2023 Environmental Monitoring Program, Resolute Bay Airport Land Treatment Unit, Cornwallis Island, Nunavut

Prepared for:

Public Services and Procurement Canada on behalf of Transport Canada

Prepared by:

Nunami Stantec Limited

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NUNAMI
STANTEC LIMITED

Limitations and Sign-off

This document entitled 2023 Environmental Monitoring Program, Resolute Bay Airport Land Treatment Unit, Cornwallis Island, Nunavut was prepared by Nunami Stantec Ltd. (“Nunami Stantec”) for the account of Public Services and Procurement Canada on behalf of Transport Canada (the “Client”).

Prepared by _____
(signature)

Ryan Hegland.
Environmental Technician

Reviewed by _____
(signature)

Matthew Redmond P.Eng.
Senior Environmental Engineer

Approved by _____
2024-02-15
(signature)

Tanya Shanoff M.Sc., P.Geo
Senior Hydrogeologist

Executive Summary

Nunami Stantec Ltd. (Nunami Stantec) completed the 2023 Environmental Monitoring Program (the Program) at the Landfarm Facility which consists of two Land Treatment Units (LTU 1 and LTU 2) located at the northern portion of the Resolute Bay Airport on Cornwallis Island, Nunavut (the Site). The Program was completed from August 8 to August 10, 2023, with the authorization of Public Services and Procurement Canada (PSPC) on behalf of Transport Canada (TC). The program consisted of monitoring and assessment activities to meet licensing requirements (Nunavut Water Board (NWB) Licence No. IBR-RLF2030, Part J) and a visual assessment of the LTU liners and berms to assess for potential seepage issues. In 2020, the licence was modified to include the requirement for surface water samples to be collected. Groundwater sampling was removed from the licence requirement.

Nunami Stantec monitored four groundwater monitoring wells surrounding LTUs 1 and 2 (MW1 through MW3 and MW5) to supplement the surface water data required by the licence. Monitoring wells MW4 and MW6 have been removed from the program but were observed to be in similar condition as noted in previous years. None of the monitoring wells contained sufficient groundwater to allow for sampling.

One surface water sample (SW23-4, from Monitoring Station SW-4) was collected from accumulated surface water at the Site in the vicinity of the LTUs in order to meet the NWB Licence requirements and assess LTU integrity. The accumulated surface water was observed south of LTU 2. The surface water sample was also duplicated (QC23-1) in the field for quality assurance, quality control (QA/QC) purposes. The samples were analyzed for the parameters outlined in the NWB Licence Part J, Item 9. The remaining surface water Monitoring Stations stipulated in the licence (SW-1, SW-2, and SW-3) were dry during the Program. Additional soil sampling was also completed for grain size analysis to further characterize the site.

A summary of guideline / standards exceedances is provided below:

Sample Location	Parameter Category	Individual Parameter	Guideline Exceeded
SW23-4 (and duplicate QC23-1) Monitoring Station SW-4, South of LTU 2 (down-gradient) near MW5 and down-gradient of a low area against the inside berm.	General Chemistry, Total Metals	Nitrite, Nitrite (as N), Aluminum (total), Iron (total), Lead (total)	The nitrite concentration (0.23 mg/L) exceeded the CCME guideline (0.20 mg/L). The nitrite (as N) concentration (0.070 mg/L) exceeded the CCME guideline (0.060 mg/L). The total aluminum concentration (0.55 mg/L) exceeded the CCME guideline (0.10 mg/L). The total iron concentration (1.4 mg/L) exceeded the CCME guideline (1.3 mg/L). The total lead concentration (0.030 mg/L) exceeded the CCME guideline (0.0070 mg/L).

During the 2018 site visit, a weathered drum labelled as containing aviation fuel was observed on the Site west of LTU 2, a weathered 1 m^3 bag containing salt was observed on the Site south of LTU 1, and a pile of construction debris was observed located inside the berms of LTU 1. A similar pile of construction debris was observed at the Site within LTU 2 during the 2018 site visit. Disposal of the aforementioned items was coordinated with the airport authority in 2018, but they were still on-site when Stantec returned in 2019 and 2021. In 2023, Nunami Stantec noted that the aviation fuel drum had been removed, but the other items remained.

During the program, Nunami Stantec personnel estimated the surface water drainage direction at the Site to be generally in southerly and westerly directions in the areas surrounding the LTUs. The groundwater flow direction in the vicinity of the Site is unknown, due to consistently insufficient water in the monitoring wells. However, based on local topography, Nunami Stantec has inferred the shallow groundwater flow direction to be southerly.

While onsite, Nunami Stantec personnel visually assessed the condition of the exposed portions of geomembrane liners and berms of both LTUs. Twenty-four areas with liner deficiencies were observed at LTU 1. The liner deficiencies at LTU 1 consisted of tears ranging in size from less than 5 centimetres (cm) to 350 cm. Eighteen areas with liner deficiencies were observed at LTU 2. The liner deficiencies at LTU 2 consisted of tears ranging in size from less than 5 cm to 400 cm, areas of low berm located north and south of the LTU access ramp on the west side of LTU 2, and a low area inside the berm (along the south berm of LTU 2). The majority of the liner deficiencies were in similar locations to those observed in 2019, 2021, and 2022, with seven new deficiencies identified. Standing surface water against the inside berms of the LTUs may potentially spill over low berms or accumulate and migrate outside of the LTUs during periods of heavy rain and/or high winds; however, no standing water was observed within the berms during the Program.

Surface water has accumulated adjacent to the outside of the south berm of LTU 2 (adjacent to the low areas). This surface water accumulation was also observed in 2018, 2019 and 2021. One sample (and one duplicate sample) contained concentrations of analyzed parameters above the referenced guidelines: SW23-4 for Nitrite, Nitrite (as N), aluminum, iron and lead.

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

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1 Introduction

Nunami Stantec Ltd. (Nunami Stantec) completed the 2023 Site Environmental Monitoring Program (the Program) at the Landfarm Facility which consists of Land Treatment Units (LTUs 1 and 2) located at the northern portion of the Resolute Bay Airport on Cornwallis Island, Nunavut (hereinafter referred to as the Site). The Program was completed under the authorization of Public Services and Procurement Canada (PSPC) on behalf of Transport Canada (TC).

Two smaller LTUs (LTU 3 and 4) are also present at the Site; however, there is no background information regarding the origin of these LTUs. TC is not the custodian of LTUs 3 and 4, and these LTUs are not included in the scope of work presented herein.

The Site location is presented in Figure 1 of **Appendix A.**

1.1 Objectives

The objectives of the Program were as follows:

- Complete a monitoring program, including the collection of surface water samples, at the Site to assess for chemicals of concern to meet Nunavut Water Board (NWB) Licence 1BR-RLF2030 Requirements
- Collect soil samples for grain size analysis to confirm applicable guidelines for remediation targets, including the base of the berm wall
- Assess LTU 1 and LTU 2 to visually evaluate the integrity and function of the LTU liners and the condition of the Site monitoring well network, including documentation with photographs

1.2 Background

The history and background of the Site provided by PSPC, including previous assessments, is summarized below:

- The Resolute Bay Airport has been in operation since 1949. It was originally constructed by the Royal Canadian Air Force. Ownership was transferred to the Government of Canada in 1964 and it was operated by Transport Canada (TC) until July 1, 1995. Ownership was transferred to the Government of the Northwest Territories in 1999 and then to the Government of Nunavut.
- In 2002, Winnipeg Environmental Remediation Inc (WERI) and Eng-Tech Consulting Ltd. supervised the construction of two LTUs (LTUs 1 and 2) that were constructed of 20 mil oil-resistant reinforced polyethylene (RPE) liner to contain and treat petroleum hydrocarbon (PHC) impacted soil from a former above ground storage tank (AST) farm that stored bulk fuel and a former fire mock-up training area (FTA). LTU 1 was subdivided into three (3) cells (numbered 1 to 3 from west to east). Zone 3 occupies the eastern half of LTU 1 and contained lighter petroleum hydrocarbon impacted soils. The two western cells contained heavier fraction petroleum hydrocarbon impacted soil. Approximately 5,500 cubic metres (m^3) of PHC impacted soil was excavated from the FTA and approximately 300 m^3 of PHC impacted soil was excavated from the aboveground storage tank (AST) farm for treatment in the LTUs. The LTUs were filled to an approximate height of 1.3 metres (m). Nutrients

were added to both LTUs; 145 kilograms (kg) of 38-0-0 Nitrogen–Phosphorus-Potassium was added to LTU 1, and 2,273 kg was added LTU 2. Approximately 40 kg of surfactant ("cyclone white") was also added to a depth of 0.3 m below the surface of LTU 2.

- In September 2003, a soil monitoring program was completed to assess the effectiveness of the nutrient amendment program. A ground heating system was installed in the northern portion of LTU 2 to conduct a pilot project to enhance bioremediation in northern half of the LTU. The infrastructure of the heating system consisted of pipes, junction boxes, and air exchange housing. The impacted soil was covered and remains covered today by a geomembrane to contain the heat generated by the heating system.
- In August 2004, 400 kg of 38-0-0 (zones 1 and 2 of LTU 1), 600 kg of 38-0-0 nutrients (uncovered LTU 2 area) and 100 kg of surfactants in zone 1 of LTU 1 were applied to the LTUs. The heating system was operated between August to early October of 2004.
- According to TC personnel, the heating system was only operated for two field seasons between 2004 and 2005 and has not been functional since 2005.
- In 2005, a soil sampling program (39 soil samples analyzed for petroleum hydrocarbon) was completed at both LTUs to assess the effectiveness of nutrient amendment under heated conditions and non-heated conditions. The report concluded bioremediation was occurring; however, the results were inconclusive to the effectiveness of either method being better than the other.
- In 2015, Arcadis Canada conducted the first annual groundwater and soil monitoring program to meet NWB Licensing requirements in late September. The maximum soil sample depth investigated was approximately 0.7 m below ground surface (mbgs). One soil sample was collected per test pit excavated at the respective LTUs (five test pits at LTU 1 and four test pits at LTU 2). The soil sampling program confirmed the presence of perfluorooctanesulfonic acid (PFOS), one of the per- and poly-fluorinated alkyl substances (PFAS), exceeding interim federal guidelines in the LTU soils sampled in both LTU 1 and LTU 2. Concentration exceedances ranged between seven and 22 times the interim guideline value. The 13 soil samples collected contained PHC concentrations exceeding applicable federal guidelines in the LTU soils. The LTUs were also assessed for capacity, and it was determined that no additional impacted soil should be added to the LTUs.
- In July 2017, the condition of six existing monitoring wells which were installed prior to 2015 was assessed (MW1 through MW6), as was the integrity of the liners at both LTUs. In August 2017, only one groundwater sample could be collected at the Site. Surface water samples were also collected around the LTU perimeter to assess for potential impacts to compensate for the lack of groundwater samples. Monitoring wells MW4 and MW6 (located upgradient and downgradient of LTU 2, respectively) were reported to have heaved and were not considered viable for future sampling.
- In 2018-2019, Stantec conducted an annual monitoring and inspection program in August for the two LTUs. The six monitoring wells at the Site were monitored; however, only one well (MW1 at LTU 1) contained sufficient groundwater to sample. The remaining monitoring wells either did not contain sufficient water for sampling (MW2 and MW6), were concluded to be compromised as the screen was partially above the surface (MW4 and MW6), were inaccessible due to a frozen bailer within the monitoring well standpipe (MW5) or were dry (MW3). MW4 and MW6 were recommended to be removed from future monitoring programs. Surface water samples from ponded water at the Site and at locations near the groundwater monitoring locations were collected as substitutes for groundwater samples to try and meet licence requirements.

A Preliminary Quantitative Human Health and Ecological Risk Assessment (PQRA) was also completed for the two LTUs in 2018. Shallow soil samples were collected to assess for potential seepage issues at the west side and southwest corner of LTU 2, and to support the PQRA. During the PQRA, Stantec reviewed the information available from previous environmental investigations to perform a preliminary quantitative evaluation for the potential for human and ecological risks associated with the contaminants of potential concern (COPCs) excluding PFAS at the Site. COPCs were not identified in shallow soil (<0.45m) in the LTUs at the Site. In deeper soil (≥0.45 m), COPCs for the direct/contact ingestion pathway included xylenes, PHC fractions, and naphthalene. For the protection of groundwater for aquatic life, COPCs in deeper soil included benzene, toluene, xylenes, PHC fractions, fluorene, naphthalene, and phenanthrene. COPCs in groundwater were limited to metals and COPCs in surface water included PHC F2, lead, nitrate, and phenols. The PQRA concluded that no unacceptable risks were anticipated for human or ecological receptors at the Site from the LTUs for the identified COPCs. Should site conditions change (e.g., loss of integrity of the LTUs liners and berms or construction of a building at the Site), the results of the risk assessment may need to be revisited to assess/confirm there are no additional or increased risks to potential receptors.

- In 2020, there were no monitoring or inspection activities completed at the Site due to the COVID-19 pandemic travel restrictions in the Territory.
- In 2021-2022, MW1, MW2, MW3, and MW5 were monitored in July 2021 and contained insufficient water for sample collection. As such, five surface water samples were collected and analyzed to meet licence requirements.
- In 2022-2023, MW1 through MW6 were monitored in August 2022 and contained insufficient water for sample collection. As such, five surface water samples were collected and analyzed to meet licence requirements. Stantec also completed a qualitative engineering assessment to identify potential solutions for the liner deficiencies at both LTUs.

An operating licence for the historical LTU (LTU 1 and 2) was obtained by TC through the Nunavut Water Board (NWB) in 2015 (Licence No. IBR-RLF1520) and required annual or semi-annual groundwater monitoring and sampling, depending on site activities. The NWB Licence dictates soil sampling requirements should soil be added to, removed from, or treated (with amendments) in the LTUs. As these activities have not occurred since 2019, soil sampling did not take place in 2022-2023. A renewed licence, 1BR-RLF2030 was issued May 19, 2020, which revised the monitoring requirements to the collection of surface water samples and the requirement of groundwater sampling was removed from the licence.

1.3 Scope of Work

The scope of work of the Program is outlined in the sections below.

1.3.1 Task 1 – Health and Safety

- Prepare a site-specific health and safety plan to identify and address site specific hazards

1.3.2 Task 2 – Groundwater/Surface Water and Soil Monitoring and Sampling

- Retain a local field assistant to provide support to Nunami Stantec staff (this was not completed, as no field assistant was available in Resolute, NU)
- Monitor the four existing and operable groundwater monitoring wells (MW1, MW2, MW3, and MW5) for thickness of free-phase liquid petroleum hydrocarbons (if present), depth to water, and field parameters to supplement the surface water data
- Document the condition of existing groundwater monitoring wells (MW1, MW2, MW3 and MW5)
- Collect surface water samples in the vicinity of the LTUs as outlined within the NWB Licence (i.e., at Monitoring Stations SW-1, SW-2, SW-3, and SW-4)
- Collect soil samples for grain size analysis, including the berm wall
- Submit the samples to an accredited laboratory according to ISO/IEC Standard 17025 for analysis of the parameters specified in the NWB Licence (and Section 3.4 of this report)
- Georeference sampling locations
- Provide a letter from Bureau Veritas, the accredited laboratory, confirming review of the quality control sampling plan (**Appendix B**)

2 Regulatory Framework

The NWB Licence provides guidelines for effluent released from the Site. As there was no planned effluent releases from the Site in 2023, the NWB Licence effluent guidelines were not considered applicable to the Site during the Program.

In 2018, the NWB directed TC to use the Ontario Ministry of the Environment, Conservation and Parks (MECP), 2011 Site Condition Standards (under Ontario Regulation 153/04) for evaluation of parameter concentrations in groundwater. A copy of the e-mail communication from the NWB is provided in **Appendix C**.

Per Ontario Regulation 153/04 (Section 35 (3)), groundwater at a property is considered non-potable when the property, and all other properties located, in whole or in part, within 250 m of the boundaries of the property, are supplied by a municipal drinking water system and have no wells installed. As there are no potable water wells within 250 m of the Site boundary, groundwater at the Site is considered non-potable. As such, the Table 3 Full Depth Generic Site Condition standards in a Non-Potable Groundwater Condition (Table 3 SCS) were considered applicable to the Site. The Table 3 SCS for groundwater are not dependent on land use.

The NWB Licence does not specify guidelines for evaluation of surface water. To evaluate surface water during the Program, the Canadian Council of Ministers of the Environment (CCME) Canadian Water Quality Guidelines (CWQG) (CCME, 2014) for freshwater aquatic life were applied to the Site for comparison purposes. It should be noted that the limited accumulated surface water at the Site is not anticipated to support aquatic life. As the Site is located more than 1 kilometre (km) from the ocean, the CWQG for protection of Marine Life were not included for comparison to surface water samples. Coarse-grained CCME guidelines were applied.

The MECP Table 3 SCS are not intended for use when evaluating parameter concentrations in surface water. However, they have been included for reference purposes due to the potential for surface water to infiltrate to ground and affect groundwater quality.

The guidelines and standards considered applicable to the program are summarized in Table 2-1, below and excerpts are provided in **Appendix D**.

Table 2-1 Summary of Applicable Guidelines and Standards

Source	Guidelines / Standards
Groundwater	MECP Table 3 SCS
Surface Water	CCME Canadian Water Quality Guidelines for Freshwater Aquatic Life (CWQG) (For reference only) MECP Table 3 SCS (For reference only)

3 Methods

3.1 Task 1 – Health and Safety

Stantec prepared a site-specific health and safety plan (HSP) to address site-specific hazards. The HSP was submitted to PSPC on August 1, 2023, prior to the initiation of field activities.

3.2 Task 2 – Groundwater Monitoring

The groundwater monitoring portion of the Program was completed on August 8, 2023. The depth to groundwater in the existing and operable groundwater monitoring wells (MW1 through MW3 and MW5) was measured using an interface probe, combustible headspace vapour (CHV) concentrations were measured using an RKI Eagle 2™, and the monitoring well locations were georeferenced using a handheld GPS unit with an estimated accuracy of ± 5 m.

Refer to Figure 2, **Appendix A,** for locations of the monitoring wells at the Site and to Table 1, **Appendix D** for field observations at monitoring well locations. The GPS coordinates of the groundwater monitoring wells are presented in Table 1, **Appendix D**.

Nunami Stantec personnel labelled the inside of the well caps with the monitoring well ID and added a reference marker to the outside of the monitoring well standpipes to indicate where the depth to water and depth to bottom in each well were measured from using a Sharpie™ marker. The reference markers were added to the highest point on the standpipe if the standpipe was cut unevenly.

3.3 Task 3 – Surface Water Sampling

The surface water sampling portion of the Program was completed on August 9, 2023. One location of accumulated surface water, at Monitoring Station SW-4, was observed in the vicinity of the LTUs during the site visit. Monitoring Stations SW-1, SW-2, and SW-3 were observed to be dry during the site visit. Because the intent of the NWB Licence is to monitor the integrity of the LTUs, Nunami Stantec took into consideration the following factors when selecting surface water sampling locations:

- Sufficient accumulated surface water available to sample
- Possible locations for berm over-flow
- Proximity of standing water to existing groundwater monitoring wells
- Nunami Stantec's field personnel focused sampling efforts on areas of consistent standing water, rather than those that were likely the result of recent rainfall.

The surface water sampling location was georeferenced using a handheld GPS unit with an estimated accuracy of ± 5 m. The approximate locations of accumulated surface water and the surface water sample are depicted on Figures 2 and 3, **Appendix A**. The GPS coordinates of the surface water sample is presented in Table 2, **Appendix D.**

Nunami Stantec collected one surface water sample and one blind field duplicate for laboratory analysis of the NWB Licence parameters. The sample was collected by submerging laboratory-provided bottles directly into the surface water.

Table 3-1 Surface Water Sample Locations

Sample ID	Purpose	Location/Rationale
SW23-4/Field Duplicate	Licence requirement	Monitoring Station SW-4, South of LTU 2 (down-gradient) near MW5 and down-gradient of a low area against the inside berm. Surface water was also observed at this location in 2019.

The surface water samples were stored in an ice-chilled cooler prior to and during transportation to the laboratory. The samples were shipped by air by a private cargo charter to Bureau Veritas's laboratory in Ottawa, Ontario for analysis.

The surface water sample locations are summarized in Table 3-1 above and are presented on Figures 2 and 3, **Appendix A**.

3.3.1 Laboratory Program

The laboratory analytical program is summarized in Table 3-2, below. Note that dissolved metals were analyzed to assist in comparison to the referenced groundwater guidelines.

Table 3-2 Laboratory Program Summary

Source	Laboratory Analysis
Surface Water SW23-4 (and Field Duplicate QC23-1)	Total Suspended Solids (TSS) Polycyclic Aromatic Hydrocarbons (PAH) Benzene, toluene, ethylbenzene, xylenes (BTEX) Total extractable hydrocarbons (TEH) Oil and Grease Total Phenols Total and Dissolved Metals (aluminum, cadmium, copper, lead, nickel, silver, zinc, arsenic, cobalt, iron, molybdenum, selenium, titanium) Routine parameters (total hardness, conductivity, calcium, sodium, chloride, magnesium, potassium, sulphate, total alkalinity, nitrate-nitrite, ammonia nitrogen, and pH) Note: SW23-4 was not analyzed for PAH, BTEX, and PHC F1 as the container broke during shipping. PAH was also not analyzed for PAH due to a laboratory error

3.3.2 Quality Assurance and Quality Control

Field quality assurance and quality control (QA/QC) procedures were followed during the Program, including.

- Groundwater monitoring and surface water sample collection equipment decontamination was completed in general accordance with Stantec's standard operating procedures (SOPs)
- Equipment was calibrated by Nunami Stantec personnel prior to fieldwork
- Surface water and soil samples were uniquely labelled and stored in ice-chilled coolers prior to and during transportation to the laboratory
- Surface water and soil samples were delivered to the laboratory following standard chain-of-custody protocols
- Workers collecting samples took measures to prevent cross contamination from walking or driving through areas where surface water was sampled at the Site
- Samples selected for analysis were analyzed by Bureau Veritas, which is accredited by the Canadian Association of Laboratory Accreditation (CALA)

- One blind field duplicate surface water sample was collected by Nunami Stantec and analyzed by Bureau Veritas. The analytical results were compared to those of the parent sample using the method of relative percent difference (RPD) to evaluate precision

In addition to the Nunami Stantec QA/QC procedures, the laboratory analyzes and assesses method blanks, Certified Reference Materials, method spikes, and surrogate recoveries to monitor data quality. These results are presented in the laboratory certificates of analysis.

3.3.3 Liner Visual Assessment

While at the Site, Nunami Stantec personnel visually assessed the condition of the exposed portions of the geomembrane liners and the berms of LTU 1 and LTU 2 for evidence of overflow and/or visible indications of tearing or material distress. The locations of observed areas of concern (defined as tears or material distress larger than 5 centimetres [cm]) were measured from the nearest corner of the respective LTU.

The locations of observed liner deficiencies are indicated on Figures 4 and 5, **Appendix A** and photographs are included in the Photographic Log, ID #12-18, **Appendix F**.

3.4 Task 4 – Soil Sampling

The soil sampling portion of the Program was completed on August 9, 2023. Nunami Stantec collected three surface soil samples for grain size analysis; one sample from each of the two LTUs and one composite sample from the berms surrounding the LTUs. The soil sample locations are summarized in Table 3-3 below. The samples were collected by filling laboratory-provided bags by hand.

Table 3-3 Soil Sampling Locations

Sample ID	Purpose	Location/Rationale
SS23-01	Confirmation of applicable remediation guidelines	Soils at the centre of the inside of the LTU 1.
SS23-02	Confirmation of applicable remediation guidelines	Soils at the centre of the inside of the LTU 2.
SS23-03	Confirmation of applicable remediation guidelines	Composite of several locations from the berm walls of LTU 1 and LTU 2.

The samples were stored in a cooler prior to and during transportation to the laboratory. The samples were shipped by air by a private cargo charter to Bureau Veritas's laboratory in Ottawa, Ontario for grain size analysis.

3.4.1 Laboratory Program

The laboratory analytical program is summarized in Table 3-4, below.

Table 3-4 Laboratory Program Summary

Source	Laboratory Analysis
Soil SS23-01 through SS23-03	Grain Size

4 Results

The 2023 field program was conducted from August 8 to August 10, 2023.

The results of the Program are presented in the following figures, tables, and appendices of the report, and are presented in detail in subsections presented below:

Description	Figures or Tables and Associated Appendix
Site Features and Surface Water Drainage	Figure 2, **Appendix A**
Groundwater Monitoring Results	Table 1, **Appendix D**
Surface Water Sample Locations and Monitoring Results	Figure 2, **Appendix A** and Table 2, **Appendix D**
Analytical Results (including QA/QC samples)	Figure 3, **Appendix A** and Tables 3, 4, and 5, **Appendix D**
GPS Locations of Monitoring Wells and Sample Locations	Tables 1-2, **Appendix D**
Observed Liner Deficiencies at LTU 1	Figure 4, **Appendix A**
Observed Liner Deficiencies at LTU 2	Figure 5, **Appendix A**
Photographic Log	**Appendix F**
Copies of Laboratory Certificates of Analysis	**Appendix G**

4.1 Site Conditions

The temperature high was between approximately 4 and 7 Celsius (^{0}C) on each day of the field program. Conditions were generally foggy in the morning with overcast conditions in the afternoons.

During the 2018 site visit, a weathered drum labelled as containing aviation fuel was observed on the Site west of LTU 2, a weathered bag (with approximately 1 m^3 volume) containing salt was observed on the Site south of LTU 1, and a pile of construction debris was observed located inside the berms of LTU 1. A similar pile of construction debris was observed at the Site within LTU 2 during the 2018 site visit. Nunami Stantec had coordinated the removal of the aforementioned items with the airport authority in 2018. However, the aviation fuel drum and weathered bag of salt observed during the 2018 site visit had not been removed when Stantec returned to the Site in 2019. The aviation fuel drum and weathered bag of salt were again observed on the Site during the 2021 site visit, and Nunami Stantec reminded the airport authority to remove them; they had not been removed by the time Stantec de-mobilized from the Site. In 2023, the aviation fuel drum was not observed on the Site, but the weathered bag of salt was still present.

Accumulated surface water was observed immediately south of LTU 2, and at various locations on top of the liner in LTU 2. Nunami Stantec was unable to confirm how long the surface water had been accumulating and present on the Site.

A small, vegetated area was observed outside of the southwest berm of LTU 1. A second and third vegetated area were observed southeast and southwest of LTU 1. Vegetated areas were also present along the west berm and to the south of LTU 2. Vegetated areas were observed within both LTUs. Other smaller vegetated areas were also identified and shown on Figure 2, **Appendix A**. Vegetated areas observed surrounding the LTUs were consistent with those previously noted at the Site; however, an increase in vegetation was observed within the LTUs. This may be due to standing water within the LTUs throughout the year.

During the program, Nunami Stantec personnel estimated the surface water drainage direction at the Site to be generally in southerly and westerly directions in the areas surrounding the LTUs. The groundwater flow direction in the vicinity of the Site has not been confirmed due to insufficient quantities of groundwater in the monitoring wells on an ongoing basis during the annual site visits. However, based on local topography, Nunami Stantec estimates the shallow groundwater flow direction to be southerly.

The observed surface water drainage directions, accumulated surface water, and vegetated areas are indicated on Figure 2, **Appendix A.**

4.2 Geology and Surficial Geology

The surficial geology in the area of the Site consists of colluvial deposits that are residual materials deposited as veneers and blankets of debris through downslope movement and in-place disintegration of bedrock, including areas of rock outcrop (Arcadis, 2017). The colluvial deposits reportedly contain rubble and silt derived from carbonate and consolidated fine clastic sedimentary rock substrate (Canada-Nunavut Geoscience Office, 2006a). The bedrock of the Site is of Paleozoic era, specifically the Arctic Platform, and is composed of Silurian carbonate and siliciclastic rocks (Canada-Nunavut Geoscience Office, 2006b).

Resolute Bay is subject to continuous permafrost, and groundwater is not used as potable water (Arcadis, 2017). The potable water source for the Hamlet is Char Lake, which is located approximately 2 km southeast and upgradient of the Site.

Based on visual observation, the surficial soil was concluded to be coarse-grained, gravelly soil. Surficial soils from each LTU and from the berm of each LTU were sampled for grain size analysis in 2023, the results of which are presented in Section 4.5. The laboratory testing confirmed that the soil in the three samples was coarse-grained.

4.3 Groundwater Monitoring

Nunami Stantec observed the condition of the four existing and operable groundwater monitoring wells as a supplementary task not required by the license (MW1, MW2, MW3, and MW5) surrounding LTU 1 and LTU 2. MW 3, MW4 and MW6 were noted to be in poor condition as per previous programs, with MW4 and MW 6 being listed as inoperable; these conditions were noted during the 2018 program and have not changed.

The four existing operable monitoring wells were monitored for depth to groundwater (MW1, MW2, MW3, and MW5) but did not contain sufficient water for sample collection. All four wells were dry at the time of monitoring. Frozen wells were not encountered during the event.

Groundwater parameters including temperature, specific conductance, pH, oxidation reduction potential, and dissolved oxygen could not be measured as there was no groundwater to obtain such measurements (Table 1, **Appendix D**).

4.4 Surface Water Sampling

Nunami Stantec collected one surface water sample and one field duplicate sample from accumulated surface water at the Site, labeled as SW23-4 and duplicate QC23-1, respectively, from Monitoring Station SW-4. Three of the surface water sample locations identified in the NWB License (SW-1, SW-2, and SW-3) could not be sampled as no additional accumulated surface water was present. Field parameters from the sampled location are summarized in Table 2, **Appendix D.** The 2023 analytical results are compared to 2019, 2021, and 2022 results in Table 4, **Appendix D,** and historical surface water sample locations are indicated on Figure 6, **Appendix A**. The surface water samples were analyzed for the parameters required by the NWB Licence.

The reported concentrations exceeding the referenced guidelines are listed in Table 4-1, below.

Table 4-1 Summary of 2023 Sampling Event Surface Water Parameters Exceeding Referenced Guidelines

Sample Location	Parameter Category	Individual Parameter	Guideline Exceeded
SW23-4 (and duplicate QC23-1) Monitoring Station SW-4, South of LTU 2 (down-gradient) near MW5 and down-gradient of a low area against the inside berm.	General Chemistry, Total Metals	Nitrite, Nitrite (as N), Aluminum (total), Iron (total), Lead (total)	The nitrite concentrations (0.23 and 0.30 mg/L) exceeded the CCME guideline (0.20 mg/L).l The nitrite (as N) concentrations (0.070 and 0.091 mg/L) exceeded the CCME guideline (0.060 mg/L). The total aluminum concentrations (0.55 and 0.59 mg/L) exceeded the CCME guideline (0.10 mg/L). The total iron concentrations (1.4 and 1.3 mg/L) exceeded the CCME guideline (0.30 mg/L). The total lead concentration (0.030 mg/L) exceeded the CCME guideline (0.0070 mg/L).

The reported concentrations of the remaining analyzed parameters in the surface water samples generally ranged from below the detection limit to detectable concentrations that were less than the referenced guidelines.

The reported concentrations of metals and/or routine parameters generally ranged from the same to two orders of magnitude below the applicable guidelines.

The reported concentrations of phenols in the collected surface water samples were below the laboratory RDLs and therefore less than the CCME guidelines and MECP SCS.

The reported concentrations of BTEX and TEH parameters were below the laboratory RDLs or were reported as above the RDL but at least one order of magnitude lower than the referenced guidelines in the samples collected. BTEX and PAH parameters were not analyzed in SW23-4 as the container was damaged during shipping. Additionally, PAH was not analyzed in the duplicate sample QC23-1 due to a laboratory error. Concentrations of PAH parameters in analyzed samples have been below referenced guidelines for the monitoring programs since 2021 and as such this is not considered to be an issue that impacts the integrity of the program.

The surface water analytical results for this program, as compared to the referenced guidelines, are presented in Table 3, **Appendix D** and are summarized on Figure 3, **Appendix A**. Historical exceedances are shown on Figure 6, **Appendix A**.

4.5 Soil Sampling

Nunami Stantec collected three soil samples from surface locations at the Site. SS23-01 and SS23-02 were collected as discrete samples from the centre of soils in LTU 1 and LTU 2, respectively. SS23-03 was collected as a composite sample from eight locations along the berms of LTU 1 and LTU 2. The 2023 analytical results are presented in Table 5, **Appendix D,** and soil sampling locations are shown on Figure 7, **Appendix A**. The soil samples were analyzed for grain size to confirm applicable guidelines for remediation targets. The results indicate that both the soils in the LTU and the berm consist of coarse-grained material.

4.6 Liner Visual Assessment

While at the Site, Nunami Stantec personnel visually assessed the condition of the exposed portions of the geomembrane liners and berms of LTU 1 and LTU 2.

4.6.1 LTU 1

In LTU 1, liner deficiencies were observed in 24 locations. The liner deficiencies are summarized in Table 4-2, below. The deficiencies observed in 2023 were consistent with those observed in 2022. The identification numbers assigned to the deficiencies in Table 4-2 were kept consistent with the 2022 report.

Table 4-2 LTU 1 Observed Liner and Berm Deficiencies

Deficiency Number	Location	Deficiency	Approximate Deficiency length (cm)	Reference to Photolog in Appendix F
23-1	0-2 m W of NE corner	Multiple tears[1]	5-40	-
23-2	3 m S of NE corner	Multiple tears	5-30	-
23-4	15-16 m S of NE corner	Multiple tears	5-30	-
23-5	22 m SE of NE corner	1 tear	25	-
23-6	24 m SE of NE corner	1 tear	25	-
23-7	3 m W of SE corner	Multiple tears	5-20	-
23-8	6 m W of SE corner	2 tears	5, 5	-
23-9	8 m W of SE corner	1 tear	20	-
23-10	12 m W of SE corner	1 tear	6	-
23-11	25 m W of SE corner	1 tear	5	-
23-12	12 m S of NW corner 1	1 tear	8	-
23-13	9 m north of SW corner	1 tear	5	-
23-14	13 m S of NW corner	1 tear	38	-
23-15	5 m north of SW corner	Liner not keyed in correctly, worn out	350	Photograph 14
23-16	14 m north of SW corner	1 tear	7	-
23-17	13 m S of NW corner	Multiple tears	20, 35, 50	-
23-18	5 m S of NW corner	Multiple tears	10, 15, 15, 15, 20	-
23-19	3 m S of NW corner	3 tears	20, 30, 36	-
23-20	19 m W of NE corner	1 tear	8	-
23-37	18-20 m SE of NE corner	Multiple tears	5-42	Photograph 12

Table 4-2 LTU 1 Observed Liner and Berm Deficiencies

Deficiency Number	Location	Deficiency	Approximate Deficiency length (cm)	Reference to Photolog in Appendix F
23-38	25 m SE of NE corner	1 tear	65	Photograph 13
23-39	SE corner	1 tear	15	-
23-40	1 m W of SE corner	1 tear	40	-
23-41	16 m W of SE corner	2 tears	6, 10	-

Notes:

1 - Multiple tears are noted to be more than five tears at the noted location.

The locations of the observed liner deficiencies in LTU 1 are indicated on Figure 4, **Appendix A** and select deficiencies are shown in Photographs 12 through 14 in **Appendix F**.

4.6.2 LTU 2

In LTU 2, liner and berm deficiencies were observed at 18 locations. The LTU 2 liner and berm deficiencies are summarized in Table 4-3, below.

The locations of the observed liner and berm deficiencies in LTU 2 are indicated on Figure 5, **Appendix A** and select deficiencies are shown in photographs 15 through 18, **Appendix F**.

Table 4-3 LTU 2 Observed Liner and Berm Deficiencies

Deficiency Number	Location	Deficiency	Approximate Deficiency Length (cm)	Reference to Photolog in Appendix F
23-21	Northeast corner	2 tears	7, 18	-
23-22	2-2.5 m S of NE corner	2 tears	10, 18	-
23-23	5 m S of NE corner	Multiple tears	11, 20, 65	-
23-24	7 m S of NE corner	Multiple tears	7-30	-
23-25	9 m S of NE corner	Multiple tears	5, 7, 25	-
23-26	11 m S of NE corner	Multiple tears	5, 25, 30	-
23-27	13-17 m S of NE corner	Multiple tears	5-60, 400	Photograph 15
23-28	20 m S of NE corner	Multiple tears	5, 10, 22	-
23-29	23 m S of NE corner	Multiple tears	5, 10, 10	-
23-30	24 m S of NE corner	Multiple tears	5, 10, 10, 15, 20	-
23-31	25 m S of NE corner	1 tear	80	Photograph 16
23-32	12 m N of SE corner	2 tears	5, 8	-
23-33	3 m W of SE corner	1 tear	90	-
23-34	4.5 m W of SE corner	1 tear	10	-
23-35	16-17 m E of SW corner	Multiple tears	5-40	-
23-36	0.5 m N of SW corner	1 tear	25	-
23-42	8 m E of SW corner	Liner not keyed in correctly, torn	150	Photograph 17
23-43	22 m N of SW corner	1 tear	150	Photograph 18

5 Quality Assurance / Quality Control

A QA/QC program was conducted to assess data reliability. Surface water samples were collected in general accordance with Stantec's SOPs, were uniquely labelled, and control was maintained using chain-of-custody forms. Surface water and soil samples were collected in laboratory-supplied containers and preserved in ice-chilled insulated coolers.

