Englobe
Soils Materials Environment

Department of National Defence / Defence Construction Canada

PHASE III ENVIRONMENTAL SITE ASSESSMENT FORMER USAF RADAR STATION, CARTWRIGHT, NL

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Prepared by:

Alex Hayes, M.A.Sc., P.Eng.
Intermediate Environmental Professional
Environmental Engineer

Approved by:

J. Andrew Higgins, BBA, P.Eng.
Project Manager
Environmental Engineering

Executive Summary

A Phase III Environmental Site Assessment (ESA) has been conducted by Englobe Corp. (Englobe) at the Former United States Air Force (USAF) Radar Station located in Cartwright, Labrador. This report presents a summary of past work at the site, the current intrusive site assessment work conducted and the findings of the work.

The request for this work was made by Defence Construction Canada (DCC), on behalf of the Department of National Defence (DND). The purpose of the work was to further delineate impacts identified during the Phase II ESA conducted by Stassinu Stantec Limited Partnership (Stantec) in 2018 and to gather sufficient information to aid in the following:

- Confirmation or Re-Classification using the federal National Classification System for Contaminated Sites (NCSCS) to obtain a new score (completed within this report);
- Development of a Remediation Strategy with associated cost (completed under separate cover);
- Completion of a Risk Assessment (RA) in the form of an Human Health and Ecological Risk Assessment (HHERA) (completed under separate cover); and
- Development of a Remedial Action Plan (RAP) and associated costs once an HHERA has been completed (based on site-specific target levels (SSTLs)) (completed under separate cover).

The following intrusive work has been completed:

- Advancement of 16 boreholes in the areas of soil exceedances identified in the Phase II ESA, with installation of groundwater monitor wells in each borehole and collection of groundwater samples and select soil samples, as required;
- Excavation of four test pits in each of the areas of petroleum hydrocarbon (PHC), volatile organic compound (VOC), polycyclic aromatic hydrocarbon (PAH) and metals impacts in soil as identified in the Phase II (for a total of 80 test pits) with the aim of achieving vertical and horizontal delineation. Note: Some soil samples for delineation were collected via borehole or test pit, whichever was more appropriate during the program. For metals in soil, only zinc and cadmium were analyzed, as no other metals above applicable guidelines were identified in the Phase II ESA;
- Collection of five surface water samples from previous sample locations to further characterize PHC, PAH, metals and general chemistry guideline exceedances in surface water as identified in the Phase II ESA, and collection of four background surface water samples to allow for comparison with background site conditions;
- Collection of three sediment samples from previous sample locations to delineate areas of PHC and PAH impacts in sediment as identified in the Phase II ESA, and collection of four background sediment samples to allow for a comparison with background PHC and PCB site conditions;
- Collection of four background vegetation samples for PCB and metals analysis to aid in the HHERA to be conducted following the Phase III ESA; and
- Collection of three asbestos samples from suspected asbestos containing material identified during field work.

Based on the information gathered, observations made during the intrusive investigation and laboratory testing results obtained from the Phase III ESA, the investigation has revealed evidence of actual environmental contamination.

Insufficient sample results were obtained to achieve full horizontal and vertical delineation, due in part to project constraints that only allowed for a single field program. Estimates of impacted material are included; however, estimates were generated based on available site data and would require further sampling to provide complete delineation. Estimates were calculated based on the estimated areas of impacts, based on analytical results from the previous Phase II ESA and current Phase III ESA. The total estimated quantity of impacted soil is 2,120 m^3. The estimated extent of surface water impacts is approximately 265 m^2. The extent of groundwater impacts could not be estimated. Impacts identified during the Phase III ESA are outlined below:

- Petroleum hydrocarbon impacts were identified in soil above the applicable regulatory criteria for a commercial site with non-potable water. Impacts in soil were identified in the Former Contractor Village (210 m^3), the Main Complex (550 m^3) and the Former USAF Dump Area and Ammunition Storage Area (10 m^3).
- Petroleum hydrocarbon concentrations above regulatory criteria were found in sediment samples from both the Phase II and Phase III ESAs. Petroleum hydrocarbon in sediment results concentrations were within or below the range of background concentrations. Based on this and comments received from the laboratory, it is likely that these exceedances are due to biogenic material that may appear as petroleum hydrocarbon products during analytical testing, and are not related to contamination from petroleum hydrocarbon usage at the Former USAF Radar Station. As such, the petroleum hydrocarbon exceedances in sediment throughout the site have not been treated as impacts requiring further action.
- PAH impacts were identified in soil above applicable regulatory criteria. Impacts in soil were identified in the Former Contractor Village (70 m^3), the Former USAF Dump Area and Former Ammunition Storage Area (100 m^3) and the Main Complex (1,090 m^3).
- PAH impacts were identified in groundwater above applicable regulatory criteria at sample locations CWT-MW1 and CWT-MW2 within the Former Contractor Village, and sample location CWT-MW4 within the Former USAF Dump Area and Former Ammunition Storage Area. The extent of groundwater impacts could not be estimated, further delineation would be required to achieve this.
- Metals impacts were identified in soil above applicable regulatory criteria. Impacts in soil were identified in the Former USAF Dump Area and Former Ammunition Storage Area (40 m^3) and the Main Complex (30 m^3).
- Metals impacts were identified in surface water above the applicable regulatory criteria.
- Metals impacts were identified in groundwater above the applicable regulatory criteria in all monitor wells. The extent of groundwater impacts could not be estimated, further delineation would be required to achieve this.
- VOC impacts in soil were identified at one location in the Former USAF Dump Area and Former Ammunition Storage Area (20 m^3).
- General Chemistry results for a majority of surface water and groundwater samples showed pH values outside of the CCME FAL guidelines.
- All three of the asbestos samples collected from the Former Dump Area (outdoors) and submitted for analysis were found to contain asbestos. Sample results ranged from 1-5% in the roofing shingles, to 30-50% in the boiler insulation.

- Metals and PCB analysis was conducted on the three background vegetation samples collected. Various metals were detected in all three samples. There are currently no guidelines for metals or PCBs in vegetation. Various metals were previously detected in the samples collected during the Phase II ESA, at concentrations that were generally similar to those from the background samples. Certain metals, such as aluminum, iron and manganese, were higher than background concentrations at various locations. No PCB concentrations were detected in any of the three samples. PCB concentrations were previously detected in 11 of the 16 vegetation samples collected during the Phase II ESA. This would seem to indicate that PCB impacts from the site are present in vegetation. The previous Phase II included sampling for PCBs; however, concentrations were below applicable guidelines in soil and sediment, and were not detected in surface water. Considering this, and as there are currently no guidelines for metals or PCBs in vegetation, no further work is recommended with regards to metals and PCBs in vegetation.

Based on the analytical results obtained, the following recommendations are made:

- Further action is required to address petroleum hydrocarbon impacts identified in soil, PAH impacts identified in soil and groundwater, metals impacts in soils, surface water and groundwater and VOC impacts in soil.
- Risk Assessment in the form of a HHERA is recommended to assess requirements for risk management or remediation at the site (to be completed under separate cover, and as outlined in the statement of work).
- An RAP should be developed (to be completed under separate cover, and as outlined in the statement of work).
- Asbestos-containing material was identified at the Former Dump Area and Former Ammunition Storage Area (asphalt roof shingles, tar paper and an old boiler). Based on the Asbestos Waste Disposal Guidance Document, published by the Newfoundland and Labrador Department of Environment and Conservation Pollution Prevention Division (November 13, 2014), asbestos waste shall be disposed of only at an approved waste disposal facility. Any person(s) engaged in the removal and/or disposal of asbestos waste is required to operate under the provisions of the Asbestos Abatement Regulations. A valid asbestos abatement contractor's certificate (available from the Occupational Health and Safety Branch of Service NL) is required to engage in asbestos removal activity in accordance with Section 6 of the Regulations. This material should be removed from site by a certified asbestos abatement contractor and disposed of at a licensed disposal facility.

Production Team

Client

Department of National Defence
and Defence Construction
Canada

Englobe Corp.

Intermediate Environmental Professional	Alex Hayes, P.Eng., M.A.Sc.
Project Manager	J. Andrew Higgins, BBA, P.Eng.

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1 Introduction

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- Collection of five surface water samples from previous sample locations to further characterize PHC, PAH, metals and general chemistry guideline exceedances in surface water as identified in the Phase II ESA, and collection of four background surface water samples to allow for comparison with background site conditions;
- Collection of three sediment samples from previous sample locations to delineate areas of PHC and PAH impacts in sediment as identified in the Phase II ESA, and collection of four background sediment samples to allow for a comparison with background PHC and PCB site conditions;

- Collection of four background vegetation samples for PCB and metals analysis to aid in the HHERA to be conducted following the Phase III ESA; and
- Collection of three asbestos samples from suspected asbestos containing material identified during field work (added following identification of the material during field work).

For each of the Phase II soil sample locations where exceedances were noted, one sample was proposed from the same location to allow for vertical delineation. Four surrounding sample locations (in the form of test pits) were proposed to allow for horizontal delineation. Surrounding sample locations were positioned by stepping out from the previous location by approximately 10 meters (m) or less (based on the previous Phase II sample locations or as deemed appropriate based on observations in the field, in order to achieve further delineation) in four directions to develop a grid around the previous exceedance. The surrounding soil sample locations were labeled with the name of the previous sample location, followed by A, B, C, D, etc. to denote a step out sample.

3 Background Information

3.1 History of the Site

The site is currently owned by the province of Newfoundland and Labrador and is located approximately 4 km to the northeast of the community of Cartwright, in Labrador. The site was established in 1953 as a General Surveillance Radar station, funded by the United States Air Force (USAF) and operated until 1968. The former operational areas of the site covered approximately 25 hectares. It was used to guide interceptor aircraft towards unidentified intruders as a Ground-Control Intercept (GCI) and warning station as part of the Pinetree Line. In total, the site contained four Troposcatter Communication Antennas, four Radomes, barracks and recreation facilities, all connected together as one complex on the hillside overlooking the Town of Cartwright. Fuel storage facilities were located near the community docks and connected to the upper petroleum, oils and lubricants (POL) tank at the radar site. Fuel was pumped via an aboveground and underground piping system to both a large steel aboveground storage tank (AST) on the hill, and smaller ASTs for the various diesel generators used to power the station. Historically, solid waste was disposed of in an unlined landfill to the east of the site which was covered and graded in 1988. Solid waste was also reportedly buried or covered in a ravine located between the main site and the main POL tank.

In 1968 the USAF transferred control of the site to the Canadian Forces and the site was officially decommissioned in 1987 with the razing of the remaining buildings/structures.

Only the concrete foundations of the former buildings and radar towers remain at the site. Presently, a Bell microwave station and Canadian Coast Guard (CCG) Navtex and MF Rx Communication Towers are located on the hill (built approximately 1970).

Previous studies at the site include the following:

- Phase I Environmental Site Assessment, Former United States Military Site, Cartwright, NL, GHD, March 2016.

- Phase II Environmental Site Assessment, Former Military Site, Cartwright, NL, Stassinu Stantec Limited Partnership, June 7, 2018.

Previous remedial work was performed related to PCB contamination at the site. The records review conducted during the Phase I ESA identified a large PCB spill in the Main Complex area in the abandoned operations building discovered in October 1979. The spill was approximately 100 gallons of PCB liquid released as a result of damage to 9 abandoned transformers remaining in the former operations building according to estimates by Environment Canada. Approximately 84 m^2, the spill leaked through the tile floor and pooled in the soil beneath the former building. PCB liquid was also tracked throughout the building by visitors to the site. The clean-up included sealing the leaking transformers, securing the remaining transformers, placing all PCB contaminated debris in sealed drums, removing the wooden floor and floor tiles heavily contaminated with PCBs, cleaning the remaining floor with solvents, excavating the heavily contaminated soil and water, placing all impacted materials in sealed drums, and cleaning the bedrock with solvents. Sealed drums were later removed from the Site and reportedly transported to Goose Bay for permanent storage. No information pertaining to the PCB concentrations encountered in the soil during the spill and/or clean-up were noted in the Phase I ESA.

In addition, the Phase I ESA noted that during site decommissioning in 1987, soil sampling in the former landfill area identified PCB concentrations in soil exceeding 15,000 ppm. In 1988 the province implemented a limited PCB removal program where 306 m^3 of PCB impacted soil of was excavated and removed. PCB impacted soil was sealed in 228 specially designed containers, stacked and temporally stored on two former concrete foundations at the Site (the locations were secured with a locked chain-link fence). Containers were later shipped to Goose Bay for storage. The excavation extended to a depth of approximately 0.2 metres and was backfilled with 1.5 metres of clean overburden.

Based on the results of the Phase I and Phase II ESA, it was indicated that further work was required. The Phase II ESA identified guideline exceedances for PHCs in soil, sediment and surface water; VOCs in soil (only one VOC exceedance for trichloroethylene was identified during the Phase II ESA); PAHs in soil, sediment and surface water; metals in soil, sediment and surface water; and general chemistry in surface water. PCBs concentrations were below applicable guidelines in soil and sediment, and were not detected in surface water. Recommendations of the report included:

- Additional delineation to define the extent of impacts identified at the site.
- Based on an ecological screening completed by Stantec, further assessment was recommended to address ecological concerns. Specifically, it was recommended that the vertical extent of impacts should be investigated with a borehole/monitor well program and should include a groundwater assessment.

In order to address the recommendations of the Phase II ESA, and to provide adequate data to aid in the completion of the deliverables outlined in Section 1, a scope of work was developed as outlined in Section 2. Any sampling results from the Phase II ESA for contaminants of potential concern (COPC) addressed in the Phase III ESA were carried forward.

3.2 Site and Area Description

The subject property is identified as the Former USAF Radar Station, located 4 km northeast of Cartwright, Labrador. A site location map and site plan are provided as Figure 1 and Figure 2, Appendix A.

The subject site is currently vacant (with the exception of the Bell microwave station and Canadian Coast Guard (CCG) Navtex and MF Rx Communication Towers), and largely treed and overgrown, with some partially cleared areas remaining. Access to the subject site from Cartwright is via a dirt and gravel road. Previous infrastructure has been removed from the site. Only the concrete foundations of the former buildings and radar towers remain.

The Phase III ESA investigated impacts in three main study areas of the site within the general area, as identified in the Phase II ESA, outlined below and shown and in Figures 3, 4 and 5 in Appendix A. The three sites for investigation were the Former Contractor Village, the Main Complex, and the Former USAF Dump Area and Former Ammunition Storage Area.

Former Contractor Village (Figure 3)

Located along the shoreline of Sandwich Bay. Formerly contained a drum-storage area, motor pool, barracks, mess hall, medical dispensary and a dock. A small pond is located on site.

Main Complex (Figure 4)

Contains a gravel road. Formerly contained an above ground waterline, above ground pipeline, above ground storage tanks (ASTs), troposcatter communication antennas and multiple buildings. A small pond is located on site. A previous PCB spill and remediation was discovered in 1979 and subsequently remediated, as discussed in Section 3.1.

Former USAF Dump Area and Former Ammunition Storage Area (Figure 5)

Contains a gravel road, former dumping area, former ammunition storage, two small ponds and the location of a PCB clean up from 1987 (discussed in Section 3.1).

An existing municipal landfill, two former municipal landfills, two DFO/Coast Guard communication towers and a Bell communication tower are present within the boundary of the site, but are not included in the current investigation. The surrounding area consists of undeveloped land.

The subject site slopes away from the Main Complex (the high point of the site at approximately 170 m above sea level) on all sides, toward Sandwich Bay to the north and west, and toward Larks Harbour Pond to the east and south. A brook drains from Larks Harbour Pond to Sandwich Bay. Regional topography slopes generally downward to Sandwich Bay, the exact direction of which depends on location with respect to Sandwich Bay.

3.3 Geology and Hydrogeology

Available surficial geology mapping of the area indicates that the site contains native surficial soils consisting of a mixture of discontinuous, non-stratified, poorly sorted silty to sandy diamicton, gravel, and sandy gravel with exposed bedrock in places (Klassen et al., 1992).

Geological mapping indicates that the subject site is underlain by late Paleoproterozoic bedrock of the Grenville, Nain and Makkovik provinces. Bedrock consists of granite, quartz, monzonite, granodiorite, syenite and minor quartz diorite (Wardle et al., 1997).

Local shallow groundwater is expected to flow toward Sandwich Bay, the exact direction of which depends on location with respect to Sandwich Bay.

4 Regulatory Criteria

As per historical reporting and taking into account land-use and knowledge of local geology, for the purposes of this project the site has been classified as a non-potable, commercial site with coarse-grained soil. Regulatory criteria and background information are provided hereafter. Precedence was given to the Atlantic Risk Based Corrective Action guidance, followed by CCME guidelines. In the absence of either of these, guidelines from other provincial jurisdictions were consulted.

4.1 Petroleum Hydrocarbons in Soil and Water

On February 22, 2005 the Newfoundland and Labrador Department of Municipal Affairs and Environment (NLDMAE) outlined remediation criteria for petroleum hydrocarbons and other COPC in both soil and groundwater. The criteria are outlined in the document entitled Guidance Document for the Management of Impacted Sites, Version 2.0 (January 2014).

The guidance document noted above aims to provide a clear process for the management of impacted sites in Newfoundland and Labrador and recommends the use of the current ARBCA guidance (Version 3, revised 2015) in assessing petroleum hydrocarbons in soil and groundwater.

Human Health Screening

The Atlantic RBCA guidance outlines risk-based screening levels (RBSLs) for evaluating human exposure to sites impacted with total petroleum hydrocarbons (TPH) and benzene, toluene, ethylbenzene and xylene (BTEX). Outlined in the Tier I RBSL Tables, these guidelines are based on default conditions for typical sites and exposure pathways, and are classified by receptor characteristics, groundwater usage, and soil type. TPH guidelines also take into account the type of hydrocarbon present (gasoline, fuel/lube oil, etc.).

If exceedances of the Tier I RBSLs are identified, the site may either be remediated or a Tier II human health risk assessment can be performed. A human health risk assessment takes into account Tier II Pathway Specific Screening Levels (PSSLs), or involves the development of Site-Specific Target Levels (SSTLS's). Tier II PSSLs include screening values for different exposure scenarios (i.e. soil contact/ingestion, inhalation of indoor air, leaching to potable groundwater). Only those pathways deemed complete are evaluated. Development of SSTLs is done using the Atlantic RBCA Toolkit Version 3.2.

Ecological Screening

The Atlantic RBCA guidance includes an Ecological Screening Protocol for PHC impacted sites, the aim of which is to assess potential risks to ecological receptors in the environment. The protocol provides a decision making framework based on:

- Identification of PHC impacts;
- Identification of the various habitat and ecological receptors at or near the site; and
- Identification of exposure pathways for those ecological receptors identified.

The environmental screening level (ESL) tables outline screening levels for ecological receptors based on various exposure pathways. Only those screening levels applicable to the site are applied (i.e. receptors and exposure pathways present at the site). Based on the application of ESLs, one of the following three conclusions can be drawn:

- The site does not pose a risk to ecological receptors. No further action is required;
- The site should be remediated to Tier I ecological screening levels; or
- Further assessment at the site is required.

The selected ecological screening levels applicable to the site were:

- 2012 (update 2015) Atlantic RBCA ESL for the Protection of Plants and Soil Invertebrates, Direct Soil Contact, for a commercial property with coarse grained soil. ESLs apply to the top 1.5 m of soil only.
- 2012 (update 2015) Atlantic RBCA Environmental Screening Level (ESL) for the Protection of Plants and Soil Invertebrates, Direct Soil Contact, for a commercial property with coarse grained soil. ESLs apply to the top 1.5 m of soil only.

4.2 Contaminants of Potential Concern in Soil and Water

The CCME Environmental Quality Guidelines (ECQG) outline limits for contaminants in the environment in order to maintain, improve and/or protect environmental quality, as well as human and ecological health. The criteria are based on land use (i.e. agricultural, residential/parkland, commercial and industrial). For soil guidelines, values are also based on soil texture (coarse vs fine grain).

The CCME soil quality guidelines for the protection of environmental and human health outline various guidelines applicable to PAHs, VOCs, metals and general chemistry. The CCME water quality guidelines for the protection of aquatic life outline various guidelines applicable to PAHs, VOCs, metals and general chemistry.

Where no CCME guidelines are available, guidelines from other Canadian jurisdictions will be applied. Guidelines applied for soil, surface water and groundwater are listed below in order of precedence. If CCME guidelines are not available, the next listed provincial guideline will be consulted. If no guidelines are available from that province, the next on the list will be consulted.

Soil

- CCME Canadian Soil Quality Guidelines (SQG);
- Alberta Environment (AENV) Surface Soil Remediation Guidelines;
- Ontario Ministry of the Environment (MOE) Soil Standards for Use under Part XV.1 of the Environmental Protection Act for the Protection of Human Health; and
- British Columbia Ministry of the Environment Contaminated Sites Regulation Schedule 4: Generic Numerical Soil Standards.

Surface Water and Groundwater

- CCME Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (FAL);
- AENV Environmental Quality Guidelines for Alberta Surface Waters; and
- British Columbia Ministry of the Environment Contaminated Sites Regulation Schedule 6: Generic Numerical Water Standards – Aquatic Life.

4.3 Contaminants of Potential Concern in Sediment

Analytical data will be compared to applicable federal and provincial guidelines, reference/background conditions, and (as necessary) applicable guidelines available from other jurisdictions. Sediment analytical results will be compared to Atlantic RBCA Ecological Screening Levels for the Protection of Freshwater and Marine Aquatic Life and CCME Interim Sediment Quality Guidelines (ISQGs) and Probable Effects Levels (PELs), at a minimum.

The following guidelines are identified as applicable to sediment (in order of precedence):

- Atlantic RBCA Ecological Screening Levels for the Protection of Freshwater and Marine Aquatic Life;
- CCME ISQGs and PELs;
- Alberta Environment (AENV) Environmental Quality Guidelines for Alberta Surface Waters, PELs; and
- Ontario Provincial Sediment Quality Guidelines Lowest Effects Level (LEL).

5 Preliminary Conceptual Site Model

Based on the Phase II ESA, concerns at the site are related to various COPC (petroleum hydrocarbons, PAHs, VOCs, metals and general chemistry) in soil, surface water, sediment and potentially groundwater. The following Preliminary Conceptual Site Model (CSM) describes exposure pathways through which human and ecological receptors could potentially be exposed to COPC at the site. The HHERA work will finalize the CSM.

5.1 Human Health Conceptual Site Model

5.1.1 Receptor Identification

The Former USAF Radar Station is currently unoccupied. A Bell microwave station and Canadian Coast Guard (CCG) Navtex and MF Rx Communication Towers (unmanned) are located at the site. The site is surrounded by woodland and vacant land. The site can be readily accessed, although the nearest residential property is approximately 4 km from the site. Therefore, there is potential for visitors to frequent the site.

Based on this land use and the hazards (petroleum hydrocarbons, metals, PAHs, PCBs and VOCs) present on the site, the following human receptors were considered for the risk assessment:

- Visitor from a nearby residential property (all ages); and

- Adult commercial worker.

These receptors are considered appropriate for the current and expected future land use of the site.

5.1.2 Exposure Pathway Identification

The exposure assessment evaluated the likelihood that human receptors may come into contact with hazards. The likelihood of exposure is determined through consideration of the properties of individual hazards that control chemical mobility, and the various pathways through which the hazard could be transported to contact the receptor, or through which the receptor could move to contact the hazard. The exposure analysis also considers the possible mechanisms through which a hazard can be introduced to a human receptor (i.e., ingestion, dermal contact, and inhalation).

Exposure pathways are used to describe how a substance could move from the impacted media (soil, water, etc.) to a point where it can come in contact with a human receptor. The exposure pathways that have been considered for human receptors at the site include:

- Ingestion/dermal contact with soil;
- Inhalation/ingestion/dermal contact with dust;
- Ingestion of vegetation or garden produce grown in impacted soil or irrigated with impacted groundwater;
- Ingestion/dermal contact with surface water;
- Ingestion/dermal contact with groundwater; and
- Inhalation of vapours.

The relevant exposure pathways are summarized in Table 5-1, which includes an evaluation of each pathway based on site-specific conditions. Those complete hazard-exposure-receptor combinations are carried forward for further quantitative analysis.

Table 5-1 Potential Exposure Pathways – Human Receptors

Exposure Pathway Description	Pathway Complete?	Carried Forward?	Justification
Ingestion of soil	Yes	Yes	The potential for dermal contact with, or the accidental ingestion of contaminated soil while visiting the site exists. Heavy winds have the potential to disturb contaminated soil and allow for particulate ingestion or dermal contact at the site. The potential for indirect dermal contact with dust/soil being tracked indoors by visitors from the site exists.
Dermal contact with soil			
Ingestion of dust			
Dermal contact with dust			
Indirect dermal contact with dust/soil			
Ingestion of vegetation/ garden produce grown in impacted soil	No	No	It is unlikely that edible produce would be grown at this site based on its current and future intended use.
Ingestion of animals who consume vegetation grown in impacted soil	Yes	Yes	Hunting may occur at or near the site. As such, the potential ingestion of animals who consume vegetation grown at the site exists.

Exposure Pathway Description	Pathway Complete?	Carried Forward?	Justification
Dermal contact with / Ingestion of surface water	Yes	Yes	Surface water exists at the site, which has the potential to be ingested by visitors to the site.
Dermal contact with / Ingestion of groundwater	No	No	Potable wells are not located on site.
Inhalation of vapours (indoors)	No	No	No buildings remain on site.
Inhalation of vapours (outdoors)	Yes	Yes	COPC such as petroleum hydrocarbons are volatile and exist in soils.

5.2 Ecological Conceptual Site Model

The various receptors and potential exposure pathways that would be considered if an Ecological Risk Assessment were to be performed are outlined in the following ecological receptors CSM. Exposure pathways, or the routes by which organisms are exposed to COPC in the environment, can be either direct or indirect. Direct contact occurs when an organism is directly exposed to contaminated media while indirect exposure comes from consuming an organism that has been directly exposed (i.e. an animal consuming another that has accumulated COPC from the contaminated media).

5.2.1 Receptor Identification

Organisms that may be exposed to COPC at the site are considered receptors. Areas of the site are covered with grass and could provide potential habitat. Potential ecological receptors identified for the site include:

- Soil invertebrates;
- Terrestrial plants;
- Aquatic Plants and Organisms;
- Birds;
- Small and large mammals; and
- Reptiles.

5.2.2 Exposure Pathway Identification

Exposure pathways outline ways (both direct and indirect) that receptors could be exposed to contaminants at the site. Exposure pathways require a contaminant source, release mechanism, transport media and a receptor to be present in order to be deemed complete. Pathways deemed incomplete were not carried forward in the development of the ecological CSM. The exposure pathways considered in developing the ecological CSM are outlined hereafter and summarized in Table 5.2:

<u>Terrestrial</u>

- Soil ingestion or direct contact with contaminated soil (plants, microorganism, invertebrates and wildlife).

- Ingestion of plants, invertebrates or wildlife that have accumulated COPC from exposure to contaminants in the soil (terrestrial mammals).
- Surface water uptake (plants).
- Groundwater uptake (plants).

Freshwater

- Surface water and soil runoff to freshwater aquatic environment (aquatic plants and organisms).
- Groundwater flow to freshwater aquatic environment (aquatic plants and organisms).

Marine

- Surface water and soil runoff to marine aquatic environment (aquatic plants and organisms).
- Groundwater flow to marine aquatic environment (aquatic plants and organisms).

Table 5-2 Potential Exposure Scenarios for Ecological Receptors

Exposure Pathway Description	Pathway Complete?	Carried Forward?	Justification
Terrestrial			
Soil ingestion or direct contact (plants, microorganism, invertebrates and terrestrial mammals)	Yes	Yes	The potential for soil ingestion or direct contact with soil exists and was selected as a possible exposure pathway.
Ingestion of plants, invertebrates or wildlife that have accumulated COPC (terrestrial mammals)	Yes	Yes	The potential for the ingestion of plants, invertebrates or wildlife that have accumulated COPC exists.
Surface water uptake (plants)	Yes	Yes	Surface water uptake to plants was considered a complete pathway.
Groundwater uptake (plants)	Yes	Yes	Groundwater uptake to plants was considered a complete pathway.
Freshwater			
Surface water and soil runoff to freshwater aquatic environment (aquatic plants and organisms)	Yes	Yes	The potential for surface water and soil runoff to impact freshwater environments exist.
Groundwater flow to freshwater aquatic environment (aquatic plants and organisms)	Yes	Yes	The potential for groundwater flow to impact freshwater environments exist.
Marine			
Surface water and soil runoff to marine aquatic environment (aquatic plants and organisms)	Yes	Yes	Marine environments (in particular Sandwich Bay) are in close proximity to the site and could be impacted should surface water or soil runoff migrate off site.
Groundwater flow to marine aquatic environment (aquatic plants and organisms)	Yes	Yes	Marine environments (in particular Sandwich Bay) are in close proximity to the site and could be impacted by groundwater flow from the site.

6 Phase III ESA

6.1 Methodology

6.1.1 Drilling Program and Monitor Well Installation

A drilling program was conducted from August 15th to 19th, 2018. The drilling program consisted of the advancement of 16 boreholes, all of which were completed as groundwater monitor wells (identified as MW1 though to MW16). The borehole and monitor well locations are provided on Figures 3, 4 and 5 in Appendix A. Rationale for each borehole location is provided below in Table 6-3.

Table 6-3 Rationale for Borehole/Monitoring Well Locations

Location	Rational For Assessment	Potential Contaminant of Concern
MW1, MW2, MW3	Former Contractor Village, in the locations of exceedances identified previously during the Phase II ESA to further investigate potential impacts in soil and groundwater.	BTEX/TPH, PAH, General Chemistry and Dissolved Metals (including mercury)
MW4, MW5, MW6	Former USAF Dump Area and Former Ammunition Storage Area, in the locations of exceedances identified previously during the Phase II ESA to further investigate potential impacts in soil and groundwater.	BTEX/TPH, PAH, General Chemistry and Dissolved Metals (including mercury)
MW7, MW8, MW9, MW10, MW11, MW12, MW13, MW14, MW15, MW16	Former USAF Main Area, in the locations of exceedances identified previously during the Phase II ESA to further investigate potential impacts in soil and groundwater.	BTEX/TPH, PAH, General Chemistry, Dissolved Metals (including mercury) and VOCs

The boreholes/monitor wells were positioned and supervised by qualified Englobe field personnel. GPS coordinates were recorded for each borehole/monitor well.

The boreholes were drilled using a truck mount drill rig supplied by Logan Drilling. Soil sampling and testing were carried out and a log of the observed conditions prepared. Standard Penetration Testing and soil sampling were performed, where possible, in the overburden using a 50-mm outer diameter split-spoon sampler. Soil samples were logged continuously at depth intervals of 0.6 m. Where coring water was used, a QA/QC sample of the core water used was taken and analyzed to characterize the core water quality. Core water was taken from the pond northwest of the Main Complex (near sample location CWT-SW2).

A summary of encountered geologic conditions is provided in the borehole and monitor well logs in Appendix B. An explanation of terms and symbols used in the report and borehole and monitor well logs is also provided in Appendix B. It should be noted that the stratigraphic boundaries on the borehole logs typically represent a transition of one soil type to another and do not necessarily indicate an exact plane of geologic change. Subsurface conditions may vary between and beyond the borehole locations.

Soil samples were collected in lab-supplied sample containers, preserved in the field (where required) and stored in ice-packed coolers. Soil samples were selected for submittal to AGAT

Laboratories (AGAT) in Dartmouth, NS. Samples chosen for analysis were based on the results of the Phase II ESA, visual observations made during field work (observed staining, static water level, etc.) and their stratigraphic location with the aim of obtaining delineation of impacts identified during the Phase II ESA. Where multiple samples were collected from the same borehole, a / followed by a number was included in the sample name. This was to denote the depth the sample was taken from (i.e. a /1 denotes that it was the first sample taken from the borehole). The depth correlating to the sample in question can be determined from the borehole logs (Appendix B) or analytical tables (Appendix D), which both indicate the stratigraphic location of samples.

During the drilling program, all 16 of the boreholes were completed as monitor wells for the purpose of providing water quality sampling stations. The monitor wells consisted of 50-mm OD polyvinyl chloride (PVC) threaded Schedule 40 casing and 20 slot screen. The screened intervals of the wells were positioned to intersect the groundwater table and the annular space around the screen was filled with clean silica sand. The installations were sealed with a bentonite plug (0.3 to 0.9 m thickness) near the surface and above the sand pack to prevent migration of the surface flow into the wells. The wells were capped with J-plugs and finished with stick-up well covers. Monitor well construction details are included on the logs in Appendix B.

6.1.2 Test Pit Program

In addition to the drilling program, a test pit program was also conducted. The test pit soil sampling program was conducted from August 15th to 18th, 2018 and consisted of the excavation of 80 test pits.

Four test pits were excavated in each of the areas of PHC, VOC, PAH and metals impacts identified during the Phase II ESA to allow for horizontal and vertical delineation of the impacts previously identified. Test pits were positioned by stepping out from the previous sample location or monitor well, by approximately 5 m in four directions to develop a grid around the previous exceedance. Test pits were advanced to a maximum depth of 2 metres below ground surface (mbgs), to the shallow groundwater table or to refusal on bedrock, whichever was reached first or as appropriate based on characteristics of the contaminant of concern. Remaining excavated soils were put back into the test hole following completion of the test pits. Every effort was made to return excavated soils into the test pits in the order in which they were removed.

The surrounding step out soil sample locations were labeled with the name of the previous sample location, followed by A, B, C, D, etc. to denote a step out sample. Where multiple samples were collected from the same test pit, a / followed by a number was included in the sample name. This was to denote the depth the sample was taken from (i.e. a /1 denotes that it was the first sample taken from the borehole). The depth correlating to the sample in question can be determined from the borehole logs (Appendix B) or analytical tables (Appendix D), which both indicate the stratigraphic location of samples.

The test pit locations were referenced to existing site features, and their positions are shown on Figures 3, 4 and 5 in Appendix A. Test pits and surface samples from the previous Phase II ESA are labeled with CWT before the TP identifier, while those excavated as part of the Phase III ESA are labeled without the CWT identifier, in order to distinguish those excavated as part of the Phase II ESA from those excavated as part of the Phase III ESA. Further information is also provided in the analytical tables. The test pits were positioned and excavation was supervised by qualified Englobe field personnel. Soil samples were collected to allow for

delineation of impacts and based on observations in the field. The samples were collected using an excavator supplied by local contractor Gerald Saunders.

A summary of encountered geologic conditions is provided in the test pit logs in Appendix B. An explanation of terms and symbols used in the report and test pit logs is also provided in Appendix B. It should be noted that the stratigraphic boundaries on the test pit logs typically represent a transition of one soil type to another and do not necessarily indicate an exact plane of geologic change. Subsurface conditions may vary between and beyond the test pit locations.

Soil samples were collected in lab-supplied sample containers, preserved in the field (where required) and stored in ice-packed coolers. Soil samples were selected for submittal to AGAT Laboratories (AGAT) in Dartmouth, NS. Samples chosen for analysis were based on the results of the Phase II ESA, visual observations made during field work (observed staining, static water level, etc.) and their stratigraphic location with the aim of obtaining delineation of impacts identified during the Phase II ESA.

Background soil samples were not collected. It was determined that as a sufficient number of soil samples without exceedances had been collected as part of previous assessments, the collection of background samples would not provide further meaningful information.

6.1.3 Groundwater Sample Collection

From August 18th to 24th, 2018, Englobe personnel measured the static water levels in the newly installed monitor wells using a Solinst interface probe. All monitor wells were checked for the presence of free phase petroleum product prior to sample collection. The monitor wells were developed following installation by purging until wells went dry, ran clear, or a minimum of three well pore volumes had been removed. Discharge water was discharged approximately 1 meter down gradient of the monitor wells and allowed to infiltrate back into the ground.

The wells were allowed to recover for a minimum of 24 hours following development prior to sampling. Groundwater samples were collected using low flow sampling methodology. As per low flow sampling methodologies, monitor wells were purged prior to sampling using low flow peristaltic pumps set to a flow rate between 100 and 400 ml/min. Temperature, pH, conductivity, dissolved oxygen (DO) and oxidation reduction potential (ORP) were recorded at 5 minute intervals until all parameters stabilized for 3 consecutive readings using a YSI multi parameter water quality meter. All purge water was directed down gradient from the monitor well to minimize the potential for water to infiltrate back into the well or for cross contamination of sampling equipment. Samples were collected for BTEX/TPH, PAH, VOC, general chemistry and metals analysis. For general chemistry analysis, it was necessary to collect the samples from each of the monitor wells using hand bailers at the end of the program due to issues with bottle availability during field work. All samples were collected on August 24.

Samples were put into lab-supplied bottles, immediately placed in an ice-packed cooler and transported to AGAT for analyses. Samples collected for metals analysis from monitor wells were filtered using a 0.45 µm filter. Some of the monitor wells contained a fair amount of suspended solids and required a number of filters to be used on each well. As such, all of the filters were used up prior to completing sampling. For this reason, samples from MW1, MW2, MW15 and MW16 were submitted without field filtration for dissolved metals analysis. Instead, lab filtration was requested prior to analysis. Field personnel wore a new pair of nitrile gloves for each sample location and appropriate decontamination procedures were used on sampling equipment. Rinsate generated was disposed of on site and directed away from and downgradient of the area of investigation.

Field sheets were completed at each sample location. Field sheets are provided in Appendix C. Upon collection, all samples were labeled. Labels detailed the sample location and date. Samples were sealed in Ziploc bags, placed in coolers and kept at a cool temperature until transport to AGAT in Dartmouth, NS. All samples were submitted for standard turnaround time.

Groundwater samples collected as part of the Phase III ESA were labeled with "-18" following the sample location name, to denote that they were collected as part of the 2018 Phase III ESA.

6.1.4 Surface Water Sample Collection

Surface water samples were collected to delineate impacts identified during the Phase II ESA and to provide sufficient data for the risk assessment. Five surface water samples were collected from previous sample locations and four background surface water samples were also collected, for select analysis of BTEX/TPH, general chemistry and metals. Sample locations are outlined in Figures 1, 3, 4 and 5 in Appendix A. Samples were collected in clean, laboratory-supplied sample bottles. Surface water sample bottles were submerged upside down to avoid sampling the water's surface, and the bottles faced upstream. Care was taken to prevent the disturbance of sediment in the vicinity of the surface water sample location. If sample bottles contained preservative, then the sample was gathered using sample bottles that did not contain preservative and transferred as necessary. Samples were not filtered.

Upon collection, all samples were labeled, sealed in Ziploc bags, placed in coolers and kept at a cool temperature until transport to AGAT in Dartmouth, NS. All samples were submitted for standard turnaround time.

At each sample location, field personnel collected field parameter measurements of pH, temperature, conductivity, redox potential, turbidity and dissolved oxygen using a YSI multi parameter water quality meter. The depth of the water at each sampling location was also measured and recorded as part of each sampling event. Visual observations, including flow conditions, were noted at each sampling location and GPS coordinates recorded. Field sheets were completed at each sample location. Field sheets are provided in Appendix C. Field sheets for sample locations SW5, SW6 and SW7 were unfortunately damaged during sampling on a rainy day, and as such have not been provided.

Background surface water samples were collected for analysis of metals and general chemistry, to allow for comparison with analytical results from previous sample locations. Background surface water samples were collected. Background sample locations are shown on Figures 1, Appendix A.

Surface water samples collected as part of the Phase III ESA were labeled with "-18" following the sample location name, to denote that they were collected as part of the 2018 Phase III ESA. Sample names otherwise correspond to the previous Phase II ESA (i.e. CWT-SW-7-18 from the Phase III ESA was sampled from the same location as CWT-SW-7 from the Phase II ESA).

6.1.5 Sediment Sample Collection

Sediment samples were collected to delineate impacts identified during the Phase II ESA and to provide sufficient data for the risk assessment. Three sediment samples were collected from previous sample locations for BTEX/TPH, fraction of organic carbon (FOC) and PAH analysis, and four background sediment samples were also collected for BTEX/TPH, FOC and PCB analysis. Sample locations are outlined in Figures 3, 4 and 5 in Appendix A.

Sediment samples were placed in clean, laboratory-supplied sample bottles. Clean nitrile gloves were worn for the collection of each sediment sample. Upon collection, all samples were labeled. Labels detailed the sample ID and date and this information was also recorded on the field sheets. Field sheets are provided in Appendix C. Sample containers were sealed in Ziploc bags, placed in coolers and kept at a cool temperature until transported to AGAT in Dartmouth, NS. All samples were submitted for standard turnaround time. Sediment samples analyzed for petroleum hydrocarbons were initially analyzed without 3x silica gel wash. They were then re-analyzed with a 3x silica gel wash applied. Silica gel wash was applied in order to exclude biogenic material from analytical results. Examples of such organic material would include plant oils (from peat moss, for example), lipids, etc. Silica gel wash operates under the idea that a majority of naturally occurring (biogenic) hydrocarbons are polar and will be retained by silica gel and removed from a sample during the wash. Analytical results for both sets of analysis are presented. This was to allow for comparison with previous Phase II ESA results, where no silica gel wash was applied.

Background sediment samples were collected to allow for comparison with analytical results from previous sample locations. Background sediment sample locations are shown in Figure 1, Appendix A.

Note: although metals impacts in sediment were identified in the Phase II ESA (manganese at 470 mg/kg, the Ontario Provincial Sediment Guideline applied is 460 mg/kg); further analysis revealed that this was not in fact a COPC warranting additional investigation. Manganese occurs naturally as oxide and carbonate and ferromanganese minerals. Natural sources are soils, sediments and metamorphic and sedimentary rocks which contribute to manganese in aquatic systems. This single manganese concentration was the only metals exceedance in sediment during the Phase II, was located in a marine sample location (as opposed to a freshwater sample location), and other naturally occurring metals such as iron and zinc were elevated at the location. Therefore, metals in sediment were not considered to be a COPC for this media and were not investigated during this Phase III ESA.

Sediment samples collected as part of the Phase III ESA were labeled with “-18” following the sample location name, to denote that they were collected as part of the 2018 Phase III ESA. Sample names otherwise correspond to the previous Phase II ESA (i.e. CWT-SED-8-18from the Phase III ESA was sampled from the same location as CWT-SED-8 from the Phase II ESA).

6.1.6 Suspected Asbestos-Containing Material Sample Collection

During field work, two instances of suspected asbestos-containing materials were noted. An old boiler with insulation, shingles and tar paper located in the Former Dump Area were identified as being potentially asbestos-containing (located adjacent to TP3). A sample of the boiler insulation, as well as a sample of the shingles and associated tar paper (two separate samples), were collected and submitted to AGAT laboratories for analysis as asbestos bulk samples. The location of the suspected asbestos-containing materials is shown in Figure 4, Appendix D.

6.1.7 Vegetation Samples

Background vegetation samples were collected for metals and PCB analysis. These samples were collected to establish background concentrations of metals and PCBs in vegetation, for comparison with vegetation samples collected as part of the previous Phase II ESA. A sufficient weight of stems and leaves were collected from each location to allow for analysis. Samples

were placed into plastic Ziploc bags, labeled accordingly and submitted to Maxxam Analytics Laboratory for analysis.

6.2 Results

The analytical results of the Phase III ESA are presented hereafter. A comparison with the corresponding analytical results from the Phase II ESA and determination of exceedances identified during the Phase III ESA is presented in Section 6.3. Analytical results from the Phase II and Phase III ESA are tabulated and presented in Tables 1 through 19 in Appendix D. Laboratory Certificates of Analysis are provided in Appendix E.

Laboratory analytical results for petroleum hydrocarbons in soil are presented in Table 1 in Appendix D. Analytical results are compared to the Atlantic RBCA Tier I RBSLs, Tier I ESLs for the Protection of Plants and Wildlife, and the Tier I ESLs for the Protection of Wildlife and Livestock, as discussed in Section 4. A copy of the laboratory certificate of analysis is provided in Appendix E.

Laboratory analytical results for PAHs in soil are presented in Table 2 in Appendix D. Analytical results are compared to the CCME SQGs, Alberta Tier I Soil and Groundwater Remediation Guidelines and the Ontario Ministry of Environment (OMOE) soil and groundwater standards for use at contaminated sites, as discussed in Section 4. A copy of the laboratory certificate of analysis is provided in Appendix E.

Laboratory analytical results for VOCs in soil are presented in Table 3, Appendix D. Analytical results are compared to the CCME Canadian Soil Quality Guidelines, Atlantic RBCA Tier I RBSLs, Atlantic RBCA Tier I ESLs, Alberta Soil, Groundwater and Remediation Guidelines, and the OMOE Soil and Groundwater Standards, as discussed in Section 4. A copy of the laboratory certificate of analysis is provided in Appendix E.

Laboratory analytical results for metals in soil are presented in Table 4 in Appendix D. Analytical results are compared to the CCME EQGs, CCME Interim Soil Quality Guidelines and the OMOE Soil and Groundwater Standards for use at Contaminated Sites, as discussed in Section 4. A copy of the laboratory certificate of analysis is provided in Appendix E.

Laboratory BTEX/TPH analytical results for surface water obtained during the Phase III ESA, are provided in Table 5 (Appendix D). Analytical results are presented in conjunction with the Atlantic RBCA Tier I ESLs for the Protection of Freshwater and Marine Aquatic Life. Laboratory certificates of analysis are provided in Appendix E.

Laboratory analytical results for metals and general chemistry in surface water are presented in Tables 6 and 7, in Appendix D. Analytical results are compared to the CCME FAL, Alberta Environmental Protection Guidelines and the British Columbia Contaminated Sites Regulations, as discussed in Section 4. A copy of the laboratory certificate of analysis is provided in Appendix E. For parameters dependent upon pH (aluminum) and hardness (cadmium, copper, lead and nickel), the appropriate guideline or equation was used to determine the site specific guideline. For any calculated guideline or results, where a laboratory result was non-detect, ½ of the detection limit was used in the equation.

Laboratory analytical results for petroleum hydrocarbons in sediment are presented in Table 8 in Appendix D. Analytical results are compared to the Atlantic RBCA Tier I ESLs for the Protection of Freshwater and Marine Aquatic Life, as discussed in Section 4. A copy of the laboratory certificate of analysis is provided in Appendix E.

Laboratory analytical results for FOC in sediment are presented in Table 9 in Appendix D. A copy of the laboratory certificate of analysis is provided in Appendix E.

Laboratory analytical results for PCBs in sediment are presented in Table 10 in Appendix D. Analytical results are compared to the CCME Sediment Quality Guidelines for the Protection of Aquatic Life, as discussed in Section 4. A copy of the laboratory certificate of analysis is provided in Appendix E.

Laboratory analytical results for petroleum hydrocarbons in sediment are presented in Table 11 in Appendix D. Analytical results are compared to the CCME Sediment Quality Guidelines for the Protection of Aquatic Life, as discussed in Section 4. A copy of the laboratory certificate of analysis is provided in Appendix E.

Laboratory petroleum hydrocarbon analytical results for groundwater are provided in Table 12 in Appendix D. Analytical results are presented in conjunction with the Atlantic RBCA Tier I RBSLs for groundwater at a commercial site with non-potable water and the Atlantic RBCA ESLs for the Protection of Freshwater and Marine Aquatic Life. Laboratory certificates of analysis are provided in Appendix E.

Laboratory analytical results for PAHs in groundwater are presented in Tables 13, in Appendix D. Groundwater results are compared to the CCME FAL and the OMOE Generic Site Condition Standards, as discussed in Section 4. A copy of the laboratory certificate of analysis is provided in Appendix E.

Laboratory analytical results for VOCs in groundwater are presented in Tables 14, in Appendix D. Groundwater results are compared to the CCME FAL, as discussed in Section 4. A copy of the laboratory certificate of analysis is provided in Appendix E.

Laboratory analytical results for metals and general chemistry in groundwater are presented in Tables 15 and 16, in Appendix D. Groundwater results are compared to the CCME FAL, Alberta Environmental Protection Guidelines and the British Columbia Contaminated Sites Regulations, as discussed in Section 4. A copy of the laboratory certificate of analysis is provided in Appendix E. For parameters dependent upon pH (aluminum) and hardness (cadmium, copper, lead and nickel), the appropriate guideline or equation was used to determine the site specific guideline. For any calculated guideline or results, where a laboratory result was non-detect, ½ of the detection limit was used in the equation.

Laboratory analytical results for asbestos are presented in Table 17 in Appendix D.

Laboratory analytical results for metals and PCBs in vegetation are presented in Tables 18 and 19, in Appendix D. Metals and PCB analysis was conducted on the three background samples collected. Various metals were detected in all three samples. No PCB concentrations were detected in any of the three background samples. There are currently no guidelines for metals or PCBs in vegetation.

6.2.1 Geologic Conditions

The subsurface conditions throughout the site consisted of root mat, underlain by fill and till.

The fill generally consisted of gravel with varying amounts of sand that was moist, loose and brown to grey in colour. Miscellaneous debris and metal was encountered in a number of test pits. Till generally consisted of sand with varying amounts of silt and gravel with cobbles and boulders, was moist to wet, loose to compact and brown in colour.

Bedrock encountered consisted of gray granite and was encountered at depths ranging from visible bedrock at the surface to bedrock at depths greater than 6 m.

6.2.2 Hydrogeologic Conditions

The subject site slopes away from the Main Complex (the high point of the site at approximately 170 m above sea level) on all sides, toward Sandwich Bay to the north and west, and toward Larks Harbour Pond to the east and south. A brook drains from Larks Harbour Pond to Sandwich Bay. Regional topography slopes generally downward to Sandwich Bay, the exact direction of which depends on location with respect to Sandwich Bay.

During sampling of the monitor wells, groundwater was encountered at depths ranging from 0.09 to 2.57 m below ground surface (mbgs) during the monitoring events. The results of groundwater depth measurements are summarized in Table 6-4. Groundwater flow direction is expected to be towards Sandwich Bay. Hydraulic conductivity testing was not conducted during the current program.

Table 6-4 Groundwater Elevations at Former USAF Radar Station, Cartwright, NL (August, 2018)

Location	Top of Casing Elevation (m above grade)	Top of Casing Elevation (m above sea level)	Depth to Groundwater (mbTOC)	Depth to Groundwater (mbgs)	Groundwater Elevation (m above sea level)
MW1	1.08	4.09	1.17	0.09	2.92
MW2	1.09	3.05	1.82	0.73	1.23
MW3	0.97	4.26	1.18	0.21	3.08
MW4	0.98	146.99	2.75	1.77	144.24
MW5	0.86	114.83	1.49	0.63	113.34
MW6	1.05	120.06	1.78	0.73	118.28
MW7	1.15	150.41	1.85	0.7	148.56
MW8	0.99	162.54	1.12	0.13	161.42
MW9	1.20	162.31	2.21	1.01	160.10
MW10	0.84	165.17	2.38	1.54	162.79
MW11	0.97	162.86	2.03	1.06	160.83
MW12	1.19	166.79	3.55	2.36	163.24
MW13	0.97	162.15	2.38	1.41	159.77
MW14	0.83	163.55	1.64	0.81	161.91
MW15	0.99	152.79	2.44	1.45	150.35
MW16	0.93	146.03	3.50	2.57	142.53

6.2.3 Former Contractor Village

Petroleum Hydrocarbons in Soil

The laboratory reported petroleum concentrations in the fuel range (>C10-C16) at sample location CWT-TP35-18-A (1,800 mg/kg), CWT-TP35-18-C (4,070 mg/kg) and CWT-TP35-18-D (1,160 mg/kg), which exceeded the Tier I ESLs for the Protection of Plants and Soil Invertebrate (260 mg/kg).

The laboratory reported a total modified TPH concentration (weathered fuel oil) at sample location CWT-TP35-18-C (4,800 mg/kg) which exceeded the Tier I RBSL (4,000 mg/kg as fuel oil).

All other petroleum hydrocarbon parameters concentrations were below the applicable regulatory criteria.

PAHs in Soil

The laboratory reported a naphthalene concentration at sample location CWT-TP36-18-B (0.06 mg/kg), which exceeded the CCME SQG (0.013 mg/kg).

The laboratory reported a phenanthrene concentration at sample location CWT-TP36-18-B (0.05 mg/kg), which exceeded the CCME SQG (0.046 mg/kg).

All other PAH parameters concentrations were below the applicable regulatory criteria.

Metals and General Chemistry in Surface Water

The pH at sample location SW-5 was outside the CCME FAL range of 6.5 to 9. No other general chemistry parameters reported by the laboratory in the surface water sample submitted for analysis exceeded the applicable regulatory criteria.

The laboratory reported an aluminum concentration at sample location SW5 (1410 µg/L) which exceeded the CCME FAL guideline (5 or 100 µg/L based on pH).

The laboratory reported an iron concentration at MW1 (987 µg/L) which exceeded the CCME FAL guideline (300 µg/L).

All other metal and general chemistry parameters were within the applicable regulatory criteria.

Petroleum Hydrocarbons in Sediment

The laboratory reported petroleum concentrations in the fuel range (>C10-C16 and >C16-C21) at sample location CWT-SED5-18 (413 and 110 mg/kg; respectively), which exceeded the Tier I ESL (25 mg/kg for both).

The laboratory reported total modified TPH concentrations at sample location CWT-SED5-18 (602 mg/kg), which exceeded the Tier I ESL (500 mg/kg).

All other petroleum hydrocarbon parameters concentrations were below the applicable regulatory criteria.

FOC in Sediment

Average FOC results ranged from 0.186 mg/kg to 0.236 mg/kg.

Petroleum Hydrocarbons in Groundwater

Sample results from all monitor wells satisfied both sets of regulatory criteria.

PAHs in Groundwater

The laboratory reported anthracene concentrations at MW1 (0.03 µg/L) and MW2 (0.021 µg/L), which exceeded the CCME FAL guideline (0.012 µg/L).

The laboratory reported fluoranthene concentrations at MW1 (0.05 µg/L) and MW2 (0.07 µg/L), which exceeded the CCME FAL guideline (0.04 µg/L).

The laboratory reported a napthalene concentration at MW1 (5.39 µg/L) which exceeded the CCME FAL guideline (1.1 µg/L).

The laboratory reported pyrene concentrations at MW1 (0.03 µg/L) and MW2 (0.05 µg/L), which exceeded the CCME FAL guideline (0.025 µg/L).

All other PAH parameters were below the applicable regulatory criteria.

Metals and General Chemistry in Groundwater

The pH at MW1 and MW2 was below the CCME FAL range of 6.5 to 9. No other general chemistry parameters reported by the laboratory in the groundwater samples submitted for analysis exceeded the applicable regulatory criteria.

The laboratory reported aluminum concentrations at MW1, MW2 and MW3 ranging from 261 to 860 µg/L, which exceeded the CCME FAL guideline (5 or 100 µg/L, based on pH).

The laboratory reported copper concentrations at MW1 (9 µg/L) and MW2 (3 µg/L) which exceeded the CCME FAL guideline (2 to 4 µg/L, calculated based on hardness).

The laboratory reported iron concentrations at MW1 (17,400 µg/L), MW2 (30,000 µg/L) and MW3 (16,000 µg/L) which exceeded the CCME FAL guideline (300 µg/L).

The laboratory reported zinc concentrations at CWT-MW1 (17 µg/L) and CWT-MW2 (12 µg/L) which exceeded the CCME FAL guideline (7 µg/L).

All other metal and general chemistry parameters concentrations were below the applicable regulatory criteria.

6.2.4 Main Complex

Petroleum Hydrocarbons in Soil

The laboratory reported petroleum concentrations in the fuel range (>C10-C16) at sample locations CWT-TP13-18-A/1 (8,360 mg/kg), CWT-TP13-18-C/1 (12,500 mg/kg) and CWT-TP13/BH-1 (1,540 mg/kg), which exceeded the Tier I ESLs for the protection of plants and soil invertebrates(260 mg/kg). CWT-TP13-18-C/1 (12,500 mg/kg) was also above the Tier I ESLs for the protection of wildlife and livestock.

The laboratory reported petroleum concentrations in the fuel range fuel range (>C16-C21) at sample location CWT-TP13-18-C/1 (2,030 mg/kg), which exceeded the Tier I ESLs for the protection of plants and soil invertebrates (1,700 mg/kg).

The laboratory reported a total modified TPH concentration (weathered fuel oil) at sample location CWT-TP35-18-A/1 (10,200 mg/kg) and CWT-TP35-18-C/1 (14,800 mg/kg) which exceeded the Tier I RBSL (4,000 mg/kg as fuel oil).

All other petroleum hydrocarbon parameters were below the applicable regulatory criteria.

PAHs in Soil

The laboratory reported acenaphthene concentrations at sample location CWT-MW13/3 (0.295 mg/kg), CWT-TP15-18-B/3 (2.97 mg/kg), CTW-TP30-18-B/2 (0.508 mg/kg) and CTW-TP30-18-C/2 (0.283 mg/kg), which exceeded the CCME SQG (0.28 mg/kg).

The laboratory reported fluorene concentrations at sample location CWT-MW13/3 (0.27 mg/kg), CWT-TP15-18-B/3 (2.76 mg/kg) and CWT-TP30-18-B/2 (0.61 mg/kg), which exceeded the CCME SQG (0.25 mg/kg).

The laboratory reported naphthalene concentrations at sample location CWT-MW13/3 (0.16 mg/kg), CWT-TP15-18-A/3 (0.02 mg/kg), CWT-TP15-18-B/3 (1.5 mg/kg), CWT-TP15-18-D/3 (0.17 mg/kg), CWT-TP15-18-F-A/3 (0.05 mg/kg), CWT-MW15/1 (0.03 mg/kg), CWT-TP25-18-A/1 (1.15 mg/kg), CWT-TP25-18-A/2 (0.03 mg/kg), CWT-TP25-18-D/2 (0.03 mg/kg), CWT-SS23-18-C/1 (0.02 mg/kg), CWT-TP30-18-B/2 (0.14 mg/kg) and CWT-TP30-18-C/2 (0.14 mg/kg) which exceeded the CCME SQG (0.013 mg/kg).

The laboratory reported phenanthrene concentrations at sample location CWT-MW13/1 (0.28 mg/kg), CWT-MW13/3 (1.69 mg/kg), CWT-TP15-18-A/1 (0.29 mg/kg), CWT-TP15-18-A/3 (0.39 mg/kg), CWT-TP15-18-B/1 (0.48 mg/kg), CWT-TP15-18-B/3 (22.5 mg/kg), CWT-TP15-18-C/1 (0.26 mg/kg), CWT-TP15-18-C/2 (0.07 mg/kg), CWT-TP15-18-D/1 (0.18 mg/kg), CWT-TP15-18-D/3 (0.26 mg/kg), CWT-TP15-18-F-A/3 (0.36 mg/kg), CWT-MW15/1 (0.76 mg/kg), CWT-TP25-18-A/1 (1.73 mg/kg), CWT-TP25-18-A/2 (0.72 mg/kg), CWT-TP25-18-D/2 (0.36 mg/kg), CWT-SS13-18-A (0.1 mg/kg), CWT-SS23-18-C/1 (0.49 mg/kg), CWT-TP11-18-B (0.49 mg/kg), CWT-TP30-18-A/2 (0.05 mg/kg), CWT-TP30-18-B/2 (1.21 mg/kg) and CWT-TP30-18-C/2 (0.11 mg/kg), which exceeded the CCME SQG (0.046mg/kg).

The laboratory reported Benzo[a]pyrene Total Potency Equivalents (B(a)P TPE) at sample location CWT-TP15-18-B/3 (9.1 mg/kg) and CWT-TP25-18-A/1 (6 mg/kg), which exceeded the CCME SQG (5.13 mg/kg).

All other PAH parameters concentrations were below the applicable regulatory criteria.

VOCs in Soil

All VOC parameters concentrations were below the applicable regulatory criteria.

Metals in Soil

The laboratory reported a zinc concentration at sample location CWT-SS16-18-A/1 (531 mg/kg), which exceeded the CCME SQG (360 mg/kg).

All other metals concentrations were below the applicable regulatory criteria.

Metals and General Chemistry in Surface Water

The pH at sample location SW-6 was below the CCME FAL range of 6.5 to 9. No other general chemistry parameters reported by the laboratory in the surface water samples submitted for analysis exceeded the applicable regulatory criteria.

The laboratory reported an aluminum concentration at SW-6 (1,130 µg/L), which exceeded the CCME FAL guideline (5 or 100 µg/L, based on pH).

The laboratory reported a copper concentration at SW-6 of 3 µg/L which exceeded the CCME FAL guideline (2 to 4 µg/L, calculated based on hardness).

The laboratory reported an iron concentration at SW-6 of 6,340 µg/L which exceeded the CCME FAL guideline (300 µg/L).

The laboratory reported a lead concentration at SW-6 of 3.4 µg/L which exceeded the CCME FAL guideline (1 to 7 µg/L, calculated based on hardness).

The laboratory reported a zinc concentration at SW-6 (33 µg/L) which exceeded the CCME FAL guideline (7 µg/L).

All other metal and general chemistry parameters were below the applicable regulatory criteria.

Petroleum Hydrocarbons in Groundwater

Sample results from all monitor wells satisfied both sets of regulatory criteria.

PAHs in Groundwater

All PAH parameters concentrations were below the applicable regulatory criteria.

VOCs in Groundwater

All VOC parameters concentrations were below the applicable regulatory criteria.

Metals and General Chemistry in Groundwater

The pH at MW15 was below the CCME FAL range MW15 (21 µg/L) of 6.5 to 9. No other general chemistry parameters reported by the laboratory in the groundwater samples submitted for analysis exceeded the applicable regulatory criteria.

The laboratory reported aluminum concentrations at all MWs ranging from 108 to 21,000 µg/L, which all exceeded the CCME FAL guideline (5 or 100 µg/L, based on pH).

The laboratory reported a cadmium concentration at MW13 (0.697 µg/L) which exceeded the CCME FAL guideline (0.04 – 0.37 µg/L, calculated based on hardness).

The laboratory reported copper concentrations at all MWs ranging from 3 to 18 µg/L which all exceeded the CCME FAL guideline (2 to 4 µg/L, calculated based on hardness).

The laboratory reported iron concentrations at MW7, MW8, MW11, MW12, MW13 and MW16 ranging from 663 to 9,790 µg/L, which exceeded the CCME FAL guideline (300 µg/L).

The laboratory reported lead concentrations at MW7, MW8, MW11 and MW13 ranging from 1.1 to 15.8 µg/L which all exceeded the CCME FAL guideline (1 - 7 µg/L, calculated based on hardness).

The laboratory reported a mercury concentration at MW8 (0.040 µg/L) which exceeded the CCME FAL guideline (0.026 µg/L).

The laboratory reported silver concentrations at MW7 (0.8 µg/L) and MW11 (0.7 µg/L) which exceeded the CCME FAL guideline (0.25 µg/L).

The laboratory reported zinc concentrations at MW7 (11 µg/L), MW9 (130 µg/L), MW11 (51 µg/L), MW12 (16 µg/L), MW13 (818 µg/L), MW14 (8 µg/L), MW15 (21 µg/L) and MW16 (18 µg/L) which exceeded the CCME FAL guideline (7 µg/L).

All other metal and general chemistry parameters were within the applicable regulatory criteria.

6.2.5 Former USAF Dump Area and Former Ammunition Storage Area

Petroleum Hydrocarbons in Soil

All petroleum hydrocarbon parameters concentrations were below the applicable regulatory criteria.

PAHs in Soil

The laboratory reported acenaphthene concentrations at sample location CWT-TP2-18C 0.7 (5.13 mg/kg), which exceeded the CCME SQG (0.28 mg/kg).

The laboratory reported benzo(a)anthracene concentrations at sample location CWT-TP2-18C 0.7 (19.7 mg/kg), which exceeded the CCME SQG (10 mg/kg).

The laboratory reported benzo(b)fluoranthene concentrations at sample location CWT-TP2-18C 0.7 (12.6 mg/kg), which exceeded the CCME SQG (10 mg/kg).

The laboratory reported fluorene concentrations at sample location CWT-TP2-18C 0.7 (6.02 mg/kg), which exceeded the CCME SQG (0.25 mg/kg).

The laboratory reported naphthalene concentrations at sample location CWT-TP5-18-C/1 (0.12 mg/kg) and CWT-TP2-18C 0.7 (0.08 mg/kg), which exceeded the CCME SQG (0.013 mg/kg).

The laboratory reported phenanthrene concentrations at sample location CWT-TP2-18C 0.7 (46.8 mg/kg), which exceeded the CCME SQG (0.046mg/kg).

The laboratory reported B(a)P TPE at sample location CWT-TP2-18C 0.7 (22 mg/kg), which exceeded the CCME SQG (5.13 mg/kg).

All other PAH parameters concentrations were below the applicable regulatory criteria.

Metals in Soil

The laboratory reported a zinc concentration at sample location CWT-SS18-18-B/1 (444 mg/kg), which exceeded the CCME SQG (360 mg/kg).

All other metals concentrations were below the applicable regulatory criteria.

Petroleum Hydrocarbons in Surface Water

Sample results from all surface water sample locations satisfied the regulatory criteria. It should be noted that during the Phase II ESA, the laboratory reported a modified TPH concentration of 0.11 µg/L at sample location SW-8. During the current Phase III ESA, the modified TPH concentration was below detection limits at sample location SW-8. Due to the non-static nature of surface water, combined with modified TPH guidelines being set at detection limits, the current analytical results were used in determining exceedances.

Metals and General Chemistry in Surface Water

The pH at sample location SW-7 and SW-8 were below the CCME FAL range of 6.5 to 9. No other general chemistry parameters reported by the laboratory in the surface water samples submitted for analysis exceeded the applicable regulatory criteria.

The laboratory reported an aluminum concentration at SW-7 of 1,600 µg/L, which exceeded the CCME FAL guideline (5 or 100 µg/L, based on pH).

The laboratory reported a copper concentration at SW-7 of 4 µg/L which exceeded the CCME FAL guideline (2 to 4 µg/L, calculated based on hardness).

The laboratory reported an iron concentration at SW-7 of 1,390 µg/L which exceeded the CCME FAL guideline (300 µg/L).

The laboratory reported a lead concentration at SW-7 of 3.8 µg/L which exceeded the CCME FAL guideline (1 to 7 µg/L, calculated based on hardness).

The laboratory reported a zinc concentration at SW-7 (22 µg/L) which exceeded the CCME FAL guideline (7 µg/L).

All other metals and general chemistry parameters were below the applicable regulatory criteria.

Petroleum Hydrocarbons in Sediment

The laboratory reported petroleum concentrations in the fuel range (>C10-C16 and >C16-C21) at sample location CWT-SED-7-18 (52 and 223 mg/kg without silica gel wash, 94 and 102 mg/kg with 3x silica gel wash) and CWT-SED8-18 (114 and 301 mg/kg without silica gel wash, 116 and 129 with 3x silica gel wash), which exceeded the Tier I ESL (25 mg/kg).

The laboratory reported petroleum concentrations in the fuel range (>C21-<C34) at sample location CWT-SED-7-18 (1,690 mg/kg) and CWT-SED8-18 (551 and 2,300 mg/kg), which exceeded the Tier I ESL (43 mg/kg).

The laboratory reported total modified TPH concentrations at sample location CWT-SED-7-18 (1,970 mg/kg) and CWT-SED8-18 (2,720 mg/kg), which exceeded the Tier I ESL (500 mg/kg).

All other petroleum hydrocarbon parameters were below the applicable regulatory criteria.

FOC in Sediment

Average FOC results ranged from 0.278 mg/kg to 0.607 mg/kg.

PAHs in Sediment

All PAH concentrations were below the applicable regulatory criteria. Chrysene was detected at sample location CWT-SED-8 during the Phase II ESA, at a concentration (12 mg/kg) that exceeded the CCME Sediment Quality Guidelines for the Protection of Aquatic Life (0.862 mg/kg). However, chrysene was not detected in either of the samples collected from the same location and analyzed during the Phase III ESA. Given the non-static nature of surface water and associated sediments, the current analytical results were used in determining exceedances.

Petroleum Hydrocarbons in Groundwater

Sample results from all monitor wells satisfied both sets of regulatory criteria.

PAHs in Groundwater

The laboratory reported a fluoranthene concentration at MW4 (0.11 µg/L) which exceeded the CCME FAL guideline (0.04 µg/L).

The laboratory reported a pyrene concentration at MW4 (0.07 µg/L) which exceeded the CCME FAL guideline (0.025 µg/L).

All other PAH parameters concentrations were below the applicable regulatory criteria.

Metals and General Chemistry in Groundwater

The pH at MW15 was below the CCME FAL range of 6.5 to 9. No other general chemistry parameters reported by the laboratory in the groundwater samples submitted for analysis exceeded the applicable regulatory criteria.

The laboratory reported an aluminum concentration at MW4 (186 µg/L), which exceeded the CCME FAL guideline (5 or 100 µg/L, based on pH).

The laboratory reported a copper concentration at MW4 (3 µg/L) which exceeded the CCME FAL guideline (2 to 4 µg/L, calculated based on hardness).

The laboratory reported iron concentrations at MW5 (506 µg/L) and MW6 (16,300 µg/L) which exceeded the CCME FAL guideline (300 µg/L).

The laboratory reported silver concentrations at MW6 (0.7 µg/L) which exceeded the CCME FAL guideline (0.25 µg/L).

The laboratory reported a zinc concentration at MW6 (252 µg/L) which exceeded the CCME FAL guideline (7 µg/L).

All other metal and general chemistry parameters satisfied the applicable regulatory criteria.

6.2.6 Background Samples

Background Metals and General Chemistry Surface Water

The pH at all background sample locations were below the CCME FAL range of 6.5 to 9. No other general chemistry parameters reported by the laboratory in the surface water samples submitted for analysis exceeded the applicable regulatory criteria.

The laboratory reported aluminum concentrations at background sample locations CWT-SW BK01 (686 µg/L), CWT-SW-BK02 (540 µg/L), CWT-SW-BK03 (569 µg/L) and CWT-SW BK04 (959 µg/L), which exceeded the CCME FAL guideline (5 or 100 µg/L, based on pH).

The laboratory reported iron concentrations at background sample locations CWT-SW BK01 (1,580 µg/L), CWT-SW-BK03 (1,130 µg/L) and CWT-SW BK04 (3,060 µg/L), which exceeded the CCME FAL guideline (2 to 4 µg/L, calculated based on hardness).

The laboratory reported a lead concentration at CWT-SW BK04 (1.5 µg/L) which exceeded the CCME FAL guideline (1 to 7 µg/L, calculated based on hardness).

The laboratory reported zinc concentrations at CWT-SW BK03 (11 µg/L) and CWT-SW BK04 (14 µg/L) which exceeded the CCME FAL guideline (7 µg/L).

All other metal and general chemistry parameters were below the applicable regulatory criteria.

Background Petroleum Hydrocarbons in Sediment

The laboratory reported petroleum concentrations in the fuel range (>C10-C21) at all background sample locations ranging from 132 to 379 mg/kg when analyzed with 3x silica gel wash, and from 228 to 2,845 mg/kg when analyzed without silica gel wash, all of which exceeded the Tier I ESL (25 mg/kg).

The laboratory reported petroleum concentrations in the fuel range (>C21-<C34) at all background sample locations ranging from 250 to 743 mg/kg when analyzed with 3x silica gel wash, and from 1,050 to 2,620 mg/kg when analyzed without silica gel wash, all of which exceeded the Tier I ESL (43 mg/kg).

The laboratory reported total modified TPH concentrations at all background sample locations ranging from 480 to 1120 mg/kg when analyzed with 3x silica gel wash, and from 1,410 to 4,040 mg/kg when analyzed without silica gel wash, all of which exceeded the Tier I ESL (500 mg/kg), with the exception of CWT-SED-BK01 with silica gel wash (480 mg/kg) and CWT-SED-BK04 with silica gel wash (480 mg/kg).

All other petroleum hydrocarbon parameters concentrations were below the applicable regulatory criteria.

In comparing the results of the background sediment samples to results of the Phase II ESA and Phase III ESA, the BTEX/TPH concentrations for the Phase II ESA were all below the background concentrations analyzed in the same manner during the Phase III ESA (i.e.: no silica gel wash applied). Petroleum hydrocarbon in sediment results concentrations were generally within or below the range of background concentrations.

It was indicated by the laboratory that the chromatograms from the Phase III analysis were not consistent with those from typical petroleum hydrocarbon products. In addition, silica gel treatment resulted in a removal of biogenic material from the extract (particularly in the >C21 – C32 range). Typically, silica gel would have little effect on the TPH number for a petroleum hydrocarbon. As such, and considering the chromatograms obtained, this would indicate that the most likely source of these exceedances would be biogenic. The laboratory comments also indicated that PAH compounds can also contribute to similar chromatographic figures; however, PAH analysis from one of the samples indicated non-detect PAH compounds and the general chromatographic features for all samples were similar. This further supports the conclusion that the most likely sources of these petroleum hydrocarbon results exceedances would be biogenic. It was noted that peat moss was observed at the site, which may have contributed to this result.

FOC in Sediment

Average FOC results ranged from 0.338 mg/kg to 0.599 mg/kg.

Background PCBs in Sediment

All PCB parameters were below the applicable regulatory criteria.

6.2.7 Asbestos-Containing Material

All three of the asbestos samples submitted for analysis were found to contain asbestos. Sample results ranged from 1-5% in the roofing shingles, to 30-50% in the boiler insulation.

6.2.8 Vegetation Samples

Various metals were previously detected in the samples collected during the Phase II ESA, at concentrations that were generally similar to those from the background samples. Certain metals, such as aluminum, iron and manganese, were higher than background concentrations at various locations. No PCB concentrations were detected in any of the three samples. PCB concentrations were previously detected in 11 of the 16 vegetation samples collected during the Phase II ESA.

6.3 Summary of Exceedances

The previous Phase II ESA and current Phase III ESA identified COPC in soil, surface water, sediment and groundwater with concentrations exceeding the applicable regulatory criteria identified. A detailed summary of impacted soil samples from the previous Phase II ESA and current Phase III ESA, including sample locations, concentrations and depths is provided in Table 20, Appendix D.

Insufficient sample results were obtained to achieve full horizontal and vertical delineation, due in part to project constraints that only allowed for a single field program. Estimates of impacted material are included; however, estimates were generated based on available site data and would require further sampling to provide complete delineation. Estimates were calculated based on the estimated areas of impacts, analytical results from the previous Phase II ESA and current Phase III ESA. Estimated areas of impacts are shown in Figures 6 - 14, Appendix A.The estimated areas of impacts from Table 20, Appendix D are summarized in Table 6-5 below.

As discussed in Section 6.2.6, BTEX/TPH concentrations in sediments were within background concentrations, although above regulatory criteria. In addition, the most likely source of petroleum hydrocarbon exceedances in sediment was determined to be biogenic. BTEX/TPH exceedances in sediment were therefore not considered as impacts requiring further remedial work and have not been included in the estimates of impacts.

Impacted soil quantities were estimated based on the estimated horizontal delineation shown in Figures 6 - 14 in Appendix A, and the depths of samples analyzed (as shown in the Analytical Results presented in Appendix D). In cases where vertical delineation was not fully achieved, the depth of the test pit or an appropriately conservative depth based on surrounding clean samples was used to estimate the vertical extent of contamination. The total estimated quantity of impacted soil is 2,120 m^3. The estimated extent of surface water impacts is approximately 265 m^2. The extent of groundwater impacts could not be estimated, further delineation would be required to achieve this.

Table 6-5 Estimate of Impacts

COPC	Media	Area of Exceedance	Impacted Samples	Estimate of Impacted Material
Petroleum Hydrocarbons	Soil	Former Contractor Village	CWT-TP35-BS2 CWT-TP35-18-A CWT-TP35-18-B CWT-TP35-18-C CWT-TP35-18-D CWT-TP41-BS2	210 m^3
		Main Complex	CWT-SS34 CWT-SS36 CWT-TP13-BS2 CWT-TP13-18-A/1 CWT-TP13-18-C/1 CWT-TP13/BH-1	550 m^3
		Former USAF Dump Area and Former Ammunition Storage Area	CWT-SS2	10 m^3
PAHs	Soil	Former Contractor	CWT-TP104-BS2 (DUP of TP36) CWT-TP36-18-B	70 m^3
PAHs		Main Complex	CWT-TP15-BS2 CWT-MW13/1 CWT-MW13/3 CWT-TP15-18-A3 CWT-TP15-18-B/3 CWT-TP15-18-C/2 CWT-TP15-18-D/3 CWT-TP15-18-F-A/3 CWT-TP25-BS2 CWT-MW15/1 CWT-TP25-18-A/2 CWT-TP25-18-D/2 CWT-SS13 CWT-SS13-18-A CWT-SS-23 CWT-SS23-18-C/1 CWT-TP17-BS2 CWT-TP11-BS1 CWT-TP11-18-B CWT-TP30-BS1 CWT-TP30-18-A/2 CWT-TP30-18-B/2 CWT-TP30-18-C/2	1090 m^3
		Former USAF Dump Area and Former	CWT-TP2-BS2 CWT-TP2-18C 0.7 CWT-TP5-BS2	100 m^3

COPC	Media	Area of Exceedance	Impacted Samples	Estimate of Impacted Material
		Ammunition Storage Area	CWT-TP5-18-B/1	
	Groundwater	Former Contractor	CWT-MW1-18 CWT-MW2-18	N/A
		Former USAF Dump Area and Former Ammunition Storage Area	CWT-MW4-18	N/A
Metals	Soil	Former USAF Dump Area and Former Ammunition Storage Area	CWT-TP3-BS2 CWT-SS8 CWT-SS8-18-B/1	40 m^3
		Main Complex	CWT-SS16 CWT-SS16-18-A/1 CWT-SS32	30 m^3
	Surface Water	Former Contractor Village	CWT-SW-5-18	20 m^2
		Former USAF Dump Area and Former Ammunition Storage Area	CWT-SW7-18	225 m^2
		Main Complex	CWT-SW-6-18	20 m^2
	Groundwater	Former Contractor	CWT-MW1-18 CWT-MW2-18 CWT-MW3-18	N/A
		Former USAF Dump Area and Former Ammunition Storage Area	CWT-MW4-18 CWT-MW5-18 CWT-MW6-18	N/A
		Main Complex	CWT-MW7-18 CWT-MW8-18 CWT-MW9-18 CWT-MW10-18 CWT-MW11-18 CWT-MW12-18 CWT-MW13-18 CWT-MW14-18 CWT-MW15-18 CWT-MW16-18	N/A
VOCs	Soil	Main Complex	CWT-TP8-BS2	20 m^3

7 Quality Assurance / Quality Control

Englobe sampling protocols were followed to ensure quality and accuracy of results. This included field blanks, decontamination procedures, labeling, preserving, Chain of Custody forms, packaging and internal QA/QC procedures by the laboratory.

A field blank (labeled CWT-Blank1) was collected for BTEX/TPH and PAH analysis. The field blank was collected and transported to the laboratory for analysis using same protocols and best practices employed during sample collection. The field blank for the event was found to have concentrations below laboratory detection limits for all parameters. This would indicate that contamination was not introduced during storage and shipping or collection of the samples.

AGAT Laboratories in Dartmouth, NS and Maxxam Analytics in Bedford, NS conducted the chemical analyses. Both laboratories maintain accreditation through the Standards Council of Canada (SCC) and according to International Standards Organization (ISO) Standard 17025. Both have QA/QC protocols for instrument calibration, lab duplicates, matrix spikes, method blanks, process recovery and surrogate spikes. The laboratory also follows Standard Operating Procedures including holding time limitations, sample preparation and preservation, data production and reporting. Methods used to analyze the samples are included in the laboratory certificates. From review of the AGAT and Maxxam provided QA/QC reports, QA/QC was deemed acceptable.

Englobe conducted the environmental sampling following standard operating procedures, including job procedures and safe work practices. The sampling was conducted in accordance with all pertinent acts, regulations, codes, guidelines and standard practices.

All samples were logged by Englobe personnel and submitted under chain of custody to AGAT and/or Maxxam. Field duplicates were collected. As part of our QA/QC program, validation criteria were established that required the field collected data to have an acceptable level of precision, accuracy, representativeness, comparability and completeness (the “PARCC” criteria). AGAT conducts their own internal QA/QC programs consistent with relevant standards and requirements for laboratory certification. The measured values and recoveries are compared to acceptable lower and upper limits. Englobe reviewed the results to verify that the sample result was representative of the QA/QC sample result.

Precision was evaluated by calculating the relative percent difference (RPD) and comparing the RPD to the acceptable amount of variation. RPD is defined as:

$$RPD = \frac{(\text{sample result} - \text{duplicate result})}{(\text{sample result} + \text{duplicate result})/2} x100$$

It should be noted that RPDs cannot be calculated in instances where the original sample, the duplicate sample, or both were found to contain no detectable concentrations or if results are less than 5x the reportable detection limits. In these cases, QA/QC is considered acceptable.

Where the detected concentrations were large enough, RPDs for the laboratory and field blind duplicate samples were generally found to be within the acceptable ranges. Based on field

procedures, laboratory methods, sampling program design and field observations, the analytical results are concluded to be representative of the site conditions in general.

The CCME (2016) guidance recommends RPD limits for laboratory duplicates of up to 30% for soil and sediment, and 20% for water. For field duplicates, an RPD limits of up to 60% for soil and sediment, and 40% for water is recommended. The higher RPD values are related to expected variations due to contaminant distribution and natural heterogeneity within soil types.

A summary of the RPD results from the QA/QC program is provided in Tables 7-6 and 7-7, below. QA/QC calculations for field duplicates are summarized in Tables 23 - 29 in Appendix D. Following review of QA/QC data, data quality is considered acceptable.

Table 7-6 QA/QC Results for Laboratory Duplicates

Analysis	Matrix (acceptable RPD)	Range of Analyte RPD Results	Number of Analytes Within Acceptable RPD	QA/QC Acceptable?
Petroleum Hydrocarbons	Soil (30%)	0 - 30%	8 of 8	Yes
	Water (30%)	0%	8 of 8	Yes
PAH	Soil (30%)	0 - 31.6%	22 of 23	Yes
	Water (20%)	0 - 18%	22 of 22	Yes
Metals (dissolved)	Water (20%)	0 - 12.6%	25 of 25	Yes
Metals (total)	Water (20%)	0 - 2.5%	25 of 25	Yes
Metals	Soil (30%)	0%	25 of 25	Yes
	Vegetation (30%)	0 – 26%	25 of 25	Yes
General Chemistry	Water (20%)	0 - 16.9%	31 of 31	Yes
Fraction of Organic Carbon	Soil (30%)	0 - 0.2%	4 of 4	Yes
VOC	Soil (30%)	0%	38 of 38	Yes
	Water (20%)	0 - 1.1%	38 of 38	Yes
PCBs	Soil (30%)	1%	38 of 38	Yes
	Vegetation (30%)	Non-calculable (results less than 5x the detection limit)	7 of 7	Yes

The RPD value was outside of the acceptable range for 2-Methylnaphthalene in soil for one of the laboratory duplicates analyzed. Although outside of the acceptable RPD range, this only occurred for one analyte in one field duplicate. Overall, data quality is deemed to be acceptable.

Table 7-7 QA/QC Results for Field Duplicates)

Analysis	Matrix (acceptable RPD)	Range of Analyte RPD Results	Number of Analytes Within Acceptable RPD	QA/QC Acceptable?
Petroleum Hydrocarbons	Soil (60%)	0 – 39%	9 of 9	Yes
	Surface Water (40%)	Non-calculable	9 of 9	Yes
	Sediment (40%)	0 – 50%	9 of 9	Yes
	Groundwater (40%)	Non-calculable	9 of 9	
FOC	Sediment (60%)	24%	4 of 4	Yes
PAH	Soil (60%)	0 – 68%	18 of 23	Yes
	Groundwater (40%)	0 – 153%	20 of 22	Yes
Metals Metals	Soil (60%)	7%	1 of 1	Yes
	Groundwater (40%)	0 – 102%	26 of 26	Yes

RPD values were outside of the acceptable range for PAHs in one of the three soil field duplicates (for 18 of 23 analytes) and one of the two groundwater field duplicates (for 20 of 22 analytes) analyzed. Although a number of analytes were outside of the acceptable RPD range, these only equate to 22% of the analytes for soil and 9% of the analytes for groundwater. In addition, two of the three soil field duplicates had acceptable RPD values for all analytes, and one of the two groundwater field duplicates had acceptable RPD values for all analytes. Overall, data quality is deemed to be acceptable.

Analytical results for the core water used during drilling indicated that all BTEX/TPH parameters were below detection limits. General chemistry and metals results were all within applicable regulatory criteria, with the exception of aluminum and pH. Aluminum was detected at a concentration of 144 µg/L and the pH was 6.46. This concentration of aluminum was lower than concentrations detected at all surface water stations, with the exception of CWT-SW2. In addition, concentrations of aluminum detected in all but four of the monitor wells were also higher. When taken in consideration with the volume of water purged from each well during development and results of the monitor well sampling, it is not expected that the core water used during drilling would have had any impact on sample results obtained from the monitor wells.

8 NCSCS Score

8.1 NCSCS Site Classification Categories

The National Classification System for Contaminated Sites (NCSCS) Version 1.3 (CCME, 2010) was developed to aid in the evaluation of contaminated sites. It aims to provide both scientific and technical assistance in the identification and prioritization of contaminated sites as high, medium or low risk. Sites are classified into general categories of risk in a systematic and rational manner, according to their current or potential adverse impact on human health and/or the environment.

While it does not provide a qualitative or quantitative risk assessment, the NCSCS is a tool used to classify and prioritize contaminated sites. The system screens sites based on the need for further action to protect human health and the environment (in the form of characterization, risk assessment, remediation, etc.). The system is designed as a screening tool only and should not be used out of context for risk assessment of individual sites.

The classification of sites involves determining the classification (Class 1, 2, 3, or N) based on individual characteristics of the site. The different classes lay out priorities for action, or designate sites as Class INS (sites that require further information before they can be classified). The term “action” does not necessarily refer to remediation but also includes risk assessment, risk management or further site characterization and data collection.

Classification groupings are as follows.

Class 1: High Priority for Action (Total NCSCS Score greater than 70)

The available information indicates that action (e.g., further site characterization, risk management, remediation, etc.) is required to address existing concerns. Typically, Class 1 sites show a propensity to high concern for several factors, and measured or observed impacts have been documented.

Class 2: Medium Priority for Action (Total NCSCS Score between 50 and 69.9)

The available information indicates that there is high potential for adverse impacts, although the threat to human health and the environment is generally not imminent. There will tend not to be indication of off-site contamination, however, the potential for this was rated high and therefore some action is likely required.

Class 3: Low Priority for Action (Total NCSCS Score between 37 and 49.9)

The available information indicates that the Site is currently not a high concern. However, additional investigation may be carried out to confirm the site classification.

Class N: Not a Priority for Action (Total NCSCS Score less than 37)

The available information indicates there is likely no significant environmental impact or human health threats. There is likely no need for action unless new information becomes available indicating greater concerns, in which case, the Site should be re-examined.

ODVV16QVILFLHQWQIRUPDWLRQRI5HVSRQVHVDUHR1RWQR1

Although a minimum of a Phase I Environmental Site Assessment has been conducted for the site, there appears to be insufficient information to classify the Site. In this event, additional information is required to address data gaps.

8.2 NCSCS Site Classification Calculation

During the field program conducted in August 2018, exceedances of various COPC were identified in soil, surface water, sediment and groundwater. As such, an updated NCSCS score was calculated and a ranking assigned to the site. The NCSCS scoring is presented in Appendix F. The site was assigned a score of 74.8 and Site Classification Category of 1.

Previously, the site had been assigned a score of 76 and a Site Classification Category of 1 (Stantec, 2018). The lower score was based on lower contaminant characteristics and exposure scores. The lower contaminant characteristic score is largely due to no impacts in sediment being identified (A single Chrysene exceedance in sediment was noted in the Phase II ESA. However, chrysene was not detected in either of the samples collected from the same location and analyzed during the Phase III ESA. Given the non-static nature of surface water and associated sediments, the current analytical results were used in determining exceedances. Metals impacts in sediment were identified in the Phase II ESA (manganese at 470 mg/kg, the Ontario Provincial Sediment Guideline applied is 460 mg/kg); further analysis revealed that this was not in fact a COPC warranting additional investigation. TPH exceedances in various sediment samples have been excluded as results concentrations were within or below the range of background concentrations. Based on this and comments received from the laboratory, it is likely that these exceedances are due to biogenic material).

This NCSCS score indicates that action (e.g., further site characterization, risk management, remediation, etc.) is required to address existing concerns. Typically, Class 1 sites show a propensity to high concern for several factors, and measured or observed impacts have been documented.

9 Discussion and Conclusions

Based on the information gathered, observations made during the intrusive investigation and laboratory testing results obtained from the Phase III ESA, the investigation has revealed evidence of actual environmental contamination.

Insufficient sample results were obtained to achieve full horizontal and vertical delineation, due in part to project constraints that only allowed for a single field program. Estimates of impacted material are included; however, estimates were generated based on available site data and would require further sampling to provide complete delineation. Estimates were calculated based on the estimated areas of impacts, analytical results from the previous Phase II ESA and current Phase III ESA. The total estimated quantity of impacted soil is 2,120 m^3. The estimated extent of surface water impacts is approximately 265 m^2. The extent of groundwater impacts could not be estimated. Impacts identified during the Phase III ESA are outlined below:

Based on the analytical results obtained, the following recommendations are made:

- Further action is required to address petroleum hydrocarbon impacts identified in soil, PAH impacts identified in soil and groundwater, metals impacts in soils, surface water and groundwater and VOC impacts in soil.
- Risk Assessment in the form of a HHERA is recommended to assess requirements for risk management or remediation at the site (to be completed under separate cover, and as outlined in the statement of work).
- An RAP should be developed (to be completed under separate cover, and as outlined in the statement of work).
- Asbestos-containing material was identified at the Former Dump Area and Former Ammunition Storage Area (asphalt roof shingles, tar paper and an old boiler). Based on the Asbestos Waste Disposal Guidance Document, published by the Newfoundland and Labrador Department of Environment and Conservation Pollution Prevention Division (November 13, 2014), asbestos waste shall be disposed of only at an approved waste disposal facility. Any person(s) engaged in the removal and/or disposal of asbestos waste is required to operate under the provisions of the Asbestos Abatement Regulations. A valid asbestos abatement contractor's certificate (available from the Occupational Health and Safety Branch of Service NL) is required to engage in asbestos removal activity in accordance with Section 6 of the Regulations. This material should be removed from site by a certified asbestos abatement contractor and disposed of at a licensed disposal facility.

10 Report Use and Conditions

This report was prepared for the exclusive use of DCC/DND and is based on data and information provided to Englobe and obtained during field work by Englobe on the subject sites including soil and groundwater sampling and select chemical analyses; and is based solely upon the condition of the property on the date of such work, supplemented by information obtained and described herein.

The evaluation and conclusions contained in this report have been prepared in light of the expertise and experience of Englobe.

Environmental conditions are dynamic in nature and changing circumstances in the environment and in the use of the property can alter radically the conclusions and information contained herein.

11 References

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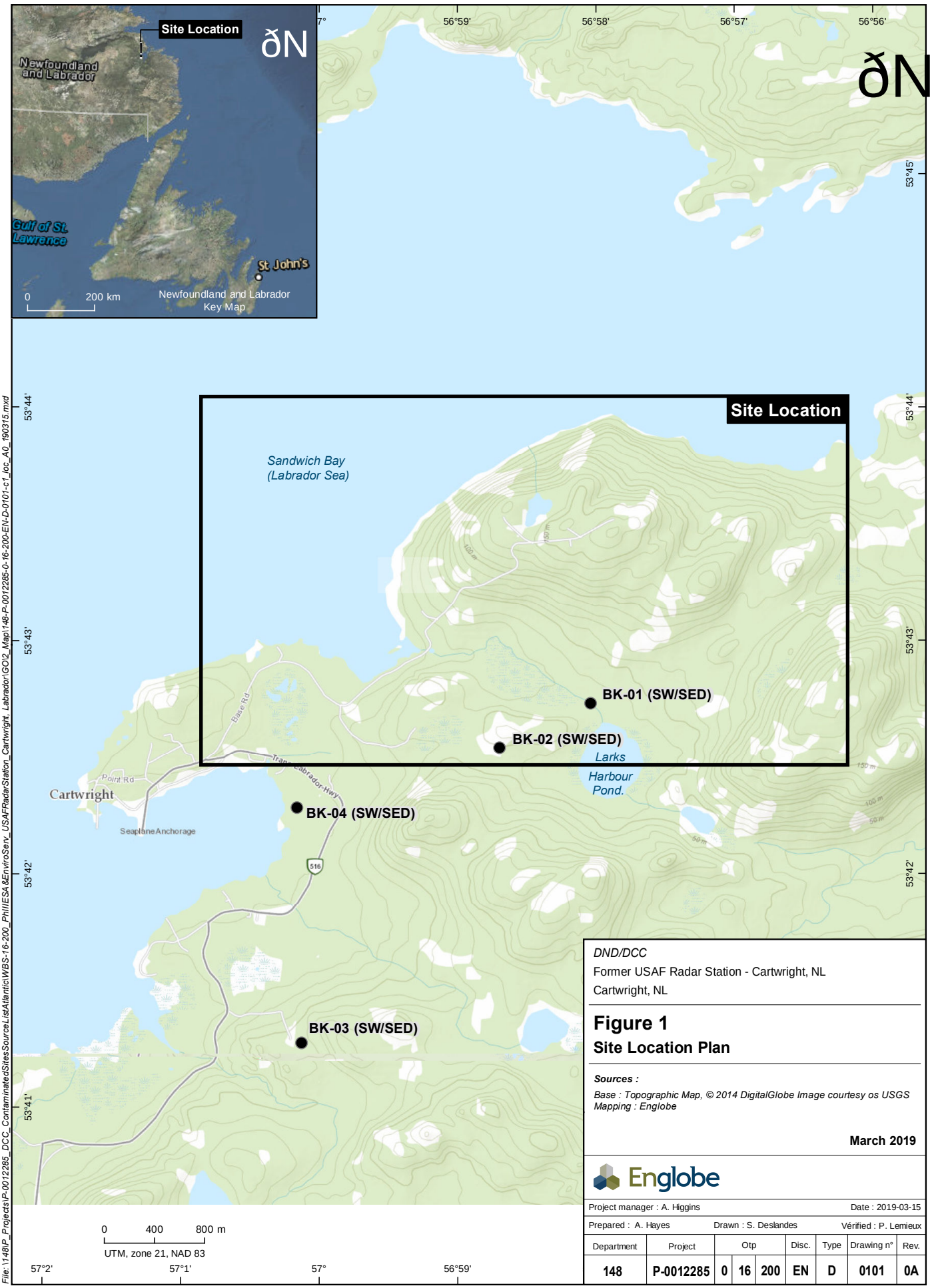
Appendix A Figures



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Former USAF Radar Station - Cartwright, NL

Cartwright, NL

Figure 1

Site Location Plan

Sources :

Base : Topographic Map, © 2014 DigitalGlobe Image courtesy os USGS
Mapping : Englobe

March 2019

Englobe

Project manager : A. Higgins							Date : 2019-03-15	
Prepared : A. Hayes		Drawn : S. Deslandes					Vérified : P. Lemieux	
Department	Project	Otp			Disc.	Type	Drawing n°	Rev.
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Legend

Sampling station (Englobe, 2018)

- BK-1 — Soil Sample
- SED-7-18 — Sediment Sample
- SW-6 — Surface Water Sample
- MW1 — Monitoring Well

Sampling station from Phase II (Stantec, 2018)

- CWT-TP18 — Test Pit
- CWT-SS63 — Soil Surface Sample
- CWT-SED3 — Sediment Sample
- CWT-SW1 — Surface Water Sample

Boundary

- Approximate Boundary of Site
- 100 — Contour Line

57° 56°59' 56°58' 56°57' 53°44'

CWT-SS52 CWT-SS54 CWT-SS53 CWT-SS55 CWT-SS56 CWT-SS57 CWT-SS62 CWT-SS61 CWT-SS60 CWT-SS59 CWT-SS58

DFO / Coast Guard Communications Tower

CWT-TP34 CWT-SED2 CWT-SW2 CWT-TP33 CWT-SS44 CWT-SS43 CWT-SS45 CWT-SS42

Helicopter Pad

Former Pump House

Bell Communications Tower

Main Complex

Figure 5, 12,13,14

Figure 3,6,7,8

Figure 4,9,10,11

Former USAF Dump and Ammunition Storage Area

Former Contractors Village (1951 - 1953)

CWT-SS46 CWT-SS47 CWT-TP43 MW3 CWT-SS49 CWT-SS48

Approximate Location of Former A/G Pipeline along Gravel Road

CWT-SW7 CWT-SED7

CWT-SS50 CWT-SW3 CWT-SED3

CWT-SS51

Former Municipal Landfills

Existing Municipal Landfill

BK-01 BK-02

Sandwich Bay (Labrador Sea)

Larks Harbour Pond

53°43'

0 125 250 m

UTM, zone 21, NAD 83

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Former USAF Radar Station - Cartwright, NL

Cartwright, NL

Figure 2

Site Area

Sources :

Image : © 2010 DigitalGlobe © 2010 GeoEye © 2016 Microsoft Corporation

Mapping : Englobe

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Prepared : A. Hayes — Drawn : S. Deslandes — Vérified : P. Lemieux

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Legend

Sampling station (Englobe, 2018)

- **BK-1** — Soil Sample
- **SED-8-18** — Sediment Sample
- **SW-6** — Surface Water Sample
- **MW1** — Monitoring Well
- **TP-1** — Test Pit

Sampling station from Phase II (Stantec, 2018)

- **CWT-TP18** — Test Pit
- **CWT-SS63** — Soil Surface Sample
- **CWT-SED3** — Sediment Sample
- **CWT-SW1** — Surface Water Sample

56°59'30"

56°59'20"

Sandwich Bay
(Labrador Sea)

Former Contractors Village
(1951 - 1953)

SED-5-18b
SED-5-18a
SED-5-18
CWT-SED5
CWT-SW5
CWT-SS63
CWT-TP40
CWT-SS64
CWT-SED4
TP41-B
TP41-A
CWT-TP41
MW2
TP41-D
CWT-TP39
CWT-SS66
TP41-C
CWT-SS65
CWT-TP42
CWT-TP38
TP35-A
TP35-D
CWT-SS67
CWT-SS68
MW1
CWT-TP35
CWT-TP37
TP35-B
TP35-C
TP36-A
TP36-B
CWT-TP36
MW3
TP36-D
TP36-C

0 10 20 m
UTM, zone 21, NAD 83

DND/DCC
Former USAF Radar Station - Cartwright, NL
Cartwright, NL

Figure 3
Sample Location - Former Contractor Village

Sources :
Image : © 2010 DigitalGlobe © 2010 GeoEye © 2016 Microsoft Corporation
Mapping : Englobe

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Prepared : A. Hayes	Drawn : S. Deslandes — Vérified : P. Lemieux

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Legend

Sampling station (Englobe, 2018)

- BK-1 — Soil Sample
- SED-8-18 — Sediment Sample
- SW-6 — Surface Water Sample
- MW1 — Monitoring Well

Sampling station from Phase II (Stantec, 2018)

- CWT-TP18 — Test Pit
- CWT-SS63 — Soil Surface Sample
- CWT-SED3 — Sediment Sample
- CWT-SW1 — Surface Water Sample

Material

- Asbestos Containing Material

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Former USAF Radar Station - Cartwright, NL
Cartwright, NL

Figure 4
Sample Location
Former USAF Dump Area and
Former Ammunition Storage Area

Sources :
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Mapping : Englobe

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Former USAF Radar Station - Cartwright, NL

Cartwright, NL

Figure 5

Sample Location

Main Complex Area

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Legend

Sampling station (Englobe, 2018)

- BK-1 — Soil Sample
- SED-8-18 — Sediment Sample
- SW-6 — Surface Water Sample
- MW1 — Monitoring Well
- TP-1 — Test Pit

Sampling station from Phase II (Stantec, 2018)

- CWT-TP18 — Test Pit
- CWT-SS63 — Soil Surface Sample
- CWT-SED3 — Sediment Sample
- CWT-SW1 — Surface Water Sample

Location of Impacts

- PAH Exceedance
- PHC Exceedance

56°59'25" 56°59'20" 56°59'15"

53°43'15"

SED-5-18b
SED-5-18a
CWT-SED5
SED-5-18
CWT-SW5

Former Contractors Village
(1951 - 1953)

Sandwich Bay
(Labrador Sea)

CWT-SS63 CWT-TP40 CWT-SS64
CWT-SED4
TP41-B TP41-A
CWT-TP39 TP41
TP41-D
CWT-SS66 TP41-C
CWT-SS65 CWT-TP42
CWT-TP38
TP35-A
CWT-SS67 CWT-SS68 TP35-D CWT-TP35
CWT-TP37 TP35-B TP35-C
TP36-A TP36-B TP36-B
CWT-TP36
TP36-D TP36-C

0 10 20 m
UTM, zone 21, NAD 83

56°59'30" 56°59'25" 56°59'20"

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Former USAF Radar Station - Cartwright, NL
Cartwright, NL

Figure 6
Locations of Soil Exceedances - Former Contractor Village

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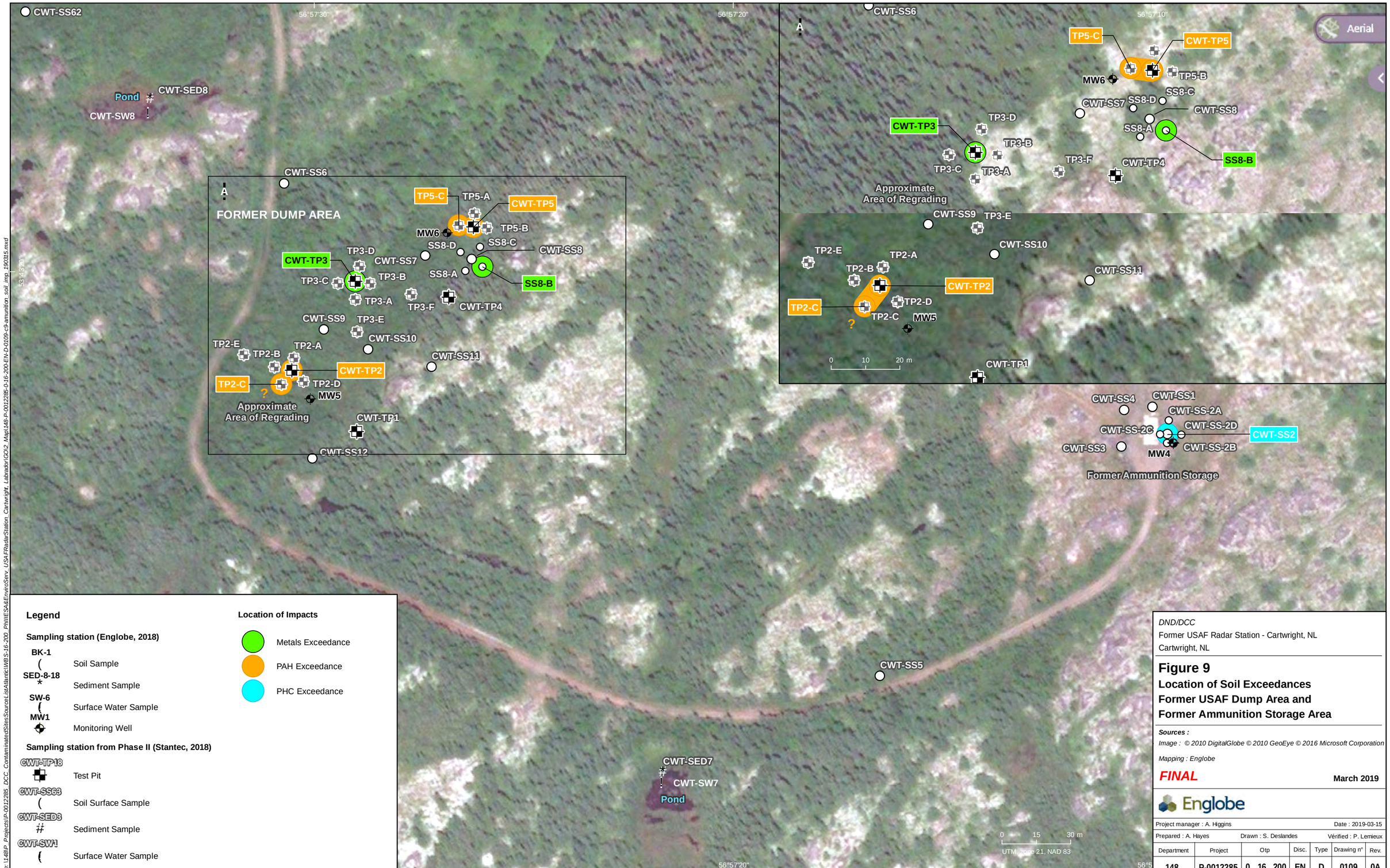

Legend

Sampling station (Englobe, 2018)

- BK-1 — Soil Sample
- SED-8-18 — Sediment Sample
- SW-6 — Surface Water Sample
- MW1 — Monitoring Well

Sampling station from Phase II (Stantec, 2018)

- CWT-TP18 — Test Pit
- CWT-SS63 — Soil Surface Sample
- CWT-SED3 — Sediment Sample
- CWT-SW1 — Surface Water Sample

Location of Impacts

- Metals Exceedance
- PAH Exceedance
- PHC Exceedance

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Former USAF Radar Station - Cartwright, NL
Cartwright, NL

Figure 9
Location of Soil Exceedances
Former USAF Dump Area and
Former Ammunition Storage Area

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CWT-SS62

56°57'30"

56°57'20"

Pond

CWT-SED8

CWT-SW8

CWT-SS6

A

FORMER DUMP AREA

TP5-A

TP5-C

CWT-TP5

MW6

TP5-B

SS8-D

SS8-C

TP3-D

CWT-SS7

CWT-SS8

CWT-TP3

TP3-B

SS8-A

SS8-B

TP3-C

TP3-A

TP3-F

CWT-TP4

CWT-SS9

TP3-E

CWT-SS10

TP2-E

TP2-A

TP2-B

CWT-TP2

CWT-SS11

TP2-D

TP2-C

MW5

Approximate
Area of Regrading

CWT-TP1

CWT-SS12

CWT-SS6

A

TP5-A

TP5-C

CWT-TP5

TP5-C

TP5-B

MW6

SS8-C

SS8-D

CWT-SS7

CWT-SS8

SS8-A

SS8-B

TP3-D

CWT-TP3

TP3-B

TP3-C

TP3-A

TP3-F

CWT-TP4

Approximate
Area of Regrading

CWT-SS9

TP3-E

CWT-SS10

TP2-E

TP2-A

TP2-B

CWT-TP2

CWT-SS11

TP2-D

TP2-C

TP2-C

MW5

0 10 20 m

CWT-TP1

CWT-SS4

CWT-SS1

CWT-SS-2A

CWT-SS-2D

CWT-SS-2C

CWT-SS2

CWT-SS3

MW4

CWT-SS-2B

Former Ammunition Storage

CWT-SS5

CWT-SED7

CWT-SW7

Pond

0 15 30 m

UTM Zone 21, NAD 83

56°57'20"

56°5

53°4'30"

Legend

Sampling station (Englobe, 2018)

- BK-1 — Soil Sample
- SED-8-18 — Sediment Sample
- SW-6 — Surface Water Sample
- MW1 — Monitoring Well

Location of Impacts

- Metals Exceedance

Sampling station from Phase II (Stantec, 2018)

- CWT-TP13 — Test Pit
- CWT-SS63 — Soil Surface Sample
- CWT-SED3 — Sediment Sample
- CWT-SW1 — Surface Water Sample

DND/DCC

Former USAF Radar Station - Cartwright, NL

Cartwright, NL

Figure 10

Location of Surface Water and Sediment Exceedances Former USAF Dump Area and Former Ammunition Storage Area

Sources :

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Mapping : Englobe

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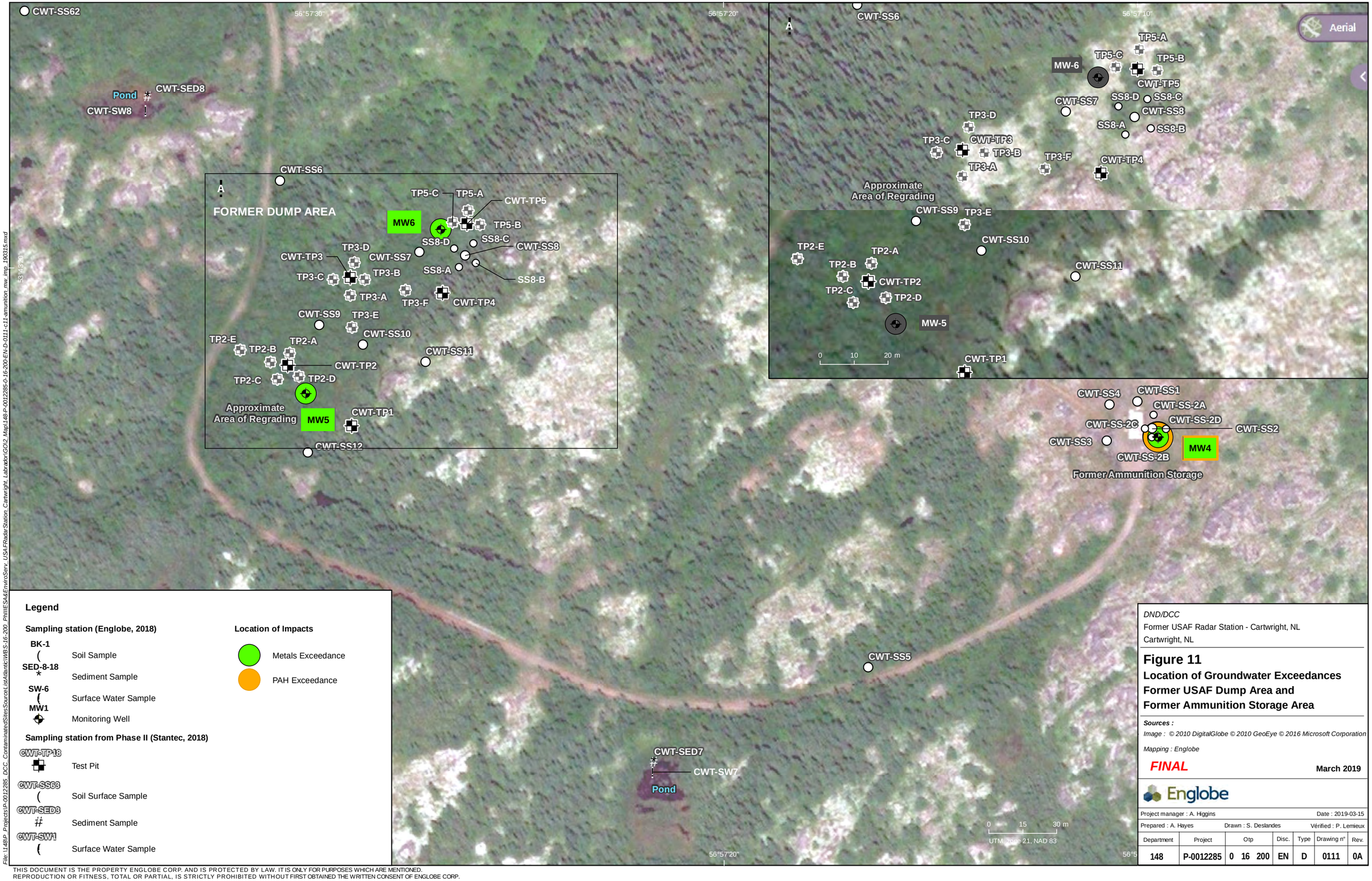

Legend

Sampling station (Englobe, 2018)

- BK-1 — Soil Sample
- SED-8-18 — Sediment Sample
- SW-6 — Surface Water Sample
- MW1 — Monitoring Well

Sampling station from Phase II (Stantec, 2018)

- CWT-TP13 — Test Pit
- CWT-SS63 — Soil Surface Sample
- CWT-SED3 — Sediment Sample
- CWT-SW1 — Surface Water Sample

Location of Impacts

- Metals Exceedance
- PAH Exceedance

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Former USAF Radar Station - Cartwright, NL
Cartwright, NL

Figure 11
Location of Groundwater Exceedances Former USAF Dump Area and Former Ammunition Storage Area

Sources :
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Mapping : Englobe

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Legend

Sampling station (Englobe, 2018)

- BK-1 — Soil Sample
- SED-8-18 — Sediment Sample
- SW-6 — Surface Water Sample
- MW1 — Monitoring Well

Sampling station from Phase II (Stantec, 2018)

- CWT-TP13 — Test Pit
- CWT-SS63 — Soil Surface Sample
- CWT-SED3 — Sediment Sample
- CWT-SW1 — Surface Water Sample

Location of Impacts

- Metals Exceedance
- PAH Exceedance
- PHC Exceedance
- VOC Exceedance

56°58'
56°57'50"
53°43'50"
53°43'25"
56°58'10"
0 13 26 m
UTM, zone 21, NAD 83

TP15-C, TP15-B, CWT-SS24, CWT-TP15, TP15-D, TP15-A, TP15-F, TP15-E, CWT-TP14, TP13-A, MW8, TP13-C, CWT-SS14, CWT-SS13-A, CWT-SS13, CWT-SS16, SS13-B, CWT-TP7, CWT-SS17, SS16-C, SS16-B, SS13-D, SS13-C, CWT-TP6, CWT-SS16, CWT-SS16-A, CWT-TP-7, TP13-bas, CWT-SS25, SS23-B, SS23-A, CWT-SS23, SS23-C, TP13-B, CWT-SS22, CWT-TP9, CWT-SS26, CWT-TP13, CWT-TP19, CWT-TP16, CWT-SS30, CWT-TP10, CWT-SS18, CWT-TP18, CWT-SS27, CWT-SS29, CWT-SS21, MW9-A, CWT-SS19, MW9-B, MW-9, MW9-D, CWT-TP8, MW9-C, CWT-TP12, CWT-SS28, CWT-SS20, CWT-SS31, CWT-TP11-B, CWT-TP11, CWT-TP20, MW-14, TP17-C, CWT-TP17, TP11-A, TP11-C, TP17-A, TP17-B, TP11-D, MW12, CWT-TP32, CWT-SS41, CWT-TP21, CWT-SS39, CWT-TP25, MW-15, CWT-TP23, CWT-TP22, TP25-D, TP25-C, CWT-SS38, CWT-SS40, TP25-B, TP25-A, CWT-TP26, CWT-TP27, SS32-B, SS32-A, SS32, SS32-C, SS32-D, CWT-SS37, SS36-B, SS36-C, CWT-SS36, SS36-A, CWT-TP24, CWT-TP28, CWT-SS33, CWT-TP31, CWT-SED6, SWT-SW6, CWT-SS35, CWT-SS34, TP30-D, MW-7, MW-16, CWT-TP30, TP29-A, SW-6, TP30-C, TP30-B

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File: I:\48\P - Projects\P-0012285 - DCC - Contaminated\Sites\Source\1stAtlantic\WBS-16-200 - Phil\IESA&EnviroServ - USAF\RadarStation_Cartwright, Labrador\GIS\2_Map\148-P-0012285-0-16-200-EN-D-0112-c12 - main soil - imp - 190315.mxd

DND/DCC
Former USAF Radar Station - Cartwright, NL
Cartwright, NL

Figure 12
Location of Soil Exceedances
Main Complex Area

Sources :
Image : © 2010 DigitalGlobe © 2010 GeoEye © 2016 Microsoft Corporation

Mapping : Englobe

FINAL

March 2019

Englobe

Project manager : A. Higgins							Date : 2019-03-15	
Prepared : A. Hayes		Drawn : S. Deslandes					Vérified : P. Lemieux	
Department	Project	Otp			Disc.	Type	Drawing n°	Rev.
138	P-0012285	0	16	200	EN	D	0112	0A

Legend

Sampling station (Englobe, 2018)

- BK-1 — Soil Sample
- SED-8-18 — Sediment Sample
- SW-6 — Surface Water Sample
- MW1 — Monitoring Well

Sampling station from Phase II (Stantec, 2018)

- CWT-TP13 — Test Pit
- CWT-SS63 — Soil Surface Sample
- CWT-SED3 — Sediment Sample
- CWT-SW1 — Surface Water Sample

Location of Impacts

- Metals Exceedance

CWT-SS24, TP15-C, CWT-TP15, TP15-B, MW-13, TP13-A, CWT-SS14, TP15-D, CWT-TP14, MW8, CWT-SS13-A, CWT-SS13, TP15-A, TP15-E, TP13-C, SS16-A, CWT-SS15, TP15-F, TP13-bas, CWT-SS16, SS13-B, CWT-TP7, CWT-SS17, SS15-C, SS15-B, CWT-SS25, SS23-B, SS13-D, SS13-C, CWT-TP6, CWT-SS23, SS23-A, CWT-SS16, CWT-SS15-A, CWT-TP19, SS23-C, TP13-B, CWT-SS22, CWT-TP9, CWT-TP-7, CWT-SS26, CWT-TP13, CWT-TP16, MW11, CWT-SS18, CWT-SS30, CWT-TP10, CWT-TP18, CWT-SS27, MW9-A, CWT-SS19, CWT-SS29, CWT-SS21, MW9-B, MW-9, MW9-D, CWT-TP8, CWT-TP12, CWT-SS28, CWT-SS20, MW9-C, CWT-SS31, CWT-TP11-B, CWT-TP11, CWT-TP20, MW-14, TP17-C, NW12, CWT-TP17, TP11-A, TP11-C, TP17-A, TP17-B, TP11-D, CWT-TP32, CWT-SS41, CWT-TP21, CWT-SS39, CWT-TP25, MW-15, CWT-TP23, CWT-TP22, TP25-D, TP25-C, CWT-SS38, CWT-SS40, TP25-B, TP25-A, CWT-TP26, CWT-TP27, SS32-B, SS32-A, SS36-B, SS36-C, CWT-SS37, SS32, SS32-C, SS32-D, CWT-TP24, CWT-SS36, SS36-A, CWT-TP28, CWT-SS33, CWT-TP31, CWT-SED6, SWT-SW6, CWT-SS35, CWT-SS34, TP30-D, MW-7, MW-16, CWT-TP30, SW-6, TP29-A, TP30-C, TP30-B

56°58'10" 56°58' 56°57'50" 53°43'50" 53°43'25"

0 13 26 m
UTM, zone 21, NAD 83

DND/DCC
Former USAF Radar Station - Cartwright, NL
Cartwright, NL

Figure 13
Location of Surface Water and Sediment Exceedances Main Complex Area

Sources :
Image : © 2010 DigitalGlobe © 2010 GeoEye © 2016 Microsoft Corporation
Mapping : Englobe

FINAL **March 2019**

Englobe

Project manager : A. Higgins							Date : 2019-03-15
Prepared : A. Hayes	Drawn : S. Deslandes						Vérified : P. Lemieux
Department	Project	Otp			Disc.	Type	Drawing n°	Rev.
138	P-0012285	0	16	200	EN	D	0113	0A

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Legend

Sampling station (Englobe, 2018)

- BK-1 — Soil Sample
- SED-8-18 — Sediment Sample
- SW-6 — Surface Water Sample
- MW1 — Monitoring Well

Sampling station from Phase II (Stantec, 2018)

- CWT-TP13 — Test Pit
- CWT-SS63 — Soil Surface Sample
- CWT-SED3 — Sediment Sample
- CWT-SW1 — Surface Water Sample

Location of Impacts

- Metals Exceedance
- PAH Exceedance
- PHC Exceedance
- PH Exceedance

56°58'
56°57'50"
53°43'50"
53°43'25"
56°58'10"
0 13 26 m
UTM, zone 21, NAD 83

CWT-SS24, TP15-C, TP15-D, TP15-B, MW-13, CWT-TP14, CWT-TP14, TP15-A, TP15-E, MW-8, TP15-F, CWT-SS14, SS16-A, CWT-SS15, SS16, SS15-C, SS15-B, SS13-B, SS13-D, SS13-C, CWT-TP7, CWT-SS17, CWT-TP6, MW10, CWT-SS25, MW-11, SS23-B, SS23-A, SS23, CWT-TP19, CWT-SS22, CWT-TP9, CWT-SS26, CWT-SS26, CWT-TP16, CWT-SS30, CWT-TP10, CWT-SS18, CWT-TP18, CWT-SS27, CWT-SS29, CWT-SS21, MW9-A, CWT-SS19, MW9-B, MW9, MW9-D, MW9-C, CWT-TP12, CWT-SS20, CWT-SS28, CWT-SS31, MW-12, TP11-B, TP11-A, TP11-C, TP11-D, MW12, CWT-TP20, TP17-D, TP17-C, MW14, TP17, TP17-A, TP17-B, CWT-TP32, CWT-SS41, CWT-TP21, CWT-SS39, CWT-TP22, MW15, TP25-D, TP25-C, CWT-SS38, CWT-TP23, CWT-SS40, TP25-A, TP25-B, CWT-TP27, CWT-TP26, SS32-B, SS32-A, SS32, SS32-C, SS32-D, CWT-SS37, SS36-B, SS36-C, CWT-SS37, SS36, SS36-A, CWT-TP24, CWT-TP28, CWT-SS33, CWT-TP31, CWT-SED6, CWT-SS35, SWT-SW6, CWT-TP29, TP29-A, MW-7, TP30-D, MW16, TP30-C, TP30-B

DND/DCC
Former USAF Radar Station - Cartwright, NL
Cartwright, NL

Figure 14
Location of Groundwater Exceedances Main Complex Area

Sources :
Image : © 2010 DigitalGlobe © 2010 GeoEye © 2016 Microsoft Corporation

Mapping : Englobe

FINAL **March 2019**

Englobe

Project manager : A. Higgins	Date : 2019-03-15
Prepared : A. Hayes	Drawn : S. Deslandes — Vérified : P. Lemieux

Department	Project	Otp			Disc.	Type	Drawing n°	Rev.
138	P-0012285	0	16	200	EN	D	0108	0A

File: I:\48\P_Projects\P-0012285_DCC_ContaminatedSites\Source_ist\Atlantic\WBS-16-200_PhII\ESA&EnviroSurv_USAFRadarStation_Cartwright_Labrador\GIS\2_Mxd\148-P-0012285-D-16-200-EN-D-0114-c14_main_mw_imp_190315.mxd

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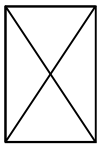
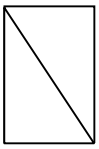
Appendix B Borehole, Monitor Well and Test Pit Logs

SOIL SAMPLES

CONDITION – This column graphically indicates the depth and condition of the sample:

undisturbed  disturbed  not recovered

TYPE – The type of sample is indicated in this column as follows:

A auger sample
B block sample
C rock core, or frozen soil core
D drive sample
G grab sample
SS split spoon
P Pitcher tube sample
U tube sample (usually thin-walled)
W wash or air return sample
O other (see report text)

PENETRATION RESISTANCE – Unless otherwise noted this column refers to the number of blows (N) of a 140 pound (63.5 kg) hammer freely dropping 30 inches (0.76 m) required to drive a 2 inch (50.8 mm) O.D. open-end sampler 0.5 feet (0.15 m) to 1.5 feet (0.45 m) into the soil, or until 100 blows have been applied, in which case, the penetration is stated. This is the standard penetration test referred to in ASTM D 1586.

