Initial Testing Program and NCSCS Classification

Former Pinetree Line Radar Station, Cape Makkovik, Labrador

Final Report

Prepared for:

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Building what matters

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Defence Construction Canada
Constitution Square
180 Kent Street, 14th floor
Ottawa, ON K1P 0B6

Attention: **Ms. Andrea Catley; Environmental Coordinator**

Dear Ms. Catley

Reference: **Final Report: Initial Testing Program and NCSCS Classification, Cape Makkovik, Labrador**

SNC-Lavalin Inc. (SNCL) is pleased to provide to Defence Construction Canada one (1) electronic copy of the Final Report for the Initial Testing Program and NCSCS Classification, Cape Makkovik, Labrador.

Should you have any questions or concerns, please contact the undersigned at your convenience.

Yours truly,

SNC-LAVALIN INC.

Approved by:

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EXECUTIVE SUMMARY

In August 2017, SNC-Lavalin Inc. (SNCL) was retained by Defense Construction Canada (DCC), on behalf of the Department of National Defence (DND), to carry out an Initial Testing Program (Phase II Environmental Site Assessment (ESA)) and complete a National Classification System for Contaminated Sites (NCSCS) for the former Pinetree Line Radar Station in Cape Makkovik, Labrador, herein referred to as the "Site". The investigation was requested as a follow-up to a Phase I ESA completed by GHD Limited in March 2016.

The purpose of this investigation was to develop and execute an individual work plan for the Site, necessary to collect sufficient soil, surface water and sediment data to complete Step 3 (Initial Testing program or Phase II ESA) and Step 4 (Classify Site using NCSCS) of the 10 Step Federal Approach to Contaminated Sites (FACS) process. The highest Step completed at the Site prior to this present program was Step 2 (Historical Review). The overall mandate of this work is to expand on the conclusions of the Phase I ESA to ensure sufficient data had been collected to allow the Site to be classified using the NCSCS and to provide a written work plan for additional environmental site assessment work required (if any) to delineate and characterize on-site impacts.

In addition, an assessment and sampling program was also conducted on building materials observed at the site to determine if asbestos containing materials were present. Building materials sampled for asbestos included building siding, insulation, vinyl floor tiles, insulating foam, felt and rubber.

Site Description

The Site, which is currently owned by the Province of Newfoundland and Labrador (NL), is located along the Labrador coastline approximately 230 kilometers northeast of the Town of Happy Valley/Goose Bay, NL and approximately 16 kilometers north of the community of Makkovik, NL. The Site was mainly used as a manned United States Air Force (USAF) Pinetree Line Gap Filler Radar Station for the Hopedale Air Station and was in operation from 1957 to 1961 and comprised of an Upper and Lower Site connected by a 2.7 kilometer gravel roadway. The Site formerly contained several structures including a two storey, 5-unit building (main building) housing: a garage, a heating and power plant, barracks (30 to 50 personnel), office space and a dining hall, disaster shack, helicopter pad, radar tower (radome), communication towers, two pumphouse buildings (one near the Lower and Upper Site), septic tank, aboveground storage tanks (AST) and concrete dykes.

The Site is now predominantly covered in vegetation, gravel, exposed bedrock and concrete from the former building structures. The elevation at the upper portion of the Site is approximately 129 meters above sea level (masl) while the elevation at the Lower Site is approximately 3 masl. Based on Site observations and topographic mapping, both surface and groundwater are anticipated to follow the surface contours in the area and flow north/northwest toward the Atlantic Ocean in the Upper Site and flow west/northwest toward the Atlantic Ocean (Aillik Bay) in the area of the Lower Site. Refer to Appendix B of this report for Site photographs.

The Site decommissioning program was completed under the approval of the Provincial Government of NL in 1987. This reportedly included razing of on-site structures and the burning of all materials on-site, followed by the burying and covering of the debris and other remaining materials. It is noted that the contractor typically buried the debris in at least two locations when the Site contained an upper and lower site. This was completed due to the distance and effort required to transport metal/other debris from the Lower Site to the Upper Site. As stated in the March 2016 GHD Phase I ESA report, this was the case during the Site decommissioning at Cape Makkovik. One of these disposal sites (1987 Disposal Site) is located approximately 0.3 kms south of the Upper Site as identified in the Phase I ESA. The location of the other 1987 disposal site believed to be near the Lower Site was not identified in the 2016 GHD Phase I ESA and could not be located at the time of the 2017 SNCL Phase II ESA site visit.

A former USAF dump used during the sites operation (1957 to 1961) was reported in the Phase I ESA to be at the Upper Site to the northeast of the main building. A second USAF dump used during operation was reported to the south of the lower tank farm area at the Lower Site, and south of this dump, a former drum dump was reportedly located approximately 1 km south of the Lower Site. The Phase I ESA reported that this drum dump was not associated with past USAF activities and the debris left behind was from the British Newfoundland Development Corporation (Brinco) during past exploration activities near the site.

Concrete foundations of the former buildings and radar towers and the roadways still remain at the Site.

Site Visit

The site visit was carried out in October 2017. The investigation included a Phase II Environmental Site Assessment which involved a soil, sediment, surface water and asbestos sampling program. The assessment did not include groundwater testing, or a title search/ legal survey of the Site. Since the Site is owned by the province of NL, both provincial and federal guidelines (where applicable) have been used to evaluate the environmental quality of the soil, sediment, surface water and asbestos samples collected within the areas of investigation.

The general surface (0-0.3 m) stratigraphy at the Site, as revealed in the Phase II ESA test pits, consists mainly of brown and greyish, moist, loose to compact coarse sand and gravel with some fine material and cobbles covered with a layer of low lying grasses and moss. Bedrock is predominantly exposed at surface at the Site and a thin soil veneer is present at various locations on the Site. Groundwater was not encountered at the Site as test pit holes dug during the soil sampling program did not exceed 0.5 meters below ground surface (bgs).

As presented in the 2016 GHD Phase I ESA completed for the Site, 4 former dumpsites were identified, the former Brinco drum dump located approximately 1km south of the Lower Site, the former USAF dump located approximately 0.2 kms meters southeast of the Lower Site, the former USAF dump located approximately 0.2 kms north of the Upper Site and the 1987 disposal site located approximately 0.3 kms south of the Upper Site.

Based on the information provided in the GHD Phase I ESA, SNCL was able to locate the 1987 disposal Site south of the Upper Site. Several samples of the debris (foam, roofing asphalt and building siding), was collected from test pits excavated within the disposal site and submitted for asbestos analysis. There was no evidence of any debris above ground surface at this disposal site location during the time of the site visit.

Several hours were spent trying to find the location and any evidence of the former USAF dump located just north of the Upper Site. Based on site observations there was no evidence of any dump located in the suspected area identified in the Phase I ESA. The entire area consisted of large boulders and exposed bedrock. There were several pieces of concrete in the suspected area but no other construction debris was identified.

The area of former USAF dump located approximately 200 meters southeast of the Lower Site was also investigated for debris as identified in the Phase I ESA. Once the site was located, only several pieces of wood and concrete blocks were observed. The entire area was covered with large boulders (no soil) and exposed bedrock.

The suspected area of the former drum dump (Brinco) located approximately 1 km south of the Lower Site was also investigated for debris. Once the site was located, no evidence of any debris was evident as the entire site was covered in large boulders, exposed bedrock and a layer of thin low-lying moss covering rock (no soil). The shoreline in this area was also investigated but no indication of a drum dump was revealed in the area identified in the GHD Phase I ESA.

There were no signs or evidence of any remaining drums, tanks or containers throughout both the Upper and Lower Site. Several pieces of wood were observed in the area where the former pumphouse building was located near the Lower Site. There were also a minimal amount of scattered construction debris such as foam, siding, vinyl floor tiles and insulation located on the ground surface around the perimeter of the Former Barracks and Former Radome area.

Conclusions

Based on the information gathered and on observations made during this investigation the following conclusions were made:

Soil sampling Program

- Results of the petroleum hydrocarbon sampling program revealed that none of the soil samples (including background samples) analyzed had petroleum hydrocarbon (PHC) concentrations that exceeded applicable guidelines.
- It should be noted that 14 soil samples did not reach baseline at C50 when analyzed for petroleum hydrocarbons. A further review of the laboratory data (chromatograms) by Maxxam Analytics confirmed that with the exception of soil sample SEPTIC-SOIL-1, all on-site and background soil samples containing PHC concentrations that did not reach baseline at C50 were a result of phytogenic sources and not related to any petrogenic or petroleum products that may have been historically used at the Site.
- Results of the soil sampling program for Polycyclic Aromatic Hydrocarbons (PAHs) revealed that the benzo(a)pyrene total potency equivalent factor was not exceeded in any of the soil samples collected at the Site or at background locations. However, the soil sampling did reveal select samples collected on site that contained concentrations of phenanthrene, only, exceeding the applicable CCME Environmental Health Soil Quality Guideline (EHSQG) which is based on the non-carcinogenic effects of PAHs and is protective of surface water for freshwater aquatic life. Concentrations of phenanthrene exceeding this CCME EHSQG were detected in the area of the former pumphouse building (Lower Site) (LPUMP-SOIL-3). No background soil samples contained concentrations of PAHs exceeding applicable guidelines. As a result, all phenanthrene soil contamination at the site is expected to be a result of historical site activities.
- Soil samples collected from the Site were compared against the background concentrations to determine if metal exceedances on-site were natural occurring or related to historical activities. 8 background soil samples (BG-SOIL-1-BG-SOIL-8) were collected in off-site areas not suspected of being contaminated. A review of analytical results show that none of the background soil samples contained metal concentrations that exceed the applicable CCME guidelines. To determine whether the site concentrations were significantly different than background concentrations, the Wilcoxon Rank-Sum test was used. Results of the test revealed that only the metal parameters zinc, vanadium and copper were not considered to be naturally occurring and are attributed to historical site activities. All other metal parameters exceeding CCME guidelines were not considered to be significantly different from background concentrations. As a result, metal contamination identified at the Upper Site in surface soil is

located in the area of the former barracks (HANGER-SOIL-2), 1987 Disposal Site (1987-SOIL-1 to 1987-SOIL-12), former helicopter pad (HEL-SOIL-3), former radome (RADOME-SOIL-1 & RADOME-SOIL-2) and former communication towers (TOWER-SOIL-3, TOWER-SOIL-4). For the Lower Site the former pumphouse (LPUMP-SOIL-3) area has areas of contaminated metals in surface soil.

- Results of the soil sampling program revealed concentrations of pesticides exceeding applicable CCME CSQGs in one sample collected from the perimeter of the former barracks building (HANGER-SOIL-4). It should be noted that due to the extensive list of pesticide/herbicide parameters and lack of guidelines, there still remain reported parameters that do not have existing guidelines for comparison purposes. Based on a review of guidelines and achievable laboratory detection limits, criteria were selected in an attempt to cover as many parameters for pesticides/herbicides as possible. As a result, analytical results for pesticides/herbicides were screened against CCME guidelines and Ontario and Alberta provincial guidelines. The concentrations of pesticides measured in this sample are likely associated with building materials, treated to combat pests (e.g., termites), and thus associated impacts to soil are likely to be localized to the areas immediately surrounding the foundations of buildings historically present at the Site.

- Results of the soil sampling program revealed that all on-site samples analyzed for Volatile Organic Compounds (VOCs), Polychlorinated Biphenyls (PCBs), and Dioxins and Furans contained concentrations that were either below applicable CCME or Atlantic Risk-Based Corrective Action (ARBCA) guidelines or laboratory detection limits.

- The NCSCS evaluation completed for the Site revealed a total category score of 47.2 with a Class 3 site classification indicating “Low Priority for Action”.

Sediment sampling Program

- Results of the petroleum hydrocarbon sampling program revealed that sample SED-2 and background samples BG-SED-1 and BG-SED-2 collected from 3 different freshwater ponds contained concentrations exceeding the applicable Atlantic Risk Based Corrective Acton (ARBCA) guidelines. However, with the exception of SED-2, a review of the laboratory data (chromatograms) by Maxxam Analytics revealed that sediment samples BG-SED-1 and BG-SED-2 contain hydrocarbons that are a result of phytogenic sources. Sample SED-2 contains a modified Total Petroleum Hydrocarbon (TPH) which resembles a weathered fuel oil fraction. Therefore, the TPH identified in this pond, located adjacent to the roadway and approximately 0.6 kilometers (kms) northwest of the Upper Site, is likely sourced from historical operations at the Site, and may be related to impacts from vehicle use on the roadway, or from the pipeline which was assumed to run adjacent to the roadway. The historical pipeline was used to transport diesel from the lower portion to upper portion of the Site. These hydrocarbon impacts appear to be very localized, as no other petroleum hydrocarbon impacts (greater than applicable guidelines) were identified in soil samples collected anywhere at the Site, or in sediment or surface water at any other ponds at the Site.

- Results of the sediment sampling program revealed concentrations of metals at two of the on-site freshwater ponds (SED-1 & SED-2), former water supply pond (WSUPPLY-SED-3) and background samples BG-SED-1 and BG-SED-2 exceeding the applicable CCME ISQG; chromium in one sample from the former water supply pond (WSUPPLY-SED-3) also exceeded the PEL. The minor ISQG exceedances measured in samples from the two ponds would be unlikely to result in significant impacts to aquatic biota, and may be attributable to background concentrations (e.g., copper). The only exceedance of a PEL concentration was for chromium in the water supply pond; however, since the other two sediment samples collected from this water supply pond had concentrations of chromium well below the PEL as well as the ISQG value, it is not anticipated that chromium-impacted sediments are widespread throughout this pond.

- Results of the sediment sampling program revealed that all on-site samples analyzed for VOCs, PAHs and PCBs contained concentrations that were either below applicable CCME or ARBCA guidelines or laboratory detection limits.

Surface Water Sampling Program

- Metal contamination in surface water was also identified in surface water samples SW-1 and SW-2 collected from on-site ponds. The metal parameter copper in sample SW-1 and metal parameters aluminum, copper and iron in sample SW-2 exceeded applicable CCME guidelines. Aluminum and copper in background surface water samples also exceeded applicable CCME guidelines; therefore, it is possible that elevated concentrations of aluminum and copper could be associated with natural background conditions at the Site and in the area. The concentrations of aluminum and copper measured in surface water on-Site and at off-Site background locations are relatively similar/within the same order of magnitude. Two of the three aluminum guideline exceedances were identified in samples collected from off-Site ponds considered to be representative of background conditions: aluminum in BG-SW-1 was measured at 140 ug/L, and at 240 ug/L at BG-SW-2. The maximum concentration of aluminum measured at the Site ponds was 430 ug/L, in a sample collected at SW-2. Copper guideline exceedances were also identified in three samples; however, two of these were collected on-Site, while one was collected from a background pond, as follows: 2.9 ug/L at SW-1, 6.4 ug/L at SW-2, and 2.2 ug/L at BG-SW-1.

  Based on site observations and information gathered from the Phase I ESA, there was no evidence of garbage dumping or any other evidence of human activity at the on-site ponds. Each of the ponds sampled on-site were shallow and the water was clear allowing any construction debris or any garbage from human activity to be easily visible. It should also be noted that the turbidity reported by the laboratory for sample SW-2 (1.1 NTU) was higher than all other samples (range of 0.24 to 0.70 NTU). The maximum concentration of iron measured at the Site ponds was 540 ug/L, in a sample collected at SW-2. The maximum background concentration of iron measured was 270 ug/L, in a sample collected at BG-SW-2. Since iron tends to prefer to remain bound to sediment, the elevated total iron concentration measured in this sample is likely associated with sediment and/or particulate matter present in the sample. Measured total aluminum and copper concentrations were also likely elevated by the presence of suspended sediments/particulate matter in SW-2. Therefore, overall, it is likely that the elevated metals concentrations identified in samples SW-1 and SW-2 at the Site are attributable to local background conditions (i.e., for aluminum and copper) and/or to the elevated turbidity measured in the SW-2 sample (i.e., for aluminum, copper and iron). As a result, anthropogenic impacts to surface water at the Site are likely to be limited or not present.

- Results of the surface water sampling program revealed that all on-site samples analyzed for petroleum hydrocarbons and PAHs contained concentrations that were either below applicable CCME or ARBCA guidelines or laboratory detection limits.

Asbestos Sampling Program

- Results of the asbestos sampling program revealed that 4 (including 1 duplicate sample) of the twelve samples collected throughout the Upper Site contained asbestos concentrations exceeding the applicable provincial guideline of >1%. Samples A3 (Grey Building Siding -

Chrysotile 15%), A4 (Brown Insulation - Amosite 20%), A11 (Black Felt - Chrysotile 7%) and A12 (Grey Building Siding - Duplicate of A3) (Chrysotile 15%) all exceeded the applicable provincial guideline. Samples A3 and duplicate sample A12 were collected from the 1987 Disposal Site, sample A4 was collected near the former radome foundation and sample A11 was collected near the former barracks foundation.

- With the exception of samples A10 and A11 collected from the perimeter of the former barrack foundation, all other samples collected that contained asbestos concentrations exceeding provincial guidelines were buried on site. Small quantities of asbestos containing tar (sample A10) and felt (sample A11) exceeding guidelines along with small pieces of building siding and floor tiles resembling materials sampled at the 1987 disposal site were visible on surface soil near the former barracks and radome foundations. Based on site observations, none of the asbestos containing material in this area is expected to release asbestos fibers unless they are disturbed or damaged in some way. As a result, no harmful effects to humans or the environment is expected to occur from any asbestos materials at the site.

Recommendations

Although lateral and vertical delineation of contaminants in soil has not been achieved during the Phase II ESA, visual and in-situ investigation revealed that the depth to bedrock in many of these areas is not much greater than the depth at which the surface soil samples were collected (0.3m). Outcropping of bedrock across the site would result in geophysical delineation of soil impacts. Visual observations of the area including the former barracks, former septic tank, former radome and former communication towers report exposed bedrock and minimal surface soil cover, which again indicates that bedrock likely serves as geophysical delineation at these areas of potential environmental concern (APEC). Historical Site use and operations are well-understood, and identified impacts appear to be localized to the areas immediately surrounding historical infrastructure (e.g., foundations of buildings) at the Site. Areas surrounding these APECs have been adequately characterized to enable the evaluation of identified impacts through risk assessment. As a result, further delineation or characterization of contaminants in surficial soil, surface water or sediment is not required to evaluate on-site contamination.

The recommended risk management strategy for this site, based on Step 7 of the Federal Approach to Contaminated Sites, would be to conduct a limited risk assessment to address the potential for risk to the environment or human health using the available information for all media of concern that were sampled.

Based on the information collected and the presence of contaminants exceeding applicable guidelines or background, a future limited risk assessment should include the following:

- Conduct a risk based review of the existing data and information to expand on the current conceptual site model completed as part of this mandate for the site in a Problem Formulation. The Problem Formulation forms the framework of a risk assessment for a site under a given land use. The framework provides a systematic and quantitative means of identifying contaminants of potential concern (COPCs) specific to human health or ecological receptors, receptors of concern (ROCs) that have the potential to be present at the Site, and the potential exposure pathways between COPCs and ROCs in a completed conceptual site model; and
- If potentially operable exposure pathways are identified between COPCs and ROCs, conduct a preliminary quantitative or qualitative assessment of the potential risks associated with potential exposures. Results of the risk assessment will be used to support the rationale for no further investigation or management of the reported site impacts. This step would take into

consideration the potential environmental effects associated with measured exceedances and relative differences from regional background conditions at the Site.

Due to the limits of surficial soil and remote access to the area, groundwater was not investigated within the scope of this ESA and was not identified or observed during investigations at the Site; therefore, any potential for impacts associated with groundwater will not be evaluated as there was no data collected for this media or associated exposure pathways. Since groundwater at the Site is presumed to be primarily located within bedrock, it is relatively inaccessible to human and ecological ROCs at the Site. Groundwater would only become accessible for potential exposure to ROCs as it migrates into surface water bodies at the Site; surface water samples have been collected from on-Site ponds to enable a direct evaluation of potential exposure and effects to ROCs at the Site. As a result, the lack of information about groundwater quality will not limit the completion of a human health and ecological risk assessment for the Site. It should be noted that there are no groundwater wells at or near the site and none are anticipated to be installed in the future.

1 INTRODUCTION

1.1 Purpose

In August 2017, SNC-Lavalin Inc. (SNCL) was retained by Defense Construction Canada (DCC) on behalf of the Department of National Defence (DND) to carry out an Initial Testing Program (Phase II Environmental Site Assessment (ESA)) and complete a National Classification System for Contaminated Sites (NCSCS) for the former Pinetree Line Radar Station in Cape Makkovik, Labrador, herein referred to as the “Site” (refer to Figures 1 & 2, Appendix A). The investigation was requested as a follow-up to a Phase I ESA completed by GHD Limited in March 2016 for the Site.

The purpose of this investigation was to develop and execute an individual work plan for the Site that collected sufficient data to complete Step 3 (Initial Testing program or Phase II ESA) and Step 4 (Classify Site using NCSCS) of the 10 Step Federal Approach to Contaminated Sites (FACS) process. The highest Step completed at the Site prior to this present program was Step 2 (Historical Review). The overall mandate of this work is to expand on the conclusions of the Phase I ESA to ensure sufficient data had been collected to allow the Site to be classified using the NCSCS and to provide a written work plan for additional environmental site assessment work required (if any) to delineate and characterize on-site impacts.

In addition, an assessment and sampling program was also conducted on building materials observed at the site to determine if asbestos containing materials were present.

This report presents a description of the Site, detailed description of the methods employed, results obtained and interpretation of the findings, assumptions related to the estimate of contaminated media, conclusions and recommendations. Report appendices include: Site Figures (A), Photographs (B), Laboratory Certificates (C), Analytical Summary Tables (D), QA/QC Program (E), Test Pit Logs (F), Phase I ESA Report (GHD, 2016) (G), NCSCS Worksheet (H), Laboratory Chromatograms (I) Ecological Screening Protocol (J), Areas of Potential Environmental Concern Sampling Program (K) and Z-Score Calculation (L).

1.2 Scope of Work

The scope of work for the investigation included the following:

- Documentation review of the GHD Limited’s Phase I ESA completed in March 2016 to develop a comprehensive understanding of past and present concerns at the Site. The historical review helped determine what potential contaminants of concern (PCOC) to identify and what specific area of potential environmental concern (AEC) to investigate at the Site;
- Completion of a Phase II ESA intrusive soil, sediment, surface water and asbestos[1] sampling program to verify the presence/absence of PCOC at the Site. The Phase II ESA was completed in accordance with the Canadian Standard Association (CSA) Standard Z769-00 (R2013) for conducting ESAs;

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[1] Asbestos samples were collected as per the Newfoundland & Labrador Asbestos Abatement Regulations under the Occupational Health and Safety Act (O.C. 98-730).

- Conduct a background soil, sediment and surface water sampling program in the adjacent area of the Site to assess whether or not PCOC concentrations measured on Site are related to historical on-site activities or off-site sources/surficial geology;
- Complete NCSCS scoring worksheets for the Site;
- Estimation of the volume and areas of impacted media (if applicable) for the Site;
- Complete a Preliminary Conceptual Site Model (CSM) identifying actual and potential contaminants, migration pathways and potential receptors of concern and exposure pathways (human and ecological);
- Complete a Site Inventory List including any Site infrastructure, buildings, drums and other waste containers still remaining on Site where applicable; and
- Complete a detailed report outlining the methodologies, regulatory criteria, findings, conclusions and recommendations of the investigation.

1.3 Site Description

The Site, which is currently owned by the Province of NL, is located along the Labrador coastline approximately 230 kilometers northeast of the Town of Happy Valley/Goose Bay, NL and approximately 16 kilometers north of the community of Makkovik, NL (Refer to Figure 1, Appendix A). The Site was mainly used as a manned Unites States Air Force (USAF) Pinetree Line Gap Filler Radar Station for the Hopedale Air Station, operated from 1957 to 1961 and comprises of an Upper and Lower Site. Once operation ceased, the facility, which included two parcels of land (Area A – 16.64 acres & Area B – 104.23 acres) was transferred to the Canadian Armed Forces for use by the Department of National Defense (DND) in connection with Mid Canada Line (MCL) (Refer to Figure 2, Appendix A). Conditions included mineral and gas rights for the Province of NL and a return clause stating that when the lands were no longer used by DND, they would be assumed by NL. For reporting purposes the Site will be discussed as two areas, the Upper and Lower Sites.

Upper Site: The station formerly contained a two storey, 5-unit building (main building) housing: a garage, a heating and power plant, barracks (30 to 50 personnel), office space and a dining hall. A tower housing the radar and radio equipment (radome) was connected to the main building via a covered corridor. The station was also equipped with two communication antennae, a water pump house building and supply lines (freshwater lake located to the south of the Upper Site), a disaster/emergency shack, a large aboveground storage tank (AST) containing diesel (1,832,000 litres in a concrete dyke southwest of the main building) and a helicopter pad. A former USAF dump used during the operation was reported to the northeast of the main building, and potable water was pumped from the freshwater water supply pond via an aboveground pipeline to the Upper Site Main building. A concrete dam was constructed on the northern shoreline of the water supply pond to help retain water. Septic waste was discharged via an aboveground pipeline to a septic tank to the southeast of the main building.

Lower Site: In addition to the Upper Site facilities, a 2.7 kilometer gravel roadway was constructed to connect the Upper Site to the lower dock area at the Lower Site. The roadway was used to transport supplies to and from the dock area to the station. A second, 3,053,000 litre steel AST in a concrete dyke, also containing diesel, was located near the dock and a pipeline was constructed which pumped diesel fuel from the dock to the lower AST (Lower Site) and from the lower AST to the upper AST (Upper Site). Two buildings (including a pump house) were also located halfway up the access road connecting the Upper and Lower Sites. The above ground pipeline from the lower to the upper tank farm is anticipated to have followed the gravel access road. The fuel was then pumped via a network of aboveground pipelines at the station to supply the diesel generators used to power the station. The diesel generators were located in the former heating and generator room at the Upper Site main building. A former fuel drum storage area and a second USAF dump used during operation was reported to the south of the lower tank farm area, and south of this dump, a former Brinco mineral exploration drum dump was reportedly located approximately 1 km south of the Lower Site.

Fuel was also reportedly handled and/or stored in portable ASTs and drums across the Site, including at the helipad, the garage, the Lower Site, and the heating and stand-alone water pump house building.

The Site is now predominantly covered in vegetation, gravel, exposed bedrock and concrete from the former building structures. The elevation at the upper portion of the Site is approximately 129 meters above sea level (masl) while the elevation at the Lower Site is approximately 3 masl. Based on Site observations and topographic mapping, both surface and groundwater are anticipated to follow the surface contours in the area and flow north/northwest toward the Atlantic Ocean in the Upper Site and flow west/northwest toward the Atlantic Ocean (Aillik Bay) in the area of the Lower Site. Refer to Appendix B of this report for Site photographs.

The Site decommissioning program was completed under the approval of the Provincial Government of NL in 1987. This reportedly included razing of on-site structures and the burning of all materials on-site, followed by the burying and covering of the debris and other remaining materials. It is noted that the contractor typically buried the debris in at least two locations when the Site contained an upper and lower site. This was completed due to the distance and effort required to transport metal/other debris from the Lower Site to the Upper Site. As stated in the March 2016 GHD Phase I ESA report, this was the case during the Site decommissioning at Cape Makkovik. One of these disposal sites (1987 Disposal Site) is located approximately 0.3 kms south of the Upper Site as identified in the Phase I ESA (Refer to Figure 2, Appendix A). The location of the other 1987 disposal site believed to be near the Lower Site was not identified in the 2016 GHD Phase I ESA and could not be located at the time of the 2017 SNCL Phase II ESA site visit. Concrete foundations of the former buildings and radar towers and the roadways still remain at each Site.

A former USAF dump used during the sites operation (1957 to 1961) was reported in the Phase I ESA to be at the Upper Site to the northeast of the main building. A second USAF dump used during operation was reported to the south of the lower tank farm area at the Lower Site, and south of this dump, a former drum dump was reportedly located approximately 1 km south of the Lower Site. The Phase I ESA reported that this drum dump was not associated with past USAF activities and the debris left behind was from the British Newfoundland Development Corporation (Brinco) during past exploration activities near the site. None of these dump sites were visible or identified during the 2017 SNCL Phase II ESA.

1.4 Stratigraphy, Geological & Hydrogeological Characteristics

Regionally, the area bedrock has been mapped as the middle Paleoproterozoic era consisting of rhyolite, ash-flow, tuff, breccias and hypabyssal rhyolite intrusions; volcaniclastic siltstone and sandstone; minor basalt belonging to the Southeastern Churchill, Makkovik, Nain and Grenville Provinces (NL Department of Natural Resources Mines Branch, January 2007, Geological Map of Labrador).

The general surface (0-0.3 m) stratigraphy at the Site, as revealed in the Phase II ESA test pits, consists mainly of brown and greyish, moist, loose to compact coarse sand and gravel with some fine material and cobbles covered with a layer of low lying grasses and moss. As the Upper Site is situated on a hill approximately 129 meters above sea level (masl) bedrock is predominantly exposed at surface especially in the areas of the former main building (barracks), former radome, former communication antennas (towers), former septic tank, former disaster shack and the suspected area of the former USAF dump (refer to Appendix A, Site Figures & Appendix B for Site Photos). Although bedrock was not reached in any of the test pits at a depth of 0.3 m throughout the Upper Site visual observations of bedrock outcrops in many of these areas indicate that soil depth is not much greater than 0.3 m and in many areas less as only a thin soil veneer is present over bedrock.

Exposed bedrock is also present throughout the Lower Site in the areas of the former lower pumphouse and suspected areas of the former USAF dump and Brinco drum dump. Similar to the Upper Site, bedrock was not encountered in any of the test pits excavated at the lower pumphouse site however exposed bedrock outcrops and a thin layer of soil (less than 0.3 m) was observed throughout much of this area (refer to Appendix B for Site Photos). For the areas of the suspected USAF dump and Brinco drum dump only a thin layer of vegetation covering bedrock was observed for the majority of these sites.

Three soil samples (SIEVE, SIEVE 2 and LAST-SOIL-3) were submitted by SNCL to a certified laboratory for a 75 micrometers (um) Sieve analysis to determine if the soil was considered either coarse or fine grained. Since the grain size results from all 3 of the soil samples contained 80 percent by mass or greater of particles than 75 µum the soil was classified to be coarse grained. Soil sample SIEVE was taken at the Upper Site, SIEVE 2 was taken along the former roadway connecting both the Upper and Lower Site and soil sample LAST-SOIL-3 was taken at the Lower Site. The locations where each sample was collected can be found on Figures 3, 6 and 10, Appendix A. The sieve analysis laboratory results are in Appendix C of this report.

Groundwater was not encountered at the Site in the test pit holes dug during the soil sampling program which did not exceed 0.5 meters bgs. Google Earth mapping identifies the Lower Site as approximately 2-3 masl. Based on this information and the close proximity of the Lower Site to the marine waters of Aillik Bay, groundwater in the area of the Lower Site is expected to be shallow. Given that the Upper Site is approximately 129 masl it is difficult to approximate the depth to groundwater, although the deep groundwater flow direction at the Site is expected to be towards the adjacent Atlantic Ocean. The provincial Water Resources Management Division of the Municipal Affairs and Environment Department was contacted to determine if any specific data regarding groundwater depths at Cape Makkovik existed. The groundwater resources manager for the Water Resources Management Division Dorothea Hanchar stated that no groundwater data for that area was on file.

Based on Site observations and topographic mapping, both surface and shallow groundwater are anticipated to follow the surface contours in the area and flow north/northwest toward the Atlantic Ocean in the Upper Site and flow west/northwest toward the Atlantic Ocean (Aillik Bay) in the area of the Lower Site.

1.5 Previous Environmental Reports

In preparation for the Phase II ESA program, SNCL conducted a detailed review of the report titled “Phase I ESA, Former United States Military Site Cape Makkovik (Aillik), NL”, completed by GHD in March 2016.

The purpose of the Phase I ESA was to identify, through non-intrusive investigation, the existence of any significant actual or potential areas of environmental impairment associated with the property. The Phase I ESA included a review of Site history, document review, interviews with individuals knowledgeable of the Site operations and correspondence with regulatory agencies. The Phase I ESA did not include a site visit to Cape Makkovik.

The Phase I ESA completed for the Site revealed the following potential environmental concerns:

- **Historic Handlings, Use, and Storage of Petroleum Hydrocarbons:** As a self-sufficient Gap Filler radar station in a remote location, significant quantities of fuel was formerly stored at the Site in ASTs, as well as in thousands of Petroleum, Oils and Lubricants (POL) drums. The Site also formerly contained a garage (i.e. motor pool) that was used to service on Site vehicles and heavy equipment, and a helicopter landing pad that contained drum storage and a portable fuel tank used for refueling helicopters. The potential for petroleum hydrocarbon impacts exist as a result of the historical petroleum storage and distribution activities conducted at the Site. The main areas of concern would include the former Upper Site area, former AST areas (upper and lower tank farms), along with the former product pipelines, the former helicopter landing area, and the former drum storage area, as well as in the former USAF dumpsites and 1987 disposal sites.

- **Solid Waste/Recyclables:** During the operation of the facility from 1957 to 1961 solid waste was historically disposed in an unlined landfill (Lower Site former USAF dump) located near the dock facilities, west and downgradient of the Upper Site. A second unlined landfill (Upper Site former USAF dump) was also located northeast of the Upper Site. Based on historical activities at the Site, these landfills may contain former Asbestos Containing Material (ACM) building materials; material with painted surfaces containing lead and/or mercury based paint, former electrical equipment containing Polychlorinated Biphenyls (PCBs), mechanical equipment debris, motor repair wastes and/or drums formerly containing POLs as well as other solvents. The Site decommissioning program was completed under the approval of the NL Department of Environment and Conservation in 1987, and included the razing of all remaining structures and the burning of all materials on Site, followed by the burying and covering of the debris and other remaining materials. It was noted that the contractor typically buried the debris in at least two locations when the Site contained an Upper and Lower Site. This was completed due to the distance and effort required to transport metal/other debris from the Lower Site to the Upper Site. As documented in the Site Restoration Status Report dated August 17, 1987, this was the case during the Site decommissioning at the former Cape Makkovik (Aillik) station. As a Site visit was not part of the scope for the Phase I ESA, it was unknown if these areas remain covered as reported in the 1987 field program. A surveillance flyover of the Site completed on September 5, 1996 by the Department of Environment and Conservation confirmed all debris on both Upper and Lower Sites remained buried. As outlined in the “Environmental Inspection Abandoned Military Sites in Labrador” report, dated October 1996, a former drum/barrel dump was located on a beach approximately one kilometre south of the Lower Site, which was not previously identified. However, an interview with a local resident revealed this area was not associated with past USAF activities; rather debris left behind by the British Newfoundland Development Corporation (Brinco) during past exploration activities near the Site.

- **Heavy Metals**: Possible sources of heavy metals may be associated with vehicle repairs at the former motor pool building and helicopter repairs at the former helicopter pad area. In addition, the former on Site buildings were constructed in the early 1950s; therefore, the potential exists that lead/mercury based paint was used on the interior and exterior surfaces which may have potentially impacted the surface soils.

- **Polychlorinated Biphenyls (PCBs):** Past uses of PCBs were identified through the records review and regulatory responses. PCBs were historically used as an insulator and coolant in electrical transformers and capacitors at the Site. PCBs were commonly used because they are chemically inert, not affected by acids and corrosive chemicals, do not conduct electricity and will not burn (only at extremely high temperatures). Although the United States banned the use of PCBs in 1972, the Cape Makkovik (Aillik) station was operated from 1957 to 1961; therefore they may have been used at the Site.

1.6 Summary of Concerns and Field Sampling Program

This section includes a summary of all areas/contaminants of potential environmental concern identified in the GHD Phase I ESA report and additional areas/contaminants of concern identified by SNCL. The SNCL field sampling program was developed based on a review of the GHD Phase I ESA report, GHD preliminary Phase II ESA sampling plan (attached to the Phase I ESA) and background information provided by DCC.

It should be noted that the GHD Phase I ESA identified a former storage building at the site. The Phase II ESA site visit did not reveal any evidence of an existing or former storage building at the Site therefore no samples were collected for this proposed location.

1.6.1 Areas of Potential Environmental Concern Identified in the GHD Phase I ESA

Each area of potential environmental concern (APEC) listed below has been assigned a number which corresponds to the numbers located on Figure 2, Appendix A.

1) Former AST (Upper & Lower Site)

Petroleum hydrocarbon and PAH soil analysis was recommended by GHD at these locations as a result of AST diesel fuel storage.

2) Former Fuel Drum Area (Lower Site)

Petroleum hydrocarbon and PAH soil analysis was recommended by GHD at this location as a result of drum fuel storage. In addition, SNCL recommended soil metals analysis as waste oils and unknown petroleum or hydrocarbon mixtures may have been stored at this location. Metal parameters such as lead, chromium and cadmium may exist in these hydrocarbon mixtures.

3) Brinco Former Drum Dump (Lower Site)

Petroleum hydrocarbon and PAH soil analysis was recommended by GHD at this location as a result of drum fuel storage. SNCL also recommended metals analysis as waste oils and unknown petroleum or hydrocarbon mixtures may have been dumped in drums at this location. Metal parameters such as lead, chromium and cadmium may exist in these hydrocarbon mixtures. PCBs may have also been dumped in drums at this location.

4) Former Aboveground Fuel Line (Upper & Lower Site)

Petroleum hydrocarbon and PAH soil analysis was recommended by GHD at this location as a result of diesel containing fuel line which connected both the Upper and Lower Site.

5) Former USAF Dump (Upper & Lower Site)

Petroleum hydrocarbon, Polycyclic Aromatic Hydrocarbons (PAHs), PCB and metals soil analysis was recommended by GHD as a result of historical waste (diesel fuel, solvents, lead containing paint, PCB containing electrical equipment) from site activities being buried at unlined dump locations. Pesticides may have been used in the paint to prevent vegetation growth on the exterior surfaces of all building structures on the site. Dioxins & Furans may have been produced from the wood burning during the demolition of the site especially if the wood had been chemically treated. Volatile Organic Compounds (VOCs) may be present from paints and coatings, solvents, hydrocarbon fuels and building materials such as building adhesives, wall boards and ceiling tiles that may have existed at this site. As a result, these additional contaminants of concern (COC) in soil were recommended to be sampled by SNCL.

6) 1987 Disposal Site

Petroleum hydrocarbon, PAH, PCB and metals soil analysis was recommended by GHD as a result of the Site decommissioning program which was completed by the NL Department of Environment and Conservation in 1987 which included the reported razing of all remaining structures and the burning of all materials on Site, followed by the burying and covering of the debris and other remaining materials. SNCL also recommended pesticide, dioxins and furans and VOCs in soil to be analysed for the same reasons discussed for the former USAF dump sites.

7) Former Helicopter Pad & Drum Cache

Petroleum hydrocarbon, PAH and metals soil analysis was recommended by GHD as a result of fuel drum storage and a portable fuel tank used for refueling helicopters at the helicopter landing pad. PCBs may have been used in the paints of the helicopter pad and PCBs may have been stored in this area if transported to the site by helicopter. Flaking paint may have entered in the soil in the vicinity of the helicopter pad and PCB spillage may have occurred during potential transport of PCBs by helicopter. As a result, these additional COC in soil were recommended to be sampled by SNCL.

8) Former Pumphouse (Upper & Lower Site)

Petroleum hydrocarbon, VOC and PAH soil analysis was recommended by GHD as a result of fuel use at each pumphouse located at both the Upper and Lower Site. SNCL also recommended metals in soil analysis as metal containing paint may have been also used on the exterior building surfaces of each pump house resulting in flaking paint entering the soil in the vicinity of each former building structure.

9) Former Main Building & Motor Pool (Upper Site)

Petroleum hydrocarbon, VOC, PAH and metals soil analysis was recommended by GHD as a result of the refueling of equipment and the use and storage of various petroleum lubricants such as cleaners, degreasers and solvents. Pesticides may have also been used in the paint to prevent vegetation growth on the exterior surfaces of all building structures on the site. PCBs may have existed in the electrical equipment of the main building and may have also been stored inside the building. As a result, these additional COC in soil were recommended to be sampled by SNCL.

10) Former Disaster Shack (Upper Site)

Petroleum hydrocarbon, VOC, PAH and metals soil analysis was recommended by GHD as a result of the potential use and storage of various petroleum lubricants such as cleaners, degreasers and solvents in the vicinity of the building structure. SNCL also recommended pesticides to be analysed in soil as pesticides may have been used in the paint to prevent vegetation growth on the exterior surfaces of all building structures on the site.

11) Former Water Supply Pond & Ponds Near Site

Petroleum hydrocarbon, PAH, metals and PCB water analysis was recommended by GHD at the former water supply pond and several ponds near the site as a result of historical activities including potential fuel handling, use and storage of various petroleum lubricants such as cleaners, degreasers and solvents and use of PCB containing equipment.

PHCs, PCBs and metals analysis in sediment was also recommended by SNCL to ensure garbage (ex. fuel drums, painted building materials) were not dumped into these ponds when the site was first decommissioned in the early 1960s.

1.6.2 Additional Areas of Concern Identified in the SNCL Phase II ESA

Based on an in-depth review of the Phase I ESA and preliminary Phase II ESA sampling plan completed by GHD Limited (Refer to Appendix G of this report) for the former United States Military Site in Cape Makkovik, Labrador, SNCL identified other areas/contaminants of concern at the Site to be investigated during the Phase II ESA.

12) Former Septic Tank (Upper Site)

The potential exists that liquids (ex. solvents) containing Petroleum Hydrocarbons (PHCs), VOCs, PCBs, metals and PAHs may have been flushed into the site septic system. As a result, soil in the vicinity of the former septic system location were analysed for these COC.

13) Former Radome Site (Upper Site)

The potential exists that metal and PCB containing paint may have been used on structures at the former Radome site resulting on soil contamination in the immediate area. Cleaning solvents and other volatile liquids may also have been used in this area as well resulting in VOC contamination in soil.

14) Former Communication Towers (Upper Site)

The potential exists that metal and PCB containing paint may have been used on the former communication towers resulting in soil contamination in the immediate area. Cleaning solvents and other volatile liquids may also have been used in this area as well resulting in VOC contamination in soil.

Background soil, surface water and sediment sampling in the surrounding areas adjacent to the site was also recommended by SNCL to help determine if any potential contamination within the water supply pond and other ponds located within the Site property boundaries may be natural occurring and representative of surrounding areas.

In addition, building materials were collected for asbestos from the 1987 Disposal Site and areas near the former Main Building and Radome.

Table 1 below identifies all areas and contaminants of environmental concern for the Site. Table 1 in Appendix K provides a more detailed overview of the Cape Makkovik sampling plan.

Table 1: Areas and Contaminants of Potential Environmental Concern

Site	Areas of Potential Environmental Concern	Contaminates of Potential Environmental Concern
Former Pinetree Line Radar Station, Cape Makkovik, Labrador	1) Former AST (Upper Site)	Soil - PHCs, PAH
	1) Former AST (Lower Site)	Soil - PHCs, PAH
	2) Former Fuel Drum Storage Area (Lower Site)	Soil - PHCs, PAH, Metals
	3) Brinco Former Drum Dump (Lower Site)	Soil - PHCs, PAH, Metals, PCBs
	4) Former Aboveground Fuel Line (Upper & Lower Site)	Soil - PHCs, PAH
	5) Former USAF Dump (Upper & Lower Site)	Soil - PHCs, PAH, Metals, PCB, VOCs, pesticides & dioxins/furans
	6) 1987 Disposal Site	Soil - PHCs, PAH, Metals, PCB, VOCs, pesticides & dioxins/furans
	7) Former Helicopter Pad and Drum Cache (Upper Site)	Soil - PHCs, PAH, Metals & PCBs
	8) Former Pump House (Upper & Lower	Soil - PHCs , PAH, Metals & VOCS

Site	Areas of Potential Environmental Concern	Contaminates of Potential Environmental Concern
	Site)	
	9) Former Main Building and Motor Pool (Upper Site)	Soil - PHCs, PAH, Metals, VOCs, PCBs & pesticides
	10) Former Disaster Shack(Upper Site)	Soil - PHCs, PAH, Metals, VOCs & pesticides
	11) Former Water Supply Pond & Ponds Near Site	Sediment - PHCs, PAH, Metals & PCBs Surface Water - PHCs, PAH, Metals & RCAP
	12) Former Septic Tank (Upper Site)	Soil - PHCs, PCBs , PAH, Metals & VOCS
	13) Former Radome Site	VOCs, PCBs & Metals
	14) Former Communication Towers	VOCs, PCBs & Metals
	Background Location(s)	Soil - PHCs, Metals, PAHs, VOCs & dioxins/furans Surface Water - PHCs, Metals, PAHs & RCAP Sediment - PHCs, Metals, PCBs, PAHs & VOCs

2 REGULATORY CRITERIA

Since the Site is owned by the province of NL, both provincial and federal guidelines (where applicable) have been used to evaluate the environmental quality of the soil, sediment, surface water and asbestos samples collected within the areas of investigation. The following Site specific information presented in Table 2 was used to select regulatory criteria for comparison to soil, sediment and surface water quality within the areas of investigation:

Table 2: Site Specific Information for Determining Applicable Regulatory Guidelines

Land Use	Commercial – In NL, properties are required to be assessed in accordance to their current or expected future land use. The Cape Makkovik Site property was used primarily for commercial purposes and although the Site has been abandoned since the 1960s the province does not require any remediation to a more stringent property classification unless there are specific plans for a new land use. For this reason the Site is considered Commercial.
Future Land Use	No change of land use is expected.
Potable Water Supply	Non-Potable - The Site did use an adjacent freshwater pond as a potable water supply when the Radar Station was in operation. However, since Site operation has ceased and the Site structures decommissioned, there are no potable water supplies being utilized at the Site.
Soil Texture	Coarse Grained – Based on site observations and sieve analysis of several samples, surface soil (0-0.3 meters below ground surface (mbgs)) at the Site (both Upper & Lower Site) have been identified as coarse grained (Refer to Appendix C for analytical results). Most soil observed at the Site consisted of a mixture of coarse grained sand and gravel.
Bedrock/Shallow Soil	Bedrock at surface and shallow soil was observed/encountered throughout the Site during the Phase II ESA.
Closest Water Body	There are several freshwater ponds in the immediate area (less than 200 meters) of both the Upper and Lower Site. The marine waters of the Atlantic Ocean are approximately 200 m from the eastern property boundary of the Upper Site and immediately adjacent to the western property boundary of the Lower Site.

2.1 Federal Guidelines

Based on the site specific information above, analytical results for soil, sediment, and surface water samples collected within the area of investigation were compared to the following federal guidelines listed in Table 3.

Table 3: Federal Guidelines

Soil	Canadian Council of Ministers of the Environment (CCME), 1999 as updated to 2017, Canadian Environmental Quality Guidelines (CEQG), Soil Quality Guidelines for the Protection of Environmental and Human Health, Commercial Land Use, Coarse Grained Surface Soils for PCBs, Pesticides, Dioxins & Furans[2], PAHs, metals and VOCs. For the case of ecological effects from non-carcinogenic PAHs, the Environmental Soil Quality Guideline (SQGE) was used, when available, which is based on the lowest of the available environmental health guidelines (soil contact, soil and food ingestion, protection of aquatic life or interim soil quality criteria (CCME 1991)). For PAHs where a soil contact guideline was not available, an overall SQGE was not calculated. In this case, the protection of freshwater life guideline was used followed by the interim soil quality criteria when available. CCME, 2001 as revised in 2008, Canada-Wide Standards (CWS) for PHC in Soil, Commercial Land Use, Coarse Grained Surface Soil.
Sediment	CCME Interim Sediment Quality Guidelines (ISQGS) and Probable Effects Levels (PELs) for the Protection of Aquatic Life (Freshwater) for PAHs, metals and PCBs (1999 as updated to 2017).
Surface Water	CCME Surface Water Quality Guidelines for the Protection of Aquatic Life (Freshwater) for Petroleum Hydrocarbons, PAHs, metals and Rapid Chemical Analysis Program (RCap) parameters[3] (2007 as updated to 2017).

Federal surface water guidelines for a number of inorganic parameters are dependent on the surface water hardness or pH as the toxicity of these inorganic parameters is a function of these water quality variables. Chemical screening of aluminum in surface water was completed based on the measured pH in surface water and the guideline applicable to the measured surface water pH. Chemical screening of copper, lead, nickel and cadmium concentrations in surface water were completed on a sample by sample basis in consideration of the sample hardness. Chemical screening of boron, zinc, uranium and cadmium in surface water was completed relative to the long term CCME freshwater aquatic life guideline which are protective of chronic exposure effects to freshwater aquatic life.

There is no single final CCME Soil Quality Guideline for any of the PAHs that will protect both human and environmental health. To ensure that both human and ecological receptors are protected, the user must (1) calculate a Benzo[a]pyrene Total Potency Equivalents (B[a]P TPE) to ensure that humans are protected from direct contact with soil contaminated with carcinogenic PAHs, (2) calculate the Index of Additive Cancer Risk (IACR) to ensure that potable water resources are protected from carcinogenic PAHs, and (3) consider all relevant guidelines to protect ecological receptors from non-carcinogenic effects for the land use in question.

As the site soil may potentially be contaminated with coal tar or creosote mixtures, the calculated Benzo[a]pyrene Total Potency Equivalents (B[a]P TPE) concentrations for soil samples were multiplied by a safety factor of 3 prior to comparison with the human health-based soil quality guideline for direct

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[2] Using the 2005 World Health Organization (WHO) toxicity equivalence factors (TEFs), the toxicity equivalence quotients (TEQs) for each dioxin like compound (DLC) is estimated by multiplying the measured DLC concentration by the TEF corresponding to the DLC. The toxicity of DLCs can be addressed by considering their toxicity relative to 2,3,7,8-tetrachlorodibenzo-p-dioxin of TCDD. The total TEQ for each soil sample is determined by summing the individual TEQ for TCDD with DLCs in the mixture.

[3] RCAp analyzes thirty (30) standard water quality variables which give a broad and complete inorganic profile of the water. Some of the parameters include pH, Total Organic Carbon, Conductivity, Turbidity and several metal parameters such as Copper and Iron.

contact (SQG_{DH}) to account for carcinogenic potential of alkylated and other PAHs present for which a Potency Equivalence Factor (PEF) does not currently exist, but which are likely to contribute to mixture carcinogenic potential.

Unlike human health, carcinogenic effects to ecological receptors is typically not considered an ecologically relevant endpoint, therefore the CCME provides ecological guidelines for individual PAH in soil based on protection of freshwater aquatic life, soil contact and soil and food ingestion, dependent on land use type and the availability of toxicity data. Insufficient data may not allow for the calculation of one or more of these exposure pathway protective guidelines and if an ecological soil contact guideline is not calculated by the CCME, an overall ecological soil quality guideline for that PAH is typically not recommended by CCME.

2.2 Provincial Guidelines

Based on the site specific information above, analytical results for soil, sediment, surface water and asbestos samples collected within the area of investigation were compared to the following provincial site guidelines listed in Table 4.

Table 4: Provincial Guidelines

Soil	Atlantic Risk-Based Corrective Action (ARBCA) for Petroleum Impacted Sites in Atlantic Canada, Version 3 (Updated January 2015) – Tier 1 Risk Based Screening Levels for Soil (mg/kg) for a non-potable/coarse grained Commercial Property. ARBCA for Petroleum Impacted Sites in Atlantic Canada, Version 3 (Updated January 2015) – Tier 1 Soil Ecological Screening Levels for the Protection of Plants and Soil Invertebrates; Direct Soil Contact. ARBCA for Petroleum Impacted Sites in Atlantic Canada, Version 3 (Updated January 2015) – Tier 1 Soil Ecological Screening Levels for the Protection of Wildlife (mammals and birds) and Livestock; Soil and Food Ingestion. Pesticides - Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, Ontario Ministry of the Environment, April 15, 2011(Full Depth, Non-Potable Water, Commercial/Industrial Land Use). Pesticides – Alberta Government Tier I Soil and Groundwater Remediation Guidelines for Commercial Land Use – All Exposure Pathways (non-potable groundwater).
Sediment	ARBCA for Petroleum Impacted Sites in Atlantic Canada, Version 3 (Updated January 2015) – Tier 1 Sediment Ecological Screening Levels for the Protection of Freshwater and Marine Aquatic Life (Typical Sediment). ARBCA for Petroleum Impacted Sites in Atlantic Canada, Version 3 (Updated January 2015) – Tier 1 Sediment Ecological Screening Levels for the Protection of Freshwater and Marine Aquatic Life (VOCs).
Surface Water	ARBCA for Petroleum Impacted Sites in Atlantic Canada, Version 3 (Updated January 2015) – Tier 1 Surface Water and Groundwater Ecological Screening Levels for the Protection of Freshwater and Marine Aquatic Life.
Asbestos	1998 NL Asbestos Abatement Regulations (NL. Reg. 111/98).

At the request of the client, soil, sediment and surface water samples for petroleum hydrocarbons were only submitted for CCME CWS hydrocarbon analysis including BTEX. No samples were submitted for Atlantic RBCA hydrocarbon analysis. The aliphatic and aromatic fraction ranges comprising the CWS PHC fractions (F1 to F4) vary from those used to identify the Atlantic RBCA Tier I Gasoline, Diesel #2 and #6 Oil/Lube guidelines. The overall carbon range used to calculate the APIRI Modified Total Petroleum Hydrocarbons (TPH) ends at C32 as opposed to C34 for the CCME PHC F4 range, although the carbon ranges are inconsistent, an indicative modified TPH comparison could be made by summing the CCME PHC F1 to F4 fraction results as outlined in the Atlantic RBCA for Petroleum Impacted Sites in Atlantic Canada, User Guidance Version 3, dated July 2012, and revised January 2015. This is an accepted method used by the province of NL when both provincial (ARBCA) and Federal (CWS) guidelines for petroleum hydrocarbons are required.

A chromatogram review completed by Maxxam Analytics revealed that with the exception of soil sample SEPTIC-SOIL-1, all on-site and background soil samples containing petroleum hydrocarbon fractions were interpreted to result from phytogenic sources and not related to any petrogenic or petroleum products that may have been historically used at the Site. As a result, estimated modified TPH comparison was not conducted for the soil sampling program (refer to section 4.1 of this report).

With the exception of the benzene, toluene, ethylbenzene and xylene (BTEX) petroleum hydrocarbon parameters, there are no CCME or Atlantic RBCA guidelines for VOCs in sediment. VOCs were analysed in Site sediment to determine if measured concentrations were representative of background concentrations.

Due to the lack of contaminant guidelines for pesticides/herbicides within the province of NL, SNCL utilized criteria from other jurisdictions, which could also be applied to the site. Due to the extensive list of pesticide/herbicide parameters and lack of guidelines, there still remain reported parameters that do not have existing guidelines for comparison purposes. Based on a review of guidelines and achievable laboratory detection limits, criteria were selected in an attempt to cover as many parameters for pesticides/herbicides as possible. As a result, analytical results for pesticides/herbicides were screened against Canadian federal guidelines, Ontario and Alberta provincial guidelines.

2.3 Ecological Screening Protocol

The most updated version of the Atlantic RBCA guidance document (Version 3, July 2012, revised January 2015) includes an Ecological Screening Protocol for Petroleum Impacted Sites in Atlantic Canada. The ecological screening protocol is intended to determine whether chemical hazards, ecological receptors and/or exposure pathways are present at a given site. Completion of the protocol does not suggest that an ecological risk assessment (ERA) has been completed. Rather, the outcome of the protocol is a determination of whether or not an ERA or remediation/risk management should be conducted, and whether or not additional site data are required to conduct an ERA, or proceed with risk management options.

While this protocol is not an ecological risk assessment, the protocol provides a decision making framework that will result in one of following three conclusions:

- The site does not pose a risk to ecological receptors/habitat and no further action is necessary related to the environment;
- The site should be remediated to Tier 1 ecological screening levels; or

- The site should undergo further assessment in terms of quantifying ecological risks at the site (e.g. further delineation, quantitative ecological risk assessment, etc.).

The ecological protocol is comprised of the following three parts.

- Part I provides ecological risk-based numerical standards to protect ecological receptors within the four defined land use categories (Agricultural, Residential, Commercial & Industrial). If the concentrations of petroleum hydrocarbons in the soil, groundwater, surface water and/or sediment are found to be below the ecological screening levels, no further action is required. If concentrations of petroleum hydrocarbons are present above ecological screening levels, Parts II and III must be completed.
- Part II prompts practitioners to identify habitats and receptors within a minimum of 200 metres of the suspected contaminated area.
- Part III examines the potential exposure pathways present at the site where petroleum hydrocarbons have the potential to influence ecological receptors and habitats identified in Part II.

With consideration of the information gathered and assessed in Parts I, II and III, a decision will then be made to determine if any additional steps are necessary in terms of addressing possible ecological risks present at the site or within the surrounding area.

Based on the completion of the protocol, additional action is required at the Site for further ecological assessment in accordance with the Atlantic RBCA requirements. Section 8 of this report describes the recommended action required for additional ecological assessment of the Site. The Ecological Screening Protocol has been completed and is included in Appendix J.

2.4 Background Soil Sampling

To determine whether the site soil metal concentrations were significantly different than background concentrations, the Wilcoxon Rank-Sum test was used. This statistical test evaluates the difference between two data sets by calculating a Z-score; if the Z-score fall outside the range of ±3 then there is less than 1% chance that differences between site data and background data are due to chance alone. Appendix L of this report explains how the Z-scores were calculated.

The background soil sample locations were determined based on geology mapping and Google earth imagery. Every effort was made to ensure each background location was unaffected by human activities. The background soil sample locations were in areas where the surficial soil was undisturbed and unstained. SNCL personnel also ensured that the background samples matched (as close as possible) to the soil type of the Site samples that were compared to the background data.

3 SITE VISIT AND EVALUATION OF FINDINGS

SNCL personnel visited the Site on October 13th, 14th, 15th and 17th, 2017[4] to collect soil, sediment, surface water and asbestos samples. All observable areas of the Site and surrounding area were visually inspected for potential sources of environmental liabilities. At the time of the site visit, the ground surface was clear, providing good conditions for the exterior assessment of the property. In addition a background soil, sediment and surface water sampling program was also conducted to assess whether concentrations of PCOC were directly related to historic activities at the Site or potential off-site sources. The Site was accessed each day via helicopter when the weather conditions permitted safe travel. Universal helicopters provided the transportation each day from their office in Goose Bay, Labrador.

Field work was conducted in accordance with the recommended requirements of the Canadian Standards Association (CSA), Phase II ESA Protocol Standard Z769-00 (R2013). The following sections review the sampling methodologies, quality control/assurance procedures, field observations, and analytical results of each sampling program. Site photographs can be found in Appendix B of this report.

3.1 Soil Sampling Program

Soil sampling completed during each site visit was completed manually using a pickaxe and stainless steel shovel. 1 surficial soil sample was collected from each test pit below the surface vegetation layer to a depth of approximately 0.3 m bgs. As each test pit was advanced, the ground profile was logged for soil type and any evidence of contamination. Test pit logs for the Phase II ESA are included in Appendix F of this report. With the exception of the test pits where soil samples 1987-SOIL-1 to 1987-SOIL-10 were collected at the 1987 Disposal Site all test pits were terminated at 0.3 m. Bedrock was not encountered at any of the test pits throughout the site.

For petroleum hydrocarbons analysis, the desired amount of soil for (VOCs & F1) was collected using lab provided Terracore samplers and placed directly into Volatile Organic Analysis (VOA) vials that were pre-weighed by the laboratory and contained methanol. Special attention and care were taken when collecting and preserving the soil samples in the field to ensure no methanol spilled out of the vial during transportation or sampling as this would have affected the w8 and bias data. Threads of the vial and cap were free from grit prior to closing each vial to prevent methanol from leaking out.

In all, a total of 68 (including duplicate samples) soil samples were collected from 59 test pit locations throughout the Upper and Lower Site. In addition, 8 background soil samples were collected from adjacent areas ranging from 0.3 to 5 kms from the Site. Once the required amount of soil was obtained, all soil samples were placed in pre-cleaned laboratory supplied sample jars and stored in coolers with ice for shipment to the laboratory. Both Site and background soil sample locations are illustrated in Appendix A, Figures 10 and 13.

3.1.1 Soil Vapour Concentrations

A PID meter was used to conduct a headspace analysis to detect if Volatile Organic Compounds (VOCs) were present in the surrounding soil of each sample location. Prior to taking the readings, the samples were placed in clear plastic bags, warmed to room temperature for 30 minutes, and then shaken to enhance volatilization. The headspace measurements were then taken by inserting the tip of the sampling

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[4] The first scheduled site visit for the Phase II ESA was on October 11th, 2017. However, poor weather conditions (fog) prevented access to the Site via helicopter on October 11th, 12th and the 16th, 2017.

instrument into each bag without contacting the soil or the side of each bag. VOCs were not detected in any of the Site or background soil samples collected during the Phase II ESA.

3.2 Surface Water Sampling Program

The Site surface water sampling program involved the collection of 7 (including duplicate samples) water samples. 3 samples were collected from the former water supply pond (WSUPPLY-SW-1 to WSUPPLY-SW-3) and 1 sample each (SW-1 to SW-3) was collected from 3 freshwater ponds located along the former roadway connecting the Upper and Lower Site. Sample location SW-1 was chosen based on its close proximity (approximately 13 meters) to the former lower pump house location where diesel fuel was used. Sample locations SW-2 and SW-3 were selected because these ponds were located downgradient from the former roadway and the Upper Site and contained sediment similar in composition. In addition, 1 background sample each (BG-SW-1 to BG-SW-3) was collected from 3 freshwater ponds. Sample location BG-SW-1 was located approximately 0.2 kms north and upgradient from the former roadway. Sample location BG-SW-2 was located approximately 3 kms southwest from the Upper Site and sample location BG-SW-3 was located approximately 6 kms south to the Upper Site.

Water samples were collected from the shoreline of each pond by holding each laboratory collection bottle and lowering it to a depth of approximately 0 to 10 cm below the water surface. Caution was used to prevent disturbing the sediment on the bottom of each pond at each sample location. Once the required amount of water was collected from each sample location sample bottles were placed in a cooler with ice until it was transported to a laboratory. All bottles were tightly capped and placed upright in the cooler for transport. Following the collection of each water sample, the general chemistry parameters (temperature, conductivity and total dissolved solids) of the surface water was measured in the field using a handheld YSI multiparameter meter. However, upon review of the field parameter readings it was later determined that the YSI unit was not working properly when it was being used at the Site. As a result, none of the field measured parameters have been included in this report as the measured readings were not accurate.

Both Site and background surface water sample locations are illustrated in Appendix A, Figures 5,8,11 and 14.

3.3 Sediment Sampling Program

The Site sediment sampling program involved the collection of 6 sediment samples. 3 samples were collected from the former water supply pond (WSUPPLY-SED-1 to WSUPPLY-SED-3) and 1 sample each (SED-1 to SED-3) was collected from 3 freshwater ponds located along the former roadway connecting the Upper and Lower Site. In addition, 1 background sample each (BG-SED-1 to BG-SED-3) was collected from 3 freshwater ponds. Sample location BG-SED-1 was located approximately 0.2 kms north and upgradient to the former roadway. Sample location BG-SED-2 was located approximately 3 kms southwest to the Upper Site and sample location BG-SED-3 was located approximately 6 kms south to the Upper Site. All sediment and surface water samples were collected at the same locations.

The sediment sampling program consisted of collecting surface sediments (0.0 – 0.30 m) from the shoreline of each pond using a stainless steel shovel. Care was taken to minimize the loss of fine-grained material by slowly moving the shovel from the pond bottom to the surface to ensure a representative sample of sediment was taken from each location. Where possible, care was taken to ensure sediment did not contain large amounts of vegetation or gravel. Once the required amount of sediment was obtained, sediment was stored into laboratory supplied bottles, bottle caps tightened and stored in coolers with ice until transported to the laboratory.

For petroleum hydrocarbons analysis, the desired amount of sediment for (VOCs & F1) was again collected using lab provided Terracore samplers and placed directly into VOA vials that were pre-weighed by the laboratory and contained methanol.

Both Site and background sediment sample locations are illustrated in Appendix A, Figures 4,9,12 and 15.

3.4 Asbestos Sampling Program

Samples of various building materials suspected of being asbestos containing that were observed throughout the Upper Site were collected. Building materials collected included vinyl floor tiles, felt, siding and insulation. To minimize dust release (where applicable), sample areas were first wetted and then removed from the host material by carefully cutting a portion of the material with a knife and placing it in a sealed bag for transportation to the laboratory. Most of the samples collected were found scattered on the ground in the immediate area of the foundation where the former barracks and former motor pool area were located. Several samples of building foam, felt and siding were also collected manually (hand dug) below ground surface (BGS); (approximately 0.7 meters) at the 1987 disposal site. No potential asbestos materials were observed at the Lower Site. A total of 12 samples (A1-A12) (including one duplicate sample) were collected and submitted for analysis.

Asbestos sample locations are illustrated in Table 6 and in Appendix A, Figure 7.

3.5 GPS Coordinates

SNCL recorded coordinates for all sampling locations using a Real Time Kinematic (RTK) satellite navigation device that provides more accuracy than typical handheld Global Positioning System (GPS) units. GPS measurements were recorded in UTM NAD83 coordinates (UTM Zone 21U). Sampling location coordinates are presented in Appendix K of this report.

3.6 Laboratory Analyses

Maxxam Analytics Inc. in Mount Pearl, NL and Bedford, Nova Scotia performed all soil, sediment, surface water and asbestos analyses. Maxxam is certified by the Canadian Association of Laboratory Accreditation (CALA).The laboratory analytical reports are presented in Appendix C. A summary of the laboratory analytical program taken during the Phase II ESA is presented in Tables 5 and 6.

Table 5: Summary of Soil, Sediment & Surface Water Analytical Program by Areas of Potential Environmental Concern

Media	Area Of Potential Environmental Concern	Contaminants Of Potential Concern	Number of Samples Submitted For Laboratory Analysis
Upper Site			
Soil	Former AST	BTEX/TPH & PAHs	5
Surface Water	Former AST	BTEX/TPH & PAHs	1
Soil	Former Helicopter Pad & Drum Cache	Metals, BTEX/TPH, PAHS & PCBs	4
Soil	Former Heating & Generator Room	Metals, BTEX/TPH,PAHS, PCBs & VOCs	2
Soil	Former Motor Pool Area	Metals, BTEX/TPH, PAHS, PCBs, VOCs & Pesticides	2
Soil	Former Radome	Metals, PCBs & VOCs	3
Soil	Former Communication Towers	Metals, PCBs & VOCs	4
Soil	Former Disaster Shack	Metals,BTEX/TPH, PAHs, VOCs & Pesticides	4
Soil	Former Septic Tank	Metals, BTEX/TPH,PAHs, PCBs & VOCs	3
Soil	1987 Disposal Site	Metals, BTEX/TPH, PAHs, PCBs,VOCs, Dioxins & Furans & Pesticides	12
Soil	Former Upper Pumphouse	Metals, BTEX/TPH, PAHs & VOCs	5
Surface Water	Former Water Supply Pond	RCAP, Metals, BTEX/TPH & PAHs	4
Sediment	Former Water Supply Pond	Metals, BTEX/TPH,PAHs,PCBs & VOCs	3
Lower Site			
Soil	Former AST	BTEX/TPH & PAHs	4
Soil	Former Fuel Drum Area	Metals, BTEX/TPH & PAHs	3
Soil	Former Lower Pumphouse	Metals,BTEX/TPH,PAHs & VOCs	4
Soil	Former Pipeline	BTEX/TPH & PAHs	5
Site Surface Water & Sediment			
Surface Water	Site Ponds (3)	RCAP,metals,BTEX/TPH, PAHs & VOCs	3
Sediment	Site Ponds (3)	Metals,BTEX/TPH,PAHs,PCBs & VOCs	3

Samples collected for asbestos analyses are provided in Table 6 below. Asbestos sample locations are illustrated on Figure 7, Appendix A. Photos of the collected samples can be found in Appendix B, Photos 33-42 of this report.

Table 6: Summary of Asbestos Analytical Program

Sample #	Location	Sample Description	Easting	Northing
A1	1987 Disposal Site (buried)	Black Foam	363511	6121586
A2	1987 Disposal Site (buried)	Black Felt	363514	6121589
A3	1987 Disposal Site (buried)	Grey building siding	363505	6121580
A4	Former Radome (buried)	Brown Insulation	363565	6121938
A5	Former Barracks	Black Foam	363544	6121929
A6	Former Barracks	Grey Building Siding	363544	6121929
A7	Former Barracks	Black Rubber	363544	6121929
A8	Former Barracks	Green vinyl floor tile	363544	6121929
A9	Former Heating & Generator Room	Black felt	363529	6121902
A10	Former Barrack Foundation	Black Tar	363533	6121915
A11	Former Heating & Generator Room	Black Felt	363529	6121903
A12 (Duplicate of A3)	1987 Disposal Site (buried)	Grey building siding	363505	6121580

3.7 Quality Assurance / Quality Control Sampling Program

A quality assurance / quality control (QA/QC) program was implemented during sampling to minimize and quantify potential impacts introduced during sample collection, handling, shipping and analysis. As part of the QA/QC program, sampling protocols included: minimizing sample handling, submitting samples within hold time limits, storing samples at appropriate temperatures, submitting field QA/QC samples, using dedicated non-contaminated sampling equipment, decontaminating dedicated sampling equipment between samples, using sample specific identification, using appropriate labelling procedures and maintaining COC records from sample collection to laboratory analysis. All soil and water samples collected during the sampling program were collected in pre-cleaned laboratory supplied jars and bottles, each asbestos sample collected was placed in a clean Ziploc bag.

Duplicate samples were collected at a 10% minimum frequency for each PCOC analysed for the Phase II ESA sampling program. For the purpose of this Phase II ESA, soil and sediment were considered the same media therefore no duplicate samples were collected for sediment. A list of the QA/QC samples submitted for laboratory analysis is summarized in Table 7.

Table 7: QA/QC Field Duplicate Samples

Sample ID	Duplicate ID	Media	Parameter
USAT-SOIL-2	USAT-SOIL-5	Soil	BTEX/TPH & PAHs
HEL-SOIL-1	HEL-SOIL-4	Soil	METALs,BTEX/TPH, PAHs & PCBs
SHACK-SOIL-3	SHACK-SOIL-4	Soil	METALs, BTEX/TPH & PAHs
1987-SOIL-2	1987-SOIL-11	Soil	METALs,BTEX/TPH, PAHs,PCBs,VOCs & PESTICIDES
1987-SOIL-3	1987-SOIL-12	Soil	METALs,BTEX/TPH, PAHs,PCBs,VOCs & DIOXINS & FURANS
UPUMP-SOIL-1	UPUMP-SOIL-4	Soil	BTEX/TPH & VOCs
UPUMP-SOIL-3	UPUMP-SOIL-5	Soil	METALs, BTEX/TPH, PAHs & VOCs
LPUMP-SOIL-1	LPUMP-SOIL-4	Soil	METALs, BTEX/TPH, PAHs & VOCs
PIPELINE-SOIL-3	PIPELINE-SOIL-5	Soil	BTEX/TPH
WSUPPLY-SW-2	WSUPPLY-SW-4	Surface Water	RCAP, METALs,BTEX/TPH & PAHs
A3	A12	Building Material	Asbestos

4 LABORATORY ANALYTICAL RESULTS

Maxxam Analytics Inc. in St. John's, NL and Bedford, NS performed all soil, sediment, surface water and asbestos analyses. The laboratory analytical certificates are presented in Appendix C. Analytical results for the samples collected during the site assessment are presented in Appendix D. Sample locations are located on Figures 3-15, Appendix A.

4.1 Soil Analytical Results

4.1.1 Petroleum Hydrocarbons in Soil

Analytical results for Petroleum Hydrocarbons in soil were compared to the CCME Soil Quality Guidelines for the Protection of Environmental and Human Health guidelines, the CCME Canada-Wide Standards Tier 1 Levels for surface soil, the Atlantic RBCA Tier I Risk Based Screening Levels for Soil and the Atlantic RBCA Tier I Soil Ecological Screening Levels for the Protection of Plants and Soil Invertebrates. Site regulatory criteria were compared to commercial, coarse-grained soil and non-potable water guidelines where applicable.

54 (including 9 duplicates) soil samples were collected from both the Upper and Lower Site and submitted for petroleum hydrocarbon analysis. In addition, 8 background soil samples were also submitted for petroleum hydrocarbon analysis. Soil samples for petroleum hydrocarbon analysis were analysed using CCME CWS including BTEX.

As previously stated in section 2.2 of this report, a chromatogram review completed by Maxxam Analytics revealed that with the exception of soil sample SEPTIC-SOIL-1, all on-site and background soil samples containing petroleum hydrocarbon fractions were interpreted to result from phytogenic sources and not related to any petrogenic or petroleum products that may have been historically used at the Site. Maxxam Analytics reported on each laboratory certificate "No resemblance to petroleum products in fuel oil/lube oil range" for all soil samples that did not reach baseline that were a result of phytogenic sources.

Results of the petroleum hydrocarbon sampling program revealed that none of the soil samples (including background samples) analyzed had petroleum hydrocarbon concentrations that exceeded applicable guidelines. It should be noted that several soil samples did not reach baseline at C50, however, this does not affect the conclusion based on the laboratory review of the soil chromatograms that with the exception of soil sample SEPTIC-SOIL-1, all on-site and background soil samples containing hydrocarbons were a result of phytogenic sources. Based on the reported volume of petroleum hydrocarbons used and stored at the Site it was not expected that all soil samples collected would not contain concentrations above applicable guidelines. However, all soil samples were collected in the areas (which could be located) suspected of containing contaminated petroleum hydrocarbon soil as identified from the GHD Phase I ESA.

See Appendix D, Tables 1-7 for petroleum hydrocarbon analytical results and comparison with applicable guidelines. Refer to Appendix I for sample chromatographs.

4.1.2 PAHs in Soil

Analytical results for PAHs in soil were compared to the CCME Soil Quality Guidelines for the Protection of Environmental and Human Health Guidelines.

53 (including 7 duplicates) soil samples were collected from both the Upper and Lower Site and submitted for PAH analysis. In addition, 8 background soil samples were also submitted for PAH analysis. Results of

the soil sampling program for PAHs revealed that the benzo(a)pyrene total potency equivalent factor of 5.3 was not exceeded in any of the soil samples collected at the Site or at background locations. This guideline is for the protection of Human Health from the carcinogenic effects of PAHs from the direct contact with contaminated soil. However, the soil sampling did reveal select samples collected on site that contained concentrations exceeding the applicable CCME Environmental Health Soil Quality Guidelines (EHSQG) which is based on the non-carcinogenic effects of PAHs to ecological receptors. Below is a list of the samples with exceeding concentrations.

UPPER SITE

Former Barracks

HANGER-SOIL-2

Phenanthrene (1.1 mg/kg) exceeded the EHSQG (0.046 mg/kg) which is based on the protection of freshwater aquatic life. The applicability of this guideline is based on whether a surface water body (which hosts aquatic life) is 10 m distant from the contaminated soil zone. At greater distances, a more relaxed guideline could be applicable (and a more conservative guideline is applicable at shorter distances). The maximum phenanthrene concentration is lower than the soil and food ingestion guideline applicable at more stringent land-uses. Since the soil sampling location is in excess of 190 m to the nearest surface water body, the CCME 1991 interim guideline of 50 mg/kg is considered applicable for soil quality comparison. As a result, no exceedances of Phenanthrene were identified at this sample location.

HANGER-SOIL-3

Phenanthrene (1.4 mg/kg) exceeded the EHSQG (0.046 mg/kg) which is based on the protection of freshwater aquatic life. Since the soil sampling location is in excess of 190 m to the nearest surface water body, the CCME 1991 interim guideline of 50 mg/kg is considered applicable for soil quality comparison. As a result, no exceedances of Phenanthrene were identified at this sample location.

LOWER SITE

Former Pump Station

LPUMP-SOIL-3

Phenanthrene (0.11 mg/kg) exceeded the EHSQG (0.046 mg/kg) which is based on the protection of freshwater aquatic life. LPUMP-SOIL-3 is situated approximately 10 m from the nearest surface water body which is assumed to possess aquatic life. Therefore, the guideline of 0.046 mg/kg is considered applicable.

See Appendix D, Tables 8-11 for PAH analytical results and comparison with applicable guidelines.

4.1.3 Metals in Soil

Analytical results for metals in soil were compared to the Commercial CCME Soil Quality Guidelines for the Protection of Environmental and Human Health Guidelines.

45 (including 6 duplicates) soil samples were collected from both the Upper and Lower Site and submitted for metals analysis. In addition, 8 background soil samples were also submitted for metals analysis.

Results of the metals sampling program revealed select samples collected on site that contained concentrations exceeding the applicable CCME CSQG. Below is a list of the samples with exceeding concentrations. None of the 8 background soil samples exceeded the applicable guidelines.

UPPER SITE

1987 Disposal Site

1987-SOIL-1 & 1987-SOIL-4

Vanadium (220 mg/kg) exceeded the Commercial CCME CSQG guideline (130 mg/kg).

1987-SOIL-2, 1987-SOIL-3, 1987-SOIL-5 & 1987-SOIL-11(Duplicate of 1987-SOIL-2)

Vanadium (210 mg/kg) exceeded the Commercial CCME CSQG guideline (130 mg/kg).

1987-SOIL-6 & 1987-SOIL-10

Vanadium (230 mg/kg/200 mg/kg) exceeded the Commercial CCME CSQG guideline (130 mg/kg).

1987-SOIL-7, 1987-SOIL-8 & 1987-SOIL-9

Vanadium (240 mg/kg) exceeded the Commercial CCME CSQG guideline (130 mg/kg).

1987-SOIL-12 (Duplicate of 1987-SOIL-3)

Vanadium (190 mg/kg) exceeded the Commercial CCME CSQG guideline (130 mg/kg).

Former Disaster Shack

SHACK-SOIL-2

Lead (350 mg/kg) exceeded the Commercial CCME CSQG guideline (260 mg/kg).

Former Helicopter Pad

HEL-SOIL-3

Arsenic (13 mg/kg) exceeded the Commercial CCME CSQG guideline (12 mg/kg).

Copper (110 mg/kg) exceeded the Commercial CCME CSQG guideline (91 mg/kg).

Former Barracks

HANGER-SOIL-2

Zinc (410 mg/kg) exceeded the Commercial CCME CSQG guideline (360 mg/kg).

Former Septic Tank

SEPTIC-SOIL-1

Antimony (43 mg/kg) exceeded the Commercial CCME CSQG guideline (40 mg/kg).

Lower Site

Former Pump Station

LPUMP-SOIL-3

Molybdenum (57 mg/kg) exceeded the Commercial CCME CSQG guideline (40 mg/kg).

Zinc (670 mg/kg) exceeded the Commercial CCME CSQG guideline (360 mg/kg).

Former Radome

RADOME-SOIL-1

Copper (93 mg/kg) exceeded the Commercial CCME CSQG guideline (91 mg/kg).

Zinc (580 mg/kg) exceeded the Commercial CCME CSQG guideline (360 mg/kg).

RADOME-SOIL-2

Zinc (570 mg/kg) exceeded the Commercial CCME CSQG guideline (360 mg/kg).

Former Towers

TOWER-SOIL-3 & TOWER-SOIL-4

Zinc (690 mg/kg; 2000 mg/kg) exceeded the Commercial CCME CSQG guideline (360 mg/kg).

See Appendix D, Tables 12-17 for metals analytical results and comparison with applicable guidelines.

4.1.4 Background Concentration Discussion

A total of 8 background soil samples (BG-SOIL-1 – BG-SOIL-8) were collected by SNCL to review Site soil data to determine if concentrations identified are due to naturally occurring conditions or Site related historical activities.

To determine whether the site metal concentrations were significantly different than background concentrations, the Wilcoxon Rank-Sum test was used. This statistical test evaluates the difference between two data sets by calculating a Z-score; if the Z-score falls outside the range of ±3 then there is less than 1% chance that differences between site data and background data are due to chance alone. Z-scores for antimony (-0.7), arsenic (-1.7), lead (-1.1), and molybdenum (1.4) are within the range of ±3; as such site concentrations of antimony, arsenic, lead, and molybdenum are not considered to be significantly different from background concentrations. Z-scores for zinc (-3.7), vanadium (-3.8), and copper (-3.2) fall outside the range of ±3. Therefore exceedances identified in soil samples collected from the Site for zinc, vanadium, and copper are not considered to be naturally occurring and are attributed to historical site activities.

Of the metals that are considered to be significantly different than background, the magnitude of exceedances at the Site are considered to be relatively low (i.e. 1X for copper, 2X for zinc and 2x for vanadium), with the exception of the zinc concentration identified in one sample (TOWER-SOIL-4) with a magnitude of exceedance of 6X the CCME guideline. Localized impacts may be present at the former communication towers; however, overall the metal concentrations identified in soil at the Upper Site and Lower Site would not be considered to have significant wide-spread impacts.

4.1.5 PCBs in Soil

Analytical results for PCBs in soil were compared to the CCME Soil Quality Guidelines for the Protection of Environmental and Human Health Guidelines.

30 (including 3 duplicates) soil samples were collected from the Upper Site and submitted for PCB analysis. Results of the PCB sampling program revealed that none of the soil samples analyzed had PCB concentrations that exceeded the applicable CCME guidelines.

See Appendix D, Tables 18-20 for PCB analytical results and comparison with applicable guidelines.

4.1.6 VOCs in Soil

Analytical results for VOCs in soil were compared to the CCME Soil Quality Guidelines for the Protection of Environmental and Human Health Guidelines.

38 (including 5 duplicates) soil samples were collected from the Site and submitted for VOC analysis. Results of the VOC sampling program revealed that none of the soil samples analyzed had VOC concentrations that exceeded the applicable CCME guidelines.

8 background soil samples (BG-1 – BG-8) were also collected and submitted for VOC analysis. None of the background soil samples analyzed had VOC concentrations that exceeded the applicable CCME guidelines.

See Appendix D, Tables 21-25 for VOC analytical results and comparison with applicable guidelines.

4.1.7 Pesticides in Soil

Analytical results for Pesticides in soil were compared to the CCME Soil Quality Guidelines for the Protection of Environmental and Human Health Guidelines, Ontario Ministry of Environment Soil and Groundwater Standards for Use at Contaminated Sites in Ontario and the Alberta Tier I Soil and Groundwater Remediation Guidelines.

4 (including 1 duplicate) soil samples were collected from the Site and submitted for Pesticide analysis. Results of the pesticide sampling program revealed select samples collected on site contained concentrations exceeding the applicable guidelines. Below is a list of the samples with exceeding concentrations.

Former Communication Towers

HANGER-SOIL-4

Chlordane (Total) (26 ug/g) exceeded the Commercial Ontario MOE guideline (0.05 ug/g).

DDT + Metabolites (570 ug/g) exceeded the Commercial CCME CSQG guideline (12 ug/g), Commercial Ontario MOE guideline (1.4 ug/g) and Commercial Alberta guideline (12 ug/g).

Heptachlor (6.9 ug/g) exceeded the Commercial Ontario MOE guideline (0.19 ug/g).

See Appendix D, Table 26 for Pesticide analytical results and comparison with applicable guidelines.

4.1.8 Dioxins & Furans

Analytical results for Dioxins and Furans in soil were compared to the 2002 CCME Soil Quality Guidelines for the Protection of Environmental and Human Health Guidelines.

3 (including 1 duplicate) soil samples were collected from the Site and submitted for Dioxins and Furan analysis. Two background soil samples (BG-SOIL-1 & BG-SOIL-3) were also submitted for analysis.

Results of the Dioxin and Furan sampling program revealed that none of the soil samples analyzed had Dioxin and Furan concentrations that exceeded the CCME Total Toxic Equivalency (TTE) guideline or the World Health Organization (WHO) Toxic Equivalency Factor (TEF) values.

See Appendix D, Table 27 for Dioxin and Furan analytical results and comparison with applicable guidelines

4.2 Sediment Analytical Results

4.2.1 Petroleum Hydrocarbons in Sediment

Analytical results for Petroleum Hydrocarbons in sediment were compared to the ARBCA Tier 1 Sediment Ecological Screening Levels for the Protection of Freshwater and Marine Aquatic Life guidelines.

6 sediment samples were collected from ponds located near or within the property boundaries of the site including the former water supply pond and submitted for petroleum hydrocarbon analysis. In addition, 3 background soil samples (BG-SED-1 – BG-SED-3) were also submitted for petroleum hydrocarbon analysis.

A chromatogram review completed by Maxxam Analytics revealed that sediment samples BG-SED-1 and BG-SED-2 contained petroleum hydrocarbon fractions that were interpreted to result from phytogenic sources and not related to any petrogenic or petroleum products that may have been historically used at the Site. Maxxam Analytics reported on each laboratory chain of custody "No resemblance to petroleum products in fuel oil/lube oil range" for these sediment samples.

Results of the petroleum hydrocarbon sampling program revealed that sample SED-2 and background samples BG-SED-1 and BG-SED-2 collected contained concentrations exceeding the applicable ARBCA guidelines. However, with the exception of SED-2, sediment samples BG-SED-1 and BG-SED-2 contain hydrocarbons that are a result of phytogenic sources based on the laboratory chromatogram review. Sample SED-2 contains a modified TPH which resembles a weathered fuel oil fraction.

Below is a list of the samples with exceeding concentrations.

Site Sediment

SED-2

Modified TPH (2860 mg/kg) exceeded the freshwater aquatic life typical sediment guideline (500 mg/kg).

Background Sediment

BG-SED-1

Modified TPH (650 mg/kg) exceeded the freshwater aquatic life typical sediment guideline (500 mg/kg).

BG-SED-2

Modified TPH (550 mg/kg) exceeded the freshwater aquatic life typical sediment guideline (500 mg/kg).

See Appendix D, Table 28 for Petroleum Hydrocarbon analytical results and comparison with applicable guidelines. Refer to Appendix I for sample chromatographs.

4.2.2 PAHs in Sediment

Analytical results for PAHs in sediment were compared to the CCME Interim Freshwater Quality Guidelines and Probable Effects Limit for sediment.

6 sediment samples were collected from ponds located near or within the property boundaries of the site including the former water supply pond and submitted for PAH analysis. In addition, 3 background soil samples were also submitted for PAH analysis.

Results of the PAH sampling program revealed that none of the sediment samples analyzed had PAH concentrations that exceeded the applicable CCME guidelines.

See Appendix D, Table 29 for PAH analytical results and comparison with applicable guidelines.

4.2.3 Metals in Sediment

Analytical results for metals in sediment were compared to the CCME Interim Freshwater Quality Guidelines and Probable Effects Limit for sediment.

6 sediment samples were collected from ponds located near or within the property boundaries of the site including the former water supply pond and submitted for metal analysis. In addition, 3 background sediment samples (BG-SED-1 – BG-SED-3) were also submitted for metal analysis.

Results of the metals sampling program revealed select samples collected contained concentrations exceeding the applicable CCME guidelines. Below is a list of the samples with exceeding concentrations.

Site Sediment

SED-1

Arsenic (7.5 mg/kg) exceeded the CCME ISQG (5.9 mg/kg).

Lead (86 mg/kg) exceeded the CCME ISQG (35 mg/kg).

SED-2

Copper (98 mg/kg) exceeded the CCME ISQG (35.7 mg/kg).

Lead (40 mg/kg) exceeded the CCME ISQG (35 mg/kg).

Mercury (0.18 mg/kg) exceeded the CCME ISQG (0.17 mg/kg).

WSUPPLY-SED-3

Chromium (120 mg/kg) exceeded the CCME ISQG (35.7 mg/kg) and PEL (90 mg/kg).

Background Sediment

BG-SED-1

Copper (56 mg/kg) exceeded the CCME ISQG (35.7 mg/kg).

BG-SED-2

Cadmium (1.4 mg/kg) exceeded the CCME ISQG (0.6 mg/kg).

Zinc (200 mg/kg) exceeded the CCME ISQG (123 mg/kg).

See Appendix D, Table 30 for metal analytical results and comparison with applicable guidelines.

4.2.4 PCBs in Sediment

Analytical results for PCBs in sediment were compared to the CCME Interim Freshwater Quality Guidelines and Probable Effects Limit for sediment.

6 sediment samples were collected from ponds located near or within the property boundaries of the site including the former water supply pond and submitted for PCB analysis. In addition, 3 background sediment samples (BG-SED-1 – BG-SED-3) were also submitted for PCB analysis.

Results of the PCB sampling program revealed that none of the sediment samples analyzed had PCB concentrations that exceeded the applicable CCME guidelines.

See Appendix D, Table 31 for PCB analytical results and comparison with applicable guidelines.

4.2.5 VOCS in Sediment

Analytical results for VOCs in sediment were compared to the ARBCA Tier 1 Sediment Ecological Screening Levels for the Protection of Freshwater and Marine Aquatic Life guidelines.

6 sediment samples were collected from ponds located near or within the property boundaries of the site including the former water supply pond and submitted for VOC analysis. In addition, 3 background sediment samples (BG-SED-1 – BG-SED-3) were also submitted for VOC analysis.

Results of the VOC sampling program revealed that none of the sediment samples analyzed had VOC concentrations that exceeded the applicable CCME guidelines.

See Appendix D, Table 32 for VOC analytical results and comparison with applicable guidelines.

4.3 Surface Water Analytical Results

4.3.1 Petroleum Hydrocarbons in Surface Water

Analytical results for Petroleum Hydrocarbons in surface water were compared to the CCME Water Quality Guidelines for the Protection of Freshwater Aquatic Life and the Atlantic RBCA Tier 1 Surface Water Ecological Screening Levels for the Protection of Freshwater and Marine Aquatic Life. It should be noted that the Atlantic RBCA guideline for xylene could not be met using CCME CWS analysis.

8 surface water samples (including 1 duplicate sample) were collected from ponds located near or within the property boundaries of the site including the former water supply pond and submitted for petroleum hydrocarbon analysis. One sample (UAST-SW-1) was also submitted from soil sample location UAST-SOIL-3 as surface water on the ground surface migrated into the test pit during excavation. In addition, 3 background surface water samples (BG-SW-1 – BG-SW-3) were also submitted for petroleum hydrocarbon analysis.

Results of the petroleum hydrocarbon sampling program revealed that none of the surface water samples analyzed had petroleum hydrocarbon concentrations that exceeded the applicable CCME guidelines.

See Appendix D, Table 33 for petroleum hydrocarbon analytical results and comparison with applicable guidelines.

4.3.2 PAHs in Surface Water

Analytical results for PAHs in surface water were compared to the CCME Water Quality Guidelines for the Protection of Freshwater Aquatic Life. 8 surface water samples (including 1 duplicate sample) were collected from ponds located near or within the property boundaries of the site including the former water supply pond and submitted for PAH analysis. 1 sample (UAST-SW-1) was also submitted from soil sample location UAST-SOIL-3 as surface water on the ground surface migrated into the test pit during excavation. In addition, 3 background surface water samples (BG-SW-1 – BG-SW-3) were also submitted for PAH analysis.

Results of the PAH sampling program revealed that none of the surface water samples analyzed had PAH concentrations that exceeded the applicable CCME guidelines.

See Appendix D, Table 34 for PAH analytical results and comparison with applicable guidelines.

4.3.3 Metals in Surface Water

Analytical results for metals in surface water were compared to the CCME Water Quality Guidelines for the Protection of Freshwater Aquatic Life.

7 surface water samples (including 1 duplicate sample) were collected from ponds located near or within the property boundaries of the site including the former water supply pond and submitted for metal analysis. In addition, 3 background surface water samples (BG-SED-1 – BG-SED-3) were also submitted for metal analysis.

Results of the metals sampling program revealed select samples collected contained concentrations exceeding the applicable CCME guidelines. Below is a list of the samples with exceeding concentrations.

Site Surface Water

SW-1

Copper (2.9 mg/kg) exceeded the CCME guideline (2.0 ug/L).

SW-2

Aluminum (430 mg/kg) exceeded the CCME guideline (5-100 ug/L).

Copper (6.4 mg/kg) exceeded the CCME guideline (2.0 ug/L).

Iron (540 mg/kg) exceeded the CCME guideline (300 ug/L).

Background Surface Water

BG-SW-1

Aluminum (140 mg/kg) exceeded the CCME guideline (5-100 ug/L).

Copper (2.2 mg/kg) exceeded the CCME guideline (2.0 ug/L).

BG-SW-2

Aluminum (240 mg/kg) exceeded the CCME guideline (5-100 ug/L).

See Appendix D, Table 35 for metal analytical results and comparison with applicable guidelines.

4.3.4 General Chemistry in Surface Water

Analytical results for general chemistry in surface water were compared to the CCME Water Quality Guidelines for the Protection of Freshwater Aquatic Life.

7 surface water samples (including 1 duplicate sample) were collected from ponds located near or within the property boundaries of the site including the former water supply pond and submitted for general chemistry analysis. In addition, 3 background surface water samples (BG-SED-1 – BG-SED-3) were also submitted for general chemistry analysis.

Results of the general chemistry sampling program revealed that none of the surface water samples analyzed had general chemistry concentrations that exceeded the applicable CCME guidelines. See Appendix D, Table 36 for general chemistry analytical results and comparison with applicable guidelines.

4.3.5 Field Measured Parameters

Field measured pH, conductivity, temperature, total dissolved solids (TDS) and dissolved oxygen (DO) results were collected at the 6 water surface locations throughout the site and the 3 background locations using an YSI Professional Plus water-quality probe. Upon review of the field parameter readings it was later determined that the YSI unit was not working properly when it was being used at the site. As a result, none of the field measured parameters have been included in this report as the measured readings were not accurate.

4.4 Asbestos Analytical Results

Sample results for asbestos were compared to the Occupational Health and Safety Act Asbestos Abatement Regulations, NL (1998), in which a material is considered an Asbestos Containing Material (ACM) if it has a percent asbestos content greater than 1%.

12 (including 1 duplicate sample) samples of suspected ACM building materials were collected from the Upper Site as indicated in Table 8. According to the applicable provincial guideline, samples A3, A4, A11 and A12 (duplicate sample of A3) are considered ACMs. A8 did contain asbestos but not at a concentration greater than 1 percent as per the provincial guideline. See Appendix D, Table 37 for asbestos analytical results and comparison with applicable guidelines.

Table 8: Laboratory Analytical Summary for Asbestos Sampling Program

Sample ID	Sample Location	Sample Description	Asbestos (%)
A1	1987 Disposal Site (buried)	Black Foam	Not Detected
A2	1987 Disposal Site (buried)	Black Felt	Not Detected
A3	1987 Disposal Site (buried)	Grey building siding	Chrysotile 15%
A4	Former Radome (buried)	Brown Insulation	Amosite 20%
A5	Former Barracks	Black Foam	Not Detected
A6	Former Barracks	Grey Building Siding	Not Detected
A7	Former Barracks	Black Rubber	Not Detected
A8	Former Barracks	Green vinyl floor tile	Chrysotile 1%
A9	Former Heating & Generator Room	Black felt	Not Detected
A10	Former Barrack Foundation	Black Tar	Not Detected
A11	Former Heating & Generator Room	Black Felt	Chrysotile 7%
A12 (Duplicate of A3)	1987 Disposal Site (buried)	Grey building siding	Chrysotile 15%

4.5 Quality Assurance / Quality Control Discussion

A QA/QC program was implemented to minimize and quantify potential bias introduced during sample collection, handling, shipping and analysis. As part of the QA/QC program, sampling protocols included minimizing sample handling, submitting field QA/QC samples (as detailed below), using dedicated non-contaminating sampling equipment wherever possible, wearing new disposable nitrile gloves for each sample handled, using sample-specific identification and labeling procedures, and using chain of custody records. Field duplicate soil, sediment and surface water samples were prepared and analyzed at a minimum rate of approximately 10%, relative to the number of samples collected, to assess the reproducibility of results.

Chemical analyses were performed by a laboratory (Maxxam Analytics) accredited by the Standards Council of Canada (SCC) for all chemical parameters and National Voluntary Laboratory Accreditation Program (NVLAP) for bulk asbestos analysis by polarized light microscopy. As indicated on laboratory certificates of analyses in Appendix C, laboratory analyses were completed in accordance with Provincial, Federal or US methods such as CCME, Ministere du Developpement durable, de l'Environnement et de la Lutte contre les changements climatiques (MDDELCC), EPA (Environmental Protection Agency) and American Public Health Association (APHA). Laboratory QA/QC measures included analysis of laboratory blank, spiked blank, duplicate and matrix spike samples. Laboratory acceptance criteria reported on laboratory certificates of analyses were used to assess the quality of laboratory QA/QC measures.

Relative percent difference (RPD) values were calculated for field duplicate soil, sediment and surface water samples to assess the reproducibility of the sampling methods and laboratory analyses. Note that consistent with laboratory practices, meaningful RPD values for field duplicate analyses were calculated only where detected concentrations in both samples were greater than 5 times the laboratory method detection limit (MDL) or lower reporting limit (LRL).

4.5.1 Field QA/QC

The field QA/QC program for the sampling program consisted of:

- Collection of 9 field duplicate soil samples for petroleum hydrocarbon analysis;
- Collection of 7 field duplicate soil samples for PAH analysis;
- Collection of 6 field duplicate soil samples for metal analysis;
- Collection of 3 field duplicate soil samples for PCB analysis;
- Collection of 5 field duplicate soil samples for VOC analysis;
- Collection of 1 field duplicate soil sample for Pesticide and analysis;
- Collection of 1 field duplicate soil sample for Dioxin and Furan analysis;
- Collection of 1 field duplicate surface water sample for RCAP analysis;
- Collection of 1 field duplicate surface water sample for metal analysis;
- Collection of 1field duplicate surface water sample for petroleum hydrocarbon analysis;
- Collection of 1 field duplicate surface water sample for PAH analysis; and
- Collection of 1 field duplicate sample for asbestos analysis;

Laboratory certificates of analysis for the sampling program are provided in Appendix C. Tabulated results of the sampling program, including duplicate samples, are presented in Appendix D. QA/QC results are presented in Appendix E. See section 3.7 of this report for duplicate samples and their corresponding original samples.

4.5.2 Field Duplicate Data Quality Objectives

Data quality objectives (DQO) for the field duplicate samples collected during the field programs are based on guidance provided by the CCME (2016a). CCME (2016a page 30) provides general field DQOs of 40% RPD for groundwater and 60% RPD for soil, based on 2 times what are considered typical laboratory RPD limits. Section 6.6 of Volume 4 (CCME, 2016b p128) provides more detailed guidance of "1.5 to 2x laboratory QC limits" as a limit for field DQOs. Field duplicate data quality objectives (DQO) applied in this assessment is based on 2x the laboratory QC limits identified by CCME (2016b) and consists of the following identified in Table 9 below:

Table 9: Field Duplicate Data Quality Objectives as Percentage RPD

Analyte Group	DQO Soil/Sediment	DQO Water	Note
VOC	100%	60%	Calculated where both the duplicate pair sample concentration results exceed 5 x RDL
PAH	100%	60%	Calculated where both the duplicate pair sample concentration results exceed 5 x RDL
PHC	60%	60%	Calculated where both the duplicate pair sample concentration results exceed 5 x RDL
PCB	100%	60%	Calculated where both the duplicate pair sample concentration results exceed 5 x LRL or RDL
OCP	100%	60%	Calculated where both the duplicate pair sample concentration results exceed 5 x LRL or RDL
Dioxins/Furans	80%	60%	Calculated where both the duplicate pair sample concentration results exceed 5 x LRL or RDL
fOC, TOC, Chromium	70%	40%	Calculated where both the duplicate pair sample concentration results exceed 5 x LRL or RDL
Ammonia	70%	40%	Calculated where both the duplicate pair sample concentration results exceed 5 x LRL or RDL
Chloride, Nitrate, Nitrite, Phosphorous, Sulphate	60%	40%	Calculated where both the duplicate pair sample concentration results exceed 5 x LRL or RDL
Conductivity, Salinity	40%	20%	Calculated where both the duplicate pair sample concentration results exceed 5 x LRL or RDL
pH	Within 0.6 pH units	Within 0.6 pH units	
Colour, TSS, Turbidity, TDS	na	40%	Calculated where both the duplicate pair sample concentration results exceed 5 x

Analyte Group	DQO Soil/Sediment	DQO Water	Note
			LRL or RDL
Metals	60% metals, except those listed below 80% (Ag, Al, Ba, Hg, K, Mo, Na, Pb, Sn, Sr, Ti)	40%	Calculated where both the duplicate pair sample concentration results exceed 5 x LRL or RDL

4.5.3 Soil Field QA/QC

Analytical results for the field duplicate soil samples are provided alongside the analytical results for its respective duplicate pair and calculated RPD values in Appendix E, Table 1 to Table 3, Table 5 to Table 13, Table 15 to Table 18, Table 20 to Table 26. The analytical methods for sediment are equivalent to soil, therefore the results of the soil field QA/QC program are applicable to sediment.