The data quality objective (DQO) of the Program was to collect data that were reproducible, complete, and suitable for comparison with the referenced guidelines / standards.

5.1 Sample Hold Times

Samples submitted to the laboratory were analyzed past the recommended hold times as outlined in the CCME 2016 Guidance Manual for Environmental Site Characterization in Support of Environmental and Human Health Risk Assessment, Volume 4 Analytical Methods (CCME, 2016b) for the following parameters:

- PHC F2
- Oil and Grease
- Ammonia as N
- Total suspended solids
- Nitrite as N
- Nitrite plus nitrate
- Alkalinity
- Conductivity
- Phenols
- Chloride/Sulphate

If parameters are analyzed after hold times, the analytical results may be biased low and should be viewed with caution. The parameters analyzed after recommended hold times were reported as either non-detectable concentrations or at least an order of magnitude lower than the guideline. These concentrations were generally consistent with previous surface water sampling events; therefore, the exceedance of the hold times was not considered by Nunami Stantec to have impacted data interpretation. The nitrite as N concentration exceeded the referenced guideline; therefore, the hold time exceedance potentially biasing the laboratory analytical result low is not considered to have impacted the interpretation of the results for this parameter.

5.2 Temperature

Sample temperatures were recorded upon arrival at the laboratory by measuring up to three random sample container temperatures and calculating the average result to obtain a representative temperature. The ideal temperature should be approximately 4°C. Samples that arrive at the laboratory with temperatures measured above 4°C may have reported concentrations that are biased low as a result of the elevated sample temperatures.

Although it is ideal to have sample temperatures below 4°C, Bureau Veritas has noted the difficulty in maintaining samples below 4°C. As such, Bureau Veritas considers a temperature range of 4°C to 10°C as acceptable. Sample coolers received at the laboratory indicated temperatures (6°C) within the acceptable range.

5.3 Field Duplicates

The method of RPD is used to evaluate the sample result variability and is calculated by the following equation:

$$RPD = \left[\frac{|S1 - S2|}{S3} \right] \times 100$$

Where:
RPD = relative percent difference
S1 = original soil or groundwater sample concentration
S2 = duplicate soil or groundwater sample concentration
S3 = average concentration = (S1 + S2)/2

In the event that the analytical result for either sample is less than five times the laboratory reportable detection limit (RDL), any calculated RPD is considered not to be valid, and no conclusion can be made with respect to the data reproducibility. The generally accepted industry standard for acceptable RPD's analyses is less than or equal to 40% for field duplicated water samples described by the CCME Guidance Manual for Environmental Site Characterization in Support of Environmental and Human Health Risk Assessment, Volume 1 Guidance Manual (CCME, 2016a).

QC23-1 was a blind field duplicate surface water sample collected from SW23-4. RPD values ranged from 0 % (multiple parameters) to 26 % (Sodium, Nitrite, Nitrite as N). As such, the data was considered valid.

The RPD results are summarized on Table 3, **Appendix D**

5.4 Trip and Equipment Blank

Trip blank and equipment blank samples were proposed to be completed as part of QA/QC procedures for the Program. Water to complete these samples was requested from Bureau Veritas; however, the trip and equipment blank sample/water were not provided due to an error in order preparation.

5.5 Laboratory QA/QC

In addition to the Stantec QA/QC procedures, the laboratory analyzes and assesses method blanks, Certified Reference Materials, method spikes, and surrogate recoveries to monitor data quality. In general, the laboratory QA/QC results were within quality control limits with the exception of the matrix spike recoveries for the following parameters:

- Dissolved zinc
- Total barium
- Total boron
- Total cadmium
- Total lithium
- Total lead
- Total molybdenum
- Total silver

Bureau Veritas indicated that the overall quality control for these analyses met acceptability criteria. The laboratory concentrations of the above-noted parameters were two to three orders of magnitude below the CCME guidelines, or less than the laboratory RDL which was one order of magnitude below the

CCME guidelines. Therefore, these matrix spike recoveries outside of the control limits did not affect the interpretation of the results.

The laboratory QA/QC results are presented as part of the copies of the laboratory certificates of analysis in **Appendix G.**

5.6 Summary

Based on the results of the assessment above, the DQO for the Program was considered to have been met and the data were considered valid; however, samples submitted to the laboratory were analyzed past the recommended hold times as outlined in the CCME 2016 Guidance Manual for Environmental Site Characterization in Support of Environmental and Human Health Risk Assessment, Volume 4 Analytical Methods (CCME, 2016b). For the parameters analyzed after hold times (i.e., PHC F2, oil and grease, Ammonia-N, total suspended solids, nitrite as N, nitrite plus nitrate, phenols, conductivity, chloride, sulphate, and alkalinity in surface water samples), the analytical results may be biased low and should be viewed with caution. The parameters analyzed after recommended hold times were reported as either non-detectable concentrations or at least an order of magnitude lower than the guideline. These concentrations were generally consistent with previous surface water sampling events; therefore, the exceedance of the hold times was not considered to have impacted data interpretation. The nitrite as N concentration exceeded the referenced guideline; therefore, the hold time exceedance potentially biasing the laboratory analytical result low is not considered to have impacted the interpretation of the results.

The laboratory QA/QC objectives for the program met acceptability criteria.

6 Summary and Conclusions

Nunami Stantec completed the 2023 Site Environmental Monitoring Program at the Landfarm Facility which is comprised of LTUs 1 and 2 located at the Resolute Bay Airport on Cornwallis Island, Nunavut in August 2023. The findings of the Program are summarized below.

Site Conditions

During the 2018 site visit, a weathered drum labelled as containing aviation fuel was observed on the Site west of LTU 2, a weathered 1 m^3 bag containing salt was observed on the Site south of LTU 1, and a pile of construction debris was observed located inside the berms of LTU 1. A pile of construction debris was also observed at the Site within LTU 2 during the 2018 program. Stantec had coordinated the removal of the aforementioned items with the airport authority in 2018. The aviation fuel drum and the weathered salt bag observed during the 2018 site visit had not been removed when Stantec returned to the Site in 2019 (the airport authority was advised to remove and had committed to removing the materials in 2018). Stantec reminded the airport authority to remove the materials while on Site in 2021. In 2023, the aviation fuel drum was not observed to be present, but the weathered salt bag was still present when Nunami Stantec completed the site visit.

The presence of a weathered bag of salt and construction debris within the LTU are considered to be a potential environmental concern for soil and groundwater at the Site.

Groundwater Monitoring

Nunami Stantec observed the condition of, and monitored, four existing and operable groundwater monitoring wells (MW1, MW2, MW3, and MW5) surrounding LTU 1 and 2. MW3, MW4, and MW6 were noted as in poor condition as they were in previous monitoring programs. The four monitored wells did not contain sufficient water for sample collection, which is consistent with previous monitoring programs completed at the Site since 2016.

Surface Water Sampling

Nunami Stantec collected one surface water sample and one field duplicate sample, labeled as SW23-4 and QC23-01, respectively, from accumulated surface water at the Site to the south of LTU 2 (at Monitoring Station SW-4). Sufficient surface water to collect additional samples from Monitoring Stations SW-1, SW-2, and SW-3 at the Site was not available.

In general, the reported concentrations of the parameters analyzed in the surface water samples were below the applicable guidelines / standards with the exception of:

- Nitrite, nitrite (as N), aluminum, iron, and lead concentrations in sample SW23-4 (and duplicate QC23-1)

Quality Assurance / Quality Control

Based on the results of the field and laboratory QA/QC program, the DQO for the Program was considered to have been met; however, the laboratory results for parameters that exceeded hold times may be biased low and should be viewed with caution. Due to the reported concentrations being consistent with previous surface water sampling events, or above the referenced guidelines, the hold time exceedances were not considered to have impacted the interpretation of the results. Due to an error by Bureau Veritas, Trip and Equipment Blanks were not supplied as requested or analyzed as part of the 2023 program.

Soil Sampling

Nunami Stantec collected three surface soil samples for grain size analysis; one sample from each of the two LTUs and one composite sample from the berms surrounding the LTUs. The laboratory results indicated that the soils sampled consisted of coarse-grained soils.

LTU Conditions and Liner Visual Assessment

While at the Site, Nunami Stantec personnel visually assessed the condition of the exposed portions of the geomembrane liners and berms of the two LTUs. Two areas of low berm were observed adjacent to the access ramp of LTU 2.

Numerous tears of the liners were observed at both LTU 1 and LTU 2. In addition to the deficiencies identified in previous monitoring programs, seven new deficiencies were identified. The largest observed tear was located 13 m south of the northeast corner of LTU 2 and measured approximately 4.0 m in length.

LTU Integrity

Based on the results of the surface water sampling and the visual assessment of the LTUs and liners, the following areas of concern for LTU integrity were noted:

- A low area where surface water may accumulate was observed inside the south berm of LTU 2. Accumulated surface water along the inside berm of the LTU has the potential to overflow and/or be blown over the berm during high wind events and accumulate outside of the LTU. This low area inside the berm is associated with an area of low berm observed by Stantec in 2018, 2019, and 2022.
- Accumulated surface water was observed south (down-gradient) of LTU 2 (south of the low area inside the berm). The corresponding surface water sample collected in 2023 (SW23-4) indicated concentrations of nitrite, nitrite (as N), aluminum, iron, and lead which exceeded the CCME guidelines. The remaining analyzed parameter concentrations were below the guidelines / standards / limits.
- Seven new liner deficiencies were identified during the 2023 monitoring program in addition to those identified in previous programs. Several deficiencies at both LTUs have increased in length since the 2022 monitoring program. This may indicate that the overall condition of the liners at both LTUs is worsening. However, no additional concerns were identified, and immediate repairs are not required at this time.

7 Limitations

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

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

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

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

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

This report is limited by the following:

- The liners at the LTUs were generally covered with soil, as a result, Nunami Stantec field staff could not visually assess the condition of the liners in the areas of soil cover.

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

8 References

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Appendix A Figures

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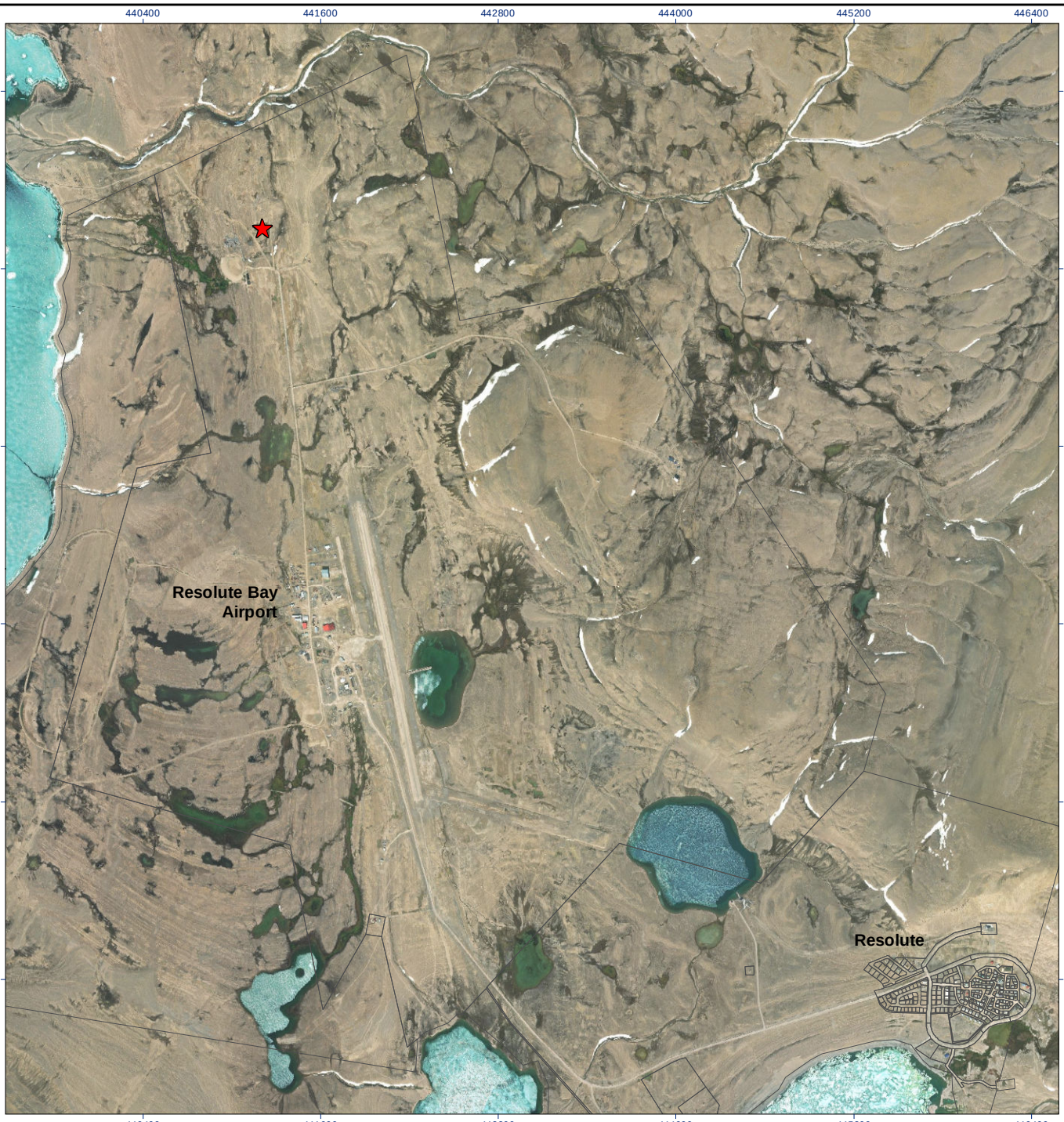
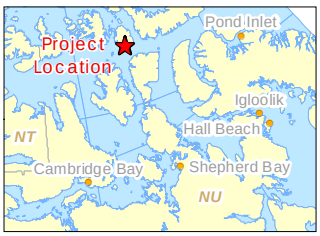




Site Location

Land Parcel

PSPC: Public Services and Procurement Canada

0 500 1,000 metres

1:40,000 (at original document size of 8.5x11)

N

NUNAMI
STANTEC LIMITED

Project Location
Cornwallis Island, Nunavut

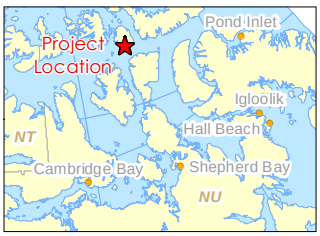
123514481
Prepared by MK on 2023-10-10
TR by MR on 2024-01-15
IR by TS on 2024-01-19

Client/Project
PSPC for Transport Canada
2023 Environmental Monitoring Program
Resolute Bay Airport Land Treatment Unit

Figure No.
1

Title
Site Location Plan

Notes
1. Coordinate System: NAD 1983 UTM Zone 15N
2. Base features: Geogratis, ©Department of Natural Resources Canada, All rights reserved.
3. Imagery Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community.
4. Parcels: Canada Lands Digital Cadastral Data,©Her Majesty the Queen in Right of Canada, Department of Natural Resources. All rights reserved.



Notes

1. Coordinate System: NAD 1983 UTM Zone 15N
2. Base features: Geogratis, ©Department of Natural Resources Canada, All rights reserved. Imagery: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community.

- Monitoring Well Location
- Monitoring Well Location - Screen Heaved above surface, Not Suitable for Sample Collection
- Surface Water Sample Location
- Previous Surface Water Sample Location – Dry in 2023
- Bag of Weathered Salt
- Soil and Construction Debris Pile
- Observed Surface Drainage Flow Direction Based on Topography
- Land Treatment Unit (LTU)
- 2023 Vegetated Areas
- Approximate Areas of Accumulated Surface Water
- Approximate Low Berm Location

PSPC: Public Services and Procurement Canada

0 10 20 metres
1:1,000 (at original document size of 8.5x11)

N

NUNAMI STANTEC LIMITED

Project Location
Cornwallis Island, Nunavut

123514481
Prepared by MK on 2023-10-10
TR by MR on 2024-01-15
IR by TS on 2024-01-19

Client/Project
PSPC for Transport Canada
2023 Environmental Monitoring Program
Resolute Bay Airport Land Treatment Unit

Figure No.
2

Title
Site Plan Showing Site Features and Sample Locations

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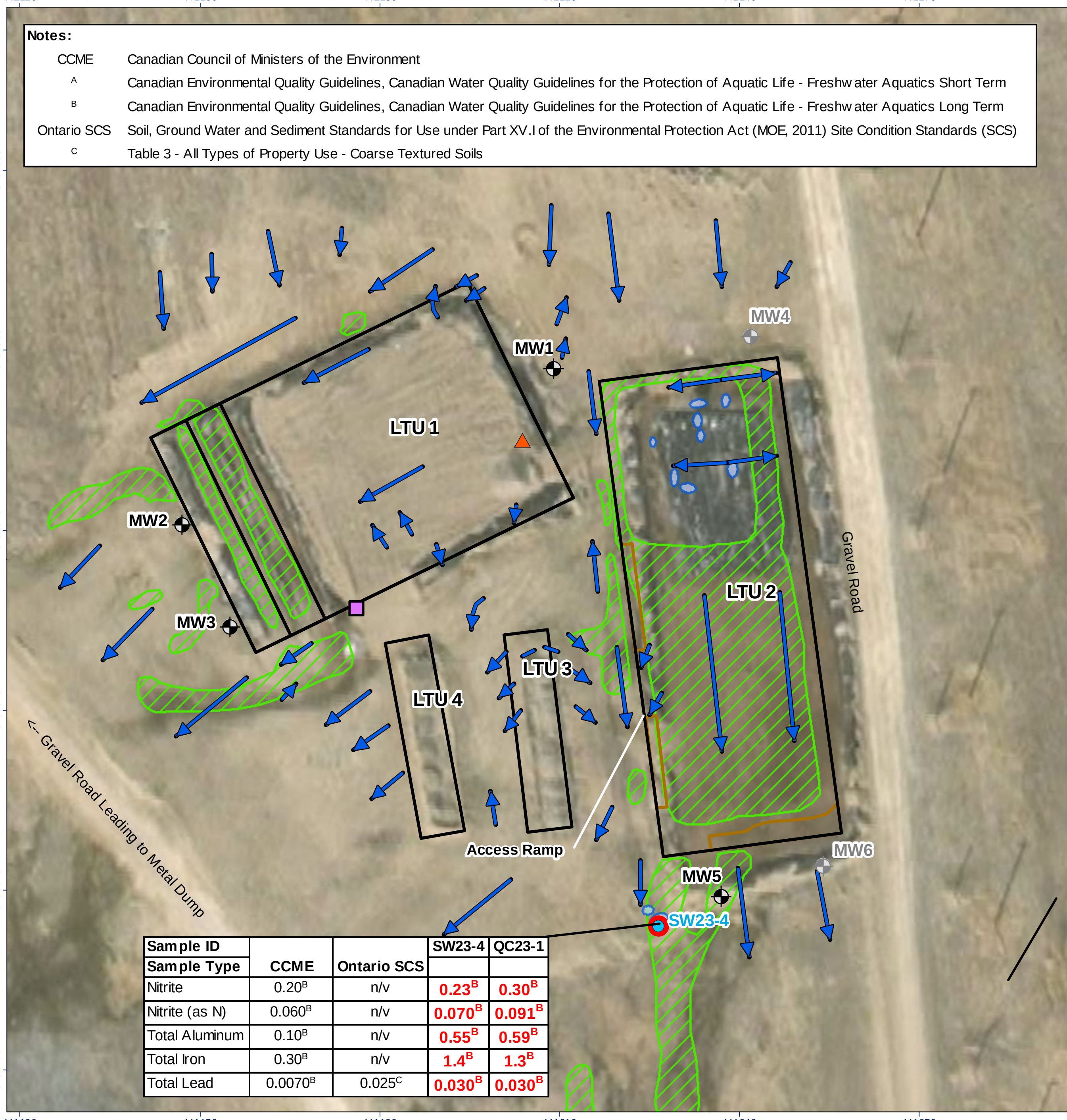
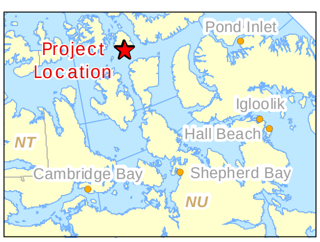
\\Cd1001-c200\workgroup\1102\active\110220771\gis\figures\2023 resolute bay ltu monitoring report\fig 3 sw sample analytical results summary.mxd Revised: 2024-02-14 By: MKuhl

Notes:

CCME	Canadian Council of Ministers of the Environment
A	Canadian Environmental Quality Guidelines, Canadian Water Quality Guidelines for the Protection of Aquatic Life - Freshwater Aquatics Short Term
B	Canadian Environmental Quality Guidelines, Canadian Water Quality Guidelines for the Protection of Aquatic Life - Freshwater Aquatics Long Term
Ontario SCS	Soil, Ground Water and Sediment Standards for Use under Part XV.I of the Environmental Protection Act (MOE, 2011) Site Condition Standards (SCS)
C	Table 3 - All Types of Property Use - Coarse Textured Soils



Sample ID			SW23-4	QC23-1
Sample Type	CCME	Ontario SCS		
Nitrite	0.20B	n/v	**0.23B**	**0.30B**
Nitrite (as N)	0.060B	n/v	**0.070B**	**0.091B**
Total Aluminum	0.10B	n/v	**0.55B**	**0.59B**
Total Iron	0.30B	n/v	**1.4B**	**1.3B**
Total Lead	0.0070B	0.025C	**0.030B**	**0.030B**



Notes
1. Coordinate System: NAD 1983 UTM Zone 15N
2. Base features: Geogratis, ©Department of Natural Resources Canada, All rights reserved.
3. Imagery: Microsoft Bing product screen shot(s) reprinted with emission from Microsoft Corporation.

Monitoring Well Location

Monitoring Well Location - Screen Heaved above surface, Not Suitable for Sample Collection

Bag of Weathered Salt

Soil and Construction Debris Pile

Surface Water Sample Location

Concentrations Above Applicable Guidelines / Standards

Surface Drainage Flow Direction Based on Topography

Land Treatment Unit (LTU)

2023 Vegetated Areas

Approximate Areas of Accumulated Surface Water

Approximate Low Berm Location

PSPC: Public Services and Procurement Canada

0 10 20 metres

1:1,000 (at original document size of 8.5x11)

N

NUNAMI STANTEC LIMITED

Project Location
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123514481

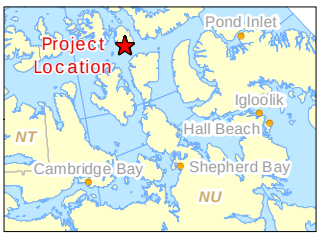
Prepared by MK on 2023-10-10
TR by MR on 2024-01-15
IR by TS on 2024-01-19

Client/Project
PSPC for Transport Canada
2022 Environmental Monitoring Program
Resolute Bay Airport Land Treatment Unit

Figure No.
3

Title
Surface Water Sample Analytical Results Summary

Deficiency Number	Location	Deficiency	Deficiency length (cm)	Reference to Photolog in Appendix F
23-1	0-2 m W of NE corner	Multiple tears	5-40	-
23-2	3 m S of NE corner	Multiple tears	5-30	-
23-4	15-16 m S of NE corner	Multiple tears	5-30	-
23-5	22 m SE of NE corner	1 tear	25	-
23-6	24 m SE of NE corner	1 tear	25	-
23-7	3 m W of SE corner	Multiple tears	5-20	-
23-8	6 m W of SE corner	2 tears	5, 5	-
23-9	8 m W of SE corner	1 tear	20	-
23-10	12 m W of SE corner	1 tear	6	-
23-11	25 m W of SE corner	1 tear	5	-
23-12	12 m S of NW corner 1	1 tear	8	-
23-13	9 m north of SW corner	1 tear	5	-
23-14	13 m S of NW corner	1 tear	38	-
23-15	5 m north of SW corner	Liner not keyed in correctly, w orn out	350	Photograph 14
23-16	14 m north of SW corner	1 tear	7	-
23-17	13 m S of NW corner	Multiple tears	20, 35, 50	-
23-18	5 m S of NW corner	Multiple tears	10, 15, 15, 15, 20	-
23-19	3 m S of NW corner	3 tears	20, 30, 36	-
23-20	19 m W of NE corner	1 tear	8	-
23-37	18-20 m SE of NE corner	Multiple tears	5-42	Photograph 12
23-38	25 m SE of NE corner	1 tear	65	Photograph 13
23-39	SE corner	1 tear	15	-
23-40	1 m W of SE corner	1 tear	40	-
23-41	16 m W of SE corner	2 tears	6, 10	-



- Monitoring Well Location
- Liner Deficiency
- Bag of Weathered Salt
- Soil and Construction Debris Pile
- Liner Deficiency Area
- Land Treatment Unit (LTU)
- 2023 Vegetated Areas

PSPC: Public Services and Procurement Canada

0 5 10 metres
1:600 (at original document size of 8.5x11)

N

NUNAMI STANTEC LIMITED

Notes
1. Coordinate System: NAD 1983 UTM Zone 15N
2. Base features: Geogratis, ©Department of Natural Resources Canada, All rights reserved.
3. Imagery: Microsoft Bing product screen shot(s) reprinted with ermission from Microsoft Corporation.

[A] Nunav ut Water Board License No. 1BR-RLF1520 requirements for effluent discharted from a sump at the Landfarm Facility, Part D, Item 6.
[B] Ontario Ministry of the Enviornment and Climate Change (now referred to as the Ministry of Enviornment, Conserv ation, and Parks). Soil, Groundwater, and Sediment Standards for use under Part XV.1 of the Environmental Protection Act. Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition.

Project Location
Comwallis Island, Nunavut

123514481
Prepared by MK on 2023-10-10
TR by MR on 2024-01-15
IR by TS on 2024-01-19

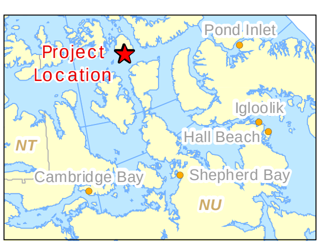
Client/Project
PSPC for Transport Canada
2023 Environmental Monitoring Program
Resolute Bay Airport Land Treatment Unit

Figure No.
4

Title
Site Plan Showing LTU 1 Observed Liner Deficiencies

\\Cd1001-c200.\workgroup\11021\active\110220771.\gis\figures\2023 resolute bay ltu_monitoring_report\fig 4_liner_condition_site_ltu1.mxd Revised: 2023-10-19 By: MKohl

Deficiency Number	Location	Deficiency	Deficiency Length (cm)	Reference to Photolog in Appendix F
23-21	Northeast corner	2 tears	7, 18	-
23-22	2-2.5 m S of NE corner	2 tears	10, 18	-
23-23	5 m S of NE corner	Multiple tears	11, 20, 65	-
23-24	7 m S of NE corner	Multiple tears	7-30	-
23-25	9 m S of NE corner	Multiple tears	5, 7, 25	-
23-26	11 m S of NE corner	Multiple tears	5, 25, 30	-
23-27	13-17 m S of NE corner	Multiple tears	5-60, 400	Photograph 15
23-28	20 m S of NE corner	Multiple tears	5, 10, 22	-
23-29	23 m S of NE corner	Multiple tears	5, 10, 10	-
23-30	24 m S of NE corner	Multiple tears	5, 10, 10, 15, 20	-
23-31	25 m S of NE corner	1 tear	80	Photograph 16
23-32	12 m N of SE corner	2 tears	5, 8	-
23-33	3 m W of SE corner	1 tear	90	-
23-34	4.5 m W of SE corner	1 tear	10	-
23-35	16-17 m E of SW corner	Multiple tears	5-40	-
23-36	0.5 m N of SW corner	1 tear	25	-
23-42	8 m E of SW corner	Liner not keyed in correctly, torn	150	Photograph 17
23-43	22 m N of SW corner	1 tear	150	Photograph 18



- Monitoring Well Location
- Monitoring Well Location - Screen Heaved above surface, Not Suitable for Sample Collection
- Surface Water Sample Location
- Liner Deficiency
- Bag of Weathered Salt
- Soil and Construction Debris Pile
- Land Treatment Unit (LTU)
- 2023 Vegetated Areas
- Accumulated Surface Water
- Approximate Low Berm Location

0 5 10 metres
1:600 (at original document size of 8.5x11)

N

NUNAMI STANTEC LIMITED

Notes
1. Coordinate System: NAD 1983 UTM Zone 15N
2. Base features: Geogratis, ©Department of Natural Resources Canada, All rights reserved.
3. Imagery: Microsoft Bing product screen shot(s) reprinted with emission from Microsoft Corporation.

PSPC: Public Services and Procurement Canada

[A] Nunavut Water Board License No. 1BR-RLF1520 requirements for effluent discharted from a sump at the Landfarm Facility, Part D, Item 6.
[B] Ontario Ministry of the Enviornment and Climate Change (now referred to as the Ministry of Environment, Conservation, and Parks). Soil, Groundwater, and Sediment Standards for use under Part XV.1 of the Environmental Protection Act. Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition.

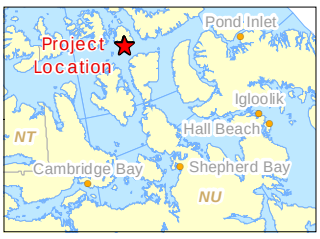
Project Location 123514481
Cornwallis Island, Nunavut
Prepared by MK on 2023-10-10
TR by MR on 2024-01-15
IR by TS on 2024-01-19

Client/Project
PSPC for Transport Canada
2023 Environmental Monitoring Program
Resolute Bay Airport Land Treatment Unit

Figure No.
5

Title
Site Plan Showing LTU 2 Observed Liner Deficiencies

\\Cd1001-c200\workgroup\1102\active\110220771\gis\figures\2023_resolute_bay_ltu_monitoring_report\fig_5_liner_condition_site_ltu2.mxd Revised: 2024-01-12 By: MKuhl



Notes

1. Coordinate System: NAD 1983 UTM Zone 15N
2. Base features: Geogratis, ©Department of Natural Resources Canada, All rights reserved.
3. Imagery: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community.

- Surface Water Sampling Location (2023)
- Surface Water Sampling Location (2022)
- Surface Water Sampling Location (2021)
- Surface Water Sampling Location (2019)
- Surface Water Sampling Location (2018)
- Historical Concentrations Above Applicable Guidelines / Standards
- Land Treatment Unit (LTU)

0 10 20 metres

1:1,000 (at original document size of 8.5x11)

N

NUNAMI STANTEC LIMITED

Project Location
Cornwallis Island, Nunavut

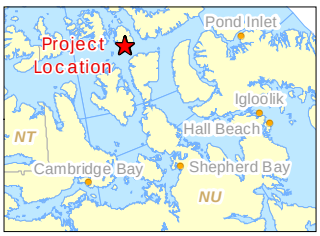
123514481
Prepared by MK on 2023-10-10
TR by MR on 2024-01-15
IR by TS on 2024-01-19

Client/Project
PSPC for Transport Canada
2023 Environmental Monitoring Program
Resolute Bay Airport Land Treatment Unit

Figure No.
6

Title
Site Plan Showing Historical Surface Water Sampling Locations

PSPC: Public Services and Procurement Canada



Notes

1. Coordinate System: NAD 1983 UTM Zone 15N
2. Base features: Geogratis, ©Department of Natural Resources Canada, All rights reserved.
3. Imagery: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community.

- Composite Soil Sampling Location (2023)
- Soil Sampling Location (2023)
- Land Treatment Unit (LTU)

0 10 20 metres

1:1,000 (at original document size of 8.5x11)

N

NUNAMI STANTEC LIMITED

Project Location
Cornwallis Island, Nunavut

123514481

Prepared by MK on 2023-10-10
TR by MR on 2024-01-15
IR by TS on 2024-01-19

Client/Project

PSPC for Transport Canada
2023 Environmental Monitoring Program
Resolute Bay Airport Land Treatment Unit

Figure No.

7

Title

Site Plan Showing Soil Sampling Locations

PSPC: Public Services and Procurement Canada

\\Cd1001-c200.\workgroup\1102\active\110220771\gis\figures\2023_prelim_report\fig_7_site_plan_ss_locs.mxd Revised: 2023-10-10 By: MKuhl

Appendix B Laboratory Review of QA/QC Plan

Stantec
10160 112 Street
Edmonton AB T5K 2L6 CA

July 28, 2023

Attention: Luke Anderson, Environmental Scientist, Team Lead

Re: Resolute Bay Airport Landfill Treatment Unit – Nunavut 2023 Environmental Program (as provided by Stantec)

Dear Mr. Anderson,

As requested, Bureau Veritas Environmental Laboratories has reviewed the Resolute Bay Airport Landfill Treatment Unit 2023 Sampling Plan (appended). In our opinion the plan meets or exceeds the CCME requirements for field QC.

If you require anything further, please do not hesitate to contact me.

Sincerely,

Kelly Hogue, B.Sc., P.Chem
NA Director, Scientific and Operational Excellence
Environmental Laboratories
kelly.hogue@bureauveritas.com

Resolute LTU

Source	Location	Laboratory Analysis
Surface Water	Up to eight (8) samples (where possible) up and down gradient from LTUs 1 and 2	Total Suspended Solids (TSS)
		Ammonia Nitrogen
		Oil and Grease
	Field Duplicate	Polycyclic Aromatic Hydrocarbons (PAH)
	Trip Blank	Benzene, toluene, ethylbenzene, xylenes (BTEX)
	Field Blank	Total extractable hydrocarbons (TEH)
		Oil and Grease
		Total Phenols
		Total Metals (aluminum, cadmium, copper, lead, nickel, silver, zinc, arsenic, cobalt, iron, molybdenum, selenium, titanium)
		Dissolved Metals (aluminum, cadmium, copper, lead, nickel, silver, zinc, arsenic, cobalt, iron, molybdenum, selenium, titanium)
		Routine parameters (total hardness, conductivity, calcium, sodium, chloride, magnesium, potassium, sulphate, total alkalinity, nitrate-nitrite, ammonia nitrogen, and pH)
	One sample (if standing water present, adjacent to metal pipe in LTU 2)	Lead (this sample to be submitted for only lead analysis)
Soil	One location on each LTU as well as one from berm (three samples)	Grain Size
		One location (near pipe in LTU 2) for lead

6740 Campobello Road, Mississauga, L5N 2L8
Tel: +1 (905) 817-5700
Fax: +1 (905) 817-5777

Appendix C NWB Licence and Communication

NUNAVUT WATER BOARD
WATER LICENCE

Licence No. 1BR-RLF2030

Pursuant to the Nunavut Waters and Nunavut Surface Rights Tribunal Act and the Agreement Between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in right of Canada, the Nunavut Water Board, hereinafter referred to as the Board, hereby grants to

TRANSPORT CANADA

(Licensee)

3rd FLOOR, 344 EDMONTON STREET, WINNIPEG, MANITOBA R3C 0P6

(Mailing Address)

hereinafter called the Licensee, the right to alter, divert or otherwise use water or dispose of waste for a period subject to restrictions and conditions contained within this Licence renewal:

Licence Number/Type:	**1BR-RLF2030 TYPE "B"**
Water Management Area:	**BATHURST & CORNWALLIS ISLANDS WATERSHED (55)**
Location:	**RESOLUTE BAY LANDFARM MAINTENANCE / MONITORING / DECOMMISSIONING PROJECT QIKIQTANI REGION, NUNAVUT**
Classification:	**INDUSTRIAL UNDERTAKING**
Purpose:	**USE OF WATER AND DEPOSIT OF WASTE**
Quantity of Water use not To Exceed:	**FIVE (5) CUBIC METERS PER ANNUM**
Effective Date:	**AUGUST 17, 2020**
Expiry of Licence:	**AUGUST 16, 2030**

This Licence issued and recorded at Gjoa Haven, Nunavut includes and is subject to the annexed conditions.