OTHER TESTS

In this column are tabulated results of other laboratory tests as indicated by the following symbols:

*C	Consolidation test
Fines	Percentage by weight smaller than #200 sieve
D_R	Relative density (formerly specific gravity)
k	Permeability coefficient
*MA	Mechanical grain size analysis and hydrometer test (if appropiate)
pp	Pocket pentrometer strength
*q	Triaxial compression test
q_U	Unconfined compressive strength
*SB	Shearbox test
SO_4	Concentration of water-soluble sulphate
*ST	Swelling test
TV	Torvane shear strength
VS	Vane Shear Strength (undistrubed-remolded)
ε_f	Unit strain at failure
γ	Unit weight of soil or rock
γ_d	Dry unit weight of soil or rock
ρ	Density of soil or rock
ρ_d	Dry density of soil or rock

* The results of these tests usually are reported separately

SYMBOLS AND TERMS USED ON THE BOREHOLE AND TEST PIT RECORDS

SOIL DESCRIPTION

Behavioural properties (i.e. plasticity, permeability) take precedence over particle gradation in describing soils.

Terminology describing soil structure:

Desiccated	- having visible signs of weathering by oxidation of clay minerals, shrinkage cracks etc.
Fissured	- having cracks, and hence a blocky structure
Varved	-composed of regular alternating layers of silt and clay
Stratified	- composed of alternating layers or different soil types, e.g. silt and sand or silt and clay
Well Graded	- having wide range in grain sizes and substantial amounts of all intermediate particle sizes
Uniformly Graded	- predominantly of one grain size.

Terminology used for describing soil strata based upon the proportion of individual particle size present:

Trace, or occasional	Less than 10%
Some	10-20%
Adjective (e.g. silty or sandy)	20-35%
And (e.g. silt and sand)	35-50%

The standard terminology to describe cohesionless soils includes the relative density, as determined by laboratory test or by the Standard Penetration Test 'N' - value: the number of blows of 140 pound (64 kg) hammer falling 30 inches (760 mm), required to drive a 2 inch (50.8 mm) O.D. split spoon sampler one foot (305 mm) into the soil.

Relative Density	'N' Value	Relative Density %
Very loose	<4	<15
Loose	4-10	15-35
Compact	10-30	35-65
Dense	30-50	65-85
Very Dense	>50	>85

The standard terminology to describe cohesive soils includes the consistency, which is based on undrained shear strength as measured by insitu vane tests, penetrometer tests, unconfined compression test, or occasionally by standard penetration tests.

Consistency	Undrained Shear Strength		'N' Value
	Kips/sq.ft.	kPa	
Very Soft	<0.25	<12.5	<2
Soft	0.25-0.5	12.5-25	2-4
Firm	0.5-1.0	25-50	4-8
Stiff	1.0-2.0	50-100	8-15
Very Stiff	2.0-4.0	100-200	15-30
Hard	>4.0	>200	>30

SOIL CLASSIFICATION SYSTEM (MODIFIED U.S.C.)

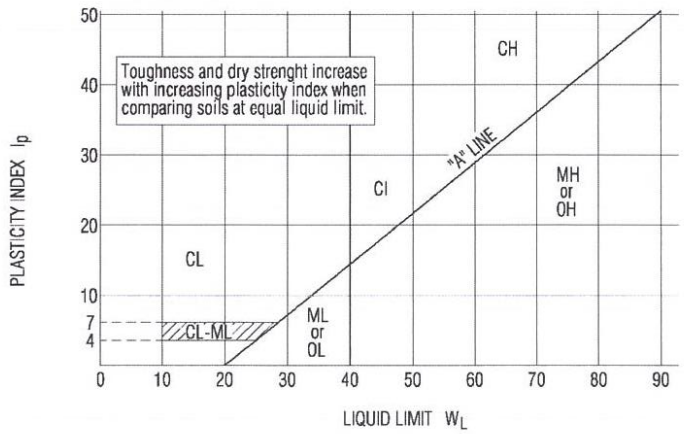
MAJOR DIVISION			GROUP SYMBOL	GRAPHIC SYMBOL	COLOR CODE	TYPICAL DESCRIPTION	LABORATORY CLASSIFICATION CRITERIA	
HIGHLY ORGANIC SOILS			Pt		ORANGE	PEAT AND OTHER HIGHLY ORGANIC SOILS	STRONG COLOR OR ODOR, AND OFTEN FIBROUS TEXTURE	
COARSE-GRAINED SOILS (MORE THAN HALF BY WEIGHT LARGER THAN NO. 200 SIEVE SIZE)	GRAVELS MORE THAN HALF COARSE FRACTION LARGER THAN NO.4 SIEVE SIZE	CLEAN GRAVELS	GW		RED	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES, <5% FINES	$Cu = \frac{D_{60}}{D_{10}} > 4$ $Cc = \frac{(D_{30})^2}{D_{10} \times D_{60}} = 1 \text{ to } 3$	
			GP		RED	POORLY-GRADED GRAVELS, AND GRAVEL-SAND MIXTURES, <5% FINES	NOT MEETING ALL ABOVE REQUIRMENTS	
		DIRTY GRAVELS	GM		YELLOW	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES >12% FINES	ATTERBERG LIMITS BELOW "A" LINE OR $I_p < 4$	
			GC		YELLOW	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES >12% FINES	ATTERBERG LIMITS ABOVE "A" LINE OR $I_p > 7$	
	SANDS MORE THAN HALF COARSE FRACTION SMALLER THAN NO.4 SIEVE SIZE	CLEAN SANDS	SW		RED	WELL-GRADED SANDS, GRAVELLY SANDS, <5% FINES	$Cu = \frac{D_{60}}{D_{10}} > 6$ $Cc = \frac{(D_{30})^2}{D_{10} \times D_{60}} = 1 \text{ to } 3$	
			SP		RED	POORLY-GRADED SANDS, OR GRAVELLY SANDS, <5% FINES	NOT MEETING ALL ABOVE REQUIRMENTS	
		DIRTY SANDS	SM		YELLOW	SILTY SANDS, SAND-SILT MIXTURES >12% FINES	ATTERBERG LIMITS BELOW "A" LINE OR $I_p < 4$	
			SC		YELLOW	CLAYEY SANDS, SAND-CLAY MIXTURES >12% FINES	ATTERBERG LIMITS ABOVE "A" LINE OR $I_p > 7$	
FINE - GRAINED SOILS (MORE THAN HALF BY WEIGHT PASSES NO.200 SIEVE SIZE)	SILTS BELOW "A" LINE ON PLASTICITY CHART; NEGLIGIBLE ORGANIC CONTENT		ML		GREEN	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY SANDS OF SLIGHT PLASTICITY	$W_L < 50$	SEE CHART BELOW
			MH		BLUE	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS, FINE SANDY OR SILTY SOILS	$W_L > 50$	
	CLAYS ABOVE "A" LINE ON PLASTICITY CHART; NEGLIGIBLE ORGANIC CONTENT		CL		GREEN	INORGANIC CLAYS OF LOW PLASTICITY, GRAVELLY, SANDY, OR SILTY CLAYS, LEAN CLAYS	$W_L < 30$	
			CI		GREEN-BLUE	INORGANIC CLAYS OF MEDIUM PLASTICITY SILTY CLAYS	$W_L > 30, < 50$	
			CH		BLUE	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS	$W_L > 50$	
	ORGANIC SILTS & ORGANIC CLAYS BELOW "A" LINE ON PLASTICITY CHART		OL		GREEN	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY	$W_L < 50$	
			OH		BLUE	ORGANIC CLAYS OF HIGH PLASTICITY	$W_L > 50$	

FILL TILL BEDROCK

1. All sieve sizes mentioned on this chart are U.S. Standard, ASTM E11.
2. Boundary classifications possessing characteristics of two groups are given combined group symbols eg GW-GC is a well-graded gravel-sand mixture wtih clay binder between 5% and 12%.
3. Soil fractions and limiting textural boundaries are in accordance with the Unified Soil Classification System, except that an inorganic clay of medium plasticity (CI) is recognized.
4. The following adjectives may be employed to define percentage ranges by weight of minor components:

and	50 - 36%
gravelly, sandy, silty, clayey, ect.	35 - 21%
some	20 - 11%
trace	10 - 1%

PLASTICITY CHART



Englobe

BOREHOLE LOG

PROJECT
Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN. DC | CKD. JAH | DATE OF INVEST. 18-8-14 | JOB NR18CRT1 | HOLE NO. CWT-MW1

DRILL TYPE: Truck mounted Drill

CASING RESISTANCE blows/300mm

WC % wp- □ w- ● wl- △
10 20 30 40 50

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION	COND.	TYPE	PENE. RESIST.	Well Details	Other Tests
DATUM									
SURFACE ELEVATION									
1		SP		SAND: some gravel and silt, trace organics, medium brown.		SS	N=9		Soil: MW1/1 PHC.
2									
3	1					SS	N=17		Soil: MW1/2 PHC.
4		SP		SAND: some gravel and silt, wet, gray.					
5						SS	N=22		Soil: MW1/3 PHC.
6				BEDROCK: granite bedrock, grey.					
7	2								
8									
9									
10	3								
11									
12									
13	4								
14									
15									
16	5								
17									
18									
19									
20	6			End of borehole at 6 m in Bedrock.					

Groundwater measured at 0.09 m on

PLATE 1

BOREHOLE LOG

PROJECT
Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN. DC	CKD. JAH	DATE OF INVEST. 18-8-14	JOB NR18CRT1	HOLE NO. CWT-MW1

CASING RESISTANCE blows/300mm

WC % wp- □ w- ● wl- △
10 20 30 40 50

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE PENE. RESIST.	DRILL TYPE
				DATUM				Truck mounted Drill
				SURFACE ELEVATION				Well Details / Other Tests
				August 20, 2018.				
22								
23	7							
24								
25								
26	8							
27								
28								
29	9							
30								
31								
32								
33	10							
34								
35								
36	11							
37								
38								
39	12							
40								
41								

PLATE 2

BOREHOLE LOG

PROJECT
Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN. DC | CKD. JAH | DATE OF INVEST. 18-8-14 | JOB NR18CRT1 | HOLE NO. CWT-MW2

DRILL TYPE: Truck mounted Drill

CASING RESISTANCE blows/300mm

WC % wp- □ w- ● wl- △
10 20 30 40 50

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE PENE. RESIST.	Well Details / Other Tests
0		SP		SAND: gravel, trace silt, brown.		SS	N=15	Soil: MW2/1 PHC.
2						SS	N=50/4"	Soil: MW2/2 PHC.
3	1	SP		SAND: some gravel, cobblestones, brown.				
6	2			BEDROCK: granite bedrock, grey.				
20	6			End of borehole at 6 m in Bedrock.				

Groundwater measured at 0.73 m on

PLATE 3

BOREHOLE LOG

PROJECT
Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN. DC	CKD. JAH	DATE OF INVEST. 18-8-14	JOB NR18CRT1	HOLE NO. CWT-MW2

CASING RESISTANCE blows/300mm

WC % wp- □ w- ● wl- △
10 20 30 40 50

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE PENE. RESIST.	DRILL TYPE
				DATUM				Truck mounted Drill
				SURFACE ELEVATION				Well Details / Other Tests
				August 20, 2018.				
22								
23	7							
24								
25								
26	8							
27								
28								
29	9							
30								
31								
32								
33	10							
34								
35								
36	11							
37								
38								
39	12							
40								
41								

PLATE 4

BOREHOLE LOG

PROJECT
Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN. DC | CKD. JAH | DATE OF INVEST. 18-8-14 | JOB NR18CRT1 | HOLE NO. CWT-MW3

DRILL TYPE: Truck mounted Drill

CASING RESISTANCE blows/300mm

WC % wp- □ w- ● wl- △
10 20 30 40 50

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION	COND.	TYPE	PENE. RESIST.	Well Details	Other Tests
				DATUM SURFACE ELEVATION					
1		SP		SAND: some silt, trace gravel, medium brown.		SS	N=8		Soil: MW3/1 PAH. Soil: MW3/2 PAH.
2		SP		SAND: gravel, trace silt, cobblestone, gray.					
3	1					SS	N=30		
4									Soil: MW3/3 PAH.
5						SS	N=50		
6	2			BEDROCK: granite bedrock, grey.					
7									
8									
9									
10	3								
11									
12									
13	4								
14									
15									
16	5								
17									
18									
19									
20	6			End of borehole at 6 m in Bedrock.					

Groundwater measured at 0.21 m on

PLATE 5

BOREHOLE LOG

PROJECT
Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN. DC	CKD. JAH	DATE OF INVEST. 18-8-14	JOB NR18CRT1	HOLE NO. CWT-MW3

CASING RESISTANCE blows/300mm

WC % wp- □ w- ● wl- △
10 20 30 40 50

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE PENE. RESIST.	DRILL TYPE
				DATUM				Truck mounted Drill
				SURFACE ELEVATION				Well Details / Other Tests
				August 20, 2018.				
22								
23	7							
24								
25								
26	8							
27								
28								
29	9							
30								
31								
32								
33	10							
34								
35								
36	11							
37								
38								
39	12							
40								
41								

PLATE 6

BOREHOLE LOG

PROJECT
Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN. DC | CKD. JAH | DATE OF INVEST. 18-8-14 | JOB NR18CRT1 | HOLE NO. CWT-MW4

DRILL TYPE: Truck mounted Drill

CASING RESISTANCE blows/300mm

WC % wp- □ w- ● wl- △
10 20 30 40 50

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE PENE. RESIST.	Well Details	Other Tests
1		SP		SAND: some gravel, trace to some silt, medium brown.		SS	N=12		Soil: MW4/1 PHC. Soil: MW4/1 PHC.
2						SS	N=50/4"		
3	1			BEDROCK: granite bedrock, medium grey.					
4									
5									
6	2								
7									
8									
9									
10	3								
11									
12									
13	4								
14									
15									
16	5								
17									
18									
19									
20	6								

PLATE 7

BOREHOLE LOG

PROJECT
Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN. DC	CKD. JAH	DATE OF INVEST. 18-8-14	JOB NR18CRT1	HOLE NO. CWT-MW4

CASING RESISTANCE blows/300mm

WC % wp- □ w- ● wl- △
10 20 30 40 50

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE PENE. RESIST.
				DATUM			
				SURFACE ELEVATION			
22							
23	7						
24							
25							
26	8						
27							
28							
29							
	9			End of borehole at 8.88 m in Bedrock.			
30							
				Groundwater measured at 1.77 m on August 17, 2018.			
31							
32							
33	10						
34							
35							
36	11						
37							
38							
39							
	12						
40							
41							

DRILL TYPE
Truck mounted Drill

Well Details

Other Tests

PLATE 8

BOREHOLE LOG

PROJECT
Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN. DC	CKD. JAH	DATE OF INVEST. 18-8-14	JOB NR18CRT1	HOLE NO. CWT-MW5

CASING RESISTANCE blows/300mm

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DRILL TYPE: Truck mounted Drill

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE PENE. RESIST.	Well Details	Other Tests
1		SP		SAND: trace silt and gravel, brown.		SS	N=10		
2		SP				SS	N=50/1"		
3	1			SAND: some gravel and silt, lots of cobblestone, brown and grey.					
4									
5									
6	2								
7									
8									
9									
10	3								
11									
12									
13	4								
14									
15									
16	5								
17									
18									
19									
20	6			End of borehole at 6.05 m in sand.					

Groundwater measured at 0.63 m on

PLATE 9

BOREHOLE LOG

PROJECT
Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN. DC	CKD. JAH	DATE OF INVEST. 18-8-14	JOB NR18CRT1	HOLE NO. CWT-MW5

CASING RESISTANCE blows/300mm

WC % wp- □ w- ● wl- △
10 20 30 40 50

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE PENE. RESIST.	DRILL TYPE / Well Details / Other Tests
				DATUM SURFACE ELEVATION				Truck mounted Drill
				August 18, 2018.				
22								
23	7							
24								
25								
26	8							
27								
28								
29	9							
30								
31								
32								
33	10							
34								
35								
36	11							
37								
38								
39	12							
40								
41								

PLATE 10

BOREHOLE LOG

PROJECT
Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN. DC	CKD. JAH	DATE OF INVEST. 18-8-14	JOB NR18CRT1	HOLE NO. CWT-MW6

CASING RESISTANCE blows/300mm

WC % wp- □ w- ● wl- △
10 20 30 40 50

DEPTH ft m

MODIFIED USCS | SOIL SYMBOL | SOIL DESCRIPTION | SOIL SAMPLE: COND. | TYPE | PENE. RESIST.

DRILL TYPE: Truck mounted Drill

Well Details | Other Tests

DATUM

SURFACE ELEVATION

ft	m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION
0	0	SP		SAND: some silt and gravel, brown.
10	3			End of borehole at 2.75 m, refusal in sand. Groundwater measured at 0.73 m on August 18, 2018.

PLATE 11

BOREHOLE LOG

PROJECT
Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN. DC	CKD. JAH	DATE OF INVEST. 18-8-14	JOB NR18CRT1	HOLE NO. CWT-MW7

CASING RESISTANCE blows/300mm

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft m

MODIFIED USCS | SOIL SYMBOL

SOIL DESCRIPTION

DATUM

SURFACE ELEVATION

SOIL SAMPLE: COND. | TYPE | PENE. RESIST.

DRILL TYPE: Truck mounted Drill

Well Details | Other Tests

Depth (ft)	Depth (m)	USCS	Soil Description	Sample Type	Penetration Resistance
0		SP	SAND: some silt, trace gravel, medium brown.	SS	N=3
2				SS	N=50/2"
3	1		BEDROCK: granite bedrock, grey to pink.		
10	3				
13	4				
16	5				
20	6				

Well Details: Soil: MW7/1 PHC, PAH.

PLATE 12

BOREHOLE LOG

PROJECT
Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN. DC	CKD. JAH	DATE OF INVEST. 18-8-14	JOB NR18CRT1	HOLE NO. CWT-MW7

CASING RESISTANCE blows/300mm

WC % wp- □ w- ● wl- △
10 20 30 40 50

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE PENE. RESIST.	DRILL TYPE / Well Details
				DATUM				Truck mounted Drill
22								
23	7							
24								
25								
26	8							
27								
28								
29								
9								
30				End of borehole at 9.09 m in Bedrock.				
31				Groundwater measured at 0.7 m on August 20, 2018.				
32								
33	10							
34								
35								
36	11							
37								
38								
39								
12								
40								
41								

Other Tests

PLATE 13

BOREHOLE LOG

PROJECT
Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN. DC | CKD. JAH | DATE OF INVEST. 18-8-14 | JOB NR18CRT1 | HOLE NO. CWT-MW8

DRILL TYPE: Truck mounted Drill

CASING RESISTANCE blows/300mm

WC % wp- □ w- ● wl- △
10 20 30 40 50

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE PENE. RESIST.	Well Details
0	0	SP		SAND: some silt and gravel, organic material present, medium brown.				
1								
2								
3	1							
4				BEDROCK: granite bedrock, grey.				
5								
6	2							
7								
8								
9								
10	3							
11								
12								
13	4							
14								
15								
16	5							
17								
18								
19								
20	6			End of borehole at 6.1 m in Bedrock.				

Other Tests

PLATE 14

BOREHOLE LOG

PROJECT
Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN. DC	CKD. JAH	DATE OF INVEST. 18-8-14	JOB NR18CRT1	HOLE NO. CWT-MW8

CASING RESISTANCE blows/300mm

WC % wp- □ w- ● wl- △
10 20 30 40 50

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE PENE. RESIST.	DRILL TYPE / Well Details / Other Tests
				DATUM SURFACE ELEVATION				Truck mounted Drill
				Groundwater measured at 0.13 m on August 20, 2018.				
22								
23	7							
24								
25								
26	8							
27								
28								
29								
30	9							
31								
32								
33	10							
34								
35								
36	11							
37								
38								
39	12							
40								
41								

PLATE 15

BOREHOLE LOG

PROJECT
Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN. DC	CKD. JAH	DATE OF INVEST. 18-8-14	JOB NR18CRT1	HOLE NO. CWT-MW9

CASING RESISTANCE blows/300mm

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE PENE. RESIST.	Well Details	Other Tests
0	0	SP		SAND: some gravel, trace to some silt, medium brown.		SS	N=50/4"		Soil: MW9/1 VOC.
1				BEDROCK: granite bedrock, medium grey.					
2									
3	1								
4									
5									
6	2								
7									
8									
9									
10	3								
11									
12									
13	4								
14									
15									
16	5								
17									
18									
19									
20	6								

DRILL TYPE: Truck mounted Drill

PLATE 16

BOREHOLE LOG

PROJECT
Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN. DC	CKD. JAH	DATE OF INVEST. 18-8-14	JOB NR18CRT1	HOLE NO. CWT-MW9

CASING RESISTANCE blows/300mm

WC % wp- □ w- ● wl- △
10 20 30 40 50

DEPTH ft m

MODIFIED USCS | SOIL SYMBOL | SOIL DESCRIPTION | SOIL SAMPLE: COND. | TYPE | PENE. RESIST. | DRILL TYPE: Truck mounted Drill | Well Details | Other Tests

DATUM

SURFACE ELEVATION

22
23 7
24
25
26 8
27
28
29
9
30
31
32
33 10
34
35
36 11
37
38
39
12
40
41

End of borehole at 9.39 m in Bedrock.

Groundwater measured at 1.01 m on August 20, 2018.

PLATE 17

BOREHOLE LOG

PROJECT
Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN. DC	CKD. JAH	DATE OF INVEST. 18-8-14	JOB NR18CRT1	HOLE NO. CWT-MW10

CASING RESISTANCE blows/300mm

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE PENE. RESIST.	Well Details
0	0	SP		SAND: some gravel, trace silt, medium brown.		SS	N=50/5"	
1				GRANITE: granite bedrock, grey to pink.				
2								
3	1							
4								
5								
6	2							
7								
8								
9								
10	3							
11								
12								
13	4							
14								
15								
16	5							
17								
18								
19								
20	6							

DRILL TYPE: Truck mounted Drill

Other Tests

PLATE 18

BOREHOLE LOG

PROJECT
Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN. DC | CKD. JAH | DATE OF INVEST. 18-8-14 | JOB NR18CRT1 | HOLE NO. CWT-MW10

CASING RESISTANCE blows/300mm

WC % wp- □ w- ● wl- △
10 20 30 40 50

DEPTH ft m

MODIFIED USCS | SOIL SYMBOL | SOIL DESCRIPTION | SOIL SAMPLE: COND. | TYPE | PENE. RESIST.

DRILL TYPE: Truck mounted Drill

Well Details | Other Tests

DATUM

SURFACE ELEVATION

ft	m
22	
23	7
24	
25	
26	8
27	
28	
29	
9	
30	
31	
32	
33	10
34	
35	
36	11
37	
38	
39	
12	
40	
41	

End of borehole at 8.94 m in Bedrock.

Groundwater measured at 1.54 m on August 17, 2018.

PLATE 19

BOREHOLE LOG

PROJECT
Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN. DC | CKD. JAH | DATE OF INVEST. 18-8-14 | JOB NR18CRT1 | HOLE NO. CWT-MW11

DRILL TYPE: Truck mounted Drill

CASING RESISTANCE blows/300mm

WC % wp- □ w- ● wl- △
10 20 30 40 50

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE PENE. RESIST.	Well Details	Other Tests
1		SP		SAND: some silt, trace gravel, cobbles, medium brown.		SS	N=23		
2						SS	N=50/4"		
3	1			GRANITE: granite bedrock, quartz present, grey.					
4									
5									
6	2								
7									
8									
9									
10	3								
11									
12									
13	4								
14									
15									
16	5								
17									
18									
19									
20	6								

PLATE 20

BOREHOLE LOG

PROJECT
Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN. DC	CKD. JAH	DATE OF INVEST. 18-8-14	JOB NR18CRT1	HOLE NO. CWT-MW11

CASING RESISTANCE blows/300mm

WC % wp- □ w- ● wl- △
10 20 30 40 50

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE PENE. RESIST.	DRILL TYPE / Well Details / Other Tests
				DATUM SURFACE ELEVATION				Truck mounted Drill Well Details Other Tests
22								
23	7							
24								
25				End of borehole at 7.47 m in Bedrock. Groundwater measured at 1.06 m on August 20, 2018.				
26	8							
27								
28								
29								
30	9							
31								
32								
33	10							
34								
35								
36	11							
37								
38								
39	12							
40								
41								

PLATE 21

BOREHOLE LOG

PROJECT
Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN. DC	CKD. JAH	DATE OF INVEST. 18-8-14	JOB NR18CRT1	HOLE NO. CWT-MW12

CASING RESISTANCE blows/300mm

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft m

MODIFIED USCS | SOIL SYMBOL

SOIL DESCRIPTION

DATUM

SURFACE ELEVATION

SOIL SAMPLE: COND. | TYPE | PENE. RESIST.

DRILL TYPE: Truck mounted Drill

Well Details | Other Tests

GRANITE: granite bedrock, quartz present, grey to pale gray.

PLATE 22

BOREHOLE LOG

PROJECT
Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN. DC | CKD. JAH | DATE OF INVEST. 18-8-14 | JOB NR18CRT1 | HOLE NO. CWT-MW12

DRILL TYPE: Truck mounted Drill

CASING RESISTANCE blows/300mm

WC % wp- □ w- ● wl- △
10 20 30 40 50

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE PENE. RESIST.	Well Details	Other Tests
22				DATUM					
23	7								
24									
25									
26	8								
27									
28									
29									
30	9			End of borehole at 8.85 m in Bedrock. Groundwater measured at 2.36 m on August 20, 2018.					
31									
32									
33	10								
34									
35									
36	11								
37									
38									
39	12								
40									
41									

SURFACE ELEVATION

PLATE 23

BOREHOLE LOG

PROJECT
Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN. DC | CKD. JAH | DATE OF INVEST. 18-8-14 | JOB NR18CRT1 | HOLE NO. CWT-MW13

DRILL TYPE: Truck mounted Drill

CASING RESISTANCE blows/300mm

WC % wp- □ w- ● wl- △
10 20 30 40 50

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE PENE. RESIST.	Well Details	Other Tests
DATUM									
SURFACE ELEVATION									
1		SP		SAND: some gravel, trace silt, brown.		SS	N=15		Soil: MW13/1 PAH.
2									
3	1					SS	N=4		
4									
5						SS	N=4		
6									Soil: MW13/2 PAH.
7	2			GRANITE: granite bedrock, strong presence of quartz, grey.					
8									
9									
10	3								
11									
12									
13	4								
14									
15									
16	5								
17									
18									
19									
20	6								

PLATE 24

BOREHOLE LOG

PROJECT
Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN. DC	CKD. JAH	DATE OF INVEST. 18-8-14	JOB NR18CRT1	HOLE NO. CWT-MW13

CASING RESISTANCE blows/300mm

WC % wp- □ w- ● wl- △
10 20 30 40 50

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE PENE. RESIST.	DRILL TYPE / Well Details / Other Tests
				DATUM SURFACE ELEVATION				Truck mounted Drill Well Details Other Tests
22								
23	7							
24								
25				End of borehole at 7.47 m in Bedrock. Groundwater measured at 1.41 m on August 20, 2018.				
26	8							
27								
28								
29								
30	9							
31								
32								
33	10							
34								
35								
36	11							
37								
38								
39	12							
40								
41								

PLATE 25

BOREHOLE LOG

PROJECT
Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN. DC | CKD. JAH | DATE OF INVEST. 18-8-14 | JOB NR18CRT1 | HOLE NO. CWT-MW14

DRILL TYPE: Truck mounted Drill

CASING RESISTANCE blows/300mm

WC % wp- □ w- ● wl- △
10 20 30 40 50

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE PENE. RESIST.	Well Details	Other Tests
0		SP		SAND: some gravel, trace silt, brown.		SS	N=50/5"		Soil: MW14/1 PAH.
1				GRANITE: granite bedrock, grey.					
2									
3	1								
4									
5									
6									
7	2								
8									
9									
10	3								
11									
12									
13	4								
14									
15									
16	5								
17									
18									
19									
20	6								

PLATE 26

BOREHOLE LOG

PROJECT
Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN. DC	CKD. JAH	DATE OF INVEST. 18-8-14	JOB NR18CRT1	HOLE NO. CWT-MW14

CASING RESISTANCE blows/300mm

WC % wp- □ w- ● wl- △
10 20 30 40 50

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE PENE. RESIST.	DRILL TYPE / Well Details / Other Tests
				DATUM SURFACE ELEVATION				Truck mounted Drill Well Details Other Tests
22								
23	7							
24								
25								
26	8							
27								
28								
29								
30	9			End of borehole at 9.14 m in Bedrock. Groundwater measured at 0.81 m on August 20, 2018.				
31								
32								
33	10							
34								
35								
36	11							
37								
38								
39	12							
40								
41								

PLATE 27

BOREHOLE LOG

PROJECT
Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN. DC | CKD. JAH | DATE OF INVEST. 18-8-14 | JOB NR18CRT1 | HOLE NO. CWT-MW15

DRILL TYPE: Truck mounted Drill

CASING RESISTANCE blows/300mm

WC % wp- □ w- ● wl- △
10 20 30 40 50

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	COND.	TYPE	PENE. RESIST.	Well Details	Other Tests
0–1		SP		SAND: gravel, trace silt, cobblestones, brown.		SS	N=8		Soil: MW15/1 PAH.
2–4	1	SP		SAND: gravel, trace silt, cobblestones, metal debris, brown.		SS	N=48		
4–5						SS	N=50/1"		
5–20	2–6			GRANITE: granite bedrock, grey.					

PLATE 28

BOREHOLE LOG

PROJECT
Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN. DC | CKD. JAH | DATE OF INVEST. 18-8-14 | JOB NR18CRT1 | HOLE NO. CWT-MW15

CASING RESISTANCE blows/300mm

WC % wp- □ w- ● wl- △
10 20 30 40 50

DEPTH ft m

MODIFIED USCS | SOIL SYMBOL

SOIL DESCRIPTION

DATUM

SURFACE ELEVATION

SOIL SAMPLE: COND. | TYPE | PENE. RESIST.

DRILL TYPE: Truck mounted Drill

Well Details | Other Tests

ft	m
22	
23	7
24	
25	
26	8
27	
28	
29	9
30	
31	
32	
33	10
34	
35	
36	11
37	
38	
39	12
40	
41	

End of borehole at 9.22 m in Bedrock.

Groundwater measured at 1.45 m on August 21, 2018.

PLATE 29

BOREHOLE LOG

PROJECT
Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN. DC	CKD. JAH	DATE OF INVEST. 18-8-14	JOB NR18CRT1	HOLE NO. CWT-MW16

CASING RESISTANCE blows/300mm

WC % wp- □ w- ● wl- △
10 20 30 40 50

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE PENE. RESIST.
				DATUM			
				SURFACE ELEVATION			
0		SP		COBBLESTONE.			
1							
2				GRANITE: granite bedrock, strong presence of quartz, grey.			
3	1						
4							
5							
6							
7	2						
8							
9							
10	3						
11							
12							
13	4						
14							
15							
16	5						
17							
18							
19							
20	6						

DRILL TYPE
Truck mounted Drill

Well Details

Other Tests

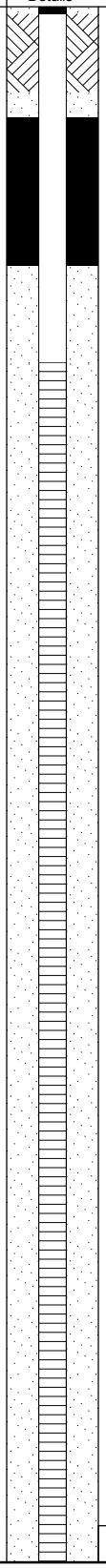


PLATE 30

BOREHOLE LOG

PROJECT
Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN. DC | CKD. JAH | DATE OF INVEST. 18-8-14 | JOB NR18CRT1 | HOLE NO. CWT-MW16

CASING RESISTANCE blows/300mm

WC % wp- □ w- ● wl- △
10 20 30 40 50

DEPTH ft m

MODIFIED USCS | SOIL SYMBOL

SOIL DESCRIPTION

DATUM

SURFACE ELEVATION

SOIL SAMPLE: COND. | TYPE | PENE. RESIST.

DRILL TYPE: Truck mounted Drill

Well Details | Other Tests

ft	m
22	
23	7
24	
25	
26	8
27	
28	
29	9
30	
31	
32	
33	10
34	
35	
36	11
37	
38	
39	12
40	
41	

End of borehole at 9.22 m in Bedrock.

Groundwater measured at 2.57 m on August 21, 2018.

PLATE 31

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN.	CKD.	DATE OF INVEST.	JOB	TEST PIT
RB	JAH	8/15/18	NR18CRT1	TP2-18-A

BACKHOE TYPE: Excavator

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	OTHER TESTS
0				ROOT MAT				Soil: PAH
0				SAND: Some gravel with some metal debris, loose, moist, brown.				
1		SM		SAND: Some gravel and boulders, loose, moist to wet, light brown.				
2								
3	1							
4								
5								
6				End of Test Pit at 1.8 m in Sand.				
7	2			Groundwater encountered at 1.4 m below grade.				
8								
9								
10	3							
11								
12								
13	4							
14								
15								
16	5							

PLATE 1

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN.	CKD.	DATE OF INVEST.	JOB	TEST PIT
RB	JAH	8/15/18	NR18CRT1	TP2-18-B

BACKHOE TYPE: Excavator

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	OTHER TESTS
				ROOT MAT: Some sand, gravel and debris, loose, moist, brown.				Soil: PAH
1		SP		SAND: Some gravel, cobbles and boulders, loose, moist to wet, light brown.				
2								
3	1							
4								
5								
6				End of Test Pit at 1.8 m in Sand. Groundwater encountered at 1.2m below grade.				
7	2							
8								
9								
10	3							
11								
12								
13	4							
14								
15								
16	5							

PLATE 2

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN.	CKD.	DATE OF INVEST.	JOB	TEST PIT
RB	JAH	8/15/18	NR18CRT1	TP2-18-C

BACKHOE TYPE: Excavator

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	OTHER TESTS
0				SAND: Some gravel, root mat and debris, loose, moist, light brown.				Soil: PAH
3	1	SP		SAND: Some gravel, cobbles and boulders, loose, moist to wet, light brown.				
6	2			End of Test Pit at 1.6 m in Sand. Groundwater encountered at 1.4m below grade.				
10	3							
13	4							
16	5							

PLATE 3

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN.	CKD.	DATE OF INVEST.	JOB	TEST PIT
RB	JAH	8/15/18	NR18CRT1	TP2-18-D

BACKHOE TYPE: Excavator

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	OTHER TESTS
0				ROOT MAT				Soil: PAH
0				SAND: Some gravel with some metal debris, loose, moist, brown.				
1		SP		SAND: Some gravel and boulders, loose, moist to wet, light brown.				
2								
3	1							
4								
5								
6				End of Test Pit at 1.8 m in Sand.				
7	2			Groundwater encountered at 1.4 m below grade.				
8								
9								
10	3							
11								
12								
13	4							
14								
15								
16	5							

PLATE 4

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN.	CKD.	DATE OF INVEST.	JOB	TEST PIT
RB	JAH	8/15/18	NR18CRT1	TP2-18-E

BACKHOE TYPE: Excavator

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	OTHER TESTS
				SAND: Debris with some gravel, loose, moist, grey.				Soil: PAH
1		SP		SAND: Some gravel, loose, moist, brown.				
2								
3	1							
4								
5				End of Test Pit at 1.5 m on inferred Bedrock.				
6				No groundwater encountered.				
7	2							
8								
9								
10	3							
11								
12								
13	4							
14								
15								
16	5							

PLATE 5

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN.	CKD.	DATE OF INVEST.	JOB	TEST PIT
RB	JAH	8/15/18	NR18CRT1	TP2-18-F

BACKHOE TYPE: Excavator

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	OTHER TESTS
0				SAND: Some gravel and boulders, loose, wet, brown.				Soil: PAH
1								
2								
3	1							
4								
5				End of Test Pit at 1.3 m in Sand. Groundwater encountered at 0.01 m below grade.				
6								
7	2							
8								
9								
10	3							
11								
12								
13	4							
14								
15								
16	5							

PLATE 6

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN.	CKD.	DATE OF INVEST.	JOB	TEST PIT
RB	JAH	8/15/18	NR18CRT1	TP3-18-A

BACKHOE TYPE: Excavator

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	OTHER TESTS
1				SAND: Some gravel and debris, loose, moist to wet, brown.		GRAB		Soil: Zinc
3	1			SAND: Some gravel and cobbles, loose, wet, brown to reddish brown.		GRAB		Soil: Zinc
5				End of Test Pit at 1.5 m on inferred Bedrock.				
6				Groundwater encountered at 0.4 m below grade.				
7	2							
10	3							
13	4							
16	5							

PLATE 7

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN. RB	CKD. JAH	DATE OF INVEST. 8/15/18	JOB NR18CRT1	TEST PIT TP3-18-B

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	BACKHOE TYPE: Excavator / OTHER TESTS
0				SAND: Some gravel and debris, loose, moist to wet, brown.		GRAB		Soil: Zinc
3	1	SP		SAND: Some gravel and cobbles, loose, wet, brown to reddish brown.		GRAB		Soil: Zinc
5				End of Test Pit at 1.5 m on inferred Bedrock.				
6	2			Groundwater encountered at 0.4 m below grade.				
10	3							
13	4							
16	5							

PLATE 8

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN.	CKD.	DATE OF INVEST.	JOB	TEST PIT
RB	JAH	8/15/18	NR18CRT1	TP3-18-C

BACKHOE TYPE: Excavator

OTHER TESTS

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.
0		SP		SAND: Some gravel and some boulders, loose, moist to wet, brown.		GRAB	
2						GRAB	
3	1			End of Test Pit at 0.8 m in Sand. Groundwater encountered at 0.3 m below grade.			
4							
5							
6	2						
7							
8							
9							
10	3						
11							
12							
13	4						
14							
15							
16	5						

PLATE 9

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN.	CKD.	DATE OF INVEST.	JOB	TEST PIT
RB	JAH	8/15/18	NR18CRT1	TP3-18-D

BACKHOE TYPE: Excavator

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	OTHER TESTS
0		SP		SAND: Some gravel and some boulders, loose, moist to wet, brown.		GRAB		Soil: Zinc
1								
2						GRAB		Soil: Zinc
3	1			End of Test Pit at 0.8 m in Sand. Groundwater encountered at 0.3 m below grade.				
4								
5								
6	2							
7								
8								
9								
10	3							
11								
12								
13	4							
14								
15								
16	5							

PLATE 10

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN.	CKD.	DATE OF INVEST.	JOB	TEST PIT
RB	JAH	8/15/18	NR18CRT1	TP3-18-E

BACKHOE TYPE: Excavator

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	OTHER TESTS
0		SP		SAND: Some gravel, loose, moist to wet, black.		GRAB		Soil: Zinc
1								Soil: Zinc
2						GRAB		
3	1			End of Test Pit at 0.9 m in Sand.				
4				Groundwater encountered at 0.4 m below grade.				
5								
6	2							
7								
8								
9								
10	3							
11								
12								
13	4							
14								
15								
16	5							

PLATE 11

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN.	CKD.	DATE OF INVEST.	JOB	TEST PIT
RB	JAH	8/15/18	NR18CRT1	TP3-18-F

BACKHOE TYPE: Excavator

OTHER TESTS

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.
0		SP		SAND: Some gravel, loose, moist to wet, black.		GRAB	
1							
2						GRAB	
3	1			End of Test Pit at 0.9 m in Sand. Groundwater encountered at 0.3 m below grade.			
4							
5							
6	2						
7							
8							
9							
10	3						
11							
12							
13	4						
14							
15							
16	5						

PLATE 12

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN.	CKD.	DATE OF INVEST.	JOB	TEST PIT
RB	JAH	8/15/18	NR18CRT1	TP5-18-A

BACKHOE TYPE: Excavator

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	OTHER TESTS
0		SP		SAND: Some gravel, loose, wet, brown.				Soil: PAH
1								Soil: PAH
2								
3	1			End of Test Pit at 0.9 m in Sand. Groundwater encountered at 0.01 m below grade.				
4								
5								
6	2							
7								
8								
9								
10	3							
11								
12								
13	4							
14								
15								
16	5							

PLATE 13

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN.	CKD.	DATE OF INVEST.	JOB	TEST PIT
RB	JAH	8/15/18	NR18CRT1	TP5-18-B

BACKHOE TYPE: Excavator

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	OTHER TESTS
0		SP		SAND: Some gravel and organics, loose, wet, brown.				Soil: PAH
1				End of Test Pit at 0.3 m in Sand. Groundwater encountered at 0.01 m below grade.				
2	1							
3								
4								
5								
6	2							
7								
8								
9								
10	3							
11								
12								
13	4							
14								
15								
16	5							

PLATE 14

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN.	CKD.	DATE OF INVEST.	JOB	TEST PIT
RB	JAH	8/15/18	NR18CRT1	TP5-18-C

BACKHOE TYPE: Excavator

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	OTHER TESTS
0		SP		SAND: Some gravel, loose, wet, brown.				Soil: PAH
1								Soil: PAH
2								
3	1			End of Test Pit at 0.8 m in Sand. Groundwater encountered at 0.01 m below grade.				
4								
5								
6	2							
7								
8								
9								
10	3							
11								
12								
13	4							
14								
15								
16	5							

PLATE 15

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN.	CKD.	DATE OF INVEST.	JOB	TEST PIT
RB	JAH	8/15/18	NR18CRT1	TP5-18-D

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	BACKHOE TYPE / OTHER TESTS
1				ORGANICS: Some silty sand and gravel, loose, wet, brown.				Excavator Soil: PAH Soil: PAH
2								
3	1			End of Test Pit at 0.8 m in Organics. Groundwater encountered at 0.01 m below grade.				
4								
5								
6	2							
7								
8								
9								
10	3							
11								
12								
13	4							
14								
15								
16	5							

PLATE 16

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN.	CKD.	DATE OF INVEST.	JOB	TEST PIT
RB	JAH	8/17/18	NR18CRT1	TP11-18-A

BACKHOE TYPE: Excavator

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	OTHER TESTS
0		GP		GRAVEL: Sand, loose, moist, brown.				Soil: PAH
1								
2				End of Test Pit at 1.6 m in Gravel.				
3	1			No groundwater encountered.				
4								
5								
6								
7	2							
8								
9								
10	3							
11								
12								
13	4							
14								
15								
16	5							

PLATE 17

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN. RB	CKD. JAH	DATE OF INVEST. 8/17/18	JOB NR18CRT1	TEST PIT TP11-18-B

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION DATUM SURFACE ELEVATION	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	BACKHOE TYPE / OTHER TESTS
0		GP		GRAVEL: Sand, loose, moist, brown.				BACKHOE TYPE: Excavator OTHER TESTS: Soil: PAH
1				End of Test Pit at 1.3 m in Gravel. No groundwater encountered.				
2								
3	1							
4								
5								
6								
7	2							
8								
9								
10	3							
11								
12								
13	4							
14								
15								
16	5							

PLATE 18

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN.	CKD.	DATE OF INVEST.	JOB	TEST PIT
RB	JAH	8/17/18	NR18CRT1	TP11-18-C

BACKHOE TYPE: Excavator

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	OTHER TESTS
0		GP		GRAVEL: Sand, loose, moist, brown.				Soil: PAH
1				End of Test Pit at 1.3 m in Gravel.				
2				No groundwater encountered.				
3	1							
4								
5								
6								
7	2							
8								
9								
10	3							
11								
12								
13	4							
14								
15								
16	5							

PLATE 19

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN.	CKD.	DATE OF INVEST.	JOB	TEST PIT
RB	JAH	8/17/18	NR18CRT1	TP11-18-D

BACKHOE TYPE: Excavator

WC % (wp- □ w- ● wl- △) 10 20 30 40 50	DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	OTHER TESTS
	1		GP		GRAVEL: Sand, loose, moist, brown.				Soil: PAH
	2				End of Test Pit at 1.6 m in Gravel.				
	3	1			No groundwater encountered.				
	4								
	5								
	6								
	7	2							
	8								
	9								
	10	3							
	11								
	12								
	13	4							
	14								
	15								
	16	5							

PLATE 20

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN.	CKD.	DATE OF INVEST.	JOB	TEST PIT
RB	JAH	8/16/18	NR18CRT1	TP13-18-A

BACKHOE TYPE: Excavator

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	OTHER TESTS
				ORGANICS: Rootmat, loose, moist, dark brown.				Soil: TPH/BTEX
1		SP		SAND: Some gravel with trace silt and cobbles, loose, moist to wet, dark brown.				
3	1			End of Test Pit at 1 m on inferred Bedrock. Groundwater encountered at 0.4 m below grade.				
7	2							
10	3							
13	4							
16	5							

PLATE 21

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN.	CKD.	DATE OF INVEST.	JOB	TEST PIT
RB	JAH	8/16/18	NR18CRT1	TP13-18-B

BACKHOE TYPE: Excavator

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	OTHER TESTS
0				ORGANICS: Rootmat, sand and gravel, loose, moist, brown.				Soil: TPH/BTEX
1				SAND: Gravel with trace silt, loose, moist to wet, dark brown.				
3	1			End of Test Pit at 1 m in Sand. Groundwater encountered at 0.5 m below grade.				
6	2							
10	3							
13	4							
16	5							

PLATE 22

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN. RB	CKD. JAH	DATE OF INVEST. 8/16/18	JOB NR18CRT1	TEST PIT TP13-18-C

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	BACKHOE TYPE / OTHER TESTS
0				ORGANICS: Rootmat and gravel, loose, moist, brown.				Excavator Soil: TPH/BTEX
1				SAND: Gravel and cobbles, loose, moist to wet, dark brown.				
3	1			End of Test Pit at 1 m in Sand. Groundwater encountered at 0.6 m below grade.				
7	2							
10	3							
13	4							
16	5							

PLATE 23

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN. RB	CKD. JAH	DATE OF INVEST. 8/16/18	JOB NR18CRT1	TEST PIT TP15-18-A

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION DATUM SURFACE ELEVATION	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	BACKHOE TYPE / OTHER TESTS
1–6	1–2	SP		SAND: Some gravel, organics and debris, loose, moist to wet, brown.				Excavator Soil: PAH
7	2			End of Test Pit at 1.9 m in Sand. Groundwater encountered at 1.5 m below grade.				
8–10	3							
11–13	4							
14–16	5							

PLATE 24

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN.	CKD.	DATE OF INVEST.	JOB	TEST PIT
RB	JAH	8/16/18	NR18CRT1	TP15-18-B

BACKHOE TYPE: Excavator

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	OTHER TESTS
1		SP		SAND: Some gravel and debris, trace silt and cobbles, loose, moist to wet, brown.				Soil: PAH
2								
3	1							
4								
5								
6								
7	2			End of Test Pit at 1.8 m in Sand. Groundwater encountered at 1.6 m below grade.				
8								
9								
10	3							
11								
12								
13	4							
14								
15								
16	5							

PLATE 25

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN.	CKD.	DATE OF INVEST.	JOB	TEST PIT
RB	JAH	8/16/18	NR18CRT1	TP15-18-C

BACKHOE TYPE: Excavator

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	OTHER TESTS
0		SP		SAND: Some organics and gravel, occasional cobbles, loose, moist, dark brown to brown.				Soil: PAH
3	1			End of Test Pit at 0.9 m in Sand. No groundwater encountered.				
6	2							
10	3							
13	4							
16	5							

PLATE 26

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN. RB	CKD. JAH	DATE OF INVEST. 8/16/18	JOB NR18CRT1	TEST PIT TP15-18-D

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	BACKHOE TYPE / OTHER TESTS
0				ORGANICS: Some debris, loose, moist to wet, black to dark brown.				BACKHOE TYPE: Excavator OTHER TESTS: Soil: PAH
3	1	SP		SAND: Some gravel, trace silt, loose, wet, brown.				
6	2			End of Test Pit at 1.7 m in Sand. Groundwater encountered at 0.8 m below grade.				
10	3							
13	4							
16	5							

PLATE 27

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN.	CKD.	DATE OF INVEST.	JOB	TEST PIT
RB	JAH	8/16/18	NR18CRT1	TP15-18-E

BACKHOE TYPE: Excavator

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	OTHER TESTS
0		SP		SAND: Some gravel and debris, loose, moist to wet, brown.				Soil: PAH
1								
2								
3	1							
4								
5								
6				End of Test Pit at 1.6 m in Sand. Groundwater encountered at 1.4 m below grade.				
7	2							
8								
9								
10	3							
11								
12								
13	4							
14								
15								
16	5							

PLATE 28

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN.	CKD.	DATE OF INVEST.	JOB	TEST PIT
RB	JAH	8/16/18	NR18CRT1	TP15-18-F

BACKHOE TYPE: Excavator

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	OTHER TESTS
1		SP		SAND: Some gravel and debris, loose, moist to wet, brown.				Soil: PAH
2	1							
3								
4								
5								
6	2			End of Test Pit at 1.6 m in Sand. Groundwater encountered at 1.3 m below grade.				
7								
8								
9								
10	3							
11								
12								
13	4							
14								
15								
16	5							

PLATE 29

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN.	CKD.	DATE OF INVEST.	JOB	TEST PIT
RB	JAH	8/16/18	NR18CRT1	TP17-18-A

BACKHOE TYPE: Shovel

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	OTHER TESTS
0		SM		SILTY SAND: Some gravel, loose, moist, reddish brown.				Soil: PAH
1				End of Test Pit at 0.2 m on inferred Bedrock.				
2				No groundwater encountered.				
3	1							
4								
5								
6								
7	2							
8								
9								
10	3							
11								
12								
13	4							
14								
15								
16	5							

PLATE 30

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN.	CKD.	DATE OF INVEST.	JOB	TEST PIT
RB	JAH	8/16/18	NR18CRT1	TP17-18-B

BACKHOE TYPE: Shovel

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	OTHER TESTS
0		SM		SILTY SAND: Some gravel, loose, moist, reddish brown.				Soil: PAH
1								
2								
3	1			End of Test Pit at 0.7 m on inferred Bedrock. No groundwater encountered.				
4								
5								
6	2							
7								
8								
9								
10	3							
11								
12								
13	4							
14								
15								
16	5							

PLATE 31

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN.	CKD.	DATE OF INVEST.	JOB	TEST PIT
RB	JAH	8/16/18	NR18CRT1	TP17-18-C

BACKHOE TYPE: Shovel

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	OTHER TESTS
0		SM		SILTY SAND: Some gravel, loose, moist, reddish brown.				Soil: PAH
1				End of Test Pit at 0.3 m on inferred Bedrock.				
2				No groundwater encountered.				
3	1							
4								
5								
6								
7	2							
8								
9								
10	3							
11								
12								
13	4							
14								
15								
16	5							

PLATE 32

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN.	CKD.	DATE OF INVEST.	JOB	TEST PIT
RB	JAH	8/16/18	NR18CRT1	TP17-18-D

BACKHOE TYPE: Shovel

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	OTHER TESTS
0		SM		SILTY SAND: Some gravel, loose, moist, reddish brown.				Soil: PAH
1				End of Test Pit at 0.3 m on inferred Bedrock.				
2				No groundwater encountered.				
3	1							
4								
5								
6								
7	2							
8								
9								
10	3							
11								
12								
13	4							
14								
15								
16	5							

PLATE 33

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN. RB	CKD. JAH	DATE OF INVEST. 8/16/18	JOB NR18CRT1	TEST PIT TP17-18-E

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.
				DATUM			
				SURFACE ELEVATION			
0	0			BOULDERS: Metal and concrete, loose, moist, brown to grey.			
5	1			SAND: Gravel, loose, moist, brown.			
7	2			End of Test Pit at 2.3 m in Sand. Groundwater encountered at 1.6 m below grade.			
10	3						
13	4						
16	5						

BACKHOE TYPE

Excavator

OTHER TESTS

PLATE 34

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN. RB	CKD. JAH	DATE OF INVEST. 8/16/18	JOB NR18CRT1	TEST PIT TP17-18-F

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.
1				ORGANICS: Coubles, gravel and metal, loose, moist, brown to grey.			
2							
3	1						
4				SAND: Gravel, loose, moist, brown.			
5							
6				End of Test Pit at 1.8 m in Sand.			
7	2			Groundwater encountered at 1.8 m below grade.			
8							
9							
10	3						
11							
12							
13	4						
14							
15							
16	5						

BACKHOE TYPE: Excavator

OTHER TESTS

PLATE 35

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN.	CKD.	DATE OF INVEST.	JOB	TEST PIT
RB	JAH	8/17/18	NR18CRT1	TP25-18-A

BACKHOE TYPE: Excavator

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	OTHER TESTS
1				SAND: Gravel, loose, moist, brown.				Soil: PAH
2								
3	1			End of Test Pit at 0.6 m on Debris.				
4				No groundwater encountered.				
5								
6	2							
7								
8								
9								
10	3							
11								
12								
13	4							
14								
15								
16	5							

PLATE 36

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN.	CKD.	DATE OF INVEST.	JOB	TEST PIT
RB	JAH	8/17/18	NR18CRT1	TP25-18-B

BACKHOE TYPE: Excavator

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	OTHER TESTS
1				SAND: Gravel with debris, loose, moist, brown.				Soil: PAH
2								
3	1			SAND: Gravel, loose, moist to wet, brown.				
4								
5				End of Test Pit at 1.5 m in Sand. Groundwater encountered at 1.4 m below grade.				
6								
7	2							
8								
9								
10	3							
11								
12								
13	4							
14								
15								
16	5							

PLATE 37

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN.	CKD.	DATE OF INVEST.	JOB	TEST PIT
RB	JAH	8/17/18	NR18CRT1	TP25-18-C

BACKHOE TYPE: Excavator

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	OTHER TESTS
0				SAND: Gravel with trace debris, loose, moist, brown.				Soil: PAH
3	1			SAND: Gravel, loose, moist to wet, brown.				
5				End of Test Pit at 1.5 m on inferred Bedrock.				
				No groundwater encountered.				
6	2							
10	3							
13	4							
16	5							

PLATE 38

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN.	CKD.	DATE OF INVEST.	JOB	TEST PIT
RB	JAH	8/17/18	NR18CRT1	TP25-18-D

BACKHOE TYPE: Excavator

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	OTHER TESTS
1				SAND: Gravel with metal debris, loose, moist, brown.				Soil: PAH
2								
3	1							
4								
5								
6				End of Test Pit at 1.6 m on Debris.				
7	2			No groundwater encountered.				
8								
9								
10	3							
11								
12								
13	4							
14								
15								
16	5							

PLATE 39

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN.	CKD.	DATE OF INVEST.	JOB	TEST PIT
RB	JAH	8/17/18	NR18CRT1	TP30-18-A

BACKHOE TYPE: Excavator

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	OTHER TESTS
1				SAND: Gravel and metal debris, loose, moist to wet, brown.				Soil: PAH
2								
3	1							
4								
5				End of Test Pit at 4.6 m in Sand. Groundwater encountered at 1.2 m below grade.				
6								
7	2							
8								
9								
10	3							
11								
12								
13	4							
14								
15								
16	5							

PLATE 40

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN.	CKD.	DATE OF INVEST.	JOB	TEST PIT
RB	JAH	8/17/18	NR18CRT1	TP30-18-B

BACKHOE TYPE: Excavator

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	OTHER TESTS
1				SAND: Gravel with some boulders and cobbles, loose, wet, brown.				Soil: PAH
2								
3	1							
4				End of Test Pit at 1.2 m in Sand.				
5				Groundwater encountered at 0.01 m below grade.				
6								
7	2							
8								
9								
10	3							
11								
12								
13	4							
14								
15								
16	5							

PLATE 41

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN. RB	CKD. JAH	DATE OF INVEST. 8/17/18	JOB NR18CRT1	TEST PIT TP30-18-C

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	BACKHOE TYPE / OTHER TESTS
1				SAND: Gravel with boulders and cobbles, loose, moist to wet, brown to black.				Excavator Soil: PAH
2								
3	1							
4								
5				End of Test Pit at 1.5 m in Sand. Groundwater encountered at 1.2 m below grade.				
6								
7	2							
8								
9								
10	3							
11								
12								
13	4							
14								
15								
16	5							

PLATE 42

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN.	CKD.	DATE OF INVEST.	JOB	TEST PIT
RB	JAH	8/17/18	NR18CRT1	TP30-18-D

BACKHOE TYPE: Excavator

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	OTHER TESTS
1				SAND: Gravel, loose, moist to wet, brown.				Soil: PAH
2								
3	1			End of Test Pit at 0.8 m on inferred Bedrock. Groundwater encountered at 0.5 m below grade.				
4								
5								
6	2							
7								
8								
9								
10	3							
11								
12								
13	4							
14								
15								
16	5							

PLATE 43

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN.	CKD.	DATE OF INVEST.	JOB	TEST PIT
RB	JAH	8/18/18	NR18CRT1	TP35-18-A

BACKHOE TYPE: Excavator

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	OTHER TESTS
0		GP		GRAVEL: Sand and cobbles, loose, wet, brown.				Soil: TPH/BTEX
1								
2				End of Test Pit at 0.6 m in Gravel.				
3	1			Groundwater encountered at 0.01 m below grade.				
4								
5								
6								
7	2							
8								
9								
10	3							
11								
12								
13	4							
14								
15								
16	5							

PLATE 44

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN.	CKD.	DATE OF INVEST.	JOB	TEST PIT
RB	JAH	8/18/18	NR18CRT1	TP35-18-B

BACKHOE TYPE: Excavator

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	OTHER TESTS
0		GP		GRAVEL: Sand and cobbles, loose, wet, brown.				Soil: TPH/BTEX
1								
2				End of Test Pit at 0.6 m in Gravel.				
3	1			Groundwater encountered at 0.01 m below grade.				
4								
5								
6								
7	2							
8								
9								
10	3							
11								
12								
13	4							
14								
15								
16	5							

PLATE 45

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN.	CKD.	DATE OF INVEST.	JOB	TEST PIT
RB	JAH	8/18/18	NR18CRT1	TP35-18-C

BACKHOE TYPE: Excavator

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	OTHER TESTS
		GP		DATUM SURFACE ELEVATION GRAVEL: Sand and cobbles, loose, wet, brown.				Soil: TPH/BTEX
1								
2				End of Test Pit at 0.6 m in Gravel.				
3	1			Groundwater encountered at 0.01 m below grade.				
4								
5								
6								
7	2							
8								
9								
10	3							
11								
12								
13	4							
14								
15								
16	5							

PLATE 46

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN.	CKD.	DATE OF INVEST.	JOB	TEST PIT
RB	JAH	8/18/18	NR18CRT1	TP35-18-D

BACKHOE TYPE: Excavator

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	OTHER TESTS
0		GP		GRAVEL: Sand and cobbles, loose, wet, brown.				Soil: TPH/BTEX
2	1			End of Test Pit at 0.6 m in Gravel. Groundwater encountered at 0.01 m below grade.				
10	3							
13	4							
16	5							

PLATE 47

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN.	CKD.	DATE OF INVEST.	JOB	TEST PIT
RB	JAH	8/18/18	NR18CRT1	TP36-18-A

BACKHOE TYPE: Excavator

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	OTHER TESTS
0		GP		GRAVEL: Sand and cobbles, loose, moist to wet, brown.				Soil: PAH
1								
2				End of Test Pit at 0.6 m in Gravel.				
3	1			Groundwater encountered at 0.2 m below grade.				
4								
5								
6								
7	2							
8								
9								
10	3							
11								
12								
13	4							
14								
15								
16	5							

PLATE 48

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN.	CKD.	DATE OF INVEST.	JOB	TEST PIT
RB	JAH	8/18/18	NR18CRT1	TP36-18-B

BACKHOE TYPE: Excavator

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	OTHER TESTS
0		GP		GRAVEL: Sand and cobbles, loose, moist to wet, brown.				Soil: PAH
1								
2				End of Test Pit at 0.6 m in Gravel.				
3	1			Groundwater encountered at 0.2 m below grade.				
4								
5								
6								
7	2							
8								
9								
10	3							
11								
12								
13	4							
14								
15								
16	5							

PLATE 49

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN.	CKD.	DATE OF INVEST.	JOB	TEST PIT
RB	JAH	8/18/18	NR18CRT1	TP36-18-C

BACKHOE TYPE: Excavator

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	OTHER TESTS
0		GP		GRAVEL: Sand and cobbles, loose, moist to wet, brown.				Soil: PAH
1								
2				End of Test Pit at 0.6 m in Gravel.				
3	1			Groundwater encountered at 0.01 m below grade.				
4								
5								
6								
7	2							
8								
9								
10	3							
11								
12								
13	4							
14								
15								
16	5							

PLATE 50

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN.	CKD.	DATE OF INVEST.	JOB	TEST PIT
RB	JAH	8/18/18	NR18CRT1	TP36-18-D

BACKHOE TYPE: Excavator

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	OTHER TESTS
0		GP		GRAVEL: Sand and cobbles, loose, moist to wet, brown.				Soil: PAH
1								
2				End of Test Pit at 0.6 m in Gravel.				
3	1			Groundwater encountered at 0.01 m below grade.				
4								
5								
6								
7	2							
8								
9								
10	3							
11								
12								
13	4							
14								
15								
16	5							

PLATE 51

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN.	CKD.	DATE OF INVEST.	JOB	TEST PIT
RB	JAH	8/18/18	NR18CRT1	TP41-18-A

BACKHOE TYPE: Excavator

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	OTHER TESTS
		GP		DATUM SURFACE ELEVATION GRAVEL: Sand and cobbles, loose, moist to wet, brown.				Soil: TPH/BTEX
1								
2				End of Test Pit at 0.6 m in Gravel.				
3	1			Groundwater encountered at 0.5 m below grade.				
4								
5								
6	2							
7								
8								
9								
10	3							
11								
12								
13	4							
14								
15								
16	5							

PLATE 52

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN.	CKD.	DATE OF INVEST.	JOB	TEST PIT
RB	JAH	8/18/18	NR18CRT1	TP41-18-B

BACKHOE TYPE: Excavator

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	OTHER TESTS
0		GP		GRAVEL: Sand and cobbles, loose, moist to wet, brown.				Soil: TPH/BTEX
1								
2				End of Test Pit at 0.6 m in Gravel.				
3	1			Groundwater encountered at 0.5 m below grade.				
4								
5								
6								
7	2							
8								
9								
10	3							
11								
12								
13	4							
14								
15								
16	5							

PLATE 53

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN.	CKD.	DATE OF INVEST.	JOB	TEST PIT
RB	JAH	8/18/18	NR18CRT1	TP41-18-C

BACKHOE TYPE: Excavator

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	OTHER TESTS
0		GP		GRAVEL: Sand and cobbles, loose, moist to wet, brown.				Soil: TPH/BTEX
1								
2				End of Test Pit at 0.6 m in Gravel.				
3	1			Groundwater encountered at 0.5 m below grade.				
4								
5								
6								
7	2							
8								
9								
10	3							
11								
12								
13	4							
14								
15								
16	5							

PLATE 54

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN.	CKD.	DATE OF INVEST.	JOB	TEST PIT
RB	JAH	8/18/18	NR18CRT1	TP41-18-D

BACKHOE TYPE: Excavator

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	OTHER TESTS
0		GP		GRAVEL: Sand and cobbles, loose, moist to wet, brown.				Soil: TPH/BTEX
2				End of Test Pit at 0.6 m in Gravel.				
				Groundwater encountered at 0.6 m below grade.				
1	0							
3								
4								
5								
6	1							
7								
8								
9								
10	2							
11								
12								
13	3							
14								
15								
16	4							
	5							

PLATE 55

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN.	CKD.	DATE OF INVEST.	JOB	TEST PIT
RB	JAH	8/15/18	NR18CRT1	SS8-18-A

BACKHOE TYPE: Shovel

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	OTHER TESTS
0		SP		SAND: Some gravel, loose, moist to wet, brown.				Soil: Zinc
1								
2				End of Test Pit at 0.6 m in Sand. Groundwater encountered at 0.6 m below grade.				
3	1							
4								
5								
6								
7	2							
8								
9								
10	3							
11								
12								
13	4							
14								
15								
16	5							

PLATE 56

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN.	CKD.	DATE OF INVEST.	JOB	TEST PIT
RB	JAH	8/15/18	NR18CRT1	SS8-18-B

BACKHOE TYPE: Shovel

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	OTHER TESTS
0		SP		SAND: Some gravel, loose, moist to wet, brown.				Soil: Zinc
1								
2				End of Test Pit at 0.6 m in Sand.				
3	1			Groundwater encountered at 0.6 m below grade.				
4								
5								
6	2							
7								
8								
9								
10	3							
11								
12								
13	4							
14								
15								
16	5							

PLATE 57

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN. RB	CKD. JAH	DATE OF INVEST. 8/15/18	JOB NR18CRT1	TEST PIT SS8-18-C

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	BACKHOE TYPE / OTHER TESTS
0		SP		SAND: Some organics and gravel, loose, moist, brown.				Shovel Soil: Zinc
1								
2				End of Test Pit at 0.6 m in Sand. No groundwater encountered.				
3	1							
4								
5								
6	2							
7								
8								
9								
10	3							
11								
12								
13	4							
14								
15								
16	5							

PLATE 58

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN.	CKD.	DATE OF INVEST.	JOB	TEST PIT
RB	JAH	8/15/18	NR18CRT1	SS8-18-D

BACKHOE TYPE: Shovel

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	OTHER TESTS
0		SP		SAND: Some organics and gravel, loose, moist, brown.				Soil: Zinc
1								
2				End of Test Pit at 0.6 m in Sand. No groundwater encountered.				
3	1							
4								
5								
6	2							
7								
8								
9								
10	3							
11								
12								
13	4							
14								
15								
16	5							

PLATE 59

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN.	CKD.	DATE OF INVEST.	JOB	TEST PIT
RB	JAH	8/16/18	NR18CRT1	SS16-18-A

BACKHOE TYPE: Shovel

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	OTHER TESTS
0				SAND: Gravel, loose, moist to wet, brown.				Soil: Zinc
1								
2				End of Test Pit at 0.6 m on inferred Bedrock.				
3	1			Groundwater encountered at 0.3 m below grade.				
4								
5								
6	2							
7								
8								
9								
10	3							
11								
12								
13	4							
14								
15								
16	5							

PLATE 60

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN.	CKD.	DATE OF INVEST.	JOB	TEST PIT
RB	JAH	8/16/18	NR18CRT1	SS16-18-B

BACKHOE TYPE: Shovel

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	OTHER TESTS
0				SAND: Gravel, loose, moist to wet, brown.				Soil: Zinc
1								
2				End of Test Pit at 0.6 m on inferred Bedrock.				
3	1			Groundwater encountered at 0.3 m below grade.				
4								
5								
6	2							
7								
8								
9								
10	3							
11								
12								
13	4							
14								
15								
16	5							

PLATE 61

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN.	CKD.	DATE OF INVEST.	JOB	TEST PIT
RB	JAH	8/16/18	NR18CRT1	SS16-18-C

BACKHOE TYPE: Shovel

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	OTHER TESTS
1				SAND: Gravel, loose, moist to wet, brown.				Soil: Zinc
2				End of Test Pit at 0.7 m on inferred Bedrock. Groundwater encountered at 0.3 m below grade.				
3	1							
4								
5								
6								
7	2							
8								
9								
10	3							
11								
12								
13	4							
14								
15								
16	5							

PLATE 62

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN.	CKD.	DATE OF INVEST.	JOB	TEST PIT
RB	JAH	8/16/18	NR18CRT1	SS23-18-A

BACKHOE TYPE: Shovel

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	OTHER TESTS
				ORGANICS: Gravel, loose, moist, dark brown.				Soil: PAH
1		GP		GRAVEL: Sand, loose, moist to wet, grey to dark brown.				
2				End of Test Pit at 0.6 m in Gravel.				
3	1			Groundwater encountered at 0.5 m below grade.				
4								
5								
6								
7	2							
8								
9								
10	3							
11								
12								
13	4							
14								
15								
16	5							

PLATE 63

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN.	CKD.	DATE OF INVEST.	JOB	TEST PIT
RB	JAH	8/16/18	NR18CRT1	SS23-18-B

BACKHOE TYPE: Shovel

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	OTHER TESTS
				ORGANICS: Rootmat, loose, moist, brown.				Soil: PAH
1				SAND: Gravel, loose, moist to wet, dark brown.				
2				End of Test Pit at 0.6 m in Sand.				
3	1			Groundwater encountered at 0.5 m below grade.				
4								
5								
6								
7	2							
8								
9								
10	3							
11								
12								
13	4							
14								
15								
16	5							

PLATE 64

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN.	CKD.	DATE OF INVEST.	JOB	TEST PIT
RB	JAH	8/16/18	NR18CRT1	SS23-18-C

BACKHOE TYPE: Shovel

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	OTHER TESTS
0	0			ORGANICS: Rootmat, loose, moist, brown.				Soil: PAH
1				SAND: Gravel, loose, moist to wet, dark brown.				
2				End of Test Pit at 0.6 m in Sand.				
3	1			Groundwater encountered at 0.5 m below grade.				
4								
5								
6								
7	2							
8								
9								
10	3							
11								
12								
13	4							
14								
15								
16	5							

PLATE 65

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN.	CKD.	DATE OF INVEST.	JOB	TEST PIT
RB	JAH	8/17/18	NR18CRT1	SS32-18-A

BACKHOE TYPE: Shovel

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	OTHER TESTS
0				SAND: Gravel, loose, moist, brown.				Soil: Zinc
1				End of Test Pit at 0.3 m in Sand.				
2				No groundwater encountered.				
3	1							
4								
5								
6								
7	2							
8								
9								
10	3							
11								
12								
13	4							
14								
15								
16	5							

PLATE 66

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN.	CKD.	DATE OF INVEST.	JOB	TEST PIT
RB	JAH	8/17/18	NR18CRT1	SS32-18-B

BACKHOE TYPE: Shovel

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	OTHER TESTS
0				SAND: Gravel, loose, moist, brown.				Soil: Zinc
1				End of Test Pit at 0.4 m in Sand.				
2				No groundwater encountered.				
3	1							
4								
5								
6								
7	2							
8								
9								
10	3							
11								
12								
13	4							
14								
15								
16	5							

PLATE 67

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN.	CKD.	DATE OF INVEST.	JOB	TEST PIT
RB	JAH	8/17/18	NR18CRT1	SS32-18-C

BACKHOE TYPE: Shovel

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	OTHER TESTS
0	0			SAND: Gravel, loose, moist, brown.				Soil: Zinc
1				End of Test Pit at 0.4 m in Sand.				
2				No groundwater encountered.				
3	1							
4								
5								
6	2							
7								
8								
9								
10	3							
11								
12								
13	4							
14								
15								
16	5							

PLATE 68

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN.	CKD.	DATE OF INVEST.	JOB	TEST PIT
RB	JAH	8/17/18	NR18CRT1	SS32-18-D

BACKHOE TYPE: Shovel

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	OTHER TESTS
0				SAND: Gravel, loose, moist, brown.				Soil: Zinc
1				End of Test Pit at 0.3 m in Sand.				
2				No groundwater encountered.				
3	1							
4								
5								
6								
7	2							
8								
9								
10	3							
11								
12								
13	4							
14								
15								
16	5							

PLATE 69

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN.	CKD.	DATE OF INVEST.	JOB	TEST PIT
RB	JAH	8/17/18	NR18CRT1	SS36-18-A

BACKHOE TYPE: Shovel

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	OTHER TESTS
0				SAND: Gravel, loose, moist, brown.				Soil: TPH/BTEX
1				End of Test Pit at 0.2 m in Sand.				
2				No groundwater encountered.				
3	1							
4								
5								
6								
7	2							
8								
9								
10	3							
11								
12								
13	4							
14								
15								
16	5							

PLATE 70

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN.	CKD.	DATE OF INVEST.	JOB	TEST PIT
RB	JAH	8/17/18	NR18CRT1	SS36-18-B

BACKHOE TYPE: Shovel

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION (DATUM / SURFACE ELEVATION)	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	OTHER TESTS
0				SAND: Gravel, loose, moist, brown.				Soil: TPH/BTEX
1				End of Test Pit at 0.2 m in Sand.				
2				No groundwater encountered.				
3	1							
4								
5								
6								
7	2							
8								
9								
10	3							
11								
12								
13	4							
14								
15								
16	5							

PLATE 71

TEST PIT LOG

PROJECT

Phase III ESA, Former USAF Radar Station
Cartwright, NL. P-0012285-0-16-200.

LOGGED/DWN.	CKD.	DATE OF INVEST.	JOB	TEST PIT
RB	JAH	8/17/18	NR18CRT1	SS36-18-C

BACKHOE TYPE: Shovel

WC % wp- □ w- ● wl- △ (10 20 30 40 50)

DEPTH ft	DEPTH m	MODIFIED USCS	SOIL SYMBOL	SOIL DESCRIPTION	SOIL SAMPLE COND.	SOIL SAMPLE TYPE	SOIL SAMPLE POCKET PENE.	OTHER TESTS
				DATUM				
				SURFACE ELEVATION				
				SAND: Gravel, loose, moist, brown.				
				End of Test Pit at 0.1 m in Sand.				
				No groundwater encountered.				
1								
2								
3	1							
4								
5								
6	2							
7								
8								
9								
10	3							
11								
12								
13	4							
14								
15								
16	5							

PLATE 72

Appendix C Field Sheets

Purge

FIELD REPORT - ~~SAMPLING / MONITORING~~

Site: Former USAF Radar Station	Location: Cartwright, Labrador	Well/Site ID: CWT-MW5
GPS Coordinates (NAD 83 UTM Zone 20T): 5952561.74 N 502747.59 E		
☑Monitoring Well ☐Pumping Well ☐Surface Water ☐Spring/Seep ☐Discharge Pipe ☐Other:		

Site Conditions

Air Temp: 25 ☑°C ☐°F Weather: Sunny	Photograph Taken? ☐ Yes ☑No
Well / Site Conditions: Locked? Yes ✓No Damaged/Repairs Needed?: NO	
Site Remarks (relevant site activities, sample gear installed in well, installed new tubing and foot valve etc.):	
New well	

Fluid Level Data

☐ Water Level ☑ Interface Probe ☐ Measuring Tape: ☐ Other:

	Measure	Remarks
Date (d.m.y)	16/08/2018	
Time (hh:mm)	9h31	
Well Depth (mbTOC) (Table Lookup or ✓Measured?)	6.91	
Depth to Floating Product (mbTOC)	NA	
Depth to Water (mbTOC/mbGrade)	1.31	
Height of Stick-up (m above Grade)	0.86	
Tape Correction (m) (recorded values already adjusted Yes/No?)		
Depth to Sinking Product (mbTOC)	NA	

Purge and Field WQ Data

Purge Method: ✓Waterra, Bailer, Pump, Other:

Casing Volume (L) = Height of Water Column (m) x [2L/m for a 2" diam. well casing] OR [8.1L/m for a 4" diam. well casing] OR [18.2L/m for a 6" diam. well casing]						Casing Volume (L): 11.2	
Date (d.m.y)	16/08/2018					✓Well goes dry while purging? ZX	
Time (hh:mm)	17h00					Meter / Probe Details ↓	Remarks ↓
Volume Purged (L)	40						
Product Recovered (L)	NA						
pH Temp. Compensated? ☐ Yes ☐ No							
Temperature °C, °F							
Conductance Specific or Electrical (µS/cm)							
Dissolved Oxygen (mg/L)							
Other ? (colour, tint, odour, turbidity, redox, sheen, etc.) red transparent PAH odor							

Sample Data

Sample Method: Grab, Waterra, Bailer, Pump, Other: Low flow

Field Sample ID (ID on bottles and Chain-of-Custody)	Sample Date (d.m.y)	Sample Time (hh:mm)	Analytical Parameter Set	Bottles No.	Bottles Size/ Type	Filtered (0.45µm)	Preservative	Remarks Ie: type of preservative
CWT-MW5-18				8		Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	

Additional Comments

Field Staff: Alexis Robitaille	Page 1 of 1

Purge

FIELD REPORT - ~~SAMPLING / MONITORING~~

Site: Former USAF Radar Station	Location: Cartwright, Labrador	Well/Site ID: CWT - MW 12
GPS Coordinates (NAD 83 UTM Zone 21T): 5952817,19 N	502302,618 E	
☑ Monitoring Well ☐ Pumping Well ☐ Surface Water ☐ Spring/Seep ☐ Discharge Pipe ☐ Other:		

Site Conditions

Air Temp: 18	☑ °C ☐ °F	Weather: Sunny & Windy.	Photograph Taken? ☐ Yes ☑ No
Well / Site Conditions: Locked? Yes No		Damaged/Repairs Needed?: NO	
Site Remarks (relevant site activities, sample gear installed in well, installed new tubing and foot valve etc.): New well			

Fluid Level Data

☐ Water Level ☑ Interface Probe ☐ Measuring Tape: ☐ Other:

	Measure	Remarks
Date (d.m.y)	17/08/2018	
Time (hh:mm)	19h00	
Well Depth (mbTOC) (Table Lookup or Measured?)	10.03	
Depth to Floating Product (mbTOC)	NA	
Depth to Water (mbTOC/mbGrade)	8.19	
Height of Stick-up (m above Grade)	1.19	
Tape Correction (m) (recorded values already adjusted Yes/No?)		
Depth to Sinking Product (mbTOC)	NA	

Purge and Field WQ Data

Purge Method: Waterra, Bailer, Pump, Other:

Casing Volume (L) ≈ Height of Water Column (m) x [2L/m for a 2" diam. well casing] OR [8.1L/m for a 4" diam. well casing] OR [18.2L/m for a 6" diam. well casing]						Casing Volume (L): 15.7	
Date (d.m.y)	17/08/2018					☑ Well goes dry while purging?	
Time (hh:mm)	18h00					Meter / Probe Details ↓	Remarks ↓
Volume Purged (L)	400						
Product Recovered (L)	0						
pH Temp Compensated? ☐ Yes ☐ No							
Temperature °C, °F							
Conductance Specific or Electrical (µS/cm)							
Dissolved Oxygen (mg/L)							
Other ? (colour, tint, odour, turbidity, redox, sheen, etc.)	clear						
	no odor						

Sample Data

Sample Method: Grab, Waterra, Bailer, Pump, Other: Low flow

Field Sample ID (ID on bottles and Chain-of-Custody)	Sample Date (d.m.y)	Sample Time (hh:mm)	Analytical Parameter Set	Bottles No.	Bottles Size/ Type	Filtered (0.45µm)	Preservative	Remarks le: type of preservative
CWT-MW12-18	18.08.2018	17h43				Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	

Additional Comments

Field Staff: Alexis Fabritaille

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Purge

FIELD REPORT - ~~SAMPLING / MONITORING~~

Site: Former USAF Radar Station	Location: Cartwright, Labrador	Well/Site ID: CWT – MW4
GPS Coordinates (NAD 83 UTM Zone 21T): 5952542.5 N 5031241.859 E		
☑Monitoring Well ☐Pumping Well ☐Surface Water ☐Spring/Seep ☐Discharge Pipe ☐Other:		

Site Conditions

Air Temp: 18 ☑ °C ☐ °F Weather: Sunny Photograph Taken? ☐ Yes ☑ No

Well / Site Conditions: Locked? Yes ✓No Damaged/Repairs Needed?: NO

Site Remarks (relevant site activities, sample gear installed in well, installed new tubing and foot valve etc.):

New well

Fluid Level Data

☐ Water Level ☑ Interface Probe ☐ Measuring Tape: ☐ Other:

	Measure	Remarks
Date (d.m.y)	17-08 /2018	
Time (hh:mm)	8h40	
Well Depth (mbTOC) (Table Lookup or ✓Measured?)	9.78	
Depth to Floating Product (mbTOC)	NA	
Depth to Water (mbTOC/mbGrade)	2.75	
Height of Stick-up (m above Grade)	0.98	
Tape Correction (m) (recorded values already adjusted Yes/No?)		
Depth to Sinking Product (mbTOC)	NA	

Purge and Field WQ Data

Purge Method: ✓Waterra, Bailer, Pump, Other:

Casing Volume (L) ≈ Height of Water Column (m) x [2L/m for a 2" diam. well casing] OR [8.1L/m for a 4" diam. well casing] OR [18.2L/m for a 6" diam. well casing]

Casing Volume (L): 14.1 L

Date (d.m.y)	15 08 2018	16 08 2018				Well goes dry while purging?	
Time (hh:mm)	17h00	17h00				Meter / Probe Details ↓	Remarks ↓
Volume Purged (L)	100	100					
Product Recovered (L)	0	0					
pH Temp. Compensated? ☐ Yes ☐ No							
Temperature °C, °F							
Conductance Specific or Electrical (µS/cm)							
Dissolved Oxygen (mg/L)							
Other ? (colour, tint, odour, turbidity, redox, sheen, etc.) milky 2 fast							
Transducide.							

Sample Data

Sample Method: Grab, Waterra, Bailer, Pump, Other: low flow

Field Sample ID (ID on bottles and Chain-of-Custody)	Sample Date (d.m.y)	Sample Time (hh:mm)	Analytical Parameter Set	Bottles No.	Bottles Size/ Type	Filtered (0.45µm)	Preservative	Remarks Ie: type of preservative
CTW-MW4-18	17 08 2018	6h45		8		Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	

Additional Comments

Field Staff: Alexis Robitaille + David Chenard.

FIELD REPORT - ~~SAMPLING / MONITORING~~ Purge

Site: Former USAF Radar Station	Location: Cartwright, Labrador	Well/Site ID: CWT - MW 10
GPS Coordinates (NAD 83 UTM Zone 20T):	5952916,03 N	502375.735 E
☑Monitoring Well ☐Pumping Well ☐Surface Water ☐Spring/Seep ☐Discharge Pipe ☐Other:		

Site Conditions

Air Temp: 23 ☑°C ☐ °F Weather: Cloudy	Photograph Taken? ☐ Yes ☑ No
Well / Site Conditions: Locked? Yes ✓No Damaged/Repairs Needed?: NO	
Site Remarks (relevant site activities, sample gear installed in well, installed new tubing and foot valve etc.):	
New well	

Fluid Level Data ☐ Water Level Probe ☐

	Measure	Remarks
Date (d.m.y)	2018	
Time (hh:mm)	11 m	
Well Depth (mbTOC) (Table Lookup or ✓Measured?)	9.78	
to Product	NF	
Depth to Water (mbTOC/mbGrade)		
Height of Stick-up (m above Grade)	A.D.U	
Tape Correction (m) (recorded values already adjusted Yes/No?)		
to Product		

Pu and Field WQ Data Method: Bailer

Casing Volume (L) ≈ Height of Water Column (m) x [2L/m for a 2" diam. well casing] OR [8.1L/m for a 4" diam. well casing] OR [18.2L/m for a 6" diam. well casing] (L)

Date (d.m.y)		Well goes dry while purging?
Time (hh:mm)	17h00	Meter / Probe Remarks
Volume Purged (L)	12.5	Details ↓
Product Recovered (L)	0	
pH Temp. Compensated? ☐ Yes ☐ No		
Temperature °C, °F		
Conductance Specific or Electrical (µS/cm)		
Dissolved Oxygen (mg/L)		
?		
t nt,		
odour,		
turbidity,		
redox,		
sheen, etc)		

le Data Method: Grab

Field Sample ID (ID on bottles and Chain-of-Custody)	Sample Date (d.m y)	Sample (hh:mm)	Analytical Parameter Set	Bottles No	Bottles Size/ Type	Filtered (0.45µm)			Preservative			Remarks le: type of preservative
CWT-MW10-18	17.08.2018	17				Yes	No	N/A	Yes	No	N/A	
						Yes	No	N/A	Yes	No	N/A	
						Yes	No	N/A	Yes	No	N/A	
						Yes	No	N/A	Yes	No	N/A	
						Yes	No	N/A	Yes	No	N/A	
						Yes	No	N/A	Yes	No	N/A	
						Yes	No	N/A	Yes	No	N/A	
						Yes	No	N/A	Yes	No	N/A	
						Yes	No	N/A	Yes	No	N/A	

Additional Comments

Field Staff: Alexis Whitehall + Dalton [illegible]

Purge

FIELD REPORT - ~~SAMPLING / MONITORING~~

Site: Former USAF Radar Station	Location: Cartwright, Labrador	Well/Site ID: CWT- MW9
GPS Coordinates (NAD 83 UTM Zone 20T):	5952856,43 N	502414,631E
☑Monitoring Well ☐Pumping Well ☐Surface Water ☐Spring/Seep ☐Discharge Pipe ☐Other:		

Site Conditions

Air Temp: 18	☑°C ☐°F	Weather: Cloudy	Photograph Taken? ☐ Yes ☑ No
Well / Site Conditions: Locked? Yes ✓No	Damaged/Repairs Needed?: NO		
Site Remarks (relevant site activities, sample gear installed in well, installed new tubing and foot valve etc.):			
Hour well.			

Fluid Level Data

☐ Water Level ☑ Interface Probe ☐ Measuring Tape: ☐ Other:

	Measure	Remarks
Date (d.m.y)	18/08/2018	
Time (hh:mm)	12h00	
Well Depth (mbTOC) (Table Lookup or ✓Measured?)	10,14	
Depth to Floating Product (mbTOC)	N.A	
Depth to Water (mbTOC/mbGrade)	1,92	
Height of Stick-up (m above Grade)	1,20	
Tape Correction (m) (recorded values already adjusted Yes/No?)		
Depth to Sinking Product (mbTOC)	N.A	

Purge and Field WQ Data

Purge Method: ✓Waterra, Bailer, Pump, Other:

Casing Volume (L) ≈ Height of Water Column (m) x [2L/m for a 2" diam. well casing] OR [8.1L/m for a 4" diam. well casing] OR [18.2L/m for a 6" diam. well casing]						Casing Volume (L): 16,44	
Date (d.m.y)	18/08/2018					Well goes dry while purging?	
Time (hh:mm)	12h00					Meter / Probe Details ↓	Remarks ↓
Volume Purged (L)	400						
Product Recovered (L)	NF						
pH Temp. Compensated? ☐ Yes ☐ No							
Temperature °C, °F							
Conductance Specific or Electrical (µS/cm)							
Dissolved Oxygen (mg/L)							
Other ? (colour, tint, odour, turbidity, redox, sheen, etc.)	Clear, strong odor						

Sample Data

Sample Method: Grab, Waterra, Bailer, Pump, Other: Low flow

Field Sample ID (ID on bottles and Chain-of-Custody)	Sample Date (d.m.y)	Sample Time (hh:mm)	Analytical Parameter Set	Bottles No.	Bottles Size/ Type	Filtered (0.45µm)	Preservative	Remarks Ie: type of preservative
CWT-MW9	18.08.2018	16h00		9		Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	

Additional Comments

Field Staff: Alex S Robitaille

Purge

FIELD REPORT - ~~SAMPLING / MONITORING~~

Site: Former USAF Radar Station	Location: Cartwright, Labrador	Well/Site ID: CWT-MW3
GPS Coordinates (NAD 83 UTM Zone 20T): 5952923.72 N	502304.987 E	
☑Monitoring Well ☐Pumping Well ☐Surface Water ☐Spring/Seep ☐Discharge Pipe ☐Other:		

Site Conditions

Air Temp: 7 ☑°C ☐°F Weather: Cloudy	Photograph Taken? ☐ Yes ☑ No
Well / Site Conditions: Locked? Yes ✓No Damaged/Repairs Needed?: NO	
Site Remarks (relevant site activities, sample gear installed in well, installed new tubing and foot valve etc.):	
New well.	

Fluid Level Data ☐ Water Level ☑ Interface Probe ☐ Measuring Tape: ☐ Other:

	Measure	Remarks
Date (d.m.y)	17/08/2018	
Time (hh:mm)	16h00	
Well Depth (mbTOC) (Table Lookup or ✓Measured?)	6.95	
Depth to Floating Product (mbTOC)	NA	
Depth to Water (mbTOC/mbGrade)	1.06	
Height of Stick-up (m above Grade)	0.99	
Tape Correction (m) (recorded values already adjusted Yes/No?)		
Depth to Sinking Product (mbTOC)	NA	

Purge and Field WQ Data Purge Method: Waterra, Bailer, ✓Pump, Other:

Casing Volume (L) = Height of Water Column (m) x [2L/m for a 2" diam. well casing] OR [8.1L/m for a 4" diam. well casing] OR [18.2L/m for a 6" diam. well casing]						Casing Volume (L): 11.8	
Date (d.m.y)	17/08/2018					✓Well goes dry while purging?	
Time (hh:mm)	16h00					Meter / Probe Details ↓	Remarks ↓
Volume Purged (L)	12.5						
Product Recovered (L)	0						
pH Temp. Compensated? ☐ Yes ☐ No							
Temperature °C, °F							
Conductance Specific or Electrical (µS/cm)							
Dissolved Oxygen (mg/L)							
Other ? (colour, tint, odour, turbidity, redox, sheen, etc.)	Clear Slight odor.						

Sample Data Sample Method: Grab, Waterra, Bailer, Pump, Other: low flow

Field Sample ID (ID on bottles and Chain-of-Custody)	Sample Date (d.m.y)	Sample Time (hh:mm)	Analytical Parameter Set	Bottles No.	Bottles Size/ Type	Filtered (0.45µm)	Preservative	Remarks le: type of preservative
CWT-MW3-18	18.08.2018	9h16		3		Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	

Additional Comments

Field Staff: Alexis Robitaille

Purge

FIELD REPORT - ~~SAMPLING / MONITORING~~

Site: Former USAF Radar Station	Location: Cartwright, Labrador	Well/Site ID: CWT-MW11
GPS Coordinates (NAD 83 UTM Zone 20T): 5952900.04 N 502272.289		
☑ Monitoring Well ☐ Pumping Well ☐ Surface Water ☐ Spring/Seep ☐ Discharge Pipe ☐ Other:		

Site Conditions

Air Temp: 20 ☑ °C ☐ °F	Weather: Sunny w clouds	Photograph Taken? ☐ Yes ☑ No
Well / Site Conditions: Locked? Yes ✓ No	Damaged/Repairs Needed?: no	
Site Remarks (relevant site activities, sample gear installed in well, installed new tubing and foot valve etc.): New Well.		

Fluid Level Data

☐ Water Level ☑ Interface Probe ☐ Measuring Tape ☐ Other:

	Measure	Remarks
Date (d.m.y)	19/08/2018	
Time (hh:mm)	15h00	
Well Depth (mbTOC) (Table Lookup or ✓ Measured?)	8.18	
Depth to Floating Product (mbTOC)	NA	
Depth to Water (mbTOC/mbGrade)	6.13	
Height of Stick-up (m above Grade)	0.97	
Tape Correction (m) (recorded values already adjusted Yes/No?)		
Depth to Sinking Product (mbTOC)	NA	

Purge and Field WQ Data

Purge Method: Waterra, Bailer, ✓ Pump, Other:

Casing Volume (L) ≈ Height of Water Column (m) x [2L/m for a 2" diam. well casing] OR [8.1L/m for a 4" diam. well casing] OR [18.2L/m for a 6" diam. well casing]						Casing Volume (L): 14.1	
Date (d.m.y)	19/08/	2018				✓ Well goes dry while purging?	
Time (hh:mm)	15h27					Meter / Probe Details ↓	Remarks ↓
Volume Purged (L)	50						
Product Recovered (L)	0						
pH Temp. Compensated? ☐ Yes ☐ No							
Temperature °C, °F							
Conductance Specific or Electrical (µS/cm)							
Dissolved Oxygen (mg/L)							
Other ? (colour, tint, odour, turbidity, redox, sheen, etc.)	Clear						
	Odor						

Sample Data

Sample Method: Grab, Waterra, Bailer, Pump, Other: Low flow

Field Sample ID (ID on bottles and Chain-of-Custody)	Sample Date (d.m.y)	Sample Time (hh:mm)	Analytical Parameter Set	Bottles No.	Bottles Size/ Type	Filtered (0.45µm)	Preservative	Remarks Ie: type of preservative
CWT-MW11-18	20.08.2018	9h20				Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	

Additional Comments

Field Staff: Alexis Robitaille

FIELD REPORT - ~~SAMPLING / MONITORING~~ Purge

Site: Former USAF Radar Station	Location: Cartwright, Labrador	Well/Site ID: CWT-MW6
GPS Coordinates (NAD 83 UTM Zone 20T): 5952634.51 N 502807.315 E		
☑Monitoring Well ☐Pumping Well ☐Surface Water ☐Spring/Seep ☐Discharge Pipe ☐Other:_____		

Site Conditions

Air Temp: 25 ☐ °C ☐ °F Weather: Sunny clouds	Photograph Taken? ☐ Yes ☑No
Well / Site Conditions: Locked? Yes ✓No Damaged/Repairs Needed?: No	
Site Remarks (relevant site activities, sample gear installed in well, installed new tubing and foot valve etc.):	
New well	

Fluid Level Data

☐ Water Level ☑Interface Probe ☐ Measuring Tape: ☐ Other:_____

	Measure	Remarks
Date (d.m.y)	16/08/2018	
Time (hh:mm)	18h30	
Well Depth (mbTOC) (Table Lookup or ✓Measured?)	3.64	
Depth to Floating Product (mbTOC)	NA	
Depth to Water (mbTOC/mbGrade)	1.02	
Height of Stick-up (m above Grade)	1.05	
Tape Correction (m) (recorded values already adjusted Yes/No?)		
Depth to Sinking Product (mbTOC)	NA	

Purge and Field WQ Data

Purge Method: ✓Waterra, Bailer, Pump, Other:_____

Casing Volume (L) ≈ Height of Water Column (m) x [2L/m for a 2" diam. well casing] OR [8.1L/m for a 4" diam. well casing] OR [18.2L/m for a 6" diam. well casing]						Casing Volume (L): 5.2L	
Date (d.m.y)	18.08.2018					✓Well goes dry while purging? 3Y	
Time (hh:mm)	18h30					Meter / Probe Details ↓	Remarks ↓
Volume Purged (L)	10						
Product Recovered (L)	NA						
pH Temp. Compensated? ☐ Yes ☐ No							
Temperature °C, °F							
Conductance Specific or Electrical (µS/cm)							
Dissolved Oxygen (mg/L)							
Other ? (colour, tint, odour, turbidity, redox, sheen, etc.) Milky PAH odor							

Sample Data

Sample Method: Grab, Waterra, Bailer, Pump, Other: Low Flow

Field Sample ID (ID on bottles and Chain-of-Custody)	Sample Date (d.m.y)	Sample Time (hh:mm)	Analytical Parameter Set	Bottles No.	Bottles Size/ Type	Filtered (0.45µm)	Preservative	Remarks Ie: type of preservative
CWT-MW6-18	18.08.2018					Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	

Additional Comments

Field Staff: Alexis Robitaille	Page 1 of 1

Purge

FIELD REPORT ~~SAMPLING / MONITORING~~

Site: Former USAF Radar Station	Location: Cartwright, Labrador	Well/Site ID: CWT-MW13
GPS Coordinates (NAD 83 UTM Zone 20T): 5952936.59 N 502268.744 E		
☑Monitoring Well ☐Pumping Well ☐Surface Water ☐Spring/Seep ☐Discharge Pipe ☐Other:_____		

Site Conditions

Air Temp: 20 ☑°C ☐ °F Weather: Sunny w/ clouds Photograph Taken? ☐ Yes ☑ No

Well / Site Conditions: Locked? Yes ✓No Damaged/Repairs Needed? NO

Site Remarks (relevant site activities, sample gear installed in well, installed new tubing and foot valve etc.):

New well

Fluid Level Data

☐ Water Level ☑ Interface Probe ☐ Measuring Tape: ☐ Other:_____

	Measure	Remarks
Date (d.m.y)	17/08 /2018	
Time (hh:mm)	15h42	
Well Depth (mbTOC) (Table Lookup or Measured?)	8.25	
Depth to Floating Product (mbTOC)	NA	
Depth to Water (mbTOC/mbGrade)	2.32	
Height of Stick-up (m above Grade)	0.97	
Tape Correction (m) (recorded values already adjusted Yes/No?)		
Depth to Sinking Product (mbTOC)	NA	

Purge and Field WQ Data

Purge Method: Waterra, Bailer, ✓Pump, Other:_____

Casing Volume (L) ≈ Height of Water Column (m) x [2L/m for a 2" diam. well casing] OR [8.1L/m for a 4" diam. well casing] OR [18.2L/m for a 6" diam. well casing]

Casing Volume (L):

Date (d.m.y)	17/08/2018					Well goes dry while purging?	
Time (hh:mm)						Meter / Probe Details ↓	Remarks ↓
Volume Purged (L)	460						
Product Recovered (L)	0						
pH Temp. Compensated? ☐ Yes ☐ No							
Temperature °C, °F							
Conductance Specific or Electrical (µS/cm)							
Dissolved Oxygen (mg/L)							
Other ? (colour, tint, odour, turbidity, redox, sheen, etc.) Transducible.							

Sample Data

Sample Method: Grab, Waterra, Bailer, Pump, Other: Low flow.

Field Sample ID (ID on bottles and Chain-of-Custody)	Sample Date (d.m.y)	Sample Time (hh:mm)	Analytical Parameter Set	Bottles No.	Bottles Size/ Type	Filtered (0.45µm)	Preservative	Remarks Ie: type of preservative
CWT-MW13-18	20/08/2018					Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	

Additional Comments

Field Staff: Alexis Robitaille

Purge

FIELD REPORT - ~~SAMPLING / MONITORING~~

Site: Former USAF Radar Station	Location: Cartwright, Labrador	Well/Site ID: CWT-MW14
GPS Coordinates (NAD 83 UTM Zone 20T):	5957089.46 N	502223.323 E

☑ Monitoring Well ☐ Pumping Well ☐ Surface Water ☐ Spring/Seep ☐ Discharge Pipe ☐ Other: _____

Site Conditions

Air Temp: 20	☑ °C ☐ °F	Weather: Sunny w/ Clouds
Photograph Taken? ☐ Yes ☐ ~~No~~		
Well / Site Conditions: Locked? Yes ~~No~~	Damaged/Repairs Needed?: NO	
Site Remarks (relevant site activities, sample gear installed in well, installed new tubing and foot valve etc.):		
New Well		

Fluid Level Data

☐ Water Level ☑ Interface Probe ☐ Measuring Tape: ☐ Other: _____

	Measure	Remarks
Date (d.m.y)	17/08/2018	
Time (hh:mm)	17h10	
Well Depth (mbTOC) (Table Lookup or ~~Measured~~?)	9.76	
Depth to Floating Product (mbTOC)	NA	
Depth to Water (mbTOC/mbGrade)	1.67	
Height of Stick-up (m above Grade)	0.83	
Tape Correction (m) (recorded values already adjusted Yes/No?)		
Depth to Sinking Product (mbTOC)		

Purge and Field WQ Data

Purge Method: Waterra, Bailer, ~~Pump~~, Other: _____

Casing Volume (L) = Height of Water Column (m) x [2L/m for a 2" diam. well casing] OR [8.1L/m for a 4" diam. well casing] OR [18.2L/m for a 6" diam. well casing]

Casing Volume (L): 16.24

Date (d.m.y)	17/08						~~Well goes dry while purging?~~	
Time (hh:mm)	17h10						Meter / Probe Details ↓	Remarks ↓
Volume Purged (L)	50							
Product Recovered (L)	0							
pH Temp. Compensated? ☐ Yes ☐ No								
Temperature °C, °F								
Conductance Specific or Electrical (µS/cm)								
Dissolved Oxygen (mg/L)								
Other ? (colour, tint, odour, turbidity, redox, sheen, etc.) Transducer								
No odor.								

Sample Data

Sample Method: Grab, Waterra, Bailer, Pump, Other: Low flow

Field Sample ID (ID on bottles and Chain-of-Custody)	Sample Date (d.m.y)	Sample Time (hh:mm)	Analytical Parameter Set	Bottles No.	Bottles Size/ Type	Filtered (0.45µm)	Preservative	Remarks le: type of preservative
CWT-MW14-18	20/06/2018	13h45				Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	

Additional Comments

Field Staff: Alexis Robitaille

Purge

FIELD REPORT - ~~SAMPLING / MONITORING~~

Site: Former USAF Radar Station	Location: Cartwright, Labrador	Well/Site ID: CWT-MW2
GPS Coordinates (NAD 83 UTM Zone 20T): 5952422.74 N 500617.023 E		
☑ Monitoring Well ☐ Pumping Well ☐ Surface Water ☐ Spring/Seep ☐ Discharge Pipe ☐ Other:		

Site Conditions

Air Temp: 15 ☑ °C ☐ °F Weather: Cloudy	Photograph Taken? ☐ Yes ☐ No
Well / Site Conditions: Locked? Yes No Damaged/Repairs Needed?: NO	
Site Remarks (relevant site activities, sample gear installed in well, installed new tubing and foot valve etc.):	
Near Well	

Fluid Level Data ☐ Water Level ☑ Interface Probe ☐ Measuring Tape: ☐ Other:

	Measure	Remarks
Date (d.m.y)	19/08/2018	
Time (hh:mm)	16h30	
Well Depth (mbTOC) (Table Lookup or Measured?)	7.00	
Depth to Floating Product (mbTOC)	NA	
Depth to Water (mbTOC/mbGrade)	1.46	
Height of Stick-up (m above Grade)	1.00	
Tape Correction (m) (recorded values already adjusted Yes/No?)		
Depth to Sinking Product (mbTOC)	NA	

Purge and Field WQ Data Purge Method: Waterra, Bailer, Pump, Other:

Casing Volume (L) = Height of Water Column (m) x [2L/m for a 2" diam. well casing] OR [8.1L/m for a 4" diam. well casing] OR [18.2L/m for a 6" diam. well casing]						Casing Volume (L): 11.08	
Date (d.m.y)	19/08/2018					☑ Well goes dry while purging? Y	
Time (hh:mm)	16h30					Meter / Probe Details ↓	Remarks ↓
Volume Purged (L)	7.0						
Product Recovered (L)	0						
pH Temp Compensated? ☐ Yes ☐ No							
Temperature °C, °F							
Conductance Specific or Electrical (µS/cm)							
Dissolved Oxygen (mg/L)							
Other ? (colour, tint, odour, turbidity, redox, sheen, etc.)	milky strong odor.						

Sample Data Sample Method: Grab, Waterra, Bailer, Pump, Other: Low flow

Field Sample ID (ID on bottles and Chain-of-Custody)	Sample Date (d.m.y)	Sample Time (hh:mm)	Analytical Parameter Set	Bottles No.	Bottles Size/ Type	Filtered (0.45µm)	Preservative	Remarks le: type of preservative
CWT-MW2-18	20.08.2018					Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	

Additional Comments

Field Staff: Alex Pelletier + Kaleb Chard	Page of

FIELD REPORT - ~~SAMPLING~~ Purge / MONITORING

Site: Former USAF Radar Station	Location: Cartwright, Labrador	Well/Site ID: CWT-MW7
GPS Coordinates (NAD 83 UTM Zone 20T): 5952691.49 N 502152.49 E		
☑ Monitoring Well ☐ Pumping Well ☐ Surface Water ☐ Spring/Seep ☐ Discharge Pipe ☐ Other:		

Site Conditions

Air Temp: 17 ☑ °C ☐ °F Weather: Sunny, Windy	Photograph Taken? ☐ Yes ☑ No
Well / Site Conditions: Locked? Yes ✓ No	Damaged/Repairs Needed?: No
Site Remarks (relevant site activities, sample gear installed in well, installed new tubing and foot valve etc.):	
Near well	

Fluid Level Data

☐ Water Level ☐ Interface Probe ☐ Measuring Tape: ☐ Other:

	Measure	Remarks
Date (d.m.y)	10/08/2018	
Time (hh:mm)		
Well Depth (mbTOC) (Table Lookup or ✓ Measured?)	9.75	
Depth to Floating Product (mbTOC)	NA	
Depth to Water (mbTOC/mbGrade)	1.43	
Height of Stick-up (m above Grade)	1.15	
Tape Correction (m) (recorded values already adjusted Yes/No?)		
Depth to Sinking Product (mbTOC)	NA	

Purge and Field WQ Data

Purge Method: Waterra, Bailer, ✓ Pump, Other:

Casing Volume (L) = Height of Water Column (m) x [2L/m for a 2" diam. well casing] OR [8.1L/m for a 4" diam. well casing] OR [18.2L/m for a 6" diam. well casing]

Casing Volume (L): 16.64

							Well goes dry while purging?	
Date (d.m.y)	10/08/2018						Meter / Probe Details ↓	Remarks ↓
Time (hh:mm)								
Volume Purged (L)	300							
Product Recovered (L)	0							
pH Temp. Compensated? ☐ Yes ☐ No								
Temperature °C, °F								
Conductance Specific or Electrical (µS/cm)								
Dissolved Oxygen (mg/L)								
Other ? (colour, tint, odour, turbidity, redox, sheen, etc.)	Translucent, No odor							

Sample Data

Sample Method: Grab, Waterra, Bailer, Pump, Other:

Field Sample ID (ID on bottles and Chain-of-Custody)	Sample Date (d.m.y)	Sample Time (hh:mm)	Analytical Parameter Set	Bottles No.	Bottles Size/ Type	Filtered (0.45µm)	Preservative	Remarks Ie: type of preservative
CWT-MW7-18	10.08.2018	16:20				Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	

Additional Comments

Field Staff: Alexis Pelletier

Page of

Purge

FIELD REPORT - ~~SAMPLING / MONITORING~~

Site: Former USAF Radar Station	Location: Cartwright, Labrador	Well/Site ID: CWT-MW3
GPS Coordinates (NAD 83 UTM Zone 20T):	5952365.22 N	500632.259 E
☑ Monitoring Well ☐ Pumping Well ☐ Surface Water ☐ Spring/Seep ☐ Discharge Pipe ☐ Other:		

Site Conditions

Air Temp: 20 ☑ °C ☐ °F Weather: Sunny	Photograph Taken? ☐ Yes ☐ No
Well / Site Conditions: Locked? Yes ☑ No Damaged/Repairs Needed?: NO	
Site Remarks (relevant site activities, sample gear installed in well, installed new tubing and foot valve etc.):	
New well	

Fluid Level Data

☐ Water Level ☑ Interface Probe ☐ Measuring Tape: ☐ Other:

	Measure	Remarks
Date (d.m.y)	19/08/2018	
Time (hh:mm)	19:00	
Well Depth (mbTOC) (Table Lookup or Measured?)	7.07	
Depth to Floating Product (mbTOC)	NO	
Depth to Water (mbTOC/mbGrade)	1.07	
Height of Stick-up (m above Grade)	0.97	
Tape Correction (m) (recorded values already adjusted Yes/No?)		
Depth to Sinking Product (mbTOC)	No	

Purge and Field WQ Data

Purge Method: Waterra, Bailer, ☑ Pump, Other:

Casing Volume (L) ≈ Height of Water Column (m) x [2L/m for a 2" diam. well casing] OR [8.1L/m for a 4" diam. well casing] OR [18.2L/m for a 6" diam. well casing]					Casing Volume (L): 10.20	
Date (d.m.y)	19/08/2018				Well goes dry while purging?	
Time (hh:mm)	19:40				Meter / Probe Details ↓	Remarks ↓
Volume Purged (L)	25					
Product Recovered (L)	NO					
pH Temp Compensated? ☐ Yes ☐ No						
Temperature °C, °F						
Conductance or Electrical						
Dissolved Oxygen (mg/L)						
Other ? (colour, tint, sheen,						

Sample Data

Method: Grab, Waterra, Bailer

Field Sample ID (ID on bottles and Chain-of-Custody)	Sample Date (d m.y)	Sample Time (hh:mm)	Analytical Parameter Set	Bottles No	Bottles Size/ Type	Filtered (0.45µm)	Preservative	Remarks Ie: type of preservative
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	

Additional Comments

Field Staff: [illegible]

Purge

FIELD REPORT - ~~SAMPLING / MONITORING~~

Site: Former USAF Radar Station	Location: Cartwright, Labrador	Well/Site ID: CWT - MW1
GPS Coordinates (NAD 83 UTM Zone 20T): 5952387.08 N 500639.534 E		
☑Monitoring Well ☐Pumping Well ☐Surface Water ☐Spring/Seep ☐Discharge Pipe ☐Other:_____		

Site Conditions

Air Temp: 20 ☑°C ☐ °F Weather: Sunny	Photograph Taken? ☐ Yes ☑ No
Well / Site Conditions: Locked? Yes ✓No Damaged/Repairs Needed?: NO	
Site Remarks (relevant site activities, sample gear installed in well, installed new tubing and foot valve etc.):	
New well	

Fluid Level Data

☐ Water Level ☑ Interface Probe ☐ Measuring Tape: ☐ Other:_____

	Measure	Remarks
Date (d.m.y) 19/08	/2018	
Time (hh:mm)	17h00	
Well Depth (mbTOC) (Table Lookup or Measured?)	6.93	
Depth to Floating Product (mbTOC)	NA	
Depth to Water (mbTOC/mbGrade)	1.17	
Height of Stick-up (m above Grade)	1.08	
Tape Correction (m) (recorded values already adjusted Yes/No?)		
Depth to Sinking Product (mbTOC)	NA	

Purge and Field WQ Data

Purge Method: Waterra, Bailer, ✓Pump, Other:_____

Casing Volume (L) = Height of Water Column (m) x [2L/m for a 2" diam. well casing] OR [8.1L/m for a 4" diam. well casing] OR [18.2L/m for a 6" diam. well casing]						Casing Volume (L):	
Date (d.m.y)	19/08/2018					Well goes dry while purging? ? Y	
Time (hh:mm)	17h00					Meter / Probe Details ↓	Remarks ↓
Volume Purged (L)	100						
Product Recovered (L)							
pH Temp. Compensated? ☐ Yes ☐ No							
Temperature °C, °F							
Conductance Specific or Electrical (µS/cm)							
Dissolved Oxygen (mg/L)							
Other ? (colour, tint, odour, turbidity, redox, sheen, etc.) rocky							
Very Strong odor							

Sample Data

Sample Method: Grab, Waterra, Bailer, Pump, Other: Low flow.