The following calculated RPD values exceeded the RPD DQOs in analysed soil samples:

- An RPD of 200% was obtained for aluminum in sample HEL-SOIL-4 and its field duplicate. No other duplicate sample aluminum RPDs exceeded the DQO and all other metals RPDs for the affected sample-duplicate pair did not exceed DQOs. The sample-duplicate sample-sample pair represents co-located samples rather than true sample splits to avoid volatile loss, affecting other parameters being analysed as part of this program that would result during sample splitting. As a result, sample heterogeneity is possible. Analytical results for aluminum are considered reliable in this assessment;
- An RPD of 91% was obtained for lead in sample 1987-SOIL-2 and its field duplicate. No other duplicate sample RPDs for these parameters exceeded the DQO and all other metals RPDs for the affected sample-duplicate pair did not exceed DQOs. The sample-duplicate sample-sample pair represents co-located samples rather than true sample splits to avoid volatile loss, affecting other parameters being analysed as part of this program that would result during sample splitting. As a result, sample heterogeneity is possible. Analytical results for lead are considered reliable in this assessment;
- RPDs of 77%, 140% and 97% were obtained for iron, manganese and strontium respectively in sample LPUMP-SOIL-3 and its field duplicate. RPDs for all other metals in the affected sample-duplicate pair did not exceed DQOs. The sample-duplicate sample-sample pair represents co-located samples rather than true sample splits to avoid volatile loss, affecting other parameters being analysed as part of this program that would result during sample splitting. As a result, sample heterogeneity, possibly due to differences in rock fragment composition between samples, is possible. Analytical results for these metals are considered reliable in this assessment;
- RPDs of 93%, 86%, 91% and 100% were obtained for iron, manganese, rubidium and vanadium in sample UPUMP-SOIL-1 and its field duplicate. RPDs for all other metals in the affected sample-duplicate pair did not exceed DQOs. The sample-duplicate sample-sample pair represents co-located samples rather than true sample splits to avoid volatile loss, affecting other parameters being analysed as part of this program that would result during sample splitting. As a result, sample heterogeneity, possibly due to differences in rock fragment composition between

samples, is possible. Analytical results for these metals are considered reliable in this assessment;

- An RPD of 62% was obtained for PHC F3 in sample LPUMP-SOIL-3 and its field duplicate which marginally exceeded the DQO of 60%. No other duplicate sample RPDs for these parameters exceeded the DQO and all other PHC RPDs for the affected sample-duplicate pair did not exceed DQOs. The sample-duplicate sample-sample pair represents co-located samples rather than true sample splits to avoid volatile loss, affecting other parameters being analysed as part of this program that would result during sample splitting. As a result, sample heterogeneity is possible. Analytical results for PHC F3 are considered reliable in this assessment;

All other RPD values calculated for soil field duplicate sample pairs were less than the adjusted CCME (2016b) based data quality objectives and therefore analytical results are considered acceptable.

4.5.4 Surface Water Field QA/QC

Analytical results for the field duplicate surface water samples are provided alongside the calculated RPD values in Appendix E, Table 4, Table 14, Table 19 and Table 27. No parameters analysed in surface water exceeded the project DQOs, therefore based on the data quality objectives, analytical results are considered acceptable.

4.5.5 Laboratory QA/QC

Analyses of lab duplicate blank and reference samples are completed as part of Maxxam Analytics internal QA/QC procedures. Approximately 15% of samples analyzed by the laboratory are randomly selected for duplicate analysis. Laboratory certificates of analysis were reviewed for any potential QA/QC issues identified by the laboratory. Results of laboratory QA/QC measures associated with soil, sediment and surface water analyses are presented in the laboratory certificates of analysis in Appendix D. The following summarizes laboratory-identified QA/QC issues:

- A number of soil samples had elevated RDLs (notably PHC F2 in samples related to soils report R5039146) due to elevated instrument baseline. In some situations, this is a result of the high moisture content of the samples;

- The laboratory RPD for PHC F3 related to soils report R5039146 exceeded the RPD limit, although Maxxam concluded that the overall quality control for the analysis meets acceptability criteria;

- The pH method for water analysis requires pH to be determined within 15 minutes of sampling, as a result, water samples for pH analysis are considered to have exceeded their hold time. Although pH variability could arise as a result of hold time exceedance, it is considered physically impossible to meet the hold time for this analysis when conducting work at remote sites. The pH results are considered indicative even though the hold time has been exceeded. This is why pH measurements are typically taken in the field to prevent the hold time from being exceeded. Although the general chemistry parameters for surface water including pH were measured in the field using a handheld YSI multiparameter meter, it was later determined that the YSI unit was not working properly when it was being used at the Site. As a result, pH measurements taken in the field have not been included in this report as the measured readings were not accurate;

- Surface water PAH acenaphthylene, anthracene, phenanthrene and quinolene related to report B7N3406 have elevated RDLs due to matrix interference. If RDLs exceed the comparative guidelines in this assessment, a false negative conclusion regarding acceptable surface water quality could be concluded;

- The matrix spike nitrite (surface water report B7N3406) was 1% below the acceptable RPD lower limit. Nitrate concentrations in water associated with the reporting batch may be slightly low biased;
- The xylene surrogate for soil sample HANGER-SOIL-1 exceeded the acceptance limits. The xylene result for this sample could be high biased. Xylene was not detected in this sample at an RDL below the applicable soil quality guidelines, therefore the impact of a potential high bias is considered negligible.
- Soil samples BG-SOIL-2, LPUMP-SOIL-1, LPUMP-SOIL-4, UPUMP-SOIL-1, UPUMP-SOIL-3, UPUMP-SOIL-5, BG-SED-2 and SEPTIC-SOIL-1 was limited in volume, therefore the detection limit was elevated for VOCs. All RDLS for these samples, with the exception of TCE, are below the federal soil quality guidelines. TCE was not detected in any site samples, therefore TCE is not considered a site COC;
- The PAH sample analysis hold time for water sample UAST-GW-1 was exceeded, therefore the potential for low bias may be present. PAH were not detected in surface water, therefore PAH is not considered a site COC;
- Sample heterogeneity affected RPDs lead in SEPTIC-SOIL-1 and nickel and molybdenum in LPUMP-SOIL-3. Heterogeneity effects is not considered to indicate a laboratory QC issue;
- Matrix interference resulted in an elevated RPDs for acenaphthylene in soil samples 1987-SOIL-1, 1987-SOIL-2, 1987-SOIL-3, 1987-SOIL-11, 1987-SOIL-12, SHACK-SOIL-1, benzo(g,h,i)perylene and perylene in soil sample BG-SOIL-5, indeno(1,2,3-cd)pyrene in soil sample PIPELINE-SOIL-5, benzo(j)fluoranthene in soil sample LAST-SOIL-3 and dibenzo(a,h)anthracene, benzo(g,h,i)perylene in sediment sample BG-SED-2, phenanthrene is sediment sample SED-2 and indeno(1,2,3-cd)pyrene in soil sample DRUM-SOIL-3. PAH RDLS are below the CCME soil quality guidelines and ½ RDL was used to calculate the TPE, therefore the effect of increased RDLs is considered immaterial in this assessment.
- A laboratory quantification issue resulted in an elevated RDL for Octa CDF in soil sample BG-SOIL-1 and 1,2,3,4,6,7,8-Hepta CDF in sample BG-SOIL-3. Although Octa CDF and 1,2,3,4,6,7,8-Hepta CDF were not detected in the sample, the TEQ calculation assumed the compounds were present at the elevated RDL and therefore the assessment is considered conservative. The sample TEQ did not exceed the CCME soil quality guideline, therefore no adverse effect on the conclusion of the report is considered present;
- The method blank (soil, report B7N4148) possessed detectable methylene chloride, therefore the RDL was raised to compensate. The elevated RDL is below the CCME guideline, therefore no effect on the conclusions of this assessment in relation to methylene chloride is considered present; and
- Laboratory RPDs for aroclor 1242 and toxaphene exceed RPD limits (soil, report B7N4148), although the lab considered that overall quality control for analysis was met. As a result, no impact on analytical results for these compounds is anticipated.

No other potential QA/QC issues were identified in laboratory analytical reports and SNC-Lavalin considers the identified laboratory QC issues to generally not materially affect the conclusions regarding this program.

4.5.6 Overall Data Quality

Based on the above discussions, the results of field and laboratory QA/QC measured associated with analyzed soil, sediment and surface water samples were generally acceptable. Where deviations were identified, the effects were determined to be negligible and are not believed to materially affect the conclusions made in this report based on these results.

5 CONCEPTUAL SITE MODEL

This section presents a Conceptual Site Model (CSM) providing information related to the Site geologic and hydrogeologic conditions, areas of potential environmental concern and the presence and distribution of potential contaminants of concern.

5.1 Site Description

The Site, which is currently owned by the Province of NL, is located along the Labrador coastline approximately 16 kilometers north of Makkovik, NL. The Site was mainly used by the United States Air Force as a manned Pinetree Line Gap Filler Radar Station for the Hopedale Air Station and was in operation from 1957 to 1961 and comprises of an Upper and Lower Site.

The Site is now predominantly covered in vegetation, gravel, exposed bedrock and concrete from the former building structures. The elevation at the upper portion of the Site is approximately 129 masl while the elevation at the Lower Site is approximately 3 masl. Based on Site observations and topographic mapping, both surface and groundwater are anticipated to follow the surface contours in the area and flow north/northwest toward the Atlantic Ocean in the Upper Site and flow west/northwest toward the Atlantic Ocean (Aillik Bay) in the area of the Lower Site. The Site is surrounded to the north, east and west by the Atlantic Ocean and several small freshwater ponds are situated between the Upper and Lower Site.

The Upper Site formerly contained a two storey, 5-unit building (main building) housing: a garage, a heating and power plant, barracks (30 to 50 personnel), office space and a dining hall. A tower housing the radar and radio equipment (radome) was connected to the main building via a covered corridor. The station was also equipped with two communication antennae, a water pump house building and supply lines (freshwater lake located to the south of the Upper Site), a disaster/emergency shack, a large aboveground storage tank (AST) containing diesel (1,832,000 litres in a concrete dyke southwest of the main building) and a helicopter pad. A former USAF dump used during the operation was reported to the northeast of the main building, and potable water was pumped from the freshwater water supply pond via an aboveground pipeline to the Upper Site Main building. A concrete dam was constructed on the northern shoreline of the water supply pond to help retain water. Septic waste was discharged via an aboveground pipeline to a septic tank to the southeast of the main building.

In addition to the Upper Site facilities, a 2.7 kilometer gravel roadway was constructed to connect the Upper Site to the lower dock area at the Lower Site. The roadway was used to transport supplies to and from the dock area to the station. A second, 3,053,000 litre steel AST in a concrete dyke, also containing diesel, was located near the dock and a pipeline was constructed which pumped diesel fuel from the dock to the lower tank farm and from the lower tank farm to the upper tank farm. Two buildings (including a pump house) were also located halfway up the access road connecting the Upper and Lower Sites. The above ground pipeline from the lower to the upper tank farm is anticipated to have followed the gravel access road. The fuel was then pumped via a network of aboveground pipelines at the station to supply the diesel generators used to power the station. The diesel generators were located in the former heating and generator room at the Upper Site main building. A former fuel drum storage area and a second USAF dump used during operation was reported to the south of the lower tank farm area, and south of this dump, a former Brinco mineral exploration drum dump was reportedly located approximately 1 km south of the Lower Site.

The Site decommissioning program was completed under the approval of the Provincial Government of NL in 1987. This reportedly included razing of on-site structures and the burning of all materials on-site, followed by the burying and covering of the debris and other remaining materials. It is noted that the contractor typically buried the debris in at least two locations when the Site contained an upper and lower site. This was completed due to the distance and effort required to transport metal/other debris from the Lower Site to the Upper Site. As stated in the March 2016 GHD Phase I ESA report, this was the case during the Site decommissioning at Cape Makkovik. One of these disposal sites (1987 Disposal Site) is located approximately 0.3 kms south of the Upper Site as identified in the Phase I ESA (Refer to Figure 2, Appendix A). The location of the other disposal site believed to be near the Lower Site was not identified in the 2016 GHD Phase I ESA and could not be located at the time of the 2017 SNCL Phase II ESA site visit. Concrete foundations of the former buildings and radar towers and the roadways still remain at each Site.

A former USAF dump used during the sites operation (1957 to 1961) was reported in the Phase I ESA to be at the Upper Site to the northeast of the main building. A second USAF dump used during operation was reported to the south of the lower tank farm area at the Lower Site, and south of this dump, a former drum dump was reportedly located approximately 1 km south of the Lower Site. The Phase I ESA reported that this drum dump was not associated with past USAF activities and the debris left behind was from the British Newfoundland Development Corporation (Brinco) during past exploration activities near the site. None of these dump sites were visible or identified during the SNCL Phase II ESA.

5.2 Stratigraphy, Geological & Hydrogeological Characteristics

As previously discussed in section 1.4 of this report, the general surface (0-0.3 m) stratigraphy at the Site, as revealed in the Phase II ESA test pits, consists mainly of brown and greyish, moist, loose to compact coarse sand and gravel with some fine material and cobbles covered with a layer of low lying grasses and moss. As the Upper Site is situated on a hill approximately 129 meters above sea level (masl) bedrock is predominantly exposed at surface especially in the areas of the former main building (barracks), former radome, former communication antennas (towers), former septic tank, former disaster shack and the suspected area of the former USAF dump (refer to Appendix A, Figure 2 and Appendix B for Site Photos). Although bedrock was not reached in any of the test pits at a depth of 0.3 m throughout the Upper Site visual observations of bedrock outcrops in many of these areas indicate that soil depth is not much greater than 0.3 m and in many areas less as only a thin soil veneer is present over bedrock.

Exposed bedrock is also present throughout the Lower Site in the areas of the former lower pumphouse and suspected areas of the former USAF dump and Brinco drum dump. Similar to the Upper Site, bedrock was not encountered in any of the test pits excavated at the lower pumphouse site however exposed bedrock outcrops and a thin layer of soil (less than 0.3 m) was observed throughout much of this area (refer to Appendix B for Site Photos). For the areas of the suspected USAF dump and Brinco drum dump only a thin layer of vegetation covering bedrock was observed for the majority of these sites.

Groundwater was not encountered at the Site in the test pit holes dug during the soil sampling program which did not exceed 0.5 meters bgs. Google Earth mapping identifies the Lower Site as approximately 2-3 masl. Based on this information and the close proximity of the Lower Site to the marine waters of Aillik Bay, groundwater in the area of the Lower Site is expected to be shallow. Given that the Upper Site is approximately 129 masl it is difficult to approximate the depth to groundwater, although the deep groundwater flow direction at the Site is expected to be towards the adjacent Atlantic Ocean.

Based on Site observations and topographic mapping, both surface and shallow groundwater are anticipated to follow the surface contours in the area and flow north/northwest toward the Atlantic Ocean in the Upper Site and flow west/northwest toward the Atlantic Ocean (Aillik Bay) in the area of the Lower Site.

5.3 On Site Infrastructure, Natural & Anthropogenic Site Details

The Site is now predominantly covered in low lying vegetation/gravel/exposed bedrock and concrete from the former building structures as there are no buildings currently present at the Site. The Site has not been used for any type of activity since cessation of operation as a former United States radar station in 1961 and currently there are no proposed developments for the Site in the future. The anticipated future land use will be as a natural area, similar to surrounding areas. The SNCL Phase II ESA did not reveal any signs of recent activity within the area of the Upper and Lower Site including the area identified in the GHD Phase I ESA as the Brinco former dump.

Concrete foundations from the former Barracks Building, Disaster Shack, Radome and Septic tank still remain at the Upper Site. The concrete dykes that surrounded the former diesel ASTs located at both the Upper and Lower Site are also still present along with the concrete dam at the former water supply pond. All remaining concrete structures are still in good condition. Based on the background information provided and observations made at the Site, there are no subsurface utilities located at the Site. Table 10 provides the location (NAD 83, Zone 21U, UTM Co-ordinates) and approximate dimensions of each remaining structure on Site. See Appendix A for Site Figures and Appendix B for Site Photographs.

Table 10: On-Site Concrete Foundations

Concrete Foundation	Approximate Dimensions (Length x Width x Depth)	Easting	Northing
Upper Tank Farm			
Former Barracks Building	70 m x 15 m x 1 m	363527	6121918
Former Disaster Shack	14 m x 8 m x 1 m	363578	6121836
Former Radome	10 m 10 m x 1 m	363570	6121942
Former Septic Tank	3 m x 3 m x 0.7 m	363563	6121869
Concrete Dyke	35 m x 35 m x 2 m	363445	6121801
Concrete Dam (Former Water Supply Pond)	37 m x 0.5 m x 3 m	363327	6120941
Concrete foundations of former communication towers (6 in total)	1.5m x 1.5 m x 1.5 m	363591	6121999
Concrete foundations of former pipeline (several remaining)	1.5m x 1.5 m x 1.5 m	363561	6122101
Lower Tank Farm			
Concrete Dyke	35 m x 35 m x 2 m	361976	6121928

As identified in the 2016 GHD Phase I ESA drawings completed for the Site, 4 former dumpsites were identified, the former Brinco drum dump located approximately 1 km south of the Lower Site, the former USAF dump located approximately 200 meters southeast of the Lower Site, the former USAF dump located approximately 0.2 kms north of the Upper Site and the 1987 disposal site located approximately 0.3 kms south of the Upper Site (See Figure 2, Appendix A for approximate dump locations). It should be noted that the other 1987 Disposal Site mentioned in the GHD Phase I ESA which was most likely located in the area of the Lower Site based on the information provided was not identified in the report figures.

On October 14th, 2017 SNCL located the 1987 disposal site after 10 manual test pits were excavated to a depth of approximately 0.5 meters in the suspected area (See Appendix B, Photo 12). SNCL is confident that this was actually the 1987 Disposal Site as this was the area identified in the GHD Phase I ESA where it was believed to be located. No other dumpsites identified in the Phase I ESA were suspected of being near this location.

During the excavation of 5 of the test pits (1987-SOIL-1 – 1987-SOIL-5), buried debris was revealed at approximately 0.5 meters. Several samples of the debris (foam, roofing felt and building siding), was collected from test pits 1987-SOIL-1 – 1987-SOIL-5 and submitted for asbestos analysis (See Appendix B, Photos 43 & 44). Test pits 1987-SOIL-1 to 1987-SOIL-5 were terminated at 0.5 m due to buried debris and the remaining test pits 1987-SOIL-6 to 1987-SOIL-10 were terminated at 0.6 m because there was no indication of buried debris and the subsurface soil was more compacted indicating that any previous excavation (debris burial) of soil unlikely occurred in these areas. There was also no indication of any building material burning as indicated in the GHD Phase I ESA within each test pit of the 1987 Disposal Site. Laboratory analysis for PAHs from each test pit for suspected burned building materials revealed that all soil samples did not contain PAH concentrations above laboratory limits.

Based on site observations and natural topography surrounding the landfill, the buried debris is expected to cover an approximate area of 350 m^2 with an approximate depth below ground surface of 0.5 meters. There was no evidence of any debris above ground surface at the location during the time of the site visit.

Former Dump/Drum Site Locations

Former USAF Dump (Upper Site)

On the evening of October 14, 2017, several hours were spent trying to find the location and any evidence of the former USAF dump located just north of the Upper Site as indicated in the GHD Phase I ESA report. SNCL personnel walked throughout the entire suspected area (approximately 10 hectares) and with the exception of several pieces of concrete no other evidence of construction debris was observed. The entire area consisted of large boulders and exposed bedrock covered with a thin layer of vegetation with sparse soil cover. Several flyovers with the helicopter over this area of the site including the downgradient cliffs and shoreline did not reveal any evidence of a former landfill. Due to the exposed bedrock and limited soil cover any construction or any other garbage debris in this area would be easily identified (See Appendix B, Photo 32).

Former USAF Dump (Lower Site)

On October 16, 2017, the area of former USAF dump located approximately 200 meters southeast of the Lower Site was investigated for debris as indicated in the GHD Phase I ESA. Once the site was located, only several pieces of wood and concrete blocks were observed. SNCL personnel walked throughout the entire suspected area and other immediate areas (approximately 8 hectares) and no other evidence of a former dump site were observed. The entire area was covered with large boulders (no soil) and exposed bedrock (See Appendix B, Photos 17-18). The possibility does exist that more buried debris may be located in the immediate area where the concrete blocks and wood debris was observed however excavation would have to be completed with a large excavator. Due to the shallow bedrock and close proximity to the coastline it is unlikely that any significant construction debris is buried in this area.

Former Brinco Drum Dump

On October 16, 2017, the suspected area of the former drum dump (Brinco) located approximately 1 km south of the Lower Site as indicated in the GHD Phase I ESA was also investigated for debris former drum dump. Once the suspected site was located, no evidence of any drums or other debris was evident as the entire area was covered in large boulders, exposed bedrock and a layer of thin low-lying moss covering rock (no soil) (See Appendix B, Photos 19 & 20). SNCL personnel walked throughout the entire suspected area and other immediate areas (approximately 14 hectares) and no other evidence of a former drum dump were observed. The shoreline in this immediate area was also investigated but no indication of a drum dump was revealed. Several flyovers with the helicopter over this area were also completed and did not reveal any evidence of a former drum dump. Due to the exposed bedrock and limited soil cover any former drum dump in this area would be easily identified. The possibility does exist that the assumed location for the former drum dump may not have been correct as indicated in the GHD Phase I ESA.

There were no signs or evidence of any dumps, remaining drums, tanks or containers throughout the remainder of the site. Several pieces of wood were observed in the area where the former pumphouse building was located near the Lower Site (See Appendix B, Photos 21-22). There were also a minimal amount (approximately 1-2 m^3) of scattered construction debris such as foam, siding, vinyl floor tiles and insulation located on the ground surface around the perimeter of the Former Barracks and Former Radome area. Several flyovers with the helicopter were conducted throughout the entire site but no additional evidence of any dumps or other debris was identified.

Due to the shallow bedrock and limited soil in the areas identified as the former drum dump (Brinco), the former Lower Site USAF dump and the former Upper Site USAF dump, SNCL does not believe any significant amount of construction debris would have been able to be buried at these locations. As previously mentioned, SNCL also did not see any evidence of dump sites located anywhere else throughout the Upper and Lower Site based on observations made from walking throughout the site and from the helicopter flyovers.

5.4 Environmentally Sensitive Areas

The CCME does not provide a concise definition of what constitutes an environmentally sensitive area although CCME refers to sensitive or critical habitat and sensitive species in “A Framework for Ecological Risk Assessment at Contaminated Sites in Canada: Review and Recommendations”. Therefore, for the purpose of this assessment, environmentally sensitive areas are considered to consist of areas providing critical habitat, areas with documented species at risk (SAR) presence or relied upon by SAR as part of their foraging and breeding habitat, parks, nature preserves, areas where endangered plants are present, wildlife migration corridors and special marine areas.

Background information including the previous Phase I ESA completed for the Site has not identified the Site within an area of natural significance or situated adjacent to an area of natural significance. The Site is not considered a special marine area, or adjacent to a special marine area, based on CPAWS (2009). A SAR review was not conducted as part of the previous Phase I ESA reporting; therefore the potential presence of SAR at the Site is unknown. SAR such as wolverine and polar bears may periodically be present at the site, although the home ranges for these species is large relative to the size of the Site and the Site does not appear to provide habitat or foraging opportunities that differ from the surroundings, therefore these species are considered transitory, if present at the Site. The Site is not part of a nature preserve, or park and the habitat provided by the Site appears to be similar to surrounding areas, therefore the Site is not anticipated to provide critical habitat. The Site is situated outside the ranges of the Red Wine Mountain, Lac Joseph and Mealy Mountain Caribou herds and lies on the fringe of the range of the George River Caribou herd (based on Schmelzer et al., 2004); therefore, the Site is not considered part of a Caribou migratory corridor.

Exposed bedrock and shallow soil conditions (less than 0.3 m) exist within the property boundaries of the Upper Site. There are several small freshwater ponds located within the property boundaries of the Upper

Site including the former water supply pond and several immediately adjacent along the former roadway to the Lower Site. All ponds range in surface area from approximately 300 m^2 to 11,000 m^2.

Based on the above considerations, the Site is not considered an environmentally sensitive area.

5.5 Climatic Conditions

The typical climate for the general area of Cape Makkovik is subarctic and dominated by the winter season, a long, bitterly cold period with short, clear days, relatively little precipitation mostly in the form of snow, and low humidity. Summers are short and mild, with long days and a prevalence of frontal precipitation associated with maritime tropical air within traveling cyclones.

Based on the Environment Canada Canadian Climate Normals from 1981- 2010 Station Data[5] for the community of Nain, Labrador, the daily average temperature during this timeframe is -2.5°C. The warmest month, on average, is August with an average temperature of 11.0 °C. The coolest month on average is January, with an average temperature of -17.6°C. Based on permafrost extent interpretations for Labrador, it is expected that either discontinuous or no permafrost is present at the Site.

The average amount of precipitation (rainfall and snow) for each year between 1981-2010 in Nain is 925.4 mm. The month with the most precipitation on average is July with 98.6 mm of precipitation. The month with the least precipitation on average is May with an average of 57.0 mm.

Based on the Site climatic conditions, it is expected that contaminant transport would occur primarily during the short summer months when ground conditions are unfrozen and when the subsurface has thawed to the point that groundwater transport may occur. The possibility does exist that permafrost may exist with peaty areas where sufficient depth is present as Cape Makkovik is in an area where isolated permafrost may occur. However, based on site observations much of the Site consists of exposed bedrock with minimal surface soil. As previously mentioned in this report, the depth to groundwater at the Site is unknown. The provincial Water Resources Management Division of the Municipal Affairs and Environment Department was contacted to determine if any specific data regarding groundwater depths at Cape Makkovik existed. The groundwater resources manager for the Water Resources Management Division Dorothea Hanchar stated that no groundwater data for that area was on file. Precipitation from rainfall and snow is expected to percolate into the groundwater at the site via fractured bedrock.

5.6 Areas/Contaminants of Environmental Concern

As previously discussed in section 1.4 of this report, the Phase I ESA completed for the Site revealed the following contaminants and areas of potential environmental:

> **Petroleum Hydrocarbons:** As a self-sufficient Gap Filler radar station in a remote location, significant quantities of fuel was formerly stored at the Site in ASTs, as well as in thousands of Petroleum, Oils and Lubricants drums. The Site also formerly contained a garage (i.e. motor pool) that was used to service on Site vehicles and heavy equipment, and a helicopter landing pad that contained drum storage and a portable fuel tank used for refueling helicopters. The potential for petroleum hydrocarbon impacts exist as a result of the historical petroleum storage and distribution activities conducted at the Site. The potential exists that liquids (ex. solvents) containing petroleum hydrocarbons may have been flushed into the site septic system.

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[5] The closest Environment Canada Climate Station to Cape Makkovik is the community of Nain, Labrador. Climate information for the Site was used from this Climate Station.

Based on this information the main areas of concern for petroleum hydrocarbon contamination in soil at the Upper Site would include the former heating and generator room, former motor pool area, former septic tank, former AST (upper tank farm), along with the former product pipelines, the former helicopter landing area, the former disaster shack, former pumphouse building located near the former water supply pond and the 1987 disposal site.

For the Lower Site the main areas of concern for petroleum hydrocarbon contamination in soil would be the former AST (lower tank farm), former drum storage area and former pumphouse located along the roadway near the Lower Site.

Other areas/media of concern include the surface water and sediment within the former water supply pond and several ponds located immediately adjacent to the former roadway as these areas could have been used as a dumpsite when the former Radar Station was decommissioned.

- **Heavy Metals:** Possible sources of heavy metals may be associated with vehicle repairs at the former motor pool building and helicopter repairs at the former helicopter pad area. In addition, the former on Site buildings were constructed in the early 1950s; therefore, the potential exists that lead/mercury based paint was used on the interior and exterior surfaces which may have potentially impacted the surface soils. Also, metal parameters such as lead, chromium and cadmium may have existed in waste oils and other petroleum hydrocarbon mixtures used at the Site. The potential exists that liquids (ex. solvents) containing heavy metals may have been also flushed into the site septic system.

  Based on this information the main areas of concern for metals contamination in soil at the Upper Site would include the former heating and generator room, former motor pool area, former septic tank, the former helicopter landing area, former disaster shack, former radome and communication towers, former pumphouse building located near the former water supply pond and the 1987 disposal site.

  For the Lower Site the main areas of concern for metal contamination in soil would be the former drum storage area and former pumphouse located along the roadway near the Lower Site.

  Other media of concern include the surface water and sediment within the former water supply pond and several ponds located immediately adjacent to the former roadway as this areas could have been used as a dumpsite when the former Radar Station was decommissioned.

- **Polychlorinated Biphenyls (PCBs):** Past uses of PCBs were identified through the records review and regulatory responses. PCBs were historically used as an insulator and coolant in electrical transformers and capacitors at the Site. PCBs were commonly used because they are chemically inert, not affected by acids and corrosive chemicals, do not conduct electricity and will not burn (only at extremely high temperatures). Although the United States banned the use of PCBs in 1972, the Cape Makkovik (Aillik) station was operated from 1957 to 1961; therefore they may have been used at the Site. PCB containing paint may also have been used at the Site. The potential exists that liquids (ex. solvents) containing PCBs may have been flushed into the site septic system.

  Based on this information the main areas of concern for PCB contamination in soil at the Upper Site would include the former heating and generator room, former motor pool area, former septic tank, former helicopter landing area, former radome and communication towers and the1987 disposal site.

  For the Lower Site the main areas of concern for metal contamination in soil would be the former drum storage area and former pumphouse located along the roadway near the Lower Site.

Other media of concern include the sediment within the former water supply pond and several ponds located immediately adjacent to the former roadway as this areas could have been used as a dumpsite when the former Radar Station was decommissioned.

- **Polycyclic Aromatic Hydrocarbons (PAHs):** The Site decommissioning program was completed under the approval of ENVC in 1987, and included the razing of all remaining structures and the burning of all materials on Site, followed by the burying and covering of the debris and other remaining materials which may have resulted in the production of PAHs. PAHs may have also existed in the diesel fuel stored and used on Site. The potential exists that liquids (ex. solvents) containing PAHs may have been flushed into the site septic system.

  Based on this information the main areas of concern for PAH contamination in soil at the Upper Site would include the former heating and generator room, former motor pool area, former septic tank, former AST (upper tank farm), along with the former product pipelines, the former helicopter landing area, the former disaster shack, former pumphouse building located near the former water supply pond and the 1987 disposal site.

  For the Lower Site the main areas of concern for PAH contamination in soil would be the former AST (lower tank farm), former drum storage area and former pumphouse located along the roadway near the Lower Site.

  Other media of concern include the surface water and sediment within the former water supply pond and several ponds located immediately adjacent to the former roadway as this areas could have been used as a dumpsite when the former Radar Station was decommissioned.

- **Volatile Organic Compounds:** Cleaning solvents and other volatile liquids may have been used throughout the Site. VOCs may be from paints and coatings, solvents, hydrocarbon fuels and building materials such as building adhesives, wall boards and ceiling tiles that may have existed at this site. The potential exists that liquids (ex. solvents) containing VOCs may have been flushed into the site septic system.

  Based on this information the main areas of concern for VOC contamination in soil at the Upper Site would include the former heating and generator room, former motor pool area, former septic tank, the former disaster shack, former pumphouse building located near the former water supply pond and the 1987 disposal site.

  For the Lower Site the main areas of concern for VOC contamination in soil would be the former pumphouse located along the roadway near the Lower Site.

  Other media of concern include the sediment within the former water supply pond and several ponds located immediately adjacent to the former roadway as this areas could have been used as a dumpsite when the former Radar Station was decommissioned.

  Pesticides: Pesticides may have been used in the paint to prevent vegetation growth on the exterior surfaces of all building structures on the site.

  Based on this information the main areas of concern for pesticide contamination in soil at the Upper Site would include the former heating and generator room, former motor pool area, former disaster shack and the 1987 disposal site.

  There were no other areas/media of concern located throughout the entire Site for Pesticides.

  Dioxins & Furans: Dioxins & Furans may have been produced from the wood burning during the demolition of the site especially if the wood had been chemically treated.

Based on this information the main area of concern for dioxin and furan contamination in soil at the Upper Site would the 1987 disposal site.

There were no other areas/media of concern located throughout the entire Site for Dioxins & Furans.

5.7 Distribution of Contaminants of Concern

For the purpose of this Phase II ESA CSM, the contaminants of concern suspected in section 5.6 of this report were identified by comparing analytical results reported for soil, sediment and surface water to the applicable Federal CCME and Provincial ARBCA guidelines as outlined in section 2 of this report. Table 11 of this report provides a summary of the contaminants of concern exceeding applicable guidelines at the areas of concern throughout the Site.

Table 11: Contaminants of Concern Exceeding Applicable Guidelines

Area of Environmental Concern	Samples Exceeding Applicable Guidelines	Exceeding Contaminant Groups	Parameters Exceeding and Magnitude of Exceedance	Sample Media
Upper Site				
Former Barracks	HANGER-SOIL-2	Metals	Zinc (1.1X)	Soil
	HANGER-SOIL-4	Pesticides	Chlordane (520X), DDT and metabolites (47.5X), heptachlor (36.3X)	Soil
1987 Disposal Site	1987-SOIL-1, 1987-SOIL-2, 1987-SOIL-3, 1987-SOIL-4, 1987-SOIL-5, 1987-SOIL-6, 1987-SOIL-7, 1987-SOIL-8, 1987-SOIL-9, 1987-SOIL-10, 1987-SOIL-11 & 1987-SOIL-12	Metals	Vanadium (1.5X – 1.8X)	Soil
Former Septic Tank	SEPTIC-SOIL-1	Metals	Antimony (1.0X)[1]	Soil
Former Helicopter Pad	HEL-SOIL-3	Metals	Arsenic (1.0X)[1] Copper (1.2X)	Soil
Former Radome	RADOME-SOIL-1	Metals	Copper (1X) Zinc (1.6X)	Soil
	RADOME-SOIL-2	Metals	Zinc (1.6X)	Soil
Former Communication Towers	TOWER-SOIL-3 & TOWER-SOIL-4	Metals	Zinc (1.9 – 5.6X)	Soil

Area of Environmental Concern	Samples Exceeding Applicable Guidelines	Exceeding Contaminant Groups	Parameters Exceeding and Magnitude of Exceedance	Sample Media
Upper Site				
Former Disaster Shack	SHACK-SOIL-2	Metals	Lead (1.3X)[1]	Soil
Lower Site				
Former Pumphouse Building	LPUMP-SOIL-3	PAHs, Metals	Phenanthrene (2.4X) Molybdenum (1.4X)[1] Zinc (1.9X)	Soil
On-site Freshwater Ponds				
Freshwater Ponds	SED-1	Metals	Arsenic (1.3X ISQG, < PEL) Lead (2.5X ISQG, < PEL)	Sediment
	SED-2	Metals, Petroleum hydrocarbons,	Copper (2.7X ISQG, < PEL)[1] Lead (1.1X ISQG, < PEL) Mercury (1.1X ISQG, < PEL) Modified TPH (5.7X)	Sediment
	SW-1	Metals	Copper (1X)[1]	Surface Water
	SW-2	Metals	Aluminum (4.3X)[1] Copper (3.2X)[1] Iron (1.8X)[1]	Surface Water
Former Water Supply Pond	WSUPPLY-SED-3	Metals	Chromium (3.4X ISQG, 1.3X PEL)	Sediment
Background Freshwater Ponds				
Freshwater Ponds	BG-SED-1 & BG-SED-2	Petroleum hydrocarbons	Modified TPH (1.1X - 1.3X)	Sediment
	BG-SED-1	Metals	Copper (1.6X ISQG, < PEL)	Sediment

Area of Environmental Concern	Samples Exceeding Applicable Guidelines	Exceeding Contaminant Groups	Parameters Exceeding and Magnitude of Exceedance	Sample Media
Upper Site				
	BG-SED-2	Metals	Cadmium (2.3X ISQG, < PEL), Zinc 1.6X ISQG, < PEL)	Sediment
Freshwater Ponds	BG-SW-1	Metals	Aluminum (1.4X), Copper (1.1X)	Surface Water
	BG-SW-2	Metals	Aluminum (2.4X)	Surface Water

Table Notes

[1] Samples underlined are considered naturally occurring.

Petroleum Hydrocarbon Distribution

At the request of SNCL, Maxxam Analytics compared the chromatograms of all on-site sediment samples (SED-2) and background sediment samples (BG-SED-1 & BG-SED-2) which contained concentrations of petroleum hydrocarbons exceeding applicable guidelines to determine if they were a result of the presence of natural occurring hydrocarbon compounds derived from plants (phytogenic) or hydrocarbon compounds associated with petroleum products or petroleum sources that were used on-site (petrogenic).

Results of the chromatogram review revealed that sediment sample SED-2 collected from an on-site pond near the former roadway contained concentrations of modified TPH resembling a weathered fuel oil fraction. Lateral and vertical delineation has not been completed in this contaminated area as it was not part of the work scope. The remaining background samples were a result of phytogenic sources (as interpreted by Maxxam Analytics) and not related to any petrogenic or petroleum products that may have been historically used at the Site. Therefore, the TPH identified in this pond, located adjacent to the roadway, is likely sourced from historical operations at the Site, and may be related to impacts from vehicle use on the roadway, or from the pipeline which was assumed to run adjacent to the roadway. The historical pipeline was used to transport diesel from the lower portion to upper portion of the Site. These hydrocarbon impacts appear to be very localized, as no other petroleum hydrocarbon impacts (greater than applicable guidelines) were identified in soil samples collected anywhere at the Site, or in sediment or surface water at any other ponds at the Site.

It should be noted that several soil samples did not reach baseline at C50, however, this does not affect the conclusion based on the laboratory review of the soil chromatograms that with the exception of soil sample SEPTIC-SOIL-1, all on-site and background soil samples containing hydrocarbons were a result of phytogenic sources. Based on the reported volume of petroleum hydrocarbons used and stored at the Site it was not expected that all soil samples collected would not contain concentrations above applicable guidelines. However, all soil samples were collected in the areas (which could be located) suspected of containing contaminated petroleum hydrocarbon soil as identified from the GHD Phase I ESA.

Refer to Figure 12, Appendix A for the location of sediment sample SED-2.

Metals Distribution

Soil samples collected from the Site were compared against the background concentrations to determine if metal exceedances on-site were natural occurring or related to historical activities. 8 background soil samples (BG-SOIL-1-BG-SOIL-8) were collected in off-site areas not suspected of being contaminated. A review of analytical results show that none of the background soil samples contained metal concentrations that exceed the applicable CCME guidelines.

As identified in Table 11 of this report, metal contamination not considered naturally occurring in soil is located throughout the Site. For the Upper Site metal contamination in surface soil is located in the area of the former barracks, 1987 Disposal Site, former helicopter pad, former radome and former communication towers. For the Lower Site the former pumphouse area has areas of contaminated metals in surface soil. Lateral and vertical distribution has not been completed in these contaminated areas as it was not part of the work scope.

To determine whether the site concentrations were significantly different than background concentrations, the Wilcoxon Rank-Sum test was used. This statistical test evaluates the difference between two data sets by calculating a Z-score; if the Z-score fall outside the range of ±3 then there is less than 1% chance that differences between site data and background data are due to chance alone. Z-scores for antimony (-0.7), arsenic (-1.7), lead (-1.1), and molybdenum (1.4) are within the range of ±3; as such site concentrations of antimony, arsenic, lead, and molybdenum are not considered to be significantly different from background concentrations. Z-scores for zinc (-3.7), vanadium (-3.8), and copper (-3.2) fall outside the range of ±3. Therefore exceedances identified in soil samples collected from the Site for zinc, vanadium, and copper are not considered to be naturally occurring and are attributed to historical site activities.

Of the metals that are considered to be significantly different than background, the magnitude of exceedances at the Site are considered to be relatively low (i.e. 1X for copper, 2X for zinc and 2X for vanadium), with the exception of the zinc concentration identified in one sample (TOWER-SOIL-4) with a magnitude of exceedance of 6X the CCME guideline. Localized impacts may be present at the former communication towers; however, overall the metal concentrations identified in soil at the Upper Site and Lower Site would not be considered to have significant wide-spread impacts.

Metal contamination in sediment was also identified in sediment samples SED-1 and SED-2 collected from on-site ponds. Concentrations of metals in sediment were compared to CCME ISQG and PEL values. CCME ISQGs are threshold effect levels, which indicate the concentration below which adverse effects are expected to occur rarely (CCME, 2001). The PEL is an upper value, defining the level above which adverse effects are expected to occur frequently (CCME, 2001). The range between the ISQG is considered a possible effects range, within which adverse effects may occasionally occur (CCME, 2001). For sample SED-1, the metal parameters arsenic and lead exceeded applicable CCME ISQGs, but were below the CCME PELs. For sample SED-2, the metal parameters copper, lead and mercury exceeded applicable CCME ISQG, but were also below the PEL. Chromium in one of the three samples collected from the former water supply pond (WSUPPLY-SED-3) exceeded both the CCME ISQG and the PEL; however, the other two sediment samples collected from this water supply pond had chromium concentrations well below the CCME ISQG and PEL values. With the exception of copper, none of the other metal parameters detected in on-site sediment exceeding applicable CCME guidelines were detected in the background sediment samples. Lateral and vertical distribution has not been completed in these contaminated areas as it was not part of the work scope. Overall, for sediment at the Site, the minor copper ISQG exceedances measured in samples from the two ponds would be unlikely to result in significant impacts to aquatic biota, and may be attributable to background concentrations. Copper exceedances were identified in Site sample SED-2 (98 mg/kg) and in a sample from background location

BG-SED-1 (56 mg/kg). These copper exceedances measured on-Site and at off-Site background locations are relatively similar/within the same order of magnitude.

The only exceedance of a PEL value was for chromium in the water supply pond; however, since the other two sediment samples collected from this pond had concentrations of chromium well below the PEL as well as the ISQG value, it is not anticipated that chromium-impacted sediments are widespread throughout the pond.

Metal contamination in surface water was also identified in surface water samples SW-1 and SW-2 collected from on-site ponds. The metal parameter copper in sample SW-1 and metal parameters aluminum, copper and iron in sample SW-2 exceeded applicable CCME guidelines. Aluminum and copper in background surface water samples also exceeded applicable CCME guidelines; therefore, it is possible that elevated concentrations of aluminum and copper could be associated with natural background conditions at the Site and in the area. The concentrations of aluminum and copper measured in surface water on-Site and at off-Site background locations are relatively similar/within the same order of magnitude. Two of the three aluminum guideline exceedances were identified in samples collected from off-Site ponds considered to be representative of background conditions: aluminum in BG-SW-1 was measured at 140 ug/L, and at 240 ug/L at BG-SW-2. The maximum concentration of aluminum measured at the Site ponds was 430 ug/L, in a sample collected at SW-2. Copper guideline exceedances were also identified in three samples; however, two of these were collected on-Site, while one was collected from a background pond, as follows: 2.9 ug/L at SW-1, 6.4 ug/L at SW-2, and 2.2 ug/L at BG-SW-1.

Based on site observations and information gathered from the Phase I ESA, there was no evidence of garbage dumping or any other evidence of human activity at the on-site ponds. Each of the ponds sampled on-site were shallow and the water was clear allowing any construction debris or any garbage from human activity to be easily visible. It should also be noted that the turbidity reported by the laboratory for sample SW-2 (1.1 NTU) was higher than all other samples (range of 0.24 to 0.70 NTU). The maximum concentration of iron measured at the Site ponds was 540 ug/L, in a sample collected at SW-2. The maximum background concentration of iron measured was 270 ug/L, in a sample collected at BG-SW-2. Since iron tends to prefer to remain bound to sediment, the elevated total iron concentration measured in this sample is likely associated with sediment and/or particulate matter present in the sample. Measured total aluminum and copper concentrations were also likely elevated by the presence of suspended sediments/particulate matter in SW-2. Therefore, overall, it is likely that the elevated metals concentrations identified in samples SW-1 and SW-2 at the Site are attributable to local background conditions (i.e., for aluminum and copper) and/or to the elevated turbidity measured in the SW-2 sample (i.e., for aluminum, copper and iron). As a result, anthropogenic impacts to surface water at the Site are likely to be limited or not present.

PAH Distribution

As identified in Table 11, PAH contamination in surface soil is located at the Lower Site former pumphouse building. Lateral and vertical distribution has not been completed in this area as it was not part of the work scope. Phenanthrene was the only PAH identified at concentrations greater than the applicable CCME guideline. Concentrations of phenanthrene were reported at 0.11 mg/kg (LPUMP-SOIL-3). The lowest applicable CCME guideline for phenanthrene is 0.046 mg/kg, and is protective of surface water for freshwater aquatic life (CCME, 2010).

A review of the laboratory results indicates that none of the background soil samples collected (BG-SOIL-1 – BG-SOIL-8) contained concentrations of PAHs reported above laboratory detection limits. As a result, all PAH contamination in surface soil at the site is considered anthropogenic and not naturally occurring.

Pesticide Distribution

4 soil samples were collected throughout the Upper Site and submitted for pesticide analysis. A review of the laboratory results has revealed that soil sample HANGER-SOIL-4 collected around the perimeter of the former barracks building contained concentrations of pesticides exceeding applicable guidelines. Lateral and vertical distribution has not been completed in this contaminated area as it was not part of the work scope. It is likely that the pesticides detected in soil at this one location were associated with treated building materials associated with historical buildings at the Site. Heptachlor was used from the early 1950s to 1970s to control termites and other insects in and around buildings (US EPA, 1992). DDT was also used in buildings for pest control (NPIC, 1999). Chlordane was also used to control termites, and was often applied underground under the foundation of buildings or to the above ground structure (US EPA, 1986). Due to the inferred historical use of these pesticides at the Site, it is likely that pesticide-impacted soil would be localized to the areas immediately surrounding the foundations of former buildings at the Site.

5.8 Contaminant Transport Pathways

Non-volatile chemicals in soil exceeding generic CCME or applicable provincial guidelines consist of metals, pesticides and PAHs. No volatile chemicals in soil exceeded applicable guidelines, therefore chemical transport and exposure pathways involving vapour phase chemicals in soil are considered incomplete. Based on climatic conditions at the Site and the physic-chemical properties of the non-volatile contaminants, significant degradation is not anticipated.

Non-volatile chemicals in sediment exceeding generic CCME or provincial ARBCA guidelines (note – these guidelines are derived to protect ecological receptors) consist of modified TPH and metals. Although these chemicals can be expected to partition to surface water, TPH in particular sorbs strongly to organic matter and therefore would primarily be expected to be retained in sediment. Depending on the hydrodynamic conditions of the individual water bodies, sediment hosted chemicals may either be sequestered in the waterbody, or be transported downstream. No volatile chemicals analysed in sediment exceeded applicable guidelines.

Non-volatile chemicals in surface water exceeding generic CCME or provincial ARBCA guidelines (note – these guidelines are derived to protect ecological receptors) consist of metals (aluminum, copper, iron). Metals in surface water may partition between sediment and surface water, be transported downstream in surface water and may be transported to groundwater if the surface water features recharge groundwater at the Site. It should be noted that these metal parameters (aluminum, copper, iron) identified at the Site are considered naturally occurring.

5.9 Human And Ecological Receptors

Based on the remoteness and current use of the Site, the human receptors of concern are assumed to consist solely of occasional visitors (e.g. involved in hunting). The terrestrial ecological receptors are considered to include birds, plants and invertebrates and mammals. Aquatic ecological receptors are considered to consist of plant and invertebrate communities and fish. The terrestrial foodweb is likely linked to the aquatic foodweb, therefore mammals and birds may also be exposed to contaminants of concern in the aquatic environment present on the Site.

5.10 Receptor Contaminant Exposure Pathways

An exposure pathway describes the mechanism through which a chemical may be contacted by a receptor. There must be a complete exposure pathway from the source of contaminant in the environment (i.e. in soil, groundwater or air) to human or ecological receptors in order for chemical exposure to occur. A complete contaminant exposure pathway consists of the following four basic components:

- A source and mechanism of chemical release to the environment;
- An environmental transport medium/mechanism;
- A point of contact (exposure point) for receptors with the COC; and
- A route of intake at the exposure point for the chemical into the receptor.

If one of these four elements is missing, then the exposure pathway can be considered incomplete and there is no intake (or potential health risks) associated with that pathway. The presence or absence of any of these elements depends on site specific conditions. All potential human exposure pathways for contaminants at the Site consist of the following:

- Outdoor ingestion of surface/subsurface soil;
- Outdoor dermal contact of surface/subsurface soil;
- Outdoor inhalation of dust derived from surface/subsurface soil;
- Outdoor ingestion of sediment;
- Outdoor dermal contact with sediment;
- Outdoor inhalation of dust or vapour from sediment;
- Outdoor air inhalation of volatiles originating from surface and subsurface soil;
- Indoor air inhalation of volatiles originating from surface and subsurface soil;
- Ingestion of surface water;
- Dermal contact with surface water;
- Inhalation of vapour from surface water;
- Ingestion of groundwater;
- Dermal contact with groundwater;
- Outdoor air inhalation of volatiles originating from groundwater;
- Indoor air inhalation of volatiles originating from groundwater;
- Ingestion of wild game, fish and plants; and
- Ingestion of produce.

All identified contaminants of concern consist of non-volatile chemicals and no structures or utilities are currently present or anticipated to be present in the future. Although the Site does present opportunity for hunting, no produce cultivation is considered possible based on the proximity of the Site to the nearest community, climatic and soil conditions; additionally, the Site is considered as commercial land, and exposure through ingestion of cultivated produce is not typically relevant to this land use type. Although surface water features are present at the Site, the Site is considered a non-potable water use Site in consideration that a Site visitor would likely be concerned about bacterial (e.g. Giardia, etc.) infection from drinking surface water. Groundwater at the Site is considered predominantly bedrock hosted and inaccessible. Volatile contaminants were not identified in any media at the Site, and thus exposure pathways related to inhalation of volatiles were not relevant exposure pathways for receptors at the Site. Based on these considerations, the following contaminant exposure pathways applicable to a human receptor are considered to be potentially present:

- Outdoor ingestion of surface/subsurface soil;
- Outdoor dermal contact of surface/subsurface soil;
- Outdoor inhalation of dust derived from surface/subsurface soil;
- Outdoor ingestion of sediment;
- Outdoor dermal contact with sediment;
- Outdoor inhalation of dust or vapour from sediment;
- Dermal contact with surface water;
- Ingestion of wild game, fish and plants.

With the exception of the ingestion of wild game route of exposure, all other exposure pathways are considered to only be potentially complete during the frost free days of the year. Ecological receptors are considered primarily exposed to contaminants through direct contact, ingestion of soil, sediment and surface water and ingestion of food items which may have accumulated contaminants present at the Site through root uptake and uptake following leaf deposition.

6 NCSCS CLASSIFICATION

The NCSCS is a tool to aid in the evaluation of contaminated Sites. Its purpose is to provide scientific and technical assistance in the identification and prioritization of Sites, which may be considered to represent high, medium, or low risk. The system classifies contaminated Sites into these 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.

The NCSCS is not designed to provide either a qualitative or quantitative risk assessment, but rather is a tool specifically for the classification and prioritization of contaminated Sites. The system screens Sites with respect to the need for further action (e.g., characterization, risk assessment, remediation, etc.) to protect human health and/or the environment.

6.1 NCSCS Site Classification Categories

Sites are classified on their individual characteristics in order to determine the appropriate classification (Class 1, 2, 3, or N) according to their priority for action, or Class INS (for Sites that require further information before they can be classified). It should be noted that the term “action” here does not necessarily refer to remediation, but could also include risk assessment, risk management or further Site characterization and data collection. The 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. (Note, this category was previously called “Action Required”.)

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. Typically, for Class 2 there is no direct indication of off-Site contamination; however, the potential for off-Site migration tends to be rated high and therefore some action is likely required. (Note, this category was previously called “Action 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. (Note, this category was previously called “Action May Be Required”.)

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. (Note, this category was previously called “Action Not Likely Required”.)

Class INS: Insufficient Information (>15% of Responses are "Do Not Know")

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.

6.2 NCSCS Score

The results of the NCSCS completed for the former radar station located at Cape Makkovik, Labrador are included in Appendix H.

The NCSCS evaluation completed for the Site revealed a total category score of 47.2 with a Class 3 site classification indicating "Low Priority for Action". The scores for each of the sections of the NCSCS are given in Table 12 below. A Class 3 site classification has been given to the site based on the chemical hazards, exceedance factors, migration potential and exposure for each contaminant of concern identified.

Table 12: NCSCS Category Scores

NCSCS Category	NCSCS Score
Contaminant Characteristics	Total score of 20.6 out of 33
Migration Potential	Total score of 8.8 out of 33
Exposure	Total score of 17.7 out of 34
Total NCSCS Score For Site	**47.2 out of 100**

7 CONCLUSIONS

Based on the information gathered and on observations made during this investigation the following conclusions include:

Soil sampling Program

- Results of the petroleum hydrocarbon sampling program revealed that none of the soil samples (including background samples) analyzed had petroleum hydrocarbon concentrations that exceeded applicable guidelines.
- It should be noted that 14 soil samples did not reach baseline at C50 when analyzed for petroleum hydrocarbons. A further review of the laboratory data (chromatograms) by Maxxam Analytics confirmed that with the exception of soil sample SEPTIC-SOIL-1, all on-site and background soil samples containing petroleum hydrocarbon concentrations that did not reach baseline at C50 were a result of phytogenic sources and not related to any petrogenic or petroleum products that may have been historically used at the Site.
- Results of the soil sampling program for PAHs revealed that the benzo(a)pyrene total potency equivalent factor was not exceeded in any of the soil samples collected at the Site or at background locations. However, the soil sampling did reveal select samples collected on site that contained concentrations of phenanthrene, only, exceeding the applicable CCME Environmental Health Soil Quality Guideline (EHSQG) which is based on the non-carcinogenic effects of PAHs and is protective of surface water for freshwater aquatic life. Concentrations of phenanthrene exceeding this CCME EHSQG were detected in the area of the former pumphouse building (Lower Site) (LPUMP-SOIL-3). No background soil samples contained concentrations of PAHs exceeding applicable guidelines. As a result, all phenanthrene soil contamination at the site is expected to be a result of historical site activities.
- Soil samples collected from the Site were compared against the background concentrations to determine if metal exceedances on-site were natural occurring or related to historical activities. 8 background soil samples (BG-SOIL-1-BG-SOIL-8) were collected in off-site areas not suspected of being contaminated. A review of analytical results show that none of the background soil samples contained metal concentrations that exceed the applicable CCME guidelines. To determine whether the site concentrations were significantly different than background concentrations, the Wilcoxon Rank-Sum test was used. Results of the test revealed that only the metal parameters zinc, vanadium and copper were not considered to be naturally occurring and are attributed to historical site activities. All other metal parameters exceeding CCME guidelines were not considered to be significantly different from background concentrations. As a result, metal contamination identified at the Upper Site in surface soil is located in the area of the former barracks (HANGER-SOIL-2), 1987 Disposal Site (1987-SOIL-1 to 1987-SOIL-12), former helicopter pad (HEL-SOIL-3), former radome (RADOME-SOIL-1 & RADOME-SOIL-2) and former communication towers (TOWER-SOIL-3, TOWER-SOIL-4). For the Lower Site the former pumphouse (LPUMP-SOIL-3) area has areas of contaminated metals in surface soil.
- Results of the soil sampling program revealed concentrations of pesticides exceeding applicable CCME CSQGs in one sample collected from the perimeter of the former barracks building (HANGER-SOIL-4). It should be noted that due to the extensive list of pesticide/herbicide parameters and lack of guidelines, there still remain reported parameters that do not have

existing guidelines for comparison purposes. Based on a review of guidelines and achievable laboratory detection limits, criteria were selected in an attempt to cover as many parameters for pesticides/herbicides as possible. As a result, analytical results for pesticides/herbicides were screened against CCME guidelines and Ontario and Alberta provincial guidelines. The concentrations of pesticides measured in this sample are likely associated with building materials, treated to combat pests (e.g., termites), and thus associated impacts to soil are likely to be localized to the areas immediately surrounding the foundations of buildings historically present at the Site.

- Results of the soil sampling program revealed that all on-site samples analyzed for VOCs, PCBs, and Dioxins and Furans contained concentrations that were either below applicable CCME or Atlantic Risk-Based Corrective Action (ARBCA) guidelines or laboratory detection limits.
- The NCSCS evaluation completed for the Site revealed a total category score of 47.2 with a Class 3 site classification indicating “Low Priority for Action”.

Sediment sampling Program

- Results of the petroleum hydrocarbon sampling program revealed that sample SED-2 and background samples BG-SED-1 and BG-SED-2 collected from 3 different freshwater ponds contained concentrations exceeding the applicable ARBCA guidelines. However, with the exception of SED-2, a review of the laboratory data (chromatograms) by Maxxam Analytics revealed that sediment samples BG-SED-1 and BG-SED-2 contain hydrocarbons that are a result of phytogenic sources. Sample SED-2 contains a modified Total Petroleum Hydrocarbon (TPH) which resembles a weathered fuel oil fraction. Therefore, the TPH identified in this pond, located adjacent to the roadway and approximately 0.6 kilometers (kms) northwest of the Upper Site, is likely sourced from historical operations at the Site, and may be related to impacts from vehicle use on the roadway, or from the pipeline which was assumed to run adjacent to the roadway. The historical pipeline was used to transport diesel from the lower portion to upper portion of the Site. These hydrocarbon impacts appear to be very localized, as no other petroleum hydrocarbon impacts (greater than applicable guidelines) were identified in soil samples collected anywhere at the Site, or in sediment or surface water at any other ponds at the Site.
- Results of the sediment sampling program revealed concentrations of metals at two of the on-site freshwater ponds (SED-1 & SED-2), former water supply pond (WSUPPLY-SED-3) and background samples BG-SED-1 and BG-SED-2 exceeding the applicable CCME ISQG; chromium in one sample from the former water supply pond (WSUPPLY-SED-3) also exceeded the PEL. The minor ISQG exceedances measured in samples from the two ponds would be unlikely to result in significant impacts to aquatic biota, and may be attributable to background concentrations (e.g., copper). The only exceedance of a PEL concentration was for chromium in the water supply pond; however, since the other two sediment samples collected from this water supply pond had concentrations of chromium well below the PEL as well as the ISQG value, it is not anticipated that chromium-impacted sediments are widespread throughout this pond.
- Results of the sediment sampling program revealed that all on-site samples analyzed for VOCs, PAHs and PCBs contained concentrations that were either below applicable CCME or ARBCA guidelines or laboratory detection limits.

Surface Water Sampling Program

- Metal contamination in surface water was also identified in surface water samples SW-1 and SW-2 collected from on-site ponds. The metal parameter copper in sample SW-1 and metal parameters aluminum, copper and iron in sample SW-2 exceeded applicable CCME guidelines. Aluminum and copper in background surface water samples also exceeded applicable CCME guidelines; therefore, it is possible that elevated concentrations of aluminum and copper could be associated with natural background conditions at the Site and in the area. The concentrations of aluminum and copper measured in surface water on-Site and at off-Site background locations are relatively similar/within the same order of magnitude. Two of the three aluminum guideline exceedances were identified in samples collected from off-Site ponds considered to be representative of background conditions: aluminum in BG-SW-1 was measured at 140 ug/L, and at 240 ug/L at BG-SW-2. The maximum concentration of aluminum measured at the Site ponds was 430 ug/L, in a sample collected at SW-2. Copper guideline exceedances were also identified in three samples; however, two of these were collected on-Site, while one was collected from a background pond, as follows: 2.9 ug/L at SW-1, 6.4 ug/L at SW-2, and 2.2 ug/L at BG-SW-1.

  Based on site observations and information gathered from the Phase I ESA, there was no evidence of garbage dumping or any other evidence of human activity at the on-site ponds. Each of the ponds sampled on-site were shallow and the water was clear allowing any construction debris or any garbage from human activity to be easily visible. It should also be noted that the turbidity reported by the laboratory for sample SW-2 (1.1 NTU) was higher than all other samples (range of 0.24 to 0.70 NTU). The maximum concentration of iron measured at the Site ponds was 540 ug/L, in a sample collected at SW-2. The maximum background concentration of iron measured was 270 ug/L, in a sample collected at BG-SW-2. Since iron tends to prefer to remain bound to sediment, the elevated total iron concentration measured in this sample is likely associated with sediment and/or particulate matter present in the sample. Measured total aluminum and copper concentrations were also likely elevated by the presence of suspended sediments/particulate matter in SW-2. Therefore, overall, it is likely that the elevated metals concentrations identified in samples SW-1 and SW-2 at the Site are attributable to local background conditions (i.e., for aluminum and copper) and/or to the elevated turbidity measured in the SW-2 sample (i.e., for aluminum, copper and iron). As a result, anthropogenic impacts to surface water at the Site are likely to be limited or not present.

- Results of the surface water sampling program revealed that all on-site samples analyzed for petroleum hydrocarbons and PAHs contained concentrations that were either below applicable CCME or ARBCA guidelines or laboratory detection limits.

Asbestos Sampling Program

- Results of the asbestos sampling program revealed that 4 (including 1 duplicate sample) of the twelve samples collected throughout the Upper Site contained asbestos concentrations exceeding the applicable provincial guideline of >1%. Samples A3 (Grey Building Siding - Chrysotile 15%), A4 (Brown Insulation - Amosite 20%), A11 (Black Felt - Chrysotile 7%) and A12 (Grey Building Siding - Duplicate of A3) (Chrysotile 15%) all exceeded the applicable provincial guideline. Samples A3 and duplicate sample A12 were collected from the 1987 Disposal Site, sample A4 was collected near the former radome foundation and sample A11 was collected near the former barracks foundation.

- With the exception of samples A10 and A11 collected from the perimeter of the former barrack foundation, all other samples collected that contained asbestos concentrations exceeding provincial guidelines were buried on site. Small quantities of asbestos containing tar (sample A10) and felt (sample A11) exceeding guidelines along with small pieces of building siding and floor tiles resembling materials sampled at the 1987 disposal site were visible on surface soil near the former barracks and radome foundations. Based on site observations, none of the asbestos containing material in this area is expected to release asbestos fibers unless they are disturbed or damaged in some way. As a result, no harmful effects to humans or the environment is expected to occur from any asbestos materials at the site.

8 RECOMMENDATIONS

Although lateral and vertical delineation of contaminants in soil has not been achieved during the Phase II ESA, visual and in-situ investigation revealed that the depth to bedrock in many of these areas is not much greater than the depth at which the majority of the surface soil samples were collected (0.3m). This outcropping of bedrock across the site would result in geophysical delineation of soil impacts. Visual observations of the area including the former barracks, former septic tank, former radome and former communication towers report exposed bedrock and minimal surface soil cover, which again indicates that bedrock likely serves as geophysical delineation at these APECs. Historical Site use and operations are well-understood, and identified impacts appear to be localized to the areas immediately surrounding historical infrastructure (e.g., foundations of buildings) at the Site. Areas surrounding these APECs have been adequately characterized to enable the evaluation of identified impacts through risk assessment. As a result, further delineation or characterization of contaminants in surficial soil, surface water or sediment is not required to evaluate on-site contamination.

The recommended risk management strategy for this site, based on Step 7 of the Federal Approach to Contaminated Sites, would be to conduct a limited risk assessment to address the potential for risk to the environment or human health using the available information for all media of concern that were sampled.

Based on the information collected and the presence of contaminants exceeding applicable guidelines or background, a future limited risk assessment will include the following:

> Conduct a risk based review of the existing data and information to expand on the current conceptual site model completed as part of this mandate for the site in a Problem Formulation. The Problem Formulation forms the framework of a risk assessment for a site under a given land use. The framework provides a systematic and quantitative means of identifying contaminants of potential concern (COPCs) specific to human health or ecological receptors, receptors of concern (ROCs) that have the potential to be present at the Site, and the potential exposure pathways between COPCs and ROCs in a completed conceptual site model; and

> If potentially operable exposure pathways are identified between COPCs and ROCs, conduct a preliminary quantitative or qualitative assessment of the potential risks associated with potential exposures. Results of the risk assessment will be used to support the rationale for no further investigation or management of the reported site impacts. This step would take into consideration the potential environmental effects associated with measured exceedances and relative differences from regional background conditions at the Site.

Due to the limits of surficial soil and remote access to the area, groundwater was not investigated within the scope of this ESA and was not identified or observed during investigations at the Site; therefore, any potential for impacts associated with groundwater will not be evaluated as there in no data collected for this media or associated exposure pathways. Since groundwater at the Site is presumed to be primarily located within bedrock, it is relatively inaccessible to human and ecological ROCs at the Site. Groundwater would only become accessible for potential exposure to ROCs as it migrates into surface water bodies at the Site; surface water samples have been collected from on-Site ponds to enable a direct evaluation of potential exposure and effects to ROCs at the Site. As a result, the lack of information about groundwater quality will not limit the completion of a human health and ecological risk assessment for the Site.

9 CLOSURE

This report has been prepared by SNCL for Defense Construction Canada, Department of National Defence and the NL Department of Municipal Affairs and the Environment. It is intended for the sole and exclusive use of Defense Construction Canada, Department of National Defence and the NL Department of Municipal Affairs and the Environment, their affiliated companies and partners, and their respective insurers, agents, employees and advisors. Any use, reliance on or decision made by any person other than Defense Construction Canada, Department of National Defence and the NL Department of Municipal Affairs and the Environment based on this report is the sole responsibility of such other person. Defense Construction Canada, Department of National Defence and the NL Department of Municipal Affairs and the Environment and SNCL make no representation or warranty to any other person with regard to this report and the work referred to in this report and they accept no duty of care to any other person or any liability or responsibility whatsoever for any losses, expenses, damages, fines, penalties or other harm that may be suffered or incurred by any other person as a result of the use of, reliance on, and decision made or any action taken based on this report or the work referred to in this report.

The investigation undertaken by SNCL with respect to this report and any conclusions or recommendations made in this report reflect SNCL's judgment based on the site conditions observed at the time of the site inspection on the date(s) set out in this report and on information available at the time of preparation of this report. This report has been prepared for specific application to this site and it is based, in part, upon visual observation of the site, subsurface investigation at discrete locations and depths, and specific analysis of specific chemical parameters and materials during a specific time interval, all as described in this report. Unless otherwise stated, the findings cannot be extended to previous or future site conditions, portions of the site which were unavailable for direct investigation, subsurface locations which were not investigated directly, or chemical parameters, materials or analysis which were not addressed. Substances other than those addressed by the investigation described in this report may exist within the site, substances addressed by the investigation may exist in areas of the site not investigated and concentrations of substances addressed which are different than those reported may exist in areas other than the locations from which samples were taken.

If site conditions or applicable standards change or if any additional information becomes available at a future date, SNCL requests notification so that we may decide if modifications to the findings, conclusions and recommendations in this report may be necessary.

Other than by Defense Construction Canada, Department of National Defence and the NL Department of Municipal Affairs and the Environment, copying or distribution of this report or use of or reliance on the information contained herein, in whole or in part, is not permitted without the express written permission of SNCL. Nothing in this report is intended to constitute or provide a legal opinion.

As required under the Newfoundland and Labrador Impacted Sites Guidance Document (revised date January 29, 2014), SNCL acknowledges that the persons signing this report have demonstrable experience, and are familiar with completing the work as described for the type of contamination at this property.

10 REFERENCES

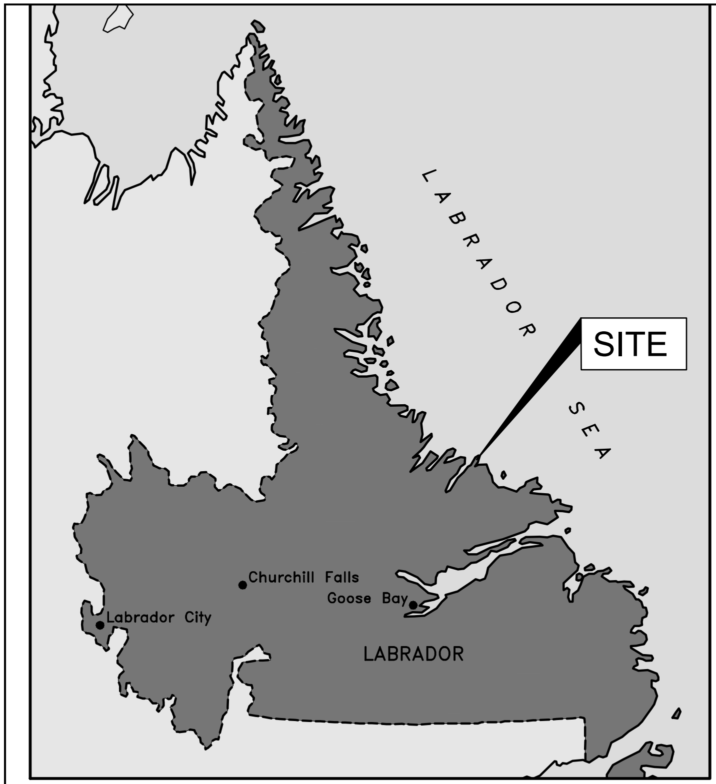
Table 13: References

Ref. No.	Date	Source	Item
1	2013	CSA Protocol Z769-00, Phase II ESA	Phase II ESA Z769-00 (R2013), Phase II ESA
2	2012 (revised January 2015)	Atlantic Risk Based Corrective Action – Version 3	Atlantic RBCA for Petroleum Impacted Sites in Atlantic Canada - Ecological Screening Assessment Criteria / Typical Sediments.
3	2012 (revised January 2015)	Atlantic Risk Based Corrective Action – Version 3	Atlantic ARBCA for Petroleum Impacted Sites in Atlantic Canada – Tier 1 Risk Based Screening Levels for Soil for a non-potable/coarse grained Agricultural Property.
4	2012 (revised January 2015)	Atlantic Risk Based Corrective Action – Version 3	ARBCA for Petroleum Impacted Sites in Atlantic Canada – Tier 1Soil Ecological Screening Levels for the Protection of Plants and Soil Invertebrates; Direct Soil Contact.
5	2012 (revised January 2015)	Atlantic Risk Based Corrective Action – Version 3	ARBCA for Petroleum Impacted Sites in Atlantic Canada, Tier 1Soil Ecological Screening Levels for the Protection of Wildlife (mammals and birds) and Livestock; Soil and Food Ingestion.
6	2012 (revised January 2015)	Atlantic Risk Based Corrective Action – Version 3	ARBCA for Petroleum Impacted Sites in Atlantic Canada – Tier 1 Surface Water and Groundwater Ecological Screening Levels for the Protection of Freshwater and Marine Aquatic Life.
7	1999	Canadian Council of Ministers of the Environment	Canadian Council of Ministers of the Environment (CCME), Canadian Environmental Quality Guidelines (CEQG), Soil Quality Guidelines for the Protection of Environmental and Human Health, Agricultural Land Use, Coarse Grained Surface Soils
8	2008	Canadian Council of Ministers of the Environment	CCME, Canada-Wide Standards (CWS) for Petroleum Hydrocarbons (PHC) in Soil, Agricultural Land Use, Coarse Grained Surface Soil.
9	2016	Canadian Council of Ministers of the Environment	Guidance Manual For Environmental Site Characterization In Support Of Environmental And Human Health Risk Assessment: Volume 1 Guidance Manual
10	2016	Canadian Council of Ministers of the Environment	Guidance Manual For Environmental Site Characterization In Support Of Environmental And Human Health Risk Assessment: Volume 4 Analytical Methods

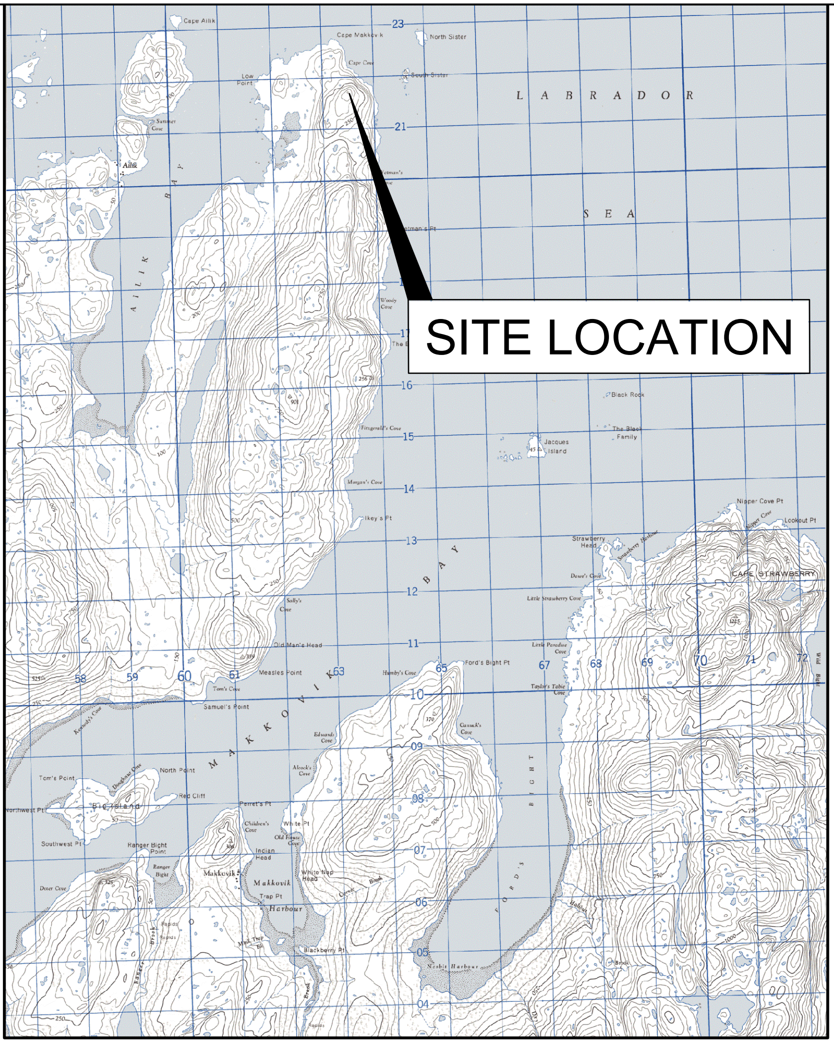
Ref. No.	Date	Source	Item
11	2007	NL Department of Natural Resources Mines	Geological Map of Labrador
12	March 2016	GHD Limited	Phase I Environmental Site Assessment, Former United States Military Site, Cape Makkovik (Aillik), NL
13	2017	Environment Canada	1981 – 2010 Climate Normals & Averages http://climate.weather.gc.ca/climate_normals/index_e.html
14	2004	Schmelzer, I. & Brazil, J, Chubbs, T., French, S., Hearn, B., Jeffery, R., LeDrew, L., Martin, H., McNeill, A., Nuna, R., Otto, R., Phillips, F., Mitchell, G, Pittman, G., Simon, N., Yetman, G.,	Recovery strategy for three Woodland caribou herds (Rangifer tarandus caribou; Boreal population) in Labrador. Department of Environment and Conservation, Government of Newfoundland and Labrador, Corner Brook.
15	2013	Kelly-Hooper, F., Farwell, A.J., Pike, G., Kennedy, J., Wang, Z., Grunsky E.C., and G.D. Dixon	Is it clean or contaminated soil? Using petrogenic versus biogenic GC-FID chromatogram patterns to mathematically resolve false petroleum hydrocarbon detections in clean organic soils: A crude oil-spiked peat microcosm experiment. Environmental Toxicology and Chemistry, v.32, no.10, 2013 Oct, p.2197(10)
16	2009	Canadian Parks And Wilderness Society	Newfoundland And Labrador Chapter (CPAWS), 2009. Special Marine Areas in Newfoundland and Labrador
17	2011	Ontario Ministry of the Environment	Soil, Ground Water and Sediment Standards for Use Under part XV.1 of the Environmental Protection Act
18	2016	Alberta Government	Alberta Tier 1 Soil and Groundwater Remediation Guidelines

Appendix A

SITE FIGURES



* FOR CLARITY PRINT DRAWING IN COLOR



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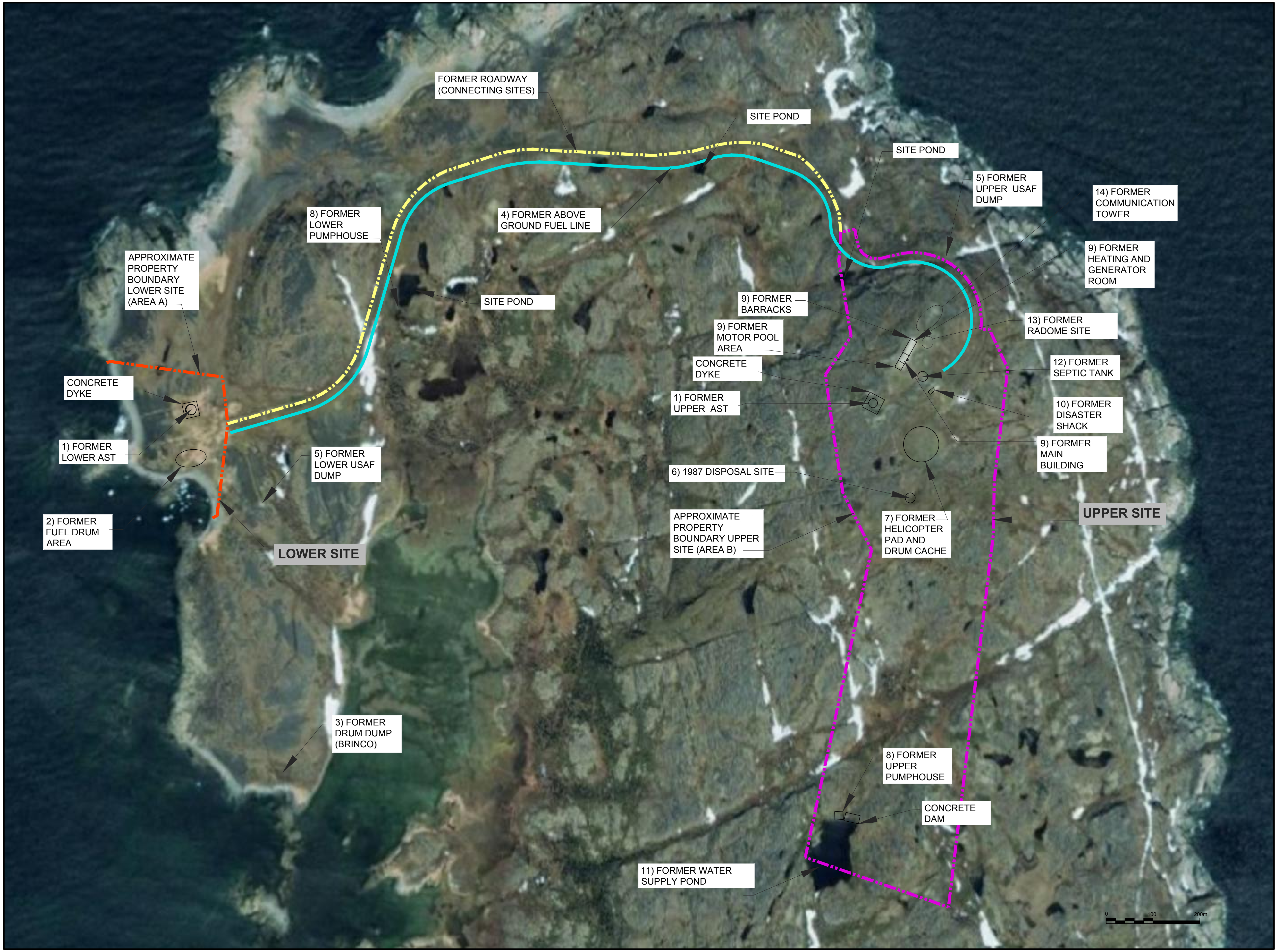
CLIENT:
DEFENCE CONSTRUCTION CANADA

PROJECT No.:
649806

PROJECT:
INITIAL TESTING PROGRAM AND
NCSCS CLASSIFICATION

DRAWING TITLE:
FIGURE 1 - SITE LOCATION AND TOPOGRAPHY
CAPE MAKKOVIK, NL



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LEGEND

SYMBOL	DESCRIPTION
▬ ▪ ▪ ▬	PROPERTY BOUNDARY

REV.	REVISIONS	CHECKED BY	APP. BY	DATE
B01	ISSUED FOR DRAFT REPORT			17-12-08

NORTH

PROFESSIONAL STAMP

PERMIT HOLDER STAMP

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CLIENT

DEFENCE CONSTRUCTION CANADA

PROJECT

INTIAL TESTING PROGRAM AND NCSCS CLASSIFICATION

TITLE

FIGURE 2
SITE LOCATION
(UPPER AND LOWER SITE)

DESIGNED BY J.G.	CHECKED BY	DATE	17-12-08
DRAWN BY V.R.	APPROVED BY	DATE	17-12-08
SCALE AS SHOWN	SNC LAVALIN PROJ. No.	649806	
	CLIENT PROJ. No.		

DRAWING No. **DW1 – XX – EN – XX – 001**

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LEGEND

SYMBOL	DESCRIPTION
◪	SAMPLE LOCATION
⌒⌒	EXPOSED BEDROCK/ SHALLOW SOIL
RED TEXT	EXCEEDANCES

REV.	REVISIONS	CHECKED BY	APP. BY	DATE
B01	ISSUED FOR DRAFT REPORT			17-12-08

NORTH

PROFESSIONAL STAMP

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CLIENT
DEFENCE CONSTRUCTION CANADA

PROJECT
INTIAL TESTING PROGRAM AND NCSCS CLASSIFICATION

TITLE
FIGURE 3
LOWER SITE
SITE PLAN - SOIL SAMPLES

DESIGNED BY	J.G.	CHECKED BY		DATE	17-12-08
DRAWN BY	V.R.	APPROVED BY		DATE	17-12-08
SCALE	AS SHOWN	SNC LAVALIN PROJ. No.	649806		
		CLIENT PROJ. No.			

DRAWING No.
DW1 – XX – EN – XX – 002
REV.

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LEGEND

SYMBOL	DESCRIPTION
⊞	SAMPLE LOCATION
RED TEXT	EXCEEDANCES

REV.	REVISIONS	CHECKED BY	APP. BY	DATE
B01	ISSUED FOR DRAFT REPORT			17-12-08

NORTH

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CLIENT
DEFENCE CONSTRUCTION CANADA

PROJECT
INTIAL TESTING PROGRAM AND NCSCS CLASSIFICATION

TITLE
FIGURE 4
LOWER SITE
SITE PLAN - SEDIMENT SAMPLES

DESIGNED BY	J.G.	CHECKED BY		DATE	17-12-08
DRAWN BY	V.R.	APPROVED BY		DATE	17-12-08
SCALE	AS SHOWN	SNC LAVALIN PROJ. No.	649806		
		CLIENT PROJ. No.			

DRAWING No.
DW1 – XX – EN – XX – 003

REV.

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LEGEND	
SYMBOL	DESCRIPTION
◪	SAMPLE LOCATION

REV.	REVISIONS	CHECKED BY	APP. BY	DATE
B01	ISSUED FOR DRAFT REPORT			17-12-08

NORTH

PROFESSIONAL STAMP

PERMIT HOLDER STAMP

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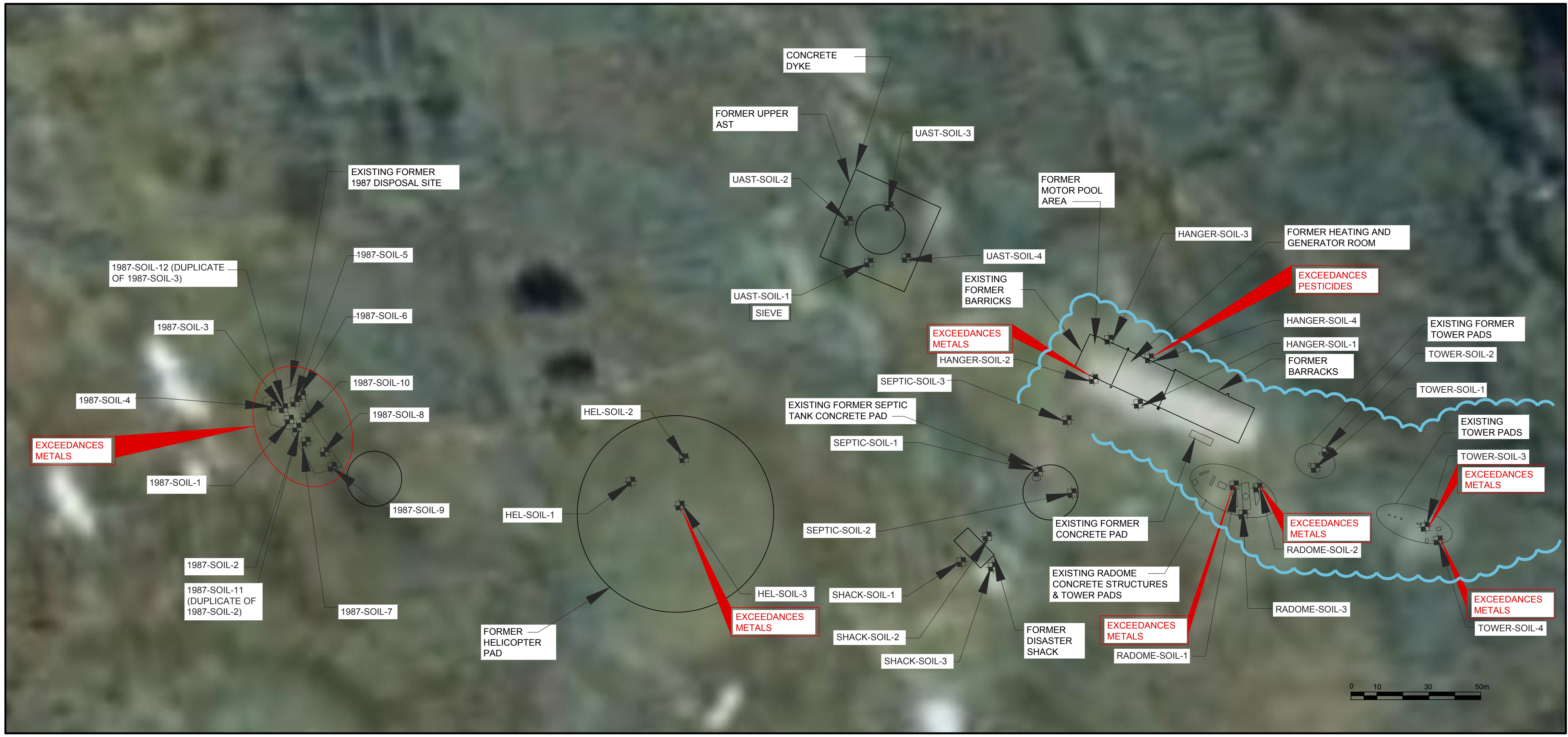
CLIENT
DEFENCE CONSTRUCTION CANADA

PROJECT
INTIAL TESTING PROGRAM AND NCSCS CLASSIFICATION

TITLE
FIGURE 5
LOWER SITE - SITE PLAN SURFACE WATER SAMPLES

DESIGNED BY	J.G.	CHECKED BY		DATE	17-12-08
DRAWN BY	V.R.	APPROVED BY		DATE	17-12-08
SCALE	AS SHOWN	SNC LAVALIN PROJ. No.	649806		
		CLIENT PROJ. No.			

DRAWING No.
DW1 – XX – EN – XX – 004
REV.



UPPER SITE AREA - 1.) FORMER UPPER AST, 6.) EXISTING FORMER 1987 DISPOSAL SITE, 7.) FORMER HELICOPTER PAD, 9.) FORMER BARRACKS, MOTOR POOL,MAIN BUILDING, HEATING & GENERATOR ROOM, 10.) FORMER DISASTER SHACK, 12.) EXISTING FORMER SEPTIC TANK CONCRETE PAD, 13.) EXISTING RADOME CONCRETE STRUCTURES & TOWER PADS 14.) EXISTING FORMER TOWER PADS

UPPER SITE AREA -11.) FORMER WATER SUPPLY POND

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LEGEND	
SYMBOL	DESCRIPTION
⊞	SAMPLE LOCATION
⌒⌒	EXPOSED BEDROCK/ SHALLOW SOIL
RED TEXT	EXCEEDANCES

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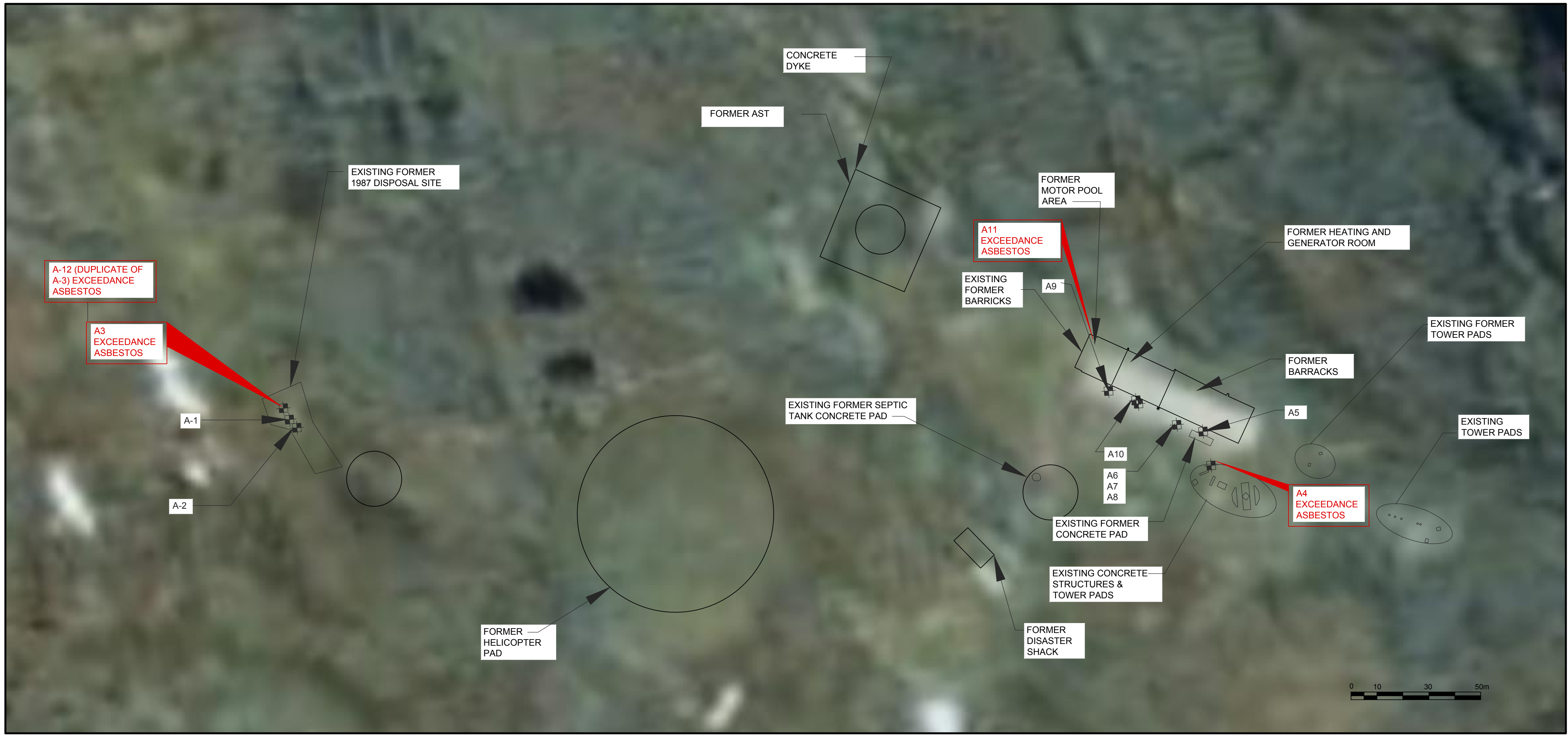
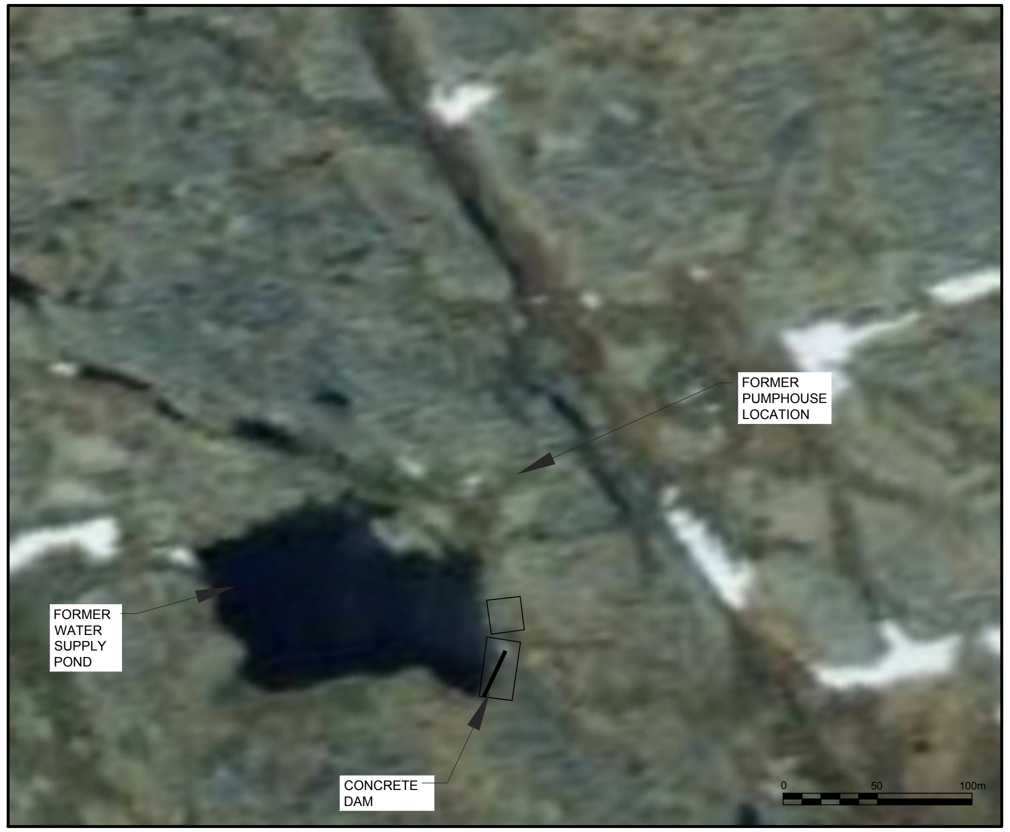
FIGURE 6
UPPER SITE
SITE PLAN - SOIL SAMPLES

DESIGNED BY	J.G.	CHECKED BY		DATE	17-12-08
DRAWN BY	V.R.	APPROVED BY		DATE	17-12-08
SCALE	AS SHOWN	SNC LAVALIN PROJ. No.	649806		
		CLIENT PROJ. No.			

DRAWING No. **DW1 – XX – EN – XX – 005** REV.





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SYMBOL	DESCRIPTION
⊞	SAMPLE LOCATION
RED TEXT	EXCEEDANCES

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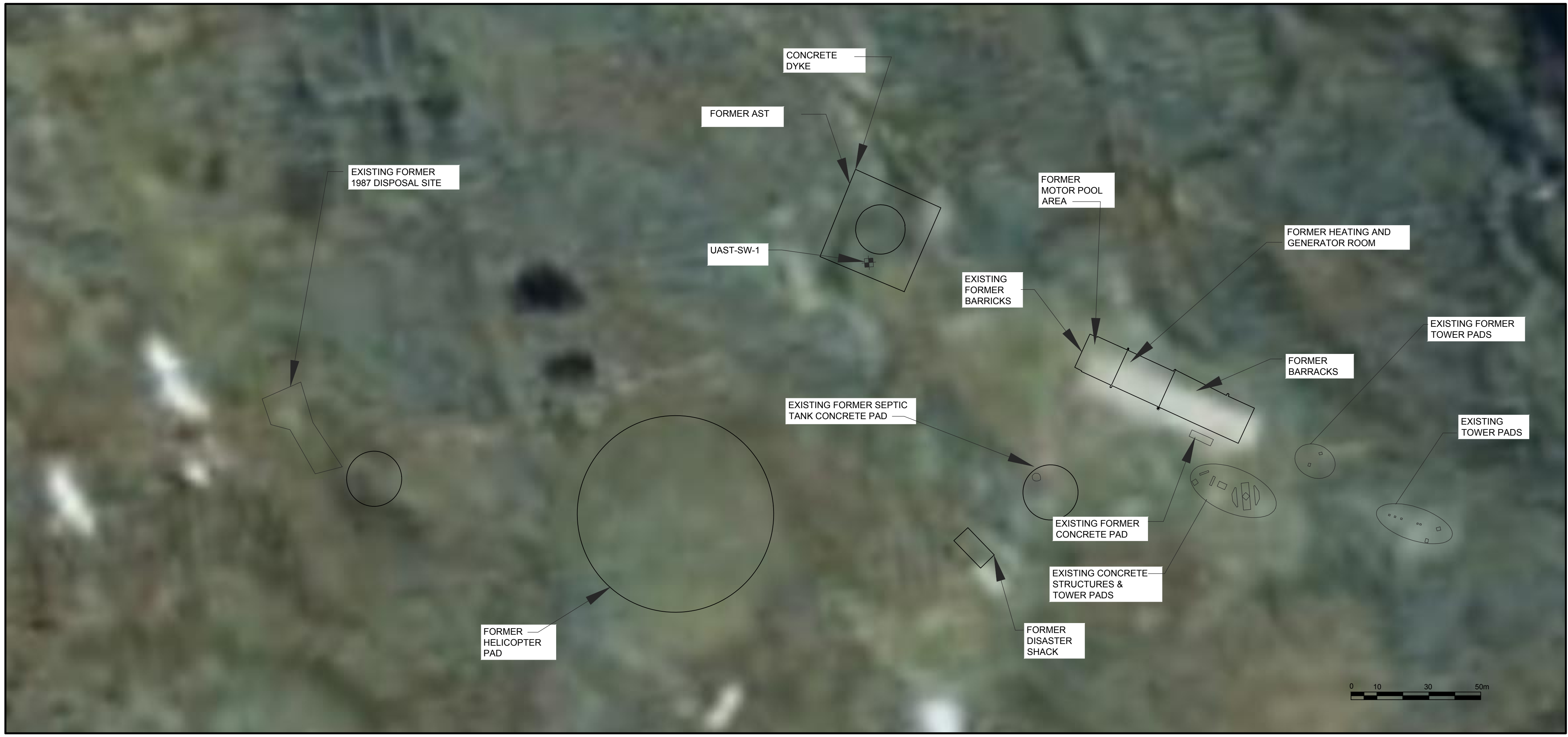
TITLE
FIGURE 7
UPPER SITE - SITE PLAN ASBESTOS SAMPLES

DESIGNED BY	J.G.	CHECKED BY		DATE	17-12-08
DRAWN BY	V.R.	APPROVED BY		DATE	17-12-08
SCALE	AS SHOWN	SNC LAVALIN PROJ. No.	649806		
		CLIENT PROJ. No.			

DRAWING No.
DW1 – XX – EN – XX – 006

REV.



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SYMBOL	DESCRIPTION
▚	SAMPLE LOCATION

REV.	REVISIONS	CHECKED BY	APP. BY	DATE
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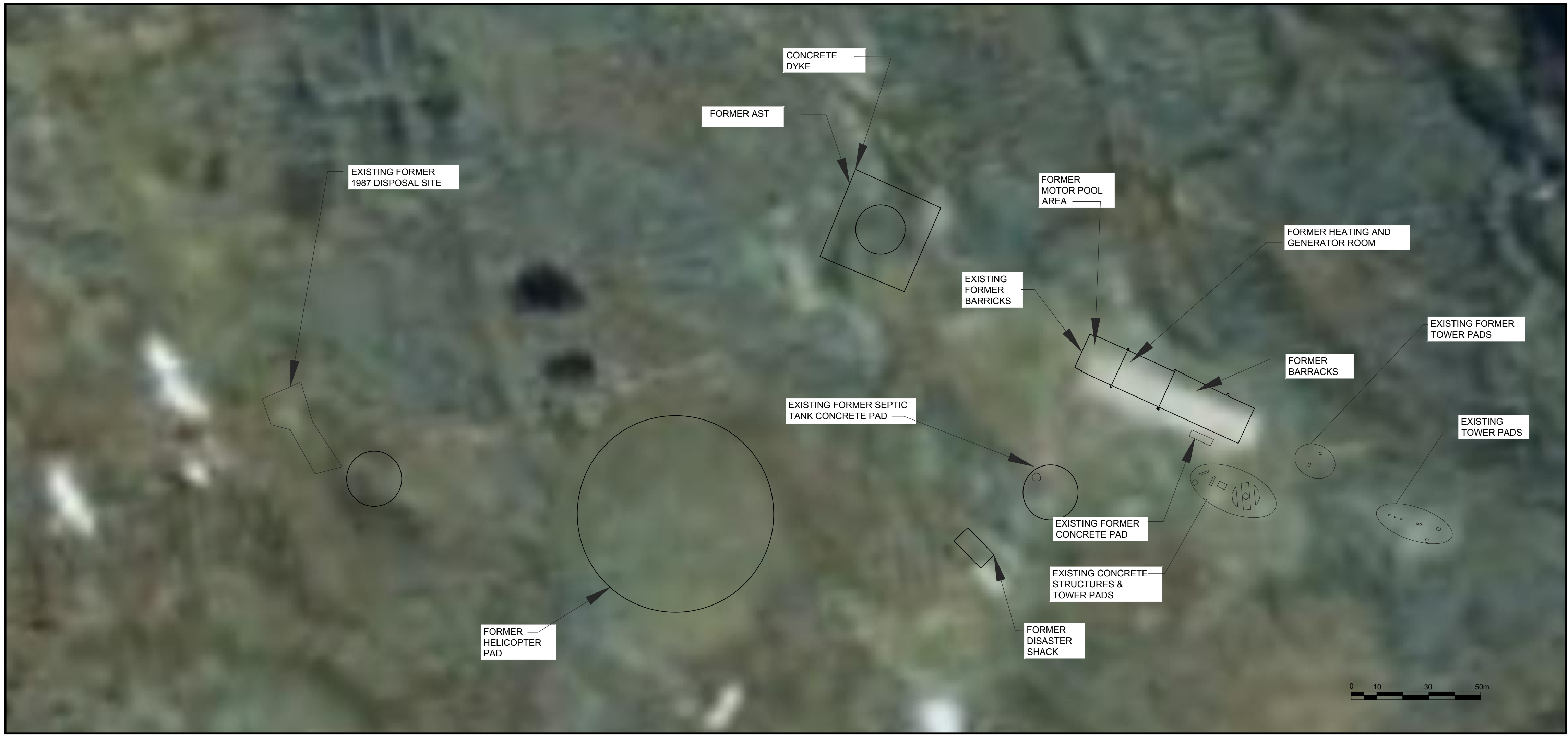
FIGURE 8
UPPER SITE - SITE PLAN SURFACE WATER SAMPLES

DESIGNED BY	J.G.	CHECKED BY	DATE 17-12-08
DRAWN BY	V.R.	APPROVED BY	DATE 17-12-08
SCALE	AS SHOWN	SNC LAVALIN PROJ. No.	649806
		CLIENT PROJ. No.	

