79	<0.50
Silver	**20**	NV	0.2	<2	<2	<2	<2	<0.5	1.6	3.3
Thallium	**1**	NV	0.1	-	-	-	-	-	<0.10	<0.10
Uranium	**23**	NV	0.20	-	-	-	-	-	0.52	0.58
Vanadium	**130**	NV	1	-	-	-	-	-	31	35
Zinc	250	**10,000**	10	126	237	71	62	145	**300**	120
Salinity	**(1)**	**(3)**								
pH	6.0 - 8.5	NV	N/A	-	-	-	-	-	7.4	7.64
Electrical Conductivity (EC)	2	NV	0.1	-	-	-	-	-	**9.5**	**8.4**
Sodium Adsorption Ratio (SAR)	5	NV	0.1	-	-	-	-	-	**30**	**17**
Percent Saturation	NV	NV	NA	-	-	-	-	-	63	68
Calcium	NV	NV	0.60	-	-	-	-	-	110	210
Magnesium	NV	NV	0.40	-	-	-	-	-	69	110
Potassium	NV	NV	0.52	-	-	-	-	-	46	57
Sodium	NV	NV	1.0	-	-	-	-	-	1300	1000
Chloride	NV	NV	40	-	-	-	-	-	1300	570
Sulphate	NV	NV	2.0	-	-	-	-	-	230	330
Soluble Cations and Anions (mg/L)	**(1)**	**(3)**								
Calcium (mg/L)	NV	NV	1.5	-	-	-	-	-	170	300
Magnesium (mg/L)	NV	NV	1	-	-	-	-	-	110	160
Potassium (mg/L)	NV	NV	1.3	-	-	-	-	-	73	84
Sodium (mg/L)	NV	NV	2.5	-	-	-	-	-	2000	1500
Chloride (mg/L)	NV	NV	100	-	-	-	-	-	2100	830
Sulphate (mg/L)	NV	NV	5	-	-	-	-	-	370	480

RDL exceeds guideline value
Applied Guideline Exceedance

BOLD - Generic Guideline Exceedance
Guideline 1 CCME Soil Quality Guideline Residential Land Use, fine grained, shallow soil (<1.5m)
Guideline 2 Canada Wide Standards for Petroleum Hydrocarbons Tier 1 Residential Eco Soil Contact
Guideline 3 Site Specific Target Levels
Guideline 4 Ontario Ministry of the Environment 2011 Soil, Groundwater, and Sediment Standards for use under Part X.V.1 of the Environmental Protection Act (MECP, 2011). Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Condition
GUIDELINE USED IS BOLD IN TABLE
QAQC Notes:
RDL - Reportable detection limit
RPD - Relative percent difference calculated as (abs(C1-C2)/average(C1+C2))*100
"-" Indicates RPD not calculated. RPD cannot be calculated if one or more of the analytical results are less than detection limits or within 5 times the detection limits.
BOLD - RPD value greater than 60%

Table 1a Soil Results
Eureka HAWS, Nunavut
BTEXs, PHCs, Metals and Salinity Analysis

				Eureka HAWS RAP					
				Temporary Soil Stockpile					
					Duplicates				
Sample ID Laboratory ID Units Sampling Date Sample Depth (m)	Guideline	Guideline	Reportable Detection Limit (RDL) mg/g	TPS22-01-S BBD090 mg/kg 29-Aug-2022 0.3	TPS22-01-D BBD091 mg/kg 29-Aug-2022 0.6	DUP-01 BBD120 mg/kg 29-Aug-2022 0.6	RPD (%)	TPS22-02-S BBD092 mg/kg 29-Aug-2022 0.3	TPS22-02-D BBD093 mg/kg 29-Aug-2022 0.6
PARAMETERS	**(1)**	**(3)**							
BTEX									
Benzene	0.0068	**2**	0.0050	**0.046**	**0.48**	**0.058**	**78**	0.017	0.05
Toluene	0.08	**120**	0.050	**0.12**	**1.0**	**0.3**	54	<0.050	**0.16**
Ethylbenzene	0.018	**110**	0.010	**0.059**	**0.8**	**0.2**	60	**0.019**	**0.23**
m-Xylene & p-Xylene	NV	NV	0.040	0.44	3.8	1.1	55	0.095	1.2
o-Xylene	NV	NV	0.020	0.13	2.6	1.1	41	0.047	0.93
Total Xylenes	2.4	**65**	0.045	0.56	**6.4**	2.1	51	0.14	2.1
Petroleum Hydrocarbons	**(2)**	**(3)**							
F1 (C6-C10)	30	**7,800**	10	**120**	**3,600**	**670**	**69**	**38**	**190**
F1 (C6-C10) - BTEX	30	**7,800**	10	**120**	**3,600**	**670**	**69**	**37**	**180**
F2 (C10-C16)	150	**4,100**	10	**410**	**250**	**340**	15	67	**3,900**
F3 (C16-C34)	300	**15,000**	50	100	68	150	-	97	170
F4 (C34-C50)	**2,800**	NV	50	<50	<50	79	-	<50	<50
Reached Baseline at C50	NV	NV	NV	Yes	Yes	Yes		Yes	Yes
F4G-SG (Heavy Hydrocarbons-Grav.)	NV	NV	500						
Metals	**(1)**	**(3)**							
Antimony	**20**	NV	0.5	<0.50	<0.50	<0.50	-	<0.50	<0.50
Arsenic	12	**40**	1	7.8	8.4	9.2	5	7.5	9.2
Barium	**500**	NV	1	64	74	77	2	58	64
Beryllium	**4**	NV	0.4	0.7	0.91	1	-	0.65	0.77
Boron (Total)	NV	**30**	5	-	-	-	-	-	-
Boron (hws)	1.5 [4]	**6**	0.1	1.4	1.3	**1.8**	16	1.1	1.5
Cadmium	**10**	NV	0.1	0.11	0.13	0.13	-	0.087	0.12
Chromium	**64**	NV	1	32	36	37	1	36	33
Chromium VI	**0.4**	NV	0.08	<0.080	<0.080	<0.080	-	<0.080	<0.080
Cobalt	**50**	NV	0.1	9.3	11	11	0	9.6	10
Copper	63	**1,100**	0.5	17	20	22	5	17	20
Lead	140	**360**	1	12	14	14	0	10	15
Mercury	**6.6**	NV	0.05	<0.050	<0.050	0.072	-	<0.050	<0.050
Molybdenum	**10**	NV	0.5	0.93	0.99	1.1	-	0.97	1.2
Nickel	45	**78**	0.5	25	28	29	2	28	27
Selenium	**1**	NV	0.5	<0.50	<0.50	<0.50	-	<0.50	<0.50
Silver	**20**	NV	0.2	<0.20	<0.20	<0.20	-	<0.20	<0.20
Thallium	**1**	NV	0.1	<0.10	0.11	0.11	-	<0.10	<0.10
Uranium	**23**	NV	0.20	0.71	0.83	0.84	-	0.62	0.71
Vanadium	**130**	NV	1	44	47	50	3	41	41
Zinc	250	**10,000**	10	65	76	72	3	56	62
Salinity	**(1)**	**(3)**							
pH	6.0 - 8.5	NV	N/A	-	-	-		-	-
Electrical Conductivity (EC)	2	NV	0.1	-	-	-		-	-
Sodium Adsorption Ratio (SAR)	5	NV	0.1	-	-	-		-	-
Percent Saturation	NV	NV	NA	-	-	-		-	-
Calcium	NV	NV	0.60	-	-	-		-	-
Magnesium	NV	NV	0.40	-	-	-		-	-
Potassium	NV	NV	0.52	-	-	-		-	-
Sodium	NV	NV	1.0	-	-	-		-	-
Chloride	NV	NV	40	-	-	-		-	-
Sulphate	NV	NV	2.0	-	-	-		-	-
Soluble Cations and Anions (mg/L)	**(1)**	**(3)**							
Calcium (mg/L)	NV	NV	1.5	-	-	-		-	-
Magnesium (mg/L)	NV	NV	1	-	-	-		-	-
Potassium (mg/L)	NV	NV	1.3	-	-	-		-	-
Sodium (mg/L)	NV	NV	2.5	-	-	-		-	-
Chloride (mg/L)	NV	NV	100	-	-	-		-	-
Sulphate (mg/L)	NV	NV	5	-	-	-		-	-

RDL exceeds guideline value
Applied Guideline Exceedance

BOLD - Generic Guideline Exceedance
Guideline 1 CCME Soil Quality Guideline Residential Land Use, fine grained, shallow soil (<1.5m)
Guideline 2 Canada Wide Standards for Petroleum Hydrocarbons Tier 1 Residential Eco Soil Contact
Guideline 3 Site Specific Target Levels
Guideline 4 Ontario Ministry of the Environment 2011 Soil, Groundwater, and Sediment Standards for use under Part X.V.1 of the Environmental Protection Act (MECP, 2011). Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Condition
GUIDELINE USED IS BOLD IN TABLE
QAQC Notes:
RDL - Reportable detection limit
RPD - Relative percent difference calculated as (abs(C1-C2)/average(C1+C2))*100
"-" Indicates RPD not calculated. RPD cannot be calculated if one or more of the analytical results are less than detection limits or within 5 times the detection limits.
BOLD - RPD value greater than 60%

Table 1a Soil Results
Eureka HAWS, Nunavut
BTEXs, PHCs, Metals and Salinity Analysis

				Eureka HAWS RAP					
				Temporary Soil Stockpile					
Sample ID Laboratory ID Units Sampling Date Sample Depth (m)	Guideline	Guideline	Reportable Detection Limit (RDL) mg/g	TPS22-03-S BBD094 mg/kg 29-Aug-2022 0.3	TPS22-03-D BBD095 mg/kg 29-Aug-2022 0.6	TPS22-04-S BBD096 mg/kg 29-Aug-2022 0.3	TPS22-04-D BBD097 mg/kg 29-Aug-2022 0.6	TPS22-05-S BBD098 mg/kg 29-Aug-2022 0.3	TPS22-05-D BBD099 mg/kg 29-Aug-2022 0.6
PARAMETERS	**(1)**	**(3)**							
BTEX									
Benzene	0.0068	**2**	0.0050	**0.021**	**0.033**	**0.21**	**0.23**	<0.0050	**0.017**
Toluene	0.08	**120**	0.050	0.067	**0.17**	<0.050	**0.18**	<0.050	<0.050
Ethylbenzene	0.018	**110**	0.010	**0.02**	**0.066**	**0.082**	**0.65**	0.017	**0.019**
m-Xylene & p-Xylene	NV	NV	0.040	0.082	0.28	0.18	1.7	0.065	0.1
o-Xylene	NV	NV	0.020	0.031	0.11	<0.020	0.59	<0.020	0.036
Total Xylenes	2.4	**65**	0.045	0.11	0.39	0.18	2.3	0.065	0.14
Petroleum Hydrocarbons	**(2)**	**(3)**							
F1 (C6-C10)	30	**7,800**	10	**33**	**270**	**55**	**180**	<10	20
F1 (C6-C10) - BTEX	30	**7,800**	10	**32**	**270**	**55**	**180**	<10	19
F2 (C10-C16)	150	**4,100**	10	**250**	**340**	**310**	**210**	140	66
F3 (C16-C34)	300	**15,000**	50	100	110	290	140	290	68
F4 (C34-C50)	**2,800**	NV	50	60	<50	<50	150	89	<50
Reached Baseline at C50	NV	NV	NV	Yes	Yes	Yes	Yes	Yes	Yes
F4G-SG (Heavy Hydrocarbons-Grav.)	NV	NV	500						
Metals	**(1)**	**(3)**							
Antimony	**20**	NV	0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Arsenic	12	**40**	1	8.3	8.3	8.9	9.3	8.3	8.4
Barium	**500**	NV	1	68	67	81	74	61	72
Beryllium	**4**	NV	0.4	0.85	0.8	0.94	0.83	0.81	0.88
Boron (Total)	NV	**30**	5	-	-	-	-	-	-
Boron (hws)	1.5 [4]	**6**	0.1	1.3	**1.9**	**3.0**	**2.0**	**3.1**	**2.4**
Cadmium	**10**	NV	0.1	0.11	0.11	0.13	0.11	0.13	0.12
Chromium	**64**	NV	1	35	34	35	35	29	39
Chromium VI	**0.4**	NV	0.08	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080
Cobalt	**50**	NV	0.1	11	10	11	11	9.9	11
Copper	63	**1,100**	0.5	20	19	21	19	19	20
Lead	140	**360**	1	14	12	14	13	16	15
Mercury	**6.6**	NV	0.05	<0.050	<0.050	0.051	<0.050	<0.050	<0.050
Molybdenum	**10**	NV	0.5	0.98	1.1	0.98	1.1	0.91	1.1
Nickel	45	**78**	0.5	27	28	28	27	24	30
Selenium	**1**	NV	0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Silver	**20**	NV	0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Thallium	**1**	NV	0.1	<0.10	<0.10	0.11	0.11	<0.10	<0.10
Uranium	**23**	NV	0.20	0.79	0.75	0.88	0.79	0.73	0.81
Vanadium	**130**	NV	1	47	45	48	47	43	48
Zinc	250	**10,000**	10	66	68	67	64	60	68
Salinity	**(1)**	**(3)**							
pH	6.0 - 8.5	NV	N/A	-	-	-	-	-	-
Electrical Conductivity (EC)	2	NV	0.1	-	-	-	-	-	-
Sodium Adsorption Ratio (SAR)	5	NV	0.1	-	-	-	-	-	-
Percent Saturation	NV	NV	NA	-	-	-	-	-	-
Calcium	NV	NV	0.60	-	-	-	-	-	-
Magnesium	NV	NV	0.40	-	-	-	-	-	-
Potassium	NV	NV	0.52	-	-	-	-	-	-
Sodium	NV	NV	1.0	-	-	-	-	-	-
Chloride	NV	NV	40	-	-	-	-	-	-
Sulphate	NV	NV	2.0	-	-	-	-	-	-
Soluble Cations and Anions (mg/L)	**(1)**	**(3)**							
Calcium (mg/L)	NV	NV	1.5	-	-	-	-	-	-
Magnesium (mg/L)	NV	NV	1	-	-	-	-	-	-
Potassium (mg/L)	NV	NV	1.3	-	-	-	-	-	-
Sodium (mg/L)	NV	NV	2.5	-	-	-	-	-	-
Chloride (mg/L)	NV	NV	100	-	-	-	-	-	-
Sulphate (mg/L)	NV	NV	5	-	-	-	-	-	-

RDL exceeds guideline value
Applied Guideline Exceedance

BOLD - Generic Guideline Exceedance
Guideline 1 CCME Soil Quality Guideline Residential Land Use, fine grained, shallow soil (<1.5m)
Guideline 2 Canada Wide Standards for Petroleum Hydrocarbons Tier 1 Residential Eco Soil Contact
Guideline 3 Site Specific Target Levels
Guideline 4 Ontario Ministry of the Environment 2011 Soil, Groundwater, and Sediment Standards for use under Part X.V.1 of the Environmental Protection Act (MECP, 2011). Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Condition
GUIDELINE USED IS BOLD IN TABLE
QAQC Notes:
RDL - Reportable detection limit
RPD - Relative percent difference calculated as (abs(C1-C2)/average(C1+C2))*100
"-" Indicates RPD not calculated. RPD cannot be calculated if one or more of the analytical results are less than detection limits or within 5 times the detection limits.
BOLD - RPD value greater than 60%

Table 1a Soil Results
Eureka HAWS, Nunavut
BTEXs, PHCs, Metals and Salinity Analysis