Field Sample ID (ID on bottles and Chain-of-Custody)	Sample Date (d.m.y)	Sample Time (hh:mm)	Analytical Parameter Set	Bottles No.	Bottles Size/ Type	Filtered (0.45µm)	Preservative	Remarks Ie: type of preservative
CWT - MW1 - 18	20/08/2018					Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	

Additional Comments

Field Staff: Alexis Rabitaille + David Chenard.	Page of

Purge

FIELD REPORT - ~~SAMPLING / MONITORING~~

Site: Former USAF Radar Station	Location: Cartwright, Labrador	Well/Site ID: CWT-MW15
GPS Coordinates (NAD 83 UTM Zone 20T):	5952771.39 N	502044.139 E
☑ Monitoring Well ☐ Pumping Well ☐ Surface Water ☐ Spring/Seep ☐ Discharge Pipe ☐ Other:		

Site Conditions

Air Temp: 4	☑ °C ☐ °F	Weather: Rain
Photograph Taken? ☐ Yes ☑ No		
Well / Site Conditions: Locked? Yes ✓ No	Damaged/Repairs Needed?: NO	
Site Remarks (relevant site activities, sample gear installed in well, installed new tubing and foot valve etc.): New Well.		

Fluid Level Data

☐ Water Level ☑ Interface Probe ☐ Measuring Tape: ☐ Other:

	Measure	Remarks
Date (d.m.y)	10/08/2018	
Time (hh:mm)	17h30	
Well Depth (mbTOC) (✓ Table Lookup or Measured?)	9.73	
Depth to Floating Product (mbTOC)	NA	
Depth to Water (mbTOC/mbGrade)	2.17	
Height of Stick-up (m above Grade)	0.99	
Tape Correction (m) (recorded values already adjusted Yes/No?)		
Depth to Sinking Product (mbTOC)		

Purge and Field WQ Data

Purge Method: Waterra, Bailer, ✓ Pump, Other: ~~PS~~

Casing Volume (L) ≈ Height of Water Column (m) x [2L/m for a 2" diam. well casing] OR [8.1L/m for a 4" diam. well casing] OR [18.2L/m for a 6" diam. well casing]						Casing Volume (L): 15.12	
Date (d.m.y)	10/08/2018					Well goes dry while purging?	
Time (hh:mm)	13h30					Meter / Probe Details ↓	Remarks ↓
Volume Purged (L)	2.65						
Product Recovered (L)	0						
pH Temp. Compensated? ☐ Yes ☐ No							
Temperature °C, °F							
Conductance Specific or Electrical (µS/cm)							
Dissolved Oxygen (mg/L)							
Other ? (colour, tint, odour, turbidity, redox, sheen, etc.)	Clear, No odor.						

Sample Data

Sample Method: Grab, Waterra, Bailer, Pump, Other: Low Flow

Field Sample ID (ID on bottles and Chain-of-Custody)	Sample Date (d.m.y)	Sample Time (hh:mm)	Analytical Parameter Set	Bottles No.	Bottles Size/ Type	Filtered (0.45µm)	Preservative	Remarks le: type of preservative
CWT-MW15-18	21.08.2018	17h20				Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	

Additional Comments

Field Staff: Alexis Robitaille

Purge

FIELD REPORT - ~~SAMPLING / MONITORING~~

Site: Former USAF Radar Station	Location: Cartwright, Labrador	Well/Site ID: CWT-MW16
GPS Coordinates (NAD 83 UTM Zone 20T): 5952680.07 N 502116.795 E		
☑ Monitoring Well ☐ Pumping Well ☐ Surface Water ☐ Spring/Seep ☐ Discharge Pipe ☐ Other:		

Site Conditions

Air Temp: 15 ☑ °C ☐ °F Weather: Rainy + cloudy	Photograph Taken? ☐ Yes ☑ No
Well / Site Conditions: Locked? Yes ✓ No Damaged/Repairs Needed? No	
Site Remarks (relevant site activities, sample gear installed in well, installed new tubing and foot valve etc.):	
About Well	

Fluid Level Data ☐ Water Level ☑ Interface Probe ☐ Measuring Tape: ☐ Other:

	Measure	Remarks
Date (d.m.y)	21/08/2018	
Time (hh:mm)	17:50	
Well Depth (mbTOC) (Table Lookup or Measured?)	9.70	
Depth to Floating Product (mbTOC)	NA	
Depth to Water (mbTOC/mbGrade)	2.28	
Height of Stick-up (m above Grade)	0.93	
Tape Correction (m) (recorded values already adjusted Yes/No?)		
Depth to Sinking Product (mbTOC)	NA	

Purge and Field WQ Data Purge Method: Waterra, Bailer, ✓ Pump, Other:

Casing Volume (L) ≈ Height of Water Column (m) x [2L/m for a 2" diam. well casing] OR [8.1L/m for a 4" diam. well casing] OR [18.2L/m for a 6" diam. well casing]

Casing Volume (L): 14.8

Date (d.m.y)	21/08/2018						✓ Well goes dry while purging? 3X	
Time (hh:mm)	13h50						Meter / Probe Details ↓	Remarks ↓
Volume Purged (L)	30							
Product Recovered (L)	0							
pH Temp Compensated? ☐ Yes ☐ No								
Temperature °C, °F								
Conductance Specific or Electrical (µS/cm)								
Dissolved Oxygen (mg/L)								
Other ? (colour, tint, odour, turbidity, redox, sheen, etc.)	Translucide no odor							

Sample Data Sample Method: Grab, Waterra, Bailer, Pump, Other: Low flow

Field Sample ID (ID on bottles and Chain-of-Custody)	Sample Date (d.m.y)	Sample Time (hh:mm)	Analytical Parameter Set	Bottles No.	Bottles Size/ Type	Filtered (0.45µm)	Preservative	Remarks le: type of preservative
CWT-MW16-18	21.08.2018	15h47				Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	

Additional Comments

Field Staff: Alexis Robitaille

Englobe

PURGE FAIBLE DÉBIT FAIBLE RABATTEMENT

Projet : CARACTÉRISATION ENVIRONNEMENTALE COMPLÉMENTAIRE **N° d'OTP :** P-0012285-0-16-200

Endroit : ANCIENNE BASE USAF CARTWRIGHT, LABRADOR, NF. **Date :** 20-08-2018

DONNÉES SUR LE PUITS ET ÉQUIPEMENTS UTILISÉS

Inscrire le no d'ECME, la marque et le modèle des équipements utilisés

N° du puits : CWT-MW12

- A - Pompe Submersible :
- B - Pompe Péristaltique : PEGASUS PUMP COMPAGNY (ALEXIS PUMP)
- C - Pompe à Vessie :
- D - Équipements dédiés :

B

Volume de la cellule (sonde multi) :

Prof. du puits : (p/r sommet du PVC) 10,03 (m)

Prof. Niv.d'eau : (p/r sommet du PVC) 3,55 (m)

Colonne d'eau dans le puits : 6,48 (m)

DONNÉES DE PURGE À FAIBLE DÉBIT, FAIBLE RABATTEMENT

Heure	Débit (ml/min)	Prof. niv d'eau (m)	pH (unité)	Temp. (°C)	Conductivité (uS/cm OU mS/cm)	O.D. (mg/L OU ppm)	ORP (mV)	Turbidité (NTU)
8H00	110	3,63	6,14	11,6	118,6	7,31	149,8	N/D
8H05	110	3,66	5,75	11,8	103,6	6,03	140,6	N/D
8H10	110	3,69	5,78	11,9	101,6	5,91	129,6	N/D
8H15	110	3,71	5,92	12	100,9	6,18	118,9	N/D
8H20	110	3,73	5,96	11,9	99,9	5,89	116,5	N/D
8H25	110	3,75	5,95	12	99,5	5,36	117,2	N/D
8H30	110	3,755	6	12,1	99,9	6,1	115,2	N/D
8H35	110	3,76	6,01	12,1	100,6	5,7	114,2	N/D
8H40	110	3,77	6,01	12,2	100,7	5	115	N/D
8H45	110	3,78	6,01	12,3	101,1	5,025	114,9	N/D
Écart admissible entre chaque lecture ≤ aux valeurs ci-après :		+/- 5 cm	+/- 0,2 unité	+/- 0,2°C	+/- 3 % de la valeur précédente	+/- 10% de la valeur précédente ou +/- 0.2 mg/L	+/- 20 mV	+/- 10 % de la valeur précédente ou 1 NTU

VOLUME TOTAL SOUTIRÉ DU PUITS (L) : ±5L.

NOTE : En théorie, le débit de pompage ne devrait pas dépasser le taux naturel d'écoulement de l'eau souterraine de la formation pouvant être captée par une crépine (rabattement nul). Si cela est impossible, le rabattement ne devrait pas exéder 25% de la distance entre le sommet de la crépine et la prise d'eau de la pompe, en évitant de dénoyer la crépine.

DONNÉES PRISES DANS LE PUITS (SI REQUIS)

Heure	Prof. niv d'eau (m)	pH unité	TEMP (°C)	CONDUCTIVITÉ (uS/cm ou mS/cm)	O.D. (mg/L-ppm)	O.R.P. (mV)	TURBIDITÉ NTU

DONNÉES SUR L'ÉCHANTILLON ET COMMENTAIRES

Couleur : Légère turbidité grisâtre **Odeur :** N/A **Autre :**

N° du duplicata et/ou blanc de terrain (s'il y a lieu) : DUPE-4 **Filtration de l'échantillon :** ■ Chantier ☐ Laboratoire

Pression atmosphérique :

Conditions météorologiques : ENSOLEILLÉ ± 17°C, LÉGÈREMENT VENTEUX

Commentaires :

Technicien : David Chénard **Date :** 20-08-2018

Vérifié par : **Date :**

Englobe

PURGE FAIBLE DÉBIT FAIBLE RABATTEMENT

Projet : CARACTÉRISATION ENVIRONNEMENTALE COMPLÉMENTAIRE **N° d'OTP :** P-0012285-0-16-200

Endroit : ANCIENNE BASE USAF CARTWRIGHT, LABRADOR, NF. **Date :** 20-08-2018

DONNÉES SUR LE PUITS ET ÉQUIPEMENTS UTILISÉS

N° du puits : CWT-MW13

Inscrire le no d'ECME, la marque et le modèle des équipements utilisés

B

A - Pompe Submersible :

B - Pompe Péristaltique : PEGASUS PUMP COMPAGNY (ALEXIS PUMP)

C - Pompe à Vessie :

D - Équipements dédiés :

Volume de la cellule (sonde multi) :

Prof. du puits : (p/r sommet du PVC) 8,25 (m)

Prof. Niv.d'eau : (p/r sommet du PVC) 2,38 (m)

Colonne d'eau dans le puits : 5,87 (m)

DONNÉES DE PURGE À FAIBLE DÉBIT, FAIBLE RABATTEMENT

Heure	Débit (ml/min)	Prof. niv d'eau (m)	pH (unité)	Temp. (°C)	Conductivité (uS/cm OU mS/cm)	O.D. (mg/L OU ppm)	ORP (mV)	Turbidité (NTU)
10H15	160	2,38	7,37	11,3	22,39	6,23	6,7	N/D
10H20	160	2,38	6,97	10,1	193,4	3,58	-29,5	N/D
10H25	160	2,38	6,47	10,1	193,6	3,47	-34,8	N/D
10H30	160	2,38	6,4	10,2	183,1	3,02	-47,1	N/D
10H35	160	2,38	6,54	10,5	174,1	2,64	-62,3	N/D
10H40	160	2,38	6,61	10,6	168,7	2,62	-71,3	N/D
10H45	160	2,38	6,64	10,6	166	2,13	-75,5	N/D
10H50	160	2,38	6,65	10,8	165,4	1,86	-77,8	N/D
10H55	160	2,38	6,66	10,6	162,7	1,62	-80,6	N/D
								N/D
Écart admissible entre chaque lecture ≤ aux valeurs ci-après :		+/- 5 cm	+/- 0,2 unité	+/- 0,2°C	+/- 3 % de la valeur précédente	+/- 10% de la valeur précédente ou +/- 0.2 mg/L	+/- 20 mV	+/- 10 % de la valeur précédente ou 1 NTU

VOLUME TOTAL SOUTIRÉ DU PUITS (L) : ±6,5L.

NOTE : En théorie, le débit de pompage ne devrait pas dépasser le taux naturel d'écoulement de l'eau souterraine de la formation pouvant être captée par une crépine (rabattement nul). Si cela est impossible, le rabattement ne devrait pas exéder 25% de la distance entre le sommet de la crépine et la prise d'eau de la pompe, en évitant de dénoyer la crépine.

DONNÉES PRISES DANS LE PUITS (SI REQUIS)

Heure	Prof. niv d'eau (m)	pH unité	TEMP (°C)	CONDUCTIVITÉ (uS/cm ou mS/cm)	O.D. (mg/L-ppm)	O.R.P. (mV)	TURBIDITÉ NTU

DONNÉES SUR L'ÉCHANTILLON ET COMMENTAIRES

Couleur : Légère turbidité grisâtre Odeur : Légère odeur d'hydrocarbure Autre :

N° du duplicata et/ou blanc de terrain (s'il y a lieu) : Filtration de l'échantillon : ■ Chantier ☐ Laboratoire

Pression atmosphérique :

Conditions météorologiques : ENSOLEILLÉ ± 17°C, LÉGÈREMENT VENTEUX

Commentaires :

Technicien : David Chénard **Date :** 20-08-2018

Vérifié par : **Date :**

Englobe

PURGE FAIBLE DÉBIT FAIBLE RABATTEMENT

Projet : CARACTÉRISATION ENVIRONNEMENTALE COMPLÉMENTAIRE **N° d'OTP :** P-0012285-0-16-200

Endroit : ANCIENNE BASE USAF CARTWRIGHT, LABRADOR, NF. **Date :** 20-08-2018

DONNÉES SUR LE PUITS ET ÉQUIPEMENTS UTILISÉS

N° du puits : CWT-MW3

Inscrire le no d'ECME, la marque et le modèle des équipements utilisés

B

- **A -** Pompe Submersible :
- **B -** Pompe Péristaltique : PEGASUS PUMP COMPAGNY (ALEXIS PUMP)
- **C -** Pompe à Vessie :
- **D -** Équipements dédiés :

Volume de la cellule (sonde multi) :

Prof. du puits : (p/r sommet du PVC) 7,07 (m)

Prof. Niv.d'eau : (p/r sommet du PVC) 0,9 (m)

Colonne d'eau dans le puits : 6,17 (m)

DONNÉES DE PURGE À FAIBLE DÉBIT, FAIBLE RABATTEMENT

Heure	Débit (ml/min)	Prof. niv d'eau (m)	pH (unité)	Temp. (°C)	Conductivité (uS/cm OU mS/cm)	O.D. (mg/L OU ppm)	ORP (mV)	Turbidité (NTU)
11H55	180	0,91	6,76	9,7	117,3	0,69	-49,1	N/D
12H00	180	0,92	6,28	8,9	111,5	0,39	-58,5	N/D
12H05	180	0,93	6,13	8,7	110,8	0,32	-67,5	N/D
12H10	180	0,94	6,05	8,5	110,7	0,25	-69,9	N/D
12H15	180	0,95	6,02	8,4	110	0,28	-73,5	N/D
12H20	180	0,96	6	8,5	109,6	0,2	-77,5	N/D
12H25	180	0,97	6,01	8,5	109,2	0,21	-78,1	N/D
Écart admissible entre chaque lecture ≤ aux valeurs ci-après :		+/- 5 cm	+/- 0,2 unité	+/- 0,2°C	+/- 3 % de la valeur précédente	+/- 10% de la valeur précédente ou +/- 0.2 mg/L	+/- 20 mV	+/- 10 % de la valeur précédente ou 1 NTU

VOLUME TOTAL SOUTIRÉ DU PUITS (L) : ±6,5L.

NOTE : En théorie, le débit de pompage ne devrait pas dépasser le taux naturel d'écoulement de l'eau souterraine de la formation pouvant être captée par une crépine (rabattement nul). Si cela est impossible, le rabattement ne devrait pas exéder 25% de la distance entre le sommet de la crépine et la prise d'eau de la pompe, en évitant de dénoyer la crépine.

DONNÉES PRISES DANS LE PUITS (SI REQUIS)

Heure	Prof. niv d'eau (m)	pH unité	TEMP (°C)	CONDUCTIVITÉ (uS/cm ou mS/cm)	O.D. (mg/L-ppm)	O.R.P. (mV)	TURBIDITÉ NTU

DONNÉES SUR L'ÉCHANTILLON ET COMMENTAIRES

Couleur : Légère turbidité grisâtre **Odeur :** Légère odeur d'hydrocarbure **Autre :**

N° du duplicata et/ou blanc de terrain (s'il y a lieu) : **Filtration de l'échantillon :** ■ Chantier ☐ Laboratoire

Pression atmosphérique :

Conditions météorologiques : ENSOLEILLÉ ± 17°C, LÉGÈREMENT VENTEUX

Commentaires :

Technicien : David Chénard **Date :** 20-08-2018

Vérifié par : **Date :**

Englobe

PURGE FAIBLE DÉBIT FAIBLE RABATTEMENT

Projet : CARACTÉRISATION ENVIRONNEMENTALE COMPLÉMENTAIRE **N° d'OTP :** P-0012285-0-16-200

Endroit : ANCIENNE BASE USAF CARTWRIGHT, LABRADOR, NF. **Date :** 20-08-2018

DONNÉES SUR LE PUITS ET ÉQUIPEMENTS UTILISÉS

N° du puits : CWT-MW3

Inscrire le no d'ECME, la marque et le modèle des équipements utilisés

A - Pompe Submersible :

B - Pompe Péristaltique : PEGASUS PUMP COMPAGNY (ALEXIS PUMP)

C - Pompe à Vessie :

D - Équipements dédiés :

B

Volume de la cellule (sonde multi) :

Prof. du puits : (p/r sommet du PVC) 6,93 (m)

Prof. Niv.d'eau : (p/r sommet du PVC) 1,18 (m)

Colonne d'eau dans le puits : 5,75 (m)

DONNÉES DE PURGE À FAIBLE DÉBIT, FAIBLE RABATTEMENT

Heure	Débit (ml/min)	Prof. niv d'eau (m)	pH (unité)	Temp. (°C)	Conductivité (uS/cm OU mS/cm)	O.D. (mg/L OU ppm)	ORP (mV)	Turbidité (NTU)
12H55	160	1,24	6,33	12	86,7	12,1	-14,1	N/D
13H00	160	1,25	6,13	11,9	86,3	0,66	-20,3	N/D
13H05	160	1,26	6,11	11,7	85,7	0,37	-28,4	N/D
13H10	160	1,27	6,11	11,6	85,6	0,41	-34,7	N/D
13H15	160	1,28	6,11	11,8	86,3	0,42	-39,1	N/D
13H20	160	1,29	6,11	11,8	86,4	0,42	-40	N/D
13H25	160	1,3	6,1	11,7	85,9	0,45	-40,2	N/D
Écart admissible entre chaque lecture ≤ aux valeurs ci-après :		+/- 5 cm	+/- 0,2 unité	+/- 0,2°C	+/- 3 % de la valeur précédente	+/- 10% de la valeur précédente ou +/- 0.2 mg/L	+/- 20 mV	+/- 10 % de la valeur précédente ou 1 NTU

VOLUME TOTAL SOUTIRÉ DU PUITS (L) : ±5L.

NOTE : En théorie, le débit de pompage ne devrait pas dépasser le taux naturel d'écoulement de l'eau souterraine de la formation pouvant être captée par une crépine (rabattement nul). Si cela est impossible, le rabattement ne devrait pas exéder 25% de la distance entre le sommet de la crépine et la prise d'eau de la pompe, en évitant de dénoyer la crépine.

DONNÉES PRISES DANS LE PUITS (SI REQUIS)

Heure	Prof. niv d'eau (m)	pH unité	TEMP (°C)	CONDUCTIVITÉ (uS/cm ou mS/cm)	O.D. (mg/L-ppm)	O.R.P. (mV)	TURBIDITÉ NTU

DONNÉES SUR L'ÉCHANTILLON ET COMMENTAIRES

Couleur : Jaune **Odeur :** Légère odeur d'hydrocarbure **Autre :**

N° du duplicata et/ou blanc de terrain (s'il y a lieu) : **Filtration de l'échantillon :** ■ Chantier ☐ Laboratoire

Pression atmosphérique :

Conditions météorologiques : ENSOLEILLÉ AVEC PASSAGE NUAGEUX ± 17°C. LÉGÈREMENT VENTEUX

Commentaires : FILTRATION DIFFICILE À L'AIDE DES FILTRES ET DE LA SERINGUE EN CHANTIER. COLMATAGE INSTANTANÉ DES FILTRES.

Technicien : David Chénard **Date :** 20-08-2018

Vérifié par : **Date :**

Englobe

PURGE FAIBLE DÉBIT FAIBLE RABATTEMENT

Projet : CARACTÉRISATION ENVIRONNEMENTALE COMPLÉMENTAIRE **N° d'OTP :** P-0012285-0-16-200

Endroit : ANCIENNE BASE USAF CARTWRIGHT, LABRADOR, NF. **Date :** 20-08-2018

DONNÉES SUR LE PUITS ET ÉQUIPEMENTS UTILISÉS

N° du puits : CWT-MW2

Inscrire le no d'ECME, la marque et le modèle des équipements utilisés

A - Pompe Submersible :

B - Pompe Péristaltique : PEGASUS PUMP COMPAGNY (ALEXIS PUMP)

C - Pompe à Vessie :

D - Équipements dédiés :

[B]

Volume de la cellule (sonde multi) :

Prof. du puits : (p/r sommet du PVC) 7,00 (m)

Prof. Niv.d'eau : (p/r sommet du PVC) 1,82 (m)

Colonne d'eau dans le puits : 5,18 (m)

DONNÉES DE PURGE À FAIBLE DÉBIT, FAIBLE RABATTEMENT

Heure	Débit (ml/min)	Prof. niv d'eau (m)	pH (unité)	Temp. (°C)	Conductivité (uS/cm OU mS/cm)	O.D. (mg/L OU ppm)	ORP (mV)	Turbidité (NTU)
14H45	150	1,82	6,21	12	127,7	1,66	12,6	N/D
14H50	150	1,84	5,85	11,9	122,7	0,27	4,7	N/D
14H55	150	1,85	5,82	11,7	122,9	0,23	-1,3	N/D
15H00	150	1,855	5,78	11,6	117,3	0,28	-0,07	N/D
15H05	150	1,86	5,79	11,8	120,6	0,29	-8,2	N/D
15H10	150	1,865	5,8	11,8	122,4	0,31	-13,3	N/D
15H15	150	1,87	6,1	11,7	123,1	0,32	-12,3	N/D
Écart admissible entre chaque lecture ≤ aux valeurs ci-après :		+/- 5 cm	+/- 0,2 unité	+/- 0,2°C	+/- 3 % de la valeur précédente	+/- 10% de la valeur précédente ou +/- 0.2 mg/L	+/- 20 mV	+/- 10 % de la valeur précédente ou 1 NTU

VOLUME TOTAL SOUTIRÉ DU PUITS (L) : ±5L.

NOTE : En théorie, le débit de pompage ne devrait pas dépasser le taux naturel d'écoulement de l'eau souterraine de la formation pouvant être captée par une crépine (rabattement nul). Si cela est impossible, le rabattement ne devrait pas exéder 25% de la distance entre le sommet de la crépine et la prise d'eau de la pompe, en évitant de dénoyer la crépine.

DONNÉES PRISES DANS LE PUITS (SI REQUIS)

Heure	Prof. niv d'eau (m)	pH unité	TEMP (°C)	CONDUCTIVITÉ (uS/cm ou mS/cm)	O.D. (mg/L-ppm)	O.R.P. (mV)	TURBIDITÉ NTU

DONNÉES SUR L'ÉCHANTILLON ET COMMENTAIRES

Couleur : Jaune **Odeur :** Légère odeur d'hydrocarbure **Autre :**

N° du duplicata et/ou blanc de terrain (s'il y a lieu) : **Filtration de l'échantillon :** ■ Chantier ☐ Laboratoire

Pression atmosphérique :

Conditions météorologiques : ENSOLEILLÉ AVEC PASSAGE NUAGEUX ± 17°C, LÉGÈREMENT VENTEUX

Commentaires : FILTRATION DIFFICILE À L'AIDE DES FILTRES ET DE LA SERINGUE EN CHANTIER. COLMATAGE INSTANTANÉ DES FILTRES.

Technicien : David Chénard **Date :** 20-08-2018

Vérifié par : **Date :**

FIELD REPORT - SAMPLING / MONITORING

Site: Former USAF Radar Station	Location: Cartwright, Labrador	Well/Site ID: C WT - MW4
GPS Coordinates (NAD 83 UTM Zone 20T): 5952542.5 N 503124.859 E		
☑ Monitoring Well ☐ Pumping Well ☐ Surface Water ☐ Spring/Seep ☐ Discharge Pipe ☐ Other:		

Site Conditions

Air Temp: 18 ☑ °C ☐ °F	Weather: Sunny — Photograph Taken? ☐ Yes ☑ No
Well / Site Conditions: Locked? ☐ Yes ☑ No	Damaged/Repairs Needed?: NO
Site Remarks (relevant site activities, sample gear installed in well, installed new tubing and foot valve etc.):	
New well	

Fluid Level Data

☐ Water Level ☑ Interface Probe ☐ Measuring Tape: ☐ Other:

	Measure	Remarks
Date (d.m.y)	17 08 /2018	
Time (hh:mm)	6h45	
Well Depth (mbTOC) (☐ Table Lookup or ☑ Measured?)	9,78	
Depth to Floating Product (mbTOC)	NA	
Depth to Water (mbTOC/mbGrade)	2,75	
Height of Stick-up (m above Grade)	0,98	
Tape Correction (m) (recorded values already adjusted Yes/No?)	NO	
Depth to Sinking Product (mbTOC)	NA	

~~Purge and~~ Field WQ Data

Purge Method: ☐ Waterra, ☐ Bailer, ☐ Pump, ☐ Other:

Casing Volume (L) ≈ Height of Water Column (m) x [2L/m for a 2" diam. well casing] OR [8.1L/m for a 4" diam. well casing] OR [18.2L/m for a 6" diam. well casing]							Casing Volume (L):	
Date (d.m.y)	17082018						Well goes dry while purging?	
Time (hh:mm)	6h45						Meter / Probe Details ↓	Remarks ↓
~~Volume Purged (L)~~								
~~Product Recovered (L)~~								
pH Temp. Compensated? ☐ Yes ☐ No	6,44							
Temperature ☐ °C, ☐ °F	6,05							
Conductance ☐ Specific or ☑ Electrical (µS/cm)	131							
Dissolved Oxygen (mg/L)	9,46							
Other ? (colour, tint, odour, turbidity, redox, sheen, etc.)								

Sam Data

Sa le Method: G Bailer

Field Sample ID (ID on bottles and Chain-of-Custody)	Sample Date (d.m y)	Sample Time (hh:mm)	Analytical Parameter Set	Bottles No.	Bottles Size/ Type	Filtered (0.45µm)			Preservative			Remarks le: type of preservative
- M	17082018			1		Yes	No	N/A	Yes	No	N/A	
						Yes	No	N/A	Yes	No	N/A	
						Yes	No	N/A	Yes	No	N/A	
						Yes	No	N/A	Yes	No	N/A	
						Yes	No	N/A	Yes	No	N/A	
						Yes	No	N/A	Yes	No	N/A	
						Yes	No	N/A	Yes	No	N/A	
						Yes	No	N/A	Yes	No	N/A	
						Yes	No	N/A	Yes	No	N/A	

Additional Comments

Field Staff: Alexis Thaillie

FIELD REPORT - SAMPLING / MONITORING

Site: Former USAF Radar Station	Location: Cartwright, Labrador	Well/Site ID: CWT-MW5
GPS Coordinates (NAD 83 UTM Zone 21T):	5952561.74 N	502747.59 E

☑ Monitoring Well ☐ Pumping Well ☐ Surface Water ☐ Spring/Seep ☐ Discharge Pipe ☐ Other: _____

Site Conditions

Air Temp: 25	☑ °C ☐ °F Weather: Sunny	Photograph Taken? ☐ Yes ☑ No
Well / Site Conditions: Locked? ☐ Yes	☑ No Damaged/Repairs Needed?: NO	
Site Remarks (relevant site activities, sample gear installed in well, installed new tubing and foot valve etc.):		
NEW WELL		

Fluid Level Data

☐ Water Level ☑ Interface Probe ☐ Measuring Tape: ☐ Other: _____

	Measure	Remarks
Date (d.m.y)	18/08/2018	
Time (hh:mm)	10:15	
Well Depth (mbTOC) (☐ Table Lookup or ☑ Measured?)	6.91	
Depth to Floating Product (mbTOC)	NA	
Depth to Water (mbTOC/mbGrade)	1.49	
Height of Stick-up (m above Grade)	0.86	
Tape Correction (m) (recorded values already adjusted Yes/No?)		
Depth to Sinking Product (mbTOC)	NA	

~~Purge and~~ Field WQ Data

Purge Method: ☐ Waterra, ☐ Bailer, ☐ Pump, Other: _____

Casing Volume (L) ≈ Height of Water Column (m) x [2L/m for a 2" diam. well casing] OR [8.1L/m for a 4" diam. well casing] OR [18.2L/m for a 6" diam. well casing]							Casing Volume (L):	
Date (d.m.y)	18082018						☐ Well goes dry while purging?	
Time (hh:mm)	10h15						Meter / Probe Details ↓	Remarks ↓
Volume Purged (L)	/							
Product Recovered (L)	/							
pH Temp. Compensated? ☐ Yes ☐ No	6.32							
Temperature ☑ °C, ☐ °F	7.57							
Conductance ☐ Specific or ☐ Electrical (µS/cm)	11.5							
Dissolved Oxygen (mg/L)	43.0							
Other ? (colour, tint, odour, turbidity, redox, sheen, etc.)	Light PAH odor							

Sample Data

Sample Method: ☐ Grab, ☐ Waterra, ☐ Bailer, ☐ Pump, ☑ Other: Low Flow

Field Sample ID (ID on bottles and Chain-of-Custody)	Sample Date (d.m.y)	Sample Time (hh:mm)	Analytical Parameter Set	Bottles No.	Bottles Size/ Type	Filtered (0.45µm)	Preservative	Remarks Ie: type of preservative
CWT-MW5-18	18.08.2018	10:15		8		Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	

Additional Comments

Field Staff: Alexis Hall

FIELD REPORT - SAMPLING / MONITORING

Site: Former USAF Radar Station	Location: Cartwright, Labrador	Well/Site ID: CWT - MW6
GPS Coordinates (NAD 83 UTM Zone 21T):	5952634.51 N	502807.315 E

☑ Monitoring Well ☐ Pumping Well ☐ Surface Water ☐ Spring/Seep ☐ Discharge Pipe ☐ Other:_____

Site Conditions

Air Temp: 25 ☑ °C ☐ °F Weather:	Sunny w clouds Photograph Taken? ☐ Yes ☑ No
Well / Site Conditions: Locked? ☐ Yes ☑ No	Damaged/Repairs Needed?: NO
Site Remarks (relevant site activities, sample gear installed in well, installed new tubing and foot valve etc.):	
NEW WELL	

Fluid Level Data

☐ Water Level ☑ Interface Probe ☐ Measuring Tape: ☐ Other:_____

	Measure	Remarks
Date (d.m.y)	18.08 /2018	
Time (hh:mm)	11h50	
Well Depth (mbTOC) (☐ Table Lookup or ☑ Measured?)	3,64	
Depth to Floating Product (mbTOC)	/	
Depth to Water (mbTOC/mbGrade)	1,78	
Height of Stick-up (m above Grade)	1,05	
Tape Correction (m) (recorded values already adjusted Yes/No?)		
Depth to Sinking Product (mbTOC)	NA	

~~Purge and~~ Field WQ Data

Purge Method: ☐ Waterra, ☐ Bailer, ☐ Pump, Other:_____

Casing Volume (L) ≈ Height of Water Column (m) x [2L/m for a 2" diam. well casing] OR [8.1L/m for a 4" diam. well casing] OR [18.2L/m for a 6" diam. well casing]							Casing Volume (L):	
Date (d.m.y)	18.08.2018						☐ Well goes dry while purging?	
Time (hh:mm)	11:50						Meter / Probe Details ↓	Remarks ↓
Volume Purged (L)	/							
Product Recovered (L)	/							
pH Temp. Compensated? ☐ Yes ☐ No	6.98							
Temperature ☑ °C, ☐ °F	11.21							
Conductance ☐ Specific or ☑ Electrical (µS/cm)								NOT available
Dissolved Oxygen (mg/L)	2.40							
Other ? (colour, tint, odour, turbidity, redox, sheen, etc.) Translucid. No odor.								

Sample Data

Sample Method: ☐ Grab, ☐ Waterra, ☐ Bailer, ☐ Pump, ☑ Other: low flow

Field Sample ID (ID on bottles and Chain-of-Custody)	Sample Date (d.m.y)	Sample Time (hh:mm)	Analytical Parameter Set	Bottles No.	Bottles Size/ Type	Filtered (0.45µm)	Preservative	Remarks Ie: type of preservative
CWT-MW6-18	18.08.2018	11:50		2		Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	

Additional Comments

Field Staff: Alyssa Hobbs

FIELD REPORT - SAMPLING / MONITORING

Site: Former USAF Radar Station	Location: Cartwright, Labrador	Well/Site ID: CWT - MW7
GPS Coordinates (NAD 83 UTM Zone 20T):	5952691.49 N	502152.46 E

☑ Monitoring Well ☐ Pumping Well ☐ Surface Water ☐ Spring/Seep ☐ Discharge Pipe ☐ Other: _____

Site Conditions

Air Temp: 17	☑ °C ☐ °F	Weather: Sunny w Clouds	Photograph Taken? ☐ Yes ☑ No
Well / Site Conditions: Locked? ☐ Yes	☑ No	Damaged/Repairs Needed?: NO	
Site Remarks (relevant site activities, sample gear installed in well, installed new tubing and foot valve etc.): NEW Well			

Fluid Level Data

☐ Water Level ☑ Interface Probe ☐ Measuring Tape: ☐ Other: _____

	Measure	Remarks
Date (d.m.y)	20/08/2018	
Time (hh:mm)	16:20	
Well Depth (mbTOC) (☐ Table Lookup or ☑ Measured?)	9.75	
Depth to Floating Product (mbTOC)	—	
Depth to Water (mbTOC/mbGrade)	1.85	
Height of Stick-up (m above Grade)	1.45	
Tape Correction (m) (recorded values already adjusted Yes/No?)		
Depth to Sinking Product (mbTOC)	—	

~~Purge~~ and Field WQ Data

Purge Method: ☐ Waterra, ☐ Bailer, ☐ Pump, ☐ Other: _____

Casing Volume (L) ≈ Height of Water Column (m) x [2L/m for a 2" diam. well casing] OR [8.1L/m for a 4" diam. well casing] OR [18.2L/m for a 6" diam. well casing]

Casing Volume (L):

							Well goes dry while purging?	
Date (d.m.y)	20.08.2018						Meter / Probe Details ↓	Remarks ↓
Time (hh:mm)	16:20							
Volume Purged (L)	—							
Product Recovered (L)	—							
pH Temp. Compensated? ☐ Yes ☐ No	6.39							
Temperature ☑ °C, ☐ °F	11.16							
Conductance ☐ Specific or ☑ Electrical (µS/cm)	175							
Dissolved Oxygen (mg/L)								
Other ? (colour, tint, odour, turbidity, redox, sheen, etc.)	Translucide ; NO odors							

Sample Data

Sample Method: ☐ Grab, ☐ Waterra, ☐ Bailer, ☐ Pump, ☑ Other: Low Flow

Field Sample ID (ID on bottles and Chain-of-Custody)	Sample Date (d.m.y)	Sample Time (hh:mm)	Analytical Parameter Set	Bottles No.	Bottles Size/ Type	Filtered (0.45µm)	Preservative	Remarks ie: type of preservative
CWT-MW7-18	20.08.2018	16:20		2		Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	

Additional Comments

Field Staff: [signature]

FIELD REPORT - SAMPLING / MONITORING

Site: Former USAF Radar Station	Location: ~~Cartwright, Labrador~~	Well/Site ID: CWT-MW8
GPS Coordinates (NAD 83 UTM Zone 20T):	59 52923, 72 N	502304.987 E

☑ Monitoring Well ☐ Pumping Well ☐ Surface Water ☐ Spring/Seep ☐ Discharge Pipe ☐ Other:_____

Site Conditions

Air Temp: 20	☑ °C ☐ °F	Weather: Cloudy	Photograph Taken? ☐ Yes ☑ No
Well / Site Conditions: Locked?	Yes ☑ No	Damaged/Repairs Needed?:	NO
Site Remarks (relevant site activities, sample gear installed in well, installed new tubing and foot valve etc.):			
NEW well			

Fluid Level Data

☐ Water Level ☑ Interface Probe ☐ Measuring Tape: ☐ Other:_____

	Measure	Remarks
Date (d.m.y)	20 08/2018	
Time (hh:mm)	09:16	
Well Depth (mbTOC) (Table Lookup or ☑ Measured?)	6.95	
Depth to Floating Product (mbTOC)	—	
Depth to Water (mbTOC/mbGrade)	6.12	
Height of Stick-up (m above Grade)	0.99	
Tape Correction (m) (recorded values already adjusted Yes/No?)		
Depth to Sinking Product (mbTOC)	—	

~~Purge and~~ Field WQ Data

Purge Method: Waterra, Bailer, Pump, Other:_____

Casing Volume (L) ≈ Height of Water Column (m) x [2L/m for a 2" diam. well casing] OR [8.1L/m for a 4" diam. well casing] OR [18.2L/m for a 6" diam. well casing]

Casing Volume (L):

						Well goes dry while purging?	
Date (d.m.y)	20-08-2018					Meter / Probe Details ↓	Remarks ↓
Time (hh:mm)	09:16						
Volume Purged (L)	—						
Product Recovered (L)	—						
pH Temp. Compensated? ☐ Yes ☐ No	6.33						
Temperature ☑ °C, °F	9.4						
Conductance Specific or ☑ Electrical (µS/cm)							NOT available
Dissolved Oxygen (mg/L)	2.30						
Other ? (colour, tint, odour, turbidity, redox, sheen, etc.)	clear, PAH odor						

Sample Data

Sample Method: Grab, Waterra, Bailer, Pump, ☑ Other: low flow

Field Sample ID (ID on bottles and Chain-of-Custody)	Sample Date (d.m.y)	Sample Time (hh:mm)	Analytical Parameter Set	Bottles No.	Bottles Size/ Type	Filtered (0.45µm)	Preservative	Remarks Ie: type of preservative
CWT-MW8-18	20.08.2018	09:16		8		Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	

Additional Comments

Field Staff: Page of

FIELD REPORT - SAMPLING / MONITORING

Site: Former USAF Radar Station	Location: ~~Cartwright~~, Labrador	Well/Site ID: CWT - MW9
GPS Coordinates (NAD 83 UTM Zone 20T):	59 5285-6.43 N	502414.63 E
☑ Monitoring Well ☐ Pumping Well ☐ Surface Water ☐ Spring/Seep ☐ Discharge Pipe ☐ Other:		

Site Conditions

Air Temp: 18	☑ °C ☐ °F Weather: Cloudy	Photograph Taken? ☐ Yes ☑ No
Well / Site Conditions: Locked? ☐ Yes ☑ No	Damaged/Repairs Needed?: NO	
Site Remarks (relevant site activities, sample gear installed in well, installed new tubing and foot valve etc.):		
NEW WELL		

Fluid Level Data

☐ Water Level ☑ Interface Probe ☐ Measuring Tape: ☐ Other:

	Measure	Remarks
Date (d.m.y)	18 09 /2018	
Time (hh:mm)	16:00	
Well Depth (mbTOC) (☐ Table Lookup or ☑ Measured?)	10.14	
Depth to Floating Product (mbTOC)	/	
Depth to Water (mbTOC/mbGrade)	2.21	
Height of Stick-up (m above Grade)	1.20	
Tape Correction (m) (recorded values already adjusted Yes/No?)	/	
Depth to Sinking Product (mbTOC)	/	

~~Purge and~~ Field WQ Data

Purge Method: ☐ Waterra, ☐ Bailer, ☐ Pump, Other:

Casing Volume (L) ≈ Height of Water Column (m) x [2L/m for a 2" diam. well casing] OR [8.1L/m for a 4" diam. well casing] OR [18.2L/m for a 6" diam. well casing]						Casing Volume (L):	
Date (d.m.y)	18 09 2018					Well goes dry while purging?	
Time (hh:mm)	16:40					Meter / Probe Details ↓	Remarks ↓
Volume Purged (L)	/						
Product Recovered (L)	/						
pH Temp. Compensated? ☐ Yes ☐ No	6.37						
Temperature ☑ °C, ☐ °F	10.71						
Conductance ☐ Specific or ☑ Electrical (µS/cm)							Not available.
Dissolved Oxygen (mg/L)	6.37						
Other ? (colour, tint, odour, turbidity, redox, sheen, etc.)	clear strong PHC odour						

Sample Data

Sample Method: ☐ Grab, ☐ Waterra, ☐ Bailer, ☐ Pump, ☑ Other: Low Flow

Field Sample ID (ID on bottles and Chain-of-Custody)	Sample Date (d.m.y)	Sample Time (hh:mm)	Analytical Parameter Set	Bottles No.	Bottles Size/ Type	Filtered (0.45µm)	Preservative	Remarks le: type of preservative
CWT-MW9	18 09 2018	16:00		8		Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	

Additional Comments

Field Staff: [signature]

FIELD REPORT - SAMPLING / MONITORING

Site: Former USAF Radar Station	Location: Cartwright, Labrador	Well/Site ID: CWT-MW10
GPS Coordinates (NAD 83 UTM Zone 20T):	5952916.03 N	502375.735 E

☑ Monitoring Well ☐ Pumping Well ☐ Surface Water ☐ Spring/Seep ☐ Discharge Pipe ☐ Other: _____

Site Conditions

Air Temp: 23 ☐ °C ☐ °F Weather: Cloudy	Photograph Taken? ☐ Yes ☐ No
Well / Site Conditions: Locked? ☐ Yes ☑ No	Damaged/Repairs Needed?: NO
Site Remarks (relevant site activities, sample gear installed in well, installed new tubing and foot valve etc.):	
NEW Well	

Fluid Level Data

☐ Water Level ☑ Interface Probe ☐ Measuring Tape: ☐ Other: _____

	Measure	Remarks
Date (d.m.y)	17 08 /2018	
Time (hh:mm)	11:00	
Well Depth (mbTOC) (☐ Table Lookup or ☐ Measured?)	9.78	
Depth to Floating Product (mbTOC)	NA	
Depth to Water (mbTOC/mbGrade)	2.38	
Height of Stick-up (m above Grade)	0.84	
Tape Correction (m) (recorded values already adjusted Yes/No?)		
Depth to Sinking Product (mbTOC)	NA	

~~Purge and~~ Field WQ Data

Purge Method: ☐ Waterra, ☐ Bailer, ☐ Pump, ☐ Other: _____

Casing Volume (L) ≈ Height of Water Column (m) x [2L/m for a 2" diam. well casing] OR [8.1L/m for a 4" diam. well casing] OR [18.2L/m for a 6" diam. well casing]

Casing Volume (L):

						Meter / Probe Details ↓	Remarks ↓
Date (d.m.y)	16082018					☐ Well goes dry while purging?	
Time (hh:mm)	12h00						
Volume Purged (L)	/						
Product Recovered (L)	/						
pH Temp. Compensated? ☐ Yes ☐ No	6.75						
Temperature ☑ °C, ☐ °F	10,79						
Conductance ☐ Specific or ☑ Electrical (µS/cm)	205						
Dissolved Oxygen (mg/L)	11.00						
Other ? (colour, tint, odour, turbidity, redox, sheen, etc.)							

Sample Data

Sample Method: ☐ Grab, ☐ Waterra, ☐ Bailer, ☐ Pump, ☑ Other: Low Flow

Field Sample ID (ID on bottles and Chain-of-Custody)	Sample Date (d.m.y)	Sample Time (hh:mm)	Analytical Parameter Set	Bottles No.	Bottles Size/ Type	Filtered (0.45µm)	Preservative	Remarks le: type of preservative
CWT-MW10-18	17.08.2018	11h33		8		Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	

Additional Comments

Field Staff: Alexis Edwards

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FIELD REPORT - SAMPLING / MONITORING

Site: Former USAF Radar Station	Location: Cartwright, Labrador	Well/Site ID: CWT-MW11
GPS Coordinates (NAD 83 UTM Zone 20T): 5952900.04 N 502272.289 E		
☑ Monitoring Well ☐ Pumping Well ☐ Surface Water ☐ Spring/Seep ☐ Discharge Pipe ☐ Other:		

Site Conditions

Air Temp: 20 ☑ C ☐ °F Weather: Sunny w cloud Photograph Taken? ☐ Yes ☑ No

Well / Site Conditions: Locked? Yes ☑ No Damaged/Repairs Needed?: NO

Site Remarks (relevant site activities, sample gear installed in well, installed new tubing and foot valve etc.):

NEW WELL

Fluid Level Data

☐ Water Level ☐ Interface Probe ☐ Measuring Tape: ☐ Other:

	Measure	Remarks
Date (d.m.y)	20/09/2018	
Time (hh:mm)	11:30	
Well Depth (mbTOC) (Table Lookup or ☑ Measured?)	8.18	
Depth to Floating Product (mbTOC)	—	
Depth to Water (mbTOC/mbGrade)	2.03	
Height of Stick-up (m above Grade)	0.97	
Tape Correction (m) (recorded values already adjusted Yes/No?)		
Depth to Sinking Product (mbTOC)	NA	

~~Purge and~~ Field WQ Data

Purge Method: Waterra, Bailer, Pump, Other:

Casing Volume (L) ≈ Height of Water Column (m) x [2L/m for a 2" diam. well casing] OR [8.1L/m for a 4" diam. well casing] OR [18.2L/m for a 6" diam. well casing]						Casing Volume (L):	
Date (d.m.y)	20/08/2018					Well goes dry while purging?	
Time (hh:mm)	11:30					Meter / Probe Details ↓	Remarks ↓
Volume Purged (L)	—						
Product Recovered (L)	—						
pH Temp. Compensated? ☐ Yes ☐ No	6.84						
Temperature ☑ C, °F	10.66						
Conductance Specific or ☑ Electrical (µS/cm)	313						
Dissolved Oxygen (mg/L)	3.19						
Other ? (colour, tint, odour, turbidity, redox, sheen, etc.) Translucide. No odors							

Sample Data

Sample Method: Grab, Waterra, Bailer, Pump, ☑ Other: Low Flow

Field Sample ID (ID on bottles and Chain-of-Custody)	Sample Date (d.m.y)	Sample Time (hh:mm)	Analytical Parameter Set	Bottles No.	Bottles Size/ Type	Filtered (0.45µm)	Preservative	Remarks Ie: type of preservative
CWT-MW11-18	20.08.2018	11:30		8		Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	

Additional Comments

Field Staff: [signature]

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FIELD REPORT - SAMPLING / MONITORING

Site: Former USAF Radar Station	Location: Cartwright, Labrador	Well/Site ID: CWT-MW14
GPS Coordinates (NAD 83 UTM Zone 20T):	5952819.46N	502223.323E

☑ Monitoring Well ☐ Pumping Well ☐ Surface Water ☐ Spring/Seep ☐ Discharge Pipe ☐ Other:_____

Site Conditions

Air Temp: 20	☑ °C ☐ °F	Weather: Sunny w Clouds	Photograph Taken? ☐ Yes ☒ No
Well / Site Conditions: Locked? ☐ Yes ☑ No		Damaged/Repairs Needed?: NO	
Site Remarks (relevant site activities, sample gear installed in well, installed new tubing and foot valve etc.): NEW Well			

Fluid Level Data

☐ Water Level ☑ Interface Probe ☐ Measuring Tape: ☐ Other:_____

	Measure	Remarks
Date (d.m.y)	20/08/2018	
Time (hh:mm)	13:45	
Well Depth (mbTOC) (☐ Table Lookup or ☑ Measured?)	9.76	
Depth to Floating Product (mbTOC)	—	
Depth to Water (mbTOC/mbGrade)	13.45	
Height of Stick-up (m above Grade)		
Tape Correction (m) (recorded values already adjusted Yes/No?)		
Depth to Sinking Product (mbTOC)		

~~Purge and~~ Field WQ Data

Purge Method: ☐ Waterra, ☐ Bailer, ☐ Pump, Other:_____

Casing Volume (L) ≈ Height of Water Column (m) x [2L/m for a 2" diam. well casing] OR [8.1L/m for a 4" diam. well casing] OR [18.2L/m for a 6" diam. well casing]							Casing Volume (L):	
Date (d.m.y)	20.08.2018						☐ Well goes dry while purging?	
Time (hh:mm)	3:45						Meter / Probe Details ↓	Remarks ↓
Volume Purged (L)	—							
Product Recovered (L)	—							
pH Temp. Compensated? ☐ Yes ☐ No	6.37							
Temperature ☑ °C, ☐ °F	9.66							
Conductance ☐ Specific or ☑ Electrical (µS/cm)	63							
Dissolved Oxygen (mg/L)	6.87							
Other ? (colour, tint, odour, turbidity, redox, sheen, etc.) Translucide white No odor								

Sample Data

Sample Method: ☐ Grab, ☐ Waterra, ☐ Bailer, ☐ Pump, ☑ Other: Low flow

Field Sample ID (ID on bottles and Chain-of-Custody)	Sample Date (d.m.y)	Sample Time (hh:mm)	Analytical Parameter Set	Bottles No.	Bottles Size/ Type	Filtered (0.45µm)	Preservative	Remarks le: type of preservative
CWT-MW14-18	20.08.2018	13:45		8		Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	

Additional Comments

Field Staff: [illegible]

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FIELD REPORT - SAMPLING / MONITORING

Site: Former USAF Radar Station	Location: Cartwright, Labrador	Well/Site ID: CWT-SW2-1B (Coming)
GPS Coordinates (NAD 83 UTM Zone 20T): N 5953013.04 E 501762.044		
☐Monitoring Well ☐Pumping Well ☑Surface Water ☐Spring/Seep ☐Discharge Pipe ☐Other:_____		

Site Conditions

Air Temp: 18 ☑°C ☐°F Weather: Sunny	Photograph Taken? ☐ Yes ☐ No
Well / Site Conditions: Locked? Yes No Damaged/Repairs Needed?: NA	
Site Remarks (relevant site activities, sample gear installed in well, installed new tubing and foot valve etc.):	

Fluid Level Data

☐ Water Level ☐ Interface Probe ☑ Measuring Tape: ☐ Other:_____

	Measure	Remarks
Date (d.m.y)	2.08 /2018	
Time (hh:mm)	12:05	
Well Depth (mbTOC) (Table Lookup or Measured?)	—	
Depth to Floating Product (mbTOC)	—	
Depth to Water (mbTOC/mbGrade)		Water Depth @ Sample location
Height of Stick-up (m above Grade)	—	
	—	
Tape Correction (m) (recorded values already adjusted Yes/No?)	—	
Depth to Sinking Product (mbTOC)	—	

Purge and Field WQ Data

Purge Method: Waterra, Bailer, Pump, Other:_____

Casing Volume (L) ≈ Height of Water Column (m) x [2L/m for a 2" diam. well casing] OR [8.1L/m for a 4" diam. well casing] OR [18.2L/m for a 6" diam. well casing]							Casing Volume (L):	
Date (d.m.y)	2|08.2018						☐ Well goes dry while purging?	
Time (hh:mm)	17:05						Meter / Probe Details ↓	Remarks ↓
Volume Purged (L)	—							
Product Recovered (L)	—							
pH Temp. Compensated? ☐ Yes ☐ No	6.09							
Temperature ☑C, °F	15.24							
Conductance Specific or ☑Electrical (µS/cm)	22							
Dissolved Oxygen (mg/L)	5.34							
Other ? (colour, tint, odour, turbidity, redox, sheen, etc.) Clear								

Sample Data

Sample Method: Grab, Waterra, Bailer, Pump, Other:_____

Field Sample ID (ID on bottles and Chain-of-Custody)	Sample Date (d.m.y)	Sample Time (hh:mm)	Analytical Parameter Set	Bottles No.	Bottles Size/ Type	Filtered (0.45µm)	Preservative	Remarks Ie: type of preservative
CWT-SW2-1B (Coming)						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	

Additional Comments

Field Staff: Page of

FIELD REPORT - SAMPLING / MONITORING

Site: Former USAF Radar Station	Location: Cartwright, Labrador	Well/Site ID: CWT-SW8-18-B
GPS Coordinates (NAD 83 UTM Zone 20T):	N 5952696.2	W 502655.289

☐Monitoring Well ☐Pumping Well ☑Surface Water ☐Spring/Seep ☐Discharge Pipe ☐Other:_____

Site Conditions

Air Temp: 10 ☑°C ☐°F Weather: Sunny	Photograph Taken? ☑Yes ☐No
Well / Site Conditions: Locked? Yes No	Damaged/Repairs Needed?: NA
Site Remarks (relevant site activities, sample gear installed in well, installed new tubing and foot valve etc.):	
NA	

Fluid Level Data ☐ Water Level ☐ Interface Probe ☐ Measuring Tape: ☐ Other:_____

	Measure	Remarks
Date (d.m.y)	16.08./2018	
Time (hh:mm)	13:30	
Well Depth (mbTOC) (☐ Table Lookup or ☐ Measured?)	/	
Depth to Floating Product (mbTOC)	/	
Depth to Water (mbTOC/mbGrade)	1.5	Water Depth @ C.t
Height of Stick-up (m above Grade)	/	
	/	
Tape Correction (m) (recorded values already adjusted Yes/No?)	/	
Depth to Sinking Product (mbTOC)	/	

Purge and Field WQ Data Purge Method: ☐ Waterra, ☐ Bailer, ☐ Pump, ☐ Other:_____

Casing Volume (L) ≈ Height of Water Column (m) x [2L/m for a 2" diam. well casing] OR [8.1L/m for a 4" diam. well casing] OR [18.2L/m for a 6" diam. well casing]						Casing Volume (L):	
Date (d.m.y)	16.08.2018					☐ Well goes dry while purging?	
Time (hh:mm)	13:30					Meter / Probe Details ↓	Remarks ↓
Volume Purged (L)	/						
Product Recovered (L)	/						
pH Temp. Compensated? ☐ Yes ☐ No	/						
Temperature ☐°C, ☐°F	6.32						
Conductance ☐ Specific or ☑ Electrical (µS/cm)	129						
Dissolved Oxygen (mg/L)	2.42						
Other ? (colour, tint, odour, turbidity, redox, sheen, etc.) - organic sheen on water.							

Sample Data Sample Method: ☐ Grab, ☐ Waterra, ☐ Bailer, ☐ Pump, ☐ Other:_____

Field Sample ID (ID on bottles and Chain-of-Custody)	Sample Date (d.m.y)	Sample Time (hh:mm)	Analytical Parameter Set	Bottles No.	Bottles Size/ Type	Filtered (0.45µm)	Preservative	Remarks Ie: type of preservative
CWT-SW8-18-B	16.08.18	13:30				Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	

Additional Comments

Field Staff: [signature]

FIELD REPORT - SAMPLING / MONITORING

Site: Former USAF Radar Station	Location: Cartwright, Labrador	Well/Site ID: CWT-SW8-18
GPS Coordinates (NAD 83 UTM Zone 20T): 595268 2.08 N	5026786.71	
☐Monitoring Well ☐Pumping Well ☑Surface Water ☐Spring/Seep ☐Discharge Pipe ☐Other:_____		

Site Conditions

Air Temp: 18 ☑°C ☐ °F Weather: Sunny	Photograph Taken? ☑ Yes ☐ No
Well / Site Conditions: Locked? ~~Yes~~ No	Damaged/Repairs Needed?: NA
Site Remarks (relevant site activities, sample gear installed in well, installed new tubing and foot valve etc.):	

Fluid Level Data

☐ Water Level ☐ Interface Probe ☐ Measuring Tape: ☐ Other:_____

	Measure	Remarks
Date (d.m.y)	16.08./2018	
Time (hh:mm)	13:00	
~~Well~~ Depth (mbTOC) (☐ Table Lookup or ✓Measured?)	/	
Depth to Floating Product (mbTOC)	/	
Depth to Water (mbTOC/mbGrade)	10	~water depth @ location
Height of Stick-up (m above Grade)	/	
	/	
Tape Correction (m) (recorded values already adjusted Yes/No?)	/	
Depth to Sinking Product (mbTOC)	/	

~~Purge and~~ Field WQ Data

Purge Method: ☐ Waterra, ☐ Bailer, ☐ Pump, Other:_____

Casing Volume (L) ≈ Height of Water Column (m) x [2L/m for a 2" diam. well casing] OR [8.1L/m for a 4" diam. well casing] OR [18.2L/m for a 6" diam. well casing]						Casing Volume (L):	
Date (d.m.y)	16.08.2018					☐ Well goes dry while purging?	
Time (hh:mm)	13:00					Meter / Probe Details ↓	Remarks ↓
Volume Purged (L)	/						
Product Recovered (L)	/						
pH Temp. Compensated? ☐ Yes ☐ No	5.75						
Temperature ✓C, ☐ °F	18.72						
Conductance ☐ Specific or ✓Electrical (µS/cm)	55						
Dissolved Oxygen (mg/L)	5.03						
Other ? (colour, tint, odour, turbidity, redox, sheen, etc.)	light turbidity yellow tint						

Sample Data

Sample Method: ✓Grab, ☐ Waterra, ☐ Bailer, ☐ Pump, ☐ Other:_____

Field Sample ID (ID on bottles and Chain-of-Custody)	Sample Date (d.m.y)	Sample Time (hh:mm)	Analytical Parameter Set	Bottles No.	Bottles Size/ Type	Filtered (0.45µm)	Preservative	Remarks le: type of preservative
CWT-SW8-18	16.08.18	13:00				Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	

Additional Comments

Field Staff: [signature]

FIELD REPORT - SAMPLING / MONITORING

Site: Former USAF Radar Station	Location: Cartwright, Labrador	Well/Site ID: SW-BK01
GPS Coordinates (NAD 83 UTM Zone 20T):	5951486.25 N	502204.886 E

☐Monitoring Well ☐Pumping Well ☑Surface Water ☐Spring/Seep ☐Discharge Pipe ☐Other:_____

Site Conditions

Air Temp: 16 ☑°C ☐°F Weather: Sunny w clouds Photograph Taken? ☑Yes ☐No

Well / Site Conditions: Locked? ~~Yes~~ ~~No~~ Damaged/Repairs Needed?: NA

Site Remarks (relevant site activities, sample gear installed in well, installed new tubing and foot valve etc.):

In stream ≈ 20 m downstream of Beaver dam.
Flow ≈ 20 cm/s

Fluid Level Data ☐ Water Level ☑ Interface Probe ☐ Measuring Tape: ☐ Other:_____

	Measure	Remarks
Date (d.m.y)	21.08 /2018	
Time (hh:mm)	11:15	
Well Depth (mbTOC) (Table Lookup or Measured?)	/	
Depth to Floating Product (mbTOC)	/	
Depth to Water (mbTOC/mbGrade)	20	Channel ≈ 2m Wide, Average depth
Height of Stick-up (m above Grade)		
Tape Correction (m) (recorded values already adjusted Yes/No?)		
Depth to Sinking Product (mbTOC)		

~~Purge and~~ Field WQ Data Purge Method: Waterra, Bailer, Pump, Other: Bottle

Casing Volume (L) ≈ Height of Water Column (m) x [2L/m for a 2" diam. well casing] OR [8.1L/m for a 4" diam. well casing] OR [18.2L/m for a 6" diam. well casing]

Casing Volume (L):

							Well goes dry while purging?	
Date (d.m.y)	21.08.2018						Meter / Probe Details ↓	Remarks ↓
Time (hh:mm)	11:15							
Volume Purged (L)	/							
Product Recovered (L)	/							
pH Temp. Compensated? ☐ Yes ☐ No	5.93							
Temperature ☑°C, °F	16.08							
Conductance Specific or ☑Electrical (µS/cm)	25							
Dissolved Oxygen (mg/L)	5.88							
Other ? (colour, tint, odour, turbidity, redox, sheen, etc.)								

Sample Data Sample Method: Grab, Waterra, Bailer, Pump, Other:_____

Field Sample ID (ID on bottles and Chain-of-Custody)	Sample Date (d.m.y)	Sample Time (hh:mm)	Analytical Parameter Set	Bottles No.	Bottles Size/ Type	Filtered (0.45µm)	Preservative	Remarks le: type of preservative
SW-BK01	21.08.2018	11:15				Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	

Additional Comments

Field Staff: [signature]

FIELD REPORT - SAMPLING / MONITORING

Site: Former USAF Radar Station	Location: Cartwright, Labrador	Well/Site ID: SW-BK 02
GPS Coordinates (NAD 83 UTM Zone 20T): 595-1144.26 N 501435.293		
☐Monitoring Well ☐Pumping Well ☑Surface Water ☐Spring/Seep ☐Discharge Pipe ☐Other:_____		

Site Conditions

Air Temp: 20 ☑°C ☐ °F Weather: Sunny w clouds Photograph Taken? ☑Yes ☐ No

Well / Site Conditions: Locked? ☐ Yes ✓No Damaged/Repairs Needed?: NA

Site Remarks (relevant site activities, sample gear installed in well, installed new tubing and foot valve etc.):

Peat land West of Lark Pound / Bed rock ridge seperate from dump, is believe to be hydrologicaly seperated

Fluid Level Data

☐ Water Level ☑Interface Probe ☐ Measuring Tape: ☐ Other:_____

	Measure	Remarks
Date (d.m.y)	21/08/2018	
Time (hh:mm)	13:00	
Well Depth (mbTOC) (Table Lookup or Measured?)	—	
Depth to Floating Product (mbTOC)	—	
Depth to Water (mbTOC/mbGrade)	15	Average deph
Height of Stick-up (m above Grade)	—	
	—	
Tape Correction (m) (recorded values already adjusted Yes/No?)	—	
Depth to Sinking Product (mbTOC)	—	

~~Purge and~~ Field WQ Data

Purge Method: Waterra, Bailer, Pump, ✓Other: Bottle

Casing Volume (L) ≈ Height of Water Column (m) x [2L/m for a 2" diam. well casing] OR [8.1L/m for a 4" diam. well casing] OR [18.2L/m for a 6" diam. well casing]						Casing Volume (L):	
Date (d.m.y)	21.08.2018					Well goes dry while purging?	
Time (hh:mm)	13:00					Meter / Probe Details ↓	Remarks ↓
Volume Purged (L)	—						
Product Recovered (L)	—						
pH Temp. Compensated? ☐ Yes ☐ No	5.36						
Temperature ✓C, °F	20.03						
Conductance Specific or ✓Electrical (µS/cm)	29						
Dissolved Oxygen (mg/L)	7.58						
Other ? (colour, tint, odour, turbidity, redox, sheen, etc.)							

Sample Data

Sample Method: Grab, Waterra, Bailer, Pump, Other:_____

Field Sample ID (ID on bottles and Chain-of-Custody)	Sample Date (d.m.y)	Sample Time (hh:mm)	Analytical Parameter Set	Bottles No.	Bottles Size/ Type	Filtered (0.45µm)	Preservative	Remarks Ie: type of preservative
SW-BK02-18	21.08.2018	13:00				Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	

Additional Comments

Field Staff: [signature]

FIELD REPORT - SAMPLING / MONITORING

Site: Former USAF Radar Station	Location: Cartwright, Labrador	Well/Site ID: SW-BK03
GPS Coordinates (NAD 83 UTM Zone 20T):	5948798.29 N	499062.219 E

☐Monitoring Well ☐Pumping Well ☑Surface Water ☐Spring/Seep ☐Discharge Pipe ☐Other:_____

Site Conditions

Air Temp: 20 ☑°C ☐ °F	Weather: Sunny	Photograph Taken? ☑Yes ☐ No
Well / Site Conditions: Locked? Yes No	Damaged/Repairs Needed?: NA	
Site Remarks (relevant site activities, sample gear installed in well, installed new tubing and foot valve etc.):		

Fluid Level Data

☐ Water Level ☐ Interface Probe ☐ Measuring Tape: ☐ Other:_____

	Measure	Remarks
Date (d.m.y)	21.08 /2018	
Time (hh:mm)	15:24	
Well Depth (mbTOC) (Table Lookup or Measured?)	—	
Depth to Floating Product (mbTOC)	—	
Depth to Water (mbTOC/mbGrade)		*Size of lake doesn't allow average depth sample taken @ depth 30 cm
Height of Stick-up (m above Grade)	—	
	—	
Tape Correction (m) (recorded values already adjusted Yes/No?)	—	
Depth to Sinking Product (mbTOC)	—	

Purge and Field WQ Data

Purge Method: Waterra, Bailer, Pump, ✓Other: Bottle

Casing Volume (L) ≈ Height of Water Column (m) x [2L/m for a 2" diam. well casing] OR [8.1L/m for a 4" diam. well casing] OR [18.2L/m for a 6" diam. well casing]							Casing Volume (L):	
Date (d.m.y)	21.08.2018						Well goes dry while purging?	
Time (hh:mm)	15:24						Meter / Probe Details ↓	Remarks ↓
Volume Purged (L)	—							
Product Recovered (L)	—							
pH Temp. Compensated? ☐ Yes ☐ No	4.80							
Temperature ✓C, °F	24							
Conductance Specific or ✓Electrical (µS/cm)	93							
Dissolved Oxygen (mg/L)	9.08							
Other ? (colour, tint, odour, turbidity, redox, sheen, etc.)								

Sample Data

Sample Method: Grab, Waterra, Bailer, Pump, Other:_____

Field Sample ID (ID on bottles and Chain-of-Custody)	Sample Date (d.m.y)	Sample Time (hh:mm)	Analytical Parameter Set	Bottles No.	Bottles Size/ Type	Filtered (0.45µm)	Preservative	Remarks le: type of preservative
SW-BK03-1B	21.08.2018	15:24				Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	

Additional Comments

Field Staff: [signature]

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FIELD REPORT - SAMPLING / MONITORING

Site: Former USAF Radar Station	Location: Cartwright, Labrador	Well/Site ID: SW-BK04
GPS Coordinates (NAD 83 UTM Zone 20T):	595666, 92 N	4998227, 328 E
☐Monitoring Well ☐Pumping Well ☑Surface Water ☐Spring/Seep ☐Discharge Pipe ☐Other:		

Site Conditions

Air Temp: 25 ☑°C ☐ °F Weather:	Sunny w Clouds Photograph Taken? ☑Yes ☐ No
Well / Site Conditions: Locked? ~~Yes~~ ~~No~~	Damaged/Repairs Needed?: NA
Site Remarks (relevant site activities, sample gear installed in well, installed new tubing and foot valve etc.):	
PoT. Tidal influence.	

Fluid Level Data

☐ Water Level ☑Interface Probe ☐ Measuring Tape: ☐ Other:

	Measure	Remarks
Date (d.m.y)	21.08 /2018	
Time (hh:mm)	16h39	
Well Depth (mbTOC) (Table Lookup or Measured?)	/	
Depth to Floating Product (mbTOC)	/	
Depth to Water (mbTOC/mbGrade)	20	Averag. Depth
Height of Stick-up (m above Grade)	-	
	-	
Tape Correction (m) (recorded values already adjusted Yes/No?)	/	
Depth to Sinking Product (mbTOC)	-	

Purge and Field WQ Data

Purge Method: Waterra, Bailer, Pump, Other:

Casing Volume (L) ≈ Height of Water Column (m) x [2L/m for a 2" diam. well casing] OR [8.1L/m for a 4" diam. well casing] OR [18.2L/m for a 6" diam. well casing]						Casing Volume (L):	
Date (d.m.y)	21.08.2018					Well goes dry while purging?	
Time (hh:mm)	16:39					Meter / Probe Details ↓	Remarks ↓
Volume Purged (L)	/						
Product Recovered (L)	/						
pH Temp. Compensated? ☐ Yes ☐ No	5.07						
Temperature ✓C, °F	25.2						
Conductance Specific or ✓Electrical (µS/cm)	64						
Dissolved Oxygen (mg/L)	3.88						
Other ? (colour, tint, odour, turbidity, redox, sheen, etc.)							

Sample Data

Sample Method: Grab, Waterra, Bailer, Pump, Other:

Field Sample ID (ID on bottles and Chain-of-Custody)	Sample Date (d.m.y)	Sample Time (hh:mm)	Analytical Parameter Set	Bottles No.	Bottles Size/ Type	Filtered (0.45µm)	Preservative	Remarks Ie: type of preservative
SW-BK04-1B	21.08.2018	16:39				Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	
						Yes No N/A	Yes No N/A	

Additional Comments

Field Staff: Alex Hall

Appendix D Analytical Results and Estimates of Impacts

TABLE 1: Petroleum Hydrocarbon (PHC) Compounds in Soil
Client: Department of National Defence
Site Location: Former USAF Radar Station, Cartwright, NL
Englobe Project No.: P-0012285-0-16-200

PARAMETER		UNITS	ATLANTIC RBCA Tier I RBSLs [1]	ATLANTIC RBCA Tier I ESLs - Wildlife and Livestock [3]	ATLANTIC RBCA Tier I ESLs - Plants and Soil Inv [2]	Stantec 2018 Phase II ESA																			
						General Area																			
						CWT-SS42 0 - 0.2 m	CWT-SS42 Lab-Dup -	CWT-SS43 0 - 0.2 m	CWT-SS44 0 - 0.2 m	CWT-SS46 0 - 0.2 m	CWT-SS48 0 - 0.2 m	CWT-SS49 0 - 0.2 m	CWT-SS50 0 - 0.2 m	CWT-SS50 Lab-Dup -	CWT-SS51 0 - 0.2 m	CWT-SS52 0 - 0.2 m	CWT-SS53 0 - 0.2 m	CWT-SS54 0 - 0.2 m	CWT-SS55 0 - 0.2 m	CWT-SS56 0 - 0.2 m	CWT-SS57 0 - 0.2 m	CWT-SS58 0 - 0.2 m	CWT-SS59 0 - 0.3 m	CWT-SS60 0 - 0.2 m	CWT-SS61 0 - 0.2 m	CWT-SS62 0 - 0.2 m
BTEX	Benzene	mg/kg	2.5	18	180	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
	Toluene	mg/kg	10 000	980	250	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
	Ethylbenzene	mg/kg	10 000	640	300	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
	Xylenes (Total)	mg/kg	110	2,600	350	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.10	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Modified TPH	Gas Range (C6-C10) (less BTEX)	mg/kg	-	11,000	320	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<5.0	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5
	Fuel Range (>C10-C16)	mg/kg	-	9,800	260	<10	-	<10	<10	<10	<10	<10	<10	-	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Fuel Range (>C16-C21)	mg/kg	-	16,000 [4]	1,700 [4]	<10	-	<10	<10	<10	<10	<10	<10	-	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Lube Range (>C21-C32)	mg/kg	-			<25	-	28	<25	<25	<25	48	<25	-	24	<25	18	<25	140	<25	<25	<25	550	21	27	<25
Total Modified TPH		mg/kg	870 as gas 4,000 as fuel oil 10,000 as lube oil	-	-	<15	-	28	<15	<15	<15	48	<15	-	24	<15	18	<15	140	<15	<15	<15	550	21	27	<15
Product Resemblance		-	-	-	-	-	-	ULO	-	-	-	PLO	-	-	PLO	-	ULO	-	ULO	-	-	-	ULO	ULO	ULO	-

Notes:

value	-exceeds Atlantic RBCA Tier I RBSL
value	-exceeds Atlantic RBCA Tier I ESL - Wilflide and Livestock
NC	-not calculated
value	-exceeds Atlantic RBCA Tier I ESL - Plants and Soil Inv
	-no guideline or value
NA	-not applicable

[1] 2012 (update 2015) Atlantic RBCA Tier I Risk-Based Screening Levels (RBSLs) for a commercial property with non-potable groundwater and coarse-grained soil.

[2] 2012 (update 2015) Atlantic RBCA Environmental Screening Level (ESL) for the Protection of Plants and Soil Invertebrates, Direct Soil Contact, for a commercial property with coarse grained soil. ESLs apply to the top 1.5 m of soil only.

[3] 2012 (update 2015) Atlantic RBCA Environmental Screening Level (ESL) for the Protection of Wildlife and Livestock, Soil & Food Ingestion, for a agricultural property with coarse grained soil (guidelines only exist for agricultural land use). ESLs apply to the top 1.5 m of soil only.

[3] Guidelines for the F3 fraction have been compared against the sum of the results for >C16-C21 and >C21-C32.

Resemblance Comment Key:

GF - Gasoline Fraction	FO = One product in the fuel oil range / fuel oil fraction
WGF - Weathered Gasoline Fraction	LO = One product in lube oil range / lube oil fraction
GR - Product in Gasoline Range	UFO = Unidentified compounds in fuel oil range
FOF - Fuel Oil Fraction	ULO = Unidentified compounds in lube oil range
WFOF - Weathered Fuel Oil Fraction	PLO = Possible lube oil fraction
FR - Product in Fuel Oil Range	FO = One produce in fuel oil range / fuel oil fraction
LOF - Lube Oil Fraction	G = One product in the gas range
LR - Lube Range	
UC - Unidentified Compounds	
NR - No Resemblance	
NA - Not Applicable	

TABLE 1: Petroleum Hydrocarbon (PHC) Compounds in Soil
Client: Department of National Defence
Site Location: Former USAF Radar Station, Cartwright, NL
Englobe Project No.: P-0012285-0-16-200

PARAMETER		UNITS	ATLANTIC RBCA Tier I RBSLs [1]	ATLANTIC RBCA Tier I ESLs - Wildlife and Livestock [3]	ATLANTIC RBCA Tier I ESLs - Plants and Soil Inv [2]	Stantec 2018 Phase II ESA																			
						General Area					Former Contractor Village														Main Complex
						CWT-TP33-BS1 0.1 - 0.6 m	CWT-TP33-BS2 1.2 - 1.7 m	CWT-TP34-BS1 0 - 0.4 m	CWT-TP43-BS1 0 - 0.4 m	CWT-TP111-BS1 0 - 0.4 m	CWT-SS63 0 - 0.2 m	CWT-SS64 0 - 0.2 m	CWT-SS66 0 - 0.3 m	CWT-SS67 0 - 0.3 m	CWT-SS68 0 - 0.3 m	CWT-TP35-BS2 1.0 - 1.5 m	CWT-TP37-BS2 0.8 - 1.3 m	CWT-TP38-BS2 0.8 - 1.3 m	CWT-TP39-BS2 0.8 - 1.3 m	CWT-TP40-BS2 0.8 - 1.3 m	CWT-TP40-BS2 Lab-Dup -	CWT-TP41-BS2 0.9 - 1.4 m	CWT-TP42-BS2 0.9 - 1.4 m	CWT-TP106-BS2 1.0 - 1.5 m	CWT-TP109-BS2 0.9 - 1.4 m	CWT-SS14 0 - 0.2 m
BTEX	Benzene	mg/kg	2.5	18	180	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
	Toluene	mg/kg	10 000	980	250	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
	Ethylbenzene	mg/kg	10 000	640	300	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	0.14	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	0.047	<0.025	<0.025
	Xylenes (Total)	mg/kg	110	2,600	350	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	1.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.17	0.4	<0.05	<0.05
Modified TPH	Gas Range (C6-C10) (less BTEX)	mg/kg	-	11,000	320	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	210	<2.5	<2.5	<2.5	<2.5	<2.5	70	260	120	25	<2.5
	Fuel Range (>C10-C16)	mg/kg	-	9,800	260	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	490	<10	15	<10	<10	-	830	27	330	68	<10
	Fuel Range (>C16-C21)	mg/kg	-	16,000 [4]	1,700 [4]	<10	20	<10	22	<10	<10	14	<10	<10	<10	53	<10	<10	<10	<10	-	<10	<10	21	<10	43
	Lube Range (>C21-C32)	mg/kg	-			100	120	<25	95	<25	<25	43	<25	<25	34	240	19	28	<25	<25	-	<25	<25	48	<25	270
Total Modified TPH		mg/kg	870 as gas 4,000 as fuel oil 10,000 as lube oil	-	-	100	140	<15	120	<15	<15	57	<15	<15	34	990	19	43	<15	<15	-	900	280	520	93	310
Product Resemblance		-	-	-	-	LO	LO	-	FO/LO	-	-	FO/LO - PLO	-	-	PLO	FO - LO - ULO	PLO	FO - PLO	-	-	-	WFO	G/FO	WFO - PLO	WFO	LO

Notes:

value	-exceeds Atlantic RBCA Tier I RBSL
value	-exceeds Atlantic RBCA Tier I ESL - Wilflide and Livestock
NC	-not calculated
value	-exceeds Atlantic RBCA Tier I ESL - Plants and Soil Inv
	-no guideline or value
NA	-not applicable

[1] 2012 (update 2015) Atlantic RBCA Tier I Risk-Based Screening Levels (RBSLs) for a commercial property with non-potable groundwater and coarse-grained soil.

[2] 2012 (update 2015) Atlantic RBCA Environmental Screening Level (ESL) for the Protection of Plants and Soil Invertebrates, Direct Soil Contact, for a commercial property with coarse grained soil. ESLs apply to the top 1.5 m of soil only.

[3] 2012 (update 2015) Atlantic RBCA Environmental Screening Level (ESL) for the Protection of Wildlife and Livestock, Soil & Food Ingestion, for a agricultural property with coarse grained soil (guidelines only exist for agricultural land use). ESLs apply to the top 1.5 m of soil only.

[3] Guidelines for the F3 fraction have been compared against the sum of the results for >C16-C21 and >C21-C32.

Resemblance Comment Key:

GF - Gasoline Fraction	FO = One product in the fuel oil range / fuel oil fraction
WGF - Weathered Gasoline Fraction	LO = One product in lube oil range / lube oil fraction
GR - Product in Gasoline Range	UFO = Unidentified compounds in fuel oil range
FOF - Fuel Oil Fraction	ULO = Unidentified compounds in lube oil range
WFOF - Weathered Fuel Oil Fraction	PLO = Possible lube oil fraction
FR - Product in Fuel Oil Range	FO = One produce in fuel oil range / fuel oil fraction
LOF - Lube Oil Fraction	G = One product in the gas range
LR - Lube Range	
UC - Unidentified Compounds	
NR - No Resemblance	
NA - Not Applicable	

TABLE 1: Petroleum Hydrocarbon (PHC) Compounds in Soil
Client: Department of National Defence
Site Location: Former USAF Radar Station, Cartwright, NL
Englobe Project No.: P-0012285-0-16-200

PARAMETER		UNITS	ATLANTIC RBCA Tier I RBSLs [1]	ATLANTIC RBCA Tier I ESLs - Wildlife and Livestock [3]	ATLANTIC RBCA Tier I ESLs - Plants and Soil Inv [2]	Stantec 2018 Phase II ESA																			
						Main Complex																			
						CWT-SS15 0 - 0.2 m	CWT-SS15 Lab-Dup -	CWT-SS16 0 - 0.2 m	CWT-SS17 0 - 0.2 m	CWT-SS18 0 - 0.2 m	CWT-SS19 0 - 0.2 m	CWT-SS20 0 - 0.2 m	CWT-SS21 0 - 0.2 m	CWT-SS22 0 - 0.2 m	CWT-SS23 0 - 0.2 m	CWT-SS24 0 - 0.2 m	CWT-SS25 0 - 0.2 m	CWT-SS26 0 - 0.2 m	CWT-SS27 0 - 0.2 m	CWT-SS29 0 - 0.2 m	CWT-SS30 0 - 0.2 m	CWT-SS31 0 - 0.2 m	CWT-SS32 0 - 0.2 m	CWT-SS33 0 - 0.2 m	CWT-SS34 0 - 0.2 m	CWT-SS34 Lab-Dup -
BTEX	Benzene	mg/kg	2.5	18	180	<0.025	-	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	-
	Toluene	mg/kg	10 000	980	250	<0.025	-	<0.025	<0.025	<0.025	<0.025	<0.025	0.23	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	-
	Ethylbenzene	mg/kg	10 000	640	300	<0.025	-	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	-
	Xylenes (Total)	mg/kg	110	2,600	350	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-
Modified TPH	Gas Range (C6-C10) (less BTEX)	mg/kg	-	11,000	320	<2.5	-	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	-
	Fuel Range (>C10-C16)	mg/kg	-	9,800	260	<10	<10	22	23	<10	<10	<10	14	<10	26	<10	20	<10	<10	<10	<10	<10	<10	1000	1000
	Fuel Range (>C16-C21)	mg/kg	-	16,000 [4]	1,700 [4]	<10	<10	78	120	<10	<10	<10	52	38	100	20	51	<10	<10	<10	<10	<10	<10	<10	*13000*	*12000*
	Lube Range (>C21-C32)	mg/kg	-			47	45	220	1100	48	40	54	180	130	490	150	120	32	26	<25	46	37	23	25	*14000*	*13000*
Total Modified TPH		mg/kg	870 as gas 4,000 as fuel oil 10,000 as lube oil	-	-	47	-	320	1200	48	40	54	240	170	620	170	190	32	26	<15	46	37	23	25	27000	-
Product Resemblance		-	-	-	-	ULO	-	UFO/ULO - LO	LO	LO	PLO	PLO	UFO/ULO - LO	FO/LO - PLO	FO/LO	LO	FO/LO	ULO	PLO	-	ULO	PLO	PLO	ULO	FO/LO	-

Notes:

value	-exceeds Atlantic RBCA Tier I RBSL
value	-exceeds Atlantic RBCA Tier I ESL - Wilflide and Livestock
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TABLE 1: Petroleum Hydrocarbon (PHC) Compounds in Soil
Client: Department of National Defence
Site Location: Former USAF Radar Station, Cartwright, NL
Englobe Project No.: P-0012285-0-16-200

PARAMETER		UNITS	ATLANTIC RBCA Tier I RBSLs [1]	ATLANTIC RBCA Tier I ESLs - Wildlife and Livestock [3]	ATLANTIC RBCA Tier I ESLs - Plants and Soil Inv [2]	Stantec 2018 Phase II ESA																			
						Main Complex																			
						CWT-SS36 0 - 0.2 m	CWT-SS38 0 - 0.2 m	CWT-SS39 0 - 0.2 m	CWT-SS40 0 - 0.2 m	CWT-SS41 0 - 0.2 m	CWT-TP6-BS1 0 - 0.6 m	CWT-TP6-BS1 Lab-Dup -	CWT-TP7-BS1 0 - 0.3 m	CWT-TP8-BS2 0.3 - 0.6 m	CWT-TP9-BS1 0 - 0.3 m	CWT-TP10-BS2 1.0 - 1.5 m	CWT-TP11-BS1 0 - 0.5 m	CWT-TP12-BS1 0 - 0.6 m	CWT-TP13-BS1 0 - 0.5 m	CWT-TP14-BS1 0.1 - 0.5 m	CWT-TP15-BS1 0.1 - 0.6 m	CWT-TP15-BS2 1.2 - 1.8 m	CWT-TP16-BS2 1.1 - 1.6 m	CWT-TP17-BS2 0.9 - 1.3 m	CWT-TP18-BS1 0 - 0.3 m	CWT-TP19-BS2 1.0 - 1.4 m
BTEX	Benzene	mg/kg	2.5	18	180	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	-	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
	Toluene	mg/kg	10 000	980	250	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	-	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
	Ethylbenzene	mg/kg	10 000	640	300	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	-	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
	Xylenes (Total)	mg/kg	110	2,600	350	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Modified TPH	Gas Range (C6-C10) (less BTEX)	mg/kg	-	11,000	320	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	-	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	98	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5
	Fuel Range (>C10-C16)	mg/kg	-	9,800	260	300	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	5100	21	110	170	17	<10	<10	<10
	Fuel Range (>C16-C21)	mg/kg	-	16,000 [4]	1,700 [4]	72	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	88	1000	49	160	200	23	13	<10	14
	Lube Range (>C21-C32)	mg/kg	-			27	<25	<25	28	<25	24	33	<25	21	74	<25	29	170	130	130	140	240	87	66	<25	71
Total Modified TPH		mg/kg	870 as gas 4,000 as fuel oil 10,000 as lube oil	-	-	400	<15	<15	28	<15	24	-	<15	21	74	<15	29	260	6300	200	410	610	130	79	<15	85
Product Resemblance		-	-	-	-	FO	-	-	PLO	-	ULO	-	-	PLO	LO	-	ULO	PLO	WFO	FO/LO	FO/LO	FO/LO	FO/LO	PLO - ULO	-	PLO - ULO

Notes:

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Englobe Project No.: P-0012285-0-16-200

PARAMETER		UNITS	ATLANTIC RBCA Tier I RBSLs [1]	ATLANTIC RBCA Tier I ESLs - Wildlife and Livestock [3]	ATLANTIC RBCA Tier I ESLs - Plants and Soil Inv [2]	Stantec 2018 Phase II ESA																				
						Main Complex																		Former USAF Dump Area and Former Ammunition Storage Area				
						CWT-TP20-BS1 0.1 - 0.6 m	CWT-TP21-BS1 0 - 0.5 m	CWT-TP22-BS1 0 - 0.3 m	CWT-TP23-BS1 0 - 0.4 m	CWT-TP24-BS1 0.2 - 0.7 m	CWT-TP25-BS2 1.0 - 1.5 m	CWT-TP26-BS2 1.0 - 1.5 m	CWT-TP27-BS2 1.1 - 1.6 m	CWT-TP27-BS2 Lab-Dup -	CWT-TP28-BS2 1.3 - 1.8 m	CWT-TP29-BS2 1.2 - 1.7 m	CWT-TP30-BS2 1.0 - 1.5 m	CWT-TP31-BS2 1.2 - 1.7 m	CWT-TP32-BS1 0 - 0.5 m	CWT-TP32-BS2 1.0 - 1.5 m	CWT-TP100-BS1 0 - 0.3 m	CWT-TP102-BS1 0.1 - 0.6 m	CWT-TP103-BS2 1.0 - 1.4 m	CWT-SS1 0 - 0.2 m	CWT-SS1 Lab-Dup -	CWT-SS2 0 - 0.2 m	CWT-SS3 0 - 0.2 m	CWT-SS4 0 - 0.2 m
BTEX	Benzene	mg/kg	2.5	18	180	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	-	<0.025	<0.025	<0.025
	Toluene	mg/kg	10 000	980	250	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	-	<0.025	<0.025	<0.025
	Ethylbenzene	mg/kg	10 000	640	300	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	-	<0.025	<0.025	<0.025
	Xylenes (Total)	mg/kg	110	2,600	350	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05
Modified TPH	Gas Range (C6-C10) (less BTEX)	mg/kg	-	11,000	320	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	-	<2.5	<2.5	<2.5
	Fuel Range (>C10-C16)	mg/kg	-	9,800	260	<10	<10	<10	<10	<10	14	<10	<10	<10	28	14	33	<10	<10	<10	<10	<10	<10	<10	75	48	140	<10	<10
	Fuel Range (>C16-C21)	mg/kg	-	16,000 [4]	1,700 [4]	<10	<10	<10	<10	21	51	<10	18	<10	38	33	100	<10	<10	<10	<10	<10	<10	<10	220	160	480	<10	<10
	Lube Range (>C21-C32)	mg/kg	-			<25	<25	<25	52	85	380	22	78	<25	110	63	420	<25	20	31	<25	<25	30	67	56	5900	20	23
Total Modified TPH		mg/kg	870 as gas 4,000 as fuel oil 10,000 as lube oil	-	-	<15	<15	<15	52	110	440	22	96	<15	180	110	560	<15	20	31	<15	<15	30	360	-	6500	20	23
Product Resemblance		-	-	-	-	-	-	-	LO	LO	LO	ULO	PLO - ULO	-	FO/LO	FO/LO	FO/LO - UFO/ULO	-	LO	PLO	-	-	ULO	FO/LO	-	UFO/ULO - LO	PLO	PLO

Notes:

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						Former USAF Dump Area and Former Ammunition Storage Area												Former Contractor Village						
						CWT-SS5 0 - 0.2 m	CWT-SS7 0 - 0.3 m	CWT-SS7 Lab-Dup -	CWT-SS9 0 - 0.3 m	CWT-SS10 0 - 0.3 m	CWT-SS11 0 - 0.3 m	CWT-SS12 0 - 0.3 m	CWT-SS12 Lab-Dup -	CWT-SS70 0 - 0.3 m	CWT-TP1-BS1 0 - 0.3 m	CWT-TP3-BS2 0.4 - 0.8 m	CWT-TP4-BS1 0 - 0.5 m	CWT-TP5-BS2 0.3 - 0.6 m	CWT-MW1/1 0 - 0.6 m 19-Aug-18	CWT-MW1/2 0.6 - 1.2 m 19-Aug-18	CWT-MW1/3 1.2 m - 1.8 m 19-Aug-18	CWT-MW1/DUPE 18-Aug-18	CWT-TP35-18-A 0 - 0.6 m 18-Aug-18	CWT-TP35-18A DUP 18-Aug-18	CWT-TP35-18-B 0 - 0.6 m 18-Aug-18
BTEX	Benzene	mg/kg	2.5	18	180	<0.025	<0.025	-	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
	Toluene	mg/kg	10 000	980	250	<0.025	<0.025	-	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
	Ethylbenzene	mg/kg	10 000	640	300	<0.025	<0.025	-	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	0.2	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
	Xylenes (Total)	mg/kg	110	2,600	350	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	1.56	<0.05	<0.05	<0.05	<0.05	<0.05	0.1
Modified TPH	Gas Range (C6-C10) (less BTEX)	mg/kg	-	11,000	320	<2.5	<2.5	-	<2.5	9.3	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	10	6	3.0	3.0	131	144	4
	Fuel Range (>C10-C16)	mg/kg	-	9,800	260	<10	<10	<10	<10	15	<10	<10	-	<10	<10	17	<10	<10	33	81	15	15	1800	1460	56
	Fuel Range (>C16-C21)	mg/kg	-	16,000 [4]	1,700 [4]	<10	<10	<10	<10	<10	<10	<10	-	<10	<10	56	<10	37	18	17	<15	<15	57	40	60
	Lube Range (>C21-C32)	mg/kg	-			<25	29	27	<25	<25	<25	<25	-	29	<25	240	<25	120	92	270	<15	<15	16	21	137
Total Modified TPH		mg/kg	870 as gas 4,000 as fuel oil 10,000 as lube oil	-	-	<15	29	-	<15	24	<15	<15	-	29	<15	310	<15	160	153	374	<20	<20	2000	1670	257
Product Resemblance		-	-	-	-	-	ULO - PLO	-	-	FO	-	-	-	ULO	-	LO	-	LO	FOF, LOF	FOF, LOF, UC	NR	NR	WFOF	FOF	WFOF+LOF+UC

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						Former Contractor Village									Former USAF Dump Area and Former Ammunition Storage Area						Main Complex						
						CWT-TP35-18-C	CWT-TP35-18-D	CWT-MW2/1	CWT-MW2/2	CWT-TP41-18-A	CWT-TP41-18-B	CWT-TP41-18B DUP	CWT-TP41-18-C	CWT-TP41-18-D	CWT-MW 4/1	CWT-MW 4/2	CWT-SS2-18-A	CWT-SS2-18-B	CWT-SS2-18-C	CWT-SS2-18-D	CWT-MW7/1	CWT-TP13-18-A/1	CWT-TP13-18-B/1	CWT-TP13-18-C/1	CWT-TP13/BH-1	CWT-SS36-18-A/1	CWT-SS36-18-B/1
						0 - 0.6 m 18-Aug-18	0 - 0.6 m 18-Aug-18	0 - 0.6 m 19-Aug-18	0.6 - 1 m 19-Aug-18	0 - 0.6 m 18-Aug-18	0 - 0.6 m 18-Aug-18	18-Aug-18	0 - 0.6 m 18-Aug-18	0 - 0.6 m 16-Aug-18	0 - 0.35 m 18-Aug-18	0.35 - 0.7 m 18-Aug-18	0 - 0.15 m 18-Aug-18	0 - 0.2 m 18-Aug-18	0 - 0.1 m 18-Aug-18	0 - 0.25 m 18-Aug-18	0 - 0.7 m 18-Aug-18	0.1 - 0.3 m 16-Aug-18	0 - 0.4 m 16-Aug-18	0.2 - 0.3 m 16-Aug-18	0.1 - 0.3 m 16-Aug-18	0 - 0.2 m 18-Aug-18	0 - 0.2 m 15-Aug-18
BTEX	Benzene	mg/kg	2.5	18	180	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
	Toluene	mg/kg	10 000	980	250	<0.04	<0.04	<0.04	<0.04	<0.04	0.056	<0.04	<0.04	0.93	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
	Ethylbenzene	mg/kg	10 000	640	300	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
	Xylenes (Total)	mg/kg	110	2,600	350	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Modified TPH	Gas Range (C6-C10) (less BTEX)	mg/kg	-	11,000	320	260	163	3.0	3.0	3	3	3	3	3.0	3	3	3	3	3	3	3.0	114	3.0	248	195	3	3
	Fuel Range (>C10-C16)	mg/kg	-	9,800	260	4070	1160	15.0	15	41	17	16	15	30	15	15	15	15	15	15	15	8360	24	12500	1540	15	15
	Fuel Range (>C16-C21)	mg/kg	-	16,000 [4]	1,700 [4]	263	22	19	<15	52	61	47	34	41	<15	<15	142	<15	<15	<15	<15	1360	<15	2030	387	<15	<15
	Lube Range (>C21-C32)	mg/kg	-			202	22	85	<15	96	368	247	137	250	30	23	1280	56	63	74	21.0	134	64	N/A	23	<15	19
Total Modified TPH		mg/kg	870 as gas 4,000 as fuel oil 10,000 as lube oil	-	-	4800	1370	104	<20	189	446	310	171	321	30	23	1420	56	63	74	21	10200	88	14800	2150	<20	<20
Product Resemblance		-	-	-	-	WFOF	FOF	WFOF, LOF	NR	WFOF+LOF+UC	LOF	LOF	WFOF+LOF	LOF+UC	LR	LR	UC	LR	UC	UC	UC	WFOF	WFOF+LR	WFOF	FOF	NR	UC

Notes:

value	-exceeds Atlantic RBCA Tier I RBSL
value	-exceeds Atlantic RBCA Tier I ESL - Wilflide and Livestock
NC	-not calculated
value	-exceeds Atlantic RBCA Tier I ESL - Plants and Soil Inv
	-no guideline or value
NA	-not applicable

[1] 2012 (update 2015) Atlantic RBCA Tier I Risk-Based Screening Levels (RBSLs) for a commercial property with non-potable groundwater and coarse-grained soil.

[2] 2012 (update 2015) Atlantic RBCA Environmental Screening Level (ESL) for the Protection of Plants and Soil Invertebrates, Direct Soil Contact, for a commercial property with coarse grained soil. ESLs apply to the top 1.5 m of soil only.

[3] 2012 (update 2015) Atlantic RBCA Environmental Screening Level (ESL) for the Protection of Wildlife and Livestock, Soil & Food Ingestion, for a agricultural property with coarse grained soil (guidelines only exist for agricultural land use). ESLs apply to the top 1.5 m of soil only.

[3] Guidelines for the F3 fraction have been compared against the sum of the results for >C16-C21 and >C21-C32.

Resemblance Comment Key:

GF - Gasoline Fraction	FO = One product in the fuel oil range / fuel oil fraction
WGF - Weathered Gasoline Fraction	LO = One product in lube oil range / lube oil fraction
GR - Product in Gasoline Range	UFO = Unidentified compounds in fuel oil range
FOF - Fuel Oil Fraction	ULO = Unidentified compounds in lube oil range
WFOF - Weathered Fuel Oil Fraction	PLO = Possible lube oil fraction
FR - Product in Fuel Oil Range	FO = One produce in fuel oil range / fuel oil fraction
LOF - Lube Oil Fraction	G = One product in the gas range
LR - Lube Range	
UC - Unidentified Compounds	
NR - No Resemblance	
NA - Not Applicable	

TABLE 2: Polycyclic Aromatic Hydrocarbons (PAHs) in Soil
Client: Department of National Defence
Site Location: Former USAF Radar Station, Cartwright, NL
Englobe Project No.: P-0012285-0-16-200

					Stantec 2018 Phase II ESA																
					General Area					Former Contractor Village						Main Complex				
PARAMETER	UNITS	B(a)P TPE	CCME SQG$_{EH}$	Human Health Guidelines	CWT-SS49 0 - 0.2 m	CWT-SS52 0 - 0.2 m	CWT-SS55 0 - 0.2 m	CWT-SS58 0 - 0.2 m	CWT-SS61 0 - 0.2 m	CWT-SS63 0 - 0.2 m	CWT-SS66 0 - 0.3 m	CWT-TP36-BS2 1.2 - 1.7 m	CWT-TP41-BS1 0.9 - 1.4 m	CWT-TP41-BS1 Lab-Dup -	CWT-TP104-BS2 1.2 - 1.7 m	CWT-SS13 0 - 0.3 m	CWT-SS20 0 - 0.2 m	CWT-SS23 0 - 0.2 m	CWT-SS32 0 - 0.2 m	CWT-SS35 0 - 0.2 m
1-Methylnaphthalene	mg/kg	-	-	160 [3]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.083	<0.01	<0.01	0.25	<0.01	<0.01	<0.01	<0.01	<0.01
2-Methylnaphthalene	mg/kg	-	-	160 [3]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.11	<0.01	<0.01	0.51	<0.01	<0.01	<0.01	<0.01	0.018
Acenaphthene	mg/kg	-	0.28 [1]	43,000 [2]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.013	0.029	<0.01	0.056	<0.01	<0.01
Acenaphthylene	mg/kg	-	320 [1]	6.6 [3]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acridine	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	mg/kg	-	32 [1]	30,000 [2]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.069	0.015	0.062	<0.01	<0.01
Benzo(a)anthracene	mg/kg	0.1	10 [1]	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.13	0.038	0.18	<0.01	<0.01
Benzo(a)pyrene	mg/kg	1	72 [1]	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.1	0.072	0.15	<0.01	<0.01
Benzo(b)fluoranthene	mg/kg	0.1	10 [1]	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.075	0.18	0.14	0.013	0.033
Benzo(b+j)fluoranthene	mg/kg	0.1	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.048	0.077	0.086	<0.01	<0.01
Benzo(e)pyrene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(ghi)perylene	mg/kg	0.01	13 [3]	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.069	0.089	0.11	<0.01	<0.01
Benzo(k)fluoranthene	mg/kg	0.1	10 [1]	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.049	0.075	0.086	<0.01	<0.01
Chrysene	mg/kg	0.01	14 [3]	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.14	0.12	0.21	0.023	<0.01
Dibenz(a,h)anthracene	mg/kg	1	10 [1]	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.016	0.025	0.024	<0.01	<0.01
Fluoranthene	mg/kg	-	180 [1]	50,000 [2]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.36	0.074	0.47	0.025	<0.01
Fluorene	mg/kg	-	0.25 [1]	39,000 [2]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.021	0.021	<0.01	0.041	<0.01	<0.01
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	10 [1]	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.056	0.085	0.097	<0.01	0.018
Naphthalene	mg/kg	-	0.013 [1]	25 [2]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.026	<0.01	<0.01	0.21	<0.01	<0.01	0.017	<0.01	<0.01
Perylene	mg/kg	-	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.032	0.02	0.038	<0.01	<0.01
Phenanthrene	mg/kg	-	0.046 [1]	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.012	0.22	0.022	0.34	<0.01	<0.01
Pyrene	mg/kg	-	100 [1]	30,000 [2]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.27	0.066	0.33	0.022	0.025
Quinoline	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B(a)P TPE [4]	-	-	-	5.3 [1,4]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.2	0.0	0.0

Notes:

value	-value exceeds HH Guidelines
[value]	-value exceeds CCME CSQG$_{EH}$
-	-no guideline or value

[1] 1999 (with 2016 update) Canadian Council of Ministers of the Environment (CCME) *Soil Quality Guidelines (SQGs) for the Protection of Environmental Health*, Commercial Land Use.

[2] 2016 Alberta Tier I Soil and Groundwater Remediation Guidelines: Table A-4, Surface Soil Remediation Guidelines, Commercial Land Use, Non-Potable Water.

[3] 2011 Ontario Ministry of the Environment (OMOE) Soil and Groundwater Standards for Use at Contaminated Sites in Ontatio, Table 3, Commercial /Industrial Land Use, Non-Potable Water.

[4] Canadian Environmental Quality Guidelines for the Protection of Environment and Human Health for Polycyclic Aromatic Hydrocarbons, 2010. When the concentration was less than the RDL, half of the RDL was used in the Benzo[a]pyrene Total Potency Equivalents (B(a)P TPE) calculations. B(a)P TPE is the sum of estimated cancer potency relative to Benzo[a]pyrene for all potentially carcinogenic unsubstituted PAHs. The B[a]P TPE for a soil sample is calculated by multiplying the concentration of each PAH in the sample by its B[a]P Potency Equivalence Factor (PEF), and summing the products. Based on an incremental lifetime cancer risk (ILCR) of 1 in 100,000.

TABLE 2: Polycyclic Aromatic Hydrocarbons (PAHs) in Soil
Client: Department of National Defence
Site Location: Former USAF Radar Station, Cartwright, NL
Englobe Project No.: P-0012285-0-16-200

PARAMETER	UNITS	B(a)P TPE	CCME SQG$_{EH}$	Human Health Guidelines	Stantec 2018 Phase II ESA																
					Main Complex																Former USAF Dump Area and Ammunition Storage Area
					CWT-SS37	CWT-TP7-BS1	CWT-TP7-BS1 Lab-Dup	CWT-TP8-BS2	CWT-TP11-BS1	CWT-TP15-BS2	CWT-TP17-BS1	CWT-TP19-BS1	CWT-TP22-BS1	CWT-TP25-BS2	CWT-TP26-BS1	CWT-TP28-BS1	CWT-TP30-BS1	CWT-TP31-BS1	CWT-TP101-BS1	CWT-SS8
					0 - 0.2 m	0 - 0.3 m	-	0.3 - 0.6 m	0 - 0.5 m	1.2 - 1.8 m	0 - 0.5 m	0 - 0.5 m	0 - 0.3 m	1.0 - 1.5 m	0 - 0.5 m	0 - 0.5 m	0.1 - 0.6 m	0.1 -0.6 m	0 - 0.5 m	0 - 0.3 m
1-Methylnaphthalene	mg/kg	-	-	160 [3]	<0.053	<0.01	<0.01	<0.01	<0.01	0.41	0.018	<0.01	<0.01	<0.01	<0.01	<0.01	0.019	<0.01	<0.01	<0.01
2-Methylnaphthalene	mg/kg	-	-	160 [3]	<0.095	<0.01	<0.01	<0.01	<0.01	0.68	0.039	<0.01	<0.01	0.016	<0.01	<0.01	0.044	<0.01	<0.01	<0.01
Acenaphthene	mg/kg	-	0.28 [1]	43,000 [2]	<0.049	<0.01	<0.01	<0.01	<0.01	4	0.096	<0.01	<0.01	0.088	<0.01	<0.01	1.8	<0.01	<0.01	<0.01
Acenaphthylene	mg/kg	-	320 [1]	6.6 [3]	<0.088	<0.01	<0.01	<0.01	0.019	0.043	0.048	<0.01	<0.01	<0.01	<0.01	<0.01	0.08	<0.01	<0.01	<0.01
Acridine	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	mg/kg	-	32 [1]	30,000 [2]	<0.056	<0.01	<0.01	<0.01	0.047	5.6	0.49	<0.01	<0.01	0.14	<0.01	<0.01	0.53	<0.01	<0.01	<0.01
Benzo(a)anthracene	mg/kg	0.1	10 [1]	-	<0.087	<0.01	<0.01	<0.01	0.066	9.1	1.7	<0.01	<0.01	0.26	<0.01	<0.01	1.5	<0.01	<0.01	<0.01
Benzo(a)pyrene	mg/kg	1	72 [1]	-	<0.01	<0.01	<0.01	<0.01	0.042	6.9	1.3	<0.01	<0.01	0.25	<0.01	<0.01	0.36	<0.01	<0.01	<0.01
Benzo(b)fluoranthene	mg/kg	0.1	10 [1]	-	0.18	<0.01	<0.01	<0.01	0.096	5.7	1.8	<0.01	<0.01	0.25	<0.01	<0.01	0.48	<0.01	<0.01	<0.01
Benzo(b+j)fluoranthene	mg/kg	0.1	-	-	<0.01	<0.01	<0.01	<0.01	0.053	3.5	1	<0.01	<0.01	0.14	<0.01	<0.01	0.3	<0.01	<0.01	<0.01
Benzo(e)pyrene	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(ghi)perylene	mg/kg	0.01	13 [3]	-	<0.035	<0.01	<0.01	<0.01	0.027	3.1	0.57	<0.01	<0.01	0.15	<0.01	<0.01	0.087	<0.01	<0.01	0.15
Benzo(k)fluoranthene	mg/kg	0.1	10 [1]	-	<0.025	<0.01	<0.01	<0.01	0.052	3.4	1	<0.01	<0.01	0.14	<0.01	<0.01	0.28	<0.01	<0.01	<0.01
Chrysene	mg/kg	0.01	14 [3]	-	1.1	<0.01	<0.01	<0.01	0.19	9.1	2.1	<0.01	<0.01	0.32	<0.01	<0.01	1.2	<0.01	<0.01	<0.01
Dibenz(a,h)anthracene	mg/kg	1	10 [1]	-	<0.01	<0.01	<0.01	<0.01	<0.01	0.91	0.14	<0.01	<0.01	0.037	<0.01	<0.01	0.024	<0.01	<0.01	<0.01
Fluoranthene	mg/kg	-	180 [1]	50,000 [2]	0.05	<0.01	<0.01	<0.01	0.22	22	4.2	<0.01	<0.01	0.7	<0.01	<0.01	9.8	<0.01	<0.01	<0.01
Fluorene	mg/kg	-	0.25 [1]	39,000 [2]	<0.14	<0.01	<0.01	<0.01	<0.01	3.4	0.18	<0.01	<0.01	0.072	<0.01	<0.01	1.3	<0.01	<0.01	<0.01
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	10 [1]	-	<0.01	<0.01	<0.01	<0.01	0.026	3.1	0.55	<0.01	<0.01	0.12	<0.01	<0.01	0.086	<0.01	<0.01	<0.01
Naphthalene	mg/kg	-	0.013 [1]	25 [2]	<0.12	<0.01	<0.01	<0.01	<0.01	1.6	0.067	<0.01	<0.01	0.026	<0.01	<0.01	0.014	<0.01	<0.01	<0.01
Perylene	mg/kg	-	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	1.8	0.26	<0.01	<0.01	0.073	<0.01	<0.01	0.098	<0.01	<0.01	0.15
Phenanthrene	mg/kg	-	0.046 [1]	-	<0.049	<0.01	<0.01	<0.01	0.062	20	1.1	<0.01	<0.01	0.57	<0.01	<0.01	4.3	<0.01	<0.01	<0.01
Pyrene	mg/kg	-	100 [1]	30,000 [2]	0.24	<0.01	<0.01	<0.01	0.18	16	4.9	<0.01	<0.01	0.52	<0.01	<0.01	6.1	<0.01	<0.01	<0.01
Quinoline	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B(a)P TPE [4]	-	-	-	5.3 [1,4]	0.0	0.0	0.0	0.0	0.1	10.4	2.1	0.0	0.0	0.4	0.0	0.0	0.7	0.0	0.0	0.0

Notes:

value	-value exceeds HH Guidelines
[value]	-value exceeds CCME CSQG$_{EH}$
-	-no guideline or value

[1] 1999 (with 2016 update) Canadian Council of Ministers of the Environment (CCME) *Soil Quality Guidelir Protection of Environmental Health*, Commercial Land Use.

[2] 2016 Alberta Tier I Soil and Groundwater Remediation Guidelines: Table A-4, Surface Soil Remediation Commercial Land Use, Non-Potable Water.

[3] 2011 Ontario Ministry of the Environment (OMOE) Soil and Groundwater Standards for Use at Contamin Ontatio, Table 3, Commercial /Industrial Land Use, Non-Potable Water.

[4] Canadian Environmental Quality Guidelines for the Protection of Environment and Human Health for Pol Hydrocarbons, 2010. When the concentration was less than the RDL, half of the RDL was used in the Be Potency Equivalents (B(a)P TPE) calculations. B(a)P TPE is the sum of estimated cancer potency relative Benzo[a]pyrene for all potentially carcinogenic unsubstituted PAHs. The B[a]P TPE for a soil sample is ca multiplying the concentration of each PAH in the sample by its B[a]P Potency Equivalence Factor (PEF), a products. Based on an incremental lifetime cancer risk (ILCR) of 1 in 100,000.

TABLE 2: Polycyclic Aromatic Hydrocarbons (PAHs) in Soil
Client: Department of National Defence
Site Location: Former USAF Radar Station, Cartwright, NL
Englobe Project No.: P-0012285-0-16-200

					Stantec 2018 Phase II ESA			Englobe 2018 Phase III ESA											
PARAMETER	UNITS	B(a)P TPE	CCME SQG$_{EH}$	Human Health Guidelines	Former USAF Dump Area and Ammunition Storage Area			Former Contractor Village								Main Complex				
					CWT-SS10	CWT-TP2-BS2	CWT-TP5-BS2	CWT-MW3/1	CWT-MW3/2	CWT-MW3/3	CWT-MW3/4	CWT-TP36-18-A	CWT-TP36-18-B	CWT-TP36-18-C	CWT-TP36-18-D	CWT-MW7/1	CWT-MW7-DUPE	CWT-MW13/1	CWT-MW13/3	CWT-TP15-18-A/1
					0 - 0.3 m	0.3 - 0.7 m	0.3 - 0.6 m	0 - 0.3 m	0.3 - 0.6 m	0.6 - 1.2 m	1.2 - 1.8 m	0 - 0.6 m	0 - 0.6 m	0 - 0.6 m	0 - 0.6 m	0 - 0.7 m		0 - 0.6 m	1.8 - 2 m	0 - 0.6 m
								19-Aug-18	19-Aug-18	19-Aug-18	19-Aug-18	18-Aug-18	18-Aug-18	18-Aug-18	18-Aug-18	18-Aug-18	18-Aug-18	18-Aug-18	18-Aug-18	16-Aug-18
1-Methylnaphthalene	mg/kg	-	-	160 [3]	<0.01	<0.01	0.04	<0.05	<0.05	<0.05	0.05	<0.05	0.08	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
2-Methylnaphthalene	mg/kg	-	-	160 [3]	<0.01	<0.01	0.047	<0.01	<0.01	0.05	0.11	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.06	<0.01
Acenaphthene	mg/kg	-	0.28 [1]	43,000 [2]	<0.01	<0.01	0.065	<0.00671	<0.00671	<0.00671	<0.00671	<0.00671	<0.00671	<0.00671	<0.00671	<0.00671	<0.00671	0.0582	0.295	<0.00671
Acenaphthylene	mg/kg	-	320 [1]	6.6 [3]	<0.01	<0.01	<0.01	<0.004	<0.004	<0.004	<0.004	0.011	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.031	<0.004
Acridine	mg/kg	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.07	<0.05
Anthracene	mg/kg	-	32 [1]	30,000 [2]	<0.01	<0.01	<0.01	<0.03	<0.03	<0.03	<0.03	<0.03	0.04	<0.03	<0.03	<0.03	<0.03	0.07	0.35	0.05
Benzo(a)anthracene	mg/kg	0.1	10 [1]	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.07	<0.01	<0.01	<0.01	<0.01	0.19	0.93	0.15
Benzo(a)pyrene	mg/kg	1	72 [1]	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.04	<0.01	<0.01	<0.01	<0.01	0.16	1.03	<0.01
Benzo(b)fluoranthene	mg/kg	0.1	10 [1]	-	<0.01	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	0.07	<0.05	<0.05	<0.05	<0.05	0.16	0.88	<0.05
Benzo(b+j)fluoranthene	mg/kg	0.1	-	-	<0.01	<0.01	<0.01	<0.1	<0.1	<0.1	<0.1	<0.1	0.11	<0.1	<0.1	<0.1	<0.1	0.24	1.55	<0.1
Benzo(e)pyrene	mg/kg	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.13	0.72	<0.05
Benzo(ghi)perylene	mg/kg	0.01	13 [3]	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	0.02	<0.01	<0.01	<0.01	<0.01	0.13	0.76	<0.01
Benzo(k)fluoranthene	mg/kg	0.1	10 [1]	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.05	<0.01	<0.01	<0.01	<0.01	0.09	0.37	<0.01
Chrysene	mg/kg	0.01	14 [3]	-	<0.01	0.013	<0.01	<0.01	<0.01	<0.01	<0.01	0.03	0.08	<0.01	<0.01	<0.01	<0.01	0.19	0.92	0.17
Dibenz(a,h)anthracene	mg/kg	1	10 [1]	-	<0.01	<0.01	<0.01	<0.006	<0.006	<0.006	<0.006	<0.006	0.009	<0.006	<0.006	<0.006	<0.006	0.029	0.168	<0.006
Fluoranthene	mg/kg	-	180 [1]	50,000 [2]	<0.01	0.015	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	0.15	<0.05	<0.05	<0.05	<0.05	0.35	1.69	0.25
Fluorene	mg/kg	-	0.25 [1]	39,000 [2]	<0.01	<0.01	0.034	<0.01	<0.01	<0.01	<0.01	<0.01	0.03	<0.01	<0.01	<0.01	<0.01	0.04	0.27	<0.01
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	10 [1]	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.03	<0.01	<0.01	<0.01	<0.01	0.14	0.85	<0.01
Naphthalene	mg/kg	-	0.013 [1]	25 [2]	<0.01	0.015	0.054	<0.01	<0.01	<0.01	<0.01	<0.01	0.66	<0.01	<0.01	<0.01	<0.01	0.01	0.16	<0.01
Perylene	mg/kg	-	-	-	<0.01	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.28	<0.05
Phenanthrene	mg/kg	-	0.046 [1]	-	<0.01	0.027	0.052	<0.03	<0.03	<0.03	<0.03	<0.03	0.05	<0.03	<0.03	<0.03	<0.03	0.28	1.69	0.29
Pyrene	mg/kg	-	100 [1]	30,000 [2]	<0.01	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	0.2	<0.05	<0.05	<0.05	<0.05	0.26	1.21	0.25
Quinoline	mg/kg	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
B(a)P TPE [4]	-	-	-	5.3 [1,4]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.3	1.6	0.0

Notes:

value	-value exceeds HH Guidelines
[value]	-value exceeds CCME CSQG$_{EH}$
-	-no guideline or value

[1] 1999 (with 2016 update) Canadian Council of Ministers of the Environment (CCME) *Soil Quality Guidelir Protection of Environmental Health*, Commercial Land Use.