Lootie Toomasie,
Nunavut Water Board, Chair

PART A: SCOPE, DEFINITIONS AND ENFORCEMENT

1. Scope

This Licence allows for the use of Water and the deposit of Waste for a Municipal undertaking classified as per Schedule 1 of the *Regulations* at the Resolute Bay Landfarm Maintenance/Monitoring/Decommissioning Project, located near Resolute Bay, within the Qikiqtani Region of Nunavut, generally at the following geographical coordinates:

Latitude: 74° 44' 34.28" N	Longitude: 95° 00' 17.18" W
Latitude: 74° 44' 34.58" N	Longitude: 95° 00' 02.78" W
Latitude: 74° 44' 30.04" N	Longitude: 95° 00' 01.46" W
Latitude: 74° 44' 30.52" N	Longitude: 95° 00' 15.23" W

a. This Licence is issued subject to the conditions contained herein with respect to the taking of water and the depositing of waste of any type in any waters or in any place under any conditions where such waste or any other waste that results from the deposits of such waste may enter any waters. Whenever new Regulations are made or existing *Regulations* are amended by the Governor in Council under the *Nunavut Waters and Nunavut Surface Rights Tribunal Act*, or other statutes imposing more stringent conditions relating to the quantity or type of waste that may be so deposited or under which any such waste may be so deposited, this Licence shall be deemed, upon promulgation of such Regulations, to be subject to such requirements; and

b. Compliance with the terms and conditions of this Licence does not absolve the Licensee from responsibility for compliance with the requirements of all applicable Federal, Territorial and Municipal legislation.

2. Definitions

"**Act**" means the *Nunavut Waters and Nunavut Surface Rights Tribunal Act;*

"**Addendum**" means the supplemental text that is added to a full plan or report usually included at the end of the document and is not intended to require a full resubmission of the revised report;

"**Amendment**" means a change to original terms and conditions of this Licence requiring correction, addition or deletion of specific terms and conditions of the Licence; modifications inconsistent with the terms of the set terms and conditions of the Licence;

"**Appurtenant Undertaking**" means an undertaking in relation to which a use of water or a deposit of waste is permitted by a licence issued by the Board;

"Board" means the Nunavut Water Board established under the *Nunavut Agreement* and the *Nunavut Waters and Nunavut Surface Rights Tribunal Act;*

"**Effluent**" means treated or untreated liquid waste material that is discharged into the environment from a structure such as a settling pond, landfarm or a treatment plant;

"**Engineer**" means a professional engineer registered to practice in Nunavut in accordance with the *Consolidation of Engineers and Geoscientists Act S. Nu 2008, c.2*d the *Engineering and Geoscience Professions Act S.N.W.T. 2006, c.16 Amended by S.N.W.T. 2009, c.12*;

"**Geotechnical Engineer**" means a professional engineer registered with the Association of Professional Engineers, Geologist and Geophysicists of Nunavut and whose principal field of specialization with the engineering properties of earth materials in dealing with man-made structures and earthworks that will be built on a site. These can include shallow and deep foundations, retaining walls, dams, and embankments;

"**Grab Sample**" means an undiluted quantity of material collected at a particular time and place that may be representative of the total substance being sampled at the time and place it was collected;

"**High Water Mark**" means the usual or average level to which a body of water rises at its highest point and remains for sufficient time so as to change the characteristics of the land (ref. Department of Fisheries and Oceans Canada, Operational Statement: Mineral Exploration Activities);

"**Inspector**" means an Inspector designated by the Minister under Section 85 (1) of the *Act*;
"**Licensee**" means the holder of this Licence;

"**Modification**" means an alteration to a physical work that introduces a new structure or eliminates an existing structure and does not alter the purpose or function of the work, but does not include an expansion;

"**Monitoring Program**" means a monitoring program established to collect data on surface water and groundwater quality to assess impacts to the freshwater aquatic environment of an appurtenant undertaking;

"**Nunavut Agreement**" means the *"Agreement Between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in Right of Canada*", including its preamble and schedules, and any amendments to that agreement made pursuant to it;

"**Regulations**" means the *Nunavut Waters Regulations SOR/2013-69 18th April, 2013*;

"**Spill Contingency Plan**" means a Plan developed to deal with unforeseen petroleum and hazardous materials events that may occur during the operations conducted under the Licence;

"**Treatment Objective**" means the treatment objective for the Land Treatment Unit which is based on the Canadian Council of Ministers of the Environment (CCME) Canada – Wide Standard for Petroleum Hydrocarbon in Soil, revised January 2008; and as determined by the Government of Nunavut, Environmental Protection Service based on the 2009 Environmental Guideline for Site Remediation; See Table No. 1;

"**Type B Soil**" means soil contaminated with petroleum hydrocarbons in which the primary petroleum product present in the soil as determined by laboratory analysis consists of fuel oil and /or diesel fuel and /or gasoline; this soil does not contain polychlorinated biphenyl (PCB);

"**Waste**" means, as defined in S.4 of the *Act*, any substance that, by itself or in combination with other substances found in water, would have the effect of altering the quality of any water to which the substance is added to an extent that is detrimental to its use by people or by any animal, fish or plant, or any water that would have that effect because of the quantity or concentration of the substances contained in it or because it has been treated or changed, by heat or other means;

"**Waste Disposal Facilities**" means all facilities designated for the disposal of waste, and includes the Sewage Disposal Facilities and Solid Waste Disposal Facilities (including Bulky metal area), as described in the previous Application for Water Licence renewal filed by the Applicant on May 27, 2014;

"**Water**" **or** "**Waters**" means waters as defined in section 4 of the Act; and

3. Enforcement

a. Failure to comply with this Licence will be a violation of the *Act*, subjecting the Licensee to the enforcement measures and the penalties provided for in the *Act*;

b. All inspection and enforcement services regarding this Licence will be provided by Inspectors appointed under the *Act*; and

c. For the purpose of enforcing this Licence and with respect to the use of water and deposit or discharge of waste by the Licensee, Inspectors appointed under the *Act,* hold all powers, privileges and protections that are conferred upon them by the *Act* or by other applicable law.

PART B: GENERAL CONDITIONS

1. The Licensee shall file an Annual Report on the Appurtenant Undertaking with the Board no later than the 31st March of the year following the calendar year being reported, containing the following information:

    a. A summary report of water use and waste disposal activities;
        i. Quantity of water used for sampling purposes;
        ii. Quantity and quality of Effluent discharged from Landfarm;
        iii. Quantity and characterization of soils placed within the Landfarm for treatment.
    b. A list of unauthorized discharges and a summary of follow-up actions taken;
    c. Any revisions to the Spill Contingency Plan, Abandonment and Restoration Plan, and other plans associated with the Licence, as required by Part B, Item 9, submitted in the form of an Addendum;
    d. Description of all progressive and or final reclamation work undertaken, including photographic records of site conditions before, during and after completion of operations;
    e. A summary of all information requested and results of the Monitoring Program;
    f. Any other details on water use or waste disposal requested by the Board by the 1st November of the year being reported.

2. The Licensee shall comply with the Monitoring Program described in this Licence, and any amendments to the Monitoring Program as may be made from time to time, pursuant to the conditions of this Licence.

3. The Licensee shall post signs in the appropriate areas to identify the stations of the Monitoring Program associated with the Landfarm Facility. All signage postings shall be in the Official Languages of Nunavut.

4. The Licensee shall notify the NWB of any changes in operating plans or conditions associated with this Project at least thirty (30) days prior to any such change.

5. The Licensee shall, for all Plans submitted under this Licence, include a proposed timetable for implementation. Plans submitted, cannot be undertaken without subsequent written Board approval and direction. The Board may alter or modify a Plan if necessary to achieve the legislative objectives and will notify the Licensee in writing of acceptance, rejection or alteration of the Plan.

6. The Licensee shall implement suitable methods required for measuring the volumes of soil and water associated with the project as required under Part J, Item 1 and Part J, Item 6, respectively.

7. The Licensee shall, for all Plans submitted under this Licence, implement the Plan as approved by the Board in writing.

8. Every Plan to be carried out pursuant to the terms and conditions of this Licence shall become a part of this Licence, and any additional terms and conditions imposed upon approval of a Plan by the Board become part of this Licence. All terms and conditions of the Licence should be contemplated in the development of a Plan where appropriate.

9. The Licensee shall review the Plans referred to in this Licence as required by changes in operation and/or technology and modify the Plans accordingly. Revisions to the Plans are to be submitted in the form of an Addendum to be included with the Annual Report required by Part B, Item 1, complete with a revisions list detailing where significant content changes are made.

10. The Licensee shall ensure a copy of this Licence is maintained at the site of operations at all times. Any communication with respect to this Licence shall be made in writing to the attention of:

(a) **Manager of Licensing:**
Nunavut Water Board
P.O. Box 119
Gjoa Haven, NU X0B 1J0
Telephone: (867) 360-6338
Fax: (867) 360-6369
Email: licensing@nwb-oen.ca

(b) **Inspector Contact:**
Manager of Field Operations, AANDC
Nunavut District, Nunavut Region
P.O. Box 100
Iqaluit, NU X0A 0H0
Telephone: (867) 975-4295
Fax: (867) 979-6445

11. The Licensee shall submit one (1) electronic copy of all reports, studies, and plans to the Board. Reports or studies submitted to the Board by the Licensee shall include a detailed executive summary in Inuktitut.

12. The Licensee shall ensure that any document(s) or correspondence submitted by the Licensee to the NWB is received and acknowledged by the Manager of Licensing.

13. This Licence is assignable as provided for in Section 44 of the Act.

14. The expiry or cancellation of this Licence does not relieve the Licensee from any obligation imposed by the Licence, or any other regulatory requirement.

PART C: CONDITIONS APPLYING TO WATER USE

1. The Licensee is authorized to use up to five (5) cubic metres of Water annually for monitoring and related purposes.

2. The use of Water from streams or any Water bodies not identified in Part C, Item 1, is prohibited unless authorized and approved by the Board in writing.

3. The Licensee shall not remove any material from below the ordinary High Water Mark of any water body unless authorized.

4. The Licensee shall not cause erosion to the banks of any body of water and shall provide necessary controls to prevent such erosion.

5. The Licensee shall implement and maintain sediment and erosion control measures prior to and during the operation to prevent entry of sediment and/or dust into Water.

PART D: CONDITIONS APPLYING TO WASTE AND WASTE MANAGEMENT

1. The Licensee shall locate areas designated for Waste disposal at a minimum distance of thirty-one (31) metres from the ordinary High Water Mark of any water body such that the quality, quantity or flow of Water is not impaired, unless otherwise approved by the Board in writing.

2. All waste generated under the Licence shall be removed from site and disposed of in an approved waste disposal facility.

3. The Licensee shall treat Type B soil contained in the Landfarm Facility to meet relevant Treatment Objective, or as otherwise approved by the Board in writing.

4. The Licensee shall maintain the Landfarm to the satisfaction of the Inspector.

5. The Licensee shall provide at least ten (10) days' written notice to the Inspector and the Board prior to any planned discharges from the Landfarm Facility. The notice shall include the estimated discharge volume, Effluent quality or results of monitoring under Part D, Item 6, and the proposed location for the discharge.

6. All Effluent discharged from the sump of the Landfarm Facility, at monitoring station RLF-1, shall not exceed the following Effluent quality limits:

Parameter	Maximum Concentration of any Grab Sample (µg/L)
pH	6 to 9 (pH units)
Oil & Grease	5000
Lead (dissolved)	1
Benzene	370
Toluene	2
Ethyl-benzene	90

7. If Effluent from RLF-1 does not meet the Effluent quality limits in Part D, Item 6, it shall be treated to meet such limits, or it shall be considered hazardous waste and disposed off-site at an approved facility or as otherwise approved by the Board in writing.

8. The discharge location for the Effluent described in Part D, Item 6 shall be situated at a minimum of thirty-one (31) metres from the ordinary High Water Mark of any water body and where direct or indirect flow into a water body is not possible and no additional impacts are created.

9. The Licensee shall dispose of soils containing contaminants in excess of the Treatment Objectives, off site at an approved treatment facility or as otherwise approved by the Board in writing.

10. Licensee shall treat all Petroleum Hydrocarbon Contaminated (PHC) soil associated with the Project at the Landfarm Facility operated by the Licensee. The contaminated soil must be treated to meet appropriate Treatment Objective.

11. The Licensee shall, prior to the removal of any treated soil for future use, confirm with the Government of Nunavut, Environmental Protection Service that the soils have been treated to meet all legislatively-required treatment objectives.

PART E: CONDITIONS APPLYING TO OPERATIONS

1. The Licensee shall implement the Plan entitled *Resolute Bay, Land Farm Operation and Maintenance Plan*, dated January 2012 that was originally approved by the Board.

2. The Licensee shall, within six (6) months of issuance of this Licence submit to the Board for approval a Landfarm Integrity Assessment and Improvement Report to assess and propose engineering options for improving the berms and prevent accumulated surface water from overflowing or blowing over the berm of Landfarm Facility.

3. The Licensee shall implement appropriate measures prior to, during, and following excavation of soil from the Landfarm Facility, to prevent or minimize impact to water.

4. The Licensee shall not mix or blend PHC contaminated soils with non-contaminated soils for the expressed purpose of achieving the Treatment Objective.

5. The Licensee shall implement proper handling, storage and transportation procedures for the management of hazardous materials during execution of the Project.

6. The Licensee shall minimize disturbance to terrain, permafrost and drainage during extraction of granular material, movement of contractor's equipment and personnel around the site and removal of site debris.

PART F: CONDITIONS APPLYING TO DRILLING OPERATIONS

1. Drilling is not authorized under this Licence

PART G: CONDITIONS APPLYING TO MODIFICATIONS AND CONSTRUCTION

1. The Licensee may, without written consent from the Board, carry out Modifications to the Water Supply Facilities and Waste Disposal Facilities provided that such Modifications are consistent with the terms of this Licence and the following requirements are met:

    a. the Licensee has notified the Board in writing of such proposed Modifications at least sixty (60) days prior to beginning the Modifications;
    b. such Modifications do not place the Licensee in contravention of the Licence or the *Act*;
    c. such Modifications are consistent with the NIRB Screening Decision;
    d. the Board has not, during the sixty (60) days following notification of the proposed Modifications, informed the Licensee that review of the proposal will require more than sixty (60) days; and
    e. the Board has not rejected the proposed Modifications.

2. Modifications for which all of the conditions referred to in Part G, Item 1 have not been met can be carried out only with written approval from the Board.

3. The Licensee shall provide as-built plans and drawings of the Modifications referred to in this Licence within ninety (90) days of completion of the Modification. These plans and drawings shall be stamped by an Engineer.

PART H: CONDITIONS APPLYING TO SPILL CONTINGENCY PLANNING

1. The Licensee shall implement the Plan entitled *Resolute Bay Land Farm Treatment Facility, Spill Contingency Plan,* dated January 2012 that was originally approved by the Board.

2. The Licensee shall update and submit for the NWB's review within the next Annual Report the Plan as referred to in Part H, Item 1, addressing the following issues:

    a. To include updated project details, names of important entities such as CIRNA;
    b. To update the effective date of the project to reflect the term of the Licence.

3. The Licensee shall prevent any chemicals, petroleum products or wastes associated with the project from entering water. All sumps and fuel caches shall be located at a distance of at least thirty-one (31) metres from the ordinary High Water Mark of any adjacent water body and inspected on a regular basis.

4. The Licensee shall carryout any equipment maintenance and servicing in designated areas and shall implement special procedures (such as the use of drip pans) to manage motor fluids and other waste and contain potential spills.

5. If during the term of this Licence, an unauthorized discharge of waste occurs, or if such a discharge is foreseeable, the Licensee shall:

    a. Employ the approved Spill Contingency Plan;
    b. Report the spill immediately to the NWT/NU 24-Hour Spill Line at (867) 920-8130 and to the Inspector at (867) 975-4295; and
    c. For each spill occurrence, submit to the Inspector, no later than thirty (30) days after initially reporting the event, a detailed report that will include the amount and type of spilled product, the GPS location of the spill, and the measures taken to contain and clean up the spill site.

PART I: CONDITIONS APPLYING TO ABANDONEMENT AND RESTORATION

1. The Licensee shall implement the Plan entitled *Stand Alone Abandonment and Restoration Plan, Resolute Bay Airport Land Farm, Nunavut*, dated January 2012 that was originally approved by the Board.

2. The Licensee shall carry out progressive reclamation of any components of the project no longer required for the Licensee's operations.

3. The Licensee shall remove from the site, all infrastructure and site materials, including all fuel caches, drums, barrels, material and equipment prior to the expiry of this Licence.

4. The Licensee shall notify the Board of its intention to proceed with final abandonment of undertaking at least six (6) months prior to the planned dates of closure.

5. The Licensee shall backfill and restore, all temporary containment sumps, to the preexisting natural contours of the land.

6. Areas that have been contaminated by hydrocarbons shall be reclaimed to meet objectives as outlined in the Government of Nunavut's *Environmental Guideline for Site Remediation, January 2009* (Revised March 2009). The use of reclaimed soils for the purpose of backfill or general site grading may be carried out only upon consultation with and approval by the Government of Nunavut – Department of Environment and an Inspector.

7. All disturbed areas shall be stabilized and re-vegetated as required, upon completion of work, and restored as practically as possible to a pre-disturbed state

PART J: CONDITIONS APPLYING TO MONITORING PROGRAM

1. The Licensee shall measure and record the volume of all soil deposited and/or removed from the Landfarm Facility.

2. The Licensee shall maintain the Monitoring Program Stations, and conduct sampling and analysis requirements as described below:

Monitoring Station ID	Description	Frequency	Parameters
RLF-1	Discharge from Landfarm Facility Sump	Prior to discharge	(Volume) Quality in accordance to Parameters in Part D, Item 6)
SW-1	South (down gradient) of LTU 1	Twice/year (After Freshet and the end of treatment season) and runoff water is observed	(Quality) in accordance with Part J, Item 9
SW-2	North of LTU 1	Twice/year (After Freshet and the end of treatment season) and runoff water is observed	(Quality) in accordance with Part J, Item 9
SW-3	West of LTU 2	Twice/year (After Freshet and the end of treatment season)	(Quality) in accordance with Part J, Item 9

		and runoff water is observed	
SW-4	South (down gradient) of LTU 2	Twice/year (After Freshet and the end of treatment season) and runoff water is observed	(Quality) in accordance with Part J, Item 9

3. The Licensee shall determine the GPS co-ordinates (in degrees, minutes and seconds of latitude and longitude) of all locations where remediated soil is deposited.

4. The Licensee shall confirm the locations and GPS coordinates for all Monitoring Program Stations referred to in Part J, Item 2 with an Inspector.

5. The Licensee shall assess and record the concentration of F1 – F4 fractions in petroleum hydrocarbon contaminated soil, according to the CCME *Canada-Wide Standard for Petroleum Hydrocarbons (PHC) in Soil* that is entering and/or removed from the Landfarm Facility.

6. The Licensee shall measure and record the volume of water used for all purposes under this licence.
7. The Licensee shall sample and record the volume of all Effluent discharged from the Landfarm Facility at Monitoring Program Station RLF-1.

8. The Licensee shall sample prior to discharge at Monitoring Program Station RLF-1, to confirm compliance with the Effluent quality limits under Part D, Item 6.

9. The Licensee shall sample Monitoring Stations RLF-1, SW-1, SW-2, SW-3 and SW-4 in accordance with frequencies included under Part J, Item 2, giving consideration to adequate ground thaw and obtaining a representative surface runoff water sample. Samples shall be analyzed for the following parameters:

Total Suspended Solids	pH
Total Hardness	Total Alkalinity
Conductivity	Nitrate-Nitrite
Ammonia Nitrogen	Chloride
Oil and Grease	Total Phenols
Calcium	Magnesium
Sodium	Potassium
Chloride	Sulphate
Total Aluminum	Total Arsenic
Total Cadmium	Total Cobalt
Total Copper	Total Iron
Total Lead	Total Molybdenum
Total Nickel	Total Selenium

Total Silver
Total Titanium
Total Zinc
Total Extractable Hydrocarbons (TEH)
Polycyclic Aromatic Hydrocarbons (PAH)
Benzene, Toluene, Ethylbenzene, Xylene (BTEX)

10. All sampling, sample preservation and analyses shall be conducted in accordance with methods prescribed in the most recent edition of *Standard Methods for the Examination of Water and Wastewater*, or by such other methods approved by the Board.

11. All analyses shall be performed in a laboratory accredited according to ISO/IEC Standard 17025. The accreditation shall be current and in good standing.

12. The Licensee shall implement the Quality Assurance and Quality Control Plan for Resolute Bay Landfarm Facility, Transport Canada, dated January 2016, as accepted by the Board.

13. Additional monitoring requirements may be requested by the Inspector.

14. The Licensee shall include in the Annual Report required under Part B, Item 1 all data, monitoring results and information required by this Part.

15. Modifications to the Monitoring Program may be made only upon written request and subsequent approval of the Board in writing.

TABLES

Table 1 Remediation Requirements

	Soil Texture	Agricultural Land Use	Residential or Parkland Land Use	Commercial Land Use	Industrial Land Use
Fraction 1	Fine	210 (170[a])	210 (170[a])	320 (170[a])	320 (170[a])
	Coarse	30[b]	30[b]	320 (240[a])	320 (240[a])
Fraction 2	Fine	150	150	260 (230[a])	260 (230[a])
	Coarse	150	150	260	260
Fraction 3	Fine	1300	1300	2500	2500
	Coarse	300	300	1700	1700
Fraction 4	Fine	5600	5600	6600	6600
	Coarse	2800	2800	3300	3300
Benzene	Fine	0.0068	0.0068	0.0068	0.0068
	Coarse	0.03	0.03	0.03	0.03
Toluene	Fine	0.08	0.08	0.08	0.08
	Coarse	0.37	0.37	0.37	0.37
Ethylbenzene	Fine	0.018	0.018	0.018	0.018
	Coarse	0.082	0.082	0.082	0.082
Xylene	Fine	2.4	2.4	2.4	2.4
	Coarse	11	11	11	11
Lead	Fine	70	140	260	600
	Coarse				
Polychlorinated Biphenyls	Fine	0.5	1.3	33	33
	Coarse				

Notes: All values are in parts per million (ppm)
a = Where applicable, for protection of potable groundwater
b = Assumes contamination near residence

Data from CCME *Canada-Wide Standards for Petroleum Hydrocarbons (PHC) in Soil,* (2001) Revised January 2008 and the Government of Nunavut *Environmental Guideline for Site remediation* (2009).

From:	Karén Kharatyan
To:	Barker, Jackie; Assol Kubeisinova
Cc:	Licensing Department
Subject:	Re: Clarifications requested regarding NWB Licence No. 1BR-FTA1828 - Transport Canada Cambridge Bay Land Treatment Units
Date:	October 16, 2018 5:05:44 PM

Hi Jackie,

Thank you for pointing this out. The table included is from the Nunavut Guideline for Contaminated Sites Remediation that provides the requirements for soil remediation. However, I noticed that there are a few oversights of numbers within the table. The NWB will issue an errata letter some time in the next week.

Regarding the question related to groundwater monitoring results: as Nunavut does not have any guidelines the respective Ontario Soil, Groundwater and Sediment standards could be used for comparison and interpretation.

Regards,

On Tue, Oct 16, 2018 at 2:12 PM Barker, Jackie <Jackie.Barker@tc.gc.ca> wrote:

Good Afternoon,

While reviewing NWB Licence No. 1BR-FTA1828, Transport Canada's consultant noted that they require some clarification from NWB as follows and attached.

+++

With respect to the Cambridge Bay Fire Training Area and Apron LTU's we are requesting clarification from the Board for the following:

1. While in the process of interpreting results, we noticed that the Remediation Requirements (Table 1 of the licence) do not match the Canada Wide Standards for Petroleum Hydrocarbons in Soil, The Canadian Soil Quality Guidelines, or the Nunavut Guideline for the Management of Contaminated Sites. Please see the attached file. Can you please provide clarification, or a revised table, as to which soil guidelines should be used in our annual report for Petroleum Hydrocarbons in Soil.

2. While in the process of interpreting results, we noticed that the licence does not specify the use of groundwater guidelines when interpreting the results from the groundwater monitoring wells. Please clarify which guidelines are appropriate for use for the groundwater monitoring wells.

Sincerely,

Jackie Barker

Environmental Officer, Prairie and Northern Region

Transport Canada / Government of Canada

jackie.barker@tc.gc.ca / Tel : 204-979-1739 / TTY : 1-888-675-6863

Agent en environnement, Région des Prairies et du Nord

Transports Canada / Gouvernement du Canada
jackie.barker@tc.gc.ca / Tél : 204-979-1739 / ATS : 1-888-675-6863

Appendix D Tables

Table 1 - Summary of Groundwater Monitoring Results
2023 Environmental Monitoring Program
Resolute Bay Airport, Land Treatment Unit
Public Services and Procurement Canada for Transport Canada

Monitoring Well ID	Easting	Northing	Date	Well Condition	CHV (ppm)	Top of Casing (m AGS)	Water Level (m BTOC)	Total Depth (m BTOC)
MW1	441209	8295897	8-Aug-23	Good (no repairs required)	0	0.725	Dry	1.19
MW2	441147	8295871	8-Aug-23	Good (no repairs required)	0	0.781	Dry	1.196
MW3	441155	8295854	8-Aug-23	Poor (well is leaning due to heaving)	0	0.815	Dry	0.923
MW4	441424	8295902	8-Aug-23	Poor (screen is above grade due to heaving, casing is leaning)	0	1.065	Dry	1.257
MW5	441237	8295809	8-Aug-23	Good (no repairs required)	0	0.902	Dry	0.981
MW6	441254	8295814	8-Aug-23	Poor (screen is above grade due to heaving)	0	1.022	Dry	0.932

Notes:
*Well was heaved so the screen was above the surface; therefore, groundwater monitoring and sampling was not completed.

CHV	Combustible headspace vapour concentrations
m AGS	Metres above ground surface
m BTOC	Metres below top of casing
ppm	parts per million

Table 2 - Summary of Surface Water Monitoring Results
2023 Environmental Monitoring Program
Resolute Bay Airport, Land Treatment Unit
Public Services and Procurement Canada for Transport Canada

Monitoring Well ID	Easting	Northing	Date Monitored/Sampled	Temperature (^{o}C)	Conductivity (mS/cm)	pH	ORP (mV)	DO (mg/L)
SW23-4	441229	8295083	8-Aug-23	6.25	646	7.74	-31.5	7.77

Notes:

^{o}C	Degrees Celsius
mS/cm	milliSiemens per centimetre
ORP	Oxidation Reduction Potential
mV	milliVolts
DO	Dissolved Oxygen
mg/L	milligrams per litre

Parameters including Temperature, Conductivity, pH, ORP, and DO were measured at the time of sample collection.

Table 3 - Summary of Surface Water Analytical Results - 2023 Samples
2023 Environmental Monitoring Program
Resolute Bay Airport, Land Treatment Unit
Public Services and Procurement Canada for Transport Canada

Sample Location				SW23-4		
Sample Date				9-Aug-23	9-Aug-23	
Sample ID				SW23-4	QC23-1	
Sampling Company				STANTEC	STANTEC	
Laboratory				BV	BV	
Laboratory Work Order				C371158	C371158	
Laboratory Sample ID				BYQ613	BYQ614	
Sample Type	Units	CCME	Ontario SCS		Field Duplicate	RPD (%)
General Chemistry						
Alkalinity (P as CaCO3)	mg/L	n/v	n/v	<1.0	<1.0	nc
Alkalinity, Bicarbonate (as CaCO3)	mg/L	n/v	n/v	500	510	2%
Alkalinity, Carbonate (as CaCO3)	mg/L	n/v	n/v	<1.0	<1.0	nc
Alkalinity, Hydroxide (as CaCO3)	mg/L	n/v	n/v	<1.0	<1.0	nc
Alkalinity, Total (as CaCO3)	mg/L	n/v	n/v	410	420	2%
Ammonia (as N)	mg/L	$_{TRC2}$[B]	n/v	27	27	0%
Anion Sum	meq/L	n/v	n/v	11	11	nc
Cation Sum	meq/L	n/v	n/v	10	10	nc
Chloride	mg/L	640[A] 120[B]	2,300[C]	72	72	0%
Electrical Conductivity, Lab	µS/cm	n/v	n/a[C]	1,000	1,000	0%
Hardness (as CaCO3)	mg/L	n/v	n/v	350	340	3%
Ion Balance % Difference	%	n/v	n/v	3.3	3.8	nc
Nitrate	mg/L	550[A] 13[B]	n/v	6.8	6.5	5%
Nitrate (as N)	mg/L	124[A] 3.0[B]	n/v	1.5	1.5	0%
Nitrate + Nitrite (as N)	mg/L	n/v	n/v	1.6	1.6	0%
Nitrite	mg/L	0.20_{n1}[B]	n/v	**0.23[B]**	**0.30[B]**	26%
Nitrite (as N)	mg/L	0.060[B]	n/v	**0.070[B]**	**0.091[B]**	26%
pH, lab	S.U.	6.5-9.0[B]	n/v	7.41	7.44	nc
Sulfate	mg/L	n/v	n/v	35	36	3%
Total Dissolved Solids	mg/L	n/v	n/v	560	560	0%
Total Suspended Solids	mg/L	$_{SN}$[B]	n/v	54	47	14%
Metals, Dissolved						
Aluminum	mg/L	n/a	n/v	0.0049	0.0036	nc
Antimony	mg/L	n/a	20[C]	<0.00060	<0.00060	nc
Arsenic	mg/L	n/a	1.9[C]	0.0014	0.0014	0%
Barium	mg/L	n/a	29[C]	0.051	0.051	0%
Beryllium	mg/L	n/a	0.067[C]	<0.0010	<0.0010	nc
Boron	mg/L	n/a	45[C]	0.080	0.081	nc
Cadmium	µg/L	n/a	2.7[C]	<0.020	<0.020	nc
Calcium	mg/L	n/a	n/v	90	90	0%
Chromium	mg/L	n/a	0.81[C]	<0.0010	<0.0010	nc
Cobalt	mg/L	n/a	0.066[C]	0.0027	0.0027	0%
Copper	mg/L	n/a	0.087[C]	0.0014	0.0012	nc
Iron	mg/L	n/a	n/v	0.31	0.31	0%
Lead	mg/L	n/a	0.025[C]	0.012	0.012	0%
Lithium	mg/L	n/a	n/v	<0.020	<0.020	nc
Magnesium	mg/L	n/a	n/v	29	29	0%
Manganese	mg/L	0.54_{EQ3}[A] 12.13_{EQ4}[B]	n/v	0.43	0.43	0%
Molybdenum	mg/L	n/a	9.2[C]	0.0018	0.0017	6%
Nickel	mg/L	n/a	0.49[C]	0.011	0.010	10%
Phosphorus	mg/L	n/a	n/v	<0.10	<0.10	nc
Potassium	mg/L	n/a	n/v	9.4	9.4	0%
Selenium	mg/L	n/a	0.063[C]	0.00068	0.00053	nc
Silicon	mg/L	n/a	n/v	1.6	1.6	nc
Silver	mg/L	n/a	0.0015[C]	<0.00010	<0.00010	nc
Sodium	mg/L	n/a	2,300[C]	30	30	0%
Strontium	mg/L	n/a	n/v	0.31	0.30	3%
Sulfur	mg/L	n/a	n/v	9.6	9.7	1%
Thallium	mg/L	n/a	0.51[C]	<0.00020	<0.00020	nc
Tin	mg/L	n/a	n/v	<0.0010	<0.0010	nc
Titanium	mg/L	n/a	n/v	<0.0010	<0.0010	nc
Uranium	mg/L	n/a	0.42[C]	0.0011	0.0011	0%
Vanadium	mg/L	n/a	0.25[C]	<0.0010	<0.0010	nc
Zinc	mg/L	0.117_{EQ1}[A] 0.024_{EQ2}[B]	1.1[C]	0.0039	<0.0030	nc
Metals, Total						
Aluminum	mg/L	0.10_{VAR1}[B]	n/v	**0.55[B]**	**0.59[B]**	7%
Antimony	mg/L	n/v	20[C]	<0.00060	<0.00060	nc
Arsenic	mg/L	0.0050[B]	1.9[C]	0.0017	0.0016	6%
Barium	mg/L	n/v	29[C]	0.059	0.060	2%
Beryllium	mg/L	n/v	0.067[C]	<0.0010	<0.0010	nc
Boron	mg/L	29[A] 1.5[B]	45[C]	0.084	0.070	nc
Cadmium	mg/L	0.0010_{STB}[A] 0.000090_{LTG}[B]	0.0027[C]	0.000053	0.000057	nc
Calcium	mg/L	n/v	n/v	100	99	1%
Chromium	mg/L	n/v	0.81[C]	0.0012	0.0014	nc
Cobalt	mg/L	n/v	0.066[C]	0.0033	0.0033	0%
Copper	mg/L	0.0040_{TRC1}[B]	0.087[C]	0.0024	0.0026	nc
Iron	mg/L	0.30[B]	n/v	**1.4[B]**	**1.3[B]**	7%
Lead	mg/L	0.0070_{TBC1}[B]	0.025[C]	**0.030[BC]**	**0.030[BC]**	0%
Lithium	mg/L	n/v	n/v	<0.020	<0.020	nc
Magnesium	mg/L	n/v	n/v	32	33	3%
Manganese	mg/L	n/a	n/v	0.54	0.47	14%
Molybdenum	mg/L	0.073[B]	9.2[C]	0.0019	0.0018	5%
Nickel	mg/L	0.150_{TBC1}[B]	0.49[C]	0.012	0.012	0%
Phosphorus	mg/L	n/v	n/v	<0.10	<0.10	nc
Potassium	mg/L	n/v	n/v	16	20	22%
Selenium	mg/L	0.0010[B]	0.063[C]	0.00064	0.00062	nc
Silicon	mg/L	n/v	n/v	3.8	4.0	5%
Silver	mg/L	0.00025[B]	0.0015[C]	<0.00010	<0.00010	nc
Sodium	mg/L	n/v	2,300[C]	43	33	26%
Strontium	mg/L	n/v	n/v	0.32	0.31	3%
Sulfur	mg/L	n/v	n/v	10	9.9	1%
Thallium	mg/L	0.00080[B]	0.51[C]	<0.00020	<0.00020	nc
Tin	mg/L	n/v	n/v	<0.0010	<0.0010	nc
Titanium	mg/L	n/v	n/v	0.028	0.033	16%
Uranium	mg/L	0.033[A] 0.015[B]	0.42[C]	0.0011	0.0012	9%
Vanadium	mg/L	n/v	0.25[C]	0.0019	0.0022	nc
Zinc	mg/L	n/a	1.1[C]	0.0076	0.0074	nc
BTEX and Petroleum Hydrocarbons						
Benzene	mg/L	0.37[B]	0.044[C]	-	<0.00040	-
Toluene	mg/L	0.0020[B]	18[C]	-	0.00054	-
Ethylbenzene	mg/L	0.090[B]	2.3[C]	-	<0.00040	-
Xylene, m & p-	mg/L	n/v	$_{s1}$[C]	-	0.0021	-
Xylene, o-	mg/L	n/v	$_{s1}$[C]	-	0.0021	-
Xylenes, Total	mg/L	n/v	4.2_{s1}[C]	-	0.0042	-
PHC F1 (C6-C10 range)	mg/L	n/v	$_{s7}$[C]	-	0.29	-
PHC F1 (C6-C10 range) minus BTEX	mg/L	n/v	0.75_{s7}[C]	-	0.28	-
Oil and Grease, Total	mg/L	n/v	n/v	5.0	<2.0	nc
Total Extractable Hydrocarbons (C10-C30)	mg/L	n/v	n/v	1.4	1.5	7%
Phenols						
Chloro-3-methyl phenol, 4-	mg/L	n/v	n/v	<0.00010	<0.00010	nc
Chlorophenol, 2- (ortho-Chlorophenol)	mg/L	0.0070[B]	3.3[C]	<0.00010	<0.00010	nc
Chlorophenol, 3 & 4-	mg/L	0.0070[B]	n/v	<0.00010	<0.00010	nc
Cresol (All Isomers)	mg/L	n/v	n/v	0.0015	0.0015	0%
Cresol, m & p- (Methylphenol, 3&4-)	mg/L	0.0040[B]	n/v	0.00060	0.00060	0%
Cresol, o- (Methylphenol, 2-)	mg/L	0.0040[B]	n/v	0.00090	0.00090	0%
Dichlorophenol, 2,4-	mg/L	0.00020[B]	4.6[C]	<0.00010	<0.00010	nc
Dichlorophenol, 2,6-	mg/L	0.00020[B]	n/v	<0.00010	<0.00010	nc
Dimethylphenol, 2,4-	mg/L	n/v	39[C]	0.00030	0.00040	nc
Dinitro-o-cresol, 4,6-	mg/L	n/v	n/v	<0.0010	<0.0010	nc
Dinitrophenol, 2,4-	mg/L	n/v	11[C]	<0.0010	<0.0010	nc
Nitrophenol, 2-	mg/L	n/v	n/v	<0.0010	<0.0010	nc
Nitrophenol, 4-	mg/L	n/v	n/v	<0.0010	<0.0010	nc
Pentachlorophenol	mg/L	0.00050[B]	0.062[C]	<0.00010	<0.00010	nc
Phenol	mg/L	0.0040[B]	12[C]	0.00050	0.00050	0%
Tetrachlorophenol, 2,3,4,6-	mg/L	0.0010[B]	n/v	<0.00010	<0.00010	nc
Tetrachlorophenol, 2,3,5,6-	mg/L	0.0010[B]	n/v	<0.00010	<0.00010	nc
Trichlorophenol, 2,3,4-	mg/L	0.018[B]	n/v	<0.00010	<0.00010	nc
Trichlorophenol, 2,3,5-	mg/L	0.018[B]	n/v	<0.00010	<0.00010	nc
Trichlorophenol, 2,4,5-	mg/L	0.018[B]	1.6[C]	<0.00010	<0.00010	nc
Trichlorophenol, 2,4,6-	mg/L	0.018[B]	0.23[C]	<0.00010	<0.00010	nc

See notes on last page.