				Eureka HAWS RAP					
				Temporary Soil Stockpile					
Sample ID Laboratory ID Units Sampling Date Sample Depth (m)	Guideline	Guideline	Reportable Detection Limit (RDL) mg/g	TPS22-06-S BBD100 mg/kg 29-Aug-2022 0.3	TPS22-06-D BBD101 mg/kg 29-Aug-2022 0.6	TPS22-07-S BBD102 mg/kg 29-Aug-2022 0.3	TPS22-07-D BBD103 mg/kg 29-Aug-2022 0.6	TPS22-08-S BBD104 mg/kg 29-Aug-2022 0.3	TPS22-08-D BBD105 mg/kg 29-Aug-2022 0.6
PARAMETERS	**(1)**	**(3)**							
BTEX									
Benzene	0.0068	**2**	0.0050	**0.052**	**0.082**	**0.034**	**0.03**	**0.028**	**0.012**
Toluene	0.08	**120**	0.050	**0.14**	**0.097**	<0.050	**0.08**	**0.13**	<0.050
Ethylbenzene	0.018	**110**	0.010	**0.033**	**0.047**	0.018	**0.16**	**0.035**	<0.010
m-Xylene & p-Xylene	NV	NV	0.040	0.19	0.2	0.07	1	0.22	<0.040
o-Xylene	NV	NV	0.020	0.052	0.037	<0.020	0.54	0.088	<0.020
Total Xylenes	2.4	**65**	0.045	0.24	0.24	0.07	1.5	0.31	<0.045
Petroleum Hydrocarbons	**(2)**	**(3)**							
F1 (C6-C10)	30	**7,800**	10	**160**	21	**76**	**55**	**120**	<10
F1 (C6-C10) - BTEX	30	**7,800**	10	**160**	21	**75**	**53**	**120**	<10
F2 (C10-C16)	150	**4,100**	10	**650**	**410**	**690**	**3,200**	120	44
F3 (C16-C34)	300	**15,000**	50	120	85	160	230	74	77
F4 (C34-C50)	**2,800**	NV	50	<50	<50	<50	<50	<50	<50
Reached Baseline at C50	NV	NV	NV	Yes	Yes	Yes	Yes	Yes	Yes
F4G-SG (Heavy Hydrocarbons-Grav.)	NV	NV	500						
Metals	**(1)**	**(3)**							
Antimony	**20**	NV	0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Arsenic	12	**40**	1	11	9.3	8	8.4	8.3	8.3
Barium	**500**	NV	1	85	74	76	68	69	68
Beryllium	**4**	NV	0.4	0.97	0.91	0.86	0.78	0.85	0.87
Boron (Total)	NV	**30**	5	-	-	-	-	-	-
Boron (hws)	1.5 [4]	**6**	0.1	1.1	**2.1**	**2.6**	**2.0**	**2.0**	1.3
Cadmium	**10**	NV	0.1	0.15	0.13	0.11	0.11	0.11	0.12
Chromium	**64**	NV	1	37	35	30	43	41	35
Chromium VI	**0.4**	NV	0.08	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080
Cobalt	**50**	NV	0.1	12	11	11	9.8	10	11
Copper	63	**1,100**	0.5	23	21	23	18	19	22
Lead	140	**360**	1	15	14	14	13	14	13
Mercury	**6.6**	NV	0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Molybdenum	**10**	NV	0.5	1.1	1	0.92	1.2	1.1	1.1
Nickel	45	**78**	0.5	29	28	25	30	30	29
Selenium	**1**	NV	0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Silver	**20**	NV	0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Thallium	**1**	NV	0.1	0.11	<0.10	<0.10	<0.10	<0.10	<0.10
Uranium	**23**	NV	0.20	0.87	1.4	0.79	0.74	0.78	0.79
Vanadium	**130**	NV	1	54	49	48	41	45	46
Zinc	250	**10,000**	10	73	77	64	60	60	64
Salinity	**(1)**	**(3)**							
pH	6.0 - 8.5	NV	N/A	-	-	-	-	-	-
Electrical Conductivity (EC)	2	NV	0.1	-	-	-	-	-	-
Sodium Adsorption Ratio (SAR)	5	NV	0.1	-	-	-	-	-	-
Percent Saturation	NV	NV	NA	-	-	-	-	-	-
Calcium	NV	NV	0.60	-	-	-	-	-	-
Magnesium	NV	NV	0.40	-	-	-	-	-	-
Potassium	NV	NV	0.52	-	-	-	-	-	-
Sodium	NV	NV	1.0	-	-	-	-	-	-
Chloride	NV	NV	40	-	-	-	-	-	-
Sulphate	NV	NV	2.0	-	-	-	-	-	-
Soluble Cations and Anions (mg/L)	**(1)**	**(3)**							
Calcium (mg/L)	NV	NV	1.5	-	-	-	-	-	-
Magnesium (mg/L)	NV	NV	1	-	-	-	-	-	-
Potassium (mg/L)	NV	NV	1.3	-	-	-	-	-	-
Sodium (mg/L)	NV	NV	2.5	-	-	-	-	-	-
Chloride (mg/L)	NV	NV	100	-	-	-	-	-	-
Sulphate (mg/L)	NV	NV	5	-	-	-	-	-	-

RDL exceeds guideline value
Applied Guideline Exceedance

BOLD - Generic Guideline Exceedance
Guideline 1 CCME Soil Quality Guideline Residential Land Use, fine grained, shallow soil (<1.5m)
Guideline 2 Canada Wide Standards for Petroleum Hydrocarbons Tier 1 Residential Eco Soil Contact
Guideline 3 Site Specific Target Levels
Guideline 4 Ontario Ministry of the Environment 2011 Soil, Groundwater, and Sediment Standards for use under Part X.V.1 of the Environmental Protection Act (MECP, 2011). Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Condition
GUIDELINE USED IS BOLD IN TABLE
QAQC Notes:
RDL - Reportable detection limit
RPD - Relative percent difference calculated as (abs(C1-C2)/average(C1+C2))*100
"-" Indicates RPD not calculated. RPD cannot be calculated if one or more of the analytical results are less than detection limits or within 5 times the detection limits.
BOLD - RPD value greater than 60%

Table 1a Soil Results
Eureka HAWS, Nunavut
BTEXs, PHCs, Metals and Salinity Analysis

				Eureka HAWS RAP					
				Temporary Soil Stockpile					
							Duplicates		
Sample ID Laboratory ID Units Sampling Date Sample Depth (m)	Guideline	Guideline	Reportable Detection Limit (RDL) mg/g	TPS22-09-S BBD106 mg/kg 29-Aug-2022 0.3	TPS22-09-D BBD107 mg/kg 29-Aug-2022 0.6	TPS22-10-S BBD108 mg/kg 30-Aug-2022 0.3	TPS22-10-D BBD109 mg/kg 30-Aug-2022 0.6	DUP-02 BBD121 mg/kg 30-Aug-2022 0.6	RPD (%)
PARAMETERS	**(1)**	**(3)**							
BTEX									
Benzene	0.0068	**2**	0.0050	**0.17**	**2.0**	**0.014**	**0.046**	**0.029**	23
Toluene	0.08	**120**	0.050	**0.23**	**1.8**	0.065	**0.32**	**0.26**	10
Ethylbenzene	0.018	**110**	0.010	**0.16**	**5.5**	<0.010	**0.087**	**0.063**	16
m-Xylene & p-Xylene	NV	NV	0.040	1.4	28	0.074	0.49	0.36	15
o-Xylene	NV	NV	0.020	0.36	7.3	0.027	0.23	0.16	18
Total Xylenes	2.4	**65**	0.045	1.8	**35**	0.1	0.71	0.52	15
Petroleum Hydrocarbons	**(2)**	**(3)**							
F1 (C6-C10)	30	**7,800**	10	**1,400**	**870**	17	**240**	**420**	27
F1 (C6-C10) - BTEX	30	**7,800**	10	**1,400**	**830**	17	**240**	**420**	27
F2 (C10-C16)	150	**4,100**	10	**380**	**170**	110	**750**	**570**	14
F3 (C16-C34)	300	**15,000**	50	110	68	120	**420**	140	-
F4 (C34-C50)	**2,800**	NV	50	<50	<50	<50	120	50	-
Reached Baseline at C50	NV	NV	NV	Yes	Yes	Yes	Yes	Yes	
F4G-SG (Heavy Hydrocarbons-Grav.)	NV	NV	500						
Metals	**(1)**	**(3)**							
Antimony	**20**	NV	0.5	<0.50	<0.50	<0.50	<0.50	<0.50	-
Arsenic	12	**40**	1	8.4	8.2	8.2	8.1	8.6	3
Barium	**500**	NV	1	80	88	69	67	81	9
Beryllium	**4**	NV	0.4	0.97	1.1	0.89	0.81	1	-
Boron (Total)	NV	**30**	5	-	-	-	-	-	-
Boron (hws)	1.5 [4]	**6**	0.1	1.3	1.4	**2.0**	**1.8**	1.5	9
Cadmium	**10**	NV	0.1	0.14	0.12	0.11	0.1	0.12	-
Chromium	**64**	NV	1	41	43	30	35	40	7
Chromium VI	**0.4**	NV	0.08	<0.080	<0.080	<0.080	<0.080	<0.080	-
Cobalt	**50**	NV	0.1	12	12	9.9	10	12	9
Copper	63	**1,100**	0.5	22	24	19	20	22	5
Lead	140	**360**	1	15	17	14	15	16	3
Mercury	**6.6**	NV	0.05	<0.050	<0.050	<0.050	<0.050	<0.050	-
Molybdenum	**10**	NV	0.5	1	0.96	0.88	1.2	1.1	-
Nickel	45	**78**	0.5	30	31	25	27	30	5
Selenium	**1**	NV	0.5	<0.50	<0.50	<0.50	<0.50	<0.50	-
Silver	**20**	NV	0.2	<0.20	<0.20	<0.20	<0.20	<0.20	-
Thallium	**1**	NV	0.1	<0.10	0.11	<0.10	<0.10	0.11	-
Uranium	**23**	NV	0.20	0.92	0.93	0.78	0.76	0.91	-
Vanadium	**130**	NV	1	50	55	45	45	52	7
Zinc	250	**10,000**	10	69	73	62	60	70	8
Salinity	**(1)**	**(3)**							
pH	6.0 - 8.5	NV	N/A	-	-	-	-	-	
Electrical Conductivity (EC)	2	NV	0.1	-	-	-	-	-	
Sodium Adsorption Ratio (SAR)	5	NV	0.1	-	-	-	-	-	
Percent Saturation	NV	NV	NA	-	-	-	-	-	
Calcium	NV	NV	0.60	-	-	-	-	-	
Magnesium	NV	NV	0.40	-	-	-	-	-	
Potassium	NV	NV	0.52	-	-	-	-	-	
Sodium	NV	NV	1.0	-	-	-	-	-	
Chloride	NV	NV	40	-	-	-	-	-	
Sulphate	NV	NV	2.0	-	-	-	-	-	
Soluble Cations and Anions (mg/L)	**(1)**	**(3)**							
Calcium (mg/L)	NV	NV	1.5	-	-	-	-	-	
Magnesium (mg/L)	NV	NV	1	-	-	-	-	-	
Potassium (mg/L)	NV	NV	1.3	-	-	-	-	-	
Sodium (mg/L)	NV	NV	2.5	-	-	-	-	-	
Chloride (mg/L)	NV	NV	100	-	-	-	-	-	
Sulphate (mg/L)	NV	NV	5	-	-	-	-	-	

RDL exceeds guideline value
Applied Guideline Exceedance

BOLD - Generic Guideline Exceedance

Guideline 1 CCME Soil Quality Guideline Residential Land Use, fine grained, shallow soil (<1.5m)
Guideline 2 Canada Wide Standards for Petroleum Hydrocarbons Tier 1 Residential Eco Soil Contact
Guideline 3 Site Specific Target Levels
Guideline 4 Ontario Ministry of the Environment 2011 Soil, Groundwater, and Sediment Standards for use under Part X.V.1 of the Environmental Protection Act (MECP, 2011). Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Condition
GUIDELINE USED IS BOLD IN TABLE
QAQC Notes:
RDL - Reportable detection limit
RPD - Relative percent difference calculated as (abs(C1-C2)/average(C1+C2))*100
"-" indicates RPD not calculated. RPD cannot be calculated if one or more of the analytical results are less than detection limits or within 5 times the detection limits.
BOLD - RPD value greater than 60%

Table 1a Soil Results
Eureka HAWS, Nunavut
BTEXs, PHCs, Metals and Salinity Analysis

				Eureka HAWS RAP					
				Temporary Soil Stockpile					
Sample ID Laboratory ID Units Sampling Date Sample Depth (m)	Guideline	Guideline	Reportable Detection Limit (RDL) mg/g	TPS22-11-S BBD110 mg/kg 30-Aug-2022 0.3	TPS22-11-D BBD111 mg/kg 30-Aug-2022 0.6	TPS22-12-S BBD112 mg/kg 30-Aug-2022 0.3	TPS22-12-D BBD113 mg/kg 30-Aug-2022 0.6	TPS22-13-S BBD114 mg/kg 30-Aug-2022 0.3	TPS22-13-D BBD115 mg/kg 30-Aug-2022 0.6
PARAMETERS	**(1)**	**(3)**							
BTEX									
Benzene	0.0068	**2**	0.0050	**0.018**	**0.05**	**0.032**	**0.036**	**0.013**	**0.034**
Toluene	0.08	**120**	0.050	<0.050	**0.14**	**0.1**	**0.23**	**0.091**	**0.27**
Ethylbenzene	0.018	**110**	0.010	0.017	**0.048**	**0.023**	**0.048**	**0.022**	**0.074**
m-Xylene & p-Xylene	NV	NV	0.040	0.098	0.42	0.1	0.31	0.11	0.37
o-Xylene	NV	NV	0.020	0.041	0.11	0.042	0.13	0.046	0.16
Total Xylenes	2.4	**65**	0.045	0.14	0.54	0.15	0.44	0.16	0.53
Petroleum Hydrocarbons	**(2)**	**(3)**							
F1 (C6-C10)	30	**7,800**	10	**140**	**140**	**70**	**310**	**37**	**440**
F1 (C6-C10) - BTEX	30	**7,800**	10	**140**	**140**	**70**	**310**	**37**	**440**
F2 (C10-C16)	150	**4,100**	10	**740**	140	82	**200**	130	**200**
F3 (C16-C34)	300	**15,000**	50	170	120	150	150	100	130
F4 (C34-C50)	**2,800**	NV	50	54	120	58	58	<50	<50
Reached Baseline at C50	NV	NV	NV	Yes	Yes	Yes	Yes	Yes	Yes
F4G-SG (Heavy Hydrocarbons-Grav.)	NV	NV	500						
Metals	**(1)**	**(3)**							
Antimony	**20**	NV	0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Arsenic	12	**40**	1	8.3	8.3	8.2	8.3	8.1	7.5
Barium	**500**	NV	1	82	79	76	78	59	60
Beryllium	**4**	NV	0.4	1	0.95	0.9	0.92	0.7	0.74
Boron (Total)	NV	**30**	5	-	-	-	-	-	-
Boron (hws)	1.5 [4]	**6**	0.1	1.3	1.2	1.5	**1.9**	**1.7**	**1.8**
Cadmium	**10**	NV	0.1	0.13	0.13	0.12	0.12	0.098	0.096
Chromium	**64**	NV	1	38	36	36	35	28	29
Chromium VI	**0.4**	NV	0.08	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080
Cobalt	**50**	NV	0.1	12	11	11	11	9	8.9
Copper	63	**1,100**	0.5	22	21	21	21	17	16
Lead	140	**360**	1	15	15	17	16	12	12
Mercury	**6.6**	NV	0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Molybdenum	**10**	NV	0.5	0.97	0.98	0.98	1	1	0.88
Nickel	45	**78**	0.5	29	28	28	28	23	23
Selenium	**1**	NV	0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Silver	**20**	NV	0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Thallium	**1**	NV	0.1	0.12	0.1	0.1	<0.10	<0.10	<0.10
Uranium	**23**	NV	0.20	0.87	0.84	0.82	0.84	0.68	0.67
Vanadium	**130**	NV	1	51	51	49	47	38	40
Zinc	250	**10,000**	10	70	67	66	65	54	53
Salinity	**(1)**	**(3)**							
pH	6.0 - 8.5	NV	N/A	-	-	-	-	-	-
Electrical Conductivity (EC)	2	NV	0.1	-	-	-	-	-	-
Sodium Adsorption Ratio (SAR)	5	NV	0.1	-	-	-	-	-	-
Percent Saturation	NV	NV	NA	-	-	-	-	-	-
Calcium	NV	NV	0.60	-	-	-	-	-	-
Magnesium	NV	NV	0.40	-	-	-	-	-	-
Potassium	NV	NV	0.52	-	-	-	-	-	-
Sodium	NV	NV	1.0	-	-	-	-	-	-
Chloride	NV	NV	40	-	-	-	-	-	-
Sulphate	NV	NV	2.0	-	-	-	-	-	-
Soluble Cations and Anions (mg/L)	**(1)**	**(3)**							
Calcium (mg/L)	NV	NV	1.5	-	-	-	-	-	-
Magnesium (mg/L)	NV	NV	1	-	-	-	-	-	-
Potassium (mg/L)	NV	NV	1.3	-	-	-	-	-	-
Sodium (mg/L)	NV	NV	2.5	-	-	-	-	-	-
Chloride (mg/L)	NV	NV	100	-	-	-	-	-	-
Sulphate (mg/L)	NV	NV	5	-	-	-	-	-	-