[2] 2016 Alberta Tier I Soil and Groundwater Remediation Guidelines: Table A-4, Surface Soil Remediation Commercial Land Use, Non-Potable Water.

[3] 2011 Ontario Ministry of the Environment (OMOE) Soil and Groundwater Standards for Use at Contamin Ontatio, Table 3, Commercial /Industrial Land Use, Non-Potable Water.

[4] Canadian Environmental Quality Guidelines for the Protection of Environment and Human Health for Pol Hydrocarbons, 2010. When the concentration was less than the RDL, half of the RDL was used in the Be Potency Equivalents (B(a)P TPE) calculations. B(a)P TPE is the sum of estimated cancer potency relative Benzo[a]pyrene for all potentially carcinogenic unsubstituted PAHs. The B[a]P TPE for a soil sample is ca multiplying the concentration of each PAH in the sample by its B[a]P Potency Equivalence Factor (PEF), a products. Based on an incremental lifetime cancer risk (ILCR) of 1 in 100,000.

TABLE 2: Polycyclic Aromatic Hydrocarbons (PAHs) in Soil
Client: Department of National Defence
Site Location: Former USAF Radar Station, Cartwright, NL
Englobe Project No.: P-0012285-0-16-200

PARAMETER	UNITS	B(a)P TPE	CCME SQG$_{EH}$	Human Health Guidelines	Englobe 2018 Phase III ESA – Main Complex														
					CWT-TP15-18-A/3 1.4 - 1.8 m 16-Aug-18	CWT-TP15-18-B/1 0 - 0.6 m 16-Aug-18	CWT-TP15-18-B/3 1.4 - 1.8 m 16-Aug-18	CWT-TP15-18-C/1 0 - 0.6 m 16-Aug-18	CWT-TP15-18-C/2 0.6 - 0.9 m 16-Aug-18	CWT-TP15-18-D/1 0 - 0.6 m 16-Aug-18	CWT-TP15-18-D/3 1.5 - 1.7 m 16-Aug-18	CWT-TP15-18-E/3 1.4 - 1.7 m 16-Aug-18	CWT-TP15-18-F-A/1 0.3 - 0.6 m 16-Aug-18	CWT-TP15-18-F-A/3 1.8 m 16-Aug-18	CWT-MW14/1 0 - 0.2 m 16-Aug-18	CWT-MW14/DUP 17-Aug-18	CWT-TP17-18-A/1 0 - 0.2 m 16-Aug-18	CWT-TP17-18-B/1 0 - 0.7 m 16-Aug-18	CWT-TP17-18-C/1 0 - 0.3 m 16-Aug-18
1-Methylnaphthalene	mg/kg	-	-	160 [3]	<0.05	<0.05	0.47	0.1	<0.05	<0.05	1.07	<0.05	<0.05	0.12	<0.05	<0.05	<0.05	<0.05	<0.05
2-Methylnaphthalene	mg/kg	-	-	160 [3]	0.02	0.04	0.74	0.1	<0.01	<0.01	1.25	<0.01	<0.01	0.22	<0.01	<0.01	<0.01	<0.01	<0.01
Acenaphthene	mg/kg	-	0.28 [1]	43,000 [2]	0.0602	0.117	2.97	0.114	0.0129	0.0308	0.0921	<0.00671	0.0149	0.0392	<0.00671	<0.00671	<0.00671	<0.00671	<0.00671
Acenaphthylene	mg/kg	-	320 [1]	6.6 [3]	0.015	0.038	0.15	0.092	<0.004	<0.004	0.078	0.147	<0.004	0.086	<0.004	<0.004	0.004	<0.004	<0.004
Acridine	mg/kg	-	-	-	<0.05	<0.05	0.79	<0.05	<0.05	<0.05	0.08	0.17	<0.05	0.08	<0.05	<0.05	<0.05	<0.05	<0.05
Anthracene	mg/kg	-	32 [1]	30,000 [2]	0.11	0.1	4.55	0.08	<0.03	0.04	0.07	0.05	<0.03	0.07	<0.03	<0.03	<0.03	<0.03	<0.03
Benzo(a)anthracene	mg/kg	0.1	10 [1]	-	0.27	0.29	9.37	0.35	0.05	0.1	0.2	0.03	0.05	0.06	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(a)pyrene	mg/kg	1	72 [1]	-	0.23	0.22	5.34	0.27	0.03	0.07	0.22	0.04	0.04	0.04	<0.01	<0.01	0.02	<0.01	<0.01
Benzo(b)fluoranthene	mg/kg	0.1	10 [1]	-	0.3	<0.05	4.64	<0.05	<0.05	<0.05	0.22	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	<0.05	<0.05
Benzo(b+j)fluoranthene	mg/kg	0.1	-	-	0.45	<0.1	10.3	<0.1	<0.1	<0.1	0.31	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(e)pyrene	mg/kg	-	-	-	0.26	0.25	3.08	0.36	<0.05	<0.05	0.17	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(ghi)perylene	mg/kg	0.01	13 [3]	-	0.25	<0.01	3.2	<0.01	0.04	0.03	0.17	0.04	0.03	0.03	0.02	<0.01	0.03	<0.01	<0.01
Benzo(k)fluoranthene	mg/kg	0.1	10 [1]	-	0.11	<0.01	2.2	<0.01	0.02	<0.01	0.09	0.03	<0.01	0.03	<0.01	<0.01	0.02	<0.01	<0.01
Chrysene	mg/kg	0.01	14 [3]	-	0.3	0.36	8.88	0.39	0.05	0.1	0.23	0.04	0.06	0.11	<0.01	<0.01	0.03	<0.01	<0.01
Dibenz(a,h)anthracene	mg/kg	1	10 [1]	-	0.058	<0.006	1.06	<0.006	0.008	0.011	0.052	0.007	<0.006	0.008	<0.006	<0.006	0.01	<0.006	<0.006
Fluoranthene	mg/kg	-	180 [1]	50,000 [2]	0.59	<0.05	24.7	<0.05	0.11	0.15	0.41	0.06	0.09	0.2	<0.05	<0.05	<0.05	<0.05	<0.05
Fluorene	mg/kg	-	0.25 [1]	39,000 [2]	0.05	<0.01	2.76	<0.01	0.01	0.02	0.1	<0.01	0.01	0.08	<0.01	<0.01	<0.01	<0.01	<0.01
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	10 [1]	-	0.24	<0.01	3.98	<0.01	0.03	0.03	0.18	0.04	0.03	0.03	0.02	<0.01	0.03	<0.01	<0.01
Naphthalene	mg/kg	-	0.013 [1]	25 [2]	0.02	<0.01	1.5	<0.01	<0.01	<0.01	0.17	<0.01	<0.01	0.05	<0.01	<0.01	<0.01	<0.01	<0.01
Perylene	mg/kg	-	-	-	0.06	<0.05	1.3	<0.05	<0.05	<0.05	0.06	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Phenanthrene	mg/kg	-	0.046 [1]	-	0.39	0.48	22.5	0.26	0.07	0.18	0.26	0.04	0.1	0.36	<0.03	<0.03	<0.03	<0.03	<0.03
Pyrene	mg/kg	-	100 [1]	30,000 [2]	0.43	<0.05	16.4	<0.05	0.08	0.15	0.36	0.07	0.09	0.16	<0.05	<0.05	<0.05	<0.05	<0.05
Quinoline	mg/kg	-	-	-	<0.05	<0.05	0.11	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
B(a)P TPE [4]	-	-	-	5.3 [1,4]	0.4	0.3	9.1	0.3	0.0	0.1	0.4	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0

Notes:

value	-value exceeds HH Guidelines
[value]	-value exceeds CCME CSQG$_{EH}$
-	-no guideline or value

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TABLE 2: Polycyclic Aromatic Hydrocarbons (PAHs) in Soil
Client: Department of National Defence
Site Location: Former USAF Radar Station, Cartwright, NL
Englobe Project No.: P-0012285-0-16-200

PARAMETER	UNITS	B(a)P TPE	CCME SQG$_{EH}$	Human Health Guidelines	Englobe 2018 Phase III ESA														
					Main Complex														
					CWT-TP17-18-D/1	CWT-MW15/1	CWT-TP25-18-A/1	CWT-TP25-18-A/2	CWT-TP25-18-A/2 DUP	CWT-TP25-18-B/2	CWT-TP25-18-C/2	CWT-TP25-18-D/1	CWT-TP25-18-D/2	CWT-SS13-18-A	CWT-SS13-18-B	CWT-SS13-18-C	CWT-SS13-18-D	CWT-SS23-18-A/1	CWT-SS23-18-B/1
					0 - 0.3 m	0 - 0.6 m	0 - 0.3 m	0.3 - 0.9 m		0.9 - 1.5 m	0.7 - 1.5 m	0 - 0.4 m	0.4 - 1.6 m	0 - 0.25 m	0 - 0.3 m	0 - 0.2 m	0 - 0.3 m	0 - 0.3 m	0 - 0.3 m
					16-Aug-18	16-Aug-18	17-Aug-18	17-Aug-18	17-Aug-18	17-Aug-18	17-Aug-18	17-Aug-18	17-Aug-18	16-Aug-18	16-Aug-18	16-Aug-18	16-Aug-18	16-Aug-18	16-Aug-18
1-Methylnaphthalene	mg/kg	-	-	160 [3]	<0.05	<0.05	1.22	<0.05	<0.05	<0.05	<0.05	1.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
2-Methylnaphthalene	mg/kg	-	-	160 [3]	<0.01	0.02	1.26	0.02	0.01	<0.01	<0.01	0.89	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acenaphthene	mg/kg	-	0.28 [1]	43,000 [2]	<0.00671	0.119	1.14	0.112	0.0551	<0.00671	<0.00671	1.2	0.0515	0.013	<0.00671	<0.00671	<0.00671	<0.00671	<0.00671
Acenaphthylene	mg/kg	-	320 [1]	6.6 [3]	<0.004	<0.004	<0.004	0.03	0.017	<0.004	<0.004	0.962	0.025	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Acridine	mg/kg	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Anthracene	mg/kg	-	32 [1]	30,000 [2]	<0.03	0.16	<0.03	0.16	0.1	<0.03	<0.03	0.85	0.07	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Benzo(a)anthracene	mg/kg	0.1	10 [1]	-	<0.01	0.38	3.31	0.42	0.21	<0.01	<0.01	3.13	0.21	0.03	<0.01	0.02	<0.01	<0.01	0.02
Benzo(a)pyrene	mg/kg	1	72 [1]	-	<0.01	0.32	2.31	0.36	0.19	<0.01	<0.01	2.28	0.19	0.03	<0.01	<0.01	<0.01	<0.01	0.01
Benzo(b)fluoranthene	mg/kg	0.1	10 [1]	-	<0.05	0.29	2.94	0.32	0.2	<0.05	<0.05	<0.05	0.18	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(b+j)fluoranthene	mg/kg	0.1	-	-	<0.1	0.52	4.97	0.54	0.33	<0.1	<0.1	<0.1	0.32	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(e)pyrene	mg/kg	-	-	-	<0.05	0.24	2.65	0.26	0.17	<0.05	<0.05	2.58	0.16	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(ghi)perylene	mg/kg	0.01	13 [3]	-	<0.01	0.23	2.36	0.25	0.15	<0.01	<0.01	2.26	0.17	0.02	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(k)fluoranthene	mg/kg	0.1	10 [1]	-	<0.01	0.14	3.51	0.17	0.13	<0.01	<0.01	<0.01	0.08	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Chrysene	mg/kg	0.01	14 [3]	-	<0.01	0.4	3.07	0.41	0.23	<0.01	<0.01	3.08	0.23	0.03	<0.01	0.01	<0.01	<0.01	0.02
Dibenz(a,h)anthracene	mg/kg	1	10 [1]	-	<0.006	0.07	2.22	0.061	0.047	<0.006	<0.006	1.95	0.035	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Fluoranthene	mg/kg	-	180 [1]	50,000 [2]	<0.05	0.77	<0.05	0.85	0.42	<0.05	<0.05	1.7	0.43	0.07	<0.05	<0.05	<0.05	<0.05	<0.05
Fluorene	mg/kg	-	0.25 [1]	39,000 [2]	<0.01	0.12	<0.01	0.09	0.05	<0.01	<0.01	1.14	0.05	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	10 [1]	-	<0.01	0.23	2.38	0.25	0.15	<0.01	<0.01	2.23	0.16	0.02	<0.01	<0.01	<0.01	<0.01	<0.01
Naphthalene	mg/kg	-	0.013 [1]	25 [2]	<0.01	0.03	1.15	0.03	<0.01	<0.01	<0.01	1.07	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perylene	mg/kg	-	-	-	<0.05	0.1	2.26	0.09	0.05	<0.05	<0.05	2.11	0.06	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Phenanthrene	mg/kg	-	0.046 [1]	-	<0.03	0.76	1.73	0.72	0.4	<0.03	<0.03	1.83	0.36	0.1	<0.03	<0.03	<0.03	<0.03	<0.03
Pyrene	mg/kg	-	100 [1]	30,000 [2]	<0.05	0.54	<0.05	0.61	0.31	<0.05	<0.05	<0.05	0.34	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Quinoline	mg/kg	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
B(a)P TPE [4]	-	-	-	5.3 [1,4]	0.0	0.5	6.0	0.6	0.3	0.0	0.0	4.8	0.3	0.0	0.0	0.0	0.0	0.0	0.0

Notes:

value	-value exceeds HH Guidelines
[value]	-value exceeds CCME CSQG$_{EH}$
-	-no guideline or value

[1] 1999 (with 2016 update) Canadian Council of Ministers of the Environment (CCME) *Soil Quality Guidelir Protection of Environmental Health*, Commercial Land Use.

[2] 2016 Alberta Tier I Soil and Groundwater Remediation Guidelines: Table A-4, Surface Soil Remediation Commercial Land Use, Non-Potable Water.

[3] 2011 Ontario Ministry of the Environment (OMOE) Soil and Groundwater Standards for Use at Contamin Ontatio, Table 3, Commercial /Industrial Land Use, Non-Potable Water.

[4] Canadian Environmental Quality Guidelines for the Protection of Environment and Human Health for Pol Hydrocarbons, 2010. When the concentration was less than the RDL, half of the RDL was used in the Be Potency Equivalents (B(a)P TPE) calculations. B(a)P TPE is the sum of estimated cancer potency relative Benzo[a]pyrene for all potentially carcinogenic unsubstituted PAHs. The B[a]P TPE for a soil sample is ca multiplying the concentration of each PAH in the sample by its B[a]P Potency Equivalence Factor (PEF), a products. Based on an incremental lifetime cancer risk (ILCR) of 1 in 100,000.

TABLE 2: Polycyclic Aromatic Hydrocarbons (PAHs) in Soil
Client: Department of National Defence
Site Location: Former USAF Radar Station, Cartwright, NL
Englobe Project No.: P-0012285-0-16-200

PARAMETER	UNITS	B(a)P TPE	CCME SQG$_{EH}$	Human Health Guidelines	Englobe 2018 Phase III ESA												
					Main Complex												Former USAF Dump Area and Former Ammunition Storage Area
					CWT-SS23-18-C/1 0 - 0.3 m 16-Aug-18	CWT-TP11-18-A 0.5 m 17-Aug-18	CWT-TP11-18-B 0.4 m 17-Aug-18	CWT-TP11-18-C 0.4 m 17-Aug-18	CWT-TP11-18-D 0.5 m 17-Aug-18	CWT-TP30-18-A/1 0 - 0.6 m 17-Aug-18	CWT-TP30-18-A/2 1 - 1.4 m 17-Aug-18	CWT-TP30-18-B/1 0 - 0.6 m 17-Aug-18	CWT-TP30-18-B/2 1 - 1.2 m 17-Aug-18	CWT-TP30-18-C/1 0 - 0.6 m 17-Aug-18	CWT-TP30-18-C/2 1 - 1.5 m 17-Aug-18	CWT-TP30-18-D/2 0.8 m 17-Aug-18	CWT-TP5-18-A/1 0 - 0.3 m 15-Aug-18
1-Methylnaphthalene	mg/kg	-	-	160 [3]	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.1	<0.05	0.42	<0.05	<0.05
2-Methylnaphthalene	mg/kg	-	-	160 [3]	0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	0.1	<0.01	0.39	<0.01	0.03
Acenaphthene	mg/kg	-	0.28 [1]	43,000 [2]	0.0763	<0.00671	0.0397	<0.00671	<0.00671	<0.00671	<0.00671	<0.00671	0.508	<0.00671	0.283	<0.00671	<0.00671
Acenaphthylene	mg/kg	-	320 [1]	6.6 [3]	<0.004	<0.004	0.018	0.006	0.014	<0.004	<0.004	<0.004	<0.004	<0.004	0.063	<0.004	<0.004
Acridine	mg/kg	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.06	<0.05	<0.05	<0.05	<0.05
Anthracene	mg/kg	-	32 [1]	30,000 [2]	0.15	<0.03	0.19	<0.03	<0.03	<0.03	<0.03	<0.03	0.17	<0.03	<0.03	<0.03	<0.03
Benzo(a)anthracene	mg/kg	0.1	10 [1]	-	0.3	<0.01	0.35	0.04	0.02	<0.01	0.02	<0.01	0.17	<0.01	0.03	<0.01	<0.01
Benzo(a)pyrene	mg/kg	1	72 [1]	-	0.24	<0.01	0.28	0.06	0.02	<0.01	<0.01	<0.01	0.07	<0.01	<0.01	<0.01	<0.01
Benzo(b)fluoranthene	mg/kg	0.1	10 [1]	-	0.23	<0.05	0.33	0.07	0.05	<0.05	<0.05	<0.05	0.06	<0.05	<0.05	<0.05	<0.05
Benzo(b+j)fluoranthene	mg/kg	0.1	-	-	0.37	<0.1	0.46	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(e)pyrene	mg/kg	-	-	-	0.22	<0.05	0.23	0.06	0.06	<0.05	<0.05	<0.05	0.07	<0.05	<0.05	<0.05	<0.05
Benzo(ghi)perylene	mg/kg	0.01	13 [3]	-	0.31	<0.01	0.2	0.05	0.03	<0.01	<0.01	<0.01	0.04	<0.01	<0.01	<0.01	<0.01
Benzo(k)fluoranthene	mg/kg	0.1	10 [1]	-	0.14	<0.01	0.14	0.03	0.02	<0.01	<0.01	<0.01	0.05	<0.01	<0.01	<0.01	<0.01
Chrysene	mg/kg	0.01	14 [3]	-	0.32	<0.01	0.38	0.05	0.06	<0.01	0.02	<0.01	0.21	<0.01	0.02	<0.01	<0.01
Dibenz(a,h)anthracene	mg/kg	1	10 [1]	-	0.06	<0.006	0.051	0.013	0.011	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Fluoranthene	mg/kg	-	180 [1]	50,000 [2]	0.73	<0.05	0.83	0.05	<0.05	<0.05	0.14	<0.05	1.18	<0.05	0.07	<0.05	<0.05
Fluorene	mg/kg	-	0.25 [1]	39,000 [2]	0.07	<0.01	0.06	<0.01	<0.01	<0.01	<0.01	<0.01	0.61	<0.01	0.21	<0.01	0.01
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	10 [1]	-	0.21	<0.01	0.23	0.05	0.03	<0.01	<0.01	<0.01	0.04	<0.01	<0.01	<0.01	<0.01
Naphthalene	mg/kg	-	0.013 [1]	25 [2]	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.14	<0.01	0.14	<0.01	<0.01
Perylene	mg/kg	-	-	-	0.07	<0.05	0.06	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Phenanthrene	mg/kg	-	0.046 [1]	-	0.49	<0.03	0.49	<0.03	<0.03	<0.03	0.05	<0.03	1.21	<0.03	0.11	<0.03	<0.03
Pyrene	mg/kg	-	100 [1]	30,000 [2]	0.52	<0.05	0.57	0.05	<0.05	<0.05	0.12	<0.05	0.77	<0.05	0.05	<0.05	<0.05
Quinoline	mg/kg	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
B(a)P TPE [4]	-	-	-	5.3 [1,4]	0.4	0.0	0.5	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0

Notes:

value	-value exceeds HH Guidelines
[value]	-value exceeds CCME CSQG$_{EH}$
-	-no guideline or value

[1] 1999 (with 2016 update) Canadian Council of Ministers of the Environment (CCME) *Soil Quality Guidelir Protection of Environmental Health*, Commercial Land Use.

[2] 2016 Alberta Tier I Soil and Groundwater Remediation Guidelines: Table A-4, Surface Soil Remediation Commercial Land Use, Non-Potable Water.

[3] 2011 Ontario Ministry of the Environment (OMOE) Soil and Groundwater Standards for Use at Contamin Ontatio, Table 3, Commercial /Industrial Land Use, Non-Potable Water.

[4] Canadian Environmental Quality Guidelines for the Protection of Environment and Human Health for Pol Hydrocarbons, 2010. When the concentration was less than the RDL, half of the RDL was used in the Be Potency Equivalents (B(a)P TPE) calculations. B(a)P TPE is the sum of estimated cancer potency relative Benzo[a]pyrene for all potentially carcinogenic unsubstituted PAHs. The B[a]P TPE for a soil sample is ca multiplying the concentration of each PAH in the sample by its B[a]P Potency Equivalence Factor (PEF), a products. Based on an incremental lifetime cancer risk (ILCR) of 1 in 100,000.

TABLE 2: Polycyclic Aromatic Hydrocarbons (PAHs) in Soil
Client: Department of National Defence
Site Location: Former USAF Radar Station, Cartwright, NL
Englobe Project No.: P-0012285-0-16-200

PARAMETER	UNITS	B(a)P TPE	CCME SQG$_{EH}$	Human Health Guidelines	Englobe 2018 Phase III ESA										
					Former USAF Dump Area and Former Ammunition Storage Area										
					CWT-TP5-18-A/2	CWT-TP5-18-B/1	CWT-TP5-18-C/1	CWT-TP5-18-C/2	CWT-TP5-18-D/1	CWT-TP5-18-D/2	CWT-TP2-18A 0.7	CWT-TP2-18B 0.7	CWT-TP2-18C 0.7	CWT-TP2-18D 0.7	CWT-TP2-18E 0.7
					0.3 - 0.9 m	0 - 0.3 m	0 - 0.3 m	0.3 - 0.9 m	0 - 0.2 m	0.2 - 0.9 m	0.3 - 0.7 m	0.3 - 0.7 m	0.3 - 0.7 m	0.3 - 0.7 m	0.3 - 0.7 m
					15-Aug-18	15-Aug-18	15-Aug-18	15-Aug-18	15-Aug-18	15-Aug-18	15-Aug-18	15-Aug-18	15-Aug-18	15-Aug-18	15-Aug-18
1-Methylnaphthalene	mg/kg	-	-	160 [3]	<0.05	<0.05	0.08	<0.05	<0.05	<0.05	<0.05	<0.05	0.53	<0.05	<0.05
2-Methylnaphthalene	mg/kg	-	-	160 [3]	<0.01	<0.01	0.08	<0.01	<0.01	<0.01	<0.01	<0.01	0.7	<0.01	<0.01
Acenaphthene	mg/kg	-	0.28 [1]	43,000 [2]	<0.00671	<0.00671	<0.00671	<0.00671	<0.00671	<0.00671	<0.00671	<0.00671	5.13	<0.00671	<0.00671
Acenaphthylene	mg/kg	-	320 [1]	6.6 [3]	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.285	0.432	<0.004
Acridine	mg/kg	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Anthracene	mg/kg	-	32 [1]	30,000 [2]	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	15.9	0.76	<0.03
Benzo(a)anthracene	mg/kg	0.1	10 [1]	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	19.7	1.03	<0.01
Benzo(a)pyrene	mg/kg	1	72 [1]	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	14.5	2.48	<0.01
Benzo(b)fluoranthene	mg/kg	0.1	10 [1]	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	12.6	3.35	<0.05
Benzo(b+j)fluoranthene	mg/kg	0.1	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	20.3	5.38	<0.1
Benzo(e)pyrene	mg/kg	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	7.71	2.07	<0.05
Benzo(ghi)perylene	mg/kg	0.01	13 [3]	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	8.19	0.8	<0.01
Benzo(k)fluoranthene	mg/kg	0.1	10 [1]	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	3.93	1.19	<0.01
Chrysene	mg/kg	0.01	14 [3]	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	16.1	2.54	<0.01
Dibenz(a,h)anthracene	mg/kg	1	10 [1]	-	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	1.9	0.249	<0.006
Fluoranthene	mg/kg	-	180 [1]	50,000 [2]	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	59.5	0.46	<0.05
Fluorene	mg/kg	-	0.25 [1]	39,000 [2]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	6.02	0.07	<0.01
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	10 [1]	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	9.27	1.07	<0.01
Naphthalene	mg/kg	-	0.013 [1]	25 [2]	<0.01	<0.01	0.12	<0.01	<0.01	<0.01	<0.01	<0.01	0.08	<0.01	<0.01
Perylene	mg/kg	-	-	-	<0.05	0.31	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	3.57	0.68	<0.05
Phenanthrene	mg/kg	-	0.046 [1]	-	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	46.8	<0.03	<0.03
Pyrene	mg/kg	-	100 [1]	30,000 [2]	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	41.8	1.14	<0.05
Quinoline	mg/kg	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
B(a)P TPE [4]	-	-	-	5.3 [1,4]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	22.0	3.6	0.0

Notes:

value	-value exceeds HH Guidelines
[value]	-value exceeds CCME CSQG$_{EH}$
-	-no guideline or value

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TABLE 3: Volatile Organic Comounds (VOCs) in Soil
Client: Department of National Defence
Site Location: Former USAF Radar Station, Cartwright, NL
Englobe Project No.: P-0012285-0-16-200

PARAMETER	UNITS	Selected Guideline	Stantec 2018 Phase II ESA													Englobe 2018 Phase III ESA				
			Former Contractor Village			Main Complex									Former USAF Dump Area and Former Ammunition Storage Area		Main Complex				
			CWT-SS67	CWT-TP36-BS2	CWT-TP104-BS2	CWT-SS13	CWT-SS16	CWT-SS34	CWT-SS36	CWT-TP8-BS2	CWT-TP11-BS1	CWT-TP26-BS2	CWT-TP28-BS2	CWT-TP30-BS2	CWT-SS11	CWT-TP5-BS2	CWT-MW9/1	CWT-TP8-18-A/1	CWT-TP8-18-B/1	CWT-TP8-18-C/1	CWT-TP8-18-D/1
			0 - 0.3 m	1.2 - 1.7 m	1.2 - 1.7 m	0 - 0.3 m	0 - 0.2 m	0 - 0.2 m	0 - 0.2 m	0.3 - 0.6 m	0 - 0.5 m	1.0 - 1.5 m	1.3 - 1.8 m	1.0 - 1.5 m	0 - 0.3 m	0.3 - 0.6 m	0 - 0.1 m 16-Aug-18	0 - 0.05 m 16-Aug-18	0 - 0.25 m 16-Aug-18	0 - 0.3 m 16-Aug-18	0 - 0.3 m 16-Aug-18
1,1,1-Trichloroethane	ug/kg	50,000 [1]	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<30	<30	<30	<30	<30
1,1,1,2-Tetrachloroethane	µg/kg	50,000 [1]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<100	<100	<100	<100	<100
1,1,2,2-Tetrachloroethane	ug/kg	50,000 [1]	<25	<25	<150	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<50	<50	<50	<50	<50
1,1,2-Trichloroethane	ug/kg	50,000 [1]	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<30	<30	<30	<30	<30
1,1-Dichloroethane	ug/kg	50,000 [1]	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<100	<100	<100	<100	<100
1,1-Dichloroethylene	ug/kg	50,000 [1]	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<50	<50	<50	<50	<50
1,2-Dichlorobenzene	ug/kg	10,000 [1]	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<50	<50	<50	<50	<50
1,2-Dibromoethane	ug/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50	<50	<50	<50	<50
1,2-Dichloroethane	ug/kg	50,000 [1]	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<100	<100	<100	<100	<100
1,2-Dichloropropane	ug/kg	50,000 [1]	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<50	<50	<50	<50	<50
1,3-Dichlorobenzene	ug/kg	10,000 [1]	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<50	<50	<50	<50	<50
1,4-Dichlorobenzene	ug/kg	10,000 [1]	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<50	<50	<50	<50	<50
2-Hexanone	ug/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<500	<500	<500	<500	<500
Acetone	ug/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<500	<500	<500	<500	<500
Benzene	ug/kg	2,500 [2], 180,000 [3], 18,000 [4]	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<6.8	<6.8	<6.8	<6.8	<6.8
Bromodichloromethane	ug/kg	18,000 [6]	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<100	<100	<100	<100	<100
Bromoform	ug/kg	610 [6]	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<100	<100	<100	<100	<100
Bromomethane	ug/kg	50,000 [6]	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
Carbon Tetrachloride	ug/kg	50,000 [1]	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<50	<50	<50	<50	<50
Chloromethane	ug/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<100	<100	<100	<100	<100
Chlorobenzene	ug/kg	10,000 [1]	<25	<25	<32	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<50	<50	<50	<50	<50
Chloroethane	ug/kg	-	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<100	<100	<100	<100	<100
Chloroform	ug/kg	50,000 [1]	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<50	<50	<50	<50	<50
cis-1,2-Dichloroethylene	ug/kg	55,000 [6]	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<100	<100	<100	<100	<100
cis-1,3-Dichloropropene	ug/kg	180 [6]	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<100	<100	<100	<100	<100
Dibromochloromethane	ug/kg	2,500 [5]	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<100	<100	<100	<100	<100
Ethylbenzene	ug/kg	10,000,000 [2], 300,000 [3], 640,000 [4]	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<18	<18	<18	<18	<18
Ethylene Dibromide	ug/kg	50 [5]	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	-	-	-	-	-
Methylene Chloride (Dichloromethane)	ug/kg	50,000 [1]	<25	36	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<100	<100	<100	<100	<100
o-Xylene	ug/kg	110,000 [2], 350,000 [3], 2,600,000 [4]	<25	<25	63	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<100	<100	<100	<100	<100
m,p-Xylene	ug/kg	2,600,000 [4]	<25	<25	110	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<100	<100	<100	<100	<100
Styrene	ug/kg	50,000 [1]	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<100	<100	<100	<100	<100
Tetrachloroethylene	ug/kg	500 [5]	<25	<25	<25	<25	170	<25	<25	<25	<25	<25	<25	<25	<25	<25	<100	<100	<100	<100	<100
Toluene	ug/kg	10,000,000 [2], 250,000 [3], 980,000 [4]	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<80	<80	<80	<80	<80
trans-1,2-Dichloroethylene	ug/kg	50,000 [1]	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<80	<80	<80	<80	<80
trans-1,3-Dichloropropene	ug/kg	180 [6]	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<100	<100	<100	<100	<100
Trichloroethylene	ug/kg	10 [2]	<10	<10	<10	<10	<10	<10	<10	14	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Trichlorofluoromethane (FREON 11)	ug/kg	32,000 [6]	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<100	<100	<100	<100	<100
Vinyl Chloride	ug/kg	4.3 [5]	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20

Notes:

value	-value exceeds guideline
-	-no guideline or value
NC	-not calculated

[1] 1999 Canadian Council of Ministers of the Environment (CCME) Canadian Soil Qaulity Guidelines (SQGs) for th Protection of Environmental and Human Health, Commercial Property.

[2] 2012 (revised 2015) Atlantic Risk-Based Corrective Action (RBCA) Tier I Risk-Based Screening Levels (RBSLs), Table 4a, Commercial Site with Non-Potable Groundwater.

[3] ARBCA Tier I Risk-Based Screening Levels (RBSLs), Tier I Soil Ecological Screening Levels (ESLs) for the Protection of Plants and Soil Invertebrates, Direct Soil Contact (Table 1a), Commmercial Site with Coarse Grained Soil (applies to top 1.5 m).

[4] 2012 (revised 2015) ARBCA Tier I Soil ESLs for the Protection of Wildlife (mammals and birds) and Livestock, Soil and Food Ingestion (Table 1b), Agricultural Site with Coarse Grained Soil (applies to top 1.5 m).

[5] 2016 Alberta Tier I Soil and Groundwater, Remediation Guidelines: Table A-4 Surface Soil Remediation Guidelines, Commercial Property with Non-Potable Water.

[6] 2011 Ontario Ministry of the Environment (OMOE) Soil and Groudnwater Standards for Use at Contaminated Sites in Ontario, Table 3, Full Depth, Commercial/Industiral Site with Non-Potable Water.

TABLE 4: Metals in Soil
Client: Department of National Defence
Site Location: Former USAF Radar Station, Cartwright, NL
Englobe Project No.: P-0012285-0-16-200

PARAMETER	UNITS	Selected Guideline	Stantec 2018 Phase II ESA															
			General Area										Former Contractor Village					
			CWT-SS43 0 - 0.2 m	CWT-SS44 0 - 0.2 m	CWT-SS48 0 - 0.2 m	CWT-SS49 0 - 0.2 m	CWT-SS52 0 - 0.2 m	CWT-SS54 0 - 0.2 m	CWT-SS56 0 - 0.2 m	CWT-SS57 0 - 0.2 m	CWT-SS58 0 - 0.2 m	CWT-SS60 0 - 0.2 m	CWT-SS62 0 - 0.2 m	CWT-SS63 0 - 0.2 m	CWT-SS65 0 - 0.3 m	CWT-SS67 0 - 0.3 m	CWT-SS68 0 - 0.3 m	CWT-TP36-BS1 0.1 - 0.6 m	CWT-TP37-BS1 0 - 0.5 m
Aluminum (Al)	mg/kg	-	4800	5100	3300	4700	3600	7700	1900	11000	25000	7800	6400	2300	3700	2300	4300	3700	3500
Antimony (Sb)	mg/kg	40 [2]	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Arsenic (As)	mg/kg	26 [1]	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	2.2	<2	<2
Barium (Ba)	mg/kg	2,000 [1]	27	40	35	59	18	18	35	48	40	41	90	13	34	17	35	36	31
Beryllium (Be)	mg/kg	8 [2]	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Bismuth (Bi)	mg/kg	-	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Boron (B)	mg/kg	120 [3]	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
Cadmium (Cd)	mg/kg	22 [1]	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Chromium (Cr)	mg/kg	87 [1]	7.5	11	9.1	8.6	7.5	9.3	<2	4.4	19	11	5	3.7	7.3	3.5	7.3	10	5.7
Cobalt (Co)	mg/kg	300 [2]	1.5	3.1	2.1	2.3	<1	<1	<1	1.1	1.4	2.8	1.5	1.4	2	1.7	2.4	2.6	2
Copper (Cu)	mg/kg	91 [1]	6.9	6	2.5	7.7	<2	3.2	<2	<2	3	6.1	5.4	3.1	5	4.6	4	6.3	8.5
Iron (Fe)	mg/kg	-	10000	13000	15000	13000	6100	6900	6300	34000	36000	20000	23000	6900	8800	8800	11000	9600	7400
Lead (Pb)	mg/kg	600 [1]	4.4	4.3	2.5	5.8	6.8	3.8	1.6	3.4	6.2	4.6	8.1	4	23	8.1	9.9	6.1	5
Lithium (Li)	mg/kg	-	<2	4	3.5	4.7	<2	<2	<2	3.2	3.1	4.4	3.7	2.8	4.6	3.1	4.4	3.3	3.3
Manganese (Mn)	mg/kg	-	110	150	160	220	46	64	80	340	240	260	510	71	120	95	140	130	110
Mercury	mg/kg	50 [1]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Molybdenum (Mo)	mg/kg	40 [2]	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Nickel (Ni)	mg/kg	89 [1]	2.9	5.1	3.8	3.2	<2	<2	<2	<2	<2	3.5	<2	2.5	3.6	3	3.5	6.3	3
Rubidium (Rb)	mg/kg	-	3.9	6.9	5.5	11	3.3	2	10	8.5	8.1	6.7	8.1	3.2	6.3	3.8	7.4	6.4	7.7
Selenium (Se)	mg/kg	2.9 [1]	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Silver (Ag)	mg/kg	40 [2]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Strontium (Sr)	mg/kg	-	8.1	8.6	6.7	9.3	<5	6.4	<5	<5	<5	7.8	6.4	7.8	7.9	6.3	8.2	10	8.9
Thallium (Tl)	mg/kg	1 [1]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Tin (Sn)	mg/kg	300 [2]	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	2.4	<2	<2	<2	29	<2
Uranium (U)	mg/kg	300 [1]	0.26	0.35	0.25	0.27	0.37	0.44	<0.1	0.16	0.69	0.43	0.26	0.3	0.27	0.19	0.28	0.31	0.29
Vanadium (V)	mg/kg	130 [1]	19	28	29	21	24	16	<2	23	45	32	12	9.3	15	8.6	19	19	14
Zinc (Zn)	mg/kg	410 [1]	48	23	22	39	6	8	11	42	42	29	54	12	29	23	25	34	26

Notes:

value	-value exceeds guideline
-	-no guideline or value
NC	-not calculated

[1] 1999 (with 2016 update) Canadian Council of Ministers of the Environment (CCME) *Soil Environmental Quality Guidelines (EQGs)* for the Protection of Environmental and Human Health, Commercial Land Use.

[2] 1991 CCME Interim Soil Quality Criteria

[3] 2011 Ontario Ministry of the Environment (OMOE) Soil and Groundwater Standards for Use at Contaminated Sites in Ontario, Table 3, Commercial/Industrial Land Use, Non-Potable Water.

TABLE 4: Metals in Soil
Client: Department of National Defence
Site Location: Former USAF Radar Station, Cartwright, NL
Englobe Project No.: P-0012285-0-16-200

PARAMETER	UNITS	Selected Guideline	Stantec 2018 Phase II ESA																		
			Former Contractor Village					Main Complex Area													
			CWT-TP37-BS1 Lab-Dup -	CWT-TP39-BS1 0 - 0.5 m	CWT-TP40-BS1 0 - 0.5 m	CWT-TP42-BS1 0.1 - 0.6 m	CWT-TP105-BS1 0.1 - 0.6 m	CWT-SS13 0 - 0.3 m	CWT-SS14 0 - 0.2 m	CWT-SS14 Lab-Dup -	CWT-SS14 Lab-Dup 2 -	CWT-SS16 0 - 0.2 m	CWT-SS18 0 - 0.2 m	CWT-SS20 0 - 0.2 m	CWT-SS22 0 - 0.2 m	CWT-SS24 0 - 0.2 m	CWT-SS26 0 - 0.2 m	CWT-SS28 0 - 0.2 m	CWT-SS30 0 - 0.2 m	CWT-SS31 0 - 0.2 m	CWT-SS32 0 - 0.2 m
Aluminum (Al)	mg/kg	-	3400	3100	4100	4600	5300	4800	4800	4700	-	7800	6000	8100	5800	4100	5700	6000	5200	4800	8900
Antimony (Sb)	mg/kg	40 [2]	<2	<2	<2	<2	<2	<2	<2	<2	-	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Arsenic (As)	mg/kg	26 [1]	<2	<2	<2	<2	2.1	<2	<2	<2	-	2.2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Barium (Ba)	mg/kg	2,000 [1]	31	28	42	32	32	61	63	65	-	140	36	54	47	48	67	33	39	79	46
Beryllium (Be)	mg/kg	8 [2]	<2	<2	<2	<2	<2	<2	<2	<2	-	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Bismuth (Bi)	mg/kg	-	<2	<2	<2	<2	<2	<2	<2	<2	-	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Boron (B)	mg/kg	120 [3]	<50	<50	<50	<50	<50	<50	<50	<50	-	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
Cadmium (Cd)	mg/kg	22 [1]	<0.3	<0.3	<0.3	<0.3	<0.3	2.3	0.82	0.79	-	0.76	<0.3	1.3	0.69	<0.3	<0.3	<0.3	1.1	0.77	49
Chromium (Cr)	mg/kg	87 [1]	6	6.6	7.5	14	18	14	14	13	-	21	11	17	11	9	9	11	11	8	13
Cobalt (Co)	mg/kg	300 [2]	1.8	1.6	2.7	2.7	2.9	3.2	3.1	2.7	-	4.8	2.8	3.2	2.9	2.5	2.4	2.8	3.3	1.8	2.6
Copper (Cu)	mg/kg	91 [1]	8.5	5.2	7.4	4	4	19	36	30	-	24	7	13	37	9	6	10	12	12	8
Iron (Fe)	mg/kg	-	7600	8500	8200	16000	21000	18000	12000	12000	-	22000	13000	20000	15000	13000	16000	14000	12000	17000	16000
Lead (Pb)	mg/kg	600 [1]	5.1	9	15	1.9	2.7	120.0	110.0	95.0	-	200.0	24.0	23.0	63.0	63.0	13.0	20.0	18.0	62.0	11.0
Lithium (Li)	mg/kg	-	3.2	2.9	3.8	5.5	5.8	4.9	5.7	5.8	-	8.3	4.8	5.1	5.0	4.0	5.8	4.0	5.4	3.7	4.3
Manganese (Mn)	mg/kg	-	120	95	120	120	150	240	220	220	-	380	200	310	260	220	280	160	220	460	180
Mercury	mg/kg	50 [1]	<0.1	<0.1	<0.1	<0.1	<0.1	0.14	<0.1	<0.1	-	0	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Molybdenum (Mo)	mg/kg	40 [2]	<2	<2	<2	<2	<2	<2	<2	<2	-	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Nickel (Ni)	mg/kg	89 [1]	3	2.8	5.4	5	5	7	6	6	-	12	5	6	5	4	4	6	6	3	4
Rubidium (Rb)	mg/kg	-	7.2	4.6	8.1	6.3	6	7.1	6	6.0	-	13	6	4.9	6	6	8	5.4	7	5.2	8
Selenium (Se)	mg/kg	2.9 [1]	<1	<1	<1	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Silver (Ag)	mg/kg	40 [2]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Strontium (Sr)	mg/kg	-	9.6	7	11	8	10	16	29	30	-	17	11	22	14	9	10	13	16	11	20
Thallium (Tl)	mg/kg	1 [1]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Tin (Sn)	mg/kg	300 [2]	<2	<2	<2	<2	<2	3.2	6.8	3.5	-	3.3	<2	<2	<2	<2	<2	<2	<2	<2	<2
Uranium (U)	mg/kg	300 [1]	0.27	0.33	0.34	0.5	0.7	0.3	0.3	0.3	-	0.6	0.4	0.7	0.4	0.3	0.4	0.4	0.5	0.3	0.4
Vanadium (V)	mg/kg	130 [1]	14	15	16	43	61	26	19	21	-	21	26	34	25	21	24	31	26	13	31
Zinc (Zn)	mg/kg	410 [1]	27	23	23	17	19	310	170	94	96	750	71	290	130	55	62	73	86	120	1400

Notes:

value	-value exceeds guideline
-	-no guideline or value
NC	-not calculated

[1] 1999 (with 2016 update) Canadian Council of Ministers of the Environment (CCME) *Soil Environmental Quality Guidelines (EQGs)* for the Protection of Environmental and Human Health, Commercial Land Use.

[2] 1991 CCME Interim Soil Quality Criteria

[3] 2011 Ontario Ministry of the Environment (OMOE) Soil and Groundwater Standards for Use at Contaminated Sites in Ontario, Table 3, Commercial/Industrial Land Use, Non-Potable Water.

TABLE 4: Metals in Soil
Client: Department of National Defence
Site Location: Former USAF Radar Station, Cartwright, NL
Englobe Project No.: P-0012285-0-16-200

PARAMETER	UNITS	Selected Guideline	Stantec 2018 Phase II ESA																		
			Main Complex Area																		
			CWT-SS32 Lab-Dup -	CWT-SS34 0 - 0.2 m	CWT-SS35 0 - 0.2 m	CWT-SS36 0 - 0.2 m	CWT-SS37 0 - 0.2 m	CWT-SS41 0 - 0.2 m	CWT-TP6-BS1 0 - 0.6 m	CWT-TP8-BS2 0.3 - 0.6 m	CWT-TP10-BS1 0 - 0.5 m	CWT-TP11-BS1 0 - 0.5 m	CWT-TP14-BS1 0.1 - 0.5 m	CWT-TP15-BS1 0.1 - 0.6 m	CWT-TP16-BS1 0 - 0.5 m	CWT-TP18-BS1 0 - 0.3 m	CWT-TP20-BS1 0.1 - 0.6 m	CWT-TP21-BS1 0 - 0.5 m	CWT-TP23-BS1 0 - 0.4 m	CWT-TP24-BS1 0.2 - 0.7 m	CWT-TP25-BS1 0 .1 - 0.5 m
Aluminum (Al)	mg/kg	-	8700	8900	6600	17000	7700	9000	5100	7400	16000	6100	4900	6200	5600	5800	5200	6900	7100	6200	8100
Antimony (Sb)	mg/kg	40 [2]	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Arsenic (As)	mg/kg	26 [1]	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Barium (Ba)	mg/kg	2,000 [1]	51	28	40	450	76	39	20	89	28	42	62	57	40	22	28	43	22	40	66
Beryllium (Be)	mg/kg	8 [2]	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Bismuth (Bi)	mg/kg	-	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Boron (B)	mg/kg	120 [3]	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
Cadmium (Cd)	mg/kg	22 [1]	52	1.2	<0.3	<0.3	0.34	6.5	<0.3	<0.3	<0.3	<0.3	<0.3	0.38	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	2.3
Chromium (Cr)	mg/kg	87 [1]	13	18	12	73	10	17	12	9	18	11	9	12	10	15	16	12	12	14	17
Cobalt (Co)	mg/kg	300 [2]	2.6	3.4	2.5	14	2.9	2.7	1.5	2.2	2.1	2	2.7	2.9	2.5	2.9	3.4	3.3	2.3	2.4	3
Copper (Cu)	mg/kg	91 [1]	8	9	6	3	6	10	4	5	4	7	6	13	5	7	7	7	12	10	20
Iron (Fe)	mg/kg	-	16000	20000	14000	31000	12000	21000	14000	21000	18000	15000	15000	16000	14000	17000	18000	15000	15000	13000	18000
Lead (Pb)	mg/kg	600 [1]	14.0	9.4	7.5	2.0	6.6	24.0	7.2	18.0	3.1	9.4	22.0	43.0	3.2	2.5	3.2	7.4	5.2	9.0	92.0
Lithium (Li)	mg/kg	-	3.7	4.2	3.1	8.2	2.3	3.0	<2	2.9	2.7	3.4	4.4	4.7	4.9	3.1	3.3	4.6	3.0	3.9	4.8
Manganese (Mn)	mg/kg	-	170	180	170	290	170	170	95	260	110	190	370	230	200	130	140	180	120	140	290
Mercury	mg/kg	50 [1]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.18
Molybdenum (Mo)	mg/kg	40 [2]	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	9.7
Nickel (Ni)	mg/kg	89 [1]	5	7	4	40	5	6	3	3	4	4	3	6	4	5	5	5	4	4	7
Rubidium (Rb)	mg/kg	-	8	5	6	35	5.7	4	2.7	19	3.2	5	7	8	6.7	4	4	7	3.2	6	5.2
Selenium (Se)	mg/kg	2.9 [1]	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Silver (Ag)	mg/kg	40 [2]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Strontium (Sr)	mg/kg	-	21	11	11	10	12	14	12	11	11	13	17	17	10	10	11	16	11	9	24
Thallium (Tl)	mg/kg	1 [1]	<0.1	<0.1	<0.1	0.25	<0.1	<0.1	0.18	<0.1	0.13	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Tin (Sn)	mg/kg	300 [2]	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Uranium (U)	mg/kg	300 [1]	0.4	0.6	0.5	0.2	0.5	0.4	0.4	0.4	0.5	0.4	0.3	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.6
Vanadium (V)	mg/kg	130 [1]	30	41	27	88	28	42	29	36	45	27	23	31	29	41	46	32	35	32	32
Zinc (Zn)	mg/kg	410 [1]	1300	48	33	57	51	300	37	42	16	45	86	120	27	16	18	34	50	36	570

Notes:

value	-value exceeds guideline
-	-no guideline or value
NC	-not calculated

[1] 1999 (with 2016 update) Canadian Council of Ministers of the Environment (CCME) *Soil Environmental Quality Guidelines (EQGs)* for the Protection of Environmental and Human Health, Commercial Land Use.

[2] 1991 CCME Interim Soil Quality Criteria

[3] 2011 Ontario Ministry of the Environment (OMOE) Soil and Groundwater Standards for Use at Contaminated Sites in Ontario, Table 3, Commercial/Industrial Land Use, Non-Potable Water.

TABLE 4: Metals in Soil
Client: Department of National Defence
Site Location: Former USAF Radar Station, Cartwright, NL
Englobe Project No.: P-0012285-0-16-200

PARAMETER	UNITS	Selected Guideline	Stantec 2018 Phase II ESA																		
			Main Complex									Former USAF Dump Area and Ammunition Storage Area									
			CWT-TP26-BS1 0 - 0.5 m	CWT-TP27-BS2 1.1 - 1.6 m	CWT-TP28-BS1 0 - 0.5 m	CWT-TP29-BS2 1.2 - 1.7 m	CWT-TP30-BS1 0.1 - 0.6 m	CWT-TP31-BS2 1.2 - 1.7 m	CWT-TP100-BS1 0 - 0.3 m	CWT-TP101-BS1 0 - 0.5 m	CWT-TP102-BS1 0.1 - 0.6 m	CWT-SS1 0 - 0.2 m	CWT-SS2 0 - 0.2 m	CWT-SS3 0 - 0.2 m	CWT-SS4 0 - 0.2 m	CWT-SS7 0 - 0.3 m	CWT-SS8 0 - 0.3 m	CWT-SS10 0 - 0.3 m	CWT-SS11 0 - 0.3 m	CWT-SS12 0 - 0.3 m	CWT-SS70 0 - 0.3 m
Aluminum (Al)	mg/kg	-	8000	6100	6400	6500	6300	13000	6100	6700	4500	5300	3900	5000	3700	6600	5600	6200	4200	4400	6400
Antimony (Sb)	mg/kg	40 [2]	<2	<2	<2	<2	5.4	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Arsenic (As)	mg/kg	26 [1]	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Barium (Ba)	mg/kg	2,000 [1]	94	25	28	28	73	170	27	64	26	77	30	93	49	49	100	41	14	21	48
Beryllium (Be)	mg/kg	8 [2]	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Bismuth (Bi)	mg/kg	-	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Boron (B)	mg/kg	120 [3]	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
Cadmium (Cd)	mg/kg	22 [1]	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	0.44	<0.3	<0.3	<0.3	<0.3
Chromium (Cr)	mg/kg	87 [1]	6	11	12	12	7	5	15	6	14	6	6	5	5	11	4	13	7	9	12
Cobalt (Co)	mg/kg	300 [2]	2	2.2	2.2	2.5	1.7	2.2	2.7	1.8	2.8	2	1.5	1.7	1.8	2.5	1.4	2.7	1	<1	2.5
Copper (Cu)	mg/kg	91 [1]	5	5	8	6	9	7	7	4	7	7	4	7	11	9	7	8	<2	4	9
Iron (Fe)	mg/kg	-	29000	13000	12000	14000	18000	43000	16000	23000	16000	18000	11000	19000	13000	11000	30000	14000	13000	3300	11000
Lead (Pb)	mg/kg	600 [1]	7.5	4.4	6.9	5.1	14.0	5.3	2.9	5.9	2.3	9.8	12.0	11.0	25.0	3.7	5.4	5.1	6.6	4.6	3.4
Lithium (Li)	mg/kg	-	4.2	2.8	3.2	3.1	3.5	6.8	3.1	3.2	2.7	4.6	2.6	4.2	3.6	5.1	<2	3.7	<2	<2	4.8
Manganese (Mn)	mg/kg	-	760	110	120	150	470	760	140	450	130	450	130	540	350	150	290	220	81	52	140
Mercury	mg/kg	50 [1]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Molybdenum (Mo)	mg/kg	40 [2]	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	2.6	<2	<2	<2	<2
Nickel (Ni)	mg/kg	89 [1]	<2	4	4	4	5	<2	5	<2	5	2	2	2	3	8	4	5	<2	2	7
Rubidium (Rb)	mg/kg	-	13	5	5	5	6	18.0	4	9.2	3	5.9	6	6	6	5.3	2	6	6	2.4	5
Selenium (Se)	mg/kg	2.9 [1]	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Silver (Ag)	mg/kg	40 [2]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Strontium (Sr)	mg/kg	-	6	8	9	10	7	7	10	6	11	8	5	8	6	12	37	12	<5.0	5	11
Thallium (Tl)	mg/kg	1 [1]	<0.1	<0.1	<0.1	<0.1	<0.1	0.11	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Tin (Sn)	mg/kg	300 [2]	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Uranium (U)	mg/kg	300 [1]	0.4	0.4	0.4	0.4	0.4	0.7	0.4	0.3	0.4	0.4	0.3	0.3	0.3	0.6	0.4	0.5	0.3	0.4	0.5
Vanadium (V)	mg/kg	130 [1]	19	31	30	33	18	8	37	19	38	14	20	13	11	24	9	33	30	13	23
Zinc (Zn)	mg/kg	410 [1]	77	50	68	25	110	120	18	55	14	78	26	80	45	150	380	29	12	6	130

Notes:

value	-value exceeds guideline
-	-no guideline or value
NC	-not calculated

[1] 1999 (with 2016 update) Canadian Council of Ministers of the Environment (CCME) *Soil Environmental Quality Guidelines (EQGs)* for the Protection of Environmental and Human Health, Commercial Land Use.

[2] 1991 CCME Interim Soil Quality Criteria

[3] 2011 Ontario Ministry of the Environment (OMOE) Soil and Groundwater Standards for Use at Contaminated Sites in Ontario, Table 3, Commercial/Industrial Land Use, Non-Potable Water.

TABLE 4: Metals in Soil
Client: Department of National Defence
Site Location: Former USAF Radar Station, Cartwright, NL
Englobe Project No.: P-0012285-0-16-200

PARAMETER	UNITS	Selected Guideline	Stantec 2018 Phase II ESA						Englobe 2018 Phase III ESA									
			Former USAF Dump Area and Ammunition Storage Area						Former USAF Dump Area and Former Ammunition Storage Area									
			CWT-TP1-BS1 0 - 0.3 m	CWT-TP2-BS2 0.3 - 0.7 m	CWT-TP3-BS2 0.4 - 0.8 m	CWT-TP4-BS1 0 - 0.5 m	CWT-TP4-BS1 Lab-Dup -	CWT-TP5-BS2 0.3 - 0.6 m	CWT-TP3-18-A/1 0 - 0.8 m	CWT-TP3-18-A/2 0.8 - 1.5 m	CWT-TP3-18-B/1 0 - 0.8 m	CWT-TP3-18-B/2 0.8 - 1.5 m	CWT-TP3-18-D/1 0 - 0.3 m	CWT-TP3-18-D/2 0.3 - 0.8 m	CWT-TP3-18-E/1 0 - 0.3 m	CWT-TP3-18-E/2 0.3 - 0.9 m	CWT-SS8-18-A/1 0 - 0.6 m	CWT-SS8-18-B/1 0 - 0.6 m
									15-Aug-18	15-Aug-18	15-Aug-18	15-Aug-18	15-Aug-18	15-Aug-18	15-Aug-18	15-Aug-18	15-Aug-18	15-Aug-18
Aluminum (Al)	mg/kg	-	7900	6500	6200	7400	7500	5800	-	-	-	-	-	-	-	-	-	-
Antimony (Sb)	mg/kg	40 [2]	<2	2.7	3.2	<2	<2	<2	-	-	-	-	-	-	-	-	-	-
Arsenic (As)	mg/kg	26 [1]	<2	<2	<2	<2	<2	<2	-	-	-	-	-	-	-	-	-	-
Barium (Ba)	mg/kg	2,000 [1]	15	37	39	14	15	58	-	-	-	-	-	-	-	-	-	-
Beryllium (Be)	mg/kg	8 [2]	<2	<2	<2	<2	<2	<2	-	-	-	-	-	-	-	-	-	-
Bismuth (Bi)	mg/kg	-	<2	<2	<2	<2	<2	<2	-	-	-	-	-	-	-	-	-	-
Boron (B)	mg/kg	120 [3]	<50	<50	<50	<50	<50	<50	-	-	-	-	-	-	-	-	-	-
Cadmium (Cd)	mg/kg	22 [1]	<0.3	0.65	2	<0.3	<0.3	<0.3	-	-	-	-	-	-	-	-	-	-
Chromium (Cr)	mg/kg	87 [1]	10	13	13	10	10	12	-	-	-	-	-	-	-	-	-	-
Cobalt (Co)	mg/kg	300 [2]	1.1	3.2	4.1	2.1	2.7	1.7	-	-	-	-	-	-	-	-	-	-
Copper (Cu)	mg/kg	91 [1]	<2	47	25	5	5	3	-	-	-	-	-	-	-	-	-	-
Iron (Fe)	mg/kg	-	20000	18000	13000	13000	15000	12000	-	-	-	-	-	-	-	-	-	-
Lead (Pb)	mg/kg	600 [1]	5.1	65.0	180.0	6.6	5.8	3.2	-	-	-	-	-	-	-	-	-	-
Lithium (Li)	mg/kg	-	<2	3.4	3.6	2.6	2.9	2.6	-	-	-	-	-	-	-	-	-	-
Manganese (Mn)	mg/kg	-	75	230	160	90	110	110	-	-	-	-	-	-	-	-	-	-
Mercury	mg/kg	50 [1]	<0.1	0	0	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-
Molybdenum (Mo)	mg/kg	40 [2]	<2	<2	6	<2	<2	<2	-	-	-	-	-	-	-	-	-	-
Nickel (Ni)	mg/kg	89 [1]	<2	7	12	4	5	3	-	-	-	-	-	-	-	-	-	-
Rubidium (Rb)	mg/kg	-	2.7	5	5	3	3	4	-	-	-	-	-	-	-	-	-	-
Selenium (Se)	mg/kg	2.9 [1]	<1	<1	<1	<1	<1	<1	-	-	-	-	-	-	-	-	-	-
Silver (Ag)	mg/kg	40 [2]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-
Strontium (Sr)	mg/kg	-	5	10	12	6	7	12	-	-	-	-	-	-	-	-	-	-
Thallium (Tl)	mg/kg	1 [1]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-
Tin (Sn)	mg/kg	300 [2]	<2	6.1	14	<2	<2	<2	-	-	-	-	-	-	-	-	-	-
Uranium (U)	mg/kg	300 [1]	0.5	0.4	0.4	0.5	0.4	0.5	-	-	-	-	-	-	-	-	-	-
Vanadium (V)	mg/kg	130 [1]	26	29	29	38	40	22	-	-	-	-	-	-	-	-	-	-
Zinc (Zn)	mg/kg	410 [1]	11	170	1800	17	19	170	39	54	298	76	25	31	22	19	268	444

Notes:

value	-value exceeds guideline
-	-no guideline or value
NC	-not calculated

[1] 1999 (with 2016 update) Canadian Council of Ministers of the Environment (CCME) *Soil Environmental Quality Guidelines (EQGs)* for the Protection of Environmental and Human Health, Commercial Land Use.

[2] 1991 CCME Interim Soil Quality Criteria

[3] 2011 Ontario Ministry of the Environment (OMOE) Soil and Groundwater Standards for Use at Contaminated Sites in Ontario, Table 3, Commercial/Industrial Land Use, Non-Potable Water.

TABLE 4: Metals in Soil
Client: Department of National Defence
Site Location: Former USAF Radar Station, Cartwright, NL
Englobe Project No.: P-0012285-0-16-200

PARAMETER	UNITS	Selected Guideline	Englobe 2018 Phase III ESA									
			Former USAF Dump Area and Former Ammunition Storage Area		Main Complex							
			CWT-SS8-18-C/1 0 - 0.6 m 15-Aug-18	CWT-SS8-18-D/1 0 - 0.6 m 15-Aug-18	CWT-SS16-18-A/1 0 - 0.3 m 17-Aug-18	CWT-SS16-18-B/1 0 - 0.3 m 17-Aug-18	CWT-SS16-18-B/2 DUP 17-Aug-18	CWT-SS16-18-C/1 0 - 0.3 m 17-Aug-18	CWT-SS32-18-A 0 - 0.3 m 17-Aug-18	CWT-SS32-18-B 0 - 0.4 m 17-Aug-18	CWT-SS32-18-C 0 - 0.4 m 17-Aug-18	CWT-SS32-18-D 0 - 0.3 m 17-Aug-18
Aluminum (Al)	mg/kg	-	-	-	-	-	-	-	-	-	-	-
Antimony (Sb)	mg/kg	40 [2]	-	-	-	-	-	-	-	-	-	-
Arsenic (As)	mg/kg	26 [1]	-	-	-	-	-	-	-	-	-	-
Barium (Ba)	mg/kg	2,000 [1]	-	-	-	-	-	-	-	-	-	-
Beryllium (Be)	mg/kg	8 [2]	-	-	-	-	-	-	-	-	-	-
Bismuth (Bi)	mg/kg	-	-	-	-	-	-	-	-	-	-	-
Boron (B)	mg/kg	120 [3]	-	-	-	-	-	-	-	-	-	-
Cadmium (Cd)	mg/kg	22 [1]	-	-	-	-	-	-	0.8	0.7	1.1	0.7
Chromium (Cr)	mg/kg	87 [1]	-	-	-	-	-	-	-	-	-	-
Cobalt (Co)	mg/kg	300 [2]	-	-	-	-	-	-	-	-	-	-
Copper (Cu)	mg/kg	91 [1]	-	-	-	-	-	-	-	-	-	-
Iron (Fe)	mg/kg	-	-	-	-	-	-	-	-	-	-	-
Lead (Pb)	mg/kg	600 [1]	-	-	-	-	-	-	-	-	-	-
Lithium (Li)	mg/kg	-	-	-	-	-	-	-	-	-	-	-
Manganese (Mn)	mg/kg	-	-	-	-	-	-	-	-	-	-	-
Mercury	mg/kg	50 [1]	-	-	-	-	-	-	-	-	-	-
Molybdenum (Mo)	mg/kg	40 [2]	-	-	-	-	-	-	-	-	-	-
Nickel (Ni)	mg/kg	89 [1]	-	-	-	-	-	-	-	-	-	-
Rubidium (Rb)	mg/kg	-	-	-	-	-	-	-	-	-	-	-
Selenium (Se)	mg/kg	2.9 [1]	-	-	-	-	-	-	-	-	-	-
Silver (Ag)	mg/kg	40 [2]	-	-	-	-	-	-	-	-	-	-
Strontium (Sr)	mg/kg	-	-	-	-	-	-	-	-	-	-	-
Thallium (Tl)	mg/kg	1 [1]	-	-	-	-	-	-	-	-	-	-
Tin (Sn)	mg/kg	300 [2]	-	-	-	-	-	-	-	-	-	-
Uranium (U)	mg/kg	300 [1]	-	-	-	-	-	-	-	-	-	-
Vanadium (V)	mg/kg	130 [1]	-	-	-	-	-	-	-	-	-	-
Zinc (Zn)	mg/kg	410 [1]	26	21	531	44	41	137	91	76	92	82

Notes:

value	-value exceeds guideline
-	-no guideline or value
NC	-not calculated

[1] 1999 (with 2016 update) Canadian Council of Ministers of the Environment (CCME) *Soil Environmental Quality Guidelines (EQGs)* for the Protection of Environmental and Human Health, Commercial Land Use.

[2] 1991 CCME Interim Soil Quality Criteria

[3] 2011 Ontario Ministry of the Environment (OMOE) Soil and Groundwater Standards for Use at Contaminated Sites in Ontario, Table 3, Commercial/Industrial Land Use, Non-Potable Water.

TABLE 5: Petroleum Hydrocarbon (PHC) Compounds in Surface Water
Client: Department of National Defence
Site Location: Former USAF Radar Station, Cartwright, NL
Englobe Project No.: P-0012285-0-16-200

PARAMETER		UNITS	ATLANTIC RBCA Tier I ESLs [1]	Stantec 2018 Phase II ESA						Englobe 2018 Phase III ESA			
				General Area		Former Contractor Village	Main Complex	Former USAF Dump Area and Former Ammunition Storage Area		Former USAF Dump Area and Former Ammunition Storage Area			General Area
				CWT-SW-2	CWT-SW-3	CWT-SW-5	CWT-SW-6	CWT-SW-7	CWT-SW-8	CWT-SW-8-18 15-Aug-18	CWT-SW-8-18B 15-Aug-18	CWT-SW-DUP-18 15-Aug-18	CWT-SW2-18 (Coring) 15-Aug-18
BTEX	Benzene	mg/L	2.1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Toluene	mg/L	0.77	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Ethylbenzene	mg/L	0.32	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Xylenes (Total)	mg/L	0.33	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Modified TPH	Gas Range (C6-C10) (less BTEX)	mg/L	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Fuel Range (>C10-C16)	mg/L	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Fuel Range (>C16-C21)	mg/L	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.10	<0.10	<0.10	<0.10
	Lube Range (>C21-C32)	mg/L	-	<0.1	<0.1	<0.1	<0.1	<0.1	0.11	<0.1	<0.1	<0.1	<0.1
Total Modified TPH - Tier I		mg/L	1.5 as gas 0.10 as fuel oil 0.10 as lube oil	<0.1	<0.1	<0.1	<0.1	<0.1	0.11	<0.1	<0.1	<0.1	<0.1
Product Resemblance		-	-	-	-	-	-	-	ULO	-	-	-	-

Notes:

value -exceeds Atlantic RBCA Tier I ESLs

- -no guideline or value

[1] 2012 (revised 2015) Atlantic Risk-Based Corrective Action (RBCA) Tier I Ecological Screening Levels (ESLs) for the Protection of Freshwater and Marine Aquatic Life (Table 3a), Surface Water Guidelines.

Resemblance Comment Key:
ULO = Unidentified compounds in lube oil range.

TABLE 6: General Chemistry in Surface Water
Client: Department of National Defence
Site Location: Former USAF Radar Station, Cartwright, NL
Englobe Project No.: P-0012285-0-16-200

PARAMETER	UNITS	Selected Guideline	Stantec 2018 Phase II ESA						Englobe 2018 Phase III ESA								
			General Area	Main Complex		Former USAF Dump Area and Former Ammunition Storage Area			Former Contractor Village	Main Complex	Former USAF Dump Area and Former Ammunitino Storage Area			Background			General Area
			CWT-SW-3	CWT-SW-6	CWT-SW-6 Lab-Dup	CWT-SW-7	CWT-SW-8	CWT-SW-8 Lab-Dup	CWT-SW-5-18	CWT-SW-6-18	CWT-SW-7-18	CWT-SW-8-18	CWT-SW-8-18B	CWT-SW-BK01	CWT-SW-BK02	CWT-SW-BK03	CWT-SW-BK04	CWT-SW2-18 (Coring)
									24-Aug-18	24-Aug-18	24-Aug-18	15-Aug-18	15-Aug-18	24-Aug-18	24-Aug-18	24-Aug-18	24-Aug-18	15-Aug-18
Anion Sum	me/L		0	1	-	0	0	-	0	0	0	-	-	0	0	0	0	0
Bicarb. Alkalinity (as CaCO3)	mg/L		<1	31	-	6	<1	-	<5	8	<5	-	-	<5	<5	<5	<5	<5
Calculated TDS	mg/L		17	79	-	24	21	-	13	24	14	-	-	11	6	10	25	8
Carb. Alkalinity (as CaCO3)	mg/L		<1	<1	-	<1	<1	-	<10	<10	<10	-	-	<10	<10	<10	<10	<10
Cation sum	me/L		0	2	-	0	0	-	0	1	1	-	-	0	0	0	1	0
Hardness	mg/L		5	44	-	5	9	-	5	11	8	-	-	6	3	5	12	3
% Difference/ Ion Balance (NS)	%		25	22	-	2	4	-	55	46	66	-	-	66	63	62	51	29
Langelier Index (@20C)	NA		-	-1	-	-5	-	-	-6	-4	-5	-	-	-5	-6	-6	-5	-5
Langelier Index (@ 4C)	NA		-	-2	-	-5	-	-	-6	-4	-5	-	-	-5	-7	-6	-5	-5
Saturation pH (@ 20C)	NA		-	9	-	11	-	-	11	10	11	-	-	11	11	11	11	11
Saturation pH (@ 4C)	NA		-	9	-	11	-	-	11	11	11	-	-	11	12	11	11	11
Alkalinity	mg/L	20 [1,3]	<5	31	-	6	<5	<5	<5	8.0	<5	-	-	<5	<5	<5	<5	<5
Chloride	mg/L	120 [3]	6	5	-	7	8	8	5	4	4	-	-	3	2	3	9	4
Fluoride	mg/L		-	-	-	-	-	-	<0.12	<0.12	<0.12	-	-	<0.12	<0.12	<0.12	<0.12	<0.12
True Color	TCU		190	37	-	63	330	340	350	137	41	-	-	235	240	190	440	59
Nitrate + Nitrite as N	mg/L	400 [4]	<0.05	0.5	-	<0.05	1.3	1.3	<0.05	<0.05	<0.05	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrate as N	mg/L		-	-	-	-	-	-	<0.05	<0.05	<0.05	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrite as N	mg/L		-	-	-	-	-	-	<0.05	<0.05	<0.05	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen (Ammonia as Nitrogen)	mg/L		<0.05	0.21	-	0.058	0.087	-	<0.03	<0.03	<0.03	-	-	0.07	<0.03	0.07	<0.03	0.04
Total Organic Carbon	mg/L		18 9	22 9	-	18 9	38 9	-	26.6	17.00	10.1	-	-	14.7	19.1	23.5	31.5	7.9
Ortho-Phosphate as P	mg/L		<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	-	<0.01	<0.01	<0.01	<0.01	<0.01
pH	unitless	6.5 - 9 [3]	5.78	7.16	-	5.83	4.35	-	5.32	6.45	5.76	5.68	6.61	5.56	4.73	5.25	5.62	6.46
Reactive Silica as SiO2	mg/L		4.2	5.6	-	6.9	0.8	0.8	5.5	4.4	1.9	-	-	2.0	3.3	<0.5	2.0	1.1
Sulphate	mg/L	218 / 309 [1,2]	<2	11.00	-	<2	<2	<2	<2	<2	<2	-	-	<2	<2	<2	<2	<2
Turbidity	NTU		0.6	92.0	99.0	160.0	1.3	-	14.0	20.6	79.7	-	-	23.7	25.3	58.9	156.0	0.7
Electrical Conductivity	umho/cm		29	97	-	35	79	-	34	39	28	-	-	26	26	27	68	22
Hydroxide	mg/L		-	-	-	-	-	-	<5	<5	<5	-	-	<5	<5	<5	<5	<5

Notes:

value	exceeds guideline
-	no guideline or value

[1] 2014 Environmental Protection Guidelines for Alberta Surface Waters, Table 1, Surface Water Quality Guidelines for the Protection of Freshwater Aquatic Life (PAL)
[2] Varies with water hardness.
[3] Canadian Council of Ministers of the Environment (CCME) Water Quality Guidelines for the Protection of Freshwater Aquatic Life
[4] Total Alkalinity guidelines is a minimum value.
5 British Columbia Ministry of the Environment Contaminated Sites Regulation Schedule 6, Generic Numerical Water Standards, Aquatic Life

TABLE 7: Metals in Surface Water
Client: Department of National Defence
Site Location: Former USAF Radar Station, Cartwright, NL
Englobe Project No.: P-0012285-0-16-200

PARAMETER	UNITS	Selected Guideline	Stantec 2018 Phase II ESA						Englobe 2018 Phase III ESA							
			General Area		Former Contractor Village	Main Complex	Former USAF Dump Area and Ammunition Storage Area		Former Contractor Village	Main Complex	Former USAF Dump Area and Former Ammunition Storage Area	Background				General Area
			CWT-SW2	CWT-SW-3	CWT-SW-5	CWT-SW-6	CWT-SW-7	CWT-SW-8	CWT-SW-5-18	CWT-SW-6-18	CWT-SW-7-18	CWT-SW-BK01	CWT-SW-BK02	CWT-SW-BK03	CWT-SW-BK04	CWT-SW2-18 (Coring)
									24-Aug-18	24-Aug-18	24-Aug-18	24-Aug-18	24-Aug-18	24-Aug-18	24-Aug-18	15-Aug-18
Aluminum	µg/L	5 - 100 [1,2]	130	520	750	3200	410	290	1410	1130	1600	686	540	569	959	144
Antimony	µg/L	200 [7]	<1	<1	<1	<1	<1	<1	<2	<2	<2	<2	<2	<2	<2	<2
Arsenic	µg/L	5 [1]	<1	<1	<1	<1	<1	<1	<2	<2	<2	<2	<2	<2	<2	<2
Barium	µg/L	10,000 [7]	2	7	5	46	25	7	10	14	95	7	<5	28	19	<5
Beryllium	µg/L	56 [7]	<1	<1	<1	<1	<1	<1	<2	<2	<2	<2	<2	<2	<2	<2
Bismuth	µg/L	-	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Boron	µg/L	1500 [1]	<50	<50	<50	250	<50	<50	<5	66	<5	<5	<5	<5	9	<5
Cadmium	µg/L	0.04 - 0.37 [1,3]	<0.01	0.01	<0.01	0.18	0.018	0.030	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09
Calcium	µg/L	-	900	790	1100	15000	1100	1600	1.0	3.1	2.0	1.5	0.4	0.6	1.9	0.7
Chromium	µg/L	-	<1	<1	<1	5	1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Cobalt	µg/L	2.5 [8]	<0.4	<0.4	<0.4	0.92	<0.4	<0.4	<1	<1	<1	<1	<1	<1	<1	<1
Copper	µg/L	2 - 4 [1,4]	<2	<2	2.7	8.2	<2	<2	<1	3	4	1	<1	1	1	<1
Iron	µg/L	300 [1]	120	800	920	13000	1000	640	987	6340	1390	1580	252	1130	3060	196
Lead	µg/L	1 - 7 [1,5]	<0.5	<0.5	2	3	<0.5	2.9	0.7	3.4	3.8	0.6	<0.5	0.7	1.5	<0.5
Magnesium	µg/L	-	460.0	670.0	910.0	1400.0	630.0	1200.0	0.6	0.8	0.7	0.6	0.4	0.8	1.7	0.4
Manganese	µg/L	-	2.2	17	8.2	120.0	12	44	9	86	25	20.0	<2	3	27	6
Mercury (Total)	µg/L	0.026 [1]	-	-	-	-	-	-	<0.026	<0.026	<0.026	<0.026	<0.026	<0.026	<0.026	<0.026
Molybdenum	µg/L	73 [1]	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Nickel	µg/L	25 - 150 [1,6]	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Phosphorus	µg/L	-	<100	<100	<100	260	130	<100	60	100	160	80	20	90	70	-
Potassium	µg/L	-	230	180	290	1900	380	110	0.2	0.3	0.7	0.2	<0.1	0.7	0.8	0.2
Selenium	µg/L	1 [1]	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Silver	µg/L	0.25 [1]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Sodium	µg/L	-	3300	3900	5700	4100	3300	2500	4.2	3.5	3.2	3.4	2.4	3.1	7.2	2.4
Strontium	µg/L	-	6	9	16	78	11	11	12	19	26	10	5	8	24	6
Thallium	µg/L	0.8 [1]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Tin	µg/L	-	6.2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Titanium	µg/L	1,000 [7]	2.2	10	16	160	4	10	28	15	24	14	4	6	18	<2
Uranium	µg/L	15 [1]	<0.1	<0.1	<0.1	0.17	<0.1	<0.1	0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Vanadium	µg/L	-	<2	<2	<2	11	<2	<2	<2	8	6	<2	<2	<2	2	<2
Zinc	µg/L	7 [1]	<5	<5	<5	20	12	18	7	33	22	5	<5	11	14	<5

Notes:

value -exceeds guideline

value -exceeds background

\- -no guideline or value

[1] 1999 Canadian Council of Ministers of the Environment (CCME) Water Quality Guidelines for the Protection of Freshwater Aquatic Life

[2] Aluminum Guideline = 5 ug/L at pH < 6.5 or 100 ug/l at pH >= 6.5

[3] Cadmium concentration = $10^{0.86[\log 10(\text{hardness})]-3.2}$

[4] Copper concetration dependant on water hardness.

[5] Lead concentration dependant on water hardness.

[6] Nickel concentration dependant on water hardness.

[7] 2014 Environmental Protection Guidelines for Alberta Surface Waters, Table 1, Surface Water Quality Guidelines for the Protection of Freshwater Aquatic Life (PAL)

[8] British Columbia Ministry of the Environment Contaminated Sites Regulation, Schedule 6, Generic Numerical Water Standards, Aquatic Life

TABLE 8: Petroleum Hydrocarbon (PHC) Compounds in Sediment
Client: Department of National Defence
Site Location: Former USAF Radar Station, Cartwright, NL
Englobe Project No.: P-00122285-0-16-200

PARAMETER		UNITS	ATLANTIC RBCA ESLs[1]	Stantec 2018 Phase II ESA								Englobe 2018 Phase III ESA														
				General Area		Former Contractor Village			Main Complex	Former USAF Dump Area and Ammunition Storage		Former Contractor Village		Former USAF Dump Area and Former Ammunition Storage Area					Background							
			Typical Sediment	CWT-SED-2	CWT-SED-3	CWT-SED-4	CWT-SED-4-Lab-Dup	CWT-SED-5	CWT-SED-6	CWT-SED-7	CWT-SED-8	CWT-SED-5-18 3x Silica Gel	CWT-SED-DUP18 3x Silica Gel	CWT-SED-7-18	CWT-SED-7-18 3x Silica Gel	CWT-SED-8-18 3x Silica Gel	CWT-SED-8-18	CWT-SED-8-18 3x Silica Gel	CWT-SED-BK01	CWT-SED-BK01 3x Silica Gel	CWT-SED-BK02	CWT-SED-BK02 3x Silica Gel	CWT-SED-BK03	CWT-SED-BK03 3x Silica Gel	CWT-SED-BK04	CWT-SED-BK04 3x Silica Gel
												15-Aug-18	15-Aug-18	24-Aug-18	24-Aug-18	15-Aug-18	24-Aug-18	24-Aug-18	24-Aug-18	24-Aug-18	24-Aug-18	24-Aug-18	24-Aug-18	24-Aug-18	24-Aug-18	24-Aug-18
BTEX	Benzene	mg/kg	1.2	<0.050	<0.025	<0.025	-	<0.025	<0.025	<0.025	<0.025	<0.03	<0.03	<0.03	-	<0.03	<0.03	-	<0.03	-	<0.03	-	<0.03	-	<0.03	-
	Toluene	mg/kg	1.4	<0.050	<0.025	<0.025	-	<0.025	<0.025	0.1	<0.025	<0.04	<0.04	<0.04	-	1.75	<0.04	-	<0.04	-	<0.04	-	<0.04	-	<0.04	-
	Ethylbenzene	mg/kg	1.2	<0.050	<0.025	<0.025	-	<0.025	<0.025	nd	<0.025	<0.03	<0.03	<0.03	-	<0.03	<0.03	-	<0.03	-	<0.03	-	<0.03	-	<0.03	-
	Xylenes (Total)	mg/kg	1.3	<0.10	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	-	<0.05	-	<0.05	-	<0.05	-	<0.05	-
Modified TPH	Gas Range (C6-C10) (less BTEX)	mg/kg	15	<5	<2.5	<2.5	-	<2.5	<2.5	<2.5	<2.5	15	25	<3	-	38	<3	-	75	-	<3	-	<3	-	<3	-
	Fuel Range (>C10-C16)	mg/kg	25	<10	<10	<10	<10	120	<10	<10	<10	413	512	52	94	<15	114	116	137	103	336	157	71	350	55	<15
	Fuel Range (>C16-C21)	mg/kg		<10	<10	<10	<10	300	<10	25	<10	110	71	223	165	94	301	129	146	65	597	103	350	229	2760	132
	Lube Range (>C21-C32)	mg/kg	43	<15	<15	<15	<15	1000	39	110	590	64	59	1690	383	551	2300	558	1050	250	2620	558	1970	743	1190	344
Total Modified TPH - Tier I[2]		mg/kg	500	<25	<25	<25	-	1400	39	140	590	602	667	1970	580	633	2720	800	1410	480	3610	820	2390	1120	4640	480
Product Resemblance		mg/kg	-	-	-	-	-	FOILO, LO	ULO, PLO	ULO, PLO	ULO	FR, UC	FR, UC	UC/LR	-	UC	UC/LR	-	UC/LR	-	UC/LR	-	UC/LR	-	UC	-

Notes:

value exceeds ESL for sediment

- no guideline or value

[1] 2012 (update 2015) Atlantic RBCA Tier I Sediment Ecological Screening Levels for the Protection of Freshwater and Marine Aquatic Life (typical)
[2] Fuel (>C16-C21) and Lube (>C21->C34) based on CWS methodology and pro-rated to ARBCA based on fresh lube oil product aliphatic and aromatic subfractions

Resemblance Comment Key:
GF - Gasoline Fraction
WGF - Weathered Gasoline Fraction
GR - Product in Gasoline Range
FCF - Fuel Oil Fraction
WFOF - Weathered Fuel Oil Fraction
FR - Product in Fuel Oil Range
LOF - Lube Oil Fraction
LR - Lube Range
UC - Unidentified Compounds
NR - No Resemblance
NA - Not Applicable

FOILO - Ore product in fuel/lube range.
LO - Lube oil fraction.
ULO - Unidentified compounds in lube oil range.
PLO - Possible lube oil fraction.

TABLE 9: Fraction Organic Carbon in Sediment
Client: Department of National Defence
Site Location: Former USAF Radar Station, Cartwright, NL
Englobe Project No.: P-0012285-0-16-200

PARAMETER	UNITS	Englobe 2018 Phase III ESA								
		Former Contractor Village		Former USAF Dump Area adnd Former Ammunition Storage Area			Background			
		CWT-SED-5-18	CWT-SED-DUP18	CWT-SED-7-18	CWT-SED-8-18	CWT-SED-8-18	CWT-SED-BK01	CWT-SED-BK02	CWT-SED-BK03	CWT-SED-BK04
		15-Aug-18	15-Aug-18	24-Aug-18	15-Aug-18	24-Aug-18	24-Aug-18	24-Aug-18	24-Aug-18	24-Aug-18
Fraction Organic Carbon-1	mg/kg	0.237	0.186	0.279	0.486	0.607	0.457	0.425	0.600	0.335
Fraction Organic Carbon-2	mg/kg	0.237	0.187	0.279	0.461	0.607	0.474	0.433	0.599	0.333
Fraction Organic Carbon-3	mg/kg	0.235	0.185	0.277	0.470	0.608	0.469	0.432	0.597	0.345
Fraction Organic Carbon-Avg	mg/kg	0.236	0.186	0.278	0.473	0.607	0.467	0.430	0.599	0.338

TABLE 10: Polychlorinated Biphenyls in Sediment
Client: Department of National Defence
Site Location: Former USAF Radar Station, Cartwright, NL
Englobe Project No.: P-0012285-0-16-200

PARAMETER	UNITS	Selected Guideline	Stantec 2018 Phase II ESA							Englobe 2018 Phase III ESA			
			General Area		Former Contractor Village		Main Complex	Former USAF Dump Area and Ammunition Storage Area		Background			
			CWT-SED-2	CWT-SED-3	CWT-SED-4	CWT-SED-5	CWT-SED-6	CWT-SED-7	CWT-SED-8	CWT-SED-BK01	CWT-SED-BK02	CWT-SED-BK03	CWT-SED-BK04
										24-Aug-18	24-Aug-18	24-Aug-18	24-Aug-18
Total Polychlorinated Biphenyls	mg/kg	0.277/0.189 [1]	<0.05	<0.05	<0.05	<0.05	0.17	<0.05	<0.05	<0.02	<0.02	<0.02	<0.02

Notes:

[1] 1999 Canadian Council of Ministers of the Environment (CCME) Sediment Quality Guidelines for the Protection of Aquatic Life - Probable Effects Levels for Freshwater / Marine Sediment (PEL)

TABLE 11: Polycyclic Aromatic Hydrocarbons in Sediment
Client: Department of National Defence
Site Location: Former USAF Radar Station, Cartwright, NL
Englobe Project No.: P-0012285-0-16-200

			Stantec 2018 Phase II ESA							Englobe 2018 Phase III ESA	
PARAMETER	UNITS	Selected Guideline	General Area		Former Contractor Village		Main Complex	Former USAF Dump Area and Former Ammunition Storage Area		Former USAF Dump Area and Former Ammunition Storage Area	
			CWT-SED-2	CWT-SED-3	CWT-SED-4	CWT-SED-5	CWT-SED-6	CWT-SED-7	CWT-SED-8	CWT-SED-8-18 15-Aug-18	CWT-SED-8-18 24-Aug-18
1-Methylnaphthalene	mg/kg	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.05
2-Methylnaphthalene	mg/kg	0.201 [1]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acenaphthene	mg/kg	0.0889 [1]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.00671	<0.00671
Acenaphthylene	mg/kg	0.128 [1]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.004	<0.004
Acridine	mg/kg	-	-	-	-	-	-	-	-	<0.05	<0.05
Anthracene	mg/kg	0.245 [1]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.03	<0.03
Benzo(a)anthracene	mg/kg	0.385 [1]	<0.01	<0.01	<0.01	<0.01	0.022	<0.01	<0.01	<0.01	<0.01
Benzo(a)pyrene	mg/kg	0.782 [1]	<0.01	<0.01	<0.01	<0.01	0.064	<0.01	<0.01	<0.01	<0.01
Benzo(b)fluoranthene	mg/kg	-	<0.01	0.035	<0.01	0.016	0.026	<0.01	<0.01	<0.05	<0.05
Benzo(b+j)fluoranthene	mg/kg	-	<0.01	<0.01	<0.01	<0.01	0.059	<0.01	<0.01	<0.1	<0.1
Benzo(e)pyrene	mg/kg	-								<0.05	<0.05
Benzo(ghi)perylene	mg/kg	0.17 [2]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(k)fluoranthene	mg/kg	0.24 [2]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Chrysene	mg/kg	0.862 [1]	<0.01	0.039	<0.01	0.16	<0.01	0.37	12	<0.01	<0.01
Dibenz(a,h)anthracene	mg/kg	0.135 [1]	<0.01	0.021	<0.01	<0.01	<0.01	<0.01	<0.01	<0.006	<0.006
Fluoranthene	mg/kg	2.355 [1]	-	-	-	-	-	-	-	<0.05	<0.05
Fluorene	mg/kg	0.144 [1]	-	-	-	-	-	-	-	<0.01	<0.01
Indeno(1,2,3-cd)pyrene	mg/kg	0.2 [2]	<0.01	0.028	<0.01	<0.01	0.022	<0.01	<0.01	<0.01	<0.01
Naphthalene	mg/kg	0.391 [1]	-	-	-	-	-	-	-	<0.01	<0.01
Perylene	mg/kg	-	-	-	-	-	-	-	-	<0.05	<0.05
Phenanthrene	mg/kg	0.515 [1]	-	-	-	-	-	-	-	<0.03	<0.03
Pyrene	mg/kg	0.875 [1]	-	-	-	-	-	-	-	<0.05	<0.05
Quinoline	mg/kg	-	-	-	-	-	-	-	-	<0.05	<0.05

Notes: value -exceeds guideline

[1] 1999 (with 2016 update) Canadian Council of Ministers of the Environment (CCME) Sediment Quality Guidelines for the Protection of Aquatic Life - Probablye Effects Levels for Freshwater Sediment (PEL)
[2] 2008 Ontario Ministry of the Environment (OMOE) Sediment Quality Guidelines, Lowest Effects Level (LEL)

TABLE 12: Petroleum Hydrocarbon (PHC) Compounds in Groundwater
Client: Department of National Defence
Site Location: Former USAF Radar Station, Cartwright, NL
Englobe Project No.: P-0012285-0-16-200

PARAMETER		UNITS	ATLANTIC RBCA Tier I RBSLs [1]	ATLANTIC RBCA ESLs [2]	Englobe 2018 Phase III ESA																	
					Former Contractor Village			Former USAF Dump Area and Former Ammunition Storage Area				Main Complex										
					CWT-MW1-18 20-Aug-18	CWT-MW2-18 20-Aug-18	CWT-MW3-18 20-Aug-18	CWT-MW4-18 18-Aug-18	CWT-MW-DUP1 18-Aug-18	CWT-MW5-18 18-Aug-18	CWT-MW6-18 18-Aug-18	CWT-MW7-18 20-Aug-18	CWT-MW8-18 20-Aug-18	CWT-MW9-18 18-Aug-18	CWT-MW10-18 18-Aug-18	CWT-MW11-18 20-Aug-18	CWT-MW12-18 18-Aug-18	CWT-DUPE4-18 20-Aug-18	CWT-MW13-18 20-Aug-18	CWT-MW15-18 24-Aug-18	CWT-MW16-18 24-Aug-18	CWT-Blank1 24-Aug-18
BTEX	Benzene	mg/L	20	4.6	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Toluene	mg/L	20	4.2	0.002	<0.001	0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Ethylbenzene	mg/L	20	3.2	0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Xylenes (Total)	mg/L	20	2.8	0.035	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Modified TPH	Gas Range (C6-C10) (less BTEX)	mg/L	-	13	0.28	0.08	0.01	0.02	0.02	<0.01	0.02	<0.01	0.06	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01
	Fuel Range (>C10-C16)	mg/L	-	0.84	0.3	0.16	<0.05	0.2	0.21	<0.05	<0.05	<0.05	0.5	<0.05	<0.05	0.63	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Fuel Range (>C16-C21)	mg/L	-		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.2	<0.10	<0.10	0.37	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	Lube Range (>C21-C32)	mg/L	-	0.48	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Modified TPH - Tier I		mg/L	20	-	0.6	0.2	<0.1	0.2	0.2	<0.1	<0.1	<0.1	0.8	<0.1	<0.1	1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Product Resemblance		-	-	-	GF	FR	WGF	WFOF+UC	WFOF+UC	NR	UC	NR	WGF, WFOF	NR	NR	WFOF	NR	NR	NR	NR	GR	NR

Notes:

value - exceeds Atlantic RBCA
value - exceeds OMOE
- - no guideline or value

[1] 2012 Atlantic RBCA Tier 1 Risk Based Screening Levels (RBSLs) for groundwater at a commercial site with non-potable water.
[2] 2012 Atlantic RBCA Environmental Screening Levels (ESLs) for the protection of freshwater and marine aquatic life.

Resemblance Comment Key:
GF - Gasoline Fraction
WGF - Weathered Gasoline Fraction
GR - Product in Gasoline Range
FOF - Fuel Oil Fraction
WFOF - Weathered Fuel Oil Fraction
FR - Product in Fuel Oil Range
LOF - Lube Oil Fraction
LR - Lube Range
UC - Unidentified Compounds
NR - No Resemblance
NA - Not Applicable

TABLE 13: Polycyclic Aromatic Hydrocarbons (PAHs) in Groundwater
Client: Department of National Defence
Site Location: Former USAF Radar Station, Cartwright, NL
Englobe Project No.: P-0012285-0-16-200

Parameter	Units	CCME [1]	OMOE [2]	Englobe 2018 Phase III ESA																	
				Former Contractor Village			Former USAF Dump Area and Former Ammunition Storage Area			Main Complex											
		Freshwater Life		CWT-MW1-18 20-Aug-18	CWT-MW2-18 20-Aug-18	CWT-MW3-18 20-Aug-18	CWT-MW4-18 18-Aug-18	CWT-MW-DUP1 18-Aug-18	CWT-MW5-18 18-Aug-18	CWT-MW6-18 18-Aug-18	CWT-MW7-18 20-Aug-18	CWT-MW8-18 20-Aug-18	CWT-MW9-18 18-Aug-18	CWT-MW10-18 18-Aug-18	CWT-MW11-18 20-Aug-18	CWT-MW12-18 18-Aug-18	CWT-DUPE4-18 20-Aug-18	CWT-MW13-18 20-Aug-18	CWT-MW14-18 20-Aug-18	CWT-MW15-18 24-Aug-18	CWT-MW16-18 24-Aug-18	CWT-Blank1 24-Aug-18
1-Methylnaphthalene	µg/L	1500	1800	2.98	0.26	0.10	0.02	0.60	0.01	0.12	0.07	0.06	<0.01	0.01	<0.01	<0.01	<0.01	0.13	<0.01	<0.01	<0.01	<0.01
2-Methylnaphthalene	µg/L	1500	1800	4.17	0.09	0.03	0.02	0.60	0.01	0.13	0.09	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	0.11	<0.01	<0.01	<0.01	<0.01
Acenaphthene	µg/L	5.8	600	0.17	0.14	<0.01	0.19	1.43	<0.01	0.12	<0.01	0.05	<0.01	0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01
Acenaphthylene	µg/L	46	1.8	<0.01	<0.01	<0.01	0.14	0.11	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acridine	µg/L	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Anthracene	µg/L	0.012	2.4	0.03	0.021	<0.012	<0.012	0.036	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012
Benzo(a)anthracene	µg/L	0.018	4.7	<0.018	<0.018	<0.018	<0.018	<0.018	<0.018	<0.018	<0.018	<0.018	<0.018	<0.018	<0.018	<0.018	<0.018	<0.018	<0.018	<0.018	<0.018	<0.018
Benzo(a)pyrene	µg/L	0.015	0.81	<0.010	<0.010	<0.010	<0.015	<0.015	<0.015	<0.015	<0.010	<0.010	<0.015	<0.015	<0.010	<0.015	<0.010	<0.010	<0.010	<0.015	<0.015	<0.015
Benzo(b)fluoranthene	µg/L	0.48	0.75	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(e)pyrene	µg/L	0.48	0.75	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(g,h,i)perylene	µg/L	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(k)fluoranthene	µg/L	0.48	0.4	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Chrysene	µg/L	-	1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dibenz(a,h)anthracene	µg/L	0.26	0.52	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Fluoranthene	µg/L	0.04	130	0.05	0.07	<0.01	0.11	0.2	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Fluorene	µg/L	3	400	0.17	0.10	0.01	<0.01	0.62	0.01	0.05	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01
Indeno(1,2,3-cd)pyrene	µg/L	0.21	0.2	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Naphthalene	µg/L	1.1	1400	5.39	0.42	0.08	<0.01	1.36	0.08	0.89	0.07	<0.01	0.01	0.02	<0.01	0.01	<0.01	0.10	<0.01	<0.01	<0.01	<0.01
Perylene	µg/L	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Phenanthrene	µg/L	0.4	580	0.19	<0.01	<0.01	<0.01	0.57	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01
Pyrene	µg/L	0.025	68	0.03	0.03	<0.01	0.07	0.08	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Quinoline	µg/L	3.4	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Notes:

value -value exceedsCCME
value -value exceeds OMOE
- -no guideline or value

[1] 1999 Canadian Council of Ministers of the Environment (CCME) Water Quality Guidelines for the Protection of Freshwater Aquatic Life.
[2] 2011 Ontario Ministry of the Environment (OMOE) Table 9: Generic Site Condition Standards for Use within 30m of a Water Body in a Non-Potable Groundwater Condition

TABLE 14: Volatile Organic Compounds (VOCs) in Groundwater
Client: Department of National Defence
Site Location: Former USAF Radar Station, Cartwright, NL
Englobe Project No.: P-0012285-0-16-200

PARAMETER	UNITS	Selected Guideline	Englobe 2018 Phase III ESA SAMPLE ID DATE SAMPLED CWT-MW9-18 18-Aug-18
Chloromethane	µg/L	-	<1
Vinyl Chloride	µg/L	-	<0.5
Bromomethane	µg/L	-	<0.89
Chloroethane	µg/L	-	<5
Trichlorofluoromethane (FREON 11)	µg/L	-	<5
Acetone	µg/L	-	<10
1,1-Dichloroethylene	µg/L	-	<0.6
Methylene Chloride (Dichloromethane)	µg/L	98.1 [1]	<2
trans-1,2-Dichloroethylene	µg/L	-	<1.6
1,1-Dichloroethane	µg/L	-	<1
cis-1,2-Dichloroethylene	µg/L	-	<1.6
Chloroform	µg/L	1.8 [1]	<1
1,2-Dichloroethane	µg/L	100 [1]	<2
1,1,1-Trichloroethane	µg/L	-	<1
Carbon Tetrachloride	µg/L	13.3 [1]	<0.56
Benzene	µg/L	370 [1]	<1
1,2-Dichloropropane	µg/L	-	<0.7
Trichloroethylene	µg/L	21 [1]	<1
Bromodichloromethane	µg/L	-	<1
cis-1,3-Dichloropropene	µg/L	-	<0.5
trans-1,3-Dichloropropene	µg/L	-	<0.5
1,1,2-Trichloroethane	µg/L	-	<1
Toluene	µg/L	2 [1]	<2
2-Hexanone	µg/L	-	<10.0
Dibromochloromethane	µg/L	-	<1
1,2-Dibromoethane	µg/L	-	<0.2
Tetrachloroethylene	µg/L	110 [1]	<1.6
1,1,1,2-Tetrachloroethane	µg/L	-	<0.5
Chlorobenzene	µg/L	-	<1.3
Ethylbenzene	µg/L	90 [1]	<2
m,p-Xylene	µg/L	-	<4
Bromoform	µg/L	-	<1
Styrene	µg/L	72 [1]	<1
1,1,2,2-Tetrachloroethane	µg/L	-	<1
o-Xylene	µg/L	-	<1
1,3-Dichlorobenzene	µg/L	150 [1]	<1
1,4-Dichlorobenzene	µg/L	26 [1]	<1
1,2-Dichlorobenzene	µg/L	0.7 [1]	<0.7

Notes:

value	-exceeds guideline
-	-no guideline or value

[1] 1999 Canadian Council of Ministers of the Environment (CCME) Water Quality Guidelines for the Protection of Freshwater Aquatic Life

TABLE 15: General Chemistry in Groundwater
Client: Department of National Defence
Site Location: Former USAF Radar Station, Cartwright, NL
Englobe Project No.: P-0012285-0-16-200

PARAMETER	UNITS	Selected Guideline	Englobe 2018 Phase III ESA															
			Former Contractor Village			Former USAF Dump Area and Former Ammunition Storage Area			Main Complex									
			CWT-MW1-18	CWT-MW2-18	CWT-MW3-18	CWT-MW4-18	CWT-MW5-18	CWT-MW6-18	CWT-MW7-18	CWT-MW8-18	CWT-MW9-18	CWT-MW10-18	CWT-MW11-18	CWT-MW12-18	CWT-MW13-18	CWT-MW14-18	CWT-MW15-18	CWT-MW16-18
			24-Aug-18	24-Aug-18	24-Aug-18	24-Aug-18	24-Aug-18	24-Aug-18	24-Aug-18	24-Aug-18	24-Aug-18	24-Aug-18	24-Aug-18	24-Aug-18	24-Aug-18	24-Aug-18	24-Aug-18	24-Aug-18
pH	unitless	6.5 - 9 [3]	6.42	5.91	7	6.98	6.79	7.12	6.72	6.87	7.14	7.22	6.90	6.73	7.36	6.83	5.99	6.91
Reactive Silica as SiO2	mg/L	-	10.1	14.4	15	11.4	11.3	6.2	9.4	10.8	7.6	9.8	12.3	10.9	8.7	7.8	6.4	9.9
Chloride	mg/L	120 [3]	7	5	6	2	7	5	2	1	2	2	2	1	2	2	3	3
Fluoride	mg/L	-	<0.12	<0.12	0	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12
Sulphate	mg/L	218 / 309 [1,2]	2	<2	<2	4.00	5.00	<2	<2	<2	<2	2.00	4.00	<2	<2	2.00	<2	<2
Alkalinity	mg/L	20 [1,3]	27	24	58	73	54	73	66	62	47	101	162	48	98	15	7	39
True Color	TCU	-	488	378	315	17	6	8	28	83	52	25	96	29	47	19	5	23
Turbidity	NTU	-	131	24	32	297	63.4	318	569	86.1	31.4	51.9	133	767	85.5	*	4.2	190
Electrical Conductivity	umho/cm	-	76	79	148	169	142	181	142	133	111	215	339	108	207	55	31	91
Nitrate + Nitrite as N	mg/L	400 [4]	<0.05	<0.05	<0.05	0	0	<0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	0	0	<0.05
Nitrate as N	mg/L	-	<0.05	<0.05	<0.05	0.1	0.1	<0.05	<0.05	<0.05	0.2	<0.05	<0.05	0.1	<0.05	0.1	0.1	<0.05
Nitrite as N	mg/L	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ammonia as N	mg/L	-	0.12	0.20	0.46	<0.03	0.13	0.23	<0.03	<0.03	<0.03	<0.03	0.16	<0.03	<0.03	<0.03	<0.03	<0.03
Total Organic Carbon	mg/L	-	26	16.4	10	<0.5	4.6	6	3.2	8.5	5.2	<0.5	32.3	<0.5	3.2	5.8	3.8	4.1
Ortho-Phosphate as P	mg/L	-	0.04	0.04	0	<0.01	<0.01	<0.01	0.01	0.01	<0.01	<0.01	0.01	<0.01	0.01	0.01	<0.01	<0.01
Dissolved Sodium	mg/L	-	9.2	8.1	9.1	5.3	7.6	15.7	9.7	3.6	3.5	6.1	43.6	5.5	5.9	6.0	3.2	4.2
Dissolved Potassium	mg/L	-	1.3	1.5	2	4.3	1.3	2.9	4.3	5	2.2	7.4	5.2	4.4	4.8	2.5	0.7	1.9
Dissolved Calcium	mg/L	-	3.5	2.2	6.1	18.1	9.9	17.3	9.1	20.4	14.2	31.4	8.4	7.8	31.8	2.2	1.8	13.4
Dissolved Magnesium	mg/L	-	1.5	2.1	2.4	1.6	2.0	2.6	1.5	1.1	1.3	2.2	1.3	1.1	3.3	0.5	0.5	1.4
Bicarb. Alkalinity (as CaCO3)	mg/L	-	27	24	58	73.0	54.0	73.0	66.0	62.0	47.0	101.0	162.0	48.0	98.0	15.0	7.0	39.0
Carb. Alkalinity (as CaCO3)	mg/L	-	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Hydroxide	mg/L	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Calculated TDS	mg/L	-	59	65	77	80	67	105	79	72	53	112	195	51	109	25	14	50
Hardness	mg/L	-	14.9	14.1	25	51.8	33	53.9	28.9	55.5	40.8	87.5	26.3	24	93	7.6	6.6	39.2
Langelier Index (@20C)	NA	-	-3.17	-3.94	-2.21	-1.48	-2.05	-1.37	-2.08	-1.60	-1.60	-0.87	-1.58	-2.26	-0.74	-3.18	-4.41	-1.93
Langelier Index (@ 4C)	NA	-	-3.49	-4.26	-3	-1.8	-2.37	-1.69	-2.4	-1.92	-1.92	-1.19	-1.9	-2.58	-1.06	-3.5	-4.73	-2.25
Saturation pH (@ 20C)	NA	-	9.59	9.85	9.03	8.46	8.84	8.49	8.80	8.47	8.74	8.09	8.48	8.99	8.10	10.00	10.40	8.84
Saturation pH (@ 4C)	NA	-	9.9	10.2	9	8.78	9.16	8.81	9.12	8.79	9.06	8.41	8.80	9.31	8.42	10.30	10.70	9.16
Anion Sum	me/L	-	0.78	0.62	1.33	1.60	1.39	1.60	1.38	1.27	1.01	2.12	3.38	0.99	2.02	0.40	0.23	0.86
Cation sum	me/L	-	1.46	1.87	1.58	1.42	1.07	2.47	2.18	1.55	1.05	2.22	5.38	0.99	2.34	0.52	0.31	1.13
% Difference/ Ion Balance (NS)	%	-	30.5	50.0	8.7	6.2	12.9	21.3	22.6	9.9	2.0	2.4	22.8	0.1	7.3	12.3	13.9	13.2

Notes:

value -value exceeds guideline

- -no guideline or value

[1] 2014 Environmental Protection Guidelines for Alberta Surface Waters, Table 1, Surface Water Quality Guidelines for the Protection of Freshwater Aquatic Life (PAL)

[2] Varies with water hardness.

[3] Canadian Council of Ministers of the Environment (CCME) Water Quality Guidelines for the Protection of Freshwater Aquatic Life

[4] Total Alkalinity guidelines is a minimum value.

5 British Columbia Ministry of the Environment Contaminated Sites Regulation Schedule 6, Generic Numerical Water Standards, Aquatic Life

TABLE 16: Metals in Groundwater
Client: Department of National Defence
Site Location: Former USAF Radar Station, Cartwright, NL
Englobe Project No.: P-0012285-0-16-200

PARAMETER	UNITS	Selected Guideline	Englobe 2018 Phase III ESA																		
			Former Contractor Village			Former USAF Dunp Area and Former Ammunition Storage Area				Main Complex											
			CWT-MW1-18	CWT-MW2-18	CWT-MW3-18	CWT-MW4-18	CWT-MW-DUP1	CWT-MW5-18	CWT-MW6-18	CWT-MW7-18	CWT-MW8-18	CWT-MW9-18	CWT-MW10-18	CWT-MW11-18	CWT-MW12-18	CWT-DUPE4-18	CWT-MW13-18	CWT-MW14-18	CWT-MW15-18	CWT-MW16-18
			20-Aug-18	20-Aug-18	20-Aug-18	18-Aug-18	18-Aug-18	18-Aug-18	18-Aug-18	20-Aug-18	20-Aug-18	18-Aug-18	18-Aug-18	20-Aug-18	18-Aug-18	20-Aug-18	20-Aug-18	20-Aug-18	24-Aug-18	24-Aug-18
Aluminum	µg/L	5 - 100 [1,2]	792	860	261	186	177	39	14	8160	261	188	115	21700	990	744	167	255	154	108
Antimony	µg/L	200 [7]	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Arsenic	µg/L	5 [1]	4	19	3	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Barium	µg/L	10,000 [7]	32	25	17	28	28	35	90	114	42	25	93	345	68	83	63	30	11	70
Beryllium	µg/L	56 [7]	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Bismuth	µg/L	-	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Boron	µg/L	1500 [1]	17	11	115	48	46	18	105	51	26	15	17	79	12	15	164	14	9	37
Cadmium	µg/L	0.04 - 0.37 [1,3]	0.021	0.017	<0.017	0.020	0.023	0.035	<0.017	<0.017	0.037	0.109	0.042	0.317	0.035	0.033	0.697	<0.017	<0.09	<0.09
Chromium	µg/L	-	4	8	4	1	2	1	2	5	3	2	2	8	2	2	3	<1	1	1
Cobalt	µg/L	-	1	1	<1	<1	<1	2	3	<1	<1	<1	<1	2	<1	<1	<1	<1	<1	<1
Copper	µg/L	2 - 4 [1,4]	9	3	<2	3	3	2	<2	6	4	5	3	18	7	7	9	8	6	3
Iron	µg/L	300 [1]	17400	30000	16000	158	156	506	16300	4050	3150	74	65	9790	1050	663	1100	223	<50	1060
Lead	µg/L	1 - 7 [1,5]	0.9	0.9	<0.5	<0.5	<0.5	<0.5	<0.5	1.1	1.5	<0.5	<0.5	15.8	<0.5	<0.5	2.1	<0.5	<0.5	<0.5
Manganese	µg/L	-	298	169	213	339	307	393	563	550	252	22	78	1270	336	499	355	126	35	1,650
Mercury	µg/L	0.026 [1]	<0.026	<0.026	<0.026	<0.026	<0.026	<0.026	<0.026	<0.026	0.04	<0.026	<0.026	<0.026	<0.026	<0.026	<0.026	<0.026	<0.026	<0.026
Molybdenum	µg/L	73 [1]	<2	<2	<2	<2	<2	<2	2	<2	<2	<2	<2	19	<2	<2	<2	<2	<2	<2
Nickel	µg/L	25 - 150 [1,6]	5	3	<2	<2	<2	3	2	6	2	<2	5	15	4	5	7	4	2.0	3.0
Selenium	µg/L	1 [1]	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Silver	µg/L	0.25 [1]	<0.1	0.2	<0.1	0.2	<0.1	<0.1	0.7	0.8	<0.1	<0.1	<0.1	0.7	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Strontium	µg/L	-	30	21	79	137	137	40	71	69	64	51	72	147	51	62	144	13	11	42
Thallium	µg/L	0.8 [1]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Tin	µg/L	-	<2	<2	<2	<2	<2	<2	<2	4	<2	<2	<2	9	<2	<2	<2	<2	<2	<2
Titanium	µg/L	1,000 [7]	20	20	10	<2	<2	<2	<2	147	4	2	<2	344	71	23	4	12	<2	<2
Uranium	µg/L	15 [1]	0.3	0.4	0.2	<0.1	<0.1	<0.1	<0.1	0.9	<0.1	<0.1	0.2	3.4	<0.1	0.2	<0.1	0.5	0.1	0.1
Vanadium	µg/L	-	13	10	19	<2	<2	<2	<2	<2	3	<2	<2	3	<2	<2	<2	<2	<2	<2
Zinc	µg/L	7 [1]	17	12	<5	<5	<5	11	252	11	<5	130	<5	51	16	15	818	8	21	18

Notes:

value -value exceeds guideline

- -no guideline or value

[1] 1999 Canadian Council of Ministers of the Environment (CCME) Water Quality Guidelines for the Protection of Freshwater Aquatic Life

[2] Aluminum Guideline = 5 ug/L at pH < 6.5 or 100 ug/l at pH >= 6.5

[3] Cadmium concentration = $10^{0.86[\log10(\text{hardness})]-3.2}$

[4] Copper concetration dependant on water hardness.

[5] Lead concentration dependant on water hardness.

[6] Nickel concentration dependant on water hardness.

[7] British Columbia Ministry of the Environment Contaminated Sites Regulation, Schedule 6, Generic Numerical Water Standards, Aquatic Life

TABLE 17: Asbestos Bulk Samples
Client: Department of National Defence
Site Location: Former USAF Radar Station, Cartwright, NL
Englobe Project No.: P-0012285-0-16-200

	Units	RDL	Englobe 2018 Phase III ESA		
			CWT-ASG1-Tar Paper	CWT-ASG2-Roofing Shingle	CWT-ASG3-Insulation
			15-Sep-18	15-Sep-18	15-Sep-18
Asbestos (Bulk)	%	0.5	15 - 30	1 - 5	30 - 50

TABLE 18: Metals in Vegetation
Client: Department of National Defence
Site Location: Former USAF Radar Station, Cartwright, NL
Englobe Project No.: P-0012285-0-16-200

		Stantec 2018 Phase II ESA																Englobe 2018 Phase III ESA			
PARAMETER	UNITS	General Area			Former Contractor Village	Main Complex											Former USAF Dump Area and Ammunition Storage Area		Background			
		CWT-VEG-5	CWT-VEG-9	CWT-BER-5	CWT-VEG-12	CWT-VEG-3	CWT-VEG-4	CWT-VEG-7	CWT-VEG-7 Lab-Dup	CWT-VEG-8	CWT-VEG-10	CWT-VEG-11	CWT-BERRY3	CWT-BERRY 4	CWT-BERRY 7	CWT-BERRY 8	CWT-VEG-1	CWT-VEG-2	CWT-VEG-BK01	CWT-VEG-BK03	CWT-VEG-BK04	CWT-VEG-BK04 Lab-Dup
																			24-Aug-18	24-Aug-18	24-Aug-18	24-Aug-18
Aluminum	mg/kg	660	120	14	660	210	3200	280	240	170	140	1100	1200	34	36	34	110	110	190	150	230	210
Antimony	mg/kg	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	<2.0	<2.0	<2.0
Arsenic	mg/kg	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	<2.0	<2.0	<2.0
Barium	mg/kg	32	51	<5	60	43	56	41	40	28	31	120	34	33	32	20	49	37	27	23	69	68
Beryllium	mg/kg	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	<2.0	<2.0	<2.0
Boron	mg/kg	5.9	21	5.3	<2	16	12	21	22	16	17	12	9	7	7.7	8.4	11	13	12	13	38	36
Cadmium	mg/kg	<5	0.3	<5	<5	<5	0.44	<5	<5	<5	<5	0.58	<5	<5	<5	<5	<5	<5	<0.30	<0.30	<0.30	<0.30
Chromium	mg/kg	2.1	<2	<2	<2	<2	5.1	<2	<2	<2	<2	<2	110	<2	<2	<2	<2	<2	<2.0	<2.0	12	9.2
Cobalt	mg/kg	<1	<1	<1	<1	<1	1.90	<1	<1	<1	<1	<1	1.50	<1	<1	<1	<1	<1	<1.0	<1.0	<1.0	<1.0
Copper	mg/kg	2.4	4.4	4.5	3.4	2.9	25.0	6.9	6.9	2.9	2.9	12.0	5.6	2.9	2.8	2.8	4.0	6.4	3.6	4.5	6.5	6.5
Iron	mg/kg	750	140	<50	1200	230	8400	930	650	230	160	1900	4600	<50	<50	<50	67	180	470	1000	950	890
Lead	mg/kg	2.9	1.1	<0.5	1.9	1.2	3.6	1.2	0.91	0.83	2.7	10	1.1	1.2	0.53	0.92	0.58	<0.5	5.8	6.8	45	37
Lithium	mg/kg	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	<2.0	<2.0	<2.0
Manganese	mg/kg	91	310	46	290	540	660	590	580	230	350	430	260	160	140	130	260	200	440	130	75	77
Molybdenum	mg/kg	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	<2.0	<2.0	<2.0
Nickel	mg/kg	<2	<2	<2	<2	<2	2.9	<2	<2	<2	<2	4.2	44.0	<2	<2	<2	<2	<2	<2.0	2.3	<2.0	<2.0
Selenium	mg/kg	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	<2.0	<2.0	<2.0
Silver	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50
Strontium	mg/kg	26	18	<5	22	21	26	13	14	12	14	58	10	<5	<5	<5	34	18	29	29	69	68
Thalium	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	<0.10	<0.10	<0.10
Uranium	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	0.21	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	<0.10	<0.10	<0.10
Vanadium	mg/kg	<2	<2	<2	<2	<2	13.0	<2	<2	<2	<2	<2	5.0	<2	<2	<2	<2	<2	<2.0	<2.0	<2.0	<2.0
Zinc	mg/kg	21	29	<5	31	29	65	120	110	13	16	680	25	7	7	7	23	20	64	62	100	91

Notes: -No applicable guidelines available for metals in vegetation.