DRAWING No.
DW1 – XX – EN – XX – 007

REV.



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LEGEND	
SYMBOL	DESCRIPTION
▚	SAMPLE LOCATION
⌒⌒	EXPOSED BEDROCK/ SHALLOW SOIL
RED TEXT	EXCEEDANCES

REV.	REVISIONS	CHECKED BY	APP. BY	DATE
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FIGURE 9
UPPER SITE - SITE PLAN
SEDIMENT SAMPLES

DESIGNED BY	J.G.	CHECKED BY		DATE	17-12-08
DRAWN BY	V.R.	APPROVED BY		DATE	17-12-08
SCALE	AS SHOWN	SNC LAVALIN PROJ. No.	649806		
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SYMBOL	DESCRIPTION
▚	SAMPLE LOCATION

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FIGURE 10 - (FORMER ROADWAY BETWEEN UPPER & LOWER SITE) SITE PLAN - SOIL SAMPLES

DESIGNED BY J.G.	CHECKED BY	DATE 17-12-08	
DRAWN BY V.R.	APPROVED BY	DATE 17-12-08	
SCALE AS SHOWN	SNC LAVALIN PROJ. No. 649806		
	CLIENT PROJ. No.		

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SYMBOL	DESCRIPTION
⊞	SAMPLE LOCATION
RED TEXT	EXCEEDANCES

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FIGURE 11 - (FORMER ROADWAY BETWEEN UPPER & LOWER SITE) SITE PLAN - SURFACE WATER

DESIGNED BY	J.G.	CHECKED BY		DATE	17-12-08
DRAWN BY	V.R.	APPROVED BY		DATE	17-12-08
SCALE	AS SHOWN	SNC LAVALIN PROJ. No.	649806		
		CLIENT PROJ. No.			

DRAWING No.
DW1 – XX – EN – XX – 010

REV.

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SYMBOL	DESCRIPTION
▚	SAMPLE LOCATION
RED TEXT	EXCEEDANCES

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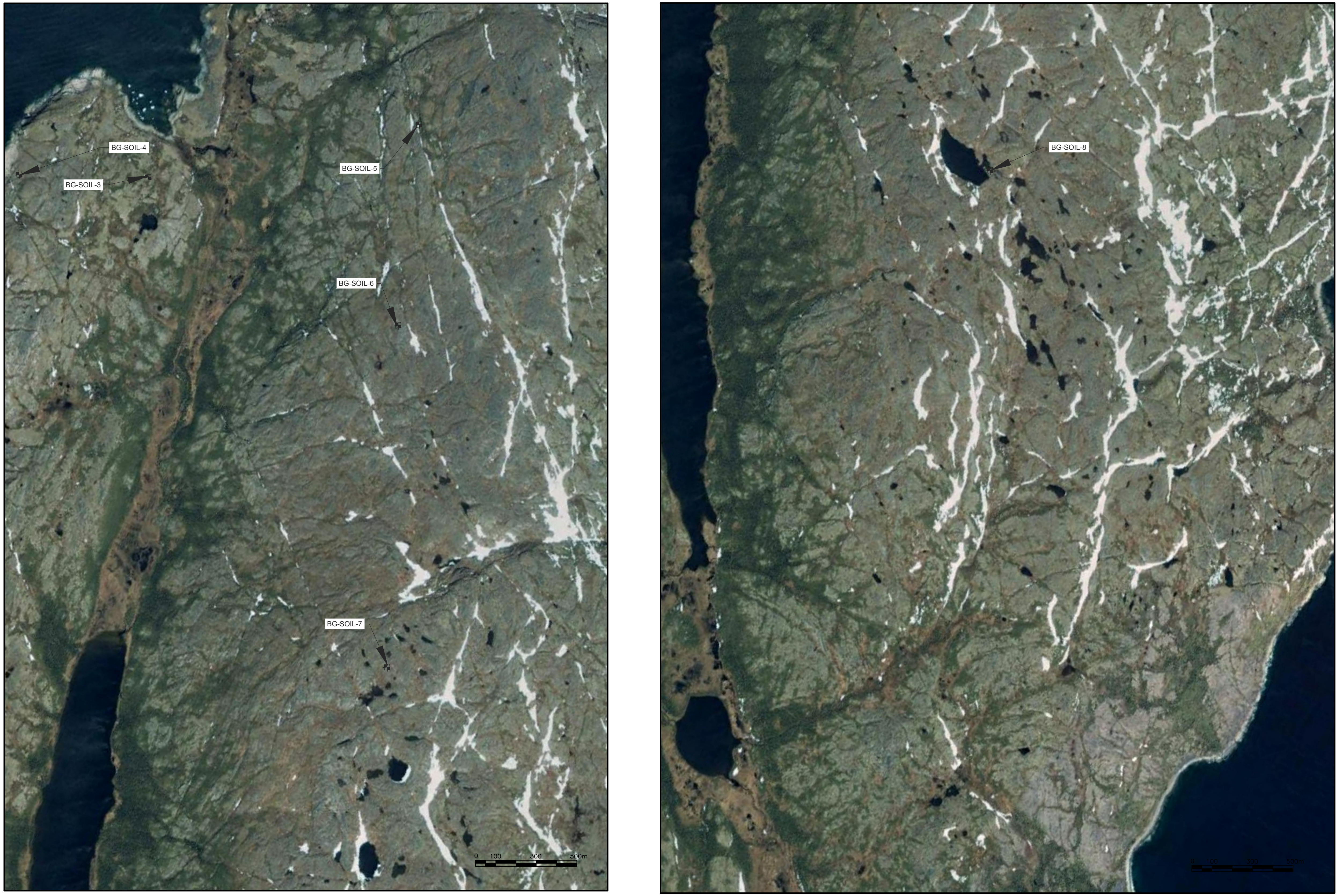
FIGURE 12 - (FORMER ROADWAY BETWEEN UPPER & LOWER SITE) SITE PLAN - SEDIMENT SAMPLES

DESIGNED BY J.G.	CHECKED BY	DATE 17-12-08	
DRAWN BY V.R.	APPROVED BY	DATE 17-12-08	
SCALE AS SHOWN	SNC LAVALIN PROJ. No. 649806		
	CLIENT PROJ. No.		

DRAWING No. **DW1 – XX – EN – XX – 011**

REV.



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LEGEND	
SYMBOL	DESCRIPTION
▚	SAMPLE LOCATION

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TITLE

FIGURE 13
BACKGROUND SAMPLING LOCATIONS - SOIL SAMPLES

DESIGNED BY	J.G.	CHECKED BY	DATE 17-12-08
DRAWN BY	V.R.	APPROVED BY	DATE 17-12-08
SCALE	AS SHOWN	SNC LAVALIN PROJ. No.	649806
		CLIENT PROJ. No.	

DRAWING No.
DW1 – XX – EN – XX – 012

REV.

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LEGEND

SYMBOL	DESCRIPTION
◪	SAMPLE LOCATION
RED TEXT	EXCEEDANCES

REV.	REVISIONS	CHECKED BY	APP. BY	DATE
B01	ISSUED FOR DRAFT REPORT			17-12-08

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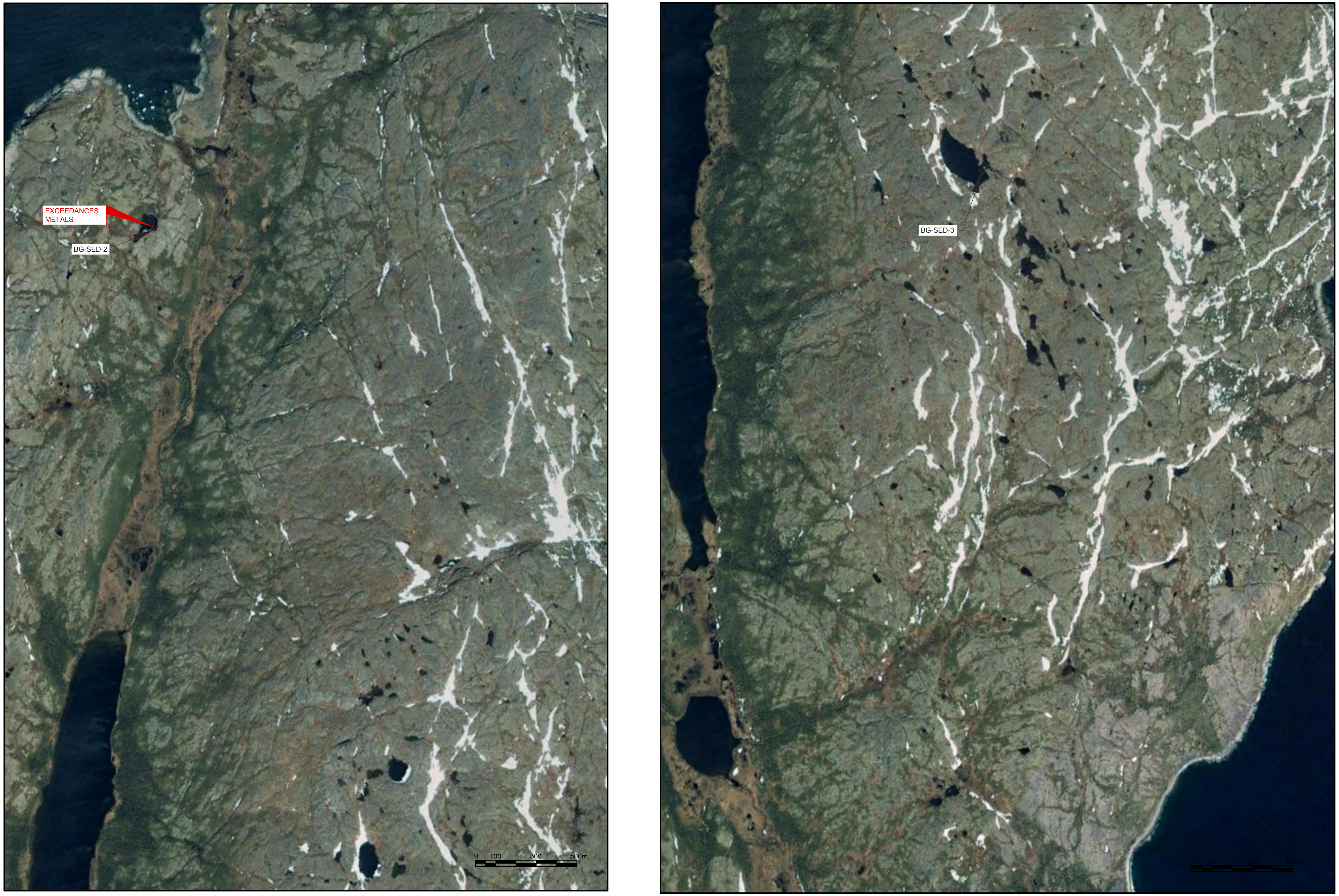
TITLE
FIGURE 14
BACKGROUND SAMPLING LOCATIONS - SURFACE WATER

DESIGNED BY J.G.
CHECKED BY
DATE 17-12-08
DRAWN BY V.R.
APPROVED BY
DATE 17-12-08
SCALE AS SHOWN
SNC LAVALIN PROJ. No. 649806
CLIENT PROJ. No.
DRAWING No. **DW1 – XX – EN – XX – 013**
REV.



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LEGEND

SYMBOL	DESCRIPTION
▚	SAMPLE LOCATION
RED TEXT	EXCEEDANCES

REV.	REVISIONS	CHECKED BY	APP. BY	DATE
B01	ISSUED FOR DRAFT REPORT			17-12-08

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TITLE
FIGURE 15
BACKGROUND SAMPLING LOCATIONS - SEDIMENT

DESIGNED BY	J.G.	CHECKED BY	
DATE	17-12-08		
DRAWN BY	V.R.	APPROVED BY	
DATE	17-12-08		
SCALE	AS SHOWN	SNC LAVALIN PROJ. No.	649806
		CLIENT PROJ. No.	

DRAWING No.
DW1 – XX – EN – XX – 014

REV.

Appendix B

PHOTOGRAPHS

Photo 1: (Upper Site) Former Helicopter Pad Looking South

Photo 2: (Upper Site) Former Helicopter Pad Looking North

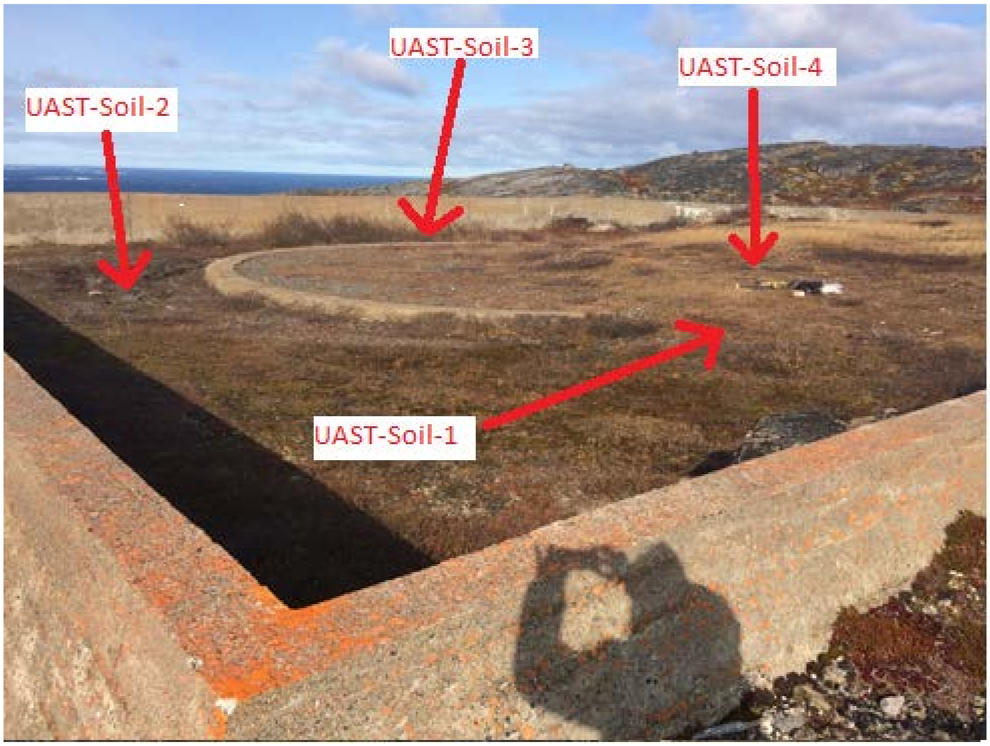

Photo 3: (Upper Site) Concrete Dyke for Former AST Looking North

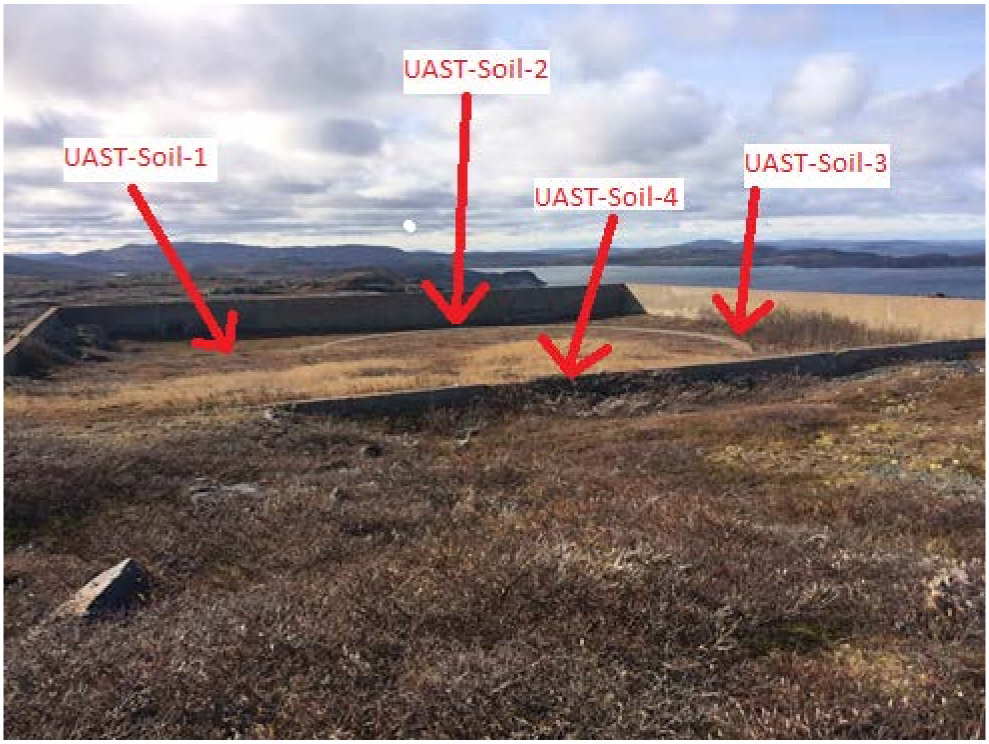

Photo 4: (Upper Site) Concrete Dyke for Former AST Looking South

Photo 5: (Upper Site) Foundation of Former Barracks Looking South

Photo 6: (Upper Site) Foundation of Former Barracks Looking North

Photo 7: (Upper Site) Foundation of Former Radome Looking West

Photo 8: (Upper Site) Foundation of Former Towers looking North

Photo 9: (Upper Site) Foundations of Former Towers Looking West

Photo 10: (Upper Site) Foundation of Former Disaster Shack Looking West

Photo 11: (Upper Site) Foundation of Former Disaster Shack Looking East

Photo 12: (Upper Site) Disposal Site (1987) Looking East

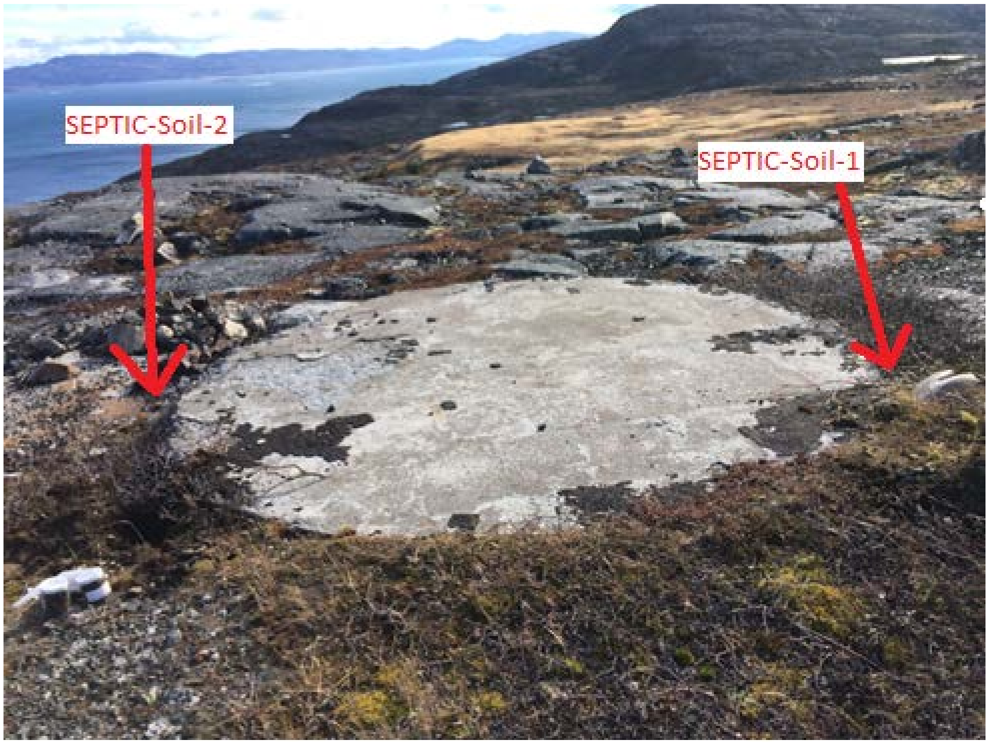

Photo 13: (Upper Site) Foundation of Former Septic Tank Looking South

Photo 14: Former Roadway Connecting Upper and Lower Sites Looking East

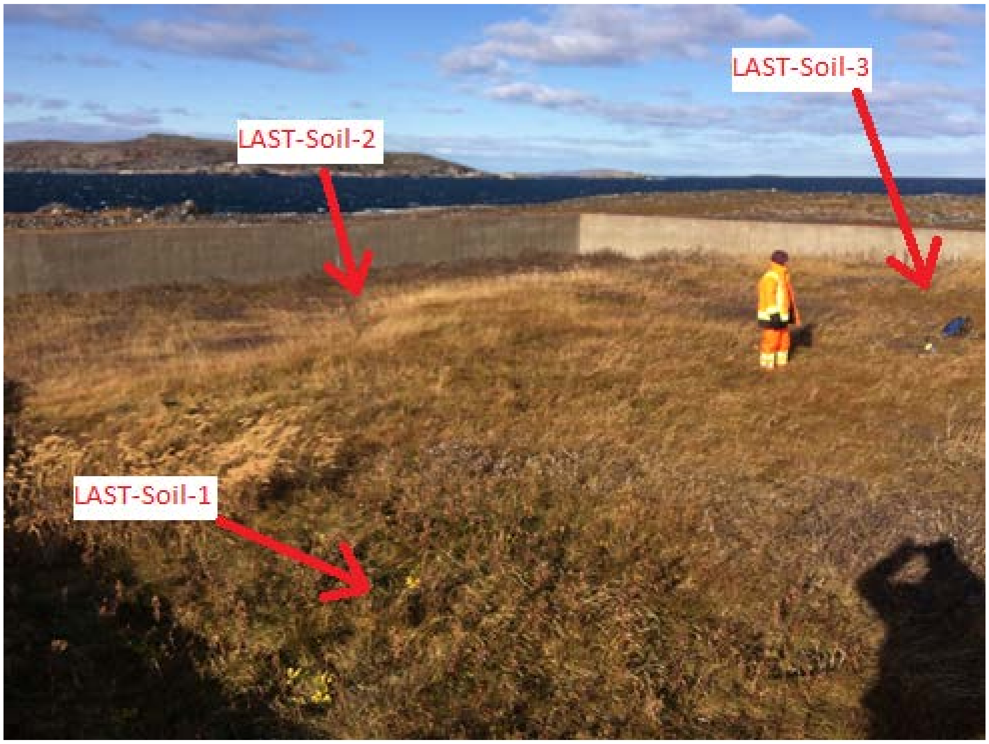

Photo 15: (Lower Site) Concrete Dyke for Former AST Looking West

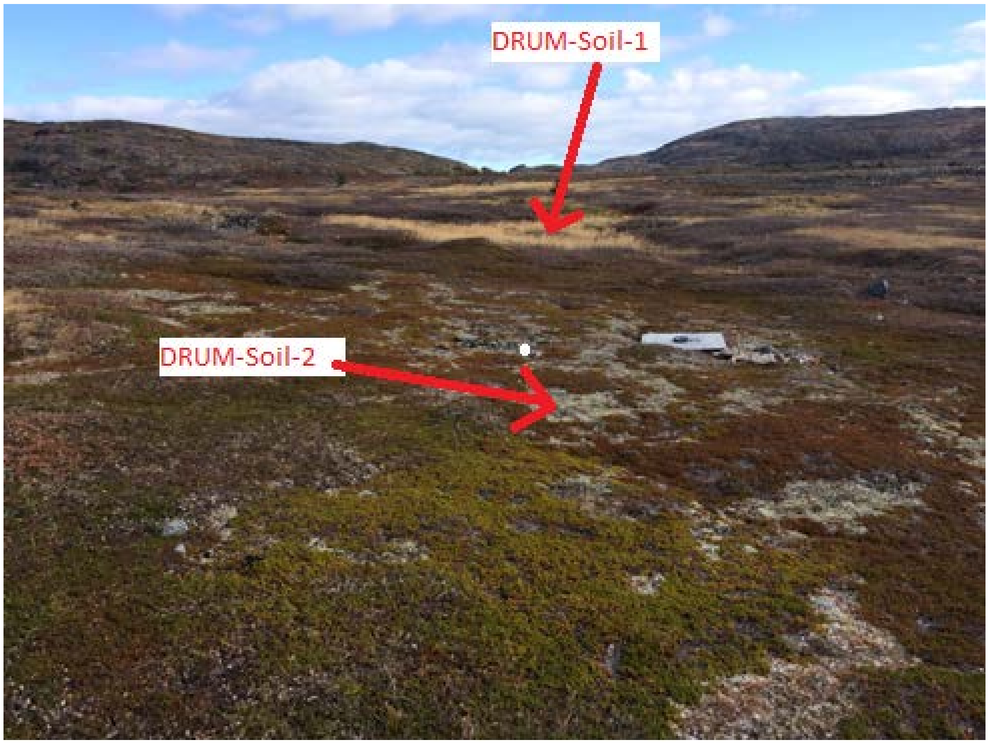

Photo 16: (Lower Site) Former Fuel Drum Area Looking East

Photo 17: (Lower Site) Former USAF Dump Looking North

Photo 18: (Lower Site) Former USAF Dump Looking South

Photo 19: (Lower Site) Former Drum Dump (Brinco) Looking East

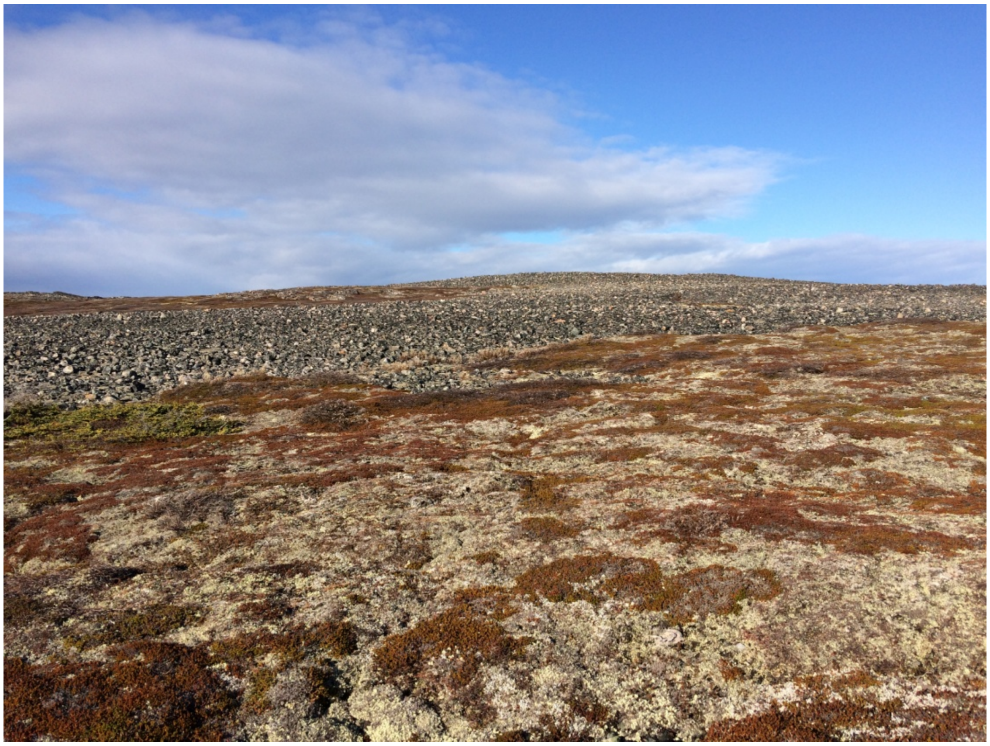

Photo 20: (Lower Site) Former Drum Dump (Brinco) Looking North

Photo 21: Former Pumphouse near Lower Site Looking East

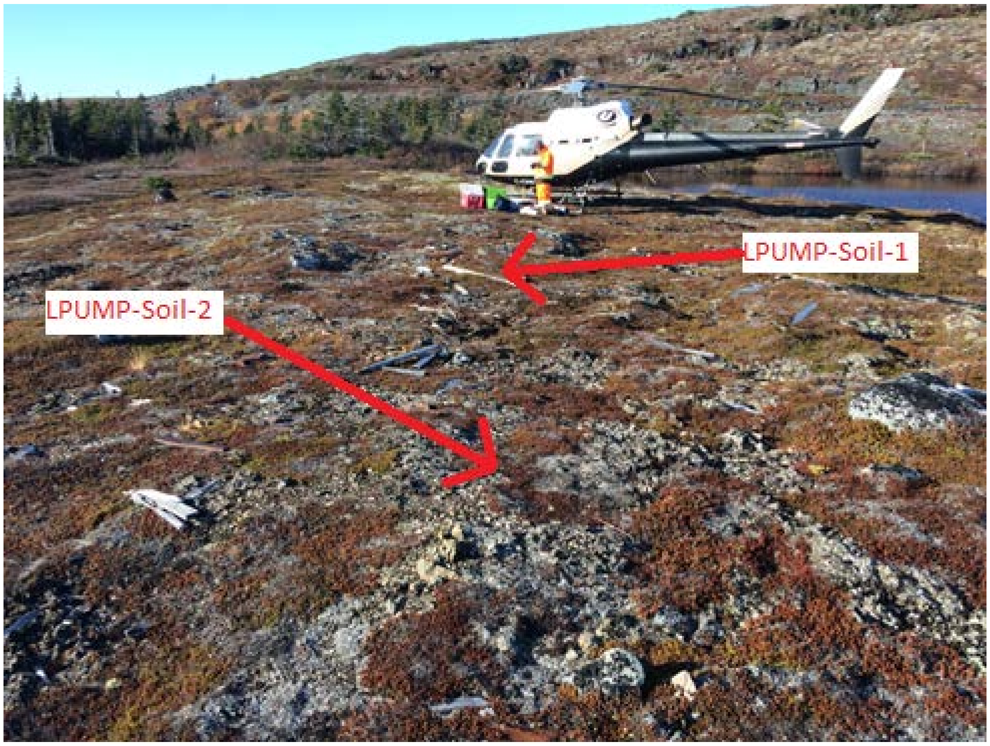

Photo 22: Former Pumphouse near Lower Site Looking West

Photo 23: Former Roadway near Lower Site Looking East

Photo 24: Background Pond (BG-SW-1 & BG-SED-2)

Photo 25: Site Pond (SW-1 & SED-1)

Photo 26: Site Pond (SW-2 & SED-2)

Photo 27: Site Pond (SW-3 & SED-3)

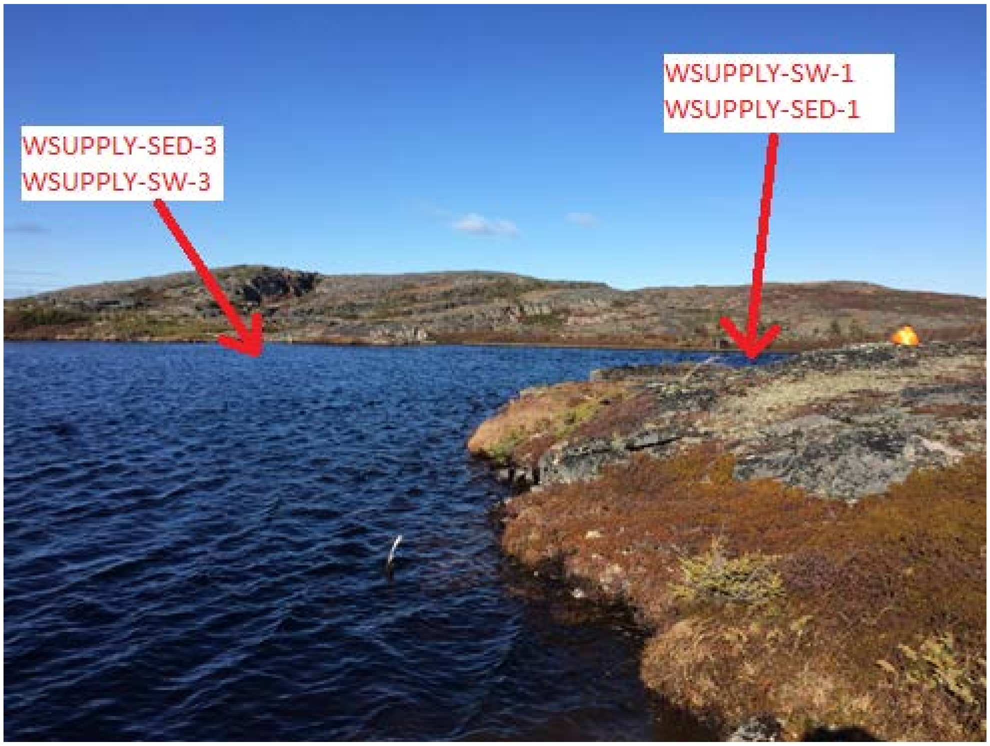

Photo 28: Former Water Supply Pond

Photo 29: Concrete Dam at Former Water Supply Pond

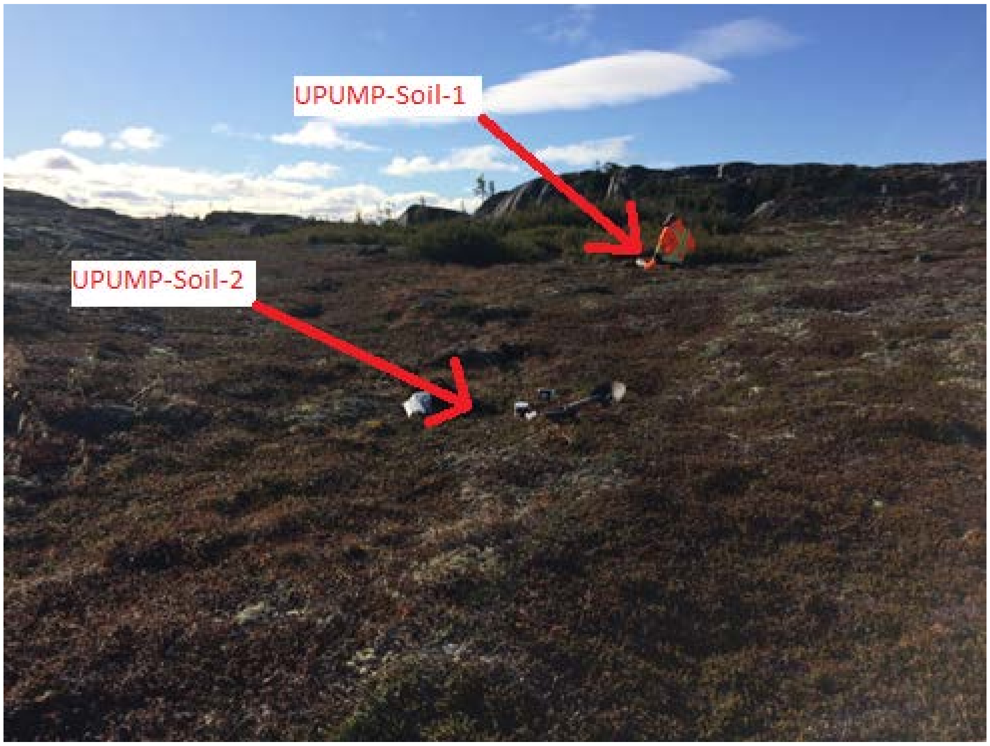

Photo 30: Location of Former Pumphouse near Former Water Supply Pond

Photo 31: Background Pond (BG-SED-3 & BG-SW-3

Photo 32: Suspected Area of former USAF Dump near Upper Site

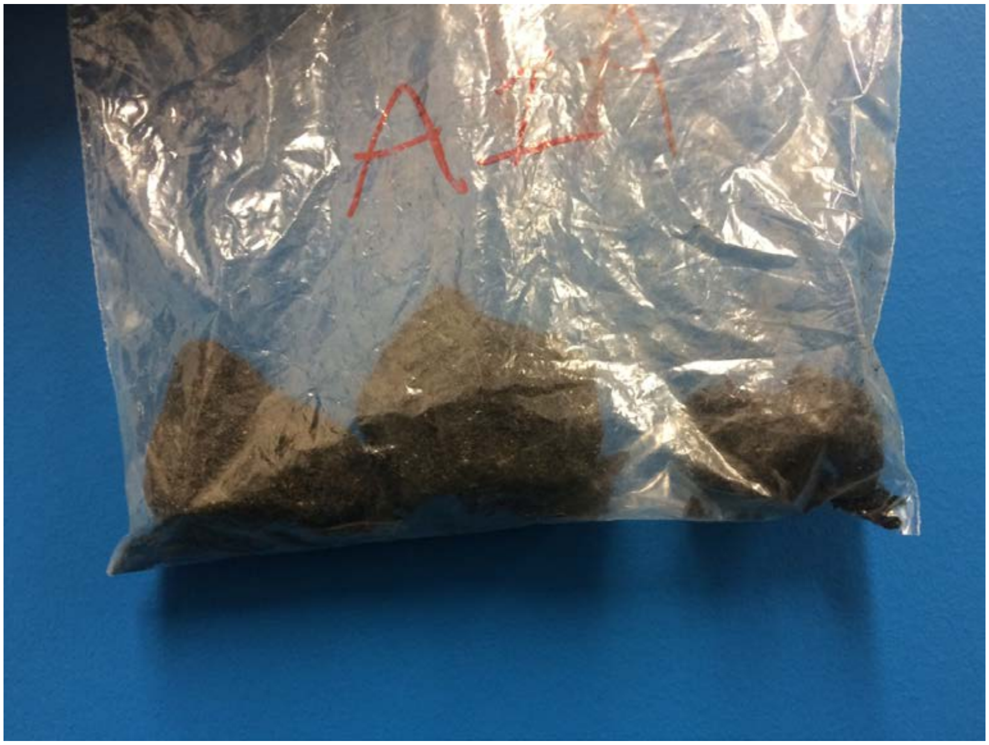

Photo 33: Sample A1 collected from 1987 Disposal Site

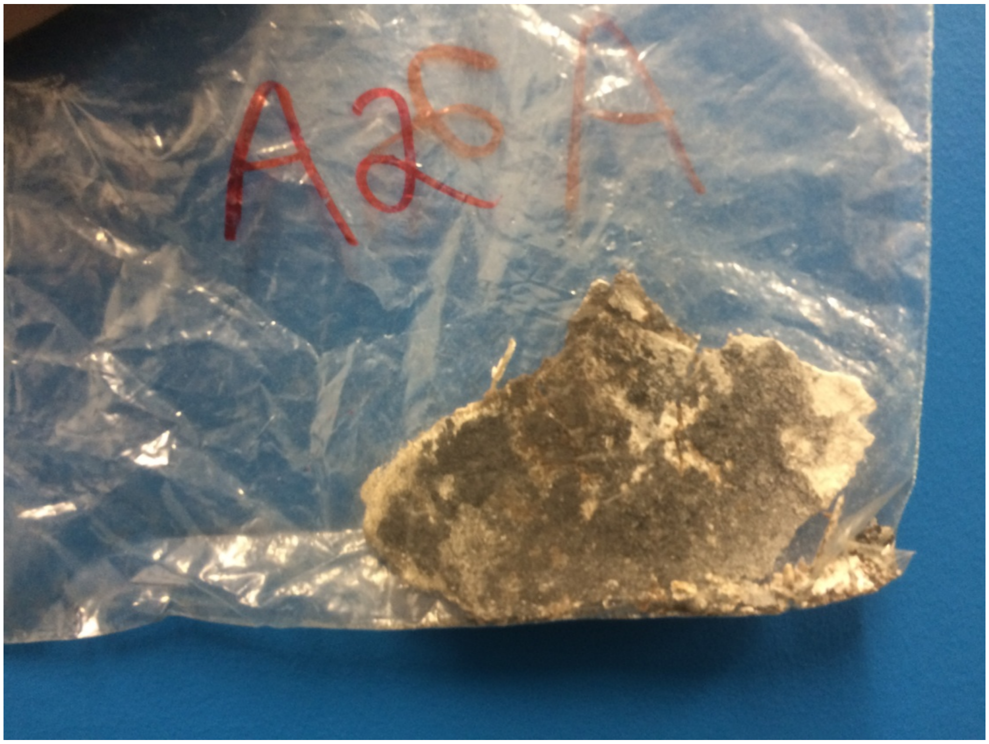

Photo 34: Sample A2 collected from 1987 Disposal Site

Photo 35: Sample A3 collected from 1987 Disposal Site

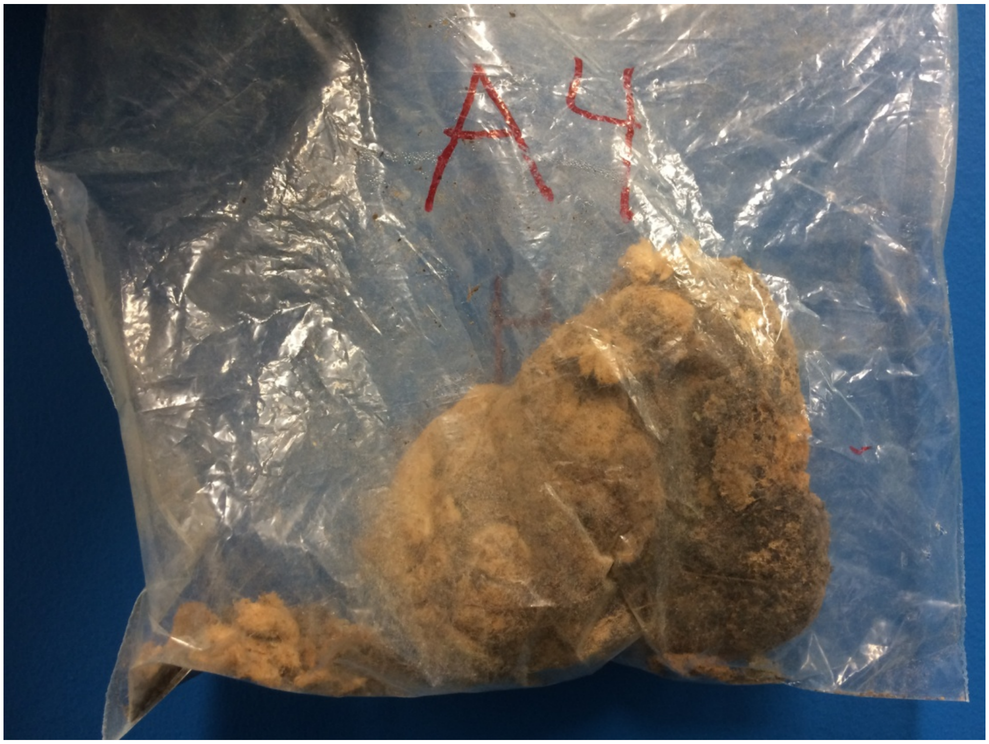

Photo 36: Sample A4 collected from former Radome Site

Photo 37: Sample A5 collected from former Barracks Site

Photo 38: Sample A6 collected from former Barracks Site

Photo 39: Sample A7 collected from former Barracks area

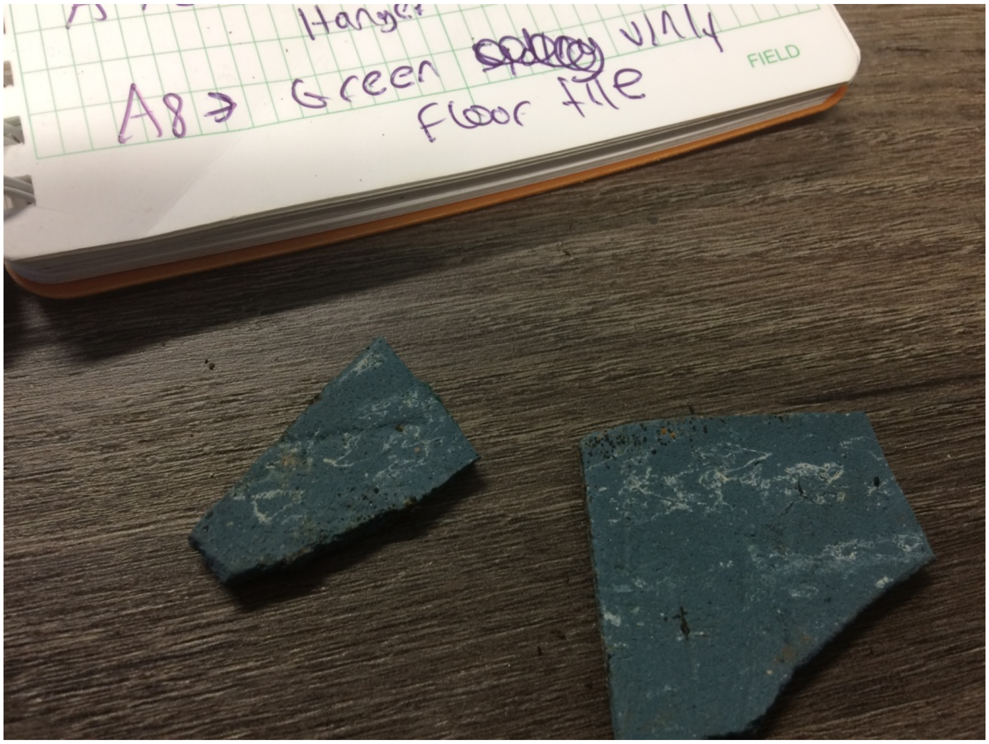

Photo 40: Sample A8 collected from former Barracks area

Photo 41: Sample A9 collected from former Barracks area

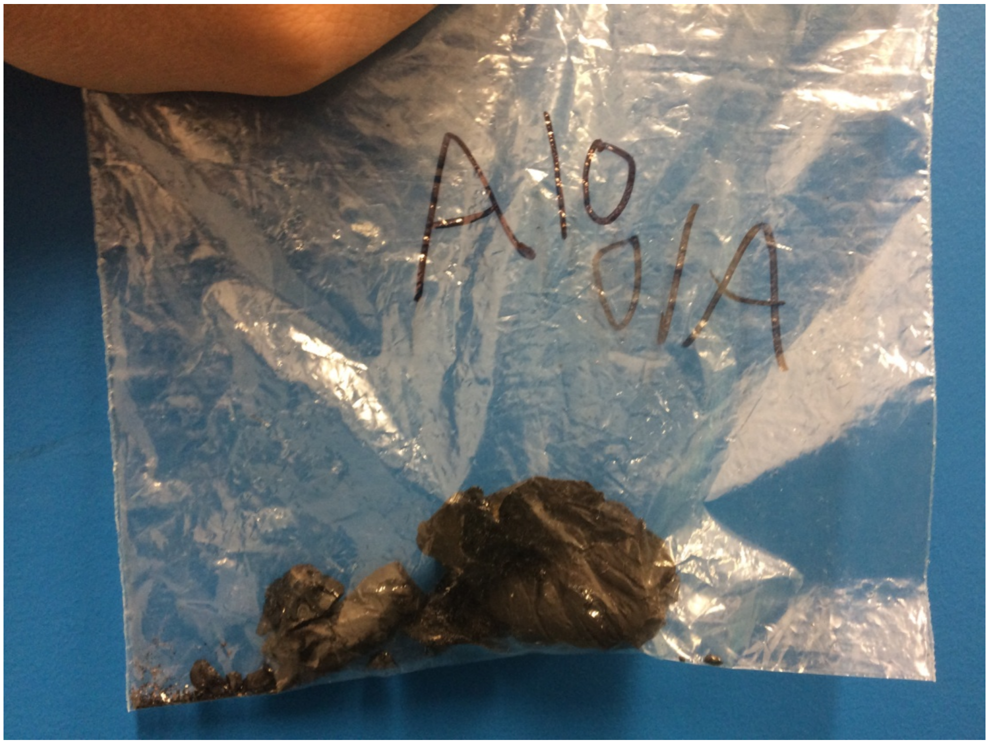

Photo 42: Sample A10 collected from former Barracks Foundation

Photo 43: (1987 Disposal Site) Buried building siding (Sample A3)

Photo 44: (1987 Disposal Site) Buried building siding and black foam (Sample A1) in test pit where soil sample 1987-SOIL-3 was collected

Appendix C

LABORATORY CERTIFICATES

Your Project #: 649806
Site Location: CAPE MAKKOVIK
Your C.O.C. #: D 26100

Attention: Jason Green

SNC-Lavalin Inc
1090 Topsail Rd
2nd Floor
Mount Pearl, NL
A1N 5E7

Report Date: 2018/03/13
Report #: R5039146
Version: 5 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B7N3343
Received: 2017/10/19, 15:30

Sample Matrix: Soil
Samples Received: 70

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
CCME F1 - BTEX Calc. for Soil	12	2017/10/20	2017/10/22	ATL SOP-00202	CCME PHC-CWS m
CCME F1 - BTEX Calc. for Soil	7	2017/10/20	2017/10/23	ATL SOP-00202	CCME PHC-CWS m
CCME F1 - BTEX Calc. for Soil	17	2017/10/20	2017/10/25	ATL SOP-00202	CCME PHC-CWS m
CCME F1 - BTEX Calc. for Soil	9	2017/10/20	2017/10/27	ATL SOP-00202	CCME PHC-CWS m
CCME F1 - BTEX Calc. for Soil	14	2017/10/20	2017/10/30	ATL SOP-00202	CCME PHC-CWS m
CCME F1 - BTEX Calc. for Soil	11	2017/10/20	2017/10/31	ATL SOP-00202	CCME PHC-CWS m
CCME F1 & BTEX in Soil - Field Preserved (1)	19	N/A	2017/10/24	ATL SOP-00202	CCME PHC-CWS m
CCME F1 & BTEX in Soil - Field Preserved (1)	8	N/A	2017/10/25	ATL SOP-00202	CCME PHC-CWS m
CCME F1 & BTEX in Soil - Field Preserved (1)	18	N/A	2017/10/27	ATL SOP-00202	CCME PHC-CWS m
CCME F1 & BTEX in Soil - Field Preserved (1)	5	N/A	2017/10/31	ATL SOP-00202	CCME PHC-CWS m
CCME F1 & BTEX in Soil - Field Preserved (1)	20	N/A	2017/11/01	ATL SOP-00202	CCME PHC-CWS m
Petroleum Hydro. CCME F2-F4 in Soil (2)	12	2017/10/23	2017/10/23	ATL SOP-00201	CCME PHC-CWS m
Petroleum Hydro. CCME F2-F4 in Soil (2)	7	2017/10/23	2017/10/24	ATL SOP-00201	CCME PHC-CWS m
Petroleum Hydro. CCME F2-F4 in Soil (2)	8	2017/10/24	2017/10/25	ATL SOP-00201	CCME PHC-CWS m
Petroleum Hydro. CCME F2-F4 in Soil (2)	9	2017/10/25	2017/10/26	ATL SOP-00201	CCME PHC-CWS m
Petroleum Hydro. CCME F2-F4 in Soil (2)	9	2017/10/26	2017/10/27	ATL SOP-00201	CCME PHC-CWS m
Petroleum Hydro. CCME F2-F4 in Soil (2)	7	2017/10/27	2017/10/30	ATL SOP-00201	CCME PHC-CWS m
Petroleum Hydro. CCME F2-F4 in Soil (2)	7	2017/10/30	2017/10/31	ATL SOP-00201	CCME PHC-CWS m
Petroleum Hydro. CCME F2-F4 in Soil (2)	11	2017/10/31	2017/11/02	ATL SOP-00201	CCME PHC-CWS m
CCME F3A Calculation for Soil	11	N/A	2017/10/23	ATL SOP-00201	CCME PHC-CWS m
CCME F3A Calculation for Soil	7	N/A	2017/10/24	ATL SOP-00201	CCME PHC-CWS m
CCME F3A Calculation for Soil	8	N/A	2017/10/25	ATL SOP-00201	CCME PHC-CWS m
CCME F3A Calculation for Soil	9	N/A	2017/10/26	ATL SOP-00201	CCME PHC-CWS m
CCME F3A Calculation for Soil	9	N/A	2017/10/27	ATL SOP-00201	CCME PHC-CWS m
CCME F3A Calculation for Soil	7	N/A	2017/10/30	ATL SOP-00201	CCME PHC-CWS m
CCME F3A Calculation for Soil	7	N/A	2017/10/31	ATL SOP-00201	CCME PHC-CWS m
CCME F3A Calculation for Soil	11	N/A	2017/11/02	ATL SOP-00201	CCME PHC-CWS m
CCME F3 Calculation for Soil	12	N/A	2017/10/23	ATL SOP-00201	CCME PHC-CWS m
CCME F3 Calculation for Soil	7	N/A	2017/10/24	ATL SOP-00201	CCME PHC-CWS m

Your Project #: 649806
Site Location: CAPE MAKKOVIK
Your C.O.C. #: D 26100

Attention: Jason Green

SNC-Lavalin Inc
1090 Topsail Rd
2nd Floor
Mount Pearl, NL
A1N 5E7

Report Date: 2018/03/13
Report #: R5039146
Version: 5 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B7N3343
Received: 2017/10/19, 15:30

Sample Matrix: Soil
Samples Received: 70

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
CCME F3 Calculation for Soil	8	N/A	2017/10/25	ATL SOP-00201	CCME PHC-CWS m
CCME F3 Calculation for Soil	9	N/A	2017/10/26	ATL SOP-00201	CCME PHC-CWS m
CCME F3 Calculation for Soil	9	N/A	2017/10/27	ATL SOP-00201	CCME PHC-CWS m
CCME F3 Calculation for Soil	7	N/A	2017/10/30	ATL SOP-00201	CCME PHC-CWS m
CCME F3 Calculation for Soil	7	N/A	2017/10/31	ATL SOP-00201	CCME PHC-CWS m
CCME F3 Calculation for Soil	11	N/A	2017/11/02	ATL SOP-00201	CCME PHC-CWS m
Moisture	12	N/A	2017/10/22	ATL SOP-00196	OMOE Handbook 1983 m
Moisture	7	N/A	2017/10/23	ATL SOP-00196	OMOE Handbook 1983 m
Moisture	8	N/A	2017/10/24	ATL SOP-00196	OMOE Handbook 1983 m
Moisture	9	N/A	2017/10/25	ATL SOP-00196	OMOE Handbook 1983 m
Moisture	9	N/A	2017/10/27	ATL SOP-00196	OMOE Handbook 1983 m
Moisture	14	N/A	2017/10/30	ATL SOP-00196	OMOE Handbook 1983 m
Moisture	11	N/A	2017/10/31	ATL SOP-00196	OMOE Handbook 1983 m

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.

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.

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.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Your Project #: 649806
Site Location: CAPE MAKKOVIK
Your C.O.C. #: D 26100

Attention: Jason Green

SNC-Lavalin Inc
1090 Topsail Rd
2nd Floor
Mount Pearl, NL
A1N 5E7

Report Date: 2018/03/13
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Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) No lab extraction date is given for C6-C10/BTEX and VOC samples that are field preserved with methanol. Extraction date is date sampled unless otherwise stated.
(2) All CCME results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Maxxam conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following “Alberta Environment’s Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Validation of Performance-Based Alternative Methods September 2003”. Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Paula Chaplin, Project Manager Assistant
Email: PChaplin@maxxam.ca
Phone# (709)754-8615
==
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.

Total Cover Pages : 3

RESULTS OF ANALYSES OF SOIL

Maxxam ID		FJL730	FJL730	FJL968	FJL969	FJL970	FJL971	FJL972		
Sampling Date		2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14		
COC Number		D 26100	D 26100	D 26100	D 26100	D 26100	D 26100	D 26100		
	UNITS	**1987-SOIL-1**	**1987-SOIL-1 Lab-Dup**	**1987-SOIL-2**	**1987-SOIL-3**	**1987-SOIL-4**	**1987-SOIL-5**	**1987-SOIL-6**	**RDL**	**QC Batch**
Inorganics										
Moisture	%	12	13	10	9.4	8.8	4.8	6.7	1.0	5225107

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

Maxxam ID		FJL973	FJL974	FJL975	FJL976	FJL977	FJL978		
Sampling Date		2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14		
COC Number		D 26100	D 26100	D 26100	D 26100	D 26100	D 26100		
	UNITS	**1987-SOIL-7**	**1987-SOIL-8**	**1987-SOIL-9**	**1987-SOIL-10**	**1987-SOIL-11**	**1987-SOIL-12**	**RDL**	**QC Batch**
Inorganics									
Moisture	%	14	4.9	5.4	5.3	9.1	9.1	1.0	5225107

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		FJL979	FJL979	FJL980	FJL981	FJL982	FJL986	FJL988		
Sampling Date		2017/10/13	2017/10/13	2017/10/13	2017/10/13	2017/10/13	2017/10/13	2017/10/13		
COC Number		D 26100	D 26100	D 26100	D 26100	D 26100	D 26100	D 26100		
	UNITS	**UAST-SOIL-1**	**UAST-SOIL-1 Lab-Dup**	**UAST-SOIL-2**	**UAST-SOIL-3**	**UAST-SOIL-4**	**UAST-SOIL-5**	**HEL-SOIL-1**	**RDL**	**QC Batch**
Inorganics										
Moisture	%	9.5	8.4	4.5	15	7.8	6.4	10	1.0	5225727

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

Maxxam ID		FJL989		FJL990	FJL990	FJL991	FJL992		
Sampling Date		2017/10/13		2017/10/13	2017/10/13	2017/10/13	2017/10/14		
COC Number		D 26100		D 26100	D 26100	D 26100	D 26100		
	UNITS	**HEL-SOIL-2**	**QC Batch**	**HEL-SOIL-3**	**HEL-SOIL-3 Lab-Dup**	**HANGER-SOIL-1**	**HANGER-SOIL-2**	**RDL**	**QC Batch**
Inorganics									
Moisture	%	9.2	5225727	15	13	11	10	1.0	5227799

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

RESULTS OF ANALYSES OF SOIL

Maxxam ID		FJL993	FJL994	FJL995	FJL996	FJL997		
Sampling Date		2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14		
COC Number		D 26100	D 26100	D 26100	D 26100	D 26100		
	UNITS	**HANGER-SOIL-3**	**HANGER-SOIL-4**	**SEPTIC-SOIL-1**	**SEPTIC-SOIL-2**	**SEPTIC-SOIL-3**	**RDL**	**QC Batch**
Inorganics								
Moisture	%	7.5	9.7	13	9.8	12	1.0	5227799

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		FJL998	FJL998	FJL999	FJM000	FJM001		FJM002		
Sampling Date		2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14		2017/10/17		
COC Number		D 26100	D 26100	D 26100	D 26100	D 26100		D 26100		
	UNITS	**HEL-SOIL-4**	**HEL-SOIL-4 Lab-Dup**	**SHACK-SOIL-1**	**SHACK-SOIL-2**	**SHACK-SOIL-3**	**QC Batch**	**BG-SOIL-1**	**RDL**	**QC Batch**
Inorganics										
Moisture	%	9.8	9.3	17	9.3	12	5229754	75	1.0	5238409

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

Maxxam ID		FJM002	FJM003	FJM004	FJM005	FJM006	FJM007	FJM008		
Sampling Date		2017/10/17	2017/10/17	2017/10/17	2017/10/17	2017/10/17	2017/10/17	2017/10/17		
COC Number		D 26100	D 26100	D 26100	D 26100	D 26100	D 26100	D 26100		
	UNITS	**BG-SOIL-1 Lab-Dup**	**BG-SOIL-2**	**BG-SOIL-3**	**BG-SOIL-4**	**BG-SOIL-5**	**BG-SOIL-6**	**BG-SOIL-7**	**RDL**	**QC Batch**
Inorganics										
Moisture	%	74	72	33	45	41	16	10	1.0	5238409

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

Maxxam ID		FJM010		FJM011	FJM012	FJM013	FJM014	FJM015		
Sampling Date		2017/10/17		2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14		
COC Number		D 26100		D 26100	D 26100	D 26100	D 26100	D 26100		
	UNITS	**BG-SOIL-8**	**QC Batch**	**BG-SED-1**	**BG-SED-2**	**BG-SED-3**	**SED-1**	**SED-2**	**RDL**	**QC Batch**
Inorganics										
Moisture	%	18	5239841	55	89	21	29	53	1.0	5229754

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

RESULTS OF ANALYSES OF SOIL

Maxxam ID		FJM016	FJM016	FJM017	FJM018	FJM019		
Sampling Date		2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14		
COC Number		D 26100	D 26100	D 26100	D 26100	D 26100		
	UNITS	**SED-3**	**SED-3 Lab-Dup**	**WSUPPLY-SED-1**	**WSUPPLY-SED-2**	**WSUPPLY-SED-3**	**RDL**	**QC Batch**
Inorganics								
Moisture	%	22	22	27	20	40	1.0	5232522

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

Maxxam ID		FJM021	FJM021	FJM022	FJM023	FJM024	FJM025		
Sampling Date		2017/10/17	2017/10/17	2017/10/17	2017/10/17	2017/10/17	2017/10/17		
COC Number		D 26100	D 26100	D 26100	D 26100	D 26100	D 26100		
	UNITS	**LPUMP-SOIL-2**	**LPUMP-SOIL-2 Lab-Dup**	**LPUMP-SOIL-3**	**LPUMP-SOIL-1**	**PIPELINE-SOIL-3**	**LPUMP-SOIL-4**	**RDL**	**QC Batch**
Inorganics									
Moisture	%	13	15	26	74	11	67	1.0	5239841

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

Maxxam ID		FJM026	FJM027	FJM028	FJM029	FJM030		
Sampling Date		2017/10/17	2017/10/17	2017/10/17	2017/10/17	2017/10/17		
COC Number		D 26100	D 26100	D 26100	D 26100	D 26100		
	UNITS	**UPUMP-SOIL-1**	**UPUMP-SOIL-2**	**UPUMP-SOIL-3**	**UPUMP-SOIL-4**	**PIPELINE-SOIL-5**	**RDL**	**QC Batch**
Inorganics								
Moisture	%	78	73	54	78	9.3	1.0	5239841

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		FJM031	FJM032	FJM033	FJM034	FJM035		
Sampling Date		2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14		
COC Number		D 26100	D 26100	D 26100	D 26100	D 26100		
	UNITS	**UPUMP-SOIL-5**	**PIPELINE-SOIL-1**	**PIPELINE-SOIL-2**	**PIPELINE-SOIL-4**	**SHACK-SOIL-4**	**RDL**	**QC Batch**
Inorganics								
Moisture	%	78	15	9.7	10	13	1.0	5232522

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

RESULTS OF ANALYSES OF SOIL

Maxxam ID		FJM036	FJM036	FJM037	FJM038	FJM039	FJM040	FJM041		
Sampling Date		2017/10/15	2017/10/15	2017/10/15	2017/10/15	2017/10/15	2017/10/15	2017/10/15		
COC Number		D 26100	D 26100	D 26100	D 26100	D 26100	D 26100	D 26100		
	UNITS	**LAST-SOIL-1**	**LAST-SOIL-1 Lab-Dup**	**LAST-SOIL-2**	**LAST-SOIL-3**	**LAST-SOIL-4**	**DRUM-SOIL-1**	**DRUM-SOIL-2**	**RDL**	**QC Batch**
Inorganics										
Moisture	%	16	16	10	15	15	54	73	1.0	5235235

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

Maxxam ID		FJM042		
Sampling Date		2017/10/15		
COC Number		D 26100		
	UNITS	**DRUM-SOIL-3**	**RDL**	**QC Batch**
Inorganics				
Moisture	%	42	1.0	5235235

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID		FJL730			FJL730			FJL968	FJL969		
Sampling Date		2017/10/14			2017/10/14			2017/10/14	2017/10/14		
COC Number		D 26100			D 26100			D 26100	D 26100		
	UNITS	**1987-SOIL-1**	**RDL**	**QC Batch**	**1987-SOIL-1 Lab-Dup**	**RDL**	**QC Batch**	**1987-SOIL-2**	**1987-SOIL-3**	**RDL**	**QC Batch**
BTEX & F1 Hydrocarbons											
Benzene	mg/kg	<0.020	0.020	5226031				<0.020	<0.020	0.020	5226031
Toluene	mg/kg	<0.020	0.020	5226031				<0.020	<0.020	0.020	5226031
Ethylbenzene	mg/kg	<0.020	0.020	5226031				<0.020	<0.020	0.020	5226031
p+m-Xylene	mg/kg	<0.040	0.040	5226031				<0.040	<0.040	0.040	5226031
o-Xylene	mg/kg	<0.020	0.020	5226031				<0.020	<0.020	0.020	5226031
Total Xylenes	mg/kg	<0.040	0.040	5226031				<0.040	<0.040	0.040	5226031
F1 (C6-C10)	mg/kg	<10	10	5226031				<10	<10	10	5226031
F1 (C6-C10) - BTEX (Calc.)	mg/kg	<10	10	5222688				<10	<10	10	5222688
F2-F4 Hydrocarbons											
F2 (C10-C16 Hydrocarbons)	mg/kg	<20 (1)	20	5225108	<20	20	5225108	<20 (1)	<20 (1)	20	5225108
F3A (C16-C22 Hydrocarbons)	mg/kg							8.8	8.5	N/A	5225558
F3B (C22-C34 Hydrocarbons)	mg/kg	18	N/A	5225108	20	N/A	5225108	20	16	N/A	5225108
F3 (C16-C34 Hydrocarbons)	mg/kg	<50	50	5225560				<50	<50	50	5225560
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	50	5225108	<50	50	5225108	<50	<50	50	5225108
Reached Baseline at C50	mg/kg	Yes		5225108	Yes		5225108	Yes	Yes		5225108
Surrogate Recovery (%)											
Isobutylbenzene - Volatile	%	104		5226031				97	101		5226031
o-Terphenyl	%	100		5225108	110		5225108	107	104		5225108

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable
(1) Elevated fuel oil range RDL due to elevated instrument baseline.

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID		FJL970	FJL971	FJL972	FJL973	FJL974	FJL975	FJL976		
Sampling Date		2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14		
COC Number		D 26100	D 26100	D 26100	D 26100	D 26100	D 26100	D 26100		
	UNITS	**1987-SOIL-4**	**1987-SOIL-5**	**1987-SOIL-6**	**1987-SOIL-7**	**1987-SOIL-8**	**1987-SOIL-9**	**1987-SOIL-10**	**RDL**	**QC Batch**
BTEX & F1 Hydrocarbons										
Benzene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	5226031
Toluene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	5226031
Ethylbenzene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	5226031
p+m-Xylene	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	5226031
o-Xylene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	5226031
Total Xylenes	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	5226031
F1 (C6-C10)	mg/kg	<10	<10	<10	<10	<10	<10	<10	10	5226031
F1 (C6-C10) - BTEX (Calc.)	mg/kg	<10	<10	<10	<10	<10	<10	<10	10	5222688
F2-F4 Hydrocarbons										
F2 (C10-C16 Hydrocarbons)	mg/kg	<20 (1)	<20 (1)	<20 (1)	<20 (1)	<20 (1)	<20 (1)	<20 (1)	20	5225108
F3A (C16-C22 Hydrocarbons)	mg/kg	7.9	6.9	7.5	7.9	7.1	7.0	7.1	N/A	5225558
F3B (C22-C34 Hydrocarbons)	mg/kg	8.3	5.7	6.2	17	7.7	6.3	7.4	N/A	5225108
F3 (C16-C34 Hydrocarbons)	mg/kg	<50	<50	<50	<50	<50	<50	<50	50	5225560
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	<50	<50	<50	<50	<50	<50	50	5225108
Reached Baseline at C50	mg/kg	Yes	Yes	Yes	Yes	Yes	Yes	Yes		5225108
Surrogate Recovery (%)										
Isobutylbenzene - Volatile	%	96	87	99	100	94	92	104		5226031
o-Terphenyl	%	101	101	101	108	102	103	102		5225108

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable
(1) Elevated fuel oil range RDL due to elevated instrument baseline.

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID		FJL976			FJL977	FJL978		FJL979		
Sampling Date		2017/10/14			2017/10/14	2017/10/14		2017/10/13		
COC Number		D 26100			D 26100	D 26100		D 26100		
	UNITS	**1987-SOIL-10 Lab-Dup**	**RDL**	**QC Batch**	**1987-SOIL-11**	**1987-SOIL-12**	**QC Batch**	**UAST-SOIL-1**	**RDL**	**QC Batch**
BTEX & F1 Hydrocarbons										
Benzene	mg/kg	<0.020	0.020	5226031	<0.020	<0.020	5226031	<0.020	0.020	5226031
Toluene	mg/kg	<0.020	0.020	5226031	<0.020	<0.020	5226031	<0.020	0.020	5226031
Ethylbenzene	mg/kg	<0.020	0.020	5226031	<0.020	<0.020	5226031	<0.020	0.020	5226031
p+m-Xylene	mg/kg	<0.040	0.040	5226031	<0.040	<0.040	5226031	<0.040	0.040	5226031
o-Xylene	mg/kg	<0.020	0.020	5226031	<0.020	<0.020	5226031	<0.020	0.020	5226031
Total Xylenes	mg/kg	<0.040	0.040	5226031	<0.040	<0.040	5226031	<0.040	0.040	5226031
F1 (C6-C10)	mg/kg	<10	10	5226031	<10	<10	5226031	<10	10	5226031
F1 (C6-C10) - BTEX (Calc.)	mg/kg				<10	<10	5222688	<10	10	5222688
F2-F4 Hydrocarbons										
F2 (C10-C16 Hydrocarbons)	mg/kg				<20 (1)	<20 (1)	5225108	<20 (1)	20	5225730
F3A (C16-C22 Hydrocarbons)	mg/kg				8.5	8.5	5225558	9.2	N/A	5225558
F3B (C22-C34 Hydrocarbons)	mg/kg				16	22	5225108	22	N/A	5225730
F3 (C16-C34 Hydrocarbons)	mg/kg				<50	<50	5225560	<50	50	5225560
F4 (C34-C50 Hydrocarbons)	mg/kg				<50	77	5225108	<50	50	5225730
Reached Baseline at C50	mg/kg				Yes	Yes	5225108	Yes		5225730
Surrogate Recovery (%)										
Isobutylbenzene - Volatile	%	104		5226031	84	75	5226031	77		5226031
o-Terphenyl	%				106	109	5225108	104		5225730

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable
(1) Elevated fuel oil range RDL due to elevated instrument baseline.

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID		FJL979			FJL980	FJL981	FJL982	FJL986		
Sampling Date		2017/10/13			2017/10/13	2017/10/13	2017/10/13	2017/10/13		
COC Number		D 26100			D 26100	D 26100	D 26100	D 26100		
	UNITS	**UAST-SOIL-1 Lab-Dup**	**RDL**	**QC Batch**	**UAST-SOIL-2**	**UAST-SOIL-3**	**UAST-SOIL-4**	**UAST-SOIL-5**	**RDL**	**QC Batch**
BTEX & F1 Hydrocarbons										
Benzene	mg/kg				<0.020	<0.020	<0.020	<0.020	0.020	5226031
Toluene	mg/kg				<0.020	<0.020	<0.020	<0.020	0.020	5226031
Ethylbenzene	mg/kg				<0.020	<0.020	<0.020	<0.020	0.020	5226031
p+m-Xylene	mg/kg				<0.040	<0.040	<0.040	<0.040	0.040	5226031
o-Xylene	mg/kg				<0.020	<0.020	<0.020	<0.020	0.020	5226031
Total Xylenes	mg/kg				<0.040	<0.040	<0.040	<0.040	0.040	5226031
F1 (C6-C10)	mg/kg				<10	<10	<10	<10	10	5226031
F1 (C6-C10) - BTEX (Calc.)	mg/kg				<10	<10	<10	<10	10	5222688
F2-F4 Hydrocarbons										
F2 (C10-C16 Hydrocarbons)	mg/kg	<20 (1)	20	5225730	<20 (1)	<20 (1)	<20 (1)	<20 (1)	20	5225730
F3A (C16-C22 Hydrocarbons)	mg/kg				6.7	11	11	9.9	N/A	5225558
F3B (C22-C34 Hydrocarbons)	mg/kg	12 (2)	N/A	5225730	7.5	31	31	14	N/A	5225730
F3 (C16-C34 Hydrocarbons)	mg/kg				<50	<50	<50	<50	50	5225560
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	50	5225730	<50	<50	<50	<50	50	5225730
Reached Baseline at C50	mg/kg	Yes		5225730	Yes	Yes	Yes	Yes		5225730
Surrogate Recovery (%)										
Isobutylbenzene - Volatile	%				78	64	88	86		5226031
o-Terphenyl	%	91		5225730	103	92	90	91		5225730

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

Lab-Dup = Laboratory Initiated Duplicate

N/A = Not Applicable

(1) Elevated fuel oil range RDL due to elevated instrument baseline.

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

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID		FJL988	FJL989		FJL990			FJL990		
Sampling Date		2017/10/13	2017/10/13		2017/10/13			2017/10/13		
COC Number		D 26100	D 26100		D 26100			D 26100		
	UNITS	**HEL-SOIL-1**	**HEL-SOIL-2**	**QC Batch**	**HEL-SOIL-3**	**RDL**	**QC Batch**	**HEL-SOIL-3 Lab-Dup**	**RDL**	**QC Batch**
BTEX & F1 Hydrocarbons										
Benzene	mg/kg	<0.020	<0.020	5226031	<0.020	0.020	5228444	<0.020	0.020	5228444
Toluene	mg/kg	<0.020	<0.020	5226031	<0.020	0.020	5228444	<0.020	0.020	5228444
Ethylbenzene	mg/kg	<0.020	<0.020	5226031	<0.020	0.020	5228444	<0.020	0.020	5228444
p+m-Xylene	mg/kg	<0.040	<0.040	5226031	<0.040	0.040	5228444	<0.040	0.040	5228444
o-Xylene	mg/kg	<0.020	<0.020	5226031	<0.020	0.020	5228444	<0.020	0.020	5228444
Total Xylenes	mg/kg	<0.040	<0.040	5226031	<0.040	0.040	5228444	<0.040	0.040	5228444
F1 (C6-C10)	mg/kg	<10	<10	5226031	<10	10	5228444	<10	10	5228444
F1 (C6-C10) - BTEX (Calc.)	mg/kg	<10	<10	5222688	<10	10	5222688			
F2-F4 Hydrocarbons										
F2 (C10-C16 Hydrocarbons)	mg/kg	<20 (1)	<20 (1)	5225730	<20 (1)	20	5227801	<20	20	5227801
F3A (C16-C22 Hydrocarbons)	mg/kg	9.7	9.3	5225558	10	N/A	5225558			
F3B (C22-C34 Hydrocarbons)	mg/kg	16	11	5225730	29	N/A	5227801	18 (2)	N/A	5227801
F3 (C16-C34 Hydrocarbons)	mg/kg	<50	<50	5225560	<50	50	5225560			
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	<50	5225730	<50	50	5227801	<50	50	5227801
Reached Baseline at C50	mg/kg	Yes	Yes	5225730	Yes		5227801	Yes		5227801
Surrogate Recovery (%)										
Isobutylbenzene - Volatile	%	81	97	5226031	114		5228444	105		5228444
o-Terphenyl	%	101	97	5225730	116		5227801	102		5227801

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable
(1) Elevated fuel oil range RDL due to elevated instrument baseline.
(2) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID		FJL991	FJL992			FJL993		
Sampling Date		2017/10/13	2017/10/14			2017/10/14		
COC Number		D 26100	D 26100			D 26100		
	UNITS	**HANGER-SOIL-1**	**HANGER-SOIL-2**	**RDL**	**QC Batch**	**HANGER-SOIL-3**	**RDL**	**QC Batch**
BTEX & F1 Hydrocarbons								
Benzene	mg/kg	<0.020	<0.020	0.020	5228444	<0.020	0.020	5228444
Toluene	mg/kg	<0.020	<0.020	0.020	5228444	<0.020	0.020	5228444
Ethylbenzene	mg/kg	<0.020	<0.020	0.020	5228444	<0.020	0.020	5228444
p+m-Xylene	mg/kg	<0.040	<0.040	0.040	5228444	<0.040	0.040	5228444
o-Xylene	mg/kg	<0.020	<0.020	0.020	5228444	<0.020	0.020	5228444
Total Xylenes	mg/kg	<0.040	<0.040	0.040	5228444	<0.040	0.040	5228444
F1 (C6-C10)	mg/kg	<10	<10	10	5228444	<10	10	5228444
F1 (C6-C10) - BTEX (Calc.)	mg/kg	<10	<10	10	5222688	<10	10	5222688
F2-F4 Hydrocarbons								
F2 (C10-C16 Hydrocarbons)	mg/kg	<20 (1)	28 (1)	20	5227801	74 (1)	20	5227801
F3A (C16-C22 Hydrocarbons)	mg/kg	15	56	N/A	5225558	160	N/A	5225558
F3B (C22-C34 Hydrocarbons)	mg/kg	81	120	N/A	5227801	120	N/A	5227801
F3 (C16-C34 Hydrocarbons)	mg/kg	96	180	50	5225560	270	50	5225560
F4 (C34-C50 Hydrocarbons)	mg/kg	110	110	50	5227801	<50	50	5227801
Reached Baseline at C50	mg/kg	No	No		5227801	Yes		5227801
Hydrocarbon Resemblance	mg/kg	COMMENT (2)	COMMENT (2)	N/A	5227801			
Surrogate Recovery (%)								
Isobutylbenzene - Volatile	%	101	117		5228444	93		5228444
o-Terphenyl	%	105	98		5227801	104		5227801

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable
(1) Elevated fuel oil range RDL due to elevated instrument baseline.
(2) No resemblance to petroleum products in fuel oil /lube oil range.

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID		FJL994	FJL995	FJL996	FJL997		
Sampling Date		2017/10/14	2017/10/14	2017/10/14	2017/10/14		
COC Number		D 26100	D 26100	D 26100	D 26100		
	UNITS	**HANGER-SOIL-4**	**SEPTIC-SOIL-1**	**SEPTIC-SOIL-2**	**SEPTIC-SOIL-3**	**RDL**	**QC Batch**
BTEX & F1 Hydrocarbons							
Benzene	mg/kg	<0.020	<0.020	<0.020	<0.020	0.020	5228444
Toluene	mg/kg	<0.020	<0.020	<0.020	<0.020	0.020	5228444
Ethylbenzene	mg/kg	<0.020	<0.020	<0.020	<0.020	0.020	5228444
p+m-Xylene	mg/kg	<0.040	<0.040	<0.040	<0.040	0.040	5228444
o-Xylene	mg/kg	<0.020	<0.020	<0.020	<0.020	0.020	5228444
Total Xylenes	mg/kg	<0.040	<0.040	<0.040	<0.040	0.040	5228444
F1 (C6-C10)	mg/kg	<10	<10	<10	<10	10	5228444
F1 (C6-C10) - BTEX (Calc.)	mg/kg	<10	<10	<10	<10	10	5222688
F2-F4 Hydrocarbons							
F2 (C10-C16 Hydrocarbons)	mg/kg	70 (1)	31 (1)	28 (1)	29 (1)	20	5227801
F3A (C16-C22 Hydrocarbons)	mg/kg	170	32	17	17	N/A	5225558
F3B (C22-C34 Hydrocarbons)	mg/kg	230	450	100	120	N/A	5227801
F3 (C16-C34 Hydrocarbons)	mg/kg	400	480	120	140	50	5225560
F4 (C34-C50 Hydrocarbons)	mg/kg	210	770	220	210	50	5227801
Reached Baseline at C50	mg/kg	No	No	No	No		5227801
Hydrocarbon Resemblance	mg/kg	COMMENT (2)	COMMENT (3)	COMMENT (2)	COMMENT (2)	N/A	5227801
Surrogate Recovery (%)							
Isobutylbenzene - Volatile	%	111	111	102	101		5228444
o-Terphenyl	%	111	97	121	101		5227801

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable
(1) Elevated fuel oil range RDL due to elevated instrument baseline.
(2) No resemblance to petroleum products in fuel oil /lube oil range.
(3) Lube oil Fraction.

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID		FJL998			FJL998			FJL999	FJM000		
Sampling Date		2017/10/14			2017/10/14			2017/10/14	2017/10/14		
COC Number		D 26100			D 26100			D 26100	D 26100		
	UNITS	**HEL-SOIL-4**	**RDL**	**QC Batch**	**HEL-SOIL-4 Lab-Dup**	**RDL**	**QC Batch**	**SHACK-SOIL-1**	**SHACK-SOIL-2**	**RDL**	**QC Batch**
BTEX & F1 Hydrocarbons											
Benzene	mg/kg	<0.020	0.020	5232844				<0.020	<0.020	0.020	5230231
Toluene	mg/kg	<0.020	0.020	5232844				<0.020	<0.020	0.020	5230231
Ethylbenzene	mg/kg	<0.020	0.020	5232844				<0.020	<0.020	0.020	5230231
p+m-Xylene	mg/kg	<0.040	0.040	5232844				<0.040	<0.040	0.040	5230231
o-Xylene	mg/kg	<0.020	0.020	5232844				<0.020	<0.020	0.020	5230231
Total Xylenes	mg/kg	<0.040	0.040	5232844				<0.040	<0.040	0.040	5230231
F1 (C6-C10)	mg/kg	<10	10	5232844				<10	<10	10	5230231
F1 (C6-C10) - BTEX (Calc.)	mg/kg	<10	10	5222688				<10	<10	10	5222688
F2-F4 Hydrocarbons											
F2 (C10-C16 Hydrocarbons)	mg/kg	<20 (1)	20	5229756	<20	20	5229756	<20 (1)	32 (1)	20	5229756
F3A (C16-C22 Hydrocarbons)	mg/kg	9.2	N/A	5225558				12	79	N/A	5225558
F3B (C22-C34 Hydrocarbons)	mg/kg	16	N/A	5229756	16	N/A	5229756	56	40	N/A	5229756
F3 (C16-C34 Hydrocarbons)	mg/kg	<50	50	5225560				68	120	50	5225560
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	50	5229756	<50	50	5229756	<50	<50	50	5229756
Reached Baseline at C50	mg/kg	Yes		5229756	Yes		5229756	Yes	Yes		5229756
Surrogate Recovery (%)											
Isobutylbenzene - Volatile	%	110		5232844				104	98		5230231
o-Terphenyl	%	119		5229756	101		5229756	105	110		5229756

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable
(1) Elevated fuel oil range RDL due to elevated instrument baseline.

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID		FJM001			FJM002			FJM002		
Sampling Date		2017/10/14			2017/10/17			2017/10/17		
COC Number		D 26100			D 26100			D 26100		
	UNITS	**SHACK-SOIL-3**	**RDL**	**QC Batch**	**BG-SOIL-1**	**RDL**	**QC Batch**	**BG-SOIL-1 Lab-Dup**	**RDL**	**QC Batch**
BTEX & F1 Hydrocarbons										
Benzene	mg/kg	<0.020	0.020	5230231	<0.020	0.020	5230231			
Toluene	mg/kg	<0.020	0.020	5230231	<0.020	0.020	5230231			
Ethylbenzene	mg/kg	<0.020	0.020	5230231	<0.020	0.020	5230231			
p+m-Xylene	mg/kg	<0.040	0.040	5230231	<0.040	0.040	5230231			
o-Xylene	mg/kg	<0.020	0.020	5230231	<0.020	0.020	5230231			
Total Xylenes	mg/kg	<0.040	0.040	5230231	<0.040	0.040	5230231			
F1 (C6-C10)	mg/kg	<10	10	5230231	<10	10	5230231			
F1 (C6-C10) - BTEX (Calc.)	mg/kg	<10	10	5222688	<10	10	5222688			
F2-F4 Hydrocarbons										
F2 (C10-C16 Hydrocarbons)	mg/kg	62 (1)	20	5229756	<10	10	5238413	<10	10	5238413
F3A (C16-C22 Hydrocarbons)	mg/kg	98	N/A	5225558	11	N/A	5225558			
F3B (C22-C34 Hydrocarbons)	mg/kg	36	N/A	5229756	430	N/A	5238413	430	N/A	5238413
F3 (C16-C34 Hydrocarbons)	mg/kg	130	50	5225560	440	50	5225560			
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	50	5229756	<50	50	5238413	<50	50	5238413
Reached Baseline at C50	mg/kg	Yes		5229756	Yes		5238413	Yes		5238413
Hydrocarbon Resemblance	mg/kg				COMMENT (2)	N/A	5238413			
Surrogate Recovery (%)										
Isobutylbenzene - Volatile	%	100		5230231	59 (3)		5230231			
o-Terphenyl	%	105		5229756	97		5238413	100		5238413

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable
(1) Elevated fuel oil range RDL due to elevated instrument baseline.
(2) No resemblance to petroleum products in fuel oil /lube oil range.
(3) Surrogate recovery not within acceptance limits; moisture exceeds 50%.

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID		FJM003			FJM004	FJM005			FJM006		
Sampling Date		2017/10/17			2017/10/17	2017/10/17			2017/10/17		
COC Number		D 26100			D 26100	D 26100			D 26100		
	UNITS	**BG-SOIL-2**	**RDL**	**QC Batch**	**BG-SOIL-3**	**BG-SOIL-4**	**RDL**	**QC Batch**	**BG-SOIL-5**	**RDL**	**QC Batch**
BTEX & F1 Hydrocarbons											
Benzene	mg/kg	<0.020	0.020	5230231	<0.020	<0.020	0.020	5230231	<0.020	0.020	5230231
Toluene	mg/kg	<0.020	0.020	5230231	<0.020	<0.020	0.020	5230231	<0.020	0.020	5230231
Ethylbenzene	mg/kg	<0.020	0.020	5230231	<0.020	<0.020	0.020	5230231	<0.020	0.020	5230231
p+m-Xylene	mg/kg	<0.040	0.040	5230231	<0.040	<0.040	0.040	5230231	<0.040	0.040	5230231
o-Xylene	mg/kg	<0.020	0.020	5230231	<0.020	<0.020	0.020	5230231	<0.020	0.020	5230231
Total Xylenes	mg/kg	<0.040	0.040	5230231	<0.040	<0.040	0.040	5230231	<0.040	0.040	5230231
F1 (C6-C10)	mg/kg	<10	10	5230231	<10	<10	10	5230231	<10	10	5230231
F1 (C6-C10) - BTEX (Calc.)	mg/kg	<10	10	5222688	<10	<10	10	5222688	<10	10	5222688
F2-F4 Hydrocarbons											
F2 (C10-C16 Hydrocarbons)	mg/kg	<10	10	5238413	<10	<10	10	5238413	<10	10	5238413
F3A (C16-C22 Hydrocarbons)	mg/kg	18	N/A	5225558	2.7	11	N/A	5225558	33	N/A	5225558
F3B (C22-C34 Hydrocarbons)	mg/kg	320	N/A	5238413	12	160	N/A	5238413	430	N/A	5238413
F3 (C16-C34 Hydrocarbons)	mg/kg	330	50	5225560	<50	170	50	5225560	460	50	5225560
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	50	5238413	<50	<50	50	5238413	150	50	5238413
Reached Baseline at C50	mg/kg	Yes		5238413	Yes	Yes		5238413	No		5238413
Hydrocarbon Resemblance	mg/kg	COMMENT (1)	N/A	5238413					COMMENT (1)		5238413
Surrogate Recovery (%)											
Isobutylbenzene - Volatile	%	94		5230231	112	58 (2)		5230231	70		5230231
o-Terphenyl	%	96		5238413	99	98		5238413	100		5238413

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable
(1) No resemblance to petroleum products in fuel oil /lube oil range.
(2) Surrogate recovery not within acceptance limits; moisture exceeds 50%.

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID		FJM007	FJM008			FJM010			FJM011		
Sampling Date		2017/10/17	2017/10/17			2017/10/17			2017/10/14		
COC Number		D 26100	D 26100			D 26100			D 26100		
	UNITS	**BG-SOIL-6**	**BG-SOIL-7**	**RDL**	**QC Batch**	**BG-SOIL-8**	**RDL**	**QC Batch**	**BG-SED-1**	**RDL**	**QC Batch**
BTEX & F1 Hydrocarbons											
Benzene	mg/kg	<0.020	<0.020	0.020	5230231	<0.020	0.020	5230231	<0.020	0.020	5230231
Toluene	mg/kg	<0.020	<0.020	0.020	5230231	<0.020	0.020	5230231	<0.020	0.020	5230231
Ethylbenzene	mg/kg	<0.020	<0.020	0.020	5230231	<0.020	0.020	5230231	<0.020	0.020	5230231
p+m-Xylene	mg/kg	<0.040	<0.040	0.040	5230231	<0.040	0.040	5230231	<0.040	0.040	5230231
o-Xylene	mg/kg	<0.020	<0.020	0.020	5230231	<0.020	0.020	5230231	<0.020	0.020	5230231
Total Xylenes	mg/kg	<0.040	<0.040	0.040	5230231	<0.040	0.040	5230231	<0.040	0.040	5230231
F1 (C6-C10)	mg/kg	<10	<10	10	5230231	<10	10	5230231	<10	10	5230231
F1 (C6-C10) - BTEX (Calc.)	mg/kg	<10	<10	10	5223341	<10	10	5223341	<10	10	5223341
F2-F4 Hydrocarbons											
F2 (C10-C16 Hydrocarbons)	mg/kg	<10	<10	10	5238413	<20 (1)	20	5239850	<20 (1)	20	5229756
F3A (C16-C22 Hydrocarbons)	mg/kg	5.1	1.8	N/A	5225558	8.4	N/A	5225558	50	N/A	5225558
F3B (C22-C34 Hydrocarbons)	mg/kg	73	2.4	N/A	5238413	15	N/A	5239850	570	N/A	5229756
F3 (C16-C34 Hydrocarbons)	mg/kg	78	<50	50	5225560	<50	50	5225560	620	50	5225560
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	<50	50	5238413	<50	50	5239850	270	50	5229756
Reached Baseline at C50	mg/kg	Yes	Yes		5238413	Yes		5239850	No		5229756
Hydrocarbon Resemblance	mg/kg								COMMENT (2)	N/A	5229756
Surrogate Recovery (%)											
Isobutylbenzene - Volatile	%	90	78		5230231	88		5230231	71		5230231
o-Terphenyl	%	106	98		5238413	88		5239850	100		5229756

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable
(1) Elevated fuel oil range RDL due to elevated instrument baseline.
(2) No resemblance to petroleum products in fuel oil /lube oil range.

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID		FJM012			FJM013			FJM013		
Sampling Date		2017/10/14			2017/10/14			2017/10/14		
COC Number		D 26100			D 26100			D 26100		
	UNITS	**BG-SED-2**	**RDL**	**QC Batch**	**BG-SED-3**	**RDL**	**QC Batch**	**BG-SED-3 Lab-Dup**	**RDL**	**QC Batch**
BTEX & F1 Hydrocarbons										
Benzene	mg/kg	<0.020	0.020	5230231	<0.020	0.020	5230231	<0.020	0.020	5230231
Toluene	mg/kg	<0.020	0.020	5230231	<0.020	0.020	5230231	<0.020	0.020	5230231
Ethylbenzene	mg/kg	<0.020	0.020	5230231	<0.020	0.020	5230231	<0.020	0.020	5230231
p+m-Xylene	mg/kg	<0.040	0.040	5230231	<0.040	0.040	5230231	<0.040	0.040	5230231
o-Xylene	mg/kg	<0.020	0.020	5230231	<0.020	0.020	5230231	<0.020	0.020	5230231
Total Xylenes	mg/kg	<0.040	0.040	5230231	<0.040	0.040	5230231	<0.040	0.040	5230231
F1 (C6-C10)	mg/kg	<10	10	5230231	<10	10	5230231	<10	10	5230231
F1 (C6-C10) - BTEX (Calc.)	mg/kg	<10	10	5223341	<10	10	5223341			
F2-F4 Hydrocarbons										
F2 (C10-C16 Hydrocarbons)	mg/kg	<20 (1)	20	5229756	<20 (1)	20	5229756			
F3A (C16-C22 Hydrocarbons)	mg/kg	150	N/A	5225559	10	N/A	5225559			
F3B (C22-C34 Hydrocarbons)	mg/kg	370	N/A	5229756	19	N/A	5229756			
F3 (C16-C34 Hydrocarbons)	mg/kg	520	50	5225561	<50	50	5225561			
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	50	5229756	<50	50	5229756			
Reached Baseline at C50	mg/kg	Yes		5229756	Yes		5229756			
Hydrocarbon Resemblance	mg/kg	COMMENT (2)	N/A	5229756						
Surrogate Recovery (%)										
Isobutylbenzene - Volatile	%	84		5230231	95		5230231	95		5230231
o-Terphenyl	%	101		5229756	108		5229756			

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable
(1) Elevated fuel oil range RDL due to elevated instrument baseline.
(2) No resemblance to petroleum products in fuel oil /lube oil range.

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID		FJM014	FJM015			FJM016			FJM016		
Sampling Date		2017/10/14	2017/10/14			2017/10/14			2017/10/14		
COC Number		D 26100	D 26100			D 26100			D 26100		
	UNITS	**SED-1**	**SED-2**	**RDL**	**QC Batch**	**SED-3**	**RDL**	**QC Batch**	**SED-3 Lab-Dup**	**RDL**	**QC Batch**
BTEX & F1 Hydrocarbons											
Benzene	mg/kg	<0.020	<0.020	0.020	5230231	<0.020	0.020	5230231			
Toluene	mg/kg	<0.020	0.10	0.020	5230231	<0.020	0.020	5230231			
Ethylbenzene	mg/kg	<0.020	<0.020	0.020	5230231	<0.020	0.020	5230231			
p+m-Xylene	mg/kg	<0.040	<0.040	0.040	5230231	<0.040	0.040	5230231			
o-Xylene	mg/kg	<0.020	<0.020	0.020	5230231	<0.020	0.020	5230231			
Total Xylenes	mg/kg	<0.040	<0.040	0.040	5230231	<0.040	0.040	5230231			
F1 (C6-C10)	mg/kg	<10	<10	10	5230231	<10	10	5230231			
F1 (C6-C10) - BTEX (Calc.)	mg/kg	<10	<10	10	5223341	<10	10	5223341			
F2-F4 Hydrocarbons											
F2 (C10-C16 Hydrocarbons)	mg/kg	<20 (1)	650 (1)	20	5229756	<15 (1)	15	5233069	<15	15	5233069
F3A (C16-C22 Hydrocarbons)	mg/kg	20	1100	N/A	5225559	2.3	N/A	5225559			
F3B (C22-C34 Hydrocarbons)	mg/kg	160	1100	N/A	5229756	15	N/A	5233069	20	N/A	5233069
F3 (C16-C34 Hydrocarbons)	mg/kg	180	2200	50	5225561	<50	50	5225561			
F4 (C34-C50 Hydrocarbons)	mg/kg	77	590	50	5229756	<50	50	5233069	<50	50	5233069
Reached Baseline at C50	mg/kg	No	Yes		5229756	Yes		5233069	Yes		5233069
Hydrocarbon Resemblance	mg/kg	COMMENT (2)	COMMENT (3)	N/A	5229756						
Surrogate Recovery (%)											
Isobutylbenzene - Volatile	%	89	58 (4)		5230231	94		5230231			
o-Terphenyl	%	119	111		5229756	98		5233069	103		5233069

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable
(1) Elevated fuel oil range RDL due to elevated instrument baseline.
(2) No resemblance to petroleum products in fuel oil /lube oil range.
(3) Weather fuel oil fraction. No resemblance to petroleum products in lube oil range.
(4) Surrogate recovery not within acceptance limits; moisture exceeds 50%.

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID		FJM017	FJM018	FJM019			FJM021		
Sampling Date		2017/10/14	2017/10/14	2017/10/14			2017/10/17		
COC Number		D 26100	D 26100	D 26100			D 26100		
	UNITS	**WSUPPLY-SED-1**	**WSUPPLY-SED-2**	**WSUPPLY-SED-3**	**RDL**	**QC Batch**	**LPUMP-SOIL-2**	**RDL**	**QC Batch**
BTEX & F1 Hydrocarbons									
Benzene	mg/kg	<0.020	<0.020	<0.020	0.020	5230231	<0.020	0.020	5232844
Toluene	mg/kg	<0.020	<0.020	<0.020	0.020	5230231	<0.020	0.020	5232844
Ethylbenzene	mg/kg	<0.020	<0.020	<0.020	0.020	5230231	<0.020	0.020	5232844
p+m-Xylene	mg/kg	<0.040	<0.040	<0.040	0.040	5230231	<0.040	0.040	5232844
o-Xylene	mg/kg	<0.020	<0.020	<0.020	0.020	5230231	<0.020	0.020	5232844
Total Xylenes	mg/kg	<0.040	<0.040	<0.040	0.040	5230231	<0.040	0.040	5232844
F1 (C6-C10)	mg/kg	<10	<10	<10	10	5230231	<10	10	5232844
F1 (C6-C10) - BTEX (Calc.)	mg/kg	<10	<10	<10	10	5223341	<10	10	5223341
F2-F4 Hydrocarbons									
F2 (C10-C16 Hydrocarbons)	mg/kg	<15 (1)	<15 (1)	<15 (1)	15	5233069	22 (1)	20	5239850
F3A (C16-C22 Hydrocarbons)	mg/kg	7.5	5.0	2.5	N/A	5225559	9.6	N/A	5225559
F3B (C22-C34 Hydrocarbons)	mg/kg	34	15	0.47	N/A	5233069	22	N/A	5239850
F3 (C16-C34 Hydrocarbons)	mg/kg	<50	<50	<50	50	5225561	<50	50	5225561
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	<50	<50	50	5233069	<50	50	5239850
Reached Baseline at C50	mg/kg	Yes	Yes	Yes		5233069	Yes		5239850
Surrogate Recovery (%)									
Isobutylbenzene - Volatile	%	90	89	95		5230231	100		5232844
o-Terphenyl	%	97	100	98		5233069	89		5239850

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable
(1) Elevated fuel oil range RDL due to elevated instrument baseline.

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID		FJM021			FJM022			FJM023		
Sampling Date		2017/10/17			2017/10/17			2017/10/17		
COC Number		D 26100			D 26100			D 26100		
	UNITS	**LPUMP-SOIL-2 Lab-Dup**	**RDL**	**QC Batch**	**LPUMP-SOIL-3**	**RDL**	**QC Batch**	**LPUMP-SOIL-1**	**RDL**	**QC Batch**
BTEX & F1 Hydrocarbons										
Benzene	mg/kg				<0.020	0.020	5232844	<0.020	0.020	5232844
Toluene	mg/kg				<0.020	0.020	5232844	<0.020	0.020	5232844
Ethylbenzene	mg/kg				<0.020	0.020	5232844	<0.020	0.020	5232844
p+m-Xylene	mg/kg				<0.040	0.040	5232844	<0.040	0.040	5232844
o-Xylene	mg/kg				<0.020	0.020	5232844	<0.020	0.020	5232844
Total Xylenes	mg/kg				<0.040	0.040	5232844	<0.040	0.040	5232844
F1 (C6-C10)	mg/kg				<10	10	5232844	<10	10	5232844
F1 (C6-C10) - BTEX (Calc.)	mg/kg				<10	10	5223341	<10	10	5223341
F2-F4 Hydrocarbons										
F2 (C10-C16 Hydrocarbons)	mg/kg	23	20	5239850	<20 (1)	20	5239850	91 (1)	20	5239850
F3A (C16-C22 Hydrocarbons)	mg/kg				12	N/A	5225559	47	N/A	5225559
F3B (C22-C34 Hydrocarbons)	mg/kg	20	N/A	5239850	63	N/A	5239850	360	N/A	5239850
F3 (C16-C34 Hydrocarbons)	mg/kg				76	50	5225561	410	50	5225561
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	50	5239850	<50	50	5239850	200	50	5239850
Reached Baseline at C50	mg/kg	Yes		5239850	Yes		5239850	No		5239850
Hydrocarbon Resemblance	mg/kg							COMMENT (2)		5239850
Surrogate Recovery (%)										
Isobutylbenzene - Volatile	%				109		5232844	88		5232844
o-Terphenyl	%	103		5239850	89		5239850	95		5239850

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable
(1) Elevated fuel oil range RDL due to elevated instrument baseline.
(2) No resemblance to petroleum products in fuel oil /lube oil range.