RDL exceeds guideline value
Applied Guideline Exceedance

BOLD - Generic Guideline Exceedance
Guideline 1 CCME Soil Quality Guideline Residential Land Use, fine grained, shallow soil (<1.5m)
Guideline 2 Canada Wide Standards for Petroleum Hydrocarbons Tier 1 Residential Eco Soil Contact
Guideline 3 Site Specific Target Levels
Guideline 4 Ontario Ministry of the Environment 2011 Soil, Groundwater, and Sediment Standards for use under Part X.V.1 of the Environmental Protection Act (MECP, 2011). Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Condition
GUIDELINE USED IS BOLD IN TABLE
QAQC Notes:
RDL - Reportable detection limit
RPD - Relative percent difference calculated as (abs(C1-C2)/average(C1+C2))*100
"-" Indicates RPD not calculated. RPD cannot be calculated if one or more of the analytical results are less than detection limits or within 5 times the detection limits.
BOLD - RPD value greater than 60%

Table 1a Soil Results
Eureka HAWS, Nunavut
BTEXs, PHCs, Metals and Salinity Analysis

				Eureka HAWS RAP					
				Temporary Soil Stockpile					
							Duplicates		
Sample ID Laboratory ID Units Sampling Date Sample Depth (m)	Guideline	Guideline	Reportable Detection Limit (RDL) mg/g	TPS22-14-S BBD116 mg/kg 30-Aug-2022 0.3	TPS22-14-D BBD117 mg/kg 30-Aug-2022 0.6	TPS22-15-S BBD118 mg/kg 30-Aug-2022 0.3	TPS22-15-D BBD119 mg/kg 30-Aug-2022 0.6	DUP-03 BBD122 mg/kg 30-Aug-2022 0.6	RPD (%)
PARAMETERS	**(1)**	**(3)**							
BTEX									
Benzene	0.0068	**2**	0.0050	**0.018**	**0.033**	**0.017**	**0.039**	**0.011**	-
Toluene	0.08	**120**	0.050	**0.11**	**0.16**	**0.11**	**0.19**	<0.050	-
Ethylbenzene	0.018	**110**	0.010	**0.027**	**0.064**	**0.029**	**0.075**	0.017	-
m-Xylene & p-Xylene	NV	NV	0.040	0.11	0.25	0.15	0.27	0.094	-
o-Xylene	NV	NV	0.020	0.049	0.094	0.058	0.11	0.039	-
Total Xylenes	2.4	**65**	0.045	0.16	0.35	0.21	0.38	0.13	-
Petroleum Hydrocarbons	**(2)**	**(3)**							
F1 (C6-C10)	30	**7,800**	10	**190**	**90**	**36**	**44**	22	-
F1 (C6-C10) - BTEX	30	**7,800**	10	**190**	**90**	**36**	**43**	22	-
F2 (C10-C16)	150	**4,100**	10	**1,800**	**470**	**450**	**210**	**190**	5
F3 (C16-C34)	300	**15,000**	50	**1,000**	**340**	190	150	170	-
F4 (C34-C50)	**2,800**	NV	50	280	160	81	52	70	-
Reached Baseline at C50	NV	NV	NV	Yes	Yes	Yes	Yes	Yes	
F4G-SG (Heavy Hydrocarbons-Grav.)	NV	NV	500						
Metals	**(1)**	**(3)**							
Antimony	**20**	NV	0.5	<0.50	<0.50	<0.50	<0.50	<0.50	-
Arsenic	12	**40**	1	8.4	7.8	9.2	7.4	8	4
Barium	**500**	NV	1	63	66	75	59	62	2
Beryllium	**4**	NV	0.4	0.8	0.82	0.91	0.69	0.72	-
Boron (Total)	NV	**30**	5	-	-	-	-	-	-
Boron (hws)	1.5 [4]	**6**	0.1	**2.0**	**1.8**	1.5	1.1	1.4	12
Cadmium	**10**	NV	0.1	0.11	0.12	0.12	0.1	0.095	-
Chromium	**64**	NV	1	30	31	35	25	30	9
Chromium VI	**0.4**	NV	0.08	<0.080	<0.080	<0.080	<0.080	<0.080	-
Cobalt	**50**	NV	0.1	9.7	10	11	8.6	9.1	3
Copper	63	**1,100**	0.5	18	19	21	16	17	3
Lead	140	**360**	1	15	15	16	12	12	0
Mercury	**6.6**	NV	0.05	<0.050	<0.050	<0.050	<0.050	<0.050	-
Molybdenum	**10**	NV	0.5	0.91	0.94	1.1	0.82	0.94	-
Nickel	45	**78**	0.5	24	25	27	21	24	7
Selenium	**1**	NV	0.5	<0.50	<0.50	<0.50	<0.50	<0.50	-
Silver	**20**	NV	0.2	<0.20	<0.20	<0.20	<0.20	<0.20	-
Thallium	**1**	NV	0.1	<0.10	<0.10	<0.10	<0.10	<0.10	-
Uranium	**23**	NV	0.20	0.72	0.73	0.83	0.66	0.69	-
Vanadium	**130**	NV	1	46	43	48	38	43	6
Zinc	250	**10,000**	10	59	62	64	53	54	1
Salinity	**(1)**	**(3)**							
pH	6.0 - 8.5	NV	N/A	-	-	-	-	-	
Electrical Conductivity (EC)	2	NV	0.1	-	-	-	-	-	
Sodium Adsorption Ratio (SAR)	5	NV	0.1	-	-	-	-	-	
Percent Saturation	NV	NV	NA	-	-	-	-	-	
Calcium	NV	NV	0.60	-	-	-	-	-	
Magnesium	NV	NV	0.40	-	-	-	-	-	
Potassium	NV	NV	0.52	-	-	-	-	-	
Sodium	NV	NV	1.0	-	-	-	-	-	
Chloride	NV	NV	40	-	-	-	-	-	
Sulphate	NV	NV	2.0	-	-	-	-	-	
Soluble Cations and Anions (mg/L)	**(1)**	**(3)**							
Calcium (mg/L)	NV	NV	1.5	-	-	-	-	-	
Magnesium (mg/L)	NV	NV	1	-	-	-	-	-	
Potassium (mg/L)	NV	NV	1.3	-	-	-	-	-	
Sodium (mg/L)	NV	NV	2.5	-	-	-	-	-	
Chloride (mg/L)	NV	NV	100	-	-	-	-	-	
Sulphate (mg/L)	NV	NV	5	-	-	-	-	-	

RDL exceeds guideline value
Applied Guideline Exceedance

BOLD - Generic Guideline Exceedance
Guideline 1 CCME Soil Quality Guideline Residential Land Use, fine grained, shallow soil (<1.5m)
Guideline 2 Canada Wide Standards for Petroleum Hydrocarbons Tier 1 Residential Eco Soil Contact
Guideline 3 Site Specific Target Levels
Guideline 4 Ontario Ministry of the Environment 2011 Soil, Groundwater, and Sediment Standards for use under Part X.V.1 of the Environmental Protection Act (MECP, 2011). Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Condition
GUIDELINE USED IS BOLD IN TABLE
QAQC Notes:
RDL - Reportable detection limit
RPD - Relative percent difference calculated as (abs(C1-C2)/average(C1+C2))*100
"-" Indicates RPD not calculated. RPD cannot be calculated if one or more of the analytical results are less than detection limits or within 5 times the detection limits.
BOLD - RPD value greater than 60%

Table 1a Soil Results
Eureka HAWS, Nunavut
BTEXs, PHCs, Metals and Salinity Analysis

				Eureka HAWS RAP									
				Former First Air Lease									
Sample ID Laboratory ID Units Sampling Date Sample Depth (m)	Guideline	Guideline	Reportable Detection Limit (RDL) mg/g	LTM-36 mg/kg 2013 - 2019 0.2 - 0.8	LTM-37 mg/kg 2008 - 2019 0.15 - 0.65	LTM-38 mg/kg 2013 - 2019 0.15 - 0.7	LTM-39 mg/kg 2013 - 2019 0.15 - 0.9	LTM-40 mg/kg 2008 - 2019 0.2 - 0.75	LTM-41 mg/kg 2008 - 2019 0.2 - 0.7	LTM-42 mg/kg 2008 - 2019 0.2 - 1.2	LTM-43 mg/kg 2013 - 2019 0.2 - 0.7	LTM-44 mg/kg 2013 - 2019 0.2 - 0.7	LTM-45 mg/kg 2013 - 2019 0.2 - 0.5
PARAMETERS	**(1)**	**(3)**											
BTEX													
Benzene	0.0068	**2**	0.0050	-	-	-	-	-	-	-	-	-	-
Toluene	0.08	**120**	0.050	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	0.018	**110**	0.010	-	-	-	-	-	-	-	-	-	-
m-Xylene & p-Xylene	NV	NV	0.040	-	-	-	-	-	-	-	-	-	-
o-Xylene	NV	NV	0.020	-	-	-	-	-	-	-	-	-	-
Total Xylenes	2.4	**65**	0.045	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons	**(2)**	**(3)**											
F1 (C6-C10)	30	**7,800**	10	-	-	-	-	-	-	-	-	-	-
F1 (C6-C10) - BTEX	30	**7,800**	10	-	-	-	-	-	-	-	-	-	-
F2 (C10-C16)	150	**4,100**	10	<10 - **1,900**	**1,800 - 9,100**	<10 - **3,400**	<10 - **10,000**	07 - 15	<10 - 300	<10 - **3,900**	23 - **910**	<10 - **2,500**	**77 - 5,200**
F3 (C16-C34)	300	**15,000**	50	<50 - **380**	170 - **2,100**	<50 - **1,400**	<50 - **1,500**	<50 - 190	<50 - 240	<50 - **480**	76 - 250	<50 - 220	63 - 240
F4 (C34-C50)	**2,800**	NV	50	<50	<5 - 2,300	<50 - 1,400	<50 - 770	<50 -110	<50 - 62	<50 - 170	<50 - 190	<50 - 82	<50
Reached Baseline at C50	NV	NV	NV	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
F4G-SG (Heavy Hydrocarbons-Grav.)	NV	NV	500	-	-	-	-	-	-	-	-	-	-
Metals	**(1)**	**(3)**											
Antimony	**20**	NV	0.5	-	-	-	-	-	-	-	-	-	-
Arsenic	12	**40**	1	-	-	-	-	-	-	-	-	-	-
Barium	**500**	NV	1	-	-	-	-	-	-	-	-	-	-
Beryllium	**4**	NV	0.4	-	-	-	-	-	-	-	-	-	-
Boron (Total)	NV	**30**	5	-	-	-	-	-	-	-	-	-	-
Boron (hws)	1.5 [a]	**6**	0.1	-	-	-	-	-	-	-	-	-	-
Cadmium	**10**	NV	0.1	-	-	-	-	-	-	-	-	-	-
Chromium	**64**	NV	1	-	-	-	-	-	-	-	-	-	-
Chromium VI	**0.4**	NV	0.08	-	-	-	-	-	-	-	-	-	-
Cobalt	**50**	NV	0.1	-	-	-	-	-	-	-	-	-	-
Copper	63	**1,100**	0.5	-	-	-	-	-	-	-	-	-	-
Lead	140	**360**	1	-	-	-	-	-	-	-	-	-	-
Mercury	**6.6**	NV	0.05	-	-	-	-	-	-	-	-	-	-
Molybdenum	**10**	NV	0.5	-	-	-	-	-	-	-	-	-	-
Nickel	45	**78**	0.5	-	-	-	-	-	-	-	-	-	-
Selenium	**1**	NV	0.5	-	-	-	-	-	-	-	-	-	-
Silver	**20**	NV	0.2	-	-	-	-	-	-	-	-	-	-
Thallium	**1**	NV	0.1	-	-	-	-	-	-	-	-	-	-
Uranium	**23**	NV	0.20	-	-	-	-	-	-	-	-	-	-
Vanadium	**130**	NV	1	-	-	-	-	-	-	-	-	-	-
Zinc	250	**10,000**	10	-	-	-	-	-	-	-	-	-	-
Salinity	**(1)**	**(3)**											
pH	6.0 - 8.5	NV	N/A	-	-	-	-	-	-	-	-	-	-
Electrical Conductivity (EC)	2	NV	0.1	-	-	-	-	-	-	-	-	-	-
Sodium Adsorption Ratio (SAR)	5	NV	0.1	-	-	-	-	-	-	-	-	-	-
Percent Saturation	NV	NV	NA	-	-	-	-	-	-	-	-	-	-
Calcium	NV	NV	0.60	-	-	-	-	-	-	-	-	-	-
Magnesium	NV	NV	0.40	-	-	-	-	-	-	-	-	-	-
Potassium	NV	NV	0.52	-	-	-	-	-	-	-	-	-	-
Sodium	NV	NV	1.0	-	-	-	-	-	-	-	-	-	-
Chloride	NV	NV	40	-	-	-	-	-	-	-	-	-	-
Sulphate	NV	NV	2.0	-	-	-	-	-	-	-	-	-	-
Soluble Cations and Anions (mg/L)	**(1)**	**(3)**											
Calcium (mg/L)	NV	NV	1.5	-	-	-	-	-	-	-	-	-	-
Magnesium (mg/L)	NV	NV	1	-	-	-	-	-	-	-	-	-	-
Potassium (mg/L)	NV	NV	1.3	-	-	-	-	-	-	-	-	-	-
Sodium (mg/L)	NV	NV	2.5	-	-	-	-	-	-	-	-	-	-
Chloride (mg/L)	NV	NV	100	-	-	-	-	-	-	-	-	-	-
Sulphate (mg/L)	NV	NV	5	-	-	-	-	-	-	-	-	-	-

RDL exceeds guideline value
Applied Guideline Exceedance

BOLD - Generic Guideline Exceedance
Guideline 1 CCME Soil Quality Guideline Residential Land Use, fine grained, shallow soil (<1.5m)
Guideline 2 Canada Wide Standards for Petroleum Hydrocarbons Tier 1 Residential Eco Soil Contact
Guideline 3 Site Specific Target Levels
Guideline 4 Ontario Ministry of the Environment 2011 Soil, Groundwater, and Sediment Standards for use under Part X.V.1 of the Environmental Protection Act (MECP, 2011). Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Condition
GUIDELINE USED IS BOLD IN TABLE
QAQC Notes:
RDL - Reportable detection limit
RPD - Relative percent difference calculated as (abs(C1-C2)/average(C1+C2))*100
"-" Indicates RPD not calculated. RPD cannot be calculated if one or more of the analytical results are less than detection limits or within 5 times the detection limits.
BOLD - RPD value greater than 60%

Table 1a Soil Results
Eureka HAWS, Nunavut
BTEXs, PHCs, Metals and Salinity Analysis