TABLE 19: Polychlorinated Biphenyls (PCBs) in Vegetation
Client: Department of National Defence
Site Location: Former USAF Radar Station, Cartwright, NL
Englobe Project No.: P-0012285-0-16-200

PARAMETER	UNITS	Stantec 2018 Phase II ESA																Englobe 2018 Phase III ESA			
		General Area					Former Contractor Village	Main Complex										Former USAF Dump Area and Ammunition Storage Area		Background			
		CWT-VEG-5	CWT-VEG-9	CWT-VEG-9 Lab-Dup	CWT-BER-5	CWT-BER-5 Lab-Dup	CWT-VEG-12	CWT-VEG-3	CWT-VEG-4	CWT-VEG-7	CWT-VEG-8	CWT-VEG-10	CWT-VEG-11	CWT-BERRY3	CWT-BERRY 4	CWT-BERRY 7	CWT-BERRY 8	CWT-VEG-1	CWT-VEG-2	CWT-VEG-BK01	CWT-VEG-BK01 Lab-Dup	CWT-VEG-BK03	CWT-VEG-BK04
																				24-Aug-18	24-Aug-18	24-Aug-18	24-Aug-18
Aroclor 1016	ug/g	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.25	<0.25	<0.25	<0.25
Aroclor 1221	ug/g	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.25	<0.25	<0.25	<0.25
Aroclor 1232	ug/g	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.25	<0.25	<0.25	<0.25
Aroclor 1248	ug/g	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.25	<0.25	<0.25	<0.25
Aroclor 1242	ug/g	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.25	<0.25	<0.25	<0.25
Aroclor 1254	ug/g	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.25	<0.25	<0.25	<0.25
Aroclor 1260	ug/g	0.24	0.35	0.33	<0.05	<0.05	0.33	0.51	0.13	0.11	0.15	0.075	0.069	<0.05	<0.05	<0.05	<0.05	0.088	0.2	<0.25	<0.25	<0.25	<0.25
Calculated Total PCB	ug/g	0.24	0.350	-	<0.05	-	0.330	0.510	0.130	0.110	0.150	0.075	0.069	<0.05	<0.05	<0.05	<0.05	0.088	0.2	<0.25	-	<0.25	<0.25

Notes: - -no guideline or value
-No applicable guidelines available for PCB in vegetation.

TABLE 20 - Estimate of Impacted Soil Quanitites
Client: Department of National Defence
Site Location: Former USAF Radar Station, Cartwright, NL
Englobe Project No.: P-0012285-0-16-200

Area	Stantec Phase II Sample ID	GPS Coordinate (Northing, Easting)	Stantec Phase II Sample Depth	Stantec Phase II Exceedance	Englobe Phase III Sample ID	Englobe Phase III Sample Depth	Englobe Phase III Exceedance	Estimated Horizontal Extent of Contamination (square meters) Based on Delineation Drawings	Estimated Vertical Extent of Contamination (meters)	Reasoning for Vertical Extent Estimation	Total volume of soil to be removed (cubic meters)
Former Contractor Village	CWT-TP35-BS2	5952519.447, 500656.5811	1.0-1.5m	F2 (490 mg/kg)	CWT-TP35-18-A	0 - 0.6 m	F2 (1800 mg/kg)	120	1.5	Depth of deepest exceedance	180
					CWT-TP35-18-B	0 - 0.6 m	F2 (1460mg/kg)				
					CWT-TP35-18-C	0 - 0.6 m	F2 (4070 mg/kg), TPH (4800 mg/kg)				
					CWT-TP35-18-D	0 - 0.6 m	F2 (1160 mg/kg)				
	CWT-TP41-BS2	5952554.259, 500649.9651	0.9-1.4	F2 (830 mg/kg)	N/A	N/A	N/A	20	1.4	Depth of deepest exceedance	30
	CWT-TP104-BS2 DUP of TP36	5952510.575, 500636.8492	1.2-1.7 m	Napthalene (0.21 mg/kg)	CWT-TP36-B	0 - 0.6 m	Napthalene (0.66 mg/kg) Penanthrene (0.05 mg/kg)	40	1.7	Depth of deepest exceedance	70
Former USAF Dump Area and Former Ammunition Storage Area	CWT-SS2	5952538.43, 503117.2549	0-0.2 m	Modified TPH (6,500 mg/kg) F3 (6,380 mg/kg)	N/A	N/A	N/A	20	0.5	No clean samples beneath, conservative depth chosen	10
	CWT-TP2-BS2	5952566.534, 502734.0682	0.3-0.7 m	Napthalene (0.015 mg/kg)	CWT-TP2-18C 0.7	0.3-0.7 m	Acenapthene (5.13 mg/kg) Fluorene (6.02 mg/kg) Napthalene (0.08 mg/kg) Phenanthrene (46.8 mg/kg) B(a)P TPE (22)	40	1.6	Depth of deepest exceedance	60
	CWT-TP3-BS2	5952607.042, 502760.9705	0.4-0.8 m	Zinc (1800 mg/kg)	N/A	N/A	N/A	20	1	No clean samples beneath, conservative depth chosen	20
	CWT-TP5-BS2	5952630.493, 502812.0042	0.3-0.6 m	Napthalene (0.054 mg/kg) Penanthrene (0.052 mg/kg)	CWT-TP5-18-C/1	0 - 0.3 m	Napthalene (0.12 mg/kg)	40	1	No clean samples beneath, conservative depth chosen	40
	CWT-SS8	5952616.807, 502811.547	0-0.2 m	Zinc (380 mg/kg) - Previously noted as an exceedance, guideline since changed to 410 mg/kg.	CWT-SS8-18-B/1	0 - 0.6 m	Zinc (444 mg/kg)	20	1	No clean samples beneath, conservative depth chosen	20
Main Complex	CWT-SS34	5952691.049, 502151.0368	0-0.2m	Modified TPH (27,000 mg/kg) F2 (1,000 mg/kg) F3 (27,000 mg/kg)	N/A	N/A	N/A	80	0.5	No clean samples beneath, conservative depth chosen	40
	CWT-SS36	5952719.898, 502098.7888	0-0.2 m	F2 (300 mg/kg)	N/A	N/A	N/A	20	0.5	No clean samples beneath, conservative	10
	CWT-TP13-BS1	5952910.078, 502296.6877	0-0.5 m	Modified TPH (6,300 mg/kg) F2 (5100 mg/kg)	CWT-TP13-18-A/1	0.1 - 0.3 m	F2 (8360 mg/kg), TPH 10200 (mg/kg)	500	1	No clean samples beneath, conservative depth chosen	500
					CWT-TP13-18-C/1	0.2 - 0.3 m	F2 (12500 mg/kg), F3 (2030 (mg/kg), TPH (14800 mg/kg)				
					CWT-TP13/BH-1	0.1 - 0.3 m	F2 (1540 mg/kg)				
	CWT-TP8-BS2	5952844.301, 502421.3798	0.3-0.6 m	Trichloroethlyene TCE (14 mg/kg)	N/A	N/A	N/A	20	1	No clean samples beneath, conservative depth chosen	20
	CWT-SS13	5952911.658, 502367.0187	0-0.3 m	Phenanthrene (0.22 mg/kg)	CWT-SS13-18-A	0-0.25 m	Phenanthrene (0.1 mg/kg)	40	0.5	No clean samples beneath, conservative depth chosen	20
	CWT-SS23	5952898.712, 502268.8806	0-0.2 m	Napthalene (0.017mg/kg) Phenthrene (0.34 mg/kg)	CWT-SS23-18-C/1	0 - 0.3 m	Napthalene (0.02mg/kg) Phenthrene (0.49 mg/kg)	40	0.5	No clean samples beneath, conservative depth chosen	20
	CWT-TP11-BS1	5952809.2, 502296.8309	0-0.5 m	Phenanthrene (0.062 mg/kg)	CWT-TP11-18-B	0.4 m	Phenanthrene (0.49 mg/kg)	40	0.5	Bedrock encountered at approximately 0.5	20
	CWT-TP15-BS2	5952935.76, 502253.3521	1.2-1.8 m	B(A)P TPE (10.41 mg/kg) Acenaphthene Fluorene Napthalene	CWT-MW13/1	0 - 0.6 m	Phenanthrene (0.28 mg/kg)	315	2	Bedrock encountered at approximately 2 m	630
					CWT-MW13/3	1.8 - 2 m	Acenaphthene (0.295 mg/kg) Fluorene (0.27 mg/kg) Napthalene (0.16 mg/kg) Phenanthrene (1.69 mg/kg)				
					CWT-TP15-18-A/1	0 - 0.6 m	Phenanthrene (0.29 mg/kg)				
					CWT-TP15-18-A/3	1.4 - 1.8 m	Napthalene (0.02 mg/kg) Phenanthrene (0.39 mg/kg)				
					CWT-TP15-18-B/1	0 - 0.6 m	Phenanthrene (0.48 mg/kg)				
					CWT-TP15-18-B/3	1.4 - 1.8 m	Acenaphthene (2.97 mg/kg) Fluorene (2.76 mg/kg) Napthalene (1.5 mg/kg) Phenanthrene (22.5 mg/kg) B(a)P TPE (9.1)				
					CWT-TP15-18-C/1	0 - 0.6 m	Phenanthrene (0.26 mg/kg)				
					CWT-TP15-18-C/2	0.6 - 0.9 m	Phenanthrene (0.07 mg/kg)				
					CWT-TP15-18-D/1	0 - 0.6 m	Phenanthrene (0.18 mg/kg)				
					CWT-TP15-18-D/3	1.5 - 1.7 m	Napthalene (0.17 mg/kg) Phenanthrene (0.26 mg/kg)				
					CWT-TP15-18-F-A/1	1.8 m	Napthalene (0.05 mg/kg) Phenanthrene (0.36 mg/kg)				
	CWT-TP17-BS1	5952809.833, 502226.5704	0-0.5 m	Napthalene (0.067 mg/kg)	N/A	N/A	N/A	20	1	No clean samples beneath, conservative	20
	CWT-TP25-BS1	5952755.205, 502103.4936	0.1 - 0.5 m	Zinc (570 mg/kg)	N/A	N/A	N/A	160	1.6	Bedrock encountered at approximateky 1.6 m	260
	CWT-TP25-BS2		1.0-1.5 m	Napthalene (0.026 mg/kg) Phenanthrene (0.57 mg/kg)	CWT-MW15/1	0 - 0.6 m	Napthalene (0.03 mg/kg) Phenanthrene (0.76 mg/kg)				
					CWT-TP25-18-A/1	0 - 0.3 m	Napthalene (1.15 mg/kg) Phenanthrene (1.73 mg/kg) B(a)P TPE (6.0)				
					CWT-TP25-18-A/2	0.3 - 0.9 m	Napthalene (0.03 mg/kg) Phenanthrene (0.72 mg/kg)				
					CWT-TP25-18-D/1	0 - 0.4 m	Acenaphthene (1.2 mg/kg)				
					CWT-TP25-18-D/2	0.4 - 1.6 m	Napthalene (0.03 mg/kg) Phenanthrene (0.36 mg/kg)				
	CWT-TP30-BS1	5952680.693, 502115.0729	0.1-0.6 m	Fluorene (1.3 mg/kg) Napthalene (0.014 mg/kg) Phenananthrene (4.3 mg/kg)	CWT-TP30-18-A/2	1 - 1.4 m	Phenanthrene (0.05 mg/kg)	80	1.5	Depth of deepest exceedance	120
					CWT-TP30-18-B/2	1 - 1.2 m	Acenaphthene (0.508 mg/kg) Fluorene (0.61 mg/kg)				
					CWT-TP30-18-C/2	1 - 1.5 m	Acenaphthene (0.283 mg/kg) Napthalene (0.14 mg/kg) Phenanthrene (0.11 mg/kg)				
	CWT-SS16	5952915.039, 502331.0775	0-0.2	Zinc (750 mg/kg)	CWT-SS16-18-A/1	0-0.3 m	Zinc (531 mg/kg)	40	0.5	No clean samples beneath, conservative	20
	CWT-SS32	5952731.555, 502178.4524	0-0.2 m	Cadmium (49 mg/kg) Zinc (1400 mg/kg)	N/A	N/A	N/A	20	0.5	No clean samples beneath, conservative depth chosen	10
										Total volume of soil requiring excavation =	**2120**

TABLE 21: QA/QC of Petroleum Hydrocarbon (PHC) Compounds in Soil
Client: Department of National Defence
Site Location: Former USAF Radar Station, Cartwright, NL
Englobe Project No.: P-0012285-0-16-200

PARAMETER		UNITS	Englobe 2018 Phase III Results								
			Former Contractors Village								
			CWT-MW1/3 1.2 m - 1.8 m 19-Aug-18	CWT-MW1/DUPE 18-Aug-18	RPD (%)	CWT-TP35-18-A 0 - 0.6 m 18-Aug-18	CWT-TP35-18A DUP 18-Aug-18	RPD (%)	CWT-TP41-18-B 0 - 0.6 m 18-Aug-18	CWT-TP41-18B DUP 18-Aug-18	RPD (%)
BTEX	Benzene	mg/kg	<0.03	<0.03	NC	<0.03	<0.03	NC	<0.03	<0.03	NC
	Toluene	mg/kg	<0.04	<0.04	NC	<0.04	<0.04	NC	0.056	<0.04	NC
	Ethylbenzene	mg/kg	<0.03	<0.03	NC	<0.03	<0.03	NC	<0.03	<0.03	NC
	Xylenes (Total)	mg/kg	<0.05	<0.05	NC	<0.05	<0.05	NC	<0.05	<0.05	NC
Modified TPH	Gas Range (C6-C10) (less BTEX)	mg/kg	<3	<3	NC	131.0	144	9	<3	<3	NC
	Fuel Range (>C10-C16)	mg/kg	<15	<15	NC	1 800.0	1 460	21	17	16	6
	Fuel Range (>C16-C21)	mg/kg	<15	<15	NC	57.0	40	35	61	47	26
	Lube Range (>C21-<C34)[5]	mg/kg	<15	<15	NC	16.0	21	27	368	247	39
Total Modified TPH		mg/kg	<20	<20	NC	2000	1670	18	446	310	36
Product Resemblance		-	NR	NR	-	WFOF	FOF		LOF	LOF	-

Notes:

RPD - Relative Percent Difference

NC - Non-calculable

RPD is considered non-calculable where concentrations are less than five times the laboratory detection limit.
RPD results of within 60% are considered to be acceptable.
Where RPD is non-calculable, results are considered acceptable where the difference between concentrations is less than the laboratory detection limit.

TABLE 22: QA/QC of Polycyclic Aromatic Hydrocarbons (PAHs) in Soil
Client: Department of National Defence
Site Location: Former USAF Radar Station, Cartwright, NL
Englobe Project No.: P-0012285-0-16-200

PARAMETER	UNITS	Englobe 2018 Phase III ESA								
		Main Complex								
		CWT-MW7/1 0 - 0.7 m 18-Aug-18	CWT-MW7-DUPE 18-Aug-18	RPD (%)	CWT-MW14/1 0 - 0.2 m 16-Aug-18	CWT-MW14/DUP 17-Aug-18	RPD (%)	CWT-TP25-18-A/2 0.3 - 0.9 m 17-Aug-18	CWT-TP25-18-A/2 DUP 17-Aug-18	RPD (%)
1-Methylnaphthalene	mg/kg	<0.05	<0.05	NC	<0.05	<0.05	NC	<0.05	<0.05	NC
2-Methylnaphthalene	mg/kg	<0.01	<0.01	NC	<0.01	<0.01	NC	0.02	0.01	NC
Acenaphthene	mg/kg	<0.00671	<0.00671	NC	<0.00671	<0.00671	NC	0.112	0.0551	68
Acenaphthylene	mg/kg	<0.004	<0.004	NC	<0.004	<0.004	NC	0.03	0.017	55
Acridine	mg/kg	<0.05	<0.05	NC	<0.05	<0.05	NC	<0.05	<0.05	NC
Anthracene	mg/kg	<0.03	<0.03	NC	<0.03	<0.03	NC	0.16	0.1	46
Benzo(a)anthracene	mg/kg	<0.01	<0.01	NC	<0.01	<0.01	NC	0.42	0.21	67
Benzo(a)pyrene	mg/kg	<0.01	<0.01	NC	<0.01	<0.01	NC	0.36	0.19	62
Benzo(b)fluoranthene	mg/kg	<0.05	<0.05	NC	<0.05	<0.05	NC	0.32	0.2	46
Benzo(b+j)fluoranthene	mg/kg	<0.1	<0.1	NC	<0.1	<0.1	NC	0.54	0.33	48
Benzo(e)pyrene	mg/kg	<0.05	<0.05	NC	<0.05	<0.05	NC	0.26	0.17	42
Benzo(ghi)perylene	mg/kg	<0.01	<0.01	NC	0.02	<0.01	NC	0.25	0.15	50
Benzo(k)fluoranthene	mg/kg	<0.01	<0.01	NC	<0.01	<0.01	NC	0.17	0.13	27
Chrysene	mg/kg	<0.01	<0.01	NC	<0.01	<0.01	NC	0.41	0.23	56
Dibenz(a,h)anthracene	mg/kg	<0.006	<0.006	NC	<0.006	<0.006	NC	0.061	0.047	26
Fluoranthene	mg/kg	<0.05	<0.05	NC	<0.05	<0.05	NC	0.85	0.42	68
Fluorene	mg/kg	<0.01	<0.01	NC	<0.01	<0.01	NC	0.09	0.05	57
Indeno(1,2,3-cd)pyrene	mg/kg	<0.01	<0.01	NC	0.02	<0.01	NC	0.25	0.15	50
Naphthalene	mg/kg	<0.01	<0.01	NC	<0.01	<0.01	NC	0.03	<0.01	NC
Perylene	mg/kg	<0.05	<0.05	NC	<0.05	<0.05	NC	0.09	0.05	NC
Phenanthrene	mg/kg	<0.03	<0.03	NC	<0.03	<0.03	NC	0.72	0.4	57
Pyrene	mg/kg	<0.05	<0.05	NC	<0.05	<0.05	NC	0.61	0.31	65
Quinoline	mg/kg	<0.05	<0.05	NC	<0.05	<0.05	NC	<0.05	<0.05	NC

Notes:

RPD - Relative Percent Difference

NC - Non-calculable

RPD is considered non-calculable where concentrations are less than five times the laboratory detection limit.

RPD results of within 60% are considered to be acceptable.

Where RPD is non-calculable, results are considered acceptable where the difference between concentrations is less than the laboratory detection limit.

TABLE 23: QA/QC of Metals in Soil
Client: Department of National Defence
Site Location: Former USAF Radar Station, Cartwright, NL
Englobe Project No.: P-0012285-0-16-200

PARAMETER	UNITS	Englobe 2018 Phase III ESA		
		Main Complex		
		CWT-SS16-18-B/1 0 - 0.3 m 17-Aug-18	CWT-SS16-18-B/2 DUP 17-Aug-18	RPD (%)
Aluminum (Al)	mg/kg	-	-	-
Antimony (Sb)	mg/kg	-	-	-
Arsenic (As)	mg/kg	-	-	-
Barium (Ba)	mg/kg	-	-	-
Beryllium (Be)	mg/kg	-	-	-
Bismuth (Bi)	mg/kg	-	-	-
Boron (B)	mg/kg	-	-	-
Cadmium (Cd)	mg/kg	-	-	-
Chromium (Cr)	mg/kg	-	-	-
Cobalt (Co)	mg/kg	-	-	-
Copper (Cu)	mg/kg	-	-	-
Iron (Fe)	mg/kg	-	-	-
Lead (Pb)	mg/kg	-	-	-
Lithium (Li)	mg/kg	-	-	-
Manganese (Mn)	mg/kg	-	-	-
Mercury	mg/kg	-	-	-
Molybdenum (Mo)	mg/kg	-	-	-
Nickel (Ni)	mg/kg	-	-	-
Rubidium (Rb)	mg/kg	-	-	-
Selenium (Se)	mg/kg	-	-	-
Silver (Ag)	mg/kg	-	-	-
Strontium (Sr)	mg/kg	-	-	-
Thallium (Tl)	mg/kg	-	-	-
Tin (Sn)	mg/kg	-	-	-
Uranium (U)	mg/kg	-	-	-
Vanadium (V)	mg/kg	-	-	-
Zinc (Zn)	mg/kg	44	41	7

Notes:

RPD - Relative Percent Difference
NC - Non-calculable
RPD is considered non-calculable where concentrations are less than five times the laboratory detection limit.
RPD results of within 60% are considered to be acceptable.
Where RPD is non-calculable, results are considered acceptable where the difference between concentrations is less than the laboratory detection limit.

TABLE 24: QA/QC of Petroleum Hydrocarbon (PHC) Compounds in Surface Water
Client: Department of National Defence
Site Location: Former USAF Radar Station, Cartwright, NL
Englobe Project No.: P-0012285-0-16-200

PARAMETER		UNITS	Englobe 2018 Phase III ESA		
			Former USAF Dump Area and Former Ammunition Storage Area		
			CWT-SW-8-18B 15-Aug-18	CWT-SW-DUP-18 15-Aug-18	RDP (%)
BTEX	Benzene	mg/L	<0.001	<0.001	NC
	Toluene	mg/L	<0.001	<0.001	NC
	Ethylbenzene	mg/L	<0.001	<0.001	NC
	Xylenes (Total)	mg/L	<0.002	<0.002	NC
Modified TPH	Gas Range (C6-C10) (less BTEX)	mg/L	<0.01	<0.01	NC
	Fuel Range (>C10-C16)	mg/L	<0.05	<0.05	NC
	Fuel Range (>C16-C21)[5]	mg/L	<0.10	<0.10	NC
	Lube Range (>C21-<C34)[5]	mg/L	<0.1	<0.1	NC
Total Modified TPH - Tier I		mg/L	<0.1	<0.1	NC
Product Resemblance		-	-	-	-

Notes:

RPD - Relative Percent Difference
NC - Non-calculable
RPD is considered non-calculable where concentrations are less than five times the laboratory detection limit.
RPD results of within 40% are considered to be acceptable.
Where RPD is non-calculable, results are considered acceptable where the difference between concentrations is less than the laboratory detection limit.

TABLE 25: QA/QC of Petroleum Hydrocarbon (PHC) Compounds in Sediment
Client: Department of National Defence
Site Location: Former USAF Radar Station, Cartwright, NL
Englobe Project No.: P-0012285-0-16-200

PARAMETER		UNITS	Englobe 2018 Phase III ESA		
			Former Contractors Village		
			CWT-SED-5-18 3x Silica Gel 15-Aug-18	CWT-SED-DUP18 3x Silica Gel 15-Aug-18	RPD (%)
BTEX	Benzene	mg/kg	<0.03	<0.03	NC
	Toluene	mg/kg	<0.04	<0.04	NC
	Ethylbenzene	mg/kg	<0.03	<0.03	NC
	Xylenes (Total)	mg/kg	<0.05	<0.05	NC
Modified TPH	Gas Range (C6-C10) (less BTEX)	mg/kg	15	25	50
	Fuel Range (>C10-C16)	mg/kg	413	512	21
	Fuel Range (>C16-C21)[2]	mg/kg	110	71	43
	Lube Range (>C21-<C34)[2]	mg/kg	64	59	8
Total Modified TPH - Tier I [2]		mg/kg	602	667	10
Product Resemblance		mg/kg	FR, UC	FR, UC	-

Notes:

RPD - Relative Percent Difference
NC - Non-calculable
RPD is considered non-calculable where concentrations are less than five times the laboratory detection limit.
RPD results of within 60% are considered to be acceptable.
Where RPD is non-calculable, results are considered acceptable where the difference between concentrations is less than the laboratory detection limit.

TABLE 26: QA/QC of Fraction Organic Carbon in Sediment
Client: Department of National Defence
Site Location: Former USAF Radar Station, Cartwright, NL
Englobe Project No.: P-0012285-0-16-200

PARAMETER	UNITS	Englobe 2018 Phase III ESA		
		Former Contractors Village		
		CWT-SED-5-18	CWT-SED-DUP18	RPD (%)
		15-Aug-18	15-Aug-18	
Fraction Organic Carbon-1	mg/kg	0.237	0.186	24
Fraction Organic Carbon-2	mg/kg	0.237	0.187	24
Fraction Organic Carbon-3	mg/kg	0.235	0.185	24
Fraction Organic Carbon-Avg	mg/kg	0.236	0.186	24

Notes:

RPD - Relative Percent Difference
NC - Non-calculable
RPD is considered non-calculable where concentrations are less than five times the laboratory detection limit.
RPD results of within 60% are considered to be acceptable.
Where RPD is non-calculable, results are considered acceptable where the difference between concentrations is less than the laboratory detection limit.

TABLE 27: QA/QC of Petroleum Hydrocarbon (PHC) Compounds in Groundwater
Client: Department of National Defence
Site Location: Former USAF Radar Station, Cartwright, NL
Englobe Project No.: P-0012285-0-16-200

PARAMETER		UNITS	Englobe 2018 Phase III ESA					
			Former Contractors Village			Main Complex		
			CWT-MW1-18 20-Aug-18	CWT-MW-DUP1 18-Aug-18	RPD (%)	CWT-MW12-18 18-Aug-18	CWT-DUPE4-18 20-Aug-18	RPD (%)
BTEX	Benzene	mg/L	<0.001	<0.001	NC	<0.001	<0.001	NC
	Toluene	mg/L	0.002	<0.001	NC	<0.001	<0.001	NC
	Ethylbenzene	mg/L	0.005	<0.001	NC	<0.001	<0.001	NC
	Xylenes (Total)	mg/L	0.035	<0.002	NC	<0.002	<0.002	NC
Modified TPH	Gas Range (C6-C10) (less BTEX)	mg/L	0.28	0.02	NC	<0.01	<0.01	NC
	Fuel Range (>C10-C16)	mg/L	0.3	0.21	NC	<0.05	<0.05	NC
	Fuel Range (>C16-C21)[5]	mg/L	<0.10	<0.10	NC	<0.10	<0.10	NC
	Lube Range (>C21-<C34)[5]	mg/L	<0.1	<0.1	NC	<0.1	<0.1	NC
Total Modified TPH - Tier I		mg/L	0.6	0.2	NC	<0.1	<0.1	NC
Product Resemblance		-	GF	WFOF+UC	-	NR	NR	-

Notes:
RPD - Relative Percent Difference
NC - Non-calculable
RPD is considered non-calculable where concentrations are less than five times the laboratory detection limit.
RPD results of within 40% are considered to be acceptable.
Where RPD is non-calculable, results are considered acceptable where the difference between concentrations is less than the laboratory detection limit.

TABLE 28: QA/QC of Polycyclic Aromatic Hydrocarbons (PAHs) in Groundwater
Client: Department of National Defence
Site Location: Former USAF Radar Station, Cartwright, NL
Englobe Project No.: P-0012285-0-16-200

Parameter	Units	Englobe 2018 Phase III ESA					
		Former USAF Dump Area and Former Ammunition Storage Area			Main Complex		
		CWT-MW4-18 18-Aug-18	CWT-MW-DUP1 18-Aug-18	RPD (%)	CWT-MW12-18 18-Aug-18	CWT-DUPE4-18 20-Aug-18	RPD (%)
1-Methylnaphthalene	µg/L	0.02	0.60	NC	<0.01	<0.01	NC
2-Methylnaphthalene	µg/L	0.02	0.60	NC	<0.01	<0.01	NC
Acenaphthene	µg/L	0.19	1.43	153	<0.01	<0.01	NC
Acenaphthylene	µg/L	0.14	0.11	24	<0.01	<0.01	NC
Acridine	µg/L	<0.01	<0.01	NC	<0.01	<0.01	NC
Anthracene	µg/L	<0.012	0.04	NC	<0.012	<0.012	NC
Benzo(a)anthracene	µg/L	<0.018	<0.018	NC	<0.018	<0.018	NC
Benzo(a)pyrene	µg/L	<0.015	<0.015	NC	<0.015	<0.010	NC
Benzo(b)fluoranthene	µg/L	<0.01	<0.01	NC	<0.01	<0.01	NC
Benzo(e)pyrene	µg/L	<0.01	<0.01	NC	<0.01	<0.01	NC
Benzo(g,h,i)perylene	µg/L	<0.01	<0.01	NC	<0.01	<0.01	NC
Benzo(k)fluoranthene	µg/L	<0.01	<0.01	NC	<0.01	<0.01	NC
Chrysene	µg/L	<0.01	<0.01	NC	<0.01	<0.01	NC
Dibenz(a,h)anthracene	µg/L	<0.01	<0.01	NC	<0.01	<0.01	NC
Fluoranthene	µg/L	0.11	0.20	58	<0.01	<0.01	NC
Fluorene	µg/L	<0.01	0.62	NC	<0.01	<0.01	NC
Indeno(1,2,3-cd)pyrene	µg/L	<0.01	<0.01	NC	<0.01	<0.01	NC
Naphthalene	µg/L	<0.01	1.36	NC	0.01	<0.01	NC
Perylene	µg/L	<0.01	<0.01	NC	<0.01	<0.01	NC
Phenanthrene	µg/L	<0.01	0.57	NC	<0.01	<0.01	NC
Pyrene	µg/L	0.07	0.08	13.33	<0.01	<0.01	NC
Quinoline	µg/L	<0.01	<0.01	NC	<0.01	<0.01	NC

Notes:
RPD - Relative Percent Difference
NC - Non-calculable
RPD is considered non-calculable where concentrations are less than five times the laboratory detection limit.
RPD results of within 40% are considered to be acceptable.
Where RPD is non-calculable, results are considered acceptable where the difference between concentrations is less than the laboratory detection limit.

TABLE 29: QA/QC of Metals in Groundwater
Client: Department of National Defence
Site Location: Former USAF Radar Station, Cartwright, NL
Englobe Project No.: P-0012285-0-16-200

PARAMETER	UNITS	Englobe 2018 Phase III ESA					
		Former USAF Dunp Area and Former Ammunition Storage Area			Main Complex		
		CWT-MW4-18 18-Aug-18	CWT-MW-DUP1 18-Aug-18	RPD (%)	CWT-MW12-18 18-Aug-18	CWT-DUPE4-18 20-Aug-18	RPD (%)
Aluminum	µg/L	186	177	5.0	990	744	28
Antimony	µg/L	<2	<2	NC	<2	<2	NC
Arsenic	µg/L	<2	<2	NC	<2	<2	NC
Barium	µg/L	28	28	0	68	83	20
Beryllium	µg/L	<2	<2	NC	<2	<2	NC
Bismuth	µg/L	<2	<2	NC	<2	<2	NC
Boron	µg/L	48	46	4	12	15	22
Cadmium	µg/L	0.020	0.023	NC	0.035	0.033	NC
Chromium	µg/L	1	2	NC	2	2	NC
Cobalt	µg/L	<1	<1	NC	<1	<1	NC
Copper	µg/L	3	3	NC	7	7	NC
Iron	µg/L	158	156	1.3	1050	663	45
Lead	µg/L	<0.5	<0.5	NC	<0.5	<0.5	NC
Manganese	µg/L	339	307	10	336	499	39
Mercury	µg/L	<0.026	<0.026	NC	<0.026	<0.026	NC
Molybdenum	µg/L	<2	<2	NC	<2	<2	NC
Nickel	µg/L	<2	<2	NC	4	5	NC
Selenium	µg/L	<1	<1	NC	<1	<1	NC
Silver	µg/L	0	<0.1	NC	<0.1	<0.1	NC
Strontium	µg/L	137	137	0	51	62	19
Thallium	µg/L	<0.1	<0.1	NC	<0.1	<0.1	NC
Tin	µg/L	<2	<2	NC	<2	<2	NC
Titanium	µg/L	<2	<2	NC	71	23	102
Uranium	µg/L	<0.1	<0.1	NC	<0.1	0	NC
Vanadium	µg/L	<2	<2	NC	<2	<2	NC
Zinc	µg/L	<5	<5	NC	16	15	6.5

Notes:

RPD - Relative Percent Difference
NC - Non-calculable
RPD is considered non-calculable where concentrations are less than five times the laboratory detection limit.
RPD results of within 40% are considered to be acceptable.
Where RPD is non-calculable, results are considered acceptable where the difference between concentrations is less than the laboratory detection limit.

Appendix E Laboratory Certificates of Analysis

AGAT Laboratories

11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
http://www.agatlabs.com

CLIENT NAME: **ENGLOBE CORP**
97 TROOP AVE
DARTMOUTH, NS B3B2A7
(902) 468-6486

ATTENTION TO: **Andrew Higgins**

PROJECT: **P-0012285-0-16-200**

AGAT WORK ORDER: **18X376667**

TRACE ORGANICS REVIEWED BY: **Kelly Hogue, B.Sc, P.Chem, Operations Manager**

WATER ANALYSIS REVIEWED BY: **Laura Baker, Inorganics Data Reporter**

DATE REPORTED: **Sep 06, 2018**

PAGES (INCLUDING COVER): **25**

VERSION*: **1**

Should you require any information regarding this analysis please contact your client services representative at (902) 468-8718

*NOTES

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

Member of: Association of Professional Engineers and Geoscientists of Alberta (APEGA)
Western Enviro-Agricultural Laboratory Association (WEALA)
Environmental Services Association of Alberta (ESAA)

AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation.

Results relate only to the items tested and to all the items tested
All reportable information as specified by ISO 17025:2005 is available from AGAT Laboratories upon request

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Certificate of Analysis

AGAT WORK ORDER: 18X376667

PROJECT: P-0012285-0-16-200

CLIENT NAME: ENGLOBE CORP

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Atlantic RBCA Tier 1 Hydrocarbons in Soil (Version 3.1) - Field Preserved

DATE RECEIVED: 2018-08-22

DATE REPORTED: 2018-09-06

		SAMPLE DESCRIPTION:		CWT-MW7/1	CWT-MW1/1	CWT-MW1/2	CWT-MW1/3	CWT-MW2/1	CWT-MW2/2	CWT-MW1/DUPE
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2018-08-18	2018-08-19	2018-08-19	2018-08-19	2018-08-19	2018-08-19	2018-08-18
Parameter	**Unit**	**G / S**	**RDL**	**9490895**	**9490897**	**9490898**	**9490899**	**9490900**	**9490901**	**9490928**
Benzene	mg/kg		0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Toluene	mg/kg		0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Ethylbenzene	mg/kg		0.03	<0.03	0.20	<0.03	<0.03	<0.03	<0.03	<0.03
Xylene (Total)	mg/kg		0.05	<0.05	1.56	<0.05	<0.05	<0.05	<0.05	<0.05
C6-C10 (less BTEX)	mg/kg		3	<3	10	6	<3	<3	<3	<3
>C10-C16 Hydrocarbons	mg/kg		15	<15	33	81	<15	<15	<15	<15
>C16-C21 Hydrocarbons	mg/kg		15	<15	18	17	<15	19	<15	<15
>C21-C32 Hydrocarbons	mg/kg		15	21	92	270	<15	85	<15	<15
Modified TPH (Tier 1)	mg/kg		20	21	153	374	<20	104	<20	<20
Resemblance Comment				UC	FOF, LOF	FOF, LOF, UC	NR	WFOF, LOF	NR	NR
Return to Baseline at C32				Y	Y	N	Y	Y	Y	Y
Surrogate	**Unit**	**Acceptable Limits**								
Isobutylbenzene - EPH	%	60-140		84	101	83	96	109	97	86
Isobutylbenzene - VPH	%	60-140		100	105	103	93	101	98	100
n-Dotriacontane - EPH	%	60-140		94	120	116	112	120	106	95

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

9490895-9490928 Results are based on the dry weight of the soil.

Resemblance Comment Key:
GF - Gasoline Fraction
WGF - Weathered Gasoline Fraction
GR - Product in Gasoline Range
FOF - Fuel Oil Fraction
WFOF - Weathered Fuel Oil Fraction
FR - Product in Fuel Oil Range
LOF - Lube Oil Fraction
LR - Lube Range
UC - Unidentified Compounds
NR - No Resemblance
NA - Not Applicable

Certified By: Kelly Hogue

Results relate only to the items tested and to all the items tested

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Certificate of Analysis

AGAT WORK ORDER: 18X376667

PROJECT: P-0012285-0-16-200

CLIENT NAME: ENGLOBE CORP

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Atlantic RBCA Tier 1 Hydrocarbons in Water (Version 3.0)

DATE RECEIVED: 2018-08-22

DATE REPORTED: 2018-09-06

		SAMPLE DESCRIPTION:		CWT-MW1-18	CWT-MW2-18	CWT-MW3-18	CWT-MW7-18	CWT-MW8-18	CWT-MW11-18	CWT-DUPE4-18	CWT-MW13-18
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2018-08-20	2018-08-20	2018-08-20	2018-08-20	2018-08-20	2018-08-20	2018-08-20	2018-08-20
Parameter	**Unit**	**G / S**	**RDL**	**9490912**	**9490917**	**9490918**	**9490920**	**9490921**	**9490922**	**9490924**	**9490925**
Benzene	mg/L		0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Toluene	mg/L		0.001	0.002	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Ethylbenzene	mg/L		0.001	0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Xylene (Total)	mg/L		0.002	0.035	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
C6-C10 (less BTEX)	mg/L		0.01	0.28	0.08	0.01	<0.01	0.06	<0.01	<0.01	<0.01
>C10-C16 Hydrocarbons	mg/L		0.05	0.30	0.16	<0.05	<0.05	0.50	0.63	<0.05	<0.05
>C16-C21 Hydrocarbons	mg/L		0.10	<0.10	<0.10	<0.10	<0.10	0.20	0.37	<0.10	<0.10
>C21-C32 Hydrocarbons	mg/L		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Modified TPH (Tier 1)	mg/L		0.1	0.6	0.2	<0.1	<0.1	0.8	1.0	<0.1	<0.1
Resemblance Comment				GF	FR	WGF	NR	WGF, WFOF	WFOF	NR	NR
Return to Baseline at C32				Y	Y	Y	Y	Y	Y	Y	Y
Surrogate	**Unit**	**Acceptable Limits**									
Isobutylbenzene - EPH	%	70-130		76	74	97	91	76	75	119	92
Isobutylbenzene - VPH	%	70-130		122	98	114	96	86	87	87	91
n-Dotriacontane - EPH	%	70-130		90	N/A	100	83	71	82	123	88

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

9490912-9490925 Resemblance Comment Key:
GF - Gasoline Fraction
WGF - Weathered Gasoline Fraction
GR - Product in Gasoline Range
FOF - Fuel Oil Fraction
WFOF - Weathered Fuel Oil Fraction
FR - Product in Fuel Oil Range
LOF - Lube Oil Fraction
LR - Lube Range
UC - Unidentified Compounds
NR - No Resemblance
NA - Not Applicable

Certified By: Kelly Hogue

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Certificate of Analysis

AGAT WORK ORDER: 18X376667

PROJECT: P-0012285-0-16-200

CLIENT NAME: ENGLOBE CORP

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Moisture

DATE RECEIVED: 2018-08-22

DATE REPORTED: 2018-09-06

Parameter	Unit	G / S	RDL	CWT-MW7/1 Soil 2018-08-18 9490895	CWT-MW1/1 Soil 2018-08-19 9490897	CWT-MW1/2 Soil 2018-08-19 9490898	CWT-MW1/3 Soil 2018-08-19 9490899	CWT-MW2/1 Soil 2018-08-19 9490900	CWT-MW2/2 Soil 2018-08-19 9490901	CWT-MW3/1 Soil 2018-08-19 9490902	CWT-MW3/2 Soil 2018-08-19 9490903
% Moisture	%		0	24	22	15	12	12	12	34	25

Parameter	Unit	G / S	RDL	CWT-MW3/3 Soil 2018-08-19 9490904	CWT-MW3/4 Soil 2018-08-19 9490905	CWT-MW7-DUPE Soil 2018-08-18 9490906	CWT-MW1/DUPE Soil 2018-08-18 9490928
% Moisture	%		0	9	8	28	14

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Certified By: Kelly Hogue

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Certificate of Analysis

AGAT WORK ORDER: 18X376667

PROJECT: P-0012285-0-16-200

CLIENT NAME: ENGLOBE CORP

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Polycyclic Aromatic Hydrocarbons in Soil

DATE RECEIVED: 2018-08-22

DATE REPORTED: 2018-09-06

SAMPLE DESCRIPTION:				CWT-MW7/1	CWT-MW3/1	CWT-MW3/2	CWT-MW3/3	CWT-MW3/4	CWT-MW7-DUPE
SAMPLE TYPE:				Soil	Soil	Soil	Soil	Soil	Soil
DATE SAMPLED:				2018-08-18	2018-08-19	2018-08-19	2018-08-19	2018-08-19	2018-08-18
Parameter	Unit	G / S	RDL	9490895	9490902	9490903	9490904	9490905	9490906
1-Methylnaphthalene	mg/kg		0.05	<0.05	<0.05	<0.05	<0.05	0.05	<0.05
2-Methylnaphthalene	mg/kg		0.01	<0.01	<0.01	<0.01	0.05	0.11	<0.01
Acenaphthene	mg/kg		0.00671	<0.00671	<0.00671	<0.00671	<0.00671	<0.00671	<0.00671
Acenaphthylene	mg/kg		0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Acridine	mg/kg		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Anthracene	mg/kg		0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Benzo(a)anthracene	mg/kg		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(a)pyrene	mg/kg		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(b)fluoranthene	mg/kg		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(b+j)fluoranthene	mg/kg		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(e)pyrene	mg/kg		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(ghi)perylene	mg/kg		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(k)fluoranthene	mg/kg		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Chrysene	mg/kg		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dibenzo(a,h)anthracene	mg/kg		0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Fluoranthene	mg/kg		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Fluorene	mg/kg		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Indeno(1,2,3)pyrene	mg/kg		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Naphthalene	mg/kg		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perylene	mg/kg		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Phenanthrene	mg/kg		0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Pyrene	mg/kg		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Quinoline	mg/kg		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Surrogate	**Unit**	**Acceptable Limits**							
Nitrobenzene-d5	%	50-140		84	90	93	86	112	94
2-Fluorobiphenyl	%	50-140		81	85	84	83	86	86
Terphenyl-d14	%	50-140		70	65	80	87	86	86

Certified By: Kelly Hogue

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FAX (902)468-8924
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 18X376667

PROJECT: P-0012285-0-16-200

CLIENT NAME: ENGLOBE CORP

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Polycyclic Aromatic Hydrocarbons in Soil

DATE RECEIVED: 2018-08-22

DATE REPORTED: 2018-09-06

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

9490895-9490906 Results are based on the dry weight of the soil.

Benzo(b)fluoranthene may include contributions from benzo(j)fluoranthene, if also present in the sample.

Certified By: Kelly Hogue

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Certificate of Analysis

AGAT WORK ORDER: 18X376667

PROJECT: P-0012285-0-16-200

CLIENT NAME: ENGLOBE CORP

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Polycyclic Aromatic Hydrocarbons in Water - (PAH)

DATE RECEIVED: 2018-08-22

DATE REPORTED: 2018-09-06

		SAMPLE DESCRIPTION:		CWT-MW1-18	CWT-MW2-18	CWT-MW3-18	CWT-MW7-18	CWT-MW8-18	CWT-MW11-18	CWT-MW14-18	CWT-DUPE4-18
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2018-08-20	2018-08-20	2018-08-20	2018-08-20	2018-08-20	2018-08-20	2018-08-20	2018-08-20
Parameter	**Unit**	**G / S**	**RDL**	**9490912**	**9490917**	**9490918**	**9490920**	**9490921**	**9490922**	**9490923**	**9490924**
1-Methylnaphthalene	ug/L		0.01	2.98	0.26	0.10	0.07	0.06	<0.01	<0.01	<0.01
2-Methylnaphthalene	ug/L		0.01	4.17	0.09	0.03	0.09	<0.01	<0.01	<0.01	<0.01
Acenaphthene	ug/L		0.01	0.17	0.14	<0.01	<0.01	0.05	<0.01	<0.01	<0.01
Acenaphthylene	ug/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acridine	ug/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Anthracene	ug/L		0.012	0.030	0.021	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012
Benzo(a)anthracene	ug/L		0.018	<0.018	<0.018	<0.018	<0.018	<0.018	<0.018	<0.018	<0.018
Benzo(a)pyrene	ug/L		0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Benzo(b)fluoranthene	ug/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(e)pyrene	ug/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(ghi)perylene	ug/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(k)fluoranthene	ug/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Chrysene	ug/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dibenzo(a,h)anthracene	ug/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Fluoranthene	ug/L		0.01	0.05	0.07	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Fluorene	ug/L		0.01	0.17	0.10	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Indeno(1,2,3-cd)pyrene	ug/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Naphthalene	ug/L		0.01	5.39	0.42	0.08	0.07	<0.01	<0.01	<0.01	<0.01
Perylene	ug/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Phenanthrene	ug/L		0.01	0.19	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Pyrene	ug/L		0.01	0.03	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Quinoline	ug/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Surrogate	**Unit**	**Acceptable Limits**									
Nitrobenzene-d5	%	50-140		66	59	52	62	61	62	56	57
2-Fluorobiphenyl	%	50-140		54	58	61	53	51	55	54	54
Terphenyl-d14	%	50-140		68	77	70	63	70	68	69	70

Certified By: Kelly Hogue

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Certificate of Analysis

AGAT WORK ORDER: 18X376667

PROJECT: P-0012285-0-16-200

CLIENT NAME: ENGLOBE CORP

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Polycyclic Aromatic Hydrocarbons in Water - (PAH)

DATE RECEIVED: 2018-08-22

DATE REPORTED: 2018-09-06

		SAMPLE DESCRIPTION:		CWT-MW13-18
		SAMPLE TYPE:		Water
		DATE SAMPLED:		2018-08-20
Parameter	**Unit**	**G / S**	**RDL**	**9490925**
1-Methylnaphthalene	ug/L		0.01	0.13
2-Methylnaphthalene	ug/L		0.01	0.11
Acenaphthene	ug/L		0.01	0.02
Acenaphthylene	ug/L		0.01	<0.01
Acridine	ug/L		0.01	<0.01
Anthracene	ug/L		0.012	<0.012
Benzo(a)anthracene	ug/L		0.018	<0.018
Benzo(a)pyrene	ug/L		0.010	<0.010
Benzo(b)fluoranthene	ug/L		0.01	<0.01
Benzo(e)pyrene	ug/L		0.01	<0.01
Benzo(ghi)perylene	ug/L		0.01	<0.01
Benzo(k)fluoranthene	ug/L		0.01	<0.01
Chrysene	ug/L		0.01	<0.01
Dibenzo(a,h)anthracene	ug/L		0.01	<0.01
Fluoranthene	ug/L		0.01	<0.01
Fluorene	ug/L		0.01	0.02
Indeno(1,2,3-cd)pyrene	ug/L		0.01	<0.01
Naphthalene	ug/L		0.01	0.10
Perylene	ug/L		0.01	<0.01
Phenanthrene	ug/L		0.01	0.02
Pyrene	ug/L		0.01	<0.01
Quinoline	ug/L		0.01	<0.01
Surrogate	**Unit**	**Acceptable Limits**		
Nitrobenzene-d5	%	50-140		63
2-Fluorobiphenyl	%	50-140		54
Terphenyl-d14	%	50-140		67

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

9490912-9490925 Benzo(b)fluoranthene may include contributions from benzo(j)fluoranthene, if also present in the sample.

Certified By: Kelly Hogue

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AGAT Laboratories
11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
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Certificate of Analysis

AGAT WORK ORDER: 18X376667

PROJECT: P-0012285-0-16-200

CLIENT NAME: ENGLOBE CORP

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Dissolved Metals

DATE RECEIVED: 2018-08-22

DATE REPORTED: 2018-09-06

		SAMPLE DESCRIPTION:		CWT-MW1-18	CWT-MW2-18	CWT-MW3-18	CWT-MW7-18	CWT-MW8-18	CWT-MW11-18	CWT-MW14-18	CWT-DUPE4-18
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2018-08-20	2018-08-20	2018-08-20	2018-08-20	2018-08-20	2018-08-20	2018-08-20	2018-08-20
Parameter	Unit	G / S	RDL	9490912	9490917	9490918	9490920	9490921	9490922	9490923	9490924
Dissolved Aluminum	ug/L		5	792	860	261	8160	261	21700	255	744
Dissolved Antimony	ug/L		2	<2	<2	<2	<2	<2	<2	<2	<2
Dissolved Arsenic	ug/L		2	4	19	3	<2	<2	<2	<2	<2
Dissolved Barium	ug/L		5	32	25	17	114	42	345	30	83
Dissolved Beryllium	ug/L		2	<2	<2	<2	<2	<2	<2	<2	<2
Dissolved Bismuth	ug/L		2	<2	<2	<2	<2	<2	<2	<2	<2
Dissolved Boron	ug/L		5	17	11	115	51	26	79	14	15
Dissolved Cadmium	ug/L		0.017	0.021	0.017	<0.017	<0.017	0.037	0.317	<0.017	0.033
Dissolved Chromium	ug/L		1	4	8	4	5	3	8	<1	2
Dissolved Cobalt	ug/L		1	1	1	<1	<1	<1	2	<1	<1
Dissolved Copper	ug/L		2	9	3	<2	6	4	18	8	7
Dissolved Iron	ug/L		50	17400	30000	16000	4050	3150	9790	223	663
Dissolved Lead	ug/L		0.5	0.9	0.9	<0.5	1.1	1.5	15.8	<0.5	<0.5
Dissolved Manganese	ug/L		2	298	169	213	550	252	1270	126	499
Dissolved Molybdenum	ug/L		2	<2	<2	<2	<2	<2	19	<2	<2
Dissolved Nickel	ug/L		2	5	3	<2	6	2	15	4	5
Dissolved Selenium	ug/L		1	<1	<1	<1	<1	<1	<1	<1	<1
Dissolved Silver	ug/L		0.1	<0.1	0.2	<0.1	0.8	<0.1	0.7	<0.1	<0.1
Dissolved Strontium	ug/L		5	30	21	79	69	64	147	13	62
Dissolved Thallium	ug/L		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dissolved Tin	ug/L		2	<2	<2	<2	4	<2	9	<2	<2
Dissolved Titanium	ug/L		2	20	20	10	147	4	344	12	23
Dissolved Uranium	ug/L		0.1	0.3	0.4	0.2	0.9	<0.1	3.4	0.5	0.2
Dissolved Vanadium	ug/L		2	13	10	19	<2	3	3	<2	<2
Dissolved Zinc	ug/L		5	17	12	<5	11	<5	51	8	15

Certified By:

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CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
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Certificate of Analysis

AGAT WORK ORDER: 18X376667

PROJECT: P-0012285-0-16-200

CLIENT NAME: ENGLOBE CORP

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Dissolved Metals

DATE RECEIVED: 2018-08-22

DATE REPORTED: 2018-09-06

		SAMPLE DESCRIPTION:		CWT-MW13-18
		SAMPLE TYPE:		Water
		DATE SAMPLED:		2018-08-20
Parameter	Unit	G / S	RDL	9490925
Dissolved Aluminum	ug/L		5	167
Dissolved Antimony	ug/L		2	<2
Dissolved Arsenic	ug/L		2	<2
Dissolved Barium	ug/L		5	63
Dissolved Beryllium	ug/L		2	<2
Dissolved Bismuth	ug/L		2	<2
Dissolved Boron	ug/L		5	164
Dissolved Cadmium	ug/L		0.017	0.697
Dissolved Chromium	ug/L		1	3
Dissolved Cobalt	ug/L		1	<1
Dissolved Copper	ug/L		2	9
Dissolved Iron	ug/L		50	1100
Dissolved Lead	ug/L		0.5	2.1
Dissolved Manganese	ug/L		2	355
Dissolved Molybdenum	ug/L		2	<2
Dissolved Nickel	ug/L		2	7
Dissolved Selenium	ug/L		1	<1
Dissolved Silver	ug/L		0.1	<0.1
Dissolved Strontium	ug/L		5	144
Dissolved Thallium	ug/L		0.1	<0.1
Dissolved Tin	ug/L		2	<2
Dissolved Titanium	ug/L		2	4
Dissolved Uranium	ug/L		0.1	<0.1
Dissolved Vanadium	ug/L		2	<2
Dissolved Zinc	ug/L		5	818

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

9490912-9490925 Analysis completed on a filtered sample.

Certified By:

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Dartmouth, Nova Scotia
CANADA B3B 1M2
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FAX (902)468-8924
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Certificate of Analysis

AGAT WORK ORDER: 18X376667

PROJECT: P-0012285-0-16-200

CLIENT NAME: ENGLOBE CORP

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Mercury Analysis in Water (Dissolved)

DATE RECEIVED: 2018-08-22

DATE REPORTED: 2018-09-06

		SAMPLE DESCRIPTION:		CWT-MW1-18	CWT-MW2-18	CWT-MW3-18	CWT-MW7-18	CWT-MW8-18	CWT-MW11-18	CWT-MW14-18	CWT-DUPE4-18
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2018-08-20	2018-08-20	2018-08-20	2018-08-20	2018-08-20	2018-08-20	2018-08-20	2018-08-20
Parameter	**Unit**	**G / S**	**RDL**	**9490912**	**9490917**	**9490918**	**9490920**	**9490921**	**9490922**	**9490923**	**9490924**
Dissolved Mercury	ug/L		0.026	<0.026	<0.026	<0.026	<0.026	0.040	<0.026	<0.026	<0.026

		SAMPLE DESCRIPTION:		CWT-MW13-18
		SAMPLE TYPE:		Water
		DATE SAMPLED:		2018-08-20
Parameter	**Unit**	**G / S**	**RDL**	**9490925**
Dissolved Mercury	ug/L		0.026	<0.026

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Certified By: Laura Baker

Results relate only to the items tested and to all the items tested

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CANADA B3B 1M2
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FAX (902)468-8924
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Certificate of Analysis

AGAT WORK ORDER: 18X376667

PROJECT: P-0012285-0-16-200

CLIENT NAME: ENGLOBE CORP

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis (Dissolved)

DATE RECEIVED: 2018-08-22

DATE REPORTED: 2018-09-06

		SAMPLE DESCRIPTION:		CWT-MW1-18	CWT-MW2-18	CWT-MW3-18	CWT-MW7-18	CWT-MW8-18	CWT-MW11-18	CWT-MW14-18	CWT-MW13-18
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2018-08-20	2018-08-20	2018-08-20	2018-08-20	2018-08-20	2018-08-20	2018-08-20	2018-08-20
Parameter	Unit	G / S	RDL	9490912	9490917	9490918	9490920	9490921	9490922	9490923	9490925
pH				6.42	5.91	6.82	6.72	6.87	6.90	6.83	7.36
Reactive Silica as SiO2	mg/L		0.5	10.1	14.4	15.0	9.4	10.8	12.3	7.8	8.7
Chloride	mg/L		1	7	5	6	2	1	2	2	2
Fluoride	mg/L		0.12	<0.12	<0.12	0.16	<0.12	<0.12	<0.12	<0.12	<0.12
Sulphate	mg/L		2	2	<2	<2	<2	<2	4	2	<2
Alkalinity	mg/L		5	27	24	58	66	62	162	15	98
True Color	TCU		5	488	378	315	28	83	96	19	47
Turbidity	NTU		0.1	131	24.1	31.6	569	86.1	133	*	85.5
Electrical Conductivity	umho/cm		1	76	79	148	142	133	339	55	207
Nitrate + Nitrite as N	mg/L		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.08	<0.05
Nitrate as N	mg/L		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.08	<0.05
Nitrite as N	mg/L		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ammonia as N	mg/L		0.03	0.12	0.20	0.46	<0.03	<0.03	0.16	<0.03	<0.03
Total Organic Carbon	mg/L		0.5	26.0	16.4	10.1	3.2	8.5	32.3	5.8	3.2
Ortho-Phosphate as P	mg/L		0.01	0.04	0.04	0.02	0.01	0.01	0.01	0.01	0.01
Dissolved Sodium	mg/L		0.1	9.2	8.1	9.1	9.7	3.6	43.6	6.0	5.9
Dissolved Potassium	mg/L		0.1	1.3	1.5	1.6	4.3	5.0	5.2	2.5	4.8
Dissolved Calcium	mg/L		0.1	3.5	2.2	6.1	9.1	20.4	8.4	2.2	31.8
Dissolved Magnesium	mg/L		0.1	1.5	2.1	2.4	1.5	1.1	1.3	0.5	3.3
Bicarb. Alkalinity (as CaCO3)	mg/L		5	27	24	58	66	62	162	15	98
Carb. Alkalinity (as CaCO3)	mg/L		10	<10	<10	<10	<10	<10	<10	<10	<10
Hydroxide	mg/L		5	<5	<5	<5	<5	<5	<5	<5	<5
Calculated TDS	mg/L		1	59	65	77	79	72	195	25	109
Hardness	mg/L			14.9	14.1	25.1	28.9	55.5	26.3	7.6	93.0
Langelier Index (@20C)	NA			-3.17	-3.94	-2.21	-2.08	-1.60	-1.58	-3.18	-0.74
Langelier Index (@ 4C)	NA			-3.49	-4.26	-2.53	-2.40	-1.92	-1.90	-3.50	-1.06
Saturation pH (@ 20C)	NA			9.59	9.85	9.03	8.80	8.47	8.48	10.0	8.10
Saturation pH (@ 4C)	NA			9.91	10.2	9.35	9.12	8.79	8.80	10.3	8.42
Anion Sum	me/L			0.78	0.62	1.33	1.38	1.27	3.38	0.40	2.02
Cation sum	me/L			1.46	1.87	1.58	2.18	1.55	5.38	0.52	2.34

Certified By:

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CANADA B3B 1M2
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FAX (902)468-8924
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Certificate of Analysis

AGAT WORK ORDER: 18X376667

PROJECT: P-0012285-0-16-200

CLIENT NAME: ENGLOBE CORP

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis (Dissolved)

DATE RECEIVED: 2018-08-22

DATE REPORTED: 2018-09-06

		SAMPLE DESCRIPTION:		CWT-MW1-18	CWT-MW2-18	CWT-MW3-18	CWT-MW7-18	CWT-MW8-18	CWT-MW11-18	CWT-MW14-18	CWT-MW13-18
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2018-08-20	2018-08-20	2018-08-20	2018-08-20	2018-08-20	2018-08-20	2018-08-20	2018-08-20
Parameter	**Unit**	**G / S**	**RDL**	**9490912**	**9490917**	**9490918**	**9490920**	**9490921**	**9490922**	**9490923**	**9490925**
% Difference/ Ion Balance (NS)	%			30.5	50.0	8.7	22.6	9.9	22.8	12.3	7.3
Dissolved Copper	ug/L		2	9	3	<2	6	4	18	8	9
Dissolved Iron	ug/L		50	17400	30000	16000	4050	3150	9790	223	1100
Dissolved Phosphorus	mg/L		0.02	0.03	0.05	<0.02	<0.02	<0.02	0.04	<0.02	<0.02
Dissolved Manganese	ug/L		2	298	169	213	550	252	1270	126	355
Dissolved Zinc	ug/L		5	17	12	<5	11	<5	51	8	818

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

9490912-9490917 Metals analysis completed on a filtered sample.
Ion Balance is biased high, contributing parameters have been confirmed.

9490918 Metals analysis completed on a filtered sample.

9490920 Metals analysis completed on a filtered sample.
Ion Balance is biased high, contributing parameters have been confirmed.

9490921 Metals analysis completed on a filtered sample.

9490922 Metals analysis completed on a filtered sample.
Ion Balance is biased high, contributing parameters have been confirmed.

9490923 Metals analysis completed on a filtered sample.
When the cation and anion sums are below 1 me/L, the acceptable criteria is less than 0.3me/L.

9490925 Metals analysis completed on a filtered sample.

Certified By: Laura Baker

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FAX (902)468-8924
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Quality Assurance

CLIENT NAME: ENGLOBE CORP
AGAT WORK ORDER: 18X376667
PROJECT: P-0012285-0-16-200
ATTENTION TO: Andrew Higgins
SAMPLING SITE:
SAMPLED BY:

Trace Organics Analysis

RPT Date: Sep 06, 2018

PARAMETER	Batch	Sample Id	DUPLICATE			Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
			Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Atlantic RBCA Tier 1 Hydrocarbons in Soil (Version 3.1) - Field Preserved															
Benzene	1	9494600	< 0.03	< 0.03	NA	< 0.03	83%	60%	140%	96%	60%	140%			
Toluene	1	9494600	< 0.04	< 0.04	NA	< 0.04	85%	60%	140%	90%	60%	140%			
Ethylbenzene	1	9494600	< 0.03	< 0.03	NA	< 0.03	83%	60%	140%	85%	60%	140%			
Xylene (Total)	1	9494600	< 0.05	< 0.05	NA	< 0.05	87%	60%	140%	90%	60%	140%			
C6-C10 (less BTEX)	1	9494600	< 3	< 3	NA	< 3	78%	60%	140%	105%	60%	140%	113%	30%	130%
>C10-C16 Hydrocarbons	1	9490900	< 15	< 15	NA	< 15	96%	60%	140%	101%	60%	140%	101%	30%	130%
>C16-C21 Hydrocarbons	1	9490900	19	17	NA	< 15	93%	60%	140%	101%	60%	140%	101%	30%	130%
>C21-C32 Hydrocarbons	1	9490900	85	85	0.0%	< 15	76%	60%	140%	101%	60%	140%	101%	30%	130%

Comments: If Matrix spike value is NA, the spiked analyte concentration was lower than that of the matrix contribution.
If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Polycyclic Aromatic Hydrocarbons in Soil															
1-Methylnaphthalene	1	9484382	< 0.05	< 0.05	NA	< 0.05	88%	50%	140%	72%	50%	140%	74%	50%	140%
2-Methylnaphthalene	1	9484382	< 0.01	< 0.01	NA	< 0.01	97%	50%	140%	75%	50%	140%	76%	50%	140%
Acenaphthene	1	9484382	< 0.00671	< 0.00671	NA	< 0.00671	94%	50%	140%	75%	50%	140%	76%	50%	140%
Acenaphthylene	1	9484382	< 0.004	< 0.004	NA	< 0.004	90%	50%	140%	69%	50%	140%	71%	50%	140%
Acridine	1	9484382	< 0.05	< 0.05	NA	< 0.05	57%	50%	140%	55%	50%	140%	50%	50%	140%
Anthracene	1	9484382	< 0.03	< 0.03	NA	< 0.03	73%	50%	140%	65%	50%	140%	67%	50%	140%
Benzo(a)anthracene	1	9484382	< 0.01	< 0.01	NA	< 0.01	88%	50%	140%	67%	50%	140%	69%	50%	140%
Benzo(a)pyrene	1	9484382	< 0.01	< 0.01	NA	< 0.01	79%	50%	140%	63%	50%	140%	73%	50%	140%
Benzo(b)fluoranthene	1	9484382	< 0.05	< 0.05	NA	< 0.05	98%	50%	140%	83%	50%	140%	98%	50%	140%
Benzo(b+j)fluoranthene	1	9484382	< 0.1	< 0.1	NA	< 0.1	123%	50%	140%	97%	50%	140%	108%	50%	140%
Benzo(e)pyrene	1	9484382	< 0.05	< 0.05	NA	< 0.05	114%	50%	140%	96%	50%	140%	107%	50%	140%
Benzo(ghi)perylene	1	9484382	< 0.01	< 0.01	NA	< 0.01	68%	50%	140%	57%	50%	140%	61%	50%	140%
Benzo(k)fluoranthene	1	9484382	< 0.01	< 0.01	NA	< 0.01	72%	50%	140%	76%	50%	140%	80%	50%	140%
Chrysene	1	9484382	< 0.01	< 0.01	NA	< 0.01	88%	50%	140%	68%	50%	140%	73%	50%	140%
Dibenzo(a,h)anthracene	1	9484382	< 0.006	< 0.006	NA	< 0.006	53%	50%	140%	52%	50%	140%	52%	50%	140%
Fluoranthene	1	9484382	< 0.05	< 0.05	NA	< 0.05	80%	50%	140%	79%	50%	140%	83%	50%	140%
Fluorene	1	9484382	< 0.01	< 0.01	NA	< 0.01	90%	50%	140%	68%	50%	140%	72%	50%	140%
Indeno(1,2,3)pyrene	1	9484382	< 0.01	< 0.01	NA	< 0.01	54%	50%	140%	56%	50%	140%	51%	50%	140%
Naphthalene	1	9484382	< 0.01	< 0.01	NA	< 0.01	98%	50%	140%	79%	50%	140%	80%	50%	140%
Perylene	1	9484382	< 0.05	< 0.05	NA	< 0.05	97%	50%	140%	85%	50%	140%	86%	50%	140%
Phenanthrene	1	9484382	< 0.03	< 0.03	NA	< 0.03	91%	50%	140%	85%	50%	140%	85%	50%	140%
Pyrene	1	9484382	< 0.05	< 0.05	NA	< 0.05	82%	50%	140%	82%	50%	140%	86%	50%	140%
Quinoline	1	9484382	< 0.05	< 0.05	NA	< 0.05	75%	50%	140%	62%	50%	140%	62%	50%	140%

Comments: If Matrix spike value is NA, the spiked analyte concentration was lower than that of the matrix contribution.
If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Atlantic RBCA Tier 1 Hydrocarbons in Water (Version 3.0)															
Benzene	1	9489329	< 0.001	< 0.001	NA	< 0.001	82%	70%	130%	96%	70%	130%			

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AGAT Laboratories
11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
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Quality Assurance

CLIENT NAME: ENGLOBE CORP
AGAT WORK ORDER: 18X376667
PROJECT: P-0012285-0-16-200
ATTENTION TO: Andrew Higgins
SAMPLING SITE:
SAMPLED BY:

Trace Organics Analysis (Continued)

RPT Date: Sep 06, 2018			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Toluene	1	9489329	< 0.001	< 0.001	NA	< 0.001	82%	70%	130%	90%	70%	130%			
Ethylbenzene	1	9489329	< 0.001	< 0.001	NA	< 0.001	81%	70%	130%	85%	70%	130%			
Xylene (Total)	1	9489329	< 0.002	< 0.002	NA	< 0.002	86%	70%	130%	90%	70%	130%			
C6-C10 (less BTEX)	1	9489329	< 0.01	< 0.01	NA	< 0.01	76%	70%	130%	91%	70%	130%	NA	70%	130%
>C10-C16 Hydrocarbons	1	9490924	< 0.05	< 0.05	NA	< 0.05	94%	70%	130%	91%	70%	130%	88%	70%	130%
>C16-C21 Hydrocarbons	1	9490924	< 0.10	< 0.10	NA	< 0.10	93%	70%	130%	91%	70%	130%	88%	70%	130%
>C21-C32 Hydrocarbons	1	9490924	< 0.1	< 0.1	NA	< 0.1	79%	70%	130%	91%	70%	130%	88%	70%	130%

Comments: If Matrix spike value is NA, the spiked analyte concentration was lower than that of the matrix contribution.
If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Polycyclic Aromatic Hydrocarbons in Water - (PAH)

1-Methylnaphthalene	1	9496313	0.01	0.01	NA	< 0.01	102%	50%	140%	71%	50%	140%	78%	50%	140%
2-Methylnaphthalene	1	9496313	0.02	0.01	NA	< 0.01	100%	50%	140%	72%	50%	140%	79%	50%	140%
Acenaphthene	1	9496313	0.01	0.01	NA	< 0.01	96%	50%	140%	64%	50%	140%	56%	50%	140%
Acenaphthylene	1	9496313	< 0.01	< 0.01	NA	< 0.01	102%	50%	140%	67%	50%	140%	64%	50%	140%
Acridine	1	9496313	< 0.01	< 0.01	NA	< 0.01	85%	50%	140%	73%	50%	140%	78%	50%	140%
Anthracene	1	9496313	< 0.012	< 0.012	NA	< 0.012	95%	50%	140%	69%	50%	140%	73%	50%	140%
Benzo(a)anthracene	1	9496313	< 0.018	< 0.018	NA	< 0.018	104%	50%	140%	70%	50%	140%	67%	50%	140%
Benzo(a)pyrene	1	9496313	< 0.010	< 0.010	NA	< 0.010	74%	50%	140%	56%	50%	140%	60%	50%	140%
Benzo(b)fluoranthene	1	9496313	< 0.01	< 0.01	NA	< 0.01	77%	50%	140%	63%	50%	140%	64%	50%	140%
Benzo(e)pyrene	1	9496313	< 0.01	< 0.01	NA	< 0.01	73%	50%	140%	53%	50%	140%	58%	50%	140%
Benzo(ghi)perylene	1	9496313	< 0.01	< 0.01	NA	< 0.01	83%	50%	140%	59%	50%	140%	60%	50%	140%
Benzo(k)fluoranthene	1	9496313	< 0.01	< 0.01	NA	< 0.01	65%	50%	140%	71%	50%	140%	58%	50%	140%
Chrysene	1	9496313	< 0.01	< 0.01	NA	< 0.01	95%	50%	140%	63%	50%	140%	61%	50%	140%
Dibenzo(a,h)anthracene	1	9496313	< 0.01	< 0.01	NA	< 0.01	83%	50%	140%	65%	50%	140%	66%	50%	140%
Fluoranthene	1	9496313	0.01	0.01	NA	< 0.01	99%	50%	140%	71%	50%	140%	74%	50%	140%
Fluorene	1	9496313	< 0.01	< 0.01	NA	< 0.01	97%	50%	140%	67%	50%	140%	67%	50%	140%
Indeno(1,2,3-cd)pyrene	1	9496313	< 0.01	< 0.01	NA	< 0.01	83%	50%	140%	64%	50%	140%	63%	50%	140%
Naphthalene	1	9496313	0.06	0.06	0.0%	< 0.01	99%	50%	140%	67%	50%	140%	74%	50%	140%
Perylene	1	9496313	< 0.01	< 0.01	NA	< 0.01	72%	50%	140%	53%	50%	140%	57%	50%	140%
Phenanthrene	1	9496313	0.01	0.01	NA	< 0.01	93%	50%	140%	63%	50%	140%	67%	50%	140%
Pyrene	1	9496313	<0.01	0.01	NA	< 0.01	99%	50%	140%	70%	50%	140%	73%	50%	140%
Quinoline	1	9496313	< 0.01	< 0.01	NA	< 0.01	97%	50%	140%	63%	50%	140%	74%	50%	140%

Comments: If Matrix spike value is NA, the spiked analyte concentration was lower than that of the matrix contribution.
If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Atlantic RBCA Tier 1 Hydrocarbons in Soil (Version 3.1) - Field Preserved

Benzene	1	9490928	< 0.03	< 0.03	NA	< 0.03	79%	60%	140%	79%	60%	140%
Toluene	1	9490928	< 0.04	< 0.04	NA	< 0.04	81%	60%	140%	73%	60%	140%
Ethylbenzene	1	9490928	< 0.03	< 0.03	NA	< 0.03	82%	60%	140%	71%	60%	140%
Xylene (Total)	1	9490928	< 0.05	< 0.05	NA	< 0.05	88%	60%	140%	78%	60%	140%

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Quality Assurance

CLIENT NAME: ENGLOBE CORP

AGAT WORK ORDER: 18X376667

PROJECT: P-0012285-0-16-200

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Trace Organics Analysis (Continued)

RPT Date: Sep 06, 2018			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
C6-C10 (less BTEX)	1	9490928	< 3	< 3	NA	< 3	78%	60%	140%	99%	60%	140%	98%	30%	130%

Comments: If Matrix spike value is NA, the spiked analyte concentration was lower than that of the matrix contribution.
If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Certified By: Kelly Hogue

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Quality Assurance

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SAMPLING SITE:
SAMPLED BY:

Water Analysis

RPT Date: Sep 06, 2018			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Dissolved Metals															
Dissolved Aluminum	9490925	9490925	167	158	5.6%	< 5	100%	80%	120%	108%	80%	120%	NA	70%	130%
Dissolved Antimony	9490925	9490925	<2	<2	NA	< 2	98%	80%	120%	118%	80%	120%	120%	70%	130%
Dissolved Arsenic	9490925	9490925	<2	<2	NA	< 2	96%	80%	120%	100%	80%	120%	109%	70%	130%
Dissolved Barium	9490925	9490925	63	60	5.0%	< 5	101%	80%	120%	102%	80%	120%	NA	70%	130%
Dissolved Beryllium	9490925	9490925	<2	<2	NA	< 2	115%	80%	120%	117%	80%	120%	126%	70%	130%
Dissolved Bismuth	9490925	9490925	<2	<2	NA	< 2	106%	80%	120%	111%	80%	120%	70%	70%	130%
Dissolved Boron	9490925	9490925	164	149	9.5%	< 5	110%	80%	120%	116%	80%	120%	NA	70%	130%
Dissolved Cadmium	9490925	9490925	0.70	0.67	3.8%	< 0.09	96%	80%	120%	99%	80%	120%	113%	70%	130%
Dissolved Chromium	9490925	9490925	3	2	NA	< 1	100%	80%	120%	104%	80%	120%	101%	70%	130%
Dissolved Cobalt	9490925	9490925	<1	<1	NA	< 1	99%	80%	120%	103%	80%	120%	104%	70%	130%
Dissolved Copper	9490925	9490925	9	9	NA	< 2	105%	80%	120%	108%	80%	120%	108%	70%	130%
Dissolved Iron	9490925	9490925	1100	1040	6.4%	< 50	108%	80%	120%	115%	80%	120%	NA	70%	130%
Dissolved Lead	9490925	9490925	2.1	2.0	NA	< 0.5	107%	80%	120%	108%	80%	120%	105%	70%	130%
Dissolved Manganese	9490925	9490925	355	362	1.9%	< 2	105%	80%	120%	110%	80%	120%	NA	70%	130%
Dissolved Molybdenum	9490925	9490925	<2	<2	NA	< 2	97%	80%	120%	101%	80%	120%	99%	70%	130%
Dissolved Nickel	9490925	9490925	7	6	NA	< 2	102%	80%	120%	105%	80%	120%	99%	70%	130%
Dissolved Selenium	9490925	9490925	<1	<1	NA	< 1	94%	80%	120%	99%	80%	120%	116%	70%	130%
Dissolved Silver	9490925	9490925	<0.1	<0.1	NA	< 0.1	108%	80%	120%	111%	80%	120%	105%	70%	130%
Dissolved Strontium	9490925	9490925	144	141	2.1%	< 5	106%	80%	120%	107%	80%	120%	NA	70%	130%
Dissolved Thallium	9490925	9490925	<0.1	<0.1	NA	< 0.1	103%	80%	120%	105%	80%	120%	104%	70%	130%
Dissolved Tin	9490925	9490925	<2	<2	NA	< 2	98%	80%	120%	102%	80%	120%	100%	70%	130%
Dissolved Titanium	9490925	9490925	4	4	NA	< 2	104%	80%	120%	108%	80%	120%	95%	70%	130%
Dissolved Uranium	9490925	9490925	<0.1	<0.1	NA	< 0.1	103%	80%	120%	104%	80%	120%	104%	70%	130%
Dissolved Vanadium	9490925	9490925	<2	<2	NA	< 2	98%	80%	120%	102%	80%	120%	107%	70%	130%
Dissolved Zinc	9490925	9490925	818	861	5.2%	< 5	100%	80%	120%	102%	80%	120%	NA	70%	130%

Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Mercury Analysis in Water (Dissolved)

Dissolved Mercury	1	9490925	< 0.026	< 0.026	NA	< 0.026	98%	80%	120%	NA	80%	120%	96%	80%	120%

Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Mercury Analysis in Water (Dissolved)

Dissolved Mercury	1	9496606	<0.26	<0.26	NA	< 0.026	107%	80%	120%		80%	120%	100%	80%	120%

Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Standard Water Analysis (Dissolved)

pH	9503075		7.91	8.03	1.5%	<	102%	80%	120%	NA	80%	120%	NA	80%	120%
Reactive Silica as SiO2	1	9509883	13.7	13.7	0.0%	< 0.5	102%	80%	120%		80%	120%	120%	80%	120%
Chloride	9503494		52	53	1.5%	< 1	91%	80%	120%	NA	80%	120%	NA	80%	120%
Fluoride	9503494		<0.12	<0.12	NA	< 0.12	99%	80%	120%	NA	80%	120%	105%	80%	120%

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Quality Assurance

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AGAT WORK ORDER: 18X376667
PROJECT: P-0012285-0-16-200
ATTENTION TO: Andrew Higgins
SAMPLING SITE:
SAMPLED BY:

Water Analysis (Continued)

RPT Date: Sep 06, 2018			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Sulphate	9503494		5	5	NA	< 2	108%	80%	120%	NA	80%	120%	92%	80%	120%
Alkalinity	9503075		104	104	0.5%	< 5	93%	80%	120%	NA	80%	120%	NA	80%	120%
True Color	9495138		20	22	NA	< 5	105%	80%	120%	NA			NA		
Turbidity	9495138		475	455	4.3%	< 0.1	96%	80%	120%	NA			NA		
Electrical Conductivity	9503075		46500	45900	1.1%	< 1	103%	80%	120%	NA	80%	120%	NA	80%	120%
Nitrate as N	9503494		2.98	3.04	2.0%	< 0.05	91%	80%	120%	NA	80%	120%	NA	80%	120%
Nitrite as N	9503494		0.12	0.11	NA	< 0.05	95%	80%	120%	NA	80%	120%	104%	80%	120%
Ammonia as N	1	9509883	<0.03	<0.03	NA	< 0.03	104%	80%	120%		80%	120%	98%	80%	120%
Total Organic Carbon	9490912	9490912	26.0	25.5	1.9%	< 0.5	95%	80%	120%	NA	80%	120%	NA	80%	120%
Ortho-Phosphate as P	1					< 0.01		80%	120%		80%	120%		80%	120%
Dissolved Sodium	9507030	9490925	17.4	17.0	2.8%	< 0.1	118%	80%	120%	110%	80%	120%	NA	70%	130%
Dissolved Potassium	9507030	9490925	2.0	2.5	NA	< 0.1	120%	80%	120%	114%	80%	120%	NA	70%	130%
Dissolved Calcium	9507030	9490925	31.1	30.9	0.6%	< 0.1	112%	80%	120%	107%	80%	120%	NA	70%	130%
Dissolved Magnesium	9507030	9490925	1.7	2.0	16.9%	< 0.1	118%	80%	120%	116%	80%	120%	NA	70%	130%
Bicarb. Alkalinity (as CaCO3)	9503075		104	104	0.5%	< 5	NA	80%	120%	NA	80%	120%	NA	80%	120%
Carb. Alkalinity (as CaCO3)	9503075		<10	<10	NA	< 10	NA	80%	120%	NA	80%	120%	NA	80%	120%
Hydroxide	9503075		<5	<5	NA	< 5	NA	80%	120%	NA	80%	120%	NA	80%	120%
Dissolved Copper	9507030	9490925	<2	<2	NA	< 2	111%	80%	120%	111%	80%	120%	119%	70%	130%
Dissolved Iron	9507030	9490925	<50	<50	NA	< 50	113%	80%	120%	113%	80%	120%	111%	70%	130%
Dissolved Phosphorus	9507030	9490925	<0.02	<0.02	NA	< 0.02	108%	80%	120%	99%	80%	120%	93%	70%	130%
Dissolved Manganese	9507030	9490925	7	8	NA	< 2	113%	80%	120%	113%	80%	120%	129%	70%	130%
Dissolved Zinc	9507030	9490925	24	28	16.4%	< 5	107%	80%	120%	107%	80%	120%	99%	70%	130%
Dissolved Metals															
Dissolved Aluminum	9490925	9490925	167	158	5.6%	< 5	107%	80%	120%	118%	80%	120%	NA	70%	130%
Dissolved Antimony	9490925	9490925	<2	<2	NA	< 2	86%	80%	120%	NA	80%	120%	120%	70%	130%
Dissolved Arsenic	9490925	9490925	<2	<2	NA	< 2	95%	80%	120%	102%	80%	120%	109%	70%	130%
Dissolved Barium	9490925	9490925	63	60	5.0%	< 5	101%	80%	120%	NA	80%	120%	NA	70%	130%
Dissolved Beryllium	9490925	9490925	<2	<2	NA	< 2	105%	80%	120%	115%	80%	120%	126%	70%	130%
Dissolved Bismuth	9490925	9490925	<2	<2	NA	< 2	102%	80%	120%	113%	80%	120%	70%	70%	130%
Dissolved Boron	9490925	9490925	164	149	9.5%	< 5	107%	80%	120%	NA	80%	120%	NA	70%	130%
Dissolved Cadmium	9490925	9490925	0.70	0.67	3.8%	< 0.09	97%	80%	120%	106%	80%	120%	113%	70%	130%
Dissolved Chromium	9490925	9490925	3	2	NA	< 1	98%	80%	120%	NA	80%	120%	101%	70%	130%
Dissolved Cobalt	9490925	9490925	<1	<1	NA	< 1	98%	80%	120%	105%	80%	120%	104%	70%	130%
Dissolved Copper	9490925	9490925	9	9	NA	< 2	102%	80%	120%	NA	80%	120%	108%	70%	130%
Dissolved Iron	9490925	9490925	1100	1040	6.4%	< 50	108%	80%	120%	NA	80%	120%	NA	70%	130%
Dissolved Lead	9490925	9490925	2.1	2.0	NA	< 0.5	107%	80%	120%	114%	80%	120%	105%	70%	130%
Dissolved Manganese	9490925	9490925	355	362	1.9%	< 2	104%	80%	120%	112%	80%	120%	NA	70%	130%

Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

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PROJECT: P-0012285-0-16-200

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Water Analysis (Continued)

RPT Date: Sep 06, 2018			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Dissolved Molybdenum	9490925	9490925	<2	<2	NA	< 2	NA	80%	120%	NA	80%	120%	99%	70%	130%
Dissolved Nickel	9490925	9490925	7	6	NA	< 2	100%	80%	120%	NA	80%	120%	99%	70%	130%
Dissolved Selenium	9490925	9490925	<1	<1	NA	< 1	94%	80%	120%	100%	80%	120%	116%	70%	130%
Dissolved Silver	9490925	9490925	<0.1	<0.1	NA	< 0.1	99%	80%	120%	NA	80%	120%	105%	70%	130%
Dissolved Strontium	9490925	9490925	144	141	2.1%	< 5	107%	80%	120%	NA	80%	120%	NA	70%	130%
Dissolved Thallium	9490925	9490925	<0.1	<0.1	NA	< 0.1	NA	80%	120%	NA	80%	120%	104%	70%	130%
Dissolved Tin	9490925	9490925	<2	<2	NA	< 2	96%	80%	120%	104%	80%	120%	100%	70%	130%
Dissolved Titanium	9490925	9490925	4	4	NA	< 2	NA	80%	120%	NA	80%	120%	95%	70%	130%
Dissolved Uranium	9490925	9490925	<0.1	<0.1	NA	< 0.1	101%	80%	120%	107%	80%	120%	104%	70%	130%
Dissolved Vanadium	9490925	9490925	<2	<2	NA	< 2	97%	80%	120%	104%	80%	120%	107%	70%	130%
Dissolved Zinc	9490925	9490925	818	861	5.2%	< 5	99%	80%	120%	NA	80%	120%	NA	70%	130%

Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Certified By:

AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation.

Results relate only to the items tested and to all the items tested

AGAT Laboratories

11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
http://www.agatlabs.com

Method Summary

CLIENT NAME: ENGLOBE CORP

AGAT WORK ORDER: 18X376667

PROJECT: P-0012285-0-16-200

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Trace Organics Analysis			
Benzene	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
Toluene	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
Ethylbenzene	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
Xylene (Total)	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
C6-C10 (less BTEX)	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS/FID
>C10-C16 Hydrocarbons	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
>C16-C21 Hydrocarbons	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
>C21-C32 Hydrocarbons	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
Modified TPH (Tier 1)	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	CALCULATION
Resemblance Comment	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS/FID
Return to Baseline at C32	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
Isobutylbenzene - EPH	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
Isobutylbenzene - VPH	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
n-Dotriacontane - EPH	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
C6-C10 (less BTEX)	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
Modified TPH (Tier 1)	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	CALCULATION
% Moisture		Calculation	GRAVIMETRIC
1-Methylnaphthalene	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
2-Methylnaphthalene	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
Acenaphthene	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
Acenaphthylene	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
Acridine	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
Anthracene	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
Benzo(a)anthracene	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
Benzo(a)pyrene	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
Benzo(b)fluoranthene	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
Benzo(b+j)fluoranthene	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
Benzo(e)pyrene	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
Benzo(ghi)perylene	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
Benzo(k)fluoranthene	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
Chrysene	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
Dibenzo(a,h)anthracene	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
Fluoranthene	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
Fluorene	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
Indeno(1,2,3)pyrene	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
Naphthalene	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
Perylene	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS

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Method Summary

CLIENT NAME: ENGLOBE CORP

AGAT WORK ORDER: 18X376667

PROJECT: P-0012285-0-16-200

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Phenanthrene	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
Pyrene	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
Quinoline	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
Nitrobenzene-d5	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
2-Fluorobiphenyl	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
Terphenyl-d14	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
1-Methylnaphthalene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
2-Methylnaphthalene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Acenaphthene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Acenaphthylene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Acridine	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Anthracene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Benzo(a)anthracene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Benzo(a)pyrene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Benzo(b)fluoranthene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Benzo(e)pyrene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Benzo(ghi)perylene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Benzo(k)fluoranthene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Chrysene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Dibenzo(a,h)anthracene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Fluoranthene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Fluorene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Indeno(1,2,3-cd)pyrene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Naphthalene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Perylene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Phenanthrene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Pyrene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Quinoline	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Nitrobenzene-d5	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
2-Fluorobiphenyl	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Terphenyl-d14	ORG-120-5104	EPA SW846/3510/8270C	GC/MS

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Method Summary

CLIENT NAME: ENGLOBE CORP

AGAT WORK ORDER: 18X376667

PROJECT: P-0012285-0-16-200

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Analysis			
Dissolved Aluminum	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Antimony	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Arsenic	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Barium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Beryllium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Bismuth	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Boron	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Cadmium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Chromium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Cobalt	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Copper	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Iron	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Lead	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Manganese	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Molybdenum	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Nickel	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Selenium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Silver	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Strontium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Thallium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Tin	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Titanium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Uranium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Vanadium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Zinc	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Mercury	MET-121-6100 & MET-121-6107	SM 3112 B	CV/AA
pH	INOR-121-6001	SM 4500 H+B	PC TITRATE
Reactive Silica as SiO2	INOR-121-6027	SM 4110 B	COLORIMETER
Chloride	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH

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Method Summary

CLIENT NAME: ENGLOBE CORP

AGAT WORK ORDER: 18X376667

PROJECT: P-0012285-0-16-200

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Fluoride	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH
Sulphate	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH
Alkalinity	INOR-121-6001	SM 2320 B	
True Color	INOR-121-6014	SM 2120 C	NEPHELOMETER
Turbidity	INOR-121-6022	SM 2130 B	NEPHELOMETER
Electrical Conductivity	INOR-121-6001	SM 2510 B	PC TITRATE
Nitrate + Nitrite as N	INORG-121-6005	SM 4110 B	CALCULATION
Nitrate as N	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH
Nitrite as N	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH
Ammonia as N	INOR-121-6047	SM 4500-NH3 G	COLORIMETER
Total Organic Carbon	INORG-121-6026	SM 5310 B	TOC ANALYZER
Ortho-Phosphate as P	INOR-121-6012	SM 4110 B	COLORIMETER
Dissolved Sodium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Potassium	MET121-6104 & MET-121-6105	SM 3125	ICP-MS
Dissolved Calcium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Magnesium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Bicarb. Alkalinity (as CaCO3)	INORG-121-6001	SM 2320 B	PC TITRATE
Carb. Alkalinity (as CaCO3)	INORG-121-6001	SM 2320 B	PC TITRATE
Hydroxide	INORG-121-6001	SM 2320 B	PC-TITRATE
Calculated TDS		SM 1030E	CALCULATION
Hardness		SM 2340B	CALCULATION
Langelier Index (@20C)			CALCULATION
Langelier Index (@ 4C)			CALCULATION
Saturation pH (@ 20C)			CALCULATION
Saturation pH (@ 4C)			CALCULATION
Anion Sum		SM 1030E	CALCULATION
Cation sum		SM 1030E	CALCULATION
% Difference/ Ion Balance (NS)		SM 1030E	CALCULATION
Dissolved Phosphorus	MET-121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS

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AGAT Laboratories
Unit 122 • 11 Morris Drive
Dartmouth, NS
B3B 1M2
webearth.agatlabs.com • www.agatlabs.com
P: 902.468.8718 • F: 902.468.8924

Chain of Custody Record

Laboratory Use Only
Arrival Condition: ☐ Good ☐ Poor (see notes)
Arrival Temperature: 2.9, 4.6, 4.5
Hold Time:
AGAT Job Number: 18X376667
Notes:

Report Information
Company: ENGLOBE CORP.
Contact: ANDREW Higgins
Address: 91 TROOP AVENUE
DARTMOUTH, NS, B3B 2A7
Phone: 902-468-6486 Fax:
Client Project #: P-001285-0-16-200
AGAT Quotation: CARTWRIGHT - ATT: JANETTE FRASER
Please Note: If quotation number is not provided client will be billed full price for analysis.

Report Information (Please print):
1. Name: ANDREW Higgins
Email: andrew.higgins@englobecorp.com
2. Name: CHRISTINA CATHWELL
Email: christina.cathwell@englobecorp.com

Report Format
☐ Single Sample per page
☐ Multiple Samples per page
☑ Excel Format Included
☐ Export
QIO-EDD FORMAT

Turnaround Time Required (TAT)
Regular TAT ☐ 5 to 7 working days
Rush TAT ☐ Same day ☐ 1 day ☐ 2 days ☐ 3 days
Date Required:

Invoice To Same Yes ☑ No ☐
Company:
Contact:
Address:
Phone: Fax:
PO/Credit Card#:

Regulatory Requirements (Check):
☐ List Guidelines on Report ☐ Do not list Guidelines on Report
☐ PIRI
☐ Tier 1 ☐ Res ☐ Pot ☐ Coarse
☐ Tier 2 ☐ Com ☐ N/Pot ☐ Fine
☐ Gas ☐ Fuel ☐ Lube
☐ CCME ☐ CDWQ
☐ Industrial ☐ NSEQS-Cont Sites
☐ Commercial ☐ HRM 101
☐ Res/Park ☐ Storm Water
☐ Agricultural ☐ Waste Water
☐ FWAL
☐ Sediment ☐ Other

Drinking Water Sample: ☐ Yes ☐ No **Salt Water Sample** ☐ Yes ☐ No
Reg. No.:

Sample Identification	Date/Time Sampled	Sample Matrix	# Containers	Comments – Site/Sample Info. Sample Containment	Field Filtered/Preserved	Standard Water Analysis	Metals: ☐ Total ☐ Diss ☐ Available	Mercury	☐ BOD ☐ CBOD	pH	☐ TSS ☐ TDS ☐ VSS	TKN	Total Phosphorus	Phenols	Tier 1: TPH/BTEX (PIRI) ☐ low level	Tier 2: TPH/BTEX Fractionation	CCME-CWS TPH/BTEX	VOC	THM	HAA	PAH	PCB	TC + EC ☐ P/A ☐ MPN ☐ MF	☐ HPC ☐ Pseudomonas	Fecal Coliform ☐ MPN ☐ MF	Other:	Other:	Hazardous (Y/N)
CWT-MW7-DUP-E	18-08-2018	SOIL	3																		X						
CWT-MW1-18	20-08-2018	GW	6		X	X	X	X							X	X					X						
CWT-MW2-18	↓		6		↓	↓	↓	↓							X						↓						
CWT-MW3-18			7												X												
CWT-MW4-18			7												X												
CWT-MW7-18			7												X												
CWT-MW8-18			7												X												
CWT-MW11-18			7												X												
CWT-MW14-18			7												X												
[illegible]															X												
CWT-DUP-E4-18	↓		7												X												
CWT-MW13-18	20-08-2018		7		↓	↓	↓	↓							X						↓						

Samples Relinquished By (Print Name): DAVID CHENARD
Date/Time: 21/08/2018
Samples Relinquished By (Sign):
Date/Time:
Samples Received By (Print Name): Jordan Boone
Date/Time: 22/Aug/18
Samples Received By (Sign):
Date/Time: 1455

Pink Copy - Client
Yellow Copy - AGAT
White Copy - AGAT

Page 2 of 2
No: 57860

Document ID: DIV 133-1501_004
Date revised: May 19, 2016

AGAT Laboratories

Unit 122 ▪ 11 Morris Drive
Dartmouth, NS
B3B 1M2
webearth.agatlabs.com ▪ www.agatlabs.com
P: 902.468.8718 ▪ F: 902.468.8924

Chain of Custody Record

Laboratory Use Only

Arrival Condition: ☐ Good ☐ Poor (see notes)
Arrival Temperature: 2.9, 4.6, 4.5
Hold Time:
AGAT Job Number: 18X376667
Notes:

Report Information

Company: ENGLOBE CORP.
Contact: ANDREW Higgins
Address: 91, TROOP AVENUE, DARTMOUTH, NOVA SCOTIA, B3B 2A7
Phone: 902-468-6486 Fax:
Client Project #: P-0012285-0-16-200
AGAT Quotation: CARTWRIGHT - Att: ~~Andrew Higgins~~ JANETTE FRASER
Please Note: If quotation number is not provided client will be billed full price for analysis.

Report Information (Please print):

1. Name: ANDREW Higgins
Email: andrew.higgins@englobecorp.com
2. Name: CHRISTINA Caldwell
Email: CHRISTINA.CALDWELL@ENGLOBECORP.COM

Report Format

☐ Single Sample per page
☐ Multiple Samples per page
☑ Excel Format Included
☐ Export

EXCEL FORMAT
Q10 - EDD FORMAT

Turnaround Time Required (TAT)

Regular TAT ☐ 5 to 7 working days
Rush TAT ☐ Same day ☐ 1 day ☐ 2 days ☐ 3 days
Date Required:

Regulatory Requirements (Check):

☐ List Guidelines on Report ☐ Do not list Guidelines on Report
☐ PIRI
☐ Tier 1 ☐ Res ☐ Pot ☐ Coarse
☐ Tier 2 ☐ Com ☐ N/Pot ☐ Fine
☐ Gas ☐ Fuel ☐ Lube
☐ CCME
☐ Industrial
☐ Commercial
☐ Res/Park
☐ Agricultural
☐ FWAL
☐ Sediment
☐ CDWQ
☐ NSEQS-Cont Sites
☐ HRM 101
☐ Storm Water
☐ Waste Water
☐ Other

Drinking Water Sample: ☐ Yes ☐ No Salt Water Sample ☐ Yes ☐ No
Reg. No.:

Invoice To Same Yes ☑ / No ☐

Company:
Contact:
Address:
Phone: Fax:
PO/Credit Card#:

Sample Identification	Date/Time Sampled	Sample Matrix	# Containers	Comments – Site/Sample Info. Sample Containment	Field Filtered/Preserved	Standard Water Analysis	Metals: ☐ Total ☐ Diss ☐ Available	Mercury	☐ BOD ☐ CBOD	pH	☐ TSS ☐ TDS ☐ VSS	TKN	Total Phosphorus	Phenols	Tier 1: TPH/BTEX (PIRI) ☐ low level	Tier 2: TPH/BTEX Fractionation	CCME-CWS TPH/BTEX	VOC	THM	HAA	PAH	PCB	TC + EC ☐ P/A ☐ MPN ☐ MF	☐ HPC ☐ Pseudomonas	Fecal Coliform ☐ MPN ☐ MF	Other:	Other:	Hazardous (Y/N)
~~[illegible]~~																												
CWT-MW7/1	18-08-2018	SOIL	3												X						X							
CWT-MW7/2	18-08-2018	↓	↓																									
CWT-MW1/1	19-08-2018	↓	↓												X													
CWT-MW1/2	↓	↓	↓												X													
CWT-MW1/3	↓	↓	↓												X													
CWT-MW2/1	↓	↓	↓												X													
CWT-MW2/2	↓	↓	↓												X													
CWT-MW3/1	↓	↓	↓																		X							
CWT-MW3/2	↓	↓	↓																		X							
CWT-MW3/3	↓	↓	↓																		X							
CWT-MW3/4	↓	↓	↓																		X							

Samples Relinquished By (Print Name):	Date/Time	Samples Received By (Print Name):	Date/Time
DAVID CHENARD	21/08/2018	Jordan Boone	22 Aug 18
Samples Relinquished By (Sign):	Date/Time	Samples Received By (Sign):	Date/Time
		Boone	1455

Pink Copy - Client
Yellow Copy - AGAT
White Copy- AGAT

Page 1 of 2

Nº: 57859

Document ID: DIV-133 1501 004

Date revised: May 19, 2016

AGAT Laboratories

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CANADA B3B 1M2
TEL (902)468-8718
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http://www.agatlabs.com

CLIENT NAME: ENGLOBE CORP
97 TROOP AVE
DARTMOUTH, NS B3B2A7
(902) 468-6486

ATTENTION TO: Andrew Higgins

PROJECT: P-0012285-0-16-200

AGAT WORK ORDER: 18X380128

SOIL ANALYSIS REVIEWED BY: Jason Coughtrey, Inorganics Supervisor

TRACE ORGANICS REVIEWED BY: Kelly Hogue, B.Sc, P.Chem, Operations Manager

WATER ANALYSIS REVIEWED BY: Laura Baker, Inorganics Data Reporter

DATE REPORTED: Sep 14, 2018

PAGES (INCLUDING COVER): 33

VERSION*: 2

Should you require any information regarding this analysis please contact your client services representative at (902) 468-8718

*NOTES
VERSION 2:Version 2.0 supersedes version 1.0

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

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Western Enviro-Agricultural Laboratory Association (WEALA)
Environmental Services Association of Alberta (ESAA)

AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation.

Results relate only to the items tested and to all the items tested
All reportable information as specified by ISO 17025:2005 is available from AGAT Laboratories upon request

AGAT Laboratories

11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 18X380128

PROJECT: P-0012285-0-16-200

CLIENT NAME: ENGLOBE CORP

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Fraction Organic Carbon

DATE RECEIVED: 2018-08-31

DATE REPORTED: 2018-09-14

SAMPLE DESCRIPTION:				CWT-SED-8-18	CWT-SED-7-18	CWT-SED-BK01	CWT-SED-BK02	CWT-SED-BK03	CWT-SED-BK04
SAMPLE TYPE:				Soil	Soil	Soil	Soil	Soil	Soil
DATE SAMPLED:				2018-08-24	2018-08-24	2018-08-24	2018-08-24	2018-08-24	2018-08-24
Parameter	Unit	G / S	RDL	9512525	9512528	9512532	9512533	9512534	9512535
Fraction Organic Carbon-1	NA		0.015	0.607	0.279	0.457	0.425	0.600	0.335
Fraction Organic Carbon-2	NA		0.015	0.607	0.279	0.474	0.433	0.599	0.333
Fraction Organic Carbon-3	NA		0.015	0.608	0.277	0.469	0.432	0.597	0.345
Fraction Organic Carbon-Avg	NA		0.015	0.607	0.278	0.467	0.430	0.599	0.338

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

9512525-9512535 Samples were analyzed and are reported in triplicate.
FOC was calculated from the Total Organic Carbon determined by Walkley Black Wet oxidation procedure.

Certified By:

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Certificate of Analysis

AGAT WORK ORDER: 18X380128

PROJECT: P-0012285-0-16-200

CLIENT NAME: ENGLOBE CORP

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Atlantic RBCA Tier 1 Hydrocarbons in Soil (Version 3.1) - Field Preserved

DATE RECEIVED: 2018-08-31

DATE REPORTED: 2018-09-14

SAMPLE DESCRIPTION:				CWT-SED-8-18	CWT-SED-7-18	CWT-SED-BK01	CWT-SED-BK02	CWT-SED-BK03	CWT-SED-BK04
SAMPLE TYPE:				Soil	Soil	Soil	Soil	Soil	Soil
DATE SAMPLED:				2018-08-24	2018-08-24	2018-08-24	2018-08-24	2018-08-24	2018-08-24
Parameter	Unit	G / S	RDL	9512525	9512528	9512532	9512533	9512534	9512535
Benzene	mg/kg		0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Toluene	mg/kg		0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Ethylbenzene	mg/kg		0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Xylene (Total)	mg/kg		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
C6-C10 (less BTEX)	mg/kg		3	<3	<3	75	<3	<3	<3
>C10-C16 Hydrocarbons	mg/kg		15	114	52	137	396	72	85
>C16-C21 Hydrocarbons	mg/kg		15	301	223	149	597	350	2760
>C21-C32 Hydrocarbons	mg/kg		15	2300	1690	1050	2620	1970	1190
Modified TPH (Tier 1)	mg/kg		20	2720	1970	1410	3610	2390	4040
Resemblance Comment				UC+LR	UC+LR	UC+LR	UC+LR	UC+LR	UC
Return to Baseline at C32				N	Y	N	N	N	Y
Surrogate	Unit	Acceptable Limits							
Isobutylbenzene - EPH	%	60-140		105	109	100	98	95	102
Isobutylbenzene - VPH	%	60-140		71	75	76	77	78	71
n-Dotriacontane - EPH	%	60-140		112	116	116	113	122	105

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

9512525-9512535 Results are based on the dry weight of the soil.

Resemblance Comment Key:
GF - Gasoline Fraction
WGF - Weathered Gasoline Fraction
GR - Product in Gasoline Range
FOF - Fuel Oil Fraction
WFOF - Weathered Fuel Oil Fraction
FR - Product in Fuel Oil Range
LOF - Lube Oil Fraction
LR - Lube Range
UC - Unidentified Compounds
NR - No Resemblance
NA - Not Applicable

Certified By: Kelly Hogue

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Certificate of Analysis

AGAT WORK ORDER: 18X380128

PROJECT: P-0012285-0-16-200

CLIENT NAME: ENGLOBE CORP

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Atlantic RBCA Tier 1 Hydrocarbons in Soil - EPH Only + 3X Silica Gel Cleanup

DATE RECEIVED: 2018-08-31

DATE REPORTED: 2018-09-14

SAMPLE DESCRIPTION:				CWT-SED-8-18	CWT-SED-7-18	CWT-SED-BK01	CWT-SED-BK02	CWT-SED-BK03	CWT-SED-BK04
SAMPLE TYPE:				Soil	Soil	Soil	Soil	Soil	Soil
DATE SAMPLED:				2018-08-24	2018-08-24	2018-08-24	2018-08-24	2018-08-24	2018-08-24
Parameter	Unit	G / S	RDL	9512525	9512528	9512532	9512533	9512534	9512535
>C10-C16 Hydrocarbons	mg/kg		15	116	94	163	157	150	<15
>C16-C21 Hydrocarbons	mg/kg		15	129	102	65	103	229	132
>C21-C32 Hydrocarbons	mg/kg		15	558	383	250	558	743	344
Return to Baseline at C32				Y	Y	Y	Y	Y	Y
Silica Gel Cleanup - 3X				Y	Y	Y	Y	Y	Y
Surrogate	Unit	Acceptable Limits							
Isobutylbenzene - EPH	%	60-140		N/A	N/A	N/A	N/A	N/A	N/A
n-Dotriacontane - EPH	%	60-140		N/A	N/A	N/A	N/A	N/A	N/A

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

9512525-9512535 Results are based on the dry weight of the soil.

Certified By: Kelly Hogue

Results relate only to the items tested and to all the items tested

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Certificate of Analysis

AGAT WORK ORDER: 18X380128

PROJECT: P-0012285-0-16-200

CLIENT NAME: ENGLOBE CORP

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Atlantic RBCA Tier 1 Hydrocarbons in Water (Version 3.0)

DATE RECEIVED: 2018-08-31

DATE REPORTED: 2018-09-14

		SAMPLE DESCRIPTION:		CWT-MW15-18	CWT-MW16-18	CWT-Blank1
		SAMPLE TYPE:		Water	Water	Water
		DATE SAMPLED:		2018-08-24	2018-08-24	2018-08-24
Parameter	Unit	G / S	RDL	9512542	9512543	9512627
Benzene	mg/L		0.001	<0.001	<0.001	<0.001
Toluene	mg/L		0.001	<0.001	<0.001	<0.001
Ethylbenzene	mg/L		0.001	<0.001	<0.001	<0.001
Xylene (Total)	mg/L		0.002	<0.002	<0.002	<0.002
C6-C10 (less BTEX)	mg/L		0.01	<0.01	0.01	<0.01
>C10-C16 Hydrocarbons	mg/L		0.05	<0.05	<0.05	<0.05
>C16-C21 Hydrocarbons	mg/L		0.10	<0.10	<0.10	<0.10
>C21-C32 Hydrocarbons	mg/L		0.1	<0.1	<0.1	<0.1
Modified TPH (Tier 1)	mg/L		0.1	<0.1	<0.1	<0.1
Resemblance Comment				NR	GR	NR
Return to Baseline at C32				Y	Y	Y
Surrogate	Unit	Acceptable Limits				
Isobutylbenzene - EPH	%	70-130		101	75	81
Isobutylbenzene - VPH	%	70-130		91	101	96
n-Dotriacontane - EPH	%	70-130		106	89	109

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

9512542-9512627 Resemblance Comment Key:
GF - Gasoline Fraction
WGF - Weathered Gasoline Fraction
GR - Product in Gasoline Range
FOF - Fuel Oil Fraction
WFOF - Weathered Fuel Oil Fraction
FR - Product in Fuel Oil Range
LOF - Lube Oil Fraction
LR - Lube Range
UC - Unidentified Compounds
NR - No Resemblance
NA - Not Applicable

Certified By: Kelly Hogue

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CANADA B3B 1M2
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AGAT WORK ORDER: 18X380128

PROJECT: P-0012285-0-16-200

CLIENT NAME: ENGLOBE CORP

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Moisture

DATE RECEIVED: 2018-08-31

DATE REPORTED: 2018-09-14

SAMPLE DESCRIPTION:				CWT-SED-8-18	CWT-SED-7-18	CWT-SED-BK01	CWT-SED-BK02	CWT-SED-BK03	CWT-SED-BK04
SAMPLE TYPE:				Soil	Soil	Soil	Soil	Soil	Soil
DATE SAMPLED:				2018-08-24	2018-08-24	2018-08-24	2018-08-24	2018-08-24	2018-08-24
Parameter	Unit	G / S	RDL	9512525	9512528	9512532	9512533	9512534	9512535
% Moisture	%		0	89	95	92	95	94	94

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Certified By: Kelly Hogue

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Dartmouth, Nova Scotia
CANADA B3B 1M2
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Certificate of Analysis

AGAT WORK ORDER: 18X380128

PROJECT: P-0012285-0-16-200

CLIENT NAME: ENGLOBE CORP

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Polycyclic Aromatic Hydrocarbons in Soil

DATE RECEIVED: 2018-08-31

DATE REPORTED: 2018-09-14

		SAMPLE DESCRIPTION:		CWT-SED-8-18
		SAMPLE TYPE:		Soil
		DATE SAMPLED:		2018-08-24
Parameter	Unit	G / S	RDL	9512525
1-Methylnaphthalene	mg/kg		0.05	<0.05
2-Methylnaphthalene	mg/kg		0.01	<0.01
Acenaphthene	mg/kg		0.00671	<0.00671
Acenaphthylene	mg/kg		0.004	<0.004
Acridine	mg/kg		0.05	<0.05
Anthracene	mg/kg		0.03	<0.03
Benzo(a)anthracene	mg/kg		0.01	<0.01
Benzo(a)pyrene	mg/kg		0.01	<0.01
Benzo(b)fluoranthene	mg/kg		0.05	<0.05
Benzo(b+j)fluoranthene	mg/kg		0.1	<0.1
Benzo(e)pyrene	mg/kg		0.05	<0.05
Benzo(ghi)perylene	mg/kg		0.01	<0.01
Benzo(k)fluoranthene	mg/kg		0.01	<0.01
Chrysene	mg/kg		0.01	<0.01
Dibenzo(a,h)anthracene	mg/kg		0.006	<0.006
Fluoranthene	mg/kg		0.05	<0.05
Fluorene	mg/kg		0.01	<0.01
Indeno(1,2,3)pyrene	mg/kg		0.01	<0.01
Naphthalene	mg/kg		0.01	<0.01
Perylene	mg/kg		0.05	<0.05
Phenanthrene	mg/kg		0.03	<0.03
Pyrene	mg/kg		0.05	<0.05
Quinoline	mg/kg		0.05	<0.05
Surrogate	Unit	Acceptable Limits		
Nitrobenzene-d5	%	50-140		82
2-Fluorobiphenyl	%	50-140		63
Terphenyl-d14	%	50-140		80

Certified By: Kelly Hogue

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Certificate of Analysis

AGAT WORK ORDER: 18X380128

PROJECT: P-0012285-0-16-200

CLIENT NAME: ENGLOBE CORP

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Polycyclic Aromatic Hydrocarbons in Soil

DATE RECEIVED: 2018-08-31

DATE REPORTED: 2018-09-14

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

9512525 Results are based on the dry weight of the soil.

Benzo(b)fluoranthene may include contributions from benzo(j)fluoranthene, if also present in the sample.

Certified By: Kelly Hogue

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11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
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AGAT WORK ORDER: 18X380128

PROJECT: P-0012285-0-16-200

CLIENT NAME: ENGLOBE CORP

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Polycyclic Aromatic Hydrocarbons in Water - (PAH)

DATE RECEIVED: 2018-08-31

DATE REPORTED: 2018-09-14

		SAMPLE DESCRIPTION:		CWT-MW15-18	CWT-MW16-18	CWT-Blank1
		SAMPLE TYPE:		Water	Water	Water
		DATE SAMPLED:		2018-08-24	2018-08-24	2018-08-24
Parameter	Unit	G / S	RDL	9512542	9512543	9512627
1-Methylnaphthalene	ug/L		0.01	<0.01	<0.01	<0.01
2-Methylnaphthalene	ug/L		0.01	<0.01	<0.01	<0.01
Acenaphthene	ug/L		0.01	<0.01	<0.01	<0.01
Acenaphthylene	ug/L		0.01	<0.01	<0.01	<0.01
Acridine	ug/L		0.01	<0.01	<0.01	<0.01
Anthracene	ug/L		0.012	<0.012	<0.012	<0.012
Benzo(a)anthracene	ug/L		0.018	<0.018	<0.018	<0.018
Benzo(a)pyrene	ug/L		0.010	<0.015	<0.015	<0.015
Benzo(b)fluoranthene	ug/L		0.01	<0.01	<0.01	<0.01
Benzo(e)pyrene	ug/L		0.01	<0.01	<0.01	<0.01
Benzo(ghi)perylene	ug/L		0.01	<0.01	<0.01	<0.01
Benzo(k)fluoranthene	ug/L		0.01	<0.01	<0.01	<0.01
Chrysene	ug/L		0.01	<0.01	<0.01	<0.01
Dibenzo(a,h)anthracene	ug/L		0.01	<0.01	<0.01	<0.01
Fluoranthene	ug/L		0.01	<0.01	<0.01	<0.01
Fluorene	ug/L		0.01	<0.01	<0.01	<0.01
Indeno(1,2,3-cd)pyrene	ug/L		0.01	<0.01	<0.01	<0.01
Naphthalene	ug/L		0.01	<0.01	<0.01	<0.01
Perylene	ug/L		0.01	<0.01	<0.01	<0.01
Phenanthrene	ug/L		0.01	<0.01	<0.01	<0.01
Pyrene	ug/L		0.01	<0.01	<0.01	<0.01
Quinoline	ug/L		0.01	<0.01	<0.01	<0.01
Surrogate	Unit	Acceptable Limits				
Nitrobenzene-d5	%	50-140		62	61	54
2-Fluorobiphenyl	%	50-140		83	59	62
Terphenyl-d14	%	50-140		76	58	64

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

9512542-9512627 Benzo(b)fluoranthene may include contributions from benzo(j)fluoranthene, if also present in the sample.

Certified By: Kelly Hogue

Results relate only to the items tested and to all the items tested

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CANADA B3B 1M2
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Certificate of Analysis

AGAT WORK ORDER: 18X380128

PROJECT: P-0012285-0-16-200

CLIENT NAME: ENGLOBE CORP

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Total Polychlorinated Biphenyls in Soil - (PCB)

DATE RECEIVED: 2018-08-31

DATE REPORTED: 2018-09-14

SAMPLE DESCRIPTION:				CWT-SED-BK01	CWT-SED-BK02	CWT-SED-BK03	CWT-SED-BK04
SAMPLE TYPE:				Soil	Soil	Soil	Soil
DATE SAMPLED:				2018-08-24	2018-08-24	2018-08-24	2018-08-24
Parameter	Unit	G / S	RDL	9512532	9512533	9512534	9512535
Total Polychlorinated Biphenyls	mg/kg		0.02	<0.02	<0.02	<0.02	<0.02
Surrogate	Unit	Acceptable Limits					
Decachlorobiphenyl	%	50-130		83	97	90	112

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

9512532-9512535 Results are based on the dry weight of the soil.

Certified By: Kelly Hogue

Results relate only to the items tested and to all the items tested

AGAT Laboratories
11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
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Certificate of Analysis

AGAT WORK ORDER: 18X380128

PROJECT: P-0012285-0-16-200

CLIENT NAME: ENGLOBE CORP

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Mercury Analysis in Water (Dissolved)

DATE RECEIVED: 2018-08-31

DATE REPORTED: 2018-09-14

		SAMPLE DESCRIPTION:		CWT-MW15-18	CWT-MW16-18
		SAMPLE TYPE:		Water	Water
		DATE SAMPLED:		2018-08-24	2018-08-24
Parameter	Unit	G / S	RDL	9512542	9512543
Dissolved Mercury	ug/L		0.026	<0.026	<0.026

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Certified By:

Results relate only to the items tested and to all the items tested

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CANADA B3B 1M2
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Certificate of Analysis

AGAT WORK ORDER: 18X380128

PROJECT: P-0012285-0-16-200

CLIENT NAME: ENGLOBE CORP

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Mercury Analysis in Water (Total)

DATE RECEIVED: 2018-08-31

DATE REPORTED: 2018-09-14

		SAMPLE DESCRIPTION:		CWT-SW-6-18	CWT-SW-5-18	CWT-SW-7-18	CWT-SW-BK01	CWT-SW-BK02	CWT-SW-BK03	CWT-SW-BK04
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2018-08-24	2018-08-24	2018-08-24	2018-08-24	2018-08-24	2018-08-24	2018-08-24
Parameter	Unit	G / S	RDL	9512517	9512518	9512519	9512520	9512521	9512522	9512523
Total Mercury	ug/L		0.026	<0.026	<0.026	<0.026	<0.026	<0.026	<0.026	<0.026

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Certified By:

Results relate only to the items tested and to all the items tested

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AGAT WORK ORDER: 18X380128

PROJECT: P-0012285-0-16-200

CLIENT NAME: ENGLOBE CORP

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Dissolved Metals

DATE RECEIVED: 2018-08-31

DATE REPORTED: 2018-09-14

		SAMPLE DESCRIPTION:		CWT-MW15-18	CWT-MW16-18
		SAMPLE TYPE:		Water	Water
		DATE SAMPLED:		2018-08-24	2018-08-24
Parameter	Unit	G / S	RDL	9512542	9512543
pH				5.99	6.91
Reactive Silica as SiO2	mg/L		0.5	6.4	9.9
Chloride	mg/L		1	3	3
Fluoride	mg/L		0.12	<0.12	<0.12
Sulphate	mg/L		2	<2	<2
Alkalinity	mg/L		5	7	39
True Color	TCU		5	5	23
Turbidity	NTU		0.1	4.2	190
Electrical Conductivity	umho/cm		1	31	91
Nitrate + Nitrite as N	mg/L		0.05	0.12	<0.05
Nitrate as N	mg/L		0.05	0.12	<0.05
Nitrite as N	mg/L		0.05	<0.05	<0.05
Ammonia as N	mg/L		0.03	<0.03	<0.03
Total Organic Carbon	mg/L		0.5	3.8	4.1
Ortho-Phosphate as P	mg/L		0.01	<0.01	<0.01
Dissolved Sodium	mg/L		0.1	3.2	4.2
Dissolved Potassium	mg/L		0.1	0.7	1.9
Dissolved Calcium	mg/L		0.1	1.8	13.4
Dissolved Magnesium	mg/L		0.1	0.5	1.4
Bicarb. Alkalinity (as CaCO3)	mg/L		5	7	39
Carb. Alkalinity (as CaCO3)	mg/L		10	<10	<10
Hydroxide	mg/L		5	<5	<5
Calculated TDS	mg/L		1	14	50
Hardness	mg/L			6.6	39.2
Langelier Index (@20C)	NA			-4.41	-1.93
Langelier Index (@ 4C)	NA			-4.73	-2.25
Saturation pH (@ 20C)	NA			10.4	8.84
Saturation pH (@ 4C)	NA			10.7	9.16
Anion Sum	me/L			0.23	0.86
Cation sum	me/L			0.31	1.13

Certified By: Laura Baker

Results relate only to the items tested and to all the items tested

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Certificate of Analysis

AGAT WORK ORDER: 18X380128

PROJECT: P-0012285-0-16-200

CLIENT NAME: ENGLOBE CORP

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Dissolved Metals

DATE RECEIVED: 2018-08-31

DATE REPORTED: 2018-09-14

		SAMPLE DESCRIPTION:		CWT-MW15-18	CWT-MW16-18
		SAMPLE TYPE:		Water	Water
		DATE SAMPLED:		2018-08-24	2018-08-24
Parameter	Unit	G / S	RDL	9512542	9512543
% Difference/ Ion Balance (NS)	%			13.9	13.2
Dissolved Aluminum	ug/L		5	154	108
Dissolved Antimony	ug/L		2	<2	<2
Dissolved Arsenic	ug/L		2	<2	<2
Dissolved Barium	ug/L		5	11	70
Dissolved Beryllium	ug/L		2	<2	<2
Dissolved Bismuth	ug/L		2	<2	<2
Dissolved Boron	ug/L		5	9	37
Dissolved Cadmium	ug/L		0.09	<0.09	<0.09
Dissolved Chromium	ug/L		1	1	1
Dissolved Cobalt	ug/L		1	<1	<1
Dissolved Copper	ug/L		2	6	3
Dissolved Iron	ug/L		50	<50	1060
Dissolved Lead	ug/L		0.5	<0.5	<0.5
Dissolved Manganese	ug/L		2	35	1650
Dissolved Molybdenum	ug/L		2	<2	<2
Dissolved Nickel	ug/L		2	2	3
Dissolved Phosphorus	mg/L		0.02	<0.02	<0.02
Dissolved Selenium	ug/L		1	<1	<1
Dissolved Silver	ug/L		0.1	<0.1	<0.1
Dissolved Strontium	ug/L		5	11	42
Dissolved Thallium	ug/L		0.1	<0.1	<0.1
Dissolved Tin	ug/L		2	<2	<2
Dissolved Titanium	ug/L		2	<2	<2
Dissolved Uranium	ug/L		0.1	0.1	0.1
Dissolved Vanadium	ug/L		2	<2	<2
Dissolved Zinc	ug/L		5	21	18

Certified By:

Results relate only to the items tested and to all the items tested

AGAT Laboratories

11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 18X380128

PROJECT: P-0012285-0-16-200

CLIENT NAME: ENGLOBE CORP

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Dissolved Metals

DATE RECEIVED: 2018-08-31

DATE REPORTED: 2018-09-14

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

9512542 Metals analysis completed on a filtered sample.
When the cation and anion sums are below 1 me/L, the acceptable criteria is less than 0.3me/L.