Maxxam Job #: B7N3343
Report Date: 2018/03/13

SNC-Lavalin Inc
Client Project #: 649806
Site Location: CAPE MAKKOVIK
Sampler Initials: JG

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID		FJM024			FJM025	FJM026		FJM027		
Sampling Date		2017/10/17			2017/10/17	2017/10/17		2017/10/17		
COC Number		D 26100			D 26100	D 26100		D 26100		
	UNITS	**PIPELINE-SOIL-3**	**RDL**	**QC Batch**	**LPUMP-SOIL-4**	**UPUMP-SOIL-1**	**RDL**	**UPUMP-SOIL-2**	**RDL**	**QC Batch**
BTEX & F1 Hydrocarbons										
Benzene	mg/kg	<0.020	0.020	5232844	<0.020	<0.020	0.020	<0.020	0.020	5232844
Toluene	mg/kg	<0.020	0.020	5232844	<0.020	<0.020	0.020	<0.020	0.020	5232844
Ethylbenzene	mg/kg	<0.020	0.020	5232844	<0.020	<0.020	0.020	<0.020	0.020	5232844
p+m-Xylene	mg/kg	<0.040	0.040	5232844	<0.040	<0.040	0.040	<0.040	0.040	5232844
o-Xylene	mg/kg	<0.020	0.020	5232844	<0.020	<0.020	0.020	<0.020	0.020	5232844
Total Xylenes	mg/kg	<0.040	0.040	5232844	<0.040	<0.040	0.040	<0.040	0.040	5232844
F1 (C6-C10)	mg/kg	<10	10	5232844	<10	<10	10	<10	10	5232844
F1 (C6-C10) - BTEX (Calc.)	mg/kg	<10	10	5223341	<10	<10	10	<10	10	5223341
F2-F4 Hydrocarbons										
F2 (C10-C16 Hydrocarbons)	mg/kg	23 (1)	20	5239850	75 (1)	100 (1)	20	110 (1)	10	5239850
F3A (C16-C22 Hydrocarbons)	mg/kg	11	N/A	5225559	47	81	N/A	130	N/A	5225559
F3B (C22-C34 Hydrocarbons)	mg/kg	57	N/A	5239850	460	870	N/A	610	N/A	5239850
F3 (C16-C34 Hydrocarbons)	mg/kg	68	50	5225561	510	950	50	740	50	5225561
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	50	5239850	220	330	50	240	50	5239850
Reached Baseline at C50	mg/kg	Yes		5239850	No	No		No		5239850
Hydrocarbon Resemblance	mg/kg				COMMENT (2)	COMMENT (2)	N/A	COMMENT (2)	N/A	5239850
Surrogate Recovery (%)										
Isobutylbenzene - Volatile	%	93		5232844	78	67		70		5232844
o-Terphenyl	%	88		5239850	85	86		110		5239850

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

N/A = Not Applicable

(1) Elevated fuel oil range RDL due to elevated instrument baseline.

(2) No resemblance to petroleum products in fuel oil /lube oil range.

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID		FJM028	FJM029			FJM029		
Sampling Date		2017/10/17	2017/10/17			2017/10/17		
COC Number		D 26100	D 26100			D 26100		
	UNITS	**UPUMP-SOIL-3**	**UPUMP-SOIL-4**	**RDL**	**QC Batch**	**UPUMP-SOIL-4 Lab-Dup**	**RDL**	**QC Batch**
BTEX & F1 Hydrocarbons								
Benzene	mg/kg	<0.020	<0.020	0.020	5232844	<0.020	0.020	5232844
Toluene	mg/kg	<0.020	<0.020	0.020	5232844	<0.020	0.020	5232844
Ethylbenzene	mg/kg	<0.020	<0.020	0.020	5232844	<0.020	0.020	5232844
p+m-Xylene	mg/kg	<0.040	<0.040	0.040	5232844	<0.040	0.040	5232844
o-Xylene	mg/kg	<0.020	<0.020	0.020	5232844	<0.020	0.020	5232844
Total Xylenes	mg/kg	<0.040	<0.040	0.040	5232844	<0.040	0.040	5232844
F1 (C6-C10)	mg/kg	<10	<10	10	5232844	<10	10	5232844
F1 (C6-C10) - BTEX (Calc.)	mg/kg	<10	<10	10	5223341			
F2-F4 Hydrocarbons								
F2 (C10-C16 Hydrocarbons)	mg/kg	57 (1)	120 (1)	20	5239850			
F3A (C16-C22 Hydrocarbons)	mg/kg	43	130	N/A	5225559			
F3B (C22-C34 Hydrocarbons)	mg/kg	340	1500	N/A	5239850			
F3 (C16-C34 Hydrocarbons)	mg/kg	390	1700	50	5225561			
F4 (C34-C50 Hydrocarbons)	mg/kg	160	720	50	5239850			
Reached Baseline at C50	mg/kg	No	No		5239850			
Hydrocarbon Resemblance	mg/kg	COMMENT (2)	COMMENT (2)	N/A	5239850			
Surrogate Recovery (%)								
Isobutylbenzene - Volatile	%	68	85		5232844	85		5232844
o-Terphenyl	%	86	86		5239850			

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable
(1) Elevated fuel oil range RDL due to elevated instrument baseline.
(2) No resemblance to petroleum products in fuel oil /lube oil range.

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID		FJM030			FJM031			FJM032		
Sampling Date		2017/10/17			2017/10/14			2017/10/14		
COC Number		D 26100			D 26100			D 26100		
	UNITS	**PIPELINE-SOIL-5**	**RDL**	**QC Batch**	**UPUMP-SOIL-5**	**RDL**	**QC Batch**	**PIPELINE-SOIL-1**	**RDL**	**QC Batch**
BTEX & F1 Hydrocarbons										
Benzene	mg/kg	<0.020	0.020	5232844	<0.020	0.020	5232844	<0.020	0.020	5232844
Toluene	mg/kg	<0.020	0.020	5232844	<0.020	0.020	5232844	<0.020	0.020	5232844
Ethylbenzene	mg/kg	<0.020	0.020	5232844	<0.020	0.020	5232844	<0.020	0.020	5232844
p+m-Xylene	mg/kg	<0.040	0.040	5232844	<0.040	0.040	5232844	<0.040	0.040	5232844
o-Xylene	mg/kg	<0.020	0.020	5232844	<0.020	0.020	5232844	<0.020	0.020	5232844
Total Xylenes	mg/kg	<0.040	0.040	5232844	<0.040	0.040	5232844	<0.040	0.040	5232844
F1 (C6-C10)	mg/kg	<10	10	5232844	<10	10	5232844	<10	10	5232844
F1 (C6-C10) - BTEX (Calc.)	mg/kg	<10	10	5223341	<10	10	5223341	<10	10	5223341
F2-F4 Hydrocarbons										
F2 (C10-C16 Hydrocarbons)	mg/kg	24 (1)	20	5239850	20 (1)	15	5233069	<15 (1)	15	5233069
F3A (C16-C22 Hydrocarbons)	mg/kg	12	N/A	5225559	52	N/A	5225559	2.8	N/A	5225559
F3B (C22-C34 Hydrocarbons)	mg/kg	43	N/A	5239850	690	N/A	5233069	18	N/A	5233069
F3 (C16-C34 Hydrocarbons)	mg/kg	55	50	5225561	740	50	5225561	<50	50	5225561
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	50	5239850	250	50	5233069	<50	50	5233069
Reached Baseline at C50	mg/kg	Yes		5239850	No		5233069	Yes		5233069
Hydrocarbon Resemblance	mg/kg				COMMENT (2)	N/A	5233069			
Surrogate Recovery (%)										
Isobutylbenzene - Volatile	%	95		5232844	61		5232844	99		5232844
o-Terphenyl	%	89		5239850	106		5233069	98		5233069

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable
(1) Elevated fuel oil range RDL due to elevated instrument baseline.
(2) No resemblance to petroleum products in fuel oil /lube oil range.

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID		FJM033	FJM034	FJM035			FJM036		
Sampling Date		2017/10/14	2017/10/14	2017/10/14			2017/10/15		
COC Number		D 26100	D 26100	D 26100			D 26100		
	UNITS	**PIPELINE-SOIL-2**	**PIPELINE-SOIL-4**	**SHACK-SOIL-4**	**RDL**	**QC Batch**	**LAST-SOIL-1**	**RDL**	**QC Batch**
BTEX & F1 Hydrocarbons									
Benzene	mg/kg	<0.020	<0.020	<0.020	0.020	5232844	<0.020	0.020	5232844
Toluene	mg/kg	<0.020	<0.020	<0.020	0.020	5232844	<0.020	0.020	5232844
Ethylbenzene	mg/kg	<0.020	<0.020	<0.020	0.020	5232844	<0.020	0.020	5232844
p+m-Xylene	mg/kg	<0.040	<0.040	<0.040	0.040	5232844	<0.040	0.040	5232844
o-Xylene	mg/kg	<0.020	<0.020	<0.020	0.020	5232844	<0.020	0.020	5232844
Total Xylenes	mg/kg	<0.040	<0.040	<0.040	0.040	5232844	<0.040	0.040	5232844
F1 (C6-C10)	mg/kg	<10	<10	<10	10	5232844	<10	10	5232844
F1 (C6-C10) - BTEX (Calc.)	mg/kg	<10	<10	<10	10	5223341	<10	10	5223341
F2-F4 Hydrocarbons									
F2 (C10-C16 Hydrocarbons)	mg/kg	<15 (1)	<15 (1)	46 (1)	15	5233069	<25 (1)	25	5235242
F3A (C16-C22 Hydrocarbons)	mg/kg	6.8	1.9	65	N/A	5225559	12	N/A	5225559
F3B (C22-C34 Hydrocarbons)	mg/kg	19	7.5	39	N/A	5233069	74	N/A	5235242
F3 (C16-C34 Hydrocarbons)	mg/kg	<50	<50	100	50	5225561	86	50	5225561
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	<50	<50	50	5233069	<50	50	5235242
Reached Baseline at C50	mg/kg	Yes	Yes	Yes		5233069	Yes		5235242
Surrogate Recovery (%)									
Isobutylbenzene - Volatile	%	97	91	120		5232844	97		5232844
o-Terphenyl	%	115	98	99		5233069	94		5235242

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable
(1) Elevated fuel oil range RDL due to elevated instrument baseline.

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID		FJM036			FJM037		FJM038		
Sampling Date		2017/10/15			2017/10/15		2017/10/15		
COC Number		D 26100			D 26100		D 26100		
	UNITS	**LAST-SOIL-1 Lab-Dup**	**RDL**	**QC Batch**	**LAST-SOIL-2**	**QC Batch**	**LAST-SOIL-3**	**RDL**	**QC Batch**
BTEX & F1 Hydrocarbons									
Benzene	mg/kg				<0.020	5232844	<0.020	0.020	5238624
Toluene	mg/kg				<0.020	5232844	<0.020	0.020	5238624
Ethylbenzene	mg/kg				<0.020	5232844	<0.020	0.020	5238624
p+m-Xylene	mg/kg				<0.040	5232844	<0.040	0.040	5238624
o-Xylene	mg/kg				<0.020	5232844	<0.020	0.020	5238624
Total Xylenes	mg/kg				<0.040	5232844	<0.040	0.040	5238624
F1 (C6-C10)	mg/kg				<10	5232844	<10	10	5238624
F1 (C6-C10) - BTEX (Calc.)	mg/kg				<10	5223341	<10	10	5223341
F2-F4 Hydrocarbons									
F2 (C10-C16 Hydrocarbons)	mg/kg	<25	25	5235242	<25 (1)	5235242	<25 (1)	25	5235242
F3A (C16-C22 Hydrocarbons)	mg/kg				11	5225559	15	N/A	5225559
F3B (C22-C34 Hydrocarbons)	mg/kg	70	N/A	5235242	14	5235242	89	N/A	5235242
F3 (C16-C34 Hydrocarbons)	mg/kg				<50	5225561	100	50	5225561
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	50	5235242	<50	5235242	<50	50	5235242
Reached Baseline at C50	mg/kg	Yes		5235242	Yes	5235242	Yes		5235242
Surrogate Recovery (%)									
Isobutylbenzene - Volatile	%				115	5232844	89		5238624
o-Terphenyl	%	84		5235242	88	5235242	97		5235242

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable
(1) Elevated fuel oil range RDL due to elevated instrument baseline.

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID		FJM038			FJM039	FJM040			FJM041		
Sampling Date		2017/10/15			2017/10/15	2017/10/15			2017/10/15		
COC Number		D 26100			D 26100	D 26100			D 26100		
	UNITS	**LAST-SOIL-3 Lab-Dup**	**RDL**	**QC Batch**	**LAST-SOIL-4**	**DRUM-SOIL-1**	**RDL**	**QC Batch**	**DRUM-SOIL-2**	**RDL**	**QC Batch**
BTEX & F1 Hydrocarbons											
Benzene	mg/kg	<0.020	0.020	5238624	<0.020	<0.020	0.020	5238624	<0.020	0.020	5238624
Toluene	mg/kg	<0.020	0.020	5238624	<0.020	<0.020	0.020	5238624	<0.020	0.020	5238624
Ethylbenzene	mg/kg	<0.020	0.020	5238624	<0.020	<0.020	0.020	5238624	<0.020	0.020	5238624
p+m-Xylene	mg/kg	<0.040	0.040	5238624	<0.040	<0.040	0.040	5238624	<0.040	0.040	5238624
o-Xylene	mg/kg	<0.020	0.020	5238624	<0.020	<0.020	0.020	5238624	<0.020	0.020	5238624
Total Xylenes	mg/kg	<0.040	0.040	5238624	<0.040	<0.040	0.040	5238624	<0.040	0.040	5238624
F1 (C6-C10)	mg/kg	<10	10	5238624	<10	<10	10	5238624	<10	10	5238624
F1 (C6-C10) - BTEX (Calc.)	mg/kg				<10	<10	10	5223341	<10	10	5223341
F2-F4 Hydrocarbons											
F2 (C10-C16 Hydrocarbons)	mg/kg				<25 (1)	<25 (1)	25	5235242	<25 (1)	25	5235242
F3A (C16-C22 Hydrocarbons)	mg/kg				14	26	N/A	5225559	48	N/A	5225559
F3B (C22-C34 Hydrocarbons)	mg/kg				76	210	N/A	5235242	390	N/A	5235242
F3 (C16-C34 Hydrocarbons)	mg/kg				89	240	50	5225561	440	50	5225561
F4 (C34-C50 Hydrocarbons)	mg/kg				<50	<50	50	5235242	<50	50	5235242
Reached Baseline at C50	mg/kg				Yes	Yes		5235242	Yes		5235242
Hydrocarbon Resemblance	mg/kg								COMMENT (2)		5235242
Surrogate Recovery (%)											
Isobutylbenzene - Volatile	%	94		5238624	107	91		5238624	94		5238624
o-Terphenyl	%				99	87		5235242	87		5235242

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable
(1) Elevated fuel oil range RDL due to elevated instrument baseline.
(2) No resemblance to petroleum products in fuel oil /lube oil range.

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID		FJM042		
Sampling Date		2017/10/15		
COC Number		D 26100		
	UNITS	**DRUM-SOIL-3**	**RDL**	**QC Batch**
BTEX & F1 Hydrocarbons				
Benzene	mg/kg	<0.020	0.020	5238624
Toluene	mg/kg	<0.020	0.020	5238624
Ethylbenzene	mg/kg	<0.020	0.020	5238624
p+m-Xylene	mg/kg	<0.040	0.040	5238624
o-Xylene	mg/kg	<0.020	0.020	5238624
Total Xylenes	mg/kg	<0.040	0.040	5238624
F1 (C6-C10)	mg/kg	<10	10	5238624
F1 (C6-C10) - BTEX (Calc.)	mg/kg	<10	10	5223341
F2-F4 Hydrocarbons				
F2 (C10-C16 Hydrocarbons)	mg/kg	<25 (1)	25	5235242
F3A (C16-C22 Hydrocarbons)	mg/kg	20	N/A	5225559
F3B (C22-C34 Hydrocarbons)	mg/kg	150	N/A	5235242
F3 (C16-C34 Hydrocarbons)	mg/kg	170	50	5225561
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	50	5235242
Reached Baseline at C50	mg/kg	Yes		5235242
Surrogate Recovery (%)				
Isobutylbenzene - Volatile	%	108		5238624
o-Terphenyl	%	95		5235242

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable
(1) Elevated fuel oil range RDL due to elevated instrument baseline.

GENERAL COMMENTS

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

Package 1	8.7°C

Revised Report: issued report with <DL as per request from Jason. HWS Nov 23/17
Revised reports due to resemblance comment added to some samples 2017-12-11.
Revised reports due to resemblance comment added to some samples 2018-03-09.

Revised Report: Change sample IDs that contain LPUMP to UPUMP and change sample IDs that contain UPUMP to LPUMP as requested by Jason Green. 2018/03/13 MMC

Results relate only to the items tested.

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
5225107	DDE	Method Blank	Moisture	2017/10/22	<1.0		%	
5225107	DDE	RPD [FJL730-01]	Moisture	2017/10/22	4.0		%	25
5225108	DDE	Matrix Spike [FJL730-01]	o-Terphenyl	2017/10/23		103	%	30 - 130
			F2 (C10-C16 Hydrocarbons)	2017/10/23		83	%	60 - 130
			F3B (C22-C34 Hydrocarbons)	2017/10/23		90	%	N/A
			F4 (C34-C50 Hydrocarbons)	2017/10/23		96	%	60 - 130
5225108	DDE	Spiked Blank	o-Terphenyl	2017/10/23		95	%	30 - 130
			F2 (C10-C16 Hydrocarbons)	2017/10/23		79	%	60 - 130
			F3B (C22-C34 Hydrocarbons)	2017/10/23		84	%	N/A
			F4 (C34-C50 Hydrocarbons)	2017/10/23		89	%	60 - 130
5225108	DDE	Method Blank	o-Terphenyl	2017/10/23		97	%	30 - 130
			F2 (C10-C16 Hydrocarbons)	2017/10/23	<20 (1)		mg/kg	
			F3B (C22-C34 Hydrocarbons)	2017/10/23	9.0		mg/kg	
			F4 (C34-C50 Hydrocarbons)	2017/10/23	<50		mg/kg	
5225108	DDE	RPD [FJL730-01]	F2 (C10-C16 Hydrocarbons)	2017/10/23	NC		%	50
			F3B (C22-C34 Hydrocarbons)	2017/10/23	11		%	30
			F4 (C34-C50 Hydrocarbons)	2017/10/23	NC		%	50
5225727	DDE	Method Blank	Moisture	2017/10/23	<1.0		%	
5225727	DDE	RPD [FJL979-01]	Moisture	2017/10/23	12		%	25
5225730	DDE	Matrix Spike [FJL979-01]	o-Terphenyl	2017/10/24		93	%	30 - 130
			F2 (C10-C16 Hydrocarbons)	2017/10/24		83	%	60 - 130
			F3B (C22-C34 Hydrocarbons)	2017/10/24		88	%	N/A
			F4 (C34-C50 Hydrocarbons)	2017/10/24		90	%	60 - 130
5225730	DDE	Spiked Blank	o-Terphenyl	2017/10/24		91	%	30 - 130
			F2 (C10-C16 Hydrocarbons)	2017/10/24		83	%	60 - 130
			F3B (C22-C34 Hydrocarbons)	2017/10/24		87	%	N/A
			F4 (C34-C50 Hydrocarbons)	2017/10/24		90	%	60 - 130
5225730	DDE	Method Blank	o-Terphenyl	2017/10/24		95	%	30 - 130
			F2 (C10-C16 Hydrocarbons)	2017/10/24	<20 (1)		mg/kg	
			F3B (C22-C34 Hydrocarbons)	2017/10/24	8.2		mg/kg	
			F4 (C34-C50 Hydrocarbons)	2017/10/24	<50		mg/kg	
5225730	DDE	RPD [FJL979-01]	F2 (C10-C16 Hydrocarbons)	2017/10/24	NC (1)		%	50
			F3B (C22-C34 Hydrocarbons)	2017/10/24	59 (2)		%	30
			F4 (C34-C50 Hydrocarbons)	2017/10/24	NC		%	50
5226031	MCT	Matrix Spike [FJL976-02]	Isobutylbenzene - Volatile	2017/10/24		105	%	60 - 140
			Benzene	2017/10/24		123	%	N/A
			Toluene	2017/10/24		120	%	N/A
			Ethylbenzene	2017/10/24		125	%	N/A
			p+m-Xylene	2017/10/24		114	%	N/A
			o-Xylene	2017/10/24		119	%	N/A
			Total Xylenes	2017/10/24		116	%	N/A
			F1 (C6-C10)	2017/10/24		104	%	60 - 140
5226031	MCT	Spiked Blank	Isobutylbenzene - Volatile	2017/10/24		102	%	60 - 140
			Benzene	2017/10/24		112	%	60 - 140
			Toluene	2017/10/24		96	%	60 - 140
			Ethylbenzene	2017/10/24		94	%	60 - 140
			p+m-Xylene	2017/10/24		96	%	60 - 140
			o-Xylene	2017/10/24		93	%	60 - 140
			Total Xylenes	2017/10/24		95	%	60 - 140
			F1 (C6-C10)	2017/10/24		84	%	60 - 140
5226031	MCT	Method Blank	Isobutylbenzene - Volatile	2017/10/24		89	%	60 - 140
			Benzene	2017/10/24	<0.020		mg/kg	

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Toluene	2017/10/24	<0.020		mg/kg	
			Ethylbenzene	2017/10/24	<0.020		mg/kg	
			p+m-Xylene	2017/10/24	<0.040		mg/kg	
			o-Xylene	2017/10/24	<0.020		mg/kg	
			Total Xylenes	2017/10/24	<0.040		mg/kg	
			F1 (C6-C10)	2017/10/24	<10		mg/kg	
5226031	MCT	RPD [FJL976-02]	Benzene	2017/10/24	NC		%	50
			Toluene	2017/10/24	NC		%	50
			Ethylbenzene	2017/10/24	NC		%	50
			p+m-Xylene	2017/10/24	NC		%	50
			o-Xylene	2017/10/24	NC		%	50
			Total Xylenes	2017/10/24	NC		%	50
			F1 (C6-C10)	2017/10/24	NC		%	50
5227799	DDE	Method Blank	Moisture	2017/10/24	<1.0		%	
5227799	DDE	RPD [FJL990-01]	Moisture	2017/10/24	12		%	25
5227801	DDE	Matrix Spike [FJL990-01]	o-Terphenyl	2017/10/25		116	%	30 - 130
			F2 (C10-C16 Hydrocarbons)	2017/10/25		95	%	60 - 130
			F3B (C22-C34 Hydrocarbons)	2017/10/25		100	%	N/A
			F4 (C34-C50 Hydrocarbons)	2017/10/25		102	%	60 - 130
5227801	DDE	Spiked Blank	o-Terphenyl	2017/10/25		98	%	30 - 130
			F2 (C10-C16 Hydrocarbons)	2017/10/25		82	%	60 - 130
			F3B (C22-C34 Hydrocarbons)	2017/10/25		87	%	N/A
			F4 (C34-C50 Hydrocarbons)	2017/10/25		90	%	60 - 130
5227801	DDE	Method Blank	o-Terphenyl	2017/10/25		99	%	30 - 130
			F2 (C10-C16 Hydrocarbons)	2017/10/25	<20 (1)		mg/kg	
			F3B (C22-C34 Hydrocarbons)	2017/10/25	6.9		mg/kg	
			F4 (C34-C50 Hydrocarbons)	2017/10/25	<50		mg/kg	
5227801	DDE	RPD [FJL990-01]	F2 (C10-C16 Hydrocarbons)	2017/10/25	NC		%	50
			F3B (C22-C34 Hydrocarbons)	2017/10/25	45 (2)		%	30
			F4 (C34-C50 Hydrocarbons)	2017/10/25	NC		%	50
5228444	MCT	Matrix Spike [FJL990-02]	Isobutylbenzene - Volatile	2017/10/25		103	%	60 - 140
			Benzene	2017/10/25		98	%	N/A
			Toluene	2017/10/25		95	%	N/A
			Ethylbenzene	2017/10/25		97	%	N/A
			p+m-Xylene	2017/10/25		93	%	N/A
			o-Xylene	2017/10/25		95	%	N/A
			Total Xylenes	2017/10/25		94	%	N/A
			F1 (C6-C10)	2017/10/25		99	%	60 - 140
5228444	MCT	Spiked Blank	Isobutylbenzene - Volatile	2017/10/25		96	%	60 - 140
			Benzene	2017/10/25		89	%	60 - 140
			Toluene	2017/10/25		78	%	60 - 140
			Ethylbenzene	2017/10/25		78	%	60 - 140
			p+m-Xylene	2017/10/25		77	%	60 - 140
			o-Xylene	2017/10/25		75	%	60 - 140
			Total Xylenes	2017/10/25		76	%	60 - 140
			F1 (C6-C10)	2017/10/25		99	%	60 - 140
5228444	MCT	Method Blank	Isobutylbenzene - Volatile	2017/10/25		100	%	60 - 140
			Benzene	2017/10/25	<0.020		mg/kg	
			Toluene	2017/10/25	<0.020		mg/kg	
			Ethylbenzene	2017/10/25	<0.020		mg/kg	
			p+m-Xylene	2017/10/25	<0.040		mg/kg	
			o-Xylene	2017/10/25	<0.020		mg/kg	

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Xylenes	2017/10/25	<0.040		mg/kg	
			F1 (C6-C10)	2017/10/25	<10		mg/kg	
5228444	MCT	RPD [FJL990-02]	Benzene	2017/10/25	NC		%	50
			Toluene	2017/10/25	NC		%	50
			Ethylbenzene	2017/10/25	NC		%	50
			p+m-Xylene	2017/10/25	NC		%	50
			o-Xylene	2017/10/25	NC		%	50
			Total Xylenes	2017/10/25	NC		%	50
			F1 (C6-C10)	2017/10/25	NC		%	50
5229754	DDE	Method Blank	Moisture	2017/10/25	<1.0		%	
5229754	DDE	RPD [FJL998-01]	Moisture	2017/10/25	5.2		%	25
5229756	DDE	Matrix Spike [FJL998-01]	o-Terphenyl	2017/10/26		110	%	30 - 130
			F2 (C10-C16 Hydrocarbons)	2017/10/26		83	%	60 - 130
			F3B (C22-C34 Hydrocarbons)	2017/10/26		89	%	N/A
			F4 (C34-C50 Hydrocarbons)	2017/10/26		91	%	60 - 130
5229756	DDE	Spiked Blank	o-Terphenyl	2017/10/26		103	%	30 - 130
			F2 (C10-C16 Hydrocarbons)	2017/10/26		78	%	60 - 130
			F3B (C22-C34 Hydrocarbons)	2017/10/26		82	%	N/A
			F4 (C34-C50 Hydrocarbons)	2017/10/26		85	%	60 - 130
5229756	DDE	Method Blank	o-Terphenyl	2017/10/26		105	%	30 - 130
			F2 (C10-C16 Hydrocarbons)	2017/10/26	<20 (1)		mg/kg	
			F3B (C22-C34 Hydrocarbons)	2017/10/26	4.6		mg/kg	
			F4 (C34-C50 Hydrocarbons)	2017/10/26	<50		mg/kg	
5229756	DDE	RPD [FJL998-01]	F2 (C10-C16 Hydrocarbons)	2017/10/26	NC		%	50
			F3B (C22-C34 Hydrocarbons)	2017/10/26	0.96		%	30
			F4 (C34-C50 Hydrocarbons)	2017/10/26	NC		%	50
5230231	MCT	Matrix Spike [FJM013-02]	Isobutylbenzene - Volatile	2017/11/01		90	%	60 - 140
			Benzene	2017/11/01		87	%	N/A
			Toluene	2017/11/01		84	%	N/A
			Ethylbenzene	2017/11/01		86	%	N/A
			p+m-Xylene	2017/11/01		82	%	N/A
			o-Xylene	2017/11/01		83	%	N/A
			Total Xylenes	2017/11/01		82	%	N/A
			F1 (C6-C10)	2017/11/01		95	%	60 - 140
5230231	MCT	Spiked Blank	Isobutylbenzene - Volatile	2017/11/01		96	%	60 - 140
			Benzene	2017/11/01		89	%	60 - 140
			Toluene	2017/11/01		79	%	60 - 140
			Ethylbenzene	2017/11/01		80	%	60 - 140
			p+m-Xylene	2017/11/01		77	%	60 - 140
			o-Xylene	2017/11/01		75	%	60 - 140
			Total Xylenes	2017/11/01		77	%	60 - 140
			F1 (C6-C10)	2017/11/01		90	%	60 - 140
5230231	MCT	Method Blank	Isobutylbenzene - Volatile	2017/11/01		94	%	60 - 140
			Benzene	2017/11/01	<0.020		mg/kg	
			Toluene	2017/11/01	<0.020		mg/kg	
			Ethylbenzene	2017/11/01	<0.020		mg/kg	
			p+m-Xylene	2017/11/01	<0.040		mg/kg	
			o-Xylene	2017/11/01	<0.020		mg/kg	
			Total Xylenes	2017/11/01	<0.040		mg/kg	
			F1 (C6-C10)	2017/11/01	<10		mg/kg	
5230231	MCT	RPD [FJM013-02]	Benzene	2017/11/01	NC		%	50
			Toluene	2017/11/01	NC		%	50

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Ethylbenzene	2017/11/01	NC		%	50
			p+m-Xylene	2017/11/01	NC		%	50
			o-Xylene	2017/11/01	NC		%	50
			Total Xylenes	2017/11/01	NC		%	50
			F1 (C6-C10)	2017/11/01	NC		%	50
5232522	ACL	RPD [FJM016-01]	Moisture	2017/10/27	4.1		%	25
5232844	MCT	Matrix Spike [FJM029-02]	Isobutylbenzene - Volatile	2017/10/27		86	%	60 - 140
			Benzene	2017/10/27		104	%	N/A
			Toluene	2017/10/27		98	%	N/A
			Ethylbenzene	2017/10/27		101	%	N/A
			p+m-Xylene	2017/10/27		92	%	N/A
			o-Xylene	2017/10/27		92	%	N/A
			Total Xylenes	2017/10/27		92	%	N/A
			F1 (C6-C10)	2017/10/27		112	%	60 - 140
5232844	MCT	Spiked Blank	Isobutylbenzene - Volatile	2017/10/27		105	%	60 - 140
			Benzene	2017/10/27		81	%	60 - 140
			Toluene	2017/10/27		73	%	60 - 140
			Ethylbenzene	2017/10/27		72	%	60 - 140
			p+m-Xylene	2017/10/27		71	%	60 - 140
			o-Xylene	2017/10/27		69	%	60 - 140
			Total Xylenes	2017/10/27		71	%	60 - 140
			F1 (C6-C10)	2017/10/27		88	%	60 - 140
5232844	MCT	Method Blank	Isobutylbenzene - Volatile	2017/10/27		94	%	60 - 140
			Benzene	2017/10/27	<0.020		mg/kg	
			Toluene	2017/10/27	<0.020		mg/kg	
			Ethylbenzene	2017/10/27	<0.020		mg/kg	
			p+m-Xylene	2017/10/27	<0.040		mg/kg	
			o-Xylene	2017/10/27	<0.020		mg/kg	
			Total Xylenes	2017/10/27	<0.040		mg/kg	
			F1 (C6-C10)	2017/10/27	<10		mg/kg	
5232844	MCT	RPD [FJM029-02]	Benzene	2017/10/27	NC		%	50
			Toluene	2017/10/27	NC		%	50
			Ethylbenzene	2017/10/27	NC		%	50
			p+m-Xylene	2017/10/27	NC		%	50
			o-Xylene	2017/10/27	NC		%	50
			Total Xylenes	2017/10/27	NC		%	50
			F1 (C6-C10)	2017/10/27	NC		%	50
5233069	DDE	Matrix Spike [FJM016-01]	o-Terphenyl	2017/10/27		100	%	30 - 130
			F2 (C10-C16 Hydrocarbons)	2017/10/27		75	%	60 - 130
			F3B (C22-C34 Hydrocarbons)	2017/10/27		78	%	N/A
			F4 (C34-C50 Hydrocarbons)	2017/10/27		76	%	60 - 130
5233069	DDE	Spiked Blank	o-Terphenyl	2017/10/27		101	%	30 - 130
			F2 (C10-C16 Hydrocarbons)	2017/10/27		78	%	60 - 130
			F3B (C22-C34 Hydrocarbons)	2017/10/27		82	%	N/A
			F4 (C34-C50 Hydrocarbons)	2017/10/27		81	%	60 - 130
5233069	DDE	Method Blank	o-Terphenyl	2017/10/27		101	%	30 - 130
			F2 (C10-C16 Hydrocarbons)	2017/10/27	<15 (1)		mg/kg	
			F3B (C22-C34 Hydrocarbons)	2017/10/27	6.0		mg/kg	
			F4 (C34-C50 Hydrocarbons)	2017/10/27	<50		mg/kg	
5233069	DDE	RPD [FJM016-01]	F2 (C10-C16 Hydrocarbons)	2017/10/27	NC		%	50
			F3B (C22-C34 Hydrocarbons)	2017/10/27	29		%	30
			F4 (C34-C50 Hydrocarbons)	2017/10/27	NC		%	50

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
5235235	DDE	Method Blank	Moisture	2017/10/30	<1.0		%	
5235235	DDE	RPD [FJM036-01]	Moisture	2017/10/30	1.9		%	25
5235242	DDE	Matrix Spike [FJM036-01]	o-Terphenyl	2017/10/30		87	%	30 - 130
			F2 (C10-C16 Hydrocarbons)	2017/10/30		88	%	60 - 130
			F3B (C22-C34 Hydrocarbons)	2017/10/30		92	%	N/A
			F4 (C34-C50 Hydrocarbons)	2017/10/30		97	%	60 - 130
5235242	DDE	Spiked Blank	o-Terphenyl	2017/10/30		87	%	30 - 130
			F2 (C10-C16 Hydrocarbons)	2017/10/30		88	%	60 - 130
			F3B (C22-C34 Hydrocarbons)	2017/10/30		93	%	N/A
			F4 (C34-C50 Hydrocarbons)	2017/10/30		96	%	60 - 130
5235242	DDE	Method Blank	o-Terphenyl	2017/10/30		86	%	30 - 130
			F2 (C10-C16 Hydrocarbons)	2017/10/30	<25		mg/kg	
			F3B (C22-C34 Hydrocarbons)	2017/10/30	12		mg/kg	
			F4 (C34-C50 Hydrocarbons)	2017/10/30	<50		mg/kg	
5235242	DDE	RPD [FJM036-01]	F2 (C10-C16 Hydrocarbons)	2017/10/30	NC		%	50
			F3B (C22-C34 Hydrocarbons)	2017/10/30	5.8		%	30
			F4 (C34-C50 Hydrocarbons)	2017/10/30	NC		%	50
5238409	DDE	Method Blank	Moisture	2017/10/30	<1.0		%	
5238409	DDE	RPD [FJM002-01]	Moisture	2017/10/30	1.5		%	25
5238413	DDE	Matrix Spike [FJM002-01]	o-Terphenyl	2017/10/31		96	%	30 - 130
			F2 (C10-C16 Hydrocarbons)	2017/10/31		74	%	60 - 130
			F3B (C22-C34 Hydrocarbons)	2017/10/31		76	%	N/A
			F4 (C34-C50 Hydrocarbons)	2017/10/31		75	%	60 - 130
5238413	DDE	Spiked Blank	o-Terphenyl	2017/10/31		80	%	30 - 130
			F2 (C10-C16 Hydrocarbons)	2017/10/31		75	%	60 - 130
			F3B (C22-C34 Hydrocarbons)	2017/10/31		74	%	N/A
			F4 (C34-C50 Hydrocarbons)	2017/10/31		72	%	60 - 130
5238413	DDE	Method Blank	o-Terphenyl	2017/10/31		100	%	30 - 130
			F2 (C10-C16 Hydrocarbons)	2017/10/31	<10		mg/kg	
			F3B (C22-C34 Hydrocarbons)	2017/10/31	6.6		mg/kg	
			F4 (C34-C50 Hydrocarbons)	2017/10/31	<50		mg/kg	
5238413	DDE	RPD [FJM002-01]	F2 (C10-C16 Hydrocarbons)	2017/10/31	NC		%	50
			F3B (C22-C34 Hydrocarbons)	2017/10/31	0.61		%	30
			F4 (C34-C50 Hydrocarbons)	2017/10/31	NC		%	50
5238624	MCT	Matrix Spike [FJM038-02]	Isobutylbenzene - Volatile	2017/10/31		94	%	60 - 140
			Benzene	2017/10/31		82	%	N/A
			Toluene	2017/10/31		82	%	N/A
			Ethylbenzene	2017/10/31		86	%	N/A
			p+m-Xylene	2017/10/31		79	%	N/A
			o-Xylene	2017/10/31		82	%	N/A
			Total Xylenes	2017/10/31		80	%	N/A
			F1 (C6-C10)	2017/10/31		89	%	60 - 140
5238624	MCT	Spiked Blank	Isobutylbenzene - Volatile	2017/10/31		99	%	60 - 140
			Benzene	2017/10/31		83	%	60 - 140
			Toluene	2017/10/31		73	%	60 - 140
			Ethylbenzene	2017/10/31		73	%	60 - 140
			p+m-Xylene	2017/10/31		73	%	60 - 140
			o-Xylene	2017/10/31		70	%	60 - 140
			Total Xylenes	2017/10/31		72	%	60 - 140
			F1 (C6-C10)	2017/10/31		89	%	60 - 140
5238624	MCT	Method Blank	Isobutylbenzene - Volatile	2017/10/31		102	%	60 - 140
			Benzene	2017/10/31	<0.020		mg/kg	

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Toluene	2017/10/31	<0.020		mg/kg	
			Ethylbenzene	2017/10/31	<0.020		mg/kg	
			p+m-Xylene	2017/10/31	<0.040		mg/kg	
			o-Xylene	2017/10/31	<0.020		mg/kg	
			Total Xylenes	2017/10/31	<0.040		mg/kg	
			F1 (C6-C10)	2017/10/31	<10		mg/kg	
5238624	MCT	RPD [FJM038-02]	Benzene	2017/10/31	NC		%	50
			Toluene	2017/10/31	NC		%	50
			Ethylbenzene	2017/10/31	NC		%	50
			p+m-Xylene	2017/10/31	NC		%	50
			o-Xylene	2017/10/31	NC		%	50
			Total Xylenes	2017/10/31	NC		%	50
			F1 (C6-C10)	2017/10/31	NC		%	50
5239841	DDE	Method Blank	Moisture	2017/10/31	<1.0		%	
5239841	DDE	RPD [FJM021-01]	Moisture	2017/10/31	19		%	25
5239850	DDE	Matrix Spike [FJM021-01]	o-Terphenyl	2017/11/02		89	%	30 - 130
			F2 (C10-C16 Hydrocarbons)	2017/11/02		84	%	60 - 130
			F3B (C22-C34 Hydrocarbons)	2017/11/02		89	%	N/A
			F4 (C34-C50 Hydrocarbons)	2017/11/02		92	%	60 - 130
5239850	DDE	Spiked Blank	o-Terphenyl	2017/11/02		88	%	30 - 130
			F2 (C10-C16 Hydrocarbons)	2017/11/02		83	%	60 - 130
			F3B (C22-C34 Hydrocarbons)	2017/11/02		88	%	N/A
			F4 (C34-C50 Hydrocarbons)	2017/11/02		91	%	60 - 130
5239850	DDE	Method Blank	o-Terphenyl	2017/11/02		96	%	30 - 130
			F2 (C10-C16 Hydrocarbons)	2017/11/02	<20 (1)		mg/kg	
			F3B (C22-C34 Hydrocarbons)	2017/11/02	16		mg/kg	
			F4 (C34-C50 Hydrocarbons)	2017/11/02	<50		mg/kg	
5239850	DDE	RPD [FJM021-01]	F2 (C10-C16 Hydrocarbons)	2017/11/02	3.6		%	50
			F3B (C22-C34 Hydrocarbons)	2017/11/02	6.8		%	30
			F4 (C34-C50 Hydrocarbons)	2017/11/02	NC		%	50

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

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

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

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

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

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

(1) Elevated fuel oil range RDL due to elevated instrument baseline.

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

VALIDATION SIGNATURE PAGE

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

PMChaplin

Paula Chaplin, Project Manager Assistant

Rob Whelan, Laboratory Manager

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.

Your Project #: 649806
Site Location: CAPE MAKKOVIK
Your C.O.C. #: D26105

Attention:Jason Green

SNC-Lavalin Inc
1090 Topsail Rd
2nd Floor
Mount Pearl, NL
A1N 5E7

Report Date: 2017/11/27
Report #: R4876943
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B7N3406
Received: 2017/10/20, 10:13

Sample Matrix: Water
Samples Received: 10

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Carbonate, Bicarbonate and Hydroxide	6	N/A	2017/10/24	N/A	SM 22 4500-CO2 D
Carbonate, Bicarbonate and Hydroxide	4	N/A	2017/10/25	N/A	SM 22 4500-CO2 D
Alkalinity	10	N/A	2017/10/26	ATL SOP 00013	EPA 310.2 R1974 m
Benzo(b/j)fluoranthene Sum (water)	4	N/A	2017/10/27	N/A	Auto Calc.
Benzo(b/j)fluoranthene Sum (water)	6	N/A	2017/10/31	N/A	Auto Calc.
Chloride	10	N/A	2017/10/30	ATL SOP 00014	SM 22 4500-Cl- E m
Colour	10	N/A	2017/10/30	ATL SOP 00020	SM 22 2120C m
Conductance - water	6	N/A	2017/10/24	ATL SOP 00004	SM 22 2510B m
Conductance - water	4	N/A	2017/10/25	ATL SOP 00004	SM 22 2510B m
Petroleum Hydro. CCME F1 & BTEX in Water (1)	10	N/A	2017/10/28	CAM SOP-00315	CCME PHC-CWS m
Petroleum Hydrocarbons F2-F4 in Water (1, 2)	8	2017/10/28	2017/10/30	CAM SOP-00316	CCME PHC-CWS m
Petroleum Hydrocarbons F2-F4 in Water (1, 2)	2	2017/10/30	2017/10/31	CAM SOP-00316	CCME PHC-CWS m
Hardness (calculated as CaCO3)	10	N/A	2017/10/26	ATL SOP 00048	SM 22 2340 B
Mercury - Total (CVAA,LL)	10	2017/10/23	2017/10/24	ATL SOP 00026	EPA 245.1 R3 m
Metals Water Total MS	10	2017/10/25	2017/10/25	ATL SOP 00058	EPA 6020A R1 m
Ion Balance (% Difference)	10	N/A	2017/10/30	N/A	Auto Calc.
Anion and Cation Sum	10	N/A	2017/10/27	N/A	Auto Calc.
Nitrogen Ammonia - water	10	N/A	2017/10/27	ATL SOP 00015	EPA 350.1 R2 m
Nitrogen - Nitrate + Nitrite	10	N/A	2017/10/30	ATL SOP 00016	USGS SOPINCF0452.2 m
Nitrogen - Nitrite	10	N/A	2017/10/27	ATL SOP 00017	SM 22 4500-NO2- B m
Nitrogen - Nitrate (as N)	10	N/A	2017/10/30	ATL SOP 00018	ASTM D3867-16
PAH (FWAL) in Water (A/Q) by GC/MS (SIM) (3)	4	2017/10/23	2017/10/27	ATL SOP 00103	EPA 8270D 2007 m
PAH (FWAL) in Water (A/Q) by GC/MS (SIM) (3)	6	2017/10/23	2017/10/28	ATL SOP 00103	EPA 8270D 2007 m
pH (4)	6	N/A	2017/10/24	ATL SOP 00003	SM 22 4500-H+ B m
pH (4)	4	N/A	2017/10/25	ATL SOP 00003	SM 22 4500-H+ B m
Phosphorus - ortho	10	N/A	2017/10/30	ATL SOP 00021	SM 22 4500-P E m
Sat. pH and Langelier Index (@ 20C)	1	N/A	2017/10/27	ATL SOP 00049	Auto Calc.
Sat. pH and Langelier Index (@ 20C)	9	N/A	2017/10/30	ATL SOP 00049	Auto Calc.
Sat. pH and Langelier Index (@ 4C)	1	N/A	2017/10/27	ATL SOP 00049	Auto Calc.

Your Project #: 649806
Site Location: CAPE MAKKOVIK
Your C.O.C. #: D26105

Attention:Jason Green

SNC-Lavalin Inc
1090 Topsail Rd
2nd Floor
Mount Pearl, NL
A1N 5E7

Report Date: 2017/11/27
Report #: R4876943
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B7N3406
Received: 2017/10/20, 10:13

Sample Matrix: Water
Samples Received: 10

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Sat. pH and Langelier Index (@ 4C)	9	N/A	2017/10/30	ATL SOP 00049	Auto Calc.
Reactive Silica	4	N/A	2017/10/26	ATL SOP 00022	EPA 366.0 m
Reactive Silica	6	N/A	2017/10/27	ATL SOP 00022	EPA 366.0 m
Sulphate	10	N/A	2017/10/27	ATL SOP 00023	ASTM D516-16 m
Total Dissolved Solids (TDS calc)	10	N/A	2017/10/30	N/A	Auto Calc.
Organic carbon - Total (TOC) (5)	10	N/A	2017/10/27	ATL SOP 00037	SM 22 5310C m
Turbidity	7	N/A	2017/10/24	ATL SOP 00011	EPA 180.1 R2 m
Turbidity	3	N/A	2017/10/25	ATL SOP 00011	EPA 180.1 R2 m

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.

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.

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.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Your Project #: 649806
Site Location: CAPE MAKKOVIK
Your C.O.C. #: D26105

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1090 Topsail Rd
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Report Date: 2017/11/27
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CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B7N3406
Received: 2017/10/20, 10:13

(1) This test was performed by Maxxam Analytics Mississauga
(2) All CCME PHC results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Maxxam conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following “Alberta Environment’s Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Validation of Performance-Based Alternative Methods September 2003”. Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.
(3) Acridine and Quinoline parameters are not accredited.
(4) The APHA Standard Method require pH to be analyzed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the APHA Standard Method holding time.
(5) TOC / DOC present in the sample should be considered as non-purgeable TOC / DOC.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Heather Macumber, Senior Project Manager
Email: HMacumber@maxxam.ca
Phone# (902)420-0203 Ext:226
==
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.

Total Cover Pages : 3

Maxxam Job #: B7N3406
Report Date: 2017/11/27

SNC-Lavalin Inc
Client Project #: 649806
Site Location: CAPE MAKKOVIK
Sampler Initials: JG

ATLANTIC RCAP-MS TOTAL METALS IN WATER (WATER)

Maxxam ID		FJM110		FJM111			FJM111		
Sampling Date		2017/10/17		2017/10/17			2017/10/17		
COC Number		D26105		D26105			D26105		
	UNITS	**WSUPPLY-SW-1**	**QC Batch**	**WSUPPLY-SW-2**	**RDL**	**QC Batch**	**WSUPPLY-SW-2 Lab-Dup**	**RDL**	**QC Batch**
Calculated Parameters									
Anion Sum	me/L	0.640	5222894	0.650	N/A	5222894			
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	14	5222886	14	1.0	5222886			
Calculated TDS	mg/L	37	5222898	37	1.0	5222898			
Carb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	5222886	<1.0	1.0	5222886			
Cation Sum	me/L	0.730	5222894	0.700	N/A	5222894			
Hardness (CaCO3)	mg/L	17	5222892	17	1.0	5222892			
Ion Balance (% Difference)	%	6.57	5222893	3.70	N/A	5222893			
Langelier Index (@ 20C)	N/A	-2.29	5222896	-2.29		5222896			
Langelier Index (@ 4C)	N/A	-2.54	5222897	-2.54		5222897			
Nitrate (N)	mg/L	<0.050	5223251	<0.050	0.050	5223251			
Saturation pH (@ 20C)	N/A	9.48	5222896	9.49		5222896			
Saturation pH (@ 4C)	N/A	9.73	5222897	9.74		5222897			
Inorganics									
Total Alkalinity (Total as CaCO3)	mg/L	14	5232354	14	5.0	5232354			
Dissolved Chloride (Cl)	mg/L	13	5232360	13	1.0	5232360			
Colour	TCU	54 (1)	5232365	56 (1)	25	5232365			
Nitrate + Nitrite (N)	mg/L	<0.050	5232379	<0.050	0.050	5232379			
Nitrite (N)	mg/L	<0.010	5232383	<0.010	0.010	5232383			
Nitrogen (Ammonia Nitrogen)	mg/L	<0.050	5232206	<0.050	0.050	5232206	<0.050	0.050	5232206
Total Organic Carbon (C)	mg/L	7.4	5235399	7.4	0.50	5235399			
Orthophosphate (P)	mg/L	<0.010	5232372	<0.010	0.010	5232372			
pH	pH	7.19	5227318	7.20	N/A	5229705			
Reactive Silica (SiO2)	mg/L	1.1	5232364	1.0	0.50	5232364			
Dissolved Sulphate (SO4)	mg/L	<2.0	5232362	<2.0	2.0	5232362			
Turbidity	NTU	0.60	5227364	0.70	0.10	5229749			
Conductivity	uS/cm	72	5227319	69	1.0	5229706			
Metals									
Total Aluminum (Al)	ug/L	89	5229695	84	5.0	5229695			
Total Antimony (Sb)	ug/L	<1.0	5229695	<1.0	1.0	5229695			
Total Arsenic (As)	ug/L	<1.0	5229695	<1.0	1.0	5229695			
Total Barium (Ba)	ug/L	8.6	5229695	8.3	1.0	5229695			
Total Beryllium (Be)	ug/L	<1.0	5229695	<1.0	1.0	5229695			

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable
(1) Elevated reporting limit due to sample matrix.

ATLANTIC RCAP-MS TOTAL METALS IN WATER (WATER)

Maxxam ID		FJM110		FJM111			FJM111		
Sampling Date		2017/10/17		2017/10/17			2017/10/17		
COC Number		D26105		D26105			D26105		
	UNITS	**WSUPPLY-SW-1**	**QC Batch**	**WSUPPLY-SW-2**	**RDL**	**QC Batch**	**WSUPPLY-SW-2 Lab-Dup**	**RDL**	**QC Batch**
Total Bismuth (Bi)	ug/L	<2.0	5229695	<2.0	2.0	5229695			
Total Boron (B)	ug/L	<50	5229695	<50	50	5229695			
Total Cadmium (Cd)	ug/L	<0.010	5229695	<0.010	0.010	5229695			
Total Calcium (Ca)	ug/L	4600	5229695	4500	100	5229695			
Total Chromium (Cr)	ug/L	<1.0	5229695	<1.0	1.0	5229695			
Total Cobalt (Co)	ug/L	<0.40	5229695	<0.40	0.40	5229695			
Total Copper (Cu)	ug/L	<2.0	5229695	<2.0	2.0	5229695			
Total Iron (Fe)	ug/L	100	5229695	110	50	5229695			
Total Lead (Pb)	ug/L	<0.50	5229695	<0.50	0.50	5229695			
Total Magnesium (Mg)	ug/L	1400	5229695	1400	100	5229695			
Total Manganese (Mn)	ug/L	3.8	5229695	4.0	2.0	5229695			
Total Molybdenum (Mo)	ug/L	<2.0	5229695	<2.0	2.0	5229695			
Total Nickel (Ni)	ug/L	<2.0	5229695	<2.0	2.0	5229695			
Total Phosphorus (P)	ug/L	<100	5229695	<100	100	5229695			
Total Potassium (K)	ug/L	630	5229695	590	100	5229695			
Total Selenium (Se)	ug/L	<1.0	5229695	<1.0	1.0	5229695			
Total Silver (Ag)	ug/L	<0.10	5229695	<0.10	0.10	5229695			
Total Sodium (Na)	ug/L	8200	5229695	7800	100	5229695			
Total Strontium (Sr)	ug/L	48	5229695	46	2.0	5229695			
Total Thallium (Tl)	ug/L	<0.10	5229695	<0.10	0.10	5229695			
Total Tin (Sn)	ug/L	<2.0	5229695	<2.0	2.0	5229695			
Total Titanium (Ti)	ug/L	<2.0	5229695	<2.0	2.0	5229695			
Total Uranium (U)	ug/L	0.30	5229695	0.26	0.10	5229695			
Total Vanadium (V)	ug/L	<2.0	5229695	<2.0	2.0	5229695			
Total Zinc (Zn)	ug/L	<5.0	5229695	<5.0	5.0	5229695			

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

Maxxam Job #: B7N3406
Report Date: 2017/11/27

SNC-Lavalin Inc
Client Project #: 649806
Site Location: CAPE MAKKOVIK
Sampler Initials: JG

ATLANTIC RCAP-MS TOTAL METALS IN WATER (WATER)

Maxxam ID		FJM112			FJM113			FJM114		
Sampling Date		2017/10/17			2017/10/17			2017/10/17		
COC Number		D26105			D26105			D26105		
	UNITS	**WSUPPLY-SW-3**	**RDL**	**QC Batch**	**SW-1**	**RDL**	**QC Batch**	**SW-2**	**RDL**	**QC Batch**
Calculated Parameters										
Anion Sum	me/L	0.650	N/A	5222894	1.26	N/A	5222894	1.09	N/A	5222894
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	15	1.0	5222886	16	1.0	5222886	14	1.0	5222886
Calculated TDS	mg/L	36	1.0	5222898	67	1.0	5222898	64	1.0	5222898
Carb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	5222886	<1.0	1.0	5222886	<1.0	1.0	5222886
Cation Sum	me/L	0.630	N/A	5222894	1.13	N/A	5222894	1.12	N/A	5222894
Hardness (CaCO3)	mg/L	16	1.0	5222892	20	1.0	5222892	21	1.0	5222892
Ion Balance (% Difference)	%	1.56	N/A	5222893	5.44	N/A	5222893	1.36	N/A	5222893
Langelier Index (@ 20C)	N/A	-2.36		5222896	-2.37		5222896	-2.53		5222896
Langelier Index (@ 4C)	N/A	-2.61		5222897	-2.62		5222897	-2.78		5222897
Nitrate (N)	mg/L	<0.050	0.050	5223251	<0.050	0.050	5223251	0.052	0.050	5223251
Saturation pH (@ 20C)	N/A	9.50		5222896	9.55		5222896	9.50		5222896
Saturation pH (@ 4C)	N/A	9.75		5222897	9.80		5222897	9.75		5222897
Inorganics										
Total Alkalinity (Total as CaCO3)	mg/L	15	5.0	5232354	16	5.0	5232354	14	5.0	5232354
Dissolved Chloride (Cl)	mg/L	13	1.0	5232360	31	1.0	5232360	27	1.0	5232360
Colour	TCU	59 (1)	25	5232365	41	5.0	5232365	190 (1)	25	5232365
Nitrate + Nitrite (N)	mg/L	<0.050	0.050	5232379	<0.050	0.050	5232379	0.052	0.050	5232379
Nitrite (N)	mg/L	<0.010	0.010	5232383	<0.010	0.010	5232383	<0.010	0.010	5232383
Nitrogen (Ammonia Nitrogen)	mg/L	0.051	0.050	5232206	0.094	0.050	5232206	<0.050	0.050	5232206
Total Organic Carbon (C)	mg/L	7.6	0.50	5235399	7.8	0.50	5235399	16	0.50	5235401
Orthophosphate (P)	mg/L	<0.010	0.010	5232372	<0.010	0.010	5232372	<0.010	0.010	5232372
pH	pH	7.15	N/A	5227318	7.18	N/A	5229705	6.98	N/A	5227318
Reactive Silica (SiO2)	mg/L	1.1	0.50	5232364	<0.50	0.50	5232364	2.3	0.50	5232364
Dissolved Sulphate (SO4)	mg/L	<2.0	2.0	5232362	2.7	2.0	5232362	2.1	2.0	5232362
Turbidity	NTU	0.47	0.10	5227364	0.37	0.10	5229749	1.1	0.10	5227364
Conductivity	uS/cm	72	1.0	5227319	130	1.0	5229706	130	1.0	5227319
Metals										
Total Aluminum (Al)	ug/L	79	5.0	5229695	41	5.0	5229695	430	5.0	5229695
Total Antimony (Sb)	ug/L	<1.0	1.0	5229695	<1.0	1.0	5229695	<1.0	1.0	5229695
Total Arsenic (As)	ug/L	<1.0	1.0	5229695	<1.0	1.0	5229695	<1.0	1.0	5229695
Total Barium (Ba)	ug/L	8.2	1.0	5229695	5.6	1.0	5229695	5.9	1.0	5229695
Total Beryllium (Be)	ug/L	<1.0	1.0	5229695	<1.0	1.0	5229695	<1.0	1.0	5229695
Total Bismuth (Bi)	ug/L	<2.0	2.0	5229695	<2.0	2.0	5229695	<2.0	2.0	5229695

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable
(1) Elevated reporting limit due to sample matrix.

ATLANTIC RCAP-MS TOTAL METALS IN WATER (WATER)

Maxxam ID		FJM112			FJM113			FJM114		
Sampling Date		2017/10/17			2017/10/17			2017/10/17		
COC Number		D26105			D26105			D26105		
	UNITS	**WSUPPLY-SW-3**	**RDL**	**QC Batch**	**SW-1**	**RDL**	**QC Batch**	**SW-2**	**RDL**	**QC Batch**
Total Boron (B)	ug/L	<50	50	5229695	<50	50	5229695	<50	50	5229695
Total Cadmium (Cd)	ug/L	<0.010	0.010	5229695	<0.010	0.010	5229695	<0.010	0.010	5229695
Total Calcium (Ca)	ug/L	4200	100	5229695	3700	100	5229695	4800	100	5229695
Total Chromium (Cr)	ug/L	<1.0	1.0	5229695	<1.0	1.0	5229695	<1.0	1.0	5229695
Total Cobalt (Co)	ug/L	<0.40	0.40	5229695	<0.40	0.40	5229695	<0.40	0.40	5229695
Total Copper (Cu)	ug/L	<2.0	2.0	5229695	2.9	2.0	5229695	6.4	2.0	5229695
Total Iron (Fe)	ug/L	97	50	5229695	180	50	5229695	540	50	5229695
Total Lead (Pb)	ug/L	<0.50	0.50	5229695	<0.50	0.50	5229695	<0.50	0.50	5229695
Total Magnesium (Mg)	ug/L	1300	100	5229695	2600	100	5229695	2300	100	5229695
Total Manganese (Mn)	ug/L	3.5	2.0	5229695	<2.0	2.0	5229695	6.1	2.0	5229695
Total Molybdenum (Mo)	ug/L	<2.0	2.0	5229695	<2.0	2.0	5229695	<2.0	2.0	5229695
Total Nickel (Ni)	ug/L	<2.0	2.0	5229695	<2.0	2.0	5229695	<2.0	2.0	5229695
Total Phosphorus (P)	ug/L	<100	100	5229695	<100	100	5229695	<100	100	5229695
Total Potassium (K)	ug/L	580	100	5229695	1100	100	5229695	870	100	5229695
Total Selenium (Se)	ug/L	<1.0	1.0	5229695	<1.0	1.0	5229695	<1.0	1.0	5229695
Total Silver (Ag)	ug/L	<0.10	0.10	5229695	<0.10	0.10	5229695	<0.10	0.10	5229695
Total Sodium (Na)	ug/L	6600	100	5229695	16000	100	5229695	15000	100	5229695
Total Strontium (Sr)	ug/L	46	2.0	5229695	27	2.0	5229695	30	2.0	5229695
Total Thallium (Tl)	ug/L	<0.10	0.10	5229695	<0.10	0.10	5229695	<0.10	0.10	5229695
Total Tin (Sn)	ug/L	<2.0	2.0	5229695	<2.0	2.0	5229695	<2.0	2.0	5229695
Total Titanium (Ti)	ug/L	<2.0	2.0	5229695	<2.0	2.0	5229695	6.3	2.0	5229695
Total Uranium (U)	ug/L	0.26	0.10	5229695	<0.10	0.10	5229695	0.35	0.10	5229695
Total Vanadium (V)	ug/L	<2.0	2.0	5229695	<2.0	2.0	5229695	<2.0	2.0	5229695
Total Zinc (Zn)	ug/L	<5.0	5.0	5229695	<5.0	5.0	5229695	6.2	5.0	5229695

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B7N3406
Report Date: 2017/11/27

SNC-Lavalin Inc
Client Project #: 649806
Site Location: CAPE MAKKOVIK
Sampler Initials: JG

ATLANTIC RCAP-MS TOTAL METALS IN WATER (WATER)

Maxxam ID		FJM115	FJM116			FJM117			FJM117		
Sampling Date		2017/10/17	2017/10/17			2017/10/17			2017/10/17		
COC Number		D26105	D26105			D26105			D26105		
	UNITS	**SW-3**	**BG-SW-1**	**RDL**	**QC Batch**	**BG-SW-2**	**RDL**	**QC Batch**	**BG-SW-2 Lab-Dup**	**RDL**	**QC Batch**
Calculated Parameters											
Anion Sum	me/L	0.500	1.23	N/A	5222894	0.640	N/A	5222894			
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	6.6	<1.0	1.0	5222886	9.2	1.0	5222886			
Calculated TDS	mg/L	27	71	1.0	5222898	37	1.0	5222898			
Carb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	<1.0	1.0	5222886	<1.0	1.0	5222886			
Cation Sum	me/L	0.460	1.19	N/A	5222894	0.650	N/A	5222894			
Hardness (CaCO3)	mg/L	8.7	13	1.0	5222892	12	1.0	5222892			
Ion Balance (% Difference)	%	4.17	1.65	N/A	5222893	0.780	N/A	5222893			
Langelier Index (@ 20C)	N/A	-3.51	NC		5222896	-3.28		5222896			
Langelier Index (@ 4C)	N/A	-3.76	NC		5222897	-3.53		5222897			
Nitrate (N)	mg/L	<0.050	<0.050	0.050	5223251	<0.050	0.050	5223251			
Saturation pH (@ 20C)	N/A	10.3	NC		5222896	9.87		5222896			
Saturation pH (@ 4C)	N/A	10.5	NC		5222897	10.1		5222897			
Inorganics											
Total Alkalinity (Total as CaCO3)	mg/L	6.6	<5.0	5.0	5232354	9.2	5.0	5232354			
Dissolved Chloride (Cl)	mg/L	11	39	1.0	5232360	16	1.0	5232360			
Colour	TCU	16	50	5.0	5232365	120 (1)	25	5232365			
Nitrate + Nitrite (N)	mg/L	<0.050	<0.050	0.050	5232379	<0.050	0.050	5232379			
Nitrite (N)	mg/L	<0.010	<0.010	0.010	5232383	<0.010	0.010	5232383			
Nitrogen (Ammonia Nitrogen)	mg/L	<0.050	0.064	0.050	5232206	0.050	0.050	5232206			
Total Organic Carbon (C)	mg/L	3.9	4.5	0.50	5235401	13	0.50	5235401			
Orthophosphate (P)	mg/L	<0.010	<0.010	0.010	5232372	<0.010	0.010	5232372			
pH	pH	6.74	6.40	N/A	5227318	6.59	N/A	5227318	6.64	N/A	5227318
Reactive Silica (SiO2)	mg/L	<0.50	0.95	0.50	5232364	2.2	0.50	5232364			
Dissolved Sulphate (SO4)	mg/L	2.3	5.8	2.0	5232362	<2.0	2.0	5232362			
Turbidity	NTU	0.39	0.28	0.10	5227364	0.53	0.10	5227361	0.58	0.10	5227361
Conductivity	uS/cm	54	150	1.0	5227319	74	1.0	5227319	74	1.0	5227319
Metals											
Total Aluminum (Al)	ug/L	68	140	5.0	5229695	240	5.0	5229695			
Total Antimony (Sb)	ug/L	<1.0	<1.0	1.0	5229695	<1.0	1.0	5229695			
Total Arsenic (As)	ug/L	<1.0	<1.0	1.0	5229695	<1.0	1.0	5229695			
Total Barium (Ba)	ug/L	4.7	2.0	1.0	5229695	3.3	1.0	5229695			
Total Beryllium (Be)	ug/L	<1.0	<1.0	1.0	5229695	<1.0	1.0	5229695			

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable
(1) Elevated reporting limit due to sample matrix.

Maxxam Job #: B7N3406
Report Date: 2017/11/27

SNC-Lavalin Inc
Client Project #: 649806
Site Location: CAPE MAKKOVIK
Sampler Initials: JG

ATLANTIC RCAP-MS TOTAL METALS IN WATER (WATER)

Maxxam ID		FJM115	FJM116			FJM117			FJM117		
Sampling Date		2017/10/17	2017/10/17			2017/10/17			2017/10/17		
COC Number		D26105	D26105			D26105			D26105		
	UNITS	**SW-3**	**BG-SW-1**	**RDL**	**QC Batch**	**BG-SW-2**	**RDL**	**QC Batch**	**BG-SW-2 Lab-Dup**	**RDL**	**QC Batch**
Total Bismuth (Bi)	ug/L	<2.0	<2.0	2.0	5229695	<2.0	2.0	5229695			
Total Boron (B)	ug/L	<50	<50	50	5229695	<50	50	5229695			
Total Cadmium (Cd)	ug/L	<0.010	0.027	0.010	5229695	<0.010	0.010	5229695			
Total Calcium (Ca)	ug/L	1700	1500	100	5229695	2900	100	5229695			
Total Chromium (Cr)	ug/L	<1.0	<1.0	1.0	5229695	<1.0	1.0	5229695			
Total Cobalt (Co)	ug/L	<0.40	<0.40	0.40	5229695	<0.40	0.40	5229695			
Total Copper (Cu)	ug/L	<2.0	2.2	2.0	5229695	<2.0	2.0	5229695			
Total Iron (Fe)	ug/L	59	<50	50	5229695	270	50	5229695			
Total Lead (Pb)	ug/L	<0.50	<0.50	0.50	5229695	<0.50	0.50	5229695			
Total Magnesium (Mg)	ug/L	1100	2300	100	5229695	1300	100	5229695			
Total Manganese (Mn)	ug/L	<2.0	<2.0	2.0	5229695	2.9	2.0	5229695			
Total Molybdenum (Mo)	ug/L	<2.0	<2.0	2.0	5229695	<2.0	2.0	5229695			
Total Nickel (Ni)	ug/L	<2.0	<2.0	2.0	5229695	<2.0	2.0	5229695			
Total Phosphorus (P)	ug/L	<100	<100	100	5229695	<100	100	5229695			
Total Potassium (K)	ug/L	510	780	100	5229695	430	100	5229695			
Total Selenium (Se)	ug/L	<1.0	<1.0	1.0	5229695	<1.0	1.0	5229695			
Total Silver (Ag)	ug/L	<0.10	<0.10	0.10	5229695	<0.10	0.10	5229695			
Total Sodium (Na)	ug/L	6200	21000	100	5229695	8600	100	5229695			
Total Strontium (Sr)	ug/L	16	20	2.0	5229695	13	2.0	5229695			
Total Thallium (Tl)	ug/L	<0.10	<0.10	0.10	5229695	<0.10	0.10	5229695			
Total Tin (Sn)	ug/L	<2.0	<2.0	2.0	5229695	<2.0	2.0	5229695			
Total Titanium (Ti)	ug/L	<2.0	<2.0	2.0	5229695	3.1	2.0	5229695			
Total Uranium (U)	ug/L	<0.10	0.19	0.10	5229695	0.28	0.10	5229695			
Total Vanadium (V)	ug/L	<2.0	<2.0	2.0	5229695	<2.0	2.0	5229695			
Total Zinc (Zn)	ug/L	<5.0	14	5.0	5229695	<5.0	5.0	5229695			

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

ATLANTIC RCAP-MS TOTAL METALS IN WATER (WATER)

Maxxam ID		FJM118			FJM119		
Sampling Date		2017/10/17			2017/10/17		
COC Number		D26105			D26105		
	UNITS	**BG-SW-3**	**RDL**	**QC Batch**	**WSUPPLY-SW-4**	**RDL**	**QC Batch**
Calculated Parameters							
Anion Sum	me/L	0.360	N/A	5222894	0.640	N/A	5222894
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	9.8	1.0	5222886	14	1.0	5222886
Calculated TDS	mg/L	20	1.0	5222898	35	1.0	5222898
Carb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	5222886	<1.0	1.0	5222886
Cation Sum	me/L	0.350	N/A	5222894	0.640	N/A	5222894
Hardness (CaCO3)	mg/L	10	1.0	5222892	17	1.0	5222892
Ion Balance (% Difference)	%	1.41	N/A	5222893	0.00	N/A	5222893
Langelier Index (@ 20C)	N/A	-2.88		5222896	-2.21		5222896
Langelier Index (@ 4C)	N/A	-3.14		5222897	-2.46		5222897
Nitrate (N)	mg/L	<0.050	0.050	5223251	0.12	0.050	5223251
Saturation pH (@ 20C)	N/A	9.80		5222896	9.51		5222896
Saturation pH (@ 4C)	N/A	10.0		5222897	9.76		5222897
Inorganics							
Total Alkalinity (Total as CaCO3)	mg/L	9.8	5.0	5232354	14	5.0	5232354
Dissolved Chloride (Cl)	mg/L	5.8	1.0	5232360	12	1.0	5232360
Colour	TCU	30	5.0	5232365	53 (1)	25	5232365
Nitrate + Nitrite (N)	mg/L	<0.050	0.050	5232379	0.12	0.050	5232379
Nitrite (N)	mg/L	<0.010	0.010	5232383	<0.010	0.010	5232383
Nitrogen (Ammonia Nitrogen)	mg/L	<0.050	0.050	5232206	<0.050	0.050	5232206
Total Organic Carbon (C)	mg/L	4.5	0.50	5235401	7.6	0.50	5235401
Orthophosphate (P)	mg/L	<0.010	0.010	5232372	<0.010	0.010	5232372
pH	pH	6.91	N/A	5229705	7.30	N/A	5229705
Reactive Silica (SiO2)	mg/L	1.6	0.50	5232364	1.0	0.50	5232364
Dissolved Sulphate (SO4)	mg/L	<2.0	2.0	5232362	<2.0	2.0	5232362
Turbidity	NTU	0.24	0.10	5229749	0.40	0.10	5227364
Conductivity	uS/cm	37	1.0	5229706	71	1.0	5229706
Metals							
Total Aluminum (Al)	ug/L	85	5.0	5229695	83	5.0	5229695
Total Antimony (Sb)	ug/L	<1.0	1.0	5229695	<1.0	1.0	5229695
Total Arsenic (As)	ug/L	<1.0	1.0	5229695	<1.0	1.0	5229695
Total Barium (Ba)	ug/L	4.7	1.0	5229695	8.2	1.0	5229695
Total Beryllium (Be)	ug/L	<1.0	1.0	5229695	<1.0	1.0	5229695
Total Bismuth (Bi)	ug/L	<2.0	2.0	5229695	<2.0	2.0	5229695

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable
(1) Elevated reporting limit due to sample matrix.

ATLANTIC RCAP-MS TOTAL METALS IN WATER (WATER)

Maxxam ID		FJM118			FJM119		
Sampling Date		2017/10/17			2017/10/17		
COC Number		D26105			D26105		
	UNITS	**BG-SW-3**	**RDL**	**QC Batch**	**WSUPPLY-SW-4**	**RDL**	**QC Batch**
Total Boron (B)	ug/L	<50	50	5229695	<50	50	5229695
Total Cadmium (Cd)	ug/L	<0.010	0.010	5229695	<0.010	0.010	5229695
Total Calcium (Ca)	ug/L	3100	100	5229695	4300	100	5229695
Total Chromium (Cr)	ug/L	<1.0	1.0	5229695	<1.0	1.0	5229695
Total Cobalt (Co)	ug/L	<0.40	0.40	5229695	<0.40	0.40	5229695
Total Copper (Cu)	ug/L	<2.0	2.0	5229695	<2.0	2.0	5229695
Total Iron (Fe)	ug/L	<50	50	5229695	100	50	5229695
Total Lead (Pb)	ug/L	<0.50	0.50	5229695	<0.50	0.50	5229695
Total Magnesium (Mg)	ug/L	630	100	5229695	1400	100	5229695
Total Manganese (Mn)	ug/L	<2.0	2.0	5229695	3.9	2.0	5229695
Total Molybdenum (Mo)	ug/L	<2.0	2.0	5229695	<2.0	2.0	5229695
Total Nickel (Ni)	ug/L	<2.0	2.0	5229695	<2.0	2.0	5229695
Total Phosphorus (P)	ug/L	<100	100	5229695	<100	100	5229695
Total Potassium (K)	ug/L	250	100	5229695	600	100	5229695
Total Selenium (Se)	ug/L	<1.0	1.0	5229695	<1.0	1.0	5229695
Total Silver (Ag)	ug/L	<0.10	0.10	5229695	<0.10	0.10	5229695
Total Sodium (Na)	ug/L	3200	100	5229695	6700	100	5229695
Total Strontium (Sr)	ug/L	25	2.0	5229695	47	2.0	5229695
Total Thallium (Tl)	ug/L	<0.10	0.10	5229695	<0.10	0.10	5229695
Total Tin (Sn)	ug/L	<2.0	2.0	5229695	<2.0	2.0	5229695
Total Titanium (Ti)	ug/L	<2.0	2.0	5229695	<2.0	2.0	5229695
Total Uranium (U)	ug/L	0.32	0.10	5229695	0.27	0.10	5229695
Total Vanadium (V)	ug/L	<2.0	2.0	5229695	<2.0	2.0	5229695
Total Zinc (Zn)	ug/L	<5.0	5.0	5229695	<5.0	5.0	5229695

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

CCME PETROLEUM HYDROCARBONS IN WATER (WATER)

Maxxam ID		FJM110			FJM110			FJM111		
Sampling Date		2017/10/17			2017/10/17			2017/10/17		
COC Number		D26105			D26105			D26105		
	UNITS	**WSUPPLY-SW-1**	**RDL**	**QC Batch**	**WSUPPLY-SW-1 Lab-Dup**	**RDL**	**QC Batch**	**WSUPPLY-SW-2**	**RDL**	**QC Batch**
BTEX & F1 Hydrocarbons										
Benzene	ug/L	<0.20	0.20	5236907	<0.20	0.20	5236907	<0.20	0.20	5236907
Toluene	ug/L	<0.20	0.20	5236907	<0.20	0.20	5236907	<0.20	0.20	5236907
Ethylbenzene	ug/L	<0.20	0.20	5236907	<0.20	0.20	5236907	<0.20	0.20	5236907
o-Xylene	ug/L	<0.20	0.20	5236907	<0.20	0.20	5236907	<0.20	0.20	5236907
p+m-Xylene	ug/L	<0.40	0.40	5236907	<0.40	0.40	5236907	<0.40	0.40	5236907
Total Xylenes	ug/L	<0.40	0.40	5236907	<0.40	0.40	5236907	<0.40	0.40	5236907
F1 (C6-C10)	ug/L	<25	25	5236907	<25	25	5236907	<25	25	5236907
F1 (C6-C10) - BTEX	ug/L	<25	25	5236907	<25	25	5236907	<25	25	5236907
F2-F4 Hydrocarbons										
F2 (C10-C16 Hydrocarbons)	ug/L	<100	100	5236936				<100	100	5236936
F3 (C16-C34 Hydrocarbons)	ug/L	<200	200	5236936				<200	200	5236936
F4 (C34-C50 Hydrocarbons)	ug/L	<200	200	5236936				<200	200	5236936
Reached Baseline at C50	ug/L	Yes		5236936				Yes		5236936
Surrogate Recovery (%)										
1,4-Difluorobenzene	%	109		5236907	112		5236907	106		5236907
4-Bromofluorobenzene	%	104		5236907	100		5236907	97		5236907
D10-Ethylbenzene	%	99		5236907	97		5236907	96		5236907
D4-1,2-Dichloroethane	%	104		5236907	107		5236907	99		5236907
o-Terphenyl	%	102		5236936				96		5236936

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

Maxxam Job #: B7N3406
Report Date: 2017/11/27

SNC-Lavalin Inc
Client Project #: 649806
Site Location: CAPE MAKKOVIK
Sampler Initials: JG

CCME PETROLEUM HYDROCARBONS IN WATER (WATER)

Maxxam ID		FJM112	FJM113		FJM114		FJM115	FJM116		
Sampling Date		2017/10/17	2017/10/17		2017/10/17		2017/10/17	2017/10/17		
COC Number		D26105	D26105		D26105		D26105	D26105		
	UNITS	**WSUPPLY-SW-3**	**SW-1**	**QC Batch**	**SW-2**	**QC Batch**	**SW-3**	**BG-SW-1**	**RDL**	**QC Batch**
BTEX & F1 Hydrocarbons										
Benzene	ug/L	<0.20	<0.20	5236907	<0.20	5236907	<0.20	<0.20	0.20	5236907
Toluene	ug/L	<0.20	<0.20	5236907	<0.20	5236907	<0.20	<0.20	0.20	5236907
Ethylbenzene	ug/L	<0.20	<0.20	5236907	<0.20	5236907	<0.20	<0.20	0.20	5236907
o-Xylene	ug/L	<0.20	<0.20	5236907	<0.20	5236907	<0.20	<0.20	0.20	5236907
p+m-Xylene	ug/L	<0.40	<0.40	5236907	<0.40	5236907	<0.40	<0.40	0.40	5236907
Total Xylenes	ug/L	<0.40	<0.40	5236907	<0.40	5236907	<0.40	<0.40	0.40	5236907
F1 (C6-C10)	ug/L	<25	<25	5236907	<25	5236907	<25	<25	25	5236907
F1 (C6-C10) - BTEX	ug/L	<25	<25	5236907	<25	5236907	<25	<25	25	5236907
F2-F4 Hydrocarbons										
F2 (C10-C16 Hydrocarbons)	ug/L	<100	<100	5236936	<100	5239547	<100	<100	100	5236936
F3 (C16-C34 Hydrocarbons)	ug/L	<200	<200	5236936	<200	5239547	<200	<200	200	5236936
F4 (C34-C50 Hydrocarbons)	ug/L	<200	<200	5236936	<200	5239547	<200	<200	200	5236936
Reached Baseline at C50	ug/L	Yes	Yes	5236936	Yes	5239547	Yes	Yes		5236936
Surrogate Recovery (%)										
1,4-Difluorobenzene	%	99	109	5236907	103	5236907	98	108		5236907
4-Bromofluorobenzene	%	97	101	5236907	98	5236907	96	104		5236907
D10-Ethylbenzene	%	98	96	5236907	94	5236907	94	92		5236907
D4-1,2-Dichloroethane	%	101	108	5236907	101	5236907	100	107		5236907
o-Terphenyl	%	99	103	5236936	102	5239547	104	100		5236936

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

CCME PETROLEUM HYDROCARBONS IN WATER (WATER)

Maxxam ID		FJM117	FJM118		FJM119		
Sampling Date		2017/10/17	2017/10/17		2017/10/17		
COC Number		D26105	D26105		D26105		
	UNITS	**BG-SW-2**	**BG-SW-3**	**QC Batch**	**WSUPPLY-SW-4**	**RDL**	**QC Batch**
BTEX & F1 Hydrocarbons							
Benzene	ug/L	<0.20	<0.20	5236907	<0.20	0.20	5236907
Toluene	ug/L	<0.20	<0.20	5236907	<0.20	0.20	5236907
Ethylbenzene	ug/L	<0.20	<0.20	5236907	<0.20	0.20	5236907
o-Xylene	ug/L	<0.20	<0.20	5236907	<0.20	0.20	5236907
p+m-Xylene	ug/L	<0.40	<0.40	5236907	<0.40	0.40	5236907
Total Xylenes	ug/L	<0.40	<0.40	5236907	<0.40	0.40	5236907
F1 (C6-C10)	ug/L	<25	<25	5236907	<25	25	5236907
F1 (C6-C10) - BTEX	ug/L	<25	<25	5236907	<25	25	5236907
F2-F4 Hydrocarbons							
F2 (C10-C16 Hydrocarbons)	ug/L	<100	<100	5236936	<100	100	5239547
F3 (C16-C34 Hydrocarbons)	ug/L	<200	<200	5236936	<200	200	5239547
F4 (C34-C50 Hydrocarbons)	ug/L	<200	<200	5236936	<200	200	5239547
Reached Baseline at C50	ug/L	Yes	Yes	5236936	Yes		5239547
Surrogate Recovery (%)							
1,4-Difluorobenzene	%	104	107	5236907	104		5236907
4-Bromofluorobenzene	%	97	98	5236907	97		5236907
D10-Ethylbenzene	%	93	94	5236907	94		5236907
D4-1,2-Dichloroethane	%	101	106	5236907	103		5236907
o-Terphenyl	%	105	98	5236936	100		5239547

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

MERCURY BY COLD VAPOUR AA (WATER)

Maxxam ID		FJM110	FJM111	FJM112	FJM113	FJM114	FJM115		
Sampling Date		2017/10/17	2017/10/17	2017/10/17	2017/10/17	2017/10/17	2017/10/17		
COC Number		D26105	D26105	D26105	D26105	D26105	D26105		
	UNITS	**WSUPPLY-SW-1**	**WSUPPLY-SW-2**	**WSUPPLY-SW-3**	**SW-1**	**SW-2**	**SW-3**	**RDL**	**QC Batch**
Metals									
Total Mercury (Hg)	ug/L	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	0.013	5225506

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		FJM116	FJM117	FJM118	FJM119		
Sampling Date		2017/10/17	2017/10/17	2017/10/17	2017/10/17		
COC Number		D26105	D26105	D26105	D26105		
	UNITS	**BG-SW-1**	**BG-SW-2**	**BG-SW-3**	**WSUPPLY-SW-4**	**RDL**	**QC Batch**
Metals							
Total Mercury (Hg)	ug/L	<0.013	<0.013	<0.013	<0.013	0.013	5225506

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B7N3406
Report Date: 2017/11/27

SNC-Lavalin Inc
Client Project #: 649806
Site Location: CAPE MAKKOVIK
Sampler Initials: JG

SEMI-VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		FJM110	FJM111	FJM112	FJM113		FJM114		
Sampling Date		2017/10/17	2017/10/17	2017/10/17	2017/10/17		2017/10/17		
COC Number		D26105	D26105	D26105	D26105		D26105		
	UNITS	**WSUPPLY-SW-1**	**WSUPPLY-SW-2**	**WSUPPLY-SW-3**	**SW-1**	**QC Batch**	**SW-2**	**RDL**	**QC Batch**
Polyaromatic Hydrocarbons									
1-Methylnaphthalene	ug/L	<0.050	<0.050	<0.050	<0.050	5225602	<0.050	0.050	5232295
2-Methylnaphthalene	ug/L	<0.050	<0.050	<0.050	<0.050	5225602	<0.050	0.050	5232295
Acenaphthene	ug/L	<0.010	<0.010	<0.010	<0.010	5225602	<0.010	0.010	5232295
Acenaphthylene	ug/L	<0.010	<0.010	<0.010	<0.010	5225602	<0.010	0.010	5232295
Acridine	ug/L	<0.050	<0.050	<0.050	<0.050	5225602	<0.050	0.050	5232295
Anthracene	ug/L	<0.010	<0.010	<0.010	<0.010	5225602	<0.010	0.010	5232295
Benzo(a)anthracene	ug/L	<0.010	<0.010	<0.010	<0.010	5225602	<0.010	0.010	5232295
Benzo(a)pyrene	ug/L	<0.010	<0.010	<0.010	<0.010	5225602	<0.010	0.010	5232295
Benzo(b)fluoranthene	ug/L	<0.010	<0.010	<0.010	<0.010	5225602	<0.010	0.010	5232295
Benzo(b/j)fluoranthene	ug/L	<0.020	<0.020	<0.020	<0.020	5225215	<0.020	0.020	5225215
Benzo(g,h,i)perylene	ug/L	<0.010	<0.010	<0.010	<0.010	5225602	<0.010	0.010	5232295
Benzo(j)fluoranthene	ug/L	<0.010	<0.010	<0.010	<0.010	5225602	<0.010	0.010	5232295
Benzo(k)fluoranthene	ug/L	<0.010	<0.010	<0.010	<0.010	5225602	<0.010	0.010	5232295
Chrysene	ug/L	<0.010	<0.010	<0.010	<0.010	5225602	<0.010	0.010	5232295
Dibenz(a,h)anthracene	ug/L	<0.010	<0.010	<0.010	<0.010	5225602	<0.010	0.010	5232295
Fluoranthene	ug/L	<0.010	<0.010	<0.010	<0.010	5225602	<0.010	0.010	5232295
Fluorene	ug/L	<0.010	<0.010	<0.010	<0.010	5225602	<0.010	0.010	5232295
Indeno(1,2,3-cd)pyrene	ug/L	<0.010	<0.010	<0.010	<0.010	5225602	<0.010	0.010	5232295
Naphthalene	ug/L	<0.20	<0.20	<0.20	<0.20	5225602	<0.20	0.20	5232295
Perylene	ug/L	<0.010	<0.010	<0.010	<0.010	5225602	<0.010	0.010	5232295
Phenanthrene	ug/L	<0.010	<0.010	<0.010	<0.010	5225602	<0.010	0.010	5232295
Pyrene	ug/L	<0.010	<0.010	<0.010	<0.010	5225602	<0.010	0.010	5232295
Quinoline	ug/L	<0.050	<0.050	<0.050	<0.050	5225602	<0.050	0.050	5232295
Surrogate Recovery (%)									
D10-Anthracene	%	89	92	88	92	5225602	81		5232295
D14-Terphenyl	%	86	91	88	88	5225602	72		5232295
D8-Acenaphthylene	%	77	81	78	81	5225602	80		5232295

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

SEMI-VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		FJM114			FJM115	FJM116	FJM117	FJM118		
Sampling Date		2017/10/17			2017/10/17	2017/10/17	2017/10/17	2017/10/17		
COC Number		D26105			D26105	D26105	D26105	D26105		
	UNITS	**SW-2 Lab-Dup**	**RDL**	**QC Batch**	**SW-3**	**BG-SW-1**	**BG-SW-2**	**BG-SW-3**	**RDL**	**QC Batch**
Polyaromatic Hydrocarbons										
1-Methylnaphthalene	ug/L	<0.050	0.050	5232295	<0.050	<0.050	<0.050	<0.050	0.050	5232295
2-Methylnaphthalene	ug/L	<0.050	0.050	5232295	<0.050	<0.050	<0.050	<0.050	0.050	5232295
Acenaphthene	ug/L	<0.010	0.010	5232295	<0.010	<0.010	<0.010	<0.010	0.010	5232295
Acenaphthylene	ug/L	<0.010	0.010	5232295	<0.010	<0.010	<0.010	<0.010	0.010	5232295
Acridine	ug/L	<0.050	0.050	5232295	<0.050	<0.050	<0.050	<0.050	0.050	5232295
Anthracene	ug/L	<0.010	0.010	5232295	<0.010	<0.010	<0.010	<0.010	0.010	5232295
Benzo(a)anthracene	ug/L	<0.010	0.010	5232295	<0.010	<0.010	<0.010	<0.010	0.010	5232295
Benzo(a)pyrene	ug/L	<0.010	0.010	5232295	<0.010	<0.010	<0.010	<0.010	0.010	5232295
Benzo(b)fluoranthene	ug/L	<0.010	0.010	5232295	<0.010	<0.010	<0.010	<0.010	0.010	5232295
Benzo(b/j)fluoranthene	ug/L				<0.020	<0.020	<0.020	<0.020	0.020	5225215
Benzo(g,h,i)perylene	ug/L	<0.010	0.010	5232295	<0.010	<0.010	<0.010	<0.010	0.010	5232295
Benzo(j)fluoranthene	ug/L	<0.010	0.010	5232295	<0.010	<0.010	<0.010	<0.010	0.010	5232295
Benzo(k)fluoranthene	ug/L	<0.010	0.010	5232295	<0.010	<0.010	<0.010	<0.010	0.010	5232295
Chrysene	ug/L	<0.010	0.010	5232295	<0.010	<0.010	<0.010	<0.010	0.010	5232295
Dibenz(a,h)anthracene	ug/L	<0.010	0.010	5232295	<0.010	<0.010	<0.010	<0.010	0.010	5232295
Fluoranthene	ug/L	<0.010	0.010	5232295	<0.010	<0.010	<0.010	<0.010	0.010	5232295
Fluorene	ug/L	<0.010	0.010	5232295	<0.010	<0.010	<0.010	<0.010	0.010	5232295
Indeno(1,2,3-cd)pyrene	ug/L	<0.010	0.010	5232295	<0.010	<0.010	<0.010	<0.010	0.010	5232295
Naphthalene	ug/L	<0.20	0.20	5232295	<0.20	<0.20	<0.20	<0.20	0.20	5232295
Perylene	ug/L	<0.010	0.010	5232295	<0.010	<0.010	<0.010	<0.010	0.010	5232295
Phenanthrene	ug/L	<0.010	0.010	5232295	<0.010	<0.010	<0.010	<0.010	0.010	5232295
Pyrene	ug/L	<0.010	0.010	5232295	<0.010	<0.010	<0.010	<0.010	0.010	5232295
Quinoline	ug/L	<0.050	0.050	5232295	<0.050	<0.050	<0.050	<0.050	0.050	5232295
Surrogate Recovery (%)										
D10-Anthracene	%	75		5232295	82	89	88	90		5232295
D14-Terphenyl	%	75		5232295	75	76	76	71		5232295
D8-Acenaphthylene	%	77		5232295	81	84	87	80		5232295

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

Maxxam Job #: B7N3406
Report Date: 2017/11/27

SNC-Lavalin Inc
Client Project #: 649806
Site Location: CAPE MAKKOVIK
Sampler Initials: JG

SEMI-VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		FJM119		
Sampling Date		2017/10/17		
COC Number		D26105		
	UNITS	**WSUPPLY-SW-4**	**RDL**	**QC Batch**
Polyaromatic Hydrocarbons				
1-Methylnaphthalene	ug/L	<0.050	0.050	5232295
2-Methylnaphthalene	ug/L	<0.050	0.050	5232295
Acenaphthene	ug/L	<0.010	0.010	5232295
Acenaphthylene	ug/L	<0.010	0.010	5232295
Acridine	ug/L	<0.050	0.050	5232295
Anthracene	ug/L	<0.010	0.010	5232295
Benzo(a)anthracene	ug/L	<0.010	0.010	5232295
Benzo(a)pyrene	ug/L	<0.010	0.010	5232295
Benzo(b)fluoranthene	ug/L	<0.010	0.010	5232295
Benzo(b/j)fluoranthene	ug/L	<0.020	0.020	5225215
Benzo(g,h,i)perylene	ug/L	<0.010	0.010	5232295
Benzo(j)fluoranthene	ug/L	<0.010	0.010	5232295
Benzo(k)fluoranthene	ug/L	<0.010	0.010	5232295
Chrysene	ug/L	<0.010	0.010	5232295
Dibenz(a,h)anthracene	ug/L	<0.010	0.010	5232295
Fluoranthene	ug/L	<0.010	0.010	5232295
Fluorene	ug/L	<0.010	0.010	5232295
Indeno(1,2,3-cd)pyrene	ug/L	<0.010	0.010	5232295
Naphthalene	ug/L	<0.20	0.20	5232295
Perylene	ug/L	<0.010	0.010	5232295
Phenanthrene	ug/L	<0.010	0.010	5232295
Pyrene	ug/L	<0.010	0.010	5232295
Quinoline	ug/L	<0.050	0.050	5232295
Surrogate Recovery (%)				
D10-Anthracene	%	86		5232295
D14-Terphenyl	%	75		5232295
D8-Acenaphthylene	%	86		5232295

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

GENERAL COMMENTS

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

Package 1	7.2°C

Revised Report: issued report with <DL as per request from Jason. SMS 2017/11/27

Sample FJM110 [WSUPPLY-SW-1] : RCAp Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Revised Report: issued report with <DL as per request from Jason. HWS Nov 21/17

Sample FJM113 [SW-1] : RCAp Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Results relate only to the items tested.