				Eureka HAWS RAP									
				Biocell									
Sample ID Laboratory ID Units Sampling Date Sample Depth (m)	Guideline	Guideline	Reportable Detection Limit (RDL) mg/g	LTM-46 mg/kg 2008 - 2019 0.1 - 1.0	LTM-47 mg/kg 2013 - 2019 0.1 - 1.0	LTM-48 mg/kg 2013 - 2019 0.2 - 1.0	LTM-49 mg/kg 2008 - 2017 0.2 - 1.0	LTM-50 mg/kg 2008 - 2019 0.2 - 1.3	LTM-51 mg/kg 2013 - 2017 0.2 - 1.2	LTM-52 mg/kg 2013 - 2019 0.2 - 1.0	LTM-53 mg/kg 2013 - 2019 0.2 - 0.8	LTM-54 mg/kg 2008 - 2019 0.15 - 1.2	LTM-55 mg/kg 2008 - 2019 0.4 - 0.7
PARAMETERS	**(1)**	**(3)**											
BTEX													
Benzene	0.0068	**2**	0.0050	-	-	-	-	-	-	-	-	-	-
Toluene	0.08	**120**	0.050	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	0.018	**110**	0.010	-	-	-	-	-	-	-	-	-	-
m-Xylene & p-Xylene	NV	NV	0.040	-	-	-	-	-	-	-	-	-	-
o-Xylene	NV	NV	0.020	-	-	-	-	-	-	-	-	-	-
Total Xylenes	2.4	**65**	0.045	-	-	-	-	-	-	-	-	-	-
Petroleum Hydrocarbons	**(2)**	**(3)**											
F1 (C6-C10)	30	**7,800**	10	-	-	-	-	-	-	-	-	-	-
F1 (C6-C10) - BTEX	30	**7,800**	10	-	-	-	-	-	-	-	-	-	-
F2 (C10-C16)	150	**4,100**	10	<5 - **820**	**460 - 2,300**	<10 - **4,700**	<5 - <10	50 - **2,300**	1,900 - **6,300**	**1,100 - 3,200**	<10	<5 - <10	<5 - <10
F3 (C16-C34)	300	**15,000**	50	44 - **560**	200 - **410**	<50 - **550**	42 - <50	120 - **310**	**320 - 5,800**	**320 - 610**	<50	<50 - 100	<50 - 75
F4 (C34-C50)	**2,800**	NV	50	40 - 110	<50 - 58	<50 - 76	29 - <50	<5 - 66	<50 - 1,800	<50 - 100	<50	<50 - 73	<50 - 51
Reached Baseline at C50	NV	NV	NV	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
F4G-SG (Heavy Hydrocarbons-Grav.)	NV	NV	500	-	-	-	-	-	-	-	-	-	-
Metals	**(1)**	**(3)**											
Antimony	**20**	NV	0.5	-	-	-	-	-	-	-	-	-	-
Arsenic	12	**40**	1	-	-	-	-	-	-	-	-	-	-
Barium	**500**	NV	1	-	-	-	-	-	-	-	-	-	-
Beryllium	**4**	NV	0.4	-	-	-	-	-	-	-	-	-	-
Boron (Total)	NV	**30**	5	-	-	-	-	-	-	-	-	-	-
Boron (hws)	1.5 [a]	**6**	0.1	-	-	-	-	-	-	-	-	-	-
Cadmium	**10**	NV	0.1	-	-	-	-	-	-	-	-	-	-
Chromium	**64**	NV	1	-	-	-	-	-	-	-	-	-	-
Chromium VI	**0.4**	NV	0.08	-	-	-	-	-	-	-	-	-	-
Cobalt	**50**	NV	0.1	-	-	-	-	-	-	-	-	-	-
Copper	63	**1,100**	0.5	-	-	-	-	-	-	-	-	-	-
Lead	140	**360**	1	-	-	-	-	-	-	-	-	-	-
Mercury	**6.6**	NV	0.05	-	-	-	-	-	-	-	-	-	-
Molybdenum	**10**	NV	0.5	-	-	-	-	-	-	-	-	-	-
Nickel	45	**78**	0.5	-	-	-	-	-	-	-	-	-	-
Selenium	**1**	NV	0.5	-	-	-	-	-	-	-	-	-	-
Silver	**20**	NV	0.2	-	-	-	-	-	-	-	-	-	-
Thallium	**1**	NV	0.1	-	-	-	-	-	-	-	-	-	-
Uranium	**23**	NV	0.20	-	-	-	-	-	-	-	-	-	-
Vanadium	**130**	NV	1	-	-	-	-	-	-	-	-	-	-
Zinc	250	**10,000**	10	-	-	-	-	-	-	-	-	-	-
Salinity	**(1)**	**(3)**											
pH	6.0 - 8.5	NV	N/A	-	-	-	-	-	-	-	-	-	-
Electrical Conductivity (EC)	2	NV	0.1	-	-	-	-	-	-	-	-	-	-
Sodium Adsorption Ratio (SAR)	5	NV	0.1	-	-	-	-	-	-	-	-	-	-
Percent Saturation	NV	NV	NA	-	-	-	-	-	-	-	-	-	-
Calcium	NV	NV	0.60	-	-	-	-	-	-	-	-	-	-
Magnesium	NV	NV	0.40	-	-	-	-	-	-	-	-	-	-
Potassium	NV	NV	0.52	-	-	-	-	-	-	-	-	-	-
Sodium	NV	NV	1.0	-	-	-	-	-	-	-	-	-	-
Chloride	NV	NV	40	-	-	-	-	-	-	-	-	-	-
Sulphate	NV	NV	2.0	-	-	-	-	-	-	-	-	-	-
Soluble Cations and Anions (mg/L)	**(1)**	**(3)**											
Calcium (mg/L)	NV	NV	1.5	-	-	-	-	-	-	-	-	-	-
Magnesium (mg/L)	NV	NV	1	-	-	-	-	-	-	-	-	-	-
Potassium (mg/L)	NV	NV	1.3	-	-	-	-	-	-	-	-	-	-
Sodium (mg/L)	NV	NV	2.5	-	-	-	-	-	-	-	-	-	-
Chloride (mg/L)	NV	NV	100	-	-	-	-	-	-	-	-	-	-
Sulphate (mg/L)	NV	NV	5	-	-	-	-	-	-	-	-	-	-

RDL exceeds guideline value
Applied Guideline Exceedance

BOLD - Generic Guideline Exceedance
Guideline 1 CCME Soil Quality Guideline Residential Land Use, fine grained, shallow soil (<1.5m)
Guideline 2 Canada Wide Standards for Petroleum Hydrocarbons Tier 1 Residential Eco Soil Contact
Guideline 3 Site Specific Target Levels
Guideline 4 Ontario Ministry of the Environment 2011 Soil, Groundwater, and Sediment Standards for use under Part X.V.1 of the Environmental Protection Act (MECP, 2011). Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Condition
GUIDELINE USED IS BOLD IN TABLE
QAQC Notes:
RDL - Reportable detection limit
RPD - Relative percent difference calculated as (abs(C1-C2)/average(C1+C2))*100
"-" Indicates RPD not calculated. RPD cannot be calculated if one or more of the analytical results are less than detection limits or within 5 times the detection limits.
BOLD - RPD value greater than 60%

Table 1b Soil Results
Eureka HAWS, Nunavut
Polycyclic Aromatic Hydrocarbons Analysis

					Eureka HAWS RAP					
					New Reservoir					
Sample ID Laboratory ID Units Sampling Date Sample Depth (m) PID Reading	Guideline (1)	Guideline (2)	Guideline (3)	Reportable Detection Limit (RDL) mg/kg	RES21-1 ADJ464 mg/kg 31-Jul-2021 0.0 - 0.3	RES21-1 ADJ465 mg/kg 31-Jul-2021 0.3 - 0.65	RES21-2 ADJ466 mg/kg 31-Jul-2021 0 - 0.25	RES21-2 ADJ467 mg/kg 31-Jul-2021 0.25 - 0.55	RES21-3 ADJ468 mg/kg 31-Jul-2021 0.0 - 0.3	RES21-4 ADJ469 mg/kg 31-Jul-2021 0.0 - 0.2
Calculated Paramters										
IACR	1	NV	NV	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Benzo(a)pyrene (TPE)	0.6	NV	NV	0.071	<0.0071	<0.0071	<0.0071	<0.0071	<0.0071	<0.0071
Specific Parameters										
Acenaphthene	NV	NV	**58**	0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Acenaphthylene	NV	**8**	0.17	0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Acridine	NV	**3**	NV	0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Anthracene	**2.5**	NV	0.74	0.004	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
Benzo(a)anthracene	**1**	NV	0.63	0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Benzo(a)pyrene	**20**	NV	0.3	0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Benzo(b/j)fluoranthene	**1**	NV	0.78	0.005	0.0069	0.0079	0.0084	0.0066	0.009	0.0063
Benzo(k)fluoranthene	**1**	NV	0.78	0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Benzo(g,h,i)perylene	NV	NV	**7.8**	0.005	0.0062	0.0096	0.011	0.0086	0.013	0.0089
Benzo(c)phenanthrene	NV	NV	NV	0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Benzo(e)pyrene	NV	NV	NV	0.005	<0.0050	<0.0050	0.0058	<0.0050	<0.0050	<0.0050
Chrysene	6.2	6.2	**7.8**	0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Dibenzo(a,h)anthracene	**1**	1	0.1	0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Fluoranthene	**50**	NV	0.69	0.005	0.0061	0.008	0.0067	0.0085	0.0071	<0.0050
Fluorene	NV	NV	**69**	0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Indeno(1,2,3-c,d)pyrene	**1**	NV	0.48	0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
1-Methylnaphthalene	NV	**70**	3.4	0.05	<0.0050	<0.0050	<0.0050	<0.0050	0.0081	<0.0050
2-Methylnaphthalene	NV	**110**	3.4	0.05	0.0067	0.0071	0.0074	0.0068	0.01	0.0061
Naphthalene	0.013	**60**	0.75	0.05	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Phenanthrene	**5**	NV	7.8	0.005	0.012	0.017	0.017	0.016	0.017	0.0095
Perylene	NV	**10**	NV	0.005	0.052	0.1	0.057	0.088	0.11	0.083
Pyrene	**10**	NV	78	0.005	0.0066	0.01	0.008	0.01	0.011	0.0073
Quinoline	NV	NV	NV	0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010

RDL exceeds guideline value
Applied Guideline Exceedance

BOLD - Generic Guideline Exceedance

Guideline 1 CCME Soil Quality Guideline Residential, fine grained, shallow soil (<1.5m), 10^{-6} incremental lifetime cancer risk. Excluding Protection of Freshwater Life
Guideline 2 Site Specific Target Levels
Guideline 3 Ontario Ministry of the Environment 2011 Soil, Groundwater, and Sediment Standards for use under Part X.V.1 of the Environmental Protection Act (MECP, 2011). Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Condition

GUIDELINE USED IS BOLD IN TABLE

QAQC Notes:
RDL - Reportable detection limit
RPD - Relative percent difference calculated as (abs(C1-C2)/average(C1+C2))*100
"-" Indicates RPD not calculated. RPD cannot be calculated if one or more of the analytical results are less than detection limits or within 5 times the detection limits.
BOLD - RPD value greater than 60%

Table 1b Soil Results
Eureka HAWS, Nunavut
Polycyclic Aromatic Hydrocarbons Analysis

					Eureka HAWS RAP						
					New Reservoir						
Sample ID Laboratory ID Units Sampling Date Sample Depth (m) PID Reading	Guideline (1)	Guideline (2)	Guideline (3)	Reportable Detection Limit (RDL) mg/kg	RES21-5 ADJ470 mg/kg 31-Jul-2021 0.0 - 0.2	RES21-5 ADJ471 mg/kg 31-Jul-2021 0.2 - 0.55	RES21-6 ADJ472 mg/kg 31-Jul-2021 0.0 - 0.25	RES21-6 ADJ473 mg/kg 31-Jul-2021 0.25 - 0.65	RES21-7 ADJ517 mg/kg 2-Aug-2021 0.0 - 0.2	RES21-7 ADJ518 mg/kg 2-Aug-2021 0.2 - 0.5	RES21-8 ADJ519 mg/kg 2-Aug-2021 0.0 - 0.35
Calculated Paramters											
IACR	1	NV	NV	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Benzo(a)pyrene (TPE)	0.6	NV	NV	0.071	0.016	<0.0071	<0.0071	<0.0071	0.015	<0.0071	0.013
Specific Parameters											
Acenaphthene	NV	NV	**58**	0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Acenaphthylene	NV	**8**	0.17	0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Acridine	NV	**3**	NV	0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Anthracene	**2.5**	NV	0.74	0.004	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
Benzo(a)anthracene	**1**	NV	0.63	0.005	0.0066	<0.0050	<0.0050	<0.0050	0.0091	<0.0050	0.0081
Benzo(a)pyrene	**20**	NV	0.3	0.005	0.0091	<0.0050	<0.0050	<0.0050	0.0078	<0.0050	0.0062
Benzo(b/j)fluoranthene	**1**	NV	0.78	0.005	0.023	0.0056	0.0059	0.0078	0.024	0.0070	0.018
Benzo(k)fluoranthene	**1**	NV	0.78	0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Benzo(g,h,i)perylene	NV	NV	**7.8**	0.005	0.028	0.0091	0.0065	0.0082	0.029	0.0074	0.021
Benzo(c)phenanthrene	NV	NV	NV	0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Benzo(e)pyrene	NV	NV	NV	0.005	0.018	<0.0050	<0.0050	0.0057	0.016	<0.0050	0.011
Chrysene	6.2	6.2	**7.8**	0.005	0.009	<0.0050	<0.0050	<0.0050	0.011	<0.0050	0.0071
Dibenzo(a,h)anthracene	**1**	1	0.1	0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Fluoranthene	**50**	NV	0.69	0.005	0.015	<0.0050	0.0061	0.0069	0.018	0.0082	0.017
Fluorene	NV	NV	**69**	0.005	<0.0050	<0.0050	<0.0050	0.0075	<0.0050	<0.0050	<0.0050
Indeno(1,2,3-c,d)pyrene	**1**	NV	0.48	0.005	0.009	<0.0050	<0.0050	<0.0050	0.0092	<0.0050	0.0082
1-Methylnaphthalene	NV	**70**	3.4	0.05	0.032	<0.0050	0.0056	0.0085	0.034	0.0076	0.02
2-Methylnaphthalene	NV	**110**	3.4	0.05	0.058	0.0079	0.0088	0.014	0.051	0.012	0.025
Naphthalene	0.013	**60**	0.75	0.05	**0.035**	<0.0050	<0.0050	0.0084	**0.034**	<0.0050	**0.014**
Phenanthrene	**5**	NV	7.8	0.005	0.053	0.013	0.013	0.023	0.051	0.019	0.036
Perylene	NV	**10**	NV	0.005	0.11	0.06	0.034	0.038	0.28	0.074	0.23
Pyrene	**10**	NV	78	0.005	0.026	0.0065	0.0069	0.0087	0.027	0.009	0.025
Quinoline	NV	NV	NV	0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010

RDL exceeds guideline value
Applied Guideline Exceedance

BOLD - Generic Guideline Exceedance

Guideline 1 CCME Soil Quality Guideline Residential, fine grained, shallow soil (<1.5m), 10^{-6} incremental lifetime cancer risk. Excluding Protection of Freshwater Life
Guideline 2 Site Specific Target Levels
Guideline 3 Ontario Ministry of the Environment 2011 Soil, Groundwater, and Sediment Standards for use under Part X.V.1 of the Environmental Protection Act (MECP, 2011). Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Condition

GUIDELINE USED IS BOLD IN TABLE

QAQC Notes:
RDL - Reportable detection limit
RPD - Relative percent difference calculated as (abs(C1-C2)/average(C1+C2))*100
"-" Indicates RPD not calculated. RPD cannot be calculated if one or more of the analytical results are less than detection limits or within 5 times the detection limits.
BOLD - RPD value greater than 60%

Table 1b Soil Results
Eureka HAWS, Nunavut
Polycyclic Aromatic Hydrocarbons Analysis