9512543 Metals analysis completed on a filtered sample.
When the cation and anion sums are at, or below, 1 me/L, therefore the acceptable criteria is a difference of less than 0.3me/L.

Certified By:

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Certificate of Analysis

AGAT WORK ORDER: 18X380128

PROJECT: P-0012285-0-16-200

CLIENT NAME: ENGLOBE CORP

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Total Metals

DATE RECEIVED: 2018-08-31

DATE REPORTED: 2018-09-14

Parameter	Unit	G / S	RDL	SAMPLE DESCRIPTION: CWT-SW-6-18	CWT-SW-5-18	CWT-SW-7-18	CWT-SW-BK01	CWT-SW-BK02	CWT-SW-BK03	CWT-SW-BK04
				SAMPLE TYPE: Water	Water	Water	Water	Water	Water	Water
				DATE SAMPLED: 2018-08-24	2018-08-24	2018-08-24	2018-08-24	2018-08-24	2018-08-24	2018-08-24
				9512517	9512518	9512519	9512520	9512521	9512522	9512523
pH				6.45	5.32	5.76	5.56	4.73	5.25	5.62
Reactive Silica as SiO2	mg/L		0.5	4.4	5.5	1.9	2.0	3.3	<0.5	2.0
Chloride	mg/L		1	4	5	4	3	2	3	9
Fluoride	mg/L		0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12
Sulphate	mg/L		2	<2	<2	<2	<2	<2	<2	<2
Alkalinity	mg/L		5	8	<5	<5	<5	<5	<5	<5
True Color	TCU		5	137	350	41	235	240	190	440
Turbidity	NTU		0.1	20.6	14.0	79.7	23.7	25.3	58.9	156
Electrical Conductivity	umho/cm		1	39	34	28	26	26	27	68
Nitrate + Nitrite as N	mg/L		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrate as N	mg/L		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrite as N	mg/L		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ammonia as N	mg/L		0.03	<0.03	<0.03	<0.03	0.07	<0.03	0.07	<0.03
Total Organic Carbon	mg/L		0.5	17.0	26.6	10.1	14.7	19.1	23.5	31.5
Ortho-Phosphate as P	mg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Total Sodium	mg/L		0.1	3.5	4.2	3.2	3.4	2.4	3.1	7.2
Total Potassium	mg/L		0.1	0.3	0.2	0.7	0.2	<0.1	0.7	0.8
Total Calcium	mg/L		0.1	3.1	1.0	2.0	1.5	0.4	0.6	1.9
Total Magnesium	mg/L		0.1	0.8	0.6	0.7	0.6	0.4	0.8	1.7
Bicarb. Alkalinity (as CaCO3)	mg/L		5	8	<5	<5	<5	<5	<5	<5
Carb. Alkalinity (as CaCO3)	mg/L		10	<10	<10	<10	<10	<10	<10	<10
Hydroxide	mg/L		5	<5	<5	<5	<5	<5	<5	<5
Calculated TDS	mg/L		1	24	13	14	11	6	10	25
Hardness	mg/L			11.0	5.0	7.9	6.2	2.6	4.8	11.7
Langelier Index (@20C)	NA			-3.68	-5.50	-4.75	-5.07	-6.46	-5.78	-4.94
Langelier Index (@ 4C)	NA			-4.00	-5.82	-5.07	-5.39	-6.78	-6.10	-5.26
Saturation pH (@ 20C)	NA			10.1	10.8	10.5	10.6	11.2	11.0	10.6
Saturation pH (@ 4C)	NA			10.5	11.1	10.8	11.0	11.5	11.3	10.9
Anion Sum	me/L			0.27	0.14	0.11	0.08	0.06	0.08	0.25
Cation sum	me/L			0.74	0.48	0.55	0.42	0.24	0.36	0.79

Certified By:

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Certificate of Analysis

AGAT WORK ORDER: 18X380128

PROJECT: P-0012285-0-16-200

CLIENT NAME: ENGLOBE CORP

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Total Metals

DATE RECEIVED: 2018-08-31

DATE REPORTED: 2018-09-14

Parameter	Unit	G / S	RDL	SAMPLE DESCRIPTION: CWT-SW-6-18	CWT-SW-5-18	CWT-SW-7-18	CWT-SW-BK01	CWT-SW-BK02	CWT-SW-BK03	CWT-SW-BK04
				SAMPLE TYPE: Water	Water	Water	Water	Water	Water	Water
				DATE SAMPLED: 2018-08-24	2018-08-24	2018-08-24	2018-08-24	2018-08-24	2018-08-24	2018-08-24
				9512517	9512518	9512519	9512520	9512521	9512522	9512523
% Difference/ Ion Balance (NS)	%			46.0	54.9	65.7	66.4	62.5	62.2	51.3
Total Aluminum	ug/L		5	1130	1410	1600	686	540	569	959
Total Antimony	ug/L		2	<2	<2	<2	<2	<2	<2	<2
Total Arsenic	ug/L		2	<2	<2	<2	<2	<2	<2	<2
Total Barium	ug/L		5	14	10	95	7	<5	28	19
Total Beryllium	ug/L		2	<2	<2	<2	<2	<2	<2	<2
Total Bismuth	ug/L		2	<2	<2	<2	<2	<2	<2	<2
Total Boron	ug/L		5	66	<5	<5	<5	<5	<5	9
Total Cadmium	ug/L		0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09
Total Chromium	ug/L		1	<1	<1	<1	<1	<1	<1	<1
Total Cobalt	ug/L		1	<1	<1	<1	<1	<1	<1	<1
Total Copper	ug/L		1	3	<1	4	1	<1	1	1
Total Iron	ug/L		50	6340	987	1390	1580	252	1130	3060
Total Lead	ug/L		0.5	3.4	0.7	3.8	0.6	<0.5	0.7	1.5
Total Manganese	ug/L		2	86	9	25	20	<2	3	27
Total Molybdenum	ug/L		2	<2	<2	<2	<2	<2	<2	<2
Total Nickel	ug/L		2	<2	<2	<2	<2	<2	<2	<2
Total Phosphorous	mg/L		0.02	0.10	0.06	0.16	0.08	0.02	0.09	0.07
Total Selenium	ug/L		1	<1	<1	<1	<1	<1	<1	<1
Total Silver	ug/L		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Strontium	ug/L		5	19	12	26	10	5	8	24
Total Thallium	ug/L		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Tin	ug/L		2	<2	<2	<2	<2	<2	<2	<2
Total Titanium	ug/L		2	15	28	24	14	4	6	18
Total Uranium	ug/L		0.1	<0.1	0.1	0.1	<0.1	<0.1	<0.1	<0.1
Total Vanadium	ug/L		2	8	<2	6	<2	<2	<2	2
Total Zinc	ug/L		5	33	7	22	5	<5	11	14

Certified By:

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FAX (902)468-8924
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Certificate of Analysis

AGAT WORK ORDER: 18X380128

PROJECT: P-0012285-0-16-200

CLIENT NAME: ENGLOBE CORP

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Total Metals

DATE RECEIVED: 2018-08-31

DATE REPORTED: 2018-09-14

Comments:	RDL - Reported Detection Limit; G / S - Guideline / Standard
9512517	Ion Balance is biased high, contributing parameters have been confirmed.
9512518	When the cation and anion sums are below 1 me/L, the acceptable criteria is less than 0.3me/L.
9512519-9512520	Ion Balance is biased high, contributing parameters have been confirmed.
9512521-9512522	When the cation and anion sums are below 1 me/L, the acceptable criteria is less than 0.3me/L.
9512523	Ion Balance is biased high, contributing parameters have been confirmed.

Certified By: Laura Baker

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Quality Assurance

CLIENT NAME: ENGLOBE CORP
AGAT WORK ORDER: 18X380128
PROJECT: P-0012285-0-16-200
ATTENTION TO: Andrew Higgins
SAMPLING SITE:
SAMPLED BY:

Soil Analysis

RPT Date: Sep 14, 2018			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Fraction Organic Carbon															
Fraction Organic Carbon-1	9512525	9512525	0.607	0.608	0.2%	< 0.003	118%	70%	130%				97%	70%	130%

Certified By:

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Quality Assurance

CLIENT NAME: ENGLOBE CORP
AGAT WORK ORDER: 18X380128
PROJECT: P-0012285-0-16-200
ATTENTION TO: Andrew Higgins
SAMPLING SITE:
SAMPLED BY:

Trace Organics Analysis

RPT Date: Sep 14, 2018			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Atlantic RBCA Tier 1 Hydrocarbons in Soil (Version 3.1) - Field Preserved															
Benzene	1	9512811	< 0.03	< 0.03	NA	< 0.03	62%	60%	140%	69%	60%	140%			
Toluene	1	9512811	< 0.04	< 0.04	NA	< 0.04	62%	60%	140%	67%	60%	140%			
Ethylbenzene	1	9512811	< 0.03	< 0.03	NA	< 0.03	63%	60%	140%	66%	60%	140%			
Xylene (Total)	1	9512811	< 0.05	< 0.05	NA	< 0.05	67%	60%	140%	71%	60%	140%			
C6-C10 (less BTEX)	1	9512811	< 3	< 3	NA	< 3	88%	60%	140%	93%	60%	140%	106%	30%	130%
>C10-C16 Hydrocarbons	1	9502431	< 15	< 15	NA	< 15	113%	60%	140%	103%	60%	140%	122%	30%	130%
>C16-C21 Hydrocarbons	1	9502431	< 15	< 15	NA	< 15	111%	60%	140%	103%	60%	140%	122%	30%	130%
>C21-C32 Hydrocarbons	1	9502431	< 15	< 15	NA	< 15	85%	60%	140%	103%	60%	140%	122%	30%	130%

Comments: If Matrix spike value is NA, the spiked analyte concentration was lower than that of the matrix contribution.
If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Polycyclic Aromatic Hydrocarbons in Soil															
1-Methylnaphthalene	1	9522207	0.07	0.06	NA	< 0.05	102%	50%	140%	60%	50%	140%	74%	50%	140%
2-Methylnaphthalene	1	9522207	0.11	0.08	31.6%	< 0.01	113%	50%	140%	65%	50%	140%	111%	50%	140%
Acenaphthene	1	9522207	< 0.00671	< 0.00671	NA	< 0.00671	99%	50%	140%	63%	50%	140%	64%	50%	140%
Acenaphthylene	1	9522207	< 0.004	< 0.004	NA	< 0.004	123%	50%	140%	59%	50%	140%	57%	50%	140%
Acridine	1	9522207	< 0.05	< 0.05	NA	< 0.05	77%	50%	140%	61%	50%	140%	64%	50%	140%
Anthracene	1	9522207	< 0.03	< 0.03	NA	< 0.03	87%	50%	140%	52%	50%	140%	57%	50%	140%
Benzo(a)anthracene	1	9522207	< 0.01	< 0.01	NA	< 0.01	93%	50%	140%	50%	50%	140%	62%	50%	140%
Benzo(a)pyrene	1	9522207	< 0.01	< 0.01	NA	< 0.01	86%	50%	140%	54%	50%	140%	63%	50%	140%
Benzo(b)fluoranthene	1	9522207	< 0.05	< 0.05	NA	< 0.05	80%	50%	140%	63%	50%	140%	78%	50%	140%
Benzo(b+j)fluoranthene	1	9522207	< 0.1	< 0.1	NA	< 0.1	105%	50%	140%	55%	50%	140%	62%	50%	140%
Benzo(e)pyrene	1	9522207	< 0.05	< 0.05	NA	< 0.05	91%	50%	140%	56%	50%	140%	66%	50%	140%
Benzo(ghi)perylene	1	9522207	< 0.01	< 0.01	NA	< 0.01	94%	50%	140%	54%	50%	140%	78%	50%	140%
Benzo(k)fluoranthene	1	9522207	< 0.01	< 0.01	NA	< 0.01	92%	50%	140%	65%	50%	140%	72%	50%	140%
Chrysene	1	9522207	< 0.01	< 0.01	NA	< 0.01	97%	50%	140%	53%	50%	140%	59%	50%	140%
Dibenzo(a,h)anthracene	1	9522207	< 0.006	< 0.006	NA	< 0.006	85%	50%	140%	62%	50%	140%	92%	50%	140%
Fluoranthene	1	9522207	< 0.05	< 0.05	NA	< 0.05	126%	50%	140%	64%	50%	140%	74%	50%	140%
Fluorene	1	9522207	< 0.01	< 0.01	NA	< 0.01	132%	50%	140%	71%	50%	140%	71%	50%	140%
Indeno(1,2,3)pyrene	1	9522207	< 0.01	< 0.01	NA	< 0.01	60%	50%	140%	64%	50%	140%	89%	50%	140%
Naphthalene	1	9522207	0.81	0.73	10.4%	< 0.01	104%	50%	140%	73%	50%	140%	123%	50%	140%
Perylene	1	9522207	< 0.05	< 0.05	NA	< 0.05	92%	50%	140%	69%	50%	140%	83%	50%	140%
Phenanthrene	1	9522207	< 0.03	< 0.03	NA	< 0.03	94%	50%	140%	54%	50%	140%	67%	50%	140%
Pyrene	1	9522207	< 0.05	< 0.05	NA	< 0.05	130%	50%	140%	65%	50%	140%	88%	50%	140%
Quinoline	1	9522207	< 0.05	< 0.05	NA	< 0.05	101%	50%	140%	65%	50%	140%	71%	50%	140%

Comments: If Matrix spike value is NA, the spiked analyte concentration was lower than that of the matrix contribution.
If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Atlantic RBCA Tier 1 Hydrocarbons in Soil (Version 3.1) - Field Preserved															
>C10-C16 Hydrocarbons	1	9512535	85	75	13	< 15	101%	60%	140%	63%	60%	140%	N/A	30%	130%

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11 Morris Drive, Unit 122
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CANADA B3B 1M2
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Quality Assurance

CLIENT NAME: ENGLOBE CORP
AGAT WORK ORDER: 18X380128
PROJECT: P-0012285-0-16-200
ATTENTION TO: Andrew Higgins
SAMPLING SITE:
SAMPLED BY:

Trace Organics Analysis (Continued)

RPT Date: Sep 14, 2018

PARAMETER	Batch	Sample Id	DUPLICATE			Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
			Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
>C16-C21 Hydrocarbons	1	9512535	2760	2570	7	< 15	105%	60%	140%	63%	60%	140%	N/A	30%	130%
>C21-C32 Hydrocarbons	1	9512535	1190	1610	30	< 15	84%	60%	140%	63%	60%	140%	N/A	30%	130%
Comments: If Matrix spike value is NA, the spiked analyte concentration was lower than that of the matrix contribution. If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.															
Total Polychlorinated Biphenyls in Soil - (PCB)															
Total Polychlorinated Biphenyls	1	9526377	298	294	1.0%	< 0.02	82%	60%	130%	117%	60%	130%	NA	60%	130%
Comments: If Matrix spike value is NA, the spiked analyte concentration was lower than that of the matrix contribution. If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.															
Atlantic RBCA Tier 1 Hydrocarbons in Water (Version 3.0)															
Benzene	1	9510337	< 0.001	< 0.001	NA	< 0.001	104%	70%	130%	103%	70%	130%			
Toluene	1	9510337	< 0.001	< 0.001	NA	< 0.001	97%	70%	130%	94%	70%	130%			
Ethylbenzene	1	9510337	< 0.001	< 0.001	NA	< 0.001	92%	70%	130%	88%	70%	130%			
Xylene (Total)	1	9510337	< 0.002	< 0.002	NA	< 0.002	92%	70%	130%	89%	70%	130%			
C6-C10 (less BTEX)	1	9510337	< 0.01	< 0.01	NA	< 0.01	98%	70%	130%	108%	70%	130%	117%	70%	130%
>C10-C16 Hydrocarbons	1	9509430	< 0.05	< 0.05	NA	< 0.05	73%	70%	130%	93%	70%	130%	NA	70%	130%
>C16-C21 Hydrocarbons	1	9509430	< 0.10	< 0.10	NA	< 0.10	94%	70%	130%	93%	70%	130%	NA	70%	130%
>C21-C32 Hydrocarbons	1	9509430	< 0.1	< 0.1	NA	< 0.1	88%	70%	130%	93%	70%	130%	NA	70%	130%
Comments: If Matrix spike value is NA, the spiked analyte concentration was lower than that of the matrix contribution. If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.															
Polycyclic Aromatic Hydrocarbons in Water - (PAH)															
1-Methylnaphthalene	1	9512801	< 0.01	< 0.01	NA	< 0.01	114%	50%	140%	61%	50%	140%	NA	50%	140%
2-Methylnaphthalene	1	9512801	< 0.01	< 0.01	NA	< 0.01	130%	50%	140%	62%	50%	140%	NA	50%	140%
Acenaphthene	1	9512801	< 0.01	< 0.01	NA	< 0.01	93%	50%	140%	57%	50%	140%	NA	50%	140%
Acenaphthylene	1	9512801	< 0.01	< 0.01	NA	< 0.01	87%	50%	140%	58%	50%	140%	NA	50%	140%
Acridine	1	9512801	< 0.01	< 0.01	NA	< 0.01	55%	50%	140%	60%	50%	140%	NA	50%	140%
Anthracene	1	9512801	< 0.012	< 0.012	NA	< 0.012	82%	50%	140%	56%	50%	140%	NA	50%	140%
Benzo(a)anthracene	1	9512801	< 0.018	< 0.018	NA	< 0.018	84%	50%	140%	56%	50%	140%	NA	50%	140%
Benzo(a)pyrene	1	9512801	< 0.010	< 0.010	NA	< 0.010	76%	50%	140%	59%	50%	140%	NA	50%	140%
Benzo(b)fluoranthene	1	9512801	< 0.01	< 0.01	NA	< 0.01	77%	50%	140%	61%	50%	140%	NA	50%	140%
Benzo(e)pyrene	1	9512801	< 0.01	< 0.01	NA	< 0.01	101%	50%	140%	57%	50%	140%	NA	50%	140%
Benzo(ghi)perylene	1	9512801	< 0.01	< 0.01	NA	< 0.01	70%	50%	140%	50%	50%	140%	NA	50%	140%
Benzo(k)fluoranthene	1	9512801	< 0.01	< 0.01	NA	< 0.01	85%	50%	140%	57%	50%	140%	NA	50%	140%
Chrysene	1	9512801	< 0.01	< 0.01	NA	< 0.01	95%	50%	140%	53%	50%	140%	NA	50%	140%
Dibenzo(a,h)anthracene	1	9512801	< 0.01	< 0.01	NA	< 0.01	63%	50%	140%	50%	50%	140%	NA	50%	140%
Fluoranthene	1	9512801	< 0.01	< 0.01	NA	< 0.01	90%	50%	140%	63%	50%	140%	NA	50%	140%
Fluorene	1	9512801	< 0.01	< 0.01	NA	< 0.01	108%	50%	140%	62%	50%	140%	NA	50%	140%
Indeno(1,2,3-cd)pyrene	1	9512801	< 0.01	< 0.01	NA	< 0.01	75%	50%	140%	56%	50%	140%	NA	50%	140%
Naphthalene	1	9512801	< 0.01	< 0.01	NA	< 0.01	96%	50%	140%	59%	50%	140%	NA	50%	140%
Perylene	1	9512801	< 0.01	< 0.01	NA	< 0.01	83%	50%	140%	59%	50%	140%	NA	50%	140%

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http://www.agatlabs.com

Quality Assurance

CLIENT NAME: ENGLOBE CORP

AGAT WORK ORDER: 18X380128

PROJECT: P-0012285-0-16-200

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Trace Organics Analysis (Continued)

RPT Date: Sep 14, 2018			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Phenanthrene	1	9512801	< 0.01	< 0.01	NA	< 0.01	91%	50%	140%	53%	50%	140%	NA	50%	140%
Pyrene	1	9512801	< 0.01	< 0.01	NA	< 0.01	91%	50%	140%	62%	50%	140%	NA	50%	140%
Quinoline	1	9512801	< 0.01	< 0.01	NA	< 0.01	87%	50%	140%	72%	50%	140%	NA	50%	140%

Comments: If Matrix spike value is NA, due to matrix interference
If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Atlantic RBCA Tier 1 Hydrocarbons in Soil - EPH Only + 3X Silica Gel Cleanup															
>C10-C16 Hydrocarbons	1	9512535	<15	<15	NA	< 15	83%	60%	140%	99%	60%	140%	NA	30%	130%
>C16-C21 Hydrocarbons	1	9512535	132	110	18.2%	< 15	77%	60%	140%	99%	60%	140%	NA	30%	130%
>C21-C32 Hydrocarbons	1	9512535	344	455	27.8%	< 15	62%	60%	140%	99%	60%	140%	NA	30%	130%

Comments: If Matrix spike value is NA, the spiked analyte concentration was lower than that of the matrix contribution.
If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Certified By: Kelly Hogue

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Quality Assurance

CLIENT NAME: ENGLOBE CORP

AGAT WORK ORDER: 18X380128

PROJECT: P-0012285-0-16-200

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Water Analysis

RPT Date: Sep 14, 2018			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Standard Water Analysis + Total Metals															
pH	9512517	9512517	6.45	6.38	1.1%	<	102%	80%	120%	NA	80%	120%	NA	80%	120%
Reactive Silica as SiO2	1	9509970	0.9	0.9	NA	< 0.5	104%	80%	120%		80%	120%	95%	80%	120%
Chloride	9512801		(607)	(612)	0.8%	< 1	92%	80%	120%	NA	80%	120%	NA	80%	120%
Fluoride	9512801		0.23	0.33	NA	< 0.12	110%	80%	120%	NA	80%	120%	100%	80%	120%
Sulphate	9512801		(500)	(504)	0.9%	< 2	109%	80%	120%	NA	80%	120%	NA	80%	120%
Alkalinity	9512517	9512517	8	7	NA	< 5	94%	80%	120%	NA	80%	120%	NA	80%	120%
True Color	9510331		<5	6	NA	< 5	100%	80%	120%	NA			NA		
Turbidity	9512523	9512523	156	149	4.6%	< 0.1	96%	80%	120%	NA			NA		
Electrical Conductivity	9512517	9512517	39	38	2.7%	< 1	103%	80%	120%	NA	80%	120%	NA	80%	120%
Nitrate as N	9512801		<0.05	<0.05	NA	< 0.05	94%	80%	120%	NA	80%	120%	103%	80%	120%
Nitrite as N	9512801		1.89	1.93	2.0%	< 0.05	96%	80%	120%	NA	80%	120%	NA	80%	120%
Ammonia as N	1	9518342	<0.05	<0.05	NA	< 0.03	104%	80%	120%		80%	120%	91%	80%	120%
Total Organic Carbon	9510662		6.1	6.3	3.2%	< 0.5	80%	80%	120%	NA	80%	120%	89%	80%	120%
Ortho-Phosphate as P	1	9509970	<0.01	<0.01	NA	< 0.01	80%	80%	120%		80%	120%	100%	80%	120%
Total Sodium	9520078		7.8	7.5	5.0%	< 0.1	109%	80%	120%	119%	80%	120%	NA	70%	130%
Total Potassium	9520078		0.4	0.4	NA	< 0.1	106%	80%	120%	113%	80%	120%	89%	70%	130%
Total Calcium	9520078		17.3	18.2	4.9%	< 0.1	106%	80%	120%	111%	80%	120%	NA	70%	130%
Total Magnesium	9520078		3.2	3.0	7.2%	< 0.1	110%	80%	120%	119%	80%	120%	NA	80%	120%
Bicarb. Alkalinity (as CaCO3)	9512517	9512517	8	7	NA	< 5	NA	80%	120%	NA	80%	120%	NA	80%	120%
Carb. Alkalinity (as CaCO3)	9512517	9512517	<10	<10	NA	< 10	NA	80%	120%	NA	80%	120%	NA	80%	120%
Hydroxide	9512517	9512517	<5	<5	NA	< 5	NA	80%	120%	NA	80%	120%	NA	80%	120%
Total Aluminum	9520078		17	16	NA	< 5	116%	80%	120%	120%	80%	120%	85%	70%	130%
Total Antimony	9520078		<2	<2	NA	< 2	85%	80%	120%	111%	80%	120%	100%	70%	130%
Total Arsenic	9520078		<2	<2	NA	< 2	94%	80%	120%	99%	80%	120%	92%	70%	130%
Total Barium	9520078		<5	<5	NA	< 5	87%	80%	120%	92%	80%	120%	95%	70%	130%
Total Beryllium	9520078		<2	<2	NA	< 2	92%	80%	120%	101%	80%	120%	93%	70%	130%
Total Bismuth	9520078		<2	<2	NA	< 2	117%	80%	120%	105%	80%	120%	94%	70%	130%
Total Boron	9520078		9	9	NA	< 5	93%	80%	120%	101%	80%	120%	97%	70%	130%
Total Cadmium	9520078		<0.09	<0.09	NA	< 0.09	93%	80%	120%	100%	80%	120%	88%	70%	130%
Total Chromium	9520078		2	2	NA	< 1	NA	80%	120%	83%	80%	120%	117%	70%	130%
Total Cobalt	9520078		<1	<1	NA	< 1	110%	80%	120%	116%	80%	120%	109%	70%	130%
Total Copper	9520078		55	51	6.7%	< 1	98%	80%	120%	106%	80%	120%	NA	70%	130%
Total Iron	9520078		180	169	NA	< 50	80%	80%	120%	94%	80%	120%	125%	70%	130%
Total Lead	9520078		1.5	1.4	NA	< 0.5	115%	80%	120%	103%	80%	120%	95%	70%	130%
Total Manganese	9520078		32	30	6.3%	< 2	98%	80%	120%	108%	80%	120%	NA	70%	130%
Total Molybdenum	9520078		<2	<2	NA	< 2	105%	80%	120%	114%	80%	120%	102%	70%	130%
Total Nickel	9520078		<2	<2	NA	< 2	104%	80%	120%	111%	80%	120%	101%	70%	130%
Total Phosphorous	9520078		0.02	0.02	NA	< 0.02	96%	80%	120%	114%	80%	120%	96%	70%	130%
Total Selenium	9520078		<1	<1	NA	< 1	101%	80%	120%	102%	80%	120%	82%	70%	130%

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Quality Assurance

CLIENT NAME: ENGLOBE CORP
PROJECT: P-0012285-0-16-200
SAMPLING SITE:

AGAT WORK ORDER: 18X380128
ATTENTION TO: Andrew Higgins
SAMPLED BY:

Water Analysis (Continued)

RPT Date: Sep 14, 2018			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Total Silver	9520078		<0.1	<0.1	NA	< 0.1	102%	80%	120%	107%	80%	120%	93%	70%	130%
Total Strontium	9520078		58	56	4.0%	< 5	105%	80%	120%	112%	80%	120%	NA	70%	130%
Total Thallium	9520078		<0.1	<0.1	NA	< 0.1	117%	80%	120%	105%	80%	120%	96%	70%	130%
Total Tin	9520078		<2	<2	NA	< 2	93%	80%	120%	99%	80%	120%	97%	70%	130%
Total Titanium	9520078		<2	<2	NA	< 2	102%	80%	120%	101%	80%	120%	92%	70%	130%
Total Uranium	9520078		0.1	0.1	NA	< 0.1	118%	80%	120%	97%	80%	120%	95%	70%	130%
Total Vanadium	9520078		<2	<2	NA	< 2	97%	80%	120%	104%	80%	120%	105%	70%	130%
Total Zinc	9520078		34	32	4.1%	< 5	102%	80%	120%	108%	80%	120%	93%	70%	130%
Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.															
Mercury Analysis in Water (Total)															
Total Mercury	1	9522558	<0.026	<0.026	NA	< 0.026	102%	80%	120%		80%	120%	100%	80%	120%
Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.															
Standard Water Analysis + Dissolved Metals															
pH	9512517	9512517	6.45	6.38	1.1%	<	102%	80%	120%	NA	80%	120%	NA	80%	120%
Chloride	9512801		(607)	(612)	0.8%	< 1	92%	80%	120%	NA	80%	120%	NA	80%	120%
Fluoride	9512801		0.23	0.33	NA	< 0.12	110%	80%	120%	NA	80%	120%	100%	80%	120%
Sulphate	9512801		(500)	(504)	0.9%	< 2	109%	80%	120%	NA	80%	120%	NA	80%	120%
Alkalinity	9512517	9512517	8	7	NA	< 5	94%	80%	120%	NA	80%	120%	NA	80%	120%
True Color	9512542	9512542	5	6	NA	< 5	90%	80%	120%	NA			NA		
Turbidity	9512523	9512523	156	149	4.6%	< 0.1	96%	80%	120%	NA			NA		
Electrical Conductivity	9512517	9512517	39	38	2.7%	< 1	103%	80%	120%	NA	80%	120%	NA	80%	120%
Nitrate as N	9512801		<0.05	<0.05	NA	< 0.05	94%	80%	120%	NA	80%	120%	103%	80%	120%
Nitrite as N	9512801		1.89	1.93	2.0%	< 0.05	96%	80%	120%	NA	80%	120%	NA	80%	120%
Total Organic Carbon	9510662		6.1	6.3	3.2%	< 0.5	80%	80%	120%	NA	80%	120%	89%	80%	120%
Dissolved Sodium	9512543	9512543	4.2	4.3	1.5%	< 0.1	113%	80%	120%	112%	80%	120%	NA	70%	130%
Dissolved Potassium	9512543	9512543	1.9	2.0	3.5%	< 0.1	109%	80%	120%	110%	80%	120%	NA	70%	130%
Dissolved Calcium	9512543	9512543	13.4	13.3	1.2%	< 0.1	110%	80%	120%	111%	80%	120%	NA	70%	130%
Dissolved Magnesium	9512543	9512543	1.4	1.4	3.6%	< 0.1	106%	80%	120%	107%	80%	120%	NA	70%	130%
Bicarb. Alkalinity (as CaCO3)	9512517	9512517	8	7	NA	< 5	NA	80%	120%	NA	80%	120%	NA	80%	120%
Carb. Alkalinity (as CaCO3)	9512517	9512517	<10	<10	NA	< 10	NA	80%	120%	NA	80%	120%	NA	80%	120%
Hydroxide	9512517	9512517	<5	<5	NA	< 5	NA	80%	120%	NA	80%	120%	NA	80%	120%
Dissolved Aluminum	9512543	9512543	108	114	5.4%	< 5	105%	80%	120%	106%	80%	120%	NA	70%	130%
Dissolved Antimony	9512543	9512543	<2	<2	NA	< 2	88%	80%	120%	113%	80%	120%	121%	70%	130%
Dissolved Arsenic	9512543	9512543	<2	<2	NA	< 2	105%	80%	120%	111%	80%	120%	121%	70%	130%
Dissolved Barium	9512543	9512543	70	72	2.2%	< 5	107%	80%	120%	112%	80%	120%	NA	70%	130%
Dissolved Beryllium	9512543	9512543	<2	<2	NA	< 2	114%	80%	120%	119%	80%	120%	130%	70%	130%
Dissolved Bismuth	9512543	9512543	<2	<2	NA	< 2	104%	80%	120%	109%	80%	120%	78%	70%	130%

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Quality Assurance

CLIENT NAME: ENGLOBE CORP

AGAT WORK ORDER: 18X380128

PROJECT: P-0012285-0-16-200

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Water Analysis (Continued)

RPT Date: Sep 14, 2018			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Dissolved Boron	9512543	9512543	37	40	8.0%	< 5	116%	80%	120%	117%	80%	120%	130%	70%	130%
Dissolved Cadmium	9512543	9512543	<0.09	<0.09	NA	< 0.09	107%	80%	120%	109%	80%	120%	120%	70%	130%
Dissolved Chromium	9512543	9512543	1	1	NA	< 1	101%	80%	120%	120%	80%	120%	112%	70%	130%
Dissolved Cobalt	9512543	9512543	<1	<1	NA	< 1	96%	80%	120%	98%	80%	120%	104%	70%	130%
Dissolved Copper	9512543	9512543	3	3	NA	< 2	100%	80%	120%	102%	80%	120%	119%	70%	130%
Dissolved Iron	9512543	9512543	1060	1070	0.8%	< 50	107%	80%	120%	120%	80%	120%	NA	70%	130%
Dissolved Lead	9512543	9512543	<0.5	<0.5	NA	< 0.5	105%	80%	120%	107%	80%	120%	112%	70%	130%
Dissolved Manganese	9512543	9512543	1650	1670	1.1%	< 2	106%	80%	120%	111%	80%	120%	NA	70%	130%
Dissolved Molybdenum	9512543	9512543	<2	<2	NA	< 2	100%	80%	120%	106%	80%	120%	108%	70%	130%
Dissolved Nickel	9512543	9512543	3	3	NA	< 2	104%	80%	120%	107%	80%	120%	116%	70%	130%
Dissolved Phosphorus	9512543	9512543	<0.02	<0.02	NA	< 0.02	97%	80%	120%	94%	80%	120%	NA	70%	130%
Dissolved Selenium	9512543	9512543	<1	<1	NA	< 1	106%	80%	120%	111%	80%	120%	129%	70%	130%
Dissolved Silver	9512543	9512543	<0.1	<0.1	NA	< 0.1	113%	80%	120%	116%	80%	120%	110%	70%	130%
Dissolved Strontium	9512543	9512543	42	44	4.5%	< 5	102%	80%	120%	103%	80%	120%	NA	70%	130%
Dissolved Thallium	9512543	9512543	<0.1	<0.1	NA	< 0.1	105%	80%	120%	106%	80%	120%	113%	70%	130%
Dissolved Tin	9512543	9512543	<2	<2	NA	< 2	105%	80%	120%	109%	80%	120%	111%	70%	130%
Dissolved Titanium	9512543	9512543	<2	<2	NA	< 2	106%	80%	120%	111%	80%	120%	100%	70%	130%
Dissolved Uranium	9512543	9512543	0.1	0.1	NA	< 0.1	97%	80%	120%	99%	80%	120%	108%	70%	130%
Dissolved Vanadium	9512543	9512543	<2	<2	NA	< 2	99%	80%	120%	100%	80%	120%	107%	70%	130%
Dissolved Zinc	9512543	9512543	18	18	NA	< 5	94%	80%	120%	96%	80%	120%	119%	70%	130%

Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Certified By:

AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation.

Results relate only to the items tested and to all the items tested

AGAT Laboratories

11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
http://www.agatlabs.com

Method Summary

CLIENT NAME: ENGLOBE CORP

AGAT WORK ORDER: 18X380128

PROJECT: P-0012285-0-16-200

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Soil Analysis			
Fraction Organic Carbon-1	INOR-93-6062	Skjemstad & Baldock, 2008 & Walkley & Balck 1934	SPECTROPHOTOMETER
Fraction Organic Carbon-2	INOR-93-6062	Skjemstad & Baldock, 2008 & Walkley & Balck 1934	SPECTROPHOTOMETER
Fraction Organic Carbon-3	INOR-93-6062	Skjemstad & Baldock, 2008 & Walkley & Balck 1934	SPECTROPHOTOMETER
Fraction Organic Carbon-Avg	INOR-93-6062	Skjemstad & Baldock, 2008 & Walkley & Balck 1934	SPECTROPHOTOMETER

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Method Summary

CLIENT NAME: ENGLOBE CORP

AGAT WORK ORDER: 18X380128

PROJECT: P-0012285-0-16-200

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Trace Organics Analysis			
Benzene	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
Toluene	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
Ethylbenzene	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
Xylene (Total)	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
C6-C10 (less BTEX)	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS/FID
>C10-C16 Hydrocarbons	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
>C16-C21 Hydrocarbons	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
>C21-C32 Hydrocarbons	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
Modified TPH (Tier 1)	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	CALCULATION
Resemblance Comment	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS/FID
Return to Baseline at C32	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
Isobutylbenzene - EPH	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
Isobutylbenzene - VPH	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
n-Dotriacontane - EPH	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
Silica Gel Cleanup - 3X			GC/FID
C6-C10 (less BTEX)	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
Modified TPH (Tier 1)	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	CALCULATION
% Moisture		Calculation	GRAVIMETRIC
1-Methylnaphthalene	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
2-Methylnaphthalene	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
Acenaphthene	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
Acenaphthylene	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
Acridine	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
Anthracene	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
Benzo(a)anthracene	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
Benzo(a)pyrene	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
Benzo(b)fluoranthene	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
Benzo(b+j)fluoranthene	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
Benzo(e)pyrene	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
Benzo(ghi)perylene	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
Benzo(k)fluoranthene	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
Chrysene	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
Dibenzo(a,h)anthracene	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
Fluoranthene	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
Fluorene	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
Indeno(1,2,3)pyrene	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
Naphthalene	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS

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Method Summary

CLIENT NAME: ENGLOBE CORP

AGAT WORK ORDER: 18X380128

PROJECT: P-0012285-0-16-200

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Perylene	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
Phenanthrene	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
Pyrene	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
Quinoline	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
Nitrobenzene-d5	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
2-Fluorobiphenyl	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
Terphenyl-d14	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
1-Methylnaphthalene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
2-Methylnaphthalene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Acenaphthene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Acenaphthylene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Acridine	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Anthracene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Benzo(a)anthracene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Benzo(a)pyrene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Benzo(b)fluoranthene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Benzo(e)pyrene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Benzo(ghi)perylene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Benzo(k)fluoranthene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Chrysene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Dibenzo(a,h)anthracene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Fluoranthene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Fluorene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Indeno(1,2,3-cd)pyrene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Naphthalene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Perylene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Phenanthrene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Pyrene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Quinoline	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Nitrobenzene-d5	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
2-Fluorobiphenyl	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Terphenyl-d14	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Total Polychlorinated Biphenyls	ORG-120-5106	EPA SW846/8081/8080	GC/ECD
Decachlorobiphenyl	ORG-120-5106	EAP SW846 3510C/8080/8010	GC/ECD

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Method Summary

CLIENT NAME: ENGLOBE CORP

AGAT WORK ORDER: 18X380128

PROJECT: P-0012285-0-16-200

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Analysis			
Dissolved Mercury	MET-121-6100 & MET-121-6107	SM 3112 B	CV/AA
Total Mercury	MET-121-6100 & MET-121-6107	SM 3112 B	CV/AA
pH	INOR-121-6001	SM 4500 H+B	PC TITRATE
Reactive Silica as SiO2	INOR-121-6027	SM 4110 B	COLORIMETER
Chloride	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH
Fluoride	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH
Sulphate	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH
Alkalinity	INOR-121-6001	SM 2320 B	
True Color	INOR-121-6014	SM 2120 C	NEPHELOMETER
Turbidity	INOR-121-6022	SM 2130 B	NEPHELOMETER
Electrical Conductivity	INOR-121-6001	SM 2510 B	PC TITRATE
Nitrate + Nitrite as N	INORG-121-6005	SM 4110 B	CALCULATION
Nitrate as N	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH
Nitrite as N	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH
Ammonia as N	INOR-121-6047	SM 4500-NH3 G	COLORIMETER
Total Organic Carbon	INORG-121-6026	SM 5310 B	TOC ANALYZER
Ortho-Phosphate as P	INOR-121-6012	SM 4110 B	COLORIMETER
Dissolved Sodium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Potassium	MET121-6104 & MET-121-6105	SM 3125	ICP-MS
Dissolved Calcium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Magnesium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Bicarb. Alkalinity (as CaCO3)	INORG-121-6001	SM 2320 B	PC TITRATE
Carb. Alkalinity (as CaCO3)	INORG-121-6001	SM 2320 B	PC TITRATE
Hydroxide	INORG-121-6001	SM 2320 B	PC-TITRATE
Calculated TDS	CALCULATION	SM 1030E	CALCULATION
Hardness	CALCULATION	SM 2340B	CALCULATION
Langelier Index (@20C)	CALCULATION	CALCULATION	CALCULATION
Langelier Index (@ 4C)	CALCULATION	CALCULATION	CALCULATION
Saturation pH (@ 20C)	CALCULATION	CALCULATION	CALCULATION
Saturation pH (@ 4C)	CALCULATION	CALCULATION	CALCULATION
Anion Sum	CALCULATION	SM 1030E	CALCULATION
Cation sum	CALCULATION	SM 1030E	CALCULATION
% Difference/ Ion Balance (NS)	CALCULATION	SM 1030E	CALCULATION
Dissolved Aluminum	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Antimony	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Arsenic	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Barium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Beryllium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Bismuth	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS

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Method Summary

CLIENT NAME: ENGLOBE CORP
AGAT WORK ORDER: 18X380128
PROJECT: P-0012285-0-16-200
ATTENTION TO: Andrew Higgins
SAMPLING SITE:
SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Dissolved Boron	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Cadmium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Chromium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Cobalt	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Copper	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Iron	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Lead	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Manganese	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Molybdenum	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Nickel	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Phosphorus	MET-121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Selenium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Silver	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Strontium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Thallium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Tin	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Titanium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Uranium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Vanadium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Zinc	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Sodium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Potassium	MET121-6104 & MET-121-6105	SM 3125	ICP-MS
Total Calcium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Magnesium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Aluminum	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Antimony	MET121-6104 & MET-121-6105	SM 3125	ICP-MS
Total Arsenic	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Barium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS

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Method Summary

CLIENT NAME: ENGLOBE CORP

AGAT WORK ORDER: 18X380128

PROJECT: P-0012285-0-16-200

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Total Beryllium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Bismuth	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Boron	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Cadmium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Chromium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Cobalt	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Copper	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Iron	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Lead	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Manganese	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Molybdenum	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Nickel	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Phosphorous	MET-121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Selenium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Silver	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Strontium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Thallium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Tin	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Titanium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Uranium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Vanadium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Zinc	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS

Results relate only to the items tested and to all the items tested

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Dartmouth, NS
B3B 1M2
webearth.agatlabs.com • www.agatlabs.com
P: 902.468.8718 • F: 902.468.8924

Chain of Custody Record

Laboratory Use Only
Arrival Condition: ☑ Good ☐ Poor (see notes)
Arrival Temperature: 6°C
Hold Time:
AGAT Job Number: 18x380128
Notes:

Report Information
Company: Exp Services
Contact: Andrew Higgins / Alex Hayes
Address:
Phone: 902-468-6486 Fax:
Client Project #: P-0012285-0-16-200.
AGAT Quotation: Please see Jeanetta Fraser
Please Note: If quotation number is not provided client will be billed full price for analysis.

Report Information (Please print):
1. Name: Andrew Higgins
Email: Andrew.Higgins@Exp.com
2. Name: Alex Hayes
Email: Alex.Hayes@Exp.com

Report Format
☐ Single Sample per page
☑ Multiple Samples per page
☑ Excel Format Included
☐ Export

Turnaround Time Required (TAT)
Regular TAT ☑ 5 to 7 working days
Rush TAT ☐ Same day ☐ 1 day ☐ 2 days ☐ 3 days
Date Required:

Regulatory Requirements (Check):
☐ List Guidelines on Report ☐ Do not list Guidelines on Report
☐ PIRI
☐ Tier 1 ☐ Res ☐ Pot ☐ Coarse
☐ Tier 2 ☐ Com ☐ N/Pot ☐ Fine
☐ Gas ☐ Fuel ☐ Lube
☐ CCME ☐ CDWQ
☐ Industrial ☐ NSEQS-Cont Sites
☐ Commercial ☐ HRM 101
☐ Res/Park ☐ Storm Water
☐ Agricultural ☐ Waste Water
☐ FWAL
☐ Sediment ☐ Other

Drinking Water Sample: ☐ Yes ☐ No **Salt Water Sample** ☐ Yes ☐ No
Reg. No.:

Invoice To Same Yes ☑ No ☐
Company: Same.
Contact:
Address:
Phone: Fax:
PO/Credit Card#:

Sample Identification	Date/Time Sampled	Sample Matrix	# Containers	Comments – Site/Sample Info. Sample Containment	Field Filtered/Preserved	Standard Water Analysis	Metals: ☑ Total ☐ Diss ☐ Available	Mercury	☐ BOD ☐ CBOD	pH	☐ TSS ☐ TDS ☐ VSS	TKN	Total Phosphorus	Phenols	Tier 1: TPH/BTEX (PIRI) ☐ low level	Tier 2: TPH/BTEX Fractionation	CCME-CWS TPH/BTEX	VOC	THM	HAA	PAH	PCB	TC + EC ☐ P/A ☐ MPN ☐ MF	☐ HPC ☐ Pseudomonas	Fecal Coliform ☐ MPN ☐ MF	Other: Hold	Other: FOC	Hazardous (Y/N)
CWT-SW-6-18	Aug 24, 2018	SW				X	X	X																				
CWT-SW-5-18						X	X	X																				
CWT-SW-7-18						X	X	X																				
CWT-SW-BK01						X	X	X																				
CWT-SW-BK02						X	X	X																				
CWT-SW-BK03						X	X	X																				
CWT-SW-BK04						X	X	X																				
CWT-SED-8-18		SED													X						X					X		
CWT-SED-8-18A																									X			
CWT-SED-8-18B																									X			
CWT-SED-7-18															X											X		
CWT-SED-7-18A																									X			

Samples Relinquished By (Print Name): Andrew Higgins
Date/Time: 30 Aug 2018
Samples Received By (Print Name): Jeanetta Fraser
Date/Time: Aug 31
Samples Relinquished By (Sign):
Date/Time: 11:06
Samples Received By (Sign): J Fraser
Date/Time: 12:15

Pink Copy - Client
Yellow Copy - AGAT
White Copy- AGAT

Page 1 of 2
N°: 59459

AGAT Laboratories

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B3B 1M2
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Chain of Custody Record

Laboratory Use Only
Arrival Condition: ☑ Good ☐ Poor (see notes)
Arrival Temperature: 6°C
Hold Time:
AGAT Job Number: 18x380128
Notes:

Report Information
Company: Englobe.
Contact: Andrew Higgins / Alex Hayes
Address:
Phone: 902-468-6486 Fax:
Client Project #: A-001285-0-16-200.
AGAT Quotation: Please see Janetta Fraser.
Please Note: If quotation number is not provided client will be billed full price for analysis.

Report Information (Please print):
1. Name: Andrew Higgins
Email: Andrew.Higgins@Englobecorp.com
2. Name: Alex Hayes
Email: Alex.Hayes@Englobecorp.com

Report Format
☐ Single Sample per page
☑ Multiple Samples per page
☑ Excel Format Included
☐ Export

Turnaround Time Required (TAT)
Regular TAT ☑ 5 to 7 working days
Rush TAT ☐ Same day ☐ 1 day ☐ 2 days ☐ 3 days
Date Required:

Regulatory Requirements (Check):
☐ List Guidelines on Report ☐ Do not list Guidelines on Report
☐ PIRI
☐ Tier 1 ☐ Res ☐ Pot ☐ Coarse
☐ Tier 2 ☐ Com ☐ N/Pot ☐ Fine
☐ Gas ☐ Fuel ☐ Lube
☐ CCME ☐ CDWQ
☐ Industrial ☐ NSEQS-Cont Sites
☐ Commercial ☐ HRM 101
☐ Res/Park ☐ Storm Water
☐ Agricultural ☐ Waste Water
☐ FWAL
☐ Sediment ☐ Other

Drinking Water Sample: ☐ Yes ☐ No **Salt Water Sample** ☐ Yes ☐ No
Reg. No.:

Invoice To Same Yes ☑ No ☐
Company:
Contact:
Address:
Phone: Fax:
PO/Credit Card#:

Sample Identification	Date/Time Sampled	Sample Matrix	# Containers	Comments – Site/Sample Info. Sample Containment	Field Filtered/Preserved	Standard Water Analysis	Metals: ☐ Total ☐ Diss ☐ Available	Mercury	☐ BOD ☐ CBOD	pH	☐ TSS ☐ TDS ☐ VSS	TKN	Total Phosphorus	Phenols	Tier 1: TPH/BTEX (PIRI) ☐ low level	Tier 2: TPH/BTEX Fractionation	CCME-CWS TPH/BTEX	VOC	THM	HAA	PAH	PCB	TC + EC ☐ P/A ☐ MPN ☐ MF	☐ HPC ☐ Pseudomonas	Fecal Coliform ☐ MPN ☐ MF	Other: Hold	Other: FOC	Hazardous (Y/N)
CWT-SED-7-18B	Aug 24	SED																							X		
CWT-SED-BK01	↓	↓													X							X				X	
CWT-SED-BK02															X							X				X	
CWT-SED-BK03															X							X				X	
CWT-SED-BK04															X							X				X	
CWT-MW1-18	Aug 24	GW		18x376067 *		X	X	X							X						X						
CWT-MW2-18	↓	↓		18x376067 *		X	X	X							X						X						
CWT-MW15-18						X	X	X							X						X						
CWT-MW16-18						X	X	X							X						X						

Samples Relinquished By (Print Name): Andrew Higgins
Date/Time: 30 Aug 2018
Samples Received By (Print Name): Janetta Fraser
Date/Time: 31 Aug
Samples Relinquished By (Sign):
Date/Time: 11:06
Samples Received By (Sign):
Date/Time: 12:15

Pink Copy - Client
Yellow Copy - AGAT
White Copy - AGAT

Page 2 of 2
N°: 59460

AGAT Laboratories

11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
http://www.agatlabs.com

CLIENT NAME: ENGLOBE CORP
97 TROOP AVE
DARTMOUTH, NS B3B2A7
(902) 468-6486

ATTENTION TO: Andrew Higgins

PROJECT: P-0012285-0-16-200

AGAT WORK ORDER: 18X377035

SOIL ANALYSIS REVIEWED BY: Jason Coughtrey, Inorganics Supervisor

TRACE ORGANICS REVIEWED BY: Amy Hunter, Trace Organics Supervisor, B.Sc.

WATER ANALYSIS REVIEWED BY: Laura Baker, Inorganics Data Reporter

DATE REPORTED: Sep 18, 2018

PAGES (INCLUDING COVER): 75

VERSION*: 2

Should you require any information regarding this analysis please contact your client services representative at (902) 468-8718

*NOTES
VERSION 2:Version 2.0 supersedes version 1.0

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

Member of: Association of Professional Engineers and Geoscientists of Alberta (APEGA)
Western Enviro-Agricultural Laboratory Association (WEALA)
Environmental Services Association of Alberta (ESAA)

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Results relate only to the items tested and to all the items tested
All reportable information as specified by ISO 17025:2005 is available from AGAT Laboratories upon request

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Certificate of Analysis

AGAT WORK ORDER: 18X377035

PROJECT: P-0012285-0-16-200

CLIENT NAME: ENGLOBE CORP

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Available Metals in Soil: Zinc

DATE RECEIVED: 2018-08-23

DATE REPORTED: 2018-09-18

SAMPLE DESCRIPTION:				CWT-TP3-18-A/1	CWT-TP3-18-A/2	CWT-TP3-18-B/1	CWT-TP3-18-B/2	CWT-TP3-18-E/1	CWT-TP3-18-E/2	CWT-TP3-18-D/1	CWT-TP3-18-D/2
SAMPLE TYPE:				Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
DATE SAMPLED:				2018-08-15	2018-08-15	2018-08-15	2018-08-15	2018-08-15	2018-08-15	2018-08-15	2018-08-15
Parameter	Unit	G / S	RDL	9493358	9493359	9493361	9493363	9493365	9493366	9493367	9493372
Zinc	mg/kg		5	39	54	298	76	22	19	25	31

SAMPLE DESCRIPTION:				CWT-SS8-18-A/1	CWT-SS8-18-B/1	CWT-SS8-18-C/1	CWT-SS8-18-D/1	CWT-SS16-18-A/1	CWT-SS16-18-B/1	CWT-SS16-18-C/1	CWT-SS16-18-B/2 DUP
SAMPLE TYPE:				Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
DATE SAMPLED:				2018-08-15	2018-08-15	2018-08-15	2018-08-15	2018-08-17	2018-08-17	2018-08-17	2018-08-17
Parameter	Unit	G / S	RDL	9493408	9493421	9493423	9493425	9493610	9493614	9493616	9493647
Zinc	mg/kg		5	268	444	26	21	531	44	137	41

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

9493358-9493647 Results are based on the dry weight of the sample.

Certified By:

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AGAT WORK ORDER: 18X377035

PROJECT: P-0012285-0-16-200

CLIENT NAME: ENGLOBE CORP

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Available Metals in Soil: Zinc, Cadmium

DATE RECEIVED: 2018-08-23

DATE REPORTED: 2018-09-18

SAMPLE DESCRIPTION:				CWT-SS32-18-A	CWT-SS32-18-B	CWT-SS32-18-C	CWT-SS32-18-D
SAMPLE TYPE:				Soil	Soil	Soil	Soil
DATE SAMPLED:				2018-08-17	2018-08-17	2018-08-17	2018-08-17
Parameter	Unit	G / S	RDL	9493620	9493622	9493623	9493624
Cadmium	mg/kg		0.3	0.8	0.7	1.1	0.7
Zinc	mg/kg		5	91	76	92	82

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

9493620-9493624 Results are based on the dry weight of the sample.

Certified By:

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AGAT WORK ORDER: 18X377035

PROJECT: P-0012285-0-16-200

CLIENT NAME: ENGLOBE CORP

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Fraction Organic Carbon

DATE RECEIVED: 2018-08-23

DATE REPORTED: 2018-09-18

SAMPLE DESCRIPTION:				CWT-SED-5-18		CWT-SED-8-18		CWT-SED-DUP18
SAMPLE TYPE:				Soil		Soil		Soil
DATE SAMPLED:				2018-08-15		2018-08-15		2018-08-15
Parameter	Unit	G / S	RDL	9492912	RDL	9492931	RDL	9492946
Fraction Organic Carbon-1	NA		0.003	0.237	0.006	0.486	0.003	0.186
Fraction Organic Carbon-2	NA		0.003	0.237	0.006	0.461	0.003	0.187
Fraction Organic Carbon-3	NA		0.003	0.235	0.006	0.470	0.003	0.185
Fraction Organic Carbon-Avg	NA		0.003	0.236	0.006	0.473	0.003	0.186

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

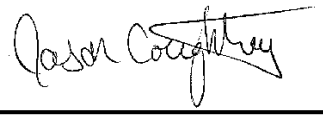
9492912 Samples were analyzed and are reported in triplicate.
FOC was calculated from the Total Organic Carbon determined by Walkley Black Wet oxidation procedure.

9492931 Samples were analyzed and are reported in triplicate.
FOC was calculated from the Total Organic Carbon determined by Walkley Black Wet oxidation procedure.

Elevated RDLs indicate the degree of sample dilutions prior to the analysis to keep analytes within the calibration range, reduce matrix interference and/or to avoid contaminating the instrument.

9492946 Samples were analyzed and are reported in triplicate.
FOC was calculated from the Total Organic Carbon determined by Walkley Black Wet oxidation procedure.

Certified By:



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Certificate of Analysis

AGAT WORK ORDER: 18X377035

PROJECT: P-0012285-0-16-200

CLIENT NAME: ENGLOBE CORP

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Atlantic RBCA Tier 1 Hydrocarbons in Soil (Version 3.0)

DATE RECEIVED: 2018-08-23

DATE REPORTED: 2018-09-18

SAMPLE DESCRIPTION:				CWT-TP13-18-A/1	CWT-TP13-18-B/1	CWT-TP13-18-C/1	CWT-TP13/BH-1
SAMPLE TYPE:				Soil	Soil	Soil	Soil
DATE SAMPLED:				2018-08-16	2018-08-16	2018-08-16	2018-08-16
Parameter	Unit	G / S	RDL	9493437	9493438	9493441	9493444
Benzene	mg/kg		0.03	<0.03	<0.03	<0.03	<0.03
Toluene	mg/kg		0.04	<0.04	<0.04	<0.04	<0.04
Ethylbenzene	mg/kg		0.03	<0.03	<0.03	<0.03	<0.03
Xylene (Total)	mg/kg		0.05	<0.05	<0.05	<0.05	<0.05
C6-C10 (less BTEX)	mg/kg		3	114	<3	248	195
>C10-C16 Hydrocarbons	mg/kg		15	8630	24	12500	1540
>C16-C21 Hydrocarbons	mg/kg		15	1360	<15	2030	387
>C21-C32 Hydrocarbons	mg/kg		15	134	64	N/A	23
Modified TPH (Tier 1)	mg/kg		20	10200	88	14800	2150
Resemblance Comment				WFOF	WFOF+LR	WFOF	FOF
Return to Baseline at C32				Y	Y	Y	Y
Surrogate	Unit	Acceptable Limits					
Isobutylbenzene - EPH	%	60-140		139	95	89	107
Isobutylbenzene - VPH	%	60-140		108	114	133	133
n-Dotriacontane - EPH	%	60-140		101	100	51	100

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AGAT WORK ORDER: 18X377035

PROJECT: P-0012285-0-16-200

CLIENT NAME: ENGLOBE CORP

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Atlantic RBCA Tier 1 Hydrocarbons in Soil (Version 3.0)

DATE RECEIVED: 2018-08-23

DATE REPORTED: 2018-09-18

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

9493437-9493438 Sample was not field preserved for VPH when received at the laboratory. Analytical results for VPH parameters should be regarded as minimum values.

Results are based on the dry weight of the soil.

Resemblance Comment Key:
GF - Gasoline Fraction
WGF - Weathered Gasoline Fraction
GR - Product in Gasoline Range
FOF - Fuel Oil Fraction
WFOF - Weathered Fuel Oil Fraction
FR - Product in Fuel Oil Range
LOF - Lube Oil Fraction
LR - Lube Range
UC - Unidentified Compounds
NR - No Resemblance
NA - Not Applicable

9493441 Sample was not field preserved for VPH when received at the laboratory. Analytical results for VPH parameters should be regarded as minimum values.
Surrogate recovery not available (N/A) due to product interferences.
Results are based on the dry weight of the soil.

Resemblance Comment Key:
GF - Gasoline Fraction
WGF - Weathered Gasoline Fraction
GR - Product in Gasoline Range
FOF - Fuel Oil Fraction
WFOF - Weathered Fuel Oil Fraction
FR - Product in Fuel Oil Range
LOF - Lube Oil Fraction
LR - Lube Range
UC - Unidentified Compounds
NR - No Resemblance
NA - Not Applicable

9493444 Sample was not field preserved for VPH when received at the laboratory. Analytical results for VPH parameters should be regarded as minimum values.

Results are based on the dry weight of the soil.

Resemblance Comment Key:
GF - Gasoline Fraction
WGF - Weathered Gasoline Fraction
GR - Product in Gasoline Range
FOF - Fuel Oil Fraction
WFOF - Weathered Fuel Oil Fraction

Certified By:

Results relate only to the items tested and to all the items tested

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AGAT WORK ORDER: 18X377035

PROJECT: P-0012285-0-16-200

CLIENT NAME: ENGLOBE CORP

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Atlantic RBCA Tier 1 Hydrocarbons in Soil (Version 3.0)

DATE RECEIVED: 2018-08-23

DATE REPORTED: 2018-09-18

FR - Product in Fuel Oil Range
LOF - Lube Oil Fraction
LR - Lube Range
UC - Unidentified Compounds
NR - No Resemblance
NA - Not Applicable

Certified By:

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AGAT WORK ORDER: 18X377035

PROJECT: P-0012285-0-16-200

CLIENT NAME: ENGLOBE CORP

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Atlantic RBCA Tier 1 Hydrocarbons in Soil (Version 3.1) - Field Preserved

DATE RECEIVED: 2018-08-23

DATE REPORTED: 2018-09-18

		SAMPLE DESCRIPTION:		CWT-TP35-18-A	CWT-TP35-18-B	CWT-TP35-18-C	CWT-TP35-18-D	CWT-TP41-18-A	CWT-TP41-18-B	CWT-TP41-18-C	CWT-MW 4/1
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2018-08-18	2018-08-18	2018-08-18	2018-08-18	2018-08-18	2018-08-18	2018-08-18	2018-08-18
Parameter	Unit	G / S	RDL	9493260	9493267	9493268	9493270	9493273	9493275	9493276	9493319
Benzene	mg/kg		0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Toluene	mg/kg		0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.056	<0.04	<0.04
Ethylbenzene	mg/kg		0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Xylene (Total)	mg/kg		0.05	<0.05	0.10	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
C6-C10 (less BTEX)	mg/kg		3	131	4	260	163	<3	<3	<3	<3
>C10-C16 Hydrocarbons	mg/kg		15	1800	56	4070	1160	41	17	<15	<15
>C16-C21 Hydrocarbons	mg/kg		15	57	60	263	22	52	61	34	<15
>C21-C32 Hydrocarbons	mg/kg		15	16	137	202	22	96	368	137	30
Modified TPH (Tier 1)	mg/kg		20	2000	257	4800	1370	189	446	171	30
Resemblance Comment				WFOF	WFOF+LOF+UC	WFOF	FOF	WFOF+LOF+UC	LOF	WFOF+LOF	LR
Return to Baseline at C32				Y	Y	Y	Y	Y	N	Y	Y
Surrogate	Unit	Acceptable Limits									
Isobutylbenzene - EPH	%	60-140		117	115	127	117	136	90	106	94
Isobutylbenzene - VPH	%	60-140		128	110	140	140	123	121	120	112
n-Dotriacontane - EPH	%	60-140		131	135	126	99	N/A	120	129	98

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AGAT WORK ORDER: 18X377035

PROJECT: P-0012285-0-16-200

CLIENT NAME: ENGLOBE CORP

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Atlantic RBCA Tier 1 Hydrocarbons in Soil (Version 3.1) - Field Preserved

DATE RECEIVED: 2018-08-23

DATE REPORTED: 2018-09-18

SAMPLE DESCRIPTION:				CWT-MW 4/2	CWT-SS2-18-A	CWT-SS2-18-B	CWT-SS2-18-C	CWT-SS2-18-D	CWT-SS36-18-A/1	CWT-SS36-18-B/1	CWT-TP35-18A DUP
SAMPLE TYPE:				Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
DATE SAMPLED:				2018-08-18	2018-08-18	2018-08-18	2018-08-18	2018-08-18	2018-08-15	2018-08-15	2018-08-18
Parameter	Unit	G / S	RDL	9493321	9493329	9493330	9493331	9493332	9493429	9493436	9493652
Benzene	mg/kg		0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Toluene	mg/kg		0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Ethylbenzene	mg/kg		0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Xylene (Total)	mg/kg		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
C6-C10 (less BTEX)	mg/kg		3	<3	<3	<3	<3	<3	<3	<3	144
>C10-C16 Hydrocarbons	mg/kg		15	<15	<15	<15	<15	<15	<15	<15	1460
>C16-C21 Hydrocarbons	mg/kg		15	<15	142	<15	<15	<15	<15	<15	40
>C21-C32 Hydrocarbons	mg/kg		15	23	1280	56	63	74	<15	19	21
Modified TPH (Tier 1)	mg/kg		20	23	1420	56	63	74	<20	<20	1670
Resemblance Comment				LR	UC	LR	UC	UC	NR	UC	FOF
Return to Baseline at C32				Y	Y	Y	Y	Y	Y	Y	Y
Surrogate	Unit	Acceptable Limits									
Isobutylbenzene - EPH	%	60-140		95	100	100	95	98	98	89	126
Isobutylbenzene - VPH	%	60-140		93	109	117	106	105	123	115	140
n-Dotriacontane - EPH	%	60-140		97	104	113	95	101	94	95	106

Certified By:

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Certificate of Analysis

AGAT WORK ORDER: 18X377035

PROJECT: P-0012285-0-16-200

CLIENT NAME: ENGLOBE CORP

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Atlantic RBCA Tier 1 Hydrocarbons in Soil (Version 3.1) - Field Preserved

DATE RECEIVED: 2018-08-23

DATE REPORTED: 2018-09-18

				CWT-TP41-18B	
SAMPLE DESCRIPTION:				DUP	CWT-TP41-18-D
SAMPLE TYPE:				Soil	Soil
DATE SAMPLED:				2018-08-18	2018-08-16
Parameter	Unit	G / S	RDL	9493653	9494005
Benzene	mg/kg		0.03	<0.03	<0.03
Toluene	mg/kg		0.04	<0.04	0.930
Ethylbenzene	mg/kg		0.03	<0.03	<0.03
Xylene (Total)	mg/kg		0.05	<0.05	<0.05
C6-C10 (less BTEX)	mg/kg		3	<3	<3
>C10-C16 Hydrocarbons	mg/kg		15	16	30
>C16-C21 Hydrocarbons	mg/kg		15	47	41
>C21-C32 Hydrocarbons	mg/kg		15	247	250
Modified TPH (Tier 1)	mg/kg		20	310	321
Resemblance Comment				LOF	LOF+UC
Return to Baseline at C32				N	N
Surrogate	Unit	Acceptable Limits			
Isobutylbenzene - EPH	%	60-140		124	89
Isobutylbenzene - VPH	%	60-140		124	126
n-Dotriacontane - EPH	%	60-140		109	109

Certified By:

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AGAT WORK ORDER: 18X377035

PROJECT: P-0012285-0-16-200

CLIENT NAME: ENGLOBE CORP

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Atlantic RBCA Tier 1 Hydrocarbons in Soil (Version 3.1) - Field Preserved

DATE RECEIVED: 2018-08-23

DATE REPORTED: 2018-09-18

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

9493260-9493270 Results are based on the dry weight of the soil.

Resemblance Comment Key:
GF - Gasoline Fraction
WGF - Weathered Gasoline Fraction
GR - Product in Gasoline Range
FOF - Fuel Oil Fraction
WFOF - Weathered Fuel Oil Fraction
FR - Product in Fuel Oil Range
LOF - Lube Oil Fraction
LR - Lube Range
UC - Unidentified Compounds
NR - No Resemblance
NA - Not Applicable

9493273 Results are based on the dry weight of the soil.
Surrogate recovery not available (N/A) due to product interferences.

Resemblance Comment Key:
GF - Gasoline Fraction
WGF - Weathered Gasoline Fraction
GR - Product in Gasoline Range
FOF - Fuel Oil Fraction
WFOF - Weathered Fuel Oil Fraction
FR - Product in Fuel Oil Range
LOF - Lube Oil Fraction
LR - Lube Range
UC - Unidentified Compounds
NR - No Resemblance
NA - Not Applicable

9493275-9494005 Results are based on the dry weight of the soil.

Resemblance Comment Key:
GF - Gasoline Fraction
WGF - Weathered Gasoline Fraction
GR - Product in Gasoline Range
FOF - Fuel Oil Fraction
WFOF - Weathered Fuel Oil Fraction
FR - Product in Fuel Oil Range
LOF - Lube Oil Fraction
LR - Lube Range
UC - Unidentified Compounds
NR - No Resemblance

Certified By:

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AGAT Laboratories

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Certificate of Analysis

AGAT WORK ORDER: 18X377035

PROJECT: P-0012285-0-16-200

CLIENT NAME: ENGLOBE CORP

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Atlantic RBCA Tier 1 Hydrocarbons in Soil (Version 3.1) - Field Preserved

DATE RECEIVED: 2018-08-23

DATE REPORTED: 2018-09-18

NA - Not Applicable

Certified By:

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Certificate of Analysis

AGAT WORK ORDER: 18X377035

PROJECT: P-0012285-0-16-200

CLIENT NAME: ENGLOBE CORP

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Atlantic RBCA Tier 1 Hydrocarbons in Soil (Version 3.1) - Field Preserved + 3X Silica Gel

DATE RECEIVED: 2018-08-23

DATE REPORTED: 2018-09-18

SAMPLE DESCRIPTION:				CWT-SED-5-18	CWT-SED-8-18	CWT-SED-DUP18
SAMPLE TYPE:				Soil	Soil	Soil
DATE SAMPLED:				2018-08-15	2018-08-15	2018-08-15
Parameter	Unit	G / S	RDL	9492912	9492931	9492946
Benzene	mg/kg		0.03	<0.03	<0.03	<0.03
Toluene	mg/kg		0.04	<0.04	1.76	<0.04
Ethylbenzene	mg/kg		0.03	<0.03	<0.03	<0.03
Xylene (Total)	mg/kg		0.05	<0.05	<0.05	<0.05
C6-C10 (less BTEX)	mg/kg		3	15	38	25
>C10-C16 Hydrocarbons - 3X silica gel	mg/kg		15	413	<15	512
>C16-C21 Hydrocarbons - 3X silica gel	mg/kg		15	110	44	71
>C21-C32 Hydrocarbons - 3X silica gel	mg/kg		15	64	551	59
Modified TPH (Tier 1) - 3X silica gel	mg/kg		20	602	633	667
Resemblance Comment				FR, UC	UC	FR, UC
Return to Baseline at C32				Y	Y	Y
Silica Gel Cleanup - 3X				Y	Y	Y
Surrogate	Unit	Acceptable Limits				
Isobutylbenzene - EPH	%	60-140		125	113	126
Isobutylbenzene - VPH	%	60-140		109	100	107
n-Dotriacontane - EPH	%	60-140		N/A	N/A	N/A

Certified By:

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Certificate of Analysis

AGAT WORK ORDER: 18X377035

PROJECT: P-0012285-0-16-200

CLIENT NAME: ENGLOBE CORP

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Atlantic RBCA Tier 1 Hydrocarbons in Soil (Version 3.1) - Field Preserved + 3X Silica Gel

DATE RECEIVED: 2018-08-23

DATE REPORTED: 2018-09-18

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

9492912 Results are based on the dry weight of the soil.
Surrogate recovery not available (N/A) due to silica gel cleanup.

Resemblance Comment Key:
GF - Gasoline Fraction
WGF - Weathered Gasoline Fraction
GR - Product in Gasoline Range
FOF - Fuel Oil Fraction
WFOF - Weathered Fuel Oil Fraction
FR - Product in Fuel Oil Range
LOF - Lube Oil Fraction
LR - Lube Range
UC - Unidentified Compounds
NR - No Resemblance
NA - Not Applicable

9492931-9492946 Results are based on the dry weight of the soil.
Surrogate recovery not available (N/A) due to silica gel cleanup.
Resemblance Comment Key:
GF - Gasoline Fraction
WGF - Weathered Gasoline Fraction
GR - Product in Gasoline Range
FOF - Fuel Oil Fraction
WFOF - Weathered Fuel Oil Fraction
FR - Product in Fuel Oil Range
LOF - Lube Oil Fraction
LR - Lube Range
UC - Unidentified Compounds
NR - No Resemblance
NA - Not Applicable

Certified By:

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CANADA B3B 1M2
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Certificate of Analysis

AGAT WORK ORDER: 18X377035

PROJECT: P-0012285-0-16-200

CLIENT NAME: ENGLOBE CORP

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Atlantic RBCA Tier 1 Hydrocarbons in Water (Version 3.0)

DATE RECEIVED: 2018-08-23

DATE REPORTED: 2018-09-18

SAMPLE DESCRIPTION:				CWT-SW-8-18	CWT-SW-8-18B	CWT-SW2-18 (Coring)	CWT-SW-DUP-18	CWT-MW5-18	CWT-MW4-18	CWT-MW10-18	CWT-MW9-18
SAMPLE TYPE:				Water	Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:				2018-08-15	2018-08-15	2018-08-15	2018-08-15	2018-08-18	2018-08-18	2018-08-18	2018-08-18
Parameter	Unit	G / S	RDL	9492948	9492951	9493246	9493254	9493660	9493661	9493662	9493663
Benzene	mg/L		0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Toluene	mg/L		0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Ethylbenzene	mg/L		0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Xylene (Total)	mg/L		0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
C6-C10 (less BTEX)	mg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01
>C10-C16 Hydrocarbons	mg/L		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.20	<0.05	<0.05
>C16-C21 Hydrocarbons	mg/L		0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
>C21-C32 Hydrocarbons	mg/L		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Modified TPH (Tier 1)	mg/L		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	<0.1	<0.1
Resemblance Comment				NR	NR	NR	NR	NR	WFOF+UC	NR	NR
Return to Baseline at C32				Y	Y	Y	Y	Y	Y	Y	Y
Surrogate	Unit	Acceptable Limits									
Isobutylbenzene - EPH	%	70-130		81	79	85	99	79	74	105	92
Isobutylbenzene - VPH	%	70-130		81	120	99	93	99	100	105	97
n-Dotriacontane - EPH	%	70-130		96	94	95	104	94	84	110	95

Certified By:

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Certificate of Analysis

AGAT WORK ORDER: 18X377035

PROJECT: P-0012285-0-16-200

CLIENT NAME: ENGLOBE CORP

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Atlantic RBCA Tier 1 Hydrocarbons in Water (Version 3.0)

DATE RECEIVED: 2018-08-23

DATE REPORTED: 2018-09-18

SAMPLE DESCRIPTION:				CWT-MW-DUP1	CWT-MW6-18	CWT-MW12-18
SAMPLE TYPE:				Water	Water	Water
DATE SAMPLED:				2018-08-18	2018-08-18	2018-08-18
Parameter	Unit	G / S	RDL	9493665	9493666	9493667
Benzene	mg/L		0.001	<0.001	0.002	<0.001
Toluene	mg/L		0.001	<0.001	0.001	<0.001
Ethylbenzene	mg/L		0.001	<0.001	<0.001	<0.001
Xylene (Total)	mg/L		0.002	<0.002	<0.002	<0.002
C6-C10 (less BTEX)	mg/L		0.01	0.02	0.02	<0.01
>C10-C16 Hydrocarbons	mg/L		0.05	0.21	<0.05	<0.05
>C16-C21 Hydrocarbons	mg/L		0.10	<0.10	<0.10	<0.10
>C21-C32 Hydrocarbons	mg/L		0.1	<0.1	<0.1	<0.1
Modified TPH (Tier 1)	mg/L		0.1	0.2	<0.1	<0.1
Resemblance Comment				WFOF+UC	UC	NR
Return to Baseline at C32				Y	Y	Y
Surrogate	Unit	Acceptable Limits				
Isobutylbenzene - EPH	%	70-130		98	88	95
Isobutylbenzene - VPH	%	70-130		115	102	95
n-Dotriacontane - EPH	%	70-130		102	88	103

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

9492948-9493667 Resemblance Comment Key:
GF - Gasoline Fraction
WGF - Weathered Gasoline Fraction
GR - Product in Gasoline Range
FOF - Fuel Oil Fraction
WFOF - Weathered Fuel Oil Fraction
FR - Product in Fuel Oil Range
LOF - Lube Oil Fraction
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UC - Unidentified Compounds
NR - No Resemblance
NA - Not Applicable

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AGAT WORK ORDER: 18X377035

PROJECT: P-0012285-0-16-200

CLIENT NAME: ENGLOBE CORP

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Moisture

DATE RECEIVED: 2018-08-23

DATE REPORTED: 2018-09-18

SAMPLE DESCRIPTION:				CWT-SED-5-18	CWT-SED-8-18	CWT-SED-DUP18	CWT-TP35-18-A	CWT-TP35-18-B	CWT-TP35-18-C	CWT-TP35-18-D	CWT-TP41-18-A
SAMPLE TYPE:				Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
DATE SAMPLED:				2018-08-15	2018-08-15	2018-08-15	2018-08-18	2018-08-18	2018-08-18	2018-08-18	2018-08-18
Parameter	Unit	G / S	RDL	9492912	9492931	9492946	9493260	9493267	9493268	9493270	9493273
% Moisture	%		0	53	93	48	19	13	16	14	20

SAMPLE DESCRIPTION:				CWT-TP41-18-B	CWT-TP41-18-C	CWT-TP36-18-A	CWT-TP36-18-B	CWT-TP36-18-C	CWT-TP36-18-D	CWT-MW 4/1	CWT-MW 4/2
SAMPLE TYPE:				Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
DATE SAMPLED:				2018-08-18	2018-08-18	2018-08-18	2018-08-18	2018-08-18	2018-08-18	2018-08-18	2018-08-18
Parameter	Unit	G / S	RDL	9493275	9493276	9493277	9493279	9493312	9493314	9493319	9493321
% Moisture	%		0	30	16	16	28	28	14	17	16

SAMPLE DESCRIPTION:				CWT-SS2-18-A	CWT-SS2-18-B	CWT-SS2-18-C	CWT-SS2-18-D	CWT-TP5-18-A/1	CWT-TP5-18-A/2	CWT-TP5-18-B/1	CWT-TP5-18-C/1
SAMPLE TYPE:				Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
DATE SAMPLED:				2018-08-18	2018-08-18	2018-08-18	2018-08-18	2018-08-15	2018-08-15	2018-08-15	2018-08-15
Parameter	Unit	G / S	RDL	9493329	9493330	9493331	9493332	9493373	9493375	9493395	9493397
% Moisture	%		0	66	13	10	11	81	34	64	86

SAMPLE DESCRIPTION:				CWT-TP5-18-C/2	CWT-TP5-18-D/1	CWT-TP5-18-D/2	CWT-SS36-18-A/1	CWT-SS36-18-B/1	CWT-TP13-18-A/1	CWT-TP13-18-B/1	CWT-TP13-18-C/1
SAMPLE TYPE:				Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
DATE SAMPLED:				2018-08-15	2018-08-15	2018-08-15	2018-08-15	2018-08-15	2018-08-16	2018-08-16	2018-08-16
Parameter	Unit	G / S	RDL	9493398	9493399	9493400	9493429	9493436	9493437	9493438	9493441
% Moisture	%		0	17	36	19	25	18	51	21	23

SAMPLE DESCRIPTION:				CWT-TP13/BH-1	CWT-MW9/1	CWT-TP8-18-A/1	CWT-TP8-18-B/1	CWT-TP8-18-C/1	CWT-TP8-18-D/1	CWT-SS13-18-A	CWT-SS13-18-B
SAMPLE TYPE:				Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
DATE SAMPLED:				2018-08-16	2018-08-16	2018-08-16	2018-08-16	2018-08-16	2018-08-16	2018-08-16	2018-08-16
Parameter	Unit	G / S	RDL	9493444	9493449	9493450	9493451	9493469	9493470	9493474	9493475
% Moisture	%		0	14	23	21	28	22	21	13	7

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FAX (902)468-8924
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AGAT WORK ORDER: 18X377035

PROJECT: P-0012285-0-16-200

CLIENT NAME: ENGLOBE CORP

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Moisture

DATE RECEIVED: 2018-08-23

DATE REPORTED: 2018-09-18

Parameter	Unit	G / S	RDL	SAMPLE DESCRIPTION: CWT-SS13-18-C SAMPLE TYPE: Soil DATE SAMPLED: 2018-08-16 9493476	CWT-SS13-18-D Soil 2018-08-16 9493477	CWT-SS23-18-A/1 Soil 2018-08-16 9493478	CWT-SS23-18-B/1 Soil 2018-08-16 9493480	CWT-SS23-18-C/1 Soil 2018-08-16 9493482	CWT-TP11-18-A Soil 2018-08-17 9493496	CWT-TP11-18-B Soil 2018-08-17 9493497	CWT-TP11-18-C Soil 2018-08-17 9493498
% Moisture	%		0	9	13	21	22	25	8	25	17

Parameter	Unit	G / S	RDL	SAMPLE DESCRIPTION: CWT-TP11-18-D SAMPLE TYPE: Soil DATE SAMPLED: 2018-08-17 9493499	CWT-TP15-18-A/1 Soil 2018-08-16 9493500	CWT-TP15-18-A/3 Soil 2018-08-16 9493502	CWT-TP15-18-B/1 Soil 2018-08-16 9493503	CWT-TP15-18-B/3 Soil 2018-08-16 9493505	CWT-TP15-18-C/1 Soil 2018-08-16 9493506	CWT-TP15-18-C/2 Soil 2018-08-16 9493507	CWT-TP15-18-D/1 Soil 2018-08-16 9493513
% Moisture	%		0	19	12	19	11	18	18	22	23

Parameter	Unit	G / S	RDL	SAMPLE DESCRIPTION: CWT-TP15-18-D/3 SAMPLE TYPE: Soil DATE SAMPLED: 2018-08-16 9493515	CWT-TP15-18-F-A/1 Soil 2018-08-16 9493516	CWT-TP15-18-F-A/3 Soil 2018-08-16 9493518	CWT-TP15-18-E/3 Soil 2018-08-16 9493521	CWT-TP17-18-A/1 Soil 2018-08-16 9493522	CWT-TP17-18-B/1 Soil 2018-08-16 9493523	CWT-TP17-18-C/1 Soil 2018-08-16 9493524	CWT-TP17-18-D/1 Soil 2018-08-16 9493564
% Moisture	%		0	17	13	16	19	18	20	15	14

Parameter	Unit	G / S	RDL	SAMPLE DESCRIPTION: CWT-MW14/1 SAMPLE TYPE: Soil DATE SAMPLED: 2018-08-16 9493565	CWT-MW15/1 Soil 2018-08-16 9493566	CWT-TP30-18-A/1 Soil 2018-08-17 9493567	CWT-TP30-18-A/2 Soil 2018-08-17 9493568	CWT-TP30-18-B/1 Soil 2018-08-17 9493569	CWT-TP30-18-B/2 Soil 2018-08-17 9493570	CWT-TP30-18-C/1 Soil 2018-08-17 9493571	CWT-TP30-18-C/2 Soil 2018-08-17 9493572
% Moisture	%		0	18	18	16	32	19	14	16	25

Parameter	Unit	G / S	RDL	SAMPLE DESCRIPTION: CWT-TP30-18-D/2 SAMPLE TYPE: Soil DATE SAMPLED: 2018-08-17 9493574	CWT-TP25-18-A/1 Soil 2018-08-17 9493575	CWT-TP25-18-A/2 Soil 2018-08-17 9493592	CWT-TP25-18-B/2 Soil 2018-08-17 9493598	CWT-TP25-18-C/2 Soil 2018-08-17 9493600	CWT-TP25-18-D/1 Soil 2018-08-17 9493601	CWT-TP25-18-D/2 Soil 2018-08-17 9493602	CWT-MW14/DUP Soil 2018-08-17 9493627
% Moisture	%		0	21	16	19	17	19	17	17	14

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AGAT WORK ORDER: 18X377035

PROJECT: P-0012285-0-16-200

CLIENT NAME: ENGLOBE CORP

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Moisture

DATE RECEIVED: 2018-08-23

DATE REPORTED: 2018-09-18

Parameter	Unit	G / S	RDL	CWT-TP25-18-A/2 DUP Soil 2018-08-17 9493648	CWT-TP35-18A DUP Soil 2018-08-18 9493652	CWT-TP41-18B DUP Soil 2018-08-18 9493653	CWT-MW13/1 Soil 2018-08-18 9493688	CWT-MW13/3 Soil 2018-08-18 9493689	CWT-TP2-18A 0.7 Soil 2018-08-15 9493700	CWT-TP2-18B 0.7 Soil 2018-08-15 9493701	CWT-TP2-18C 0.7 Soil 2018-08-15 9493702
% Moisture	%		0	18	18	19	13	21	15	24	61

Parameter	Unit	G / S	RDL	CWT-TP2-18D 0.7 Soil 2018-08-15 9493703	CWT-TP2-18E 0.7 Soil 2018-08-15 9493704	CWT-TP41-18-D Soil 2018-08-16 9494005
% Moisture	%		0	30	17	27

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Certified By:

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AGAT WORK ORDER: 18X377035

PROJECT: P-0012285-0-16-200

CLIENT NAME: ENGLOBE CORP

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Polycyclic Aromatic Hydrocarbons in Soil

DATE RECEIVED: 2018-08-23

DATE REPORTED: 2018-09-18

SAMPLE DESCRIPTION:				CWT-SED-8-18	CWT-TP36-18-A	CWT-TP36-18-B	CWT-TP36-18-C	CWT-TP36-18-D	CWT-TP5-18-A/1	CWT-TP5-18-A/2	CWT-TP5-18-B/1
SAMPLE TYPE:				Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
DATE SAMPLED:				2018-08-15	2018-08-18	2018-08-18	2018-08-18	2018-08-18	2018-08-15	2018-08-15	2018-08-15
Parameter	Unit	G / S	RDL	9492931	9493277	9493279	9493312	9493314	9493373	9493375	9493395
1-Methylnaphthalene	mg/kg		0.05	<0.05	<0.05	0.08	<0.05	<0.05	<0.05	<0.05	<0.05
2-Methylnaphthalene	mg/kg		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.03	<0.01	<0.01
Acenaphthene	mg/kg		0.00671	<0.00671	<0.00671	<0.00671	<0.00671	<0.00671	<0.00671	<0.00671	<0.00671
Acenaphthylene	mg/kg		0.004	<0.004	0.011	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Acridine	mg/kg		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Anthracene	mg/kg		0.03	<0.03	<0.03	0.04	<0.03	<0.03	<0.03	<0.03	<0.03
Benzo(a)anthracene	mg/kg		0.01	<0.01	0.01	0.07	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(a)pyrene	mg/kg		0.01	<0.01	<0.01	0.04	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(b)fluoranthene	mg/kg		0.05	<0.05	<0.05	0.07	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(b+j)fluoranthene	mg/kg		0.1	<0.1	<0.1	0.11	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(e)pyrene	mg/kg		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(ghi)perylene	mg/kg		0.01	<0.01	0.02	0.02	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(k)fluoranthene	mg/kg		0.01	<0.01	<0.01	0.05	<0.01	<0.01	<0.01	<0.01	<0.01
Chrysene	mg/kg		0.01	<0.01	0.03	0.08	<0.01	<0.01	<0.01	<0.01	<0.01
Dibenzo(a,h)anthracene	mg/kg		0.006	<0.006	<0.006	0.009	<0.006	<0.006	<0.006	<0.006	<0.006
Fluoranthene	mg/kg		0.05	<0.05	<0.05	0.15	<0.05	<0.05	<0.05	<0.05	<0.05
Fluorene	mg/kg		0.01	<0.01	<0.01	0.03	<0.01	<0.01	0.01	<0.01	<0.01
Indeno(1,2,3)pyrene	mg/kg		0.01	<0.01	0.01	0.03	<0.01	<0.01	<0.01	<0.01	<0.01
Naphthalene	mg/kg		0.01	<0.01	<0.01	0.66	<0.01	<0.01	<0.01	<0.01	<0.01
Perylene	mg/kg		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.31
Phenanthrene	mg/kg		0.03	<0.03	<0.03	0.05	<0.03	<0.03	<0.03	<0.03	<0.03
Pyrene	mg/kg		0.05	<0.05	<0.05	0.20	<0.05	<0.05	<0.05	<0.05	<0.05
Quinoline	mg/kg		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Surrogate	Unit	Acceptable Limits									
Nitrobenzene-d5	%	50-140		94	85	112	94	91	81	96	92
2-Fluorobiphenyl	%	50-140		74	71	77	79	78	82	83	86
Terphenyl-d14	%	50-140		85	78	77	77	78	78	75	81

Certified By:

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11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 18X377035

PROJECT: P-0012285-0-16-200

CLIENT NAME: ENGLOBE CORP

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Polycyclic Aromatic Hydrocarbons in Soil

DATE RECEIVED: 2018-08-23

DATE REPORTED: 2018-09-18

SAMPLE DESCRIPTION:				CWT-TP5-18-C/1	CWT-TP5-18-C/2	CWT-TP5-18-D/1	CWT-TP5-18-D/2	CWT-SS13-18-A	CWT-SS13-18-B	CWT-SS13-18-C	CWT-SS13-18-D
SAMPLE TYPE:				Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
DATE SAMPLED:				2018-08-15	2018-08-15	2018-08-15	2018-08-15	2018-08-16	2018-08-16	2018-08-16	2018-08-16
Parameter	Unit	G / S	RDL	9493397	9493398	9493399	9493400	9493474	9493475	9493476	9493477
1-Methylnaphthalene	mg/kg		0.05	0.08	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
2-Methylnaphthalene	mg/kg		0.01	0.08	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acenaphthene	mg/kg		0.00671	<0.00671	<0.00671	<0.00671	<0.00671	0.013	<0.00671	<0.00671	<0.00671
Acenaphthylene	mg/kg		0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Acridine	mg/kg		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Anthracene	mg/kg		0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Benzo(a)anthracene	mg/kg		0.01	<0.01	<0.01	<0.01	<0.01	0.03	<0.01	0.02	<0.01
Benzo(a)pyrene	mg/kg		0.01	<0.01	<0.01	<0.01	<0.01	0.03	<0.01	<0.01	<0.01
Benzo(b)fluoranthene	mg/kg		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(b+j)fluoranthene	mg/kg		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(e)pyrene	mg/kg		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(ghi)perylene	mg/kg		0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01
Benzo(k)fluoranthene	mg/kg		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Chrysene	mg/kg		0.01	<0.01	<0.01	<0.01	<0.01	0.03	<0.01	0.01	<0.01
Dibenzo(a,h)anthracene	mg/kg		0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Fluoranthene	mg/kg		0.05	<0.05	<0.05	<0.05	<0.05	0.07	<0.05	<0.05	<0.05
Fluorene	mg/kg		0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01
Indeno(1,2,3)pyrene	mg/kg		0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01
Naphthalene	mg/kg		0.01	0.12	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perylene	mg/kg		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Phenanthrene	mg/kg		0.03	<0.03	<0.03	<0.03	<0.03	0.10	<0.03	<0.03	<0.03
Pyrene	mg/kg		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Quinoline	mg/kg		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Surrogate	Unit	Acceptable Limits									
Nitrobenzene-d5	%	50-140		96	86	91	86	92	82	72	78
2-Fluorobiphenyl	%	50-140		69	77	86	77	84	78	84	79
Terphenyl-d14	%	50-140		79	78	80	75	74	93	91	85

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CANADA B3B 1M2
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Certificate of Analysis

AGAT WORK ORDER: 18X377035

PROJECT: P-0012285-0-16-200

CLIENT NAME: ENGLOBE CORP

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Polycyclic Aromatic Hydrocarbons in Soil

DATE RECEIVED: 2018-08-23

DATE REPORTED: 2018-09-18

SAMPLE DESCRIPTION:				CWT-SS23-18-A/1	CWT-SS23-18-B/1	CWT-SS23-18-C/1	CWT-TP11-18-A	CWT-TP11-18-B	CWT-TP11-18-C	CWT-TP11-18-D	CWT-TP15-18-A/1
SAMPLE TYPE:				Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
DATE SAMPLED:				2018-08-16	2018-08-16	2018-08-16	2018-08-17	2018-08-17	2018-08-17	2018-08-17	2018-08-16
Parameter	Unit	G / S	RDL	9493478	9493480	9493482	9493496	9493497	9493498	9493499	9493500
1-Methylnaphthalene	mg/kg		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
2-Methylnaphthalene	mg/kg		0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	0.01	<0.01
Acenaphthene	mg/kg		0.00671	<0.00671	<0.00671	0.0763	<0.00671	0.0397	<0.00671	<0.00671	<0.00671
Acenaphthylene	mg/kg		0.004	<0.004	<0.004	<0.004	<0.004	0.018	0.006	0.014	<0.004
Acridine	mg/kg		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Anthracene	mg/kg		0.03	<0.03	<0.03	0.15	<0.03	0.19	<0.03	<0.03	0.05
Benzo(a)anthracene	mg/kg		0.01	<0.01	0.02	0.30	<0.01	0.35	0.04	0.02	0.15
Benzo(a)pyrene	mg/kg		0.01	<0.01	0.01	0.24	<0.01	0.28	0.06	0.02	<0.01
Benzo(b)fluoranthene	mg/kg		0.05	<0.05	<0.05	0.23	<0.05	0.33	0.07	0.05	<0.05
Benzo(b+j)fluoranthene	mg/kg		0.1	<0.1	<0.1	0.37	<0.1	0.46	0.10	<0.1	<0.1
Benzo(e)pyrene	mg/kg		0.05	<0.05	<0.05	0.22	<0.05	0.23	0.06	0.06	<0.05
Benzo(ghi)perylene	mg/kg		0.01	<0.01	<0.01	0.31	<0.01	0.20	0.05	0.03	<0.01
Benzo(k)fluoranthene	mg/kg		0.01	<0.01	<0.01	0.14	<0.01	0.14	0.03	0.02	<0.01
Chrysene	mg/kg		0.01	<0.01	0.02	0.32	<0.01	0.38	0.05	0.06	0.17
Dibenzo(a,h)anthracene	mg/kg		0.006	<0.006	<0.006	0.060	<0.006	0.051	0.013	0.011	<0.006
Fluoranthene	mg/kg		0.05	<0.05	<0.05	0.73	<0.05	0.83	0.05	<0.05	0.25
Fluorene	mg/kg		0.01	<0.01	<0.01	0.07	<0.01	0.06	<0.01	<0.01	<0.01
Indeno(1,2,3)pyrene	mg/kg		0.01	<0.01	<0.01	0.21	<0.01	0.23	0.05	0.03	<0.01
Naphthalene	mg/kg		0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01
Perylene	mg/kg		0.05	<0.05	<0.05	0.07	<0.05	0.06	<0.05	<0.05	<0.05
Phenanthrene	mg/kg		0.03	<0.03	<0.03	0.49	<0.03	0.49	<0.03	<0.03	0.29
Pyrene	mg/kg		0.05	<0.05	<0.05	0.52	<0.05	0.57	0.05	<0.05	0.25
Quinoline	mg/kg		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Surrogate	Unit	Acceptable Limits									
Nitrobenzene-d5	%	50-140		87	92	78	71	79	66	75	121
2-Fluorobiphenyl	%	50-140		88	73	70	75	83	71	74	93
Terphenyl-d14	%	50-140		103	94	91	84	93	80	93	84

Certified By:

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11 Morris Drive, Unit 122
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CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 18X377035

PROJECT: P-0012285-0-16-200

CLIENT NAME: ENGLOBE CORP

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Polycyclic Aromatic Hydrocarbons in Soil

DATE RECEIVED: 2018-08-23

DATE REPORTED: 2018-09-18

		SAMPLE DESCRIPTION:		CWT-TP15-18-A/3	CWT-TP15-18-B/1	CWT-TP15-18-B/3	CWT-TP15-18-C/1	CWT-TP15-18-C/2	CWT-TP15-18-D/1	CWT-TP15-18-D/3	CWT-TP15-18-F-A/1
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2018-08-16	2018-08-16	2018-08-16	2018-08-16	2018-08-16	2018-08-16	2018-08-16	2018-08-16
Parameter	Unit	G / S	RDL	9493502	9493503	9493505	9493506	9493507	9493513	9493515	9493516
1-Methylnaphthalene	mg/kg		0.05	<0.05	<0.05	0.47	0.10	<0.05	<0.05	1.07	<0.05
2-Methylnaphthalene	mg/kg		0.01	0.02	0.04	0.74	0.10	<0.01	<0.01	1.25	<0.01
Acenaphthene	mg/kg		0.00671	0.0602	0.117	2.97	0.114	0.0129	0.0308	0.0921	0.0149
Acenaphthylene	mg/kg		0.004	0.015	0.038	0.150	0.092	<0.004	<0.004	0.078	<0.004
Acridine	mg/kg		0.05	<0.05	<0.05	0.79	<0.05	<0.05	<0.05	0.08	<0.05
Anthracene	mg/kg		0.03	0.11	0.10	4.55	0.08	<0.03	0.04	0.07	<0.03
Benzo(a)anthracene	mg/kg		0.01	0.27	0.29	9.37	0.35	0.05	0.10	0.20	0.05
Benzo(a)pyrene	mg/kg		0.01	0.23	0.22	5.34	0.27	0.03	0.07	0.22	0.04
Benzo(b)fluoranthene	mg/kg		0.05	0.30	<0.05	4.64	<0.05	<0.05	<0.05	0.22	<0.05
Benzo(b+j)fluoranthene	mg/kg		0.1	0.45	<0.1	10.3	<0.1	<0.1	<0.1	0.31	<0.1
Benzo(e)pyrene	mg/kg		0.05	0.26	0.25	3.08	0.36	<0.05	<0.05	0.17	<0.05
Benzo(ghi)perylene	mg/kg		0.01	0.25	<0.01	3.20	<0.01	0.04	0.03	0.17	0.03
Benzo(k)fluoranthene	mg/kg		0.01	0.11	<0.01	2.20	<0.01	0.02	<0.01	0.09	<0.01
Chrysene	mg/kg		0.01	0.30	0.36	8.88	0.39	0.05	0.10	0.23	0.06
Dibenzo(a,h)anthracene	mg/kg		0.006	0.058	<0.006	1.06	<0.006	0.008	0.011	0.052	<0.006
Fluoranthene	mg/kg		0.05	0.59	<0.05	24.7	<0.05	0.11	0.15	0.41	0.09
Fluorene	mg/kg		0.01	0.05	<0.01	2.76	<0.01	0.01	0.02	0.10	0.01
Indeno(1,2,3)pyrene	mg/kg		0.01	0.24	<0.01	3.98	<0.01	0.03	0.03	0.18	0.03
Naphthalene	mg/kg		0.01	0.02	<0.01	1.50	<0.01	<0.01	<0.01	0.17	<0.01
Perylene	mg/kg		0.05	0.06	<0.05	1.30	<0.05	<0.05	<0.05	0.06	<0.05
Phenanthrene	mg/kg		0.03	0.39	0.48	22.5	0.26	0.07	0.18	0.26	0.10
Pyrene	mg/kg		0.05	0.43	<0.05	16.4	<0.05	0.08	0.15	0.36	0.09
Quinoline	mg/kg		0.05	<0.05	<0.05	0.11	<0.05	<0.05	<0.05	<0.05	<0.05
Surrogate	Unit	Acceptable Limits									
Nitrobenzene-d5	%	50-140		68	124	75	117	75	126	66	63
2-Fluorobiphenyl	%	50-140		67	106	71	88	82	82	75	50
Terphenyl-d14	%	50-140		80	99	84	83	105	91	88	52

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CANADA B3B 1M2
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Certificate of Analysis

AGAT WORK ORDER: 18X377035

PROJECT: P-0012285-0-16-200

CLIENT NAME: ENGLOBE CORP

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Polycyclic Aromatic Hydrocarbons in Soil

DATE RECEIVED: 2018-08-23

DATE REPORTED: 2018-09-18

SAMPLE DESCRIPTION:				CWT-TP15-18-F-A/3	CWT-TP15-18-E/3	CWT-TP17-18-A/1	CWT-TP17-18-B/1	CWT-TP17-18-C/1	CWT-TP17-18-D/1	CWT-MW14/1	CWT-MW15/1
SAMPLE TYPE:				Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
DATE SAMPLED:				2018-08-16	2018-08-16	2018-08-16	2018-08-16	2018-08-16	2018-08-16	2018-08-16	2018-08-16
Parameter	Unit	G / S	RDL	9493518	9493521	9493522	9493523	9493524	9493564	9493565	9493566
1-Methylnaphthalene	mg/kg		0.05	0.12	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
2-Methylnaphthalene	mg/kg		0.01	0.22	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02
Acenaphthene	mg/kg		0.00671	0.0392	<0.00671	<0.00671	<0.00671	<0.00671	<0.00671	<0.00671	0.119
Acenaphthylene	mg/kg		0.004	0.086	0.147	0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Acridine	mg/kg		0.05	0.08	0.17	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Anthracene	mg/kg		0.03	0.07	0.05	<0.03	<0.03	<0.03	<0.03	<0.03	0.16
Benzo(a)anthracene	mg/kg		0.01	0.06	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	0.38
Benzo(a)pyrene	mg/kg		0.01	0.04	0.04	0.02	<0.01	<0.01	<0.01	<0.01	0.32
Benzo(b)fluoranthene	mg/kg		0.05	<0.05	<0.05	0.05	<0.05	<0.05	<0.05	<0.05	0.29
Benzo(b+j)fluoranthene	mg/kg		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.52
Benzo(e)pyrene	mg/kg		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.24
Benzo(ghi)perylene	mg/kg		0.01	0.03	0.04	0.03	<0.01	<0.01	<0.01	0.02	0.23
Benzo(k)fluoranthene	mg/kg		0.01	0.03	0.03	0.02	<0.01	<0.01	<0.01	<0.01	0.14
Chrysene	mg/kg		0.01	0.11	0.04	0.03	<0.01	<0.01	<0.01	<0.01	0.40
Dibenzo(a,h)anthracene	mg/kg		0.006	0.008	0.007	0.010	<0.006	<0.006	<0.006	<0.006	0.070
Fluoranthene	mg/kg		0.05	0.20	0.06	<0.05	<0.05	<0.05	<0.05	<0.05	0.77
Fluorene	mg/kg		0.01	0.08	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.12
Indeno(1,2,3)pyrene	mg/kg		0.01	0.03	0.04	0.03	<0.01	<0.01	<0.01	0.02	0.23
Naphthalene	mg/kg		0.01	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.03
Perylene	mg/kg		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.10
Phenanthrene	mg/kg		0.03	0.36	0.04	<0.03	<0.03	<0.03	<0.03	<0.03	0.76
Pyrene	mg/kg		0.05	0.16	0.07	<0.05	<0.05	<0.05	<0.05	<0.05	0.54
Quinoline	mg/kg		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Surrogate	Unit	Acceptable Limits									
Nitrobenzene-d5	%	50-140		72	92	66	67	83	79	73	90
2-Fluorobiphenyl	%	50-140		70	72	71	74	93	84	77	83
Terphenyl-d14	%	50-140		119	90	84	83	85	94	68	74

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AGAT WORK ORDER: 18X377035

PROJECT: P-0012285-0-16-200

CLIENT NAME: ENGLOBE CORP

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Polycyclic Aromatic Hydrocarbons in Soil

DATE RECEIVED: 2018-08-23

DATE REPORTED: 2018-09-18

		SAMPLE DESCRIPTION:		CWT-TP30-18-A/1	CWT-TP30-18-A/2	CWT-TP30-18-B/1	CWT-TP30-18-B/2	CWT-TP30-18-C/1	CWT-TP30-18-C/2	CWT-TP30-18-D/2	CWT-TP25-18-A/1
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2018-08-17	2018-08-17	2018-08-17	2018-08-17	2018-08-17	2018-08-17	2018-08-17	2018-08-17
Parameter	Unit	G / S	RDL	9493567	9493568	9493569	9493570	9493571	9493572	9493574	9493575
1-Methylnaphthalene	mg/kg		0.05	<0.05	<0.05	<0.05	0.10	<0.05	0.42	<0.05	1.22
2-Methylnaphthalene	mg/kg		0.01	<0.01	<0.01	<0.01	0.10	<0.01	0.39	<0.01	1.26
Acenaphthene	mg/kg		0.00671	<0.00671	<0.00671	<0.00671	0.508	<0.00671	0.283	<0.00671	1.14
Acenaphthylene	mg/kg		0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.063	<0.004	<0.004
Acridine	mg/kg		0.05	<0.05	<0.05	<0.05	0.06	<0.05	<0.05	<0.05	<0.05
Anthracene	mg/kg		0.03	<0.03	<0.03	<0.03	0.17	<0.03	<0.03	<0.03	<0.03
Benzo(a)anthracene	mg/kg		0.01	<0.01	0.02	<0.01	0.17	<0.01	0.03	<0.01	3.31
Benzo(a)pyrene	mg/kg		0.01	<0.01	<0.01	<0.01	0.07	<0.01	<0.01	<0.01	2.31
Benzo(b)fluoranthene	mg/kg		0.05	<0.05	<0.05	<0.05	0.06	<0.05	<0.05	<0.05	2.94
Benzo(b+j)fluoranthene	mg/kg		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	4.97
Benzo(e)pyrene	mg/kg		0.05	<0.05	<0.05	<0.05	0.07	<0.05	<0.05	<0.05	2.65
Benzo(ghi)perylene	mg/kg		0.01	<0.01	<0.01	<0.01	0.04	<0.01	<0.01	<0.01	2.36
Benzo(k)fluoranthene	mg/kg		0.01	<0.01	<0.01	<0.01	0.05	<0.01	<0.01	<0.01	3.51
Chrysene	mg/kg		0.01	<0.01	0.02	<0.01	0.21	<0.01	0.02	<0.01	3.07
Dibenzo(a,h)anthracene	mg/kg		0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	2.22
Fluoranthene	mg/kg		0.05	<0.05	0.14	<0.05	1.18	<0.05	0.07	<0.05	<0.05
Fluorene	mg/kg		0.01	<0.01	<0.01	<0.01	0.61	<0.01	0.21	<0.01	<0.01
Indeno(1,2,3)pyrene	mg/kg		0.01	<0.01	<0.01	<0.01	0.04	<0.01	<0.01	<0.01	2.38
Naphthalene	mg/kg		0.01	<0.01	<0.01	<0.01	0.14	<0.01	0.14	<0.01	1.15
Perylene	mg/kg		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	2.26
Phenanthrene	mg/kg		0.03	<0.03	0.05	<0.03	1.21	<0.03	0.11	<0.03	1.73
Pyrene	mg/kg		0.05	<0.05	0.12	<0.05	0.77	<0.05	0.05	<0.05	<0.05
Quinoline	mg/kg		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Surrogate	Unit	Acceptable Limits									
Nitrobenzene-d5	%	50-140		130	98	129	127	127	121	88	91
2-Fluorobiphenyl	%	50-140		89	96	84	85	83	97	85	96
Terphenyl-d14	%	50-140		93	91	98	98	96	94	76	96

Certified By:

Results relate only to the items tested and to all the items tested

AGAT Laboratories

11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 18X377035

PROJECT: P-0012285-0-16-200

CLIENT NAME: ENGLOBE CORP

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Polycyclic Aromatic Hydrocarbons in Soil

DATE RECEIVED: 2018-08-23

DATE REPORTED: 2018-09-18

		SAMPLE DESCRIPTION:		CWT-TP25-18-A/2	CWT-TP25-18-B/2	CWT-TP25-18-C/2	CWT-TP25-18-D/1	CWT-TP25-18-D/2	CWT-MW14/DUP	CWT-TP25-18-A/2 DUP	CWT-MW13/1
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2018-08-17	2018-08-17	2018-08-17	2018-08-17	2018-08-17	2018-08-17	2018-08-17	2018-08-18
Parameter	Unit	G / S	RDL	9493592	9493598	9493600	9493601	9493602	9493627	9493648	9493688
1-Methylnaphthalene	mg/kg		0.05	<0.05	<0.05	<0.05	1.01	<0.05	<0.05	<0.05	<0.05
2-Methylnaphthalene	mg/kg		0.01	0.02	<0.01	<0.01	0.89	0.01	<0.01	0.01	0.01
Acenaphthene	mg/kg		0.00671	0.112	<0.00671	<0.00671	1.20	0.0515	<0.00671	0.0551	0.0582
Acenaphthylene	mg/kg		0.004	0.030	<0.004	<0.004	0.962	0.025	<0.004	0.017	<0.004
Acridine	mg/kg		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Anthracene	mg/kg		0.03	0.16	<0.03	<0.03	0.85	0.07	<0.03	0.10	0.07
Benzo(a)anthracene	mg/kg		0.01	0.42	<0.01	<0.01	3.13	0.21	<0.01	0.21	0.19
Benzo(a)pyrene	mg/kg		0.01	0.36	<0.01	<0.01	2.28	0.19	<0.01	0.19	0.16
Benzo(b)fluoranthene	mg/kg		0.05	0.32	<0.05	<0.05	<0.05	0.18	<0.05	0.20	0.16
Benzo(b+j)fluoranthene	mg/kg		0.1	0.54	<0.1	<0.1	<0.1	0.32	<0.1	0.33	0.24
Benzo(e)pyrene	mg/kg		0.05	0.26	<0.05	<0.05	2.58	0.16	<0.05	0.17	0.13
Benzo(ghi)perylene	mg/kg		0.01	0.25	<0.01	<0.01	2.26	0.17	<0.01	0.15	0.13
Benzo(k)fluoranthene	mg/kg		0.01	0.17	<0.01	<0.01	<0.01	0.08	<0.01	0.13	0.09
Chrysene	mg/kg		0.01	0.41	<0.01	<0.01	3.08	0.23	<0.01	0.23	0.19
Dibenzo(a,h)anthracene	mg/kg		0.006	0.061	<0.006	<0.006	1.95	0.035	<0.006	0.047	0.029
Fluoranthene	mg/kg		0.05	0.85	<0.05	<0.05	1.70	0.43	<0.05	0.42	0.35
Fluorene	mg/kg		0.01	0.09	<0.01	<0.01	1.14	0.05	<0.01	0.05	0.04
Indeno(1,2,3)pyrene	mg/kg		0.01	0.25	<0.01	<0.01	2.23	0.16	<0.01	0.15	0.14
Naphthalene	mg/kg		0.01	0.03	<0.01	<0.01	1.07	0.03	<0.01	<0.01	0.01
Perylene	mg/kg		0.05	0.09	<0.05	<0.05	2.11	0.06	<0.05	0.05	<0.05
Phenanthrene	mg/kg		0.03	0.72	<0.03	<0.03	1.83	0.36	<0.03	0.40	0.28
Pyrene	mg/kg		0.05	0.61	<0.05	<0.05	<0.05	0.34	<0.05	0.31	0.26
Quinoline	mg/kg		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Surrogate	Unit	Acceptable Limits									
Nitrobenzene-d5	%	50-140		84	95	78	99	91	97	85	88
2-Fluorobiphenyl	%	50-140		86	91	87	66	85	79	69	101
Terphenyl-d14	%	50-140		77	86	89	84	72	80	75	81

Certified By:

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CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 18X377035

PROJECT: P-0012285-0-16-200

CLIENT NAME: ENGLOBE CORP

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Polycyclic Aromatic Hydrocarbons in Soil

DATE RECEIVED: 2018-08-23

DATE REPORTED: 2018-09-18

		SAMPLE DESCRIPTION:		CWT-MW13/3	CWT-TP2-18A 0.7	CWT-TP2-18B 0.7	CWT-TP2-18C 0.7	CWT-TP2-18D 0.7	CWT-TP2-18E 0.7
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2018-08-18	2018-08-15	2018-08-15	2018-08-15	2018-08-15	2018-08-15
Parameter	Unit	G / S	RDL	9493689	9493700	9493701	9493702	9493703	9493704
1-Methylnaphthalene	mg/kg		0.05	<0.05	<0.05	<0.05	0.53	<0.05	<0.05
2-Methylnaphthalene	mg/kg		0.01	0.06	<0.01	<0.01	0.70	<0.01	<0.01
Acenaphthene	mg/kg		0.00671	0.295	<0.00671	<0.00671	5.13	<0.00671	<0.00671
Acenaphthylene	mg/kg		0.004	0.031	<0.004	<0.004	0.285	0.432	<0.004
Acridine	mg/kg		0.05	0.07	<0.05	<0.05	<0.05	<0.05	<0.05
Anthracene	mg/kg		0.03	0.35	<0.03	<0.03	15.9	0.76	<0.03
Benzo(a)anthracene	mg/kg		0.01	0.93	<0.01	<0.01	19.7	1.03	<0.01
Benzo(a)pyrene	mg/kg		0.01	1.03	<0.01	<0.01	14.5	2.48	<0.01
Benzo(b)fluoranthene	mg/kg		0.05	0.88	<0.05	<0.05	12.6	3.35	<0.05
Benzo(b+j)fluoranthene	mg/kg		0.1	1.55	<0.1	<0.1	20.3	5.38	<0.1
Benzo(e)pyrene	mg/kg		0.05	0.72	<0.05	<0.05	7.71	2.07	<0.05
Benzo(ghi)perylene	mg/kg		0.01	0.76	<0.01	<0.01	8.19	0.80	<0.01
Benzo(k)fluoranthene	mg/kg		0.01	0.37	<0.01	<0.01	3.93	1.19	<0.01
Chrysene	mg/kg		0.01	0.92	<0.01	<0.01	16.1	2.54	<0.01
Dibenzo(a,h)anthracene	mg/kg		0.006	0.168	<0.006	<0.006	1.90	0.249	<0.006
Fluoranthene	mg/kg		0.05	1.69	<0.05	<0.05	59.5	0.46	<0.05
Fluorene	mg/kg		0.01	0.27	<0.01	<0.01	6.02	0.07	<0.01
Indeno(1,2,3)pyrene	mg/kg		0.01	0.85	<0.01	<0.01	9.27	1.07	<0.01
Naphthalene	mg/kg		0.01	0.16	<0.01	<0.01	0.08	<0.01	<0.01
Perylene	mg/kg		0.05	0.28	<0.05	<0.05	3.57	0.68	<0.05
Phenanthrene	mg/kg		0.03	1.69	<0.03	<0.03	46.8	<0.03	<0.03
Pyrene	mg/kg		0.05	1.21	<0.05	<0.05	41.8	1.14	<0.05
Quinoline	mg/kg		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Surrogate	Unit	Acceptable Limits							
Nitrobenzene-d5	%	50-140		83	102	102	86	104	88
2-Fluorobiphenyl	%	50-140		80	85	99	66	82	79
Terphenyl-d14	%	50-140		70	80	86	78	83	90

Certified By:

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AGAT Laboratories

11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 18X377035

PROJECT: P-0012285-0-16-200

CLIENT NAME: ENGLOBE CORP

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Polycyclic Aromatic Hydrocarbons in Soil

DATE RECEIVED: 2018-08-23

DATE REPORTED: 2018-09-18

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

9492931-9493704 Results are based on the dry weight of the soil.

Benzo(b)fluoranthene may include contributions from benzo(j)fluoranthene, if also present in the sample.