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
5225506	ARS	Matrix Spike	Total Mercury (Hg)	2017/10/24		106	%	80 - 120
5225506	ARS	Spiked Blank	Total Mercury (Hg)	2017/10/24		106	%	80 - 120
5225506	ARS	Method Blank	Total Mercury (Hg)	2017/10/24	<0.013		ug/L	
5225506	ARS	RPD	Total Mercury (Hg)	2017/10/24	NC		%	20
5225602	GTH	Matrix Spike	Benzo(j)fluoranthene	2017/10/27		74	%	30 - 130
			D10-Anthracene	2017/10/27		89	%	50 - 130
			D14-Terphenyl	2017/10/27		74	%	50 - 130
			D8-Acenaphthylene	2017/10/27		76	%	50 - 130
			1-Methylnaphthalene	2017/10/27		NC	%	30 - 130
			2-Methylnaphthalene	2017/10/27		NC	%	30 - 130
			Acenaphthene	2017/10/27		56	%	30 - 130
			Acenaphthylene	2017/10/27		70	%	30 - 130
			Acridine	2017/10/27		94	%	30 - 130
			Anthracene	2017/10/27		77	%	30 - 130
			Benzo(a)anthracene	2017/10/27		79	%	30 - 130
			Benzo(a)pyrene	2017/10/27		72	%	30 - 130
			Benzo(b)fluoranthene	2017/10/27		69	%	30 - 130
			Benzo(g,h,i)perylene	2017/10/27		69	%	30 - 130
			Benzo(k)fluoranthene	2017/10/27		71	%	30 - 130
			Chrysene	2017/10/27		72	%	30 - 130
			Dibenz(a,h)anthracene	2017/10/27		61	%	30 - 130
			Fluoranthene	2017/10/27		85	%	30 - 130
			Fluorene	2017/10/27		NC	%	30 - 130
			Indeno(1,2,3-cd)pyrene	2017/10/27		65	%	30 - 130
			Naphthalene	2017/10/27		NC	%	30 - 130
			Perylene	2017/10/27		70	%	30 - 130
			Phenanthrene	2017/10/27		71	%	30 - 130
			Pyrene	2017/10/27		82	%	30 - 130
			Quinoline	2017/10/27		90	%	30 - 130
5225602	GTH	Spiked Blank	Benzo(j)fluoranthene	2017/10/26		85	%	30 - 130
			D10-Anthracene	2017/10/26		91	%	50 - 130
			D14-Terphenyl	2017/10/26		92	%	50 - 130
			D8-Acenaphthylene	2017/10/26		81	%	50 - 130
			1-Methylnaphthalene	2017/10/26		73	%	30 - 130
			2-Methylnaphthalene	2017/10/26		77	%	30 - 130
			Acenaphthene	2017/10/26		81	%	30 - 130
			Acenaphthylene	2017/10/26		85	%	30 - 130
			Acridine	2017/10/26		76	%	30 - 130
			Anthracene	2017/10/26		85	%	30 - 130
			Benzo(a)anthracene	2017/10/26		89	%	30 - 130
			Benzo(a)pyrene	2017/10/26		82	%	30 - 130
			Benzo(b)fluoranthene	2017/10/26		80	%	30 - 130
			Benzo(g,h,i)perylene	2017/10/26		90	%	30 - 130
			Benzo(k)fluoranthene	2017/10/26		82	%	30 - 130
			Chrysene	2017/10/26		89	%	30 - 130
			Dibenz(a,h)anthracene	2017/10/26		83	%	30 - 130
			Fluoranthene	2017/10/26		87	%	30 - 130
			Fluorene	2017/10/26		80	%	30 - 130
			Indeno(1,2,3-cd)pyrene	2017/10/26		86	%	30 - 130
			Naphthalene	2017/10/26		76	%	30 - 130
			Perylene	2017/10/26		83	%	30 - 130
			Phenanthrene	2017/10/26		80	%	30 - 130

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Pyrene	2017/10/26		85	%	30 - 130
			Quinoline	2017/10/26		63	%	30 - 130
5225602	GTH	Method Blank	Benzo(j)fluoranthene	2017/10/26	<0.010		ug/L	
			D10-Anthracene	2017/10/26		97	%	50 - 130
			D14-Terphenyl	2017/10/26		94	%	50 - 130
			D8-Acenaphthylene	2017/10/26		83	%	50 - 130
			1-Methylnaphthalene	2017/10/26	<0.050		ug/L	
			2-Methylnaphthalene	2017/10/26	<0.050		ug/L	
			Acenaphthene	2017/10/26	<0.010		ug/L	
			Acenaphthylene	2017/10/26	<0.010		ug/L	
			Acridine	2017/10/26	<0.050		ug/L	
			Anthracene	2017/10/26	<0.010		ug/L	
			Benzo(a)anthracene	2017/10/26	<0.010		ug/L	
			Benzo(a)pyrene	2017/10/26	<0.010		ug/L	
			Benzo(b)fluoranthene	2017/10/26	<0.010		ug/L	
			Benzo(g,h,i)perylene	2017/10/26	<0.010		ug/L	
			Benzo(k)fluoranthene	2017/10/26	<0.010		ug/L	
			Chrysene	2017/10/26	<0.010		ug/L	
			Dibenz(a,h)anthracene	2017/10/26	<0.010		ug/L	
			Fluoranthene	2017/10/26	<0.010		ug/L	
			Fluorene	2017/10/26	<0.010		ug/L	
			Indeno(1,2,3-cd)pyrene	2017/10/26	<0.010		ug/L	
			Naphthalene	2017/10/26	<0.20		ug/L	
			Perylene	2017/10/26	<0.010		ug/L	
			Phenanthrene	2017/10/26	<0.010		ug/L	
			Pyrene	2017/10/26	<0.010		ug/L	
			Quinoline	2017/10/26	<0.050		ug/L	
5225602	GTH	RPD	1-Methylnaphthalene	2017/10/26	14		%	40
			2-Methylnaphthalene	2017/10/26	1.4		%	40
			Acenaphthene	2017/10/26	4.8		%	40
			Acenaphthylene	2017/10/26	NC (1)		%	40
			Acridine	2017/10/26	NC		%	40
			Anthracene	2017/10/26	NC (1)		%	40
			Benzo(a)anthracene	2017/10/26	NC		%	40
			Benzo(a)pyrene	2017/10/26	NC		%	40
			Benzo(b)fluoranthene	2017/10/26	NC		%	40
			Benzo(g,h,i)perylene	2017/10/26	NC		%	40
			Benzo(k)fluoranthene	2017/10/26	NC		%	40
			Chrysene	2017/10/26	NC		%	40
			Dibenz(a,h)anthracene	2017/10/26	NC		%	40
			Fluoranthene	2017/10/26	NC		%	40
			Fluorene	2017/10/26	6.7		%	40
			Indeno(1,2,3-cd)pyrene	2017/10/26	NC		%	40
			Naphthalene	2017/10/26	NC		%	40
			Perylene	2017/10/26	NC		%	40
			Phenanthrene	2017/10/26	NC (1)		%	40
			Pyrene	2017/10/26	NC		%	40
			Quinoline	2017/10/26	NC (1)		%	40
5227318	JMV	QC Standard	pH	2017/10/24		100	%	97 - 103
5227318	JMV	RPD [FJM117-01]	pH	2017/10/24	0.72		%	N/A
5227319	JMV	Spiked Blank	Conductivity	2017/10/24		102	%	80 - 120

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
5227319	JMV	Method Blank	Conductivity	2017/10/24	1.4, RDL=1.0		uS/cm	
5227319	JMV	RPD [FJM117-01]	Conductivity	2017/10/24	0.14		%	25
5227361	JMV	QC Standard	Turbidity	2017/10/24		94	%	80 - 120
5227361	JMV	Spiked Blank	Turbidity	2017/10/24		93	%	80 - 120
5227361	JMV	Method Blank	Turbidity	2017/10/24	<0.10		NTU	
5227361	JMV	RPD [FJM117-01]	Turbidity	2017/10/24	9.0		%	20
5227364	JMV	QC Standard	Turbidity	2017/10/24		95	%	80 - 120
5227364	JMV	Spiked Blank	Turbidity	2017/10/24		92	%	80 - 120
5227364	JMV	Method Blank	Turbidity	2017/10/24	<0.10		NTU	
5227364	JMV	RPD	Turbidity	2017/10/24	2.7		%	20
5229695	BAN	Matrix Spike	Total Aluminum (Al)	2017/10/25		95	%	80 - 120
			Total Antimony (Sb)	2017/10/25		102	%	80 - 120
			Total Arsenic (As)	2017/10/25		98	%	80 - 120
			Total Barium (Ba)	2017/10/25		97	%	80 - 120
			Total Beryllium (Be)	2017/10/25		101	%	80 - 120
			Total Bismuth (Bi)	2017/10/25		102	%	80 - 120
			Total Boron (B)	2017/10/25		100	%	80 - 120
			Total Cadmium (Cd)	2017/10/25		99	%	80 - 120
			Total Calcium (Ca)	2017/10/25		102	%	80 - 120
			Total Chromium (Cr)	2017/10/25		100	%	80 - 120
			Total Cobalt (Co)	2017/10/25		100	%	80 - 120
			Total Copper (Cu)	2017/10/25		100	%	80 - 120
			Total Iron (Fe)	2017/10/25		94	%	80 - 120
			Total Lead (Pb)	2017/10/25		99	%	80 - 120
			Total Magnesium (Mg)	2017/10/25		99	%	80 - 120
			Total Manganese (Mn)	2017/10/25		99	%	80 - 120
			Total Molybdenum (Mo)	2017/10/25		104	%	80 - 120
			Total Nickel (Ni)	2017/10/25		100	%	80 - 120
			Total Phosphorus (P)	2017/10/25		103	%	80 - 120
			Total Potassium (K)	2017/10/25		101	%	80 - 120
			Total Selenium (Se)	2017/10/25		100	%	80 - 120
			Total Silver (Ag)	2017/10/25		99	%	80 - 120
			Total Sodium (Na)	2017/10/25		95	%	80 - 120
			Total Strontium (Sr)	2017/10/25		101	%	80 - 120
			Total Thallium (Tl)	2017/10/25		103	%	80 - 120
			Total Tin (Sn)	2017/10/25		104	%	80 - 120
			Total Titanium (Ti)	2017/10/25		103	%	80 - 120
			Total Uranium (U)	2017/10/25		104	%	80 - 120
			Total Vanadium (V)	2017/10/25		102	%	80 - 120
			Total Zinc (Zn)	2017/10/25		97	%	80 - 120
5229695	BAN	Spiked Blank	Total Aluminum (Al)	2017/10/25		102	%	80 - 120
			Total Antimony (Sb)	2017/10/25		101	%	80 - 120
			Total Arsenic (As)	2017/10/25		97	%	80 - 120
			Total Barium (Ba)	2017/10/25		97	%	80 - 120
			Total Beryllium (Be)	2017/10/25		100	%	80 - 120
			Total Bismuth (Bi)	2017/10/25		102	%	80 - 120
			Total Boron (B)	2017/10/25		99	%	80 - 120
			Total Cadmium (Cd)	2017/10/25		99	%	80 - 120
			Total Calcium (Ca)	2017/10/25		101	%	80 - 120
			Total Chromium (Cr)	2017/10/25		100	%	80 - 120
			Total Cobalt (Co)	2017/10/25		100	%	80 - 120

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Copper (Cu)	2017/10/25		100	%	80 - 120
			Total Iron (Fe)	2017/10/25		102	%	80 - 120
			Total Lead (Pb)	2017/10/25		98	%	80 - 120
			Total Magnesium (Mg)	2017/10/25		102	%	80 - 120
			Total Manganese (Mn)	2017/10/25		102	%	80 - 120
			Total Molybdenum (Mo)	2017/10/25		101	%	80 - 120
			Total Nickel (Ni)	2017/10/25		101	%	80 - 120
			Total Phosphorus (P)	2017/10/25		103	%	80 - 120
			Total Potassium (K)	2017/10/25		100	%	80 - 120
			Total Selenium (Se)	2017/10/25		98	%	80 - 120
			Total Silver (Ag)	2017/10/25		99	%	80 - 120
			Total Sodium (Na)	2017/10/25		98	%	80 - 120
			Total Strontium (Sr)	2017/10/25		100	%	80 - 120
			Total Thallium (Tl)	2017/10/25		102	%	80 - 120
			Total Tin (Sn)	2017/10/25		104	%	80 - 120
			Total Titanium (Ti)	2017/10/25		103	%	80 - 120
			Total Uranium (U)	2017/10/25		103	%	80 - 120
			Total Vanadium (V)	2017/10/25		102	%	80 - 120
			Total Zinc (Zn)	2017/10/25		99	%	80 - 120
5229695	BAN	Method Blank	Total Aluminum (Al)	2017/10/25	<5.0		ug/L	
			Total Antimony (Sb)	2017/10/25	<1.0		ug/L	
			Total Arsenic (As)	2017/10/25	<1.0		ug/L	
			Total Barium (Ba)	2017/10/25	<1.0		ug/L	
			Total Beryllium (Be)	2017/10/25	<1.0		ug/L	
			Total Bismuth (Bi)	2017/10/25	<2.0		ug/L	
			Total Boron (B)	2017/10/25	<50		ug/L	
			Total Cadmium (Cd)	2017/10/25	<0.010		ug/L	
			Total Calcium (Ca)	2017/10/25	<100		ug/L	
			Total Chromium (Cr)	2017/10/25	<1.0		ug/L	
			Total Cobalt (Co)	2017/10/25	<0.40		ug/L	
			Total Copper (Cu)	2017/10/25	<2.0		ug/L	
			Total Iron (Fe)	2017/10/25	<50		ug/L	
			Total Lead (Pb)	2017/10/25	<0.50		ug/L	
			Total Magnesium (Mg)	2017/10/25	<100		ug/L	
			Total Manganese (Mn)	2017/10/25	<2.0		ug/L	
			Total Molybdenum (Mo)	2017/10/25	<2.0		ug/L	
			Total Nickel (Ni)	2017/10/25	<2.0		ug/L	
			Total Phosphorus (P)	2017/10/25	<100		ug/L	
			Total Potassium (K)	2017/10/25	<100		ug/L	
			Total Selenium (Se)	2017/10/25	<1.0		ug/L	
			Total Silver (Ag)	2017/10/25	<0.10		ug/L	
			Total Sodium (Na)	2017/10/25	<100		ug/L	
			Total Strontium (Sr)	2017/10/25	<2.0		ug/L	
			Total Thallium (Tl)	2017/10/25	<0.10		ug/L	
			Total Tin (Sn)	2017/10/25	<2.0		ug/L	
			Total Titanium (Ti)	2017/10/25	<2.0		ug/L	
			Total Uranium (U)	2017/10/25	<0.10		ug/L	
			Total Vanadium (V)	2017/10/25	<2.0		ug/L	
			Total Zinc (Zn)	2017/10/25	<5.0		ug/L	
5229695	BAN	RPD	Total Iron (Fe)	2017/10/25	0.65		%	20
5229705	JMV	QC Standard	pH	2017/10/25		100	%	97 - 103
5229705	JMV	RPD	pH	2017/10/25	0.71		%	N/A

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
5229706	JMV	Spiked Blank	Conductivity	2017/10/25		100	%	80 - 120
5229706	JMV	Method Blank	Conductivity	2017/10/25	<1.0		uS/cm	
5229706	JMV	RPD	Conductivity	2017/10/25	0.53		%	25
5229749	JMV	QC Standard	Turbidity	2017/10/25		94	%	80 - 120
5229749	JMV	Spiked Blank	Turbidity	2017/10/25		92	%	80 - 120
5229749	JMV	Method Blank	Turbidity	2017/10/25	<0.10		NTU	
5229749	JMV	RPD	Turbidity	2017/10/25	4.7		%	20
5232206	NRG	Matrix Spike [FJM111-03]	Nitrogen (Ammonia Nitrogen)	2017/10/27		105	%	80 - 120
5232206	NRG	Spiked Blank	Nitrogen (Ammonia Nitrogen)	2017/10/26		105	%	80 - 120
5232206	NRG	Method Blank	Nitrogen (Ammonia Nitrogen)	2017/10/26	<0.050		mg/L	
5232206	NRG	RPD [FJM111-03]	Nitrogen (Ammonia Nitrogen)	2017/10/27	NC		%	20
5232295	GTH	Matrix Spike [FJM116-04]	Benzo(j)fluoranthene	2017/10/31		58	%	30 - 130
			D10-Anthracene	2017/10/31		78	%	50 - 130
			D14-Terphenyl	2017/10/31		89	%	50 - 130
			D8-Acenaphthylene	2017/10/31		76	%	50 - 130
			1-Methylnaphthalene	2017/10/31		54	%	30 - 130
			2-Methylnaphthalene	2017/10/31		60	%	30 - 130
			Acenaphthene	2017/10/31		65	%	30 - 130
			Acenaphthylene	2017/10/31		66	%	30 - 130
			Acridine	2017/10/31		67	%	30 - 130
			Anthracene	2017/10/31		66	%	30 - 130
			Benzo(a)anthracene	2017/10/31		73	%	30 - 130
			Benzo(a)pyrene	2017/10/31		57	%	30 - 130
			Benzo(b)fluoranthene	2017/10/31		63	%	30 - 130
			Benzo(g,h,i)perylene	2017/10/31		65	%	30 - 130
			Benzo(k)fluoranthene	2017/10/31		52	%	30 - 130
			Chrysene	2017/10/31		75	%	30 - 130
			Dibenz(a,h)anthracene	2017/10/31		62	%	30 - 130
			Fluoranthene	2017/10/31		72	%	30 - 130
			Fluorene	2017/10/31		67	%	30 - 130
			Indeno(1,2,3-cd)pyrene	2017/10/31		62	%	30 - 130
			Naphthalene	2017/10/31		55	%	30 - 130
			Perylene	2017/10/31		59	%	30 - 130
			Phenanthrene	2017/10/31		64	%	30 - 130
			Pyrene	2017/10/31		71	%	30 - 130
			Quinoline	2017/10/31		48 (2)	%	30 - 130
5232295	GTH	Spiked Blank	Benzo(j)fluoranthene	2017/10/28		72	%	30 - 130
			D10-Anthracene	2017/10/28		89	%	50 - 130
			D14-Terphenyl	2017/10/28		84	%	50 - 130
			D8-Acenaphthylene	2017/10/28		85	%	50 - 130
			1-Methylnaphthalene	2017/10/28		64	%	30 - 130
			2-Methylnaphthalene	2017/10/28		68	%	30 - 130
			Acenaphthene	2017/10/28		74	%	30 - 130
			Acenaphthylene	2017/10/28		73	%	30 - 130
			Acridine	2017/10/28		59	%	30 - 130
			Anthracene	2017/10/28		71	%	30 - 130
			Benzo(a)anthracene	2017/10/28		69	%	30 - 130
			Benzo(a)pyrene	2017/10/28		66	%	30 - 130
			Benzo(b)fluoranthene	2017/10/28		65	%	30 - 130
			Benzo(g,h,i)perylene	2017/10/28		68	%	30 - 130
			Benzo(k)fluoranthene	2017/10/28		68	%	30 - 130
			Chrysene	2017/10/28		69	%	30 - 130

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dibenz(a,h)anthracene	2017/10/28		58	%	30 - 130
			Fluoranthene	2017/10/28		71	%	30 - 130
			Fluorene	2017/10/28		71	%	30 - 130
			Indeno(1,2,3-cd)pyrene	2017/10/28		64	%	30 - 130
			Naphthalene	2017/10/28		68	%	30 - 130
			Perylene	2017/10/28		66	%	30 - 130
			Phenanthrene	2017/10/28		71	%	30 - 130
			Pyrene	2017/10/28		71	%	30 - 130
			Quinoline	2017/10/28		51	%	30 - 130
5232295	GTH	Method Blank	Benzo(j)fluoranthene	2017/10/28	<0.010		ug/L	
			D10-Anthracene	2017/10/28		71	%	50 - 130
			D14-Terphenyl	2017/10/28		70	%	50 - 130
			D8-Acenaphthylene	2017/10/28		70	%	50 - 130
			1-Methylnaphthalene	2017/10/28	<0.050		ug/L	
			2-Methylnaphthalene	2017/10/28	<0.050		ug/L	
			Acenaphthene	2017/10/28	<0.010		ug/L	
			Acenaphthylene	2017/10/28	<0.010		ug/L	
			Acridine	2017/10/28	<0.050		ug/L	
			Anthracene	2017/10/28	<0.010		ug/L	
			Benzo(a)anthracene	2017/10/28	<0.010		ug/L	
			Benzo(a)pyrene	2017/10/28	<0.010		ug/L	
			Benzo(b)fluoranthene	2017/10/28	<0.010		ug/L	
			Benzo(g,h,i)perylene	2017/10/28	<0.010		ug/L	
			Benzo(k)fluoranthene	2017/10/28	<0.010		ug/L	
			Chrysene	2017/10/28	<0.010		ug/L	
			Dibenz(a,h)anthracene	2017/10/28	<0.010		ug/L	
			Fluoranthene	2017/10/28	<0.010		ug/L	
			Fluorene	2017/10/28	<0.010		ug/L	
			Indeno(1,2,3-cd)pyrene	2017/10/28	<0.010		ug/L	
			Naphthalene	2017/10/28	<0.20		ug/L	
			Perylene	2017/10/28	<0.010		ug/L	
			Phenanthrene	2017/10/28	<0.010		ug/L	
			Pyrene	2017/10/28	<0.010		ug/L	
			Quinoline	2017/10/28	<0.050		ug/L	
5232295	GTH	RPD [FJM114-04]	Benzo(j)fluoranthene	2017/10/28	NC		%	40
			1-Methylnaphthalene	2017/10/28	NC		%	40
			2-Methylnaphthalene	2017/10/28	NC		%	40
			Acenaphthene	2017/10/28	NC		%	40
			Acenaphthylene	2017/10/28	NC		%	40
			Acridine	2017/10/28	NC		%	40
			Anthracene	2017/10/28	NC		%	40
			Benzo(a)anthracene	2017/10/28	NC		%	40
			Benzo(a)pyrene	2017/10/28	NC		%	40
			Benzo(b)fluoranthene	2017/10/28	NC		%	40
			Benzo(g,h,i)perylene	2017/10/28	NC		%	40
			Benzo(k)fluoranthene	2017/10/28	NC		%	40
			Chrysene	2017/10/28	NC		%	40
			Dibenz(a,h)anthracene	2017/10/28	NC		%	40
			Fluoranthene	2017/10/28	NC		%	40
			Fluorene	2017/10/28	NC		%	40
			Indeno(1,2,3-cd)pyrene	2017/10/28	NC		%	40
			Naphthalene	2017/10/28	NC		%	40

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Perylene	2017/10/28	NC		%	40
			Phenanthrene	2017/10/28	NC		%	40
			Pyrene	2017/10/28	NC		%	40
			Quinoline	2017/10/28	NC		%	40
5232354	NRG	Matrix Spike	Total Alkalinity (Total as CaCO3)	2017/10/26		85	%	80 - 120
5232354	NRG	Spiked Blank	Total Alkalinity (Total as CaCO3)	2017/10/26		106	%	80 - 120
5232354	NRG	Method Blank	Total Alkalinity (Total as CaCO3)	2017/10/26	<5.0		mg/L	
5232354	NRG	RPD	Total Alkalinity (Total as CaCO3)	2017/10/26	NC		%	25
5232360	NRG	Matrix Spike	Dissolved Chloride (Cl)	2017/10/30		104	%	80 - 120
5232360	NRG	QC Standard	Dissolved Chloride (Cl)	2017/10/30		107	%	80 - 120
5232360	NRG	Spiked Blank	Dissolved Chloride (Cl)	2017/10/30		105	%	80 - 120
5232360	NRG	Method Blank	Dissolved Chloride (Cl)	2017/10/30	<1.0		mg/L	
5232360	NRG	RPD	Dissolved Chloride (Cl)	2017/10/30	3.5		%	25
5232362	NRG	Matrix Spike	Dissolved Sulphate (SO4)	2017/10/27		94	%	80 - 120
5232362	NRG	Spiked Blank	Dissolved Sulphate (SO4)	2017/10/27		99	%	80 - 120
5232362	NRG	Method Blank	Dissolved Sulphate (SO4)	2017/10/27	<2.0		mg/L	
5232362	NRG	RPD	Dissolved Sulphate (SO4)	2017/10/27	NC		%	25
5232364	NRG	Matrix Spike	Reactive Silica (SiO2)	2017/10/26		96	%	80 - 120
5232364	NRG	Spiked Blank	Reactive Silica (SiO2)	2017/10/27		94	%	80 - 120
5232364	NRG	Method Blank	Reactive Silica (SiO2)	2017/10/27	<0.50		mg/L	
5232364	NRG	RPD	Reactive Silica (SiO2)	2017/10/26	0.64		%	25
5232365	NRG	Spiked Blank	Colour	2017/10/30		100	%	80 - 120
5232365	NRG	Method Blank	Colour	2017/10/30	<5.0		TCU	
5232365	NRG	RPD	Colour	2017/10/30	3.8 (3)		%	20
5232372	MCN	Matrix Spike	Orthophosphate (P)	2017/10/30		93	%	80 - 120
5232372	MCN	Spiked Blank	Orthophosphate (P)	2017/10/30		102	%	80 - 120
5232372	MCN	Method Blank	Orthophosphate (P)	2017/10/30	<0.010		mg/L	
5232372	MCN	RPD	Orthophosphate (P)	2017/10/30	NC		%	25
5232379	NRG	Matrix Spike	Nitrate + Nitrite (N)	2017/10/30		105	%	80 - 120
5232379	NRG	Spiked Blank	Nitrate + Nitrite (N)	2017/10/30		101	%	80 - 120
5232379	NRG	Method Blank	Nitrate + Nitrite (N)	2017/10/30	<0.050		mg/L	
5232379	NRG	RPD	Nitrate + Nitrite (N)	2017/10/30	0.84		%	25
5232383	NRG	Matrix Spike	Nitrite (N)	2017/10/27		79 (4)	%	80 - 120
5232383	NRG	Spiked Blank	Nitrite (N)	2017/10/27		98	%	80 - 120
5232383	NRG	Method Blank	Nitrite (N)	2017/10/27	<0.010		mg/L	
5232383	NRG	RPD	Nitrite (N)	2017/10/27	NC		%	25
5235399	SSI	Matrix Spike	Total Organic Carbon (C)	2017/10/27		102	%	80 - 120
5235399	SSI	Spiked Blank	Total Organic Carbon (C)	2017/10/27		105	%	80 - 120
5235399	SSI	Method Blank	Total Organic Carbon (C)	2017/10/27	<0.50		mg/L	
5235399	SSI	RPD	Total Organic Carbon (C)	2017/10/27	3.4		%	20
5235401	SSI	Matrix Spike	Total Organic Carbon (C)	2017/10/27		100	%	80 - 120
5235401	SSI	Spiked Blank	Total Organic Carbon (C)	2017/10/27		103	%	80 - 120
5235401	SSI	Method Blank	Total Organic Carbon (C)	2017/10/27	<0.50		mg/L	
5235401	SSI	RPD	Total Organic Carbon (C)	2017/10/27	2.4		%	20
5236907	AGA	Matrix Spike [FJM110-06]	1,4-Difluorobenzene	2017/10/28		104	%	70 - 130
			4-Bromofluorobenzene	2017/10/28		103	%	70 - 130
			D10-Ethylbenzene	2017/10/28		101	%	70 - 130
			D4-1,2-Dichloroethane	2017/10/28		102	%	70 - 130
			Benzene	2017/10/28		108	%	70 - 130
			Toluene	2017/10/28		106	%	70 - 130
			Ethylbenzene	2017/10/28		106	%	70 - 130
			o-Xylene	2017/10/28		108	%	70 - 130

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			p+m-Xylene	2017/10/28		106	%	70 - 130
			F1 (C6-C10)	2017/10/28		109	%	70 - 130
5236907	AGA	Spiked Blank	1,4-Difluorobenzene	2017/10/28		104	%	70 - 130
			4-Bromofluorobenzene	2017/10/28		101	%	70 - 130
			D10-Ethylbenzene	2017/10/28		98	%	70 - 130
			D4-1,2-Dichloroethane	2017/10/28		104	%	70 - 130
			Benzene	2017/10/28		106	%	70 - 130
			Toluene	2017/10/28		105	%	70 - 130
			Ethylbenzene	2017/10/28		102	%	70 - 130
			o-Xylene	2017/10/28		108	%	70 - 130
			p+m-Xylene	2017/10/28		102	%	70 - 130
			F1 (C6-C10)	2017/10/28		110	%	70 - 130
5236907	AGA	Method Blank	1,4-Difluorobenzene	2017/10/28		105	%	70 - 130
			4-Bromofluorobenzene	2017/10/28		99	%	70 - 130
			D10-Ethylbenzene	2017/10/28		103	%	70 - 130
			D4-1,2-Dichloroethane	2017/10/28		103	%	70 - 130
			Benzene	2017/10/28	<0.20		ug/L	
			Toluene	2017/10/28	<0.20		ug/L	
			Ethylbenzene	2017/10/28	<0.20		ug/L	
			o-Xylene	2017/10/28	<0.20		ug/L	
			p+m-Xylene	2017/10/28	<0.40		ug/L	
			Total Xylenes	2017/10/28	<0.40		ug/L	
			F1 (C6-C10)	2017/10/28	<25		ug/L	
			F1 (C6-C10) - BTEX	2017/10/28	<25		ug/L	
5236907	AGA	RPD [FJM110-06]	Benzene	2017/10/28	NC		%	30
			Toluene	2017/10/28	NC		%	30
			Ethylbenzene	2017/10/28	NC		%	30
			o-Xylene	2017/10/28	NC		%	30
			p+m-Xylene	2017/10/28	NC		%	30
			Total Xylenes	2017/10/28	NC		%	30
			F1 (C6-C10)	2017/10/28	NC		%	30
			F1 (C6-C10) - BTEX	2017/10/28	NC		%	30
5236936	KLI	Matrix Spike	o-Terphenyl	2017/10/30		107	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2017/10/30		NC	%	50 - 130
			F3 (C16-C34 Hydrocarbons)	2017/10/30		NC	%	50 - 130
			F4 (C34-C50 Hydrocarbons)	2017/10/30		110	%	50 - 130
5236936	KLI	Spiked Blank	o-Terphenyl	2017/10/30		104	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2017/10/30		107	%	60 - 130
			F3 (C16-C34 Hydrocarbons)	2017/10/30		105	%	60 - 130
			F4 (C34-C50 Hydrocarbons)	2017/10/30		105	%	60 - 130
5236936	KLI	Method Blank	o-Terphenyl	2017/10/30		98	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2017/10/30	<100		ug/L	
			F3 (C16-C34 Hydrocarbons)	2017/10/30	<200		ug/L	
			F4 (C34-C50 Hydrocarbons)	2017/10/30	<200		ug/L	
5236936	KLI	RPD	F2 (C10-C16 Hydrocarbons)	2017/10/30	0.088		%	30
			F3 (C16-C34 Hydrocarbons)	2017/10/30	NC		%	30
			F4 (C34-C50 Hydrocarbons)	2017/10/30	NC		%	30
5239547	ZZ	Matrix Spike	o-Terphenyl	2017/10/31		102	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2017/10/31		100	%	50 - 130
			F3 (C16-C34 Hydrocarbons)	2017/10/31		99	%	50 - 130
			F4 (C34-C50 Hydrocarbons)	2017/10/31		97	%	50 - 130
5239547	ZZ	Spiked Blank	o-Terphenyl	2017/10/31		101	%	60 - 130

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			F2 (C10-C16 Hydrocarbons)	2017/10/31		97	%	60 - 130
			F3 (C16-C34 Hydrocarbons)	2017/10/31		100	%	60 - 130
			F4 (C34-C50 Hydrocarbons)	2017/10/31		96	%	60 - 130
5239547	ZZ	Method Blank	o-Terphenyl	2017/10/31		97	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2017/10/31	<100		ug/L	
			F3 (C16-C34 Hydrocarbons)	2017/10/31	<200		ug/L	
			F4 (C34-C50 Hydrocarbons)	2017/10/31	<200		ug/L	
5239547	ZZ	RPD	F2 (C10-C16 Hydrocarbons)	2017/10/31	NC		%	30
			F3 (C16-C34 Hydrocarbons)	2017/10/31	NC		%	30
			F4 (C34-C50 Hydrocarbons)	2017/10/31	NC		%	30

N/A = Not Applicable

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

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

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

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

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

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

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

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

(1) Elevated PAH RDL(s) due to matrix / co-extractive interference.

(2) Matrix Spike: < 10 % of compounds in multi-component analysis in violation.

(3) Elevated reporting limit due to sample matrix.

(4) Poor spike recovery due to sample matrix, results confirmed by repeat analysis.

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

Eva

Eva Pranjic

Ewa Pranjic, M.Sc., C.Chem, Scientific Specialist

RoseMarie MacDonald

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.

Your Project #: 649806
Site Location: CAPE MAKKOVIK

Attention: Jason Green

SNC-Lavalin Inc
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Your C.O.C. #: D26100, D26101, D26096, D26097, D26106, D26107, D26102, D26099, D26098, D26104

Report Date: 2018/03/29
Report #: R5058495
Version: 5 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B7N4148
Received: 2017/10/20, 10:13

Sample Matrix: Ground Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Benzo(b/j)fluoranthene Sum (water) (1)	1	N/A	2017/10/31	N/A	Auto Calc.
Petroleum Hydro. CCME F1 & BTEX in Water (2)	1	N/A	2017/10/27	CAM SOP-00315	CCME PHC-CWS m
Petroleum Hydrocarbons F2-F4 in Water (2, 3)	1	2017/10/27	2017/10/28	CAM SOP-00316	CCME PHC-CWS m
PAH (FWAL) in Water (A/Q) by GC/MS (SIM) (1, 4)	1	2017/10/23	2017/10/28	ATL SOP 00103	EPA 8270D 2007 m

Sample Matrix: Soil
Samples Received: 60

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Benzo(b/j)fluoranthene Sum (soil) (1)	1	N/A	2017/10/27	N/A	Auto Calc.
Benzo(b/j)fluoranthene Sum (soil) (1)	7	N/A	2017/10/28	N/A	Auto Calc.
Benzo(b/j)fluoranthene Sum (soil) (1)	15	N/A	2017/10/30	N/A	Auto Calc.
Benzo(b/j)fluoranthene Sum (soil) (1)	17	N/A	2017/11/01	N/A	Auto Calc.
Benzo(b/j)fluoranthene Sum (soil) (1)	20	N/A	2017/11/02	N/A	Auto Calc.
Dioxins/Furans in Soil (EPS 1/RM/23) (2, 5)	3	2017/11/15	2017/11/22	BRL SOP-00406 (mod)	EPS 1/RM/23 m
Dioxins/Furans in Soil (EPS 1/RM/23) (2, 5)	1	2017/11/15	2017/11/23	BRL SOP-00406 (mod)	EPS 1/RM/23 m
Dioxins/Furans in Soil (EPS 1/RM/23) (2, 5)	1	2017/11/24	2017/12/01	BRL SOP-00406 (mod)	EPS 1/RM/23 m
Metals Solids Acid Extr. ICPMS (1)	4	2017/10/24	2017/10/25	ATL SOP 00058	EPA 6020A R1 m
Metals Solids Acid Extr. ICPMS (1)	25	2017/10/26	2017/10/26	ATL SOP 00058	EPA 6020A R1 m
Metals Solids Acid Extr. ICPMS (1)	21	2017/10/27	2017/10/27	ATL SOP 00058	EPA 6020A R1 m
Metals Solids Acid Extr. ICPMS (1)	3	2017/11/08	2017/11/08	ATL SOP 00058	EPA 6020A R1 m
Moisture (1)	7	N/A	2017/10/24	ATL SOP 00001	OMOE Handbook 1983 m
Moisture (1)	62	N/A	2017/10/25	ATL SOP 00001	OMOE Handbook 1983 m
Moisture (1)	1	N/A	2017/10/27	ATL SOP 00001	OMOE Handbook 1983 m
OC Pesticides (Selected) & PCB (2, 8)	2	2017/10/26	2017/10/27	CAM SOP-00307	SW846 8081, 8082
OC Pesticides (Selected) & PCB (2, 8)	1	2017/10/26	2017/10/30	CAM SOP-00307	SW846 8081, 8082

Your Project #: 649806
Site Location: CAPE MAKKOVIK

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Report Date: 2018/03/29
Report #: R5058495
Version: 5 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B7N4148
Received: 2017/10/20, 10:13

Sample Matrix: Soil
Samples Received: 70

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
OC Pesticides (Selected) & PCB (2, 8)	1	2017/10/27	2017/10/30	CAM SOP-00307	SW846 8081, 8082
OC Pesticides Summed Parameters (2)	3	N/A	2017/10/24	CAM SOP-00307	EPA 8081/8082 m
OC Pesticides Summed Parameters (2)	1	N/A	2017/10/25	CAM SOP-00307	EPA 8081/8082 m
GC/MS Analysis of OP Pesticides (2)	4	2017/10/27	2017/10/27	CAM SOP-00301	EPA 8270 m
PAH Compounds by GCMS (SIM) (1, 6)	7	2017/10/25	2017/10/28	ATL SOP 00102	EPA 8270D 2007 m
PAH Compounds by GCMS (SIM) (1, 6)	1	2017/10/26	2017/10/27	ATL SOP 00102	EPA 8270D 2007 m
PAH Compounds by GCMS (SIM) (1, 6)	2	2017/10/26	2017/10/29	ATL SOP 00102	EPA 8270D 2007 m
PAH Compounds by GCMS (SIM) (1, 6)	6	2017/10/26	2017/10/31	ATL SOP 00102	EPA 8270D 2007 m
PAH Compounds by GCMS (SIM) (1, 6)	23	2017/10/26	2017/11/01	ATL SOP 00102	EPA 8270D 2007 m
PAH Compounds by GCMS (SIM) (1, 6)	8	2017/10/26	2017/11/02	ATL SOP 00102	EPA 8270D 2007 m
PAH Compounds by GCMS (SIM) (1, 6)	13	2017/10/27	2017/10/29	ATL SOP 00102	EPA 8270D 2007 m
PCBs in soil by GC/ECD (1, 6)	5	2017/10/24	2017/10/26	ATL SOP 00106	EPA 8082A 2007 m
PCBs in soil by GC/ECD (1, 6)	16	2017/10/26	2017/10/27	ATL SOP 00106	EPA 8082A 2007 m
PCBs in soil by GC/ECD (1, 6)	1	2017/10/27	2017/10/27	ATL SOP 00106	EPA 8082A 2007 m
PCBs in soil by GC/ECD (1, 6)	7	2017/10/27	2017/10/31	ATL SOP 00106	EPA 8082A 2007 m
PCBs in soil by GC/ECD (1, 6)	1	2017/10/30	2017/10/31	ATL SOP 00106	EPA 8082A 2007 m
PCB Aroclor sum (soil) (1)	3	N/A	2017/10/26	N/A	Auto Calc.
PCB Aroclor sum (soil) (1)	16	N/A	2017/10/27	N/A	Auto Calc.
PCB Aroclor sum (soil) (1)	2	N/A	2017/10/30	N/A	Auto Calc.
PCB Aroclor sum (soil) (1)	9	N/A	2017/10/31	N/A	Auto Calc.
Grain Size - Calculated (1)	2	N/A	2017/10/30		
Grain Size - Calculated (1)	1	N/A	2017/11/01		
Particle Size (Sieve), Sieve/pan 75um (1)	2	N/A	2017/10/30	ATL SOP 00053	ASTM D1140-14 m
Particle Size (Sieve), Sieve/pan 75um (1)	1	N/A	2017/11/01	ATL SOP 00053	ASTM D1140-14 m
VOCs in Soil - Field Preserved (1, 7)	16	N/A	2017/10/24	ATL SOP 00133	EPA 8260C R3 m
VOCs in Soil - Field Preserved (1, 7)	19	N/A	2017/10/25	ATL SOP 00133	EPA 8260C R3 m

Your Project #: 649806
Site Location: CAPE MAKKOVIK

Attention: Jason Green

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Your C.O.C. #: D26100, D26101, D26096, D26097, D26106, D26107, D26102, D26099, D26098, D26104

Report Date: 2018/03/29
Report #: R5058495
Version: 5 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B7N4148
Received: 2017/10/20, 10:13

Sample Matrix: Soil
Samples Received: 70

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
VOCs in Soil - Field Preserved (1, 7)	11	N/A	2017/10/26	ATL SOP 00133	EPA 8260C R3 m

Sample Matrix: SEDIMENT
Samples Received: 9

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Benzo(b/j)fluoranthene Sum (LL soil) (1)	9	N/A	2017/10/30	N/A	Auto Calc.
Metals Solids Acid Extr. ICPMS (1)	9	2017/10/26	2017/10/26	ATL SOP 00058	EPA 6020A R1 m
Moisture (1)	9	N/A	2017/10/25	ATL SOP 00001	OMOE Handbook 1983 m
PAH in sediment by GC/MS (Low Level) (1, 6)	2	2017/10/25	2017/10/29	ATL SOP 00102	EPA 8270D 2014 m
PAH in sediment by GC/MS (Low Level) (1, 6)	7	2017/10/27	2017/10/29	ATL SOP 00102	EPA 8270D 2014 m
PCBs in soil by GC/ECD (1, 6)	6	2017/10/27	2017/10/31	ATL SOP 00106	EPA 8082A 2007 m
PCB Aroclor sum (soil) (1)	6	N/A	2017/12/06	N/A	Auto Calc.
VOCs in Soil - Field Preserved (1, 7)	4	N/A	2017/10/24	ATL SOP 00133	EPA 8260C R3 m
VOCs in Soil - Field Preserved (1, 7)	5	N/A	2017/10/25	ATL SOP 00133	EPA 8260C R3 m

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.

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

Your Project #: 649806
Site Location: CAPE MAKKOVIK

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Report Date: 2018/03/29
Report #: R5058495
Version: 5 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B7N4148
Received: 2017/10/20, 10:13
agreed in writing.

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.
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) This test was performed by Maxxam Bedford
(2) This test was performed by Maxxam Analytics Mississauga
(3) All CCME PHC results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Maxxam conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following “Alberta Environment’s Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Validation of Performance-Based Alternative Methods September 2003”. Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.
(4) Acridine and Quinoline parameters are not accredited.
(5) Soils are reported on a dry weight basis unless otherwise specified.

Confirmatory runs for 2,3,7,8-TCDF are performed only if the primary result is greater than the RDL.
(6) Soils are reported on a dry weight basis unless otherwise specified.
(7) No lab extraction date is given for C6-C10/BTEX and VOC samples that are field preserved with methanol. Extraction date is date sampled unless otherwise stated.
(8) Chlordane (Total) = Alpha Chlordane + Gamma Chlordane

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Heather Macumber, Senior Project Manager
Email: HMacumber@maxxam.ca
Phone# (902)420-0203 Ext:226
==
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.

PART. SIZE (SIEVE/PAN 75 UM-CCMEHC,PIRI)

Maxxam ID		FJP618				FJP715				FJP758			
Sampling Date		2017/10/14				2017/10/15				2017/10/18			
COC Number		D26106				D26104							
	UNITS	**SIEVE 2**	**RDL**	**MDL**	**QC Batch**	**LAST-SOIL-3**	**RDL**	**MDL**	**QC Batch**	**SIEVE**	**RDL**	**MDL**	**QC Batch**
Calculated Parameters													
Grain Size	N/A	COARSE	N/A	N/A	5225642	COARSE	N/A	N/A	5225642	COARSE	N/A	N/A	5232494
Sieve - #200 (>0.075mm)	%	82	1	N/A	5237768	91	1	N/A	5237768	92	1	N/A	5239637
Sieve - Pan	%	18	1	N/A	5237768	9	1	N/A	5237768	8	1	N/A	5239637
Inorganics													
Moisture	%	13	1.0	0.20	5229985					6.8	1.0	0.20	5234745

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam ID		FJP758			
Sampling Date		2017/10/18			
COC Number					
	UNITS	**SIEVE Lab-Dup**	**RDL**	**MDL**	**QC Batch**
Inorganics					
Moisture	%	7.4	1.0	0.20	5234745

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

ATLANTIC VOC IN SOIL (FIELD PRES.)

Maxxam ID		FJP535				FJP535			
Sampling Date		2017/10/14				2017/10/14			
COC Number		D26100				D26100			
	UNITS	**1987-SOIL-1**	**RDL**	**MDL**	**QC Batch**	**1987-SOIL-1 Lab-Dup**	**RDL**	**MDL**	**QC Batch**
Inorganics									
Moisture	%	10	1.0	0.20	5226081	10	1.0	0.20	5226081
Volatile Organics									
1,1,1-Trichloroethane	ug/kg	<25	25	0.00010	5226049				
1,1,2,2-Tetrachloroethane	ug/kg	<25	25	0.00040	5226049				
1,1,2-Trichloroethane	ug/kg	<25	25	0.00040	5226049				
1,1-Dichloroethane	ug/kg	<25	25	0.00010	5226049				
1,1-Dichloroethylene	ug/kg	<25	25	0.00010	5226049				
1,2-Dichlorobenzene	ug/kg	<25	25	0.00020	5226049				
1,2-Dichloroethane	ug/kg	<25	25	0.00010	5226049				
1,2-Dichloropropane	ug/kg	<25	25	0.00020	5226049				
1,3-Dichlorobenzene	ug/kg	<25	25	0.00020	5226049				
1,4-Dichlorobenzene	ug/kg	<25	25	0.00030	5226049				
Benzene	ug/kg	<25	25	0.00010	5226049				
Bromodichloromethane	ug/kg	<25	25	0.00020	5226049				
Bromoform	ug/kg	<25	25	0.00030	5226049				
Bromomethane	ug/kg	<50	50	0.00040	5226049				
Carbon Tetrachloride	ug/kg	<25	25	0.00010	5226049				
Chlorobenzene	ug/kg	<25	25	0.00010	5226049				
Chloroethane	ug/kg	<200	200	0.00030	5226049				
Chloroform	ug/kg	<25	25	0.00010	5226049				
cis-1,2-Dichloroethylene	ug/kg	<25	25	0.00010	5226049				
cis-1,3-Dichloropropene	ug/kg	<25	25	0.00020	5226049				
Dibromochloromethane	ug/kg	<25	25	0.00030	5226049				
Ethylbenzene	ug/kg	<25	25	0.00010	5226049				
Ethylene Dibromide	ug/kg	<25	25	0.00040	5226049				
Methyl t-butyl ether (MTBE)	ug/kg	<25	25	0.00010	5226049				
Methylene Chloride(Dichloromethane)	ug/kg	<25	25	0.00020	5226049				
o-Xylene	ug/kg	<25	25	0.00010	5226049				
p+m-Xylene	ug/kg	<25	25	0.00010	5226049				
Styrene	ug/kg	<25	25	0.00020	5226049				
Tetrachloroethylene	ug/kg	<25	25	0.00030	5226049				
Toluene	ug/kg	<25	25	0.00010	5226049				

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

ATLANTIC VOC IN SOIL (FIELD PRES.)

Maxxam ID		FJP535				FJP535			
Sampling Date		2017/10/14				2017/10/14			
COC Number		D26100				D26100			
	UNITS	**1987-SOIL-1**	**RDL**	**MDL**	**QC Batch**	**1987-SOIL-1 Lab-Dup**	**RDL**	**MDL**	**QC Batch**
Total Xylenes	ug/kg	<50	50	N/A	5226049				
trans-1,2-Dichloroethylene	ug/kg	<25	25	0.00020	5226049				
trans-1,3-Dichloropropene	ug/kg	<25	25	0.00030	5226049				
Trichloroethylene	ug/kg	<10	10	0.00020	5226049				
Trichlorofluoromethane (FREON 11)	ug/kg	<25	25	0.00030	5226049				
Vinyl Chloride	ug/kg	<20	20	0.00020	5226049				
Surrogate Recovery (%)									
4-Bromofluorobenzene	%	99			5226049				
D10-o-Xylene	%	91 (1)			5226049				
D4-1,2-Dichloroethane	%	98			5226049				
D8-Toluene	%	98			5226049				

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable
(1) VOC samples were extracted using a flat-bed shaker instead of the accelerated mechanical shaker due to matrix incompatibility.

ATLANTIC VOC IN SOIL (FIELD PRES.)

Maxxam ID		FJP536	FJP537				FJP560			
Sampling Date		2017/10/14	2017/10/14				2017/10/14			
COC Number		D26100	D26100				D26101			
	UNITS	**1987-SOIL-2**	**1987-SOIL-3**	**RDL**	**MDL**	**QC Batch**	**1987-SOIL-4**	**RDL**	**MDL**	**QC Batch**
Inorganics										
Moisture	%	10	9.8	1.0	0.20	5226081				
Volatile Organics										
1,1,1-Trichloroethane	ug/kg	<25	<25	25	0.00010	5226049	<25	25	0.00010	5226049
1,1,2,2-Tetrachloroethane	ug/kg	<25	<25	25	0.00040	5226049	<25	25	0.00040	5226049
1,1,2-Trichloroethane	ug/kg	<25	<25	25	0.00040	5226049	<25	25	0.00040	5226049
1,1-Dichloroethane	ug/kg	<25	<25	25	0.00010	5226049	<25	25	0.00010	5226049
1,1-Dichloroethylene	ug/kg	<25	<25	25	0.00010	5226049	<25	25	0.00010	5226049
1,2-Dichlorobenzene	ug/kg	<25	<25	25	0.00020	5226049	<25	25	0.00020	5226049
1,2-Dichloroethane	ug/kg	<25	<25	25	0.00010	5226049	<25	25	0.00010	5226049
1,2-Dichloropropane	ug/kg	<25	<25	25	0.00020	5226049	<25	25	0.00020	5226049
1,3-Dichlorobenzene	ug/kg	<25	<25	25	0.00020	5226049	<25	25	0.00020	5226049
1,4-Dichlorobenzene	ug/kg	<25	<25	25	0.00030	5226049	<25	25	0.00030	5226049
Benzene	ug/kg	<25	<25	25	0.00010	5226049	<25	25	0.00010	5226049
Bromodichloromethane	ug/kg	<25	<25	25	0.00020	5226049	<25	25	0.00020	5226049
Bromoform	ug/kg	<25	<25	25	0.00030	5226049	<25	25	0.00030	5226049
Bromomethane	ug/kg	<50	<50	50	0.00040	5226049	<50	50	0.00040	5226049
Carbon Tetrachloride	ug/kg	<25	<25	25	0.00010	5226049	<25	25	0.00010	5226049
Chlorobenzene	ug/kg	<25	<25	25	0.00010	5226049	<25	25	0.00010	5226049
Chloroethane	ug/kg	<200	<200	200	0.00030	5226049	<200	200	0.00030	5226049
Chloroform	ug/kg	<25	<25	25	0.00010	5226049	<25	25	0.00010	5226049
cis-1,2-Dichloroethylene	ug/kg	<25	<25	25	0.00010	5226049	<25	25	0.00010	5226049
cis-1,3-Dichloropropene	ug/kg	<25	<25	25	0.00020	5226049	<25	25	0.00020	5226049
Dibromochloromethane	ug/kg	<25	<25	25	0.00030	5226049	<25	25	0.00030	5226049
Ethylbenzene	ug/kg	<25	<25	25	0.00010	5226049	<25	25	0.00010	5226049
Ethylene Dibromide	ug/kg	<25	<25	25	0.00040	5226049	<25	25	0.00040	5226049
Methyl t-butyl ether (MTBE)	ug/kg	<25	<25	25	0.00010	5226049	<25	25	0.00010	5226049
Methylene Chloride(Dichloromethane)	ug/kg	<25	<25	25	0.00020	5226049	<25	25	0.00020	5226049
o-Xylene	ug/kg	<25	<25	25	0.00010	5226049	<25	25	0.00010	5226049
p+m-Xylene	ug/kg	<25	<25	25	0.00010	5226049	<25	25	0.00010	5226049
Styrene	ug/kg	<25	<25	25	0.00020	5226049	<25	25	0.00020	5226049
Tetrachloroethylene	ug/kg	<25	<25	25	0.00030	5226049	<25	25	0.00030	5226049
Toluene	ug/kg	<25	<25	25	0.00010	5226049	<25	25	0.00010	5226049
Total Xylenes	ug/kg	<50	<50	50	N/A	5226049	<50	50	N/A	5226049

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

ATLANTIC VOC IN SOIL (FIELD PRES.)

Maxxam ID		FJP536	FJP537				FJP560			
Sampling Date		2017/10/14	2017/10/14				2017/10/14			
COC Number		D26100	D26100				D26101			
	UNITS	**1987-SOIL-2**	**1987-SOIL-3**	**RDL**	**MDL**	**QC Batch**	**1987-SOIL-4**	**RDL**	**MDL**	**QC Batch**
trans-1,2-Dichloroethylene	ug/kg	<25	<25	25	0.00020	5226049	<25	25	0.00020	5226049
trans-1,3-Dichloropropene	ug/kg	<25	<25	25	0.00030	5226049	<25	25	0.00030	5226049
Trichloroethylene	ug/kg	<10	<10	10	0.00020	5226049	<10	10	0.00020	5226049
Trichlorofluoromethane (FREON 11)	ug/kg	<25	<25	25	0.00030	5226049	<25	25	0.00030	5226049
Vinyl Chloride	ug/kg	<20	<20	20	0.00020	5226049	<20	20	0.00020	5226049
Surrogate Recovery (%)										
4-Bromofluorobenzene	%	100	101			5226049	100			5226049
D10-o-Xylene	%	95	98 (1)			5226049	97			5226049
D4-1,2-Dichloroethane	%	96	97			5226049	96			5226049
D8-Toluene	%	99	99			5226049	99			5226049

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) VOC samples were extracted using a flat-bed shaker instead of the accelerated mechanical shaker due to matrix incompatibility.

ATLANTIC VOC IN SOIL (FIELD PRES.)

Maxxam ID		FJP561	FJP562				FJP563			
Sampling Date		2017/10/14	2017/10/14				2017/10/14			
COC Number		D26101	D26101				D26101			
	UNITS	**1987-SOIL-5**	**1987-SOIL-6**	**RDL**	**MDL**	**QC Batch**	**1987-SOIL-7**	**RDL**	**MDL**	**QC Batch**
Volatile Organics										
1,1,1-Trichloroethane	ug/kg	<25	<25	25	0.00010	5226049	<25	25	0.00010	5227338
1,1,2,2-Tetrachloroethane	ug/kg	<25	<25	25	0.00040	5226049	<25	25	0.00040	5227338
1,1,2-Trichloroethane	ug/kg	<25	<25	25	0.00040	5226049	<25	25	0.00040	5227338
1,1-Dichloroethane	ug/kg	<25	<25	25	0.00010	5226049	<25	25	0.00010	5227338
1,1-Dichloroethylene	ug/kg	<25	<25	25	0.00010	5226049	<25	25	0.00010	5227338
1,2-Dichlorobenzene	ug/kg	<25	<25	25	0.00020	5226049	<25	25	0.00020	5227338
1,2-Dichloroethane	ug/kg	<25	<25	25	0.00010	5226049	<25	25	0.00010	5227338
1,2-Dichloropropane	ug/kg	<25	<25	25	0.00020	5226049	<25	25	0.00020	5227338
1,3-Dichlorobenzene	ug/kg	<25	<25	25	0.00020	5226049	<25	25	0.00020	5227338
1,4-Dichlorobenzene	ug/kg	<25	<25	25	0.00030	5226049	<25	25	0.00030	5227338
Benzene	ug/kg	<25	<25	25	0.00010	5226049	<25	25	0.00010	5227338
Bromodichloromethane	ug/kg	<25	<25	25	0.00020	5226049	<25	25	0.00020	5227338
Bromoform	ug/kg	<25	<25	25	0.00030	5226049	<25	25	0.00030	5227338
Bromomethane	ug/kg	<50	<50	50	0.00040	5226049	<50	50	0.00040	5227338
Carbon Tetrachloride	ug/kg	<25	<25	25	0.00010	5226049	<25	25	0.00010	5227338
Chlorobenzene	ug/kg	<25	<25	25	0.00010	5226049	<25	25	0.00010	5227338
Chloroethane	ug/kg	<200	<200	200	0.00030	5226049	<200	200	0.00030	5227338
Chloroform	ug/kg	<25	<25	25	0.00010	5226049	<25	25	0.00010	5227338
cis-1,2-Dichloroethylene	ug/kg	<25	<25	25	0.00010	5226049	<25	25	0.00010	5227338
cis-1,3-Dichloropropene	ug/kg	<25	<25	25	0.00020	5226049	<25	25	0.00020	5227338
Dibromochloromethane	ug/kg	<25	<25	25	0.00030	5226049	<25	25	0.00030	5227338
Ethylbenzene	ug/kg	<25	<25	25	0.00010	5226049	<25	25	0.00010	5227338
Ethylene Dibromide	ug/kg	<25	<25	25	0.00040	5226049	<25	25	0.00040	5227338
Methyl t-butyl ether (MTBE)	ug/kg	<25	<25	25	0.00010	5226049	<25	25	0.00010	5227338
Methylene Chloride(Dichloromethane)	ug/kg	<25	<25	25	0.00020	5226049	<30 (1)	30	0.00024	5227338
o-Xylene	ug/kg	<25	<25	25	0.00010	5226049	<25	25	0.00010	5227338
p+m-Xylene	ug/kg	<25	<25	25	0.00010	5226049	<25	25	0.00010	5227338
Styrene	ug/kg	<25	<25	25	0.00020	5226049	<25	25	0.00020	5227338
Tetrachloroethylene	ug/kg	<25	<25	25	0.00030	5226049	<25	25	0.00030	5227338
Toluene	ug/kg	<25	<25	25	0.00010	5226049	<25	25	0.00010	5227338
Total Xylenes	ug/kg	<50	<50	50	N/A	5226049	<50	50	N/A	5227338
trans-1,2-Dichloroethylene	ug/kg	<25	<25	25	0.00020	5226049	<25	25	0.00020	5227338

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable
(1) Elevated VOC RDL(s) due to detected levels in the method blank.

ATLANTIC VOC IN SOIL (FIELD PRES.)

Maxxam ID		FJP561	FJP562				FJP563			
Sampling Date		2017/10/14	2017/10/14				2017/10/14			
COC Number		D26101	D26101				D26101			
	UNITS	**1987-SOIL-5**	**1987-SOIL-6**	**RDL**	**MDL**	**QC Batch**	**1987-SOIL-7**	**RDL**	**MDL**	**QC Batch**
trans-1,3-Dichloropropene	ug/kg	<25	<25	25	0.00030	5226049	<25	25	0.00030	5227338
Trichloroethylene	ug/kg	<10	<10	10	0.00020	5226049	<10	10	0.00020	5227338
Trichlorofluoromethane (FREON 11)	ug/kg	<25	<25	25	0.00030	5226049	<25	25	0.00030	5227338
Vinyl Chloride	ug/kg	<20	<20	20	0.00020	5226049	<20	20	0.00020	5227338
Surrogate Recovery (%)										
4-Bromofluorobenzene	%	100	100			5226049	100			5227338
D10-o-Xylene	%	95	95			5226049	105			5227338
D4-1,2-Dichloroethane	%	96	100			5226049	96			5227338
D8-Toluene	%	98	98			5226049	102			5227338

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

ATLANTIC VOC IN SOIL (FIELD PRES.)

Maxxam ID		FJP564	FJP565				FJP566			
Sampling Date		2017/10/14	2017/10/14				2017/10/14			
COC Number		D26101	D26101				D26101			
	UNITS	1987-SOIL-8	1987-SOIL-9	RDL	MDL	QC Batch	1987-SOIL-10	RDL	MDL	QC Batch
Volatile Organics										
1,1,1-Trichloroethane	ug/kg	<25	<25	25	0.00010	5227338	<25	25	0.00010	5227759
1,1,2,2-Tetrachloroethane	ug/kg	<25	<25	25	0.00040	5227338	<25	25	0.00040	5227759
1,1,2-Trichloroethane	ug/kg	<25	<25	25	0.00040	5227338	<25	25	0.00040	5227759
1,1-Dichloroethane	ug/kg	<25	<25	25	0.00010	5227338	<25	25	0.00010	5227759
1,1-Dichloroethylene	ug/kg	<25	<25	25	0.00010	5227338	<25	25	0.00010	5227759
1,2-Dichlorobenzene	ug/kg	<25	<25	25	0.00020	5227338	<25	25	0.00020	5227759
1,2-Dichloroethane	ug/kg	<25	<25	25	0.00010	5227338	<25	25	0.00010	5227759
1,2-Dichloropropane	ug/kg	<25	<25	25	0.00020	5227338	<25	25	0.00020	5227759
1,3-Dichlorobenzene	ug/kg	<25	<25	25	0.00020	5227338	<25	25	0.00020	5227759
1,4-Dichlorobenzene	ug/kg	<25	<25	25	0.00030	5227338	<25	25	0.00030	5227759
Benzene	ug/kg	<25	<25	25	0.00010	5227338	<25	25	0.00010	5227759
Bromodichloromethane	ug/kg	<25	<25	25	0.00020	5227338	<25	25	0.00020	5227759
Bromoform	ug/kg	<25	<25	25	0.00030	5227338	<25	25	0.00030	5227759
Bromomethane	ug/kg	<50	<50	50	0.00040	5227338	<50	50	0.00040	5227759
Carbon Tetrachloride	ug/kg	<25	<25	25	0.00010	5227338	<25	25	0.00010	5227759
Chlorobenzene	ug/kg	<25	<25	25	0.00010	5227338	<25	25	0.00010	5227759
Chloroethane	ug/kg	<200	<200	200	0.00030	5227338	<200	200	0.00030	5227759
Chloroform	ug/kg	<25	<25	25	0.00010	5227338	<25	25	0.00010	5227759
cis-1,2-Dichloroethylene	ug/kg	<25	<25	25	0.00010	5227338	<25	25	0.00010	5227759
cis-1,3-Dichloropropene	ug/kg	<25	<25	25	0.00020	5227338	<25	25	0.00020	5227759
Dibromochloromethane	ug/kg	<25	<25	25	0.00030	5227338	<25	25	0.00030	5227759
Ethylbenzene	ug/kg	<25	<25	25	0.00010	5227338	<25	25	0.00010	5227759
Ethylene Dibromide	ug/kg	<25	<25	25	0.00040	5227338	<25	25	0.00040	5227759
Methyl t-butyl ether (MTBE)	ug/kg	<25	<25	25	0.00010	5227338	55	25	0.00010	5227759
Methylene Chloride(Dichloromethane)	ug/kg	<30 (1)	<30 (1)	30	0.00024	5227338	<25	25	0.00020	5227759
o-Xylene	ug/kg	<25	<25	25	0.00010	5227338	<25	25	0.00010	5227759
p+m-Xylene	ug/kg	<25	<25	25	0.00010	5227338	<25	25	0.00010	5227759
Styrene	ug/kg	<25	<25	25	0.00020	5227338	<25	25	0.00020	5227759
Tetrachloroethylene	ug/kg	<25	<25	25	0.00030	5227338	<25	25	0.00030	5227759
Toluene	ug/kg	<25	<25	25	0.00010	5227338	<25	25	0.00010	5227759
Total Xylenes	ug/kg	<50	<50	50	N/A	5227338	<50	50	N/A	5227759
trans-1,2-Dichloroethylene	ug/kg	<25	<25	25	0.00020	5227338	<25	25	0.00020	5227759

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable
(1) Elevated VOC RDL(s) due to detected levels in the method blank.

ATLANTIC VOC IN SOIL (FIELD PRES.)

Maxxam ID		FJP564	FJP565				FJP566			
Sampling Date		2017/10/14	2017/10/14				2017/10/14			
COC Number		D26101	D26101				D26101			
	UNITS	**1987-SOIL-8**	**1987-SOIL-9**	**RDL**	**MDL**	**QC Batch**	**1987-SOIL-10**	**RDL**	**MDL**	**QC Batch**
trans-1,3-Dichloropropene	ug/kg	<25	<25	25	0.00030	5227338	<25	25	0.00030	5227759
Trichloroethylene	ug/kg	<10	<10	10	0.00020	5227338	<10	10	0.00020	5227759
Trichlorofluoromethane (FREON 11)	ug/kg	<25	<25	25	0.00030	5227338	<25	25	0.00030	5227759
Vinyl Chloride	ug/kg	<20	<20	20	0.00020	5227338	<20	20	0.00020	5227759
Surrogate Recovery (%)										
4-Bromofluorobenzene	%	99	99			5227338	100			5227759
D10-o-Xylene	%	117	103			5227338	122			5227759
D4-1,2-Dichloroethane	%	99	98			5227338	97			5227759
D8-Toluene	%	102	102			5227338	103			5227759

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

ATLANTIC VOC IN SOIL (FIELD PRES.)

Maxxam ID		FJP567	FJP568	FJP577			
Sampling Date		2017/10/14	2017/10/14	2017/10/13			
COC Number		D26101	D26101	D26096			
	UNITS	**1987-SOIL-11**	**1987-SOIL-12**	**HANGER-SOIL-1**	**RDL**	**MDL**	**QC Batch**
Volatile Organics							
1,1,1-Trichloroethane	ug/kg	<25	<25	<25	25	0.00010	5227338
1,1,2,2-Tetrachloroethane	ug/kg	<25	<25	<25	25	0.00040	5227338
1,1,2-Trichloroethane	ug/kg	<25	<25	<25	25	0.00040	5227338
1,1-Dichloroethane	ug/kg	<25	<25	<25	25	0.00010	5227338
1,1-Dichloroethylene	ug/kg	<25	<25	<25	25	0.00010	5227338
1,2-Dichlorobenzene	ug/kg	<25	<25	<25	25	0.00020	5227338
1,2-Dichloroethane	ug/kg	<25	<25	<25	25	0.00010	5227338
1,2-Dichloropropane	ug/kg	<25	<25	<25	25	0.00020	5227338
1,3-Dichlorobenzene	ug/kg	<25	<25	<25	25	0.00020	5227338
1,4-Dichlorobenzene	ug/kg	<25	<25	<25	25	0.00030	5227338
Benzene	ug/kg	<25	<25	<25	25	0.00010	5227338
Bromodichloromethane	ug/kg	<25	<25	<25	25	0.00020	5227338
Bromoform	ug/kg	<25	<25	<25	25	0.00030	5227338
Bromomethane	ug/kg	<50	<50	<50	50	0.00040	5227338
Carbon Tetrachloride	ug/kg	<25	<25	<25	25	0.00010	5227338
Chlorobenzene	ug/kg	<25	<25	<25	25	0.00010	5227338
Chloroethane	ug/kg	<200	<200	<200	200	0.00030	5227338
Chloroform	ug/kg	<25	<25	<25	25	0.00010	5227338
cis-1,2-Dichloroethylene	ug/kg	<25	<25	<25	25	0.00010	5227338
cis-1,3-Dichloropropene	ug/kg	<25	<25	<25	25	0.00020	5227338
Dibromochloromethane	ug/kg	<25	<25	<25	25	0.00030	5227338
Ethylbenzene	ug/kg	<25	<25	<25	25	0.00010	5227338
Ethylene Dibromide	ug/kg	<25	<25	<25	25	0.00040	5227338
Methyl t-butyl ether (MTBE)	ug/kg	<25	<25	<25	25	0.00010	5227338
Methylene Chloride(Dichloromethane)	ug/kg	<30 (1)	<30 (1)	<30 (1)	30	0.00024	5227338
o-Xylene	ug/kg	<25	<25	<25	25	0.00010	5227338
p+m-Xylene	ug/kg	<25	<25	<25	25	0.00010	5227338
Styrene	ug/kg	<25	<25	<25	25	0.00020	5227338
Tetrachloroethylene	ug/kg	<25	<25	<25	25	0.00030	5227338
Toluene	ug/kg	<25	<25	<25	25	0.00010	5227338
Total Xylenes	ug/kg	<50	<50	<50	50	N/A	5227338
trans-1,2-Dichloroethylene	ug/kg	<25	<25	<25	25	0.00020	5227338

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable
(1) Elevated VOC RDL(s) due to detected levels in the method blank.

ATLANTIC VOC IN SOIL (FIELD PRES.)

Maxxam ID		FJP567	FJP568	FJP577			
Sampling Date		2017/10/14	2017/10/14	2017/10/13			
COC Number		D26101	D26101	D26096			
	UNITS	**1987-SOIL-11**	**1987-SOIL-12**	**HANGER-SOIL-1**	**RDL**	**MDL**	**QC Batch**
trans-1,3-Dichloropropene	ug/kg	<25	<25	<25	25	0.00030	5227338
Trichloroethylene	ug/kg	<10	<10	<10	10	0.00020	5227338
Trichlorofluoromethane (FREON 11)	ug/kg	<25	<25	<25	25	0.00030	5227338
Vinyl Chloride	ug/kg	<20	<20	<20	20	0.00020	5227338
Surrogate Recovery (%)							
4-Bromofluorobenzene	%	100	99	100			5227338
D10-o-Xylene	%	122	107	138 (1)			5227338
D4-1,2-Dichloroethane	%	98	98	100			5227338
D8-Toluene	%	102	102	101			5227338

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

(1) VOC samples were extracted using a flat-bed shaker instead of the accelerated mechanical shaker due to matrix incompatibility. VOC surrogate not within acceptance limits. Analysis was repeated with similar results.

ATLANTIC VOC IN SOIL (FIELD PRES.)

Maxxam ID		FJP578			FJP580			
Sampling Date		2017/10/13			2017/10/18			
COC Number		D26096			D26097			
	UNITS	**HANGER-SOIL-2**	**RDL**	**MDL**	**HANGER-SOIL-3**	**RDL**	**MDL**	**QC Batch**
Volatile Organics								
1,1,1-Trichloroethane	ug/kg	<25	25	0.00010	<25	25	0.00010	5227759
1,1,2,2-Tetrachloroethane	ug/kg	<25	25	0.00040	<25	25	0.00040	5227759
1,1,2-Trichloroethane	ug/kg	<25	25	0.00040	<25	25	0.00040	5227759
1,1-Dichloroethane	ug/kg	<25	25	0.00010	<25	25	0.00010	5227759
1,1-Dichloroethylene	ug/kg	<25	25	0.00010	<25	25	0.00010	5227759
1,2-Dichlorobenzene	ug/kg	<25	25	0.00020	<25	25	0.00020	5227759
1,2-Dichloroethane	ug/kg	<25	25	0.00010	<25	25	0.00010	5227759
1,2-Dichloropropane	ug/kg	<25	25	0.00020	<25	25	0.00020	5227759
1,3-Dichlorobenzene	ug/kg	<25	25	0.00020	<25	25	0.00020	5227759
1,4-Dichlorobenzene	ug/kg	<25	25	0.00030	<25	25	0.00030	5227759
Benzene	ug/kg	<25	25	0.00010	<25	25	0.00010	5227759
Bromodichloromethane	ug/kg	<25	25	0.00020	<25	25	0.00020	5227759
Bromoform	ug/kg	<25	25	0.00030	<25	25	0.00030	5227759
Bromomethane	ug/kg	<50	50	0.00040	<50	50	0.00040	5227759
Carbon Tetrachloride	ug/kg	<25	25	0.00010	<25	25	0.00010	5227759
Chlorobenzene	ug/kg	<25	25	0.00010	<25	25	0.00010	5227759
Chloroethane	ug/kg	<200	200	0.00030	<200	200	0.00030	5227759
Chloroform	ug/kg	<25	25	0.00010	<25	25	0.00010	5227759
cis-1,2-Dichloroethylene	ug/kg	<25	25	0.00010	<25	25	0.00010	5227759
cis-1,3-Dichloropropene	ug/kg	<25	25	0.00020	<25	25	0.00020	5227759
Dibromochloromethane	ug/kg	<25	25	0.00030	<25	25	0.00030	5227759
Ethylbenzene	ug/kg	<25	25	0.00010	<25	25	0.00010	5227759
Ethylene Dibromide	ug/kg	<25	25	0.00040	<25	25	0.00040	5227759
Methyl t-butyl ether (MTBE)	ug/kg	<25	25	0.00010	<31 (1)	31	0.00012	5227759
Methylene Chloride(Dichloromethane)	ug/kg	<25	25	0.00020	<25	25	0.00020	5227759
o-Xylene	ug/kg	<25	25	0.00010	<25	25	0.00010	5227759
p+m-Xylene	ug/kg	<25	25	0.00010	<25	25	0.00010	5227759
Styrene	ug/kg	<25	25	0.00020	<25	25	0.00020	5227759
Tetrachloroethylene	ug/kg	<25	25	0.00030	<25	25	0.00030	5227759
Toluene	ug/kg	310	25	0.00010	<25	25	0.00010	5227759
Total Xylenes	ug/kg	<50	50	N/A	<50	50	N/A	5227759
trans-1,2-Dichloroethylene	ug/kg	<25	25	0.00020	<25	25	0.00020	5227759

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable
(1) Elevated VOC RDL(s) due to matrix interference.

ATLANTIC VOC IN SOIL (FIELD PRES.)

Maxxam ID		FJP578			FJP580			
Sampling Date		2017/10/13			2017/10/18			
COC Number		D26096			D26097			
	UNITS	**HANGER-SOIL-2**	**RDL**	**MDL**	**HANGER-SOIL-3**	**RDL**	**MDL**	**QC Batch**
trans-1,3-Dichloropropene	ug/kg	<25	25	0.00030	<25	25	0.00030	5227759
Trichloroethylene	ug/kg	<10	10	0.00020	<10	10	0.00020	5227759
Trichlorofluoromethane (FREON 11)	ug/kg	<25	25	0.00030	<25	25	0.00030	5227759
Vinyl Chloride	ug/kg	<20	20	0.00020	<20	20	0.00020	5227759
Surrogate Recovery (%)								
4-Bromofluorobenzene	%	100			101			5227759
D10-o-Xylene	%	114 (1)			117 (1)			5227759
D4-1,2-Dichloroethane	%	97			98			5227759
D8-Toluene	%	102			103			5227759

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

(1) VOC samples were extracted using a flat-bed shaker instead of the accelerated mechanical shaker due to matrix incompatibility.

ATLANTIC VOC IN SOIL (FIELD PRES.)

Maxxam ID		FJP581			FJP582			FJP583			
Sampling Date		2017/10/18			2017/10/18			2017/10/18			
COC Number		D26097			D26097			D26097			
	UNITS	**HANGER-SOIL-4**	**RDL**	**MDL**	**SEPTIC-SOIL-1**	**RDL**	**MDL**	**SEPTIC-SOIL-2**	**RDL**	**MDL**	**QC Batch**
Volatile Organics											
1,1,1-Trichloroethane	ug/kg	<25	25	0.00010	<50	50	0.00020	<25	25	0.00010	5227759
1,1,2,2-Tetrachloroethane	ug/kg	<25	25	0.00040	<50	50	0.00080	<25	25	0.00040	5227759
1,1,2-Trichloroethane	ug/kg	<25	25	0.00040	<50	50	0.00080	<25	25	0.00040	5227759
1,1-Dichloroethane	ug/kg	<25	25	0.00010	<50	50	0.00020	<25	25	0.00010	5227759
1,1-Dichloroethylene	ug/kg	<25	25	0.00010	<50	50	0.00020	<25	25	0.00010	5227759
1,2-Dichlorobenzene	ug/kg	<25	25	0.00020	<50	50	0.00040	<25	25	0.00020	5227759
1,2-Dichloroethane	ug/kg	<25	25	0.00010	<50	50	0.00020	<25	25	0.00010	5227759
1,2-Dichloropropane	ug/kg	<25	25	0.00020	<50	50	0.00040	<25	25	0.00020	5227759
1,3-Dichlorobenzene	ug/kg	<25	25	0.00020	<50	50	0.00040	<25	25	0.00020	5227759
1,4-Dichlorobenzene	ug/kg	<25	25	0.00030	<50	50	0.00060	<25	25	0.00030	5227759
Benzene	ug/kg	<25	25	0.00010	<50	50	0.00020	<25	25	0.00010	5227759
Bromodichloromethane	ug/kg	<25	25	0.00020	<50	50	0.00040	<25	25	0.00020	5227759
Bromoform	ug/kg	<25	25	0.00030	<50	50	0.00060	<25	25	0.00030	5227759
Bromomethane	ug/kg	<50	50	0.00040	<100	100	0.00080	<50	50	0.00040	5227759
Carbon Tetrachloride	ug/kg	<25	25	0.00010	<50	50	0.00020	<25	25	0.00010	5227759
Chlorobenzene	ug/kg	<25	25	0.00010	<50	50	0.00020	<25	25	0.00010	5227759
Chloroethane	ug/kg	<200	200	0.00030	<400	400	0.00060	<200	200	0.00030	5227759
Chloroform	ug/kg	<25	25	0.00010	<50	50	0.00020	<25	25	0.00010	5227759
cis-1,2-Dichloroethylene	ug/kg	<25	25	0.00010	<50	50	0.00020	<25	25	0.00010	5227759
cis-1,3-Dichloropropene	ug/kg	<25	25	0.00020	<50	50	0.00040	<25	25	0.00020	5227759
Dibromochloromethane	ug/kg	<25	25	0.00030	<50	50	0.00060	<25	25	0.00030	5227759
Ethylbenzene	ug/kg	<25	25	0.00010	<50	50	0.00020	<25	25	0.00010	5227759
Ethylene Dibromide	ug/kg	<25	25	0.00040	<50	50	0.00080	<25	25	0.00040	5227759
Methyl t-butyl ether (MTBE)	ug/kg	88	25	0.00010	<50	50	0.00020	<25	25	0.00010	5227759
Methylene Chloride(Dichloromethane)	ug/kg	<25	25	0.00020	<50	50	0.00040	<25	25	0.00020	5227759
o-Xylene	ug/kg	<25	25	0.00010	<50	50	0.00020	<25	25	0.00010	5227759
p+m-Xylene	ug/kg	<25	25	0.00010	<50	50	0.00020	<25	25	0.00010	5227759
Styrene	ug/kg	<25	25	0.00020	<50	50	0.00040	<25	25	0.00020	5227759
Tetrachloroethylene	ug/kg	<25	25	0.00030	<50	50	0.00060	<25	25	0.00030	5227759
Toluene	ug/kg	<25	25	0.00010	<50	50	0.00020	<25	25	0.00010	5227759
Total Xylenes	ug/kg	<50	50	N/A	<100	100	N/A	<50	50	N/A	5227759
trans-1,2-Dichloroethylene	ug/kg	<25	25	0.00020	<50	50	0.00040	<25	25	0.00020	5227759

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

ATLANTIC VOC IN SOIL (FIELD PRES.)

Maxxam ID		FJP581			FJP582			FJP583			
Sampling Date		2017/10/18			2017/10/18			2017/10/18			
COC Number		D26097			D26097			D26097			
	UNITS	**HANGER-SOIL-4**	**RDL**	**MDL**	**SEPTIC-SOIL-1**	**RDL**	**MDL**	**SEPTIC-SOIL-2**	**RDL**	**MDL**	**QC Batch**
trans-1,3-Dichloropropene	ug/kg	<25	25	0.00030	<50	50	0.00060	<25	25	0.00030	5227759
Trichloroethylene	ug/kg	<10	10	0.00020	<20	20	0.00040	<10	10	0.00020	5227759
Trichlorofluoromethane (FREON 11)	ug/kg	<25	25	0.00030	<50	50	0.00060	<25	25	0.00030	5227759
Vinyl Chloride	ug/kg	<20	20	0.00020	<40	40	0.00040	<20	20	0.00020	5227759
Surrogate Recovery (%)											
4-Bromofluorobenzene	%	100			99			100			5227759
D10-o-Xylene	%	115 (1)			118 (2)			109 (1)			5227759
D4-1,2-Dichloroethane	%	97			98			98			5227759
D8-Toluene	%	103			119			101			5227759

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

(1) VOC samples were extracted using a flat-bed shaker instead of the accelerated mechanical shaker due to matrix incompatibility.

(2) VOC samples were extracted using a flat-bed shaker instead of the accelerated mechanical shaker due to matrix incompatibility. Elevated VOC RDL(s) due to limited sample.

ATLANTIC VOC IN SOIL (FIELD PRES.)

Maxxam ID		FJP584	FJP586				FJP587			
Sampling Date		2017/10/18	2017/10/18				2017/10/18			
COC Number		D26097	D26097				D26097			
	UNITS	**SEPTIC-SOIL-3**	**SHACK-SOIL-1**	**RDL**	**MDL**	**QC Batch**	**SHACK-SOIL-2**	**RDL**	**MDL**	**QC Batch**
Volatile Organics										
1,1,1-Trichloroethane	ug/kg	<25	<25	25	0.00010	5227759	<25	25	0.00010	5227338
1,1,2,2-Tetrachloroethane	ug/kg	<25	<25	25	0.00040	5227759	<25	25	0.00040	5227338
1,1,2-Trichloroethane	ug/kg	<25	<25	25	0.00040	5227759	<25	25	0.00040	5227338
1,1-Dichloroethane	ug/kg	<25	<25	25	0.00010	5227759	<25	25	0.00010	5227338
1,1-Dichloroethylene	ug/kg	<25	<25	25	0.00010	5227759	<25	25	0.00010	5227338
1,2-Dichlorobenzene	ug/kg	<25	<25	25	0.00020	5227759	<25	25	0.00020	5227338
1,2-Dichloroethane	ug/kg	<25	<25	25	0.00010	5227759	<25	25	0.00010	5227338
1,2-Dichloropropane	ug/kg	<25	<25	25	0.00020	5227759	<25	25	0.00020	5227338
1,3-Dichlorobenzene	ug/kg	<25	<25	25	0.00020	5227759	<25	25	0.00020	5227338
1,4-Dichlorobenzene	ug/kg	<25	<25	25	0.00030	5227759	<25	25	0.00030	5227338
Benzene	ug/kg	<25	<25	25	0.00010	5227759	<25	25	0.00010	5227338
Bromodichloromethane	ug/kg	<25	<25	25	0.00020	5227759	<25	25	0.00020	5227338
Bromoform	ug/kg	<25	<25	25	0.00030	5227759	<25	25	0.00030	5227338
Bromomethane	ug/kg	<50	<50	50	0.00040	5227759	<50	50	0.00040	5227338
Carbon Tetrachloride	ug/kg	<25	<25	25	0.00010	5227759	<25	25	0.00010	5227338
Chlorobenzene	ug/kg	<25	<25	25	0.00010	5227759	<25	25	0.00010	5227338
Chloroethane	ug/kg	<200	<200	200	0.00030	5227759	<200	200	0.00030	5227338
Chloroform	ug/kg	<25	<25	25	0.00010	5227759	<25	25	0.00010	5227338
cis-1,2-Dichloroethylene	ug/kg	<25	<25	25	0.00010	5227759	<25	25	0.00010	5227338
cis-1,3-Dichloropropene	ug/kg	<25	<25	25	0.00020	5227759	<25	25	0.00020	5227338
Dibromochloromethane	ug/kg	<25	<25	25	0.00030	5227759	<25	25	0.00030	5227338
Ethylbenzene	ug/kg	<25	<25	25	0.00010	5227759	<25	25	0.00010	5227338
Ethylene Dibromide	ug/kg	<25	<25	25	0.00040	5227759	<25	25	0.00040	5227338
Methyl t-butyl ether (MTBE)	ug/kg	44	<25	25	0.00010	5227759	<25	25	0.00010	5227338
Methylene Chloride(Dichloromethane)	ug/kg	<25	<25	25	0.00020	5227759	<30 (1)	30	0.00024	5227338
o-Xylene	ug/kg	<25	<25	25	0.00010	5227759	<25	25	0.00010	5227338
p+m-Xylene	ug/kg	<25	<25	25	0.00010	5227759	<25	25	0.00010	5227338
Styrene	ug/kg	<25	<25	25	0.00020	5227759	<25	25	0.00020	5227338
Tetrachloroethylene	ug/kg	<25	<25	25	0.00030	5227759	<25	25	0.00030	5227338
Toluene	ug/kg	<25	<25	25	0.00010	5227759	<25	25	0.00010	5227338
Total Xylenes	ug/kg	<50	<50	50	N/A	5227759	<50	50	N/A	5227338
trans-1,2-Dichloroethylene	ug/kg	<25	<25	25	0.00020	5227759	<25	25	0.00020	5227338

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable
(1) Elevated VOC RDL(s) due to detected levels in the method blank.

ATLANTIC VOC IN SOIL (FIELD PRES.)

Maxxam ID		FJP584	FJP586				FJP587			
Sampling Date		2017/10/18	2017/10/18				2017/10/18			
COC Number		D26097	D26097				D26097			
	UNITS	**SEPTIC-SOIL-3**	**SHACK-SOIL-1**	**RDL**	**MDL**	**QC Batch**	**SHACK-SOIL-2**	**RDL**	**MDL**	**QC Batch**
trans-1,3-Dichloropropene	ug/kg	<25	<25	25	0.00030	5227759	<25	25	0.00030	5227338
Trichloroethylene	ug/kg	<10	<10	10	0.00020	5227759	<10	10	0.00020	5227338
Trichlorofluoromethane (FREON 11)	ug/kg	<25	<25	25	0.00030	5227759	<25	25	0.00030	5227338
Vinyl Chloride	ug/kg	<20	<20	20	0.00020	5227759	<20	20	0.00020	5227338
Surrogate Recovery (%)										
4-Bromofluorobenzene	%	100	100			5227759	100			5227338
D10-o-Xylene	%	122 (1)	103 (1)			5227759	109			5227338
D4-1,2-Dichloroethane	%	97	98			5227759	99			5227338
D8-Toluene	%	102	102			5227759	103			5227338

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) VOC samples were extracted using a flat-bed shaker instead of the accelerated mechanical shaker due to matrix incompatibility.

ATLANTIC VOC IN SOIL (FIELD PRES.)

Maxxam ID		FJP588			FJP619	FJP620			
Sampling Date		2017/10/18			2017/10/14	2017/10/14			
COC Number		D26097			D26106	D26106			
	UNITS	**SHACK-SOIL-3**	**RDL**	**MDL**	**BG-SOIL-1**	**BG-SOIL-2**	**RDL**	**MDL**	**QC Batch**
Volatile Organics									
1,1,1-Trichloroethane	ug/kg	<25	25	0.00010	<50	<50	50	0.00020	5227338
1,1,2,2-Tetrachloroethane	ug/kg	<25	25	0.00040	<50	<50	50	0.00080	5227338
1,1,2-Trichloroethane	ug/kg	<25	25	0.00040	<50	<50	50	0.00080	5227338
1,1-Dichloroethane	ug/kg	<25	25	0.00010	<50	<50	50	0.00020	5227338
1,1-Dichloroethylene	ug/kg	<25	25	0.00010	<50	<50	50	0.00020	5227338
1,2-Dichlorobenzene	ug/kg	<25	25	0.00020	<50	<50	50	0.00040	5227338
1,2-Dichloroethane	ug/kg	<25	25	0.00010	<50	<50	50	0.00020	5227338
1,2-Dichloropropane	ug/kg	<25	25	0.00020	<50	<50	50	0.00040	5227338
1,3-Dichlorobenzene	ug/kg	<25	25	0.00020	<50	<50	50	0.00040	5227338
1,4-Dichlorobenzene	ug/kg	<25	25	0.00030	<50	<50	50	0.00060	5227338
Benzene	ug/kg	<25	25	0.00010	<50	<50	50	0.00020	5227338
Bromodichloromethane	ug/kg	<25	25	0.00020	<50	<50	50	0.00040	5227338
Bromoform	ug/kg	<25	25	0.00030	<50	<50	50	0.00060	5227338
Bromomethane	ug/kg	<50	50	0.00040	<100	<100	100	0.00080	5227338
Carbon Tetrachloride	ug/kg	<25	25	0.00010	<50	<50	50	0.00020	5227338
Chlorobenzene	ug/kg	<25	25	0.00010	<50	<50	50	0.00020	5227338
Chloroethane	ug/kg	<200	200	0.00030	<400	<400	400	0.00060	5227338
Chloroform	ug/kg	<25	25	0.00010	<50	<50	50	0.00020	5227338
cis-1,2-Dichloroethylene	ug/kg	<25	25	0.00010	<50	<50	50	0.00020	5227338
cis-1,3-Dichloropropene	ug/kg	<25	25	0.00020	<50	<50	50	0.00040	5227338
Dibromochloromethane	ug/kg	<25	25	0.00030	<50	<50	50	0.00060	5227338
Ethylbenzene	ug/kg	<25	25	0.00010	<50	<50	50	0.00020	5227338
Ethylene Dibromide	ug/kg	<25	25	0.00040	<50	<50	50	0.00080	5227338
Methyl t-butyl ether (MTBE)	ug/kg	<25	25	0.00010	<50	<50	50	0.00020	5227338
Methylene Chloride(Dichloromethane)	ug/kg	<30 (1)	30	0.00024	<50	<50	50	0.00040	5227338
o-Xylene	ug/kg	<25	25	0.00010	<50	<50	50	0.00020	5227338
p+m-Xylene	ug/kg	<25	25	0.00010	<50	<50	50	0.00020	5227338
Styrene	ug/kg	<25	25	0.00020	<50	<50	50	0.00040	5227338
Tetrachloroethylene	ug/kg	<25	25	0.00030	<50	<50	50	0.00060	5227338
Toluene	ug/kg	<25	25	0.00010	<50	<50	50	0.00020	5227338
Total Xylenes	ug/kg	<50	50	N/A	<100	<100	100	N/A	5227338
trans-1,2-Dichloroethylene	ug/kg	<25	25	0.00020	<50	<50	50	0.00040	5227338

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable
(1) Elevated VOC RDL(s) due to detected levels in the method blank.

ATLANTIC VOC IN SOIL (FIELD PRES.)

Maxxam ID		FJP588			FJP619	FJP620			
Sampling Date		2017/10/18			2017/10/14	2017/10/14			
COC Number		D26097			D26106	D26106			
	UNITS	**SHACK-SOIL-3**	**RDL**	**MDL**	**BG-SOIL-1**	**BG-SOIL-2**	**RDL**	**MDL**	**QC Batch**
trans-1,3-Dichloropropene	ug/kg	<25	25	0.00030	<50	<50	50	0.00060	5227338
Trichloroethylene	ug/kg	<10	10	0.00020	<20	<20	20	0.00040	5227338
Trichlorofluoromethane (FREON 11)	ug/kg	<25	25	0.00030	<50	<50	50	0.00060	5227338
Vinyl Chloride	ug/kg	<20	20	0.00020	<40	<40	40	0.00040	5227338
Surrogate Recovery (%)									
4-Bromofluorobenzene	%	100			100	100			5227338
D10-o-Xylene	%	116 (1)			89 (2)	85 (2)			5227338
D4-1,2-Dichloroethane	%	97			99	101			5227338
D8-Toluene	%	103			102	101			5227338

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

(1) VOC samples were extracted using a flat-bed shaker instead of the accelerated mechanical shaker due to matrix incompatibility.

(2) Elevated VOC RDL(s) due to limited sample.

ATLANTIC VOC IN SOIL (FIELD PRES.)

Maxxam ID		FJP621	FJP622	FJP622	FJP623	FJP624	FJP625			
Sampling Date		2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14			
COC Number		D26106	D26106	D26106	D26106	D26106	D26106			
	UNITS	**BG-SOIL-3**	**BG-SOIL-4**	**BG-SOIL-4 Lab-Dup**	**BG-SOIL-5**	**BG-SOIL-6**	**BG-SOIL-7**	**RDL**	**MDL**	**QC Batch**
Volatile Organics										
1,1,1-Trichloroethane	ug/kg	<25	<25	<25	<25	<25	<25	25	0.00010	5227338
1,1,2,2-Tetrachloroethane	ug/kg	<25	<25	<25	<25	<25	<25	25	0.00040	5227338
1,1,2-Trichloroethane	ug/kg	<25	<25	<25	<25	<25	<25	25	0.00040	5227338
1,1-Dichloroethane	ug/kg	<25	<25	<25	<25	<25	<25	25	0.00010	5227338
1,1-Dichloroethylene	ug/kg	<25	<25	<25	<25	<25	<25	25	0.00010	5227338
1,2-Dichlorobenzene	ug/kg	<25	<25	<25	<25	<25	<25	25	0.00020	5227338
1,2-Dichloroethane	ug/kg	<25	<25	<25	<25	<25	<25	25	0.00010	5227338
1,2-Dichloropropane	ug/kg	<25	<25	<25	<25	<25	<25	25	0.00020	5227338
1,3-Dichlorobenzene	ug/kg	<25	<25	<25	<25	<25	<25	25	0.00020	5227338
1,4-Dichlorobenzene	ug/kg	<25	<25	<25	<25	<25	<25	25	0.00030	5227338
Benzene	ug/kg	<25	<25	<25	<25	<25	<25	25	0.00010	5227338
Bromodichloromethane	ug/kg	<25	<25	<25	<25	<25	<25	25	0.00020	5227338
Bromoform	ug/kg	<25	<25	<25	<25	<25	<25	25	0.00030	5227338
Bromomethane	ug/kg	<50	<50	<50	<50	<50	<50	50	0.00040	5227338
Carbon Tetrachloride	ug/kg	<25	<25	<25	<25	<25	<25	25	0.00010	5227338
Chlorobenzene	ug/kg	<25	<25	<25	<25	<25	<25	25	0.00010	5227338
Chloroethane	ug/kg	<200	<200	<200	<200	<200	<200	200	0.00030	5227338
Chloroform	ug/kg	<25	<25	<25	<25	<25	<25	25	0.00010	5227338
cis-1,2-Dichloroethylene	ug/kg	<25	<25	<25	<25	<25	<25	25	0.00010	5227338
cis-1,3-Dichloropropene	ug/kg	<25	<25	<25	<25	<25	<25	25	0.00020	5227338
Dibromochloromethane	ug/kg	<25	<25	<25	<25	<25	<25	25	0.00030	5227338
Ethylbenzene	ug/kg	<25	<25	<25	<25	<25	<25	25	0.00010	5227338
Ethylene Dibromide	ug/kg	<25	<25	<25	<25	<25	<25	25	0.00040	5227338
Methyl t-butyl ether (MTBE)	ug/kg	<25	<25	<25	<25	<25	<25	25	0.00010	5227338
Methylene Chloride(Dichloromethane)	ug/kg	<30 (1)	<30 (1)	<30 (1)	<30 (1)	<30 (1)	<30 (1)	30	0.00024	5227338
o-Xylene	ug/kg	<25	<25	<25	<25	<25	<25	25	0.00010	5227338
p+m-Xylene	ug/kg	<25	<25	<25	<25	<25	<25	25	0.00010	5227338
Styrene	ug/kg	<25	<25	<25	<25	<25	<25	25	0.00020	5227338
Tetrachloroethylene	ug/kg	<25	<25	<25	<25	<25	<25	25	0.00030	5227338
Toluene	ug/kg	<25	<25	<25	<25	<25	<25	25	0.00010	5227338
Total Xylenes	ug/kg	<50	<50	<50	<50	<50	<50	50	N/A	5227338

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable
(1) Elevated VOC RDL(s) due to detected levels in the method blank.

ATLANTIC VOC IN SOIL (FIELD PRES.)

Maxxam ID		FJP621	FJP622	FJP622	FJP623	FJP624	FJP625			
Sampling Date		2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14			
COC Number		D26106	D26106	D26106	D26106	D26106	D26106			
	UNITS	**BG-SOIL-3**	**BG-SOIL-4**	**BG-SOIL-4 Lab-Dup**	**BG-SOIL-5**	**BG-SOIL-6**	**BG-SOIL-7**	**RDL**	**MDL**	**QC Batch**
trans-1,2-Dichloroethylene	ug/kg	<25	<25	<25	<25	<25	<25	25	0.00020	5227338
trans-1,3-Dichloropropene	ug/kg	<25	<25	<25	<25	<25	<25	25	0.00030	5227338
Trichloroethylene	ug/kg	<10	<10	<10	<10	<10	<10	10	0.00020	5227338
Trichlorofluoromethane (FREON 11)	ug/kg	<25	<25	<25	<25	<25	<25	25	0.00030	5227338
Vinyl Chloride	ug/kg	<20	<20	<20	<20	<20	<20	20	0.00020	5227338
Surrogate Recovery (%)										
4-Bromofluorobenzene	%	99	100	100	101	99	100			5227338
D10-o-Xylene	%	115	80	82	77	103	103			5227338
D4-1,2-Dichloroethane	%	101	98	99	96	98	95			5227338
D8-Toluene	%	101	101	103	103	102	103			5227338

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

ATLANTIC VOC IN SOIL (FIELD PRES.)

Maxxam ID		FJP626				FJP681	FJP682			
Sampling Date		2017/10/14				2017/10/17	2017/10/17			
COC Number		D26106				D26102	D26102			
	UNITS	**BG-SOIL-8**	**RDL**	**MDL**	**QC Batch**	**LPUMP-SOIL-2**	**LPUMP-SOIL-3**	**RDL**	**MDL**	**QC Batch**
Volatile Organics										
1,1,1-Trichloroethane	ug/kg	<25	25	0.00010	5227338	<25	<25	25	0.00010	5227759
1,1,2,2-Tetrachloroethane	ug/kg	<25	25	0.00040	5227338	<25	<25	25	0.00040	5227759
1,1,2-Trichloroethane	ug/kg	<25	25	0.00040	5227338	<25	<25	25	0.00040	5227759
1,1-Dichloroethane	ug/kg	<25	25	0.00010	5227338	<25	<25	25	0.00010	5227759
1,1-Dichloroethylene	ug/kg	<25	25	0.00010	5227338	<25	<25	25	0.00010	5227759
1,2-Dichlorobenzene	ug/kg	<25	25	0.00020	5227338	<25	<25	25	0.00020	5227759
1,2-Dichloroethane	ug/kg	<25	25	0.00010	5227338	<25	<25	25	0.00010	5227759
1,2-Dichloropropane	ug/kg	<25	25	0.00020	5227338	<25	<25	25	0.00020	5227759
1,3-Dichlorobenzene	ug/kg	<25	25	0.00020	5227338	<25	<25	25	0.00020	5227759
1,4-Dichlorobenzene	ug/kg	<25	25	0.00030	5227338	<25	<25	25	0.00030	5227759
Benzene	ug/kg	<25	25	0.00010	5227338	<25	<25	25	0.00010	5227759
Bromodichloromethane	ug/kg	<25	25	0.00020	5227338	<25	<25	25	0.00020	5227759
Bromoform	ug/kg	<25	25	0.00030	5227338	<25	<25	25	0.00030	5227759
Bromomethane	ug/kg	<50	50	0.00040	5227338	<50	<50	50	0.00040	5227759
Carbon Tetrachloride	ug/kg	<25	25	0.00010	5227338	<25	<25	25	0.00010	5227759
Chlorobenzene	ug/kg	<25	25	0.00010	5227338	<25	<25	25	0.00010	5227759
Chloroethane	ug/kg	<200	200	0.00030	5227338	<200	<200	200	0.00030	5227759
Chloroform	ug/kg	<25	25	0.00010	5227338	<25	<25	25	0.00010	5227759
cis-1,2-Dichloroethylene	ug/kg	<25	25	0.00010	5227338	<25	<25	25	0.00010	5227759
cis-1,3-Dichloropropene	ug/kg	<25	25	0.00020	5227338	<25	<25	25	0.00020	5227759
Dibromochloromethane	ug/kg	<25	25	0.00030	5227338	<25	<25	25	0.00030	5227759
Ethylbenzene	ug/kg	<25	25	0.00010	5227338	<25	<25	25	0.00010	5227759
Ethylene Dibromide	ug/kg	<25	25	0.00040	5227338	<25	<25	25	0.00040	5227759
Methyl t-butyl ether (MTBE)	ug/kg	<25	25	0.00010	5227338	<25	<25	25	0.00010	5227759
Methylene Chloride(Dichloromethane)	ug/kg	<30 (1)	30	0.00024	5227338	<25	<25	25	0.00020	5227759
o-Xylene	ug/kg	<25	25	0.00010	5227338	<25	<25	25	0.00010	5227759
p+m-Xylene	ug/kg	<25	25	0.00010	5227338	<25	<25	25	0.00010	5227759
Styrene	ug/kg	<25	25	0.00020	5227338	<25	<25	25	0.00020	5227759
Tetrachloroethylene	ug/kg	<25	25	0.00030	5227338	<25	<25	25	0.00030	5227759
Toluene	ug/kg	<25	25	0.00010	5227338	<25	<25	25	0.00010	5227759
Total Xylenes	ug/kg	<50	50	N/A	5227338	<50	<50	50	N/A	5227759
trans-1,2-Dichloroethylene	ug/kg	<25	25	0.00020	5227338	<25	<25	25	0.00020	5227759

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable
(1) Elevated VOC RDL(s) due to detected levels in the method blank.

ATLANTIC VOC IN SOIL (FIELD PRES.)

Maxxam ID		FJP626				FJP681	FJP682			
Sampling Date		2017/10/14				2017/10/17	2017/10/17			
COC Number		D26106				D26102	D26102			
	UNITS	**BG-SOIL-8**	**RDL**	**MDL**	**QC Batch**	**LPUMP-SOIL-2**	**LPUMP-SOIL-3**	**RDL**	**MDL**	**QC Batch**
trans-1,3-Dichloropropene	ug/kg	<25	25	0.00030	5227338	<25	<25	25	0.00030	5227759
Trichloroethylene	ug/kg	<10	10	0.00020	5227338	<10	<10	10	0.00020	5227759
Trichlorofluoromethane (FREON 11)	ug/kg	<25	25	0.00030	5227338	<25	<25	25	0.00030	5227759
Vinyl Chloride	ug/kg	<20	20	0.00020	5227338	<20	<20	20	0.00020	5227759
Surrogate Recovery (%)										
4-Bromofluorobenzene	%	100			5227338	100	100			5227759
D10-o-Xylene	%	113			5227338	117 (1)	111			5227759
D4-1,2-Dichloroethane	%	98			5227338	99	99			5227759
D8-Toluene	%	103			5227338	102	102			5227759

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) VOC samples were extracted using a flat-bed shaker instead of the accelerated mechanical shaker due to matrix incompatibility.

ATLANTIC VOC IN SOIL (FIELD PRES.)

Maxxam ID		FJP683	FJP685	FJP686			
Sampling Date		2017/10/17	2017/10/17	2017/10/17			
COC Number		D26102	D26102	D26102			
	UNITS	**LPUMP-SOIL-1**	**LPUMP-SOIL-4**	**UPUMP-SOIL-1**	**RDL**	**MDL**	**QC Batch**
Volatile Organics							
1,1,1-Trichloroethane	ug/kg	<50	<50	<50	50	0.00020	5227759
1,1,2,2-Tetrachloroethane	ug/kg	<50	<50	<50	50	0.00080	5227759
1,1,2-Trichloroethane	ug/kg	<50	<50	<50	50	0.00080	5227759
1,1-Dichloroethane	ug/kg	<50	<50	<50	50	0.00020	5227759
1,1-Dichloroethylene	ug/kg	<50	<50	<50	50	0.00020	5227759
1,2-Dichlorobenzene	ug/kg	<50	<50	<50	50	0.00040	5227759
1,2-Dichloroethane	ug/kg	<50	<50	<50	50	0.00020	5227759
1,2-Dichloropropane	ug/kg	<50	<50	<50	50	0.00040	5227759
1,3-Dichlorobenzene	ug/kg	<50	<50	<50	50	0.00040	5227759
1,4-Dichlorobenzene	ug/kg	<50	<50	<50	50	0.00060	5227759
Benzene	ug/kg	<50	<50	<50	50	0.00020	5227759
Bromodichloromethane	ug/kg	<50	<50	<50	50	0.00040	5227759
Bromoform	ug/kg	<50	<50	<50	50	0.00060	5227759
Bromomethane	ug/kg	<100	<100	<100	100	0.00080	5227759
Carbon Tetrachloride	ug/kg	<50	<50	<50	50	0.00020	5227759
Chlorobenzene	ug/kg	<50	<50	<50	50	0.00020	5227759
Chloroethane	ug/kg	<400	<400	<400	400	0.00060	5227759
Chloroform	ug/kg	<50	<50	<50	50	0.00020	5227759
cis-1,2-Dichloroethylene	ug/kg	<50	<50	<50	50	0.00020	5227759
cis-1,3-Dichloropropene	ug/kg	<50	<50	<50	50	0.00040	5227759
Dibromochloromethane	ug/kg	<50	<50	<50	50	0.00060	5227759
Ethylbenzene	ug/kg	<50	<50	<50	50	0.00020	5227759
Ethylene Dibromide	ug/kg	<50	<50	<50	50	0.00080	5227759
Methyl t-butyl ether (MTBE)	ug/kg	<50	<50	<50	50	0.00020	5227759
Methylene Chloride(Dichloromethane)	ug/kg	<50	<50	<50	50	0.00040	5227759
o-Xylene	ug/kg	<50	<50	<50	50	0.00020	5227759
p+m-Xylene	ug/kg	<50	<50	<50	50	0.00020	5227759
Styrene	ug/kg	<50	<50	<50	50	0.00040	5227759
Tetrachloroethylene	ug/kg	<50	<50	<50	50	0.00060	5227759
Toluene	ug/kg	<50	<50	<50	50	0.00020	5227759
Total Xylenes	ug/kg	<100	<100	<100	100	N/A	5227759
trans-1,2-Dichloroethylene	ug/kg	<50	<50	<50	50	0.00040	5227759

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

ATLANTIC VOC IN SOIL (FIELD PRES.)

Maxxam ID		FJP683	FJP685	FJP686			
Sampling Date		2017/10/17	2017/10/17	2017/10/17			
COC Number		D26102	D26102	D26102			
	UNITS	**LPUMP-SOIL-1**	**LPUMP-SOIL-4**	**UPUMP-SOIL-1**	**RDL**	**MDL**	**QC Batch**
trans-1,3-Dichloropropene	ug/kg	<50	<50	<50	50	0.00060	5227759
Trichloroethylene	ug/kg	<20	<20	<20	20	0.00040	5227759
Trichlorofluoromethane (FREON 11)	ug/kg	<50	<50	<50	50	0.00060	5227759
Vinyl Chloride	ug/kg	<40	<40	<40	40	0.00040	5227759
Surrogate Recovery (%)							
4-Bromofluorobenzene	%	100	100	100			5227759
D10-o-Xylene	%	96 (1)	100 (1)	90 (1)			5227759
D4-1,2-Dichloroethane	%	99	99	98			5227759
D8-Toluene	%	103	102	102			5227759

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) Elevated VOC RDL(s) due to limited sample.

ATLANTIC VOC IN SOIL (FIELD PRES.)

Maxxam ID		FJP687			FJP688			
Sampling Date		2017/10/17			2017/10/17			
COC Number		D26102			D26102			
	UNITS	UPUMP-SOIL-2	RDL	MDL	UPUMP-SOIL-3	RDL	MDL	QC Batch
Volatile Organics								
1,1,1-Trichloroethane	ug/kg	<25	25	0.00010	<50	50	0.00020	5229883
1,1,2,2-Tetrachloroethane	ug/kg	<25	25	0.00040	<50	50	0.00080	5229883
1,1,2-Trichloroethane	ug/kg	<25	25	0.00040	<50	50	0.00080	5229883
1,1-Dichloroethane	ug/kg	<25	25	0.00010	<50	50	0.00020	5229883
1,1-Dichloroethylene	ug/kg	<25	25	0.00010	<50	50	0.00020	5229883
1,2-Dichlorobenzene	ug/kg	<25	25	0.00020	<50	50	0.00040	5229883
1,2-Dichloroethane	ug/kg	<25	25	0.00010	<50	50	0.00020	5229883
1,2-Dichloropropane	ug/kg	<25	25	0.00020	<50	50	0.00040	5229883
1,3-Dichlorobenzene	ug/kg	<25	25	0.00020	<50	50	0.00040	5229883
1,4-Dichlorobenzene	ug/kg	<25	25	0.00030	<50	50	0.00060	5229883
Benzene	ug/kg	<25	25	0.00010	<50	50	0.00020	5229883
Bromodichloromethane	ug/kg	<25	25	0.00020	<50	50	0.00040	5229883
Bromoform	ug/kg	<25	25	0.00030	<50	50	0.00060	5229883
Bromomethane	ug/kg	<50	50	0.00040	<100	100	0.00080	5229883
Carbon Tetrachloride	ug/kg	<25	25	0.00010	<50	50	0.00020	5229883
Chlorobenzene	ug/kg	<25	25	0.00010	<50	50	0.00020	5229883
Chloroethane	ug/kg	<200	200	0.00030	<400	400	0.00060	5229883
Chloroform	ug/kg	<25	25	0.00010	<50	50	0.00020	5229883
cis-1,2-Dichloroethylene	ug/kg	<25	25	0.00010	<50	50	0.00020	5229883
cis-1,3-Dichloropropene	ug/kg	<25	25	0.00020	<50	50	0.00040	5229883
Dibromochloromethane	ug/kg	<25	25	0.00030	<50	50	0.00060	5229883
Ethylbenzene	ug/kg	<25	25	0.00010	<50	50	0.00020	5229883
Ethylene Dibromide	ug/kg	<25	25	0.00040	<50	50	0.00080	5229883
Methyl t-butyl ether (MTBE)	ug/kg	<25	25	0.00010	<50	50	0.00020	5229883
Methylene Chloride(Dichloromethane)	ug/kg	<25	25	0.00020	<50	50	0.00040	5229883
o-Xylene	ug/kg	<25	25	0.00010	<50	50	0.00020	5229883
p+m-Xylene	ug/kg	<25	25	0.00010	<50	50	0.00020	5229883
Styrene	ug/kg	<25	25	0.00020	<50	50	0.00040	5229883
Tetrachloroethylene	ug/kg	<25	25	0.00030	<50	50	0.00060	5229883
Toluene	ug/kg	<25	25	0.00010	<50	50	0.00020	5229883
Total Xylenes	ug/kg	<50	50	N/A	<100	100	N/A	5229883
trans-1,2-Dichloroethylene	ug/kg	<25	25	0.00020	<50	50	0.00040	5229883

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

ATLANTIC VOC IN SOIL (FIELD PRES.)

Maxxam ID		FJP687			FJP688			
Sampling Date		2017/10/17			2017/10/17			
COC Number		D26102			D26102			
	UNITS	**UPUMP-SOIL-2**	**RDL**	**MDL**	**UPUMP-SOIL-3**	**RDL**	**MDL**	**QC Batch**
trans-1,3-Dichloropropene	ug/kg	<25	25	0.00030	<50	50	0.00060	5229883
Trichloroethylene	ug/kg	<10	10	0.00020	<20	20	0.00040	5229883
Trichlorofluoromethane (FREON 11)	ug/kg	<25	25	0.00030	<50	50	0.00060	5229883
Vinyl Chloride	ug/kg	<20	20	0.00020	<40	40	0.00040	5229883
Surrogate Recovery (%)								
4-Bromofluorobenzene	%	99			99			5229883
D10-o-Xylene	%	79			82 (1)			5229883
D4-1,2-Dichloroethane	%	101			98			5229883
D8-Toluene	%	97			97			5229883

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) Elevated VOC RDL(s) due to limited sample.