					Eureka HAWS RAP								
					New Reservoir								
											Duplicates		
Sample ID Laboratory ID Units Sampling Date Sample Depth (m) PID Reading	Guideline (1)	Guideline (2)	Guideline (3)	Reportable Detection Limit (RDL) mg/kg	RES21-9 ADJ520 mg/kg 30-Jul-2021 0.0 - 0.5	RES21-9 ADJ521 mg/kg 30-Jul-2021 0.5 - 0.8	RES21-10 ADJ522 mg/kg 30-Jul-2021 0.0 - 0.5	RES21-10 ADJ523 mg/kg 30-Jul-2021 0.5 - 0.8	RES21-11 ADJ524 mg/kg 2-Aug-2021 0.0 - 0.3	RES21-11 ADJ525 mg/kg 2-Aug-2021 0.3 - 0.7	RES21-12 ADJ526 mg/kg 2-Aug-2021 0.0 -0.35	DUP-004 ADJ632 mg/kg 2-Aug-2021 0.0 - 0.35	RPD (%)
Calculated Paramters													
IACR	1	NV	NV	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	-
Benzo(a)pyrene (TPE)	0.6	NV	NV	0.071	0.008	0.014	<0.0071	0.008	0.014	<0.0071	0.012	0.013	-
Specific Parameters													
Acenaphthene	NV	NV	**58**	0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	-
Acenaphthylene	NV	**8**	0.17	0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	-
Acridine	NV	**3**	NV	0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	-
Anthracene	**2.5**	NV	0.74	0.004	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	-
Benzo(a)anthracene	**1**	NV	0.63	0.005	0.0051	0.0065	<0.0050	<0.0050	0.0076	<0.0050	0.0072	0.0074	-
Benzo(a)pyrene	**20**	NV	0.3	0.005	<0.0050	0.0072	<0.0050	<0.0050	0.0071	<0.0050	0.0062	0.0064	-
Benzo(b/j)fluoranthene	**1**	NV	0.78	0.005	0.015	0.020	0.0062	0.017	0.021	0.0073	0.017	0.019	-
Benzo(k)fluoranthene	**1**	NV	0.78	0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	-
Benzo(g,h,i)perylene	NV	NV	**7.8**	0.005	0.015	0.023	0.0061	0.015	0.021	0.0082	0.022	0.026	-
Benzo(c)phenanthrene	NV	NV	NV	0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	-
Benzo(e)pyrene	NV	NV	NV	0.005	0.011	0.016	<0.0050	0.012	0.014	<0.0050	0.01	0.013	-
Chrysene	6.2	6.2	**7.8**	0.005	0.0062	0.011	<0.0050	0.0086	0.008	<0.0050	0.0081	0.0087	-
Dibenzo(a,h)anthracene	**1**	1	0.1	0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	-
Fluoranthene	**50**	NV	0.69	0.005	0.0096	0.014	<0.0050	0.011	0.014	0.0064	0.017	0.016	-
Fluorene	NV	NV	**69**	0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	-
Indeno(1,2,3-c,d)pyrene	**1**	NV	0.48	0.005	<0.0050	0.0065	<0.0050	0.006	0.0084	<0.0050	0.0079	0.009	-
1-Methylnaphthalene	NV	**70**	3.4	0.05	0.019	0.024	0.0053	0.019	0.054	0.0074	0.017	0.016	-
2-Methylnaphthalene	NV	**110**	3.4	0.05	0.039	0.044	0.0099	0.036	0.17	0.0096	0.024	0.02	-
Naphthalene	0.013	**60**	0.75	0.05	**0.023**	**0.029**	0.0068	**0.023**	**0.066**	0.0052	**0.018**	0.01	-
Phenanthrene	**5**	NV	7.8	0.005	0.036	0.052	0.011	0.037	0.038	0.016	0.033	0.029	13
Perylene	NV	**10**	NV	0.005	0.071	0.066	0.013	0.069	0.11	0.073	0.23	0.24	4
Pyrene	**10**	NV	78	0.005	0.012	0.019	<0.0050	0.012	0.025	0.0085	0.027	0.024	-
Quinoline	NV	NV	NV	0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	-

RDL exceeds guideline value
Applied Guideline Exceedance

BOLD - Generic Guideline Exceedance

Guideline 1 CCME Soil Quality Guideline Residential, fine grained, shallow soil (<1.5m), 10^{-6} incremental lifetime cancer risk. Excluding Protection of Freshwater Life
Guideline 2 Site Specific Target Levels
Guideline 3 Ontario Ministry of the Environment 2011 Soil, Groundwater, and Sediment Standards for use under Part X.V.1 of the Environmental Protection Act (MECP, 2011). Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Condition
GUIDELINE USED IS BOLD IN TABLE
QAQC Notes:
RDL - Reportable detection limit
RPD - Relative percent difference calculated as (abs(C1-C2)/average(C1+C2))*100
"-" Indicates RPD not calculated. RPD cannot be calculated if one or more of the analytical results are less than detection limits or within 5 times the detection limits.
BOLD - RPD value greater than 60%

Table 1b Soil Results
Eureka HAWS, Nunavut
Polycyclic Aromatic Hydrocarbons Analysis

					Eureka HAWS RAP					
					In-situ Landfarm					
								Duplicates		
Sample ID Laboratory ID Units Sampling Date Sample Depth (m) PID Reading	Guideline (1)	Guideline (2)	Guideline (3)	Reportable Detection Limit (RDL) mg/kg	ISL21-1 ADJ610 mg/kg 29-Jul-2021 0.1 - 0.45	ISL21-1 ADJ611 mg/kg 29-Jul-2021 0.45 - 1.0	ISL21-2 ADJ612 mg/kg 29-Jul-2021 0.0 - 0.5	ISL21-2 ADJ622 mg/kg 29-Jul-2021 0.5 - 0.8	DUP-001 ADJ629 mg/kg 29-Jul-2021 0.5 - 0.8	RPD (%)
Calculated Paramters										
IACR	1	NV	NV	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	-
Benzo(a)pyrene (TPE)	0.6	NV	NV	0.071	0.02	<0.0071	<0.0071	<0.0071	<0.0071	-
Specific Parameters										
Acenaphthene	NV	NV	**58**	0.005	0.0052	0.14	<0.0050	<0.0050	<0.0050	-
Acenaphthylene	NV	**8**	0.17	0.005	<0.0050	0.096	<0.0050	<0.0050	<0.0050	-
Acridine	NV	**3**	NV	0.01	<0.010	0.2	<0.010	<0.010	<0.010	-
Anthracene	**2.5**	NV	0.74	0.004	<0.0040	0.018	<0.0040	<0.0040	<0.0040	-
Benzo(a)anthracene	**1**	NV	0.63	0.005	0.0061	<0.0050	<0.0050	<0.0050	<0.0050	-
Benzo(a)pyrene	**20**	NV	0.3	0.005	0.012	<0.0050	<0.0050	<0.0050	<0.0050	-
Benzo(b/j)fluoranthene	**1**	NV	0.78	0.005	0.025	0.0087	0.0075	0.0056	<0.0050	-
Benzo(k)fluoranthene	**1**	NV	0.78	0.005	0.0066	<0.0050	<0.0050	<0.0050	<0.0050	-
Benzo(g,h,i)perylene	NV	NV	**7.8**	0.005	0.027	0.0087	0.0099	0.0058	0.0056	-
Benzo(c)phenanthrene	NV	NV	NV	0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	-
Benzo(e)pyrene	NV	NV	NV	0.005	0.024	0.0062	0.0057	<0.0050	<0.0050	-
Chrysene	6.2	6.2	**7.8**	0.005	0.0093	<0.0050	<0.0050	<0.0050	<0.0050	-
Dibenzo(a,h)anthracene	**1**	1	0.1	0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	-
Fluoranthene	**50**	NV	0.69	0.005	0.0074	0.0074	<0.0050	<0.0050	<0.0050	-
Fluorene	NV	NV	**69**	0.005	<0.0050	0.055	<0.0050	<0.0050	<0.0050	-
Indeno(1,2,3-c,d)pyrene	**1**	NV	0.48	0.005	0.017	<0.0050	<0.0050	<0.0050	<0.0050	-
1-Methylnaphthalene	NV	**70**	3.4	0.05	0.025	0.19	0.0057	<0.0050	<0.0050	-
2-Methylnaphthalene	NV	**110**	3.4	0.05	0.067	0.21	0.0099	0.0065	<0.0050	-
Naphthalene	0.013	**60**	0.75	0.05	**0.031**	**0.38**	0.0071	0.0051	<0.0050	-
Phenanthrene	**5**	NV	7.8	0.005	0.022	0.032	0.016	0.013	0.007	-
Perylene	NV	**10**	NV	0.005	0.035	0.018	0.019	0.025	0.024	-
Pyrene	**10**	NV	78	0.005	0.016	0.016	<0.0050	<0.0050	<0.0050	-
Quinoline	NV	NV	NV	0.01	<0.010	<0.010	<0.010	<0.010	<0.010	-

RDL exceeds guideline value
Applied Guideline Exceedance

BOLD - Generic Guideline Exceedance

Guideline 1 CCME Soil Quality Guideline Residential, fine grained, shallow soil (<1.5m), 10^{-6} incremental lifetime cancer risk. Excluding Protection of Freshwater Life
Guideline 2 Site Specific Target Levels
Guideline 3 Ontario Ministry of the Environment 2011 Soil, Groundwater, and Sediment Standards for use under Part X.V.1 of the Environmental Protection Act (MECP, 2011). Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Condition

GUIDELINE USED IS BOLD IN TABLE

QAQC Notes:
RDL - Reportable detection limit
RPD - Relative percent difference calculated as (abs(C1-C2)/average(C1+C2))*100
"-" Indicates RPD not calculated. RPD cannot be calculated if one or more of the analytical results are less than detection limits or within 5 times the detection limits.
BOLD - RPD value greater than 60%

Table 1b Soil Results
Eureka HAWS, Nunavut
Polycyclic Aromatic Hydrocarbons Analysis

					Eureka HAWS RAP								
					Old Tank Farm								
										Duplicates			
Sample ID Laboratory ID Units Sampling Date Sample Depth (m) PID Reading	Guideline (1)	Guideline (2)	Guideline (3)	Reportable Detection Limit (RDL) mg/kg	OFT21-1 ADJ603 mg/kg 29-Jul-2021 0.8 - 1.15	OFT21-2 ADJ604 mg/kg 29-Jul-2021 0.0 - 1.05	OFT21-3 ADJ605 mg/kg 29-Jul-2021 0.0 - 1.2	OFT21-4 ADJ606 mg/kg 29-Jul-2021 0.0 - 1.05	OFT21-5 ADJ607 mg/kg 29-Jul-2021 0.0 - 0.8	OFT21-6 ADJ608 mg/kg 30-Jul-2021 0.0 - 1.0	DUP-002 ADJ630 mg/kg 31-Jul-2021 0.0 - 0.5	RPD (%)	OFT21-7 ADJ609 mg/kg 30-Jul-2021 0.0 - 1.1
Calculated Paramters													
IACR	1	NV	NV	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	-	<0.10
Benzo(a)pyrene (TPE)	0.6	NV	NV	0.071	0.024	0.014	0.009	0.013	0.029	0.008	<0.0071	-	0.026
Specific Parameters													
Acenaphthene	NV	NV	**58**	0.005	0.46	0.018	0.68	0.57	<0.0050	0.6	0.43	-	0.38
Acenaphthylene	NV	**8**	0.17	0.005	0.2	0.011	0.31	0.31	<0.0050	0.3	0.21	35	0.16
Acridine	NV	**3**	NV	0.01	0.081	<0.010	0.23	0.26	<0.010	0.12	0.081	39	0.23
Anthracene	**2.5**	NV	0.74	0.004	0.012	<0.0040	0.67	0.029	<0.0040	0.015	<0.0040	-	0.03
Benzo(a)anthracene	**1**	NV	0.63	0.005	0.013	0.0073	0.0062	0.0067	0.016	0.0079	<0.0050	-	0.013
Benzo(a)pyrene	**20**	NV	0.3	0.005	0.014	0.0065	<0.0050	0.0064	0.017	<0.0050	<0.0050	-	0.016
Benzo(b/j)fluoranthene	**1**	NV	0.78	0.005	0.037	0.025	0.018	0.018	0.045	0.016	0.009	-	0.039
Benzo(k)fluoranthene	**1**	NV	0.78	0.005	0.0076	<0.0050	<0.0050	<0.0050	0.0089	<0.0050	<0.0050	-	0.0086
Benzo(g,h,i)perylene	NV	NV	**7.8**	0.005	0.033	0.019	0.016	0.017	0.039	0.014	0.0092	-	0.037
Benzo(c)phenanthrene	NV	NV	NV	0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	-	<0.0050
Benzo(e)pyrene	NV	NV	NV	0.005	0.025	0.015	0.012	0.012	0.027	0.012	0.0067	-	0.025
Chrysene	6.2	6.2	**7.8**	0.005	0.016	0.0091	0.008	0.007	0.015	0.011	<0.0050	-	0.015
Dibenzo(a,h)anthracene	**1**	1	0.1	0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	-	<0.0050
Fluoranthene	**50**	NV	0.69	0.005	0.027	0.014	0.015	0.019	0.036	0.021	0.0083	-	0.036
Fluorene	NV	NV	**69**	0.005	0.44	0.023	0.95	0.97	0.01	0.71	0.48	39	0.51
Indeno(1,2,3-c,d)pyrene	**1**	NV	0.48	0.005	0.013	0.0098	0.0066	0.0075	0.019	0.0063	<0.0050	-	0.016
1-Methylnaphthalene	NV	**70**	3.4	0.05	19	1	25	23	0.049	21	15	33	20
2-Methylnaphthalene	NV	**110**	3.4	0.05	38	1.6	54	36	0.06	37	28	28	56
Naphthalene	0.013	**60**	0.75	0.05	**24**	**0.55**	**31**	**11**	**0.057**	**27**	**16**	51	**30**
Phenanthrene	**5**	NV	7.8	0.005	0.3	0.047	0.59	0.68	0.05	0.43	0.28	42	0.59
Perylene	NV	**10**	NV	0.005	0.18	0.09	0.081	0.1	0.32	0.045	0.028	47	0.26
Pyrene	**10**	NV	78	0.005	0.055	0.017	0.029	0.034	0.067	0.031	0.014	-	0.058
Quinoline	NV	NV	NV	0.01	<0.010	<0.010	<0.010	<0.010 (1)	<0.010	<0.010	<0.010	-	<0.010

RDL exceeds guideline value
Applied Guideline Exceedance

BOLD - Generic Guideline Exceedance

Guideline 1 CCME Soil Quality Guideline Residential, fine grained, shallow soil (<1.5m), 10^{-6} incremental lifetime cancer risk. Excluding Protection of Freshwater Life
Guideline 2 Site Specific Target Levels
Guideline 3 Ontario Ministry of the Environment 2011 Soil, Groundwater, and Sediment Standards for use under Part X.V.1 of the Environmental Protection Act (MECP, 2011). Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Condition

GUIDELINE USED IS BOLD IN TABLE

QAQC Notes:
RDL - Reportable detection limit
RPD - Relative percent difference calculated as (abs(C1-C2)/average(C1+C2))*100
"-" Indicates RPD not calculated. RPD cannot be calculated if one or more of the analytical results are less than detection limits or within 5 times the detection limits.
BOLD - RPD value greater than 60%

Table 1b Soil Results
Eureka HAWS, Nunavut
Polycyclic Aromatic Hydrocarbons Analysis