Certified By:

Results relate only to the items tested and to all the items tested

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Dartmouth, Nova Scotia
CANADA B3B 1M2
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FAX (902)468-8924
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Certificate of Analysis

AGAT WORK ORDER: 18X377035

PROJECT: P-0012285-0-16-200

CLIENT NAME: ENGLOBE CORP

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Polycyclic Aromatic Hydrocarbons in Water - (PAH)

DATE RECEIVED: 2018-08-23

DATE REPORTED: 2018-09-18

		SAMPLE DESCRIPTION:		CWT-MW5-18	CWT-MW4-18	CWT-MW10-18	CWT-MW9-18	CWT-MW-DUP1	CWT-MW6-18	CWT-MW12-18
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2018-08-18	2018-08-18	2018-08-18	2018-08-18	2018-08-18	2018-08-18	2018-08-18
Parameter	Unit	G / S	RDL	9493660	9493661	9493662	9493663	9493665	9493666	9493667
1-Methylnaphthalene	ug/L		0.01	0.01	0.02	0.01	<0.01	0.60	0.12	<0.01
2-Methylnaphthalene	ug/L		0.01	0.01	0.02	0.01	<0.01	0.60	0.13	<0.01
Acenaphthene	ug/L		0.01	<0.01	0.19	0.01	<0.01	1.43	0.12	<0.01
Acenaphthylene	ug/L		0.01	<0.01	0.14	<0.01	<0.01	0.11	<0.01	<0.01
Acridine	ug/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Anthracene	ug/L		0.012	<0.012	<0.012	<0.012	<0.012	0.036	<0.012	<0.012
Benzo(a)anthracene	ug/L		0.018	<0.018	<0.018	<0.018	<0.018	<0.018	<0.018	<0.018
Benzo(a)pyrene	ug/L		0.010	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015
Benzo(b)fluoranthene	ug/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(e)pyrene	ug/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(ghi)perylene	ug/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(k)fluoranthene	ug/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Chrysene	ug/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dibenzo(a,h)anthracene	ug/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Fluoranthene	ug/L		0.01	<0.01	0.11	<0.01	<0.01	0.20	<0.01	<0.01
Fluorene	ug/L		0.01	0.01	<0.01	0.02	<0.01	0.62	0.05	<0.01
Indeno(1,2,3-cd)pyrene	ug/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Naphthalene	ug/L		0.01	0.08	<0.01	0.02	0.01	1.36	0.89	0.01
Perylene	ug/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Phenanthrene	ug/L		0.01	<0.01	<0.01	<0.01	<0.01	0.57	0.01	<0.01
Pyrene	ug/L		0.01	<0.01	0.07	<0.01	<0.01	0.08	<0.01	<0.01
Quinoline	ug/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Surrogate	Unit	Acceptable Limits								
Nitrobenzene-d5	%	50-140		77	85	84	86	54	59	52
2-Fluorobiphenyl	%	50-140		72	73	80	66	58	67	58
Terphenyl-d14	%	50-140		95	83	93	87	76	79	73

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

9493660-9493667 Benzo(b)fluoranthene may include contributions from benzo(j)fluoranthene, if also present in the sample.

Certified By:

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11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
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Certificate of Analysis

AGAT WORK ORDER: 18X377035

PROJECT: P-0012285-0-16-200

CLIENT NAME: ENGLOBE CORP

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Volatile Organic Compounds in Soil

DATE RECEIVED: 2018-08-23

DATE REPORTED: 2018-09-18

SAMPLE DESCRIPTION:				CWT-MW9/1	CWT-TP8-18-A/1	CWT-TP8-18-B/1	CWT-TP8-18-C/1	CWT-TP8-18-D/1
SAMPLE TYPE:				Soil	Soil	Soil	Soil	Soil
DATE SAMPLED:				2018-08-16	2018-08-16	2018-08-16	2018-08-16	2018-08-16
Parameter	Unit	G / S	RDL	9493449	9493450	9493451	9493469	9493470
Chloromethane	ug/kg		100	<100	<100	<100	<100	<100
Vinyl Chloride	ug/kg		20	<20	<20	<20	<20	<20
Bromomethane	ug/kg		50	<50	<50	<50	<50	<50
Chloroethane	ug/kg		100	<100	<100	<100	<100	<100
Trichlorofluoromethane (FREON 11)	ug/kg		100	<100	<100	<100	<100	<100
Acetone	ug/kg		500	<500	<500	<500	<500	<500
1,1-Dichloroethylene	ug/kg		50	<50	<50	<50	<50	<50
Methylene Chloride (Dichloromethane)	ug/kg		100	<100	<100	<100	<100	<100
trans-1,2-Dichloroethylene	ug/kg		80	<80	<80	<80	<80	<80
1,1-Dichloroethane	ug/kg		100	<100	<100	<100	<100	<100
cis-1,2-Dichloroethylene	ug/kg		100	<100	<100	<100	<100	<100
Chloroform	ug/kg		50	<50	<50	<50	<50	<50
1,2-Dichloroethane	ug/kg		100	<100	<100	<100	<100	<100
1,1,1-Trichloroethane	ug/kg		30	<30	<30	<30	<30	<30
Carbon Tetrachloride	ug/kg		50	<50	<50	<50	<50	<50
Benzene	ug/kg		6.8	<6.8	<6.8	<6.8	<6.8	<6.8
1,2-Dichloropropane	ug/kg		50	<50	<50	<50	<50	<50
Trichloroethylene	ug/kg		10	<10	<10	<10	<10	<10
Bromodichloromethane	ug/kg		100	<100	<100	<100	<100	<100
cis-1,3-Dichloropropene	ug/kg		100	<100	<100	<100	<100	<100
trans-1,3-Dichloropropene	ug/kg		100	<100	<100	<100	<100	<100
1,1,2-Trichloroethane	ug/kg		30	<30	<30	<30	<30	<30
Toluene	ug/kg		80	<80	<80	<80	<80	<80
2-Hexanone	ug/kg		500	<500	<500	<500	<500	<500
Dibromochloromethane	ug/kg		100	<100	<100	<100	<100	<100
1,2-Dibromoethane	ug/kg		50	<50	<50	<50	<50	<50
Tetrachloroethylene	ug/kg		100	<100	<100	<100	<100	<100
1,1,1,2-Tetrachloroethane	µg/kg		100	<100	<100	<100	<100	<100
Chlorobenzene	ug/kg		50	<50	<50	<50	<50	<50

Certified By:

Results relate only to the items tested and to all the items tested

		SAMPLE DESCRIPTION:		CWT-MW9/1	CWT-TP8-18-A/1	CWT-TP8-18-B/1	CWT-TP8-18-C/1	CWT-TP8-18-D/1
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2018-08-16	2018-08-16	2018-08-16	2018-08-16	2018-08-16
Parameter	Unit	G / S	RDL	9493449	9493450	9493451	9493469	9493470
Ethylbenzene	ug/kg		18	<18	<18	<18	<18	<18

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Certificate of Analysis

AGAT WORK ORDER: 18X377035

PROJECT: P-0012285-0-16-200

CLIENT NAME: ENGLOBE CORP

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Mercury Analysis in Water (Dissolved)

DATE RECEIVED: 2018-08-23

DATE REPORTED: 2018-09-18

		SAMPLE DESCRIPTION:		CWT-MW5-18	CWT-MW4-18	CWT-MW10-18	CWT-MW9-18	CWT-MW-DUP1	CWT-MW6-18	CWT-MW12-18
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2018-08-18	2018-08-18	2018-08-18	2018-08-18	2018-08-18	2018-08-18	2018-08-18
Parameter	Unit	G / S	RDL	9493660	9493661	9493662	9493663	9493665	9493666	9493667
Dissolved Mercury	ug/L		0.026	<0.026	<0.026	<0.026	<0.026	<0.026	<0.026	<0.026

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Certified By:

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AGAT WORK ORDER: 18X377035

PROJECT: P-0012285-0-16-200

CLIENT NAME: ENGLOBE CORP

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Mercury Analysis in Water (Total)

DATE RECEIVED: 2018-08-23

DATE REPORTED: 2018-09-18

				CWT-SW2-18
SAMPLE DESCRIPTION:				(Coring)
SAMPLE TYPE:				Water
DATE SAMPLED:				2018-08-15
Parameter	Unit	G / S	RDL	9493246
Total Mercury	ug/L		0.026	<0.026

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

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AGAT WORK ORDER: 18X377035

PROJECT: P-0012285-0-16-200

CLIENT NAME: ENGLOBE CORP

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis (Dissolved)

DATE RECEIVED: 2018-08-23

DATE REPORTED: 2018-09-18

Parameter	Unit	G / S	RDL	SAMPLE DESCRIPTION: CWT-MW5-18	CWT-MW4-18	CWT-MW10-18	CWT-MW9-18	CWT-MW6-18	CWT-MW12-18
				SAMPLE TYPE: Water	Water	Water	Water	Water	Water
				DATE SAMPLED: 2018-08-18	2018-08-18	2018-08-18	2018-08-18	2018-08-18	2018-08-18
				9493660	9493661	9493662	9493663	9493666	9493667
pH				6.79	6.98	7.22	7.14	7.12	6.73
Reactive Silica as SiO2	mg/L		0.5	11.3	11.4	9.8	7.6	6.2	10.9
Chloride	mg/L		1	7	2	2	2	5	1
Fluoride	mg/L		0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12
Sulphate	mg/L		2	5	4	2	<2	<2	<2
Alkalinity	mg/L		5	54	73	101	47	73	48
True Color	TCU		5	6	17	25	52	8	29
Turbidity	NTU		0.1	63.4	297	51.9	31.4	318	767
Electrical Conductivity	umho/cm		1	142	169	215	111	181	108
Nitrate + Nitrite as N	mg/L		0.05	0.07	0.06	<0.05	0.23	<0.05	0.09
Nitrate as N	mg/L		0.05	0.07	0.06	<0.05	0.23	<0.05	0.09
Nitrite as N	mg/L		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ammonia as N	mg/L		0.03	0.13	<0.03	<0.03	<0.03	0.23	<0.03
Total Organic Carbon	mg/L		0.5	4.6	<0.5	<0.5	5.2	6.0	<0.5
Ortho-Phosphate as P	mg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dissolved Sodium	mg/L		0.1	7.6	5.3	6.1	3.5	15.7	5.5
Dissolved Potassium	mg/L		0.1	1.3	4.3	7.4	2.2	2.9	4.4
Dissolved Calcium	mg/L		0.1	9.9	18.1	31.4	14.2	17.3	7.8
Dissolved Magnesium	mg/L		0.1	2.0	1.6	2.2	1.3	2.6	1.1
Bicarb. Alkalinity (as CaCO3)	mg/L		5	54	73	101	47	73	48
Carb. Alkalinity (as CaCO3)	mg/L		10	<10	<10	<10	<10	<10	<10
Hydroxide	mg/L		5	<5	<5	<5	<5	<5	<5
Calculated TDS	mg/L		1	67	80	112	53	105	51
Hardness	mg/L			33.0	51.8	87.5	40.8	53.9	24.0
Langelier Index (@20C)	NA			-2.05	-1.48	-0.87	-1.60	-1.37	-2.26
Langelier Index (@ 4C)	NA			-2.37	-1.80	-1.19	-1.92	-1.69	-2.58
Saturation pH (@ 20C)	NA			8.84	8.46	8.09	8.74	8.49	8.99
Saturation pH (@ 4C)	NA			9.16	8.78	8.41	9.06	8.81	9.31
Anion Sum	me/L			1.39	1.60	2.12	1.01	1.60	0.99
Cation sum	me/L			1.07	1.42	2.22	1.05	2.47	0.99

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Certificate of Analysis

AGAT WORK ORDER: 18X377035

PROJECT: P-0012285-0-16-200

CLIENT NAME: ENGLOBE CORP

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis (Dissolved)

DATE RECEIVED: 2018-08-23

DATE REPORTED: 2018-09-18

		SAMPLE DESCRIPTION:		CWT-MW5-18	CWT-MW4-18	CWT-MW10-18	CWT-MW9-18	CWT-MW6-18	CWT-MW12-18
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2018-08-18	2018-08-18	2018-08-18	2018-08-18	2018-08-18	2018-08-18
Parameter	Unit	G / S	RDL	9493660	9493661	9493662	9493663	9493666	9493667
% Difference/ Ion Balance (NS)	%			12.9	6.2	2.4	2.0	21.3	0.1
Dissolved Copper	ug/L		2	2	3	3	5	<2	7
Dissolved Iron	ug/L		50	506	158	65	74	16300	1050
Dissolved Phosphorus	mg/L		0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Dissolved Manganese	ug/L		2	393	339	78	22	563	336
Dissolved Zinc	ug/L		5	11	<5	<5	130	252	16

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

9493660 Metals analysis completed on a filtered sample.
Ion Balance is biased high, contributing parameters have been confirmed.

9493661-9493663 Metals analysis completed on a filtered sample.

9493666 Metals analysis completed on a filtered sample.
Ion Balance is biased high, contributing parameters have been confirmed.

9493667 Metals analysis completed on a filtered sample.

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AGAT WORK ORDER: 18X377035

PROJECT: P-0012285-0-16-200

CLIENT NAME: ENGLOBE CORP

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis (Total)

DATE RECEIVED: 2018-08-23

DATE REPORTED: 2018-09-18

Parameter	Unit	G / S	RDL	CWT-SW2-18 (Coring) 9493246
SAMPLE DESCRIPTION:				CWT-SW2-18 (Coring)
SAMPLE TYPE:				Water
DATE SAMPLED:				2018-08-15
pH				6.46
Reactive Silica as SiO2	mg/L		0.5	1.1
Chloride	mg/L		1	4
Fluoride	mg/L		0.12	<0.12
Sulphate	mg/L		2	<2
Alkalinity	mg/L		5	<5
True Color	TCU		5	59
Turbidity	NTU		0.1	0.7
Electrical Conductivity	umho/cm		1	22
Nitrate + Nitrite as N	mg/L		0.05	<0.05
Nitrate as N	mg/L		0.05	<0.05
Nitrite as N	mg/L		0.05	<0.05
Ammonia as N	mg/L		0.03	0.04
Total Organic Carbon	mg/L		0.5	7.9
Ortho-Phosphate as P	mg/L		0.01	<0.01
Total Sodium	mg/L		0.1	2.4
Total Potassium	mg/L		0.1	0.2
Total Calcium	mg/L		0.1	0.7
Total Magnesium	mg/L		0.1	0.4
Bicarb. Alkalinity (as CaCO3)	mg/L		5	<5
Carb. Alkalinity (as CaCO3)	mg/L		10	<10
Hydroxide	mg/L		5	<5
Calculated TDS	mg/L		1	8
Hardness	mg/L			3.4
Langelier Index (@20C)	NA			-4.50
Langelier Index (@ 4C)	NA			-4.82
Saturation pH (@ 20C)	NA			11.0
Saturation pH (@ 4C)	NA			11.3
Anion Sum	me/L			0.11

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PROJECT: P-0012285-0-16-200

CLIENT NAME: ENGLOBE CORP

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis (Total)

DATE RECEIVED: 2018-08-23

DATE REPORTED: 2018-09-18

				SAMPLE DESCRIPTION:	CWT-SW2-18 (Coring)
				SAMPLE TYPE:	Water
				DATE SAMPLED:	2018-08-15
Parameter	Unit	G / S	RDL		9493246
Cation sum	me/L				0.20
% Difference/ Ion Balance (NS)	%				28.7
Total Copper	ug/L		1		<1
Total Iron	ug/L		50		196
Total Manganese	ug/L		2		6
Total Phosphorous	mg/L		0.02		0.03
Total Zinc	ug/L		5		<5

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

9493246 When the cation and anion sums are below 1 me/L, the acceptable criteria is less than 0.3me/L.

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PROJECT: P-0012285-0-16-200

CLIENT NAME: ENGLOBE CORP

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Total Metals

DATE RECEIVED: 2018-08-23

DATE REPORTED: 2018-09-18

				SAMPLE DESCRIPTION:	CWT-SW2-18 (Coring)
				SAMPLE TYPE:	Water
				DATE SAMPLED:	2018-08-15
Parameter	Unit	G / S	RDL		9493246
Total Aluminum	ug/L		5		144
Total Antimony	ug/L		2		<2
Total Arsenic	ug/L		2		<2
Total Barium	ug/L		5		<5
Total Beryllium	ug/L		2		<2
Total Bismuth	ug/L		2		<2
Total Boron	ug/L		5		<5
Total Cadmium	ug/L		0.09		<0.09
Total Chromium	ug/L		1		<1
Total Cobalt	ug/L		1		<1
Total Copper	ug/L		1		<1
Total Iron	ug/L		50		196
Total Lead	ug/L		0.5		<0.5
Total Manganese	ug/L		2		6
Total Molybdenum	ug/L		2		<2
Total Nickel	ug/L		2		<2
Total Selenium	ug/L		1		<1
Total Silver	ug/L		0.1		<0.1
Total Strontium	ug/L		5		6
Total Thallium	ug/L		0.1		<0.1
Total Tin	ug/L		2		<2
Total Titanium	ug/L		2		<2
Total Uranium	ug/L		0.1		<0.1
Total Vanadium	ug/L		2		<2
Total Zinc	ug/L		5		<5

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

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PROJECT: P-0012285-0-16-200

CLIENT NAME: ENGLOBE CORP

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

pH

DATE RECEIVED: 2018-08-23

DATE REPORTED: 2018-09-18

Parameter	Unit	G / S	RDL	SAMPLE DESCRIPTION: CWT-SW-8-18 SAMPLE TYPE: Water DATE SAMPLED: 2018-08-15 9492948	SAMPLE DESCRIPTION: CWT-SW-8-18B SAMPLE TYPE: Water DATE SAMPLED: 2018-08-15 9492951
pH				5.68	6.61

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

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CANADA B3B 1M2
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Quality Assurance

CLIENT NAME: ENGLOBE CORP
AGAT WORK ORDER: 18X377035
PROJECT: P-0012285-0-16-200
ATTENTION TO: Andrew Higgins
SAMPLING SITE:
SAMPLED BY:

Soil Analysis

RPT Date: Sep 18, 2018			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Available Metals in Soil: Zinc															
Zinc	9493647	9493647	41	33	NA	< 5	103%	80%	120%	99%	80%	120%	107%	70%	130%
Available Metals in Soil: Zinc, Cadmium															
Cadmium	9493647	9493647	<0.3	<0.3	NA	< 0.3	97%	80%	120%	97%	80%	120%	101%	70%	130%
Zinc	9493647	9493647	41	33	NA	< 5	103%	80%	120%	99%	80%	120%	107%	70%	130%
Fraction Organic Carbon															
Fraction Organic Carbon-1	9492912		0.237	0.237	0.0%	< 0.003	122%	70%	130%				99%	70%	130%

Certified By:

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Quality Assurance

CLIENT NAME: ENGLOBE CORP
AGAT WORK ORDER: 18X377035
PROJECT: P-0012285-0-16-200
ATTENTION TO: Andrew Higgins
SAMPLING SITE:
SAMPLED BY:

Trace Organics Analysis

RPT Date: Sep 18, 2018

PARAMETER	Batch	Sample Id	DUPLICATE			Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
			Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Atlantic RBCA Tier 1 Hydrocarbons in Water (Version 3.0)															
Benzene	1	9489329	< 0.001	< 0.001	NA	< 0.001	82%	70%	130%	96%	70%	130%			
Toluene	1	9489329	< 0.001	< 0.001	NA	< 0.001	82%	70%	130%	90%	70%	130%			
Ethylbenzene	1	9489329	< 0.001	< 0.001	NA	< 0.001	81%	70%	130%	85%	70%	130%			
Xylene (Total)	1	9489329	< 0.002	< 0.002	NA	< 0.002	86%	70%	130%	90%	70%	130%			
C6-C10 (less BTEX)	1	9489329	< 0.01	< 0.01	NA	< 0.01	76%	70%	130%	91%	70%	130%	NA	70%	130%

Comments: If Matrix spike value is NA, the spiked analyte concentration was lower than that of the matrix contribution.
If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Atlantic RBCA Tier 1 Hydrocarbons in Water (Version 3.0)															
Benzene	1	9493661	< 0.001	< 0.001	NA	< 0.001	95%	70%	130%	113%	70%	130%			
Toluene	1	9493661	< 0.001	< 0.001	NA	< 0.001	106%	70%	130%	101%	70%	130%			
Ethylbenzene	1	9493661	< 0.001	< 0.001	NA	< 0.001	107%	70%	130%	94%	70%	130%			
Xylene (Total)	1	9493661	< 0.002	< 0.002	NA	< 0.002	116%	70%	130%	102%	70%	130%			
C6-C10 (less BTEX)	1	9493661	0.02	0.01	NA	< 0.01	84%	70%	130%	115%	70%	130%	100%	70%	130%
>C10-C16 Hydrocarbons	1	9496313	<0.05	<0.05	NA	< 0.05	103%	70%	130%	109%	70%	130%	126%	70%	130%
>C16-C21 Hydrocarbons	1	9496313	<0.05	<0.05	NA	< 0.10	95%	70%	130%	109%	70%	130%	126%	70%	130%
>C21-C32 Hydrocarbons	1	9496313	<0.01	<0.01	NA	< 0.1	81%	70%	130%	109%	70%	130%	126%	70%	130%

Comments: If Matrix spike value is NA, the spiked analyte concentration was lower than that of the matrix contribution.
If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Atlantic RBCA Tier 1 Hydrocarbons in Soil (Version 3.1) - Field Preserved															
Benzene	1	9490928	< 0.03	< 0.03	NA	< 0.03	79%	60%	140%	79%	60%	140%			
Toluene	1	9490928	< 0.04	< 0.04	NA	< 0.04	81%	60%	140%	73%	60%	140%			
Ethylbenzene	1	9490928	< 0.03	< 0.03	NA	< 0.03	82%	60%	140%	71%	60%	140%			
Xylene (Total)	1	9490928	< 0.05	< 0.05	NA	< 0.05	88%	60%	140%	78%	60%	140%			
C6-C10 (less BTEX)	1	9490928	< 3	< 3	NA	< 3	78%	60%	140%	99%	60%	140%	98%	30%	130%

Comments: If Matrix spike value is NA, the spiked analyte concentration was lower than that of the matrix contribution.
If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Atlantic RBCA Tier 1 Hydrocarbons in Soil (Version 3.1) - Field Preserved															
Benzene	1	9491184	< 0.03	< 0.03	NA	< 0.03	97%	60%	140%	96%	60%	140%			
Toluene	1	9491184	< 0.04	< 0.04	NA	< 0.04	101%	60%	140%	91%	60%	140%			
Ethylbenzene	1	9491184	< 0.03	< 0.03	NA	< 0.03	100%	60%	140%	89%	60%	140%			
Xylene (Total)	1	9491184	< 0.05	< 0.05	NA	< 0.05	105%	60%	140%	97%	60%	140%			
C6-C10 (less BTEX)	1	9491184	< 3	< 3	NA	< 3	100%	60%	140%	120%	60%	140%	NA	30%	130%
>C10-C16 Hydrocarbons	1	9493270	1160	1200	3	< 15	102%	60%	140%	101%	60%	140%		30%	130%
>C16-C21 Hydrocarbons	1	9493270	22	25	13	< 15	100%	60%	140%	101%	60%	140%		30%	130%
>C21-C32 Hydrocarbons	1	9493270	22	25	13	< 15	88%	60%	140%	101%	60%	140%		30%	130%

Comments: If Matrix spike value is NA, the spiked analyte concentration was lower than that of the matrix contribution.
If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Polycyclic Aromatic Hydrocarbons in Soil

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Quality Assurance

CLIENT NAME: ENGLOBE CORP
PROJECT: P-0012285-0-16-200
SAMPLING SITE:

AGAT WORK ORDER: 18X377035
ATTENTION TO: Andrew Higgins
SAMPLED BY:

Trace Organics Analysis (Continued)

RPT Date: Sep 18, 2018			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
1-Methylnaphthalene	1	9484714	< 0.05	< 0.05	NA	< 0.05	93%	50%	140%	72%	50%	140%	73%	50%	140%
2-Methylnaphthalene	1	9484714	< 0.01	< 0.01	NA	< 0.01	95%	50%	140%	72%	50%	140%	82%	50%	140%
Acenaphthene	1	9484714	< 0.00671	< 0.00671	NA	< 0.00671	100%	50%	140%	69%	50%	140%	83%	50%	140%
Acenaphthylene	1	9484714	< 0.004	< 0.004	NA	< 0.004	91%	50%	140%	68%	50%	140%	74%	50%	140%
Acridine	1	9484714	< 0.05	< 0.05	NA	< 0.05	79%	50%	140%	58%	50%	140%	55%	50%	140%
Anthracene	1	9484714	< 0.03	< 0.03	NA	< 0.03	84%	50%	140%	60%	50%	140%	65%	50%	140%
Benzo(a)anthracene	1	9484714	< 0.01	< 0.01	NA	< 0.01	92%	50%	140%	74%	50%	140%	75%	50%	140%
Benzo(a)pyrene	1	9484714	< 0.01	< 0.01	NA	< 0.01	82%	50%	140%	85%	50%	140%	68%	50%	140%
Benzo(b)fluoranthene	1	9484714	< 0.05	< 0.05	NA	< 0.05	84%	50%	140%	80%	50%	140%	72%	50%	140%
Benzo(b+j)fluoranthene	1	9484714	< 0.1	< 0.1	NA	< 0.1	91%	50%	140%	90%	50%	140%	80%	50%	140%
Benzo(e)pyrene	1	9484714	< 0.05	< 0.05	NA	< 0.05	86%	50%	140%	87%	50%	140%	75%	50%	140%
Benzo(ghi)perylene	1	9484714	< 0.01	< 0.01	NA	< 0.01	89%	50%	140%	92%	50%	140%	79%	50%	140%
Benzo(k)fluoranthene	1	9484714	< 0.01	< 0.01	NA	< 0.01	63%	50%	140%	73%	50%	140%	65%	50%	140%
Chrysene	1	9484714	< 0.01	< 0.01	NA	< 0.01	92%	50%	140%	73%	50%	140%	74%	50%	140%
Dibenzo(a,h)anthracene	1	9484714	< 0.006	< 0.006	NA	< 0.006	87%	50%	140%	87%	50%	140%	75%	50%	140%
Fluoranthene	1	9484714	< 0.05	< 0.05	NA	< 0.05	82%	50%	140%	66%	50%	140%	73%	50%	140%
Fluorene	1	9484714	< 0.01	< 0.01	NA	< 0.01	99%	50%	140%	70%	50%	140%	83%	50%	140%
Indeno(1,2,3)pyrene	1	9484714	< 0.01	< 0.01	NA	< 0.01	79%	50%	140%	81%	50%	140%	68%	50%	140%
Naphthalene	1	9484714	< 0.01	< 0.01	NA	< 0.01	99%	50%	140%	79%	50%	140%	86%	50%	140%
Perylene	1	9484714	< 0.05	< 0.05	NA	< 0.05	85%	50%	140%	90%	50%	140%	76%	50%	140%
Phenanthrene	1	9484714	< 0.03	< 0.03	NA	< 0.03	95%	50%	140%	72%	50%	140%	78%	50%	140%
Pyrene	1	9484714	< 0.05	< 0.05	NA	< 0.05	95%	50%	140%	67%	50%	140%	75%	50%	140%
Quinoline	1	9484714	< 0.05	< 0.05	NA	< 0.05	88%	50%	140%	70%	50%	140%	70%	50%	140%

Comments: If Matrix spike value is NA, the spiked analyte concentration was lower than that of the matrix contribution.
If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Polycyclic Aromatic Hydrocarbons in Soil

1-Methylnaphthalene	1	9493475	< 0.05	< 0.05	NA	< 0.05	94%	50%	140%	100%	50%	140%	64%	50%	140%
2-Methylnaphthalene	1	9493475	< 0.01	< 0.01	NA	< 0.01	92%	50%	140%	101%	50%	140%	66%	50%	140%
Acenaphthene	1	9493475	< 0.00671	< 0.00671	NA	< 0.00671	95%	50%	140%	78%	50%	140%	72%	50%	140%
Acenaphthylene	1	9493475	< 0.004	< 0.004	NA	< 0.004	97%	50%	140%	77%	50%	140%	71%	50%	140%
Acridine	1	9493475	< 0.05	< 0.05	NA	< 0.05	74%	50%	140%	61%	50%	140%	54%	50%	140%
Anthracene	1	9493475	< 0.03	< 0.03	NA	< 0.03	89%	50%	140%	70%	50%	140%	65%	50%	140%
Benzo(a)anthracene	1	9493475	< 0.01	< 0.01	NA	< 0.01	98%	50%	140%	78%	50%	140%	72%	50%	140%
Benzo(a)pyrene	1	9493475	< 0.01	< 0.01	NA	< 0.01	80%	50%	140%	58%	50%	140%	57%	50%	140%
Benzo(b)fluoranthene	1	9493475	< 0.05	< 0.05	NA	< 0.05	82%	50%	140%	63%	50%	140%	60%	50%	140%
Benzo(b+j)fluoranthene	1	9493475	< 0.1	< 0.1	NA	< 0.1	82%	50%	140%	61%	50%	140%	61%	50%	140%
Benzo(e)pyrene	1	9493475	< 0.05	< 0.05	NA	< 0.05	84%	50%	140%	62%	50%	140%	59%	50%	140%
Benzo(ghi)perylene	1	9493475	< 0.01	< 0.01	NA	< 0.01	82%	50%	140%	61%	50%	140%	59%	50%	140%
Benzo(k)fluoranthene	1	9493475	< 0.01	< 0.01	NA	< 0.01	76%	50%	140%	55%	50%	140%	54%	50%	140%
Chrysene	1	9493475	< 0.01	< 0.01	NA	< 0.01	93%	50%	140%	72%	50%	140%	66%	50%	140%

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Results relate only to the items tested and to all the items tested

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CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
http://www.agatlabs.com

Quality Assurance

CLIENT NAME: ENGLOBE CORP
PROJECT: P-0012285-0-16-200
SAMPLING SITE:

AGAT WORK ORDER: 18X377035
ATTENTION TO: Andrew Higgins
SAMPLED BY:

Trace Organics Analysis (Continued)

RPT Date: Sep 18, 2018			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Dibenzo(a,h)anthracene	1	9493475	< 0.006	< 0.006	NA	< 0.006	74%	50%	140%	54%	50%	140%	55%	50%	140%
Fluoranthene	1	9493475	< 0.05	< 0.05	NA	< 0.05	94%	50%	140%	76%	50%	140%	73%	50%	140%
Fluorene	1	9493475	< 0.01	< 0.01	NA	< 0.01	93%	50%	140%	75%	50%	140%	74%	50%	140%
Indeno(1,2,3)pyrene	1	9493475	< 0.01	< 0.01	NA	< 0.01	59%	50%	140%	53%	50%	140%	59%	50%	140%
Naphthalene	1	9493475	< 0.01	< 0.01	NA	< 0.01	94%	50%	140%	81%	50%	140%	72%	50%	140%
Perylene	1	9493475	< 0.05	< 0.05	NA	< 0.05	77%	50%	140%	59%	50%	140%	56%	50%	140%
Phenanthrene	1	9493475	< 0.03	< 0.03	NA	< 0.03	91%	50%	140%	72%	50%	140%	67%	50%	140%
Pyrene	1	9493475	< 0.05	< 0.05	NA	< 0.05	93%	50%	140%	77%	50%	140%	72%	50%	140%
Quinoline	1	9493475	< 0.05	< 0.05	NA	< 0.05	82%	50%	140%	81%	50%	140%	60%	50%	140%

Comments: If Matrix spike value is NA, the spiked analyte concentration was lower than that of the matrix contribution.
If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Polycyclic Aromatic Hydrocarbons in Soil

1-Methylnaphthalene	1	9493524	< 0.05	< 0.05	NA	< 0.05	97%	50%	140%	65%	50%	140%	98%	50%	140%
2-Methylnaphthalene	1	9493524	< 0.01	< 0.01	NA	< 0.01	105%	50%	140%	70%	50%	140%	104%	50%	140%
Acenaphthene	1	9493524	< 0.00671	< 0.00671	NA	< 0.00671	97%	50%	140%	68%	50%	140%	88%	50%	140%
Acenaphthylene	1	9493524	< 0.004	< 0.004	NA	< 0.004	92%	50%	140%	52%	50%	140%	86%	50%	140%
Acridine	1	9493524	< 0.05	< 0.05	NA	< 0.05	69%	50%	140%	51%	50%	140%	69%	50%	140%
Anthracene	1	9493524	< 0.03	< 0.03	NA	< 0.03	79%	50%	140%	55%	50%	140%	79%	50%	140%
Benzo(a)anthracene	1	9493524	< 0.01	< 0.01	NA	< 0.01	96%	50%	140%	64%	50%	140%	85%	50%	140%
Benzo(a)pyrene	1	9493524	< 0.01	< 0.01	NA	< 0.01	92%	50%	140%	60%	50%	140%	79%	50%	140%
Benzo(b)fluoranthene	1	9493524	< 0.05	< 0.05	NA	< 0.05	95%	50%	140%	64%	50%	140%	80%	50%	140%
Benzo(b+j)fluoranthene	1	9493524	< 0.1	< 0.1	NA	< 0.1	122%	50%	140%	67%	50%	140%	91%	50%	140%
Benzo(e)pyrene	1	9493524	< 0.05	< 0.05	NA	< 0.05	96%	50%	140%	63%	50%	140%	81%	50%	140%
Benzo(ghi)perylene	1	9493524	< 0.01	< 0.01	NA	< 0.01	101%	50%	140%	59%	50%	140%	78%	50%	140%
Benzo(k)fluoranthene	1	9493524	< 0.01	< 0.01	NA	< 0.01	83%	50%	140%	58%	50%	140%	79%	50%	140%
Chrysene	1	9493524	< 0.01	< 0.01	NA	< 0.01	89%	50%	140%	60%	50%	140%	79%	50%	140%
Dibenzo(a,h)anthracene	1	9493524	< 0.006	< 0.006	NA	< 0.006	94%	50%	140%	54%	50%	140%	77%	50%	140%
Fluoranthene	1	9493524	< 0.05	< 0.05	NA	< 0.05	81%	50%	140%	55%	50%	140%	70%	50%	140%
Fluorene	1	9493524	< 0.01	< 0.01	NA	< 0.01	96%	50%	140%	60%	50%	140%	87%	50%	140%
Indeno(1,2,3)pyrene	1	9493524	< 0.01	< 0.01	NA	< 0.01	91%	50%	140%	54%	50%	140%	75%	50%	140%
Naphthalene	1	9493524	< 0.01	< 0.01	NA	< 0.01	93%	50%	140%	67%	50%	140%	86%	50%	140%
Perylene	1	9493524	< 0.05	< 0.05	NA	< 0.05	93%	50%	140%	63%	50%	140%	79%	50%	140%
Phenanthrene	1	9493524	< 0.03	< 0.03	NA	< 0.03	93%	50%	140%	63%	50%	140%	80%	50%	140%
Pyrene	1	9493524	< 0.05	< 0.05	NA	< 0.05	83%	50%	140%	57%	50%	140%	71%	50%	140%
Quinoline	1	9493524	< 0.05	< 0.05	NA	< 0.05	94%	50%	140%	64%	50%	140%	86%	50%	140%

Comments: If Matrix spike value is NA, the spiked analyte concentration was lower than that of the matrix contribution.
If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Volatile Organic Compounds in Soil

Chloromethane	1	9493449	< 100	< 100	NA	< 100	70%	70%	130%	80%	60%	140%	NA	60%	140%

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Quality Assurance

CLIENT NAME: ENGLOBE CORP
AGAT WORK ORDER: 18X377035
PROJECT: P-0012285-0-16-200
ATTENTION TO: Andrew Higgins
SAMPLING SITE:
SAMPLED BY:

Trace Organics Analysis (Continued)

RPT Date: Sep 18, 2018			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Vinyl Chloride	1	9493449	< 20	< 20	NA	< 20	NA	70%	130%	70%	60%	140%	NA	60%	140%
Bromomethane	1	9493449	< 50	< 50	NA	< 50	78%	70%	130%	89%	60%	140%	NA	60%	140%
Chloroethane	1	9493449	< 100	< 100	NA	< 100	NA	70%	130%	60%	60%	140%	NA	60%	140%
Trichlorofluoromethane (FREON 11)	1	9493449	< 100	< 100	NA	< 100	73%	70%	130%	85%	60%	140%	NA	60%	140%
Acetone	1	9493449	< 500	< 500	NA	< 500	100%	70%	130%	NA	60%	140%	NA	60%	140%
1,1-Dichloroethylene	1	9493449	< 50	< 50	NA	< 50	81%	70%	130%	97%	60%	140%	NA	60%	140%
Methylene Chloride (Dichloromethane)	1	9493449	< 100	< 100	NA	< 100	97%	70%	130%	138%	60%	140%	NA	60%	140%
trans-1,2-Dichloroethylene	1	9493449	< 80	< 80	NA	< 80	82%	70%	130%	89%	60%	140%	NA	60%	140%
1,1-Dichloroethane	1	9493449	< 100	< 100	NA	< 100	86%	70%	130%	87%	60%	140%	NA	60%	140%
cis-1,2-Dichloroethylene	1	9493449	< 100	< 100	NA	< 100	85%	70%	130%	90%	60%	140%	NA	60%	140%
Chloroform	1	9493449	< 50	< 50	NA	< 50	91%	70%	130%	99%	60%	140%	NA	60%	140%
1,2-Dichloroethane	1	9493449	< 100	< 100	NA	< 100	94%	70%	130%	88%	60%	140%	NA	60%	140%
1,1,1-Trichloroethane	1	9493449	< 30	< 30	NA	< 30	83%	70%	130%	91%	60%	140%	NA	60%	140%
Carbon Tetrachloride	1	9493449	< 50	< 50	NA	< 50	80%	70%	130%	82%	60%	140%	NA	60%	140%
Benzene	1	9493449	< 6.8	< 6.8	NA	< 6.8	86%	70%	130%	97%	60%	140%	NA	60%	140%
1,2-Dichloropropane	1	9493449	< 50	< 50	NA	< 50	89%	70%	130%	89%	60%	140%	NA	60%	140%
Trichloroethylene	1	9493449	< 10	< 10	NA	< 10	86%	70%	130%	90%	60%	140%	NA	60%	140%
Bromodichloromethane	1	9493449	< 100	< 100	NA	< 100	87%	70%	130%	83%	60%	140%	NA	60%	140%
cis-1,3-Dichloropropene	1	9493449	< 100	< 100	NA	< 100	NA	70%	130%	74%	60%	140%	NA	60%	140%
trans-1,3-Dichloropropene	1	9493449	< 100	< 100	NA	< 100	70%	70%	130%	72%	60%	140%	NA	60%	140%
1,1,2-Trichloroethane	1	9493449	< 30	< 30	NA	< 30	102%	70%	130%	100%	60%	140%	NA	60%	140%
Toluene	1	9493449	< 80	< 80	NA	< 80	89%	70%	130%	93%	60%	140%	NA	60%	140%
2-Hexanone	1	9493449	< 500	< 500	NA	< 500	82%	70%	130%	73%	60%	140%	NA	60%	140%
Dibromochloromethane	1	9493449	< 100	< 100	NA	< 100	91%	70%	130%	86%	60%	140%	NA	60%	140%
1,2-Dibromoethane	1	9493449	< 50	< 50	NA	< 50	95%	70%	130%	90%	60%	140%	NA	60%	140%
Tetrachloroethylene	1	9493449	< 100	< 100	NA	< 100	89%	70%	130%	125%	60%	140%	NA	60%	140%
1,1,1,2-Tetrachloroethane	1	9493449	< 100	< 100	NA	< 100	91%	70%	130%	93%	60%	140%	NA	60%	140%
Chlorobenzene	1	9493449	< 50	< 50	NA	< 50	86%	70%	130%	100%	60%	140%	NA	60%	140%
Ethylbenzene	1	9493449	< 18	< 18	NA	< 18	86%	70%	130%	138%	60%	140%	NA	60%	140%
m,p-Xylene	1	9493449	< 100	< 100	NA	< 100	88%	70%	130%	98%	60%	140%	NA	60%	140%
Bromoform	1	9493449	< 100	< 100	NA	< 100	89%	70%	130%	81%	60%	140%	NA	60%	140%
Styrene	1	9493449	< 100	< 100	NA	< 100	83%	70%	130%	82%	60%	140%	NA	60%	140%
1,1,2,2-Tetrachloroethane	1	9493449	< 50	< 50	NA	< 50	101%	70%	130%	94%	60%	140%	NA	60%	140%
o-Xylene	1	9493449	< 100	< 100	NA	< 100	86%	70%	130%	129%	60%	140%	NA	60%	140%
1,3-Dichlorobenzene	1	9493449	< 50	< 50	NA	< 50	86%	70%	130%	89%	60%	140%	NA	60%	140%
1,4-Dichlorobenzene	1	9493449	< 50	< 50	NA	< 50	85%	70%	130%	89%	60%	140%	NA	60%	140%

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Quality Assurance

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Trace Organics Analysis (Continued)

RPT Date: Sep 18, 2018			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper

Comments: If Matrix spike value is NA, the spiked analyte concentration was lower than that of the matrix contribution.
If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Polycyclic Aromatic Hydrocarbons in Water - (PAH)															
1-Methylnaphthalene	1	9489643	0.02	0.02	NA	< 0.01	107%	50%	140%	64%	50%	140%	60%	50%	140%
2-Methylnaphthalene	1	9489643	0.02	0.02	NA	< 0.01	106%	50%	140%	65%	50%	140%	60%	50%	140%
Acenaphthene	1	9489643	< 0.01	< 0.01	NA	< 0.01	95%	50%	140%	59%	50%	140%	66%	50%	140%
Acenaphthylene	1	9489643	< 0.01	< 0.01	NA	< 0.01	96%	50%	140%	60%	50%	140%	65%	50%	140%
Acridine	1	9489643	< 0.01	< 0.01	NA	< 0.01	76%	50%	140%	63%	50%	140%	71%	50%	140%
Anthracene	1	9489643	< 0.012	< 0.012	NA	< 0.012	91%	50%	140%	58%	50%	140%	68%	50%	140%
Benzo(a)anthracene	1	9489643	< 0.018	< 0.018	NA	< 0.018	100%	50%	140%	62%	50%	140%	68%	50%	140%
Benzo(a)pyrene	1	9489643	< 0.010	< 0.010	NA	< 0.010	84%	50%	140%	54%	50%	140%	61%	50%	140%
Benzo(b)fluoranthene	1	9489643	< 0.01	< 0.01	NA	< 0.01	89%	50%	140%	58%	50%	140%	65%	50%	140%
Benzo(e)pyrene	1	9489643	< 0.01	< 0.01	NA	< 0.01	87%	50%	140%	53%	50%	140%	60%	50%	140%
Benzo(ghi)perylene	1	9489643	< 0.01	< 0.01	NA	< 0.01	82%	50%	140%	56%	50%	140%	61%	50%	140%
Benzo(k)fluoranthene	1	9489643	< 0.01	< 0.01	NA	< 0.01	77%	50%	140%	52%	50%	140%	71%	50%	140%
Chrysene	1	9489643	< 0.01	< 0.01	NA	< 0.01	93%	50%	140%	57%	50%	140%	64%	50%	140%
Dibenzo(a,h)anthracene	1	9489643	< 0.01	< 0.01	NA	< 0.01	82%	50%	140%	56%	50%	140%	57%	50%	140%
Fluoranthene	1	9489643	<0.01	0.01	NA	< 0.01	95%	50%	140%	62%	50%	140%	69%	50%	140%
Fluorene	1	9489643	< 0.01	< 0.01	NA	< 0.01	94%	50%	140%	61%	50%	140%	77%	50%	140%
Indeno(1,2,3-cd)pyrene	1	9489643	< 0.01	< 0.01	NA	< 0.01	87%	50%	140%	53%	50%	140%	54%	50%	140%
Naphthalene	1	9489643	0.05	0.06	18.2%	< 0.01	96%	50%	140%	59%	50%	140%	72%	50%	140%
Perylene	1	9489643	< 0.01	< 0.01	NA	< 0.01	80%	50%	140%	52%	50%	140%	58%	50%	140%
Phenanthrene	1	9489643	0.02	0.02	NA	< 0.01	91%	50%	140%	56%	50%	140%	64%	50%	140%
Pyrene	1	9489643	<0.01	0.01	NA	< 0.01	95%	50%	140%	62%	50%	140%	68%	50%	140%
Quinoline	1	9489643	< 0.01	< 0.01	NA	< 0.01	99%	50%	140%	56%	50%	140%	70%	50%	140%

Comments: If Matrix spike value is NA, the spiked analyte concentration was lower than that of the matrix contribution.
If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Polycyclic Aromatic Hydrocarbons in Soil															
1-Methylnaphthalene	1	9493513	< 0.05	< 0.05	NA	< 0.05	88%	50%	140%	83%	50%	140%	78%	50%	140%
2-Methylnaphthalene	1	9493513	< 0.01	< 0.01	NA	< 0.01	86%	50%	140%	79%	50%	140%	78%	50%	140%
Acenaphthene	1	9493513	0.0308	0.0289	NA	< 0.00671	90%	50%	140%	90%	50%	140%	73%	50%	140%
Acenaphthylene	1	9493513	< 0.004	< 0.004	NA	< 0.004	81%	50%	140%	81%	50%	140%	78%	50%	140%
Acridine	1	9493513	< 0.05	< 0.05	NA	< 0.05	68%	50%	140%	63%	50%	140%	67%	50%	140%
Anthracene	1	9493513	0.04	0.05	NA	< 0.03	77%	50%	140%	72%	50%	140%	70%	50%	140%
Benzo(a)anthracene	1	9493513	0.10	0.10	0.0%	< 0.01	87%	50%	140%	75%	50%	140%	70%	50%	140%
Benzo(a)pyrene	1	9493513	0.07	0.06	15.4%	< 0.01	80%	50%	140%	67%	50%	140%	56%	50%	140%
Benzo(b)fluoranthene	1	9493513	< 0.05	< 0.05	NA	< 0.05	85%	50%	140%	63%	50%	140%	100%	50%	140%
Benzo(b+j)fluoranthene	1	9493513	< 0.1	< 0.1	NA	< 0.1	94%	50%	140%	83%	50%	140%	73%	50%	140%
Benzo(e)pyrene	1	9493513	< 0.05	< 0.05	NA	< 0.05	86%	50%	140%	88%	50%	140%	61%	50%	140%

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Quality Assurance

CLIENT NAME: ENGLOBE CORP
PROJECT: P-0012285-0-16-200
SAMPLING SITE:

AGAT WORK ORDER: 18X377035
ATTENTION TO: Andrew Higgins
SAMPLED BY:

Trace Organics Analysis (Continued)

RPT Date: Sep 18, 2018			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Benzo(ghi)perylene	1	9493513	0.03	0.03	NA	< 0.01	83%	50%	140%	84%	50%	140%	61%	50%	140%
Benzo(k)fluoranthene	1	9493513	< 0.01	< 0.01	NA	< 0.01	84%	50%	140%	65%	50%	140%	65%	50%	140%
Chrysene	1	9493513	0.10	0.10	0.0%	< 0.01	91%	50%	140%	90%	50%	140%	62%	50%	140%
Dibenzo(a,h)anthracene	1	9493513	0.011	0.011	NA	< 0.006	80%	50%	140%	71%	50%	140%	65%	50%	140%
Fluoranthene	1	9493513	0.15	0.15	NA	< 0.05	79%	50%	140%	74%	50%	140%	52%	50%	140%
Fluorene	1	9493513	0.02	0.02	NA	< 0.01	87%	50%	140%	89%	50%	140%	76%	50%	140%
Indeno(1,2,3)pyrene	1	9493513	0.03	0.03	NA	< 0.01	84%	50%	140%	85%	50%	140%	61%	50%	140%
Naphthalene	1	9493513	< 0.01	< 0.01	NA	< 0.01	94%	50%	140%	92%	50%	140%	79%	50%	140%
Perylene	1	9493513	< 0.05	< 0.05	NA	< 0.05	81%	50%	140%	87%	50%	140%	67%	50%	140%
Phenanthrene	1	9493513	0.18	0.17	5.7%	< 0.03	88%	50%	140%	86%	50%	140%	52%	50%	140%
Pyrene	1	9493513	0.15	0.15	NA	< 0.05	79%	50%	140%	74%	50%	140%	60%	50%	140%
Quinoline	1	9493513	< 0.05	< 0.05	NA	< 0.05	83%	50%	140%	67%	50%	140%	67%	50%	140%
Volatile Organic Compounds in Water															
Chloromethane	1	9536959	< 1	< 1	NA	< 1	72%	70%	130%	72%	60%	140%	NA	60%	140%
Vinyl Chloride	1	9536959	< 0.5	< 0.5	NA	< 0.5	NA	70%	130%	73%	60%	140%	NA	60%	140%
Bromomethane	1	9536959	< 0.89	< 0.89	NA	< 0.89	121%	70%	130%	124%	60%	140%	NA	60%	140%
Chloroethane	1	9536959	< 5	< 5	NA	< 5	102%	70%	130%	103%	60%	140%	NA	60%	140%
Trichlorofluoromethane (FREON 11)	1	9536959	< 5	< 5	NA	< 5	108%	70%	130%	116%	60%	140%	NA	60%	140%
Acetone	1	9536959	< 10	< 10	NA	< 10	117%	70%	130%	124%	60%	140%	NA	60%	140%
1,1-Dichloroethylene	1	9536959	< 0.6	< 0.6	NA	< 0.6	NA	70%	130%	101%	60%	140%	NA	60%	140%
Methylene Chloride (Dichloromethane)	1	9536959	< 2	< 2	NA	< 2	98%	70%	130%	100%	60%	140%	NA	60%	140%
trans-1,2-Dichloroethylene	1	9536959	< 1.6	< 1.6	NA	< 1.6	90%	70%	130%	92%	60%	140%	NA	60%	140%
1,1-Dichloroethane	1	9536959	< 1	< 1	NA	< 1	83%	70%	130%	82%	60%	140%	NA	60%	140%
cis-1,2-Dichloroethylene	1	9536959	< 1.6	< 1.6	NA	< 1.6	93%	70%	130%	95%	60%	140%	NA	60%	140%
Chloroform	1	9536959	87	88	1.1%	< 1	95%	70%	130%	100%	60%	140%	NA	60%	140%
1,2-Dichloroethane	1	9536959	< 2	< 2	NA	< 2	91%	70%	130%	96%	60%	140%	NA	60%	140%
1,1,1-Trichloroethane	1	9536959	< 1	< 1	NA	< 1	103%	70%	130%	104%	60%	140%	NA	60%	140%
Carbon Tetrachloride	1	9536959	< 0.56	< 0.56	NA	< 0.56	100%	70%	130%	105%	60%	140%	NA	60%	140%
Benzene	1	9536959	< 1	< 1	NA	< 1	95%	70%	130%	96%	60%	140%	NA	60%	140%
1,2-Dichloropropane	1	9536959	< 0.7	< 0.7	NA	< 0.7	87%	70%	130%	89%	60%	140%	NA	60%	140%
Trichloroethylene	1	9536959	< 1	< 1	NA	< 1	102%	70%	130%	104%	60%	140%	NA	60%	140%
Bromodichloromethane	1	9536959	11	11	0.0%	< 1	89%	70%	130%	90%	60%	140%	NA	60%	140%
cis-1,3-Dichloropropene	1	9536959	< 0.5	< 0.5	NA	< 0.5	72%	70%	130%	72%	60%	140%	NA	60%	140%
trans-1,3-Dichloropropene	1	9536959	< 0.5	< 0.5	NA	< 0.5	NA	70%	130%	64%	60%	140%	NA	60%	140%
1,1,2-Trichloroethane	1	9536959	< 1	< 1	NA	< 1	89%	70%	130%	88%	60%	140%	NA	60%	140%
Toluene	1	9536959	< 2	< 2	NA	< 2	92%	70%	130%	91%	60%	140%	NA	60%	140%

Comments: If Matrix spike value is NA, the spiked analyte concentration was lower than that of the matrix contribution.
If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

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Quality Assurance

CLIENT NAME: ENGLOBE CORP

AGAT WORK ORDER: 18X377035

PROJECT: P-0012285-0-16-200

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Trace Organics Analysis (Continued)

RPT Date: Sep 18, 2018			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
2-Hexanone	1	9536959	< 10.0	< 10.0	NA	< 10.0	NA	70%	130%	72%	60%	140%	NA	60%	140%
Dibromochloromethane	1	9536959	< 1	< 1	NA	< 1	89%	70%	130%	88%	60%	140%	NA	60%	140%
1,2-Dibromoethane	1	9536959	< 0.2	< 0.2	NA	< 0.2	84%	70%	130%	83%	60%	140%	NA	60%	140%
Tetrachloroethylene	1	9536959	< 1.6	< 1.6	NA	< 1.6	107%	70%	130%	107%	60%	140%	NA	60%	140%
1,1,1,2-Tetrachloroethane	1	9536959	< 0.5	< 0.5	NA	< 0.5	96%	70%	130%	96%	60%	140%	NA	60%	140%
Chlorobenzene	1	9536959	< 1.3	< 1.3	NA	< 1.3	92%	70%	130%	96%	60%	140%	NA	60%	140%
Ethylbenzene	1	9536959	< 2	< 2	NA	< 2	91%	70%	130%	91%	60%	140%	NA	60%	140%
m,p-Xylene	1	9536959	< 4	< 4	NA	< 4	94%	70%	130%	94%	60%	140%	NA	60%	140%
Bromoform	1	9536959	< 1	< 1	NA	< 1	85%	70%	130%	85%	60%	140%	NA	60%	140%
Styrene	1	9536959	< 1	< 1	NA	< 1	88%	70%	130%	87%	60%	140%	NA	60%	140%
1,1,2,2-Tetrachloroethane	1	9536959	< 1	< 1	NA	< 1	80%	70%	130%	80%	60%	140%	NA	60%	140%
o-Xylene	1	9536959	< 1	< 1	NA	< 1	95%	70%	130%	95%	60%	140%	NA	60%	140%
1,3-Dichlorobenzene	1	9536959	< 1	< 1	NA	< 1	97%	70%	130%	98%	60%	140%	NA	60%	140%
1,4-Dichlorobenzene	1	9536959	< 1	< 1	NA	< 1	98%	70%	130%	100%	60%	140%	NA	60%	140%
1,2-Dichlorobenzene	1	9536959	< 0.7	< 0.7	NA	< 0.7	103%	70%	130%	103%	60%	140%	NA	60%	140%

Comments: If Matrix spike value is NA, the spiked analyte concentration was lower than that of the matrix contribution.
If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Certified By:

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Quality Assurance

CLIENT NAME: ENGLOBE CORP
AGAT WORK ORDER: 18X377035
PROJECT: P-0012285-0-16-200
ATTENTION TO: Andrew Higgins
SAMPLING SITE:
SAMPLED BY:

Water Analysis

RPT Date: Sep 18, 2018			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
pH															
pH	9493728		7.99	8.01	0.3%	<	102%	80%	120%	NA	80%	120%	NA	80%	120%
Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.															
Total Metals															
Total Aluminum	9495116		10	10	NA	< 5	103%	80%	120%	99%	80%	120%	92%	70%	130%
Total Antimony	9495116		<2	<2	NA	< 2	84%	80%	120%	101%	80%	120%	100%	70%	130%
Total Arsenic	9495116		12	12	2.5%	< 2	95%	80%	120%	94%	80%	120%	NA	70%	130%
Total Barium	9495116		11	10	NA	< 5	98%	80%	120%	95%	80%	120%	94%	70%	130%
Total Beryllium	9495116		<2	<2	NA	< 2	105%	80%	120%	98%	80%	120%	98%	70%	130%
Total Bismuth	9495116		<2	<2	NA	< 2	99%	80%	120%	100%	80%	120%	104%	70%	130%
Total Boron	9495116		13	13	NA	< 5	104%	80%	120%	100%	80%	120%	102%	70%	130%
Total Cadmium	9495116		<0.09	<0.09	NA	< 0.09	95%	80%	120%	90%	80%	120%	89%	70%	130%
Total Chromium	9495116		<1	<1	NA	< 1	98%	80%	120%	93%	80%	120%	110%	70%	130%
Total Cobalt	9495116		<1	<1	NA	< 1	99%	80%	120%	95%	80%	120%	111%	70%	130%
Total Copper	9495116		54	52	2.4%	< 1	102%	80%	120%	97%	80%	120%	NA	70%	130%
Total Iron	9495116		64	61	NA	< 50	101%	80%	120%	100%	80%	120%	118%	70%	130%
Total Lead	9495116		0.6	0.6	NA	< 0.5	102%	80%	120%	100%	80%	120%	104%	70%	130%
Total Manganese	9495116		<2	<2	NA	< 2	103%	80%	120%	100%	80%	120%	117%	70%	130%
Total Molybdenum	9495116		<2	<2	NA	< 2	96%	80%	120%	94%	80%	120%	116%	70%	130%
Total Nickel	9495116		<2	<2	NA	< 2	101%	80%	120%	97%	80%	120%	111%	70%	130%
Total Selenium	9495116		<1	<1	NA	< 1	97%	80%	120%	95%	80%	120%	88%	70%	130%
Total Silver	9495116		<0.1	<0.1	NA	< 0.1	99%	80%	120%	94%	80%	120%	101%	70%	130%
Total Strontium	9495116		118	116	1.7%	< 5	103%	80%	120%	99%	80%	120%	NA	70%	130%
Total Thallium	9495116		<0.1	<0.1	NA	< 0.1	99%	80%	120%	96%	80%	120%	104%	70%	130%
Total Tin	9495116		<2	<2	NA	< 2	94%	80%	120%	91%	80%	120%	97%	70%	130%
Total Titanium	9495116		<2	<2	NA	< 2	101%	80%	120%	100%	80%	120%	87%	70%	130%
Total Uranium	9495116		19.5	19.2	1.8%	< 0.1	96%	80%	120%	94%	80%	120%	NA	70%	130%
Total Vanadium	9495116		<2	<2	NA	< 2	99%	80%	120%	93%	80%	120%	112%	70%	130%
Total Zinc	9495116		10	10	NA	< 5	99%	80%	120%	96%	80%	120%	102%	70%	130%
Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.															
Dissolved Metals															
Dissolved Aluminum	9493667	9493667	990	1040	4.9%	< 5	107%	80%	120%	106%	80%	120%	NA	70%	130%
Dissolved Antimony	9493667	9493667	<2	<2	NA	< 2	89%	80%	120%	103%	80%	120%	116%	70%	130%
Dissolved Arsenic	9493667	9493667	<2	<2	NA	< 2	97%	80%	120%	93%	80%	120%	112%	70%	130%
Dissolved Barium	9493667	9493667	68	71	4.1%	< 5	97%	80%	120%	94%	80%	120%	NA	70%	130%
Dissolved Beryllium	9493667	9493667	<2	<2	NA	< 2	109%	80%	120%	106%	80%	120%	126%	70%	130%
Dissolved Bismuth	9493667	9493667	<2	<2	NA	< 2	98%	80%	120%	99%	80%	120%	74%	70%	130%
Dissolved Boron	9493667	9493667	12	12	NA	< 5	105%	80%	120%	106%	80%	120%	127%	70%	130%
Dissolved Cadmium	9493667	9493667	<0.09	<0.09	NA	< 0.09	96%	80%	120%	93%	80%	120%	110%	70%	130%

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Quality Assurance

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AGAT WORK ORDER: 18X377035
PROJECT: P-0012285-0-16-200
ATTENTION TO: Andrew Higgins
SAMPLING SITE:
SAMPLED BY:

Water Analysis (Continued)

RPT Date: Sep 18, 2018

PARAMETER	Batch	Sample Id	DUPLICATE Dup #1	Dup #2	RPD	Method Blank	REFERENCE MATERIAL Measured Value	Acceptable Limits Lower	Upper	METHOD BLANK SPIKE Recovery	Acceptable Limits Lower	Upper	MATRIX SPIKE Recovery	Acceptable Limits Lower	Upper
Dissolved Chromium	9493667	9493667	2	2	NA	< 1	112%	80%	120%	94%	80%	120%	100%	70%	130%
Dissolved Cobalt	9493667	9493667	<1	<1	NA	< 1	92%	80%	120%	88%	80%	120%	102%	70%	130%
Dissolved Copper	9493667	9493667	7	7	NA	< 2	100%	80%	120%	97%	80%	120%	112%	70%	130%
Dissolved Iron	9493667	9493667	1050	1090	4.2%	< 50	104%	80%	120%	92%	80%	120%	NA	70%	130%
Dissolved Lead	9493667	9493667	<0.5	<0.5	NA	< 0.5	98%	80%	120%	96%	80%	120%	114%	70%	130%
Dissolved Manganese	9493667	9493667	336	347	3.1%	< 2	96%	80%	120%	90%	80%	120%	NA	70%	130%
Dissolved Molybdenum	9493667	9493667	<2	<2	NA	< 2	91%	80%	120%	90%	80%	120%	100%	70%	130%
Dissolved Nickel	9493667	9493667	4	4	NA	< 2	96%	80%	120%	93%	80%	120%	106%	70%	130%
Dissolved Selenium	9493667	9493667	<1	<1	NA	< 1	100%	80%	120%	93%	80%	120%	121%	70%	130%
Dissolved Silver	9493667	9493667	<0.1	<0.1	NA	< 0.1	94%	80%	120%	98%	80%	120%	95%	70%	130%
Dissolved Strontium	9493667	9493667	51	53	2.4%	< 5	91%	80%	120%	87%	80%	120%	NA	70%	130%
Dissolved Thallium	9493667	9493667	<0.1	<0.1	NA	< 0.1	98%	80%	120%	98%	80%	120%	110%	70%	130%
Dissolved Tin	9493667	9493667	<2	<2	NA	< 2	93%	80%	120%	94%	80%	120%	98%	70%	130%
Dissolved Titanium	9493667	9493667	71	80	12.6%	< 2	103%	80%	120%	103%	80%	120%	NA	70%	130%
Dissolved Uranium	9493667	9493667	<0.1	<0.1	NA	< 0.1	92%	80%	120%	92%	80%	120%	106%	70%	130%
Dissolved Vanadium	9493667	9493667	<2	<2	NA	< 2	91%	80%	120%	87%	80%	120%	101%	70%	130%
Dissolved Zinc	9493667	9493667	16	17	NA	< 5	93%	80%	120%	88%	80%	120%	119%	70%	130%

Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Mercury Analysis in Water (Dissolved)

Dissolved Mercury	1	9493667	<0.026	<0.026	NA	< 0.026	100%	80%	120%		80%	120%	100%	80%	120%

Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Standard Water Analysis (Total)

pH	9493695		7.50	7.48	0.3%	<	103%	80%	120%	NA	80%	120%	NA	80%	120%
Reactive Silica as SiO2	1	9493728	8.5	8.5	0.0%	< 0.5	100%	80%	120%		80%	120%	80%	80%	120%
Chloride	9494281		57	64	11.4%	< 1	91%	80%	120%	NA	80%	120%	NA	80%	120%
Sulphate	9494281		12	13	13.1%	< 2	107%	80%	120%	NA	80%	120%	NA	80%	120%
Alkalinity	9493695		49	50	0.4%	< 5	96%	80%	120%	NA	80%	120%	NA	80%	120%
True Color	9493246	9493246	59	52	12.6%	< 5	95%	80%	120%	NA			NA		
Turbidity	9493246	9493246	0.7	0.8	10.9%	< 0.1	96%	80%	120%	NA			NA		
Electrical Conductivity	9493695		384	381	0.8%	< 1	106%	80%	120%	NA	80%	120%	NA	80%	120%
Nitrate as N	9494281		0.17	0.19	NA	< 0.05	92%	80%	120%	NA	80%	120%	117%	80%	120%
Nitrite as N	9494281		0.08	0.09	NA	< 0.05	96%	80%	120%	NA	80%	120%	90%	80%	120%
Ammonia as N	1	9494055	<0.03	<0.03	NA	< 0.03	105%	80%	120%		80%	120%	99%	80%	120%
Total Organic Carbon	9495759		<0.5	0.5	NA	< 0.5	85%	80%	120%	NA	80%	120%	85%	80%	120%
Ortho-Phosphate as P	1	9493728	0.12	0.12	0.0%	< 0.01	95%	80%	120%		80%	120%	96%	80%	120%
Total Sodium	9495116		6.2	6.2	0.8%	< 0.1	103%	80%	120%	97%	80%	120%	NA	70%	130%
Total Potassium	9495116		2.3	2.2	1.0%	< 0.1	101%	80%	120%	100%	80%	120%	NA	70%	130%
Total Calcium	9495116		33.1	33.3	0.6%	< 0.1	102%	80%	120%	102%	80%	120%	NA	70%	130%

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Quality Assurance

CLIENT NAME: ENGLOBE CORP
PROJECT: P-0012285-0-16-200
SAMPLING SITE:

AGAT WORK ORDER: 18X377035
ATTENTION TO: Andrew Higgins
SAMPLED BY:

Water Analysis (Continued)

RPT Date: Sep 18, 2018			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Total Magnesium	9495116		2.3	2.4	1.7%	< 0.1	101%	80%	120%	100%	80%	120%	NA	70%	130%
Bicarb. Alkalinity (as CaCO3)	9493695		49	50	0.4%	< 5	NA	80%	120%	NA	80%	120%	NA	80%	120%
Carb. Alkalinity (as CaCO3)	9493695		<10	<10	NA	< 10	NA	80%	120%	NA	80%	120%	NA	80%	120%
Hydroxide	9493695		<5	<5	NA	< 5	NA	80%	120%	NA	80%	120%	NA	80%	120%
Total Copper	9495116		54	52	2.4%	< 1	102%	80%	120%	97%	80%	120%	NA	70%	130%
Total Iron	9495116		64	61	NA	< 50	101%	80%	120%	100%	80%	120%	118%	70%	130%
Total Manganese	9495116		<2	<2	NA	< 2	103%	80%	120%	100%	80%	120%	117%	70%	130%
Total Phosphorous	9495116		0.04	0.04	NA	< 0.02	101%	80%	120%	104%	80%	120%	77%	70%	130%
Total Zinc	9495116		10	10	NA	< 5	99%	80%	120%	96%	80%	120%	102%	70%	130%
Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.															
Standard Water Analysis (Dissolved)															
pH	9503075		7.91	8.03	1.5%	<	102%	80%	120%	NA	80%	120%	NA	80%	120%
Reactive Silica as SiO2	1	9509883	13.7	13.7	0.0%	< 0.5	102%	80%	120%		80%	120%	120%	80%	120%
Chloride	9503494		52	53	1.5%	< 1	91%	80%	120%	NA	80%	120%	NA	80%	120%
Fluoride	9503494		<0.12	<0.12	NA	< 0.12	99%	80%	120%	NA	80%	120%	105%	80%	120%
Sulphate	9503494		5	5	NA	< 2	108%	80%	120%	NA	80%	120%	92%	80%	120%
Alkalinity	9503075		104	104	0.5%	< 5	93%	80%	120%	NA	80%	120%	NA	80%	120%
True Color	9495138		20	22	NA	< 5	105%	80%	120%	NA			NA		
Turbidity	9495138		475	455	4.3%	< 0.1	96%	80%	120%	NA			NA		
Electrical Conductivity	9503075		46500	45900	1.1%	< 1	103%	80%	120%	NA	80%	120%	NA	80%	120%
Nitrate as N	9503494		2.98	3.04	2.0%	< 0.05	91%	80%	120%	NA	80%	120%	NA	80%	120%
Nitrite as N	9503494		0.12	0.11	NA	< 0.05	95%	80%	120%	NA	80%	120%	104%	80%	120%
Ammonia as N	1	9509883	<0.03	<0.03	NA	< 0.03	104%	80%	120%		80%	120%	98%	80%	120%
Total Organic Carbon	9490912		26.0	25.5	1.9%	< 0.5	95%	80%	120%	NA	80%	120%	NA	80%	120%
Ortho-Phosphate as P	1	9509883	0.14	0.14	0.0%	< 0.01	92%	80%	120%		80%	120%	96%	80%	120%
Dissolved Sodium	9493667	9493667	5.5	5.7	2.4%	< 0.1	109%	80%	120%	108%	80%	120%	NA	70%	130%
Dissolved Potassium	9493667	9493667	4.4	4.5	2.0%	< 0.1	101%	80%	120%	96%	80%	120%	NA	70%	130%
Dissolved Calcium	9493667	9493667	7.8	7.8	0.4%	< 0.1	103%	80%	120%	99%	80%	120%	NA	70%	130%
Dissolved Magnesium	9493667	9493667	1.1	1.1	2.3%	< 0.1	110%	80%	120%	110%	80%	120%	NA	70%	130%
Bicarb. Alkalinity (as CaCO3)	9503075		104	104	0.5%	< 5	NA	80%	120%	NA	80%	120%	NA	80%	120%
Carb. Alkalinity (as CaCO3)	9503075		<10	<10	NA	< 10	NA	80%	120%	NA	80%	120%	NA	80%	120%
Hydroxide	9503075		<5	<5	NA	< 5	NA	80%	120%	NA	80%	120%	NA	80%	120%
Dissolved Copper	9493667	9493667	2	7	NA	< 2	100%	80%	120%	97%	80%	120%	NA	70%	130%
Dissolved Iron	9493667	9493667	1050	1090	3.7%	< 50	104%	80%	120%	92%	80%	120%	NA	70%	130%
Dissolved Phosphorus	9493667	9493667	<0.02	<0.02	NA	< 0.02	105%	80%	120%	95%	80%	120%	84%	70%	130%
Dissolved Manganese	9493667	9493667	78	347	NA	< 2	96%	80%	120%	90%	80%	120%	NA	70%	130%
Dissolved Zinc	9493667	9493667	11	17	NA	< 5	93%	80%	120%	88%	80%	120%	NA	70%	130%
Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.															

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Quality Assurance

CLIENT NAME: ENGLOBE CORP

AGAT WORK ORDER: 18X377035

PROJECT: P-0012285-0-16-200

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Water Analysis (Continued)

RPT Date: Sep 18, 2018			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Standard Water Analysis (Dissolved)															
Chloride	9503512		10	10	5.2%	< 1	91%	80%	120%	NA	80%	120%	NA	80%	120%
Fluoride	9503512		1.04	0.99	4.8%	< 0.12	100%	80%	120%	NA	80%	120%	NA	80%	120%
Sulphate	9503512		<2	<2	NA	< 2	110%	80%	120%	NA	80%	120%	94%	80%	120%
Nitrate as N	9503512		0.06	<0.05	NA	< 0.05	92%	80%	120%	NA	80%	120%	90%	80%	120%
Nitrite as N	9503512		<0.05	<0.05	NA	< 0.05	96%	80%	120%	NA	80%	120%	104%	80%	120%

Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Certified By:

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Method Summary

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PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Soil Analysis			
Zinc	MET-121-6105 & MET-121-6103	EPA SW 846 6020A/3050B & SM 3125	ICP/MS
Cadmium	MET-121-6105 & MET-121-6103	EPA SW 846 6020A/3050B & SM 3125	ICP/MS
Fraction Organic Carbon-1	INOR-93-6062	Skjemstad & Baldock, 2008 & Walkley & Balck 1934	SPECTROPHOTOMETER
Fraction Organic Carbon-2	INOR-93-6062	Skjemstad & Baldock, 2008 & Walkley & Balck 1934	SPECTROPHOTOMETER
Fraction Organic Carbon-3	INOR-93-6062	Skjemstad & Baldock, 2008 & Walkley & Balck 1934	SPECTROPHOTOMETER
Fraction Organic Carbon-Avg	INOR-93-6062	Skjemstad & Baldock, 2008 & Walkley & Balck 1934	SPECTROPHOTOMETER

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PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Trace Organics Analysis			
Benzene	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
Toluene	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
Ethylbenzene	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
Xylene (Total)	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
C6-C10 (less BTEX)	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS/FID
>C10-C16 Hydrocarbons	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
>C16-C21 Hydrocarbons	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
>C21-C32 Hydrocarbons	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
Modified TPH (Tier 1)	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	CALCULATION
Resemblance Comment	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS/FID
Return to Baseline at C32	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
Isobutylbenzene - EPH	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
Isobutylbenzene - VPH	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
n-Dotriacontane - EPH	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
>C10-C16 Hydrocarbons - 3X silica gel	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
>C16-C21 Hydrocarbons - 3X silica gel	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS/FID
>C21-C32 Hydrocarbons - 3X silica gel	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/FID
Modified TPH (Tier 1) - 3X silica gel	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	CALCULATION
Silica Gel Cleanup - 3X			GC/FID
C6-C10 (less BTEX)	VOL-120-5013	Atlantic RBCA Guidelines for Laboratories Tier 1	GC/MS
Modified TPH (Tier 1)	ORG-120-5101	Atlantic RBCA Guidelines for Laboratories Tier 1	CALCULATION
% Moisture		Calculation	GRAVIMETRIC
1-Methylnaphthalene	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
2-Methylnaphthalene	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
Acenaphthene	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
Acenaphthylene	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
Acridine	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
Anthracene	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
Benzo(a)anthracene	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
Benzo(a)pyrene	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
Benzo(b)fluoranthene	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
Benzo(b+j)fluoranthene	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
Benzo(e)pyrene	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS

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PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Benzo(ghi)perylene	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
Benzo(k)fluoranthene	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
Chrysene	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
Dibenzo(a,h)anthracene	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
Fluoranthene	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
Fluorene	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
Indeno(1,2,3)pyrene	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
Naphthalene	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
Perylene	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
Phenanthrene	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
Pyrene	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
Quinoline	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
Nitrobenzene-d5	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
2-Fluorobiphenyl	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
Terphenyl-d14	ORG-120-5104	EPA SW846/3541/3510/8270C	GC/MS
1-Methylnaphthalene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
2-Methylnaphthalene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Acenaphthene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Acenaphthylene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Acridine	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Anthracene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Benzo(a)anthracene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Benzo(a)pyrene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Benzo(b)fluoranthene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Benzo(e)pyrene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Benzo(ghi)perylene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Benzo(k)fluoranthene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Chrysene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Dibenzo(a,h)anthracene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Fluoranthene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Fluorene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Indeno(1,2,3-cd)pyrene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Naphthalene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Perylene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Phenanthrene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Pyrene	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Quinoline	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Nitrobenzene-d5	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
2-Fluorobiphenyl	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Terphenyl-d14	ORG-120-5104	EPA SW846/3510/8270C	GC/MS
Chloromethane	VOL-120-5002	EPA SW846 5035/8260B	GC/MS
Vinyl Chloride	VOL-120-5002	EPA SW846 5035/8260B	GC/MS
Bromomethane	VOL-120-5002	EPA SW846 5035/8260B	GC/MS
Chloroethane	VOL-120-5002	EPA SW846 5230B/8260	GC/MS
Trichlorofluoromethane (FREON 11)	VOL-120-5002	EPA SW846 5035/8260B	GC/MS
Acetone	VOL-120-5002	EPA SW846 5035/8260B	GC/MS
1,1-Dichloroethylene	VOL-120-5002	EPA SW846 5035/8260B	GC/MS
Methylene Chloride (Dichloromethane)	VOL-120-5002	EPA SW846 5035/8260B	GC/MS
trans-1,2-Dichloroethylene	VOL-120-5002	EPA SW846 5035/8260B	GC/MS
1,1-Dichloroethane	VOL-120-5002	EPA SW846 5035/8260B	GC/MS

Results relate only to the items tested and to all the items tested

AGAT Laboratories

11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
http://www.agatlabs.com

Method Summary

CLIENT NAME: ENGLOBE CORP

AGAT WORK ORDER: 18X377035

PROJECT: P-0012285-0-16-200

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
cis-1,2-Dichloroethylene	VOL-120-5002	EPA SW846 5035/8260B	GC/MS
Chloroform	VOL-120-5002	EPA SW846 5035/8260B	GC/MS
1,2-Dichloroethane	VOL-120-5002	EPA SW846 5035/8260B	GC/MS
1,1,1-Trichloroethane	VOL-120-5002	EPA SW846 5035/8260B	GC/MS
Carbon Tetrachloride	VOL-120-5002	EPA SW846 5035/8260B	GC/MS
Benzene	VOL-120-5002	EPA SW846 5035/8260B	GC/MS
1,2-Dichloropropane	VOL-120-5002	EPA SW846 5035/8260B	GC/MS
Trichloroethylene	VOL-120-5002	EPA SW846 5035/8260B	GC/MS
Bromodichloromethane	VOL-120-5002	EPA SW846 5035/8260B	GC/MS
cis-1,3-Dichloropropene	VOL-120-5002	EPA SW846 5035/8260B	GC/MS
trans-1,3-Dichloropropene	VOL-120-5002	EPA SW846 5035/8260B	GC/MS
1,1,2-Trichloroethane	VOL-120-5002	EPA SW846 5035/8260B	GC/MS
Toluene	VOL-120-5002	EPA SW846 5035/8260B	GC/MS
2-Hexanone	VOL-120-5002	EPA SW846 5035/8260B	GC/MS
Dibromochloromethane	VOL-120-5002	EPA SW846 5035/8260B	GC/MS
1,2-Dibromoethane	VOL-120-5002	EPA SW846 5235/8260B	GC/MS
Tetrachloroethylene	VOL-120-5002	EPA SW846 5035/8260B	GC/MS
1,1,1,2-Tetrachloroethane	VOL-120- 5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Chlorobenzene	VOL-120-5002	EPA SW846 5035/8260B	GC/MS
Ethylbenzene	VOL-120-5002	EPA SW846 5035/8260B	GC/MS
m,p-Xylene	VOL-120-5002	EPA SW846 5035/8260B	GC/MS
Bromoform	VOL-120-5002	EPA SW846 5035/8260B	GC/MS
Styrene	VOL-120-5002	EPA SW846 5035/8260B	GC/MS
1,1,2,2-Tetrachloroethane	VOL-120-5002	EPA SW846 5035/8260B	GC/MS
o-Xylene	VOL-120-5002	EPA SW846 5035/8260B	GC/MS
1,3-Dichlorobenzene	VOL-120-5002	EPA SW846 5035/8260B	GC/MS
1,4-Dichlorobenzene	VOL-120-5002	EPA SW846 5035/8260B	GC/MS
1,2-Dichlorobenzene	VOL-120-5002	EPA SW846 5235/8260B	GC/MS
Toluene-d8			GC/MS
4-Bromofluorobenzene			GC/MS
Chloromethane	VOL-120-5001	EPA SW-846 5030B/8260B	GC/MS
Vinyl Chloride	VOL-120-5001	EPA SW846 5230B/8260	GC/MS
Bromomethane	VOL-120-5001	EPA SW846 5230B/8260	GC/MS
Chloroethane	VOL-120-5001	EPA SW-846 5030B/8260B	GC/MS
Trichlorofluoromethane (FREON 11)	VOL-120-5001	EPA SW-846 5030B/8260B	GC/MS
Acetone	VOL-120-5001	EPA SW-846 5030B/8260B	GC/MS
1,1-Dichloroethylene	VOL-120-5001	EPA SW-846 5030B/8260B	GC/MS
Methylene Chloride (Dichloromethane)	VOL-120-5001	EPA SW-846 5030B/8260B	GC/MS
trans-1,2-Dichloroethylene	VOL-120-5001	EPA SW846 5230B/8260	GC/MS
1,1-Dichloroethane	VOL-120-5001	EPA SW-846 5030B/8260B	GC/MS
cis-1,2-Dichloroethylene	VOL-120-5001	EPA SW-846 5030B/8260B	GC/MS
Chloroform	VOL-120-5001	EPA SW-846 5030B/8260B	GC/MS
1,2-Dichloroethane	VOL-120-5001	EPA SW846 5230B/8260	GC/MS
1,1,1-Trichloroethane	VOL-120-5001	EPA SW-846 5030B/8260B	GC/MS
Carbon Tetrachloride	VOL-120-5001	EPA SW846 5230B/8260	GC/MS
Benzene	VOL-120-5001	EPA SW-846 5030B/8260	GC/MS
1,2-Dichloropropane	VOL-120-5001	EPA SW-846 5030B/8260B	GC/MS
Trichloroethylene	VOL-120-5001	EPA SW846 5230B/8260	GC/MS
Bromodichloromethane	VOL-120-5001	EPA SW846 5230B/8260	GC/MS
cis-1,3-Dichloropropene	VOL-120-5001	EPA SW-846 5030B/8260B	GC/MS

Results relate only to the items tested and to all the items tested

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CANADA B3B 1M2
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Method Summary

CLIENT NAME: ENGLOBE CORP

AGAT WORK ORDER: 18X377035

PROJECT: P-0012285-0-16-200

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
trans-1,3-Dichloropropene	VOL-120-5001	EPA SW-846 5030B/8260B	GC/MS
1,1,2-Trichloroethane	VOL-120-5001	EPA SW-846 5030B/8260B	GC/MS
Toluene	VOL-120-5001	EPA SW-846 5030B/8260	GC/MS
2-Hexanone	VOL-120-5001	EPA SW846 5230B/8260	GC/MS
Dibromochloromethane	VOL-120-5001	EPA SW846 5230B/8260	GC/MS
1,2-Dibromoethane	VOL-120-5001	EPA SW-846 5030B/8260B	GC/MS
Tetrachloroethylene	VOL-120-5001	EPA SW846 5230B/8260	GC/MS
1,1,1,2-Tetrachloroethane	VOL-120-5001	EPA SW846 5035/8260B	GC/MS
Chlorobenzene	VOL-120-5001	EPA SW846 5230B/8260	GC/MS
Ethylbenzene	VOL-120-5001	EPA SW-846 5030B/8260	GC/MS
m,p-Xylene	VOL-120-5001	EPA SW846 5230B/8260	GC/MS
Bromoform	VOL-120-5001	EPA SW846 5230B/8260	GC/MS
Styrene	VOL-120-5001	EPA SW846 5230B/8260	GC/MS
1,1,2,2-Tetrachloroethane	VOL-120-5001	EPA SW-846 5030B/8260B	GC/MS
o-Xylene	VOL-120-5001	EPA SW846 5230B/8260	GC/MS
1,3-Dichlorobenzene	VOL-120-5001	EPA SW-846 5030B/8260B	GC/MS
1,4-Dichlorobenzene	VOL-120-5001	EPA SW846 5230B/8260	GC/MS
1,2-Dichlorobenzene	VOL-120-5001	EPA SW-846 5030B/8260B	GC/MS

Results relate only to the items tested and to all the items tested

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Method Summary

CLIENT NAME: ENGLOBE CORP
AGAT WORK ORDER: 18X377035
PROJECT: P-0012285-0-16-200
ATTENTION TO: Andrew Higgins
SAMPLING SITE:
SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Analysis			
Dissolved Aluminum	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Antimony	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Arsenic	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Barium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Beryllium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Bismuth	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Boron	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Cadmium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Chromium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Cobalt	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Copper	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Iron	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Lead	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Manganese	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Molybdenum	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Nickel	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Selenium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Silver	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Strontium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Thallium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Tin	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Titanium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Uranium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Vanadium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Zinc	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Mercury	MET-121-6100 & MET-121-6107	SM 3112 B	CV/AA
Total Mercury	MET-121-6100 & MET-121-6107	SM 3112 B	CV/AA
pH	INOR-121-6001	SM 4500 H+B	PC TITRATE

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Method Summary

CLIENT NAME: ENGLOBE CORP

AGAT WORK ORDER: 18X377035

PROJECT: P-0012285-0-16-200

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Reactive Silica as SiO2	INOR-121-6027	SM 4110 B	COLORIMETER
Chloride	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH
Fluoride	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH
Sulphate	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH
Alkalinity	INOR-121-6001	SM 2320 B	
True Color	INOR-121-6014	SM 2120 C	NEPHELOMETER
Turbidity	INOR-121-6022	SM 2130 B	NEPHELOMETER
Electrical Conductivity	INOR-121-6001	SM 2510 B	PC TITRATE
Nitrate + Nitrite as N	INORG-121-6005	SM 4110 B	CALCULATION
Nitrate as N	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH
Nitrite as N	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH
Ammonia as N	INOR-121-6047	SM 4500-NH3 G	COLORIMETER
Total Organic Carbon	INORG-121-6026	SM 5310 B	TOC ANALYZER
Ortho-Phosphate as P	INOR-121-6012	SM 4110 B	COLORIMETER
Dissolved Sodium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Potassium	MET121-6104 & MET-121-6105	SM 3125	ICP-MS
Dissolved Calcium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Dissolved Magnesium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Bicarb. Alkalinity (as CaCO3)	INORG-121-6001	SM 2320 B	PC TITRATE
Carb. Alkalinity (as CaCO3)	INORG-121-6001	SM 2320 B	PC TITRATE
Hydroxide	INORG-121-6001	SM 2320 B	PC-TITRATE
Calculated TDS		SM 1030E	CALCULATION
Hardness		SM 2340B	CALCULATION
Langelier Index (@20C)			CALCULATION
Langelier Index (@ 4C)			CALCULATION
Saturation pH (@ 20C)			CALCULATION
Saturation pH (@ 4C)			CALCULATION
Anion Sum		SM 1030E	CALCULATION
Cation sum		SM 1030E	CALCULATION
% Difference/ Ion Balance (NS)		SM 1030E	CALCULATION
Dissolved Phosphorus	MET-121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Sodium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Potassium	MET121-6104 & MET-121-6105	SM 3125	ICP-MS
Total Calcium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Magnesium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Copper	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Iron	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Manganese	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Phosphorous	MET-121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS

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Method Summary

CLIENT NAME: ENGLOBE CORP

AGAT WORK ORDER: 18X377035

PROJECT: P-0012285-0-16-200

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Total Zinc	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Aluminum	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Antimony	MET121-6104 & MET-121-6105	SM 3125	ICP-MS
Total Arsenic	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Barium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Beryllium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Bismuth	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Boron	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Cadmium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Chromium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Cobalt	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Lead	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Molybdenum	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Nickel	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Selenium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Silver	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Strontium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Thallium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Tin	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Titanium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Uranium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Vanadium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS

Results relate only to the items tested and to all the items tested

AGAT Laboratories

Unit 122 • 11 Morris Drive
Dartmouth, NS
B3B 1M2
webearth.agatlabs.com • www.agatlabs.com
P: 902.468.8718 • F: 902.468.8924

Chain of Custody Record

Laboratory Use Only
Arrival Condition: ☐ Good ☐ Poor (see notes)
Arrival Temperature: 5.1, 2.3, 7.4, 6.4, 6.3
Hold Time:
AGAT Job Number: 18X377035
Notes:

Report Information
Company: Englobe Corp.
Contact: Andrew Higgins
Address: 97 Troop Ave
Dartmouth, NS
Phone: 902.468.6486 Fax: 902.468.4919
Client Project #: Cartwright - Attention Janetta Fraser
AGAT Quotation: P-0012285-0-16-200
Please Note: If quotation number is not provided client will be billed full price for analysis

Report Information (Please print):
1. Name: Andrew Higgins
Email: andrew.higgins@englobecorp.com
2. Name: Christina Caldwell
Email: christina.caldwell@englobecorp.com

Report Format
☐ Single Sample per page
☐ Multiple Samples per page
☑ Excel Format Included
☐ Export
Goto EDD Format

Turnaround Time Required (TAT)
Regular TAT ☑ 5 to 7 working days
Rush TAT ☐ Same day ☐ 1 day ☐ 2 days ☐ 3 days
Date Required:

Invoice To Same Yes ☑ / No ☐
Company:
Contact:
Address:
Phone: Fax:
PO/Credit Card#:

Regulatory Requirements (Check):
☐ List Guidelines on Report ☐ Do not list Guidelines on Report
☐ PIRI
☐ Tier 1 ☐ Res ☐ Pot ☐ Coarse
☐ Tier 2 ☐ Com ☐ N/Pot ☐ Fine
☐ Gas ☐ Fuel ☐ Lube
☐ CCME ☐ CDWQ
☐ Industrial ☐ NSEQS-Cont Sites
☐ Commercial ☐ HRM 101
☐ Res/Park ☐ Storm Water
☐ Agricultural ☐ Waste Water
☐ FWAL
☐ Sediment ☐ Other

Drinking Water Sample: ☐ Yes ☐ No **Salt Water Sample** ☐ Yes ☐ No
Reg. No.:

Sample Identification	Date/Time Sampled	Sample Matrix	# Containers	Comments - Site/Sample Info. Sample Containment
CWT-SED-5-18	To follow	SED	3	
CWT-SED-5-18A			3	
CWT-SED-5-18B			3	
CWT-SED-7-18			5	
CWT-SED-7-18A			3	
CWT-SED-7-18B			3	
CWT-SED-8-18			3	
CWT-SED-8-18A			3	
CWT-SED-8-18B			3	
CWT-SED-Dup-18			3	
CWT-SW-8-18		SW	5	
CWT-SW-8-18B		SW	5	

Field Filtered/Preserved	Standard Water Analysis	Metals: ☐ Total ☐ Diss ☐ Available	Mercury	☐ BOD ☐ CBOD	pH	☐ TSS ☐ TDS ☐ VSS	TKN	Total Phosphorus	Phenols	Tier 1: TPH/BTEX (PIRI) ☐ low level	Tier 2: TPH/BTEX Fractionation	CCME-CWS TPH/BTEX	VOC	THM	HAA	PAH	PCB	TC + EC ☐ P/A ☐ MPN ☐ MF	☐ HPC ☐ Pseudomonas	Fecal Coliform ☐ MPN ☐ MF	Other: FOC	Other: Hold	~~Hazardous (PIRI)~~ Triple Silica Gel clean up
										X											X		X
																						X	
																						X	
										[redacted]											[redacted]	X	AH [redacted]
																						X	
																						X	
										X						X					X		X
																						X	
										[redacted] AH												X	
										X											X	[redacted] AH	X
					X					X													
					X					X													

Samples Relinquished By (Print Name): Andrew Higgins
Samples Relinquished By (Sign):
Date/Time: 23 Aug 2018
Time: 1315
Samples Received By (Print Name): Jordan Bone
Samples Received By (Sign):
Date/Time: 03/Aug/18
Time: 1515

Pink Copy - Client
Yellow Copy - AGAT
White Copy - AGAT

Page 1 of 13
N°: 063921

Date revised: May 19, 2011

AGAT Laboratories

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B3B 1M2
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Chain of Custody Record

Laboratory Use Only

Arrival Condition: ☐ Good ☐ Poor (see notes)
Arrival Temperature:
Hold Time:
AGAT Job Number:
Notes:

Report Information

Company: Englobe Corp.
Contact: Andrew Higgins
Address: 97 Troop Ave.
Dartmouth, NS
Phone: 902.468.6486 Fax: 902.468.4919
Client Project #: [redacted] P-0012285-0-16-200
AGAT Quotation: Cartwright - Att: Janetta Fraser
Please Note: If quotation number is not provided client will be billed full price for analysis

Report Information (Please print):

1. Name: Andrew Higgins
   Email: andrew.higgins@englobecorp.com
2. Name: Christina Caldwell
   Email: christina.caldwell@englobecorp.com

Report Format

☐ Single Sample per page
☐ Multiple Samples per page
☑ Excel Format Included
☐ Export
Q010 EDD Format

Turnaround Time Required (TAT)

Regular TAT ☑ 5 to 7 working days
Rush TAT ☐ Same day ☐ 1 day ☐ 2 days ☐ 3 days
Date Required:

Regulatory Requirements (Check):

☐ List Guidelines on Report ☐ Do not list Guidelines on Report
☐ PIRI
☐ Tier 1 ☐ Res ☐ Pot ☐ Coarse
☐ Tier 2 ☐ Com ☐ N/Pot ☐ Fine
☐ Gas ☐ Fuel ☐ Lube
☐ CCME
☐ Industrial
☐ Commercial
☐ Res/Park
☐ Agricultural
☐ FWAL
☐ Sediment
☐ CDWQ
☐ NSEQS-Cont Sites
☐ HRM 101
☐ Storm Water
☐ Waste Water
☐ Other

Drinking Water Sample: ☐ Yes ☐ No Salt Water Sample ☐ Yes ☐ No
Reg. No.:

Invoice To Same Yes ☑ / No ☐

Company:
Contact:
Address:
Phone: Fax:
PO/Credit Card#:

Sample Identification	Date/Time Sampled	Sample Matrix	# Containers	Comments – Site/Sample Info. Sample Containment	Field Filtered/Preserved	Standard Water Analysis	Metals: ☐ Total ☐ Diss ☐ Available	Mercury	☐ BOD ☐ CBOD	pH	☐ TSS ☐ TDS ☐ VSS	TKN	Total Phosphorus	Phenols	Tier 1: TPH/BTEX (PIRI) ☐ low level	Tier 2: TPH/BTEX Fractionation	CCME-CWS TPH/BTEX	VOC	THM	HAA	PAH	PCB	TC + EC ☐ P/A ☐ MPN ☐ MF	☐ HPC ☐ Pseudomonas	Fecal Coliform ☐ MPN ☐ MF	Other:	Other:	Hazardous (Y/N)
CWT-SW2-18 (coring)	To Follow	SW	6			X	X	X							X													
CWT-SW-Dup-18		SW	6			X	X	X							X													
CWT-TP35-18-A	Aug 18-2018	Soil	3												X													
CWT-TP35-18-B			3												X													
CWT-TP35-18-C			3												X													
CWT-TP35-18-D			3												X													
CWT-TP41-18-A	Aug 18-2018		3												X													
CWT-TP41-18-B			3												X													
CWT-TP41-18-C			3												X													
CWT-TP41-18-D			3												X													
CWT-TP36-18-A	Aug 18/18		1																		X							
CWT-TP36-18-B	Aug 18/18		1																		X							

Samples Relinquished By (Print Name)	Date/Time	Samples Received By (Print Name)	Date/Time
Andrew Higgins	23 Aug 2018	[signature]	23/Aug/18
Samples Relinquished By (Sign): [signature]	Date/Time 1315	Samples Received By (Sign):	Date/Time 1315

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Page 2 of 13
Nº: 063922

Date revised: May 19, 2016

AGAT Laboratories

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P: 902.468.8718 • F: 902.468.8924

Chain of Custody Record

Laboratory Use Only
Arrival Condition: ☐ Good ☐ Poor (see notes)
Arrival Temperature: _____
Hold Time: _____
AGAT Job Number: _____
Notes:

Report Information
Company: Englobe Corp.
Contact: (97 Troop Ave.) Andrew Higgins
Address: Dartmouth, NS
Phone: 902.468.6486 Fax: 902.468.4919
Client Project #: P-0012285-0-16-200
AGAT Quotation: Cartwright – Att: Janetta Fraser
Please Note: If quotation number is not provided client will be billed full price for analysis

Report Information (Please print):
1. Name: Andrew Higgins
Email: andrew.higgins@englobecorp.com
2. Name: Christina Caldwell
Email: christina.caldwell@englobecorp.com

Report Format
☐ Single Sample per page
☐ Multiple Samples per page
☑ Excel Format Included
☐ Export
goto EDD Format

Turnaround Time Required (TAT)
Regular TAT ☑ 5 to 7 working days
Rush TAT ☐ Same day ☐ 1 day ☐ 2 days ☐ 3 days
Date Required: _____

Invoice To Same Yes ☑ / No ☐
Company:
Contact:
Address:
Phone: Fax:
PO/Credit Card#:

Regulatory Requirements (Check):
☐ List Guidelines on Report ☐ Do not list Guidelines on Report
☐ PIRI
☐ Tier 1 ☐ Res ☐ Pot ☐ Coarse
☐ Tier 2 ☐ Com ☐ N/Pot ☐ Fine
☐ Gas ☐ Fuel ☐ Lube
☐ CCME ☐ CDWQ
☐ Industrial ☐ NSEQS-Cont Sites
☐ Commercial ☐ HRM 101
☐ Res/Park ☐ Storm Water
☐ Agricultural ☐ Waste Water
☐ FWAL
☐ Sediment ☐ Other

Drinking Water Sample: ☐ Yes ☐ No **Salt Water Sample** ☐ Yes ☐ No
Reg. No.: _____

Sample Identification	Date/Time Sampled	Sample Matrix	# Containers	Comments - Site/Sample Info. Sample Containment	Field Filtered/Preserved	Standard Water Analysis	Metals: ☐ Total ☐ Diss ☐ Available	Mercury	☐ BOD ☐ CBOD	pH	☐ TSS ☐ TDS ☐ VSS	TKN	Total Phosphorus	Phenols	Tier 1: TPH/BTEX (PIRI) ☐ low level	Tier 2: TPH/BTEX Fractionation	CCME-CWS TPH/BTEX	VOC	THM	HAA	PAH	PCB	TC + EC ☐ P/A ☐ MPN ☐ MF	☐ HPC ☐ Pseudomonas	Fecal Coliform ☐ MPN ☐ MF	Other:	Other:	Hazardous (Y/N)
CWT-TP36-18-C	Aug 18-2018 To Follow	Soil		1																	X						
CWT-TP36-18-D	Aug 18-2018			1																	X						
CWT-MW 4/1				3											X												
CWT-MW 4/2				3											X												
CWT-SS2-18-A				3											X												
CWT-SS2-18-B				3											X												
CWT-SS2-18-C				3											X												
CWT-SS2-18-D				3											X												
CWT-TP2-18-A	Aug 15-2018			1																	X						
CWT-TP2-18-B	Aug 15-2018			1																	X						
CWT-TP2-18-C	Aug 15-2018			1																	X						
CWT-TP2-18-D	Aug 15-2018			1																	X						

Samples Relinquished By (Print Name): Andrew Higgins
Samples Relinquished By (Sign):
Date/Time: 23 Aug 2018
Date/Time: 1:15 pm
Samples Received By (Print Name):
Samples Received By (Sign):
Date/Time: 23/Aug/18
Date/Time: 1315

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N°: 063923

DIV 233-1502-002

Date revised: May 19, 2011

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Chain of Custody Record

Laboratory Use Only
Arrival Condition: ☐ Good ☐ Poor (see notes)
Arrival Temperature:
Hold Time:
AGAT Job Number:
Notes:

Report Information
Company: Englobe Corp.
Contact: Andrew Higgins
Address: 97 Troop Avenue
Dartmouth, NS
Phone: 902.468.6486 Fax: 902.468.4919
Client Project #: P-0012285-0-16-200
AGAT Quotation: Cartwright - Att: Janetta Fraser
Please Note: If quotation number is not provided client will be billed full price for analysis

Report Information (Please print):
1. Name: Andrew Higgins
Email: andrew.higgins@englobecorp.com
2. Name: Christina Caldwell
Email: Christina.Caldwell@englobecorp.com

Report Format
☐ Single Sample per page
☐ Multiple Samples per page
☑ Excel Format Included
☐ Export
2016 EDD Format

Turnaround Time Required (TAT)
Regular TAT ☑ 5 to 7 working days
Rush TAT ☐ Same day ☐ 1 day ☐ 2 days ☐ 3 days
Date Required:

Invoice To Same Yes ☑ / No ☐
Company:
Contact:
Address:
Phone: Fax:
PO/Credit Card#:

Regulatory Requirements (Check):
☐ List Guidelines on Report ☐ Do not list Guidelines on Report
☐ PIRI
☐ Tier 1 ☐ Res ☐ Pot ☐ Coarse
☐ Tier 2 ☐ Com ☐ N/Pot ☐ Fine
☐ Gas ☐ Fuel ☐ Lube
☐ CCME ☐ CDWQ
☐ Industrial ☐ NSEQS-Cont Sites
☐ Commercial ☐ HRM 101
☐ Res/Park ☐ Storm Water
☐ Agricultural ☐ Waste Water
☐ FWAL
☐ Sediment ☐ Other

Drinking Water Sample: ☐ Yes ☐ No **Salt Water Sample** ☐ Yes ☐ No
Reg. No.:

Sample Identification	Date/Time Sampled	Sample Matrix	# Containers	Comments - Site/Sample Info. Sample Containment	Field Filtered/Preserved	Standard Water Analysis	Metals: ☐ Total ☐ Diss ☐ Available	Mercury	☐ BOD ☐ CBOD	pH	☐ TSS ☐ TDS ☐ VSS	TKN	Total Phosphorus	Phenols	Tier 1: TPH/BTEX (PIRI) ☐ low level	Tier 2: TPH/BTEX Fractionation	CCME-CWS TPH/BTEX	VOC	THM	HAA	PAH	PCB	TC + EC ☐ P/A ☐ MPN ☐ MF	☐ HPC ☐ Pseudomonas	Fecal Coliform ☐ MPN ☐ MF	Other: Zinc	Other: Hold	Hazardous (Y/N)
CWT-TP-2-18 E	To Follow	Soil		1																	X						AH
CWT-TP-2-18 F	Aug 15, 2018			1																	X						AH
CWT-TP-3-18-A/1	Aug. 15-2018			1																					X		
CWT-TP-3-18-A/2				1																					X		AH
CWT-TP-3-18-B/1				1																					X		
CWT-TP-3-18-B/2				1																					X		AH
CWT-TP-3-18-E/1				1																					X		
CWT-TP-3-18-E/2				1																					X		AH
CWT-TP-3-18-D/1				1																					X		
CWT-TP-3-18-D/2	Aug 15-2018			1																					X		AH
CWT-TP5-18-A/1				1																	X						AH
CWT-TP5-18-A/2				1																	X						AH

Samples Relinquished By (Print Name): Andrew Higgins
Date/Time: 23 Aug 2018 1:15
Samples Received By (Print Name):
Date/Time: 23/Aug/18 1315

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Page 4 of 13
Nº: 063924

Document ID: DW 133 1502 002
Date revised: May 19, 2015

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Chain of Custody Record

Laboratory Use Only
Arrival Condition: ☐ Good ☐ Poor (see notes)
Arrival Temperature: _____
Hold Time: _____
AGAT Job Number: _____
Notes:

Report Information
Company: Englobe Corp.
Contact: Andrew Higgins
Address: 97 Troop Ave.
Dartmouth, NS
Phone: 902.468.6486 Fax: 902.468.4919
Client Project #: P-0012285-0-16-200
AGAT Quotation: Cartwright ÷ Att: Janetta Fraser
Please Note: If quotation number is not provided client will be billed full price for analysis

Report Information (Please print):
1. Name: Andrew Higgins
Email: Andrew.higgins@englobecorp.com
2. Name: Christina Caldwell
Email: christina.caldwell@englobecorp.com

Report Format
☐ Single Sample per page
☐ Multiple Samples per page
☑ Excel Format Included
☐ Export
Quote EDD

Turnaround Time Required (TAT)
Regular TAT ☑ 5 to 7 working days
Rush TAT ☐ Same day ☐ 1 day ☐ 2 days ☐ 3 days
Date Required: _____

Invoice To Same Yes ☑ No ☐
Company:
Contact:
Address:
Phone: Fax:
PO/Credit Card#:

Regulatory Requirements (Check):
☐ List Guidelines on Report ☐ Do not list Guidelines on Report
☐ PIRI
☐ Tier 1 ☐ Res ☐ Pot ☐ Coarse
☐ Tier 2 ☐ Com ☐ N/Pot ☐ Fine
☐ Gas ☐ Fuel ☐ Lube
☐ CCME ☐ CDWQ
☐ Industrial ☐ NSEQS-Cont Sites
☐ Commercial ☐ HRM 101
☐ Res/Park ☐ Storm Water
☐ Agricultural ☐ Waste Water
☐ FWAL ☐ Other
☐ Sediment

Drinking Water Sample: ☐ Yes ☐ No **Salt Water Sample** ☐ Yes ☐ No
Reg. No.: _____

Sample Identification	Date/Time Sampled	Sample Matrix	# Containers	Comments - Site/Sample Info. Sample Containment	Field Filtered/Preserved	Standard Water Analysis	Metals: ☐ Total ☐ Diss ☐ Available	Mercury	☐ BOD ☐ CBOD	pH	☐ TSS ☐ TDS ☐ VSS	TKN	Total Phosphorus	Phenols	Tier 1: TPH/BTEX (PIRI) ☐ low level	Tier 2: TPH/BTEX Fractionation	CCME-CWS TPH/BTEX	VOC	THM	HAA	PAH	PCB	TC + EC ☐ P/A ☐ MPN ☐ MF	☐ HPC ☐ Pseudomonas	Fecal Coliform ☐ MPN ☐ MF	Other: Hold	Other: Zinc	Hazardous (Y/N)
CWT-TP5-18-B/1	To Follow Aug 15-2018	Soil		←																	X						
CWT-TP5-18-C/1																					X						
CWT-TP5-18-C/2																					X						
CWT-TP5-18-D/1																					X						
CWT-TP5-18-D/2																					X				AH		
CWT-SS8-18-A/1	Aug 15-2018																									X	
CWT-SS8-18-A/2																									X		
CWT-SS8-18-B/1																										X	
CWT-SS8-18-B/2																									X		
CWT-SS8-18-C/1																										X	
CWT-SS8-18-C/2																									X		
CWT-SS8-18-D/1																										X	

Samples Relinquished By (Print Name): Andrew Higgins
Date/Time: 23 Aug 2018
Time: 1515
Samples Received By (Print Name):
Samples Received By (Sign):
Date/Time: 23/Aug/18
Time: 1315

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Page 5 of 13
N°: 063925

Date revised: May 19, 2014

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Chain of Custody Record

Laboratory Use Only
Arrival Condition: ☐ Good ☐ Poor (see notes)
Arrival Temperature: _____
Hold Time: _____
AGAT Job Number: _____
Notes:

Report Information
Company: Englobe Corp.
Contact: Andrew Higgins
Address: 97 Troop Ave.
Dartmouth, NS
Phone: 902.468.6486 Fax: 902.468.4919
Client Project #: P-0012285-0-16-200
AGAT Quotation: Cathright – Att: Janetta Fraser
Please Note: If quotation number is not provided client will be billed full price for analysis.

Report Information (Please print):
1. Name: Andrew Higgins
Email: andrew.higgins@englobecorp.com
2. Name: Christina Caldwell
Email: christina.caldwell@englobecorp.com

Report Format
☐ Single Sample per page
☐ Multiple Samples per page
☑ Excel Format Included
☐ Export
2010 EDD Format

Turnaround Time Required (TAT)
Regular TAT ☑ 5 to 7 working days
Rush TAT ☐ Same day ☐ 1 day ☐ 2 days ☐ 3 days
Date Required: _____

Invoice To Same Yes ☑ / No ☐
Company:
Contact:
Address:
Phone: Fax:
PO/Credit Card#:

Regulatory Requirements (Check):
☐ List Guidelines on Report ☐ Do not list Guidelines on Report
☐ PIRI
☐ Tier 1 ☐ Res ☐ Pot ☐ Coarse
☐ Tier 2 ☐ Com ☐ N/Pot ☐ Fine
☐ Gas ☐ Fuel ☐ Lube
☐ CCME ☐ CDWQ
☐ Industrial ☐ NSEQS-Cont Sites
☐ Commercial ☐ HRM 101
☐ Res/Park ☐ Storm Water
☐ Agricultural ☐ Waste Water
☐ FWAL
☐ Sediment ☐ Other

Drinking Water Sample: ☐ Yes ☐ No **Salt Water Sample** ☐ Yes ☐ No
Reg. No.:

Sample Identification	Date/Time Sampled	Sample Matrix	# Containers	Comments – Site/Sample Info. Sample Containment	Field Filtered/Preserved	Standard Water Analysis	Metals: ☐ Total ☐ Diss ☐ Available	Mercury	☐ BOD ☐ CBOD	pH	☐ TSS ☐ TDS ☐ VSS	TKN	Total Phosphorus	Phenols	Tier 1: TPH/BTEX (PIRI) ☐ low level	Tier 2: TPH/BTEX Fractionation	CCME-CWS TPH/BTEX	VOC	THM	HAA	PAH	PCB	TC + EC ☐ P/A ☐ MPN ☐ MF	☐ HPC ☐ Pseudomonas	Fecal Coliform ☐ MPN ☐ MF	Other: Hold	Other:	Hazardous (Y/N)
CWT-SS8-18-D/2	To Follow	Soil	1												X	AH										X	
CWT-SS36-18-A/1	Aug 17-2018		3												X												
CWT-SS36-18-B/1	Aug 17-2018		3												X												
CWT-TP13-18-A/1	Aug 16 2018		3												X												
CWT-TP13-18-B/1			3												X												
CWT-TP13-18-B/2			3																						X		
CWT-TP13-18-C/1	Aug 16-2018		3												X												
CWT-TP13-18-C/2	Aug 16-2018		3																						X		
CWT-TP13/BH-1	Aug 16-205		3												X												
CWT-MW9/1			1															X									
CWT-TP8-18-A/1	DAVID		1															X									
CWT-TP8-18-B/1			1															X									

Samples Relinquished By (Print Name): Andrew Higgins
Samples Relinquished By (Sign): [signature]
Date/Time: 23 Aug 2018
Date/Time: 1315
Samples Received By (Print Name):
Samples Received By (Sign): [signature]
Date/Time: 23/Aug/18
Date/Time: 1315

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Page 6 of 13
N°: 063926

Date revised: May 19, 201

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Chain of Custody Record

Laboratory Use Only
Arrival Condition: ☐ Good ☐ Poor (see notes)
Arrival Temperature: _____
Hold Time: _____
AGAT Job Number: _____
Notes:

Report Information
Company: Englobe Corp.
Contact: Andrew Higgins
Address: 97 Troop Ave.
Dartmouth, NS
Phone: 902.468.6486 Fax: 902.468.4919
Client Project #: P-0012285-0-16-200
AGAT Quotation: Cartwright - Att: Janetta Fraser
Please Note: If quotation number is not provided client will be billed full price for analysis.

Report Information (Please print):
1. Name: Andrew Higgins
Email: andrew.higgins@englobecorp.com
2. Name: Christina Caldwell
Email: christina.caldwell@englobecorp.com

Report Format
☐ Single Sample per page
☐ Multiple Samples per page
☑ Excel Format Included
☐ Export
Qolo EDD Format

Turnaround Time Required (TAT)
Regular TAT ☑ 5 to 7 working days
Rush TAT ☐ Same day ☐ 1 day ☐ 2 days ☐ 3 days
Date Required: _____

Invoice To Same Yes ☑ No ☐
Company:
Contact:
Address:
Phone: Fax:
PO/Credit Card#:

Regulatory Requirements (Check):
☐ List Guidelines on Report ☐ Do not list Guidelines on Report
☐ PIRI
☐ Tier 1 ☐ Res ☐ Pot ☐ Coarse
☐ Tier 2 ☐ Com ☐ N/Pot ☐ Fine
☐ Gas ☐ Fuel ☐ Lube
☐ CCME ☐ CDWQ
☐ Industrial ☐ NSEQS-Cont Sites
☐ Commercial
☐ Res/Park ☐ HRM 101
☐ Agricultural ☐ Storm Water
☐ FWAL ☐ Waste Water
☐ Sediment ☐ Other

Drinking Water Sample: ☐ Yes ☐ No **Salt Water Sample** ☐ Yes ☐ No
Reg. No.: _____

Sample Identification	Date/Time Sampled	Sample Matrix	# Containers	Comments – Site/Sample Info. Sample Containment	Field Filtered/Preserved	Standard Water Analysis	Metals: ☐ Total ☐ Diss ☐ Available	Mercury	☐ BOD ☐ CBOD	pH	☐ TSS ☐ TDS ☐ VSS	TKN	Total Phosphorus	Phenols	Tier 1: TPH/BTEX (PIRI) ☐ low level	Tier 2: TPH/BTEX Fractionation	CCME-CWS TPH/BTEX	VOC	THM	HAA	PAH	PCB	TC + EC ☐ P/A ☐ MPN ☐ MF	☐ HPC ☐ Pseudomonas	Fecal Coliform ☐ MPN ☐ MF	Other: Hold	Other:	Hazardous (Y/N)
CWT-TP8-18-C/1	To Follow (David)	Soil																X									
CWT-TP8-18-D/1																		X									
CWT-SS13-18-A																					X						
CWT-SS13-18-B																					X						
CWT-SS13-18-C																					X						
CWT-SS13-18-D																					X						
CWT-SS23-18-A/1																					X						
CWT-SS23-18-A/2																									X		
CWT-SS23-18-B/1																					X						
CWT-SS28-18-B/2																									X		
CWT-SS23-18-C/1																					X						
CWT-SS23-18-C/2																									X		

Samples Relinquished By (Print Name): Andrew Higgins
Date/Time: 23 Aug 2018
Time: 1315
Samples Received By (Print Name): Steve
Date/Time: 23/Aug/18
Time: 1315

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Page 7 of 13
N°: 063927

Date revised: May 19, 2011

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Chain of Custody Record

Laboratory Use Only
Arrival Condition: ☐ Good ☐ Poor (see notes)
Arrival Temperature: _____
Hold Time: _____
AGAT Job Number: _____
Notes:

Report Information
Company: Englobe Corp.
Contact: ~~47 Troop Ave~~ Andrew Higgins
Address: 47 Troop Ave.
Dartmouth, NS
Phone: 902.468.6486 Fax: 902.468.4919
Client Project #: P-0012285-0-16-200
AGAT Quotation: Coltwright — Att: Janetta Fraser
Please Note: If quotation number is not provided client will be billed full price for analysis

Report Information (Please print):
1. Name: Andrew Higgins
Email: andrew.higgins@englobecorp.com
2. Name: Christina Caldwell
Email: Christina.caldwell@englobecorp.com

Report Format
☐ Single Sample per page
☐ Multiple Samples per page
☑ Excel Format Included
☐ Export
Golder EDD Format

Turnaround Time Required (TAT)
Regular TAT ☑ 5 to 7 working days
Rush TAT ☐ Same day ☐ 1 day ☐ 2 days ☐ 3 days
Date Required: _____

Invoice To Same Yes ☑ No ☐
Company:
Contact:
Address:
Phone: Fax:
PO/Credit Card#:

Regulatory Requirements (Check):
☐ List Guidelines on Report ☐ Do not list Guidelines on Report
☐ PIRI
☐ Tier 1 ☐ Res ☐ Pot ☐ Coarse
☐ Tier 2 ☐ Com ☐ N/Pot ☐ Fine
☐ Gas ☐ Fuel ☐ Lube
☐ CCME ☐ CDWQ
☐ Industrial ☐ NSEQS-Cont Sites
☐ Commercial ☐ HRM 101
☐ Res/Park ☐ Storm Water
☐ Agricultural ☐ Waste Water
☐ FWAL ☐ Other
☐ Sediment

Drinking Water Sample: ☐ Yes ☐ No Salt Water Sample ☐ Yes ☐ No
Reg. No.: _____

Sample Identification	Date/Time Sampled	Sample Matrix	# Containers	Comments - Site/Sample Info. Sample Containment	Field Filtered/Preserved	Standard Water Analysis	Metals: ☐ Total ☐ Diss ☐ Available	Mercury	☐ BOD ☐ CBOD	pH	☐ TSS ☐ TDS ☐ VSS	TKN	Total Phosphorus	Phenols	Tier 1: TPH/BTEX (PIRI) ☐ low level	Tier 2: TPH/BTEX Fractionation	CCME-CWS TPH/BTEX	VOC	THM	HAA	PAH	PCB	TC + EC ☐ P/A ☐ MPN ☐ MF	☐ HPC ☐ Pseudomonas	Fecal Coliform ☐ MPN ☐ MF	Other: Hold	Other:	Hazardous (Y/N)
CWT-TP11-18-A	Aug 17, 2018 To Follow	Soil		←																	X						
CWT-TP11-18-B																					X						
CWT-TP11-18-C	Aug 17 2018																				X						
CWT-TP11-18-D	Aug 17 2018																				X						
CWT-TP15-18-A/1	Aug 16 2018																								X		
CWT-TP15-18-A/2																									X		
CWT-TP15-18-A/3																					X						
CWT-TP15-18-B/1																									X		
CWT-TP15-18-B/2																									X		
CWT-TP15-18-B/3																					X						
CWT-TP15-18-C/1																									X		
CWT-TP15-18-C/2																					X						

Samples Relinquished By (Print Name): Andrew Higgins Sr.
Date/Time: 23 Aug 2018 1315
Samples Received By (Print Name):
Date/Time: 23/Aug/18 1315

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White Copy - AGAT

Page 8 of 13
N°: 063928

Date revised: May 19, 2016

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P: 902.468.8718 • F: 902.468.8924

Chain of Custody Record

Laboratory Use Only
Arrival Condition: ☐ Good ☐ Poor (see notes)
Arrival Temperature: _____
Hold Time: _____
AGAT Job Number: _____
Notes:

Report Information
Company: Englobe Corp.
Contact: Andrew Higgins
Address: 97 Troop Ave.
Dartmouth, NS
Phone: 902.468.6486 Fax: 902.468.4919
Client Project #: P-0012285-0-16-200
AGAT Quotation: Cartwright - Att: Janetta Fraser
Please Note: If quotation number is not provided client will be billed full price for analysis.