Table 3 - Summary of Surface Water Analytical Results - 2023 Samples
2023 Environmental Monitoring Program
Resolute Bay Airport, Land Treatment Unit
Public Services and Procurement Canada for Transport Canada

Notes:

CCME	Canadian Council of Ministers of the Environment
A	Canadian Environmental Quality Guidelines, Canadian Water Quality Guidelines for the Protection of Aquatic Life - Freshwater Aquatics Short Term
B	Canadian Environmental Quality Guidelines, Canadian Water Quality Guidelines for the Protection of Aquatic Life - Freshwater Aquatics Long Term
Ontario SCS	Soil, Ground Water and Sediment Standards for Use under Part XV.I of the Environmental Protection Act (MOE, 2011) Site Condition Standards (SCS)
C	Table 3 - All Types of Property Use - Coarse Textured Soils
6.5[A]	Concentration exceeds the indicated standard.
15.2	Measured concentration did not exceed the indicated standard.
<0.50	Laboratory reporting limit was greater than the applicable standard.
<0.03	Analyte was not detected at a concentration greater than the laboratory reporting limit.
n/a	Not applied.
n/v	No standard/guideline value.
-	Parameter not analyzed / not available.
EQ1	The short-term benchmark is for dissolved zinc and is calculated using the following equation: Benchmark = exp(0.833[ln(hardness mg·L-1)] + 0.240[ln(DOC mg·L-1)] + 0.526). The value in the table is for surface water of 198 mg CaCO3·L−1 hardness and 0.5 mg·L−1 dissolved organic carbon (DOC). The benchmark equation is valid between hardness 13.8 and 250.5 mg CaCO3·L−1 and DOC 0.3 and 17.3 mg·L−1.
EQ2	The long-term CWQG is for dissolved zinc and is calculated using the following equation: CWQG = exp(0.947[ln(hardness mg·L-1)] - 0.815[pH] + 0.398[ln(DOC mg·L-1)] + 4.625). The value in the table is for surface water of 198 mg CaCO3·L−1 hardness, pH of 7.5 and 0.5 mg·L−1 DOC. The CWQG equation is valid between hardness 23.4 and 399 mg CaCO3·L−1, pH 6.5 and 8.13 and DOC 0.3 to 22.9 mg·L−1.
EQ3	The short-term benchmark is calculated using the benchmark calculator in Appendix B of the Scientific Criteria Document for the Development of the Canadian Water Quality Guidelines for the Protection of Aquatic Life: Manganese or the following equation: Benchmark = exp(0.878[ln(hardness)] + 4.76) where the benchmark is expressed in dissolved manganese concentration (µg/L), and hardness is measured as CaCO3 equivalents in mg/L. The value in the table is for surface water of 198 mg/L hardness. The benchmark equation is valid between hardness 25 and 250 mg/L.
EQ4	The long-term CWQG is found using the look-up table (see Table 5) or the CWQG and benchmark calculator is Appendix B of CCME (2019). The value in the table is for surface water of 198 mg/L hardness and pH of 7.6. The CWQG table is valid between hardness 25 and 670 mg/L and pH 5.8 and 8.4.
LTG	The CWQG for cadmium (i.e. long-term guideline) of 0.09 µg·L-1 is for waters of 50 mg CaCO3·L-1 hardness. The CWQG for cadmium is related to water hardness (as CaCO3): When the water hardness is > 0 to < 17 mg/L, the CWQG is 0.04 µg/L; at hardness ≥ 17 to ≤ 280 mg/L, the CWQG is calculated using this equation (CWQG (µg/L) = 10^{0.83(log[hardness]) – 2.46 }); At hardness > 280 mg/L, the CWQG is 0.37 µg/L.
n1	Guideline is expressed as Nitrite (as N) in ug/L. This value is equivalent to 197 ug/L for Nitrite.
n/a	Not applicable.
s1	Standard is applicable to total xylenes, and m & p-xylenes and o-xylenes should be summed for comparison.
s2	Standard is for benzo(b)fluoranthene; however, the analytical laboratory can not distinguish between benzo(b)fluoranthene and benzo(j)fluoranthene, and therefore, the result is a combination of the two isomers, against which the standard has been compared.
s3	Standard is applicable to both 1-methylnaphthalene and 2-methylnaphthalene, with the provision that if both are detected the sum of the two must not exceed the standard.
s7	Standard is applicable to PHC in the F1 range minus BTEX.
s15	Standard is applicable to PHC in the F2 range minus naphthalene. If naphthalene was not analyzed, the standard is applied to F2.
SN	see Narrative
STB	The short-term benchmark concentration of 1.0 µg·L-1 is for waters of 50 mg CaCO3·L-1 hardness. The short-term benchmark for cadmium is related to water hardness (as CaCO3): When the water hardness is 0 to < 5.3 mg/L, the short-term benchmark is 0.11 µg/L, At hardness ≥ 5.3 to ≤ 360 mg/L, the short-term benchmark is calculated using this equation (Short-term benchmark (µg/L) = 10^{1.016(log[hardness]) – 1.71 }); At hardness > 360 mg/L, the short-term benchmark is 7.7 µg/L.
TBC1	Value is minimum value available. Sample-specific value to be calculated (equation).
TBC2	To be calculated (equation), then the present guideline values (mg/L NH3) can be converted to mg/L total ammonia-N by multiplying the corresponding guideline value by 0.8224.
VAR1	Variable, 5 µg/L if pH < 6.5 and 100 µg/L if pH > 6.5
RPD	Relative Percent Difference.
61%	RPD exceeds data quality objective of 40%.
nc	RPD is not calculated if one or more values is non detect or if one or more values is less than five times the reportable detection limit.

Table 4 - Summary of Surface Water Analytical Results - 2019-2023 Samples
2023 Environmental Monitoring Program
Resolute Bay Airport, Land Treatment Unit
Public Services and Procurement Canada for Transport Canada

Sample Location				SW21-1	SW21-2	SW21-3			SW21-4	SW21-6	SW22-1	SW22-2	SW22-3			SW22-4	SW22-7	SW22-BG	SW23-4			FIELD BLANK	
Sample Date				25-Jul-21	25-Jul-21	25-Jul-21	25-Jul-21		25-Jul-21	25-Jul-21	15-Aug-22	14-Aug-22	15-Aug-22	15-Aug-22		15-Aug-22	14-Aug-22	14-Aug-22	9-Aug-23	9-Aug-23		15-Aug-22	15-Aug-22
Sample ID				SW21-1	SW21-2	SW21-3	SW21-DUP		SW21-4	SW21-6	SW22-1	SW22-2	SW22-3	SW22-DUP		SW22-4	SW22-7	SW22-BG	SW23-4	QC23-1		FIELD BLANK	FIELD BLANK Lab-Dup
Sampling Company				STANTEC	STANTEC	STANTEC	STANTEC		STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC		STANTEC	STANTEC	STANTEC	STANTEC	STANTEC		STANTEC	STANTEC
Laboratory				BV	BV	BV	BV		BV	BV	BV	BV	BV	BV		BV	BV	BV	BV	BV		BV	BV
Laboratory Work Order				C154208	C154208	C154208	C154208		C154208	C154208	C267211	C267211	C267211	C267211		C267211	C267211	C267211	C371158	C371158		C267211	C267211
Laboratory Sample ID				ACS915	ACS916	ACS917	ACS921		ACS918	ACS920	BBD270	BBD271	BBD272	BBD275		BBD273	BBD274	BBD276	BYQ613	BYQ614		BBD269	BBD269
Sample Type	Units	CCME	Ontario SCS				Field Duplicate	RPD (%)						Field Duplicate	RPD (%)						RPD (%)	Field Blank	Field Blank
General Chemistry																							
Alkalinity (P as CaCO3)	mg/L	n/v	n/v	3.1	<1.0	<1.0	<1.0	nc	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	nc	<1.0	<1.0	-	<1.0	<1.0	nc	<1.0	-
Alkalinity, Bicarbonate (as CaCO3)	mg/L	n/v	n/v	240	150	170	170	0%	300	150	170	160	290	280	4%	310	150	-	500	510	2%	<1.0	-
Alkalinity, Carbonate (as CaCO3)	mg/L	n/v	n/v	3.7	<1.0	<1.0	<1.0	nc	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	nc	<1.0	<1.0	-	<1.0	<1.0	nc	<1.0	-
Alkalinity, Hydroxide (as CaCO3)	mg/L	n/v	n/v	<1.0	<1.0	<1.0	<1.0	nc	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	nc	<1.0	<1.0	-	<1.0	<1.0	nc	<1.0	-
Alkalinity, Total (as CaCO3)	mg/L	n/v	n/v	200	120	140	140	0%	250	130	140	130	230	230	0%	260	120	-	410	420	2%	<1.0	-
Ammonia (as N)	mg/L	$_{TRCP}$[B]	n/v	<0.015	<0.015	0.022	0.022	nc	0.021	<0.015	0.019	<0.015	8.3	11	28%	17	0.018	-	27	27	0%	<0.015	<0.015
Anion Sum	meq/L	n/v	n/v	4.3	2.8	3.1	3.0	nc	5.4	2.7	3.2	5.4	5.8	5.7	nc	6.3	2.6	-	11	11	nc	0.028	-
Cation Sum	meq/L	n/v	n/v	4.8	2.7	3.2	3.2	nc	5.7	2.6	3.3	5.5	5.6	5.8	nc	7.1	2.6	-	10	10	nc	0.036	-
Chloride	mg/L	640[A] 120[B]	2.300[C]	4.6	11	6.8	6.7	1%	11	5.7	12	86	30	31	3%	26	4.7	-	72	72	0%	<1.0	-
Electrical Conductivity, Lab	µS/cm	n/v	n/a[C]	400	270	280	280	0%	490	260	300	560	560	560	0%	600	250	-	1,000	1,000	0%	<2.0	-
Hardness (as CaCO3)	mg/L	n/v	n/v	220	110	150	140	7%	260	120	140	180	200	200	0%	250	120	-	350	340	3%	<0.50	-
Ion Balance % Difference	%	n/v	n/v	5.0	3.2	1.9	3.1	nc	2.7	1.6	0.76	0.85	1.8	0.27	nc	6.0	0.69	-	3.3	3.8	nc	NC	-
Nitrate	mg/L	550[A] 13[B]	n/v	<0.044	0.28	0.18	0.22	nc	0.37	<0.044	<0.044	2.2	0.40	0.39	3%	13	<0.044	-	6.8	6.5	5%	<0.044	-
Nitrate (as N)	mg/L	124[A] 3.0[B]	n/v	<0.010	0.062	0.041	0.050	nc	0.083	<0.010	<0.010	0.50	0.090	0.088	2%	2.9	<0.010	-	1.5	1.5	0%	<0.010	-
Nitrate + Nitrite (as N)	mg/L	n/v	n/v	<0.010	0.062	0.041	0.050	nc	0.083	<0.010	<0.010	0.50	0.090	0.088	2%	2.9	<0.010	-	1.6	1.6	0%	<0.010	-
Nitrite	mg/L	0.20_{n1}[B]	n/v	<0.033	<0.033	<0.033	<0.033	nc	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	nc	0.11	<0.033	-	**0.23[B]**	**0.30[B]**	26%	<0.033	-
Nitrite (as N)	mg/L	0.060[B]	n/v	<0.010	<0.010	<0.010	<0.010	nc	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	nc	0.035	<0.010	-	**0.070[B]**	**0.091[B]**	26%	<0.010	-
pH, lab	S.U.	6.5-9.0[B]	n/v	8.35	7.88	7.97	8.09	nc	8.27	7.93	7.51	7.56	7.61	7.63	nc	7.91	7.09	-	7.41	7.44	nc	**4.45[B]**	-
Sulfate	mg/L	n/v	n/v	6.1	5.6	3.0	2.0	nc	7.5	2.2	1.3	17	10	11	10%	12	1.3	-	35	36	3%	1.4	-
Total Dissolved Solids	mg/L	n/v	n/v	210	140	150	150	0%	270	130	150	280	290	290	0%	330	120	-	560	560	0%	<10	-
Total Suspended Solids	mg/L	$_{SN}$[B]	n/v	1.3	6.7	6.1	16	**90%**	2.4	14	3.9	3.7	3.3	2.7	nc	1.8	6.4	-	54	47	14%	<1.0	-
Metals, Dissolved																							
Aluminum	mg/L	n/a	n/v	<0.0030	<0.0030	<0.0030	<0.0030	nc	<0.0030	0.0051	0.0062	<0.0030	0.0061	0.0056	nc	0.0035	0.0055	0.0064	0.0049	0.0036	nc	<0.0030	-
Antimony	mg/L	n/a	20[C]	<0.00060	<0.00060	<0.00060	<0.00060	nc	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	nc	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	nc	<0.00060	-
Arsenic	mg/L	n/a	1.9[C]	0.00060	0.00048	0.00032	0.00036	nc	0.00060	0.00024	0.00079	<0.00020	0.00089	0.00080	nc	0.00058	0.00031	0.00049	0.0014	0.0014	0%	<0.00020	-
Barium	mg/L	n/a	29[C]	0.019	<0.010	<0.010	<0.010	nc	0.025	<0.010	<0.010	0.017	0.019	0.019	nc	0.038	0.012	<0.010	0.051	0.051	0%	<0.010	-
Beryllium	mg/L	n/a	0.067[C]	<0.0010	<0.0010	<0.0010	<0.0010	nc	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	nc	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	nc	<0.0010	-
Boron	mg/L	n/a	45[C]	0.045	0.052	0.032	0.029	nc	0.047	<0.020	<0.020	0.16	0.075	0.074	nc	0.064	<0.020	<0.020	0.080	0.081	nc	<0.020	-
Cadmium	µg/L	n/a	2.7[C]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.020	<0.020	nc	-	-
Cadmium	mg/L	n/a	0.0027[C]	<0.000020	<0.000020	<0.000020	<0.000020	nc	<0.000020	<0.000020	<0.00002	<0.00002	<0.00002	<0.00002	nc	<0.00002	<0.00002	<0.000020	-	-	-	<0.00002	-
Calcium	mg/L	n/a	n/v	46	27	37	37	0%	72	26	19	36	47	46	2%	61	28	40	90	90	0%	<0.30	-
Chromium	mg/L	n/a	0.81[C]	0.0011	0.0011	0.0014	0.0011	nc	0.0013	0.0011	<0.0010	<0.0010	<0.0010	<0.0010	nc	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	nc	<0.0010	-
Cobalt	mg/L	n/a	0.066[C]	<0.00030	<0.00030	<0.00030	<0.00030	nc	<0.00030	<0.00030	<0.00030	<0.00030	0.0012	0.0013	nc	0.00039	<0.00030	<0.00030	0.0027	0.0027	0%	<0.00030	-
Copper	mg/L	n/a	0.087[C]	0.0049	0.0043	0.0042	0.00075	nc	0.0034	0.0049	0.0014	<0.0010	0.0016	0.0016	nc	0.0053	0.0013	0.0010	0.0014	0.0012	nc	<0.0010	-
Iron	mg/L	n/a	n/v	<0.060	<0.060	<0.060	<0.060	nc	<0.060	<0.060	<0.060	<0.060	0.087	0.092	nc	<0.060	0.062	<0.060	0.31	0.31	0%	<0.060	-
Lead	mg/L	n/a	0.025[C]	0.00096	<0.00020	0.00090	0.00080	nc	0.0054	<0.00020	0.00047	<0.00020	0.010	0.0098	2%	0.011	0.00085	<0.00020	0.012	0.012	0%	<0.00020	-
Lithium	mg/L	n/a	n/v	<0.020	<0.020	<0.020	<0.020	nc	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	nc	<0.020	<0.020	<0.020	<0.020	<0.020	nc	<0.020	-
Magnesium	mg/L	n/a	n/v	27	11	13	13	0%	19	14	22	21	20	20	0%	23	12	15	29	29	0%	<0.20	-
Manganese	mg/L	0.54_{EO3}[A] 12.13_{EO4}[B]	n/v	<0.0040	<0.0040	<0.0040	<0.0040	nc	<0.0040	<0.0040	<0.0040	<0.0040	0.17	0.17	0%	<0.0040	0.015	0.0040	0.43	0.43	0%	<0.0040	-
Molybdenum	mg/L	n/a	9.2[C]	0.00058	0.00087	0.0011	0.0011	0%	0.00080	0.00080	0.00084	0.0023	0.0032	0.0031	3%	0.00079	0.0022	0.00063	0.0018	0.0017	6%	<0.00020	-
Nickel	mg/L	n/a	0.49[C]	0.0019	<0.00050	0.00051	<0.00050	nc	0.0015	<0.00050	0.0027	<0.00050	0.0059	0.0055	7%	0.0037	0.00090	0.00066	0.011	0.010	10%	<0.00050	-
Phosphorus	mg/L	n/a	n/v	<0.10	<0.10	<0.10	<0.10	nc	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	nc	<0.10	<0.10	<0.10	<0.10	<0.10	nc	<0.10	-
Potassium	mg/L	n/a	n/v	1.4	1.3	1.2	1.2	nc	2.7	0.46	1.3	3.3	6.3	6.2	2%	7.2	0.87	0.43	9.4	9.4	0%	<0.30	-
Selenium	mg/L	n/a	0.063[C]	<0.00020	<0.00020	<0.00020	<0.00020	nc	<0.00020	<0.00020	<0.00020	0.00078	0.00028	0.00028	nc	0.00036	<0.00020	<0.00020	0.00068	0.00053	nc	<0.00020	-
Silicon	mg/L	n/a	n/v	0.72	0.41	0.30	0.27	nc	0.97	<0.10	0.99	0.81	0.62	0.60	nc	0.92	<0.50	<0.50	1.6	1.6	nc	<0.50	-
Silver	mg/L	n/a	0.0015[C]	<0.00010	<0.00010	<0.00010	<0.00010	nc	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	nc	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	nc	<0.00010	-
Sodium	mg/L	n/a	2.300[C]	6.1	8.3	5.4	5.3	2%	9.5	4.1	10	42	19	19	0%	16	4.5	13	30	30	0%	<0.50	-
Strontium	mg/L	n/a	n/v	0.21	0.080	0.11	0.11	0%	0.24	0.069	0.12	0.12	0.17	0.17	0%	0.25	0.12	0.078	0.31	0.30	3%	<0.020	-
Sulfur	mg/L	n/a	n/v	2.4	1.5	0.84	0.85	nc	2.1	0.81	2.0	5.0	4.0	4.0	0%	4.4	1.0	1.1	9.6	9.7	1%	<0.20	-
Thallium	mg/L	n/a	0.51[C]	<0.00020	<0.00020	<0.00020	<0.00020	nc	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	nc	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	nc	<0.00020	-
Tin	mg/L	n/a	n/v	<0.0010	<0.0010	<0.0010	<0.0010	nc	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	nc	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	nc	<0.0010	-
Titanium	mg/L	n/a	n/v	<0.0010	<0.0010	<0.0010	<0.0010	nc	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	nc	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	nc	<0.0010	-
Uranium	mg/L	n/a	0.42[C]	0.00050	0.00020	0.00041	0.00042	nc	0.00059	0.00013	0.00042	0.00035	0.0026	0.0025	4%	0.00064	<0.00010	0.00024	0.0011	0.0011	0%	<0.00010	-
Vanadium	mg/L	n/a	0.25[C]	<0.0010	<0.0010	<0.0010	<0.0010	nc	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	nc	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	nc	<0.0010	-
Zinc	mg/L	0.117_{EQ1}[A] 0.024_{EQ2}[B]	1.1[C]	<0.0030	<0.0030	0.0045	<0.0030	nc	<0.0030	0.0039	<0.0030	<0.0030	<0.0030	<0.0030	nc	<0.0030	<0.0030	<0.0030	0.0039	<0.0030	nc	<0.0030	-

See notes on last page.

Table 4 - Summary of Surface Water Analytical Results - 2019-2023 Samples
2023 Environmental Monitoring Program
Resolute Bay Airport, Land Treatment Unit
Public Services and Procurement Canada for Transport Canada

Sample Location				SW21-1	SW21-2	SW21-3	SW21-3		SW21-4	SW21-6	SW22-1	SW22-2	SW22-3	SW22-3		SW22-4	SW22-7	SW22-BG	SW23-4	SW23-4		FIELD BLANK	FIELD BLANK
Sample Date				25-Jul-21	25-Jul-21	25-Jul-21	25-Jul-21		25-Jul-21	25-Jul-21	15-Aug-22	14-Aug-22	15-Aug-22	15-Aug-22		15-Aug-22	14-Aug-22	14-Aug-22	9-Aug-23	9-Aug-23		15-Aug-22	15-Aug-22
Sample ID				SW21-1	SW21-2	SW21-3	SW21-DUP		SW21-4	SW21-6	SW22-1	SW22-2	SW22-3	SW22-DUP		SW22-4	SW22-7	SW22-BG	SW23-4	QC23-1		FIELD BLANK	FIELD BLANK Lab-Dup
Sampling Company				STANTEC	STANTEC	STANTEC	STANTEC		STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC		STANTEC	STANTEC	STANTEC	STANTEC	STANTEC		STANTEC	STANTEC
Laboratory				BV	BV	BV	BV		BV	BV	BV	BV	BV	BV		BV	BV	BV	BV	BV		BV	BV
Laboratory Work Order				C154208	C154208	C154208	C154208		C154208	C154208	C267211	C267211	C267211	C267211		C267211	C267211	C267211	C371158	C371158		C267211	C267211
Laboratory Sample ID				ACS915	ACS916	ACS917	ACS921		ACS918	ACS920	BBD270	BBD271	BBD272	BBD275		BBD273	BBD274	BBD276	BYQ613	BYQ614		BBD269	BBD269
Sample Type	Units	CCME	Ontario SCS				Field Duplicate	RPD (%)						Field Duplicate	RPD (%)						RPD (%)	Field Blank	Field Blank
Metals, Total																							
Aluminum	mg/L	0.10_{VAR1}[B]	n/v	0.010	0.027	0.011 NH	0.046	nc	0.0047	0.067	0.083	0.0047	0.025	0.023	8%	0.030	0.052	**0.16**[B]	**0.55**[B]	**0.59**[B]	7%	<0.0030	-
Antimony	mg/L	n/v	20[C]	<0.00060	<0.00060	<0.00060	<0.00060	nc	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	nc	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	nc	<0.00060	-
Arsenic	mg/L	0.0050[B]	1.9[C]	0.00054	<0.00020	0.00025	0.00023	nc	0.00050	<0.00020	0.00081	<0.00020	0.00085	0.00086	nc	0.00055	0.00046	0.00054	0.0017	0.0016	6%	<0.00020	-
Barium	mg/L	n/v	29[C]	0.015	<0.010	<0.010	<0.010	nc	0.021	<0.010	<0.010	0.017	0.019	0.019	nc	0.035	0.013	<0.010	0.059	0.060	2%	<0.010	-
Beryllium	mg/L	n/v	0.067[C]	<0.0010	<0.0010	<0.0010	<0.0010	nc	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	nc	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	nc	<0.0010	-
Boron	mg/L	29[A] 1.5[B]	45[C]	0.030	0.053	0.030	0.042	nc	0.045	0.022	0.027	0.17	0.076	0.081	nc	0.069	0.025	<0.020	0.084	0.070	nc	<0.020	-
Cadmium	mg/L	0.0010_{STB}[A] 0.000090_{LTG}[B]	0.0027^{C}	<0.000020	<0.000020	<0.000020	<0.000020	nc	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	nc	<0.000020	<0.000020	<0.000020	0.000053	0.000057	nc	<0.000020	-
Calcium	mg/L	n/v	n/v	44	30	35	36	3%	71	28	19	35	45	45	0%	64	30	43	100	99	1%	<0.30	-
Chromium	mg/L	n/v	0.81[C]	<0.0010	0.0015	<0.0010	<0.0010	nc	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010 RY	<0.0010	nc	<0.0010	<0.0010	<0.0010	0.0012	0.0014	nc	<0.0010	-
Cobalt	mg/L	n/v	0.066[C]	<0.00030	<0.00030	<0.00030	<0.00030	nc	<0.00030	<0.00030	<0.00030	<0.00030	0.0013	0.0013	nc	0.00042	<0.00030	<0.00030	0.0033	0.0033	0%	<0.00030	-
Copper	mg/L	0.0040_{TBC1}[B]	0.087[C]	0.00081	0.00028	0.00040 NH	0.00046	nc	0.0011	0.00046	<0.0010	<0.0010	0.0016	0.0015	nc	0.0017	<0.0010	<0.0010	0.0024	0.0026	nc	<0.0010	-
Iron	mg/L	0.30[B]	n/v	<0.060	<0.060	<0.060	<0.060	nc	<0.060	<0.060	0.15	<0.060	0.12	0.12	nc	<0.060	0.20	**0.36**[B]	**1.4**[B]	**1.3**[B]	7%	<0.060	-
Lead	mg/L	0.0070_{TBC1}[B]	0.025[C]	0.0011	<0.00020	0.00095	0.0011	nc	0.0062	<0.00020	0.00097	<0.00020	**0.012**[B]	**0.011**[B]	9%	**0.012**[B]	0.0028	0.00030	**0.030**[BC]	**0.030**[BC]	0%	<0.00020	-
Lithium	mg/L	n/v	n/v	<0.020	<0.020	<0.020	0.022	nc	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	nc	<0.020	<0.020	<0.020	<0.020	<0.020	nc	<0.020	-
Magnesium	mg/L	n/v	n/v	26	12	13	13	0%	19	16	22	20	19	19	0%	24	12	16	32	33	3%	<0.20	-
Manganese	mg/L	n/a	n/v	<0.0040	<0.0040	<0.0040	0.0042	nc	<0.0040	<0.0040	0.0080	<0.0040	0.17	0.16	6%	<0.0040	0.031	0.010	0.54	0.47	14%	<0.0040	-
Molybdenum	mg/L	0.073[B]	9.2[C]	0.00064	0.00095	0.0010	0.0012	18%	0.00068	0.00077	0.00094	0.0025	0.0032	0.0032	0%	0.00082	0.00053	0.00058	0.0019	0.0018	5%	<0.00020	-
Nickel	mg/L	0.150_{TBC1}[B]	0.49[C]	0.0024	<0.00050	0.0031	0.0016	nc	0.0023	<0.00050	0.0030	<0.00050	0.0063	0.0059	7%	0.0040	0.0011	0.00079	0.012	0.012	0%	<0.00050	-
Phosphorus	mg/L	n/v	n/v	<0.10	<0.10	<0.10	<0.10	nc	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	nc	<0.10	<0.10	<0.10	<0.10	<0.10	nc	<0.10	-
Potassium	mg/L	n/v	n/v	1.4	1.6	1.2	1.3	nc	2.8	0.53	1.3	3.1	6.0	6.1	2%	7.4	0.90	0.54	16	20	22%	<0.30	-
Selenium	mg/L	0.0010[B]	0.063[C]	<0.00020	<0.00020	<0.00020	<0.00020	nc	<0.00020	<0.00020	<0.00020	0.00050	<0.00020	0.00033	nc	0.00033	<0.00020	<0.00020	0.00064	0.00062	nc	<0.00020	-
Silicon	mg/L	n/v	n/v	0.78	0.60	0.38	0.43	nc	1.1	<0.10	1.5	1.2	1.1	1.2	nc	1.3	0.67	1.0	3.8	4.0	5%	<0.50	-
Silver	mg/L	0.00025[B]	0.0015[C]	<0.00010	<0.00010	<0.00010	<0.00010	nc	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	nc	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	nc	<0.00010	-
Sodium	mg/L	n/v	2.300[C]	5.7	8.9	4.9	5.2	6%	9.0	4.4	9.8	41	18	18	0%	17	4.6	13	43	33	26%	<0.50	-
Strontium	mg/L	n/v	n/v	0.20	0.087	0.098	0.11	nc	0.23	0.073	0.12	0.11	0.16	0.16	0%	0.25	0.12	0.080	0.32	0.31	3%	<0.020	-
Sulfur	mg/L	n/v	n/v	2.6	1.8	0.93	0.92	nc	2.3	0.90	1.8	5.1	3.9	4.0	3%	4.8	1.2	0.88	10	9.9	1%	<0.20	-
Thallium	mg/L	0.00080[B]	0.51[C]	<0.00020	<0.00020	<0.00020	<0.00020	nc	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	nc	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	nc	<0.00020	-
Tin	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	nc	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	nc	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	nc	<0.0010	-
Titanium	mg/L	n/v	n/v	<0.0010	0.0014	<0.0010	<0.0010	nc	<0.0010	<0.0010	0.0027	<0.0010	0.0014	0.0011	nc	<0.0010	0.0013	0.0063	0.028	0.033	16%	<0.0010	-
Uranium	mg/L	0.033[A] 0.015[B]	0.42[C]	0.00048	0.00020	0.00038	0.00040	nc	0.00061	0.00014	0.00043	0.00037	0.0026	0.0025	4%	0.00073	0.00013	0.00017	0.0011	0.0012	9%	<0.00010	-
Vanadium	mg/L	n/v	0.25[C]	<0.0010	<0.0010	<0.0010	<0.0010	nc	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	nc	<0.0010	<0.0010	<0.0010	0.0019	0.0022	nc	<0.0010	-
Zinc	mg/L	n/a	1.1[C]	<0.0030	0.0064	0.0054 NH	<0.0030	nc	0.0037	0.0041	<0.0030	<0.0030	<0.0030	<0.0030	nc	<0.0030	<0.0030	<0.0030	0.0076	0.0074	nc	<0.0030	-
BTEX and Petroleum Hydrocarbons																							
Benzene	mg/L	0.37[B]	0.044[C]	<0.00040	<0.00040	<0.00040	<0.00040	nc	<0.00040	<0.00040	<0.00040	<0.00040	0.013	0.012	8%	<0.00040	<0.00040	-	-	<0.00040	-	<0.00040	-
Toluene	mg/L	0.0020[B]	18[C]	<0.00040	<0.00040	<0.00040	<0.00040	nc	<0.00040	<0.00040	<0.00040	<0.00040	**0.047**[B]	**0.046**[B]	2%	<0.00040	<0.00040	-	-	0.00054	-	<0.00040	-
Ethylbenzene	mg/L	0.090[B]	2.3[C]	<0.00040	<0.00040	<0.00040	<0.00040	nc	<0.00040	<0.00040	<0.00040	<0.00040	0.00096	0.00095	nc	<0.00040	<0.00040	-	-	<0.00040	-	<0.00040	-
Xylene, m & p-	mg/L	n/v	$_{s1}$[C]	<0.00080	<0.00080	<0.00080	<0.00080	nc	<0.00080	<0.00080	<0.00080	<0.00080	0.012	0.012	0%	<0.00080	<0.00080	-	-	0.0021	-	<0.00080	-
Xylene, o-	mg/L	n/v	$_{s1}$[C]	<0.00040	<0.00040	<0.00040	<0.00040	nc	<0.00040	<0.00040	<0.00040	<0.00040	0.011	0.011	0%	<0.00040	<0.00040	-	-	0.0021	-	<0.00040	-
Xylenes, Total	mg/L	n/v	4.2_{s1}[C]	<0.00089	<0.00089	<0.00089	<0.00089	nc	<0.00089	<0.00089	<0.00089	<0.00089	0.023	0.023	0%	<0.00089	<0.00089	-	-	0.0042	-	<0.00089	-
PHC F1 (C6-C10 range)	mg/L	n/v	$_{s7}$[C]	<0.10	<0.10	<0.10	<0.10	nc	<0.10	<0.10	<0.10	<0.10	0.19	0.20	nc	<0.10	<0.10	-	-	0.29	-	<0.10	-
PHC F1 (C6-C10 range) minus BTEX	mg/L	n/v	0.75_{s7}[C]	<0.10	<0.10	<0.10	<0.10	nc	<0.10	<0.10	<0.10	<0.10	0.10	0.12	nc	<0.10	<0.10	-	-	0.28	-	<0.10	-
PHC F2 (>C10-C16 range)	mg/L	n/v	0.15_{s15}[C]	<0.10	<0.10	<0.10	<0.10	nc	<0.10	<0.10	<0.10	<0.10	**0.20**[C]	**0.17**[C]	nc	0.15	<0.10	-	-	-	-	<0.10	-
Oil and Grease, Total	mg/L	n/v	n/v	<2.0	<2.0	<2.0	<2.0	nc	<2.0	<2.0	<2.0	3.0	<2.0	3.0	nc	4.0	<2.0	-	5.0	<2.0	nc	2.0	-
Total Extractable Hydrocarbons (C10-C30)	mg/L	n/v	n/v	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.4	1.5	7%	-	-

See notes on last page.