					Eureka HAWS RAP				
					Embankment Area				
Sample ID Laboratory ID Units Sampling Date Sample Depth (m) PID Reading	Guideline (1)	Guideline (2)	Guideline (3)	Reportable Detection Limit (RDL) mg/kg	EMB21-1 ADJ584 mg/kg 28-Jul-2021 0.0 - 0.5	EMB21-2 ADJ585 mg/kg 31-Jul-2021 0.0 - 0.5	EMB21-3 ADJ586 mg/kg 31-Jul-2021 0.0 - 0.5	EMB21-4 ADJ587 mg/kg 31-Jul-2021 0.0 - 0.6	EMB21-5 ADJ701 mg/kg 1-Aug-2021 0.0 - 0.6
Calculated Paramters									
IACR	1	NV	NV	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Benzo(a)pyrene (TPE)	0.6	NV	NV	0.071	<0.0071	<0.0071	<0.0071	<0.0071	<0.0071
Specific Parameters									
Acenaphthene	NV	NV	**58**	0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Acenaphthylene	NV	**8**	0.17	0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Acridine	NV	**3**	NV	0.01	<0.010	<0.010	<0.010	<0.010	<0.010
Anthracene	**2.5**	NV	0.74	0.004	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
Benzo(a)anthracene	**1**	NV	0.63	0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Benzo(a)pyrene	**20**	NV	0.3	0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Benzo(b/j)fluoranthene	**1**	NV	0.78	0.005	0.011	0.0066	<0.0050	0.0079	0.0072
Benzo(k)fluoranthene	**1**	NV	0.78	0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Benzo(g,h,i)perylene	NV	NV	**7.8**	0.005	0.011	0.012	0.0089	0.0087	0.013
Benzo(c)phenanthrene	NV	NV	NV	0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Benzo(e)pyrene	NV	NV	NV	0.005	0.0067	0.0052	<0.0050	0.0057	0.0063
Chrysene	6.2	6.2	**7.8**	0.005	<0.0050	<0.0050	<0.0050	0.0058	<0.0050
Dibenzo(a,h)anthracene	**1**	1	0.1	0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Fluoranthene	**50**	NV	0.69	0.005	<0.0050	<0.0050	<0.0050	0.0058	<0.0050
Fluorene	NV	NV	**69**	0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Indeno(1,2,3-c,d)pyrene	**1**	NV	0.48	0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
1-Methylnaphthalene	NV	**70**	3.4	0.05	0.0052	0.013	0.024	0.0075	0.0066
2-Methylnaphthalene	NV	**110**	3.4	0.05	0.008	0.02	0.031	0.016	0.011
Naphthalene	0.013	**60**	0.75	0.05	<0.0050	0.0083	**0.021**	0.0079	<0.0050
Phenanthrene	**5**	NV	7.8	0.005	0.014	0.015	0.0093	0.019	0.016
Perylene	NV	**10**	NV	0.005	0.075	0.15	0.038	0.026	0.055
Pyrene	**10**	NV	78	0.005	0.0056	0.0076	0.021	<0.0050	0.0061
Quinoline	NV	NV	NV	0.01	<0.010	<0.010	<0.010	<0.010	<0.010

RDL exceeds guideline value
Applied Guideline Exceedance

BOLD - Generic Guideline Exceedance

Guideline 1 CCME Soil Quality Guideline Residential, fine grained, shallow soil (<1.5m), 10^{-6} incremental lifetime cancer risk. Excluding Protection of Freshwater Life
Guideline 2 Site Specific Target Levels
Guideline 3 Ontario Ministry of the Environment 2011 Soil, Groundwater, and Sediment Standards for use under Part X.V.1 of the Environmental Protection Act (MECP, 2011). Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Condition
GUIDELINE USED IS BOLD IN TABLE
QAQC Notes:
RDL - Reportable detection limit
RPD - Relative percent difference calculated as (abs(C1-C2)/average(C1+C2))*100
"-" Indicates RPD not calculated. RPD cannot be calculated if one or more of the analytical results are less than detection limits or within 5 times the detection limits.
BOLD - RPD value greater than 60%

Table 1b Soil Results
Eureka HAWS, Nunavut
Polycyclic Aromatic Hydrocarbons Analysis

					Eureka HAWS RAP							
					Delta Area						Sewage Lagoon	
					Duplicates							
Sample ID Laboratory ID Units Sampling Date Sample Depth (m) PID Reading	Guideline (1)	Guideline (2)	Guideline (3)	Reportable Detection Limit (RDL) mg/kg	BL23-1 ADJ623 mg/kg 30-Jul-2021 0.0 - 1.1	DUP-003 ADJ631 mg/kg 30-Jul-2021 0.0 - 1.1	RPD (%)	BL23-2 ADJ624 mg/kg 30-Jul-2021 0.0 - 1.1	BL23-3 ADJ625 mg/kg 30-Jul-2021 0.0 - 1.4	BL23-4 ADJ626 mg/kg 30-Jul-2021 0.0 - 0.9	SEW21-1 ADJ627 mg/kg 30-Jul-2021 0.0 - 0.5	SEW21-2 ADJ628 mg/kg 30-Jul-2021 0.0 - 0.5
Calculated Paramters												
IACR	1	NV	NV	0.10	<0.10	<0.10	-	<0.10	<0.10	<0.10	<0.10	<0.10
Benzo(a)pyrene (TPE)	0.6	NV	NV	0.071	<0.0071	<0.0071	-	<0.0071	<0.0071	<0.0071	0.12	0.071
Specific Parameters												
Acenaphthene	NV	NV	**58**	0.005	<0.0050	<0.0050	-	<0.0050	<0.0050	<0.0050	<0.050	<0.050
Acenaphthylene	NV	**8**	0.17	0.005	<0.0050	<0.0050	-	<0.0050	<0.0050	<0.0050	<0.050	<0.050
Acridine	NV	**3**	NV	0.01	<0.010	<0.010	-	<0.010	<0.010	<0.010	0.41	<0.10
Anthracene	**2.5**	NV	0.74	0.004	<0.0040	<0.0040	-	<0.0040	<0.0040	<0.0040	<0.040	<0.040
Benzo(a)anthracene	**1**	NV	0.63	0.005	<0.0050	<0.0050	-	<0.0050	<0.0050	<0.0050	<0.050	<0.050
Benzo(a)pyrene	**20**	NV	0.3	0.005	<0.0050	<0.0050	-	<0.0050	<0.0050	<0.0050	<0.050	<0.050
Benzo(b/j)fluoranthene	**1**	NV	0.78	0.005	0.0067	0.0053	-	0.0074	<0.0050	0.0082	<0.050	<0.050
Benzo(k)fluoranthene	**1**	NV	0.78	0.005	<0.0050	<0.0050	-	<0.0050	<0.0050	<0.0050	<0.050	<0.050
Benzo(g,h,i)perylene	NV	NV	**7.8**	0.005	0.0066	0.0063	-	0.008	<0.0050	0.0083	<0.050	<0.050
Benzo(c)phenanthrene	NV	NV	NV	0.005	<0.0050	<0.0050	-	<0.0050	<0.0050	<0.0050	<0.050	<0.050
Benzo(e)pyrene	NV	NV	NV	0.005	<0.0050	<0.0050	-	<0.0050	<0.0050	0.0064	<0.050	<0.050
Chrysene	6.2	6.2	**7.8**	0.005	<0.0050	<0.0050	-	<0.0050	<0.0050	<0.0050	<0.050	<0.050
Dibenzo(a,h)anthracene	**1**	1	0.1	0.005	<0.0050	<0.0050	-	<0.0050	<0.0050	<0.0050	<0.050	<0.050
Fluoranthene	**50**	NV	0.69	0.005	<0.0050	<0.0050	-	<0.0050	<0.0050	<0.0050	<0.050	<0.050
Fluorene	NV	NV	**69**	0.005	<0.0050	<0.0050	-	<0.0050	<0.0050	<0.0050	<0.050	<0.050
Indeno(1,2,3-c,d)pyrene	**1**	NV	0.48	0.005	<0.0050	<0.0050	-	<0.0050	<0.0050	<0.0050	0.65	0.13
1-Methylnaphthalene	NV	**70**	3.4	0.05	0.0073	0.0051	-	0.0053	0.0079	0.0067	0.43	0.088
2-Methylnaphthalene	NV	**110**	3.4	0.05	0.016	0.011	-	0.011	0.018	0.017	0.18	0.14
Naphthalene	0.013	**60**	0.75	0.05	0.0093	<0.0050	-	0.0059	0.0062	0.0059	<0.050	<0.050
Phenanthrene	**5**	NV	7.8	0.005	0.014	0.0074	-	0.01	0.0099	0.011	0.096	0.11
Perylene	NV	**10**	NV	0.005	0.026	0.026	0	0.039	0.017	0.033	<0.050	0.078
Pyrene	**10**	NV	78	0.005	0.0054	<0.0050	-	<0.0050	<0.0050	0.0055	<0.050	<0.050
Quinoline	NV	NV	NV	0.01	<0.010	<0.010	-	<0.010	<0.010	<0.010	<0.10	NC

RDL exceeds guideline value
Applied Guideline Exceedance

BOLD - Generic Guideline Exceedance

Guideline 1 CCME Soil Quality Guideline Residential, fine grained, shallow soil (<1.5m), 10^{-6} incremental lifetime cancer risk. Excluding Protection of Freshwater Life
Guideline 2 Site Specific Target Levels
Guideline 3 Ontario Ministry of the Environment 2011 Soil, Groundwater, and Sediment Standards for use under Part X.V.1 of the Environmental Protection Act (MECP, 2011). Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Condition

GUIDELINE USED IS BOLD IN TABLE

QAQC Notes:
RDL - Reportable detection limit
RPD - Relative percent difference calculated as (abs(C1-C2)/average(C1+C2))*100
"-" Indicates RPD not calculated. RPD cannot be calculated if one or more of the analytical results are less than detection limits or within 5 times the detection limits.
BOLD - RPD value greater than 60%

Table 2a Sediment Results
Eureka HAWS, Nunavut
BTEXs, PHCs, Metals and Salinity Analysis

				Eureka HAWS RAP									
				Stream Area				Drainage Pond					
Sample ID Laboratory ID Units Sampling Date Sample Depth (m) PID Reading (ppm)	Guideline	Guideline	Reportable Detection Limit (RDL) mg/g	LTM-SD1 mg/kg 2009 - 2019	LTM-SD2 mg/kg 2013 - 2019	LTM-SD3 mg/kg 2009 - 2019	LTM-SD4 mg/kg 2008 - 2019	LTM-SD5 mg/kg 2008 - 2019	LTM-SD6 mg/kg 2008 - 2019	LTM-SD7 mg/kg 2012 - 2019	LTM-SD8 mg/kg 2012 - 2019	LTM-SD9 mg/kg 2013 - 2019	LTM-SD10 mg/kg 2008 - 2019
PARAMETERS	**(1)**	**(3)**											
BTEX													
Benzene	NV	**1.2**	0.0050	<0.005	<0.005 - <0.006	<0.002 - <0.006	<0.005 - <0.006	<0.005 - 0.59	<0.005 - <0.01	0.013 - 0.92	<0.005 - <0.012	<0.005 - <0.01	<0.005 - 0.066
Toluene	NV	NV	0.050	<0.02 - <0.05	<0.02	0.003 - <0.05	<0.02	<0.01 - 0.098	<0.01 - <0.04	<0.02 - 0.14	<0.02 - <0.04	<0.02 - <0.04	<0.01 - <0.04
Ethylbenzene	NV	**1.2**	0.010	<0.010 - <0.015	<0.010	<0.002 - <0.010	<0.010 - 0.02	<0.010 - **1.9**	<0.010 - <0.02	0.16 - **16**	<0.01 - <0.02	<0.01 - <0.02	<0.01 - 0.35
m-Xylene & p-Xylene	NV	NV	0.040	-	-	-	-	-	-	-	-	-	-
o-Xylene	NV	NV	0.020	-	-	-	-	-	-	-	-	-	-
Total Xylenes	NV	**1.3**	0.045	<0.02 - <0.04	<0.02 - <0.04	<0.002 - <0.04	<0.02 - 0.03	<0.02 - 0.58	<0.02 - <0.08	0.16 - **20**	<0.04 - 0.04	<0.02 - <0.08	<0.02 - <0.08
Petroleum Hydrocarbons	**(2)**	**(3)**											
F1 (C6-C10)	NV	**21**	10	<10 - <12	<10 - <12	<10 - <12	8 - <12	<5 - **57**	<10 - **43**	17 - **5,900**	<5 - **<30**	<10 - <20	<10 - **25**
F1 (C6-C10) - BTEX	NV	**21**	60	<10 - <12	<10 - <12	<10 - <12	8 - <12	<5 - **57**	<10 - **43**	17 - **5,900**	<5 - **<30**	<10 - <20	<10 - **25**
F2 (C10-C16)	NV	**57**	10	<10 - **92**	<10 - **270**	<10	39 - **1,600**	**160 - 4,300**	<10 - **840**	**740 - 19,000**	<10 - **150**	**72 - 160**	<10 - **270**
F3 (C16-C34)	NV	**99**	10	<50 - 96	<50 - **300**	<50 - 83	<50 - **1,400**	54 - **1,600**	<50 - **250**	**110 - 1,100**	<50 - **330**	<50	<50 - **160**
F4 (C34-C50)	NV	NV	50	<20 - <50	<50 -55	<50 - 63	<50 - 270	<50 - <100	<50 - 69	<10 - <50	<50 - <150	<50	20 - 61
Reached Baseline at C50	NV	NV	NV	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Metals	**(1)**	**(3)**											
Antimony	NV	NV	0.2	<0.2 - <1.0	<0.2 - <1.0	<0.2 - <1.0	<0.2 - <1.0	<0.2 - <1.0	<0.2	<0.2	<0.2 - <1.0	0.22 - <1.0	0.23 - 0.4
Arsenic	5.9	**25**	1	**10 - 15**	**8.8 - 17**	**7.5 - 22.2**	**7.2 - 14**	5.3 - **11**	**6.7 - 12**	1.2 - 2.8	5 - **16**	**12 -14**	**9.4 - 13**
Barium	NV	NV	0.5	35 - 52	23 - 43	25.4 - 48	25 - 55	28 - 45	23 - 31	16 - 24	26 - 57	45 - 74	50 - 60
Beryllium	NV	NV	0.2	0.4 - <1.0	0.4 - 0.49	0.33 - <1.0	0.29 - <1.0	0.29 - <1.0	0.26 - 0.29	<0.2	0.25 - 0.71	0.61 - 0.9	0.57 - 0.69
Boron (Total)	NV	NV	5	6.2 - 18	5.2 - 13	5.3 - 12	6.7 - 13	8.5 - 12	6.1 - 8.7	<5.0	7.1 - 13	9.1 - 17	13 - 26
Boron (HWS)	NV	NV	0.1	-	-	-	-	-	-	-	-	-	-
Cadmium	**0.6**	NV	0.1	<0.10 - <0.5	<0.10	<0.10 - <0.5	<0.10 - <0.5	<0.10 - <0.5	<0.10	<0.10	<0.10	<0.10	<0.10 - 0.11
Chromium	37.3	**58**	1	13.4 - 26	11 - 14	10 - 17	10 - 21.7	8.4 - 16.3	6.9 - 10	2.4 - 4.3	6.8 - 18	17 - 25	15 - 20
Chromium VI	NV	NV	0.08	-	-	-	-	-	-	-	-	-	-
Cobalt	NV	NV	0.1	8.3 - 11	7.6 - 11	6.8 - 13	7 - 12	5 - 9.2	5.1 - 9.4	1.8 - 2.6	4.3 - 12	11 - 15	10 - 14
Copper	35.7	**84**	0.5	15 - 20	13 - 27	12 - 23	11 - 26	9.8 - 24	8.2 - 15	1.8 - 4.3	7.2 - 22	18 - 28	17 - 24
Lead	**35**	NV	1	9.1 - 14	8.4 - 10	7.5 - 14.3	8.3 - 15	7.5 - 14	5.4 - 7.8	2 - 3	6.1 - 14	13 - 17	12 - 15
Mercury	**0.17**	NV	0.05	<0.05 - 0.085	<0.05 - 0.095	<0.05 - 0.165	<0.05 - 0.062	<0.05 - 0.057	<0.05 - 0.078	<0.05	<0.05 - 0.053	<0.05 - 0.078	<0.05 - 0.078
Molybdenum	NV	NV	0.5	0.72 - 1.4	0.58 - 2.4	0.67 - 1.7	0.67 - 1.7	0.56 - <1	0.69 - 1.3	<0.5	<0.5 - 1.3	0.8 - 0.9	0.7 - 1.2
Nickel	NV	NV	0.5	20 - 34	17 - 28	15 - 31	13 - 28	12 - 23	12 - 19	5.4 - 7.4	9.6 - 29	25 - 36	24 - 32
Selenium	NV	NV	0.5	<0.50 - 0.6	<0.50 - 0.7	<0.50 - 0.62	<0.50 - 0.6	<0.50	<0.50	<0.5	<0.5 - 0.64	<0.5 - 0.58	<0.5 - 0.65
Silver	NV	NV	0.2	<0.2 - <1	<0.2 - <1	<0.2 - <1	<0.2 - <1	<0.2 - <1	<0.2	<0.2	<0.2 - <1.0	<0.2 - <1.0	<0.2
Thallium	NV	NV	0.05	0.083 - <1	0.079 - <0.3	0.068 - <1.0	0.067 - <1.0	0.059 - <1	0.06 - 0.094	<0.05	<0.05 - <0.3	0.099 - <0.3	0.1 - 0.14
Uranium	NV	NV		0.44 - <2	0.38 - <1	0.34 - <2	0.34 - <2	0.52 - <2	0.29 - 0.54	0.15 - 0.2	0.25 - <1.0	0.64 - <1.0	0.72 - 0.9
Vanadium	NV	NV	5	28 - 43	24 - 37	27 - 42	31 - 37	19 - 29	19 - 51	5 - 10	15 - 36	31 - 40	28 - 40
Zinc	123	**197**	5	47 - 68	56 - 89	62 - 120	61 - **340**	45 - **200**	29 - 42	13 - 25	25 - 67	59 - 77	57 - 66
Salinity	**(1)**	**(3)**											
pH	6.0 - 8.5	NV	N/A	-	-	-	-	-	-	-	-	-	-
Electrical Conductivity (EC)	4	NV	0.1	-	-	-	-	-	-	-	-	-	-
Sodium Adsorption Ratio (SAR)	12	NV	0.1	-	-	-	-	-	-	-	-	-	-
Percent Saturation	NV	NV	NA	-	-	-	-	-	-	-	-	-	-
Calcium	NV	NV	0.60	-	-	-	-	-	-	-	-	-	-
Magnesium	NV	NV	0.40	-	-	-	-	-	-	-	-	-	-
Potassium	NV	NV	0.52	-	-	-	-	-	-	-	-	-	-
Sodium	NV	NV	1.0	-	-	-	-	-	-	-	-	-	-
Chloride	NV	NV	40	-	-	-	-	-	-	-	-	-	-
Sulphate	NV	NV	2.0	-	-	-	-	-	-	-	-	-	-
Soluble Cations and Anions (mg/L)	**(1)**	**(3)**											
Calcium (mg/L)	NV	NV	1.5	-	-	-	-	-	-	-	-	-	-
Magnesium (mg/L)	NV	NV	1	-	-	-	-	-	-	-	-	-	-
Potassium (mg/L)	NV	NV	1.3	-	-	-	-	-	-	-	-	-	-
Sodium (mg/L)	NV	NV	2.5	-	-	-	-	-	-	-	-	-	-
Chloride (mg/L)	NV	NV	100	-	-	-	-	-	-	-	-	-	-
Sulphate (mg/L)	NV	NV	5	-	-	-	-	-	-	-	-	-	-