ATLANTIC VOC IN SOIL (FIELD PRES.)

Maxxam ID		FJP689				FJP691			
Sampling Date		2017/10/17				2017/10/17			
COC Number		D26102				D26102			
	UNITS	**UPUMP-SOIL-4**	**RDL**	**MDL**	**QC Batch**	**UPUMP-SOIL-5**	**RDL**	**MDL**	**QC Batch**
Inorganics									
Moisture	%	76	1.0	0.20	5229745				
Volatile Organics									
1,1,1-Trichloroethane	ug/kg	<50	50	0.00020	5229883	<50	50	0.00020	5229883
1,1,2,2-Tetrachloroethane	ug/kg	<50	50	0.00080	5229883	<50	50	0.00080	5229883
1,1,2-Trichloroethane	ug/kg	<50	50	0.00080	5229883	<50	50	0.00080	5229883
1,1-Dichloroethane	ug/kg	<50	50	0.00020	5229883	<50	50	0.00020	5229883
1,1-Dichloroethylene	ug/kg	<50	50	0.00020	5229883	<50	50	0.00020	5229883
1,2-Dichlorobenzene	ug/kg	<50	50	0.00040	5229883	<50	50	0.00040	5229883
1,2-Dichloroethane	ug/kg	<50	50	0.00020	5229883	<50	50	0.00020	5229883
1,2-Dichloropropane	ug/kg	<50	50	0.00040	5229883	<50	50	0.00040	5229883
1,3-Dichlorobenzene	ug/kg	<50	50	0.00040	5229883	<50	50	0.00040	5229883
1,4-Dichlorobenzene	ug/kg	<50	50	0.00060	5229883	<50	50	0.00060	5229883
Benzene	ug/kg	<50	50	0.00020	5229883	<50	50	0.00020	5229883
Bromodichloromethane	ug/kg	<50	50	0.00040	5229883	<50	50	0.00040	5229883
Bromoform	ug/kg	<50	50	0.00060	5229883	<50	50	0.00060	5229883
Bromomethane	ug/kg	<100	100	0.00080	5229883	<100	100	0.00080	5229883
Carbon Tetrachloride	ug/kg	<50	50	0.00020	5229883	<50	50	0.00020	5229883
Chlorobenzene	ug/kg	<50	50	0.00020	5229883	<50	50	0.00020	5229883
Chloroethane	ug/kg	<400	400	0.00060	5229883	<400	400	0.00060	5229883
Chloroform	ug/kg	<50	50	0.00020	5229883	<50	50	0.00020	5229883
cis-1,2-Dichloroethylene	ug/kg	<50	50	0.00020	5229883	<50	50	0.00020	5229883
cis-1,3-Dichloropropene	ug/kg	<50	50	0.00040	5229883	<50	50	0.00040	5229883
Dibromochloromethane	ug/kg	<50	50	0.00060	5229883	<50	50	0.00060	5229883
Ethylbenzene	ug/kg	<50	50	0.00020	5229883	<50	50	0.00020	5229883
Ethylene Dibromide	ug/kg	<50	50	0.00080	5229883	<50	50	0.00080	5229883
Methyl t-butyl ether (MTBE)	ug/kg	<50	50	0.00020	5229883	<50	50	0.00020	5229883
Methylene Chloride(Dichloromethane)	ug/kg	<50	50	0.00040	5229883	<50	50	0.00040	5229883
o-Xylene	ug/kg	<50	50	0.00020	5229883	<50	50	0.00020	5229883
p+m-Xylene	ug/kg	<50	50	0.00020	5229883	<50	50	0.00020	5229883
Styrene	ug/kg	<50	50	0.00040	5229883	<50	50	0.00040	5229883
Tetrachloroethylene	ug/kg	<50	50	0.00060	5229883	<50	50	0.00060	5229883
Toluene	ug/kg	<50	50	0.00020	5229883	<50	50	0.00020	5229883
Total Xylenes	ug/kg	<100	100	N/A	5229883	<100	100	N/A	5229883

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

ATLANTIC VOC IN SOIL (FIELD PRES.)

Maxxam ID		FJP689				FJP691			
Sampling Date		2017/10/17				2017/10/17			
COC Number		D26102				D26102			
	UNITS	**UPUMP-SOIL-4**	**RDL**	**MDL**	**QC Batch**	**UPUMP-SOIL-5**	**RDL**	**MDL**	**QC Batch**
trans-1,2-Dichloroethylene	ug/kg	<50	50	0.00040	5229883	<50	50	0.00040	5229883
trans-1,3-Dichloropropene	ug/kg	<50	50	0.00060	5229883	<50	50	0.00060	5229883
Trichloroethylene	ug/kg	<20	20	0.00040	5229883	<20	20	0.00040	5229883
Trichlorofluoromethane (FREON 11)	ug/kg	<50	50	0.00060	5229883	<50	50	0.00060	5229883
Vinyl Chloride	ug/kg	<40	40	0.00040	5229883	<40	40	0.00040	5229883
Surrogate Recovery (%)									
4-Bromofluorobenzene	%	98			5229883	97			5229883
D10-o-Xylene	%	75 (1)			5229883	81 (1)			5229883
D4-1,2-Dichloroethane	%	102			5229883	104			5229883
D8-Toluene	%	97			5229883	96			5229883

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) Elevated VOC RDL(s) due to limited sample.

ATLANTIC VOC IN SOIL (FIELD PRES.)

Maxxam ID		FJP706	FJP707	FJP707	FJP708			
Sampling Date		2017/10/13	2017/10/13	2017/10/13	2017/10/13			
COC Number		D26098	D26098	D26098	D26098			
	UNITS	**RADOME-SOIL-1**	**RADOME-SOIL-2**	**RADOME-SOIL-2 Lab-Dup**	**RADOME-SOIL-3**	**RDL**	**MDL**	**QC Batch**
Volatile Organics								
1,1,1-Trichloroethane	ug/kg	<25	<25	<25	<25	25	0.00010	5229883
1,1,2,2-Tetrachloroethane	ug/kg	<25	<25	<25	<25	25	0.00040	5229883
1,1,2-Trichloroethane	ug/kg	<25	<25	<25	<25	25	0.00040	5229883
1,1-Dichloroethane	ug/kg	<25	<25	<25	<25	25	0.00010	5229883
1,1-Dichloroethylene	ug/kg	<25	<25	<25	<25	25	0.00010	5229883
1,2-Dichlorobenzene	ug/kg	<25	<25	<25	<25	25	0.00020	5229883
1,2-Dichloroethane	ug/kg	<25	<25	<25	<25	25	0.00010	5229883
1,2-Dichloropropane	ug/kg	<25	<25	<25	<25	25	0.00020	5229883
1,3-Dichlorobenzene	ug/kg	<25	<25	<25	<25	25	0.00020	5229883
1,4-Dichlorobenzene	ug/kg	<25	<25	<25	<25	25	0.00030	5229883
Benzene	ug/kg	<25	<25	<25	<25	25	0.00010	5229883
Bromodichloromethane	ug/kg	<25	<25	<25	<25	25	0.00020	5229883
Bromoform	ug/kg	<25	<25	<25	<25	25	0.00030	5229883
Bromomethane	ug/kg	<50	<50	<50	<50	50	0.00040	5229883
Carbon Tetrachloride	ug/kg	<25	<25	<25	<25	25	0.00010	5229883
Chlorobenzene	ug/kg	<25	<25	<25	<25	25	0.00010	5229883
Chloroethane	ug/kg	<200	<200	<200	<200	200	0.00030	5229883
Chloroform	ug/kg	<25	<25	<25	<25	25	0.00010	5229883
cis-1,2-Dichloroethylene	ug/kg	<25	<25	<25	<25	25	0.00010	5229883
cis-1,3-Dichloropropene	ug/kg	<25	<25	<25	<25	25	0.00020	5229883
Dibromochloromethane	ug/kg	<25	<25	<25	<25	25	0.00030	5229883
Ethylbenzene	ug/kg	<25	<25	<25	<25	25	0.00010	5229883
Ethylene Dibromide	ug/kg	<25	<25	<25	<25	25	0.00040	5229883
Methyl t-butyl ether (MTBE)	ug/kg	<25	<25	<25	<25	25	0.00010	5229883
Methylene Chloride(Dichloromethane)	ug/kg	<25	<25	<25	<25	25	0.00020	5229883
o-Xylene	ug/kg	<25	<25	<25	<25	25	0.00010	5229883
p+m-Xylene	ug/kg	<25	<25	<25	<25	25	0.00010	5229883
Styrene	ug/kg	<25	<25	<25	<25	25	0.00020	5229883
Tetrachloroethylene	ug/kg	<25	<25	<25	<25	25	0.00030	5229883
Toluene	ug/kg	<25	<25	<25	<25	25	0.00010	5229883
Total Xylenes	ug/kg	<50	<50	<50	<50	50	N/A	5229883
trans-1,2-Dichloroethylene	ug/kg	<25	<25	<25	<25	25	0.00020	5229883

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

ATLANTIC VOC IN SOIL (FIELD PRES.)

Maxxam ID		FJP706	FJP707	FJP707	FJP708			
Sampling Date		2017/10/13	2017/10/13	2017/10/13	2017/10/13			
COC Number		D26098	D26098	D26098	D26098			
	UNITS	**RADOME-SOIL-1**	**RADOME-SOIL-2**	**RADOME-SOIL-2 Lab-Dup**	**RADOME-SOIL-3**	**RDL**	**MDL**	**QC Batch**
trans-1,3-Dichloropropene	ug/kg	<25	<25	<25	<25	25	0.00030	5229883
Trichloroethylene	ug/kg	<10	<10	<10	<10	10	0.00020	5229883
Trichlorofluoromethane (FREON 11)	ug/kg	<25	<25	<25	<25	25	0.00030	5229883
Vinyl Chloride	ug/kg	<20	<20	<20	<20	20	0.00020	5229883
Surrogate Recovery (%)								
4-Bromofluorobenzene	%	99	100	100	100			5229883
D10-o-Xylene	%	102 (1)	95 (1)	94 (1)	93 (1)			5229883
D4-1,2-Dichloroethane	%	99	102	101	103			5229883
D8-Toluene	%	98	97	97	97			5229883

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
(1) VOC samples were extracted using a flat-bed shaker instead of the accelerated mechanical shaker due to matrix incompatibility.

ATLANTIC VOC IN SOIL (FIELD PRES.)

Maxxam ID		FJP709	FJP710	FJP711	FJP712			
Sampling Date		2017/10/13	2017/10/13	2017/10/13	2017/10/13			
COC Number		D26098	D26098	D26098	D26098			
	UNITS	**TOWER-SOIL-1**	**TOWER-SOIL-2**	**TOWER-SOIL-3**	**TOWER-SOIL-4**	**RDL**	**MDL**	**QC Batch**
Volatile Organics								
1,1,1-Trichloroethane	ug/kg	<25	<25	<25	<25	25	0.00010	5229883
1,1,2,2-Tetrachloroethane	ug/kg	<25	<25	<25	<25	25	0.00040	5229883
1,1,2-Trichloroethane	ug/kg	<25	<25	<25	<25	25	0.00040	5229883
1,1-Dichloroethane	ug/kg	<25	<25	<25	<25	25	0.00010	5229883
1,1-Dichloroethylene	ug/kg	<25	<25	<25	<25	25	0.00010	5229883
1,2-Dichlorobenzene	ug/kg	<25	<25	<25	<25	25	0.00020	5229883
1,2-Dichloroethane	ug/kg	<25	<25	<25	<25	25	0.00010	5229883
1,2-Dichloropropane	ug/kg	<25	<25	<25	<25	25	0.00020	5229883
1,3-Dichlorobenzene	ug/kg	<25	<25	<25	<25	25	0.00020	5229883
1,4-Dichlorobenzene	ug/kg	<25	<25	<25	<25	25	0.00030	5229883
Benzene	ug/kg	<25	<25	<25	<25	25	0.00010	5229883
Bromodichloromethane	ug/kg	<25	<25	<25	<25	25	0.00020	5229883
Bromoform	ug/kg	<25	<25	<25	<25	25	0.00030	5229883
Bromomethane	ug/kg	<50	<50	<50	<50	50	0.00040	5229883
Carbon Tetrachloride	ug/kg	<25	<25	<25	<25	25	0.00010	5229883
Chlorobenzene	ug/kg	<25	<25	<25	<25	25	0.00010	5229883
Chloroethane	ug/kg	<200	<200	<200	<200	200	0.00030	5229883
Chloroform	ug/kg	<25	<25	<25	<25	25	0.00010	5229883
cis-1,2-Dichloroethylene	ug/kg	<25	<25	<25	<25	25	0.00010	5229883
cis-1,3-Dichloropropene	ug/kg	<25	<25	<25	<25	25	0.00020	5229883
Dibromochloromethane	ug/kg	<25	<25	<25	<25	25	0.00030	5229883
Ethylbenzene	ug/kg	<25	<25	<25	<25	25	0.00010	5229883
Ethylene Dibromide	ug/kg	<25	<25	<25	<25	25	0.00040	5229883
Methyl t-butyl ether (MTBE)	ug/kg	<25	<25	<25	<25	25	0.00010	5229883
Methylene Chloride(Dichloromethane)	ug/kg	<25	<25	<25	<25	25	0.00020	5229883
o-Xylene	ug/kg	<25	<25	<25	<25	25	0.00010	5229883
p+m-Xylene	ug/kg	<25	<25	<25	<25	25	0.00010	5229883
Styrene	ug/kg	<25	<25	<25	<25	25	0.00020	5229883
Tetrachloroethylene	ug/kg	<25	<25	<25	<25	25	0.00030	5229883
Toluene	ug/kg	<25	<25	<25	<25	25	0.00010	5229883
Total Xylenes	ug/kg	<50	<50	<50	<50	50	N/A	5229883
trans-1,2-Dichloroethylene	ug/kg	<25	<25	<25	<25	25	0.00020	5229883

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

ATLANTIC VOC IN SOIL (FIELD PRES.)

Maxxam ID		FJP709	FJP710	FJP711	FJP712			
Sampling Date		2017/10/13	2017/10/13	2017/10/13	2017/10/13			
COC Number		D26098	D26098	D26098	D26098			
	UNITS	**TOWER-SOIL-1**	**TOWER-SOIL-2**	**TOWER-SOIL-3**	**TOWER-SOIL-4**	**RDL**	**MDL**	**QC Batch**
trans-1,3-Dichloropropene	ug/kg	<25	<25	<25	<25	25	0.00030	5229883
Trichloroethylene	ug/kg	<10	<10	<10	<10	10	0.00020	5229883
Trichlorofluoromethane (FREON 11)	ug/kg	<25	<25	<25	<25	25	0.00030	5229883
Vinyl Chloride	ug/kg	<20	<20	<20	<20	20	0.00020	5229883
Surrogate Recovery (%)								
4-Bromofluorobenzene	%	100	100	99	99			5229883
D10-o-Xylene	%	100 (1)	94 (1)	93 (1)	92			5229883
D4-1,2-Dichloroethane	%	101	102	102	101			5229883
D8-Toluene	%	97	97	97	98			5229883

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

(1) VOC samples were extracted using a flat-bed shaker instead of the accelerated mechanical shaker due to matrix incompatibility.

ATLANTIC VOC IN SOIL (FIELD PRES.)

Maxxam ID		FJP642			FJP643			FJP644			
Sampling Date		2017/10/14			2017/10/14			2017/10/14			
COC Number		D26107			D26107			D26107			
	UNITS	**BG-SED-1**	**RDL**	**MDL**	**BG-SED-2**	**RDL**	**MDL**	**BG-SED-3**	**RDL**	**MDL**	**QC Batch**
Volatile Organics											
1,1,1-Trichloroethane	ug/kg	<25	25	0.00010	<50	50	0.00020	<25	25	0.00010	5227338
1,1,2,2-Tetrachloroethane	ug/kg	<25	25	0.00040	<50	50	0.00080	<25	25	0.00040	5227338
1,1,2-Trichloroethane	ug/kg	<25	25	0.00040	<50	50	0.00080	<25	25	0.00040	5227338
1,1-Dichloroethane	ug/kg	<25	25	0.00010	<50	50	0.00020	<25	25	0.00010	5227338
1,1-Dichloroethylene	ug/kg	<25	25	0.00010	<50	50	0.00020	<25	25	0.00010	5227338
1,2-Dichlorobenzene	ug/kg	<25	25	0.00020	<50	50	0.00040	<25	25	0.00020	5227338
1,2-Dichloroethane	ug/kg	<25	25	0.00010	<50	50	0.00020	<25	25	0.00010	5227338
1,2-Dichloropropane	ug/kg	<25	25	0.00020	<50	50	0.00040	<25	25	0.00020	5227338
1,3-Dichlorobenzene	ug/kg	<25	25	0.00020	<50	50	0.00040	<25	25	0.00020	5227338
1,4-Dichlorobenzene	ug/kg	<25	25	0.00030	<50	50	0.00060	<25	25	0.00030	5227338
Benzene	ug/kg	<25	25	0.00010	<50	50	0.00020	<25	25	0.00010	5227338
Bromodichloromethane	ug/kg	<25	25	0.00020	<50	50	0.00040	<25	25	0.00020	5227338
Bromoform	ug/kg	<25	25	0.00030	<50	50	0.00060	<25	25	0.00030	5227338
Bromomethane	ug/kg	<50	50	0.00040	<100	100	0.00080	<50	50	0.00040	5227338
Carbon Tetrachloride	ug/kg	<25	25	0.00010	<50	50	0.00020	<25	25	0.00010	5227338
Chlorobenzene	ug/kg	<25	25	0.00010	<50	50	0.00020	<25	25	0.00010	5227338
Chloroethane	ug/kg	<200	200	0.00030	<400	400	0.00060	<200	200	0.00030	5227338
Chloroform	ug/kg	<25	25	0.00010	<50	50	0.00020	<25	25	0.00010	5227338
cis-1,2-Dichloroethylene	ug/kg	<25	25	0.00010	<50	50	0.00020	<25	25	0.00010	5227338
cis-1,3-Dichloropropene	ug/kg	<25	25	0.00020	<50	50	0.00040	<25	25	0.00020	5227338
Dibromochloromethane	ug/kg	<25	25	0.00030	<50	50	0.00060	<25	25	0.00030	5227338
Ethylbenzene	ug/kg	<25	25	0.00010	<50	50	0.00020	<25	25	0.00010	5227338
Ethylene Dibromide	ug/kg	<25	25	0.00040	<50	50	0.00080	<25	25	0.00040	5227338
Methyl t-butyl ether (MTBE)	ug/kg	<25	25	0.00010	<50	50	0.00020	<25	25	0.00010	5227338
Methylene Chloride(Dichloromethane)	ug/kg	<30 (1)	30	0.00024	<50	50	0.00040	<30 (1)	30	0.00024	5227338
o-Xylene	ug/kg	<25	25	0.00010	<50	50	0.00020	<25	25	0.00010	5227338
p+m-Xylene	ug/kg	<25	25	0.00010	<50	50	0.00020	<25	25	0.00010	5227338
Styrene	ug/kg	<25	25	0.00020	<50	50	0.00040	<25	25	0.00020	5227338
Tetrachloroethylene	ug/kg	<25	25	0.00030	<50	50	0.00060	<25	25	0.00030	5227338
Toluene	ug/kg	<25	25	0.00010	<50	50	0.00020	<25	25	0.00010	5227338
Total Xylenes	ug/kg	<50	50	N/A	<100	100	N/A	<50	50	N/A	5227338
trans-1,2-Dichloroethylene	ug/kg	<25	25	0.00020	<50	50	0.00040	<25	25	0.00020	5227338
trans-1,3-Dichloropropene	ug/kg	<25	25	0.00030	<50	50	0.00060	<25	25	0.00030	5227338

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable
(1) Elevated VOC RDL(s) due to detected levels in the method blank.

ATLANTIC VOC IN SOIL (FIELD PRES.)

Maxxam ID		FJP642			FJP643			FJP644			
Sampling Date		2017/10/14			2017/10/14			2017/10/14			
COC Number		D26107			D26107			D26107			
	UNITS	**BG-SED-1**	**RDL**	**MDL**	**BG-SED-2**	**RDL**	**MDL**	**BG-SED-3**	**RDL**	**MDL**	**QC Batch**
Trichloroethylene	ug/kg	<10	10	0.00020	<20	20	0.00040	<10	10	0.00020	5227338
Trichlorofluoromethane (FREON 11)	ug/kg	<25	25	0.00030	<50	50	0.00060	<25	25	0.00030	5227338
Vinyl Chloride	ug/kg	<20	20	0.00020	<40	40	0.00040	<20	20	0.00020	5227338
Surrogate Recovery (%)											
4-Bromofluorobenzene	%	101			100			99			5227338
D10-o-Xylene	%	90			103 (1)			102			5227338
D4-1,2-Dichloroethane	%	100			100			99			5227338
D8-Toluene	%	102			102			104			5227338

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) Elevated VOC RDL(s) due to limited sample.

Maxxam Job #: B7N4148
Report Date: 2018/03/29

SNC-Lavalin Inc
Client Project #: 649806
Site Location: CAPE MAKKOVIK
Sampler Initials: JG

ATLANTIC VOC IN SOIL (FIELD PRES.)

Maxxam ID		FJP645				FJP646	FJP647	FJP647			
Sampling Date		2017/10/14				2017/10/14	2017/10/14	2017/10/14			
COC Number		D26107				D26107	D26107	D26107			
	UNITS	**SED-1**	**RDL**	**MDL**	**QC Batch**	**SED-2**	**SED-3**	**SED-3 Lab-Dup**	**RDL**	**MDL**	**QC Batch**
Volatile Organics											
1,1,1-Trichloroethane	ug/kg	<25	25	0.00010	5227338	<25	<25	<25	25	0.00010	5227759
1,1,2,2-Tetrachloroethane	ug/kg	<25	25	0.00040	5227338	<25	<25	<25	25	0.00040	5227759
1,1,2-Trichloroethane	ug/kg	<25	25	0.00040	5227338	<25	<25	<25	25	0.00040	5227759
1,1-Dichloroethane	ug/kg	<25	25	0.00010	5227338	<25	<25	<25	25	0.00010	5227759
1,1-Dichloroethylene	ug/kg	<25	25	0.00010	5227338	<25	<25	<25	25	0.00010	5227759
1,2-Dichlorobenzene	ug/kg	<25	25	0.00020	5227338	<25	<25	<25	25	0.00020	5227759
1,2-Dichloroethane	ug/kg	<25	25	0.00010	5227338	<25	<25	<25	25	0.00010	5227759
1,2-Dichloropropane	ug/kg	<25	25	0.00020	5227338	<25	<25	<25	25	0.00020	5227759
1,3-Dichlorobenzene	ug/kg	<25	25	0.00020	5227338	<25	<25	<25	25	0.00020	5227759
1,4-Dichlorobenzene	ug/kg	<25	25	0.00030	5227338	<25	<25	<25	25	0.00030	5227759
Benzene	ug/kg	<25	25	0.00010	5227338	<25	<25	<25	25	0.00010	5227759
Bromodichloromethane	ug/kg	<25	25	0.00020	5227338	<25	<25	<25	25	0.00020	5227759
Bromoform	ug/kg	<25	25	0.00030	5227338	<25	<25	<25	25	0.00030	5227759
Bromomethane	ug/kg	<50	50	0.00040	5227338	<50	<50	<50	50	0.00040	5227759
Carbon Tetrachloride	ug/kg	<25	25	0.00010	5227338	<25	<25	<25	25	0.00010	5227759
Chlorobenzene	ug/kg	<25	25	0.00010	5227338	<25	<25	<25	25	0.00010	5227759
Chloroethane	ug/kg	<200	200	0.00030	5227338	<200	<200	<200	200	0.00030	5227759
Chloroform	ug/kg	<25	25	0.00010	5227338	<25	<25	<25	25	0.00010	5227759
cis-1,2-Dichloroethylene	ug/kg	<25	25	0.00010	5227338	<25	<25	<25	25	0.00010	5227759
cis-1,3-Dichloropropene	ug/kg	<25	25	0.00020	5227338	<25	<25	<25	25	0.00020	5227759
Dibromochloromethane	ug/kg	<25	25	0.00030	5227338	<25	<25	<25	25	0.00030	5227759
Ethylbenzene	ug/kg	<25	25	0.00010	5227338	<25	<25	<25	25	0.00010	5227759
Ethylene Dibromide	ug/kg	<25	25	0.00040	5227338	<25	<25	<25	25	0.00040	5227759
Methyl t-butyl ether (MTBE)	ug/kg	<25	25	0.00010	5227338	<25	<25	<25	25	0.00010	5227759
Methylene Chloride(Dichloromethane)	ug/kg	<30 (1)	30	0.00024	5227338	<25	<25	<25	25	0.00020	5227759
o-Xylene	ug/kg	<25	25	0.00010	5227338	<25	<25	<25	25	0.00010	5227759
p+m-Xylene	ug/kg	<25	25	0.00010	5227338	<25	<25	<25	25	0.00010	5227759
Styrene	ug/kg	<25	25	0.00020	5227338	<25	<25	<25	25	0.00020	5227759
Tetrachloroethylene	ug/kg	<25	25	0.00030	5227338	<25	<25	<25	25	0.00030	5227759
Toluene	ug/kg	<25	25	0.00010	5227338	<25	<25	<25	25	0.00010	5227759
Total Xylenes	ug/kg	<50	50	N/A	5227338	<50	<50	<50	50	N/A	5227759
trans-1,2-Dichloroethylene	ug/kg	<25	25	0.00020	5227338	<25	<25	<25	25	0.00020	5227759

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable
(1) Elevated VOC RDL(s) due to detected levels in the method blank.

ATLANTIC VOC IN SOIL (FIELD PRES.)

Maxxam ID		FJP645				FJP646	FJP647	FJP647			
Sampling Date		2017/10/14				2017/10/14	2017/10/14	2017/10/14			
COC Number		D26107				D26107	D26107	D26107			
	UNITS	**SED-1**	**RDL**	**MDL**	**QC Batch**	**SED-2**	**SED-3**	**SED-3 Lab-Dup**	**RDL**	**MDL**	**QC Batch**
trans-1,3-Dichloropropene	ug/kg	<25	25	0.00030	5227338	<25	<25	<25	25	0.00030	5227759
Trichloroethylene	ug/kg	<10	10	0.00020	5227338	<10	<10	<10	10	0.00020	5227759
Trichlorofluoromethane (FREON 11)	ug/kg	<25	25	0.00030	5227338	<25	<25	<25	25	0.00030	5227759
Vinyl Chloride	ug/kg	<20	20	0.00020	5227338	<20	<20	<20	20	0.00020	5227759
Surrogate Recovery (%)											
4-Bromofluorobenzene	%	99			5227338	100	100	100			5227759
D10-o-Xylene	%	92			5227338	92	104	105			5227759
D4-1,2-Dichloroethane	%	101			5227338	98	97	97			5227759
D8-Toluene	%	101			5227338	101	101	102			5227759

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

ATLANTIC VOC IN SOIL (FIELD PRES.)

Maxxam ID		FJP648	FJP649	FJP650			
Sampling Date		2017/10/14	2017/10/14	2017/10/14			
COC Number		D26107	D26107	D26107			
	UNITS	**WSUPPLY-SED-1**	**WSUPPLY-SED-2**	**WSUPPLY-SED-3**	**RDL**	**MDL**	**QC Batch**
Volatile Organics							
1,1,1-Trichloroethane	ug/kg	<25	<25	<25	25	0.00010	5227759
1,1,2,2-Tetrachloroethane	ug/kg	<25	<25	<25	25	0.00040	5227759
1,1,2-Trichloroethane	ug/kg	<25	<25	<25	25	0.00040	5227759
1,1-Dichloroethane	ug/kg	<25	<25	<25	25	0.00010	5227759
1,1-Dichloroethylene	ug/kg	<25	<25	<25	25	0.00010	5227759
1,2-Dichlorobenzene	ug/kg	<25	<25	<25	25	0.00020	5227759
1,2-Dichloroethane	ug/kg	<25	<25	<25	25	0.00010	5227759
1,2-Dichloropropane	ug/kg	<25	<25	<25	25	0.00020	5227759
1,3-Dichlorobenzene	ug/kg	<25	<25	<25	25	0.00020	5227759
1,4-Dichlorobenzene	ug/kg	<25	<25	<25	25	0.00030	5227759
Benzene	ug/kg	<25	<25	<25	25	0.00010	5227759
Bromodichloromethane	ug/kg	<25	<25	<25	25	0.00020	5227759
Bromoform	ug/kg	<25	<25	<25	25	0.00030	5227759
Bromomethane	ug/kg	<50	<50	<50	50	0.00040	5227759
Carbon Tetrachloride	ug/kg	<25	<25	<25	25	0.00010	5227759
Chlorobenzene	ug/kg	<25	<25	<25	25	0.00010	5227759
Chloroethane	ug/kg	<200	<200	<200	200	0.00030	5227759
Chloroform	ug/kg	<25	<25	<25	25	0.00010	5227759
cis-1,2-Dichloroethylene	ug/kg	<25	<25	<25	25	0.00010	5227759
cis-1,3-Dichloropropene	ug/kg	<25	<25	<25	25	0.00020	5227759
Dibromochloromethane	ug/kg	<25	<25	<25	25	0.00030	5227759
Ethylbenzene	ug/kg	<25	<25	<25	25	0.00010	5227759
Ethylene Dibromide	ug/kg	<25	<25	<25	25	0.00040	5227759
Methyl t-butyl ether (MTBE)	ug/kg	<25	<25	<25	25	0.00010	5227759
Methylene Chloride(Dichloromethane)	ug/kg	<25	<25	<25	25	0.00020	5227759
o-Xylene	ug/kg	<25	<25	<25	25	0.00010	5227759
p+m-Xylene	ug/kg	<25	<25	<25	25	0.00010	5227759
Styrene	ug/kg	<25	<25	<25	25	0.00020	5227759
Tetrachloroethylene	ug/kg	<25	<25	<25	25	0.00030	5227759
Toluene	ug/kg	<25	<25	<25	25	0.00010	5227759
Total Xylenes	ug/kg	<50	<50	<50	50	N/A	5227759
trans-1,2-Dichloroethylene	ug/kg	<25	<25	<25	25	0.00020	5227759
trans-1,3-Dichloropropene	ug/kg	<25	<25	<25	25	0.00030	5227759

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

ATLANTIC VOC IN SOIL (FIELD PRES.)

Maxxam ID		FJP648	FJP649	FJP650			
Sampling Date		2017/10/14	2017/10/14	2017/10/14			
COC Number		D26107	D26107	D26107			
	UNITS	**WSUPPLY-SED-1**	**WSUPPLY-SED-2**	**WSUPPLY-SED-3**	**RDL**	**MDL**	**QC Batch**
Trichloroethylene	ug/kg	<10	<10	<10	10	0.00020	5227759
Trichlorofluoromethane (FREON 11)	ug/kg	<25	<25	<25	25	0.00030	5227759
Vinyl Chloride	ug/kg	<20	<20	<20	20	0.00020	5227759
Surrogate Recovery (%)							
4-Bromofluorobenzene	%	99	100	99			5227759
D10-o-Xylene	%	110	102	119			5227759
D4-1,2-Dichloroethane	%	99	100	101			5227759
D8-Toluene	%	102	102	102			5227759

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

CCME PETROLEUM HYDROCARBONS IN WATER (GROUND WATER)

Maxxam ID		FJP720			
Sampling Date		2017/10/14			
COC Number		D26104			
	UNITS	**UAST-GW-1**	**RDL**	**MDL**	**QC Batch**
BTEX & F1 Hydrocarbons					
Benzene	ug/L	<0.20	0.20	0.040	5235711
Toluene	ug/L	<0.20	0.20	0.040	5235711
Ethylbenzene	ug/L	<0.20	0.20	0.040	5235711
o-Xylene	ug/L	<0.20	0.20	0.040	5235711
p+m-Xylene	ug/L	<0.40	0.40	0.080	5235711
Total Xylenes	ug/L	<0.40	0.40	0.080	5235711
F1 (C6-C10)	ug/L	<25	25	20	5235711
F1 (C6-C10) - BTEX	ug/L	<25	25	20	5235711
F2-F4 Hydrocarbons					
F2 (C10-C16 Hydrocarbons)	ug/L	<100	100	50	5235390
F3 (C16-C34 Hydrocarbons)	ug/L	<200	200	70	5235390
F4 (C34-C50 Hydrocarbons)	ug/L	<200	200	50	5235390
Reached Baseline at C50	ug/L	Yes			5235390
Surrogate Recovery (%)					
1,4-Difluorobenzene	%	105			5235711
4-Bromofluorobenzene	%	101			5235711
D10-Ethylbenzene	%	106			5235711
D4-1,2-Dichloroethane	%	103			5235711
o-Terphenyl	%	100			5235390

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

SEMI-VOLATILE ORGANICS BY GC-MS (GROUND WATER)

Maxxam ID		FJP720			
Sampling Date		2017/10/14			
COC Number		D26104			
	UNITS	**UAST-GW-1**	**RDL**	**MDL**	**QC Batch**
Polyaromatic Hydrocarbons					
1-Methylnaphthalene	ug/L	<0.050	0.050	N/A	5232295
2-Methylnaphthalene	ug/L	<0.050	0.050	N/A	5232295
Acenaphthene	ug/L	<0.010	0.010	N/A	5232295
Acenaphthylene	ug/L	<0.010	0.010	N/A	5232295
Acridine	ug/L	<0.050	0.050	N/A	5232295
Anthracene	ug/L	<0.010	0.010	N/A	5232295
Benzo(a)anthracene	ug/L	<0.010	0.010	N/A	5232295
Benzo(a)pyrene	ug/L	<0.010	0.010	N/A	5232295
Benzo(b)fluoranthene	ug/L	<0.010	0.010	N/A	5232295
Benzo(b/j)fluoranthene	ug/L	<0.020	0.020	N/A	5225634
Benzo(g,h,i)perylene	ug/L	<0.010	0.010	N/A	5232295
Benzo(j)fluoranthene	ug/L	<0.010	0.010	N/A	5232295
Benzo(k)fluoranthene	ug/L	<0.010	0.010	N/A	5232295
Chrysene	ug/L	<0.010	0.010	N/A	5232295
Dibenz(a,h)anthracene	ug/L	<0.010	0.010	N/A	5232295
Fluoranthene	ug/L	<0.010	0.010	N/A	5232295
Fluorene	ug/L	<0.010	0.010	N/A	5232295
Indeno(1,2,3-cd)pyrene	ug/L	<0.010	0.010	N/A	5232295
Naphthalene	ug/L	<0.20	0.20	N/A	5232295
Perylene	ug/L	<0.010	0.010	N/A	5232295
Phenanthrene	ug/L	<0.010	0.010	N/A	5232295
Pyrene	ug/L	<0.010	0.010	N/A	5232295
Quinoline	ug/L	<0.050	0.050	N/A	5232295
Surrogate Recovery (%)					
D10-Anthracene	%	84			5232295
D14-Terphenyl	%	51 (1)			5232295
D8-Acenaphthylene	%	76			5232295

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable
(1) PAH sample analysed past recommended hold time as per client request.

RESULTS OF ANALYSES OF SOIL

Maxxam ID		FJP560	FJP561	FJP562	FJP563	FJP564	FJP565			
Sampling Date		2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14			
COC Number		D26101	D26101	D26101	D26101	D26101	D26101			
	UNITS	**1987-SOIL-4**	**1987-SOIL-5**	**1987-SOIL-6**	**1987-SOIL-7**	**1987-SOIL-8**	**1987-SOIL-9**	**RDL**	**MDL**	**QC Batch**
Inorganics										
Moisture	%	8.2	4.9	5.5	19	6.2	4.7	1.0	0.20	5229906

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		FJP566		FJP567	FJP568		FJP569			
Sampling Date		2017/10/14		2017/10/14	2017/10/14		2017/10/13			
COC Number		D26101		D26101	D26101		D26096			
	UNITS	**1987-SOIL-10**	**QC Batch**	**1987-SOIL-11**	**1987-SOIL-12**	**QC Batch**	**UAST-SOIL-1**	**RDL**	**MDL**	**QC Batch**
Inorganics										
Moisture	%	4.8	5229906	9.1	9.2	5226081	7.6	1.0	0.20	5229906

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		FJP570	FJP571	FJP572	FJP573	FJP574	FJP575			
Sampling Date		2017/10/13	2017/10/13	2017/10/13	2017/10/13	2017/10/13	2017/10/13			
COC Number		D26096	D26096	D26096	D26096	D26096	D26096			
	UNITS	**UAST-SOIL-2**	**UAST-SOIL-3**	**UAST-SOIL-4**	**UAST-SOIL-5**	**HEL-SOIL-1**	**HEL-SOIL-2**	**RDL**	**MDL**	**QC Batch**
Inorganics										
Moisture	%	5.4	24	7.2	6.1	12	9.0	1.0	0.20	5229906

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		FJP576	FJP577	FJP577	FJP578	FJP580			
Sampling Date		2017/10/13	2017/10/13	2017/10/13	2017/10/13	2017/10/18			
COC Number		D26096	D26096	D26096	D26096	D26097			
	UNITS	**HEL-SOIL-3**	**HANGER-SOIL-1**	**HANGER-SOIL-1 Lab-Dup**	**HANGER-SOIL-2**	**HANGER-SOIL-3**	**RDL**	**MDL**	**QC Batch**
Inorganics									
Moisture	%	8.9	8.8	9.5	9.5	7.5	1.0	0.20	5229906

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

RESULTS OF ANALYSES OF SOIL

Maxxam ID		FJP581	FJP582		FJP583	FJP583	FJP584			
Sampling Date		2017/10/18	2017/10/18		2017/10/18	2017/10/18	2017/10/18			
COC Number		D26097	D26097		D26097	D26097	D26097			
	UNITS	**HANGER-SOIL-4**	**SEPTIC-SOIL-1**	**QC Batch**	**SEPTIC-SOIL-2**	**SEPTIC-SOIL-2 Lab-Dup**	**SEPTIC-SOIL-3**	**RDL**	**MDL**	**QC Batch**
Inorganics										
Moisture	%	8.2	15	5229906	12	12	16	1.0	0.20	5229985

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

Maxxam ID		FJP585		FJP586		FJP587	FJP588			
Sampling Date		2017/10/18		2017/10/18		2017/10/18	2017/10/18			
COC Number		D26097		D26097		D26097	D26097			
	UNITS	**HEL-SOIL-4**	**QC Batch**	**SHACK-SOIL-1**	**QC Batch**	**SHACK-SOIL-2**	**SHACK-SOIL-3**	**RDL**	**MDL**	**QC Batch**
Inorganics										
Moisture	%	12	5229985	13	5226081	12	17	1.0	0.20	5229985

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		FJP619	FJP620		FJP621		FJP622	FJP623			
Sampling Date		2017/10/14	2017/10/14		2017/10/14		2017/10/14	2017/10/14			
COC Number		D26106	D26106		D26106		D26106	D26106			
	UNITS	**BG-SOIL-1**	**BG-SOIL-2**	**QC Batch**	**BG-SOIL-3**	**QC Batch**	**BG-SOIL-4**	**BG-SOIL-5**	**RDL**	**MDL**	**QC Batch**
Inorganics											
Moisture	%	75	62	5229985	27	5226081	24	33	1.0	0.20	5229985

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		FJP624	FJP625		FJP626	FJP626		FJP681			
Sampling Date		2017/10/14	2017/10/14		2017/10/14	2017/10/14		2017/10/17			
COC Number		D26106	D26106		D26106	D26106		D26102			
	UNITS	**BG-SOIL-6**	**BG-SOIL-7**	**QC Batch**	**BG-SOIL-8**	**BG-SOIL-8 Lab-Dup**	**QC Batch**	**LPUMP-SOIL-2**	**RDL**	**MDL**	**QC Batch**
Inorganics											
Moisture	%	14	11	5229985	16	16	5229780	18	1.0	0.20	5229745

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

RESULTS OF ANALYSES OF SOIL

Maxxam ID		FJP682	FJP683	FJP684	FJP685	FJP686			
Sampling Date		2017/10/17	2017/10/17	2017/10/17	2017/10/17	2017/10/17			
COC Number		D26102	D26102	D26102	D26102	D26102			
	UNITS	**LPUMP-SOIL-3**	**LPUMP-SOIL-1**	**PIPELINE-SOIL-3**	**LPUMP-SOIL-4**	**UPUMP-SOIL-1**	**RDL**	**MDL**	**QC Batch**
Inorganics									
Moisture	%	27	60	12	64	81	1.0	0.20	5229745

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		FJP687	FJP688	FJP690	FJP690	FJP691			
Sampling Date		2017/10/17	2017/10/17	2017/10/17	2017/10/17	2017/10/17			
COC Number		D26102	D26102	D26102	D26102	D26102			
	UNITS	**UPUMP-SOIL-2**	**UPUMP-SOIL-3**	**PIPELINE-SOIL-5**	**PIPELINE-SOIL-5 Lab-Dup**	**UPUMP-SOIL-5**	**RDL**	**MDL**	**QC Batch**
Inorganics									
Moisture	%	80	47	12	10	82	1.0	0.20	5229745

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

Maxxam ID		FJP692		FJP693		FJP694	FJP705			
Sampling Date		2017/10/18		2017/10/18		2017/10/18	2017/10/13			
COC Number		D26099		D26099		D26099	D26098			
	UNITS	**PIPELINE-SOIL-1**	**QC Batch**	**PIPELINE-SOIL-2**	**QC Batch**	**PIPELINE-SOIL-4**	**SHACK-SOIL-4**	**RDL**	**MDL**	**QC Batch**
Inorganics										
Moisture	%	24	5229780	13	5229745	12	15	1.0	0.20	5229780

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		FJP706	FJP707	FJP708	FJP709	FJP710			
Sampling Date		2017/10/13	2017/10/13	2017/10/13	2017/10/13	2017/10/13			
COC Number		D26098	D26098	D26098	D26098	D26098			
	UNITS	**RADOME-SOIL-1**	**RADOME-SOIL-2**	**RADOME-SOIL-3**	**TOWER-SOIL-1**	**TOWER-SOIL-2**	**RDL**	**MDL**	**QC Batch**
Inorganics									
Moisture	%	6.4	9.9	9.2	9.1	12	1.0	0.20	5229780

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

RESULTS OF ANALYSES OF SOIL

Maxxam ID		FJP711	FJP712	FJP713	FJP714	FJP715	FJP716			
Sampling Date		2017/10/13	2017/10/13	2017/10/15	2017/10/15	2017/10/15	2017/10/15			
COC Number		D26098	D26098	D26104	D26104	D26104	D26104			
	UNITS	**TOWER-SOIL-3**	**TOWER-SOIL-4**	**LAST-SOIL-1**	**LAST-SOIL-2**	**LAST-SOIL-3**	**LAST-SOIL-4**	**RDL**	**MDL**	**QC Batch**
Inorganics										
Moisture	%	6.7	5.4	20	7.6	18	18	1.0	0.20	5229780

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		FJP717	FJP718	FJP719			
Sampling Date		2017/10/15	2017/10/15	2017/10/15			
COC Number		D26104	D26104	D26104			
	UNITS	**DRUM-SOIL-1**	**DRUM-SOIL-2**	**DRUM-SOIL-3**	**RDL**	**MDL**	**QC Batch**
Inorganics							
Moisture	%	50	61	53	1.0	0.20	5229780

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B7N4148
Report Date: 2018/03/29

SNC-Lavalin Inc
Client Project #: 649806
Site Location: CAPE MAKKOVIK
Sampler Initials: JG

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		FJP535	FJP536	FJP537		FJP560	FJP561			
Sampling Date		2017/10/14	2017/10/14	2017/10/14		2017/10/14	2017/10/14			
COC Number		D26100	D26100	D26100		D26101	D26101			
	UNITS	**1987-SOIL-1**	**1987-SOIL-2**	**1987-SOIL-3**	**QC Batch**	**1987-SOIL-4**	**1987-SOIL-5**	**RDL**	**MDL**	**QC Batch**
Metals										
Acid Extractable Aluminum (Al)	mg/kg	16000	18000	17000	5254226	14000	15000	10	N/A	5234500
Acid Extractable Antimony (Sb)	mg/kg	<2.0	8.6	4.9	5254226	<2.0	<2.0	2.0	N/A	5234500
Acid Extractable Arsenic (As)	mg/kg	<2.0	<2.0	<2.0	5254226	<2.0	<2.0	2.0	N/A	5234500
Acid Extractable Barium (Ba)	mg/kg	150	160	210	5254226	160	200	5.0	N/A	5234500
Acid Extractable Beryllium (Be)	mg/kg	<2.0	<2.0	<2.0	5254226	<2.0	<2.0	2.0	N/A	5234500
Acid Extractable Bismuth (Bi)	mg/kg	<2.0	<2.0	<2.0	5254226	<2.0	<2.0	2.0	N/A	5234500
Acid Extractable Boron (B)	mg/kg	<50	<50	<50	5254226	<50	<50	50	N/A	5234500
Acid Extractable Cadmium (Cd)	mg/kg	<0.30	<0.30	<0.30	5254226	<0.30	<0.30	0.30	N/A	5234500
Acid Extractable Chromium (Cr)	mg/kg	34	31	32	5254226	36	30	2.0	N/A	5234500
Acid Extractable Cobalt (Co)	mg/kg	36	43	42	5254226	37	46	1.0	N/A	5234500
Acid Extractable Copper (Cu)	mg/kg	29	35	37	5254226	31	39	2.0	N/A	5234500
Acid Extractable Iron (Fe)	mg/kg	75000	82000	81000	5254226	78000	80000	50	N/A	5234500
Acid Extractable Lead (Pb)	mg/kg	8.4	16	11	5254226	6.2	2.9	0.50	N/A	5234500
Acid Extractable Lithium (Li)	mg/kg	15	16	14	5254226	12	14	2.0	N/A	5234500
Acid Extractable Manganese (Mn)	mg/kg	610	690	810	5254226	650	860	2.0	N/A	5234500
Acid Extractable Mercury (Hg)	mg/kg	<0.10	<0.10	<0.10	5254226	<0.10	<0.10	0.10	N/A	5234500
Acid Extractable Molybdenum (Mo)	mg/kg	<2.0	<2.0	<2.0	5254226	<2.0	<2.0	2.0	N/A	5234500
Acid Extractable Nickel (Ni)	mg/kg	23	25	23	5254226	24	25	2.0	N/A	5234500
Acid Extractable Rubidium (Rb)	mg/kg	16	21	20	5254226	17	18	2.0	N/A	5234500
Acid Extractable Selenium (Se)	mg/kg	<1.0	<1.0	<1.0	5254226	<1.0	<1.0	1.0	N/A	5234500
Acid Extractable Silver (Ag)	mg/kg	<0.50	<0.50	<0.50	5254226	<0.50	<0.50	0.50	N/A	5234500
Acid Extractable Strontium (Sr)	mg/kg	37	43	43	5254226	38	44	5.0	N/A	5234500
Acid Extractable Thallium (Tl)	mg/kg	<0.10	0.10	0.12	5254226	0.10	<0.10	0.10	N/A	5234500
Acid Extractable Tin (Sn)	mg/kg	<2.0	<2.0	<2.0	5254226	<2.0	<2.0	2.0	N/A	5234500
Acid Extractable Uranium (U)	mg/kg	0.28	0.36	0.27	5254226	0.19	0.15	0.10	N/A	5234500
Acid Extractable Vanadium (V)	mg/kg	220	210	210	5254226	220	210	2.0	N/A	5234500
Acid Extractable Zinc (Zn)	mg/kg	150	210	180	5254226	240	140	5.0	N/A	5234500

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		FJP562	FJP563	FJP564		FJP565			
Sampling Date		2017/10/14	2017/10/14	2017/10/14		2017/10/14			
COC Number		D26101	D26101	D26101		D26101			
	UNITS	**1987-SOIL-6**	**1987-SOIL-7**	**1987-SOIL-8**	**QC Batch**	**1987-SOIL-9**	**RDL**	**MDL**	**QC Batch**
Metals									
Acid Extractable Aluminum (Al)	mg/kg	12000	15000	17000	5234500	15000	10	N/A	5232257
Acid Extractable Antimony (Sb)	mg/kg	<2.0	<2.0	<2.0	5234500	<2.0	2.0	N/A	5232257
Acid Extractable Arsenic (As)	mg/kg	<2.0	<2.0	<2.0	5234500	<2.0	2.0	N/A	5232257
Acid Extractable Barium (Ba)	mg/kg	180	130	220	5234500	250	5.0	N/A	5232257
Acid Extractable Beryllium (Be)	mg/kg	<2.0	<2.0	<2.0	5234500	<2.0	2.0	N/A	5232257
Acid Extractable Bismuth (Bi)	mg/kg	<2.0	<2.0	<2.0	5234500	<2.0	2.0	N/A	5232257
Acid Extractable Boron (B)	mg/kg	<50	<50	<50	5234500	<50	50	N/A	5232257
Acid Extractable Cadmium (Cd)	mg/kg	<0.30	<0.30	<0.30	5234500	<0.30	0.30	N/A	5232257
Acid Extractable Chromium (Cr)	mg/kg	37	40	40	5234500	45	2.0	N/A	5232257
Acid Extractable Cobalt (Co)	mg/kg	43	26	44	5234500	46	1.0	N/A	5232257
Acid Extractable Copper (Cu)	mg/kg	49	22	42	5234500	51	2.0	N/A	5232257
Acid Extractable Iron (Fe)	mg/kg	78000	76000	82000	5234500	86000	50	N/A	5232257
Acid Extractable Lead (Pb)	mg/kg	3.5	5.1	8.6	5234500	3.5	0.50	N/A	5232257
Acid Extractable Lithium (Li)	mg/kg	11	11	15	5234500	14	2.0	N/A	5232257
Acid Extractable Manganese (Mn)	mg/kg	710	560	940	5234500	860	2.0	N/A	5232257
Acid Extractable Mercury (Hg)	mg/kg	<0.10	<0.10	<0.10	5234500	<0.10	0.10	N/A	5232257
Acid Extractable Molybdenum (Mo)	mg/kg	<2.0	<2.0	3.9	5234500	<2.0	2.0	N/A	5232257
Acid Extractable Nickel (Ni)	mg/kg	31	17	23	5234500	28	2.0	N/A	5232257
Acid Extractable Rubidium (Rb)	mg/kg	19	13	10	5234500	16	2.0	N/A	5232257
Acid Extractable Selenium (Se)	mg/kg	<1.0	<1.0	<1.0	5234500	<1.0	1.0	N/A	5232257
Acid Extractable Silver (Ag)	mg/kg	<0.50	<0.50	<0.50	5234500	<0.50	0.50	N/A	5232257
Acid Extractable Strontium (Sr)	mg/kg	35	32	31	5234500	36	5.0	N/A	5232257
Acid Extractable Thallium (Tl)	mg/kg	<0.10	<0.10	0.11	5234500	0.11	0.10	N/A	5232257
Acid Extractable Tin (Sn)	mg/kg	<2.0	<2.0	<2.0	5234500	<2.0	2.0	N/A	5232257
Acid Extractable Uranium (U)	mg/kg	0.31	0.24	0.38	5234500	<0.10	0.10	N/A	5232257
Acid Extractable Vanadium (V)	mg/kg	230	240	240	5234500	240	2.0	N/A	5232257
Acid Extractable Zinc (Zn)	mg/kg	140	100	200	5234500	160	5.0	N/A	5232257

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		FJP566		FJP567		FJP568	FJP568			
Sampling Date		2017/10/14		2017/10/14		2017/10/14	2017/10/14			
COC Number		D26101		D26101		D26101	D26101			
	UNITS	**1987-SOIL-10**	**QC Batch**	**1987-SOIL-11**	**QC Batch**	**1987-SOIL-12**	**1987-SOIL-12 Lab-Dup**	**RDL**	**MDL**	**QC Batch**
Metals										
Acid Extractable Aluminum (Al)	mg/kg	11000	5234500	15000	5227396	15000	15000	10	N/A	5227738
Acid Extractable Antimony (Sb)	mg/kg	<2.0	5234500	4.5	5227396	<2.0	<2.0	2.0	N/A	5227738
Acid Extractable Arsenic (As)	mg/kg	<2.0	5234500	<2.0	5227396	<2.0	<2.0	2.0	N/A	5227738
Acid Extractable Barium (Ba)	mg/kg	140	5234500	120	5227396	170	170	5.0	N/A	5227738
Acid Extractable Beryllium (Be)	mg/kg	<2.0	5234500	<2.0	5227396	<2.0	<2.0	2.0	N/A	5227738
Acid Extractable Bismuth (Bi)	mg/kg	<2.0	5234500	<2.0	5227396	<2.0	<2.0	2.0	N/A	5227738
Acid Extractable Boron (B)	mg/kg	<50	5234500	<50	5227396	<50	<50	50	N/A	5227738
Acid Extractable Cadmium (Cd)	mg/kg	<0.30	5234500	<0.30	5227396	<0.30	<0.30	0.30	N/A	5227738
Acid Extractable Chromium (Cr)	mg/kg	33	5234500	35	5227396	32	34	2.0	N/A	5227738
Acid Extractable Cobalt (Co)	mg/kg	28	5234500	36	5227396	38	39	1.0	N/A	5227738
Acid Extractable Copper (Cu)	mg/kg	29	5234500	27	5227396	31	32	2.0	N/A	5227738
Acid Extractable Iron (Fe)	mg/kg	65000	5234500	74000	5227396	75000	78000	50	N/A	5227738
Acid Extractable Lead (Pb)	mg/kg	3.6	5234500	6.0	5227396	6.5	6.8	0.50	N/A	5227738
Acid Extractable Lithium (Li)	mg/kg	10	5234500	12	5227396	12	12	2.0	N/A	5227738
Acid Extractable Manganese (Mn)	mg/kg	490	5234500	600	5227396	700	720	2.0	N/A	5227738
Acid Extractable Mercury (Hg)	mg/kg	<0.10	5234500	<0.10	5227396	<0.10	<0.10	0.10	N/A	5227738
Acid Extractable Molybdenum (Mo)	mg/kg	<2.0	5234500	<2.0	5227396	<2.0	<2.0	2.0	N/A	5227738
Acid Extractable Nickel (Ni)	mg/kg	22	5234500	20	5227396	21	22	2.0	N/A	5227738
Acid Extractable Rubidium (Rb)	mg/kg	12	5234500	15	5227396	17	17	2.0	N/A	5227738
Acid Extractable Selenium (Se)	mg/kg	<1.0	5234500	<1.0	5227396	<1.0	<1.0	1.0	N/A	5227738
Acid Extractable Silver (Ag)	mg/kg	<0.50	5234500	<0.50	5227396	<0.50	<0.50	0.50	N/A	5227738
Acid Extractable Strontium (Sr)	mg/kg	33	5234500	33	5227396	37	37	5.0	N/A	5227738
Acid Extractable Thallium (Tl)	mg/kg	<0.10	5234500	<0.10	5227396	0.10	<0.10	0.10	N/A	5227738
Acid Extractable Tin (Sn)	mg/kg	<2.0	5234500	<2.0	5227396	<2.0	<2.0	2.0	N/A	5227738
Acid Extractable Uranium (U)	mg/kg	0.17	5234500	0.18	5227396	0.25	0.25	0.10	N/A	5227738
Acid Extractable Vanadium (V)	mg/kg	200	5234500	210	5227396	190	210	2.0	N/A	5227738
Acid Extractable Zinc (Zn)	mg/kg	88	5234500	150	5227396	170	210	5.0	N/A	5227738

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		FJP574	FJP575	FJP576		FJP577	FJP578			
Sampling Date		2017/10/13	2017/10/13	2017/10/13		2017/10/13	2017/10/13			
COC Number		D26096	D26096	D26096		D26096	D26096			
	UNITS	**HEL-SOIL-1**	**HEL-SOIL-2**	**HEL-SOIL-3**	**QC Batch**	**HANGER-SOIL-1**	**HANGER-SOIL-2**	**RDL**	**MDL**	**QC Batch**
Metals										
Acid Extractable Aluminum (Al)	mg/kg	8500	8800	10000	5234500	7800	8400	10	N/A	5232257
Acid Extractable Antimony (Sb)	mg/kg	<2.0	<2.0	<2.0	5234500	2.6	<2.0	2.0	N/A	5232257
Acid Extractable Arsenic (As)	mg/kg	6.6	7.0	13	5234500	5.5	7.7	2.0	N/A	5232257
Acid Extractable Barium (Ba)	mg/kg	73	54	110	5234500	48	70	5.0	N/A	5232257
Acid Extractable Beryllium (Be)	mg/kg	<2.0	<2.0	<2.0	5234500	<2.0	<2.0	2.0	N/A	5232257
Acid Extractable Bismuth (Bi)	mg/kg	<2.0	<2.0	<2.0	5234500	<2.0	<2.0	2.0	N/A	5232257
Acid Extractable Boron (B)	mg/kg	<50	<50	<50	5234500	<50	<50	50	N/A	5232257
Acid Extractable Cadmium (Cd)	mg/kg	<0.30	<0.30	<0.30	5234500	0.80	4.6	0.30	N/A	5232257
Acid Extractable Chromium (Cr)	mg/kg	22	22	22	5234500	24	23	2.0	N/A	5232257
Acid Extractable Cobalt (Co)	mg/kg	12	11	19	5234500	10	11	1.0	N/A	5232257
Acid Extractable Copper (Cu)	mg/kg	57	47	110	5234500	40	47	2.0	N/A	5232257
Acid Extractable Iron (Fe)	mg/kg	20000	19000	27000	5234500	18000	19000	50	N/A	5232257
Acid Extractable Lead (Pb)	mg/kg	10	8.7	12	5234500	44	39	0.50	N/A	5232257
Acid Extractable Lithium (Li)	mg/kg	15	15	16	5234500	13	15	2.0	N/A	5232257
Acid Extractable Manganese (Mn)	mg/kg	280	310	420	5234500	270	330	2.0	N/A	5232257
Acid Extractable Mercury (Hg)	mg/kg	<0.10	<0.10	<0.10	5234500	<0.10	<0.10	0.10	N/A	5232257
Acid Extractable Molybdenum (Mo)	mg/kg	2.1	<2.0	<2.0	5234500	<2.0	<2.0	2.0	N/A	5232257
Acid Extractable Nickel (Ni)	mg/kg	22	22	32	5234500	22	22	2.0	N/A	5232257
Acid Extractable Rubidium (Rb)	mg/kg	14	17	30	5234500	11	11	2.0	N/A	5232257
Acid Extractable Selenium (Se)	mg/kg	<1.0	<1.0	<1.0	5234500	<1.0	<1.0	1.0	N/A	5232257
Acid Extractable Silver (Ag)	mg/kg	<0.50	<0.50	<0.50	5234500	<0.50	<0.50	0.50	N/A	5232257
Acid Extractable Strontium (Sr)	mg/kg	24	22	21	5234500	60	34	5.0	N/A	5232257
Acid Extractable Thallium (Tl)	mg/kg	0.10	0.12	0.27	5234500	<0.10	0.10	0.10	N/A	5232257
Acid Extractable Tin (Sn)	mg/kg	<2.0	<2.0	<2.0	5234500	<2.0	<2.0	2.0	N/A	5232257
Acid Extractable Uranium (U)	mg/kg	1.2	1.1	2.3	5234500	0.76	0.94	0.10	N/A	5232257
Acid Extractable Vanadium (V)	mg/kg	41	37	44	5234500	36	36	2.0	N/A	5232257
Acid Extractable Zinc (Zn)	mg/kg	46	44	76	5234500	200	410	5.0	N/A	5232257

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam Job #: B7N4148
Report Date: 2018/03/29

SNC-Lavalin Inc
Client Project #: 649806
Site Location: CAPE MAKKOVIK
Sampler Initials: JG

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		FJP580	FJP581		FJP582	FJP582			
Sampling Date		2017/10/18	2017/10/18		2017/10/18	2017/10/18			
COC Number		D26097	D26097		D26097	D26097			
	UNITS	**HANGER-SOIL-3**	**HANGER-SOIL-4**	**QC Batch**	**SEPTIC-SOIL-1**	**SEPTIC-SOIL-1 Lab-Dup**	**RDL**	**MDL**	**QC Batch**
Metals									
Acid Extractable Aluminum (Al)	mg/kg	8700	8500	5232257	7600	7600	10	N/A	5234588
Acid Extractable Antimony (Sb)	mg/kg	<2.0	<2.0	5232257	43	36	2.0	N/A	5234588
Acid Extractable Arsenic (As)	mg/kg	5.9	7.0	5232257	6.7	6.5	2.0	N/A	5234588
Acid Extractable Barium (Ba)	mg/kg	48	81	5232257	47	50	5.0	N/A	5234588
Acid Extractable Beryllium (Be)	mg/kg	<2.0	<2.0	5232257	<2.0	<2.0	2.0	N/A	5234588
Acid Extractable Bismuth (Bi)	mg/kg	<2.0	<2.0	5232257	<2.0	<2.0	2.0	N/A	5234588
Acid Extractable Boron (B)	mg/kg	<50	<50	5232257	<50	<50	50	N/A	5234588
Acid Extractable Cadmium (Cd)	mg/kg	2.3	1.5	5232257	<0.30	<0.30	0.30	N/A	5234588
Acid Extractable Chromium (Cr)	mg/kg	25	29	5232257	31	25	2.0	N/A	5234588
Acid Extractable Cobalt (Co)	mg/kg	11	11	5232257	14	13	1.0	N/A	5234588
Acid Extractable Copper (Cu)	mg/kg	64	78	5232257	78	82	2.0	N/A	5234588
Acid Extractable Iron (Fe)	mg/kg	21000	22000	5232257	23000	23000	50	N/A	5234588
Acid Extractable Lead (Pb)	mg/kg	150	100	5232257	46	26 (1)	0.50	N/A	5234588
Acid Extractable Lithium (Li)	mg/kg	16	14	5232257	13	14	2.0	N/A	5234588
Acid Extractable Manganese (Mn)	mg/kg	270	280	5232257	300	290	2.0	N/A	5234588
Acid Extractable Mercury (Hg)	mg/kg	<0.10	<0.10	5232257	5.0	5.3	0.10	N/A	5234588
Acid Extractable Molybdenum (Mo)	mg/kg	<2.0	<2.0	5232257	<2.0	<2.0	2.0	N/A	5234588
Acid Extractable Nickel (Ni)	mg/kg	26	29	5232257	29	28	2.0	N/A	5234588
Acid Extractable Rubidium (Rb)	mg/kg	14	15	5232257	12	13	2.0	N/A	5234588
Acid Extractable Selenium (Se)	mg/kg	<1.0	<1.0	5232257	<1.0	<1.0	1.0	N/A	5234588
Acid Extractable Silver (Ag)	mg/kg	<0.50	<0.50	5232257	<0.50	<0.50	0.50	N/A	5234588
Acid Extractable Strontium (Sr)	mg/kg	31	41	5232257	21	19	5.0	N/A	5234588
Acid Extractable Thallium (Tl)	mg/kg	0.10	0.12	5232257	0.13	0.11	0.10	N/A	5234588
Acid Extractable Tin (Sn)	mg/kg	<2.0	<2.0	5232257	<2.0	<2.0	2.0	N/A	5234588
Acid Extractable Uranium (U)	mg/kg	0.77	0.80	5232257	0.90	0.82	0.10	N/A	5234588
Acid Extractable Vanadium (V)	mg/kg	36	39	5232257	38	35	2.0	N/A	5234588
Acid Extractable Zinc (Zn)	mg/kg	260	350	5232257	130	120	5.0	N/A	5234588

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable
(1) Poor RPD due to sample inhomogeneity. Result confirmed by repeat digestion and analysis.

Maxxam Job #: B7N4148
Report Date: 2018/03/29

SNC-Lavalin Inc
Client Project #: 649806
Site Location: CAPE MAKKOVIK
Sampler Initials: JG

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		FJP582				FJP583		FJP584			
Sampling Date		2017/10/18				2017/10/18		2017/10/18			
COC Number		D26097				D26097		D26097			
	UNITS	**SEPTIC-SOIL-1 Lab-Dup 2**	**RDL**	**MDL**	**QC Batch**	**SEPTIC-SOIL-2**	**QC Batch**	**SEPTIC-SOIL-3**	**RDL**	**MDL**	**QC Batch**
Metals											
Acid Extractable Aluminum (Al)	mg/kg					7500	5234500	10000	10	N/A	5234588
Acid Extractable Antimony (Sb)	mg/kg					<2.0	5234500	<2.0	2.0	N/A	5234588
Acid Extractable Arsenic (As)	mg/kg					6.9	5234500	5.7	2.0	N/A	5234588
Acid Extractable Barium (Ba)	mg/kg					51	5234500	230	5.0	N/A	5234588
Acid Extractable Beryllium (Be)	mg/kg					<2.0	5234500	<2.0	2.0	N/A	5234588
Acid Extractable Bismuth (Bi)	mg/kg					<2.0	5234500	<2.0	2.0	N/A	5234588
Acid Extractable Boron (B)	mg/kg					<50	5234500	<50	50	N/A	5234588
Acid Extractable Cadmium (Cd)	mg/kg					<0.30	5234500	<0.30	0.30	N/A	5234588
Acid Extractable Chromium (Cr)	mg/kg					20	5234500	21	2.0	N/A	5234588
Acid Extractable Cobalt (Co)	mg/kg					13	5234500	13	1.0	N/A	5234588
Acid Extractable Copper (Cu)	mg/kg					64	5234500	54	2.0	N/A	5234588
Acid Extractable Iron (Fe)	mg/kg					18000	5234500	26000	50	N/A	5234588
Acid Extractable Lead (Pb)	mg/kg	22 (1)	0.50	N/A	5234588	9.8	5234500	32	0.50	N/A	5234588
Acid Extractable Lithium (Li)	mg/kg					14	5234500	18	2.0	N/A	5234588
Acid Extractable Manganese (Mn)	mg/kg					270	5234500	530	2.0	N/A	5234588
Acid Extractable Mercury (Hg)	mg/kg					<0.10	5234500	<0.10	0.10	N/A	5234588
Acid Extractable Molybdenum (Mo)	mg/kg					<2.0	5234500	<2.0	2.0	N/A	5234588
Acid Extractable Nickel (Ni)	mg/kg					25	5234500	23	2.0	N/A	5234588
Acid Extractable Rubidium (Rb)	mg/kg					14	5234500	18	2.0	N/A	5234588
Acid Extractable Selenium (Se)	mg/kg					<1.0	5234500	<1.0	1.0	N/A	5234588
Acid Extractable Silver (Ag)	mg/kg					<0.50	5234500	<0.50	0.50	N/A	5234588
Acid Extractable Strontium (Sr)	mg/kg					21	5234500	30	5.0	N/A	5234588
Acid Extractable Thallium (Tl)	mg/kg					0.12	5234500	0.19	0.10	N/A	5234588
Acid Extractable Tin (Sn)	mg/kg					<2.0	5234500	<2.0	2.0	N/A	5234588
Acid Extractable Uranium (U)	mg/kg					0.75	5234500	1.9	0.10	N/A	5234588
Acid Extractable Vanadium (V)	mg/kg					34	5234500	42	2.0	N/A	5234588
Acid Extractable Zinc (Zn)	mg/kg					50	5234500	100	5.0	N/A	5234588

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable
(1) Poor RPD due to sample inhomogeneity.

Maxxam
A Bureau Veritas Group Company

Maxxam Job #: B7N4148
Report Date: 2018/03/29

SNC-Lavalin Inc
Client Project #: 649806
Site Location: CAPE MAKKOVIK
Sampler Initials: JG

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		FJP585		FJP586		FJP587	FJP588			
Sampling Date		2017/10/18		2017/10/18		2017/10/18	2017/10/18			
COC Number		D26097		D26097		D26097	D26097			
	UNITS	**HEL-SOIL-4**	**QC Batch**	**SHACK-SOIL-1**	**QC Batch**	**SHACK-SOIL-2**	**SHACK-SOIL-3**	**RDL**	**MDL**	**QC Batch**
Metals										
Acid Extractable Aluminum (Al)	mg/kg	8400	5234588	8600	5227396	11000	9800	10	N/A	5234588
Acid Extractable Antimony (Sb)	mg/kg	<2.0	5234588	<2.0	5227396	<2.0	<2.0	2.0	N/A	5234588
Acid Extractable Arsenic (As)	mg/kg	7.3	5234588	4.2	5227396	6.8	7.0	2.0	N/A	5234588
Acid Extractable Barium (Ba)	mg/kg	67	5234588	96	5227396	63	41	5.0	N/A	5234588
Acid Extractable Beryllium (Be)	mg/kg	<2.0	5234588	<2.0	5227396	<2.0	<2.0	2.0	N/A	5234588
Acid Extractable Bismuth (Bi)	mg/kg	<2.0	5234588	<2.0	5227396	<2.0	<2.0	2.0	N/A	5234588
Acid Extractable Boron (B)	mg/kg	<50	5234588	<50	5227396	<50	<50	50	N/A	5234588
Acid Extractable Cadmium (Cd)	mg/kg	<0.30	5234588	0.49	5227396	0.70	<0.30	0.30	N/A	5234588
Acid Extractable Chromium (Cr)	mg/kg	24	5234588	14	5227396	25	20	2.0	N/A	5234588
Acid Extractable Cobalt (Co)	mg/kg	12	5234588	9.8	5227396	13	10	1.0	N/A	5234588
Acid Extractable Copper (Cu)	mg/kg	63	5234588	37	5227396	49	37	2.0	N/A	5234588
Acid Extractable Iron (Fe)	mg/kg	20000	5234588	21000	5227396	23000	22000	50	N/A	5234588
Acid Extractable Lead (Pb)	mg/kg	9.7	5234588	12	5227396	350	14	0.50	N/A	5234588
Acid Extractable Lithium (Li)	mg/kg	13	5234588	16	5227396	23	19	2.0	N/A	5234588
Acid Extractable Manganese (Mn)	mg/kg	290	5234588	370	5227396	420	270	2.0	N/A	5234588
Acid Extractable Mercury (Hg)	mg/kg	<0.10	5234588	<0.10	5227396	<0.10	<0.10	0.10	N/A	5234588
Acid Extractable Molybdenum (Mo)	mg/kg	<2.0	5234588	<2.0	5227396	<2.0	2.1	2.0	N/A	5234588
Acid Extractable Nickel (Ni)	mg/kg	23	5234588	12	5227396	18	15	2.0	N/A	5234588
Acid Extractable Rubidium (Rb)	mg/kg	16	5234588	15	5227396	20	17	2.0	N/A	5234588
Acid Extractable Selenium (Se)	mg/kg	<1.0	5234588	<1.0	5227396	<1.0	<1.0	1.0	N/A	5234588
Acid Extractable Silver (Ag)	mg/kg	<0.50	5234588	<0.50	5227396	<0.50	<0.50	0.50	N/A	5234588
Acid Extractable Strontium (Sr)	mg/kg	36	5234588	19	5227396	31	23	5.0	N/A	5234588
Acid Extractable Thallium (Tl)	mg/kg	0.12	5234588	0.11	5227396	0.17	0.14	0.10	N/A	5234588
Acid Extractable Tin (Sn)	mg/kg	<2.0	5234588	<2.0	5227396	<2.0	<2.0	2.0	N/A	5234588
Acid Extractable Uranium (U)	mg/kg	1.1	5234588	1.3	5227396	0.94	1.0	0.10	N/A	5234588
Acid Extractable Vanadium (V)	mg/kg	38	5234588	32	5227396	42	41	2.0	N/A	5234588
Acid Extractable Zinc (Zn)	mg/kg	47	5234588	68	5227396	110	65	5.0	N/A	5234588

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		FJP619	FJP620		FJP621		FJP622			
Sampling Date		2017/10/14	2017/10/14		2017/10/14		2017/10/14			
COC Number		D26106	D26106		D26106		D26106			
	UNITS	**BG-SOIL-1**	**BG-SOIL-2**	**QC Batch**	**BG-SOIL-3**	**QC Batch**	**BG-SOIL-4**	**RDL**	**MDL**	**QC Batch**
Metals										
Acid Extractable Aluminum (Al)	mg/kg	3000	2400	5234588	1300	5227396	3300	10	N/A	5234588
Acid Extractable Antimony (Sb)	mg/kg	<2.0	<2.0	5234588	<2.0	5227396	<2.0	2.0	N/A	5234588
Acid Extractable Arsenic (As)	mg/kg	2.3	<2.0	5234588	<2.0	5227396	<2.0	2.0	N/A	5234588
Acid Extractable Barium (Ba)	mg/kg	17	18	5234588	5.7	5227396	10	5.0	N/A	5234588
Acid Extractable Beryllium (Be)	mg/kg	<2.0	<2.0	5234588	<2.0	5227396	<2.0	2.0	N/A	5234588
Acid Extractable Bismuth (Bi)	mg/kg	<2.0	<2.0	5234588	<2.0	5227396	<2.0	2.0	N/A	5234588
Acid Extractable Boron (B)	mg/kg	<50	<50	5234588	<50	5227396	<50	50	N/A	5234588
Acid Extractable Cadmium (Cd)	mg/kg	<0.30	<0.30	5234588	<0.30	5227396	<0.30	0.30	N/A	5234588
Acid Extractable Chromium (Cr)	mg/kg	<2.0	<2.0	5234588	3.7	5227396	6.2	2.0	N/A	5234588
Acid Extractable Cobalt (Co)	mg/kg	<1.0	<1.0	5234588	<1.0	5227396	<1.0	1.0	N/A	5234588
Acid Extractable Copper (Cu)	mg/kg	17	4.0	5234588	2.0	5227396	3.8	2.0	N/A	5234588
Acid Extractable Iron (Fe)	mg/kg	3300	5100	5234588	1800	5227396	5900	50	N/A	5234588
Acid Extractable Lead (Pb)	mg/kg	19	7.9	5234588	12	5227396	7.1	0.50	N/A	5234588
Acid Extractable Lithium (Li)	mg/kg	<2.0	<2.0	5234588	<2.0	5227396	3.8	2.0	N/A	5234588
Acid Extractable Manganese (Mn)	mg/kg	17	20	5234588	28	5227396	52	2.0	N/A	5234588
Acid Extractable Mercury (Hg)	mg/kg	0.30	0.16	5234588	<0.10	5227396	<0.10	0.10	N/A	5234588
Acid Extractable Molybdenum (Mo)	mg/kg	<2.0	<2.0	5234588	4.6	5227396	6.2	2.0	N/A	5234588
Acid Extractable Nickel (Ni)	mg/kg	<2.0	<2.0	5234588	<2.0	5227396	<2.0	2.0	N/A	5234588
Acid Extractable Rubidium (Rb)	mg/kg	<2.0	2.4	5234588	<2.0	5227396	<2.0	2.0	N/A	5234588
Acid Extractable Selenium (Se)	mg/kg	1.0	<1.0	5234588	<1.0	5227396	<1.0	1.0	N/A	5234588
Acid Extractable Silver (Ag)	mg/kg	<0.50	<0.50	5234588	<0.50	5227396	<0.50	0.50	N/A	5234588
Acid Extractable Strontium (Sr)	mg/kg	42	41	5234588	7.1	5227396	12	5.0	N/A	5234588
Acid Extractable Thallium (Tl)	mg/kg	<0.10	<0.10	5234588	<0.10	5227396	<0.10	0.10	N/A	5234588
Acid Extractable Tin (Sn)	mg/kg	<2.0	<2.0	5234588	<2.0	5227396	<2.0	2.0	N/A	5234588
Acid Extractable Uranium (U)	mg/kg	2.8	2.8	5234588	0.52	5227396	2.5	0.10	N/A	5234588
Acid Extractable Vanadium (V)	mg/kg	2.1	3.3	5234588	6.6	5227396	12	2.0	N/A	5234588
Acid Extractable Zinc (Zn)	mg/kg	21	19	5234588	6.9	5227396	14	5.0	N/A	5234588

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam Job #: B7N4148
Report Date: 2018/03/29

SNC-Lavalin Inc
Client Project #: 649806
Site Location: CAPE MAKKOVIK
Sampler Initials: JG

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		FJP623		FJP624	FJP625		FJP626			
Sampling Date		2017/10/14		2017/10/14	2017/10/14		2017/10/14			
COC Number		D26106		D26106	D26106		D26106			
	UNITS	**BG-SOIL-5**	**QC Batch**	**BG-SOIL-6**	**BG-SOIL-7**	**QC Batch**	**BG-SOIL-8**	**RDL**	**MDL**	**QC Batch**
Metals										
Acid Extractable Aluminum (Al)	mg/kg	3900	5234588	8000	4100	5234500	3200	10	N/A	5232147
Acid Extractable Antimony (Sb)	mg/kg	<2.0	5234588	<2.0	<2.0	5234500	<2.0	2.0	N/A	5232147
Acid Extractable Arsenic (As)	mg/kg	<2.0	5234588	2.7	2.7	5234500	2.1	2.0	N/A	5232147
Acid Extractable Barium (Ba)	mg/kg	22	5234588	21	29	5234500	17	5.0	N/A	5232147
Acid Extractable Beryllium (Be)	mg/kg	<2.0	5234588	<2.0	<2.0	5234500	<2.0	2.0	N/A	5232147
Acid Extractable Bismuth (Bi)	mg/kg	<2.0	5234588	<2.0	<2.0	5234500	<2.0	2.0	N/A	5232147
Acid Extractable Boron (B)	mg/kg	<50	5234588	<50	<50	5234500	<50	50	N/A	5232147
Acid Extractable Cadmium (Cd)	mg/kg	<0.30	5234588	<0.30	<0.30	5234500	<0.30	0.30	N/A	5232147
Acid Extractable Chromium (Cr)	mg/kg	8.7	5234588	14	10	5234500	7.1	2.0	N/A	5232147
Acid Extractable Cobalt (Co)	mg/kg	1.8	5234588	2.5	4.7	5234500	1.3	1.0	N/A	5232147
Acid Extractable Copper (Cu)	mg/kg	22	5234588	14	15	5234500	7.9	2.0	N/A	5232147
Acid Extractable Iron (Fe)	mg/kg	12000	5234588	9400	6400	5234500	3500	50	N/A	5232147
Acid Extractable Lead (Pb)	mg/kg	9.5	5234588	9.1	6.5	5234500	4.4	0.50	N/A	5232147
Acid Extractable Lithium (Li)	mg/kg	5.0	5234588	7.7	7.3	5234500	2.5	2.0	N/A	5232147
Acid Extractable Manganese (Mn)	mg/kg	82	5234588	120	110	5234500	70	2.0	N/A	5232147
Acid Extractable Mercury (Hg)	mg/kg	<0.10	5234588	<0.10	<0.10	5234500	<0.10	0.10	N/A	5232147
Acid Extractable Molybdenum (Mo)	mg/kg	4.1	5234588	<2.0	5.5	5234500	<2.0	2.0	N/A	5232147
Acid Extractable Nickel (Ni)	mg/kg	4.0	5234588	5.7	7.3	5234500	3.4	2.0	N/A	5232147
Acid Extractable Rubidium (Rb)	mg/kg	2.7	5234588	6.6	6.6	5234500	2.9	2.0	N/A	5232147
Acid Extractable Selenium (Se)	mg/kg	1.1	5234588	<1.0	<1.0	5234500	<1.0	1.0	N/A	5232147
Acid Extractable Silver (Ag)	mg/kg	<0.50	5234588	<0.50	<0.50	5234500	<0.50	0.50	N/A	5232147
Acid Extractable Strontium (Sr)	mg/kg	21	5234588	16	12	5234500	11	5.0	N/A	5232147
Acid Extractable Thallium (Tl)	mg/kg	<0.10	5234588	<0.10	<0.10	5234500	<0.10	0.10	N/A	5232147
Acid Extractable Tin (Sn)	mg/kg	<2.0	5234588	<2.0	<2.0	5234500	<2.0	2.0	N/A	5232147
Acid Extractable Uranium (U)	mg/kg	6.2	5234588	3.8	4.7	5234500	2.5	0.10	N/A	5232147
Acid Extractable Vanadium (V)	mg/kg	18	5234588	29	17	5234500	13	2.0	N/A	5232147
Acid Extractable Zinc (Zn)	mg/kg	58	5234588	28	47	5234500	19	5.0	N/A	5232147

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		FJP681	FJP682	FJP682			
Sampling Date		2017/10/17	2017/10/17	2017/10/17			
COC Number		D26102	D26102	D26102			
	UNITS	**LPUMP-SOIL-2**	**LPUMP-SOIL-3**	**LPUMP-SOIL-3 Lab-Dup**	**RDL**	**MDL**	**QC Batch**
Metals							
Acid Extractable Aluminum (Al)	mg/kg	5700	21000	23000	10	N/A	5232257
Acid Extractable Antimony (Sb)	mg/kg	<2.0	<2.0	<2.0	2.0	N/A	5232257
Acid Extractable Arsenic (As)	mg/kg	9.0	8.2	8.4	2.0	N/A	5232257
Acid Extractable Barium (Ba)	mg/kg	21	150	170	5.0	N/A	5232257
Acid Extractable Beryllium (Be)	mg/kg	<2.0	<2.0	<2.0	2.0	N/A	5232257
Acid Extractable Bismuth (Bi)	mg/kg	<2.0	<2.0	<2.0	2.0	N/A	5232257
Acid Extractable Boron (B)	mg/kg	<50	<50	<50	50	N/A	5232257
Acid Extractable Cadmium (Cd)	mg/kg	<0.30	0.45	0.51	0.30	N/A	5232257
Acid Extractable Chromium (Cr)	mg/kg	13	38	43	2.0	N/A	5232257
Acid Extractable Cobalt (Co)	mg/kg	3.7	23	25	1.0	N/A	5232257
Acid Extractable Copper (Cu)	mg/kg	7.6	14	14	2.0	N/A	5232257
Acid Extractable Iron (Fe)	mg/kg	26000	66000	71000	50	N/A	5232257
Acid Extractable Lead (Pb)	mg/kg	18	28	32	0.50	N/A	5232257
Acid Extractable Lithium (Li)	mg/kg	6.5	83	94	2.0	N/A	5232257
Acid Extractable Manganese (Mn)	mg/kg	450	1800	2000	2.0	N/A	5232257
Acid Extractable Mercury (Hg)	mg/kg	<0.10	<0.10	<0.10	0.10	N/A	5232257
Acid Extractable Molybdenum (Mo)	mg/kg	11	57	35 (1)	2.0	N/A	5232257
Acid Extractable Nickel (Ni)	mg/kg	7.0	41	45	2.0	N/A	5232257
Acid Extractable Rubidium (Rb)	mg/kg	11	54	61	2.0	N/A	5232257
Acid Extractable Selenium (Se)	mg/kg	<1.0	<1.0	<1.0	1.0	N/A	5232257
Acid Extractable Silver (Ag)	mg/kg	<0.50	<0.50	<0.50	0.50	N/A	5232257
Acid Extractable Strontium (Sr)	mg/kg	12	16	17	5.0	N/A	5232257
Acid Extractable Thallium (Tl)	mg/kg	<0.10	0.89	1.0	0.10	N/A	5232257
Acid Extractable Tin (Sn)	mg/kg	<2.0	3.1	3.5	2.0	N/A	5232257
Acid Extractable Uranium (U)	mg/kg	1.7	1.2	1.1	0.10	N/A	5232257
Acid Extractable Vanadium (V)	mg/kg	33	110	120	2.0	N/A	5232257
Acid Extractable Zinc (Zn)	mg/kg	260	670	680	5.0	N/A	5232257

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable
(1) Poor RPD due to sample inhomogeneity. Result verified by repeat digestion and analysis.

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		FJP682				FJP683	FJP685			
Sampling Date		2017/10/17				2017/10/17	2017/10/17			
COC Number		D26102				D26102	D26102			
	UNITS	**LPUMP-SOIL-3 Lab-Dup 2**	**RDL**	**MDL**	**QC Batch**	**LPUMP-SOIL-1**	**LPUMP-SOIL-4**	**RDL**	**MDL**	**QC Batch**
Metals										
Acid Extractable Aluminum (Al)	mg/kg					6800	3300	10	N/A	5232257
Acid Extractable Antimony (Sb)	mg/kg					8.0	6.7	2.0	N/A	5232257
Acid Extractable Arsenic (As)	mg/kg					4.7	<2.0	2.0	N/A	5232257
Acid Extractable Barium (Ba)	mg/kg					150	89	5.0	N/A	5232257
Acid Extractable Beryllium (Be)	mg/kg					<2.0	<2.0	2.0	N/A	5232257
Acid Extractable Bismuth (Bi)	mg/kg					<2.0	<2.0	2.0	N/A	5232257
Acid Extractable Boron (B)	mg/kg					<50	<50	50	N/A	5232257
Acid Extractable Cadmium (Cd)	mg/kg					<0.30	<0.30	0.30	N/A	5232257
Acid Extractable Chromium (Cr)	mg/kg					15	6.2	2.0	N/A	5232257
Acid Extractable Cobalt (Co)	mg/kg					6.2	2.4	1.0	N/A	5232257
Acid Extractable Copper (Cu)	mg/kg					3.0	3.4	2.0	N/A	5232257
Acid Extractable Iron (Fe)	mg/kg					30000	11000	50	N/A	5232257
Acid Extractable Lead (Pb)	mg/kg					7.9	9.7	0.50	N/A	5232257
Acid Extractable Lithium (Li)	mg/kg					16	6.1	2.0	N/A	5232257
Acid Extractable Manganese (Mn)	mg/kg					300	120	2.0	N/A	5232257
Acid Extractable Mercury (Hg)	mg/kg					0.11	0.14	0.10	N/A	5232257
Acid Extractable Molybdenum (Mo)	mg/kg	39 (1)	2.0	N/A	5232257	14	6.2	2.0	N/A	5232257
Acid Extractable Nickel (Ni)	mg/kg					5.9	2.9	2.0	N/A	5232257
Acid Extractable Rubidium (Rb)	mg/kg					24	9.0	2.0	N/A	5232257
Acid Extractable Selenium (Se)	mg/kg					<1.0	<1.0	1.0	N/A	5232257
Acid Extractable Silver (Ag)	mg/kg					<0.50	<0.50	0.50	N/A	5232257
Acid Extractable Strontium (Sr)	mg/kg					38	63	5.0	N/A	5232257
Acid Extractable Thallium (Tl)	mg/kg					0.37	0.16	0.10	N/A	5232257
Acid Extractable Tin (Sn)	mg/kg					<2.0	<2.0	2.0	N/A	5232257
Acid Extractable Uranium (U)	mg/kg					0.27	0.16	0.10	N/A	5232257
Acid Extractable Vanadium (V)	mg/kg					63	21	2.0	N/A	5232257
Acid Extractable Zinc (Zn)	mg/kg					120	150	5.0	N/A	5232257

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable
(1) Poor RPD due to sample inhomogeneity.

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		FJP686	FJP687	FJP688		FJP691			
Sampling Date		2017/10/17	2017/10/17	2017/10/17		2017/10/17			
COC Number		D26102	D26102	D26102		D26102			
	UNITS	**UPUMP-SOIL-1**	**UPUMP-SOIL-2**	**UPUMP-SOIL-3**	**QC Batch**	**UPUMP-SOIL-5**	**RDL**	**MDL**	**QC Batch**
Metals									
Acid Extractable Aluminum (Al)	mg/kg	2400	4700	5100	5232257	5200	10	N/A	5232147
Acid Extractable Antimony (Sb)	mg/kg	<2.0	<2.0	<2.0	5232257	<2.0	2.0	N/A	5232147
Acid Extractable Arsenic (As)	mg/kg	<2.0	<2.0	<2.0	5232257	<2.0	2.0	N/A	5232147
Acid Extractable Barium (Ba)	mg/kg	100	77	39	5232257	84	5.0	N/A	5232147
Acid Extractable Beryllium (Be)	mg/kg	<2.0	<2.0	<2.0	5232257	<2.0	2.0	N/A	5232147
Acid Extractable Bismuth (Bi)	mg/kg	<2.0	<2.0	<2.0	5232257	<2.0	2.0	N/A	5232147
Acid Extractable Boron (B)	mg/kg	<50	<50	<50	5232257	<50	50	N/A	5232147
Acid Extractable Cadmium (Cd)	mg/kg	<0.30	<0.30	<0.30	5232257	<0.30	0.30	N/A	5232147
Acid Extractable Chromium (Cr)	mg/kg	<2.0	2.5	6.9	5232257	<2.0	2.0	N/A	5232147
Acid Extractable Cobalt (Co)	mg/kg	2.4	2.8	4.2	5232257	2.7	1.0	N/A	5232147
Acid Extractable Copper (Cu)	mg/kg	4.0	4.8	5.0	5232257	5.8	2.0	N/A	5232147
Acid Extractable Iron (Fe)	mg/kg	1900	7400	16000	5232257	7100	50	N/A	5232147
Acid Extractable Lead (Pb)	mg/kg	3.8	4.6	4.8	5232257	6.5	0.50	N/A	5232147
Acid Extractable Lithium (Li)	mg/kg	<2.0	<2.0	3.9	5232257	<2.0	2.0	N/A	5232147
Acid Extractable Manganese (Mn)	mg/kg	33	20	85	5232257	15	2.0	N/A	5232147
Acid Extractable Mercury (Hg)	mg/kg	0.17	0.20	0.13	5232257	0.20	0.10	N/A	5232147
Acid Extractable Molybdenum (Mo)	mg/kg	<2.0	<2.0	3.3	5232257	<2.0	2.0	N/A	5232147
Acid Extractable Nickel (Ni)	mg/kg	2.9	3.7	7.8	5232257	4.4	2.0	N/A	5232147
Acid Extractable Rubidium (Rb)	mg/kg	<2.0	<2.0	5.2	5232257	<2.0	2.0	N/A	5232147
Acid Extractable Selenium (Se)	mg/kg	<1.0	1.1	<1.0	5232257	<1.0	1.0	N/A	5232147
Acid Extractable Silver (Ag)	mg/kg	<0.50	<0.50	<0.50	5232257	<0.50	0.50	N/A	5232147
Acid Extractable Strontium (Sr)	mg/kg	50	25	10	5232257	29	5.0	N/A	5232147
Acid Extractable Thallium (Tl)	mg/kg	<0.10	<0.10	<0.10	5232257	<0.10	0.10	N/A	5232147
Acid Extractable Tin (Sn)	mg/kg	<2.0	<2.0	<2.0	5232257	2.7	2.0	N/A	5232147
Acid Extractable Uranium (U)	mg/kg	0.14	0.78	0.60	5232257	0.75	0.10	N/A	5232147
Acid Extractable Vanadium (V)	mg/kg	2.6	3.7	29	5232257	3.7	2.0	N/A	5232147
Acid Extractable Zinc (Zn)	mg/kg	12	20	17	5232257	22	5.0	N/A	5232147

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		FJP705	FJP706	FJP707	FJP708			
Sampling Date		2017/10/13	2017/10/13	2017/10/13	2017/10/13			
COC Number		D26098	D26098	D26098	D26098			
	UNITS	**SHACK-SOIL-4**	**RADOME-SOIL-1**	**RADOME-SOIL-2**	**RADOME-SOIL-3**	**RDL**	**MDL**	**QC Batch**
Metals								
Acid Extractable Aluminum (Al)	mg/kg	11000	9500	9000	9300	10	N/A	5232147
Acid Extractable Antimony (Sb)	mg/kg	<2.0	<2.0	<2.0	<2.0	2.0	N/A	5232147
Acid Extractable Arsenic (As)	mg/kg	6.8	6.7	9.4	7.5	2.0	N/A	5232147
Acid Extractable Barium (Ba)	mg/kg	47	70	61	68	5.0	N/A	5232147
Acid Extractable Beryllium (Be)	mg/kg	<2.0	<2.0	<2.0	<2.0	2.0	N/A	5232147
Acid Extractable Bismuth (Bi)	mg/kg	<2.0	<2.0	<2.0	<2.0	2.0	N/A	5232147
Acid Extractable Boron (B)	mg/kg	<50	<50	<50	<50	50	N/A	5232147
Acid Extractable Cadmium (Cd)	mg/kg	0.46	1.3	0.56	0.35	0.30	N/A	5232147
Acid Extractable Chromium (Cr)	mg/kg	24	31	21	25	2.0	N/A	5232147
Acid Extractable Cobalt (Co)	mg/kg	11	15	12	15	1.0	N/A	5232147
Acid Extractable Copper (Cu)	mg/kg	40	93	56	71	2.0	N/A	5232147
Acid Extractable Iron (Fe)	mg/kg	24000	23000	20000	22000	50	N/A	5232147
Acid Extractable Lead (Pb)	mg/kg	29	85	72	19	0.50	N/A	5232147
Acid Extractable Lithium (Li)	mg/kg	18	18	16	16	2.0	N/A	5232147
Acid Extractable Manganese (Mn)	mg/kg	300	340	290	310	2.0	N/A	5232147
Acid Extractable Mercury (Hg)	mg/kg	<0.10	<0.10	<0.10	<0.10	0.10	N/A	5232147
Acid Extractable Molybdenum (Mo)	mg/kg	<2.0	<2.0	<2.0	<2.0	2.0	N/A	5232147
Acid Extractable Nickel (Ni)	mg/kg	17	36	23	32	2.0	N/A	5232147
Acid Extractable Rubidium (Rb)	mg/kg	17	16	15	18	2.0	N/A	5232147
Acid Extractable Selenium (Se)	mg/kg	<1.0	<1.0	<1.0	<1.0	1.0	N/A	5232147
Acid Extractable Silver (Ag)	mg/kg	<0.50	<0.50	<0.50	<0.50	0.50	N/A	5232147
Acid Extractable Strontium (Sr)	mg/kg	23	31	31	25	5.0	N/A	5232147
Acid Extractable Thallium (Tl)	mg/kg	0.15	0.13	0.12	0.14	0.10	N/A	5232147
Acid Extractable Tin (Sn)	mg/kg	<2.0	2.2	<2.0	<2.0	2.0	N/A	5232147
Acid Extractable Uranium (U)	mg/kg	0.90	1.2	0.92	1.0	0.10	N/A	5232147
Acid Extractable Vanadium (V)	mg/kg	44	43	41	41	2.0	N/A	5232147
Acid Extractable Zinc (Zn)	mg/kg	99	580	570	160	5.0	N/A	5232147

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		FJP709	FJP709		FJP710	FJP711			
Sampling Date		2017/10/13	2017/10/13		2017/10/13	2017/10/13			
COC Number		D26098	D26098		D26098	D26098			
	UNITS	**TOWER-SOIL-1**	**TOWER-SOIL-1 Lab-Dup**	**QC Batch**	**TOWER-SOIL-2**	**TOWER-SOIL-3**	**RDL**	**MDL**	**QC Batch**
Metals									
Acid Extractable Aluminum (Al)	mg/kg	7700	7800	5232111	7500	8500	10	N/A	5232147
Acid Extractable Antimony (Sb)	mg/kg	<2.0	<2.0	5232111	<2.0	<2.0	2.0	N/A	5232147
Acid Extractable Arsenic (As)	mg/kg	2.2	<2.0	5232111	3.8	3.7	2.0	N/A	5232147
Acid Extractable Barium (Ba)	mg/kg	48	46	5232111	55	69	5.0	N/A	5232147
Acid Extractable Beryllium (Be)	mg/kg	<2.0	<2.0	5232111	<2.0	<2.0	2.0	N/A	5232147
Acid Extractable Bismuth (Bi)	mg/kg	<2.0	<2.0	5232111	<2.0	<2.0	2.0	N/A	5232147
Acid Extractable Boron (B)	mg/kg	<50	<50	5232111	<50	<50	50	N/A	5232147
Acid Extractable Cadmium (Cd)	mg/kg	0.53	0.49	5232111	0.91	1.4	0.30	N/A	5232147
Acid Extractable Chromium (Cr)	mg/kg	11	11	5232111	20	18	2.0	N/A	5232147
Acid Extractable Cobalt (Co)	mg/kg	9.5	10	5232111	9.7	10	1.0	N/A	5232147
Acid Extractable Copper (Cu)	mg/kg	30	30	5232111	42	48	2.0	N/A	5232147
Acid Extractable Iron (Fe)	mg/kg	17000	18000	5232111	20000	20000	50	N/A	5232147
Acid Extractable Lead (Pb)	mg/kg	11	11	5232111	17	25	0.50	N/A	5232147
Acid Extractable Lithium (Li)	mg/kg	13	14	5232111	9.2	16	2.0	N/A	5232147
Acid Extractable Manganese (Mn)	mg/kg	440	520	5232111	310	400	2.0	N/A	5232147
Acid Extractable Mercury (Hg)	mg/kg	<0.10	<0.10	5232111	<0.10	<0.10	0.10	N/A	5232147
Acid Extractable Molybdenum (Mo)	mg/kg	<2.0	<2.0	5232111	<2.0	<2.0	2.0	N/A	5232147
Acid Extractable Nickel (Ni)	mg/kg	17	18	5232111	20	22	2.0	N/A	5232147
Acid Extractable Rubidium (Rb)	mg/kg	9.6	11	5232111	8.3	15	2.0	N/A	5232147
Acid Extractable Selenium (Se)	mg/kg	<1.0	<1.0	5232111	<1.0	<1.0	1.0	N/A	5232147
Acid Extractable Silver (Ag)	mg/kg	<0.50	<0.50	5232111	<0.50	<0.50	0.50	N/A	5232147
Acid Extractable Strontium (Sr)	mg/kg	12	10	5232111	56	25	5.0	N/A	5232147
Acid Extractable Thallium (Tl)	mg/kg	0.12	0.12	5232111	<0.10	0.13	0.10	N/A	5232147
Acid Extractable Tin (Sn)	mg/kg	<2.0	<2.0	5232111	<2.0	2.4	2.0	N/A	5232147
Acid Extractable Uranium (U)	mg/kg	0.52	0.68	5232111	0.99	0.77	0.10	N/A	5232147
Acid Extractable Vanadium (V)	mg/kg	20	20	5232111	21	27	2.0	N/A	5232147
Acid Extractable Zinc (Zn)	mg/kg	61	63	5232111	56	690	5.0	N/A	5232147

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		FJP712	FJP712	FJP717	FJP718			
Sampling Date		2017/10/13	2017/10/13	2017/10/15	2017/10/15			
COC Number		D26098	D26098	D26104	D26104			
	UNITS	**TOWER-SOIL-4**	**TOWER-SOIL-4 Lab-Dup**	**DRUM-SOIL-1**	**DRUM-SOIL-2**	**RDL**	**MDL**	**QC Batch**
Metals								
Acid Extractable Aluminum (Al)	mg/kg	6400	5500	5500	4900	10	N/A	5232147
Acid Extractable Antimony (Sb)	mg/kg	<2.0	<2.0	<2.0	<2.0	2.0	N/A	5232147
Acid Extractable Arsenic (As)	mg/kg	2.3	2.3	7.5	3.5	2.0	N/A	5232147
Acid Extractable Barium (Ba)	mg/kg	63	56	61	48	5.0	N/A	5232147
Acid Extractable Beryllium (Be)	mg/kg	<2.0	<2.0	<2.0	<2.0	2.0	N/A	5232147
Acid Extractable Bismuth (Bi)	mg/kg	<2.0	<2.0	<2.0	<2.0	2.0	N/A	5232147
Acid Extractable Boron (B)	mg/kg	<50	<50	<50	<50	50	N/A	5232147
Acid Extractable Cadmium (Cd)	mg/kg	1.2	1.4	<0.30	0.32	0.30	N/A	5232147
Acid Extractable Chromium (Cr)	mg/kg	12	9.4	23	24	2.0	N/A	5232147
Acid Extractable Cobalt (Co)	mg/kg	6.0	5.9	5.3	4.4	1.0	N/A	5232147
Acid Extractable Copper (Cu)	mg/kg	25	26	13	11	2.0	N/A	5232147
Acid Extractable Iron (Fe)	mg/kg	15000	14000	15000	14000	50	N/A	5232147
Acid Extractable Lead (Pb)	mg/kg	27	24	12	7.1	0.50	N/A	5232147
Acid Extractable Lithium (Li)	mg/kg	9.9	8.2	5.6	4.5	2.0	N/A	5232147
Acid Extractable Manganese (Mn)	mg/kg	580	530	150	95	2.0	N/A	5232147
Acid Extractable Mercury (Hg)	mg/kg	2.6	2.4	<0.10	<0.10	0.10	N/A	5232147
Acid Extractable Molybdenum (Mo)	mg/kg	<2.0	<2.0	<2.0	<2.0	2.0	N/A	5232147
Acid Extractable Nickel (Ni)	mg/kg	11	7.8	11	12	2.0	N/A	5232147
Acid Extractable Rubidium (Rb)	mg/kg	6.3	5.6	9.6	13	2.0	N/A	5232147
Acid Extractable Selenium (Se)	mg/kg	<1.0	<1.0	<1.0	<1.0	1.0	N/A	5232147
Acid Extractable Silver (Ag)	mg/kg	<0.50	<0.50	<0.50	<0.50	0.50	N/A	5232147
Acid Extractable Strontium (Sr)	mg/kg	9.6	7.9	41	29	5.0	N/A	5232147
Acid Extractable Thallium (Tl)	mg/kg	<0.10	<0.10	<0.10	<0.10	0.10	N/A	5232147
Acid Extractable Tin (Sn)	mg/kg	8.8	9.3	<2.0	<2.0	2.0	N/A	5232147
Acid Extractable Uranium (U)	mg/kg	0.98	0.87	1.1	0.51	0.10	N/A	5232147
Acid Extractable Vanadium (V)	mg/kg	19	17	30	29	2.0	N/A	5232147
Acid Extractable Zinc (Zn)	mg/kg	2000	1700	50	46	5.0	N/A	5232147

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		FJP719			
Sampling Date		2017/10/15			
COC Number		D26104			
	UNITS	**DRUM-SOIL-3**	**RDL**	**MDL**	**QC Batch**
Metals					
Acid Extractable Aluminum (Al)	mg/kg	8100	10	N/A	5232257
Acid Extractable Antimony (Sb)	mg/kg	<2.0	2.0	N/A	5232257
Acid Extractable Arsenic (As)	mg/kg	12	2.0	N/A	5232257
Acid Extractable Barium (Ba)	mg/kg	67	5.0	N/A	5232257
Acid Extractable Beryllium (Be)	mg/kg	<2.0	2.0	N/A	5232257
Acid Extractable Bismuth (Bi)	mg/kg	<2.0	2.0	N/A	5232257
Acid Extractable Boron (B)	mg/kg	<50	50	N/A	5232257
Acid Extractable Cadmium (Cd)	mg/kg	0.38	0.30	N/A	5232257
Acid Extractable Chromium (Cr)	mg/kg	23	2.0	N/A	5232257
Acid Extractable Cobalt (Co)	mg/kg	12	1.0	N/A	5232257
Acid Extractable Copper (Cu)	mg/kg	38	2.0	N/A	5232257
Acid Extractable Iron (Fe)	mg/kg	22000	50	N/A	5232257
Acid Extractable Lead (Pb)	mg/kg	9.3	0.50	N/A	5232257
Acid Extractable Lithium (Li)	mg/kg	11	2.0	N/A	5232257
Acid Extractable Manganese (Mn)	mg/kg	270	2.0	N/A	5232257
Acid Extractable Mercury (Hg)	mg/kg	<0.10	0.10	N/A	5232257
Acid Extractable Molybdenum (Mo)	mg/kg	<2.0	2.0	N/A	5232257
Acid Extractable Nickel (Ni)	mg/kg	18	2.0	N/A	5232257
Acid Extractable Rubidium (Rb)	mg/kg	16	2.0	N/A	5232257
Acid Extractable Selenium (Se)	mg/kg	<1.0	1.0	N/A	5232257
Acid Extractable Silver (Ag)	mg/kg	<0.50	0.50	N/A	5232257
Acid Extractable Strontium (Sr)	mg/kg	33	5.0	N/A	5232257
Acid Extractable Thallium (Tl)	mg/kg	0.13	0.10	N/A	5232257
Acid Extractable Tin (Sn)	mg/kg	<2.0	2.0	N/A	5232257
Acid Extractable Uranium (U)	mg/kg	1.5	0.10	N/A	5232257
Acid Extractable Vanadium (V)	mg/kg	45	2.0	N/A	5232257
Acid Extractable Zinc (Zn)	mg/kg	77	5.0	N/A	5232257

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		FJP535		FJP536		FJP537			FJP560			
Sampling Date		2017/10/14		2017/10/14		2017/10/14			2017/10/14			
COC Number		D26100		D26100		D26100			D26101			
	UNITS	**1987-SOIL-1**	**RDL**	**1987-SOIL-2**	**RDL**	**1987-SOIL-3**	**RDL**	**QC Batch**	**1987-SOIL-4**	**RDL**	**MDL**	**QC Batch**
Polyaromatic Hydrocarbons												
1-Methylnaphthalene	mg/kg	<0.010	0.010	<0.010	0.010	<0.010	0.010	5229955	<0.010	0.010	N/A	5232258
2-Methylnaphthalene	mg/kg	<0.010	0.010	<0.010	0.010	<0.010	0.010	5229955	<0.010	0.010	N/A	5232258
Acenaphthene	mg/kg	<0.010	0.010	<0.010	0.010	<0.010	0.010	5229955	<0.010	0.010	N/A	5232258
Acenaphthylene	mg/kg	<0.030 (1)	0.030	<0.040 (1)	0.040	<0.030 (1)	0.030	5229955	<0.010	0.010	N/A	5232258
Anthracene	mg/kg	<0.010	0.010	<0.010	0.010	<0.010	0.010	5229955	<0.010	0.010	N/A	5232258
Benzo(a)anthracene	mg/kg	<0.010	0.010	<0.010	0.010	<0.010	0.010	5229955	<0.010	0.010	N/A	5232258
Benzo(a)pyrene	mg/kg	<0.010	0.010	<0.010	0.010	<0.010	0.010	5229955	<0.010	0.010	N/A	5232258
Benzo(b)fluoranthene	mg/kg	<0.010	0.010	0.013	0.010	<0.010	0.010	5229955	<0.010	0.010	N/A	5232258
Benzo(b/j)fluoranthene	mg/kg	<0.020	0.020	<0.020	0.020	<0.020	0.020	5225630	<0.020	0.020	N/A	5225630
Benzo(g,h,i)perylene	mg/kg	<0.010	0.010	<0.010	0.010	<0.010	0.010	5229955	<0.010	0.010	N/A	5232258
Benzo(j)fluoranthene	mg/kg	<0.010	0.010	<0.010	0.010	<0.010	0.010	5229955	<0.010	0.010	N/A	5232258
Benzo(k)fluoranthene	mg/kg	<0.010	0.010	<0.010	0.010	<0.010	0.010	5229955	<0.010	0.010	N/A	5232258
Chrysene	mg/kg	<0.010	0.010	0.015	0.010	<0.010	0.010	5229955	<0.010	0.010	N/A	5232258
Dibenz(a,h)anthracene	mg/kg	<0.010	0.010	<0.010	0.010	<0.010	0.010	5229955	<0.010	0.010	N/A	5232258
Fluoranthene	mg/kg	<0.010	0.010	<0.010	0.010	<0.010	0.010	5229955	<0.010	0.010	N/A	5232258
Fluorene	mg/kg	<0.010	0.010	<0.010	0.010	<0.010	0.010	5229955	<0.010	0.010	N/A	5232258
Indeno(1,2,3-cd)pyrene	mg/kg	<0.010	0.010	<0.010	0.010	<0.010	0.010	5229955	<0.010	0.010	N/A	5232258
Naphthalene	mg/kg	<0.010	0.010	<0.010	0.010	<0.010	0.010	5229955	<0.010	0.010	N/A	5232258
Perylene	mg/kg	<0.010	0.010	<0.010	0.010	<0.010	0.010	5229955	<0.010	0.010	N/A	5232258
Phenanthrene	mg/kg	<0.010	0.010	<0.010	0.010	<0.010	0.010	5229955	<0.010	0.010	N/A	5232258
Pyrene	mg/kg	<0.010	0.010	<0.010	0.010	<0.010	0.010	5229955	<0.010	0.010	N/A	5232258
Surrogate Recovery (%)												
D10-Anthracene	%	71		78		69		5229955	80			5232258
D14-Terphenyl (FS)	%	77		77		69		5229955	94			5232258
D8-Acenaphthylene	%	75		77		71		5229955	106			5232258

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable
(1) Elevated PAH RDL(s) due to matrix / co-extractive interference.