Table 4 - Summary of Surface Water Analytical Results - 2019-2023 Samples
2023 Environmental Monitoring Program
Resolute Bay Airport, Land Treatment Unit
Public Services and Procurement Canada for Transport Canada

Sample Location				SW21-1	SW21-2	SW21-3			SW21-4	SW21-6	SW22-1	SW22-2	SW22-3			SW22-4	SW22-7	SW22-BG	SW23-4			FIELD BLANK	
Sample Date				25-Jul-21	25-Jul-21	25-Jul-21	25-Jul-21		25-Jul-21	25-Jul-21	15-Aug-22	14-Aug-22	15-Aug-22	15-Aug-22		15-Aug-22	14-Aug-22	14-Aug-22	9-Aug-23	9-Aug-23		15-Aug-22	15-Aug-22
Sample ID				SW21-1	SW21-2	SW21-3	SW21-DUP		SW21-4	SW21-6	SW22-1	SW22-2	SW22-3	SW22-DUP		SW22-4	SW22-7	SW22-BG	SW23-4	QC23-1		FIELD BLANK	FIELD BLANK Lab-Dup
Sampling Company				STANTEC	STANTEC	STANTEC	STANTEC		STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC		STANTEC	STANTEC	STANTEC	STANTEC	STANTEC		STANTEC	STANTEC
Laboratory				BV	BV	BV	BV		BV	BV	BV	BV	BV	BV		BV	BV	BV	BV	BV		BV	BV
Laboratory Work Order				C154208	C154208	C154208	C154208		C154208	C154208	C267211	C267211	C267211	C267211		C267211	C267211	C267211	C371158	C371158		C267211	C267211
Laboratory Sample ID				ACS915	ACS916	ACS917	ACS921		ACS918	ACS920	BBD270	BBD271	BBD272	BBD275		BBD273	BBD274	BBD276	BYQ613	BYQ614		BBD269	BBD269
Sample Type	Units	CCME	Ontario SCS				Field Duplicate	RPD (%)						Field Duplicate	RPD (%)						RPD (%)	Field Blank	Field Blank
Polycyclic Aromatic Hydrocarbons																							
Acenaphthene	mg/L	0.0058[B]	0.60[C]	<0.00010	<0.00010	<0.00010	<0.00010	nc	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	nc	<0.00010	<0.00010	-	-	-	-	<0.00010	-
Acenaphthylene	mg/L	n/v	0.0018[C]	<0.00010	<0.00010	<0.00010	<0.00010	nc	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	nc	<0.00010	<0.00010	-	-	-	-	<0.00010	-
Acridine	mg/L	0.0044[B]	n/v	<0.000040	<0.000040	<0.000040	<0.000040	nc	<0.000040	<0.000040	<0.000040	<0.000040	<0.000040	<0.000040	nc	<0.000040	<0.000040	-	-	-	-	<0.000040	-
Anthracene	mg/L	0.000012[B]	0.0024[C]	<0.000010	<0.000010	<0.000010	<0.000010	nc	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	nc	<0.000010	<0.000010	-	-	-	-	<0.000010	-
Benzo(a)anthracene	mg/L	0.000018[B]	0.0047[C]	<0.0000085	<0.0000085	<0.0000085	<0.0000085	nc	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	nc	<0.0000085	<0.0000085	-	-	-	-	<0.0000085	-
Benzo(a)pyrene	mg/L	0.000015[B]	0.00081[C]	<0.0000075	<0.0000075	<0.0000075	<0.0000075	nc	<0.0000075	<0.0000075	<0.0000075	<0.0000075	<0.0000075	<0.0000075	nc	<0.0000075	<0.0000075	-	-	-	-	<0.0000075	-
Benzo(b)pyridine (Quinoline)	mg/L	0.0034[B]	n/v	<0.00020	<0.00020	<0.00020	<0.00020	nc	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	nc	<0.00020	<0.00020	-	-	-	-	<0.00020	-
Benzo(b/j)fluoranthene	mg/L	n/v	0.00075$_{b2}$[C]	<0.0000085	<0.0000085	<0.0000085	<0.0000085	nc	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	nc	<0.0000085	<0.0000085	-	-	-	-	<0.0000085	-
Benzo(c)phenanthrene	mg/L	n/v	n/v	<0.000050	<0.000050	<0.000050	<0.000050	nc	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	nc	<0.000050	<0.000050	-	-	-	-	<0.000050	-
Benzo(e)pyrene	mg/L	n/v	n/v	<0.000050	<0.000050	<0.000050	<0.000050	nc	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	nc	<0.000050	<0.000050	-	-	-	-	<0.000050	-
Benzo(g,h,i)perylene	mg/L	n/v	0.00020[C]	<0.0000085	<0.0000085	<0.0000085	<0.0000085	nc	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	nc	<0.0000085	<0.0000085	-	-	-	-	<0.0000085	-
Benzo(k)fluoranthene	mg/L	n/v	0.00040[C]	<0.0000085	<0.0000085	<0.0000085	<0.0000085	nc	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	nc	<0.0000085	<0.0000085	-	-	-	-	<0.0000085	-
Chrysene	mg/L	n/v	0.0010[C]	<0.0000085	<0.0000085	<0.0000085	<0.0000085	nc	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	nc	<0.0000085	<0.0000085	-	-	-	-	<0.0000085	-
Dibenzo(a,h)anthracene	mg/L	n/v	0.00052[C]	<0.0000075	<0.0000075	<0.0000075	<0.0000075	nc	<0.0000075	<0.0000075	<0.0000075	<0.0000075	<0.0000075	<0.0000075	nc	<0.0000075	<0.0000075	-	-	-	-	<0.0000075	-
Fluoranthene	mg/L	0.000040[B]	0.13[C]	<0.000010 MSP	<0.000010	<0.000010	<0.000010	nc	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	nc	<0.000010	<0.000010	-	-	-	-	<0.000010	-
Fluorene	mg/L	0.0030[B]	0.40[C]	<0.000050	<0.000050	<0.000050	<0.000050	nc	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	nc	<0.000050	<0.000050	-	-	-	-	<0.000050	-
Indeno(1,2,3-cd)pyrene	mg/L	n/v	0.00020[C]	<0.0000085	<0.0000085	<0.0000085	<0.0000085	nc	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	<0.0000085	nc	<0.0000085	<0.0000085	-	-	-	-	<0.0000085	-
Methylnaphthalene (Total)	mg/L	n/v	1.8$_{s3}$[C]	<0.00010	<0.00010	<0.00010	<0.00010	nc	<0.00010	<0.00010	<0.00010	<0.00010	0.00032	0.00034	nc	<0.00010	<0.00010	-	-	-	-	<0.00010	-
Methylnaphthalene, 1-	mg/L	n/v	$_{s3}$[C]	<0.00010	<0.00010	<0.00010	<0.00010	nc	<0.00010	<0.00010	<0.00010	<0.00010	0.00019	0.00020	nc	<0.00010	<0.00010	-	-	-	-	<0.00010	-
Methylnaphthalene, 2-	mg/L	n/v	$_{s3}$[C]	<0.00010	<0.00010	<0.00010	<0.00010	nc	<0.00010	<0.00010	<0.00010	<0.00010	0.00013	0.00014	nc	<0.00010	<0.00010	-	-	-	-	<0.00010	-
Naphthalene	mg/L	0.0011[B]	1.4[C]	<0.00010	<0.00010	<0.00010	<0.00010	nc	<0.00010	<0.00010	<0.00010	<0.00010	0.00052	0.00054	4%	<0.00010	<0.00010	-	-	-	-	<0.00010	-
Perylene	mg/L	n/v	n/v	<0.000050	<0.000050	<0.000050	<0.000050	nc	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	nc	<0.000050	<0.000050	-	-	-	-	<0.000050	-
Phenanthrene	mg/L	0.00040[B]	0.58[C]	<0.000050	<0.000050	<0.000050	<0.000050	nc	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	nc	<0.000050	<0.000050	-	-	-	-	<0.000050	-
Pyrene	mg/L	0.000025[B]	0.068[C]	<0.000020 MSP	<0.000020	<0.000020	<0.000020	nc	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	nc	<0.000020	<0.000020	-	-	-	-	<0.000020	-
Benzo(a)pyrene Total Potency Equivalents	mg/L	n/v	n/v	<0.000010	<0.000010	<0.000010	<0.000010	nc	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	nc	<0.000010	<0.000010	-	-	-	-	<0.000010	-
Phenols																							
Chloro-3-methyl phenol, 4-	mg/L	n/v	n/v	<0.00010	<0.00010	<0.00010	<0.00010	nc	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	nc	<0.00010	<0.00010	-	<0.00010	<0.00010	nc	<0.00010	-
Chlorophenol, 2- (ortho-Chlorophenol)	mg/L	0.0070[B]	3.3[C]	<0.00010	<0.00010	<0.00010	<0.00010	nc	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	nc	<0.00010	<0.00010	-	<0.00010	<0.00010	nc	<0.00010	-
Chlorophenol, 3 & 4-	mg/L	0.0070[B]	n/v	<0.00010	<0.00010	<0.00010	<0.00010	nc	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	nc	<0.00010	<0.00010	-	<0.00010	<0.00010	nc	<0.00010	-
Cresol (All Isomers)	mg/L	n/v	n/v	<0.00014	<0.00014	<0.00014	<0.00014	nc	0.00040	<0.00014	<0.00014	<0.00014	0.0038	0.0036	5%	0.0011	0.00030	-	0.0015	0.0015	0%	<0.00014	-
Cresol, m & p- (Methylphenol, 3&4-)	mg/L	0.0040[B]	n/v	0.00010	<0.00010	<0.00010	<0.00010	nc	0.00020	<0.00010	<0.00010	<0.00010	0.0023	0.0021	9%	0.00030	0.00030	-	0.00060	0.00060	0%	<0.00010	-
Cresol, o- (Methylphenol, 2-)	mg/L	0.0040[B]	n/v	<0.00010	<0.00010	<0.00010	<0.00010	nc	0.00020	<0.00010	<0.00010	<0.00010	0.0015	0.0015	0%	0.00080	<0.00010	-	0.00090	0.00090	0%	<0.00010	-
Dichlorophenol, 2,4-	mg/L	0.00020[B]	4.6[C]	<0.00010	<0.00010	<0.00010	<0.00010	nc	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	nc	<0.00010	<0.00010	-	<0.00010	<0.00010	nc	<0.00010	-
Dichlorophenol, 2,6-	mg/L	0.00020[B]	n/v	<0.00010	<0.00010	<0.00010	<0.00010	nc	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	nc	<0.00010	<0.00010	-	<0.00010	<0.00010	nc	<0.00010	-
Dimethylphenol, 2,4-	mg/L	n/v	39[C]	0.00040	<0.00010	<0.00010	<0.00010	nc	0.00050	<0.00010	<0.00010	<0.00010	0.00010	0.00020	nc	0.00010	<0.00010	-	0.00030	0.00040	nc	<0.00010	-
Dinitro-o-cresol, 4,6-	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	nc	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	nc	<0.0010	<0.0010	-	<0.0010	<0.0010	nc	<0.0010	-
Dinitrophenol, 2,4-	mg/L	n/v	11[C]	<0.0010	<0.0010	<0.0010	<0.0010	nc	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	nc	<0.0010	<0.0010	-	<0.0010	<0.0010	nc	<0.0010	-
Nitrophenol, 2-	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	nc	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	nc	<0.0010	<0.0010	-	<0.0010	<0.0010	nc	<0.0010	-
Nitrophenol, 4-	mg/L	n/v	n/v	<0.0010	<0.0010	<0.0010	<0.0010	nc	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	nc	<0.0010	<0.0010	-	<0.0010	<0.0010	nc	<0.0010	-
Pentachlorophenol	mg/L	0.00050[B]	0.062[C]	<0.00010	<0.00010	<0.00010	<0.00010	nc	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	nc	<0.00010	<0.00010	-	<0.00010	<0.00010	nc	<0.00010	-
Phenol	mg/L	0.0040[B]	12[C]	<0.00010	<0.00010	<0.00010	<0.00010	nc	<0.00010	<0.00010	<0.00010	<0.00010	0.0018	0.0017	6%	<0.00010	<0.00010	-	0.00050	0.00050	0%	<0.00010	-
Tetrachlorophenol, 2,3,4,6-	mg/L	0.0010[B]	n/v	<0.00010	<0.00010	<0.00010	<0.00010	nc	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	nc	<0.00010	<0.00010	-	<0.00010	<0.00010	nc	<0.00010	-
Tetrachlorophenol, 2,3,5,6-	mg/L	0.0010[B]	n/v	<0.00010	<0.00010	<0.00010	<0.00010	nc	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	nc	<0.00010	<0.00010	-	<0.00010	<0.00010	nc	<0.00010	-
Trichlorophenol, 2,3,4-	mg/L	0.018[B]	n/v	<0.00010	<0.00010	<0.00010	<0.00010	nc	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	nc	<0.00010	<0.00010	-	<0.00010	<0.00010	nc	<0.00010	-
Trichlorophenol, 2,3,5-	mg/L	0.018[B]	n/v	<0.00010	<0.00010	<0.00010	<0.00010	nc	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	nc	<0.00010	<0.00010	-	<0.00010	<0.00010	nc	<0.00010	-
Trichlorophenol, 2,4,5-	mg/L	0.018[B]	1.6[C]	<0.00010	<0.00010	<0.00010	<0.00010	nc	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	nc	<0.00010	<0.00010	-	<0.00010	<0.00010	nc	<0.00010	-
Trichlorophenol, 2,4,6-	mg/L	0.018[B]	0.23[C]	<0.00010	<0.00010	<0.00010	<0.00010	nc	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	nc	<0.00010	<0.00010	-	<0.00010	<0.00010	nc	<0.00010	-

See notes on last page.

Table 4 - Summary of Surface Water Analytical Results - 2019-2023 Samples
2023 Environmental Monitoring Program
Resolute Bay Airport, Land Treatment Unit
Public Services and Procurement Canada for Transport Canada

Sample Location				TRIP BLANK
Sample Date				15-Aug-22
Sample ID				TRIP BLANK
Sampling Company				STANTEC
Laboratory				BV
Laboratory Work Order				C267211
Laboratory Sample ID				BBD268
Sample Type	Units	CCME	Ontario SCS	Trip Blank
General Chemistry				
Alkalinity (P as CaCO3)	mg/L	n/v	n/v	<1.0
Alkalinity, Bicarbonate (as CaCO3)	mg/L	n/v	n/v	<1.0
Alkalinity, Carbonate (as CaCO3)	mg/L	n/v	n/v	<1.0
Alkalinity, Hydroxide (as CaCO3)	mg/L	n/v	n/v	<1.0
Alkalinity, Total (as CaCO3)	mg/L	n/v	n/v	<1.0
Ammonia (as N)	mg/L	$_{TRC?}$[B]	n/v	<0.015
Anion Sum	meq/L	n/v	n/v	0.0000
Cation Sum	meq/L	n/v	n/v	0.035
Chloride	mg/L	640[A] 120[B]	2.300[C]	<1.0
Electrical Conductivity, Lab	µS/cm	n/v	n/a[C]	<2.0
Hardness (as CaCO3)	mg/L	n/v	n/v	<0.50
Ion Balance % Difference	%	n/v	n/v	NC
Nitrate	mg/L	550[A] 13[B]	n/v	<0.044
Nitrate (as N)	mg/L	124[A] 3.0[B]	n/v	<0.010
Nitrate + Nitrite (as N)	mg/L	n/v	n/v	<0.010
Nitrite	mg/L	0.20_{n1}[B]	n/v	<0.033
Nitrite (as N)	mg/L	0.060[B]	n/v	<0.010
pH, lab	S.U.	6.5-9.0[B]	n/v	**4.46[B]**
Sulfate	mg/L	n/v	n/v	<1.0
Total Dissolved Solids	mg/L	n/v	n/v	<10
Total Suspended Solids	mg/L	$_{SN}$[B]	n/v	<0.96
Metals, Dissolved				
Aluminum	mg/L	n/a	n/v	<0.0030
Antimony	mg/L	n/a	20[C]	<0.00060
Arsenic	mg/L	n/a	1.9[C]	<0.00020
Barium	mg/L	n/a	29[C]	<0.010
Beryllium	mg/L	n/a	0.067[C]	<0.0010
Boron	mg/L	n/a	45[C]	<0.020
Cadmium	µg/L	n/a	2.7[C]	-
Cadmium	mg/L	n/a	0.0027[C]	<0.00002
Calcium	mg/L	n/a	n/v	<0.30
Chromium	mg/L	n/a	0.81[C]	<0.0010
Cobalt	mg/L	n/a	0.066[C]	<0.00030
Copper	mg/L	n/a	0.087[C]	<0.0010
Iron	mg/L	n/a	n/v	<0.060
Lead	mg/L	n/a	0.025[C]	<0.00020
Lithium	mg/L	n/a	n/v	<0.020
Magnesium	mg/L	n/a	n/v	<0.20
Manganese	mg/L	0.54_{EO3}[A] 12.13_{EO4}[B]	n/v	<0.0040
Molybdenum	mg/L	n/a	9.2[C]	<0.00020
Nickel	mg/L	n/a	0.49[C]	<0.00050
Phosphorus	mg/L	n/a	n/v	<0.10
Potassium	mg/L	n/a	n/v	<0.30
Selenium	mg/L	n/a	0.063[C]	<0.00020
Silicon	mg/L	n/a	n/v	<0.50
Silver	mg/L	n/a	0.0015[C]	<0.00010
Sodium	mg/L	n/a	2.300[C]	<0.50
Strontium	mg/L	n/a	n/v	<0.020
Sulfur	mg/L	n/a	n/v	<0.20
Thallium	mg/L	n/a	0.51[C]	<0.00020
Tin	mg/L	n/a	n/v	<0.0010
Titanium	mg/L	n/a	n/v	<0.0010
Uranium	mg/L	n/a	0.42[C]	<0.00010
Vanadium	mg/L	n/a	0.25[C]	<0.0010
Zinc	mg/L	0.117_{EQ1}[A] 0.024_{EQ2}[B]	1.1[C]	<0.0030

See notes on last page.

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2023 Environmental Monitoring Program
Resolute Bay Airport, Land Treatment Unit
Public Services and Procurement Canada for Transport Canada

Sample Location				TRIP BLANK
Sample Date				15-Aug-22
Sample ID				TRIP BLANK
Sampling Company				STANTEC
Laboratory				BV
Laboratory Work Order				C267211
Laboratory Sample ID				BBD268
Sample Type	Units	CCME	Ontario SCS	Trip Blank
Metals, Total				
Aluminum	mg/L	0.10_{VAR1}[B]	n/v	0.0032
Antimony	mg/L	n/v	20[C]	<0.00060
Arsenic	mg/L	0.0050[B]	1.9[C]	<0.00020
Barium	mg/L	n/v	29[C]	<0.010
Beryllium	mg/L	n/v	0.067[C]	<0.0010
Boron	mg/L	29[A] 1.5[B]	45[C]	<0.020
Cadmium	mg/L	0.0010_{STB}[A] 0.000090_{LTG}[B]	0.0027[C]	<0.000020
Calcium	mg/L	n/v	n/v	<0.30
Chromium	mg/L	n/v	0.81[C]	<0.0010
Cobalt	mg/L	n/v	0.066[C]	<0.00030
Copper	mg/L	0.0040_{TBC1}[B]	0.087[C]	<0.0010
Iron	mg/L	0.30[B]	n/v	<0.060
Lead	mg/L	0.0070_{TBC1}[B]	0.025[C]	<0.00020
Lithium	mg/L	n/v	n/v	<0.020
Magnesium	mg/L	n/v	n/v	<0.20
Manganese	mg/L	n/a	n/v	<0.0040
Molybdenum	mg/L	0.073[B]	9.2[C]	<0.00020
Nickel	mg/L	0.150_{TBC1}[B]	0.49[C]	<0.00050
Phosphorus	mg/L	n/v	n/v	<0.10
Potassium	mg/L	n/v	n/v	<0.30
Selenium	mg/L	0.0010[B]	0.063[C]	<0.00020
Silicon	mg/L	n/v	n/v	<0.50
Silver	mg/L	0.00025[B]	0.0015[C]	<0.00010
Sodium	mg/L	n/v	2,300[C]	<0.50
Strontium	mg/L	n/v	n/v	<0.020
Sulfur	mg/L	n/v	n/v	<0.20
Thallium	mg/L	0.00080[B]	0.51[C]	<0.00020
Tin	mg/L	n/v	n/v	<0.0010
Titanium	mg/L	n/v	n/v	<0.0010
Uranium	mg/L	0.033[A] 0.015[B]	0.42[C]	<0.00010
Vanadium	mg/L	n/v	0.25[C]	<0.0010
Zinc	mg/L	n/a	1.1[C]	<0.0030
BTEX and Petroleum Hydrocarbons				
Benzene	mg/L	0.37[B]	0.044[C]	<0.00040
Toluene	mg/L	0.0020[B]	18[C]	<0.00040
Ethylbenzene	mg/L	0.090[B]	2.3[C]	<0.00040
Xylene, m & p-	mg/L	n/v	[C]	<0.00080
Xylene, o-	mg/L	n/v	[C]	<0.00040
Xylenes, Total	mg/L	n/v	$4.2_{\leq 1}$[C]	<0.00089
PHC F1 (C6-C10 range)	mg/L	n/v	[C]	<0.10
PHC F1 (C6-C10 range) minus BTEX	mg/L	n/v	$0.75_{\leq 7}$[C]	<0.10
PHC F2 (>C10-C16 range)	mg/L	n/v	$0.15_{\leq 15}$[C]	<0.10
Oil and Grease, Total	mg/L	n/v	n/v	<2.0
Total Extractable Hydrocarbons (C10-C30)	mg/L	n/v	n/v	-

See notes on last page.

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Sample Location				TRIP BLANK
Sample Date				15-Aug-22
Sample ID				TRIP BLANK
Sampling Company				STANTEC
Laboratory				BV
Laboratory Work Order				C267211
Laboratory Sample ID				BBD268
Sample Type	Units	CCME	Ontario SCS	Trip Blank
Polycyclic Aromatic Hydrocarbons				
Acenaphthene	mg/L	0.0058[B]	0.60[C]	<0.00010
Acenaphthylene	mg/L	n/v	0.0018[C]	<0.00010
Acridine	mg/L	0.0044[B]	n/v	<0.000040
Anthracene	mg/L	0.000012[B]	0.0024[C]	<0.000010
Benzo(a)anthracene	mg/L	0.000018[B]	0.0047[C]	<0.0000085
Benzo(a)pyrene	mg/L	0.000015[B]	0.00081[C]	<0.0000075
Benzo(b)pyridine (Quinoline)	mg/L	0.0034[B]	n/v	<0.00020
Benzo(b/j)fluoranthene	mg/L	n/v	0.00075$_{b2}$[C]	<0.0000085
Benzo(c)phenanthrene	mg/L	n/v	n/v	<0.000050
Benzo(e)pyrene	mg/L	n/v	n/v	<0.000050
Benzo(g,h,i)perylene	mg/L	n/v	0.00020[C]	<0.0000085
Benzo(k)fluoranthene	mg/L	n/v	0.00040[C]	<0.0000085
Chrysene	mg/L	n/v	0.0010[C]	<0.0000085
Dibenzo(a,h)anthracene	mg/L	n/v	0.00052[C]	<0.0000075
Fluoranthene	mg/L	0.000040[B]	0.13[C]	<0.000010
Fluorene	mg/L	0.0030[B]	0.40[C]	<0.000050
Indeno(1,2,3-cd)pyrene	mg/L	n/v	0.00020[C]	<0.0000085
Methylnaphthalene (Total)	mg/L	n/v	1.8$_{s3}$[C]	<0.00010
Methylnaphthalene, 1-	mg/L	n/v	^{s3}[C]	<0.00010
Methylnaphthalene, 2-	mg/L	n/v	$_{s3}$[C]	<0.00010
Naphthalene	mg/L	0.0011[B]	1.4[C]	<0.00010
Perylene	mg/L	n/v	n/v	<0.000050
Phenanthrene	mg/L	0.00040[B]	0.58[C]	<0.000050
Pyrene	mg/L	0.000025[B]	0.068[C]	<0.000020
Benzo(a)pyrene Total Potency Equivalents	mg/L	n/v	n/v	<0.000010
Phenols				
Chloro-3-methyl phenol, 4-	mg/L	n/v	n/v	<0.00010
Chlorophenol, 2- (ortho-Chlorophenol)	mg/L	0.0070[B]	3.3[C]	<0.00010
Chlorophenol, 3 & 4-	mg/L	0.0070[B]	n/v	<0.00010
Cresol (All Isomers)	mg/L	n/v	n/v	<0.00014
Cresol, m & p- (Methylphenol, 3&4-)	mg/L	0.0040[B]	n/v	<0.00010
Cresol, o- (Methylphenol, 2-)	mg/L	0.0040[B]	n/v	<0.00010
Dichlorophenol, 2,4-	mg/L	0.00020[B]	4.6[C]	<0.00010
Dichlorophenol, 2,6-	mg/L	0.00020[B]	n/v	<0.00010
Dimethylphenol, 2,4-	mg/L	n/v	39[C]	<0.00010
Dinitro-o-cresol, 4,6-	mg/L	n/v	n/v	<0.0010
Dinitrophenol, 2,4-	mg/L	n/v	11[C]	<0.0010
Nitrophenol, 2-	mg/L	n/v	n/v	<0.0010
Nitrophenol, 4-	mg/L	n/v	n/v	<0.0010
Pentachlorophenol	mg/L	0.00050[B]	0.062[C]	<0.00010
Phenol	mg/L	0.0040[B]	12[C]	<0.00010
Tetrachlorophenol, 2,3,4,6-	mg/L	0.0010[B]	n/v	<0.00010
Tetrachlorophenol, 2,3,5,6-	mg/L	0.0010[B]	n/v	<0.00010
Trichlorophenol, 2,3,4-	mg/L	0.018[B]	n/v	<0.00010
Trichlorophenol, 2,3,5-	mg/L	0.018[B]	n/v	<0.00010
Trichlorophenol, 2,4,5-	mg/L	0.018[B]	1.6[C]	<0.00010
Trichlorophenol, 2,4,6-	mg/L	0.018[B]	0.23[C]	<0.00010

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Resolute Bay Airport, Land Treatment Unit
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Notes:

CCME	Canadian Council of Ministers of the Environment
A	Canadian Environmental Quality Guidelines, Canadian Water Quality Guidelines for the Protection of Aquatic Life - Freshwater Aquatics Short Term
B	Canadian Environmental Quality Guidelines, Canadian Water Quality Guidelines for the Protection of Aquatic Life - Freshwater Aquatics Long Term
Ontario SCS	Soil, Ground Water and Sediment Standards for Use under Part XV.I of the Environmental Protection Act (MOE, 2011) Site Condition Standards (SCS)
C	Table 3 - All Types of Property Use - Coarse Textured Soils
6.5[A]	Concentration exceeds the indicated standard.
15.2	Measured concentration did not exceed the indicated standard.
<0.50	Laboratory reporting limit was greater than the applicable standard.
<0.03	Analyte was not detected at a concentration greater than the laboratory reporting limit.
n/a	Not applied.
n/v	No standard/guideline value.
-	Parameter not analyzed / not available.
EQ1	The short-term benchmark is for dissolved zinc and is calculated using the following equation: Benchmark = exp(0.833[ln(hardness mg·L-1)] + 0.240[ln(DOC mg·L-1)] + 0.526). The value in the table is for surface water of 198 mg CaCO3·L−1 hardness and 0.5 mg·L−1 dissolved organic carbon (DOC). The benchmark equation is valid between hardness 13.8 and 250.5 mg CaCO3·L−1 and DOC 0.3 and 17.3 mg·L−1.
EQ2	The long-term CWQG is for dissolved zinc and is calculated using the following equation: CWQG = exp(0.947[ln(hardness mg·L-1)] - 0.815[pH] + 0.398[ln(DOC mg·L-1)] + 4.625). The value in the table is for surface water of 198 mg CaCO3·L−1 hardness, pH of 7.5 and 0.5 mg·L−1 DOC. The CWQG equation is valid between hardness 23.4 and 399 mg CaCO3·L−1, pH 6.5 and 8.13 and DOC 0.3 to 22.9 mg·L−1.
EQ3	The short-term benchmark is calculated using the benchmark calculator in Appendix B of the Scientific Criteria Document for the Development of the Canadian Water Quality Guidelines for the Protection of Aquatic Life: Manganese or the following equation: Benchmark = exp(0.878[ln(hardness)] + 4.76) where the benchmark is expressed in dissolved manganese concentration (µg/L), and hardness is measured as CaCO3 equivalents in mg/L. The value in the table is for surface water of 198 mg/L hardness. The benchmark equation is valid between hardness 25 and 250 mg/L.
EQ4	The long-term CWQG is found using the look-up table (see Table 5) or the CWQG and benchmark calculator is Appendix B of CCME (2019). The value in the table is for surface water of 198 mg/L hardness and pH of 7.6. The CWQG table is valid between hardness 25 and 670 mg/L and pH 5.8 and 8.4.
LTG	The CWQG for cadmium (i.e. long-term guideline) of 0.09 µg·L-1 is for waters of 50 mg CaCO3·L-1 hardness. The CWQG for cadmium is related to water hardness (as CaCO3): When the water hardness is > 0 to < 17 mg/L, the CWQG is 0.04 µg/L; at hardness ≥ 17 to ≤ 280 mg/L, the CWQG is calculated using this equation (CWQG (µg/L) = 10^{0.83(log[hardness]) – 2.46 }); At hardness > 280 mg/L, the CWQG is 0.37 µg/L.
n1	Guideline is expressed as Nitrite (as N) in ug/L. This value is equivalent to 197 ug/L for Nitrite.
n/a	Not applicable.
s1	Standard is applicable to total xylenes, and m & p-xylenes and o-xylenes should be summed for comparison.
s2	Standard is for benzo(b)fluoranthene; however, the analytical laboratory can not distinguish between benzo(b)fluoranthene and benzo(j)fluoranthene, and therefore, the result is a combination of the two isomers, against which the standard has been compared.
s3	Standard is applicable to both 1-methylnaphthalene and 2-methylnaphthalene, with the provision that if both are detected the sum of the two must not exceed the standard.
s7	Standard is applicable to PHC in the F1 range minus BTEX.
s15	Standard is applicable to PHC in the F2 range minus naphthalene. If naphthalene was not analyzed, the standard is applied to F2.
SN	see Narrative
STB	The short-term benchmark concentration of 1.0 µg·L-1 is for waters of 50 mg CaCO3·L-1 hardness. The short-term benchmark for cadmium is related to water hardness (as CaCO3): When the water hardness is 0 to < 5.3 mg/L, the short-term benchmark is 0.11 µg/L, At hardness ≥ 5.3 to ≤ 360 mg/L, the short-term benchmark is calculated using this equation (Short-term benchmark (µg/L) = 10^{1.016(log[hardness]) – 1.71 }); At hardness > 360 mg/L, the short-term benchmark is 7.7 µg/L.
TBC1	Value is minimum value available. Sample-specific value to be calculated (equation).
TBC2	To be calculated (equation), then the present guideline values (mg/L NH3) can be converted to mg/L total ammonia-N by multiplying the corresponding guideline value by 0.8224.
VAR1	Variable, 5 µg/L if pH < 6.5 and 100 µg/L if pH > 6.5
MSP	Matrix spike outside acceptance limits, probable matrix interference.
NC	Not calculated.
NH	Duplicate exceeds acceptance criteria due to sample non homogeneity. Reanalysis yields similar results.
RY	Duplicate exceeds acceptance criteria due to sample matrix. Reanalysis yields similar results
RPD	Relative Percent Difference.
61%	RPD exceeds data quality objective of 40%.
nc	RPD is not calculated if one or more values is non detect or if one or more values is less than five times the reportable detection limit.

Table 5 - Summary of Soil Analytical Results
2023 Environmental Monitoring Program
Resolute Bay Airport, Land Treatment Unit
Public Services and Procurement Canada for Transport Canada

Sample Location		SS23-01	SS23-02	SS23-03
Sample Date		9-Aug-23	9-Aug-23	9-Aug-23
Sample ID		SS23-01	SS23-02	SS23-03
Sampling Company		STANTEC	STANTEC	STANTEC
Laboratory		BV	BV	BV
Laboratory Work Order		C370892	C370892	C370892
Laboratory Sample ID		BYO596	BYO597	BYO598
Sample Type	Units			
Physical Properties				
Grain Size	none	COARSE	COARSE	COARSE
Sieve - #10 (>2.00mm)	%	42	51	31
Sieve - #200 (>0.075mm)	%	56	53	51
Sieve - Pan	%	44	47	49

Notes:

15.2 Measured concentration.

<0.03 Analyte was not detected at a concentration greater than the laboratory reporting limit.

Appendix E Applicable Standards and Guidelines

Ontario Ministry of the Environment (Now the Ontario Ministry of the Environment, Conservation and Parks) Soil, Groundwater and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act. 2011. Table 3 Site Condition Standards. Accessed from [https://www.ontario.ca/page/soil-ground-water-and-sediment-standards-use-under-part-xv1-environmental-protection-act] on October 22, 2019.

Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition

Contaminant	Soil Standards (other than sediment) µg/g Residential/Parkland/ Institutional Property Use	Soil Standards (other than sediment) µg/g Industrial/Commercial/ Community Property Use	Non-potable ground water µg/L All Types of Property Use
Acenaphthene	(58) 7.9	96	(1700) 600
Acenaphthylene	(0.17) 0.15	(0.17) 0.15	1.8
Acetone	(28) 16	(28) 16	130000
Aldrin	0.05	(0.11) 0.088	8.5
Anthracene	(0.74) 0.67	(0.74) 0.67	2.4
Antimony	7.5	(50) 40	20000
Arsenic	18	18	1900
Barium	390	670	29000
Benzene	(0.17) 0.21	(0.4) 0.32	(430) 44
Benz[a]anthracene	(0.63) 0.5	0.96	4.7
Benzo[a]pyrene	0.3	0.3	0.81
Benzo[b]fluoranthene	0.78	0.96	0.75
Benzo[ghi]perylene	(7.8) 6.6	9.6	0.2
Benzo[k]fluoranthene	0.78	0.96	0.4
Beryllium	(5) 4	(10) 8	67
Biphenyl 1,1'-	(1.1) 0.31	(210) 52	(2200) 1000
Bis(2-chloroethyl)ether	0.5	0.5	300000
Bis(2-chloroisopropyl)ether	(1.8) 0.67	(14) 11	20000
Bis(2-ethylhexyl)phthalate	5	(35) 28	140
Boron (Hot Water Soluble) *	1.5	2	NA
Boron (total)	120	120	45000
Bromodichloromethane	13	18	85000
Bromoform	(0.26) 0.27	(1.7) 0.61	(770) 380
Bromomethane	0.05	0.05	(56) 5.6
Cadmium	1.2	1.9	2.7
Carbon Tetrachloride	(0.12) 0.05	(1.5) 0.21	(8.4) 0.79
Chlordane	0.05	0.05	28
Chloroaniline p-	(0.53) 0.5	(0.53) 0.5	400
Chlorobenzene	(2.7) 2.4	(2.7) 2.4	630
Chloroform	(0.18) 0.05	(0.18) 0.47	(22) 2.4
Chlorophenol, 2-	(2) 1.6	(3.9) 3.1	3300
Chromium Total	160	160	810
Chromium VI	(10) 8	(10) 8	140
Chrysene	(7.8) 7	9.6	1
Cobalt	22	(100) 80	66
Copper	(180) 140	(300) 230	87
Cyanide (CN-)	0.051	0.051	66
Dibenz[a h]anthracene	0.1	0.1	0.52
Dibromochloromethane	9.4	13	82000

Ontario Ministry of the Environment (Now the Ontario Ministry of the Environment, Conservation and Parks) Soil, Groundwater and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act. 2011. Table 3 Site Condition Standards. Accessed from [https://www.ontario.ca/page/soil-ground-water-and-sediment-standards-use-under-part-xv1-environmental-protection-act] on October 22, 2019.

Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition

Contaminant	Soil Standards (other than sediment) µg/g Residential/Parkland/ Institutional Property Use	Soil Standards (other than sediment) µg/g Industrial/Commercial/ Community Property Use	Non-potable ground water µg/L All Types of Property Use
Dichlorobenzene, 1,2-	(4.3) 3.4	(8.5) 6.8	(9600) 4600
Dichlorobenzene, 1,3-	(6) 4.8	(12) 9.6	9600
Dichlorobenzene, 1,4-	(0.097) 0.083	(0.84) 0.2	(67) 8
Dichlorobenzidine, 3,3'-	1	1	640
Dichlorodifluoromethane	(25) 16	(25) 16	4400
DDD	3.3	4.6	45
DDE	(0.33) 0.26	(0.65) 0.52	20
DDT	1.4	1.4	2.8
Dichloroethane, 1,1-	(11) 3.5	(21) 17	(3100) 320
Dichloroethane, 1,2-	0.05	0.05	(12) 1.6
Dichloroethylene, 1,1-	0.05	(0.48) 0.064	(17) 1.6
Dichloroethylene, 1,2-cis-	(30) 3.4	(37) 55	(17) 1.6
Dichloroethylene, 1,2-trans-	(0.75) 0.084	(9.3) 1.3	(17) 1.6
Dichlorophenol, 2,4-	(2.1) 1.7	(4.2) 3.4	4600
Dichloropropane, 1,2-	(0.085) 0.05	(0.68) 0.16	(140) 16
Dichloropropene,1,3-	(0.083) 0.05	(0.21) 0.18	(45) 5.2
Dieldrin	0.05	(0.11) 0.088	0.75
Diethyl Phthalate	0.5	0.5	38
Dimethylphthalate	0.5	0.5	38
Dimethylphenol, 2,4-	(420) 390	(440) 390	39000
Dinitrophenol, 2,4-	38	(66) 59	11000
Dinitrotoluene, 2,4 & 2,6-	0.92	1.2	2900
Dioxane, 1,4	1.8	1.8	(7300000)1900000
Dioxin/Furan (TEQ)	0.000013	0.000099	(0.023) 0.014
Endosulfan	0.04	(0.38) 0.3	1.5
Endrin	0.04	0.04	0.48
Ethylbenzene	(15) 2	(19) 9.5	2300
Ethylene dibromide	0.05	0.05	(0.83) 0.25
Fluoranthene	0.69	9.6	130
Fluorene	(69) 62	(69) 62	400
Heptachlor	0.15	0.19	2.5
Heptachlor Epoxide	0.05	0.05	0.048
Hexachlorobenzene	0.52	0.66	3.1
Hexachlorobutadiene	(0.014) 0.012	(0.095) 0.031	(4.5) 0.44
Hexachlorocyclohexane Gamma-	(0.063) 0.056	(0.063) 0.056	1.2
Hexachloroethane	(0.071) 0.089	(0.43) 0.21	(200) 94
Hexane (n)	(34) 2.8	(88) 46	(520) 51
Indeno[1 2 3-cd]pyrene	(0.48) 0.38	(0.95) 0.76	0.2
Lead	120	120	25

Ontario Ministry of the Environment (Now the Ontario Ministry of the Environment, Conservation and Parks) Soil, Groundwater and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act. 2011. Table 3 Site Condition Standards. Accessed from [https://www.ontario.ca/page/soil-ground-water-and-sediment-standards-use-under-part-xv1-environmental-protection-act] on October 22, 2019.

Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition

Contaminant	Soil Standards (other than sediment) µg/g Residential/Parkland/ Institutional Property Use	Soil Standards (other than sediment) µg/g Industrial/Commercial/ Community Property Use	Non-potable ground water µg/L All Types of Property Use
Mercury	(1.8) 0.27	(20) 3.9	(2.8) 0.29
Methoxychlor	0.13	1.6	6.5
Methyl Ethyl Ketone	(44) 16	(88) 70	(1500000) 470000
Methyl Isobutyl Ketone	(4.3) 1.7	(210) 31	(580000) 140000
Methyl Mercury **	(0.0094) 0.0084	(0.0094) 0.0084	0.15
Methyl tert-Butyl Ether (MTBE)	(1.4) 0.75	(3.2) 11	(1400) 190
Methylene Chloride	(0.96) 0.1	(2) 1.6	(5500) 610
Methlynaphthalene, 2-(1-) ***	(3.4) 0.99	(85) 76	1800
Molybdenum	6.9	40	9200
Naphthalene	(0.75) 0.6	(28) 9.6	(6400) 1400
Nickel	(130) 100	(340) 270	490
Pentachlorophenol	0.1	(3.3) 2.9	62
Petroleum Hydrocarbons F1 ****	(65) 55	(65) 55	750
Petroleum Hydrocarbons F2	(150) 98	(250) 230	150
Petroleum Hydrocarbons F3	(1300) 300	(2500) 1700	500
Petroleum Hydrocarbons F4	(5600) 2800	(6600) 3300	500
Phenanthrene	(7.8) 6.2	(16) 12	580
Phenol	9.4	9.4	12000
Polychlorinated Biphenyls	0.35	1.1	(15) 7.8
Pyrene	78	96	68
Selenium	2.4	5.5	63
Silver	(25) 20	(50) 40	1.5
Styrene	(2.2) 0.7	(43) 34	(9100) 1300
Tetrachloroethane, 1,1,1,2-	(0.05) 0.058	(0.11) 0.087	(28) 3.3
Tetrachloroethane, 1,1,2,2-	0.05	(0.094) 0.05	(15) 3.2
Tetrachloroethylene	(2.3) 0.28	(21) 4.5	(17) 1.6
Thallium	1	3.3	510
Toluene	(6) 2.3	(78) 68	18000
Trichlorobenzene, 1,2,4-	(1.4) 0.36	(16) 3.2	(850) 180
Trichloroethane, 1,1,1-	(3.4) 0.38	(12) 6.1	(6700) 640
Trichloroethane, 1,1,2-	0.05	(0.11) 0.05	(30) 4.7
Trichloroethylene	(0.52) 0.061	(0.61) 0.91	(17) 1.6
Trichlorofluoromethane	(5.8) 4	(5.8) 4	2500
Trichlorophenol, 2,4,5-	(5.5) 4.4	10	1600
Trichlorophenol, 2,4,6-	(4.2) 3.8	(4.2) 3.8	230
Uranium	23	33	420
Vanadium	86	86	250
Vinyl Chloride	(0.022) 0.02	(0.25) 0.032	(1.7) 0.5

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Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition

Contaminant	Soil Standards (other than sediment) µg/g Residential/Parkland/ Institutional Property Use	Soil Standards (other than sediment) µg/g Industrial/Commercial/ Community Property Use	Non-potable ground water µg/L All Types of Property Use
Xylene Mixture	(25) 3.1	(30) 26	4200
Zinc	340	340	1100
Electrical Conductivity (mS/cm)	0.7	1.4	#N/A
Chloride	NA	NA	2300000
Sodium Adsorption Ratio	5	12	NA
Sodium	NA	NA	2300000

Canadian Environmental Quality GuidelinesSummary Table		Water Quality Guidelinesfor the Protection of Aquatic Life					
		Freshwater			Marine		
		Concentration (ug/L)	Concentration (ug/L)	Date	Concentration (ug/L)	Concentration (ug/L)	Date
Chemical Name	Chemical Groups	Short Term	Long Term		Short Term	Long Term	
Acenaphthene\n\n	*Organic Polyaromatic compounds Polycyclic aromatic hydrocarbons*	*No data*	*5.8*	*1999*	*No data*	*Insufficient data*	*1999*
Acenaphthylene\n\n	*Organic Polyaromatic compounds Polycyclic aromatic hydrocarbons*	*No data*	*No data*	*1999*	*No data*	*No data*	*1999*
Acridine\n\n	*Organic Polyaromatic compounds Polycyclic aromatic hydrocarbons*	*No data*	*4.4*	*1999*	*No data*	*Insufficient data*	*1999*
Aluminium\n\n	*Inorganic Metals*	*No data*	*Variable*	*1987*	*No data*	*No data*	*No data*
Ammonia (total)\n\n	*Inorganic Inorganic nitrogen compounds*	*No data*	*Table*	*2001*	*No data*	*No data*	*No data*

Canadian Environmental Quality GuidelinesSummary Table		Water Quality Guidelinesfor the Protection of Aquatic Life					
		Freshwater			Marine		
		Concentration (ug/L)	Concentration (ug/L)	Date	Concentration (ug/L)	Concentration (ug/L)	Date
Chemical Name	Chemical Groups	Short Term	Long Term		Short Term	Long Term	
Anthracene\n\n	*Organic Polyaromatic compounds Polycyclic aromatic hydrocarbons*	*No data*	*0.012*	*1999*	*No data*	*Insufficient data*	*1999*
Arsenic\n\nCASRN none	*Inorganic Metals*	*No data*	*5*	*1997*	*No data*	*12.5*	*1997*
Benz(a)anthracene\n\n	*Organic Polyaromatic compounds Polycyclic aromatic hydrocarbons*	*No data*	*0.018*	*1999*	*No data*	*Insufficient data*	*1999*
Benzene\n\nCASRN 71432	*Organic Monocyclic aromatic compounds*	*No data*	*370*	*1999*	*No data*	*110*	*1999*
Benzo(a)pyrene\n\n	*Organic Polyaromatic compounds Polycyclic aromatic hydrocarbons*	*No data*	*0.015*	*1999*	*No data*	*Insufficient data*	*1999*

Canadian Environmental Quality GuidelinesSummary Table		Water Quality Guidelinesfor the Protection of Aquatic Life					
		Freshwater			Marine		
		Concentration (ug/L)	Concentration (ug/L)	Date	Concentration (ug/L)	Concentration (ug/L)	Date
Chemical Name	Chemical Groups	Short Term	Long Term		Short Term	Long Term	
Cadmium\n\nCASRN 7440439	*Inorganic Metals*	*1*	*0.09*	*2014*	*NRG*	*0.12*	*2014*
Chloride\n\n	*Inorganic*	*640,000 µg/L or 640 mg/L*	*120,000 µg/L or 120 mg/L*	*2011*	*NRG*	*NRG*	*2011*
Chrysene\n\n	*Organic Polyaromatic compounds Polycyclic aromatic hydrocarbons*	*No data*	*Insufficient data*	*1999*	*No data*	*Insufficient data*	*1999*
Copper\n\n	*Inorganic Metals*	*No data*	*Equation*	*1987*	*No data*	*No data*	*No data*
Ethylbenzene\n\nCASRN 100414	*Organic Monocyclic aromatic compounds*	*No data*	*90*	*1996*	*No data*	*25*	*1996*

Canadian Environmental Quality GuidelinesSummary Table		Water Quality Guidelinesfor the Protection of Aquatic Life					
		Freshwater			Marine		
		Concentration (ug/L)	Concentration (ug/L)	Date	Concentration (ug/L)	Concentration (ug/L)	Date
Chemical Name	Chemical Groups	Short Term	Long Term		Short Term	Long Term	
Fluoranthene\n\n	*Organic Polyaromatic compounds Polycyclic aromatic hydrocarbons*	*No data*	*0.04*	*1999*	*No data*	*Insufficient data*	*1999*
Fluorene\n\n	*Organic Polyaromatic compounds Polycyclic aromatic hydrocarbons*	*No data*	*3*	*1999*	*No data*	*Insufficient data*	*1999*
Iron\n\n	*Inorganic Metals*	*No data*	*300*	*1987*	*No data*	*No data*	*No data*
Lead\n\n	*Inorganic Metals*	*No data*	*Equation*	*1987*	*No data*	*No data*	*No data*
Molybdenum\n\n	*Inorganic Metals*	*No data*	*73*	*1999*	*No data*	*No data*	*No data*

Canadian Environmental Quality GuidelinesSummary Table		Water Quality Guidelinesfor the Protection of Aquatic Life					
		Freshwater			Marine		
		Concentration (ug/L)	Concentration (ug/L)	Date	Concentration (ug/L)	Concentration (ug/L)	Date
Chemical Name	Chemical Groups	Short Term	Long Term		Short Term	Long Term	
Naphthalene\n\n	*Organic Polyaromatic compounds Polycyclic aromatic hydrocarbons*	*No data*	*1.1*	*1999*	*No data*	*1.4*	*1999*
Nickel\n\n	*Inorganic Metals*	*No data*	*Equation*	*1987*	*No data*	*No data*	*No data*
Nitrate\n\nCASRN 14797-55-8	*Inorganic Inorganic nitrogen compounds*	*550,000 µg/L or 550 mg/L*	*13,000 µg/L or 13 mg/L*	*2012*	*1,500,000 µg/L or 1500 mg/L*	*200,000 µg/L or 200 mg/L*	*2012*
Nitrite\n\n	*Inorganic Inorganic nitrogen compounds*	*No data*	*60 NO_2-N*	*1987*	*No data*	*No data*	*No data*
Phenanthrene\n\n	*Organic Polyaromatic compounds Polycyclic aromatic hydrocarbons*	*No data*	*0.4*	*1999*	*No data*	*Insufficient data*	*1999*

Canadian Environmental Quality GuidelinesSummary Table		Water Quality Guidelinesfor the Protection of Aquatic Life					
		Freshwater			Marine		
		Concentration (ug/L)	Concentration (ug/L)	Date	Concentration (ug/L)	Concentration (ug/L)	Date
Chemical Name	Chemical Groups	Short Term	Long Term		Short Term	Long Term	
Phenols (mono-& dihydric)\n\nCASRN 108952	*Organic Aromatic hydroxy compounds*	*No data*	*4*	*1999*	*No data*	*No data*	*No data*
Pyrene\n\n	*Organic Polyaromatic compounds Polycyclic aromatic hydrocarbons*	*No data*	*0.025*	*1999*	*No data*	*Insufficient data*	*1999*
pH\n\n	*Inorganic Acidity, alkalinity and pH*	*No data*	*6.5 to 9.0*	*1987*	*No data*	*7.0 to 8.7 & Narrative*	*1996*
Quinoline\n\n	*Organic Polyaromatic compounds Polycyclic aromatic hydrocarbons*	*No data*	*3.4*	*1999*	*No data*	*Insufficient data*	*1999*
Selenium\n\n	*Inorganic Metals*	*No data*	*1*	*1987*	*No data*	*No data*	*No data*

Canadian Environmental Quality GuidelinesSummary Table		Water Quality Guidelinesfor the Protection of Aquatic Life					
		Freshwater			Marine		
		Concentration (ug/L)	Concentration (ug/L)	Date	Concentration (ug/L)	Concentration (ug/L)	Date
Chemical Name	Chemical Groups	Short Term	Long Term		Short Term	Long Term	
Silver\n\n	*Inorganic Metals*	*NRG*	*0.25*	*2015*	*7.5*	*NRG*	*2015*
Toluene\n\nCASRN 108883	*Organic Monocyclic aromatic compounds*	*No data*	*2*	*1996*	*No data*	*215*	*1996*
Zinc\n\n	*Inorganic Metals*	*37*	*7*	*2018*	*Not assessed*	*Not assessed*	*2018*

Appendix F Photographic Log

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Photographic Log

Client:	**Public Services and Procurement Canada**	**Project:**	**2023 Environmental Monitoring Program**
Site Name:	**Resolute Bay Airport Land Treatment Unit**	**Site Location:**	**Cornwallis Island, Nunavut**

Photograph ID: 1 **Photo Location:** LTU 1 **Direction:** Northeast **Survey Date:** 8/8/2023 **Comments:** View of LTU 1 from southwest berm	
Photograph ID: 2 **Photo Location:** LTU 1 **Direction:** Southeast **Survey Date:** 8/8/2023 **Comments:** Weathered salt bag southeast of LTU 1	

Client:	**Public Services and Procurement Canada**	**Project:**	**2023 Environmental Monitoring Program**
Site Name:	**Resolute Bay Airport Land Treatment Unit**	**Site Location:**	**Cornwallis Island, Nunavut**

Photograph ID: 3 **Photo Location:** LTU 1 **Direction:** Southwest **Survey Date:** 8/10/2023 **Comments:** Debris pile on east corner of LTU 1	
Photograph ID: 4 **Photo Location:** LTU 2 **Direction:** Southeast **Survey Date:** 8/8/2023 **Comments:** View of LTU 2 from northwest corner	

Client:	**Public Services and Procurement Canada**	**Project:**	**2023 Environmental Monitoring Program**
Site Name:	**Resolute Bay Airport Land Treatment Unit**	**Site Location:**	**Cornwallis Island, Nunavut**

Photograph ID: 5 **Photo Location:** LTU 2 **Direction:** Northeast **Survey Date:** 8/8/2023 **Comments:** View of LTU 2 from southwest corner	
Photograph ID: 6 **Photo Location:** LTU 1 **Direction:** Southeast **Survey Date:** 8/8/2023 **Comments:** MW2 (front) and MW3 (back) southwest of LTU 1	

Client:	**Public Services and Procurement Canada**	**Project:**	**2023 Environmental Monitoring Program**
Site Name:	**Resolute Bay Airport Land Treatment Unit**	**Site Location:**	**Cornwallis Island, Nunavut**

Photograph ID: 7 **Photo Location:** LTU 1 **Direction:** Southwest **Survey Date:** 8/9/2023 **Comments:** Soil sampling location SS23-01	
Photograph ID: 8 **Photo Location:** LTU 2 **Direction:** North **Survey Date:** 8/9/2023 **Comments:** Soil sampling location SS23-02	

Client:	**Public Services and Procurement Canada**	**Project:**	**2023 Environmental Monitoring Program**
Site Name:	**Resolute Bay Airport Land Treatment Unit**	**Site Location:**	**Cornwallis Island, Nunavut**

Photograph ID: 9 **Photo Location:** LTU 2 **Direction:** South **Survey Date:** 8/8/2023 **Comments:** Historical surface water sampling location SW3, dry	
Photograph ID: 10 **Photo Location:** LTU 2 **Direction:** North **Survey Date:** 8/8/2023 **Comments:** Surface water sampling location SW23-4	

Client:	**Public Services and Procurement Canada**	**Project:**	**2023 Environmental Monitoring Program**
Site Name:	**Resolute Bay Airport Land Treatment Unit**	**Site Location:**	**Cornwallis Island, Nunavut**

Photograph ID: 11 **Photo Location:** LTU 1 **Direction:** Northwest **Survey Date:** 8/8/2023 **Comments:** Historical surface water sampling location SW1, dry	
Photograph ID: 12 **Photo Location:** LTU 1 **Direction:** East **Survey Date:** 8/10/2023 **Comments:** Liner deficiency 23-37	

Client:	**Public Services and Procurement Canada**	**Project:**	**2023 Environmental Monitoring Program**
Site Name:	**Resolute Bay Airport Land Treatment Unit**	**Site Location:**	**Cornwallis Island, Nunavut**

Photograph ID: 13 **Photo Location:** LTU 1 **Direction:** Southwest **Survey Date:** 8/10/2023 **Comments:** Liner deficiency 23-38	
Photograph ID: 14 **Photo Location:** LTU 1 **Direction:** East **Survey Date:** 8/10/2023 **Comments:** Liner deficiency 23-15	

Client:	**Public Services and Procurement Canada**	**Project:**	**2023 Environmental Monitoring Program**
Site Name:	**Resolute Bay Airport Land Treatment Unit**	**Site Location:**	**Cornwallis Island, Nunavut**

Photograph ID: 15 **Photo Location:** LTU 2 **Direction:** East **Survey Date:** 8/10/2023 **Comments:** Liner deficiency 23-27	
Photograph ID: 16 **Photo Location:** LTU 2 **Direction:** West **Survey Date:** 8/10/2023 **Comments:** Liner deficiency 23-31	

Client:	**Public Services and Procurement Canada**	**Project:**	**2023 Environmental Monitoring Program**
Site Name:	**Resolute Bay Airport Land Treatment Unit**	**Site Location:**	**Cornwallis Island, Nunavut**

Photograph ID: 17 **Photo Location:** LTU 2 **Direction:** East **Survey Date:** 8/10/2023 **Comments:** Liner deficiency 23-42	
Photograph ID: 18 **Photo Location:** LTU 2 **Direction:** West **Survey Date:** 8/10/2023 **Comments:** Liner deficiency 23-43	

Appendix G Copies of Laboratory Analytical Results

Your Project #: 123514481
Your C.O.C. #: 1/1

Attention: Luke Anderson

STANTEC CONSULTING LTD
#400, 10220 - 103 Avenue NW
EDMONTON, AB
CANADA T5J 0K4

Report Date: 2023/09/13
Report #: R3394983
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C370892
Received: 2023/09/08, 10:50

Sample Matrix: Soil
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Moisture	3	N/A	2023/09/13	AB SOP-00002	CCME PHC-CWS m
Particle Size by Sieve (75 micron)	3	N/A	2023/09/13		Auto Calc
Particle Size by Sieve	3	N/A	2023/09/13	AB SOP-00022	ASTM D6913-17 m

Remarks:

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

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

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

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

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Your Project #: 123514481
Your C.O.C. #: 1/1

Attention: Luke Anderson

STANTEC CONSULTING LTD
#400, 10220 - 103 Avenue NW
EDMONTON, AB
CANADA T5J 0K4

Report Date: 2023/09/13
Report #: R3394983
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C370892
Received: 2023/09/08, 10:50

Encryption Key

Please direct all questions regarding this Certificate of Analysis to:
Geraldlyn Gouthro, Key Account Specialist
Email: geraldlyn.gouthro@bureauveritas.com
Phone# (780)577-7173

==========

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Bureau Veritas Job #: C370892
Report Date: 2023/09/13

STANTEC CONSULTING LTD
Client Project #: 123514481
Sampler Initials: RH

PARTICLE SIZE BY SIEVE (75 UM)

Bureau Veritas ID		BYO596		BYO597		BYO598			
Sampling Date		2023/08/09		2023/08/09		2023/08/09			
COC Number		1/1		1/1		1/1			
	UNITS	**SS23-01**	**MU**	**SS23-02**	**MU**	**SS23-03**	**MU**	**RDL**	**QC Batch**
Physical Properties									
Grain Size	N/A	COARSE	N/A	COARSE	N/A	COARSE	N/A	N/A	B101766
Sieve - #10 (>2.00mm)	%	42	N/A	51	N/A	31	N/A	0.20	B104556
Sieve - #200 (>0.075mm)	%	56	N/A	53	N/A	51	N/A	0.20	B104556
Sieve - Pan	%	44	N/A	47	N/A	49	N/A	0.20	B104556

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

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PHYSICAL TESTING (SOIL)

Bureau Veritas ID		BYO596		BYO597		BYO598			
Sampling Date		2023/08/09		2023/08/09		2023/08/09			
COC Number		1/1		1/1		1/1			
	UNITS	SS23-01	MU	SS23-02	MU	SS23-03	MU	RDL	QC Batch
Physical Properties									
Moisture	%	12	+/- 0.92	11	+/- 0.84	14	+/- 1.0	0.30	B104402

RDL = Reportable Detection Limit
MU = Measurement Uncertainty

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GENERAL COMMENTS

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

Package 1	0.7°C
Package 2	0.3°C

Sample BYO596 [SS23-01] : Sample was analyzed past method specified hold time for Particle Size by Sieve. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample BYO597 [SS23-02] : Sample was analyzed past method specified hold time for Particle Size by Sieve. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample BYO598 [SS23-03] : Sample was analyzed past method specified hold time for Particle Size by Sieve. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

The estimate of uncertainty has been reported as an expanded uncertainty and calculated using a coverage factor of 2, which gives a level of confidence of 95%.

Results relate only to the items tested.

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Bureau Veritas Job #: C370892
Report Date: 2023/09/13

STANTEC CONSULTING LTD
Client Project #: 123514481
Sampler Initials: RH

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
B104402	TLP	Method Blank	Moisture	2023/09/13	<0.30		%	
B104402	TLP	RPD	Moisture	2023/09/13	13		%	20
B104556	VSO	QC Standard	Sieve - #200 (>0.075mm)	2023/09/13		103	%	75 - 125
			Sieve - Pan	2023/09/13		98	%	75 - 125
B104556	VSO	RPD	Sieve - #10 (>2.00mm)	2023/09/13	16		%	30
			Sieve - #200 (>0.075mm)	2023/09/13	2.6		%	30
			Sieve - Pan	2023/09/13	1.4		%	30

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

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

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

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VALIDATION SIGNATURE PAGE

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

Suwan (Sze Yeung) Fock, B.Sc., Scientific Specialist

Veronica Falk, B.Sc., P.Chem., QP, Scientific Specialist, Organics

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Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

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CHAIN OF CUSTODY RECORD

ENV COC - 00013v3

Page 1 of 1

Received in Ottawa

05-Sep-23 10:21
Cristina (Maria) Bacchus
C3R1897
JM ENV-890

Invoice Information		Invoice to (requires report) ☐	Report Information (if differs from invoice)		Project Information	
Company:	Stantec Consulting Ltd.		Company:		Quotation #:	
Contact Name:	Luke Anderson		Contact Name:		P.O. #/ AFE#:	
Street Address:	500-10220 103 Avenue NW		Street Address:		Project #:	123514481
City:	Edmonton	Prov: AB Postal Code: T5J 0K4	City:	Prov: Postal Code:	Site #:	
Phone:	~~587-336-2957~~ 780-905-4314		Phone:		Site Location:	
Email:	luke.anderson@stantec.com		Email:		Site Location Province:	
Copies:			Copies:		Sampled By:	RH

Regulatory Criteria

☐ AT1 ☒ CCME RH ☐ Drinking Water - Canada ☐ Drinking Water - Manitoba
☐ Saskatchewan ☐ Drinking Water - Alberta ☐ Other _____

SAMPLES MUST BE KEPT COOL (<10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BUREAU VERITAS

Regular Turnaround Time (TAT)
☐ 5 to 7 Day ☑ 10 Day

Rush Turnaround Time (TAT) Surcharges apply
☐ Same Day ☐ 1 Day ☐ 2 Day ☐ 3 Day ☐ 4 Day

Date Required: YY MM DD

	Sample Identification	Date Sampled YY	MM	DD	Time (24hr) HH	MM	Matrix	1 FIELD FILTERED	2 FIELD PRESERVED	3 LAB FILTRATION REQUIRED	4 BTEX F1	5 VOCs	6 BTEX F1-F2	7 BTEX F1-F4	8 Routine water	9 Regulated metals - total	10 Regulated metals - dissolved	11 Mercury - total	12 Mercury - dissolved	13 Salinity 4	14 Sieve (75 micron)	15 Texture (% sand, silt, clay)	16 Basic class II landfill	17 Lead	18	19	20	21 # OF CONTAINERS SUBMITTED	22 HOLD - DO NOT ANALYZE	Comments
1	SS23-01	23	08	09			Soil														✓							1		
2	SS23-02	23	08	09			Soil														✓							1		
3	SS23-03	23	08	09			Soil														✓							1		
4	SS23-04	23	08	09			Soil																	✓				1		
5																														
6																														
7																														
8																														
9																														
10																														
11																														
12																														

mcal-09-621
Y1

*UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BUREAU VERITAS STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS AND CONDITIONS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVNA.COM/TERMS-AND-CONDITIONS OR BY CALLING THE LABORATORY LISTED ABOVE TO OBTAIN A COPY

LAB USE ONLY	Yes	No	°C			
Seal present	✓					
Seal intact	✓					
Cooling media present		✓		6	7	6
				1	2	3

LAB USE ONLY	Yes	No	°C			
Seal present	✓					
Seal intact	✓					
Cooling media present	✓			1	1	0
				1	2	3

LAB USE ONLY	Yes	No	°C				Temperature reading by:
Seal present	✓						
Seal intact	✓						
Cooling media present	✓			0	1	0	
				1	2	3	

Relinquished by: (Signature/ Print)	Date YY	MM	DD	Time HH	MM	Received by: (Signature/ Print)	Date YY	MM	DD	Time HH	MM	Special instructions
1 Ryan Heyland	23	08	11	09	00	1 [illegible]	2023	09	05	10	21	
2						2 Mirel NIRAL PATEL	2023	09	06	08	30	
						ASRAVRGill	2023	09	08	10	50	Seal-Y Ice-Y

Your Project #: 123514481
Your C.O.C. #: 1/1

Attention: Luke Anderson

STANTEC CONSULTING LTD
#400, 10220 - 103 Avenue NW
EDMONTON, AB
CANADA T5J 0K4

Report Date: 2023/09/16
Report #: R3396444
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C371158
Received: 2023/09/05, 10:24

Sample Matrix: Water
Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity @25C (pp, total), CO3,HCO3,OH	2	N/A	2023/09/14	AB SOP-00005	SM 24 2320 B m
BTEX/F1 in Water by HS GC/MS/FID	1	N/A	2023/09/15	AB SOP-00039	CCME CWS/EPA 8260d m
F1-BTEX	1	N/A	2023/09/15		Auto Calc
Cadmium - low level CCME - Dissolved	2	N/A	2023/09/15		Auto Calc
Chloride/Sulphate by Auto Colourimetry	2	N/A	2023/09/13	AB SOP-00020	SM24-4500-Cl/SO4-E m
Total Cresols Calculation	2	N/A	2023/09/16		Auto Calc
Conductivity @25C	2	N/A	2023/09/14	AB SOP-00005	SM 24 2510 B m
Hardness	1	N/A	2023/09/15		Auto Calc
Hardness	1	N/A	2023/09/16		Auto Calc
Elements by ICP - Dissolved (1)	2	N/A	2023/09/14	AB SOP-00042	EPA 6010d R5 m
Elements by ICP - Total	1	2023/09/12	2023/09/12	AB SOP-00014 / AB SOP-00042	EPA 6010d R5 m
Elements by ICP - Total	1	2023/09/12	2023/09/13	AB SOP-00014 / AB SOP-00042	EPA 6010d R5 m
Elements by ICPMS - Dissolved (1)	2	N/A	2023/09/14	AB SOP-00043	EPA 6020b R2 m
Elements by ICPMS - Total	2	2023/09/12	2023/09/12	AB SOP-00014 / AB SOP-00043	EPA 6020b R2 m
Ion Balance	1	N/A	2023/09/15		Auto Calc
Ion Balance	1	N/A	2023/09/16		Auto Calc
Sum of cations, anions	1	N/A	2023/09/15		Auto Calc
Sum of cations, anions	1	N/A	2023/09/16		Auto Calc
Ammonia-N (Total)	2	N/A	2023/09/12	AB SOP-00007	SM 24 4500 NH3 A G m
Nitrate and Nitrite	2	N/A	2023/09/14		Auto Calc
NO2 (N); NO2 (N) + NO3 (N) in Water	2	N/A	2023/09/13	AB SOP-00091	SM 24 4500 NO3m
Nitrate (as N)	2	2023/09/11	2023/09/14		Auto Calc
Oil and Grease (Gravimetric, n-Hexane)	2	2023/09/13	2023/09/13	AB SOP-00092	SM 23 5520B/5520F m
pH @25°C (2)	2	N/A	2023/09/14	AB SOP-00005	SM 24 4500-H+B m
Phenols (semivolatile)	2	2023/09/13	2023/09/13	CAL SOP-00164	EPA 8270e m
Total Dissolved Solids (Calculated)	1	N/A	2023/09/15		Auto Calc
Total Dissolved Solids (Calculated)	1	N/A	2023/09/16		Auto Calc
Hydrocarbons (C10-C30) in Water - GC/FID	2	2023/09/13	2023/09/14	AB SOP-00037	CCME PHC-CWS m
Total Suspended Solids (NFR)	1	2023/09/13	2023/09/14	AB SOP-00061	SM 24 2540 D m

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Your Project #: 123514481
Your C.O.C. #: 1/1

Attention: Luke Anderson

STANTEC CONSULTING LTD
#400, 10220 - 103 Avenue NW
EDMONTON, AB
CANADA T5J 0K4

Report Date: 2023/09/16
Report #: R3396444
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C371158
Received: 2023/09/05, 10:24

Sample Matrix: Water
Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Total Suspended Solids (NFR)	1	2023/09/15	2023/09/15	AB SOP-00061	SM 24 2540 D m

Remarks:

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

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

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

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Dissolved > Total Imbalance: When applicable, Dissolved and Total results were reviewed and data quality meets acceptable levels unless otherwise noted.
(2) The CCME method requires pH to be analysed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the CCME holding time. Bureau Veritas endeavours to analyze samples as soon as possible after receipt.

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Your Project #: 123514481
Your C.O.C. #: 1/1

Attention: Luke Anderson

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#400, 10220 - 103 Avenue NW
EDMONTON, AB
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Report Date: 2023/09/16
Report #: R3396444
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BUREAU VERITAS JOB #: C371158
Received: 2023/09/05, 10:24

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Email: geraldlyn.gouthro@bureauveritas.com
Phone# (780)577-7173

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ROUTINE WATER & DISS. REGULATED METALS (WATER)

Bureau Veritas ID		BYQ613			BYQ614			
Sampling Date		2023/08/09 09:30			2023/08/09 09:30			
COC Number		1/1			1/1			
	UNITS	SW23-4	MU	QC Batch	QC23-1	MU	RDL	QC Batch
Calculated Parameters								
Anion Sum	meq/L	11	N/A	B101727	11	N/A	N/A	B101727
Cation Sum	meq/L	10	N/A	B101727	10	N/A	N/A	B101727
Hardness (CaCO3)	mg/L	350	N/A	B101725	340	N/A	0.50	B101725
Ion Balance (% Difference)	%	3.3	N/A	B101726	3.8	N/A	N/A	B101726
Nitrate (N)	mg/L	1.5	N/A	B103405	1.5	N/A	0.050	B103405
Nitrate (NO3)	mg/L	6.8	N/A	B101722	6.5	N/A	0.22	B101722
Nitrite (NO2)	mg/L	0.23	N/A	B101722	0.30	N/A	0.033	B101722
Calculated Total Dissolved Solids	mg/L	560	N/A	B101723	560	N/A	10	B101723
Elements								
Dissolved Cadmium (Cd)	ug/L	<0.020	N/A	B101162	<0.020	N/A	0.020	B101162
Misc. Inorganics								
Conductivity	uS/cm	1000	+/- 27	B106527	1000	+/- 27	2.0	B106527
pH	pH	7.41	+/- 0.0735	B106314	7.44	+/- 0.0737	N/A	B106314
Anions								
Alkalinity (PP as CaCO3)	mg/L	<1.0	N/A	B106312	<1.0	N/A	1.0	B106312
Alkalinity (Total as CaCO3)	mg/L	410	+/- 31	B106312	420	+/- 31	1.0	B106312
Bicarbonate (HCO3)	mg/L	500	+/- 7.7	B106312	510	+/- 7.8	1.0	B106312
Carbonate (CO3)	mg/L	<1.0	N/A	B106312	<1.0	N/A	1.0	B106312
Hydroxide (OH)	mg/L	<1.0	N/A	B106312	<1.0	N/A	1.0	B106312
Chloride (Cl)	mg/L	72	+/- 5.6	B106155	72	+/- 5.6	1.0	B106155
Sulphate (SO4)	mg/L	35	+/- 2.6	B106155	36	+/- 2.7	1.0	B106155
Nutrients								
Nitrite (N)	mg/L	0.070	+/- <RDL	B106165	0.091	+/- <RDL	0.010	B106165
Nitrate plus Nitrite (N)	mg/L	1.6	+/- 0.14	B106165	1.6	+/- 0.14	0.050	B106165
Elements								
Dissolved Aluminum (Al)	mg/L	0.0049	+/- <RDL	B108267	0.0036	+/- <RDL	0.0030	B108257
Dissolved Antimony (Sb)	mg/L	<0.00060	N/A	B108267	<0.00060	N/A	0.00060	B108257
Dissolved Arsenic (As)	mg/L	0.0014	+/- 0.00039	B108267	0.0014	+/- 0.00038	0.00020	B108257
Dissolved Barium (Ba)	mg/L	0.051	+/- <RDL	B107571	0.051	+/- <RDL	0.010	B107536
Dissolved Beryllium (Be)	mg/L	<0.0010	N/A	B108267	<0.0010	N/A	0.0010	B108257
Dissolved Boron (B)	mg/L	0.080	+/- 0.020	B107571	0.081	+/- 0.020	0.020	B107536

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

ROUTINE WATER & DISS. REGULATED METALS (WATER)

Bureau Veritas ID		BYQ613			BYQ614			
Sampling Date		2023/08/09 09:30			2023/08/09 09:30			
COC Number		1/1			1/1			
	UNITS	SW23-4	MU	QC Batch	QC23-1	MU	RDL	QC Batch
Dissolved Calcium (Ca)	mg/L	90	+/- 7.4	B107571	90	+/- 7.3	0.30	B107536
Dissolved Chromium (Cr)	mg/L	<0.0010	N/A	B108267	<0.0010	N/A	0.0010	B108257
Dissolved Cobalt (Co)	mg/L	0.0027	+/- 0.00046	B108267	0.0027	+/- 0.00046	0.00030	B108257
Dissolved Copper (Cu)	mg/L	0.0014	+/- <RDL	B108267	0.0012	+/- <RDL	0.0010	B108257
Dissolved Iron (Fe)	mg/L	0.31	+/- <RDL	B107571	0.31	+/- <RDL	0.060	B107536
Dissolved Lead (Pb)	mg/L	0.012	+/- 0.00086	B108267	0.012	+/- 0.00085	0.00020	B108257
Dissolved Lithium (Li)	mg/L	<0.020	N/A	B107571	<0.020	N/A	0.020	B107536
Dissolved Magnesium (Mg)	mg/L	29	+/- 1.4	B107571	29	+/- 1.4	0.20	B107536
Dissolved Manganese (Mn)	mg/L	0.43	+/- 0.027	B107571	0.43	+/- 0.027	0.0040	B107536
Dissolved Molybdenum (Mo)	mg/L	0.0018	+/- <RDL	B108267	0.0017	+/- <RDL	0.00020	B108257
Dissolved Nickel (Ni)	mg/L	0.011	+/- 0.0012	B108267	0.010	+/- 0.0012	0.00050	B108257
Dissolved Phosphorus (P)	mg/L	<0.10	N/A	B107571	<0.10	N/A	0.10	B107536
Dissolved Potassium (K)	mg/L	9.4	+/- 0.47	B107571	9.4	+/- 0.47	0.30	B107536
Dissolved Selenium (Se)	mg/L	0.00068	+/- 0.00025	B108267	0.00053	+/- 0.00022	0.00020	B108257
Dissolved Silicon (Si)	mg/L	1.6	+/- <RDL	B107571	1.6	+/- <RDL	0.50	B107536
Dissolved Silver (Ag)	mg/L	<0.00010	N/A	B108267	<0.00010	N/A	0.00010	B108257
Dissolved Sodium (Na)	mg/L	30	+/- 2.9	B107571	30	+/- 2.9	0.50	B107536
Dissolved Strontium (Sr)	mg/L	0.31	+/- 0.028	B107571	0.30	+/- 0.028	0.020	B107536
Dissolved Sulphur (S)	mg/L	9.6	+/- 0.84	B107571	9.7	+/- 0.85	0.20	B107536
Dissolved Thallium (Tl)	mg/L	<0.00020	N/A	B108267	<0.00020	N/A	0.00020	B108257
Dissolved Tin (Sn)	mg/L	<0.0010	N/A	B108267	<0.0010	N/A	0.0010	B108257
Dissolved Titanium (Ti)	mg/L	<0.0010	N/A	B108267	<0.0010	N/A	0.0010	B108257
Dissolved Uranium (U)	mg/L	0.0011	+/- 0.00026	B108267	0.0011	+/- 0.00026	0.00010	B108257
Dissolved Vanadium (V)	mg/L	<0.0010	N/A	B108267	<0.0010	N/A	0.0010	B108257
Dissolved Zinc (Zn)	mg/L	0.0039	+/- <RDL	B108267	<0.0030	N/A	0.0030	B108257

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

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REGULATED METALS (CCME/AT1) - TOTAL