RDL exceeds guideline value
Applied Guideline Exceedance
BOLD - Generic Guideline Exceedance
Guideline 1 CCME Sediment Quality Guideline for the Protection of Aquatic Life

Guideline 2 Canada Wide Standards for Petroleum Hydrocarbons Tier 1 Residential Eco Soil Contact
Guideline 3 Site Specific Target Levels
APPLIED GUIDELINE SHOWN IN BOLD
QAQC Notes:
RDL - Reportable detection limit
RPD - Relative percent difference calculated as (abs(C1-C2)/average(C1+C2))*100
"-" Indicates RPD not calculated. RPD cannot be calculated if one or more of the analytical results are less than detection limits or within 5 times the detection limits.
BOLD - RPD value greater than 60%

Table 2a Sediment Results
Eureka HAWS, Nunavut
BTEXs, PHCs, Metals and Salinity Analysis

				Eureka HAWS RAP									
				Drainage Pond									Biocell
										Duplicates			
Sample ID Laboratory ID Units Sampling Date Sample Depth (m) PID Reading (ppm)	Guideline	Guideline	Reportable Detection Limit (RDL) mg/g	SD21-1 ADJ588 mg/kg 31-Jul-2021 0.0 - 0.1	SD21-2 ADJ589 mg/kg 31-Jul-2021 0.0 - 0.1	SD21-3 ADJ590 mg/kg 31-Jul-2021 0.0 - 0.1	SD21-4 ADJ591 mg/kg 31-Jul-2021 0.0 - 0.1	SD21-5 ADJ592 mg/kg 31-Jul-2021 0.0 - 0.1	SD21-6 ADJ593 mg/kg 31-Jul-2021 0.0 - 0.1	SD21-7 ADJ594 mg/kg 31-Jul-2021 0.0 - 0.1	DUP-005 ADJ633 mg/kg 31-Jul-2021 0.0 - 0.1	RPD (%)	LTM15-SD11 ADJ593 mg/kg 2015 - 2019
PARAMETERS	**(1)**	**(3)**											
BTEX													
Benzene	NV	**1.2**	0.0050	0.084	0.039	<0.0050	<0.0050	0.0091	<0.0050	<0.0050	<0.0050	-	<0.006 - <0.03
Toluene	NV	NV	0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	-	0.028 - <0.1
Ethylbenzene	NV	**1.2**	0.010	0.086	0.41	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	-	0.039 - 0.9
m-Xylene & p-Xylene	NV	NV	0.040	<0.040	0.11	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	-	-
o-Xylene	NV	NV	0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	-	-
Total Xylenes	NV	**1.3**	0.045	<0.045	0.11	<0.045	<0.045	<0.045	<0.045	<0.045	<0.045	-	0.2 - **6.9**
Petroleum Hydrocarbons	**(2)**	**(3)**											
F1 (C6-C10)	NV	**21**	10	<10	13	<10	<10	<10	33	<17	<10	-	**37 - 720**
F1 (C6-C10) - BTEX	NV	**21**	60	<10	13	<10	<10	<10	33	<17 (1)	<10	-	**37 - 720**
F2 (C10-C16)	NV	**57**	10	**2,600**	**540**	**100**	35	38	**770**	15	18	-	**3,600 - 8,500**
F3 (C16-C34)	NV	**99**	10	**1,500**	**180**	85	**120**	**110**	**110**	52	<50	-	**1,100 - 2,100**
F4 (C34-C50)	NV	NV	50	<50	<50	<50	<50	<50	<50	<50	<50	-	180 - 270
Reached Baseline at C50	NV	NV	NV	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	-	Yes
Metals	**(1)**	**(3)**											
Antimony	NV	NV	0.2	<0.50	<0.50	-	<0.50	<0.50	<0.50	<0.50	0.58	-	0.22 - 0.3
Arsenic	5.9	**25**	1	**9.7**	**14**	-	**12**	**12**	**10**	**10**	**31**	**102**	**7.7 - 8.0**
Barium	NV	NV	0.5	40	31	-	49	67	36	37	35	6	39 - 58
Beryllium	NV	NV	0.2	0.57	0.47	-	0.58	0.91	0.53	0.49	0.56	-	0.49 - 0.68
Boron (Total)	NV	NV	5	-	-	-	-	-	-	-	-	-	11 - 16
Boron (HWS)	NV	NV	0.1	3.5	3.3	-	0.79	0.76	0.91	0.42	0.56	-	-
Cadmium	**0.6**	NV	0.1	0.085	0.072	-	0.089	0.089	0.062	0.068	0.069	-	<0.10 - 0.22
Chromium	37.3	**58**	1	17	**49 (1)**	-	34	**42**	26	**43**	14	**102**	14 - 19
Chromium VI	NV	NV	0.08	<0.080	<0.080	-	<0.080	<0.080	<0.080	<0.080	<0.080	-	-
Cobalt	NV	NV	0.1	9.5	11	-	11	15	9.6	14	10	33	7.4 - 9.3
Copper	35.7	**84**	0.5	15	18	-	22	29	18	37	20	**60**	16 - 23
Lead	**35**	NV	1	10	11	-	10	16	9.5	7.5	9.7	26	13 - 18
Mercury	**0.17**	NV	0.05	0.071	0.076	-	0.07	0.076	0.057	<0.050	0.097	-	<0.05
Molybdenum	NV	NV	0.5	0.82	2	-	1.5	1.3	1	1.3	1.6	-	1.2 - 1.6
Nickel	NV	NV	0.5	24	40	-	33	43	27	45	24	**61**	16 - 21
Selenium	NV	NV	0.5	<0.50	<0.50	-	<0.50	0.56	<0.50	<0.50	<0.50	-	<0.5
Silver	NV	NV	0.2	<0.20	<0.20	-	<0.20	<0.20	<0.20	<0.20	<0.20	-	<0.2
Thallium	NV	NV	0.05	<0.10	<0.10	-	0.12	0.25	<0.10	<0.10	<0.10	-	0.08 - 0.1
Uranium	NV	NV		0.67	0.6	-	0.62	0.7	0.53	0.42	0.56	29	0.5 - 0.7
Vanadium	NV	NV	5	30	46	-	43	44	33	53	38	33	34 - 37
Zinc	123	**197**	5	49	54	-	55	95	49	57	54	5	58 - 75
Salinity	**(1)**	**(3)**											
pH	6.0 - 8.5	NV	N/A	-	7.55	7.1	7.55	6.86	7.16	7.6	7.37	3	-
Electrical Conductivity (EC)	4	NV	0.1	-	**4.1**	2.2	3.9	1.6	2	1.3	1.4	7	-
Sodium Adsorption Ratio (SAR)	12	NV	0.1	-	6.3	4.2	3.1	2.7	1.8	3.1	3.5	12	-
Percent Saturation	NV	NV	NA	-	33	26	39	55	43	30	26	14	-
Calcium	NV	NV	0.60	-	89	34	200	79	110	26	24	8	-
Magnesium	NV	NV	0.40	-	52	18	58	25	29	8.7	8.6	1	-
Potassium	NV	NV	0.52	-	32	5.5	17	15	14	3.5	3.1	12	-
Sodium	NV	NV	1.0	-	170	62	120	79	53	38	39	3	-
Chloride	NV	NV	40	-	270	87	140	77	75	57	62	8	-
Sulphate	NV	NV	2.0	-	480	170	760	350	420	110	98	12	-
Soluble Cations and Anions (mg/L)	**(1)**	**(3)**											
Calcium (mg/L)	NV	NV	1.5	-	270	130	520	140	250	88	93	6	-
Magnesium (mg/L)	NV	NV	1	-	160	67	150	46	68	29	34	16	-
Potassium (mg/L)	NV	NV	1.3	-	96	21	44	27	33	12	12	0	-
Sodium (mg/L)	NV	NV	2.5	-	520	240	310	140	120	130	150	14	-
Chloride (mg/L)	NV	NV	100	-	830	330	350	140	170	190	240	-	-
Sulphate (mg/L)	NV	NV	5	-	1400	650	2000	650	990	360	380	5	-

RDL exceeds guideline value
Applied Guideline Exceedance

BOLD - Generic Guideline Exceedance
Guideline 1 CCME Sediment Quality Guideline for the Protection of Aquatic Life

Guideline 2 Canada Wide Standards for Petroleum Hydrocarbons Tier 1 Residential Eco Soil Contact
Guideline 3 Site Specific Target Levels
APPLIED GUIDELINE SHOWN IN BOLD
QAQC Notes:
RDL - Reportable detection limit
RPD - Relative percent difference calculated as (abs(C1-C2)/average(C1+C2))*100
"-" Indicates RPD not calculated. RPD cannot be calculated if one or more of the analytical results are less than detection limits or within 5 times the detection limits.
BOLD - RPD value greater than 60%

Table 2b Sediment Results
Eureka HAWS, Nunavut
Polycyclic Aromatic Hydrocarbons Analysis