Report Information (Please print):
1. Name: Andrew Higgins
Email: andrew.higgins@englobecorp.com
2. Name: Christina Caldwell
Email: christina.caldwell@englobecorp.com

Report Format
☐ Single Sample per page
☐ Multiple Samples per page
☑ Excel Format Included
☐ Export
2010 EQD Format

Turnaround Time Required (TAT)
Regular TAT ☑ 5 to 7 working days
Rush TAT ☐ Same day ☐ 1 day ☐ 2 days ☐ 3 days
Date Required: _____

Invoice To Same Yes ☑ / No ☐
Company:
Contact:
Address:
Phone: Fax:
PO/Credit Card#:

Regulatory Requirements (Check):
☐ List Guidelines on Report ☐ Do not list Guidelines on Report
☐ PIRI
☐ Tier 1 ☐ Res ☐ Pot ☐ Coarse
☐ Tier 2 ☐ Com ☐ N/Pot ☐ Fine
☐ Gas ☐ Fuel ☐ Lube
☐ CCME ☐ CDWQ
☐ Industrial ☐ NSEQS-Cont Sites
☐ Commercial ☐ HRM 101
☐ Res/Park ☐ Storm Water
☐ Agricultural ☐ Waste Water
☐ FWAL
☐ Sediment ☐ Other

Drinking Water Sample: ☐ Yes ☐ No **Salt Water Sample** ☐ Yes ☐ No
Reg. No.: _____

Sample Identification	Date/Time Sampled	Sample Matrix	# Containers	Comments – Site/Sample Info. Sample Containment	Field Filtered/Preserved	Standard Water Analysis	Metals: ☐ Total ☐ Diss ☐ Available	Mercury	☐ BOD ☐ CBOD	pH	☐ TSS ☐ TDS ☐ VSS	TKN	Total Phosphorus	Phenols	Tier 1: TPH/BTEX (PIRI) ☐ low level	Tier 2: TPH/BTEX Fractionation	CCME-CWS TPH/BTEX	VOC	THM	HAA	PAH	PCB	TC + EC ☐ P/A = MPN ☐ MF	☐ HPC ☐ Pseudomonas	Fecal Coliform ☐ MPN ☐ MF	Other: Hold	Other:	Hazardous (Y/N)
CWT-TP15-18-D/1	To Follow	Soil		1																						X	
CWT-TP15-18-D/2	Aug 16-2018			1																						X	
CWT-TP15-18-D/3				1																	X						
CWT-TP15-18-F-A/1				1																						X	
CWT-TP15-18-F-A/2				1																						X	
CWT-TP15-18-F-A/3				1																	X						
CWT-TP15-18-E/1				1																						X	
CWT-TP15-18-E/2				1																						X	
CWT-TP15-18-E/3	Aug 16-2018			1																	X						
CWT-TP17-18-A/1				1																	X						
CWT-TP17-18-B/1				1																	X						
CWT-TP17-18-C/1				1																	X						

Sampled By (Print Name): Andrew Higgins
Sampled By (Signature):
Date/Time: 23 Aug 2018
Date/Time: 1315
Samples Received By (Print Name):
Samples Received By (Sign):
Date/Time: 23 Aug 18
Date/Time: 1315

Pink Copy - Client
Yellow Copy - AGAT
White Copy - AGAT

Page 9 of 13
N°: 063916

Date revised: May 19, 2016

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Dartmouth, NS
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Chain of Custody Record

Laboratory Use Only
Arrival Condition: ☐ Good ☐ Poor (see notes)
Arrival Temperature:
Hold Time:
AGAT Job Number:
Notes:

Report Information
Company: Englobe Corp.
Contact: Andrew Higgins
Address: 97 Troop Ave.
Dartmouth, NS
Phone: 902.468.6486 Fax: 902.468.4919
Client Project #: P-001285-0-16-200
AGAT Quotation: Caltwright – Att: Janetta Fraser
Please Note: If quotation number is not provided client will be billed full price for analysis

Report Information (Please print):
1. Name: Andrew Higgins
Email: andrew.higgins@englobecorp.com
2. Name: Christina Caldwell
Email: christina.caldwell@englobecorp.com

Report Format
☐ Single Sample per page
☐ Multiple Samples per page
☑ Excel Format Included
☐ Export
Gold EDD Format

Turnaround Time Required (TAT)
Regular TAT ☑ 5 to 7 working days
Rush TAT ☐ Same day ☐ 1 day ☐ 2 days ☐ 3 days
Date Required:

Invoice To Same Yes ☑ / No ☐
Company:
Contact:
Address:
Phone: Fax:
PO/Credit Card#:

Regulatory Requirements (Check):
☐ List Guidelines on Report ☐ Do not list Guidelines on Report
☐ PIRI
☐ Tier 1 ☐ Res ☐ Pot ☐ Coarse
☐ Tier 2 ☐ Com ☐ N/Pot ☐ Fine
☐ Gas ☐ Fuel ☐ Lube
☐ CCME ☐ CDWQ
☐ Industrial ☐ NSEQS-Cont Sites
☐ Commercial ☐ HRM 101
☐ Res/Park ☐ Storm Water
☐ Agricultural ☐ Waste Water
☐ FWAL
☐ Sediment ☐ Other

Drinking Water Sample: ☐ Yes ☐ No **Salt Water Sample** ☐ Yes ☐ No
Reg. No.:

Sample Identification	Date/Time Sampled	Sample Matrix	# Containers	Comments – Site/Sample Info, Sample Containment
CWT-TP17-18-D1	Aug 16 - 2018 To Follow	Soil		
CWT-MW14/1				
CWT-MW15/1				
CWT-TP30-18-A11	Aug 17 - 2018			
CWT-TP30-18-A12				
CWT-TP30-18-B11				
CWT-TP30-18-B12				
CWT-TP30-18-C1				
CWT-TP30-18-C2				
CWT-TP30-18-D1				
CWT-TP30-18-D2				
CWT-TP25-18-A1				

Field Filtered/Preserved	Standard Water Analysis	Metals: ☐ Total ☐ Diss ☐ Available	Mercury	☐ BOD ☐ CBOD	pH	☐ TSS ☐ TDS ☐ VSS	TKN	Total Phosphorus	Phenols	Tier 1: TPH/BTEX (PIRI) ☐ low level	Tier 2: TPH/BTEX Fractionation	CCME-CWS TPH/BTEX	VOC	THM	HAA	PAH	PCB	TC + EC ☐ P/A ☐ MPN ☐ MF	☐ HPC ☐ Pseudomonas	Fecal Coliform ☐ MPN ☐ MF	Other: Hold	Other:	Hazardous (Y/N)
																X							
																X							
																X							
																					X		
																X							
																					X		
																X							
																					X		
																X							
																					X		
																X							
																					X		

Sampled By (Print Name): Andrew Higgins
Date/Time: 23 Aug 2018
Time: 1315
Samples Received By (Print Name):
Samples Received By (Sign):
Date/Time: 23/Aug/18
Time: 1315

Pink Copy - Client
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No: 063917

Date revised: May 19, 2016

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Chain of Custody Record

Laboratory Use Only
Arrival Condition: ☐ Good ☐ Poor (see notes)
Arrival Temperature: _____
Hold Time: _____
AGAT Job Number: _____
Notes:

Report Information
Company: Englobe Corp.
Contact: Andrew Higgins
Address: 47 Troop Ave
Dartmouth, NS
Phone: 902.468.6486 Fax: 902.468.4919
Client Project #: P-0012285-0-16-200
AGAT Quotation: Cartwright – Att: Janetta Fraser
Please Note: If quotation number is not provided client will be billed full price for analysis

Report Information (Please print):
1. Name: Andrew Higgins
Email: andrew.higgins@englobecorp.com
2. Name: Christina Caldwell
Email: christina.caldwell@englobecorp.com

Report Format
☐ Single Sample per page
☐ Multiple Samples per page
☑ Excel Format Included
☐ Export
Add EDD Format

Turnaround Time Required (TAT)
Regular TAT ☑ 5 to 7 working days
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Date Required: _____

Invoice To Same Yes ☑ No ☐
Company:
Contact:
Address:
Phone: Fax:
PO/Credit Card#:

Regulatory Requirements (Check):
☐ List Guidelines on Report ☐ Do not list Guidelines on Report
☐ PIRI
☐ Tier 1 ☐ Res ☐ Pot ☐ Coarse
☐ Tier 2 ☐ Com ☐ N/Pot ☐ Fine
☐ Gas ☐ Fuel ☐ Lube
☐ CCME ☐ CDWQ
☐ Industrial ☐ NSEQS-Cont Sites
☐ Commercial ☐ HRM 101
☐ Res/Park ☐ Storm Water
☐ Agricultural ☐ Waste Water
☐ FWAL
☐ Sediment ☐ Other

Drinking Water Sample: ☐ Yes ☐ No **Salt Water Sample** ☐ Yes ☐ No
Reg. No.: _____

Sample Identification	Date/Time Sampled	Sample Matrix	# Containers	Comments - Site/Sample Info. Sample Containment	Field Filtered/Preserved	Standard Water Analysis	Metals: ☐ Total ☐ Diss ☐ Available	Mercury	☐ BOD ☐ CBOD	pH	☐ TSS ☐ TDS ☐ VSS	TKN	Total Phosphorus	Phenols	Tier 1: TPH/BTEX (PIRI) ☐ low level	Tier 2: TPH/BTEX Fractionation	CCME-CWS TPH/BTEX	VOC	THM	HAA	PAH	PCB	TC + EC ☐ P/A ☐ MPN ☐ MF	☐ HPC ☐ Pseudomonas	Fecal Coliform ☐ MPN ☐ MF	Other: Hold	Other: Zinc	Hazardous (Y/N)
CWT-TP25-18-A2	To Follow	Soil																			X				X		
CWT-TP25-18-B1	Aug 17 2018																										
CWT-TP25-18-B2																					X				X		
CWT-TP25-18-C1																											
CWT-TP25-18-C2																					X				X		
CWT-TP25-18-D1	Aug 17 2018																										
CWT-TP25-18-D2																					X				X		
CWT-SS16-18-A1																											
CWT-SS16-18-A2																										X	
CWT-SS16-18-B1																									X		
CWT-SS16-18-B2																										X	
CWT-SS16-18-C1																									X		

Samples Relinquished By (Print Name): Andrew Higgins
Samples Relinquished By (Sign): Andrew Higgins
Date/Time: 23 Aug 2018
Time: 1315
Samples Received By (Print Name):
Samples Received By (Sign):
Date/Time: 23/Aug/18
Time: 1315

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Page 11 of 13
N°: 063918

Date revised: May 19, 2016

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Chain of Custody Record

Laboratory Use Only
Arrival Condition: ☐ Good ☐ Poor (see notes)
Arrival Temperature:
Hold Time:
AGAT Job Number:
Notes:

Report Information
Company: Englobe Corp.
Contact: Andrew Higgins
Address: 97 Troop Ave.
Dartmouth, NS
Phone: 902.468.6486 Fax: 902.468.4919
Client Project #: P-00 12285-0-16-200
AGAT Quotation: Cartwright – Att: Janetta Fraser
Please Note: If quotation number is not provided client will be billed full price for analysis.

Report Information (Please print):
1. Name: Andrew Higgins
Email: andrew.higgins@englobecorp.com
2. Name: Christina Caldwell
Email: christina.caldwell@englobecorp.com

Report Format
☐ Single Sample per page
☐ Multiple Samples per page
☑ Excel Format Included
☐ Export
Zero EDD Format

Turnaround Time Required (TAT)
Regular TAT ☑ 5 to 7 working days
Rush TAT ☐ Same day ☐ 1 day ☐ 2 days ☐ 3 days
Date Required:

Regulatory Requirements (Check):
☐ List Guidelines on Report ☐ Do not list Guidelines on Report
☐ PIRI
☐ Tier 1 ☐ Res ☐ Pot ☐ Coarse
☐ Tier 2 ☐ Com ☐ N/Pot ☐ Fine
☐ Gas ☐ Fuel ☐ Lube
☐ CCME
☐ Industrial
☐ Commercial
☐ Res/Park
☐ Agricultural
☐ FWAL
☐ Sediment
☐ CDWQ
☐ NSEQS-Cont Sites
☐ HRM 101
☐ Storm Water
☐ Waste Water
☐ Other

Drinking Water Sample: ☐ Yes ☐ No Salt Water Sample ☐ Yes ☐ No
Reg. No.:

Invoice To Same Yes ☐ / No ☐
Company:
Contact:
Address:
Phone: Fax:
PO/Credit Card#:

Sample Identification	Date/Time Sampled	Sample Matrix	# Containers	Comments – Site/Sample Info. Sample Containment	Field Filtered/Preserved	Standard Water Analysis	Metals: ☐ Total ☐ Diss ☐ Available	Mercury	☐ BOD ☐ CBOD	pH	☐ TSS ☐ TDS ☐ VSS	TKN	Total Phosphorus	Phenols	Tier 1: TPH/BTEX (PIRI) ☐ low level	Tier 2: TPH/BTEX Fractionation	CCME-CWS TPH/BTEX	VOC	THM	HAA	PAH	PCB	TC + EC ☐ P/A ☐ MPN ☐ MF	☐ HPC ☐ Pseudomonas	Fecal Coliform ☐ MPN ☐ MF	Other: Hold	Other: Zinc/cadmium	Hazardous (Y/N)
CWT-SS16-18-C2	To Follow	Soil	1	*																						X		
CWT-SS32-18-A	Aug 17-2018		1	*																							X	
CWT-SS32-18-B			1																								X	
CWT-SS32-18-C			1																								X	
CWT-SS32-18-D			1																								X	
CWT-MW14/Dup			1																		X							
CWT-SS16-18-B/2 Dup			1	Only zinc																							X	
CWT-TP25-18-A/2 Dup	Aug 17-2018		1																		X							
CWT-TP35-18A Dup	Aug 18/18		3												X													
CWT-TP41-18B Dup	" "		3												X													

Samples Relinquished By (Print Name): Andrew Higgins
Date/Time: 23 Aug 2018
Samples Received By (Print Name): [signature]
Date/Time: 23 Aug 18
Samples Relinquished By (Sign): [signature]
Date/Time: 1315
Samples Received By (Sign):
Date/Time: 1315

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Page 12 of 13
Nº: 063919

Date revised: May 19, 2016

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Chain of Custody Record

Laboratory Use Only
Arrival Condition: ☐ Good ☐ Poor (see notes)
Arrival Temperature: _____
Hold Time: _____
AGAT Job Number: _____
Notes:

Report Information
Company: Englobe Corp.
Contact: 197 Troop Ave. | Andrew Higgins
Address: Dartmouth, NS
Phone: 902.468.6486 Fax: 902.468.4918
Client Project #: P-0012285-0-16-200
AGAT Quotation: Cartwright – Att: Janetta Fraser
Please Note: If quotation number is not provided client will be billed full price for analysis.

Report Information (Please print):
1. Name: Andrew Higgins
Email: andrew.higgins@englobecorp.com
2. Name: Christina Caldwell
Email: christina.caldwell@englobecorp.com

Report Format
☐ Single Sample per page
☐ Multiple Samples per page
☑ Excel Format included
☐ Export
Polo EDD Format

Turnaround Time Required (TAT)
Regular TAT ☑ 5 to 7 working days
Rush TAT ☐ Same day ☐ 1 day ☐ 2 days ☐ 3 days
Date Required: _____

Invoice To Same Yes ☐ / No ☐
Company:
Contact:
Address:
Phone: Fax:
PO/Credit Card#:

Regulatory Requirements (Check):
☐ List Guidelines on Report ☐ Do not list Guidelines on Report
☐ PIRI
☐ Tier 1 ☐ Res ☐ Pot ☐ Coarse
☐ Tier 2 ☐ Com ☐ N/Pot ☐ Fine
☐ Gas ☐ Fuel ☐ Lube
☐ CCME ☐ CDWQ
☐ Industrial ☐ NSEQS-Cont Sites
☐ Commercial ☐ HRM 101
☐ Res/Park ☐ Storm Water
☐ Agricultural ☐ Waste Water
☐ FWAL ☐ Other
☐ Sediment

Drinking Water Sample: ☐ Yes ☐ No **Salt Water Sample** ☐ Yes ☐ No
Reg. No.: _____

Sample Identification	Date/Time Sampled	Sample Matrix	# Containers	Comments - Site/Sample Info. Sample Containment	Field Filtered/Preserved	Standard Water Analysis	Metals: ☐ Total ☐ Diss ☐ Available	Mercury	☐ BOD ☐ CBOD	pH	☐ TSS ☐ TDS ☐ VSS	TKN	Total Phosphorus	Phenols	Tier 1: TPH/BTEX (PIRI) ☐ low level	Tier 2: TPH/BTEX Fractionation	CCME-CWS TPH/BTEX	VOC	THM	HAA	PAH	PCB	TC + EC ☐ P/A ☐ MPN ☐ MF	☐ HPC ☐ Pseudomonas	Fecal Coliform ☐ MPN ☐ MF	Other:	Other:	Hazardous (Y/N)
CWT-MW5-18	To Follow	GW		6	X	X	X	X							X						X						
CWT-MW4-18				6	X	X	X	X							X						X						
CWT-MW10-18				6	X	X	X	X							X						X						
CWT-MW9-18				6	X	X	X	X							X						X						
CWT-MW-Dup1				6	X	X	X	X							X						X						
CWT-MW6-18				6	X	X	X	X							X						X						
CWT-MW12-18				6	X	X	X	X							X						X						

Samples Relinquished By (Print Name): Andrew Higgins
Date/Time: 23 Aug 2018
Time: 1315
Samples Received By (Print Name):
Samples Received By (Sign):
Date/Time: 23/Aug/18
Time: 1315

Pink Copy - Client
Yellow Copy - AGAT
White Copy - AGAT

N°: 063920

Date revised: May 19, 2016

Maxxam
A Bureau Veritas Group Company

Your Project #: P-12285-0-16-200
Site Location: CARTWRIGHT
Your C.O.C. #: D30884

Attention: Andrew Higgins

Englobe Corp
97 Troop Ave
Dartmouth, NS
CANADA B3B 2A7

Report Date: 2018/09/20
Report #: R5407773
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B8N9746
Received: 2018/09/12, 15:22

Sample Matrix: Vegetation
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Metals in Terrestrial Biota	3	2018/09/18	2018/09/19	ATL SOP 00058	EPA 6020A R1 m
PCBs in soil by GC/ECD (1)	3	2018/09/17	2018/09/19	ATL SOP 00106	EPA 8082A 2007 m
PCB Aroclor sum (soil)	3	N/A	2018/09/19	N/A	Auto Calc.

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

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

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam 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 Maxxam, unless otherwise agreed in writing. Maxxam 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 Maxxam, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Soils are reported on a dry weight basis unless otherwise specified.

Maxxam
A Bureau Veritas Group Company

Your Project #: P-12285-0-16-200
Site Location: CARTWRIGHT
Your C.O.C. #: D30884

Attention: Andrew Higgins

Englobe Corp
97 Troop Ave
Dartmouth, NS
CANADA B3B 2A7

Report Date: 2018/09/20
Report #: R5407773
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B8N9746
Received: 2018/09/12, 15:22

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Keri Mackay, Senior Project Manager
Email: kmackay@maxxam.ca
Phone# (902)420-0203 Ext:294

==========

This report has been generated and distributed using a secure automated process.
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Job #: B8N9746
Report Date: 2018/09/20

Englobe Corp
Client Project #: P-12285-0-16-200
Site Location: CARTWRIGHT
Sampler Initials: AR

ELEMENTS BY ATOMIC SPECTROSCOPY (VEGETATION)

Maxxam ID		HTD240	HTD242	HTD243	HTD243			
Sampling Date		2018/08/24	2018/08/24	2018/08/24	2018/08/24			
COC Number		D30884	D30884	D30884	D30884			
	UNITS	CWT-VEG-BK01	CWT-VEG-BK03	CWT-VEG-BK04	CWT-VEG-BK04 Lab-Dup	RDL	QC Batch	MDL
Metals								
Acid Extractable Aluminum (Al)	mg/kg	190	150	230	210	10	5736632	N/A
Acid Extractable Antimony (Sb)	mg/kg	<2.0	<2.0	<2.0	<2.0	2.0	5736632	N/A
Acid Extractable Arsenic (As)	mg/kg	<2.0	<2.0	<2.0	<2.0	2.0	5736632	N/A
Acid Extractable Barium (Ba)	mg/kg	27	23	69	68	5.0	5736632	N/A
Acid Extractable Beryllium (Be)	mg/kg	<2.0	<2.0	<2.0	<2.0	2.0	5736632	N/A
Acid Extractable Boron (B)	mg/kg	12	13	38	36	5.0	5736632	N/A
Acid Extractable Cadmium (Cd)	mg/kg	<0.30	<0.30	<0.30	<0.30	0.30	5736632	N/A
Acid Extractable Chromium (Cr)	mg/kg	<2.0	<2.0	12	9.2	2.0	5736632	N/A
Acid Extractable Cobalt (Co)	mg/kg	<1.0	<1.0	<1.0	<1.0	1.0	5736632	N/A
Acid Extractable Copper (Cu)	mg/kg	3.6	4.5	6.5	6.5	2.0	5736632	N/A
Acid Extractable Iron (Fe)	mg/kg	470	1000	950	890	50	5736632	N/A
Acid Extractable Lead (Pb)	mg/kg	5.8	6.8	45	37	0.50	5736632	N/A
Acid Extractable Lithium (Li)	mg/kg	<2.0	<2.0	<2.0	<2.0	2.0	5736632	N/A
Acid Extractable Manganese (Mn)	mg/kg	440	130	75	77	2.0	5736632	N/A
Acid Extractable Molybdenum (Mo)	mg/kg	<2.0	<2.0	<2.0	<2.0	2.0	5736632	N/A
Acid Extractable Nickel (Ni)	mg/kg	<2.0	2.3	<2.0	<2.0	2.0	5736632	N/A
Acid Extractable Selenium (Se)	mg/kg	<2.0	<2.0	<2.0	<2.0	2.0	5736632	N/A
Acid Extractable Silver (Ag)	mg/kg	<0.50	<0.50	<0.50	<0.50	0.50	5736632	N/A
Acid Extractable Strontium (Sr)	mg/kg	29	29	69	68	5.0	5736632	N/A
Acid Extractable Thallium (Tl)	mg/kg	<0.10	<0.10	<0.10	<0.10	0.10	5736632	N/A
Acid Extractable Uranium (U)	mg/kg	<0.10	<0.10	<0.10	<0.10	0.10	5736632	N/A
Acid Extractable Vanadium (V)	mg/kg	<2.0	<2.0	<2.0	<2.0	2.0	5736632	N/A
Acid Extractable Zinc (Zn)	mg/kg	64	62	100	91	5.0	5736632	N/A

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics 200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel: 902-420-0203 Toll-free: 800-565-7227 Fax: 902-420-8612 www.maxxamanalytics.com

Maxxam Job #: B8N9746
Report Date: 2018/09/20

Englobe Corp
Client Project #: P-12285-0-16-200
Site Location: CARTWRIGHT
Sampler Initials: AR

POLYCHLORINATED BIPHENYLS BY GC-ECD (VEGETATION)

Maxxam ID		HTD240				HTD240			
Sampling Date		2018/08/24				2018/08/24			
COC Number		D30884				D30884			
	UNITS	CWT-VEG-BK01	RDL	QC Batch	MDL	CWT-VEG-BK01 Lab-Dup	RDL	QC Batch	MDL
PCBs									
Aroclor 1016	ug/g	<0.25	0.25	5735126	N/A	<0.25	0.25	5735126	N/A
Aroclor 1221	ug/g	<0.25	0.25	5735126	N/A	<0.25	0.25	5735126	N/A
Aroclor 1232	ug/g	<0.25	0.25	5735126	N/A	<0.25	0.25	5735126	N/A
Aroclor 1248	ug/g	<0.25	0.25	5735126	N/A	<0.25	0.25	5735126	N/A
Aroclor 1242	ug/g	<0.25	0.25	5735126	N/A	<0.25	0.25	5735126	N/A
Aroclor 1254	ug/g	<0.25	0.25	5735126	N/A	<0.25	0.25	5735126	N/A
Aroclor 1260	ug/g	<0.25	0.25	5735126	N/A	<0.25	0.25	5735126	N/A
Calculated Total PCB	ug/g	<0.25	0.25	5731321	N/A				
Surrogate Recovery (%)									
Decachlorobiphenyl	%	82 (1)		5735126		82 (1)		5735126	

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable
(1) Elevated PCB RDL due to matrix / co-extractive interference. PCB sample analysed past recommended hold time as per client request.

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Maxxam Job #: B8N9746
Report Date: 2018/09/20

Englobe Corp
Client Project #: P-12285-0-16-200
Site Location: CARTWRIGHT
Sampler Initials: AR

POLYCHLORINATED BIPHENYLS BY GC-ECD (VEGETATION)

Maxxam ID		HTD242	HTD243			
Sampling Date		2018/08/24	2018/08/24			
COC Number		D30884	D30884			
	UNITS	CWT-VEG-BK03	CWT-VEG-BK04	RDL	QC Batch	MDL
PCBs						
Aroclor 1016	ug/g	<0.25	<0.25	0.25	5735126	N/A
Aroclor 1221	ug/g	<0.25	<0.25	0.25	5735126	N/A
Aroclor 1232	ug/g	<0.25	<0.25	0.25	5735126	N/A
Aroclor 1248	ug/g	<0.25	<0.25	0.25	5735126	N/A
Aroclor 1242	ug/g	<0.25	<0.25	0.25	5735126	N/A
Aroclor 1254	ug/g	<0.25	<0.25	0.25	5735126	N/A
Aroclor 1260	ug/g	<0.25	<0.25	0.25	5735126	N/A
Calculated Total PCB	ug/g	<0.25	<0.25	0.25	5731321	N/A
Surrogate Recovery (%)						
Decachlorobiphenyl	%	81 (1)	89 (2)		5735126	

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

N/A = Not Applicable

(1) Elevated PCB RDL due to matrix / co-extractive interference. PCB sample analysed past recommended hold time as per client request.

(2) Elevated PCB RDL due to matrix / co-extractive interference.
PCB sample analysed past recommended hold time as per client request.

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Maxxam Job #: B8N9746
Report Date: 2018/09/20

Englobe Corp
Client Project #: P-12285-0-16-200
Site Location: CARTWRIGHT
Sampler Initials: AR

TEST SUMMARY

Maxxam ID: HTD240
Sample ID: CWT-VEG-BK01
Matrix: Vegetation

Collected: 2018/08/24
Shipped:
Received: 2018/09/12

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals in Terrestrial Biota	FICP/MS	5736632	2018/09/18	2018/09/19	Bryon Angevine
PCBs in soil by GC/ECD	GC/ECD	5735126	2018/09/17	2018/09/19	Ryan Greenham
PCB Aroclor sum (soil)	CALC	5731321	N/A	2018/09/19	Automated Statchk

Maxxam ID: HTD240 Dup
Sample ID: CWT-VEG-BK01
Matrix: Vegetation

Collected: 2018/08/24
Shipped:
Received: 2018/09/12

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
PCBs in soil by GC/ECD	GC/ECD	5735126	2018/09/17	2018/09/19	Ryan Greenham

Maxxam ID: HTD242
Sample ID: CWT-VEG-BK03
Matrix: Vegetation

Collected: 2018/08/24
Shipped:
Received: 2018/09/12

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals in Terrestrial Biota	FICP/MS	5736632	2018/09/18	2018/09/19	Bryon Angevine
PCBs in soil by GC/ECD	GC/ECD	5735126	2018/09/17	2018/09/19	Ryan Greenham
PCB Aroclor sum (soil)	CALC	5731321	N/A	2018/09/19	Automated Statchk

Maxxam ID: HTD243
Sample ID: CWT-VEG-BK04
Matrix: Vegetation

Collected: 2018/08/24
Shipped:
Received: 2018/09/12

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals in Terrestrial Biota	FICP/MS	5736632	2018/09/18	2018/09/19	Bryon Angevine
PCBs in soil by GC/ECD	GC/ECD	5735126	2018/09/17	2018/09/19	Ryan Greenham
PCB Aroclor sum (soil)	CALC	5731321	N/A	2018/09/19	Automated Statchk

Maxxam ID: HTD243 Dup
Sample ID: CWT-VEG-BK04
Matrix: Vegetation

Collected: 2018/08/24
Shipped:
Received: 2018/09/12

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals in Terrestrial Biota	FICP/MS	5736632	2018/09/18	2018/09/19	Bryon Angevine

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Maxxam Job #: B8N9746
Report Date: 2018/09/20

Englobe Corp
Client Project #: P-12285-0-16-200
Site Location: CARTWRIGHT
Sampler Initials: AR

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Acid Extractable Uranium (U)	2018/09/19	NC		%	35
			Acid Extractable Vanadium (V)	2018/09/19	NC		%	35
			Acid Extractable Zinc (Zn)	2018/09/19	13		%	35

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

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

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

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

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

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

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Maxxam Job #: B8N9746
Report Date: 2018/09/20

Englobe Corp
Client Project #: P-12285-0-16-200
Site Location: CARTWRIGHT
Sampler Initials: AR

VALIDATION SIGNATURE PAGE

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

Eric Dearman, Scientific Specialist

Rosemarie MacDonald, Scientific Specialist (Organics)

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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200 Bluewater Road, Suite 105, Bedford, Nova Scotia B4B 1G9 Tel: 902-420-0203 Fax: 902-420-8612 Toll Free: 1-800-565-7227
49-55 Elizabeth Avenue, St John's, NL A1A 1W9 Tel: 709-754-0203 Fax: 709-754-8612 Toll Free: 1-888-492-7227
465 George Street,Unit G,Sydney, NS B1P 1K5 Tel: 902-567-1255 Fax: 902-539-6504 Toll Free: 1-888-535-7770
www.maxxam.ca E-mail: Customerservicebedford@maxxam.ca

ATL FCD 00149 / 22

CHAIN OF CUSTODY RECORD

COC #: D30884 Page 1 of 1

Invoice Information	Report Information (if differs from invoice)	Project Information (where applicable)	Turnaround Time (TAT) Required
Company Name: Englobe	Company Name:	Quotation #:	☑ Regular TAT (5 business days) Most analyses
Contact Name: Andrew Higgins	Contact Name:	P.O. #:	PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS
Address: 97 Troop Ave. Dtmth. Postal Code: B3B-2A7	Address: Postal Code:	Project #: P-12285-016-200.	IF RUSH please specify date (Surcharges will be applied)
Phone: 902-468-6486 Fax:	Phone: Fax:	Site Location: Cartwright.	DATE REQUIRED:
Email: Andrew.Higgins@Englobecorp.com	Email:	Site #:	
		Sampled By: Alexis Robitaille	

Laboratory Use Only

CUSTODY SEAL Present	CUSTODY SEAL Intact	COOLER TEMPERATURES	COOLER TEMPERATURES
		20, 20, 20	

COOLING MEDIA PRESENT Y / N

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

Analysis Requested

	SAMPLE IDENTIFICATION	DATE SAMPLED (YYYY/MM/DD)	TIME SAMPLED (HH:MM)	MATRIX	# OF CONTAINERS SUBMITTED	FIELD FILTERED &PRESERVED	LAB FILTRATION REQUIRED	RCAP-MS [Total Metals] Well / Surface water	RCAP-MS [Dissolved Metals] Ground waters	Metals (Water): Total Digest (Default Method) for well water & surface water	Metals (Water): Dissolved for ground water	Metals (Water): Mercury (CIRCLE) TOTAL / DISSOLVED	Metals (Soil): Metals & Mercury Default Acid Extractable (Available) Digest	Metals (Soil): Metals Total Digest -for Ocean sediments (HNO3/HF/HClO4)	Metals (Soil): Mercury Low level by Cold Vapour AA	Metals (Soil): Hot Water Soluble Boron (required for CCME Agricultural/ Landfill)	RBCA Hydrocarbons (BTEX, C6-C32)	Hydrocarbons Soil (Potable), NS Fuel Oil Spill Policy Low Level BTEX ,C6-C32	CCME Hydrocarbons (CWS=PHC F1/BTEX, F2-F4)	NB Potable Water BTEX, VPH, Low level T.E.H	PAHs (Default for water/soil)	PAHs (PWAL /CCME Sediment)	PCBs	VOCs	Total Coliform/E.coli (Presence/Absence)	Total Coliform/E.Coli (Count)		HOLD- DO NOT ANALYZE
1	CWT-VEG-BK01	2018/08/24		Vegetation									X										X				
2	CWT-VEG-BK02	↓		↓									X										X				
3	CWT-VEG-BK03												X										X				
4	CWT-VEG-BK04												X										X				
5																											
6																											
7																											
8																											
9																											
10																											

Regulatory Requirements (Specify)

COMMENTS

*Homogenize Sample and notify of weight should there not be sufficient sample for complete analysis

SEP 12 15:22

RELINQUISHED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)	RECEIVED BY:(Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)	MAXXAM JOB #
Andrew Higgins	2018/09/12	3:20	DHilbert			B8N9746

Unless otherwise agreed to in writing, work submitted on this Chain of Custody is subject to Maxxam's standard Terms and Conditions. Signing of this Chain of Custody document is acknowledgment and acceptance of our terms which are available for viewing at www.maxxam.ca/terms.

White: Maxxam Pink: Client

AGAT Laboratories

11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
http://www.agatlabs.com

CLIENT NAME: ENGLOBE CORP
97 TROOP AVE
DARTMOUTH, NS B3B2A7
(902) 468-6486

ATTENTION TO: Andrew Higgins

PROJECT:

AGAT WORK ORDER: 18X387912

ASBESTOS REVIEWED BY: Whenhong Zou, Lab Analyst

DATE REPORTED: Sep 25, 2018

PAGES (INCLUDING COVER): 4

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (902) 468-8718

*NOTES

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

Member of: Association of Professional Engineers and Geoscientists of Alberta (APEGA)
Western Enviro-Agricultural Laboratory Association (WEALA)
Environmental Services Association of Alberta (ESAA)

AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation.

Results relate only to the items tested and to all the items tested
All reportable information as specified by ISO 17025:2005 is available from AGAT Laboratories upon request

AGAT Laboratories

11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 18X387912

PROJECT:

CLIENT NAME: ENGLOBE CORP

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

Bulk Asbestos

DATE RECEIVED: 2018-09-21

DATE REPORTED: 2018-09-25

Parameter	Unit	G / S	RDL	CWT-ASG1-Tar Paper Soil 2018-09-15 9564174	CWT-ASG2-Roofing Shingle Soil 2018-09-15 9564175	CWT-ASG3-Insulation Soil 2018-09-15 9564177
SAMPLE DESCRIPTION:				CWT-ASG1-Tar Paper	CWT-ASG2-Roofing Shingle	CWT-ASG3-Insulation
SAMPLE TYPE:				Soil	Soil	Soil
DATE SAMPLED:				2018-09-15	2018-09-15	2018-09-15
Asbestos (Bulk)	%	0.5	0.5	15-30	1-5	30-50

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to ON OHSA - Reg. 278
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

9564174-9564177 Condition of sample was satisfactory at time of arrival in laboratory. Analysis done at AGAT 5623 McAdam Road Mississauga location.

Asbestos Present: Chrysotile

Analysis performed at AGAT Toronto

Certified By: Wenhong Zou

Results relate only to the items tested and to all the items tested

AGAT Laboratories

11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
http://www.agatlabs.com

Method Summary

CLIENT NAME: ENGLOBE CORP

AGAT WORK ORDER: 18X387912

PROJECT:

ATTENTION TO: Andrew Higgins

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Asbestos (Bulk)	INORG 93-6010	EPA 600/R-93/116 & NIOSH 9002	PLM

Results relate only to the items tested and to all the items tested

AGAT Laboratories

Unit 122 • 11 Morris Drive
Dartmouth, NS
B3B 1M2
webearth.agatlabs.com • www.agatlabscom
P: 902.468.8718 • F: 902.468.8924

Chain of Custody Record

Laboratory Use Only
Arrival Condition: ☐ Good ☐ Poor (see notes)
Arrival Temperature: N/A
AGAT Job Number: 18X387912
Notes:

Report Information
Company: Englobe.
Contact: Andrew Higgins
Address:
Phone: Fax:
LSD:
Client Project #:

Report Information
1. Name: Andrew Higgins
Email: Andrew.Higgins@Englobecorp.com
2. Name:
Email:

Report Format
☐ Single Sample per page
☑ Multiple Samples per page
☑ Excel Format Included

Turnaround Time Required (TAT)
Regular TAT ☑ 5 to 7 working days
Rush TAT ☐ Same day ☐ 1 day ☐ 2 days ☐ 3 days
Date Required:

Invoice To Same Yes☐ / No☐
Company:
Contact:
Address:
Phone: Fax:
PO/Credit Card#:

Regulatory Requirements (Check):
☐ List Guidelines on Report ☑ Do not list Guidelines on Report
☐ PIRI
☐ Tier 1 ☐ Res ☐ Pot ☐ Coarse
☐ Tier 2 ☐ Com ☐ N/Pot ☐ Fine
☐ Gas ☐ Fuel ☐ Lube
☐ CCME ☐ CDWQ
☐ Industrial ☑ NSDFOSP
☐ Commercial ☐ HRM 101
☐ Res/Park ☐ Storm Water
☐ Agricultural ☐ Waste Water
☐ FWAL
☐ Sediment ☐ Other

Drinking Water Sample: ☐ Yes ☐ No
Reg. No.:

Sample Identification	Date/Time Sampled	Sample Matrix	# Containers	Comments – Site/Sample Info. Sample Containment	Field Filtered/Preserved	Standard Water Analysis	Metals: ☐ Total ☐ Diss ☐ Available	Mercury	☐ BOD ☐ CBOD	pH	☐ TSS ☐ TDS ☐ VSS	TKN	Total Phosphorus	Phenols	Tier 1: TPH/BTEX (PIRI)	Tier 2: TPH/BTEX Fractionation	CCME-CWS TPH/BTEX	VOC	THM	HAA	PAH	PCB	Tot. Coliforms + E.Coli (Presence/Absence)	Total Coliforms + E.Coli (MPN)	Fecal Coliform (MF)	Other: Asbestos	Other:	Hazardous (Y/N)
CWT-Asb1-Tar Paper	Aug 15, 2018	Tar Paper	1																						X		
CWT-Asb2-Roofing Shingle	Aug 15, 2018	Roofing Shingle	1																						X		
CWT-Asb3-Insulation	Aug 15, 2018	Insulation	1																						X		

Samples Relinquished By (Print Name)	Date/Time	Samples Received By (Print Name)	Date/Time
Andrew Higgins	21 Sept	Tim McDonald	21-Sept
Samples Relinquished By (Sign)	Date/Time	Samples Received By (Sign)	Date/Time
	10:40		10:40

Pink Copy - Client
Yellow Copy - AGAT
White Copy- AGAT

Page 1 of 1
N°: 39296

Document ID: DIV-133-1501,001
Date revised: January 4, 2013

Appendix F NCSCS Scoring

CCME National Classification System for Contaminated Sites (2008) version 1.3
Pre-Screening Checklist

Question	Response (yes / no)	Comment
1. Are **Radioactive material**, **Bacterial contamination** or **Biological hazards** likely to be present at the site?	No	If yes, do not proceed through the NCSCS. Contact applicable regulatory agency immediately.
2. Are there **no contamination exceedances** (known or suspected)? Determination of exceedances may be based on: 1) CCME environmental quality guidelines; 2) equivalent provincial guidelines/standards if no CCME guideline exists for a specific chemical in a relevant medium; or 3) toxicity benchmarks derived from the literature for chemicals not covered by CCME or provincial guidelines/standards; or 4) background concentration.	No	If yes (*i.e.* , there are no exceedances), do not proceed through the NCSCS.
3. Have **partial/incompleted or no environmental site investigations** been conducted for the Site?	No	If yes, do not proceed through the NCSCS.
4. Is there direct and significant evidence of **impacts to humans** at the site, or off-site due to migration of contaminants from the site?	No	If yes, automatically rate the site as Class 1, a priority for remediation or risk management, regardless of the total score obtained should one be calculated.
5. Is there direct and significant evidence of **impacts to ecological receptors** at the site, or off-site due to migration of contaminants from the site?	No	Some low levels of impact to ecological receptors are considered acceptable, particularly on commercial and industrial land uses. However, if ecological effects are considered to be severe, the site may be categorized as Class 1, regardless of the numerical total NCSCS score. For the purpose of application of the NCSCS, effects that would be considered severe include observed effects on survival, growth or reproduction which could threaten the viability of a population of ecological receptors at the site. Other evidence that qualifies as severe adverse effects may be determined based on professional judgement and in consultation with the relevant jurisdiction.
6. Are there indicators of significant **adverse effects in the exposure zone** (*i.e* ., the zone in which receptors may come into contact with contaminants)? Some examples are as follows: -Hydrocarbon sheen or NAPL in the exposure zone -Severely stressed biota or devoid of biota; -Presence of material at ground surface or sediment with suspected high concentration of contaminants such as ore tailings, sandblasting grit, slag, and coal tar.	No	To answer “yes”, two scenarios should be satisfied; (1) there has to be a high probability that receptors will be exposed to the contaminant source in the near future, and (2) the predicted impacts to ecological receptors after exposure must be significant (see question 5). A low probability of exposure resulting in significant impacts, or a high probability of exposure but with only low to moderate effects expected should not result in a Class 1 designation, neither would a low probability of exposure resulting in low-to-moderate effects. If yes, automatically rate the site as Class 1, a priority for remediation or risk management, regardless of the total score obtained should one be calculated.
7. Do measured concentrations of volatiles or unexploded ordnances represent an **explosion hazard**?	No	If yes, do not proceed through the NCSCS. Do not continue until the safety risks have been addressed. Consult your jurisdiction's occupational health and safety guidance or legislation on exposive hazards and measurement of lower explosive limits.

Rationale for not proceeding with NCSCS
(document any assumptions, reports, or site-specific information to support selection of "Yes" in Pre-Screening checklist)

If none of the above applies, proceed with the NCSCS scoring.

CCME National Classification System for Contaminated Sites (2008) version 1.3
Summary of Site Conditions

Site:	Site will be identified by:	Site Common Name
Civic Address: *(or other description of location)*	Former USAF Radar Station, Cartwright, Newfoundland and Labrador (NL)	
Site Common Name: *(if applicable)*	Cartwright Radar Station	
Code identifier: *(e.g., FCSI 8-digit identifier)*	N/A	
Site Owner or Custodian: *(Organization and Contact Person)*	Government of Newfoundland and Labrador	
Legal description *or* metes and bounds:	See Figure 1 in Appendix A of Phase III ESA Report	
Approximate Site area:	25 hectares	
Parcel Identifier(s) [PID]: *(or Parcel Identification Numbers [PIN] if untitled Crown land)*	N/A	
Centre of site: *(provide latitude/longitude or UTM coordinates)*	Latitude:___53___ degrees ___43___ min ___29___ secs; Longitude:___56___ degrees ___57___ min ___54___ secs	
	UTM Coordinate: Northing Easting	
Site Land Use:	Current:	Commercial
	Proposed:	No Change
Site Plan	**To delineate the bounds of the Site a site plan MUST be attached. The plan must be drawn to scale indicating the boundaries in relation to well-defined reference points and/or legal descriptions. Delineation of the contamination should also be indicated on the site plan.**	
Provide a brief description of the Site:	The site is currently owned by the province of Newfoundland and Labrador and is located approximately 4 km to the northeast of the community of Cartwright, in Labrador. The site was established in 1953 as a General Surveillance Radar station, funded by the United States Air Force (USAF) and operated until 1968. The former operational areas of the site covered approximately 25 hectares. It was used to guide interceptor aircraft towards unidentified intruders as a Ground-Control Intercept (GCI) and warning station as part of the Pinetree Line. In total, the site contained four Troposcatter Communication Antennas, four Radomes, barracks and recreation facilities, all connected together as one complex on the hillside overlooking the Town of Cartwright. Fuel storage facilities were located near the community docks (known as the lower Petroleum, Oils and Lubricants (POL)) and connected to the upper POL tank at the radar site. Fuel was pumped via an aboveground pipeline to a large steel aboveground storage tank (AST) on the hill, which in turn supplied smaller ASTs for the diesel generators used to power the station. Historically, solid waste was disposed of in an unlined landfill to the east of the site which was covered and graded in 1988. Solid waste was also reportedly buried or covered in a ravine located between the main site and the main POL tank. In 1968 the USAF transferred control of the site to the Canadian Forces and the site was officially decommissioned in 1987 with the razing of the remaining buildings/structures. Only the concrete foundations of the former buildings and radar towers remain at the site. Presently, a Bell microwave station and Canadian Coast Guard (CCG) Navtex and MF Rx Communication Towers are located on the hill.	

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Summary of Site Conditions

Affected media and Contaminants of Potential Concern (COPC):	- Soil: Petroleum Hydrocarbons, Polycyclic Aromatic Hydrocarbons (PAHs), Metals, VOCs - Surface Water: Metals - Sediment: Petroleum Hydrocarbons Groundwater: PAHs, Metals

Please fill in the "letter" that best describes the level of information available for the site being assessed:

Site Letter Grade **C**

If letter grade is F, <u>do not</u> continue, you must have a minimum of a Phase I Environmental Site Assessment or equivalent.

Scoring Completed By:	Alex Hayes
Date Scoring Completed:	

CCME National Classification System (2008) version 1.3

(I) Contaminant Characteristics

Site: Cartwright Radar Station

Definition	Score	Rationale for Score (document any assumptions, reports, or site-specific information; provide references)	Method of Evaluation	Notes
1. Residency Media (replaces physical state)				
Which of the following residency media are known (or strongly suspected) to have one or more exceedances of the applicable CCME guidelines? **yes** = has an exceedance or strongly suspected to have an exceedance **no** = does not have an exceedance or strongly suspected not to have an exceedance		Exceedances above the applicable regulatory criteria were found in: - Soil: Petroleum Hydrocarbons, Polycyclic Aromatic Hydrocarbons (PAHs), Metals, VOCs - Surface Water: Metals, pH (background values also outside the range of regulatory criteria) - Groundwater: PAHs, Metals, pH (background values also outside the range of regulatory criteria) A single Chrysene exceedance in sediment was noted in the Phase II ESA. However, chrysene was not detected in either of the samples collected from the same location and analyzed during the Phase III ESA. Given the non-static nature of surface water and associated sediments, the current analytical results were used in determining exceedances. Metals impacts in sediment were identified in the Phase II ESA (manganese at 470 mg/kg, the Ontario Provincial Sediment Guideline applied is 460 mg/kg); further analysis revealed that this was not in fact a COPC warranting additional investigation. Further information is provided in the Phase III ESA. TPH exceedances in various sediment samples have been excluded as results concentrations were within or below the range of background concentrations. Based on this and comments received from the laboratory, it is likely that these exceedances are due to biogenic material.	The overall score is calculated by adding the individual scores from each residency media (having one or more exceedance of the most conservative media specific and land-use appropriate CCME guideline). Summary tables of the Canadian Environmental Quality Guidelines for soil, water (aquatic life, non-potable groundwater environments, and agricultural water uses) and sediment are available on the CCME website at http://st-ts.ccme.ca/ For potable groundwater environments, guidelines for Canadian Drinking Water Quality (for comparison with groundwater monitoring data) are available on the Health Canada website at http://hc-sc.gc.ca/ewh-semt/water-eau/drink-potab/guide/index-eng.php	An increasing number of residency media containing chemical exceedances often equates to a greater potential risk due to an increase in the number of potential exposure pathways.
A. Soil	Yes			
Yes No Do Not Know				
B. Groundwater	Yes			
Yes No Do Not Know				
C. Surface water	Yes			
Yes No Do Not Know				
D. Sediment	No			
Yes No Do Not Know				
"Known" -score	6			
"Potential" - score	---			
2. Chemical Hazard				
What is the relative degree of chemical hazard of the contaminant in the list of hazard rankings proposed by the Federal Contaminated Sites Action Plan (FCSAP)?	High	COPC listed above range from medium to high risk, as identified in the FCSAP.	The relative degree of chemical hazard should be selected based on the most hazardous contaminant known or suspected to be present at the site. The degree of hazard has been defined by the Federal Contaminated Sites Action Plan (FCSAP) and a list of substances with their associated hazard (Low, Medium and High) has been provided as a separate sheet in this file. *See Attached Reference Material for Contaminant Hazard Rankings.*	Hazard as defined in the revised NCSCS pertains to the physical properties of a chemical which can cause harm. Properties can include toxic potency, propensity to biomagnify, persistence in the environment, etc. Although there is some overlap between hazard and contaminant exceedance factor below, it will not be possible to derive contaminant exceedance factors for many substances which have a designated chemical hazard designation, but don't have a CCME guideline. The purpose of this category is to avoid missing a measure of toxic potential.
High Medium Low Do Not Know				
"Known" -score	8			
"Potential" - score	---			

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(I) Contaminant Characteristics

Site: Cartwright Radar Station

Definition	Score	Rationale for Score (document any assumptions, reports, or site-specific information; provide references)	Method of Evaluation	Notes
3. Contaminant Exceedance Factor				
What is the ratio between the measured contaminant concentration and the applicable CCME guidelines (or other "standards")? NAPL (mobile or immobile) High (>100x) Medium (10x to 100x) Low (1x to 10x) Do Not Know	High (>100x)	The maximum concentration of aluminum identified in surface water (3,200 ug/L during the Phase II and 1,600 ug/L during the Phase III) is over 100x the CCME guidelines of 5 ug/L. The maximum concentration of phenanthrene identified in soil (46.8 mg/kg) is over 100x the CCME guideline of 0.046 mg/kg.	Ranking of contaminant "exceedance" is determined by comparing contaminant concentrations with the *most conservative media-specific and land-use appropriate CCME* environmental quality guidelines. **Ranking should be based on contaminant with greatest exceedance of CCME guidelines.** Ranking of contaminant hazard as high, medium and low is as follows: High = One or more measured contaminant concentration is greater than 100 X appropriate CCME guidelines Medium = One or more measured contaminant concentration is 10 - 99.99 X appropriate CCME guidelines Low = One or more measured contaminant concentration is 1 - 9.99 X appropriate CCME guidelines NAPL (LNAPL or DNAPL) = Contaminant is a non-aqueous phase liquid (*i.e.,* due to its low solubility, it does not dissolve in water, but remains as a separate liquid) and is present at a sufficiently high saturation (*i.e.* , greater than residual NAPL saturation) such that there is significant potential for mobility either downwards or laterally. Any amount of NAPL should be scored, *i.e* . small amounts and sheens cannot be ignored. The presence of a NAPL (mobile or immoblie or regardless of amount) may be considered unnaceptable by some jurisidcations. If NAPL is present, consult jurisdiction on how to proceed with NCSCS. Other standards may include local background concentration or published toxicity benchmarks. Results of toxicity testing with site samples can be used as an alternative. This approach is only relevant for contaminants that do not biomagnify in the food web, since toxicity tests would not indicate potential effects at higher trophic levels. High = lethality observed. Medium = no lethality, but sub lethal effects observed. Low = neither lethal nor sub lethal effects observed.	In the event that elevated levels of a material with no associated CCME guidelines are present, check provincial and USEPA environmental criteria. Hazard Quotients (sometimes referred to as a screening quotient in risk assessments) refer to the ratio of measured concentration to the concentration believed to be the threshold for toxicity. A similar calculation is used here to determine the contaminant exceedance factor (CEF). Concentrations greater than one times the applicable CCME guideline (*i.e.* , CEF=>1) indicate that risks are possible. Mobile NAPL has the highest associated score (8) because of its highly concentrated nature and potential for increase in the size of the impacted zone.
"Known" -score	6			
"Potential" - score	---			
4. Contaminant Quantity (known or strongly suspected)				
What is the known or strongly suspected quantity of all contaminants? >10 hectare (ha) or 5000 m^3 2 to 10 ha or 1000 to 5000 m^3 <2 ha or 1000 m^3 Do Not Know	2 to 10 ha or 1000 to 5000 m3	Estimate of contaminated soil is greater than 1,000 cubic meters.	Measure or estimate the area or quantity of total contamination (*i.e* , all contaminants known or strongly suspected to be present on the site). The "Area of Contamination" is defined as the area or volume of contaminated media (soil, sediment, groundwater, surface water) exceeding appropriate environmental criteria.	A larger quantity of a potentially toxic substance can result in a larger frequency of exposure as well as a greater probability of migration, therefore, larger quantities of these substances earn a higher score.
"Known" -score	6			
"Potential" - score	---			

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(I) Contaminant Characteristics

Site: Cartwright Radar Station

Definition	Score	Rationale for Score (document any assumptions, reports, or site-specific information; provide references)	Method of Evaluation	Notes
5. Modifying Factors				
Does the chemical fall in the class of persistent chemicals based on its behavior in the environment? Yes No Do Not Know	Yes	Persistent chemicals (benzo(a)pyrene) were identified at the site, as outlined in the FCSAP.	Persistent chemicals, *e.g.,* PCBs, chlorinated pesticides etc. either do not degrade or take longer to degrade, and therefore may be available to cause effects for a longer period of time. Canadian Environmental Protection Act (CEPA) classifies a chemical as persistent when it has at least one of the following characteristics: (a) in air, (i) its half-life is equal to or greater than 2 days, or (ii) it is subject to atmospheric transport from its source to a remote area; (b) in water, its half-life is equal to or greater than 182 days; (c) in sediments, its half-life is equal to or greater than 365 days; or (d) in soil, its half-life is equal to or greater than 182 days. Elements do not degrade, therefore treat any metal, metalloid, or halogen COPC as persistent.	*Examples of Persistent Substances are provided in attached Reference Materials*
Are there contaminants present that could cause damage to utilities and infrastructure, either now or in the future, given their location? Yes No Do Not Know	Yes	Should future development occurr in areas impacted by petroleum hydrocarbons, PAHs, or VOCs, these COPC may damage any infrastructrue installed.	If answered Yes, in Rationale for Score column document the location and extent of the infrastructure that is/may be damaged, verify the mode of contact between contaminants of potential concern (COPCs) and infrastructure, list the specific COPCs that could cause damage, and note the expected effect on specific infrastructure.	Some contaminants may react or absorb into underground utilities and infrastructure. For example, organic solvents may degrade some plastics, and salts could cause corrosion of metal.
How many different contaminant classes have representative CCME guideline exceedances? one two to four five or more Do Not Know	five or more	Petroleum hydrocarbon (light and heavy extractable petroleum hydrocarbons), PAH, VOC and metals impacts have been identified in various media which exceed the CCME guidelines.	For the purposes of the revised NCSCS, the following chemicals represent distinct chemical "classes": inorganic substances (including metals), volatile petroleum hydrocarbons, light extractable petroleum hydrocarbons, heavy extractable petroleum hydrocarbons, PAHs, phenolic substances, chlorinated hydrocarbons, halogenated methanes, phthalate esters, pesticides.	*Refer to the Reference Material sheet for a list of example substances that fall under the various chemical classes.*
"Known" - Score	7			
"Potential" - Score	---			

Contaminant Characteristic Total

Raw Total Score- "Known"	33	
Raw Total Score- "Potential"	---	
Raw Combined Total Score (Known + Potential)	33	
Adjusted Total Score (Raw Combined / 40 * 33)	**27.2**	maximum 33

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(II) Migration Potential (Evaluation of contaminant migration pathways)

Site: Cartwright Radar Station

Definition	Score	Rationale for Score (document any assumptions, reports, or site-specific information; provide references)	Method Of Evaluation	Notes
1. Groundwater Movement				
A. Known COPC exceedances and an operable groundwater pathway within and/or beyond the property boundary.				
i) For **potable groundwater environments**, 1) groundwater concentrations exceed background concentrations and 1X the Guideline for Canadian Drinking Water Quality (GCDWQ) or 2) there is known contact of contaminants with groundwater, based on physical evidence of groundwater contamination. For **non-potable environments** (typically urban environments with municipal services), 1) groundwater concentrations exceed 1X the applicable non potable guidelines or modified generic guidelines (which exclude ingestion of drinking water pathway) or 2) there is known contact of contaminants with groundwater, based on physical evidence of groundwater impacts. ii) Same as (i) except the information is not known but strongly suspected based on indirect observations. iii) Meets GCDWQ for potable environments; meets non-potable criteria or modified generic criteria (excludes ingestion of drinking water pathway) for non-potable environments or Absence of groundwater exposure pathway (*i.e.,* there is no aquifer (see definition at right) at the site or there is an adequate isolating layer between the aquifer and the contamination, and within 5 km of the site there are no aquatic receiving environments and the groundwater does not daylight).	12 9 0 12	Non-potable environment with GW exceedances; however, GW pathways for ecological receptors are complete.	Review chemical data and evaluate groundwater quality. The evaluation method concentrates on 1) a potable or non-potable groundwater environment; 2) the groundwater flow system and its potential to be an exposure pathway to known or potential receptors An aquifer is defined as a geologic unit that yields groundwater in usable quantities and drinking water quality. The aquifer can currently be used as a potable water supply or could have the potential for use in the future. Non-potable groundwater environments are defined as areas that are serviced with a reliable alternative water supply (most commonly provided in urban areas). The evaluation of a non-potable environment will be based on a site specific basis. Physical evidence includes significant sheens, liquid phase contamination, or contaminant saturated soils. Seeps and springs are considered part of the groundwater pathway. In Arctic environments, the potability and evaluation of the seasonal active layer (above the permafrost) as a groundwater exposure pathway will be considered on a site-specific basis.	The 1992 NCS rationale evaluated the off-site migration as a regulatory issue. The exposure assessment and classification of hazards should be evaluated regardless of the property boundaries. Someone experienced must provide a thorough description of the sources researched to determine the presence/absence of a groundwater supply source in the vicinity of the contaminated site. This information must be documented in the NCS Site Classification Worksheet including contact names, phone numbers, e-mail correspondence and/or reference maps/reports and other resources such as internet links. Note that for potable groundwater that also daylights into a nearby surface water body, the more stringent guidelines for both drinking water and protection of aquatic life should be considered. **Selected References** Potable Environments Guidelines for Canadian Drinking Water Quality: http://hc-sc.gc.ca/ewh-semt/water-eau/drink-potab/guide/index-eng.php Non-Potable Environments CCME. 1999. Canadian Water Quality Guidelines for Protection of Aquatic Life. http://ceqg-rcqe.ccme.ca/ Compilation and Review of Canadian Remediation Guidelines, Standards and Regulations. Science Applications International Corporation (SAIC Canada), report to Environment Canada, January 4, 2002.
Score	12			
NOTE: If a score is assigned here for Known COPC Exceedances, then you should skip Part B (Potential for groundwater pathway) and go to Section 2 (Surface Water Pathway)				
B. Potential for groundwater pathway.				
a. Relative mobility of contaminant High Moderate Low Insignificant Do Not Know	Do Not Know	Skip B if A is complete.	Organics Koc (L/kg) Koc < 500 (*i.e.,* log Koc < 2.7) Koc = 500 to 5000 (*i.e.,* log Koc = 2.7 to 3.7) Koc = 5,000 to 100,000 (*i.e.,* log Koc = 3.7 to 5) Koc > 100,000 (*i.e.,* log Koc > 5) Metals with higher mobility at acidic conditions pH < 5 pH = 5 to 6 pH > 6 Metals with higher mobility at alkaline conditions pH > 8.5 pH = 7.5 to 8.5 pH < 7.5 For PHC fractions; score F1 as Moderate, F2 as Low, and F3 and F4 as Insignificant.	Reference: US EPA Soil Screening Guidance (Part 5 - Table 39) If a score of zero is assigned for relative mobility, it is still recommended that the following sections on potential for groundwater pathway be evaluated and scored. Although the Koc of an individual contaminant may suggest that it will be relatively immobile, it is possible that, with complex mixtures, there could be enhanced mobility due to co-solvent effects. Therefore, the Koc cannot be relied on solely as a measure of mobility. An evaluation of other factors such as containment, thickness of confining layer, hydraulic conductivities and precipitation infiltration rate are still useful in predicting potential for groundwater migration, even if a contaminant is expected to have insignificant mobility based on its chemistry alone.
Score	2			
b. Presence of engineered sub-surface containment? No containment Partial containment Full containment Do Not Know	Do Not Know	Skip B if A is complete.	Review the existing engineered systems or natural attenuation processes for the site and determine if full or partial containment is achieved. Full containment is defined as an engineered system or natural attenuation processes, monitored as being effective, which provide for full capture and/or treatment of contaminants. All chemicals of concern must be contained for "Full Containment" scoring. Natural attenuation must have sufficient data, and reports cited with monitoring data to support steady state conditions and the attenuation processes. If there is no containment or insufficient natural attenuation process, this category is evaluated as high. If there is less than full containment or if uncertain, then evaluate as medium. In Arctic environments, permafrost will be evaluated, as appropriate, based on detailed evaluations, effectiveness and reliability to contain/control contaminant migration.	Someone experienced must provide a thorough description of the sources researched to determine the containment of the source at the contaminated site. This information must be documented in the NCS Site Classification Worksheet including contact names, phone numbers, e-mail correspondence and/or reference maps, geotechnical reports or natural attenuation studies and other resources such as internet links. **Selected Resources:** United States Environmental Protection Agency (USEPA) 1998. Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Groundwater. EPA/600/R-98/128.
Score	1.5			
c. Thickness of confining layer over aquifer of concern or groundwater exposure pathway 3 m or less including no confining layer or discontinuous confining layer 3 to 10 m > 10 m Do Not Know	Do Not Know	Skip B if A is complete.	The term "confining layer" refers to geologic material with little or no permeability or hydraulic conductivity (such as unfractured clay); water does not pass through this layer or the rate of movement is extremely slow. Measure the thickness and extent of materials that will impede the migration of contaminants to the groundwater exposure pathway. The evaluation of this category is based on: 1) The presence and thickness of saturated subsurface materials that impede the vertical migration of contaminants to lower aquifer units which can or are used as drinking water sources or 2) The presence and thickness of unsaturated subsurface materials that impede the vertical migration of contaminants from the source location to the saturated zone (*e.g.,* water table aquifer, first hydrostratigraphic unit or other groundwater pathway).	
Score	0.5			

(II) Migration Potential (Evaluation of contaminant migration pathways)

Site: Cartwright Radar Station

Definition	Score	Rationale for Score (document any assumptions, reports, or site-specific information; provide references)	Method Of Evaluation	Notes
d. Hydraulic conductivity of confining layer >10^{-4} cm/s or no confining layer 10^{-4} to 10^{-6} cm/s <10^{-6} cm/s Do Not Know	Do Not Know	Skip B if A is complete.	Determine the nature of geologic materials and estimate hydraulic conductivity from published material (or use "Range of Values of Hydraulic Conductivity and Permeability" figure in the Reference Material sheet). Unfractured clays should be scored low. Silts should be scored medium. Sand, gravel should be scored high. The evaluation of this category is based on: 1) The presence and hydraulic conductivity ("K") of saturated subsurface materials that impede the vertical migration of contaminants to lower aquifer units which can or are used as a drinking water source, groundwater exposure pathway or 2) The presence and permeability ("k") of unsaturated subsurface materials that impede the vertical migration of contaminants from the source location to the saturated water table aquifer, first hydrostratigraphic unit or other groundwater pathway.	
Score	0.5			
B. Potential for groundwater pathway.				
e. Precipitation infiltration rate (Annual precipitation factor x surface soil relative permeability factor) High (infiltration score > 0.6) Moderate (0.4 < infiltration score ≤ 0.6) Low (0.2 < infiltration score ≤ 0.4) Very Low (0 < infiltration score ≤ 0.2) None (infiltration score = 0) Do Not Know	Do Not Know	Skip B if A is complete.	Precipitation Refer to Environment Canada precipitation records for relevant areas (30 year average preferred). Divide annual precipitation (rainfall + snowfall) by 1000 and round to nearest tenth (*e.g.,* 667 mm = 0.7 score). Permeability For surface soil relative permeability (*i.e.* , infiltration) assume: gravel (1), sand (0.6), loam (0.3) and pavement or clay (0). Multiply the surface soil relative permeability factor with precipitation factor to obtain the score for precipitation infiltration rate (*e.g.,* precipitation factor of 0.7 from above x 0.6 (sand) = 0.42 or "Moderate").	Selected Sources: Environment Canada web page link: http://climate.weather.gc.ca/climate_normals/index_e.html Snow to rainfall conversion apply ratio of 10(snow):1(water) https://www.ec.gc.ca/meteo-weather/default.asp?lang=En&n=108C6C74-1
Score	0.4			
f. Hydraulic conductivity of aquifer >10^{-2} cm/s 10^{-2} to 10^{-4} cm/s <10^{-4} cm/s Do Not Know	Do Not Know	Skip B if A is complete.	Determine the nature of geologic materials and estimate hydraulic conductivity of all aquifers of concern from published material (refer to "Range of Values of Hydraulic Conductivity and Permeability" in the Reference Material sheet).	
Score	1			
Potential groundwater pathway total	5.9	Note: If a "known" score is provided, the "potential" score is disallowed.		
Allowed Potential score	---			
Groundwater pathway total	**12**			
2. Surface Water Movement				
A. Demonstrated migration of COPC in surface water above background conditions				
Known concentrations of surface water: i) Concentrations exceed background concentrations and exceed CCME CWQG for protection of aquatic life, irrigation, livestock water, and/or recreation (whichever uses are applicable at the site) by >1 X; or There is known contact of contaminants with surface water based on site observations. or In the absence of CWQG, chemicals have been proven to be toxic based on site specific testing (*e.g.,* toxicity testing; or other indicator testing of exposure).	12	Metals impacts were identified in surface water above the applicable regulatory criteria. Background concentrations were also above the applicable regulatory criteria; however, metals impacts outside of the background sample ranges were identified (for example, at at sample location SW-5, SW-6 and SW-7).	Collect all available information on quality of surface water near to site. Evaluate available data against Canadian Water Quality Guidelines (select appropriate guidelines based on local water use, *e.g.,* recreation, irrigation, aquatic life, livestock watering, etc.). The evaluation method concentrates on the surface water flow system and its potential to be an exposure pathway. Contamination is present on the surface (above ground) and has the potential to impact surface water bodies. Surface water is defined as a water body that supports one of the following uses: recreation, irrigation, livestock watering, aquatic life.	General Notes: Someone experienced must provide a thorough description of the sources researched to classify the surface water body in the vicinity of the contaminated site. This information must be documented in the NCS Site Classification Worksheet including contact names, phone numbers, e-mail correspondence and/or reference maps/reports and other resource such as internet links. Selected References: CCME. 1999. Canadian Water Quality Guidelines for the Protection of Aquatic Life http://ceqg-rcqe.ccme.ca/ CCME. 1999. Canadian Water Quality Guidelines for the Protection of Agricultural Water Uses (Irrigation and Livestock Water) http://ceqg-rcqe.ccme.ca/ Health and Welfare Canada. 1992. Guidelines for Canadian Recreational Water Quality. http://www.hc-sc.gc.ca/ewh-semt/water-eau/recreat/index-eng.php
ii) Same as (i) except the information is not known but strongly suspected based on indirect observations.	8		Examples of indirect evidence may include observed staining of sediment and/or river banks, but surface water has not been tested.	
iii) Meets CWQG or absence of surface water exposure pathway (*e.g.,* Distance to nearest surface water is > 5 km.)	0			
	12			
Score	12			
NOTE: If a score is assigned here for Demonstrated Migration in Surface Water, then you should skip Part B (Potential for migration of COPCs in surface water) and go to Section 3 (Surface Soils)				
B. Potential for migration of COPCs in surface water				
a. Presence of containment No containment Partial containment Full containment Do Not Know	Do Not Know	Skip B if A is complete.	Review the existing engineered systems and relate these structures to site conditions and proximity to surface water and determine if full containment is achieved: score low if there is full containment such as capping, berms, dikes; score medium if there is partial containment such as natural barriers, trees, ditches, sedimentation ponds; score high if there are no intervening barriers between the site and nearby surface water. Full containment must include containment of all chemicals.	
Score	3			

(II) Migration Potential (Evaluation of contaminant migration pathways)

Site: Cartwright Radar Station

Definition	Score	Rationale for Score (document any assumptions, reports, or site-specific information; provide references)	Method Of Evaluation	Notes
b. Distance to Surface Water 0 to <100 m 100 - 300 m >300 m Do Not Know		Skip B if A is complete.	Review available mapping and survey data to determine distance to nearest surface water bodies.	
	Do Not Know			
Score	2			
c. Topography Contaminants above ground level and slope is steep Contaminants at or below ground level and slope is steep Contaminants above ground level and slope is intermediate Contaminants at or below ground level and slope is intermediate Contaminants above ground level and slope is flat Contaminants at or below ground level and slope is flat Do Not Know		Skip B if A is complete.	Review engineering documents on the topography of the site and the slope of surrounding terrain. Steep slope = >50% Intermediate slope = between 5 and 50% Flat slope = < 5% Note: Type of fill placement (*e.g.,* trench, above ground, etc.).	
	At/below and flat			
Score	0			
d. Run-off potential High (run-off score > 0.6) Moderate (0.4 < run-off score ≤ 0.6) Low (0.2 < run-off score ≤ 0.4) Very Low (0 < run-off score ≤ 0.2) None (run-off score = 0) Do Not Know		Skip B if A is complete.	Precipitation Refer to Environment Canada precipitation records for relevant areas (30 year average preferred). Divide precipitation (rainfall + snowfall) by 1000 and round to nearest tenth (*e.g.* , 667 mm = 0.7 score). Permeability For infiltration assume: gravel (0), sand (0.3), loam (0.6) and pavement or clay (1). Multiply the permeability (infiltration) factor with precipitation factor to obtain Run-off potential score (*e.g.* , precipitation factor of 0.7 from above x 0.6 (loam) = 0.42 or "Moderate").	Selected Sources: Environment Canada web page link: http://climate.weather.gc.ca/climate_normals/index_e.html Snow to rainfall conversion apply ratio of 10(snow):1(water) https://www.ec.gc.ca/meteo-weather/default.asp?lang=En&n=108C6C74-1
	Do Not Know			
Score	0.4			
e. Flood potential 1 in 2 years 1 in 10 years 1 in 50 years not in floodplain Do Not Know		Skip B if A is complete.	Review published data such as flood plain mapping or flood potential (*e.g.,* spring or mountain run-off) and Conservation Authority records to evaluate flood potential of nearby water courses both up and down gradient. Rate zero if site not in flood plain.	
	Do Not Know			
Score	0.5			
Potential surface water pathway total	5.9			
Allowed Potential score	---	Note: If a "known" score is provided, the "potential" score is disallowed.		
Surface water pathway total	**12**			
3. Surface Soils (potential for dust, dermal and ingestion exposure)				
A. Demonstrated concentrations of COPC in surface soils (top 1.5 m)				
COPCs measured in surface soils exceed the CCME soil quality guideline.	12	Petroleum hydrocarbon, PAH, VOC and metals exceed the CCME guidelines.	Collect all available information on quality of surface soils (*i.e.,* top 1.5 metres) at the site. Evaluate available data against Canadian Soil Quality Guidelines. Select appropriate guidelines based on current (or proposed future) land use (*i.e,* agricultural, residential/parkland, commercial, or industrial), and soil texture if applicable (*i.e.,* coarse or fine). Examples of strongly suspected exceedences of soil guidelines may include evidence of staining, odours, or significant debris infill materials.	Selected References: CCME. 1999. Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health. http://ceqg-rcqe.ccme.ca/
Strongly suspected that soils exceed guidelines.	9			
COPCs in surface soils does not exceed the CCME soil quality guideline or is not present (i.e., bedrock).	0			
	12			
Score	12			
NOTE: If a score is assigned here for Demonstrated Concentrations in Surface Soils, then you should skip Part B (Potential for a surface soils migration pathway) and go to Section 4 (Vapour)				
B. Potential for a surface soils (top 1.5 m) migration pathway				
a. Are the soils in question covered? Exposed Vegetated Landscaped Paved Do Not Know		Skip B if A is complete.	Consult engineering or risk assessment reports for the site. Alternatively, review photographs or perform a site visit. Landscaped surface soils must include a minimum of 0.5 m of topsoil.	The possibility of contaminants in blowing snow have not been included in the revised NCSCS as it is difficult to assess what constitutes an unacceptable concentration and secondly, spills to snow or ice are most efficiently mitigated while freezing conditions remain.
	Do Not Know			
Score	4			
b. For what proportion of the year does the site remain covered by snow? 0 to 10% of the year 10 to 30% of the year More than 30% of the year Do Not Know		Skip B if A is complete.	Consult climatic information for the site. The increments represent the full span from soils which are always wet or covered with snow (and therefore less likely to generate dust) to those soils which are predominantly dry and not covered by snow (and therefore are more likely to generate dust).	
	Do Not Know			
Score	3			
Potential surface soil pathway total	7			
Allowed Potential score	---	Note: If a "known" score is provided, the "potential" score is disallowed.		
Soil pathway total	**12**			

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(II) Migration Potential (Evaluation of contaminant migration pathways)

Site: Cartwright Radar Station

Definition	Score	Rationale for Score (document any assumptions, reports, or site-specific information; provide references)	Method Of Evaluation	Notes
4. Vapour				
A. Demonstrated COPCs in vapour.				
Vapour has been measured (indoor or outdoor) in concentrations exceeding risk based concentrations.	12	Go to potential.	Consult previous investigations, including human health risk assessments, for reports of vapours detected. Due to the potential for significant spatial and temporal variation in soil vapour concentrations, limited vapour monitoring studies (*e.g.,* single point in time "snap-shot") that do not detect vapour at sites where volatiles are suspected, does not necessarily mean that vapours are not an issue at the site. In this case, section B " Potential for COPCs in vapour" should be completed.	
Strongly suspected (based on observations and/or modelling)	9			
Vapour has not been measured (i.e. not detected) and volatile hydrocarbons have not been found in site soils or groundwater, or vapour has been measured (indoor or outdoor) in concentrations not exceeding risk based concentrations.	0			
	Go to Potential			
Score	---			
NOTE: If a score is assigned here for Demonstrated COPCs in Vapour, then you should skip Part B (Potential for COPCs in vapour) and go to Section 5 (Sediment)				
B. Potential for COPCs in vapour				
a. Relative Volatility based on Henry's Law Constant, H' (dimensionless) High (H' > 1.0E-1) Moderate (H' = 1.0E-1 to 1.0E-3) Low (H' < 1.0E-3) Not Volatile Do Not Know		Petroleum hydrocarbons are considered to be of moderate volatility.	Reference: US EPA Soil Screening Guidance (Part 5 - Table 36) *Provided in Attached Reference Materials* For PHC fractions; score F1 as High, F2 as Moderate, and F3 and F4 as Not Volatile. Substance is considered Not Volatile (*i.e.* , pathway not a concern) if the product of the water solubility and unitless Henry's law constant does not exceed published or derived tolerable concentration or risk-specific concentration. If NAPL is present, see Appendix D of the CCME soil vapour quality guideline protocol (CCME 2014) for further guidance.	If the Henry's Law Constant for a substance indicates that it is not volatile, and a score of zero is assigned here for relative volatility, then the other three questions in this section on Potential for COPCs will be automatically assigned scores of zero and you can skip to section 5. Selected References: CCME. 2014. A Protocol for the Derivation of Soil Vapour Quality Guidelines for Protection of Human Exposures via Inhalation of Vapours. Winnipeg, Manitoba. http://ceqg-rcqe.ccme.ca
	Moderate			
Score	2.5			
b. What is the soil grain size? Fine Coarse Do Not Know		Based on observations during field work.	Review soil permeability data in engineering reports. The greater the permeability of soils, the greater the possible movement of vapours. Fine-grained soils are defined as those which contain greater than 50% by mass particles less than 75 µm mean diameter (D50 < 75 µm). Coarse-grained soils are defined as those which contain greater than 50% by mass particles greater than 75 µm mean diameter (D50 > 75 µm).	
	Coarse			
Score	4			
c. Is the depth to the source less than 10m? Yes No Do Not Know		Expected to be less than 10 m, COPC identified in the top 1.5 m.	Review groundwater depths below grade for the site.	
	Yes			
Score	2			
d. Are there any preferential pathways? Yes No Do Not Know		Fractured bedrock or other preferential pathways were not noted during the Phase III ESA work.	Visit the site during dry summer conditions and/or review available photographs. Where bedrock is present, fractures would likely act as preferential pathyways.	Preferential pathways refer to areas where vapour migration is more likely to occur because there is lower resistance to flow than in the surrounding materials. For example, underground conduits such as sewer and utility lines, drains, or septic systems may serve as preferential pathways. Features of the building itself that may also be preferential pathways include earthen floors, expansion joints, wall cracks, or foundation perforations for subsurface features such as utility pipes, sumps, and drains.
	No			
Score	0			
Potential vapour pathway total	8.5			
Allowed Potential score	8.5	Note: If a "known" score is provided, the "potential" score is disallowed.		
Vapour pathway total	**8.5**			
5. Sediment Movement				
A. Demonstrated migration of sediments containing COPCs				
There is evidence to suggest that sediments originally deposited to the site (exceeding the CCME sediment quality guidelines) have migrated.	12	TPH exceedances in various sediment samples have been excluded as results concentrations were within or below the range of background concentrations. Based on this and comments received from the laboratory, it is likely that these exceedances are due to biogenic material.	Review sediment assessment reports. Evidence of migration of contaminants in sediments must be reported by someone experienced in this area.	Usually not considered a significant concern in lakes/marine environments, but could be very important in rivers where transport downstream could be significant.
Strongly suspected (based on observations and/or modelling)	9			
Sediments have been contained and there is no indication that sediments will migrate in future. or Sediment meets CCME sediment quality guidelines or absence of sediment exposure pathway (*i.e.,* within 5 km of the site there are no aquatic receiving environments, and therefore no sediments).	0			
	0			
Score	0			
NOTE: If a score is assigned here for Demonstrated Migration of Sediments, then you should skip Part B (Potential for Sediment Migration) and go to Section 6 (Modifying Factors)				

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(II) Migration Potential (Evaluation of contaminant migration pathways)

Site: Cartwright Radar Station

Definition	Score	Rationale for Score (document any assumptions, reports, or site-specific information; provide references)	Method Of Evaluation	Notes
B. Potential for sediment migration				
a. Are the sediments having COPC exceedances capped with sediments having no exceedances ("clean sediments")?	Do Not Know	Skip B if A is complete.	Review existing sediment assessments. If sediment coring has been completed, it may indicate that historically contaminated sediments have been covered over by newer "clean" sediments. This assessment will require that cores collected demonstrate a low concentration near the top and higher concentration with sediment depth.	
Yes / No / Do Not Know	2			
b. For lakes and marine habitats, are the contaminated sediments in shallow water and therefore likely to be affected by tidal action, wave action or propeller wash?	Do Not Know		Review existing sediment assessments. If the sediments present at the site are in a river, select "no" for this question.	
Yes / No / Do Not Know	2			
c. For rivers, are the contaminated sediments in an area prone to sediment scouring?	Do Not Know		Review existing sediment assessments. It is important that the assessment is made under worst case flows (high yearly flows). Under high yearly flows, areas which are commonly depositional may become scoured. If the sediments present at the site are in a lake or marine habitat, select "no" for this question.	
Yes / No / Do Not Know	2			
Potential sediment pathway total	6			
Allowed Potential score	---	Note: If a "known" score is provided, the "potential" score is disallowed.		
Sediment pathway total	**0**			
6. Modifying Factors				
Are there subsurface utility conduits in the area affected by contamination?	Yes	Hisorical buried utilities may be present in the area with the potential to affect contaminant movement (water lines, storm sewers, electrical, ect.). In addition, two landfills are located at the site. Buried debris could affect contaminant movement.	Consult existing engineering reports. Subsurface utilities can act as conduits for contaminant migration.	
Yes / No / Do Not Know				
Known	4			
Potential	---			

Migration Potential Total		
Raw Total Score- "Known"	40	Note: If "Known" and "Potential" scores are provided, the checklist defaults to known. Therefore, the total "Potential" Score may not reflect the sum of the individual "Potential" scores.
Raw Total Score- "Potential"	8.5	
Raw Combined Total Score (Known + Potential)	48.5	
Adjusted Total Score (Raw Combined / 64 * 33)	**25.0**	maximum 33

CCME National Classification System (2008) version 1.3

(III) Exposure (Demonstrates the presence of an exposure pathway and receptors)

Site: Cartwright Radar Station

Definition	Score	Rationale for Score (document any assumptions, reports, or site-specific information; provide references)	Method Of Evaluation	Notes
1. Human				
A. Known exposure				
Documented adverse impact or high quantified exposure which has or will result in an adverse effect, injury or harm or impairment of the safety to humans as a result of the contaminated site. (Class 1 Site*)	22	Go to potential.	*Where adverse effects on humans are documented, the site should be automatically designated as a Class 1 site (*i.e.,* action required). Known impacts could include blood test results (*e.g.,* blood lead > 10 µg/dL) or results of other health based studies and tests. There is no need to proceed through the NCSCS in this case. However, a scoring guideline (22) is provided in case a numerical score for the site is still desired. A score of 22 can also be assigned when Hazard Quotients (or Hazard Index) >> 1.0 or incremental lifetime cancer risks considerably exceed acceptable levels defined by the jurisdiction for carcinogenic chemicals. The category, "Strongly suspected", can be based on the outcomes of risk assessments and applies to studies which have reported Hazard Quotients (or Hazard Index) > 0.2 (excluding the Estimated Daily Intake) or > 1.0 with Estimated Daily Intake and/or incremental lifetime cancer risks that exceed acceptable levels defined by the jurisdiction for carcinogenic chemicals (for most jurisdictions this is typically either >10^{-5} or >10^{-6}). The category, no exposure/impacts, can be based on the outcomes of risk assessments and applies to studies which have reported Hazard Quotients (or Hazard Index) of ≤ 0.2 (excluding the Estimated Daily Intake) or ≤ 1.0 with Estimated Daily Intake AND incremental lifetime cancer risks for carcinogenic chemicals that are within acceptable levels as defined by the jurisdiction (for most jurisdictions this is less than either 10^{-6} or 10^{-5}).	Known adverse impact includes domestic and traditional food sources. Adverse effects based on food chain transfer to humans and/or animals can be scored in this category. However, the weight of evidence must show a direct link of a contaminated food source/supply and subsequent ingestion/transfer to humans. Any associated adverse effects to the environment are scored separately later in this worksheet. Someone experienced must provide a thorough description of the sources researched to evaluate and determine the quantified exposure/impact (adverse effect) in the vicinity of the contaminated site. **Selected References:** Health Canada – Federal Contaminated Site Risk Assessment in Canada Parts 1 and 2 Guidance on Human Heath Screening Level Risk Assessments, available at http://www.hc-sc.gc.ca/ewh-semt/pubs/contamsite/index-eng.php United States Environmental Protection Agency, Integrated Risk Information System (IRIS), available at http://toxnet.nlm.nih.gov
Same as above, but "Strongly Suspected" based on observations or indirect evidence.	10			
No quantified or suspected exposures/impacts in humans.	0			
	Go to Potential			
Score	---			
NOTE: If a score is assigned here for Known Exposure, then you should skip Part B (Potential for Human Exposure) and go to Section 2 (Human Exposure Modifying Factors)				
B. Potential for human exposure				
a) Land use (provides an indication of potential human exposure scenarios) Agricultural Residential / Parkland Commercial Industrial Do Not Know		Site is identified as a commercial site.	Review zoning and land use maps over the distances indicated. If the proposed future land use is more "sensitive" than the current land use, evaluate this factor assuming the proposed future use is in place. Agricultural land use is defined as uses of land where the activities are related to the productive capability of the land or facility (*e.g.,* greenhouse) and are agricultural in nature, or activities related to the feeding and housing of animals as livestock. Residential/Parkland land uses are defined as uses of land on which dwelling on a permanent, temporary, or seasonal basis is the activity (residential), as well as uses on which the activities are recreational in nature and require the natural or human designed capability of the land to sustain that activity (parkland). Parkland includes campgrounds, but excludes wildlands such as national or provincial parks. Commercial/Industrial land uses are defined as land on which the activities are related to the buying, selling, or trading of merchandise or services (commercial), as well as land uses which are related to the production, manufacture, or storage of materials (industrial).	This is the main "receptor" factor used in site scoring. A higher score implies a greater exposure and/or exposure of more sensitive human receptors (*e.g.,* children).
	Commercial			
Score	1			
b) Indicate the level of accessibility to the contaminated portion of the site (*e.g.,* the potential for coming in contact with contamination) Limited barriers to prevent site access; contamination not covered Moderate access or no intervening barriers, contaminants are covered. Remote locations in which contaminants not covered. Controlled access or remote location and contaminants are covered Do Not Know		Access to all area of the site is not limited. Contaminants are not covered.	Review location and structures and contaminants at the site and determine if there are intervening barriers between the site and humans. A low rating should be assigned to a (covered) site surrounded by a fence or in a remote location, whereas a high score should be assigned to a site that has no cover, fence, natural barriers or buffer.	
	Access, not covered			
Score	2			
B. Potential for human exposure				
c) Potential for intake of contaminated soil, water, sediment or foods for operable or potentially operable pathways, as identified in Worksheet II (Migration Potential). i) direct contact Is dermal contact with contaminated surface water, groundwater, sediments or soils anticipated? Yes No Do Not Know		The potential for dermal contact with soil, surface water or sediments is possible.	If soils or potable groundwater are present exceeding their respective CCME guidelines, dermal contact is assumed. Exposure to surface water, non-potable groundwater or sediments exceeding their respective CCME guidelines will depend on the site. Select "Yes" if dermal exposure to surface water, non-potable groundwater or sediments is expected. For instance, dermal contact with sediments would not be expected in an active port. Only soils in the top 1.5 m are defined by CCME (2003) as surface soils. If contaminated soils are only located deeper than 1.5 m, direct contact with soils is not anticipated to be an operable contaminant exposure pathway.	Exposure via the skin is generally believed to be a minor exposure route. However for some organic contaminants, skin exposure can play a very important component of overall exposure. Dermal exposure can occur while swimming in contaminated waters, bathing with contaminated surface water/groundwater and digging in contaminated dirt, etc.
	Yes			
Score	3			
ii) inhalation (*i.e.,* inhalation of dust, vapour) Vapour - Are there inhabitable buildings on the site within 30 m of soils or groundwater with volatile contamination as determined in Worksheet II (Migration Potential)? Yes No Do Not Know		No buildings are located on the site.	If inhabitable buildings are on the site within 30 m of soils or groundwater exceeding their respective guidelines for volatile chemicals, there is a potential of risk to human health (Health Canada, 2004). Review site investigations for location of soil samples (having exceedances of volatile substances) relative to buildings. Refer to (II) Migration Potential worksheet, 4B.a), *Potential for COPCs in Vapour* for a definition of volatility.	Exposure via the lungs (inhalation) can be a very important exposure pathway. Inhalation can be via both particulates (dust) and gas (vapours). Vapours can be a problem where buildings have been built on former industrial sites or where volatile contaminants have migrated below buildings resulting in the potential for vapour intrusion. Assesses the potential for humans to be exposed to vapours originating from site soils. The closer the receptor is to a source of volatile chemicals in soil, the greater the potential of exposure. Also, coarser-grained soil will convey vapour much more efficiently in the soil than finer grained material such as clays and silts. General Notes; Someone experienced must provide a thorough description of the sources researched to determine the presence/absence of a vapour migration and/or dust generation in the vicinity of the contaminated site. This information must be documented in the NCS Site Classification Worksheet including contact names, phone numbers, e-mail correspondence and/or reference maps/reports and other resource such as internet links. Selected References; Canadian Council of Ministers of the Environment (CCME). 2006. Protocol for the Derivation of Environmental and Human Health Soil Quality Guidelines. PN 1332. http://ceqg-rcqe.ccme.ca/ Golder, 2004. Soil Vapour Intrusion Guidance for Health Canada Screening Level Risk Assessment (SLRA) Submitted to Health Canada, Burnaby, BC
	No			
Score	0			
Dust - If there is contaminated surface soil (*e.g.,* top 1.5 m) , indicate whether the soil is fine or coarse textured. If it is known that surface soil is not contaminated, enter a score of zero. Fine Coarse Surface soil is not contaminated or absent (bedrock) Do Not Know Texture			Consult grain size data for the site. If soils (containing exceedances of the CCME soil quality guidelines) predominantly consist of fine material (having a median grain size of 75 microns; as defined by CCME (2006)) then these soils are more likely to generate dusts.	
	Coarse			
Score	1			
inhalation total	1			

(III) Exposure (Demonstrates the presence of an exposure pathway and receptors)

Site: Cartwright Radar Station

Definition	Score	Rationale for Score (document any assumptions, reports, or site-specific information; provide references)	Method Of Evaluation	Notes
B. Potential for human exposure				
iii) Ingestion (*i.e.,* ingestion of food items, water and soils [for children]), including traditional foods. Drinking Water: Choose a score based on the proximity to a drinking water supply, to indicate the potential for contamination (present or future). 0 to 100 m 100 to 300 m 300 m to 1 km 1 to 5 km No drinking water present No potential for aquifer contamination Do Not Know	No drinking water present	Site is a non-potable site. No drinking water is present.	Review available site data to determine if drinking water (groundwater, surface water, private, commercial or municipal supply) is known or suspected to be contaminated above Guidelines for Canadian Drinking Water Quality. If drinking water supply is known to be contaminated, some immediate action (*e.g.,* provision of alternate drinking water supply) should be initiated to reduce or eliminate exposure. The evaluation of significant potential for exceedances of the water supply in the future may be based on the capture zones of the drinking water wells; contaminant travel times; computer modelling of flow and contaminant transport. For aquifers, examples of "No drinking water present" includes municipal bylaws prohibiting water wells for potable water use and naturally non-potable (*e.g.,* saline) shallow groundwater. Groundwater used for drinking water may not be at risk from contamination due to a lack of hydrological connection between contaminated soil or groundwater, or the drinking water is sufficiently up-gradient of the contamination source. Selection of "No potential for aquifer contamination" must be supported with sufficient documentation, *e.g.,* lithological and contaminant properties, well capture zones (map drawn to scale), and capture zone delineation methodology.	**Selected References:** Guidelines for Canadian Drinking Water Quality: http://hc-sc.gc.ca/ewh-semt/water-eau/drink-potab/guide/index-eng.php Drinking water can be an extremely important exposure pathway to humans. If site groundwater or surface water is not used for drinking, then this pathway is considered to be inoperable. Consider both wild foods such as salmon, venison, caribou, as well as agricultural sources of food items if the contaminated site is on or adjacent to agricultural land uses.
Score	0			
Is an alternative water supply readily available? Yes No Not Applicable Do Not Know	Not Applicable	Non-potable site.	Answer Not Applicable if "No drinking water present" or "No potential for aquifer contamination" was selected in previous question.	
Score	0			
Is human ingestion of contaminated soils possible? Yes No Do Not Know	Yes	Human ingestion of contaminated soils is possible.	If contaminated soils are located within the top 1.5 m, it is assumed that ingestion of soils is an operable exposure pathway. Exposure to soils deeper than 1.5 m is possible, but less likely, and the duration is shorter. Refer to human health risk assessment reports for the site in question.	
Score	3			
Are food items consumed by people, such as plants, domestic animals or wildlife harvested from the contaminated land and its surroundings? Yes No Do Not Know	Yes	Hunting may occur at or near the site. As such, the potential ingestion of animals who consume vegetation grown at the site exists.	Use human health risk assessment reports (or others) to determine if there is significant reliance on traditional food sources associated with the site. Is the food item in question going to spend a large proportion of its time at the site (*e.g.,* large mammals may spend a very small amount of time at a small contaminated site)? Human health risk assessment reports for the site in question will also provide information on potential bioaccumulation of the COPC in question.	
Score	1			
Ingestion total	4			
Human Health Total "Potential" Score	11	Note if a "Known" Human Health score is provided, the "Potential" score is disallowed.		
Allowed "Potential" Score	11			
2. Human Exposure Modifying Factors				
a) Strong reliance of local people on natural resources for survival (*i.e.,* food, water, shelter, etc.) in contaminated area. Yes No Do Not Know	Yes	Although reliance on natural resources within the area for survival is not considered to be strong, the potential for harvesting of natural resources exists.		
Human Exposure Modifying Factors - "Known"	6			
Human Exposure Modifying Factors - "Potential"	---			
Raw Human "Known" total	6			
Raw Human "Potential" total	11			
Raw Combined Total Human Score	17			
Adjusted Total Human Score (max 22)	**17**			

(III) Exposure (Demonstrates the presence of an exposure pathway and receptors)

Site: Cartwright Radar Station

Definition	**Score**	**Rationale for Score** (document any assumptions, reports, or site-specific information; provide references)	**Method Of Evaluation**	**Notes**
3. Ecological				
A. Known exposure				
Documented adverse impact or high quantified exposure which has or will result in an adverse effect, injury or harm or impairment of the safety to terrestrial or aquatic organisms as a result of the contaminated site.	18	Go to potential.	Some low levels of impact to ecological receptors are considered acceptable, particularly on commercial and industrial land uses. However, if ecological effects are deemed to be severe, the site may be categorized as class one (*i.e.,* a priority for remediation or risk management), regardless of the numerical total NCS score. For the purpose of application of the NCS, effects that would be considered severe include observed effects on survival, growth or reproduction which could threaten the viability of a population of ecological receptors at the site. Other evidence that qualifies as severe adverse effects may be determined based on professional judgement and in consultation with the relevant jurisdiction. If ecological effects are determined to be severe and an automatic Class 1 is assigned, there is no need to proceed through the NCS. However, a scoring guideline (18) is provided in case a numerical score for the site is still desired.	CCME, 1999: Canadian Water Quality Guidelines for the Protection of Aquatic Life. CCME, 1999: Canadian Water Quality Guidelines for the Protection of Agricultural Water Uses. http://ceqg-rcqe.ccme.ca/ Sensitive receptors- review: Canadian Council on Ecological Areas; www.ccea.org Ecological effects should be evaluated at a population or community level, as opposed to at the level of individuals. For example, population-level effects could include reduced reproduction, growth or survival in a species. Community-level effects could include reduced species diversity or relative abundances. Further discussion of ecological assessment endpoints is provided in *A Framework for Ecological Risk Assessment: General Guidance* (CCME 1996). Notes: Someone experienced must provide a thorough description of the sources researched to classify the environmental receptors in the vicinity of the contaminated site. This information must be documented in the NCS Site Classification Worksheet including contact names, phone numbers, e-mail correspondence and/or reference maps/reports and other resource such as internet links.
Same as above, but "Strongly Suspected" based on observations or indirect evidence.	12		This category can be based on the outcomes of risk assessments and applies to studies which have reported Hazard Quotients >1. Alternatively, known impacts can also be evaluated based on a weight of evidence assessment involving a combination of site observations, tissue testing, toxicity testing and quantitative community assessments. Scoring of adverse effects on individual rare or endangered species will be completed on a case-by-case basis with full scientific justification.	
No quantified or suspected exposures/impacts in terrestrial or aquatic organisms	0		This category can be based on the outcomes of risk assessments and applies to studies which have reported Hazard Quotients of less than 1 and no other observable or measurable sign of impacts. Alternatively, it can be based on a combination of other lines of evidence showing no adverse effects, such as site observations, tissue testing, toxicity testing and quantitative community assessments.	
	Go to Potential			
Score	---			
NOTE: If a score is assigned here for Known Exposure, then you should skip Part B (Potential for Ecological Exposure) and go to Section 4 (Ecological Exposure Modifying Factors)				
B. Potential for ecological exposure (for the contaminated portion of the site)				
a) Terrestrial i) Land use Agricultural (or Wild lands) Residential / Parkland Commercial Industrial Do Not Know	Commercial		Review zoning and land use maps. If the proposed future land use is more "sensitive" than the current land use, evaluate this factor assuming the proposed future use is in place (indicate in the worksheet that future land use is the consideration). Agricultural land use is defined as uses of land where the activities are related to the productive capability of the land or facility (*e.g.,* greenhouse) and are agricultural in nature, or activities related to the feeding and housing of animals as livestock. Wild lands are grouped with agricultural land due to the similarities in receptors that would be expected to occur there (e.g., herbivorous mammals and birds) and the similar need for a high level of protection to ensure ecological functioning. Residential/Parkland land uses are defined as uses of land on which dwelling on a permanent, temporary, or seasonal basis is the activity (residential), as well as uses on which the activities are recreational in nature and require the natural or human designed capability of the land to sustain that activity (parkland). Commercial/Industrial land uses are defined as land on which the activities are related to the buying, selling, or trading of merchandise or services (commercial), as well as land uses which are related to the production, manufacture, or storage of materials (industrial).	
Score	1			
ii) Uptake potential		Exposure of plants and/or soil invertebrates to contaminated soils is possible.	If contaminated soils are located within the top 1.5 m, it is assumed that direct contact of soils with plants and soil invertebrates is an operable exposure pathway. Exposure to soils deeper than 1.5 m is possible, but less likely.	
Direct Contact - Are plants and/or soil invertebrates likely exposed to contaminated soils at the site? Yes No Do Not Know	Yes			
Score	1			
iii) Ingestion (*i.e.,* wildlife or domestic animals ingesting contaminated food items, soils or water) Are terrestrial animals likely to be ingesting contaminated water at the site? Yes No Do Not Know	Yes	Metals impacts were identified in surface water above the applicable regulatory criteria. Background concentrations were also above the applicable regulatory criteria; however, metals impacts outside of the background sample ranges were identified at a number of sample locations (for example, SW-5, SW-6 and SW-7).	Refer to an Ecological Risk Assessment for the site. If there is contaminated surface water at the site, assume that terrestrial organisms will ingest it.	
Score	1			
Are terrestrial animals likely to be ingesting contaminated soils at the site? Yes No Do Not Know	Yes	The potential for terrestrial animals to ingest contaminated soils exists.	Refer to an Ecological Risk Assessment report. Most animals will co-ingest some soil while eating plant matter or soil invertebrates.	
Score	1			
Can the contamination identified bioaccumulate? Yes No Do Not Know	No	The COPC identified in the Phase III are not expected to bioaccumulate.	Substances can be considered bioaccumulative if; • There is a Tissue Residue Guideline (TRG) or Soil Quality Guideline for Soil and Food Ingestion for the protection of secondary (SQG_{2C}) and/or tertiary consumers (SQG_{3C}). • Bioaccumulation factor (BAF) or bioconcentration factor (BCF) greater than 5000. • If BAF or BCF is not available, or reliable, the log Kow is equal to or greater than 5. If a literature review indicates that a substance biomagnifies, it should be treated as biomagnifying regardless of whether or not it meets the criteria above. It should also be noted that some substances with a log Kow greater than 5 do not biomagnify. If studies on a substance with a high Kow demonstrate a lack of biomagnification in upper trophic levels, then the substance can be considered not bioaccumulative. Petroleum hydrocarbons F1 to F4 are not considered bioaccumulative.	*See attached Reference Material including log(Kow)* Consult *CEPA (1999) Persistence and Bioaccumulation Regulations* for additional guidance; http://laws-lois.justice.gc.ca/eng/regulations/SOR-2000-107/page-1.html
Score	0			
Distance to sensitive terrestrial ecological area 0 to 300 m 300 m to 1 km 1 to 5 km > 5 km Do Not Know	> 5 km	Sensitive terrestrial ecological areas are not known or suspected within 5 km of the site.	It is considered that within 300 m of a site, there is a concern for contamination. Therefore an environmental receptor located within this area of the site will be subject to further evaluations. It is also considered that any environmental receptor located greater than 5 km will not be a concern for evaluation. Review Conservation Authority mapping and literature including Canadian Council on Ecological Areas link: www.ccea.org	Environmental receptors include: local, regional or provincial species of interest or significance; arctic environments (on a site specific basis); nature preserves, habitats for species at risk, sensitive forests, natural parks or forests.

(III) Exposure (Demonstrates the presence of an exposure pathway and receptors)

Site: Cartwright Radar Station

Definition	**Score**	**Rationale for Score** (document any assumptions, reports, or site-specific information; provide references)	**Method Of Evaluation**	**Notes**
Score	0.5			
Raw Terrestrial "Potential" total	4.5	Note if a "Known" Ecological Effects score is provided, the "Potential" score is disallowed.		
Allowed Terrestrial "Potential" total	4.5			

(III) Exposure (Demonstrates the presence of an exposure pathway and receptors)

Site: Cartwright Radar Station

Definition	Score	Rationale for Score (document any assumptions, reports, or site-specific information; provide references)	Method Of Evaluation	Notes
B. Potential for ecological exposure (for the contaminated portion of the site)				
b) Aquatic		Aquatic environment is expected to be typical.	"Sensitive aquatic environments" include those in or adjacent to shellfish or fish harvesting areas, marine parks, ecological reserves and fish migration paths. Also includes those areas deemed to have ecological significance such as for fish food resources, spawning areas or having rare or endangered species. "Typical aquatic environments" include those in areas other than those listed above.	
i) Classification of aquatic environment Sensitive Typical Not Applicable (no aquatic environment present) Do Not Know	Typical			
Score	1			
ii) Uptake potential Does groundwater daylighting to an aquatic environment exceed the CCME water quality guidelines for the protection of aquatic life at the point of contact? Yes No (or Not Applicable) Do Not Know	Yes	Groundwater exceedances for PAHs, Metals and pH (background values also outside the range of regulatory criteria) were identified.	Groundwater concentrations of contaminants at the point of contact with an aquatic receiving environment can be estimated in three ways: 1) by comparing collected nearshore groundwater concentrations to the CCME water quality guidelines (this will be a conservative comparison, as contaminant concentrations in groundwater often decrease between nearshore wells and the point of discharge). 2) by conducting groundwater modeling to estimate the concentration of groundwater immediately before discharge. 3) by installing water samplers, "peepers", in the sediments in the area of daylighting groundwater.	
Score	1			
Distance from the contaminated site to an important surface water resource 0 to 300 m 300 m to 1 km 1 to 5 km > 5 km Do Not Know	0 to 300 m	Surface water is located on site, and the Atlantic Ocean is adjacent to the site.	It is considered that within 300 m of a site, there is a concern for contamination. Therefore an environmental receptor or important water resource located within this area of the site will be subject to further evaluation. It is also considered that any environmental receptor located greater than 5 km away will not be a concern for evaluation. Review Conservation Authority mapping and literature including Canadian Council on Ecological Areas link: www.ccea.org	Environmental receptors include: local, regional or provincial species of interest or significance, sensitive wetlands and fens and other aquatic environments.
Score	3			
Are aquatic species (*i.e.,* forage fish, invertebrates or plants) that are consumed by predatory fish or wildlife consumers, such as mammals and birds, likely to accumulate contaminants in their tissues? Yes No Do Not Know	No	The COPC identified in the Phase III are not expected to bioaccumulate.	Substances can be considered bioaccumulative if; • There is a Tissue Residue Guideline (TRG) • Bioaccumulation factor (BAF) or bioconcentration factor (BCF) greater than 5000. • If BAF or BCF is not available, or reliable, the log Kow is equal to or greater than 5. If a literature review indicates that a substance biomagnifies, it should be treated as biomagnifying regardless of whether or not it meets the criteria above. It should also be noted that some substances with a log Kow greater than 5 do not biomagnify. If studies on a substance with a high Kow demonstrate a lack of biomagnification in upper trophic levels, then the substance can be considered not bioaccumulative.	*See attached Reference Material including log(Kow)* Consult *CEPA (1999) Persistence and Bioaccumulation Regulations* for additional guidance; http://laws-lois.justice.gc.ca/eng/regulations/SOR-2000-107/page-1.html
Score	0			
Raw Aquatic "Potential" total	5	Note if a "Known" Ecological Effects score is provided, the "Potential" score is disallowed.		
Allowed Aquatic "Potential" total	5			
4. Ecological Exposure Modifying Factors				
a) Known, or potential, occurrence of a species at risk.		Species at risk have the potential to frequent the site (Polar bear, wolverine, etc.) See: https://www.flr.gov.nl.ca/publications/wildlife/index.html	Consult any ecological risk assessment reports. If information is not present, utilize on-line databases such as NatureServe Explorer (http://explorer.natureserve.org/). Regional, Provincial (Environment Ministries), or Federal staff (Fisheries and Oceans or Environment Canada) should be able to provide some guidance.	Species at risk include those that are extirpated, endangered, threatened, or of special concern. For a list of species at risk, consult Schedule 1 of the federal Species at Risk Act, available at: http://www.sararegistry.gc.ca/species/schedules_e.cfm?id=1 Many provincial governments may also provide regionally applicable lists of species at risk. For example, in British Columbia, consult: BCMWLAP. 2005. Endangered Species and Ecosystems in British Columbia. Provincial red and blue lists. Ministry of Sustainable Resource Management and Water, Land and Air Protection. http://www2.gov.bc.ca/gov/content/environment/plants-animals-ecosystems/species-ecosystems-at-risk
Is there a potential for a species at risk to be present at the site, or a known presence? Yes No Do Not Know	Yes	To assess the potential for a species at risk to be present, the site (or surroundings) should be located within range of a species at risk (using on-line resources and consultation with knowledgeable government departments or biologists, see above), and there should be an assessment of habitat suitability for any identified potential species at risk.		
	2			
	---			
b) Potential impact of aesthetics (*e.g.,* enrichment of a lake or tainting of food flavour).		No reports of evidence of aesthetic impacts are known.		
Is there evidence of aesthetic impact to receiving water bodies? Yes No Do Not Know	No		Documentation may consist of environmental investigation reports, press articles, petitions or other records.	This Item will require some level of documentation by user, including contact names, addresses, phone numbers, e-mail addresses. Evidence of changes must be documented, please attach copy of report containing relevant information.
	0			

Is there evidence of olfactory impact (*i.e.,* unpleasant smell)? Yes No Do Not Know	No	No reports of evidence of olfactory impacts are known.	Examples of olfactory change can include the smell of a COPC or an increase in the rate of decay in an aquatic habitat.	
	0			

Is there evidence of increase in plant growth in the lake or water body? Yes No Do Not Know	No	No reports of increases in plant growth in lakes or water bodies are known.	A distinct increase of plant growth in an aquatic environment may suggest enrichment. Nutrients *e.g.,* nitrogen or phosphorous releases to an aquatic body can act as a fertilizer.	
	0			

Is there evidence that fish or meat taken from or adjacent to the site smells or tastes different? Yes No Do Not Know	Do Not Know	It is now known if fish or meat taken from or near to the site smell or taste any different.	Some contaminants can result in a distinctive change in the way food gathered from the site tastes or smells.	

	1			
Ecological Modifying Factors Total - Known	2			
Ecological Modifying Factors Total - Potential	1			
Raw Ecological "Known" total	2			
Raw Ecological "Potential" total	10.5			
Raw Combined Total Ecological Score	12.5			
Adjusted Total Ecological Score (Max 18)	**12.5**			

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(III) Exposure (Demonstrates the presence of an exposure pathway and receptors)

Site: Cartwright Radar Station

Definition	Score	Rationale for Score (document any assumptions, reports, or site-specific information; provide references)	Method Of Evaluation	Notes
5. Other Potential Contaminant Receptors				
a) Exposure of permafrost (leading to erosion and structural concerns)		It is not suspected that roads are dependant on permafrost for structural integrity. No buildings are located on site.		Plants and lichens provide a natural insulating layer which will help prevent thawing of the permafrost during the summer. Plants and lichens may also absorb less solar radiation. Solar radiation is turned into heat which can also cause underlying permafrost to melt.
Are there improvements (roads, buildings) at the site dependant upon the permafrost for structural integrity?	No		Consult engineering reports, site plans or air photos of the site. When permafrost melts, the stability of the soil decreases, leading to erosion. Human structures, such as roads and/or buildings are often dependent on the stability that the permafrost provides.	
Yes	0			
No				
Do Not Know	---			
Is there a physical pathway which can transport soils released by damaged permafrost to a nearby aquatic environment?	Do Not Know		Melting permafrost leads to a decreased stability of underlying soils. Wind or surface run-off erosion can carry soils into nearby aquatic habitats. The increased soil loadings into a river can cause an increase in total dissolved solids and a resulting decrease in aquatic habitat quality. In addition, the erosion can bring contaminants from soils to aquatic environments.	
Yes	---			
No				
Do Not Know	1			
Other Potential Receptors Total - Known	0			
Other Potential Receptors Total - Potential	1			

Exposure Total		
Raw Human Health + Ecological Total + Other Receptors - "Known"	8	
Raw Human Health + Ecological Total + Other Receptors - "Potential"	22.5	Only includes "Allowed potential" - if a "Known" score was supplied under a given category then the "Potential" score was not included.
Raw Total Exposure Score (not adjusted)	30.5	HH or Eco Total score has not yet been capped at 22 and 18, respectively.
Adjusted Total Score (Adjusted Total Exposure / 46 * 34)	**22.5**	maximum 34

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Score Summary

Site: Cartwright Radar Station

Scores from individual worksheets are tallied in this worksheet.
Refer to this sheet after filling out the revised NCSCS completely.

I. Contaminant Characteristics	Known	Potential
1. Residency Media	6	---
2. Chemical Hazard	8	---
3. Contaminant Exceedance Factor	6	---
4. Contaminant Quantity	6	---
5. Modifying Factors	7	---
Raw Total Score	33	---
Raw Combined Total Score (Known + Potential)	33	
Adjusted Total Score (Raw Combined Total/40*33)	**27.2**	(max 33)

II. Migration Potential	Known	Potential
1. Groundwater Movement	12	---
2. Surface Water Movement	12	---
3. Soil	12	---
4. Vapour	---	8.5
5. Sediment Movement	0	---
6. Modifying Factors	4	---
Raw Total Score	40	8.5
Raw Combined Total Score (Known + Potential)	48.5	
Adjusted Total Score (Raw Combined Total/64*33)	**25.0**	(max 33)

III. Exposure	Known	Potential
1. Human Receptors		
A. Known Impact	---	
B Potential		
a. Land Use		1
b. Accessibility		2
c. Exposure Route		
i. Direct Contact		3
ii. Inhalation		1
iii. Ingestion		4
2. Human Receptors Modifying Factors	6	---
Raw Total Human Score	6	11
Raw Combined Total Human Score (Known + Potential)	17	
Adjusted Total Human Score	17	(maximum 22)
3. Ecological Receptors		
A. Known Impact	---	
B. Potential		
a. Terrestrial		4.5
b. Aquatic		5
4. Ecological Receptors Modifying Factors	2	1
Raw Total Ecological Score	2	10.5
Raw Combined Total Ecological Score (Known + Potential)	12.5	
Adjusted Total Ecological Score	12.5	(maximum 18)
5. Other Receptors	0	1
Total Other Receptors Score (Known + Potential)	1	
Total Exposure Score (Human + Ecological + Other)	**30.5**	
Adjusted Total Score (Total Exposure/46*34)	**22.5**	(maximum 34)

Site Score

Site Letter Grade	**C**
Certainty Percentage	**81%**
% Responses that are "Do Not Know"	**3%**
Total NCSCS Score for site	**74.8**
Site Classification Category	**1**

Site Classification Categories*:
Class 1 - High Priority for Action (Total NCS Score >70)
Class 2 - Medium Priority for Action (Total NCS Score 50 - 69.9)
Class 3 - Low Priority for Action (Total NCS Score 37 - 49.9)
Class N - Not a Priority for Action (Total NCS Score <37)
Class INS - Insufficient Information (≥15% of responses are "Do Not Know", or a site letter grade of F has been assigned)

* NOTE: The term "action" in the above categories does not necessarily refer to remediation, but could also include risk assessment, risk management or further site characterization and data collection.

Appendix G Photographs

Photo 1 (facing southwest): Subject site, with the Town of Cartwright and Sandwich Bay in the background (August, 2018).

Photo 2 (facing southeast): Larks Harbour Pond (August, 2018).

Photo 3 (facing northwest): Present day communication towers (August, 2018).

Photo 4 (facing west): Pond located on site adjacent to the communication towers. Sandwich Bay can be seen in the background (August, 2018).

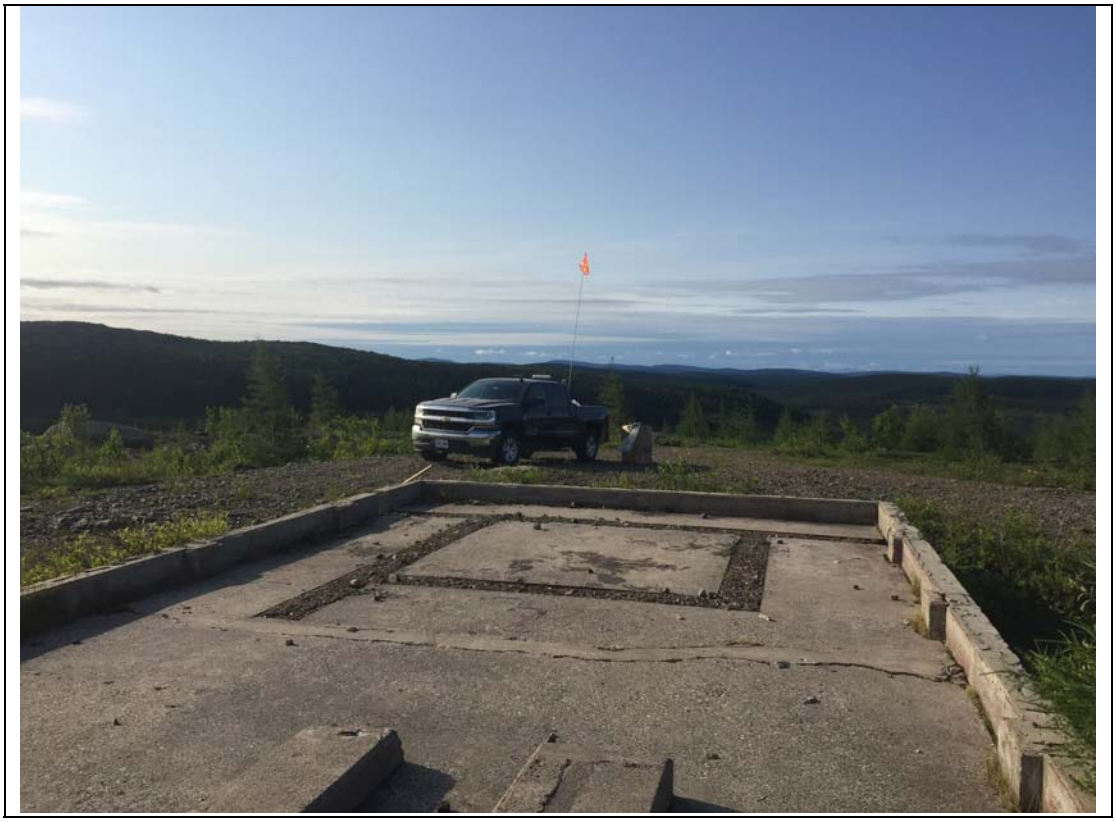

Photo 5 (facing east): Concrete foundation located in the Former Ammunition Storage Area (August, 2018).

Photo 6 (facing south): Monitor well drilling activities (August, 2018).

Photo 7: Digging of TP3-18-B (August, 2018).

Photo 8: Boiler found adjacent to TP3 (August, 2018).

Photo 9: Boiler insulation material determined to be asbestos containing (August, 2018).

Photo 10: Shingle and tar paper determined to be asbestos containing (August, 2018).

Photo 11: Shingles and tar paper (August, 2018).

Englobe