Bureau Veritas ID		BYQ613			BYQ614			
Sampling Date		2023/08/09 09:30			2023/08/09 09:30			
COC Number		1/1			1/1			
	UNITS	SW23-4	MU	QC Batch	QC23-1	MU	RDL	QC Batch
Elements								
Total Aluminum (Al)	mg/L	0.55	+/- 0.10	B103537	0.59	+/- 0.11	0.0030	B103833
Total Antimony (Sb)	mg/L	<0.00060	N/A	B103537	<0.00060	N/A	0.00060	B103833
Total Arsenic (As)	mg/L	0.0017	+/- 0.00026	B103537	0.0016	+/- 0.00025	0.00020	B103833
Total Barium (Ba)	mg/L	0.059	+/- <RDL	B103540	0.060	+/- <RDL	0.010	B103836
Total Beryllium (Be)	mg/L	<0.0010	N/A	B103537	<0.0010	N/A	0.0010	B103833
Total Boron (B)	mg/L	0.084	+/- <RDL	B103540	0.070	+/- <RDL	0.020	B103836
Total Cadmium (Cd)	mg/L	0.000053	+/- <RDL	B103537	0.000057	+/- <RDL	0.000020	B103833
Total Calcium (Ca)	mg/L	100	+/- 10	B103540	99	+/- 9.8	0.30	B103836
Total Chromium (Cr)	mg/L	0.0012	+/- <RDL	B103537	0.0014	+/- <RDL	0.0010	B103833
Total Cobalt (Co)	mg/L	0.0033	+/- <RDL	B103537	0.0033	+/- <RDL	0.00030	B103833
Total Copper (Cu)	mg/L	0.0024	+/- <RDL	B103537	0.0026	+/- <RDL	0.0010	B103833
Total Iron (Fe)	mg/L	1.4	+/- 0.19	B103540	1.3	+/- 0.17	0.060	B103836
Total Lead (Pb)	mg/L	0.030	+/- 0.0054	B103537	0.030	+/- 0.0054	0.00020	B103833
Total Lithium (Li)	mg/L	<0.020	N/A	B103540	<0.020	N/A	0.020	B103836
Total Magnesium (Mg)	mg/L	32	+/- 2.2	B103540	33	+/- 2.3	0.20	B103836
Total Manganese (Mn)	mg/L	0.54	+/- 0.039	B103540	0.47	+/- 0.034	0.0040	B103836
Total Molybdenum (Mo)	mg/L	0.0019	+/- 0.00034	B103537	0.0018	+/- 0.00033	0.00020	B103833
Total Nickel (Ni)	mg/L	0.012	+/- 0.0018	B103537	0.012	+/- 0.0018	0.00050	B103833
Total Phosphorus (P)	mg/L	<0.10	N/A	B103540	<0.10	N/A	0.10	B103836
Total Potassium (K)	mg/L	16	+/- 1.0	B103540	20	+/- 1.3	0.30	B103836
Total Selenium (Se)	mg/L	0.00064	+/- <RDL	B103537	0.00062	+/- <RDL	0.00020	B103833
Total Silicon (Si)	mg/L	3.8	+/- <RDL	B103540	4.0	+/- <RDL	0.50	B103836
Total Silver (Ag)	mg/L	<0.00010	N/A	B103537	<0.00010	N/A	0.00010	B103833
Total Sodium (Na)	mg/L	43	+/- 2.8	B103540	33	+/- 2.2	0.50	B103836
Total Strontium (Sr)	mg/L	0.32	+/- 0.033	B103540	0.31	+/- 0.031	0.020	B103836
Total Sulphur (S)	mg/L	10	+/- 1.1	B103540	9.9	+/- 1.1	0.20	B103836
Total Thallium (Tl)	mg/L	<0.00020	N/A	B103537	<0.00020	N/A	0.00020	B103833
Total Tin (Sn)	mg/L	<0.0010	N/A	B103537	<0.0010	N/A	0.0010	B103833
Total Titanium (Ti)	mg/L	0.028	+/- 0.0047	B103537	0.033	+/- 0.0057	0.0010	B103833
Total Uranium (U)	mg/L	0.0011	+/- <RDL	B103537	0.0012	+/- <RDL	0.00010	B103833
Total Vanadium (V)	mg/L	0.0019	+/- <RDL	B103537	0.0022	+/- <RDL	0.0010	B103833

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N/A = Not Applicable

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REGULATED METALS (CCME/AT1) - TOTAL

Bureau Veritas ID		BYQ613			BYQ614			
Sampling Date		2023/08/09 09:30			2023/08/09 09:30			
COC Number		1/1			1/1			
	UNITS	**SW23-4**	**MU**	**QC Batch**	**QC23-1**	**MU**	**RDL**	**QC Batch**
Total Zinc (Zn)	mg/L	0.0076	+/- <RDL	B103537	0.0074	+/- <RDL	0.0030	B103833

RDL = Reportable Detection Limit
MU = Measurement Uncertainty

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RESULTS OF CHEMICAL ANALYSES OF WATER

Bureau Veritas ID		BYQ613			BYQ614			
Sampling Date		2023/08/09 09:30			2023/08/09 09:30			
COC Number		1/1			1/1			
	UNITS	**SW23-4**	**MU**	**QC Batch**	**QC23-1**	**MU**	**RDL**	**QC Batch**
Misc. Inorganics								
Total Suspended Solids	mg/L	54	+/- 7.8	B104941	47	+/- 6.9	1.0	B108829
Nutrients								
Total Ammonia (N)	mg/L	27	+/- 2.9	B104365	27	+/- 2.9	0.38	B104365
Misc. Organics								
Total Oil and grease	mg/L	5.0	+/- <RDL	B102290	<2.0	N/A	2.0	B102290

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SEMIVOLATILE ORGANICS BY GC-MS (WATER)

Bureau Veritas ID		BYQ613			BYQ614			
Sampling Date		2023/08/09 09:30			2023/08/09 09:30			
COC Number		1/1			1/1			
	UNITS	SW23-4	MU	QC Batch	QC23-1	MU	RDL	QC Batch
Phenols								
2,3,4-trichlorophenol	mg/L	<0.00010	N/A	B105482	<0.00010	N/A	0.00010	B105482
Cresols	mg/L	0.0015	N/A	B102550	0.0015	N/A	0.00014	B102551
Phenol	mg/L	0.00050	+/- 0.00017	B105482	0.00050	+/- 0.00017	0.00010	B105482
3 & 4-chlorophenol	mg/L	<0.00010	N/A	B105482	<0.00010	N/A	0.00010	B105482
2,3,5,6-tetrachlorophenol	mg/L	<0.00010	N/A	B105482	<0.00010	N/A	0.00010	B105482
2,3,4,6-tetrachlorophenol	mg/L	<0.00010	N/A	B105482	<0.00010	N/A	0.00010	B105482
2,4,5-trichlorophenol	mg/L	<0.00010	N/A	B105482	<0.00010	N/A	0.00010	B105482
2,4,6-trichlorophenol	mg/L	<0.00010	N/A	B105482	<0.00010	N/A	0.00010	B105482
2,3,5-trichlorophenol	mg/L	<0.00010	N/A	B105482	<0.00010	N/A	0.00010	B105482
2,4-dichlorophenol	mg/L	<0.00010	N/A	B105482	<0.00010	N/A	0.00010	B105482
2,4-dimethylphenol	mg/L	0.00030	+/- <RDL	B105482	0.00040	+/- 0.00012	0.00010	B105482
2,4-dinitrophenol	mg/L	<0.0010	N/A	B105482	<0.0010	N/A	0.0010	B105482
2,6-dichlorophenol	mg/L	<0.00010	N/A	B105482	<0.00010	N/A	0.00010	B105482
2-chlorophenol	mg/L	<0.00010	N/A	B105482	<0.00010	N/A	0.00010	B105482
2-methylphenol	mg/L	0.00090	+/- 0.00028	B105482	0.00090	+/- 0.00028	0.00010	B105482
2-nitrophenol	mg/L	<0.0010	N/A	B105482	<0.0010	N/A	0.0010	B105482
3 & 4-methylphenol	mg/L	0.00060	+/- 0.00019	B105482	0.00060	+/- 0.00019	0.00010	B105482
4,6-dinitro-2-methylphenol	mg/L	<0.0010	N/A	B105482	<0.0010	N/A	0.0010	B105482
4-chloro-3-methylphenol	mg/L	<0.00010	N/A	B105482	<0.00010	N/A	0.00010	B105482
4-nitrophenol	mg/L	<0.0010	N/A	B105482	<0.0010	N/A	0.0010	B105482
Pentachlorophenol	mg/L	<0.00010	N/A	B105482	<0.00010	N/A	0.00010	B105482
Surrogate Recovery (%)								
2,4,6-TRIBROMOPHENOL (sur.)	%	113	N/A	B105482	112	N/A	N/A	B105482
2,4-DIBROMOPHENOL (sur.)	%	102	N/A	B105482	101	N/A	N/A	B105482

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VOLATILE ORGANICS BY GC-MS (WATER)

Bureau Veritas ID		BYQ614			
Sampling Date		2023/08/09 09:30			
COC Number		1/1			
	UNITS	**QC23-1**	**MU**	**RDL**	**QC Batch**
Volatiles					
Benzene	mg/L	<0.00040	N/A	0.00040	B103837
Toluene	mg/L	0.00054	+/- <RDL	0.00040	B103837
Ethylbenzene	mg/L	<0.00040	N/A	0.00040	B103837
m & p-Xylene	mg/L	0.0021	+/- <RDL	0.00080	B103837
o-Xylene	mg/L	0.0021	+/- 0.00073	0.00040	B103837
Xylenes (Total)	mg/L	0.0042	N/A	0.00089	B101687
F1 (C6-C10) - BTEX	mg/L	0.28	N/A	0.10	B101687
F1 (C6-C10)	mg/L	0.29	+/- <RDL	0.10	B103837
Surrogate Recovery (%)					
1,4-Difluorobenzene (sur.)	%	91	N/A	N/A	B103837
4-Bromofluorobenzene (sur.)	%	98	N/A	N/A	B103837
D4-1,2-Dichloroethane (sur.)	%	114	N/A	N/A	B103837

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N/A = Not Applicable

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TOTAL PETROLEUM HYDROCARBONS (WATER)

Bureau Veritas ID		BYQ613		BYQ614			
Sampling Date		2023/08/09 09:30		2023/08/09 09:30			
COC Number		1/1		1/1			
	UNITS	**SW23-4**	**MU**	**QC23-1**	**MU**	**RDL**	**QC Batch**
Hydrocarbons							
Total Extractables C10 to C30	mg/L	1.4	N/A	1.5	N/A	0.20	B103296
Surrogate Recovery (%)							
O-TERPHENYL (sur.)	%	101	N/A	103	N/A	N/A	B103296

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

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GENERAL COMMENTS

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

Package 1	6.0°C

Sample BYQ613 [SW23-4] : Sample was analyzed past method specified hold time for Hydrocarbons (C10-C30) in Water - GC/FID. Sample was analyzed past method specified hold time for Oil and Grease (Gravimetric, n-Hexane). Sample was analyzed past method specified hold time for Ammonia-N (Total). Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised. Sample was analyzed past method specified hold time for Total Suspended Solids (NFR). Sample was analyzed past method specified hold time for Phenols (semivolatile). Sample was analyzed past method specified hold time for Chloride/Sulphate by Auto Colourimetry. Sample was analyzed past method specified hold time for NO2 (N); NO2 (N) + NO3 (N) in Water. Sample was analyzed past method specified hold time for Alkalinity @25C (pp, total), CO3,HCO3,OH. Sample was analyzed past method specified hold time for Conductivity @25C.

Sample BYQ614 [QC23-1] : Sample was analyzed past method specified hold time for Hydrocarbons (C10-C30) in Water - GC/FID. Sample was analyzed past method specified hold time for Ammonia-N (Total). Sample was analyzed past method specified hold time for Oil and Grease (Gravimetric, n-Hexane). Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised. Sample was analyzed past method specified hold time for Total Suspended Solids (NFR). Sample was analyzed past method specified hold time for Phenols (semivolatile). Sample was analyzed past method specified hold time for Chloride/Sulphate by Auto Colourimetry. Sample was analyzed past method specified hold time for NO2 (N); NO2 (N) + NO3 (N) in Water. Sample was analyzed past method specified hold time for Alkalinity @25C (pp, total), CO3,HCO3,OH. Sample was analyzed past method specified hold time for Conductivity @25C. Sample was analyzed past method specified hold time for BTEX/F1 in Water by HS GC/MS/FID.

The estimate of uncertainty has been reported as an expanded uncertainty and calculated using a coverage factor of 2, which gives a level of confidence of 95%.

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
B102290	JB9	Matrix Spike	Total Oil and grease	2023/09/13		105	%	70 - 130
B102290	JB9	Spiked Blank	Total Oil and grease	2023/09/13		114	%	70 - 130
B102290	JB9	Method Blank	Total Oil and grease	2023/09/13	<2.0		mg/L	
B102290	JB9	RPD	Total Oil and grease	2023/09/13	2.7		%	40
B103296	BQU	Spiked Blank	O-TERPHENYL (sur.)	2023/09/14		101	%	60 - 140
			Total Extractables C10 to C30	2023/09/14		85	%	70 - 130
B103296	BQU	Method Blank	O-TERPHENYL (sur.)	2023/09/14		103	%	60 - 140
			Total Extractables C10 to C30	2023/09/14	<0.20		mg/L	
B103537	KH2	Matrix Spike	Total Aluminum (Al)	2023/09/12		109	%	80 - 120
			Total Antimony (Sb)	2023/09/12		111	%	80 - 120
			Total Arsenic (As)	2023/09/12		95	%	80 - 120
			Total Beryllium (Be)	2023/09/12		92	%	80 - 120
			Total Cadmium (Cd)	2023/09/12		48 (1)	%	80 - 120
			Total Chromium (Cr)	2023/09/12		106	%	80 - 120
			Total Cobalt (Co)	2023/09/12		99	%	80 - 120
			Total Copper (Cu)	2023/09/12		88	%	80 - 120
			Total Lead (Pb)	2023/09/12		47 (1)	%	80 - 120
			Total Molybdenum (Mo)	2023/09/12		123 (1)	%	80 - 120
			Total Nickel (Ni)	2023/09/12		91	%	80 - 120
			Total Selenium (Se)	2023/09/12		81	%	80 - 120
			Total Silver (Ag)	2023/09/12		65 (1)	%	80 - 120
			Total Thallium (Tl)	2023/09/12		86	%	80 - 120
			Total Tin (Sn)	2023/09/12		107	%	80 - 120
			Total Titanium (Ti)	2023/09/12		119	%	80 - 120
			Total Uranium (U)	2023/09/12		103	%	80 - 120
			Total Vanadium (V)	2023/09/12		116	%	80 - 120
			Total Zinc (Zn)	2023/09/12		84	%	80 - 120
B103537	KH2	Spiked Blank	Total Aluminum (Al)	2023/09/12		116	%	80 - 120
			Total Antimony (Sb)	2023/09/12		120	%	80 - 120
			Total Arsenic (As)	2023/09/12		109	%	80 - 120
			Total Beryllium (Be)	2023/09/12		110	%	80 - 120
			Total Cadmium (Cd)	2023/09/12		110	%	80 - 120
			Total Chromium (Cr)	2023/09/12		113	%	80 - 120
			Total Cobalt (Co)	2023/09/12		114	%	80 - 120
			Total Copper (Cu)	2023/09/12		114	%	80 - 120
			Total Lead (Pb)	2023/09/12		116	%	80 - 120
			Total Molybdenum (Mo)	2023/09/12		113	%	80 - 120
			Total Nickel (Ni)	2023/09/12		112	%	80 - 120
			Total Selenium (Se)	2023/09/12		109	%	80 - 120
			Total Silver (Ag)	2023/09/12		113	%	80 - 120
			Total Thallium (Tl)	2023/09/12		116	%	80 - 120
			Total Tin (Sn)	2023/09/12		111	%	80 - 120
			Total Titanium (Ti)	2023/09/12		112	%	80 - 120
			Total Uranium (U)	2023/09/12		112	%	80 - 120
			Total Vanadium (V)	2023/09/12		113	%	80 - 120
			Total Zinc (Zn)	2023/09/12		112	%	80 - 120
B103537	KH2	Method Blank	Total Aluminum (Al)	2023/09/12	<0.0030		mg/L	
			Total Antimony (Sb)	2023/09/12	<0.00060		mg/L	
			Total Arsenic (As)	2023/09/12	<0.00020		mg/L	
			Total Beryllium (Be)	2023/09/12	<0.0010		mg/L	
			Total Cadmium (Cd)	2023/09/12	<0.000020		mg/L	
			Total Chromium (Cr)	2023/09/12	<0.0010		mg/L	
			Total Cobalt (Co)	2023/09/12	<0.00030		mg/L	
			Total Copper (Cu)	2023/09/12	<0.0010		mg/L	
			Total Lead (Pb)	2023/09/12	<0.00020		mg/L	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Molybdenum (Mo)	2023/09/12	<0.00020		mg/L	
			Total Nickel (Ni)	2023/09/12	<0.00050		mg/L	
			Total Selenium (Se)	2023/09/12	<0.00020		mg/L	
			Total Silver (Ag)	2023/09/12	<0.00010		mg/L	
			Total Thallium (Tl)	2023/09/12	<0.00020		mg/L	
			Total Tin (Sn)	2023/09/12	<0.0010		mg/L	
			Total Titanium (Ti)	2023/09/12	<0.0010		mg/L	
			Total Uranium (U)	2023/09/12	<0.00010		mg/L	
			Total Vanadium (V)	2023/09/12	<0.0010		mg/L	
			Total Zinc (Zn)	2023/09/12	<0.0030		mg/L	
B103537	KH2	RPD	Total Aluminum (Al)	2023/09/12	3.1		%	20
			Total Zinc (Zn)	2023/09/12	5.9		%	20
B103540	VSC	Matrix Spike	Total Barium (Ba)	2023/09/12		72 (1)	%	80 - 120
			Total Boron (B)	2023/09/12		73 (1)	%	80 - 120
			Total Calcium (Ca)	2023/09/12		NC	%	80 - 120
			Total Iron (Fe)	2023/09/12		111	%	80 - 120
			Total Lithium (Li)	2023/09/12		76 (1)	%	80 - 120
			Total Magnesium (Mg)	2023/09/12		NC	%	80 - 120
			Total Manganese (Mn)	2023/09/12		101	%	80 - 120
			Total Phosphorus (P)	2023/09/12		94	%	80 - 120
			Total Potassium (K)	2023/09/12		NC	%	80 - 120
			Total Silicon (Si)	2023/09/12		107	%	80 - 120
			Total Sodium (Na)	2023/09/12		NC	%	80 - 120
			Total Strontium (Sr)	2023/09/12		NC	%	80 - 120
			Total Sulphur (S)	2023/09/12		NC	%	80 - 120
B103540	VSC	Spiked Blank	Total Barium (Ba)	2023/09/12		102	%	80 - 120
			Total Boron (B)	2023/09/12		98	%	80 - 120
			Total Calcium (Ca)	2023/09/12		103	%	80 - 120
			Total Iron (Fe)	2023/09/12		106	%	80 - 120
			Total Lithium (Li)	2023/09/12		105	%	80 - 120
			Total Magnesium (Mg)	2023/09/12		102	%	80 - 120
			Total Manganese (Mn)	2023/09/12		110	%	80 - 120
			Total Phosphorus (P)	2023/09/12		101	%	80 - 120
			Total Potassium (K)	2023/09/12		103	%	80 - 120
			Total Silicon (Si)	2023/09/12		101	%	80 - 120
			Total Sodium (Na)	2023/09/12		104	%	80 - 120
			Total Strontium (Sr)	2023/09/12		98	%	80 - 120
			Total Sulphur (S)	2023/09/12		99	%	80 - 120
B103540	VSC	Method Blank	Total Barium (Ba)	2023/09/12	<0.010		mg/L	
			Total Boron (B)	2023/09/12	<0.020		mg/L	
			Total Calcium (Ca)	2023/09/12	<0.30		mg/L	
			Total Iron (Fe)	2023/09/12	<0.060		mg/L	
			Total Lithium (Li)	2023/09/12	<0.020		mg/L	
			Total Magnesium (Mg)	2023/09/12	<0.20		mg/L	
			Total Manganese (Mn)	2023/09/12	<0.0040		mg/L	
			Total Phosphorus (P)	2023/09/12	<0.10		mg/L	
			Total Potassium (K)	2023/09/12	<0.30		mg/L	
			Total Silicon (Si)	2023/09/12	<0.50		mg/L	
			Total Sodium (Na)	2023/09/12	<0.50		mg/L	
			Total Strontium (Sr)	2023/09/12	<0.020		mg/L	
			Total Sulphur (S)	2023/09/12	<0.20		mg/L	
B103540	VSC	RPD	Total Calcium (Ca)	2023/09/12	0.32		%	20
			Total Magnesium (Mg)	2023/09/12	0.085		%	20
B103833	KH2	Matrix Spike	Total Aluminum (Al)	2023/09/12		108	%	80 - 120
			Total Antimony (Sb)	2023/09/12		107	%	80 - 120

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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Arsenic (As)	2023/09/12		103	%	80 - 120
			Total Beryllium (Be)	2023/09/12		104	%	80 - 120
			Total Cadmium (Cd)	2023/09/12		106	%	80 - 120
			Total Chromium (Cr)	2023/09/12		103	%	80 - 120
			Total Cobalt (Co)	2023/09/12		102	%	80 - 120
			Total Copper (Cu)	2023/09/12		100	%	80 - 120
			Total Lead (Pb)	2023/09/12		104	%	80 - 120
			Total Molybdenum (Mo)	2023/09/12		108	%	80 - 120
			Total Nickel (Ni)	2023/09/12		101	%	80 - 120
			Total Selenium (Se)	2023/09/12		102	%	80 - 120
			Total Silver (Ag)	2023/09/12		105	%	80 - 120
			Total Thallium (Tl)	2023/09/12		106	%	80 - 120
			Total Tin (Sn)	2023/09/12		109	%	80 - 120
			Total Titanium (Ti)	2023/09/12		104	%	80 - 120
			Total Uranium (U)	2023/09/12		103	%	80 - 120
			Total Vanadium (V)	2023/09/12		105	%	80 - 120
			Total Zinc (Zn)	2023/09/12		99	%	80 - 120
B103833	KH2	Spiked Blank	Total Aluminum (Al)	2023/09/12		108	%	80 - 120
			Total Antimony (Sb)	2023/09/12		108	%	80 - 120
			Total Arsenic (As)	2023/09/12		101	%	80 - 120
			Total Beryllium (Be)	2023/09/12		102	%	80 - 120
			Total Cadmium (Cd)	2023/09/12		104	%	80 - 120
			Total Chromium (Cr)	2023/09/12		103	%	80 - 120
			Total Cobalt (Co)	2023/09/12		103	%	80 - 120
			Total Copper (Cu)	2023/09/12		104	%	80 - 120
			Total Lead (Pb)	2023/09/12		106	%	80 - 120
			Total Molybdenum (Mo)	2023/09/12		105	%	80 - 120
			Total Nickel (Ni)	2023/09/12		101	%	80 - 120
			Total Selenium (Se)	2023/09/12		103	%	80 - 120
			Total Silver (Ag)	2023/09/12		105	%	80 - 120
			Total Thallium (Tl)	2023/09/12		106	%	80 - 120
			Total Tin (Sn)	2023/09/12		107	%	80 - 120
			Total Titanium (Ti)	2023/09/12		103	%	80 - 120
			Total Uranium (U)	2023/09/12		103	%	80 - 120
			Total Vanadium (V)	2023/09/12		102	%	80 - 120
			Total Zinc (Zn)	2023/09/12		103	%	80 - 120
B103833	KH2	Method Blank	Total Aluminum (Al)	2023/09/12	<0.0030		mg/L	
			Total Antimony (Sb)	2023/09/12	<0.00060		mg/L	
			Total Arsenic (As)	2023/09/12	<0.00020		mg/L	
			Total Beryllium (Be)	2023/09/12	<0.0010		mg/L	
			Total Cadmium (Cd)	2023/09/12	<0.000020		mg/L	
			Total Chromium (Cr)	2023/09/12	<0.0010		mg/L	
			Total Cobalt (Co)	2023/09/12	<0.00030		mg/L	
			Total Copper (Cu)	2023/09/12	<0.0010		mg/L	
			Total Lead (Pb)	2023/09/12	<0.00020		mg/L	
			Total Molybdenum (Mo)	2023/09/12	<0.00020		mg/L	
			Total Nickel (Ni)	2023/09/12	<0.00050		mg/L	
			Total Selenium (Se)	2023/09/12	<0.00020		mg/L	
			Total Silver (Ag)	2023/09/12	<0.00010		mg/L	
			Total Thallium (Tl)	2023/09/12	<0.00020		mg/L	
			Total Tin (Sn)	2023/09/12	<0.0010		mg/L	
			Total Titanium (Ti)	2023/09/12	<0.0010		mg/L	
			Total Uranium (U)	2023/09/12	<0.00010		mg/L	
			Total Vanadium (V)	2023/09/12	<0.0010		mg/L	
			Total Zinc (Zn)	2023/09/12	<0.0030		mg/L	

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B103833	KH2	RPD	Total Aluminum (Al)	2023/09/12	NC		%	20
			Total Antimony (Sb)	2023/09/12	NC		%	20
			Total Arsenic (As)	2023/09/12	NC		%	20
			Total Beryllium (Be)	2023/09/12	NC		%	20
			Total Chromium (Cr)	2023/09/12	NC		%	20
			Total Cobalt (Co)	2023/09/12	NC		%	20
			Total Copper (Cu)	2023/09/12	NC		%	20
			Total Lead (Pb)	2023/09/12	NC		%	20
			Total Molybdenum (Mo)	2023/09/12	NC		%	20
			Total Nickel (Ni)	2023/09/12	NC		%	20
			Total Selenium (Se)	2023/09/12	NC		%	20
			Total Silver (Ag)	2023/09/12	NC		%	20
			Total Thallium (Tl)	2023/09/12	NC		%	20
			Total Tin (Sn)	2023/09/12	NC		%	20
			Total Titanium (Ti)	2023/09/12	NC		%	20
			Total Uranium (U)	2023/09/12	NC		%	20
			Total Vanadium (V)	2023/09/12	NC		%	20
			Total Zinc (Zn)	2023/09/12	NC		%	20
B103836	VSC	Matrix Spike	Total Barium (Ba)	2023/09/12		97	%	80 - 120
			Total Boron (B)	2023/09/12		92	%	80 - 120
			Total Calcium (Ca)	2023/09/12		95	%	80 - 120
			Total Iron (Fe)	2023/09/12		98	%	80 - 120
			Total Lithium (Li)	2023/09/12		97	%	80 - 120
			Total Magnesium (Mg)	2023/09/12		97	%	80 - 120
			Total Manganese (Mn)	2023/09/12		97	%	80 - 120
			Total Phosphorus (P)	2023/09/12		97	%	80 - 120
			Total Potassium (K)	2023/09/12		95	%	80 - 120
			Total Silicon (Si)	2023/09/12		97	%	80 - 120
			Total Sodium (Na)	2023/09/12		97	%	80 - 120
			Total Strontium (Sr)	2023/09/12		93	%	80 - 120
			Total Sulphur (S)	2023/09/12		94	%	80 - 120
B103836	VSC	Spiked Blank	Total Barium (Ba)	2023/09/12		98	%	80 - 120
			Total Boron (B)	2023/09/12		91	%	80 - 120
			Total Calcium (Ca)	2023/09/12		97	%	80 - 120
			Total Iron (Fe)	2023/09/12		97	%	80 - 120
			Total Lithium (Li)	2023/09/12		97	%	80 - 120
			Total Magnesium (Mg)	2023/09/12		100	%	80 - 120
			Total Manganese (Mn)	2023/09/12		96	%	80 - 120
			Total Phosphorus (P)	2023/09/12		96	%	80 - 120
			Total Potassium (K)	2023/09/12		96	%	80 - 120
			Total Silicon (Si)	2023/09/12		96	%	80 - 120
			Total Sodium (Na)	2023/09/12		98	%	80 - 120
			Total Strontium (Sr)	2023/09/12		95	%	80 - 120
			Total Sulphur (S)	2023/09/12		94	%	80 - 120
B103836	VSC	Method Blank	Total Barium (Ba)	2023/09/12	<0.010		mg/L	
			Total Boron (B)	2023/09/12	<0.020		mg/L	
			Total Calcium (Ca)	2023/09/12	<0.30		mg/L	
			Total Iron (Fe)	2023/09/12	<0.060		mg/L	
			Total Lithium (Li)	2023/09/12	<0.020		mg/L	
			Total Magnesium (Mg)	2023/09/12	<0.20		mg/L	
			Total Manganese (Mn)	2023/09/12	<0.0040		mg/L	
			Total Phosphorus (P)	2023/09/12	<0.10		mg/L	
			Total Potassium (K)	2023/09/12	<0.30		mg/L	
			Total Silicon (Si)	2023/09/12	<0.50		mg/L	
			Total Sodium (Na)	2023/09/12	<0.50		mg/L	

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			Total Strontium (Sr)	2023/09/12	<0.020		mg/L	
			Total Sulphur (S)	2023/09/12	<0.20		mg/L	
B103836	VSC	RPD	Total Barium (Ba)	2023/09/12	NC		%	20
			Total Boron (B)	2023/09/12	NC		%	20
			Total Calcium (Ca)	2023/09/12	NC		%	20
			Total Iron (Fe)	2023/09/12	NC		%	20
			Total Lithium (Li)	2023/09/12	NC		%	20
			Total Magnesium (Mg)	2023/09/12	NC		%	20
			Total Manganese (Mn)	2023/09/12	NC		%	20
			Total Phosphorus (P)	2023/09/12	NC		%	20
			Total Potassium (K)	2023/09/12	NC		%	20
			Total Silicon (Si)	2023/09/12	NC		%	20
			Total Sodium (Na)	2023/09/12	NC		%	20
			Total Strontium (Sr)	2023/09/12	NC		%	20
			Total Sulphur (S)	2023/09/12	NC		%	20
B103837	RIL	Matrix Spike	1,4-Difluorobenzene (sur.)	2023/09/15		88	%	50 - 140
			4-Bromofluorobenzene (sur.)	2023/09/15		92	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2023/09/15		87	%	50 - 140
			Benzene	2023/09/15		90	%	50 - 140
			Toluene	2023/09/15		92	%	50 - 140
			Ethylbenzene	2023/09/15		90	%	50 - 140
			m & p-Xylene	2023/09/15		99	%	50 - 140
			o-Xylene	2023/09/15		101	%	50 - 140
			F1 (C6-C10)	2023/09/15		127	%	60 - 140
B103837	RIL	Spiked Blank	1,4-Difluorobenzene (sur.)	2023/09/14		83	%	50 - 140
			4-Bromofluorobenzene (sur.)	2023/09/14		83	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2023/09/14		81	%	50 - 140
			Benzene	2023/09/14		86	%	60 - 130
			Toluene	2023/09/14		89	%	60 - 130
			Ethylbenzene	2023/09/14		91	%	60 - 130
			m & p-Xylene	2023/09/14		96	%	60 - 130
			o-Xylene	2023/09/14		92	%	60 - 130
			F1 (C6-C10)	2023/09/14		122	%	60 - 140
B103837	RIL	Method Blank	1,4-Difluorobenzene (sur.)	2023/09/15		97	%	50 - 140
			4-Bromofluorobenzene (sur.)	2023/09/15		91	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2023/09/15		76	%	50 - 140
			Benzene	2023/09/15	<0.00040		mg/L	
			Toluene	2023/09/15	<0.00040		mg/L	
			Ethylbenzene	2023/09/15	<0.00040		mg/L	
			m & p-Xylene	2023/09/15	<0.00080		mg/L	
			o-Xylene	2023/09/15	<0.00040		mg/L	
			F1 (C6-C10)	2023/09/15	<0.10		mg/L	
B103837	RIL	RPD	Benzene	2023/09/15	NC		%	30
			Toluene	2023/09/15	NC		%	30
			Ethylbenzene	2023/09/15	NC		%	30
			m & p-Xylene	2023/09/15	NC		%	30
			o-Xylene	2023/09/15	NC		%	30
			F1 (C6-C10)	2023/09/15	NC		%	30
B104365	AFI	Matrix Spike	Total Ammonia (N)	2023/09/12		NC	%	80 - 120
B104365	AFI	Spiked Blank	Total Ammonia (N)	2023/09/12		98	%	80 - 120
B104365	AFI	Method Blank	Total Ammonia (N)	2023/09/12	<0.015		mg/L	
B104365	AFI	RPD	Total Ammonia (N)	2023/09/12	1.8		%	20
B104941	HE1	Matrix Spike	Total Suspended Solids	2023/09/14		103	%	80 - 120
B104941	HE1	Spiked Blank	Total Suspended Solids	2023/09/14		101	%	80 - 120
B104941	HE1	Method Blank	Total Suspended Solids	2023/09/14	<1.0		mg/L	

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B104941	HE1	RPD	Total Suspended Solids	2023/09/14	5.4		%	20
B105482	SJ1	Spiked Blank	2,3,4-trichlorophenol	2023/09/13		114	%	50 - 140
			2,4,6-TRIBROMOPHENOL (sur.)	2023/09/13		92	%	50 - 140
			2,4-DIBROMOPHENOL (sur.)	2023/09/13		92	%	50 - 140
			Phenol	2023/09/13		56	%	30 - 130
			3 & 4-chlorophenol	2023/09/13		101	%	50 - 140
			2,3,5,6-tetrachlorophenol	2023/09/13		106	%	50 - 140
			2,3,4,6-tetrachlorophenol	2023/09/13		110	%	50 - 140
			2,4,5-trichlorophenol	2023/09/13		116	%	50 - 140
			2,4,6-trichlorophenol	2023/09/13		108	%	50 - 140
			2,3,5-trichlorophenol	2023/09/13		108	%	50 - 140
			2,4-dichlorophenol	2023/09/13		111	%	50 - 140
			2,4-dimethylphenol	2023/09/13		100	%	50 - 140
			2,4-dinitrophenol	2023/09/13		60	%	30 - 130
			2,6-dichlorophenol	2023/09/13		112	%	50 - 140
			2-chlorophenol	2023/09/13		90	%	50 - 140
			2-methylphenol	2023/09/13		84	%	50 - 140
			2-nitrophenol	2023/09/13		108	%	50 - 140
			3 & 4-methylphenol	2023/09/13		86	%	50 - 140
			4,6-dinitro-2-methylphenol	2023/09/13		70	%	30 - 130
			4-chloro-3-methylphenol	2023/09/13		110	%	50 - 140
			4-nitrophenol	2023/09/13		86	%	50 - 140
			Pentachlorophenol	2023/09/13		102	%	50 - 140
B105482	SJ1	Method Blank	2,3,4-trichlorophenol	2023/09/13	<0.00010		mg/L	
			2,4,6-TRIBROMOPHENOL (sur.)	2023/09/13		93	%	50 - 140
			2,4-DIBROMOPHENOL (sur.)	2023/09/13		93	%	50 - 140
			Phenol	2023/09/13	<0.00010		mg/L	
			3 & 4-chlorophenol	2023/09/13	<0.00010		mg/L	
			2,3,5,6-tetrachlorophenol	2023/09/13	<0.00010		mg/L	
			2,3,4,6-tetrachlorophenol	2023/09/13	<0.00010		mg/L	
			2,4,5-trichlorophenol	2023/09/13	<0.00010		mg/L	
			2,4,6-trichlorophenol	2023/09/13	<0.00010		mg/L	
			2,3,5-trichlorophenol	2023/09/13	<0.00010		mg/L	
			2,4-dichlorophenol	2023/09/13	<0.00010		mg/L	
			2,4-dimethylphenol	2023/09/13	<0.00010		mg/L	
			2,4-dinitrophenol	2023/09/13	<0.0010		mg/L	
			2,6-dichlorophenol	2023/09/13	<0.00010		mg/L	
			2-chlorophenol	2023/09/13	<0.00010		mg/L	
			2-methylphenol	2023/09/13	<0.00010		mg/L	
			2-nitrophenol	2023/09/13	<0.0010		mg/L	
			3 & 4-methylphenol	2023/09/13	<0.00010		mg/L	
			4,6-dinitro-2-methylphenol	2023/09/13	<0.0010		mg/L	
			4-chloro-3-methylphenol	2023/09/13	<0.00010		mg/L	
			4-nitrophenol	2023/09/13	<0.0010		mg/L	
			Pentachlorophenol	2023/09/13	<0.00010		mg/L	
B106155	TOR	Matrix Spike	Chloride (Cl)	2023/09/13		101	%	80 - 120
			Sulphate (SO4)	2023/09/13		101	%	80 - 120
B106155	TOR	Spiked Blank	Chloride (Cl)	2023/09/13		100	%	80 - 120
			Sulphate (SO4)	2023/09/13		100	%	80 - 120
B106155	TOR	Method Blank	Chloride (Cl)	2023/09/13	<1.0		mg/L	
			Sulphate (SO4)	2023/09/13	<1.0		mg/L	
B106155	TOR	RPD	Chloride (Cl)	2023/09/13	0.20		%	20
			Sulphate (SO4)	2023/09/13	NC		%	20
B106165	AFI	Matrix Spike	Nitrite (N)	2023/09/13		101	%	80 - 120
			Nitrate plus Nitrite (N)	2023/09/13		102	%	80 - 120