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		FJP561	FJP562	FJP563				FJP563			
Sampling Date		2017/10/14	2017/10/14	2017/10/14				2017/10/14			
COC Number		D26101	D26101	D26101				D26101			
	UNITS	**1987-SOIL-5**	**1987-SOIL-6**	**1987-SOIL-7**	**RDL**	**MDL**	**QC Batch**	**1987-SOIL-7 Lab-Dup**	**RDL**	**MDL**	**QC Batch**
Polyaromatic Hydrocarbons											
1-Methylnaphthalene	mg/kg	<0.010	<0.010	<0.010	0.010	N/A	5232258	<0.010	0.010	N/A	5232258
2-Methylnaphthalene	mg/kg	<0.010	<0.010	<0.010	0.010	N/A	5232258	<0.010	0.010	N/A	5232258
Acenaphthene	mg/kg	<0.010	<0.010	<0.010	0.010	N/A	5232258	<0.010	0.010	N/A	5232258
Acenaphthylene	mg/kg	<0.010	<0.010	<0.010	0.010	N/A	5232258	<0.010	0.010	N/A	5232258
Anthracene	mg/kg	<0.010	<0.010	<0.010	0.010	N/A	5232258	<0.010	0.010	N/A	5232258
Benzo(a)anthracene	mg/kg	<0.010	<0.010	<0.010	0.010	N/A	5232258	<0.010	0.010	N/A	5232258
Benzo(a)pyrene	mg/kg	<0.010	<0.010	<0.010	0.010	N/A	5232258	<0.010	0.010	N/A	5232258
Benzo(b)fluoranthene	mg/kg	<0.010	<0.010	<0.010	0.010	N/A	5232258	<0.010	0.010	N/A	5232258
Benzo(b/j)fluoranthene	mg/kg	<0.020	<0.020	<0.020	0.020	N/A	5225630				
Benzo(g,h,i)perylene	mg/kg	<0.010	<0.010	<0.010	0.010	N/A	5232258	<0.010	0.010	N/A	5232258
Benzo(j)fluoranthene	mg/kg	<0.010	<0.010	<0.010	0.010	N/A	5232258	<0.010	0.010	N/A	5232258
Benzo(k)fluoranthene	mg/kg	<0.010	<0.010	<0.010	0.010	N/A	5232258	<0.010	0.010	N/A	5232258
Chrysene	mg/kg	<0.010	<0.010	<0.010	0.010	N/A	5232258	<0.010	0.010	N/A	5232258
Dibenz(a,h)anthracene	mg/kg	<0.010	<0.010	<0.010	0.010	N/A	5232258	<0.010	0.010	N/A	5232258
Fluoranthene	mg/kg	<0.010	<0.010	<0.010	0.010	N/A	5232258	<0.010	0.010	N/A	5232258
Fluorene	mg/kg	<0.010	<0.010	<0.010	0.010	N/A	5232258	<0.010	0.010	N/A	5232258
Indeno(1,2,3-cd)pyrene	mg/kg	<0.010	<0.010	<0.010	0.010	N/A	5232258	<0.010	0.010	N/A	5232258
Naphthalene	mg/kg	<0.010	<0.010	<0.010	0.010	N/A	5232258	<0.010	0.010	N/A	5232258
Perylene	mg/kg	<0.010	<0.010	<0.010	0.010	N/A	5232258	<0.010	0.010	N/A	5232258
Phenanthrene	mg/kg	<0.010	<0.010	<0.010	0.010	N/A	5232258	<0.010	0.010	N/A	5232258
Pyrene	mg/kg	<0.010	<0.010	<0.010	0.010	N/A	5232258	<0.010	0.010	N/A	5232258
Surrogate Recovery (%)											
D10-Anthracene	%	76	86	84			5232258	85			5232258
D14-Terphenyl (FS)	%	93	91	90			5232258	93			5232258
D8-Acenaphthylene	%	107	101	104			5232258	107			5232258

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		FJP564	FJP565	FJP566			FJP567			
Sampling Date		2017/10/14	2017/10/14	2017/10/14			2017/10/14			
COC Number		D26101	D26101	D26101			D26101			
	UNITS	**1987-SOIL-8**	**1987-SOIL-9**	**1987-SOIL-10**	**RDL**	**QC Batch**	**1987-SOIL-11**	**RDL**	**MDL**	**QC Batch**
Polyaromatic Hydrocarbons										
1-Methylnaphthalene	mg/kg	<0.010	<0.010	<0.010	0.010	5232258	<0.010	0.010	N/A	5229955
2-Methylnaphthalene	mg/kg	<0.010	<0.010	<0.010	0.010	5232258	<0.010	0.010	N/A	5229955
Acenaphthene	mg/kg	<0.010	<0.010	<0.010	0.010	5232258	<0.010	0.010	N/A	5229955
Acenaphthylene	mg/kg	<0.010	<0.010	<0.010	0.010	5232258	<0.040 (1)	0.040	N/A	5229955
Anthracene	mg/kg	<0.010	<0.010	<0.010	0.010	5232258	<0.010	0.010	N/A	5229955
Benzo(a)anthracene	mg/kg	<0.010	<0.010	<0.010	0.010	5232258	<0.010	0.010	N/A	5229955
Benzo(a)pyrene	mg/kg	<0.010	<0.010	<0.010	0.010	5232258	<0.010	0.010	N/A	5229955
Benzo(b)fluoranthene	mg/kg	<0.010	<0.010	<0.010	0.010	5232258	<0.010	0.010	N/A	5229955
Benzo(b/j)fluoranthene	mg/kg	<0.020	<0.020	<0.020	0.020	5225630	<0.020	0.020	N/A	5225630
Benzo(g,h,i)perylene	mg/kg	<0.010	<0.010	<0.010	0.010	5232258	<0.010	0.010	N/A	5229955
Benzo(j)fluoranthene	mg/kg	<0.010	<0.010	<0.010	0.010	5232258	<0.010	0.010	N/A	5229955
Benzo(k)fluoranthene	mg/kg	<0.010	<0.010	<0.010	0.010	5232258	<0.010	0.010	N/A	5229955
Chrysene	mg/kg	<0.010	<0.010	<0.010	0.010	5232258	<0.010	0.010	N/A	5229955
Dibenz(a,h)anthracene	mg/kg	<0.010	<0.010	<0.010	0.010	5232258	<0.010	0.010	N/A	5229955
Fluoranthene	mg/kg	<0.010	<0.010	<0.010	0.010	5232258	<0.010	0.010	N/A	5229955
Fluorene	mg/kg	<0.010	<0.010	<0.010	0.010	5232258	<0.010	0.010	N/A	5229955
Indeno(1,2,3-cd)pyrene	mg/kg	<0.010	<0.010	<0.010	0.010	5232258	<0.010	0.010	N/A	5229955
Naphthalene	mg/kg	<0.010	<0.010	<0.010	0.010	5232258	<0.010	0.010	N/A	5229955
Perylene	mg/kg	<0.010	<0.010	<0.010	0.010	5232258	<0.010	0.010	N/A	5229955
Phenanthrene	mg/kg	<0.010	<0.010	<0.010	0.010	5232258	<0.010	0.010	N/A	5229955
Pyrene	mg/kg	<0.010	<0.010	<0.010	0.010	5232258	<0.010	0.010	N/A	5229955
Surrogate Recovery (%)										
D10-Anthracene	%	83	94	90		5232258	76			5229955
D14-Terphenyl (FS)	%	98	107	101		5232258	81			5229955
D8-Acenaphthylene	%	102	108	104		5232258	78			5229955

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable
(1) Elevated PAH RDL(s) due to matrix / co-extractive interference.

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		FJP568			FJP569	FJP570	FJP571	FJP572			
Sampling Date		2017/10/14			2017/10/13	2017/10/13	2017/10/13	2017/10/13			
COC Number		D26101			D26096	D26096	D26096	D26096			
	UNITS	**1987-SOIL-12**	**RDL**	**QC Batch**	**UAST-SOIL-1**	**UAST-SOIL-2**	**UAST-SOIL-3**	**UAST-SOIL-4**	**RDL**	**MDL**	**QC Batch**
Polyaromatic Hydrocarbons											
1-Methylnaphthalene	mg/kg	<0.010	0.010	5229955	<0.010	<0.010	<0.010	<0.010	0.010	N/A	5232258
2-Methylnaphthalene	mg/kg	<0.010	0.010	5229955	<0.010	<0.010	<0.010	<0.010	0.010	N/A	5232258
Acenaphthene	mg/kg	<0.010	0.010	5229955	<0.010	<0.010	<0.010	<0.010	0.010	N/A	5232258
Acenaphthylene	mg/kg	<0.030 (1)	0.030	5229955	<0.010	<0.010	<0.010	<0.010	0.010	N/A	5232258
Anthracene	mg/kg	<0.010	0.010	5229955	<0.010	<0.010	<0.010	<0.010	0.010	N/A	5232258
Benzo(a)anthracene	mg/kg	<0.010	0.010	5229955	<0.010	<0.010	<0.010	<0.010	0.010	N/A	5232258
Benzo(a)pyrene	mg/kg	<0.010	0.010	5229955	<0.010	<0.010	<0.010	<0.010	0.010	N/A	5232258
Benzo(b)fluoranthene	mg/kg	<0.010	0.010	5229955	<0.010	<0.010	<0.010	<0.010	0.010	N/A	5232258
Benzo(b/j)fluoranthene	mg/kg	<0.020	0.020	5225630	<0.020	<0.020	<0.020	<0.020	0.020	N/A	5225630
Benzo(g,h,i)perylene	mg/kg	<0.010	0.010	5229955	<0.010	<0.010	<0.010	<0.010	0.010	N/A	5232258
Benzo(j)fluoranthene	mg/kg	<0.010	0.010	5229955	<0.010	<0.010	<0.010	<0.010	0.010	N/A	5232258
Benzo(k)fluoranthene	mg/kg	<0.010	0.010	5229955	<0.010	<0.010	<0.010	<0.010	0.010	N/A	5232258
Chrysene	mg/kg	<0.010	0.010	5229955	<0.010	<0.010	<0.010	<0.010	0.010	N/A	5232258
Dibenz(a,h)anthracene	mg/kg	<0.010	0.010	5229955	<0.010	<0.010	<0.010	<0.010	0.010	N/A	5232258
Fluoranthene	mg/kg	<0.010	0.010	5229955	<0.010	<0.010	<0.010	<0.010	0.010	N/A	5232258
Fluorene	mg/kg	<0.010	0.010	5229955	<0.010	<0.010	<0.010	<0.010	0.010	N/A	5232258
Indeno(1,2,3-cd)pyrene	mg/kg	<0.010	0.010	5229955	<0.010	<0.010	<0.010	<0.010	0.010	N/A	5232258
Naphthalene	mg/kg	<0.010	0.010	5229955	<0.010	<0.010	<0.010	<0.010	0.010	N/A	5232258
Perylene	mg/kg	<0.010	0.010	5229955	<0.010	<0.010	<0.010	<0.010	0.010	N/A	5232258
Phenanthrene	mg/kg	<0.010	0.010	5229955	<0.010	<0.010	<0.010	<0.010	0.010	N/A	5232258
Pyrene	mg/kg	<0.010	0.010	5229955	<0.010	<0.010	<0.010	<0.010	0.010	N/A	5232258
Surrogate Recovery (%)											
D10-Anthracene	%	79		5229955	99	77	77	87			5232258
D14-Terphenyl (FS)	%	76		5229955	112	93	96	110			5232258
D8-Acenaphthylene	%	74		5229955	89	99	106	105			5232258

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable
(1) Elevated PAH RDL(s) due to matrix / co-extractive interference.

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		FJP573	FJP574	FJP575	FJP576	FJP577	FJP578			
Sampling Date		2017/10/13	2017/10/13	2017/10/13	2017/10/13	2017/10/13	2017/10/13			
COC Number		D26096	D26096	D26096	D26096	D26096	D26096			
	UNITS	**UAST-SOIL-5**	**HEL-SOIL-1**	**HEL-SOIL-2**	**HEL-SOIL-3**	**HANGER-SOIL-1**	**HANGER-SOIL-2**	**RDL**	**MDL**	**QC Batch**
Polyaromatic Hydrocarbons										
1-Methylnaphthalene	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	N/A	5232258
2-Methylnaphthalene	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	N/A	5232258
Acenaphthene	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	0.10	0.010	N/A	5232258
Acenaphthylene	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	N/A	5232258
Anthracene	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	0.21	0.010	N/A	5232258
Benzo(a)anthracene	mg/kg	<0.010	<0.010	<0.010	<0.010	0.023	0.66	0.010	N/A	5232258
Benzo(a)pyrene	mg/kg	<0.010	<0.010	<0.010	<0.010	0.052	0.60	0.010	N/A	5232258
Benzo(b)fluoranthene	mg/kg	<0.010	<0.010	<0.010	<0.010	0.039	0.63	0.010	N/A	5232258
Benzo(b/j)fluoranthene	mg/kg	<0.020	<0.020	<0.020	<0.020	0.054	0.94	0.020	N/A	5225630
Benzo(g,h,i)perylene	mg/kg	<0.010	<0.010	<0.010	<0.010	0.10	0.30	0.010	N/A	5232258
Benzo(j)fluoranthene	mg/kg	<0.010	<0.010	<0.010	<0.010	0.015	0.31	0.010	N/A	5232258
Benzo(k)fluoranthene	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	0.31	0.010	N/A	5232258
Chrysene	mg/kg	<0.010	<0.010	<0.010	<0.010	0.054	0.64	0.010	N/A	5232258
Dibenz(a,h)anthracene	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	0.084	0.010	N/A	5232258
Fluoranthene	mg/kg	<0.010	<0.010	<0.010	<0.010	0.017	1.8	0.010	N/A	5232258
Fluorene	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	0.079	0.010	N/A	5232258
Indeno(1,2,3-cd)pyrene	mg/kg	<0.010	<0.010	<0.010	<0.010	0.030	0.28	0.010	N/A	5232258
Naphthalene	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	N/A	5232258
Perylene	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	0.15	0.010	N/A	5232258
Phenanthrene	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	1.1	0.010	N/A	5232258
Pyrene	mg/kg	<0.010	<0.010	<0.010	<0.010	0.038	1.3	0.010	N/A	5232258
Surrogate Recovery (%)										
D10-Anthracene	%	102	83	76	85	81	81			5232258
D14-Terphenyl (FS)	%	114	101	97	96	100	92			5232258
D8-Acenaphthylene	%	119	110	106	107	104	105			5232258

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		FJP580	FJP581	FJP582		FJP583	FJP584			
Sampling Date		2017/10/18	2017/10/18	2017/10/18		2017/10/18	2017/10/18			
COC Number		D26097	D26097	D26097		D26097	D26097			
	UNITS	**HANGER-SOIL-3**	**HANGER-SOIL-4**	**SEPTIC-SOIL-1**	**QC Batch**	**SEPTIC-SOIL-2**	**SEPTIC-SOIL-3**	**RDL**	**MDL**	**QC Batch**
Polyaromatic Hydrocarbons										
1-Methylnaphthalene	mg/kg	<0.010	<0.010	<0.010	5232258	<0.010	<0.010	0.010	N/A	5232260
2-Methylnaphthalene	mg/kg	<0.010	<0.010	<0.010	5232258	<0.010	<0.010	0.010	N/A	5232260
Acenaphthene	mg/kg	<0.010	<0.010	<0.010	5232258	<0.010	<0.010	0.010	N/A	5232260
Acenaphthylene	mg/kg	<0.010	<0.010	<0.010	5232258	<0.010	<0.010	0.010	N/A	5232260
Anthracene	mg/kg	<0.010	<0.010	<0.010	5232258	<0.010	<0.010	0.010	N/A	5232260
Benzo(a)anthracene	mg/kg	0.092	0.022	0.073	5232258	<0.010	0.023	0.010	N/A	5232260
Benzo(a)pyrene	mg/kg	0.11	0.038	0.16	5232258	<0.010	0.032	0.010	N/A	5232260
Benzo(b)fluoranthene	mg/kg	0.12	0.046	0.28	5232258	<0.010	0.031	0.010	N/A	5232260
Benzo(b/j)fluoranthene	mg/kg	0.18	0.065	0.39	5225630	<0.020	0.044	0.020	N/A	5225630
Benzo(g,h,i)perylene	mg/kg	0.068	0.041	0.19	5232258	<0.010	0.022	0.010	N/A	5232260
Benzo(j)fluoranthene	mg/kg	0.068	0.019	0.11	5232258	<0.010	0.013	0.010	N/A	5232260
Benzo(k)fluoranthene	mg/kg	0.058	0.017	0.10	5232258	<0.010	0.014	0.010	N/A	5232260
Chrysene	mg/kg	0.12	0.042	0.26	5232258	<0.010	0.023	0.010	N/A	5232260
Dibenz(a,h)anthracene	mg/kg	0.018	<0.010	0.042	5232258	<0.010	<0.010	0.010	N/A	5232260
Fluoranthene	mg/kg	0.25	0.052	0.13	5232258	<0.010	0.043	0.010	N/A	5232260
Fluorene	mg/kg	<0.010	<0.010	<0.010	5232258	<0.010	<0.010	0.010	N/A	5232260
Indeno(1,2,3-cd)pyrene	mg/kg	0.051	0.030	0.14	5232258	<0.010	0.016	0.010	N/A	5232260
Naphthalene	mg/kg	<0.010	<0.010	<0.010	5232258	<0.010	<0.010	0.010	N/A	5232260
Perylene	mg/kg	0.035	<0.010	0.043	5232258	<0.010	<0.010	0.010	N/A	5232260
Phenanthrene	mg/kg	0.14	0.030	<0.010	5232258	<0.010	0.014	0.010	N/A	5232260
Pyrene	mg/kg	0.18	0.041	0.14	5232258	<0.010	0.035	0.010	N/A	5232260
Surrogate Recovery (%)										
D10-Anthracene	%	80	84	83	5232258	91	86			5232260
D14-Terphenyl (FS)	%	100	94	95	5232258	91	85			5232260
D8-Acenaphthylene	%	102	104	107	5232258	95	93			5232260

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		FJP585			FJP586			FJP587			
Sampling Date		2017/10/18			2017/10/18			2017/10/18			
COC Number		D26097			D26097			D26097			
	UNITS	**HEL-SOIL-4**	**RDL**	**QC Batch**	**SHACK-SOIL-1**	**RDL**	**QC Batch**	**SHACK-SOIL-2**	**RDL**	**MDL**	**QC Batch**
Polyaromatic Hydrocarbons											
1-Methylnaphthalene	mg/kg	<0.010	0.010	5232260	<0.010	0.010	5229955	<0.010	0.010	N/A	5232260
2-Methylnaphthalene	mg/kg	<0.010	0.010	5232260	<0.010	0.010	5229955	<0.010	0.010	N/A	5232260
Acenaphthene	mg/kg	<0.010	0.010	5232260	<0.010	0.010	5229955	<0.010	0.010	N/A	5232260
Acenaphthylene	mg/kg	<0.010	0.010	5232260	<0.040 (1)	0.040	5229955	<0.010	0.010	N/A	5232260
Anthracene	mg/kg	<0.010	0.010	5232260	<0.010	0.010	5229955	<0.010	0.010	N/A	5232260
Benzo(a)anthracene	mg/kg	<0.010	0.010	5232260	<0.010	0.010	5229955	<0.010	0.010	N/A	5232260
Benzo(a)pyrene	mg/kg	<0.010	0.010	5232260	<0.010	0.010	5229955	<0.010	0.010	N/A	5232260
Benzo(b)fluoranthene	mg/kg	<0.010	0.010	5232260	<0.010	0.010	5229955	<0.010	0.010	N/A	5232260
Benzo(b/j)fluoranthene	mg/kg	<0.020	0.020	5225630	<0.020	0.020	5225630	<0.020	0.020	N/A	5225630
Benzo(g,h,i)perylene	mg/kg	<0.010	0.010	5232260	<0.010	0.010	5229955	<0.010	0.010	N/A	5232260
Benzo(j)fluoranthene	mg/kg	<0.010	0.010	5232260	<0.010	0.010	5229955	<0.010	0.010	N/A	5232260
Benzo(k)fluoranthene	mg/kg	<0.010	0.010	5232260	<0.010	0.010	5229955	<0.010	0.010	N/A	5232260
Chrysene	mg/kg	<0.010	0.010	5232260	<0.010	0.010	5229955	<0.010	0.010	N/A	5232260
Dibenz(a,h)anthracene	mg/kg	<0.010	0.010	5232260	<0.010	0.010	5229955	<0.010	0.010	N/A	5232260
Fluoranthene	mg/kg	<0.010	0.010	5232260	<0.010	0.010	5229955	0.014	0.010	N/A	5232260
Fluorene	mg/kg	<0.010	0.010	5232260	<0.010	0.010	5229955	<0.010	0.010	N/A	5232260
Indeno(1,2,3-cd)pyrene	mg/kg	<0.010	0.010	5232260	<0.010	0.010	5229955	<0.010	0.010	N/A	5232260
Naphthalene	mg/kg	<0.010	0.010	5232260	<0.010	0.010	5229955	<0.010	0.010	N/A	5232260
Perylene	mg/kg	<0.010	0.010	5232260	<0.010	0.010	5229955	<0.010	0.010	N/A	5232260
Phenanthrene	mg/kg	<0.010	0.010	5232260	<0.010	0.010	5229955	<0.010	0.010	N/A	5232260
Pyrene	mg/kg	<0.010	0.010	5232260	<0.010	0.010	5229955	0.013	0.010	N/A	5232260
Surrogate Recovery (%)											
D10-Anthracene	%	88		5232260	88		5229955	97			5232260
D14-Terphenyl (FS)	%	90		5232260	86		5229955	96			5232260
D8-Acenaphthylene	%	96		5232260	87		5229955	88			5232260

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable
(1) Elevated PAH RDL(s) due to matrix / co-extractive interference.

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		FJP587				FJP588	FJP619	FJP620			
Sampling Date		2017/10/18				2017/10/18	2017/10/14	2017/10/14			
COC Number		D26097				D26097	D26106	D26106			
	UNITS	**SHACK-SOIL-2 Lab-Dup**	**RDL**	**MDL**	**QC Batch**	**SHACK-SOIL-3**	**BG-SOIL-1**	**BG-SOIL-2**	**RDL**	**MDL**	**QC Batch**
Polyaromatic Hydrocarbons											
1-Methylnaphthalene	mg/kg	<0.010	0.010	N/A	5232260	<0.010	<0.010	<0.010	0.010	N/A	5232260
2-Methylnaphthalene	mg/kg	<0.010	0.010	N/A	5232260	<0.010	<0.010	<0.010	0.010	N/A	5232260
Acenaphthene	mg/kg	<0.010	0.010	N/A	5232260	<0.010	<0.010	<0.010	0.010	N/A	5232260
Acenaphthylene	mg/kg	<0.010	0.010	N/A	5232260	<0.010	<0.010	<0.010	0.010	N/A	5232260
Anthracene	mg/kg	<0.010	0.010	N/A	5232260	<0.010	<0.010	<0.010	0.010	N/A	5232260
Benzo(a)anthracene	mg/kg	<0.010	0.010	N/A	5232260	0.022	<0.010	<0.010	0.010	N/A	5232260
Benzo(a)pyrene	mg/kg	<0.010	0.010	N/A	5232260	0.064	<0.010	<0.010	0.010	N/A	5232260
Benzo(b)fluoranthene	mg/kg	<0.010	0.010	N/A	5232260	0.060	<0.010	<0.010	0.010	N/A	5232260
Benzo(b/j)fluoranthene	mg/kg					0.092	<0.020	<0.020	0.020	N/A	5225630
Benzo(g,h,i)perylene	mg/kg	<0.010	0.010	N/A	5232260	0.044	<0.010	<0.010	0.010	N/A	5232260
Benzo(j)fluoranthene	mg/kg	<0.010	0.010	N/A	5232260	0.031	<0.010	<0.010	0.010	N/A	5232260
Benzo(k)fluoranthene	mg/kg	<0.010	0.010	N/A	5232260	0.028	<0.010	<0.010	0.010	N/A	5232260
Chrysene	mg/kg	<0.010	0.010	N/A	5232260	0.037	<0.010	<0.010	0.010	N/A	5232260
Dibenz(a,h)anthracene	mg/kg	<0.010	0.010	N/A	5232260	<0.010	<0.010	<0.010	0.010	N/A	5232260
Fluoranthene	mg/kg	<0.010	0.010	N/A	5232260	0.020	<0.010	<0.010	0.010	N/A	5232260
Fluorene	mg/kg	<0.010	0.010	N/A	5232260	<0.010	<0.010	<0.010	0.010	N/A	5232260
Indeno(1,2,3-cd)pyrene	mg/kg	<0.010	0.010	N/A	5232260	0.044	<0.010	<0.010	0.010	N/A	5232260
Naphthalene	mg/kg	<0.010	0.010	N/A	5232260	<0.010	<0.010	<0.010	0.010	N/A	5232260
Perylene	mg/kg	<0.010	0.010	N/A	5232260	<0.010	<0.010	<0.010	0.010	N/A	5232260
Phenanthrene	mg/kg	<0.010	0.010	N/A	5232260	<0.010	<0.010	<0.010	0.010	N/A	5232260
Pyrene	mg/kg	<0.010	0.010	N/A	5232260	0.036	<0.010	<0.010	0.010	N/A	5232260
Surrogate Recovery (%)											
D10-Anthracene	%	95			5232260	89	76	81			5232260
D14-Terphenyl (FS)	%	97			5232260	89	83	91			5232260
D8-Acenaphthylene	%	91			5232260	97	91	92			5232260

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		FJP621		FJP622		FJP623		FJP624	FJP625			
Sampling Date		2017/10/14		2017/10/14		2017/10/14		2017/10/14	2017/10/14			
COC Number		D26106		D26106		D26106		D26106	D26106			
	UNITS	**BG-SOIL-3**	**QC Batch**	**BG-SOIL-4**	**RDL**	**BG-SOIL-5**	**RDL**	**BG-SOIL-6**	**BG-SOIL-7**	**RDL**	**MDL**	**QC Batch**
Polyaromatic Hydrocarbons												
1-Methylnaphthalene	mg/kg	<0.010	5229955	<0.010	0.010	<0.010	0.010	<0.010	<0.010	0.010	N/A	5232260
2-Methylnaphthalene	mg/kg	<0.010	5229955	<0.010	0.010	<0.010	0.010	<0.010	<0.010	0.010	N/A	5232260
Acenaphthene	mg/kg	<0.010	5229955	<0.010	0.010	<0.010	0.010	<0.010	<0.010	0.010	N/A	5232260
Acenaphthylene	mg/kg	<0.010	5229955	<0.010	0.010	<0.010	0.010	<0.010	<0.010	0.010	N/A	5232260
Anthracene	mg/kg	<0.010	5229955	<0.010	0.010	<0.010	0.010	<0.010	<0.010	0.010	N/A	5232260
Benzo(a)anthracene	mg/kg	<0.010	5229955	<0.010	0.010	<0.010	0.010	<0.010	<0.010	0.010	N/A	5232260
Benzo(a)pyrene	mg/kg	<0.010	5229955	<0.010	0.010	<0.010	0.010	<0.010	<0.010	0.010	N/A	5232260
Benzo(b)fluoranthene	mg/kg	<0.010	5229955	<0.010	0.010	<0.010	0.010	<0.010	<0.010	0.010	N/A	5232260
Benzo(b/j)fluoranthene	mg/kg	<0.020	5225630	<0.020	0.020	<0.020	0.020	<0.020	<0.020	0.020	N/A	5225630
Benzo(g,h,i)perylene	mg/kg	<0.010	5229955	<0.010	0.010	<0.043 (1)	0.043	<0.010	<0.010	0.010	N/A	5232260
Benzo(j)fluoranthene	mg/kg	<0.010	5229955	<0.010	0.010	<0.010	0.010	<0.010	<0.010	0.010	N/A	5232260
Benzo(k)fluoranthene	mg/kg	<0.010	5229955	<0.010	0.010	<0.010	0.010	<0.010	<0.010	0.010	N/A	5232260
Chrysene	mg/kg	<0.010	5229955	<0.010	0.010	<0.010	0.010	<0.010	<0.010	0.010	N/A	5232260
Dibenz(a,h)anthracene	mg/kg	<0.010	5229955	<0.010	0.010	<0.010	0.010	<0.010	<0.010	0.010	N/A	5232260
Fluoranthene	mg/kg	<0.010	5229955	<0.010	0.010	<0.010	0.010	<0.010	<0.010	0.010	N/A	5232260
Fluorene	mg/kg	<0.010	5229955	<0.010	0.010	<0.010	0.010	<0.010	<0.010	0.010	N/A	5232260
Indeno(1,2,3-cd)pyrene	mg/kg	<0.010	5229955	<0.010	0.010	<0.010	0.010	<0.010	<0.010	0.010	N/A	5232260
Naphthalene	mg/kg	<0.010	5229955	<0.010	0.010	<0.010	0.010	<0.010	<0.010	0.010	N/A	5232260
Perylene	mg/kg	<0.010	5229955	<0.010	0.010	<0.12 (1)	0.12	<0.010	<0.010	0.010	N/A	5232260
Phenanthrene	mg/kg	<0.010	5229955	<0.010	0.010	<0.010	0.010	<0.010	<0.010	0.010	N/A	5232260
Pyrene	mg/kg	<0.010	5229955	<0.010	0.010	<0.010	0.010	<0.010	<0.010	0.010	N/A	5232260
Surrogate Recovery (%)												
D10-Anthracene	%	85	5229955	85		75		82	86			5232260
D14-Terphenyl (FS)	%	82	5229955	89		81		89	89			5232260
D8-Acenaphthylene	%	86	5229955	94		84		94	92			5232260

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable
(1) Elevated PAH RDL(s) due to matrix / co-extractive interference.

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		FJP626	FJP681		FJP682	FJP683	FJP684			
Sampling Date		2017/10/14	2017/10/17		2017/10/17	2017/10/17	2017/10/17			
COC Number		D26106	D26102		D26102	D26102	D26102			
	UNITS	**BG-SOIL-8**	**LPUMP-SOIL-2**	**QC Batch**	**LPUMP-SOIL-3**	**LPUMP-SOIL-1**	**PIPELINE-SOIL-3**	**RDL**	**MDL**	**QC Batch**
Polyaromatic Hydrocarbons										
1-Methylnaphthalene	mg/kg	<0.010	<0.010	5232260	<0.010	<0.010	<0.010	0.010	N/A	5232260
2-Methylnaphthalene	mg/kg	<0.010	<0.010	5232260	<0.010	<0.010	<0.010	0.010	N/A	5232260
Acenaphthene	mg/kg	<0.010	<0.010	5232260	<0.010	<0.010	<0.010	0.010	N/A	5232260
Acenaphthylene	mg/kg	<0.010	<0.010	5232260	<0.010	<0.010	<0.010	0.010	N/A	5232260
Anthracene	mg/kg	<0.010	<0.010	5232260	0.020	<0.010	<0.010	0.010	N/A	5232260
Benzo(a)anthracene	mg/kg	<0.010	<0.010	5232260	0.089	<0.010	<0.010	0.010	N/A	5232260
Benzo(a)pyrene	mg/kg	<0.010	<0.010	5232260	0.10	<0.010	<0.010	0.010	N/A	5232260
Benzo(b)fluoranthene	mg/kg	<0.010	<0.010	5232260	0.089	<0.010	<0.010	0.010	N/A	5232260
Benzo(b/j)fluoranthene	mg/kg	<0.020	<0.020	5225630	0.15	<0.020	<0.020	0.020	N/A	5225631
Benzo(g,h,i)perylene	mg/kg	<0.010	<0.010	5232260	0.057	<0.010	<0.010	0.010	N/A	5232260
Benzo(j)fluoranthene	mg/kg	<0.010	<0.010	5232260	0.057	<0.010	<0.010	0.010	N/A	5232260
Benzo(k)fluoranthene	mg/kg	<0.010	<0.010	5232260	0.057	<0.010	<0.010	0.010	N/A	5232260
Chrysene	mg/kg	<0.010	<0.010	5232260	0.10	<0.010	<0.010	0.010	N/A	5232260
Dibenz(a,h)anthracene	mg/kg	<0.010	<0.010	5232260	<0.010	<0.010	<0.010	0.010	N/A	5232260
Fluoranthene	mg/kg	<0.010	0.013	5232260	0.25	<0.010	<0.010	0.010	N/A	5232260
Fluorene	mg/kg	<0.010	<0.010	5232260	<0.010	<0.010	<0.010	0.010	N/A	5232260
Indeno(1,2,3-cd)pyrene	mg/kg	<0.010	<0.010	5232260	0.060	<0.010	<0.010	0.010	N/A	5232260
Naphthalene	mg/kg	<0.010	<0.010	5232260	<0.010	<0.010	<0.010	0.010	N/A	5232260
Perylene	mg/kg	<0.010	<0.010	5232260	0.020	<0.010	<0.010	0.010	N/A	5232260
Phenanthrene	mg/kg	<0.010	<0.010	5232260	0.11	<0.010	<0.010	0.010	N/A	5232260
Pyrene	mg/kg	<0.010	<0.010	5232260	0.20	<0.010	<0.010	0.010	N/A	5232260
Surrogate Recovery (%)										
D10-Anthracene	%	81	80	5232260	79	80	76			5232260
D14-Terphenyl (FS)	%	85	91	5232260	88	89	83			5232260
D8-Acenaphthylene	%	95	94	5232260	94	88	90			5232260

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		FJP685	FJP686		FJP687	FJP688			
Sampling Date		2017/10/17	2017/10/17		2017/10/17	2017/10/17			
COC Number		D26102	D26102		D26102	D26102			
	UNITS	**LPUMP-SOIL-4**	**UPUMP-SOIL-1**	**QC Batch**	**UPUMP-SOIL-2**	**UPUMP-SOIL-3**	**RDL**	**MDL**	**QC Batch**
Polyaromatic Hydrocarbons									
1-Methylnaphthalene	mg/kg	<0.010	<0.010	5232260	<0.010	<0.010	0.010	N/A	5234534
2-Methylnaphthalene	mg/kg	<0.010	<0.010	5232260	<0.010	<0.010	0.010	N/A	5234534
Acenaphthene	mg/kg	<0.010	<0.010	5232260	<0.010	<0.010	0.010	N/A	5234534
Acenaphthylene	mg/kg	<0.010	<0.010	5232260	<0.010	<0.010	0.010	N/A	5234534
Anthracene	mg/kg	<0.010	<0.010	5232260	<0.010	<0.010	0.010	N/A	5234534
Benzo(a)anthracene	mg/kg	<0.010	<0.010	5232260	<0.010	<0.010	0.010	N/A	5234534
Benzo(a)pyrene	mg/kg	<0.010	<0.010	5232260	<0.010	<0.010	0.010	N/A	5234534
Benzo(b)fluoranthene	mg/kg	<0.010	<0.010	5232260	<0.010	<0.010	0.010	N/A	5234534
Benzo(b/j)fluoranthene	mg/kg	<0.020	<0.020	5225631	<0.020	<0.020	0.020	N/A	5225631
Benzo(g,h,i)perylene	mg/kg	<0.010	<0.010	5232260	<0.010	<0.010	0.010	N/A	5234534
Benzo(j)fluoranthene	mg/kg	<0.010	<0.010	5232260	<0.010	<0.010	0.010	N/A	5234534
Benzo(k)fluoranthene	mg/kg	<0.010	<0.010	5232260	<0.010	<0.010	0.010	N/A	5234534
Chrysene	mg/kg	<0.010	<0.010	5232260	<0.010	<0.010	0.010	N/A	5234534
Dibenz(a,h)anthracene	mg/kg	<0.010	<0.010	5232260	<0.010	<0.010	0.010	N/A	5234534
Fluoranthene	mg/kg	<0.010	<0.010	5232260	<0.010	<0.010	0.010	N/A	5234534
Fluorene	mg/kg	<0.010	<0.010	5232260	<0.010	<0.010	0.010	N/A	5234534
Indeno(1,2,3-cd)pyrene	mg/kg	<0.010	<0.010	5232260	<0.010	<0.010	0.010	N/A	5234534
Naphthalene	mg/kg	<0.010	<0.010	5232260	<0.010	<0.010	0.010	N/A	5234534
Perylene	mg/kg	<0.010	<0.010	5232260	<0.010	<0.010	0.010	N/A	5234534
Phenanthrene	mg/kg	<0.010	<0.010	5232260	<0.010	<0.010	0.010	N/A	5234534
Pyrene	mg/kg	<0.010	<0.010	5232260	<0.010	<0.010	0.010	N/A	5234534
Surrogate Recovery (%)									
D10-Anthracene	%	88	80	5232260	90	85			5234534
D14-Terphenyl (FS)	%	100	87	5232260	96	95			5234534
D8-Acenaphthylene	%	98	79	5232260	90	87			5234534

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam Job #: B7N4148
Report Date: 2018/03/29

SNC-Lavalin Inc
Client Project #: 649806
Site Location: CAPE MAKKOVIK
Sampler Initials: JG

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		FJP690		FJP691	FJP692	FJP693			
Sampling Date		2017/10/17		2017/10/17	2017/10/18	2017/10/18			
COC Number		D26102		D26102	D26099	D26099			
	UNITS	**PIPELINE-SOIL-5**	**RDL**	**UPUMP-SOIL-5**	**PIPELINE-SOIL-1**	**PIPELINE-SOIL-2**	**RDL**	**MDL**	**QC Batch**
Polyaromatic Hydrocarbons									
1-Methylnaphthalene	mg/kg	<0.010	0.010	<0.010	<0.010	<0.010	0.010	N/A	5234534
2-Methylnaphthalene	mg/kg	<0.010	0.010	<0.010	<0.010	<0.010	0.010	N/A	5234534
Acenaphthene	mg/kg	<0.010	0.010	<0.010	<0.010	<0.010	0.010	N/A	5234534
Acenaphthylene	mg/kg	<0.010	0.010	<0.010	<0.010	<0.010	0.010	N/A	5234534
Anthracene	mg/kg	<0.010	0.010	<0.010	<0.010	<0.010	0.010	N/A	5234534
Benzo(a)anthracene	mg/kg	<0.010	0.010	<0.010	<0.010	<0.010	0.010	N/A	5234534
Benzo(a)pyrene	mg/kg	<0.010	0.010	<0.010	<0.010	<0.010	0.010	N/A	5234534
Benzo(b)fluoranthene	mg/kg	<0.010	0.010	<0.010	<0.010	<0.010	0.010	N/A	5234534
Benzo(b/j)fluoranthene	mg/kg	<0.020	0.020	<0.020	<0.020	<0.020	0.020	N/A	5225631
Benzo(g,h,i)perylene	mg/kg	<0.010	0.010	0.099	<0.010	<0.010	0.010	N/A	5234534
Benzo(j)fluoranthene	mg/kg	<0.010	0.010	<0.010	<0.010	<0.010	0.010	N/A	5234534
Benzo(k)fluoranthene	mg/kg	<0.010	0.010	<0.010	<0.010	<0.010	0.010	N/A	5234534
Chrysene	mg/kg	<0.010	0.010	<0.010	<0.010	<0.010	0.010	N/A	5234534
Dibenz(a,h)anthracene	mg/kg	<0.010	0.010	<0.010	<0.010	<0.010	0.010	N/A	5234534
Fluoranthene	mg/kg	<0.010	0.010	<0.010	<0.010	<0.010	0.010	N/A	5234534
Fluorene	mg/kg	<0.010	0.010	<0.010	<0.010	<0.010	0.010	N/A	5234534
Indeno(1,2,3-cd)pyrene	mg/kg	<0.029 (1)	0.029	<0.010	<0.010	<0.010	0.010	N/A	5234534
Naphthalene	mg/kg	<0.010	0.010	<0.010	<0.010	<0.010	0.010	N/A	5234534
Perylene	mg/kg	<0.010	0.010	<0.010	<0.010	<0.010	0.010	N/A	5234534
Phenanthrene	mg/kg	<0.010	0.010	<0.010	<0.010	<0.010	0.010	N/A	5234534
Pyrene	mg/kg	<0.010	0.010	<0.010	<0.010	<0.010	0.010	N/A	5234534
Surrogate Recovery (%)									
D10-Anthracene	%	106		98	104	102			5234534
D14-Terphenyl (FS)	%	114		103	104	108			5234534
D8-Acenaphthylene	%	99		95	97	97			5234534

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable
(1) Elevated PAH RDL(s) due to matrix / co-extractive interference.

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		FJP694				FJP694			
Sampling Date		2017/10/18				2017/10/18			
COC Number		D26099				D26099			
	UNITS	**PIPELINE-SOIL-4**	**RDL**	**MDL**	**QC Batch**	**PIPELINE-SOIL-4 Lab-Dup**	**RDL**	**MDL**	**QC Batch**
Polyaromatic Hydrocarbons									
1-Methylnaphthalene	mg/kg	<0.010	0.010	N/A	5234534	<0.010	0.010	N/A	5234534
2-Methylnaphthalene	mg/kg	<0.010	0.010	N/A	5234534	<0.010	0.010	N/A	5234534
Acenaphthene	mg/kg	<0.010	0.010	N/A	5234534	<0.010	0.010	N/A	5234534
Acenaphthylene	mg/kg	<0.010	0.010	N/A	5234534	<0.010	0.010	N/A	5234534
Anthracene	mg/kg	<0.010	0.010	N/A	5234534	<0.010	0.010	N/A	5234534
Benzo(a)anthracene	mg/kg	<0.010	0.010	N/A	5234534	<0.010	0.010	N/A	5234534
Benzo(a)pyrene	mg/kg	<0.010	0.010	N/A	5234534	<0.010	0.010	N/A	5234534
Benzo(b)fluoranthene	mg/kg	<0.010	0.010	N/A	5234534	<0.010	0.010	N/A	5234534
Benzo(b/j)fluoranthene	mg/kg	<0.020	0.020	N/A	5225631				
Benzo(g,h,i)perylene	mg/kg	<0.010	0.010	N/A	5234534	<0.010	0.010	N/A	5234534
Benzo(j)fluoranthene	mg/kg	<0.010	0.010	N/A	5234534	<0.010	0.010	N/A	5234534
Benzo(k)fluoranthene	mg/kg	<0.010	0.010	N/A	5234534	<0.010	0.010	N/A	5234534
Chrysene	mg/kg	<0.010	0.010	N/A	5234534	<0.010	0.010	N/A	5234534
Dibenz(a,h)anthracene	mg/kg	<0.010	0.010	N/A	5234534	<0.010	0.010	N/A	5234534
Fluoranthene	mg/kg	<0.010	0.010	N/A	5234534	<0.010	0.010	N/A	5234534
Fluorene	mg/kg	<0.010	0.010	N/A	5234534	<0.010	0.010	N/A	5234534
Indeno(1,2,3-cd)pyrene	mg/kg	<0.010	0.010	N/A	5234534	<0.010	0.010	N/A	5234534
Naphthalene	mg/kg	<0.010	0.010	N/A	5234534	<0.010	0.010	N/A	5234534
Perylene	mg/kg	<0.010	0.010	N/A	5234534	<0.010	0.010	N/A	5234534
Phenanthrene	mg/kg	<0.010	0.010	N/A	5234534	<0.010	0.010	N/A	5234534
Pyrene	mg/kg	<0.010	0.010	N/A	5234534	<0.010	0.010	N/A	5234534
Surrogate Recovery (%)									
D10-Anthracene	%	102			5234534	99			5234534
D14-Terphenyl (FS)	%	102			5234534	102			5234534
D8-Acenaphthylene	%	100			5234534	101			5234534

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		FJP705	FJP713	FJP714		FJP715		FJP716			
Sampling Date		2017/10/13	2017/10/15	2017/10/15		2017/10/15		2017/10/15			
COC Number		D26098	D26104	D26104		D26104		D26104			
	UNITS	**SHACK-SOIL-4**	**LAST-SOIL-1**	**LAST-SOIL-2**	**RDL**	**LAST-SOIL-3**	**RDL**	**LAST-SOIL-4**	**RDL**	**MDL**	**QC Batch**
Polyaromatic Hydrocarbons											
1-Methylnaphthalene	mg/kg	<0.010	<0.010	<0.010	0.010	<0.010	0.010	<0.010	0.010	N/A	5234534
2-Methylnaphthalene	mg/kg	<0.010	<0.010	<0.010	0.010	<0.010	0.010	<0.010	0.010	N/A	5234534
Acenaphthene	mg/kg	<0.010	<0.010	<0.010	0.010	<0.010	0.010	<0.010	0.010	N/A	5234534
Acenaphthylene	mg/kg	<0.010	<0.010	<0.010	0.010	<0.010	0.010	<0.010	0.010	N/A	5234534
Anthracene	mg/kg	<0.010	<0.010	<0.010	0.010	<0.010	0.010	<0.010	0.010	N/A	5234534
Benzo(a)anthracene	mg/kg	<0.010	<0.010	<0.010	0.010	<0.010	0.010	<0.010	0.010	N/A	5234534
Benzo(a)pyrene	mg/kg	0.024	<0.010	<0.010	0.010	<0.010	0.010	<0.010	0.010	N/A	5234534
Benzo(b)fluoranthene	mg/kg	0.026	<0.010	<0.010	0.010	<0.010	0.010	<0.010	0.010	N/A	5234534
Benzo(b/j)fluoranthene	mg/kg	0.039	<0.020	<0.020	0.020	<0.088	0.088	<0.020	0.020	N/A	5225631
Benzo(g,h,i)perylene	mg/kg	0.022	0.013	<0.010	0.010	0.017	0.010	<0.010	0.010	N/A	5234534
Benzo(j)fluoranthene	mg/kg	0.013	<0.010	<0.010	0.010	<0.078 (1)	0.078	<0.010	0.010	N/A	5234534
Benzo(k)fluoranthene	mg/kg	<0.010	<0.010	<0.010	0.010	<0.010	0.010	<0.010	0.010	N/A	5234534
Chrysene	mg/kg	0.014	<0.010	<0.010	0.010	<0.010	0.010	<0.010	0.010	N/A	5234534
Dibenz(a,h)anthracene	mg/kg	<0.010	<0.010	<0.010	0.010	<0.010	0.010	<0.010	0.010	N/A	5234534
Fluoranthene	mg/kg	<0.010	<0.010	<0.010	0.010	<0.010	0.010	<0.010	0.010	N/A	5234534
Fluorene	mg/kg	<0.010	<0.010	<0.010	0.010	<0.010	0.010	<0.010	0.010	N/A	5234534
Indeno(1,2,3-cd)pyrene	mg/kg	0.018	<0.010	<0.010	0.010	<0.010	0.010	<0.010	0.010	N/A	5234534
Naphthalene	mg/kg	<0.010	<0.010	<0.010	0.010	<0.010	0.010	<0.010	0.010	N/A	5234534
Perylene	mg/kg	<0.010	<0.010	<0.010	0.010	<0.010	0.010	<0.010	0.010	N/A	5234534
Phenanthrene	mg/kg	<0.010	<0.010	<0.010	0.010	<0.010	0.010	<0.010	0.010	N/A	5234534
Pyrene	mg/kg	0.017	<0.010	<0.010	0.010	<0.010	0.010	<0.010	0.010	N/A	5234534
Surrogate Recovery (%)											
D10-Anthracene	%	88	91	98		96		89			5234534
D14-Terphenyl (FS)	%	97	103	112		114		103			5234534
D8-Acenaphthylene	%	96	93	105		95		93			5234534

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable
(1) Elevated PAH RDL(s) due to matrix / co-extractive interference.

SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		FJP717		FJP718		FJP719			
Sampling Date		2017/10/15		2017/10/15		2017/10/15			
COC Number		D26104		D26104		D26104			
	UNITS	**DRUM-SOIL-1**	**RDL**	**DRUM-SOIL-2**	**RDL**	**DRUM-SOIL-3**	**RDL**	**MDL**	**QC Batch**
Polyaromatic Hydrocarbons									
1-Methylnaphthalene	mg/kg	<0.010	0.010	<0.010	0.010	<0.010	0.010	N/A	5234534
2-Methylnaphthalene	mg/kg	<0.010	0.010	<0.010	0.010	<0.010	0.010	N/A	5234534
Acenaphthene	mg/kg	<0.010	0.010	<0.010	0.010	<0.010	0.010	N/A	5234534
Acenaphthylene	mg/kg	<0.010	0.010	<0.010	0.010	<0.010	0.010	N/A	5234534
Anthracene	mg/kg	<0.010	0.010	<0.010	0.010	<0.010	0.010	N/A	5234534
Benzo(a)anthracene	mg/kg	<0.010	0.010	<0.010	0.010	<0.010	0.010	N/A	5234534
Benzo(a)pyrene	mg/kg	<0.010	0.010	<0.010	0.010	<0.010	0.010	N/A	5234534
Benzo(b)fluoranthene	mg/kg	<0.010	0.010	<0.010	0.010	<0.010	0.010	N/A	5234534
Benzo(b/j)fluoranthene	mg/kg	<0.020	0.020	<0.020	0.020	<0.020	0.020	N/A	5225631
Benzo(g,h,i)perylene	mg/kg	0.068	0.010	0.082	0.010	0.073	0.010	N/A	5234534
Benzo(j)fluoranthene	mg/kg	<0.010	0.010	<0.010	0.010	<0.010	0.010	N/A	5234534
Benzo(k)fluoranthene	mg/kg	<0.010	0.010	<0.010	0.010	<0.010	0.010	N/A	5234534
Chrysene	mg/kg	<0.010	0.010	<0.010	0.010	<0.010	0.010	N/A	5234534
Dibenz(a,h)anthracene	mg/kg	<0.010	0.010	<0.010	0.010	<0.030 (1)	0.030	N/A	5234534
Fluoranthene	mg/kg	<0.010	0.010	<0.010	0.010	<0.010	0.010	N/A	5234534
Fluorene	mg/kg	<0.010	0.010	<0.010	0.010	<0.010	0.010	N/A	5234534
Indeno(1,2,3-cd)pyrene	mg/kg	<0.010	0.010	<0.052 (1)	0.052	<0.25 (1)	0.25	N/A	5234534
Naphthalene	mg/kg	<0.010	0.010	<0.010	0.010	<0.010	0.010	N/A	5234534
Perylene	mg/kg	<0.010	0.010	<0.010	0.010	<0.010	0.010	N/A	5234534
Phenanthrene	mg/kg	<0.010	0.010	<0.010	0.010	<0.010	0.010	N/A	5234534
Pyrene	mg/kg	<0.010	0.010	<0.010	0.010	<0.010	0.010	N/A	5234534
Surrogate Recovery (%)									
D10-Anthracene	%	89		81		80			5234534
D14-Terphenyl (FS)	%	106		105		97			5234534
D8-Acenaphthylene	%	89		85		87			5234534

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable
(1) Elevated PAH RDL(s) due to matrix / co-extractive interference.

POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		FJP535		FJP536		FJP537		FJP560			
Sampling Date		2017/10/14		2017/10/14		2017/10/14		2017/10/14			
COC Number		D26100		D26100		D26100		D26101			
	UNITS	**1987-SOIL-1**	**RDL**	**1987-SOIL-2**	**RDL**	**1987-SOIL-3**	**QC Batch**	**1987-SOIL-4**	**RDL**	**MDL**	**QC Batch**
PCBs											
Aroclor 1016	ug/g	<0.050	0.050	<0.050	0.050	<0.050	5228079	<0.050	0.050	N/A	5232173
Aroclor 1221	ug/g	<0.050	0.050	<0.050	0.050	<0.050	5228079	<0.050	0.050	N/A	5232173
Aroclor 1232	ug/g	<0.050	0.050	<0.050	0.050	<0.050	5228079	<0.050	0.050	N/A	5232173
Aroclor 1248	ug/g	<0.050	0.050	<0.050	0.050	<0.050	5228079	<0.050	0.050	N/A	5232173
Aroclor 1242	ug/g	<0.050	0.050	<0.050	0.050	<0.050	5228079	<0.050	0.050	N/A	5232173
Aroclor 1254	ug/g	<0.050	0.050	<0.050	0.050	<0.050	5228079	<0.050	0.050	N/A	5232173
Aroclor 1260	ug/g	<0.050	0.050	<0.050	0.050	<0.050	5228079	<0.050	0.050	N/A	5232173
Calculated Total PCB	ug/g	<0.050	0.050	<0.015	0.015	<0.050	5225466	<0.050	0.050	N/A	5225466
Surrogate Recovery (%)											
Decachlorobiphenyl	%	88		90		89	5228079	92			5232173

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam ID		FJP561	FJP562	FJP563	FJP564	FJP565			
Sampling Date		2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14			
COC Number		D26101	D26101	D26101	D26101	D26101			
	UNITS	**1987-SOIL-5**	**1987-SOIL-6**	**1987-SOIL-7**	**1987-SOIL-8**	**1987-SOIL-9**	**RDL**	**MDL**	**QC Batch**
PCBs									
Aroclor 1016	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	N/A	5232173
Aroclor 1221	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	N/A	5232173
Aroclor 1232	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	N/A	5232173
Aroclor 1248	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	N/A	5232173
Aroclor 1242	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	N/A	5232173
Aroclor 1254	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	N/A	5232173
Aroclor 1260	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	N/A	5232173
Calculated Total PCB	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	N/A	5225466
Surrogate Recovery (%)									
Decachlorobiphenyl	%	102	107	104	103	103			5232173

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam Job #: B7N4148
Report Date: 2018/03/29

SNC-Lavalin Inc
Client Project #: 649806
Site Location: CAPE MAKKOVIK
Sampler Initials: JG

POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		FJP566			FJP567		FJP568			
Sampling Date		2017/10/14			2017/10/14		2017/10/14			
COC Number		D26101			D26101		D26101			
	UNITS	**1987-SOIL-10**	**RDL**	**QC Batch**	**1987-SOIL-11**	**RDL**	**1987-SOIL-12**	**RDL**	**MDL**	**QC Batch**
PCBs										
Aroclor 1016	ug/g	<0.050	0.050	5234764	<0.050	0.050	<0.050	0.050	N/A	5228079
Aroclor 1221	ug/g	<0.050	0.050	5234764	<0.050	0.050	<0.050	0.050	N/A	5228079
Aroclor 1232	ug/g	<0.050	0.050	5234764	<0.050	0.050	<0.050	0.050	N/A	5228079
Aroclor 1248	ug/g	<0.050	0.050	5234764	<0.050	0.050	<0.050	0.050	N/A	5228079
Aroclor 1242	ug/g	<0.050	0.050	5234764	<0.050	0.050	<0.050	0.050	N/A	5228079
Aroclor 1254	ug/g	<0.050	0.050	5234764	<0.050	0.050	<0.050	0.050	N/A	5228079
Aroclor 1260	ug/g	<0.050	0.050	5234764	<0.050	0.050	<0.050	0.050	N/A	5228079
Calculated Total PCB	ug/g	<0.050	0.050	5225466	<0.015	0.015	<0.050	0.050	N/A	5225466
Surrogate Recovery (%)										
Decachlorobiphenyl	%	95		5234764	86		86			5228079

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam ID		FJP574	FJP575				FJP575			
Sampling Date		2017/10/13	2017/10/13				2017/10/13			
COC Number		D26096	D26096				D26096			
	UNITS	**HEL-SOIL-1**	**HEL-SOIL-2**	**RDL**	**MDL**	**QC Batch**	**HEL-SOIL-2 Lab-Dup**	**RDL**	**MDL**	**QC Batch**
PCBs										
Aroclor 1016	ug/g	<0.050	<0.050	0.050	N/A	5232173	<0.050	0.050	N/A	5232173
Aroclor 1221	ug/g	<0.050	<0.050	0.050	N/A	5232173	<0.050	0.050	N/A	5232173
Aroclor 1232	ug/g	<0.050	<0.050	0.050	N/A	5232173	<0.050	0.050	N/A	5232173
Aroclor 1248	ug/g	<0.050	<0.050	0.050	N/A	5232173	<0.050	0.050	N/A	5232173
Aroclor 1242	ug/g	<0.050	<0.050	0.050	N/A	5232173	<0.050	0.050	N/A	5232173
Aroclor 1254	ug/g	<0.050	<0.050	0.050	N/A	5232173	<0.050	0.050	N/A	5232173
Aroclor 1260	ug/g	<0.050	<0.050	0.050	N/A	5232173	<0.050	0.050	N/A	5232173
Calculated Total PCB	ug/g	<0.050	<0.050	0.050	N/A	5225466				
Surrogate Recovery (%)										
Decachlorobiphenyl	%	99	99			5232173	111			5232173

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		FJP576	FJP577	FJP578		FJP580			
Sampling Date		2017/10/13	2017/10/13	2017/10/13		2017/10/18			
COC Number		D26096	D26096	D26096		D26097			
	UNITS	**HEL-SOIL-3**	**HANGER-SOIL-1**	**HANGER-SOIL-2**	**RDL**	**HANGER-SOIL-3**	**RDL**	**MDL**	**QC Batch**
PCBs									
Aroclor 1016	ug/g	<0.050	<0.050	<0.050	0.050	<13	13	N/A	5232173
Aroclor 1221	ug/g	<0.050	<0.050	<0.050	0.050	<13	13	N/A	5232173
Aroclor 1232	ug/g	<0.050	<0.050	<0.050	0.050	<13	13	N/A	5232173
Aroclor 1248	ug/g	<0.050	<0.050	<0.050	0.050	<13	13	N/A	5232173
Aroclor 1242	ug/g	<0.050	<0.050	<0.050	0.050	<13	13	N/A	5232173
Aroclor 1254	ug/g	<0.050	<0.050	<0.050	0.050	<13	13	N/A	5232173
Aroclor 1260	ug/g	<0.050	0.088	<0.050	0.050	<13	13	N/A	5232173
Calculated Total PCB	ug/g	<0.050	0.088	<0.050	0.050	<13	13	N/A	5225466
Surrogate Recovery (%)									
Decachlorobiphenyl	%	103	103	101		93 (1)			5232173

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable
(1) PCB:Unidentified (possibly halogenated) compounds detected. Elevated PCB RDL due to matrix / co-extractive interference.

Maxxam ID		FJP581			FJP582		FJP583	FJP584			
Sampling Date		2017/10/18			2017/10/18		2017/10/18	2017/10/18			
COC Number		D26097			D26097		D26097	D26097			
	UNITS	**HANGER-SOIL-4**	**RDL**	**QC Batch**	**SEPTIC-SOIL-1**	**QC Batch**	**SEPTIC-SOIL-2**	**SEPTIC-SOIL-3**	**RDL**	**MDL**	**QC Batch**
PCBs											
Aroclor 1016	ug/g	<0.050	0.050	5232173	<0.050	5237942	<0.050	<0.050	0.050	N/A	5232173
Aroclor 1221	ug/g	<0.050	0.050	5232173	<0.050	5237942	<0.050	<0.050	0.050	N/A	5232173
Aroclor 1232	ug/g	<0.050	0.050	5232173	<0.050	5237942	<0.050	<0.050	0.050	N/A	5232173
Aroclor 1248	ug/g	<0.050	0.050	5232173	<0.050	5237942	<0.050	<0.050	0.050	N/A	5232173
Aroclor 1242	ug/g	<0.050	0.050	5232173	<0.050	5237942	<0.050	<0.050	0.050	N/A	5232173
Aroclor 1254	ug/g	<0.050	0.050	5232173	<0.050	5237942	<0.050	0.32	0.050	N/A	5232173
Aroclor 1260	ug/g	<0.050	0.050	5232173	<0.050	5237942	<0.050	<0.050	0.050	N/A	5232173
Calculated Total PCB	ug/g	<15	15	5225466	<0.050	5225466	<0.050	0.32	0.050	N/A	5225466
Surrogate Recovery (%)											
Decachlorobiphenyl	%	95		5232173	87	5237942	92	88			5232173

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		FJP585		FJP706	FJP707		FJP708			
Sampling Date		2017/10/18		2017/10/13	2017/10/13		2017/10/13			
COC Number		D26097		D26098	D26098		D26098			
	UNITS	**HEL-SOIL-4**	**QC Batch**	**RADOME-SOIL-1**	**RADOME-SOIL-2**	**QC Batch**	**RADOME-SOIL-3**	**RDL**	**MDL**	**QC Batch**
PCBs										
Aroclor 1016	ug/g	<0.050	5232173	<0.050	<0.050	5234764	<0.050	0.050	N/A	5234526
Aroclor 1221	ug/g	<0.050	5232173	<0.050	<0.050	5234764	<0.050	0.050	N/A	5234526
Aroclor 1232	ug/g	<0.050	5232173	<0.050	<0.050	5234764	<0.050	0.050	N/A	5234526
Aroclor 1248	ug/g	<0.050	5232173	<0.050	<0.050	5234764	<0.050	0.050	N/A	5234526
Aroclor 1242	ug/g	<0.050	5232173	<0.050	<0.050	5234764	<0.050	0.050	N/A	5234526
Aroclor 1254	ug/g	<0.050	5232173	<0.050	<0.050	5234764	<0.050	0.050	N/A	5234526
Aroclor 1260	ug/g	<0.050	5232173	<0.050	<0.050	5234764	<0.050	0.050	N/A	5234526
Calculated Total PCB	ug/g	<0.050	5225466	<0.050	<0.050	5225637	<0.050	0.050	N/A	5225637
Surrogate Recovery (%)										
Decachlorobiphenyl	%	88	5232173	92 (1)	92	5234764	108			5234526

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable
(1) PCB:Unidentified (possibly halogenated) compounds detected.

Maxxam ID		FJP708				FJP709	FJP710	FJP711			
Sampling Date		2017/10/13				2017/10/13	2017/10/13	2017/10/13			
COC Number		D26098				D26098	D26098	D26098			
	UNITS	**RADOME-SOIL-3 Lab-Dup**	**RDL**	**MDL**	**QC Batch**	**TOWER-SOIL-1**	**TOWER-SOIL-2**	**TOWER-SOIL-3**	**RDL**	**MDL**	**QC Batch**
PCBs											
Aroclor 1016	ug/g	<0.050	0.050	N/A	5234526	<0.050	<0.050	<0.050	0.050	N/A	5234764
Aroclor 1221	ug/g	<0.050	0.050	N/A	5234526	<0.050	<0.050	<0.050	0.050	N/A	5234764
Aroclor 1232	ug/g	<0.050	0.050	N/A	5234526	<0.050	<0.050	<0.050	0.050	N/A	5234764
Aroclor 1248	ug/g	<0.050	0.050	N/A	5234526	<0.050	<0.050	<0.050	0.050	N/A	5234764
Aroclor 1242	ug/g	<0.050	0.050	N/A	5234526	<0.050	<0.050	<0.050	0.050	N/A	5234764
Aroclor 1254	ug/g	<0.050	0.050	N/A	5234526	<0.050	<0.050	<0.050	0.050	N/A	5234764
Aroclor 1260	ug/g	<0.050	0.050	N/A	5234526	<0.050	<0.050	<0.050	0.050	N/A	5234764
Calculated Total PCB	ug/g					<0.050	<0.050	<0.050	0.050	N/A	5225637
Surrogate Recovery (%)											
Decachlorobiphenyl	%	109			5234526	95	95 (1)	97			5234764

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable
(1) PCB:Unidentified (possibly halogenated) compounds detected.

POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		FJP712			
Sampling Date		2017/10/13			
COC Number		D26098			
	UNITS	**TOWER-SOIL-4**	**RDL**	**MDL**	**QC Batch**
PCBs					
Aroclor 1016	ug/g	<0.050	0.050	N/A	5234764
Aroclor 1221	ug/g	<0.050	0.050	N/A	5234764
Aroclor 1232	ug/g	<0.050	0.050	N/A	5234764
Aroclor 1248	ug/g	<0.050	0.050	N/A	5234764
Aroclor 1242	ug/g	<0.050	0.050	N/A	5234764
Aroclor 1254	ug/g	<0.050	0.050	N/A	5234764
Aroclor 1260	ug/g	<0.050	0.050	N/A	5234764
Calculated Total PCB	ug/g	<0.050	0.050	N/A	5225637
Surrogate Recovery (%)					
Decachlorobiphenyl	%	94			5234764

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

ORGANOPHOSPHORUS PESTICIDES BY GC-MS (SOIL)

Maxxam ID		FJP536	FJP567	FJP581	FJP581	FJP586			
Sampling Date		2017/10/14	2017/10/14	2017/10/18	2017/10/18	2017/10/18			
COC Number		D26100	D26101	D26097	D26097	D26097			
	UNITS	**1987-SOIL-2**	**1987-SOIL-11**	**HANGER-SOIL-4**	**HANGER-SOIL-4 Lab-Dup**	**SHACK-SOIL-1**	**RDL**	**MDL**	**QC Batch**
Pesticides & Herbicides									
Bendiocarb	ug/g	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	N/A	5234901
Demeton-S	ug/g	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	N/A	5234901
Dichlorvos	ug/g	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	N/A	5234901
Dimethoate	ug/g	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	N/A	5234901
Fenchlorphos (Ronnel)	ug/g	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	N/A	5234901
Fonofos	ug/g	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	N/A	5234901
Metolachlor	ug/g	<10	<10	<10	<10	<10	10	N/A	5234901
Mevinphos	ug/g	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	N/A	5234901
Phosmet	ug/g	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	N/A	5234901
Triallate	ug/g	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	N/A	5234901
Trifluralin	ug/g	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	N/A	5234901
Fenthion	ug/g	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	N/A	5234901
Ethion	ug/g	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	N/A	5234901
Guthion (Azinphos-methyl)	ug/g	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	N/A	5234901
Phorate	ug/g	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	N/A	5234901
Terbufos	ug/g	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	N/A	5234901
Aldicarb	ug/g	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	N/A	5234901
Atrazine	ug/g	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	N/A	5234901
Carbaryl	ug/g	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	N/A	5234901
Carbofuran	ug/g	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	N/A	5234901
Cyanazine (Bladex)	ug/g	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	N/A	5234901
Diazinon	ug/g	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	N/A	5234901
Parathion Ethyl	ug/g	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	N/A	5234901
Parathion Methyl	ug/g	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	N/A	5234901
Prometryne	ug/g	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	N/A	5234901
Malathion	ug/g	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	N/A	5234901
Simazine	ug/g	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	N/A	5234901
Chlorpyrifos (Dursban)	ug/g	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	N/A	5234901
Surrogate Recovery (%)									
2-Fluorobiphenyl	%	85	69	90	88	84			5234901
D14-Terphenyl (FS)	%	83	87	89	89	88			5234901
D5-Nitrobenzene	%	83	86	82	78	83			5234901

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

ORGANOCHLORINATED PESTICIDES BY GC-ECD (SOIL)

Maxxam ID		FJP536	FJP567			FJP581			
Sampling Date		2017/10/14	2017/10/14			2017/10/18			
COC Number		D26100	D26101			D26097			
	UNITS	**1987-SOIL-2**	**1987-SOIL-11**	**RDL**	**MDL**	**HANGER-SOIL-4**	**RDL**	**MDL**	**QC Batch**
Calculated Parameters									
Aldrin + Dieldrin	ug/g	<0.0020	<0.0020	0.0020	N/A	<0.20	0.20	N/A	5225632
Chlordane (Total)	ug/g	<0.0020	<0.0020	0.0020	N/A	26	1.0	N/A	5225632
DDT+ Metabolites	ug/g	0.0058	<0.0020	0.0020	N/A	570	100	N/A	5225632
Heptachlor + Heptachlor epoxide	ug/g	<0.0020	<0.0020	0.0020	N/A	6.9	0.20	N/A	5225632
o,p-DDD + p,p-DDD	ug/g	<0.0020	<0.0020	0.0020	N/A	76	10	N/A	5225632
o,p-DDE + p,p-DDE	ug/g	<0.0020	<0.0020	0.0020	N/A	<5.5	5.5	N/A	5225632
o,p-DDT + p,p-DDT	ug/g	0.0058	<0.0020	0.0020	N/A	490	100	N/A	5225632
Total Endosulfan	ug/g	<0.0020	<0.0020	0.0020	N/A	<0.20	0.20	N/A	5225632
Total PCB	ug/g	<0.015	<0.015	0.015	N/A	<15	15	N/A	5225632
Pesticides & Herbicides									
Aldrin	ug/g	<0.0020	<0.0020	0.0020	0.00040	<0.20	0.20	0.040	5232820
a-Chlordane	ug/g	<0.0020	<0.0020	0.0020	0.00040	13	1.0	0.20	5232820
g-Chlordane	ug/g	<0.0020	<0.0020	0.0020	0.00040	14	1.0	0.20	5232820
o,p-DDD	ug/g	<0.0020	<0.0020	0.0020	0.00040	10	1.0	0.20	5232820
p,p-DDD	ug/g	<0.0020	<0.0020	0.0020	0.00040	66	10	2.0	5232820
o,p-DDE	ug/g	<0.0020	<0.0020	0.0020	0.00040	<5.5	5.5	1.1	5232820
p,p-DDE	ug/g	<0.0020	<0.0020	0.0020	0.00040	2.8	1.0	0.20	5232820
o,p-DDT	ug/g	<0.0020	<0.0020	0.0020	0.00040	84	10	2.0	5232820
p,p-DDT	ug/g	0.0058	<0.0020	0.0020	0.00040	400	100	20	5232820
Dieldrin	ug/g	<0.0020	<0.0020	0.0020	0.00040	<0.20	0.20	0.040	5232820
Lindane	ug/g	<0.0020	<0.0020	0.0020	0.00040	<0.20	0.20	0.040	5232820
Endosulfan I (alpha)	ug/g	<0.0020	<0.0020	0.0020	0.00040	<0.20	0.20	0.040	5232820
Endosulfan II (beta)	ug/g	<0.0020	<0.0020	0.0020	0.00040	<0.20	0.20	0.040	5232820
Endrin	ug/g	<0.0020	<0.0020	0.0020	0.00040	<0.20	0.20	0.040	5232820
Heptachlor	ug/g	<0.0020	<0.0020	0.0020	0.00040	6.9	0.20	0.040	5232820
Heptachlor epoxide	ug/g	<0.0020	<0.0020	0.0020	0.00040	<0.20	0.20	0.040	5232820
Hexachlorobenzene	ug/g	<0.0020	<0.0020	0.0020	0.00040	<0.20	0.20	0.040	5232820
Methoxychlor	ug/g	<0.0050	<0.0050	0.0050	0.0016	<0.50	0.50	0.16	5232820
Aroclor 1016	ug/g	<0.015	<0.015	0.015	0.0030	<15	15	3.0	5232820
Aroclor 1221	ug/g	<0.015	<0.015	0.015	0.0030	<15	15	3.0	5232820
Aroclor 1232	ug/g	<0.015	<0.015	0.015	0.0030	<15	15	3.0	5232820
Aroclor 1242	ug/g	<0.015	<0.015	0.015	0.0030	<15	15	3.0	5232820
Aroclor 1248	ug/g	<0.015	<0.015	0.015	0.0030	<15	15	3.0	5232820

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

ORGANOCHLORINATED PESTICIDES BY GC-ECD (SOIL)

Maxxam ID		FJP536	FJP567			FJP581			
Sampling Date		2017/10/14	2017/10/14			2017/10/18			
COC Number		D26100	D26101			D26097			
	UNITS	**1987-SOIL-2**	**1987-SOIL-11**	**RDL**	**MDL**	**HANGER-SOIL-4**	**RDL**	**MDL**	**QC Batch**
Aroclor 1254	ug/g	<0.015	<0.015	0.015	0.0030	<15	15	3.0	5232820
Aroclor 1260	ug/g	<0.015	<0.015	0.015	0.0030	<15	15	3.0	5232820
Aroclor 1262	ug/g	<0.015	<0.015	0.015	0.0030	<15	15	3.0	5232820
Aroclor 1268	ug/g	<0.015	<0.015	0.015	0.0030	<15	15	3.0	5232820
alpha-BHC	ug/g	<0.0020	<0.0020	0.0020	0.00040	<0.20	0.20	0.040	5232820
beta-BHC	ug/g	<0.0020	<0.0020	0.0020	0.00040	<0.20	0.20	0.040	5232820
delta-BHC	ug/g	<0.0020	<0.0020	0.0020	0.00040	<0.20	0.20	0.040	5232820
Endosulfan sulfate	ug/g	<0.0020	<0.0020	0.0020	0.00040	<0.20	0.20	0.040	5232820
Endrin aldehyde	ug/g	<0.0020	<0.0020	0.0020	0.00040	<0.20	0.20	0.040	5232820
Endrin ketone	ug/g	<0.0020	<0.0020	0.0020	0.00040	<0.20	0.20	0.040	5232820
Mirex	ug/g	<0.0020	<0.0020	0.0020	0.00040	<0.20	0.20	0.040	5232820
Octachlorostyrene	ug/g	<0.0020	<0.0020	0.0020	0.00040	<0.20	0.20	0.040	5232820
Toxaphene	ug/g	<0.080	<0.080	0.080	0.020	<71	71	18	5232820
Surrogate Recovery (%)									
2,4,5,6-Tetrachloro-m-xylene	%	84	91			84			5232820
Decachlorobiphenyl	%	118	117			118			5232820

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B7N4148
Report Date: 2018/03/29

SNC-Lavalin Inc
Client Project #: 649806
Site Location: CAPE MAKKOVIK
Sampler Initials: JG

ORGANOCHLORINATED PESTICIDES BY GC-ECD (SOIL)

Maxxam ID		FJP586			
Sampling Date		2017/10/18			
COC Number		D26097			
	UNITS	**SHACK-SOIL-1**	**RDL**	**MDL**	**QC Batch**
Calculated Parameters					
Aldrin + Dieldrin	ug/g	<0.0020	0.0020	N/A	5225632
Chlordane (Total)	ug/g	<0.0020	0.0020	N/A	5225632
DDT+ Metabolites	ug/g	0.027	0.0020	N/A	5225632
Heptachlor + Heptachlor epoxide	ug/g	<0.0020	0.0020	N/A	5225632
o,p-DDD + p,p-DDD	ug/g	0.0027	0.0020	N/A	5225632
o,p-DDE + p,p-DDE	ug/g	0.0028	0.0020	N/A	5225632
o,p-DDT + p,p-DDT	ug/g	0.021	0.0020	N/A	5225632
Total Endosulfan	ug/g	<0.0020	0.0020	N/A	5225632
Total PCB	ug/g	<0.015	0.015	N/A	5225632
Pesticides & Herbicides					
Aldrin	ug/g	<0.0020	0.0020	0.00040	5235180
a-Chlordane	ug/g	<0.0020	0.0020	0.00040	5235180
g-Chlordane	ug/g	<0.0020	0.0020	0.00040	5235180
o,p-DDD	ug/g	<0.0020	0.0020	0.00040	5235180
p,p-DDD	ug/g	0.0027	0.0020	0.00040	5235180
o,p-DDE	ug/g	<0.0020	0.0020	0.00040	5235180
p,p-DDE	ug/g	0.0028	0.0020	0.00040	5235180
o,p-DDT	ug/g	0.0041	0.0020	0.00040	5235180
p,p-DDT	ug/g	0.017	0.0020	0.00040	5235180
Dieldrin	ug/g	<0.0020	0.0020	0.00040	5235180
Lindane	ug/g	<0.0020	0.0020	0.00040	5235180
Endosulfan I (alpha)	ug/g	<0.0020	0.0020	0.00040	5235180
Endosulfan II (beta)	ug/g	<0.0020	0.0020	0.00040	5235180
Endrin	ug/g	<0.0020	0.0020	0.00040	5235180
Heptachlor	ug/g	<0.0020	0.0020	0.00040	5235180
Heptachlor epoxide	ug/g	<0.0020	0.0020	0.00040	5235180
Hexachlorobenzene	ug/g	<0.0020	0.0020	0.00040	5235180
Methoxychlor	ug/g	<0.0050	0.0050	0.0016	5235180
Aroclor 1016	ug/g	<0.015	0.015	0.0030	5235180
Aroclor 1221	ug/g	<0.015	0.015	0.0030	5235180
Aroclor 1232	ug/g	<0.015	0.015	0.0030	5235180
Aroclor 1242	ug/g	<0.015	0.015	0.0030	5235180
Aroclor 1248	ug/g	<0.015	0.015	0.0030	5235180

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

ORGANOCHLORINATED PESTICIDES BY GC-ECD (SOIL)

Maxxam ID		FJP586			
Sampling Date		2017/10/18			
COC Number		D26097			
	UNITS	**SHACK-SOIL-1**	**RDL**	**MDL**	**QC Batch**
Aroclor 1254	ug/g	<0.015	0.015	0.0030	5235180
Aroclor 1260	ug/g	<0.015	0.015	0.0030	5235180
Aroclor 1262	ug/g	<0.015	0.015	0.0030	5235180
Aroclor 1268	ug/g	<0.015	0.015	0.0030	5235180
alpha-BHC	ug/g	<0.0020	0.0020	0.00040	5235180
beta-BHC	ug/g	<0.0020	0.0020	0.00040	5235180
delta-BHC	ug/g	<0.0020	0.0020	0.00040	5235180
Endosulfan sulfate	ug/g	<0.0020	0.0020	0.00040	5235180
Endrin aldehyde	ug/g	<0.0020	0.0020	0.00040	5235180
Endrin ketone	ug/g	<0.0020	0.0020	0.00040	5235180
Mirex	ug/g	<0.0020	0.0020	0.00040	5235180
Octachlorostyrene	ug/g	<0.0020	0.0020	0.00040	5235180
Toxaphene	ug/g	<0.080	0.080	0.020	5235180
Surrogate Recovery (%)					
2,4,5,6-Tetrachloro-m-xylene	%	77			5235180
Decachlorobiphenyl	%	109			5235180

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B7N4148
Report Date: 2018/03/29

SNC-Lavalin Inc
Client Project #: 649806
Site Location: CAPE MAKKOVIK
Sampler Initials: JG

DIOXINS AND FURANS BY HRMS (SOIL)

Maxxam ID		FJP535							
Sampling Date		2017/10/14							
COC Number		D26100				TOXIC EQUIVALENCY		# of	
	UNITS	1987-SOIL-1	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
Dioxins & Furans									
2,3,7,8-Tetra CDD *	pg/g	<0.101	0.101	0.993	N/A	1.00	0.101		5278896
1,2,3,7,8-Penta CDD *	pg/g	<0.0881	0.0881	0.993	N/A	1.00	0.0881		5278896
1,2,3,4,7,8-Hexa CDD *	pg/g	<0.101	0.101	0.993	N/A	0.100	0.0101		5278896
1,2,3,6,7,8-Hexa CDD *	pg/g	<0.101	0.101	0.993	N/A	0.100	0.0101		5278896
1,2,3,7,8,9-Hexa CDD *	pg/g	<0.0905	0.0905	0.993	N/A	0.100	0.00905		5278896
1,2,3,4,6,7,8-Hepta CDD *	pg/g	1.33	0.0990	0.993	N/A	0.0100	0.0133		5278896
Octa CDD *	pg/g	24.5	0.118	9.93	N/A	0.000300	0.00735		5278896
Total Tetra CDD *	pg/g	<0.101	0.101	0.993	N/A			0	5278896
Total Penta CDD *	pg/g	<0.0881	0.0881	0.993	N/A			0	5278896
Total Hexa CDD *	pg/g	<0.0972	0.0972	0.993	N/A			0	5278896
Total Hepta CDD *	pg/g	2.46	0.0990	0.993	N/A			2	5278896
2,3,7,8-Tetra CDF **	pg/g	0.138	0.106	0.993	N/A	0.100	0.0138		5278896
1,2,3,7,8-Penta CDF **	pg/g	<0.0985	0.0985	0.993	N/A	0.0300	0.00296		5278896
2,3,4,7,8-Penta CDF **	pg/g	<0.0979	0.0979	0.993	N/A	0.300	0.0294		5278896
1,2,3,4,7,8-Hexa CDF **	pg/g	<0.0927	0.0927	0.993	N/A	0.100	0.00927		5278896
1,2,3,6,7,8-Hexa CDF **	pg/g	<0.0902	0.0902	0.993	N/A	0.100	0.00902		5278896
2,3,4,6,7,8-Hexa CDF **	pg/g	<0.101	0.101	0.993	N/A	0.100	0.0101		5278896
1,2,3,7,8,9-Hexa CDF **	pg/g	<0.111	0.111	0.993	N/A	0.100	0.0111		5278896
1,2,3,4,6,7,8-Hepta CDF **	pg/g	0.681	0.0798	0.993	N/A	0.0100	0.00681		5278896
1,2,3,4,7,8,9-Hepta CDF **	pg/g	<0.106	0.106	0.993	N/A	0.0100	0.00106		5278896
Octa CDF **	pg/g	0.405	0.128	9.93	N/A	0.000300	0.000122		5278896
Total Tetra CDF **	pg/g	0.443	0.106	0.993	N/A			2	5278896
Total Penta CDF **	pg/g	<0.0982	0.0982	0.993	N/A			0	5278896
Total Hexa CDF **	pg/g	<0.0981	0.0981	0.993	N/A			0	5278896
Total Hepta CDF **	pg/g	0.985	0.0911	0.993	N/A			2	5278896
TOTAL TOXIC EQUIVALENCY	pg/g						0.333		

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

N/A = Not Applicable

** CDF = Chloro Dibenzo-p-Furan

DIOXINS AND FURANS BY HRMS (SOIL)

Maxxam ID		FJP535							
Sampling Date		2017/10/14							
COC Number		D26100				TOXIC EQUIVALENCY		# of	
	UNITS	1987-SOIL-1	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
Surrogate Recovery (%)									
C13-1234678 HeptaCDD *	%	97							5278896
C13-1234678 HeptaCDF **	%	88							5278896
C13-123678 HexaCDD *	%	87							5278896
C13-123678 HexaCDF **	%	77							5278896
C13-12378 PentaCDD *	%	119							5278896
C13-12378 PentaCDF **	%	80							5278896
C13-2378 TetraCDD *	%	83							5278896
C13-2378 TetraCDF **	%	64							5278896
C13-OCDD *	%	119							5278896

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

** CDF = Chloro Dibenzo-p-Furan

DIOXINS AND FURANS BY HRMS (SOIL)

Maxxam ID		FJP537							
Sampling Date		2017/10/14							
COC Number		D26100				TOXIC EQUIVALENCY		# of	
	UNITS	1987-SOIL-3	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
Dioxins & Furans									
2,3,7,8-Tetra CDD *	pg/g	<0.104	0.104	0.994	N/A	1.00	0.104		5278896
1,2,3,7,8-Penta CDD *	pg/g	<0.100	0.100	0.994	N/A	1.00	0.100		5278896
1,2,3,4,7,8-Hexa CDD *	pg/g	<0.0956	0.0956	0.994	N/A	0.100	0.00956		5278896
1,2,3,6,7,8-Hexa CDD *	pg/g	<0.0961	0.0961	0.994	N/A	0.100	0.00961		5278896
1,2,3,7,8,9-Hexa CDD *	pg/g	<0.0860	0.0860	0.994	N/A	0.100	0.00860		5278896
1,2,3,4,6,7,8-Hepta CDD *	pg/g	0.308	0.109	0.994	N/A	0.0100	0.00308		5278896
Octa CDD *	pg/g	3.80	0.118	9.94	N/A	0.000300	0.00114		5278896
Total Tetra CDD *	pg/g	<0.104	0.104	0.994	N/A			0	5278896
Total Penta CDD *	pg/g	<0.100	0.100	0.994	N/A			0	5278896
Total Hexa CDD *	pg/g	<0.0923	0.0923	0.994	N/A			0	5278896
Total Hepta CDD *	pg/g	0.679	0.109	0.994	N/A			2	5278896
2,3,7,8-Tetra CDF **	pg/g	<0.0985	0.0985	0.994	N/A	0.100	0.00985		5278896
1,2,3,7,8-Penta CDF **	pg/g	<0.0828	0.0828	0.994	N/A	0.0300	0.00248		5278896
2,3,4,7,8-Penta CDF **	pg/g	<0.0823	0.0823	0.994	N/A	0.300	0.0247		5278896
1,2,3,4,7,8-Hexa CDF **	pg/g	<0.0850	0.0850	0.994	N/A	0.100	0.00850		5278896
1,2,3,6,7,8-Hexa CDF **	pg/g	<0.0827	0.0827	0.994	N/A	0.100	0.00827		5278896
2,3,4,6,7,8-Hexa CDF **	pg/g	<0.0928	0.0928	0.994	N/A	0.100	0.00928		5278896
1,2,3,7,8,9-Hexa CDF **	pg/g	<0.102	0.102	0.994	N/A	0.100	0.0102		5278896
1,2,3,4,6,7,8-Hepta CDF **	pg/g	0.156	0.0890	0.994	N/A	0.0100	0.00156		5278896
1,2,3,4,7,8,9-Hepta CDF **	pg/g	<0.118	0.118	0.994	N/A	0.0100	0.00118		5278896
Octa CDF **	pg/g	<0.102	0.102	9.94	N/A	0.000300	0.0000306		5278896
Total Tetra CDF **	pg/g	0.131	0.0985	0.994	N/A			1	5278896
Total Penta CDF **	pg/g	<0.0826	0.0826	0.994	N/A			0	5278896
Total Hexa CDF **	pg/g	<0.0900	0.0900	0.994	N/A			0	5278896
Total Hepta CDF **	pg/g	0.156	0.102	0.994	N/A			1	5278896
TOTAL TOXIC EQUIVALENCY	pg/g						0.312		

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

N/A = Not Applicable

** CDF = Chloro Dibenzo-p-Furan

DIOXINS AND FURANS BY HRMS (SOIL)

Maxxam ID		FJP537							
Sampling Date		2017/10/14							
COC Number		D26100				**TOXIC EQUIVALENCY**		# of	
	UNITS	**1987-SOIL-3**	**EDL**	**RDL**	**MDL**	**TEF (2005 WHO)**	**TEQ(DL)**	**Isomers**	**QC Batch**
Surrogate Recovery (%)									
C13-1234678 HeptaCDD *	%	104							5278896
C13-1234678 HeptaCDF **	%	88							5278896
C13-123678 HexaCDD *	%	86							5278896
C13-123678 HexaCDF **	%	75							5278896
C13-12378 PentaCDD *	%	130							5278896
C13-12378 PentaCDF **	%	85							5278896
C13-2378 TetraCDD *	%	87							5278896
C13-2378 TetraCDF **	%	70							5278896
C13-OCDD *	%	120							5278896

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

** CDF = Chloro Dibenzo-p-Furan

DIOXINS AND FURANS BY HRMS (SOIL)

Maxxam ID		FJP568							
Sampling Date		2017/10/14							
COC Number		D26101				TOXIC EQUIVALENCY		# of	
	UNITS	1987-SOIL-12	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
Dioxins & Furans									
2,3,7,8-Tetra CDD *	pg/g	<0.113	0.113	0.995	N/A	1.00	0.113		5278896
1,2,3,7,8-Penta CDD *	pg/g	<0.315 (1)	0.315	0.995	N/A	1.00	0.315		5278896
1,2,3,4,7,8-Hexa CDD *	pg/g	1.38	0.108	0.995	N/A	0.100	0.138		5278896
1,2,3,6,7,8-Hexa CDD *	pg/g	0.281	0.108	0.995	N/A	0.100	0.0281		5278896
1,2,3,7,8,9-Hexa CDD *	pg/g	0.565	0.0969	0.995	N/A	0.100	0.0565		5278896
1,2,3,4,6,7,8-Hepta CDD *	pg/g	3.28	0.0971	0.995	N/A	0.0100	0.0328		5278896
Octa CDD *	pg/g	101	0.0979	9.95	N/A	0.000300	0.0303		5278896
Total Tetra CDD *	pg/g	<0.141 (1)	0.141	0.995	N/A			0	5278896
Total Penta CDD *	pg/g	3.09	0.108	0.995	N/A			5	5278896
Total Hexa CDD *	pg/g	19.9	0.104	0.995	N/A			7	5278896
Total Hepta CDD *	pg/g	13.0	0.0971	0.995	N/A			2	5278896
2,3,7,8-Tetra CDF **	pg/g	<0.105	0.105	0.995	N/A	0.100	0.0105		5278896
1,2,3,7,8-Penta CDF **	pg/g	<0.0973	0.0973	0.995	N/A	0.0300	0.00292		5278896
2,3,4,7,8-Penta CDF **	pg/g	<0.0967	0.0967	0.995	N/A	0.300	0.0290		5278896
1,2,3,4,7,8-Hexa CDF **	pg/g	<0.103	0.103	0.995	N/A	0.100	0.0103		5278896
1,2,3,6,7,8-Hexa CDF **	pg/g	<0.100	0.100	0.995	N/A	0.100	0.0100		5278896
2,3,4,6,7,8-Hexa CDF **	pg/g	<0.112	0.112	0.995	N/A	0.100	0.0112		5278896
1,2,3,7,8,9-Hexa CDF **	pg/g	<0.123	0.123	0.995	N/A	0.100	0.0123		5278896
1,2,3,4,6,7,8-Hepta CDF **	pg/g	<0.0888	0.0888	0.995	N/A	0.0100	0.000888		5278896
1,2,3,4,7,8,9-Hepta CDF **	pg/g	<0.118	0.118	0.995	N/A	0.0100	0.00118		5278896
Octa CDF **	pg/g	<0.117	0.117	9.95	N/A	0.000300	0.0000351		5278896
Total Tetra CDF **	pg/g	1.05	0.105	0.995	N/A			1	5278896
Total Penta CDF **	pg/g	2.28	0.0970	0.995	N/A			3	5278896
Total Hexa CDF **	pg/g	1.15	0.109	0.995	N/A			2	5278896
Total Hepta CDF **	pg/g	<0.101	0.101	0.995	N/A			0	5278896
TOTAL TOXIC EQUIVALENCY	pg/g						0.802		

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

N/A = Not Applicable

** CDF = Chloro Dibenzo-p-Furan

(1) RT>2 seconds - PCDD/DF analysis-Peak maxima of monitored ions exceeds 2 seconds

DIOXINS AND FURANS BY HRMS (SOIL)

Maxxam ID		FJP568							
Sampling Date		2017/10/14							
COC Number		D26101				TOXIC EQUIVALENCY		# of	
	UNITS	**1987-SOIL-12**	**EDL**	**RDL**	**MDL**	**TEF (2005 WHO)**	**TEQ(DL)**	**Isomers**	**QC Batch**
Surrogate Recovery (%)									
C13-1234678 HeptaCDD *	%	98							5278896
C13-1234678 HeptaCDF **	%	83							5278896
C13-123678 HexaCDD *	%	78							5278896
C13-123678 HexaCDF **	%	68							5278896
C13-12378 PentaCDD *	%	119							5278896
C13-12378 PentaCDF **	%	80							5278896
C13-2378 TetraCDD *	%	77							5278896
C13-2378 TetraCDF **	%	64							5278896
C13-OCDD *	%	110							5278896

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

** CDF = Chloro Dibenzo-p-Furan

DIOXINS AND FURANS BY HRMS (SOIL)

Maxxam ID		FJP619							
Sampling Date		2017/10/14							
COC Number		D26106				TOXIC EQUIVALENCY		# of	
	UNITS	BG-SOIL-1	EDL	RDL	MDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
Dioxins & Furans									
2,3,7,8-Tetra CDD *	pg/g	<0.113	0.113	0.999	N/A	1.00	0.113		5292455
1,2,3,7,8-Penta CDD *	pg/g	1.21	0.114	0.999	N/A	1.00	1.21		5292455
1,2,3,4,7,8-Hexa CDD *	pg/g	1.39	0.109	0.999	N/A	0.100	0.139		5292455
1,2,3,6,7,8-Hexa CDD *	pg/g	2.14	0.106	0.999	N/A	0.100	0.214		5292455
1,2,3,7,8,9-Hexa CDD *	pg/g	3.85	0.0994	0.999	N/A	0.100	0.385		5292455
1,2,3,4,6,7,8-Hepta CDD *	pg/g	34.2	0.119	0.999	N/A	0.0100	0.342		5292455
Octa CDD *	pg/g	733	0.113	9.99	N/A	0.000300	0.220		5292455
Total Tetra CDD *	pg/g	67.4	0.113	0.999	N/A			8	5292455
Total Penta CDD *	pg/g	111	0.114	0.999	N/A			11	5292455
Total Hexa CDD *	pg/g	119	0.105	0.999	N/A			7	5292455
Total Hepta CDD *	pg/g	190	0.119	0.999	N/A			2	5292455
2,3,7,8-Tetra CDF **	pg/g	0.195	0.111	0.999	N/A	0.100	0.0195		5292455
1,2,3,7,8-Penta CDF **	pg/g	<0.111	0.111	0.999	N/A	0.0300	0.00333		5292455
2,3,4,7,8-Penta CDF **	pg/g	<0.113	0.113	0.999	N/A	0.300	0.0339		5292455
1,2,3,4,7,8-Hexa CDF **	pg/g	0.260 (1)	0.108	0.999	N/A	0.100	0.0260		5292455
1,2,3,6,7,8-Hexa CDF **	pg/g	<0.107	0.107	0.999	N/A	0.100	0.0107		5292455
2,3,4,6,7,8-Hexa CDF **	pg/g	<0.115	0.115	0.999	N/A	0.100	0.0115		5292455
1,2,3,7,8,9-Hexa CDF **	pg/g	<0.125	0.125	0.999	N/A	0.100	0.0125		5292455
1,2,3,4,6,7,8-Hepta CDF **	pg/g	0.386	0.105	0.999	N/A	0.0100	0.00386		5292455
1,2,3,4,7,8,9-Hepta CDF **	pg/g	<0.126	0.126	0.999	N/A	0.0100	0.00126		5292455
Octa CDF **	pg/g	<0.458 (2)	0.458	9.99	N/A	0.000300	0.000137		5292455
Total Tetra CDF **	pg/g	53.1	0.111	0.999	N/A			9	5292455
Total Penta CDF **	pg/g	12.3	0.112	0.999	N/A			6	5292455

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

N/A = Not Applicable

** CDF = Chloro Dibenzo-p-Furan

(1) EMPC / Merged Peak

(2) EMPC / DPE - Diphenylether interference present caused dibenzofuran detected to become a "non-detect" with an elevated detection limit.
EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

DIOXINS AND FURANS BY HRMS (SOIL)