				Eureka HAWS RAP									
				Stream Area				Drainage Pond					
Sample ID Laboratory ID Units Sampling Date Sample Depth (m) PID Reading	Guideline (1)	Guideline (2)	Reportable Detection Limit (RDL) mg/kg	LTM-SD1 mg/kg 2009 - 2019	LTM-SD2 mg/kg 2013 - 2019	LTM-SD3 mg/kg 2009 - 2019	LTM-SD4 mg/kg 2008 - 2019	LTM-SD5 mg/kg 2008 - 2019	LTM-SD6 mg/kg 2008 - 2019	LTM-SD7 mg/kg 2012 - 2019	LTM-SD8 mg/kg 2008 - 2019	LTM-SD9 mg/kg 2013 - 2019	LTM-SD10 mg/kg 2008 - 2019
Calculated Paramters													
IACR	**1**	NV	0.10	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene (TPE)	**0.6**	NV	0.071	<0.01 - <0.10	<0.01 - <0.10	<0.0071- <0.10	<0.0071- <0.10	<0.0071 - <0.10	<0.0071 - <0.10	<0.0071 - <0.10	0.01 - <0.1	0.01 - <0.10	0.01 - <0.10
Specific Parameters													
Acenaphthene	0.00671	**0.02**	0.005	<0.005 - **0.0091**	<0.005 - 0.0061	<0.005	<0.005	**0.031 - 0.17**	<0.005 - **0.021**	**0.03 - 0.89**	<0.005 - **0.02**	<0.005 - 0.0061	<0.005 - **0.012**
Acenaphthylene	0.00587	**0.03**	0.005	<0.005	<0.005	<0.005	<0.005	**<0.0090 - 0.076**	<0.005	0.0055 - **0.24**	<0.005	<0.005	<0.005 - **<0.015**
Acridine	NV	**0.05**	0.01	<0.010	<0.010	<0.010	<0.010	**<0.010 - 0.23**	<0.010	<0.01 - <0.035	<0.01	<0.01	<0.01
Anthracene	0.0469	**0.11**	0.004	<0.0040 - <0.005	<0.0040 - <0.005	<0.0040 - <0.005	<0.0040 - <0.005	<0.0040 - 0.035	<0.0040 - <0.005	<0.004 - **0.052**	<0.004 - <0.005	<0.004 - <0.005	<0.004 - <0.015
Benzo(a)anthracene	**0.0317**	NV	0.005	<0.0050 - 0.0093	<0.0050 - 0.0064	<0.0050 - <0.01	<0.0050 - <0.01	<0.0050 - <0.01	<0.0050 - <0.01	<0.005 - 0.017	<0.005 - 0.01	<0.005 - 0.016	0.0072 - <0.015
Benzo(a)pyrene	0.0319	**0.16**	0.005	<0.0050 - 0.0094	<0.0050 - 0.0068	<0.0050 - <0.01	<0.0050 - <0.01	<0.0050 - <0.01	<0.0050 - <0.01	<0.005 - 0.013	<0.005 - <0.01	0.006 - **0.11**	0.0075 - <0.015
Benzo(b/j)fluoranthene	NV	**0.16**	0.005	0.0065 - 0.023	<0.005 - 0.015	<0.0050 - <0.01	0.007 - 0.013	0.01 - 0.032	<0.0050 - 0.015	<0.005 - 0.038	0.0093 - 0.01	0.014 - 0.052	<0.015 - 0.027
Benzo(k)fluoranthene	NV	**0.16**	0.005	<0.0050 - <0.01	<0.0050	<0.0050 - <0.01	<0.0050 - <0.01	<0.0050 - <0.01	<0.0050 - <0.01	<0.005 - 0.0068	<0.005 - <0.01	<0.005	<0.005 - <0.015
Benzo(g,h,i)perylene	NV	**0.16**	0.005	0.0053 - 0.03	<0.005 - 0.025	<0.005 - 0.011	0.0071 - 0.012	0.0099 - 0.023	<0.0050 - 0.011	<0.005 - 0.025	0.011 - 0.026	0.019 - 0.041	<0.015 - 0.031
Benzo(c)phenanthrene	NV	NV	0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Benzo(e)pyrene	NV	NV	0.005	<0.005 - 0.015	<0.005 - 0.012	<0.005 - 0.0071	0.005 - 0.013	0.0077 - 0.027	<0.0050 - 0.014	<0.0050 - 0.025	0.0082 - 0.022	0.01 - 0.052	0.013 - 0.023
Chrysene	**0.0571**	NV	0.005	<0.0050 - 0.01	<0.0050 - 0.0064	<0.0050	<0.0050	<0.0050 - 0.017	<0.0050 - 0.0086	<0.0050 - 0.02	<0.0050 - 0.012	<0.0050 - 0.032	0.0068 - 0.015
Dibenzo(a,h)anthracene	**0.00622**	NV	0.005	<0.0050 - **<0.01**	<0.0050	<0.0050 - <0.01	<0.0050 - <0.01	<0.0050 - **<0.01**	<0.0050 - **<0.01**	<0.0050	<0.0050 - **<0.01**	<0.0050	<0.0050 - **<0.015**
Fluoranthene	**0.111**	NV	0.005	0.0069 - 0.017	<0.005 - 0.012	<0.005 - 0.0056	<0.005 - 0.0083	0.009 - 0.03	<0.0050 - 0.012	<0.0050 - 0.012	0.0065 - 0.025	0.0076 - 0.038	0.012 - 0.022
Fluorene	0.0212	**0.05**	0.005	<0.005 - 0.0091	<0.005 - 0.0061	<0.005	<0.005	**0.064 - 0.34**	<0.0050 - **0.035**	<0.0050 - **0.035**	<0.0050 - 0.015	<0.0050 - 0.012	<0.0050 - 0.014
Indeno(1,2,3-c,d)pyrene	NV	NV	0.005	<0.0050 - 0.013	<0.0050 - 0.0084	<0.0050 - <0.01	<0.0050 - <0.01	<0.0050 - 0.11	<0.0050 - <0.01	<0.0050 - <0.01	<0.0050 - <0.01	0.0061 - 0.015	0.0064- <0.015
1-Methylnaphthalene	NV	**0.06**	0.05	0.032 - **0.061**	0.0056 - 0.02	<0.005 - 0.013	0.014 - 0.06	**0.09 - 2**	0.0067 - **0.16**	**1.1 - 55**	0.012 - 0.043	0.027 - 0.16	**0.066 - 0.45**
2-Methylnaphthalene	0.0202	**0.06**	0.05	0.013 - **0.13**	0.0071 - **0.04**	<0.005 - **0.078**	0.026 - **0.09**	**0.13 - 3.6**	<0.01 - **0.27**	**0.64 - 100**	0.02 - **0.12**	**0.025 - 0.26**	0.016 - **0.54**
Naphthalene	0.0346	**0.12**	0.05	0.0069 - **0.05**	0.0057 - 0.02	<0.005 - **0.055**	0.011 - **0.06**	**0.09 - 1.3**	0.0085 - **0.14**	**0.44 - 44**	0.014 - **0.09**	0.019 - **0.22**	0.01 - **0.21**
Phenanthrene	0.0419	**0.15**	0.005	0.017 - **0.049**	0.011 - 0.027	<0.005 - **0.072**	0.012 - 0.025	**0.047 - 0.34**	0.0083 - **0.065**	0.023 - **0.43**	0.021 - **0.09**	0.017 - **0.21**	0.02 - **0.13**
Perylene	NV	**0.05**	0.005	0.042 - **0.34**	0.027 - **0.23**	0.037 - 0.05	0.036 - 0.068	0.04 - **0.11**	<0.0050 - **0.06**	0.013 - **0.25**	0.043 - **0.36**	0.15 - **0.18**	**0.17 - 0.38**
Pyrene	0.053	**0.22**	0.005	0.014 - **0.066**	<0.005 - 0.02	<0.005 - 0.028	0.0071 - 0.012	0.014 - **0.066**	<0.0050 - 0.018	0.01 - **0.057**	0.0077 - 0.044	0.015 - **0.059**	<0.015 - 0.04
Quinoline	NV	NV	0.01	<0.01	<0.01	<0.01	<0.01	<0.01 - 0.4	<0.0050 - <0.23	<0.01 - <3.0	<0.01 - 0.014	<0.01	<0.01

RDL exceeds guideline value
Applied Guideline Exceedance

BOLD - Generic Guideline Exceedance

Guideline 1 CCME Sediment Quality Guideline for the Protection of Aquatic Life
Guideline 2 Site Specific Target Levels
APPLIED GUIDELINE SHOWN IN BOLD
QAQC Notes:
RDL - Reportable detection limit
RPD - Relative percent difference calculated as (abs(C1-C2)/average(C1+C2))*100
"-" Indicates RPD not calculated. RPD cannot be calculated if one or more of the analytical results are less than detection limits or within 5 times the detection limits.
BOLD - RPD value greater than 60%

Table 2b Sediment Results
Eureka HAWS, Nunavut
Polycyclic Aromatic Hydrocarbons Analysis

				Eureka HAWS									
				Drainage Pond						Duplicates			Biocell
Sample ID Laboratory ID Units Sampling Date Sample Depth (m) PID Reading	Guideline (1)	Guideline (2)	Reportable Detection Limit (RDL) mg/kg	SD21-1 ADJ588 mg/kg 31-Jul-2021 0.0 - 0.1	SD21-2 ADJ589 mg/kg 31-Jul-2021 0.0 - 0.1	SD21-3 ADJ590 mg/kg 31-Jul-2021 0.0 - 0.1	SD21-4 ADJ591 mg/kg 31-Jul-2021 0.0 - 0.1	SD21-5 ADJ592 mg/kg 31-Jul-2021 0.0 - 0.1	SD21-6 ADJ593 mg/kg 31-Jul-2021 0.0 - 0.1	SD21-7 ADJ594 mg/kg 31-Jul-2021 0.0 - 0.1	DUP-005 ADJ633 mg/kg 31-Jul-2021 0.0 - 0.1	RPD (%)	LTM15-SD11 ADJ593 mg/kg 2015 - 2019
Calculated Paramters													
IACR	**1**	NV	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	-	
Benzo(a)pyrene (TPE)	**0.6**	NV	0.071	0.009	0.013	<0.0071	0.008	0.019	0.013	<0.0071	<0.0071	-	0.015 - <0.10
Specific Parameters													
Acenaphthene	0.00671	**0.02**	0.005	**0.12 (1)**	**0.014**	<0.0050	<0.0050	<0.0050	**0.012 (1)**	<0.0050	<0.0050	-	**<0.012 - 0.13**
Acenaphthylene	0.00587	**0.03**	0.005	**0.047 (1)**	**0.010 (1)**	<0.0050	<0.0050	<0.0050	**0.0083 (1)**	<0.0050	<0.0050	-	**0.01 - 0.12**
Acridine	NV	**0.05**	0.01	**0.22**	0.018	<0.010	<0.010	<0.010	0.021	<0.010	<0.010	-	<0.01 - 0.023
Anthracene	0.0469	**0.11**	0.004	0.025	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	-	<0.0040 - 0.012
Benzo(a)anthracene	**0.0317**	NV	0.005	0.007	<0.0050	<0.0050	<0.0050	0.0095	0.0078	<0.0050	<0.0050	-	<0.0050 - 0.011
Benzo(a)pyrene	0.0319	**0.16**	0.005	<0.0050	0.0070	<0.0050	<0.0050	0.011	0.0066	<0.0050	<0.0050	-	<0.0050 - 0.011
Benzo(b/j)fluoranthene	NV	**0.16**	0.005	0.02	0.019	0.0061	0.015	0.034	0.02	<0.0050	<0.0050	-	0.017 - 0.02
Benzo(k)fluoranthene	NV	**0.16**	0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	-	<0.0050
Benzo(g,h,i)perylene	NV	**0.16**	0.005	0.020	0.023	0.0075	0.022	0.038	0.024	<0.0050	<0.0050	-	0.0081 - 0.012
Benzo(c)phenanthrene	NV	NV	0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	-	<0.0050
Benzo(e)pyrene	NV	NV	0.005	0.014	0.016	<0.0050	0.01	0.031	0.012	<0.0050	<0.0050	-	0.0081 - 0.012
Chrysene	**0.0571**	NV	0.005	0.011	0.0095	<0.0050	<0.0050	0.021	0.0091	<0.0050	<0.0050	-	0.0069 - 0.0092
Dibenzo(a,h)anthracene	**0.00622**	NV	0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	-	<0.0050
Fluoranthene	**0.111**	NV	0.005	0.035	0.015	<0.0050	0.013	0.024	0.023	<0.0050	<0.0050	-	0.013 - 0.026
Fluorene	0.0212	**0.05**	0.005	**0.092**	**0.027**	0.011	0.0065	0.0089	0.018	<0.0050	<0.0050	-	**0.033 - 0.39**
Indeno(1,2,3-c,d)pyrene	NV	NV	0.005	0.0087	0.0073	<0.0050	0.0072	0.0099	0.0078	<0.0050	<0.0050	-	0.0073 - 0.0099
1-Methylnaphthalene	NV	**0.06**	0.05	**0.55**	**0.83**	**0.071**	0.016	**0.07**	0.059 (1)	0.0071	<0.0050	-	**1.3**
2-Methylnaphthalene	0.0202	**0.06**	0.05	**0.45**	**0.79**	**0.11**	**0.028**	**0.15**	**0.11**	0.016	0.011	-	**0.27 - 1.3**
Naphthalene	0.0346	**0.12**	0.05	**0.48**	**1.2**	**0.041**	0.016	**0.1**	0.03	0.0062	<0.0050	-	**0.11 - 0.42**
Phenanthrene	0.0419	**0.15**	0.005	**0.11**	**0.075**	0.017	0.029	**0.12**	**0.06**	0.0099	<0.0050	-	0.022 - **0.066**
Perylene	NV	**0.05**	0.005	**0.099**	**0.088**	0.033	**0.2**	**0.11**	**0.2**	0.011	0.011	-	**0.051 - 0.085**
Pyrene	0.053	**0.22**	0.005	**0.081**	0.026	0.0072	0.025	0.035	0.035	<0.0050	<0.0050	-	0.028 - **0.056**
Quinoline	NV	NV	0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	-	<0.010 - 0.089

RDL exceeds guideline value
Applied Guideline Exceedance
BOLD - Generic Guideline Exceedance
Guideline 1 CCME Sediment Quality Guideline for the Protection of Aquatic Life
Guideline 2 Site Specific Target Levels
APPLIED GUIDELINE SHOWN IN BOLD
QAQC Notes:
RDL - Reportable detection limit
RPD - Relative percent difference calculated as (abs(C1-C2)/average(C1+C2))*100
"-" Indicates RPD not calculated. RPD cannot be calculated if one or more of the analytical results are less than detection limits or within 5 times the detection limits.
BOLD - RPD value greater than 60%

Table 3 Soil Results
Eureka HAWS, Nunavut
Grain Size, Texture and Fraction Organic Carbon Analysis

			Eureka HAWS RAP					
			New Reservoir	In-situ Landfarm	Embankment Area		Sewage Lagoon	Drainage Pond
Sample ID Laboratory ID Sampling Date Sample Depth (m) PID Reading (ppm)	Unit	Reportable Detection	RES21-10 ADJ523 30-Jul-2021 0.5 - 0.8	ISL21-1 ADJ611 29-Jul-2021 0.45 - 1.0	EMB21-1 ADJ636 1-Aug-2021 0.0 - 0.5	EMB21-3 ADJ586 31-Jul-2021 0.0 - 0.5	SEW21-1 ADJ627 30-Jul-2021 0.0 - 0.5	SD21-2 ADJ635 1-Aug-2021 0.0 - 0.1
Grain Size and FOC								
Physical Properties								
Sieve - #10 (>2.00mm)	%	0.2		9.5	26			4.2
Sieve - #200 (>0.075mm)	%	0.2		35	72			41
Sieve - Pan	%	0.2		65	28			59
Grain Size	NA	NA		FINE	COARSE			FINE
Fraction of Organic Carbon	g/g	0.0002	0.0093	0.019		0.0019	0.017	0.0041
Total Organic Carbon	%	0.05	0.93	1.9		0.19	1.7	0.41
Texture Analysis								
Sand	%	NA		66.4	81.1			53.8
Silt	%			20.7	9.3			31.3
Clay	%			12.9	9.5			14.8
Soil Classification	NA	NA		COARSE	COARSE			FINE

Table 4 Soil Results
Eureka HAWS, Nunavut
Landfill Suitability Analysis

			Eureka HAWS RAP				
			New Reservoir	In-situ Landfarm	Embankment Area	Sewage Lagoon	Drainage Pond
Sample ID Laboratory ID Units Sampling Date Sample Depth (m) PID Reading (ppm)	Guideline (1)	Reportable Detection Limit (RDL) mg/g	RES21-10 ADJ523 mg/L 30-Jul-2021 0.5 - 0.8	ISL21-1 ADJ611 mg/L 29-Jul-2021 0.45 - 1.0	EMB21-3 ADJ586 mg/L 31-Jul-2021 0.0 - 0.5	SEW21-1 ADJ627 mg/L 30-Jul-2021 0.0 - 0.5	SD21-2 ADJ589 mg/L 31-Jul-2021 0.0 - 0.1
PARAMETERS							
Landfill Characterization							
pH (1:1)	2.0 - 12.5	NA	7.69	7.92	8.20	5.92	7.58
Free Liquid	No free liquid		PASS	PASS	PASS	PASS	PASS
Flash Point	Minimum 61		>61	>61	>61	>61	>61
Leachable BTEX							
Benzene	0.5	10	<0.01	<0.01	<0.01	<0.01	<0.01
Toluene	0.5	10	<0.01	<0.01	<0.01	<0.01	<0.01
Ethylbenzene	0.5	10	<0.01	<0.01	<0.01	<0.01	<0.01
Xylenes Total	0.5	20	<0.02	<0.02	<0.02	<0.02	<0.02
Leachable Metals							
Antimony	500	1	<1.0	<1.0	<1.0	<1.0	<1.0
Arsenic	5	0.5	<0.50	<0.50	<0.50	<0.50	<0.50
Barium	100	1	<1.0	<1.0	<1.0	<1.0	<1.0
Beryllium	5	0.5	<0.50	<0.50	<0.50	<0.50	<0.50
Boron	500	1	<1.0	<1.0	<1.0	<1.0	<1.0
Cadmium	1	0.1	<0.10	<0.10	<0.10	<0.10	<0.10
Chromium	5	0.5	<0.50	<0.50	<0.50	<0.50	<0.50
Cobalt	100	1	<1.0	<1.0	<1.0	<1.0	<1.0
Copper	100	1	<1.0	<1.0	<1.0	<1.0	<1.0
Iron	1000	1	4.8	1.6	7.2	99	13
Lead	5	0.5	<0.50	<0.50	<0.50	<0.50	<0.50
Mercury	0.2	0.02	<0.020	<0.020	<0.020	<0.020	<0.020
Nickel	5	0.5	<0.50	<0.50	<0.50	<0.50	<0.50
Selenium	1	0.1	<0.10	<0.10	<0.10	<0.10	<0.10
Silver	5	0.5	<0.50	<0.50	<0.50	<0.50	<0.50
Thallium	5	0.5	<0.50	<0.50	<0.50	<0.50	<0.50
Uranium	2	0.2	<0.20	<0.20	<0.20	<0.20	<0.20
Vanadium	100	1	<1.0	<1.0	<1.0	<1.0	<1.0
Zinc	500	1	<1.0	<1.0	<1.0	<1.0	<1.0
Zirconium	500	1	<1.0	<1.0	<1.0	<1.0	<1.0

RDL exceeds guideline value
Applied Guideline Exceedance

Guideline 1 Alberta Environmental Protection. 1996. Schedule to the Alberta User Guide for Waste Managers (AUGWM). Pages 4-1 to 4-17 in Alberta User Guide for Waste Managers