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B106165	AFI	Spiked Blank	Nitrite (N)	2023/09/13		95	%	80 - 120
			Nitrate plus Nitrite (N)	2023/09/13		102	%	80 - 120
B106165	AFI	Method Blank	Nitrite (N)	2023/09/13	<0.010		mg/L	
			Nitrate plus Nitrite (N)	2023/09/13	<0.010		mg/L	
B106165	AFI	RPD	Nitrite (N)	2023/09/13	NC		%	20
			Nitrate plus Nitrite (N)	2023/09/13	NC		%	20
B106312	JVM	Spiked Blank	Alkalinity (Total as CaCO3)	2023/09/14		99	%	80 - 120
B106312	JVM	Method Blank	Alkalinity (PP as CaCO3)	2023/09/14	<1.0		mg/L	
			Alkalinity (Total as CaCO3)	2023/09/14	<1.0		mg/L	
			Bicarbonate (HCO3)	2023/09/14	<1.0		mg/L	
			Carbonate (CO3)	2023/09/14	<1.0		mg/L	
			Hydroxide (OH)	2023/09/14	<1.0		mg/L	
B106312	JVM	RPD	Alkalinity (PP as CaCO3)	2023/09/14	NC		%	20
			Alkalinity (Total as CaCO3)	2023/09/14	1.1		%	20
			Bicarbonate (HCO3)	2023/09/14	1.1		%	20
			Carbonate (CO3)	2023/09/14	NC		%	20
			Hydroxide (OH)	2023/09/14	NC		%	20
B106314	JVM	Spiked Blank	pH	2023/09/14		100	%	97 - 103
B106314	JVM	RPD	pH	2023/09/14	0.52		%	N/A
B106527	JVM	Spiked Blank	Conductivity	2023/09/14		100	%	90 - 110
B106527	JVM	Method Blank	Conductivity	2023/09/14	<2.0		uS/cm	
B106527	JVM	RPD	Conductivity	2023/09/14	0		%	10
B107536	VSC	Matrix Spike	Dissolved Barium (Ba)	2023/09/14		96	%	80 - 120
			Dissolved Boron (B)	2023/09/14		103	%	80 - 120
			Dissolved Calcium (Ca)	2023/09/14		99	%	80 - 120
			Dissolved Iron (Fe)	2023/09/14		102	%	80 - 120
			Dissolved Lithium (Li)	2023/09/14		100	%	80 - 120
			Dissolved Magnesium (Mg)	2023/09/14		102	%	80 - 120
			Dissolved Manganese (Mn)	2023/09/14		108	%	80 - 120
			Dissolved Phosphorus (P)	2023/09/14		99	%	80 - 120
			Dissolved Potassium (K)	2023/09/14		102	%	80 - 120
			Dissolved Silicon (Si)	2023/09/14		92	%	80 - 120
			Dissolved Sodium (Na)	2023/09/14		101	%	80 - 120
			Dissolved Strontium (Sr)	2023/09/14		95	%	80 - 120
			Dissolved Sulphur (S)	2023/09/14		99	%	80 - 120
B107536	VSC	Spiked Blank	Dissolved Barium (Ba)	2023/09/14		98	%	80 - 120
			Dissolved Boron (B)	2023/09/14		103	%	80 - 120
			Dissolved Calcium (Ca)	2023/09/14		100	%	80 - 120
			Dissolved Iron (Fe)	2023/09/14		103	%	80 - 120
			Dissolved Lithium (Li)	2023/09/14		101	%	80 - 120
			Dissolved Magnesium (Mg)	2023/09/14		102	%	80 - 120
			Dissolved Manganese (Mn)	2023/09/14		109	%	80 - 120
			Dissolved Phosphorus (P)	2023/09/14		99	%	80 - 120
			Dissolved Potassium (K)	2023/09/14		103	%	80 - 120
			Dissolved Silicon (Si)	2023/09/14		98	%	80 - 120
			Dissolved Sodium (Na)	2023/09/14		101	%	80 - 120
			Dissolved Strontium (Sr)	2023/09/14		97	%	80 - 120
			Dissolved Sulphur (S)	2023/09/14		100	%	80 - 120
B107536	VSC	Method Blank	Dissolved Barium (Ba)	2023/09/14	<0.010		mg/L	
			Dissolved Boron (B)	2023/09/14	<0.020		mg/L	
			Dissolved Calcium (Ca)	2023/09/14	<0.30		mg/L	
			Dissolved Iron (Fe)	2023/09/14	<0.060		mg/L	
			Dissolved Lithium (Li)	2023/09/14	<0.020		mg/L	
			Dissolved Magnesium (Mg)	2023/09/14	<0.20		mg/L	
			Dissolved Manganese (Mn)	2023/09/14	<0.0040		mg/L	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Phosphorus (P)	2023/09/14	<0.10		mg/L	
			Dissolved Potassium (K)	2023/09/14	<0.30		mg/L	
			Dissolved Silicon (Si)	2023/09/14	<0.50		mg/L	
			Dissolved Sodium (Na)	2023/09/14	<0.50		mg/L	
			Dissolved Strontium (Sr)	2023/09/14	<0.020		mg/L	
			Dissolved Sulphur (S)	2023/09/14	<0.20		mg/L	
B107536	VSC	RPD	Dissolved Barium (Ba)	2023/09/14	0.18		%	20
			Dissolved Boron (B)	2023/09/14	7.3		%	20
			Dissolved Calcium (Ca)	2023/09/14	0.16		%	20
			Dissolved Iron (Fe)	2023/09/14	0.85		%	20
			Dissolved Lithium (Li)	2023/09/14	2.3		%	20
			Dissolved Magnesium (Mg)	2023/09/14	0.51		%	20
			Dissolved Manganese (Mn)	2023/09/14	1.6		%	20
			Dissolved Phosphorus (P)	2023/09/14	12		%	20
			Dissolved Potassium (K)	2023/09/14	1.6		%	20
			Dissolved Silicon (Si)	2023/09/14	0.75		%	20
			Dissolved Sodium (Na)	2023/09/14	0.19		%	20
			Dissolved Strontium (Sr)	2023/09/14	0.27		%	20
			Dissolved Sulphur (S)	2023/09/14	0.76		%	20
B107571	MPU	Matrix Spike	Dissolved Barium (Ba)	2023/09/14		97	%	80 - 120
			Dissolved Boron (B)	2023/09/14		104	%	80 - 120
			Dissolved Calcium (Ca)	2023/09/14		101	%	80 - 120
			Dissolved Iron (Fe)	2023/09/14		99	%	80 - 120
			Dissolved Lithium (Li)	2023/09/14		100	%	80 - 120
			Dissolved Magnesium (Mg)	2023/09/14		103	%	80 - 120
			Dissolved Manganese (Mn)	2023/09/14		106	%	80 - 120
			Dissolved Phosphorus (P)	2023/09/14		102	%	80 - 120
			Dissolved Potassium (K)	2023/09/14		103	%	80 - 120
			Dissolved Silicon (Si)	2023/09/14		96	%	80 - 120
			Dissolved Sodium (Na)	2023/09/14		NC	%	80 - 120
			Dissolved Strontium (Sr)	2023/09/14		97	%	80 - 120
			Dissolved Sulphur (S)	2023/09/14		103	%	80 - 120
B107571	MPU	Spiked Blank	Dissolved Barium (Ba)	2023/09/14		99	%	80 - 120
			Dissolved Boron (B)	2023/09/14		103	%	80 - 120
			Dissolved Calcium (Ca)	2023/09/14		101	%	80 - 120
			Dissolved Iron (Fe)	2023/09/14		103	%	80 - 120
			Dissolved Lithium (Li)	2023/09/14		102	%	80 - 120
			Dissolved Magnesium (Mg)	2023/09/14		103	%	80 - 120
			Dissolved Manganese (Mn)	2023/09/14		108	%	80 - 120
			Dissolved Phosphorus (P)	2023/09/14		100	%	80 - 120
			Dissolved Potassium (K)	2023/09/14		104	%	80 - 120
			Dissolved Silicon (Si)	2023/09/14		99	%	80 - 120
			Dissolved Sodium (Na)	2023/09/14		102	%	80 - 120
			Dissolved Strontium (Sr)	2023/09/14		98	%	80 - 120
			Dissolved Sulphur (S)	2023/09/14		100	%	80 - 120
B107571	MPU	Method Blank	Dissolved Barium (Ba)	2023/09/16	<0.010		mg/L	
			Dissolved Boron (B)	2023/09/16	<0.020		mg/L	
			Dissolved Calcium (Ca)	2023/09/16	<0.30		mg/L	
			Dissolved Iron (Fe)	2023/09/16	<0.060		mg/L	
			Dissolved Lithium (Li)	2023/09/16	<0.020		mg/L	
			Dissolved Magnesium (Mg)	2023/09/16	<0.20		mg/L	
			Dissolved Manganese (Mn)	2023/09/16	<0.0040		mg/L	
			Dissolved Phosphorus (P)	2023/09/16	<0.10		mg/L	
			Dissolved Potassium (K)	2023/09/16	<0.30		mg/L	
			Dissolved Silicon (Si)	2023/09/16	<0.50		mg/L	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Sodium (Na)	2023/09/16	<0.50		mg/L	
			Dissolved Strontium (Sr)	2023/09/16	<0.020		mg/L	
			Dissolved Sulphur (S)	2023/09/16	<0.20		mg/L	
B107571	MPU	RPD	Dissolved Calcium (Ca)	2023/09/16	5.2		%	20
			Dissolved Iron (Fe)	2023/09/16	NC		%	20
			Dissolved Magnesium (Mg)	2023/09/16	19		%	20
			Dissolved Manganese (Mn)	2023/09/16	3.1		%	20
			Dissolved Potassium (K)	2023/09/16	10		%	20
			Dissolved Sodium (Na)	2023/09/16	0.28		%	20
B108257	JAB	Matrix Spike	Dissolved Aluminum (Al)	2023/09/14		110	%	80 - 120
			Dissolved Antimony (Sb)	2023/09/14		102	%	80 - 120
			Dissolved Arsenic (As)	2023/09/14		98	%	80 - 120
			Dissolved Beryllium (Be)	2023/09/14		95	%	80 - 120
			Dissolved Chromium (Cr)	2023/09/14		98	%	80 - 120
			Dissolved Cobalt (Co)	2023/09/14		97	%	80 - 120
			Dissolved Copper (Cu)	2023/09/14		95	%	80 - 120
			Dissolved Lead (Pb)	2023/09/14		98	%	80 - 120
			Dissolved Molybdenum (Mo)	2023/09/14		100	%	80 - 120
			Dissolved Nickel (Ni)	2023/09/14		93	%	80 - 120
			Dissolved Selenium (Se)	2023/09/14		105	%	80 - 120
			Dissolved Silver (Ag)	2023/09/14		97	%	80 - 120
			Dissolved Thallium (Tl)	2023/09/14		99	%	80 - 120
			Dissolved Tin (Sn)	2023/09/14		99	%	80 - 120
			Dissolved Titanium (Ti)	2023/09/14		97	%	80 - 120
			Dissolved Uranium (U)	2023/09/14		98	%	80 - 120
			Dissolved Vanadium (V)	2023/09/14		99	%	80 - 120
			Dissolved Zinc (Zn)	2023/09/14		77 (1)	%	80 - 120
B108257	JAB	Spiked Blank	Dissolved Aluminum (Al)	2023/09/14		120	%	80 - 120
			Dissolved Antimony (Sb)	2023/09/14		105	%	80 - 120
			Dissolved Arsenic (As)	2023/09/14		98	%	80 - 120
			Dissolved Beryllium (Be)	2023/09/14		96	%	80 - 120
			Dissolved Chromium (Cr)	2023/09/14		99	%	80 - 120
			Dissolved Cobalt (Co)	2023/09/14		100	%	80 - 120
			Dissolved Copper (Cu)	2023/09/14		99	%	80 - 120
			Dissolved Lead (Pb)	2023/09/14		103	%	80 - 120
			Dissolved Molybdenum (Mo)	2023/09/14		102	%	80 - 120
			Dissolved Nickel (Ni)	2023/09/14		98	%	80 - 120
			Dissolved Selenium (Se)	2023/09/14		105	%	80 - 120
			Dissolved Silver (Ag)	2023/09/14		99	%	80 - 120
			Dissolved Thallium (Tl)	2023/09/14		102	%	80 - 120
			Dissolved Tin (Sn)	2023/09/14		99	%	80 - 120
			Dissolved Titanium (Ti)	2023/09/14		103	%	80 - 120
			Dissolved Uranium (U)	2023/09/14		100	%	80 - 120
			Dissolved Vanadium (V)	2023/09/14		100	%	80 - 120
			Dissolved Zinc (Zn)	2023/09/14		101	%	80 - 120
B108257	JAB	Method Blank	Dissolved Aluminum (Al)	2023/09/14	<0.0030		mg/L	
			Dissolved Antimony (Sb)	2023/09/14	<0.00060		mg/L	
			Dissolved Arsenic (As)	2023/09/14	<0.00020		mg/L	
			Dissolved Beryllium (Be)	2023/09/14	<0.0010		mg/L	
			Dissolved Chromium (Cr)	2023/09/14	<0.0010		mg/L	
			Dissolved Cobalt (Co)	2023/09/14	<0.00030		mg/L	
			Dissolved Copper (Cu)	2023/09/14	<0.0010		mg/L	
			Dissolved Lead (Pb)	2023/09/14	<0.00020		mg/L	
			Dissolved Molybdenum (Mo)	2023/09/14	<0.00020		mg/L	
			Dissolved Nickel (Ni)	2023/09/14	<0.00050		mg/L	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Selenium (Se)	2023/09/14	<0.00020		mg/L	
			Dissolved Silver (Ag)	2023/09/14	<0.00010		mg/L	
			Dissolved Thallium (Tl)	2023/09/14	<0.00020		mg/L	
			Dissolved Tin (Sn)	2023/09/14	<0.0010		mg/L	
			Dissolved Titanium (Ti)	2023/09/14	<0.0010		mg/L	
			Dissolved Uranium (U)	2023/09/14	<0.00010		mg/L	
			Dissolved Vanadium (V)	2023/09/14	<0.0010		mg/L	
			Dissolved Zinc (Zn)	2023/09/14	<0.0030		mg/L	
B108257	JAB	RPD	Dissolved Aluminum (Al)	2023/09/14	NC		%	20
			Dissolved Antimony (Sb)	2023/09/14	NC		%	20
			Dissolved Arsenic (As)	2023/09/14	19		%	20
			Dissolved Beryllium (Be)	2023/09/14	NC		%	20
			Dissolved Chromium (Cr)	2023/09/14	NC		%	20
			Dissolved Cobalt (Co)	2023/09/14	NC		%	20
			Dissolved Copper (Cu)	2023/09/14	NC		%	20
			Dissolved Lead (Pb)	2023/09/14	NC		%	20
			Dissolved Molybdenum (Mo)	2023/09/14	NC		%	20
			Dissolved Nickel (Ni)	2023/09/14	NC		%	20
			Dissolved Selenium (Se)	2023/09/14	NC		%	20
			Dissolved Silver (Ag)	2023/09/14	NC		%	20
			Dissolved Thallium (Tl)	2023/09/14	NC		%	20
			Dissolved Tin (Sn)	2023/09/14	NC		%	20
			Dissolved Titanium (Ti)	2023/09/14	NC		%	20
			Dissolved Uranium (U)	2023/09/14	NC		%	20
			Dissolved Vanadium (V)	2023/09/14	NC		%	20
			Dissolved Zinc (Zn)	2023/09/14	2.8		%	20
B108267	JAB	Matrix Spike	Dissolved Aluminum (Al)	2023/09/14		110	%	80 - 120
			Dissolved Antimony (Sb)	2023/09/14		102	%	80 - 120
			Dissolved Arsenic (As)	2023/09/14		100	%	80 - 120
			Dissolved Beryllium (Be)	2023/09/14		95	%	80 - 120
			Dissolved Chromium (Cr)	2023/09/14		97	%	80 - 120
			Dissolved Cobalt (Co)	2023/09/14		95	%	80 - 120
			Dissolved Copper (Cu)	2023/09/14		89	%	80 - 120
			Dissolved Lead (Pb)	2023/09/14		93	%	80 - 120
			Dissolved Molybdenum (Mo)	2023/09/14		105	%	80 - 120
			Dissolved Nickel (Ni)	2023/09/14		NC	%	80 - 120
			Dissolved Selenium (Se)	2023/09/14		NC	%	80 - 120
			Dissolved Silver (Ag)	2023/09/14		94	%	80 - 120
			Dissolved Thallium (Tl)	2023/09/14		94	%	80 - 120
			Dissolved Tin (Sn)	2023/09/14		102	%	80 - 120
			Dissolved Titanium (Ti)	2023/09/14		102	%	80 - 120
			Dissolved Uranium (U)	2023/09/14		NC	%	80 - 120
			Dissolved Vanadium (V)	2023/09/14		99	%	80 - 120
			Dissolved Zinc (Zn)	2023/09/14		89	%	80 - 120
B108267	JAB	Spiked Blank	Dissolved Aluminum (Al)	2023/09/14		120	%	80 - 120
			Dissolved Antimony (Sb)	2023/09/14		105	%	80 - 120
			Dissolved Arsenic (As)	2023/09/14		99	%	80 - 120
			Dissolved Beryllium (Be)	2023/09/14		99	%	80 - 120
			Dissolved Chromium (Cr)	2023/09/14		99	%	80 - 120
			Dissolved Cobalt (Co)	2023/09/14		100	%	80 - 120
			Dissolved Copper (Cu)	2023/09/14		100	%	80 - 120
			Dissolved Lead (Pb)	2023/09/14		102	%	80 - 120
			Dissolved Molybdenum (Mo)	2023/09/14		103	%	80 - 120
			Dissolved Nickel (Ni)	2023/09/14		99	%	80 - 120
			Dissolved Selenium (Se)	2023/09/14		103	%	80 - 120

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Silver (Ag)	2023/09/14		100	%	80 - 120
			Dissolved Thallium (Tl)	2023/09/14		102	%	80 - 120
			Dissolved Tin (Sn)	2023/09/14		102	%	80 - 120
			Dissolved Titanium (Ti)	2023/09/14		98	%	80 - 120
			Dissolved Uranium (U)	2023/09/14		102	%	80 - 120
			Dissolved Vanadium (V)	2023/09/14		99	%	80 - 120
			Dissolved Zinc (Zn)	2023/09/14		105	%	80 - 120
B108267	JAB	Method Blank	Dissolved Aluminum (Al)	2023/09/14	<0.0030		mg/L	
			Dissolved Antimony (Sb)	2023/09/14	<0.00060		mg/L	
			Dissolved Arsenic (As)	2023/09/14	<0.00020		mg/L	
			Dissolved Beryllium (Be)	2023/09/14	<0.0010		mg/L	
			Dissolved Chromium (Cr)	2023/09/14	<0.0010		mg/L	
			Dissolved Cobalt (Co)	2023/09/14	<0.00030		mg/L	
			Dissolved Copper (Cu)	2023/09/14	<0.0010		mg/L	
			Dissolved Lead (Pb)	2023/09/14	<0.00020		mg/L	
			Dissolved Molybdenum (Mo)	2023/09/14	<0.00020		mg/L	
			Dissolved Nickel (Ni)	2023/09/14	<0.00050		mg/L	
			Dissolved Selenium (Se)	2023/09/14	<0.00020		mg/L	
			Dissolved Silver (Ag)	2023/09/14	<0.00010		mg/L	
			Dissolved Thallium (Tl)	2023/09/14	<0.00020		mg/L	
			Dissolved Tin (Sn)	2023/09/14	<0.0010		mg/L	
			Dissolved Titanium (Ti)	2023/09/14	<0.0010		mg/L	
			Dissolved Uranium (U)	2023/09/14	<0.00010		mg/L	
			Dissolved Vanadium (V)	2023/09/14	<0.0010		mg/L	
			Dissolved Zinc (Zn)	2023/09/14	<0.0030		mg/L	
B108267	JAB	RPD	Dissolved Aluminum (Al)	2023/09/14	1.6		%	20
			Dissolved Antimony (Sb)	2023/09/14	NC		%	20
			Dissolved Arsenic (As)	2023/09/14	3.5		%	20
			Dissolved Beryllium (Be)	2023/09/14	NC		%	20
			Dissolved Chromium (Cr)	2023/09/14	NC		%	20
			Dissolved Cobalt (Co)	2023/09/14	1.5		%	20
			Dissolved Copper (Cu)	2023/09/14	3.7		%	20
			Dissolved Lead (Pb)	2023/09/14	NC		%	20
			Dissolved Molybdenum (Mo)	2023/09/14	6.7		%	20
			Dissolved Nickel (Ni)	2023/09/14	1.3		%	20
			Dissolved Selenium (Se)	2023/09/14	12		%	20
			Dissolved Silver (Ag)	2023/09/14	NC		%	20
			Dissolved Thallium (Tl)	2023/09/14	NC		%	20
			Dissolved Tin (Sn)	2023/09/14	NC		%	20
			Dissolved Titanium (Ti)	2023/09/14	NC		%	20
			Dissolved Uranium (U)	2023/09/14	3.0		%	20
			Dissolved Vanadium (V)	2023/09/14	NC		%	20
			Dissolved Zinc (Zn)	2023/09/14	2.1		%	20
B108829	HE1	Matrix Spike	Total Suspended Solids	2023/09/15		95	%	80 - 120
B108829	HE1	Spiked Blank	Total Suspended Solids	2023/09/15		99	%	80 - 120
B108829	HE1	Method Blank	Total Suspended Solids	2023/09/15	<1.0		mg/L	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
B108829	HE1	RPD	Total Suspended Solids	2023/09/15	0.80		%	20

N/A = Not Applicable

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

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

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

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

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

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

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

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

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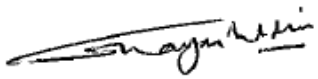
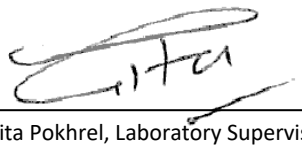
VALIDATION SIGNATURE PAGE

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

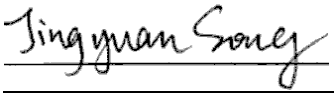


Ghayasuddin Khan, M.Sc., P.Chem., QP, Scientific Specialist, Inorganics

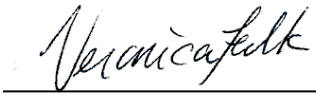


Gita Pokhrel, Laboratory Supervisor

Rahul Suryawanshi, Senior Analyst



Jingyuan Song, QP, Organics – Senior Analyst



Veronica Falk, B.Sc., P.Chem., QP, Scientific Specialist, Organics

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CHAIN OF CUSTODY RECORD

ENV COC - 00013v3

05-Sep-23 10:24
Cristina (Maria) Bacchus
C3R1882
JM ENV-1327

Invoice Information — Invoice to (requires report) ☐		Report Information (if differs from invoice)		Project Information	
Company:	Stantec Consulting Ltd.	Company:		Quotation #:	
Contact Name:	Luke Anderson	Contact Name:		P.O. #/ AFE#:	
Street Address:	500-10220 103 Avenue NW	Street Address:		Project #:	123514481
City: / Prov: / Postal Code:	Edmonton / AB / T5J 0K4	City: / Prov: / Postal Code:		Site #:	
Phone:	780-905-4314	Phone:		Site Location:	
Email:	luke.anderson@stantec.com	Email:		Site Location Province:	
Copies:		Copies:		Sampled By:	RH

Regulatory Criteria

☐ AT1 ☑ CCME ☐ Drinking Water - Canada ☐ Drinking Water - Manitoba
☐ Saskatchewan ☐ Drinking Water - Alberta ☐ Other ________

SAMPLES MUST BE KEPT COOL (<10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BUREAU VERITAS

Regular Turnaround Time (TAT): ☐ 5 to 7 Day ☑ 10 Day

Rush Turnaround Time (TAT) — Surcharges apply: ☐ Same Day ☐ 1 Day ☐ 2 Day ☐ 3 Day ☐ 4 Day

Date Required: YY ___ MM ___ DD ___

Analysis columns: 1 FIELD FILTERED; 2 FIELD PRESERVED; 3 LAB FILTRATION REQUIRED; 4 BTEX [redacted]; 5 [redacted] PAH; 6 [redacted] TSS; 7 BTEX F1-F4; 8 Routine water; 9 Regulated metals - total; 10 Regulated metals - dissolved; 11 Mercury - total; 12 Mercury - dissolved; 13 Salinity 4; 14 Sieve (75 micron); 15 Texture (% sand, silt, clay); 16 Basic class II landfill; 17 Ammonia Nitrogen; 18 Oil and grease; 19 Total Phenols; 20 TEH; 21 # OF CONTAINERS SUBMITTED; 22 HOLD - DO NOT ANALYZE

#	Sample Identification	YY	MM	DD	HH	MM	Matrix	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Comments
1	SW23-4	23	08	09	09	30	water	✓	✓		✓	✓	✓		✓	✓	✓							✓	✓	✓	✓	9		
2	QC23-1	23	08	09	09	30	water	✓	✓		✓	✓	✓		✓	✓	✓							✓	✓	✓	✓	9		
3	QC23-2	23									✓	✓	✓		✓	✓	✓							✓	✓	✓	✓			
4																														
5																														
6																														
7																														
8																														
9																														
10																														
11																														
12																														

mcal-09-700

*UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BUREAU VERITAS STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS AND CONDITIONS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVNA.COM/TERMS-AND-CONDITIONS OR BY CALLING THE LABORATORY LISTED ABOVE TO OBTAIN A COPY

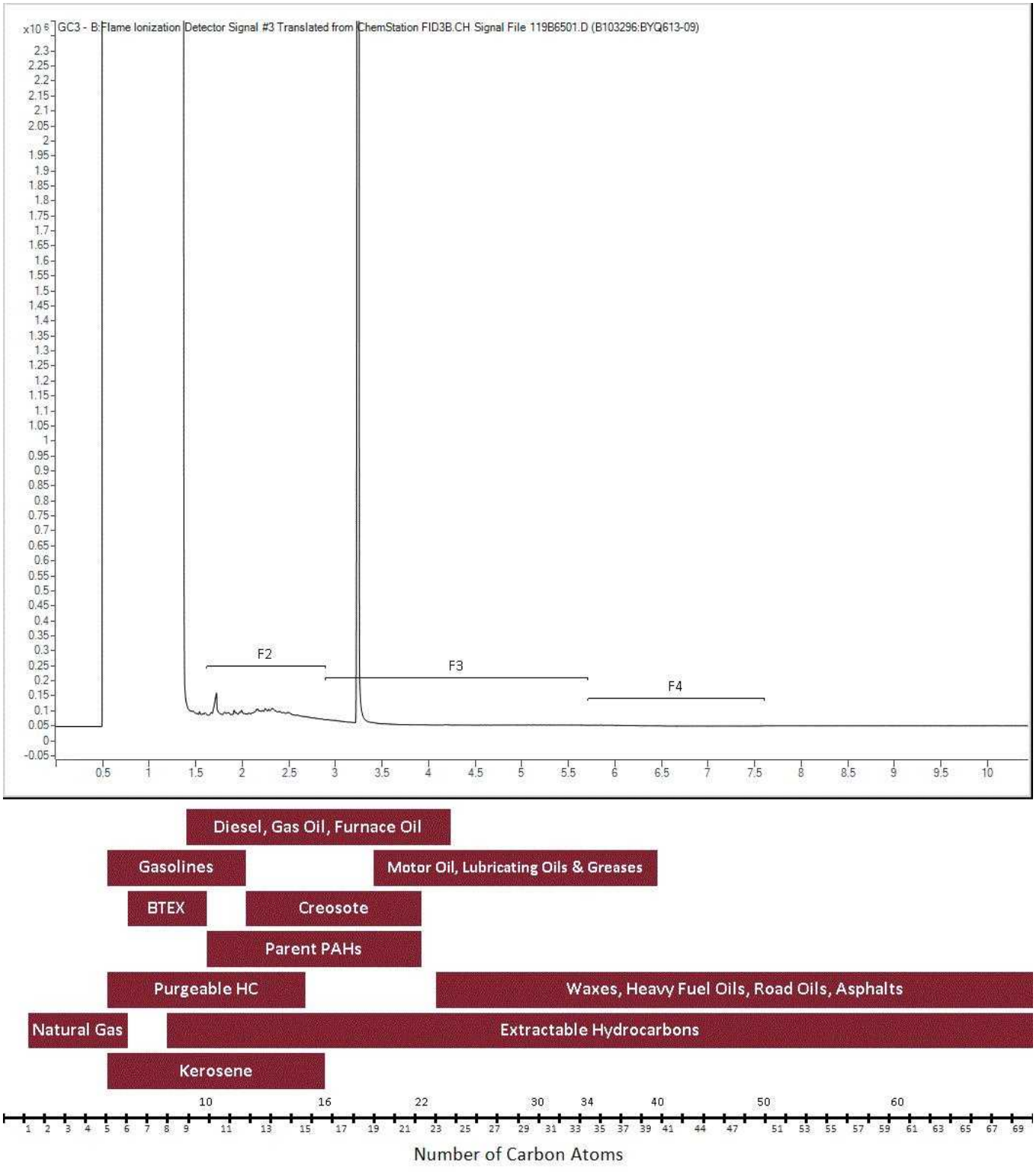
LAB USE ONLY	Yes	No	°C	1	2	3
Seal present	✓		ice	6	6	6
Seal intact	✓					
Cooling media present	✓					

LAB USE ONLY	Yes	No	°C	1	2	3
Seal present	✓			1	1	0
Seal intact	✓					
Cooling media present	✓					

LAB USE ONLY	Yes	No	°C	1	2	3	Temperature reading by:
Seal present	✓			0	1	0	
Seal intact	✓						
Cooling media present	✓						

	Relinquished by: (Signature/ Print)	YY	MM	DD	HH	MM	Received by: (Signature/ Print)	YY	MM	DD	HH	MM	Special instructions
1	Ryan Hegland	23	08	11	09	00	Lawrence Addison Lawrence	2023	09	05	10	24	temps: 7, 7, 7
2							Niral NIRAL PATEL	2023	09	06	08	30	CS-4
							[signature]	2023	09	09	09	30	ICE-4

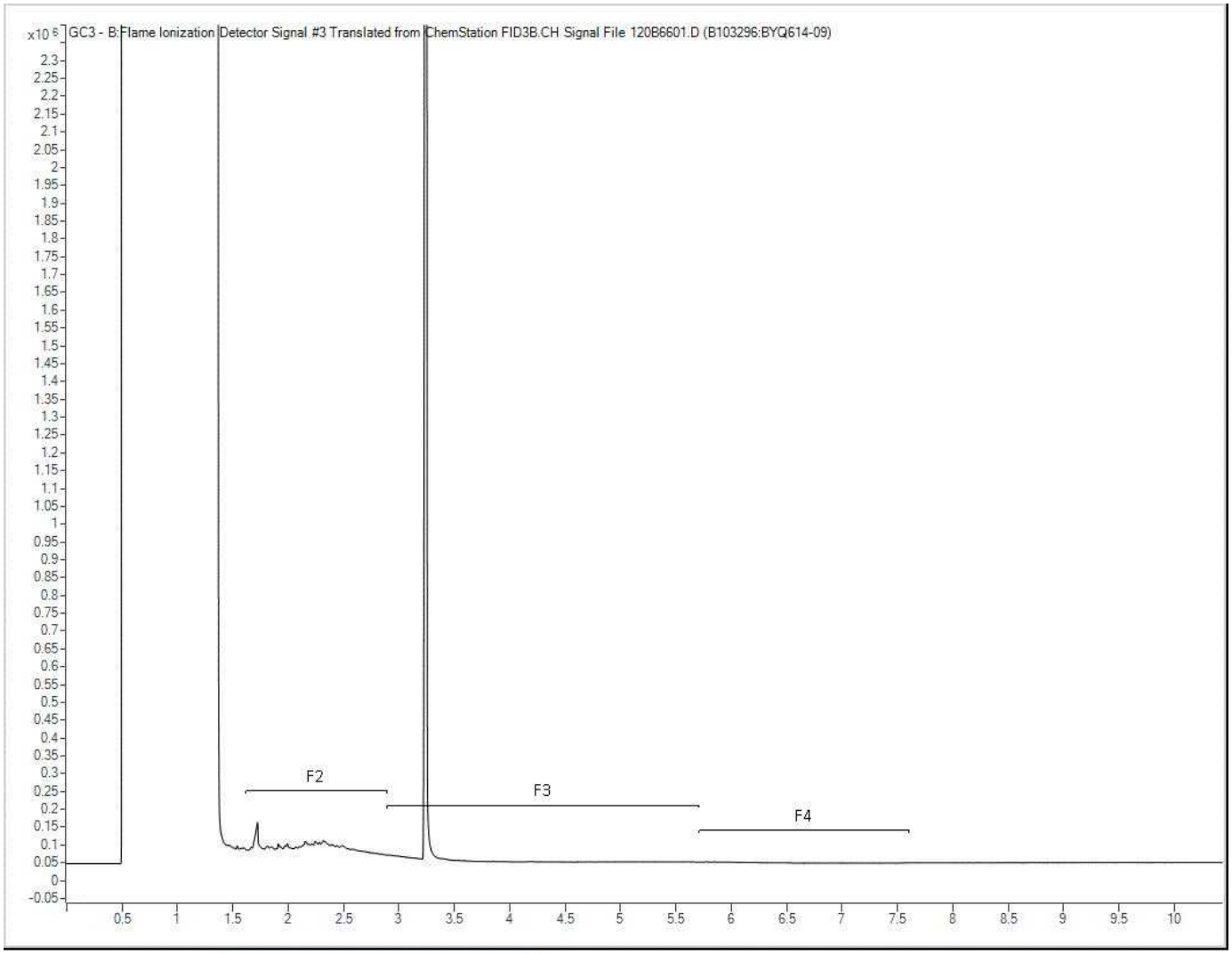
Hydrocarbons (C10-C30) in Water - GC/FID Chromatogram

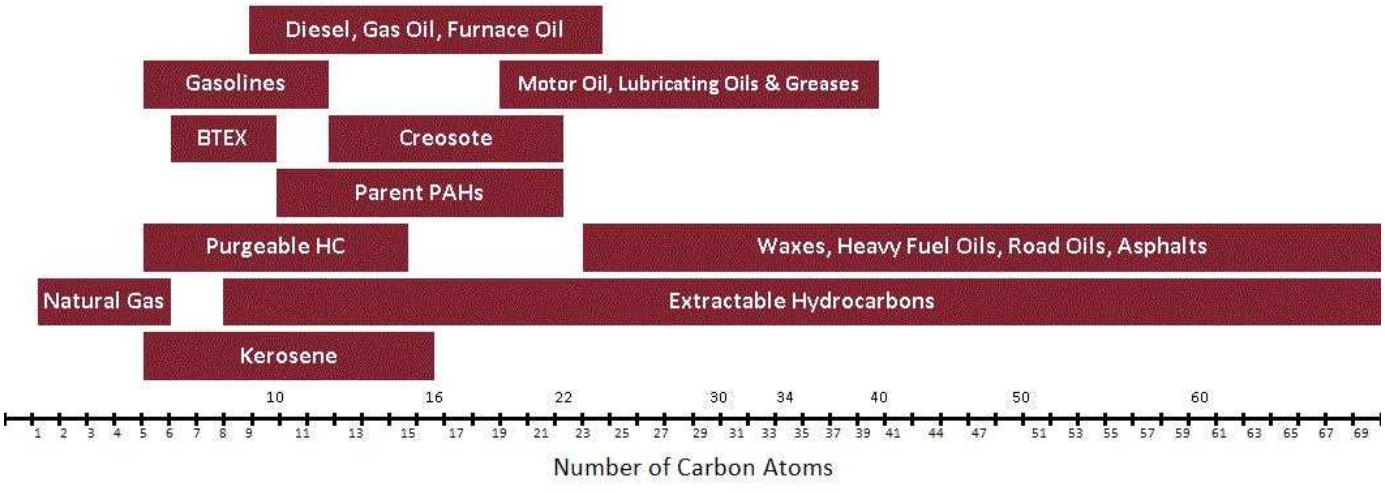


hpchem20\HPchem\1\DATA\2023\09\RUN0913

Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

Hydrocarbons (C10-C30) in Water - GC/FID Chromatogram





hpchem20\HPchem\1\DATA\2023\09\RUN0913

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