Maxxam ID		FJP619							
Sampling Date		2017/10/14							
COC Number		D26106				TOXIC EQUIVALENCY		# of	
	UNITS	**BG-SOIL-1**	**EDL**	**RDL**	**MDL**	**TEF (2005 WHO)**	**TEQ(DL)**	**Isomers**	**QC Batch**
Total Hexa CDF **	pg/g	2.16	0.113	0.999	N/A			4	5292455
Total Hepta CDF **	pg/g	0.528	0.114	0.999	N/A			2	5292455
TOTAL TOXIC EQUIVALENCY	pg/g						2.75		
Surrogate Recovery (%)									
C13-1234678 HeptaCDD *	%	77							5292455
C13-1234678 HeptaCDF **	%	82							5292455
C13-123678 HexaCDD *	%	85							5292455
C13-123678 HexaCDF **	%	84							5292455
C13-12378 PentaCDD *	%	73							5292455
C13-12378 PentaCDF **	%	68							5292455
C13-2378 TetraCDD *	%	95							5292455
C13-2378 TetraCDF **	%	80							5292455
C13-OCDD *	%	88							5292455

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

** CDF = Chloro Dibenzo-p-Furan

N/A = Not Applicable

* CDD = Chloro Dibenzo-p-Dioxin

DIOXINS AND FURANS BY HRMS (SOIL)

Maxxam ID		FJP621							
Sampling Date		2017/10/14							
COC Number		D26106				TOXIC EQUIVALENCY		# of	
	UNITS	**BG-SOIL-3**	**EDL**	**RDL**	**MDL**	**TEF (2005 WHO)**	**TEQ(DL)**	**Isomers**	**QC Batch**
Dioxins & Furans									
2,3,7,8-Tetra CDD *	pg/g	<0.0873	0.0873	0.997	N/A	1.00	0.0873		5278896
1,2,3,7,8-Penta CDD *	pg/g	<0.103	0.103	0.997	N/A	1.00	0.103		5278896
1,2,3,4,7,8-Hexa CDD *	pg/g	<0.110	0.110	0.997	N/A	0.100	0.0110		5278896
1,2,3,6,7,8-Hexa CDD *	pg/g	<0.111	0.111	0.997	N/A	0.100	0.0111		5278896
1,2,3,7,8,9-Hexa CDD *	pg/g	<0.0993	0.0993	0.997	N/A	0.100	0.00993		5278896
1,2,3,4,6,7,8-Hepta CDD *	pg/g	0.418	0.0994	0.997	N/A	0.0100	0.00418		5278896
Octa CDD *	pg/g	3.58	0.132	9.97	N/A	0.000300	0.00107		5278896
Total Tetra CDD *	pg/g	<0.0873	0.0873	0.997	N/A			0	5278896
Total Penta CDD *	pg/g	<0.103	0.103	0.997	N/A			0	5278896
Total Hexa CDD *	pg/g	0.175	0.107	0.997	N/A			1	5278896
Total Hepta CDD *	pg/g	0.921	0.0994	0.997	N/A			2	5278896
2,3,7,8-Tetra CDF **	pg/g	<0.107	0.107	0.997	N/A	0.100	0.0107		5278896
1,2,3,7,8-Penta CDF **	pg/g	<0.0986	0.0986	0.997	N/A	0.0300	0.00296		5278896
2,3,4,7,8-Penta CDF **	pg/g	<0.0980	0.0980	0.997	N/A	0.300	0.0294		5278896
1,2,3,4,7,8-Hexa CDF **	pg/g	<0.0964	0.0964	0.997	N/A	0.100	0.00964		5278896
1,2,3,6,7,8-Hexa CDF **	pg/g	<0.0938	0.0938	0.997	N/A	0.100	0.00938		5278896
2,3,4,6,7,8-Hexa CDF **	pg/g	<0.105	0.105	0.997	N/A	0.100	0.0105		5278896
1,2,3,7,8,9-Hexa CDF **	pg/g	<0.115	0.115	0.997	N/A	0.100	0.0115		5278896
1,2,3,4,6,7,8-Hepta CDF **	pg/g	<0.158 (1)	0.158	0.997	N/A	0.0100	0.00158		5278896
1,2,3,4,7,8,9-Hepta CDF **	pg/g	<0.121	0.121	0.997	N/A	0.0100	0.00121		5278896
Octa CDF **	pg/g	0.167	0.113	9.97	N/A	0.000300	0.0000501		5278896
Total Tetra CDF **	pg/g	<0.107	0.107	0.997	N/A			0	5278896
Total Penta CDF **	pg/g	<0.0983	0.0983	0.997	N/A			0	5278896
Total Hexa CDF **	pg/g	<0.102	0.102	0.997	N/A			0	5278896
Total Hepta CDF **	pg/g	0.129	0.103	0.997	N/A			1	5278896
TOTAL TOXIC EQUIVALENCY	pg/g						0.315		

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

N/A = Not Applicable

** CDF = Chloro Dibenzo-p-Furan

(1) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

DIOXINS AND FURANS BY HRMS (SOIL)

Maxxam ID		FJP621							
Sampling Date		2017/10/14							
COC Number		D26106				TOXIC EQUIVALENCY		# of	
	UNITS	**BG-SOIL-3**	**EDL**	**RDL**	**MDL**	**TEF (2005 WHO)**	**TEQ(DL)**	**Isomers**	**QC Batch**
Surrogate Recovery (%)									
C13-1234678 HeptaCDD *	%	86							5278896
C13-1234678 HeptaCDF **	%	78							5278896
C13-123678 HexaCDD *	%	71							5278896
C13-123678 HexaCDF **	%	64							5278896
C13-12378 PentaCDD *	%	114							5278896
C13-12378 PentaCDF **	%	75							5278896
C13-2378 TetraCDD *	%	74							5278896
C13-2378 TetraCDF **	%	63							5278896
C13-OCDD *	%	100							5278896

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

QC Batch = Quality Control Batch

* CDD = Chloro Dibenzo-p-Dioxin

** CDF = Chloro Dibenzo-p-Furan

RESULTS OF ANALYSES OF SEDIMENT

Maxxam ID		FJP642	FJP643		FJP644	FJP645	FJP646	FJP647			
Sampling Date		2017/10/14	2017/10/14		2017/10/14	2017/10/14	2017/10/14	2017/10/14			
COC Number		D26107	D26107		D26107	D26107	D26107	D26107			
	UNITS	**BG-SED-1**	**BG-SED-2**	**QC Batch**	**BG-SED-3**	**SED-1**	**SED-2**	**SED-3**	**RDL**	**MDL**	**QC Batch**
Inorganics											
Moisture	%	63	89	5229780	17	32	71	26	1.0	0.20	5229745

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		FJP648	FJP649	FJP650			
Sampling Date		2017/10/14	2017/10/14	2017/10/14			
COC Number		D26107	D26107	D26107			
	UNITS	**WSUPPLY-SED-1**	**WSUPPLY-SED-2**	**WSUPPLY-SED-3**	**RDL**	**MDL**	**QC Batch**
Inorganics							
Moisture	%	31	22	28	1.0	0.20	5229745

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

ELEMENTS BY ATOMIC SPECTROSCOPY (SEDIMENT)

Maxxam ID		FJP642	FJP643		FJP644	FJP645	FJP646			
Sampling Date		2017/10/14	2017/10/14		2017/10/14	2017/10/14	2017/10/14			
COC Number		D26107	D26107		D26107	D26107	D26107			
	UNITS	**BG-SED-1**	**BG-SED-2**	**QC Batch**	**BG-SED-3**	**SED-1**	**SED-2**	**RDL**	**MDL**	**QC Batch**
Metals										
Acid Extractable Aluminum (Al)	mg/kg	6600	2800	5232147	1400	3000	10000	10	N/A	5232257
Acid Extractable Antimony (Sb)	mg/kg	<2.0	<2.0	5232147	<2.0	<2.0	<2.0	2.0	N/A	5232257
Acid Extractable Arsenic (As)	mg/kg	4.8	3.6	5232147	<2.0	7.5	2.4	2.0	N/A	5232257
Acid Extractable Barium (Ba)	mg/kg	23	29	5232147	5.6	30	74	5.0	N/A	5232257
Acid Extractable Beryllium (Be)	mg/kg	2.2	<2.0	5232147	<2.0	<2.0	<2.0	2.0	N/A	5232257
Acid Extractable Bismuth (Bi)	mg/kg	<2.0	<2.0	5232147	<2.0	<2.0	<2.0	2.0	N/A	5232257
Acid Extractable Boron (B)	mg/kg	<50	<50	5232147	<50	<50	<50	50	N/A	5232257
Acid Extractable Cadmium (Cd)	mg/kg	<0.30	1.4	5232147	<0.30	<0.30	0.49	0.30	N/A	5232257
Acid Extractable Chromium (Cr)	mg/kg	7.3	<2.0	5232147	4.1	13	16	2.0	N/A	5232257
Acid Extractable Cobalt (Co)	mg/kg	1.1	<1.0	5232147	1.5	2.6	10	1.0	N/A	5232257
Acid Extractable Copper (Cu)	mg/kg	56	17	5232147	9.6	16	98	2.0	N/A	5232257
Acid Extractable Iron (Fe)	mg/kg	3300	8100	5232147	7100	18000	14000	50	N/A	5232257
Acid Extractable Lead (Pb)	mg/kg	20	17	5232147	16	86	40	0.50	N/A	5232257
Acid Extractable Lithium (Li)	mg/kg	<2.0	<2.0	5232147	<2.0	3.0	8.9	2.0	N/A	5232257
Acid Extractable Manganese (Mn)	mg/kg	34	91	5232147	78	160	160	2.0	N/A	5232257
Acid Extractable Mercury (Hg)	mg/kg	<0.10	0.16	5232147	<0.10	<0.10	0.18	0.10	N/A	5232257
Acid Extractable Molybdenum (Mo)	mg/kg	<2.0	3.5	5232147	6.0	5.0	3.7	2.0	N/A	5232257
Acid Extractable Nickel (Ni)	mg/kg	4.0	3.5	5232147	2.2	6.2	16	2.0	N/A	5232257
Acid Extractable Rubidium (Rb)	mg/kg	3.3	<2.0	5232147	<2.0	7.7	7.8	2.0	N/A	5232257
Acid Extractable Selenium (Se)	mg/kg	1.4	<1.0	5232147	<1.0	<1.0	<1.0	1.0	N/A	5232257
Acid Extractable Silver (Ag)	mg/kg	<0.50	<0.50	5232147	<0.50	<0.50	<0.50	0.50	N/A	5232257
Acid Extractable Strontium (Sr)	mg/kg	39	44	5232147	11	14	43	5.0	N/A	5232257
Acid Extractable Thallium (Tl)	mg/kg	<0.10	<0.10	5232147	<0.10	<0.10	0.14	0.10	N/A	5232257
Acid Extractable Tin (Sn)	mg/kg	<2.0	<2.0	5232147	<2.0	93	<2.0	2.0	N/A	5232257
Acid Extractable Uranium (U)	mg/kg	4.9	4.7	5232147	10	0.87	4.1	0.10	N/A	5232257
Acid Extractable Vanadium (V)	mg/kg	7.7	3.5	5232147	7.6	24	27	2.0	N/A	5232257
Acid Extractable Zinc (Zn)	mg/kg	49	200	5232147	40	37	97	5.0	N/A	5232257

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

ELEMENTS BY ATOMIC SPECTROSCOPY (SEDIMENT)

Maxxam ID		FJP647	FJP648	FJP649	FJP650			
Sampling Date		2017/10/14	2017/10/14	2017/10/14	2017/10/14			
COC Number		D26107	D26107	D26107	D26107			
	UNITS	**SED-3**	**WSUPPLY-SED-1**	**WSUPPLY-SED-2**	**WSUPPLY-SED-3**	**RDL**	**MDL**	**QC Batch**
Metals								
Acid Extractable Aluminum (Al)	mg/kg	12000	8700	8400	8000	10	N/A	5232257
Acid Extractable Antimony (Sb)	mg/kg	<2.0	<2.0	<2.0	<2.0	2.0	N/A	5232257
Acid Extractable Arsenic (As)	mg/kg	<2.0	3.7	3.7	4.1	2.0	N/A	5232257
Acid Extractable Barium (Ba)	mg/kg	84	58	75	30	5.0	N/A	5232257
Acid Extractable Beryllium (Be)	mg/kg	<2.0	<2.0	<2.0	<2.0	2.0	N/A	5232257
Acid Extractable Bismuth (Bi)	mg/kg	<2.0	<2.0	<2.0	<2.0	2.0	N/A	5232257
Acid Extractable Boron (B)	mg/kg	<50	<50	<50	<50	50	N/A	5232257
Acid Extractable Cadmium (Cd)	mg/kg	<0.30	<0.30	<0.30	<0.30	0.30	N/A	5232257
Acid Extractable Chromium (Cr)	mg/kg	30	22	19	120	2.0	N/A	5232257
Acid Extractable Cobalt (Co)	mg/kg	8.2	8.6	7.4	15	1.0	N/A	5232257
Acid Extractable Copper (Cu)	mg/kg	13	18	18	6.7	2.0	N/A	5232257
Acid Extractable Iron (Fe)	mg/kg	23000	15000	15000	38000	50	N/A	5232257
Acid Extractable Lead (Pb)	mg/kg	6.0	4.3	4.3	13	0.50	N/A	5232257
Acid Extractable Lithium (Li)	mg/kg	8.3	13	11	11	2.0	N/A	5232257
Acid Extractable Manganese (Mn)	mg/kg	180	110	110	260	2.0	N/A	5232257
Acid Extractable Mercury (Hg)	mg/kg	<0.10	<0.10	<0.10	<0.10	0.10	N/A	5232257
Acid Extractable Molybdenum (Mo)	mg/kg	5.1	5.3	4.4	3.6	2.0	N/A	5232257
Acid Extractable Nickel (Ni)	mg/kg	14	21	21	150	2.0	N/A	5232257
Acid Extractable Rubidium (Rb)	mg/kg	8.9	6.1	6.6	6.8	2.0	N/A	5232257
Acid Extractable Selenium (Se)	mg/kg	<1.0	<1.0	<1.0	<1.0	1.0	N/A	5232257
Acid Extractable Silver (Ag)	mg/kg	<0.50	<0.50	<0.50	<0.50	0.50	N/A	5232257
Acid Extractable Strontium (Sr)	mg/kg	36	19	23	18	5.0	N/A	5232257
Acid Extractable Thallium (Tl)	mg/kg	<0.10	<0.10	0.11	<0.10	0.10	N/A	5232257
Acid Extractable Tin (Sn)	mg/kg	<2.0	<2.0	<2.0	<2.0	2.0	N/A	5232257
Acid Extractable Uranium (U)	mg/kg	1.8	4.8	4.2	0.59	0.10	N/A	5232257
Acid Extractable Vanadium (V)	mg/kg	110	29	28	130	2.0	N/A	5232257
Acid Extractable Zinc (Zn)	mg/kg	71	77	75	99	5.0	N/A	5232257

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

SEMI-VOLATILE ORGANICS BY GC-MS (SEDIMENT)

Maxxam ID		FJP642				FJP642			
Sampling Date		2017/10/14				2017/10/14			
COC Number		D26107				D26107			
	UNITS	**BG-SED-1**	**RDL**	**MDL**	**QC Batch**	**BG-SED-1 Lab-Dup**	**RDL**	**MDL**	**QC Batch**
Polyaromatic Hydrocarbons									
1-Methylnaphthalene	mg/kg	<0.0050	0.0050	N/A	5234665	<0.0050	0.0050	N/A	5234665
2-Methylnaphthalene	mg/kg	<0.0050	0.0050	N/A	5234665	<0.0050	0.0050	N/A	5234665
Acenaphthene	mg/kg	<0.0050	0.0050	N/A	5234665	<0.0050	0.0050	N/A	5234665
Acenaphthylene	mg/kg	<0.0050	0.0050	N/A	5234665	<0.0050	0.0050	N/A	5234665
Anthracene	mg/kg	<0.0050	0.0050	N/A	5234665	<0.0050	0.0050	N/A	5234665
Benzo(a)anthracene	mg/kg	<0.0050	0.0050	N/A	5234665	<0.0050	0.0050	N/A	5234665
Benzo(a)pyrene	mg/kg	<0.0050	0.0050	N/A	5234665	<0.0050	0.0050	N/A	5234665
Benzo(b)fluoranthene	mg/kg	<0.0050	0.0050	N/A	5234665	<0.0050	0.0050	N/A	5234665
Benzo(b/j)fluoranthene	mg/kg	<0.010	0.010	N/A	5225633				
Benzo(g,h,i)perylene	mg/kg	<0.0050	0.0050	N/A	5234665	<0.0050	0.0050	N/A	5234665
Benzo(j)fluoranthene	mg/kg	<0.0050	0.0050	N/A	5234665	<0.0050	0.0050	N/A	5234665
Benzo(k)fluoranthene	mg/kg	<0.0050	0.0050	N/A	5234665	<0.0050	0.0050	N/A	5234665
Chrysene	mg/kg	<0.0050	0.0050	N/A	5234665	<0.0050	0.0050	N/A	5234665
Dibenz(a,h)anthracene	mg/kg	<0.0050	0.0050	N/A	5234665	<0.0050	0.0050	N/A	5234665
Fluoranthene	mg/kg	<0.0050	0.0050	N/A	5234665	<0.0050	0.0050	N/A	5234665
Fluorene	mg/kg	<0.0050	0.0050	N/A	5234665	<0.0050	0.0050	N/A	5234665
Indeno(1,2,3-cd)pyrene	mg/kg	<0.0050	0.0050	N/A	5234665	<0.0050	0.0050	N/A	5234665
Naphthalene	mg/kg	<0.0050	0.0050	N/A	5234665	<0.0050	0.0050	N/A	5234665
Perylene	mg/kg	<0.0050	0.0050	N/A	5234665	<0.0050	0.0050	N/A	5234665
Phenanthrene	mg/kg	<0.0050	0.0050	N/A	5234665	<0.0050	0.0050	N/A	5234665
Pyrene	mg/kg	<0.0050	0.0050	N/A	5234665	<0.0050	0.0050	N/A	5234665
Surrogate Recovery (%)									
D10-Anthracene	%	91			5234665	90			5234665
D14-Terphenyl	%	86			5234665	83			5234665
D8-Acenaphthylene	%	90			5234665	88			5234665

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

Maxxam Job #: B7N4148
Report Date: 2018/03/29

SNC-Lavalin Inc
Client Project #: 649806
Site Location: CAPE MAKKOVIK
Sampler Initials: JG

SEMI-VOLATILE ORGANICS BY GC-MS (SEDIMENT)

Maxxam ID		FJP643		FJP644	FJP645		FJP646			
Sampling Date		2017/10/14		2017/10/14	2017/10/14		2017/10/14			
COC Number		D26107		D26107	D26107		D26107			
	UNITS	**BG-SED-2**	**RDL**	**BG-SED-3**	**SED-1**	**RDL**	**SED-2**	**RDL**	**MDL**	**QC Batch**
Polyaromatic Hydrocarbons										
1-Methylnaphthalene	mg/kg	<0.0050	0.0050	<0.0050	<0.0050	0.0050	<0.0050	0.0050	N/A	5234665
2-Methylnaphthalene	mg/kg	<0.0050	0.0050	<0.0050	<0.0050	0.0050	<0.0050	0.0050	N/A	5234665
Acenaphthene	mg/kg	<0.0050	0.0050	<0.0050	<0.0050	0.0050	<0.0050	0.0050	N/A	5234665
Acenaphthylene	mg/kg	<0.0050	0.0050	<0.0050	<0.0050	0.0050	<0.0050	0.0050	N/A	5234665
Anthracene	mg/kg	<0.0050	0.0050	<0.0050	<0.0050	0.0050	<0.0050	0.0050	N/A	5234665
Benzo(a)anthracene	mg/kg	<0.0050	0.0050	<0.0050	<0.0050	0.0050	<0.0050	0.0050	N/A	5234665
Benzo(a)pyrene	mg/kg	<0.0050	0.0050	<0.0050	<0.0050	0.0050	<0.0050	0.0050	N/A	5234665
Benzo(b)fluoranthene	mg/kg	<0.0050	0.0050	<0.0050	<0.0050	0.0050	<0.0050	0.0050	N/A	5234665
Benzo(b/j)fluoranthene	mg/kg	<0.010	0.010	<0.010	<0.010	0.010	<0.010	0.010	N/A	5225633
Benzo(g,h,i)perylene	mg/kg	<0.098 (1)	0.098	<0.0050	<0.0050	0.0050	<0.0050	0.0050	N/A	5234665
Benzo(j)fluoranthene	mg/kg	<0.0050	0.0050	<0.0050	<0.0050	0.0050	<0.0050	0.0050	N/A	5234665
Benzo(k)fluoranthene	mg/kg	<0.0050	0.0050	<0.0050	<0.0050	0.0050	<0.0050	0.0050	N/A	5234665
Chrysene	mg/kg	<0.0050	0.0050	<0.0050	<0.0050	0.0050	0.044	0.0050	N/A	5234665
Dibenz(a,h)anthracene	mg/kg	<0.0050	0.0050	<0.0050	<0.0050	0.0050	<0.0050	0.0050	N/A	5234665
Fluoranthene	mg/kg	<0.0050	0.0050	<0.0050	<0.0050	0.0050	<0.0050	0.0050	N/A	5234665
Fluorene	mg/kg	<0.0050	0.0050	<0.0050	<0.0050	0.0050	<0.0050	0.0050	N/A	5234665
Indeno(1,2,3-cd)pyrene	mg/kg	<0.0050	0.0050	<0.0050	<0.0050	0.0050	<0.0050	0.0050	N/A	5234665
Naphthalene	mg/kg	<0.0050	0.0050	<0.0050	<0.0050	0.0050	<0.0050	0.0050	N/A	5234665
Perylene	mg/kg	0.093	0.0050	<0.0050	<0.0050	0.0050	<0.0050	0.0050	N/A	5234665
Phenanthrene	mg/kg	<0.0050	0.0050	<0.0050	<0.0050	0.0050	<0.026 (1)	0.026	N/A	5234665
Pyrene	mg/kg	<0.0050	0.0050	<0.0050	<0.0050	0.0050	0.039	0.0050	N/A	5234665
Surrogate Recovery (%)										
D10-Anthracene	%	117		103	97		110			5234665
D14-Terphenyl	%	100		88	87		98			5234665
D8-Acenaphthylene	%	102		102	98		103			5234665

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable
(1) Elevated PAH RDL(s) due to matrix / co-extractive interference.

SEMI-VOLATILE ORGANICS BY GC-MS (SEDIMENT)

Maxxam ID		FJP647	FJP648	FJP649	FJP650			
Sampling Date		2017/10/14	2017/10/14	2017/10/14	2017/10/14			
COC Number		D26107	D26107	D26107	D26107			
	UNITS	**SED-3**	**WSUPPLY-SED-1**	**WSUPPLY-SED-2**	**WSUPPLY-SED-3**	**RDL**	**MDL**	**QC Batch**
Polyaromatic Hydrocarbons								
1-Methylnaphthalene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5234665
2-Methylnaphthalene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5234665
Acenaphthene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5234665
Acenaphthylene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5234665
Anthracene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5234665
Benzo(a)anthracene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5234665
Benzo(a)pyrene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5234665
Benzo(b)fluoranthene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5234665
Benzo(b/j)fluoranthene	mg/kg	<0.010	<0.010	<0.010	<0.010	0.010	N/A	5225633
Benzo(g,h,i)perylene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5234665
Benzo(j)fluoranthene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5234665
Benzo(k)fluoranthene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5234665
Chrysene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5234665
Dibenz(a,h)anthracene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5234665
Fluoranthene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5234665
Fluorene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5234665
Indeno(1,2,3-cd)pyrene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5234665
Naphthalene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5234665
Perylene	mg/kg	<0.0050	0.024	0.066	<0.0050	0.0050	N/A	5234665
Phenanthrene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5234665
Pyrene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	N/A	5234665
Surrogate Recovery (%)								
D10-Anthracene	%	107	90	109	101			5234665
D14-Terphenyl	%	95	88	97	84			5234665
D8-Acenaphthylene	%	97	100	95	104			5234665

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

POLYCHLORINATED BIPHENYLS BY GC-ECD (SEDIMENT)

Maxxam ID		FJP645	FJP646	FJP647	FJP648		FJP649			
Sampling Date		2017/10/14	2017/10/14	2017/10/14	2017/10/14		2017/10/14			
COC Number		D26107	D26107	D26107	D26107		D26107			
	UNITS	**SED-1**	**SED-2**	**SED-3**	**WSUPPLY-SED-1**	**QC Batch**	**WSUPPLY-SED-2**	**RDL**	**MDL**	**QC Batch**
PCBs										
Aroclor 1016	ug/g	<0.030	<0.030	<0.030	<0.030	5234764	<0.030	0.030	N/A	5234764
Aroclor 1221	ug/g	<0.030	<0.030	<0.030	<0.030	5234764	<0.030	0.030	N/A	5234764
Aroclor 1232	ug/g	<0.030	<0.030	<0.030	<0.030	5234764	<0.030	0.030	N/A	5234764
Aroclor 1248	ug/g	<0.030	<0.030	<0.030	<0.030	5234764	<0.030	0.030	N/A	5234764
Aroclor 1242	ug/g	<0.030	<0.030	<0.030	<0.030	5234764	<0.030	0.030	N/A	5234764
Aroclor 1254	ug/g	<0.030	<0.030	<0.030	<0.030	5234764	<0.030	0.030	N/A	5234764
Aroclor 1260	ug/g	<0.030	<0.030	<0.030	<0.030	5234764	<0.030	0.030	N/A	5234764
Calculated Total PCB	ug/g	<0.030	<0.030	<0.030	<0.030	5225466	<0.030	0.030	N/A	5225637
Surrogate Recovery (%)										
Decachlorobiphenyl	%	100 (1)	92 (1)	95 (1)	99 (1)	5234764	95 (1)			5234764

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable
(1) PCB RDL(s) lowered as per client request.

Maxxam ID		FJP650			
Sampling Date		2017/10/14			
COC Number		D26107			
	UNITS	**WSUPPLY-SED-3**	**RDL**	**MDL**	**QC Batch**
PCBs					
Aroclor 1016	ug/g	<0.030	0.030	N/A	5234764
Aroclor 1221	ug/g	<0.030	0.030	N/A	5234764
Aroclor 1232	ug/g	<0.030	0.030	N/A	5234764
Aroclor 1248	ug/g	<0.030	0.030	N/A	5234764
Aroclor 1242	ug/g	<0.030	0.030	N/A	5234764
Aroclor 1254	ug/g	<0.030	0.030	N/A	5234764
Aroclor 1260	ug/g	<0.030	0.030	N/A	5234764
Calculated Total PCB	ug/g	<0.030	0.030	N/A	5225637
Surrogate Recovery (%)					
Decachlorobiphenyl	%	99 (1)			5234764

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable
(1) PCB RDL(s) lowered as per client request.

TEST SUMMARY

Maxxam ID: FJP535
Sample ID: 1987-SOIL-1
Matrix: Soil

Collected: 2017/10/14
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (soil)	CALC	5225630	N/A	2017/10/28	Automated Statchk
Dioxins/Furans in Soil (EPS 1/RM/23)	HRMS/MS	5278896	2017/11/15	2017/11/22	Angel Guerrero
Metals Solids Acid Extr. ICPMS	ICP/MS	5254226	2017/11/08	2017/11/08	Bryon Angevine
Moisture	BAL	5226081	N/A	2017/10/24	David Balfour
PAH Compounds by GCMS (SIM)	GC/MS	5229955	2017/10/25	2017/10/28	Gina Thompson
PCBs in soil by GC/ECD	GC/ECD	5228079	2017/10/24	2017/10/26	Lisa Gates
PCB Aroclor sum (soil)	CALC	5225466	N/A	2017/10/26	Automated Statchk
VOCs in Soil - Field Preserved	HS/MS	5226049	N/A	2017/10/25	Amanda Swales

Maxxam ID: FJP535 Dup
Sample ID: 1987-SOIL-1
Matrix: Soil

Collected: 2017/10/14
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	5226081	N/A	2017/10/24	David Balfour

Maxxam ID: FJP536
Sample ID: 1987-SOIL-2
Matrix: Soil

Collected: 2017/10/14
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (soil)	CALC	5225630	N/A	2017/10/28	Automated Statchk
Metals Solids Acid Extr. ICPMS	ICP/MS	5254226	2017/11/08	2017/11/08	Bryon Angevine
Moisture	BAL	5226081	N/A	2017/10/24	David Balfour
OC Pesticides (Selected) & PCB	GC/ECD	5232820	2017/10/26	2017/10/27	Joy Zhang
OC Pesticides Summed Parameters	CALC	5225632	N/A	2017/10/24	Automated Statchk
GC/MS Analysis of OP Pesticides	GC/MS	5234901	2017/10/27	2017/10/27	May Yin Mak
PAH Compounds by GCMS (SIM)	GC/MS	5229955	2017/10/25	2017/10/28	Gina Thompson
PCBs in soil by GC/ECD	GC/ECD	5228079	2017/10/24	2017/10/26	Lisa Gates
PCB Aroclor sum (soil)	CALC	5225466	N/A	2017/10/30	Automated Statchk
VOCs in Soil - Field Preserved	HS/MS	5226049	N/A	2017/10/25	Amanda Swales

Maxxam ID: FJP537
Sample ID: 1987-SOIL-3
Matrix: Soil

Collected: 2017/10/14
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (soil)	CALC	5225630	N/A	2017/10/28	Automated Statchk
Dioxins/Furans in Soil (EPS 1/RM/23)	HRMS/MS	5278896	2017/11/15	2017/11/22	Angel Guerrero
Metals Solids Acid Extr. ICPMS	ICP/MS	5254226	2017/11/08	2017/11/08	Bryon Angevine
Moisture	BAL	5226081	N/A	2017/10/24	David Balfour
PAH Compounds by GCMS (SIM)	GC/MS	5229955	2017/10/25	2017/10/28	Gina Thompson
PCBs in soil by GC/ECD	GC/ECD	5228079	2017/10/24	2017/10/26	Lisa Gates
PCB Aroclor sum (soil)	CALC	5225466	N/A	2017/10/26	Automated Statchk

TEST SUMMARY

Maxxam ID: FJP537
Sample ID: 1987-SOIL-3
Matrix: Soil

Collected: 2017/10/14
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
VOCs in Soil - Field Preserved	HS/MS	5226049	N/A	2017/10/25	Amanda Swales

Maxxam ID: FJP560
Sample ID: 1987-SOIL-4
Matrix: Soil

Collected: 2017/10/14
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (soil)	CALC	5225630	N/A	2017/11/02	Automated Statchk
Metals Solids Acid Extr. ICPMS	ICP/MS	5234500	2017/10/27	2017/10/27	Bryon Angevine
Moisture	BAL	5229906	N/A	2017/10/25	Jacob Henley
PAH Compounds by GCMS (SIM)	GC/MS	5232258	2017/10/26	2017/11/01	Gina Thompson
PCBs in soil by GC/ECD	GC/ECD	5232173	2017/10/26	2017/10/27	Chloe Bramble
PCB Aroclor sum (soil)	CALC	5225466	N/A	2017/10/27	Automated Statchk
VOCs in Soil - Field Preserved	HS/MS	5226049	N/A	2017/10/25	Amanda Swales

Maxxam ID: FJP561
Sample ID: 1987-SOIL-5
Matrix: Soil

Collected: 2017/10/14
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (soil)	CALC	5225630	N/A	2017/11/02	Automated Statchk
Metals Solids Acid Extr. ICPMS	ICP/MS	5234500	2017/10/27	2017/10/27	Bryon Angevine
Moisture	BAL	5229906	N/A	2017/10/25	Jacob Henley
PAH Compounds by GCMS (SIM)	GC/MS	5232258	2017/10/26	2017/11/01	Gina Thompson
PCBs in soil by GC/ECD	GC/ECD	5232173	2017/10/26	2017/10/27	Chloe Bramble
PCB Aroclor sum (soil)	CALC	5225466	N/A	2017/10/27	Automated Statchk
VOCs in Soil - Field Preserved	HS/MS	5226049	N/A	2017/10/25	Amanda Swales

Maxxam ID: FJP562
Sample ID: 1987-SOIL-6
Matrix: Soil

Collected: 2017/10/14
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (soil)	CALC	5225630	N/A	2017/11/02	Automated Statchk
Metals Solids Acid Extr. ICPMS	ICP/MS	5234500	2017/10/27	2017/10/27	Bryon Angevine
Moisture	BAL	5229906	N/A	2017/10/25	Jacob Henley
PAH Compounds by GCMS (SIM)	GC/MS	5232258	2017/10/26	2017/11/01	Gina Thompson
PCBs in soil by GC/ECD	GC/ECD	5232173	2017/10/26	2017/10/27	Chloe Bramble
PCB Aroclor sum (soil)	CALC	5225466	N/A	2017/10/27	Automated Statchk
VOCs in Soil - Field Preserved	HS/MS	5226049	N/A	2017/10/25	Amanda Swales

TEST SUMMARY

Maxxam ID: FJP563
Sample ID: 1987-SOIL-7
Matrix: Soil

Collected: 2017/10/14
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (soil)	CALC	5225630	N/A	2017/11/02	Automated Statchk
Metals Solids Acid Extr. ICPMS	ICP/MS	5234500	2017/10/27	2017/10/27	Bryon Angevine
Moisture	BAL	5229906	N/A	2017/10/25	Jacob Henley
PAH Compounds by GCMS (SIM)	GC/MS	5232258	2017/10/26	2017/11/01	Gina Thompson
PCBs in soil by GC/ECD	GC/ECD	5232173	2017/10/26	2017/10/27	Chloe Bramble
PCB Aroclor sum (soil)	CALC	5225466	N/A	2017/10/27	Automated Statchk
VOCs in Soil - Field Preserved	HS/MS	5227338	N/A	2017/10/24	Amanda Swales

Maxxam ID: FJP563 Dup
Sample ID: 1987-SOIL-7
Matrix: Soil

Collected: 2017/10/14
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
PAH Compounds by GCMS (SIM)	GC/MS	5232258	2017/10/26	2017/11/01	Gina Thompson

Maxxam ID: FJP564
Sample ID: 1987-SOIL-8
Matrix: Soil

Collected: 2017/10/14
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (soil)	CALC	5225630	N/A	2017/11/02	Automated Statchk
Metals Solids Acid Extr. ICPMS	ICP/MS	5234500	2017/10/27	2017/10/27	Bryon Angevine
Moisture	BAL	5229906	N/A	2017/10/25	Jacob Henley
PAH Compounds by GCMS (SIM)	GC/MS	5232258	2017/10/26	2017/11/01	Gina Thompson
PCBs in soil by GC/ECD	GC/ECD	5232173	2017/10/26	2017/10/27	Chloe Bramble
PCB Aroclor sum (soil)	CALC	5225466	N/A	2017/10/27	Automated Statchk
VOCs in Soil - Field Preserved	HS/MS	5227338	N/A	2017/10/24	Amanda Swales

Maxxam ID: FJP565
Sample ID: 1987-SOIL-9
Matrix: Soil

Collected: 2017/10/14
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (soil)	CALC	5225630	N/A	2017/11/02	Automated Statchk
Metals Solids Acid Extr. ICPMS	ICP/MS	5232257	2017/10/26	2017/10/26	Bryon Angevine
Moisture	BAL	5229906	N/A	2017/10/25	Jacob Henley
PAH Compounds by GCMS (SIM)	GC/MS	5232258	2017/10/26	2017/11/01	Gina Thompson
PCBs in soil by GC/ECD	GC/ECD	5232173	2017/10/26	2017/10/27	Chloe Bramble
PCB Aroclor sum (soil)	CALC	5225466	N/A	2017/10/27	Automated Statchk
VOCs in Soil - Field Preserved	HS/MS	5227338	N/A	2017/10/24	Amanda Swales

TEST SUMMARY

Maxxam ID: FJP566
Sample ID: 1987-SOIL-10
Matrix: Soil

Collected: 2017/10/14
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (soil)	CALC	5225630	N/A	2017/11/02	Automated Statchk
Metals Solids Acid Extr. ICPMS	ICP/MS	5234500	2017/10/27	2017/10/27	Bryon Angevine
Moisture	BAL	5229906	N/A	2017/10/25	Jacob Henley
PAH Compounds by GCMS (SIM)	GC/MS	5232258	2017/10/26	2017/11/01	Gina Thompson
PCBs in soil by GC/ECD	GC/ECD	5234764	2017/10/27	2017/10/31	Chloe Bramble
PCB Aroclor sum (soil)	CALC	5225466	N/A	2017/10/31	Automated Statchk
VOCs in Soil - Field Preserved	HS/MS	5227759	N/A	2017/10/25	Amanda Swales

Maxxam ID: FJP567
Sample ID: 1987-SOIL-11
Matrix: Soil

Collected: 2017/10/14
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (soil)	CALC	5225630	N/A	2017/10/28	Automated Statchk
Metals Solids Acid Extr. ICPMS	ICP/MS	5227396	2017/10/24	2017/10/25	Bryon Angevine
Moisture	BAL	5226081	N/A	2017/10/24	David Balfour
OC Pesticides (Selected) & PCB	GC/ECD	5232820	2017/10/26	2017/10/27	Joy Zhang
OC Pesticides Summed Parameters	CALC	5225632	N/A	2017/10/24	Automated Statchk
GC/MS Analysis of OP Pesticides	GC/MS	5234901	2017/10/27	2017/10/27	May Yin Mak
PAH Compounds by GCMS (SIM)	GC/MS	5229955	2017/10/25	2017/10/28	Gina Thompson
PCBs in soil by GC/ECD	GC/ECD	5228079	2017/10/24	2017/10/26	Lisa Gates
PCB Aroclor sum (soil)	CALC	5225466	N/A	2017/10/30	Automated Statchk
VOCs in Soil - Field Preserved	HS/MS	5227338	N/A	2017/10/24	Amanda Swales

Maxxam ID: FJP568
Sample ID: 1987-SOIL-12
Matrix: Soil

Collected: 2017/10/14
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (soil)	CALC	5225630	N/A	2017/10/28	Automated Statchk
Dioxins/Furans in Soil (EPS 1/RM/23)	HRMS/MS	5278896	2017/11/15	2017/11/22	Angel Guerrero
Metals Solids Acid Extr. ICPMS	ICP/MS	5227738	2017/10/24	2017/10/25	Bryon Angevine
Moisture	BAL	5226081	N/A	2017/10/24	David Balfour
PAH Compounds by GCMS (SIM)	GC/MS	5229955	2017/10/25	2017/10/28	Gina Thompson
PCBs in soil by GC/ECD	GC/ECD	5228079	2017/10/24	2017/10/26	Lisa Gates
PCB Aroclor sum (soil)	CALC	5225466	N/A	2017/10/26	Automated Statchk
VOCs in Soil - Field Preserved	HS/MS	5227338	N/A	2017/10/24	Amanda Swales

Maxxam ID: FJP568 Dup
Sample ID: 1987-SOIL-12
Matrix: Soil

Collected: 2017/10/14
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	5227738	2017/10/24	2017/10/25	Bryon Angevine

TEST SUMMARY

Maxxam ID: FJP569
Sample ID: UAST-SOIL-1
Matrix: Soil

Collected: 2017/10/13
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (soil)	CALC	5225630	N/A	2017/11/02	Automated Statchk
Moisture	BAL	5229906	N/A	2017/10/25	Jacob Henley
PAH Compounds by GCMS (SIM)	GC/MS	5232258	2017/10/26	2017/11/01	Gina Thompson

Maxxam ID: FJP570
Sample ID: UAST-SOIL-2
Matrix: Soil

Collected: 2017/10/13
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (soil)	CALC	5225630	N/A	2017/11/02	Automated Statchk
Moisture	BAL	5229906	N/A	2017/10/25	Jacob Henley
PAH Compounds by GCMS (SIM)	GC/MS	5232258	2017/10/26	2017/11/01	Gina Thompson

Maxxam ID: FJP571
Sample ID: UAST-SOIL-3
Matrix: Soil

Collected: 2017/10/13
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (soil)	CALC	5225630	N/A	2017/11/02	Automated Statchk
Moisture	BAL	5229906	N/A	2017/10/25	Jacob Henley
PAH Compounds by GCMS (SIM)	GC/MS	5232258	2017/10/26	2017/11/01	Gina Thompson

Maxxam ID: FJP572
Sample ID: UAST-SOIL-4
Matrix: Soil

Collected: 2017/10/13
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (soil)	CALC	5225630	N/A	2017/11/02	Automated Statchk
Moisture	BAL	5229906	N/A	2017/10/25	Jacob Henley
PAH Compounds by GCMS (SIM)	GC/MS	5232258	2017/10/26	2017/11/01	Gina Thompson

Maxxam ID: FJP573
Sample ID: UAST-SOIL-5
Matrix: Soil

Collected: 2017/10/13
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (soil)	CALC	5225630	N/A	2017/11/02	Automated Statchk
Moisture	BAL	5229906	N/A	2017/10/25	Jacob Henley
PAH Compounds by GCMS (SIM)	GC/MS	5232258	2017/10/26	2017/11/01	Gina Thompson

TEST SUMMARY

Maxxam ID: FJP574
Sample ID: HEL-SOIL-1
Matrix: Soil

Collected: 2017/10/13
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (soil)	CALC	5225630	N/A	2017/11/02	Automated Statchk
Metals Solids Acid Extr. ICPMS	ICP/MS	5234500	2017/10/27	2017/10/27	Bryon Angevine
Moisture	BAL	5229906	N/A	2017/10/25	Jacob Henley
PAH Compounds by GCMS (SIM)	GC/MS	5232258	2017/10/26	2017/11/02	Gina Thompson
PCBs in soil by GC/ECD	GC/ECD	5232173	2017/10/26	2017/10/27	Chloe Bramble
PCB Aroclor sum (soil)	CALC	5225466	N/A	2017/10/27	Automated Statchk

Maxxam ID: FJP575
Sample ID: HEL-SOIL-2
Matrix: Soil

Collected: 2017/10/13
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (soil)	CALC	5225630	N/A	2017/11/02	Automated Statchk
Metals Solids Acid Extr. ICPMS	ICP/MS	5234500	2017/10/27	2017/10/27	Bryon Angevine
Moisture	BAL	5229906	N/A	2017/10/25	Jacob Henley
PAH Compounds by GCMS (SIM)	GC/MS	5232258	2017/10/26	2017/11/02	Gina Thompson
PCBs in soil by GC/ECD	GC/ECD	5232173	2017/10/26	2017/10/27	Chloe Bramble
PCB Aroclor sum (soil)	CALC	5225466	N/A	2017/10/27	Automated Statchk

Maxxam ID: FJP575 Dup
Sample ID: HEL-SOIL-2
Matrix: Soil

Collected: 2017/10/13
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
PCBs in soil by GC/ECD	GC/ECD	5232173	2017/10/26	2017/10/27	Chloe Bramble

Maxxam ID: FJP576
Sample ID: HEL-SOIL-3
Matrix: Soil

Collected: 2017/10/13
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (soil)	CALC	5225630	N/A	2017/11/02	Automated Statchk
Metals Solids Acid Extr. ICPMS	ICP/MS	5234500	2017/10/27	2017/10/27	Bryon Angevine
Moisture	BAL	5229906	N/A	2017/10/25	Jacob Henley
PAH Compounds by GCMS (SIM)	GC/MS	5232258	2017/10/26	2017/11/02	Gina Thompson
PCBs in soil by GC/ECD	GC/ECD	5232173	2017/10/26	2017/10/27	Chloe Bramble
PCB Aroclor sum (soil)	CALC	5225466	N/A	2017/10/27	Automated Statchk

Maxxam ID: FJP577
Sample ID: HANGER-SOIL-1
Matrix: Soil

Collected: 2017/10/13
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (soil)	CALC	5225630	N/A	2017/11/02	Automated Statchk
Metals Solids Acid Extr. ICPMS	ICP/MS	5232257	2017/10/26	2017/10/26	Bryon Angevine

TEST SUMMARY

Maxxam ID: FJP577
Sample ID: HANGER-SOIL-1
Matrix: Soil

Collected: 2017/10/13
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	5229906	N/A	2017/10/25	Jacob Henley
PAH Compounds by GCMS (SIM)	GC/MS	5232258	2017/10/26	2017/11/02	Gina Thompson
PCBs in soil by GC/ECD	GC/ECD	5232173	2017/10/26	2017/10/27	Chloe Bramble
PCB Aroclor sum (soil)	CALC	5225466	N/A	2017/10/27	Automated Statchk
VOCs in Soil - Field Preserved	HS/MS	5227338	N/A	2017/10/24	Amanda Swales

Maxxam ID: FJP577 Dup
Sample ID: HANGER-SOIL-1
Matrix: Soil

Collected: 2017/10/13
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	5229906	N/A	2017/10/25	Jacob Henley

Maxxam ID: FJP578
Sample ID: HANGER-SOIL-2
Matrix: Soil

Collected: 2017/10/13
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (soil)	CALC	5225630	N/A	2017/11/02	Automated Statchk
Metals Solids Acid Extr. ICPMS	ICP/MS	5232257	2017/10/26	2017/10/26	Bryon Angevine
Moisture	BAL	5229906	N/A	2017/10/25	Jacob Henley
PAH Compounds by GCMS (SIM)	GC/MS	5232258	2017/10/26	2017/11/02	Gina Thompson
PCBs in soil by GC/ECD	GC/ECD	5232173	2017/10/26	2017/10/27	Chloe Bramble
PCB Aroclor sum (soil)	CALC	5225466	N/A	2017/10/27	Automated Statchk
VOCs in Soil - Field Preserved	HS/MS	5227759	N/A	2017/10/25	Amanda Swales

Maxxam ID: FJP580
Sample ID: HANGER-SOIL-3
Matrix: Soil

Collected: 2017/10/18
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (soil)	CALC	5225630	N/A	2017/11/02	Automated Statchk
Metals Solids Acid Extr. ICPMS	ICP/MS	5232257	2017/10/26	2017/10/26	Bryon Angevine
Moisture	BAL	5229906	N/A	2017/10/25	Jacob Henley
PAH Compounds by GCMS (SIM)	GC/MS	5232258	2017/10/26	2017/11/02	Gina Thompson
PCBs in soil by GC/ECD	GC/ECD	5232173	2017/10/26	2017/10/27	Chloe Bramble
PCB Aroclor sum (soil)	CALC	5225466	N/A	2017/10/27	Automated Statchk
VOCs in Soil - Field Preserved	HS/MS	5227759	N/A	2017/10/25	Amanda Swales

Maxxam ID: FJP581
Sample ID: HANGER-SOIL-4
Matrix: Soil

Collected: 2017/10/18
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (soil)	CALC	5225630	N/A	2017/11/02	Automated Statchk

TEST SUMMARY

Maxxam ID: FJP581
Sample ID: HANGER-SOIL-4
Matrix: Soil

Collected: 2017/10/18
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	5232257	2017/10/26	2017/10/26	Bryon Angevine
Moisture	BAL	5229906	N/A	2017/10/25	Jacob Henley
OC Pesticides (Selected) & PCB	GC/ECD	5232820	2017/10/26	2017/10/30	Joy Zhang
OC Pesticides Summed Parameters	CALC	5225632	N/A	2017/10/25	Automated Statchk
GC/MS Analysis of OP Pesticides	GC/MS	5234901	2017/10/27	2017/10/27	May Yin Mak
PAH Compounds by GCMS (SIM)	GC/MS	5232258	2017/10/26	2017/11/02	Gina Thompson
PCBs in soil by GC/ECD	GC/ECD	5232173	2017/10/26	2017/10/27	Chloe Bramble
PCB Aroclor sum (soil)	CALC	5225466	N/A	2017/10/31	Automated Statchk
VOCs in Soil - Field Preserved	HS/MS	5227759	N/A	2017/10/25	Amanda Swales

Maxxam ID: FJP581 Dup
Sample ID: HANGER-SOIL-4
Matrix: Soil

Collected: 2017/10/18
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
GC/MS Analysis of OP Pesticides	GC/MS	5234901	2017/10/27	2017/10/27	May Yin Mak

Maxxam ID: FJP582
Sample ID: SEPTIC-SOIL-1
Matrix: Soil

Collected: 2017/10/18
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (soil)	CALC	5225630	N/A	2017/11/02	Automated Statchk
Metals Solids Acid Extr. ICPMS	ICP/MS	5234588	2017/10/27	2017/10/27	Bryon Angevine
Moisture	BAL	5229906	N/A	2017/10/25	Jacob Henley
PAH Compounds by GCMS (SIM)	GC/MS	5232258	2017/10/26	2017/11/02	Gina Thompson
PCBs in soil by GC/ECD	GC/ECD	5237942	2017/10/30	2017/10/31	Chloe Bramble
PCB Aroclor sum (soil)	CALC	5225466	N/A	2017/10/31	Automated Statchk
VOCs in Soil - Field Preserved	HS/MS	5227759	N/A	2017/10/25	Amanda Swales

Maxxam ID: FJP582 Dup
Sample ID: SEPTIC-SOIL-1
Matrix: Soil

Collected: 2017/10/18
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	5234588	2017/10/27	2017/10/27	Bryon Angevine

Maxxam ID: FJP582 Dup2
Sample ID: SEPTIC-SOIL-1
Matrix: Soil

Collected: 2017/10/18
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	5234588	2017/10/31	2017/11/01	Bryon Angevine

TEST SUMMARY

Maxxam ID: FJP583
Sample ID: SEPTIC-SOIL-2
Matrix: Soil

Collected: 2017/10/18
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (soil)	CALC	5225630	N/A	2017/11/01	Automated Statchk
Metals Solids Acid Extr. ICPMS	ICP/MS	5234500	2017/10/27	2017/10/27	Bryon Angevine
Moisture	BAL	5229985	N/A	2017/10/25	Jacob Henley
PAH Compounds by GCMS (SIM)	GC/MS	5232260	2017/10/26	2017/10/31	Gina Thompson
PCBs in soil by GC/ECD	GC/ECD	5232173	2017/10/26	2017/10/27	Chloe Bramble
PCB Aroclor sum (soil)	CALC	5225466	N/A	2017/10/27	Automated Statchk
VOCs in Soil - Field Preserved	HS/MS	5227759	N/A	2017/10/25	Amanda Swales

Maxxam ID: FJP583 Dup
Sample ID: SEPTIC-SOIL-2
Matrix: Soil

Collected: 2017/10/18
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	5229985	N/A	2017/10/25	Jacob Henley

Maxxam ID: FJP584
Sample ID: SEPTIC-SOIL-3
Matrix: Soil

Collected: 2017/10/18
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (soil)	CALC	5225630	N/A	2017/11/01	Automated Statchk
Metals Solids Acid Extr. ICPMS	ICP/MS	5234588	2017/10/27	2017/10/27	Bryon Angevine
Moisture	BAL	5229985	N/A	2017/10/25	Jacob Henley
PAH Compounds by GCMS (SIM)	GC/MS	5232260	2017/10/26	2017/10/31	Gina Thompson
PCBs in soil by GC/ECD	GC/ECD	5232173	2017/10/26	2017/10/27	Chloe Bramble
PCB Aroclor sum (soil)	CALC	5225466	N/A	2017/10/27	Automated Statchk
VOCs in Soil - Field Preserved	HS/MS	5227759	N/A	2017/10/25	Amanda Swales

Maxxam ID: FJP585
Sample ID: HEL-SOIL-4
Matrix: Soil

Collected: 2017/10/18
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (soil)	CALC	5225630	N/A	2017/11/01	Automated Statchk
Metals Solids Acid Extr. ICPMS	ICP/MS	5234588	2017/10/27	2017/10/27	Bryon Angevine
Moisture	BAL	5229985	N/A	2017/10/25	Jacob Henley
PAH Compounds by GCMS (SIM)	GC/MS	5232260	2017/10/26	2017/10/31	Gina Thompson
PCBs in soil by GC/ECD	GC/ECD	5232173	2017/10/26	2017/10/27	Chloe Bramble
PCB Aroclor sum (soil)	CALC	5225466	N/A	2017/10/27	Automated Statchk

TEST SUMMARY

Maxxam ID: FJP586
Sample ID: SHACK-SOIL-1
Matrix: Soil

Collected: 2017/10/18
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (soil)	CALC	5225630	N/A	2017/10/28	Automated Statchk
Metals Solids Acid Extr. ICPMS	ICP/MS	5227396	2017/10/24	2017/10/25	Bryon Angevine
Moisture	BAL	5226081	N/A	2017/10/24	David Balfour
OC Pesticides (Selected) & PCB	GC/ECD	5235180	2017/10/27	2017/10/30	Mahmudul Khan
OC Pesticides Summed Parameters	CALC	5225632	N/A	2017/10/24	Automated Statchk
GC/MS Analysis of OP Pesticides	GC/MS	5234901	2017/10/27	2017/10/27	May Yin Mak
PAH Compounds by GCMS (SIM)	GC/MS	5229955	2017/10/25	2017/10/28	Gina Thompson
VOCs in Soil - Field Preserved	HS/MS	5227759	N/A	2017/10/25	Amanda Swales

Maxxam ID: FJP587
Sample ID: SHACK-SOIL-2
Matrix: Soil

Collected: 2017/10/18
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (soil)	CALC	5225630	N/A	2017/10/27	Automated Statchk
Metals Solids Acid Extr. ICPMS	ICP/MS	5234588	2017/10/27	2017/10/27	Bryon Angevine
Moisture	BAL	5229985	N/A	2017/10/25	Jacob Henley
PAH Compounds by GCMS (SIM)	GC/MS	5232260	2017/10/26	2017/10/27	Gina Thompson
VOCs in Soil - Field Preserved	HS/MS	5227338	N/A	2017/10/24	Amanda Swales

Maxxam ID: FJP587 Dup
Sample ID: SHACK-SOIL-2
Matrix: Soil

Collected: 2017/10/18
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
PAH Compounds by GCMS (SIM)	GC/MS	5232260	2017/10/26	2017/10/27	Gina Thompson

Maxxam ID: FJP588
Sample ID: SHACK-SOIL-3
Matrix: Soil

Collected: 2017/10/18
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (soil)	CALC	5225630	N/A	2017/11/01	Automated Statchk
Metals Solids Acid Extr. ICPMS	ICP/MS	5234588	2017/10/27	2017/10/27	Bryon Angevine
Moisture	BAL	5229985	N/A	2017/10/25	Jacob Henley
PAH Compounds by GCMS (SIM)	GC/MS	5232260	2017/10/26	2017/10/31	Gina Thompson
VOCs in Soil - Field Preserved	HS/MS	5227338	N/A	2017/10/24	Amanda Swales

Maxxam ID: FJP618
Sample ID: SIEVE 2
Matrix: Soil

Collected: 2017/10/14
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	5229985	N/A	2017/10/25	Jacob Henley
Grain Size - Calculated		5225642	N/A	2017/10/30	Automated Statchk

TEST SUMMARY

Maxxam ID: FJP618 **Collected:** 2017/10/14
Sample ID: SIEVE 2 **Shipped:**
Matrix: Soil **Received:** 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Particle Size (Sieve), Sieve/pan 75um		5237768	N/A	2017/10/30	Brent Boudreau

Maxxam ID: FJP619 **Collected:** 2017/10/14
Sample ID: BG-SOIL-1 **Shipped:**
Matrix: Soil **Received:** 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (soil)	CALC	5225630	N/A	2017/11/01	Automated Statchk
Dioxins/Furans in Soil (EPS 1/RM/23)	HRMS/MS	5292455	2017/11/24	2017/12/01	Cathy Xu
Metals Solids Acid Extr. ICPMS	ICP/MS	5234588	2017/10/27	2017/10/27	Bryon Angevine
Moisture	BAL	5229985	N/A	2017/10/25	Jacob Henley
PAH Compounds by GCMS (SIM)	GC/MS	5232260	2017/10/26	2017/10/31	Gina Thompson
VOCs in Soil - Field Preserved	HS/MS	5227338	N/A	2017/10/24	Amanda Swales

Maxxam ID: FJP620 **Collected:** 2017/10/14
Sample ID: BG-SOIL-2 **Shipped:**
Matrix: Soil **Received:** 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (soil)	CALC	5225630	N/A	2017/11/01	Automated Statchk
Metals Solids Acid Extr. ICPMS	ICP/MS	5234588	2017/10/27	2017/10/27	Bryon Angevine
Moisture	BAL	5229985	N/A	2017/10/25	Jacob Henley
PAH Compounds by GCMS (SIM)	GC/MS	5232260	2017/10/26	2017/10/31	Gina Thompson
VOCs in Soil - Field Preserved	HS/MS	5227338	N/A	2017/10/24	Amanda Swales

Maxxam ID: FJP621 **Collected:** 2017/10/14
Sample ID: BG-SOIL-3 **Shipped:**
Matrix: Soil **Received:** 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (soil)	CALC	5225630	N/A	2017/10/28	Automated Statchk
Dioxins/Furans in Soil (EPS 1/RM/23)	HRMS/MS	5278896	2017/11/15	2017/11/23	Angel Guerrero
Metals Solids Acid Extr. ICPMS	ICP/MS	5227396	2017/10/24	2017/10/25	Bryon Angevine
Moisture	BAL	5226081	N/A	2017/10/24	David Balfour
PAH Compounds by GCMS (SIM)	GC/MS	5229955	2017/10/25	2017/10/28	Gina Thompson
VOCs in Soil - Field Preserved	HS/MS	5227338	N/A	2017/10/24	Amanda Swales

Maxxam ID: FJP622 **Collected:** 2017/10/14
Sample ID: BG-SOIL-4 **Shipped:**
Matrix: Soil **Received:** 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (soil)	CALC	5225630	N/A	2017/11/01	Automated Statchk
Metals Solids Acid Extr. ICPMS	ICP/MS	5234588	2017/10/27	2017/10/27	Bryon Angevine
Moisture	BAL	5229985	N/A	2017/10/25	Jacob Henley

TEST SUMMARY

Maxxam ID: FJP622
Sample ID: BG-SOIL-4
Matrix: Soil

Collected: 2017/10/14
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
PAH Compounds by GCMS (SIM)	GC/MS	5232260	2017/10/26	2017/11/01	Gina Thompson
VOCs in Soil - Field Preserved	HS/MS	5227338	N/A	2017/10/24	Amanda Swales

Maxxam ID: FJP622 Dup
Sample ID: BG-SOIL-4
Matrix: Soil

Collected: 2017/10/14
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
VOCs in Soil - Field Preserved	HS/MS	5227338	N/A	2017/10/24	Amanda Swales

Maxxam ID: FJP623
Sample ID: BG-SOIL-5
Matrix: Soil

Collected: 2017/10/14
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (soil)	CALC	5225630	N/A	2017/11/01	Automated Statchk
Metals Solids Acid Extr. ICPMS	ICP/MS	5234588	2017/10/27	2017/10/27	Bryon Angevine
Moisture	BAL	5229985	N/A	2017/10/25	Jacob Henley
PAH Compounds by GCMS (SIM)	GC/MS	5232260	2017/10/26	2017/11/01	Gina Thompson
VOCs in Soil - Field Preserved	HS/MS	5227338	N/A	2017/10/24	Amanda Swales

Maxxam ID: FJP624
Sample ID: BG-SOIL-6
Matrix: Soil

Collected: 2017/10/14
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (soil)	CALC	5225630	N/A	2017/11/01	Automated Statchk
Metals Solids Acid Extr. ICPMS	ICP/MS	5234500	2017/10/27	2017/10/27	Bryon Angevine
Moisture	BAL	5229985	N/A	2017/10/25	Jacob Henley
PAH Compounds by GCMS (SIM)	GC/MS	5232260	2017/10/26	2017/11/01	Gina Thompson
VOCs in Soil - Field Preserved	HS/MS	5227338	N/A	2017/10/24	Amanda Swales

Maxxam ID: FJP625
Sample ID: BG-SOIL-7
Matrix: Soil

Collected: 2017/10/14
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (soil)	CALC	5225630	N/A	2017/11/01	Automated Statchk
Metals Solids Acid Extr. ICPMS	ICP/MS	5234500	2017/10/27	2017/10/27	Bryon Angevine
Moisture	BAL	5229985	N/A	2017/10/25	Jacob Henley
PAH Compounds by GCMS (SIM)	GC/MS	5232260	2017/10/26	2017/11/01	Gina Thompson
VOCs in Soil - Field Preserved	HS/MS	5227338	N/A	2017/10/24	Amanda Swales

TEST SUMMARY

Maxxam ID: FJP626
Sample ID: BG-SOIL-8
Matrix: Soil

Collected: 2017/10/14
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (soil)	CALC	5225630	N/A	2017/11/01	Automated Statchk
Metals Solids Acid Extr. ICPMS	ICP/MS	5232147	2017/10/26	2017/10/26	Bryon Angevine
Moisture	BAL	5229780	N/A	2017/10/25	Jacob Henley
PAH Compounds by GCMS (SIM)	GC/MS	5232260	2017/10/26	2017/11/01	Gina Thompson
VOCs in Soil - Field Preserved	HS/MS	5227338	N/A	2017/10/24	Amanda Swales

Maxxam ID: FJP626 Dup
Sample ID: BG-SOIL-8
Matrix: Soil

Collected: 2017/10/14
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	5229780	N/A	2017/10/25	Jacob Henley

Maxxam ID: FJP642
Sample ID: BG-SED-1
Matrix: SEDIMENT

Collected: 2017/10/14
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (LL soil)	CALC	5225633	N/A	2017/10/30	Automated Statchk
Metals Solids Acid Extr. ICPMS	ICP/MS	5232147	2017/10/26	2017/10/26	Bryon Angevine
Moisture	BAL	5229780	N/A	2017/10/25	Jacob Henley
PAH in sediment by GC/MS (Low Level)	GC/MS	5234665	2017/10/27	2017/10/29	Gina Thompson
VOCs in Soil - Field Preserved	HS/MS	5227338	N/A	2017/10/24	Amanda Swales

Maxxam ID: FJP642 Dup
Sample ID: BG-SED-1
Matrix: SEDIMENT

Collected: 2017/10/14
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
PAH in sediment by GC/MS (Low Level)	GC/MS	5234665	2017/10/27	2017/10/29	Gina Thompson

Maxxam ID: FJP643
Sample ID: BG-SED-2
Matrix: SEDIMENT

Collected: 2017/10/14
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (LL soil)	CALC	5225633	N/A	2017/10/30	Automated Statchk
Metals Solids Acid Extr. ICPMS	ICP/MS	5232147	2017/10/26	2017/10/26	Bryon Angevine
Moisture	BAL	5229780	N/A	2017/10/25	Jacob Henley
PAH in sediment by GC/MS (Low Level)	GC/MS	5234665	2017/10/27	2017/10/29	Gina Thompson
VOCs in Soil - Field Preserved	HS/MS	5227338	N/A	2017/10/24	Amanda Swales

TEST SUMMARY

Maxxam ID: FJP644
Sample ID: BG-SED-3
Matrix: SEDIMENT

Collected: 2017/10/14
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (LL soil)	CALC	5225633	N/A	2017/10/30	Automated Statchk
Metals Solids Acid Extr. ICPMS	ICP/MS	5232257	2017/10/26	2017/10/26	Bryon Angevine
Moisture	BAL	5229745	N/A	2017/10/25	David Balfour
PAH in sediment by GC/MS (Low Level)	GC/MS	5234665	2017/10/25	2017/10/29	Gina Thompson
VOCs in Soil - Field Preserved	HS/MS	5227338	N/A	2017/10/24	Amanda Swales

Maxxam ID: FJP645
Sample ID: SED-1
Matrix: SEDIMENT

Collected: 2017/10/14
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (LL soil)	CALC	5225633	N/A	2017/10/30	Automated Statchk
Metals Solids Acid Extr. ICPMS	ICP/MS	5232257	2017/10/26	2017/10/26	Bryon Angevine
Moisture	BAL	5229745	N/A	2017/10/25	David Balfour
PAH in sediment by GC/MS (Low Level)	GC/MS	5234665	2017/10/25	2017/10/29	Gina Thompson
PCBs in soil by GC/ECD	GC/ECD	5234764	2017/10/27	2017/10/31	Chloe Bramble
PCB Aroclor sum (soil)	CALC	5225466	N/A	2017/12/06	Automated Statchk
VOCs in Soil - Field Preserved	HS/MS	5227338	N/A	2017/10/24	Amanda Swales

Maxxam ID: FJP646
Sample ID: SED-2
Matrix: SEDIMENT

Collected: 2017/10/14
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (LL soil)	CALC	5225633	N/A	2017/10/30	Automated Statchk
Metals Solids Acid Extr. ICPMS	ICP/MS	5232257	2017/10/26	2017/10/26	Bryon Angevine
Moisture	BAL	5229745	N/A	2017/10/25	David Balfour
PAH in sediment by GC/MS (Low Level)	GC/MS	5234665	2017/10/27	2017/10/29	Gina Thompson
PCBs in soil by GC/ECD	GC/ECD	5234764	2017/10/27	2017/10/31	Chloe Bramble
PCB Aroclor sum (soil)	CALC	5225466	N/A	2017/12/06	Automated Statchk
VOCs in Soil - Field Preserved	HS/MS	5227759	N/A	2017/10/25	Amanda Swales

Maxxam ID: FJP647
Sample ID: SED-3
Matrix: SEDIMENT

Collected: 2017/10/14
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (LL soil)	CALC	5225633	N/A	2017/10/30	Automated Statchk
Metals Solids Acid Extr. ICPMS	ICP/MS	5232257	2017/10/26	2017/10/26	Bryon Angevine
Moisture	BAL	5229745	N/A	2017/10/25	David Balfour
PAH in sediment by GC/MS (Low Level)	GC/MS	5234665	2017/10/27	2017/10/29	Gina Thompson
PCBs in soil by GC/ECD	GC/ECD	5234764	2017/10/27	2017/10/31	Chloe Bramble
PCB Aroclor sum (soil)	CALC	5225466	N/A	2017/12/06	Automated Statchk
VOCs in Soil - Field Preserved	HS/MS	5227759	N/A	2017/10/25	Amanda Swales

TEST SUMMARY

Maxxam ID: FJP647 Dup
Sample ID: SED-3
Matrix: SEDIMENT

Collected: 2017/10/14
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
VOCs in Soil - Field Preserved	HS/MS	5227759	N/A	2017/10/25	Amanda Swales

Maxxam ID: FJP648
Sample ID: WSUPPLY-SED-1
Matrix: SEDIMENT

Collected: 2017/10/14
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (LL soil)	CALC	5225633	N/A	2017/10/30	Automated Statchk
Metals Solids Acid Extr. ICPMS	ICP/MS	5232257	2017/10/26	2017/10/26	Bryon Angevine
Moisture	BAL	5229745	N/A	2017/10/25	David Balfour
PAH in sediment by GC/MS (Low Level)	GC/MS	5234665	2017/10/27	2017/10/29	Gina Thompson
PCBs in soil by GC/ECD	GC/ECD	5234764	2017/10/27	2017/10/31	Chloe Bramble
PCB Aroclor sum (soil)	CALC	5225466	N/A	2017/12/06	Automated Statchk
VOCs in Soil - Field Preserved	HS/MS	5227759	N/A	2017/10/25	Amanda Swales

Maxxam ID: FJP649
Sample ID: WSUPPLY-SED-2
Matrix: SEDIMENT

Collected: 2017/10/14
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (LL soil)	CALC	5225633	N/A	2017/10/30	Automated Statchk
Metals Solids Acid Extr. ICPMS	ICP/MS	5232257	2017/10/26	2017/10/26	Bryon Angevine
Moisture	BAL	5229745	N/A	2017/10/25	David Balfour
PAH in sediment by GC/MS (Low Level)	GC/MS	5234665	2017/10/27	2017/10/29	Gina Thompson
PCBs in soil by GC/ECD	GC/ECD	5234764	2017/10/27	2017/10/31	Chloe Bramble
PCB Aroclor sum (soil)	CALC	5225637	N/A	2017/12/06	Automated Statchk
VOCs in Soil - Field Preserved	HS/MS	5227759	N/A	2017/10/25	Amanda Swales

Maxxam ID: FJP650
Sample ID: WSUPPLY-SED-3
Matrix: SEDIMENT

Collected: 2017/10/14
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (LL soil)	CALC	5225633	N/A	2017/10/30	Automated Statchk
Metals Solids Acid Extr. ICPMS	ICP/MS	5232257	2017/10/26	2017/10/26	Bryon Angevine
Moisture	BAL	5229745	N/A	2017/10/25	David Balfour
PAH in sediment by GC/MS (Low Level)	GC/MS	5234665	2017/10/27	2017/10/29	Gina Thompson
PCBs in soil by GC/ECD	GC/ECD	5234764	2017/10/27	2017/10/31	Chloe Bramble
PCB Aroclor sum (soil)	CALC	5225637	N/A	2017/12/06	Automated Statchk
VOCs in Soil - Field Preserved	HS/MS	5227759	N/A	2017/10/25	Amanda Swales

TEST SUMMARY

Maxxam ID: FJP681
Sample ID: LPUMP-SOIL-2
Matrix: Soil

Collected: 2017/10/17
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (soil)	CALC	5225630	N/A	2017/11/01	Automated Statchk
Metals Solids Acid Extr. ICPMS	ICP/MS	5232257	2017/10/26	2017/10/26	Bryon Angevine
Moisture	BAL	5229745	N/A	2017/10/25	David Balfour
PAH Compounds by GCMS (SIM)	GC/MS	5232260	2017/10/26	2017/11/01	Gina Thompson
VOCs in Soil - Field Preserved	HS/MS	5227759	N/A	2017/10/25	Amanda Swales

Maxxam ID: FJP682
Sample ID: LPUMP-SOIL-3
Matrix: Soil

Collected: 2017/10/17
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (soil)	CALC	5225631	N/A	2017/11/01	Automated Statchk
Metals Solids Acid Extr. ICPMS	ICP/MS	5232257	2017/10/26	2017/10/26	Bryon Angevine
Moisture	BAL	5229745	N/A	2017/10/25	David Balfour
PAH Compounds by GCMS (SIM)	GC/MS	5232260	2017/10/26	2017/11/01	Gina Thompson
VOCs in Soil - Field Preserved	HS/MS	5227759	N/A	2017/10/25	Amanda Swales

Maxxam ID: FJP682 Dup
Sample ID: LPUMP-SOIL-3
Matrix: Soil

Collected: 2017/10/17
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	5232257	2017/10/26	2017/10/26	Bryon Angevine

Maxxam ID: FJP682 Dup2
Sample ID: LPUMP-SOIL-3
Matrix: Soil

Collected: 2017/10/17
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	5232257	2017/11/01	2017/11/01	Bryon Angevine

Maxxam ID: FJP683
Sample ID: LPUMP-SOIL-1
Matrix: Soil

Collected: 2017/10/17
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (soil)	CALC	5225631	N/A	2017/11/01	Automated Statchk
Metals Solids Acid Extr. ICPMS	ICP/MS	5232257	2017/10/26	2017/10/26	Bryon Angevine
Moisture	BAL	5229745	N/A	2017/10/25	David Balfour
PAH Compounds by GCMS (SIM)	GC/MS	5232260	2017/10/26	2017/11/01	Gina Thompson
VOCs in Soil - Field Preserved	HS/MS	5227759	N/A	2017/10/25	Amanda Swales

TEST SUMMARY

Maxxam ID: FJP684
Sample ID: PIPELINE-SOIL-3
Matrix: Soil

Collected: 2017/10/17
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (soil)	CALC	5225631	N/A	2017/11/01	Automated Statchk
Moisture	BAL	5229745	N/A	2017/10/25	David Balfour
PAH Compounds by GCMS (SIM)	GC/MS	5232260	2017/10/26	2017/11/01	Gina Thompson

Maxxam ID: FJP685
Sample ID: LPUMP-SOIL-4
Matrix: Soil

Collected: 2017/10/17
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (soil)	CALC	5225631	N/A	2017/11/01	Automated Statchk
Metals Solids Acid Extr. ICPMS	ICP/MS	5232257	2017/10/26	2017/10/26	Bryon Angevine
Moisture	BAL	5229745	N/A	2017/10/25	David Balfour
PAH Compounds by GCMS (SIM)	GC/MS	5232260	2017/10/26	2017/11/01	Gina Thompson
VOCs in Soil - Field Preserved	HS/MS	5227759	N/A	2017/10/25	Amanda Swales

Maxxam ID: FJP686
Sample ID: UPUMP-SOIL-1
Matrix: Soil

Collected: 2017/10/17
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (soil)	CALC	5225631	N/A	2017/11/01	Automated Statchk
Metals Solids Acid Extr. ICPMS	ICP/MS	5232257	2017/10/26	2017/10/26	Bryon Angevine
Moisture	BAL	5229745	N/A	2017/10/25	David Balfour
PAH Compounds by GCMS (SIM)	GC/MS	5232260	2017/10/26	2017/11/01	Gina Thompson
VOCs in Soil - Field Preserved	HS/MS	5227759	N/A	2017/10/25	Amanda Swales

Maxxam ID: FJP687
Sample ID: UPUMP-SOIL-2
Matrix: Soil

Collected: 2017/10/17
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (soil)	CALC	5225631	N/A	2017/10/30	Automated Statchk
Metals Solids Acid Extr. ICPMS	ICP/MS	5232257	2017/10/26	2017/10/26	Bryon Angevine
Moisture	BAL	5229745	N/A	2017/10/25	David Balfour
PAH Compounds by GCMS (SIM)	GC/MS	5234534	2017/10/26	2017/10/29	Gina Thompson
VOCs in Soil - Field Preserved	HS/MS	5229883	N/A	2017/10/26	Amanda Swales

Maxxam ID: FJP688
Sample ID: UPUMP-SOIL-3
Matrix: Soil

Collected: 2017/10/17
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (soil)	CALC	5225631	N/A	2017/10/30	Automated Statchk
Metals Solids Acid Extr. ICPMS	ICP/MS	5232257	2017/10/26	2017/10/26	Bryon Angevine
Moisture	BAL	5229745	N/A	2017/10/25	David Balfour

TEST SUMMARY

Maxxam ID: FJP688
Sample ID: UPUMP-SOIL-3
Matrix: Soil

Collected: 2017/10/17
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
PAH Compounds by GCMS (SIM)	GC/MS	5234534	2017/10/26	2017/10/29	Gina Thompson
VOCs in Soil - Field Preserved	HS/MS	5229883	N/A	2017/10/26	Amanda Swales

Maxxam ID: FJP689
Sample ID: UPUMP-SOIL-4
Matrix: Soil

Collected: 2017/10/17
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	5229745	N/A	2017/10/25	David Balfour
VOCs in Soil - Field Preserved	HS/MS	5229883	N/A	2017/10/26	Amanda Swales

Maxxam ID: FJP690
Sample ID: PIPELINE-SOIL-5
Matrix: Soil

Collected: 2017/10/17
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (soil)	CALC	5225631	N/A	2017/10/30	Automated Statchk
Moisture	BAL	5229745	N/A	2017/10/25	David Balfour
PAH Compounds by GCMS (SIM)	GC/MS	5234534	2017/10/27	2017/10/29	Gina Thompson

Maxxam ID: FJP690 Dup
Sample ID: PIPELINE-SOIL-5
Matrix: Soil

Collected: 2017/10/17
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	5229745	N/A	2017/10/25	David Balfour

Maxxam ID: FJP691
Sample ID: UPUMP-SOIL-5
Matrix: Soil

Collected: 2017/10/17
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (soil)	CALC	5225631	N/A	2017/10/30	Automated Statchk
Metals Solids Acid Extr. ICPMS	ICP/MS	5232147	2017/10/26	2017/10/26	Bryon Angevine
Moisture	BAL	5229745	N/A	2017/10/25	David Balfour
PAH Compounds by GCMS (SIM)	GC/MS	5234534	2017/10/27	2017/10/29	Gina Thompson
VOCs in Soil - Field Preserved	HS/MS	5229883	N/A	2017/10/26	Amanda Swales

Maxxam ID: FJP692
Sample ID: PIPELINE-SOIL-1
Matrix: Soil

Collected: 2017/10/18
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (soil)	CALC	5225631	N/A	2017/10/30	Automated Statchk
Moisture	BAL	5229780	N/A	2017/10/25	Jacob Henley

TEST SUMMARY

Maxxam ID: FJP692
Sample ID: PIPELINE-SOIL-1
Matrix: Soil

Collected: 2017/10/18
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
PAH Compounds by GCMS (SIM)	GC/MS	5234534	2017/10/27	2017/10/29	Gina Thompson

Maxxam ID: FJP693
Sample ID: PIPELINE-SOIL-2
Matrix: Soil

Collected: 2017/10/18
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (soil)	CALC	5225631	N/A	2017/10/30	Automated Statchk
Moisture	BAL	5229745	N/A	2017/10/25	David Balfour
PAH Compounds by GCMS (SIM)	GC/MS	5234534	2017/10/27	2017/10/29	Gina Thompson

Maxxam ID: FJP694
Sample ID: PIPELINE-SOIL-4
Matrix: Soil

Collected: 2017/10/18
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (soil)	CALC	5225631	N/A	2017/10/30	Automated Statchk
Moisture	BAL	5229780	N/A	2017/10/25	Jacob Henley
PAH Compounds by GCMS (SIM)	GC/MS	5234534	2017/10/27	2017/10/29	Gina Thompson

Maxxam ID: FJP694 Dup
Sample ID: PIPELINE-SOIL-4
Matrix: Soil

Collected: 2017/10/18
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
PAH Compounds by GCMS (SIM)	GC/MS	5234534	2017/10/27	2017/10/29	Gina Thompson

Maxxam ID: FJP705
Sample ID: SHACK-SOIL-4
Matrix: Soil

Collected: 2017/10/13
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (soil)	CALC	5225631	N/A	2017/10/30	Automated Statchk
Metals Solids Acid Extr. ICPMS	ICP/MS	5232147	2017/10/26	2017/10/26	Bryon Angevine
Moisture	BAL	5229780	N/A	2017/10/25	Jacob Henley
PAH Compounds by GCMS (SIM)	GC/MS	5234534	2017/10/27	2017/10/29	Gina Thompson

Maxxam ID: FJP706
Sample ID: RADOME-SOIL-1
Matrix: Soil

Collected: 2017/10/13
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	5232147	2017/10/26	2017/10/26	Bryon Angevine
Moisture	BAL	5229780	N/A	2017/10/25	Jacob Henley
PCBs in soil by GC/ECD	GC/ECD	5234764	2017/10/27	2017/10/31	Chloe Bramble

TEST SUMMARY

Maxxam ID: FJP706
Sample ID: RADOME-SOIL-1
Matrix: Soil

Collected: 2017/10/13
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
PCB Aroclor sum (soil)	CALC	5225637	N/A	2017/10/31	Automated Statchk
VOCs in Soil - Field Preserved	HS/MS	5229883	N/A	2017/10/26	Amanda Swales

Maxxam ID: FJP707
Sample ID: RADOME-SOIL-2
Matrix: Soil

Collected: 2017/10/13
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	5232147	2017/10/26	2017/10/26	Bryon Angevine
Moisture	BAL	5229780	N/A	2017/10/25	Jacob Henley
PCBs in soil by GC/ECD	GC/ECD	5234764	2017/10/27	2017/10/31	Chloe Bramble
PCB Aroclor sum (soil)	CALC	5225637	N/A	2017/10/31	Automated Statchk
VOCs in Soil - Field Preserved	HS/MS	5229883	N/A	2017/10/26	Amanda Swales

Maxxam ID: FJP707 Dup
Sample ID: RADOME-SOIL-2
Matrix: Soil

Collected: 2017/10/13
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
VOCs in Soil - Field Preserved	HS/MS	5229883	N/A	2017/10/26	Amanda Swales

Maxxam ID: FJP708
Sample ID: RADOME-SOIL-3
Matrix: Soil

Collected: 2017/10/13
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	5232147	2017/10/26	2017/10/26	Bryon Angevine
Moisture	BAL	5229780	N/A	2017/10/25	Jacob Henley
PCBs in soil by GC/ECD	GC/ECD	5234526	2017/10/27	2017/10/27	Chloe Bramble
PCB Aroclor sum (soil)	CALC	5225637	N/A	2017/10/27	Automated Statchk
VOCs in Soil - Field Preserved	HS/MS	5229883	N/A	2017/10/26	Amanda Swales

Maxxam ID: FJP708 Dup
Sample ID: RADOME-SOIL-3
Matrix: Soil

Collected: 2017/10/13
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
PCBs in soil by GC/ECD	GC/ECD	5234526	2017/10/27	2017/10/27	Chloe Bramble

Maxxam ID: FJP709
Sample ID: TOWER-SOIL-1
Matrix: Soil

Collected: 2017/10/13
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	5232111	2017/10/26	2017/10/26	Bryon Angevine

TEST SUMMARY

Maxxam ID: FJP709
Sample ID: TOWER-SOIL-1
Matrix: Soil

Collected: 2017/10/13
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	5229780	N/A	2017/10/25	Jacob Henley
PCBs in soil by GC/ECD	GC/ECD	5234764	2017/10/27	2017/10/31	Chloe Bramble
PCB Aroclor sum (soil)	CALC	5225637	N/A	2017/10/31	Automated Statchk
VOCs in Soil - Field Preserved	HS/MS	5229883	N/A	2017/10/26	Amanda Swales

Maxxam ID: FJP709 Dup
Sample ID: TOWER-SOIL-1
Matrix: Soil

Collected: 2017/10/13
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	5232111	2017/10/26	2017/10/26	Bryon Angevine

Maxxam ID: FJP710
Sample ID: TOWER-SOIL-2
Matrix: Soil

Collected: 2017/10/13
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	5232147	2017/10/26	2017/10/26	Bryon Angevine
Moisture	BAL	5229780	N/A	2017/10/25	Jacob Henley
PCBs in soil by GC/ECD	GC/ECD	5234764	2017/10/27	2017/10/31	Chloe Bramble
PCB Aroclor sum (soil)	CALC	5225637	N/A	2017/10/31	Automated Statchk
VOCs in Soil - Field Preserved	HS/MS	5229883	N/A	2017/10/26	Amanda Swales

Maxxam ID: FJP711
Sample ID: TOWER-SOIL-3
Matrix: Soil

Collected: 2017/10/13
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	5232147	2017/10/26	2017/10/26	Bryon Angevine
Moisture	BAL	5229780	N/A	2017/10/25	Jacob Henley
PCBs in soil by GC/ECD	GC/ECD	5234764	2017/10/27	2017/10/31	Chloe Bramble
PCB Aroclor sum (soil)	CALC	5225637	N/A	2017/10/31	Automated Statchk
VOCs in Soil - Field Preserved	HS/MS	5229883	N/A	2017/10/26	Amanda Swales

Maxxam ID: FJP712
Sample ID: TOWER-SOIL-4
Matrix: Soil

Collected: 2017/10/13
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	5232147	2017/10/26	2017/10/26	Bryon Angevine
Moisture	BAL	5229780	N/A	2017/10/25	Jacob Henley
PCBs in soil by GC/ECD	GC/ECD	5234764	2017/10/27	2017/10/31	Chloe Bramble
PCB Aroclor sum (soil)	CALC	5225637	N/A	2017/10/31	Automated Statchk
VOCs in Soil - Field Preserved	HS/MS	5229883	N/A	2017/10/26	Amanda Swales

TEST SUMMARY

Maxxam ID: FJP712 Dup
Sample ID: TOWER-SOIL-4
Matrix: Soil

Collected: 2017/10/13
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Metals Solids Acid Extr. ICPMS	ICP/MS	5232147	2017/10/26	2017/10/26	Bryon Angevine

Maxxam ID: FJP713
Sample ID: LAST-SOIL-1
Matrix: Soil

Collected: 2017/10/15
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (soil)	CALC	5225631	N/A	2017/10/30	Automated Statchk
Moisture	BAL	5229780	N/A	2017/10/25	Jacob Henley
PAH Compounds by GCMS (SIM)	GC/MS	5234534	2017/10/27	2017/10/29	Gina Thompson

Maxxam ID: FJP714
Sample ID: LAST-SOIL-2
Matrix: Soil

Collected: 2017/10/15
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (soil)	CALC	5225631	N/A	2017/10/30	Automated Statchk
Moisture	BAL	5229780	N/A	2017/10/25	Jacob Henley
PAH Compounds by GCMS (SIM)	GC/MS	5234534	2017/10/27	2017/10/29	Gina Thompson

Maxxam ID: FJP715
Sample ID: LAST-SOIL-3
Matrix: Soil

Collected: 2017/10/15
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (soil)	CALC	5225631	N/A	2017/10/30	Automated Statchk
Moisture	BAL	5229780	N/A	2017/10/25	Jacob Henley
PAH Compounds by GCMS (SIM)	GC/MS	5234534	2017/10/27	2017/10/29	Gina Thompson
Grain Size - Calculated		5225642	N/A	2017/10/30	Automated Statchk
Particle Size (Sieve), Sieve/pan 75um		5237768	N/A	2017/10/30	Brent Boudreau

Maxxam ID: FJP716
Sample ID: LAST-SOIL-4
Matrix: Soil

Collected: 2017/10/15
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (soil)	CALC	5225631	N/A	2017/10/30	Automated Statchk
Moisture	BAL	5229780	N/A	2017/10/25	Jacob Henley
PAH Compounds by GCMS (SIM)	GC/MS	5234534	2017/10/27	2017/10/29	Gina Thompson

TEST SUMMARY

Maxxam ID: FJP717
Sample ID: DRUM-SOIL-1
Matrix: Soil

Collected: 2017/10/15
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (soil)	CALC	5225631	N/A	2017/10/30	Automated Statchk
Metals Solids Acid Extr. ICPMS	ICP/MS	5232147	2017/10/26	2017/10/26	Bryon Angevine
Moisture	BAL	5229780	N/A	2017/10/25	Jacob Henley
PAH Compounds by GCMS (SIM)	GC/MS	5234534	2017/10/27	2017/10/29	Gina Thompson

Maxxam ID: FJP718
Sample ID: DRUM-SOIL-2
Matrix: Soil

Collected: 2017/10/15
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (soil)	CALC	5225631	N/A	2017/10/30	Automated Statchk
Metals Solids Acid Extr. ICPMS	ICP/MS	5232147	2017/10/26	2017/10/26	Bryon Angevine
Moisture	BAL	5229780	N/A	2017/10/25	Jacob Henley
PAH Compounds by GCMS (SIM)	GC/MS	5234534	2017/10/27	2017/10/29	Gina Thompson

Maxxam ID: FJP719
Sample ID: DRUM-SOIL-3
Matrix: Soil

Collected: 2017/10/15
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (soil)	CALC	5225631	N/A	2017/10/30	Automated Statchk
Metals Solids Acid Extr. ICPMS	ICP/MS	5232257	2017/10/26	2017/10/26	Bryon Angevine
Moisture	BAL	5229780	N/A	2017/10/25	Jacob Henley
PAH Compounds by GCMS (SIM)	GC/MS	5234534	2017/10/27	2017/10/29	Gina Thompson

Maxxam ID: FJP720
Sample ID: UAST-GW-1
Matrix: Ground Water

Collected: 2017/10/14
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Benzo(b/j)fluoranthene Sum (water)	CALC	5225634	N/A	2017/10/31	Automated Statchk
Petroleum Hydro. CCME F1 & BTEX in Water	HSGC/MSFD	5235711	N/A	2017/10/27	Haibin Wu
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	5235390	2017/10/27	2017/10/28	Zhiyue (Frank) Zhu
PAH (FWAL) in Water (A/Q) by GC/MS (SIM)	GC/MS	5232295	2017/10/23	2017/10/28	Gina Thompson

Maxxam ID: FJP758
Sample ID: SIEVE
Matrix: Soil

Collected: 2017/10/18
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	5234745	N/A	2017/10/27	David Balfour
Grain Size - Calculated		5232494	N/A	2017/11/01	Automated Statchk
Particle Size (Sieve), Sieve/pan 75um		5239637	N/A	2017/11/01	Brent Boudreau

TEST SUMMARY

Maxxam ID: FJP758 Dup
Sample ID: SIEVE
Matrix: Soil

Collected: 2017/10/18
Shipped:
Received: 2017/10/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	5234745	N/A	2017/10/27	David Balfour

GENERAL COMMENTS

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

Package 1	8.5°C

Sample UAST-GW-1 analyzed past the recommended hold time due to lab error.

Revised Report: PCB RDLs lowered to 0.03ug/g for samples SED-1, SED-2, SED-3, WSUPPLY-SED-1, WSUPPLY-SED-2 and WSUPPLY-SED-3 as per request from Jason. HWS Dec 6/17

Revised Report: Change sample IDs that contain LPUMP to UPUMP and change sample IDs that contain UPUMP to LPUMP as requested by Jason Green. SMS 2018/03/29

Sample FJP581 [HANGER-SOIL-4] : OC Pesticide Analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.

Results relate only to the items tested.

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
5226049	ASL	Matrix Spike	4-Bromofluorobenzene	2017/10/25		101	%	60 - 140
			D10-o-Xylene	2017/10/25		95 (1)	%	60 - 130
			D4-1,2-Dichloroethane	2017/10/25		101	%	60 - 140
			D8-Toluene	2017/10/25		97	%	60 - 140
			1,1,1-Trichloroethane	2017/10/25		108	%	60 - 140
			1,1,2,2-Tetrachloroethane	2017/10/25		105	%	60 - 140
			1,1,2-Trichloroethane	2017/10/25		105	%	60 - 140
			1,1-Dichloroethane	2017/10/25		110	%	60 - 140
			1,1-Dichloroethylene	2017/10/25		103	%	60 - 140
			1,2-Dichlorobenzene	2017/10/25		93	%	60 - 140
			1,2-Dichloroethane	2017/10/25		101	%	60 - 140
			1,2-Dichloropropane	2017/10/25		102	%	60 - 140
			1,3-Dichlorobenzene	2017/10/25		94	%	60 - 140
			1,4-Dichlorobenzene	2017/10/25		92	%	60 - 140
			Benzene	2017/10/25		102	%	60 - 140
			Bromodichloromethane	2017/10/25		106	%	60 - 140
			Bromoform	2017/10/25		107	%	60 - 140
			Bromomethane	2017/10/25		92	%	60 - 140
			Carbon Tetrachloride	2017/10/25		107	%	60 - 140
			Chlorobenzene	2017/10/25		99	%	60 - 140
			Chloroethane	2017/10/25		92	%	60 - 140
			Chloroform	2017/10/25		99	%	60 - 140
			cis-1,2-Dichloroethylene	2017/10/25		110	%	60 - 140
			cis-1,3-Dichloropropene	2017/10/25		100	%	60 - 140
			Dibromochloromethane	2017/10/25		107	%	60 - 140
			Ethylbenzene	2017/10/25		97	%	60 - 140
			Ethylene Dibromide	2017/10/25		103	%	60 - 140
			Methyl t-butyl ether (MTBE)	2017/10/25		98	%	60 - 140
			Methylene Chloride(Dichloromethane)	2017/10/25		111	%	60 - 140
			o-Xylene	2017/10/25		99	%	60 - 140
			p+m-Xylene	2017/10/25		97	%	60 - 140
			Styrene	2017/10/25		84	%	60 - 140
			Tetrachloroethylene	2017/10/25		109	%	60 - 140
			Toluene	2017/10/25		100	%	60 - 140
			trans-1,2-Dichloroethylene	2017/10/25		108	%	60 - 140
			trans-1,3-Dichloropropene	2017/10/25		88	%	60 - 140
			Trichloroethylene	2017/10/25		108	%	60 - 140
			Trichlorofluoromethane (FREON 11)	2017/10/25		90	%	60 - 140
			Vinyl Chloride	2017/10/25		95	%	60 - 140
5226049	ASL	Spiked Blank	4-Bromofluorobenzene	2017/10/25		102	%	60 - 140
			D10-o-Xylene	2017/10/25		102	%	60 - 130
			D4-1,2-Dichloroethane	2017/10/25		98	%	60 - 140
			D8-Toluene	2017/10/25		98	%	60 - 140
			1,1,1-Trichloroethane	2017/10/25		114	%	60 - 130
			1,1,2,2-Tetrachloroethane	2017/10/25		105	%	60 - 130
			1,1,2-Trichloroethane	2017/10/25		106	%	60 - 130
			1,1-Dichloroethane	2017/10/25		114	%	60 - 130
			1,1-Dichloroethylene	2017/10/25		114	%	60 - 130
			1,2-Dichlorobenzene	2017/10/25		97	%	60 - 130
			1,2-Dichloroethane	2017/10/25		103	%	60 - 130
			1,2-Dichloropropane	2017/10/25		105	%	60 - 130
			1,3-Dichlorobenzene	2017/10/25		100	%	60 - 130

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			1,4-Dichlorobenzene	2017/10/25		98	%	60 - 130
			Benzene	2017/10/25		107	%	60 - 130
			Bromodichloromethane	2017/10/25		108	%	60 - 130
			Bromoform	2017/10/25		109	%	60 - 130
			Bromomethane	2017/10/25		104	%	60 - 140
			Carbon Tetrachloride	2017/10/25		114	%	60 - 130
			Chlorobenzene	2017/10/25		104	%	60 - 130
			Chloroethane	2017/10/25		100	%	60 - 140
			Chloroform	2017/10/25		101	%	60 - 130
			cis-1,2-Dichloroethylene	2017/10/25		114	%	60 - 130
			cis-1,3-Dichloropropene	2017/10/25		108	%	60 - 130
			Dibromochloromethane	2017/10/25		109	%	60 - 130
			Ethylbenzene	2017/10/25		105	%	60 - 130
			Ethylene Dibromide	2017/10/25		105	%	60 - 130
			Methyl t-butyl ether (MTBE)	2017/10/25		102	%	60 - 130
			Methylene Chloride(Dichloromethane)	2017/10/25		115	%	60 - 130
			o-Xylene	2017/10/25		108	%	60 - 130
			p+m-Xylene	2017/10/25		106	%	60 - 130
			Styrene	2017/10/25		104	%	60 - 130
			Tetrachloroethylene	2017/10/25		117	%	60 - 130
			Toluene	2017/10/25		107	%	60 - 130
			trans-1,2-Dichloroethylene	2017/10/25		115	%	60 - 130
			trans-1,3-Dichloropropene	2017/10/25		94	%	60 - 130
			Trichloroethylene	2017/10/25		115	%	60 - 130
			Trichlorofluoromethane (FREON 11)	2017/10/25		105	%	60 - 140
			Vinyl Chloride	2017/10/25		109	%	60 - 140
5226049	ASL	Method Blank	4-Bromofluorobenzene	2017/10/25		100	%	60 - 140
			D10-o-Xylene	2017/10/25		96	%	60 - 130
			D4-1,2-Dichloroethane	2017/10/25		97	%	60 - 140
			D8-Toluene	2017/10/25		97	%	60 - 140
			1,1,1-Trichloroethane	2017/10/25	<25		ug/kg	
			1,1,2,2-Tetrachloroethane	2017/10/25	<25		ug/kg	
			1,1,2-Trichloroethane	2017/10/25	<25		ug/kg	
			1,1-Dichloroethane	2017/10/25	<25		ug/kg	
			1,1-Dichloroethylene	2017/10/25	<25		ug/kg	
			1,2-Dichlorobenzene	2017/10/25	<25		ug/kg	
			1,2-Dichloroethane	2017/10/25	<25		ug/kg	
			1,2-Dichloropropane	2017/10/25	<25		ug/kg	
			1,3-Dichlorobenzene	2017/10/25	<25		ug/kg	
			1,4-Dichlorobenzene	2017/10/25	<25		ug/kg	
			Benzene	2017/10/25	<25		ug/kg	
			Bromodichloromethane	2017/10/25	<25		ug/kg	
			Bromoform	2017/10/25	<25		ug/kg	
			Bromomethane	2017/10/25	<50		ug/kg	
			Carbon Tetrachloride	2017/10/25	<25		ug/kg	
			Chlorobenzene	2017/10/25	<25		ug/kg	
			Chloroethane	2017/10/25	<200		ug/kg	
			Chloroform	2017/10/25	<25		ug/kg	
			cis-1,2-Dichloroethylene	2017/10/25	<25		ug/kg	
			cis-1,3-Dichloropropene	2017/10/25	<25		ug/kg	
			Dibromochloromethane	2017/10/25	<25		ug/kg	
			Ethylbenzene	2017/10/25	<25		ug/kg	

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Ethylene Dibromide	2017/10/25	<25		ug/kg	
			Methyl t-butyl ether (MTBE)	2017/10/25	<25		ug/kg	
			Methylene Chloride(Dichloromethane)	2017/10/25	<25		ug/kg	
			o-Xylene	2017/10/25	<25		ug/kg	
			p+m-Xylene	2017/10/25	<25		ug/kg	
			Styrene	2017/10/25	<25		ug/kg	
			Tetrachloroethylene	2017/10/25	<25		ug/kg	
			Toluene	2017/10/25	<25		ug/kg	
			Total Xylenes	2017/10/25	<50		ug/kg	
			trans-1,2-Dichloroethylene	2017/10/25	<25		ug/kg	
			trans-1,3-Dichloropropene	2017/10/25	<25		ug/kg	
			Trichloroethylene	2017/10/25	<10		ug/kg	
			Trichlorofluoromethane (FREON 11)	2017/10/25	<25		ug/kg	
			Vinyl Chloride	2017/10/25	<20		ug/kg	
5226049	ASL	RPD - Sample/Sample Dup	1,1,1-Trichloroethane	2017/10/25	NC		%	50
			1,1,2,2-Tetrachloroethane	2017/10/25	NC		%	50
			1,1,2-Trichloroethane	2017/10/25	NC		%	50
			1,1-Dichloroethane	2017/10/25	NC		%	50
			1,1-Dichloroethylene	2017/10/25	NC		%	50
			1,2-Dichlorobenzene	2017/10/25	NC		%	50
			1,2-Dichloroethane	2017/10/25	NC		%	50
			1,2-Dichloropropane	2017/10/25	NC		%	50
			1,3-Dichlorobenzene	2017/10/25	NC		%	50
			1,4-Dichlorobenzene	2017/10/25	NC		%	50
			Benzene	2017/10/25	NC		%	50
			Bromodichloromethane	2017/10/25	NC		%	50
			Bromoform	2017/10/25	NC		%	50
			Bromomethane	2017/10/25	NC		%	50
			Carbon Tetrachloride	2017/10/25	NC		%	50
			Chlorobenzene	2017/10/25	NC		%	50
			Chloroethane	2017/10/25	NC		%	50
			Chloroform	2017/10/25	NC		%	50
			cis-1,2-Dichloroethylene	2017/10/25	NC		%	50
			cis-1,3-Dichloropropene	2017/10/25	NC		%	50
			Dibromochloromethane	2017/10/25	NC		%	50
			Ethylbenzene	2017/10/25	NC		%	50
			Ethylene Dibromide	2017/10/25	NC		%	50
			Methyl t-butyl ether (MTBE)	2017/10/25	NC		%	50
			Methylene Chloride(Dichloromethane)	2017/10/25	NC		%	50
			o-Xylene	2017/10/25	NC		%	50
			p+m-Xylene	2017/10/25	NC		%	50
			Styrene	2017/10/25	NC		%	50
			Tetrachloroethylene	2017/10/25	NC		%	50
			Toluene	2017/10/25	NC		%	50
			Total Xylenes	2017/10/25	NC		%	50
			trans-1,2-Dichloroethylene	2017/10/25	NC		%	50
			trans-1,3-Dichloropropene	2017/10/25	NC		%	50
			Trichloroethylene	2017/10/25	NC		%	50
			Trichlorofluoromethane (FREON 11)	2017/10/25	NC		%	50
			Vinyl Chloride	2017/10/25	NC		%	50
5226081	DBF	RPD - Sample/Sample Dup	Moisture	2017/10/24	3.9		%	25
5227338	ASL	Matrix Spike(FJP622)	4-Bromofluorobenzene	2017/10/24		100	%	60 - 140

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			D10-o-Xylene	2017/10/24		93	%	60 - 130
			D4-1,2-Dichloroethane	2017/10/24		99	%	60 - 140
			D8-Toluene	2017/10/24		102	%	60 - 140
			1,1,1-Trichloroethane	2017/10/24		100	%	60 - 140
			1,1,2,2-Tetrachloroethane	2017/10/24		88	%	60 - 140
			1,1,2-Trichloroethane	2017/10/24		93	%	60 - 140
			1,1-Dichloroethane	2017/10/24		101	%	60 - 140
			1,1-Dichloroethylene	2017/10/24		100	%	60 - 140
			1,2-Dichlorobenzene	2017/10/24		81	%	60 - 140
			1,2-Dichloroethane	2017/10/24		95	%	60 - 140
			1,2-Dichloropropane	2017/10/24		93	%	60 - 140
			1,3-Dichlorobenzene	2017/10/24		83	%	60 - 140
			1,4-Dichlorobenzene	2017/10/24		82	%	60 - 140
			Benzene	2017/10/24		95	%	60 - 140
			Bromodichloromethane	2017/10/24		97	%	60 - 140
			Bromoform	2017/10/24		89	%	60 - 140
			Bromomethane	2017/10/24		92	%	60 - 140
			Carbon Tetrachloride	2017/10/24		98	%	60 - 140
			Chlorobenzene	2017/10/24		92	%	60 - 140
			Chloroethane	2017/10/24		88	%	60 - 140
			Chloroform	2017/10/24		91	%	60 - 140
			cis-1,2-Dichloroethylene	2017/10/24		100	%	60 - 140
			cis-1,3-Dichloropropene	2017/10/24		98	%	60 - 140
			Dibromochloromethane	2017/10/24		94	%	60 - 140
			Ethylbenzene	2017/10/24		98	%	60 - 140
			Ethylene Dibromide	2017/10/24		89	%	60 - 140
			Methyl t-butyl ether (MTBE)	2017/10/24		115	%	60 - 140
			Methylene Chloride(Dichloromethane)	2017/10/24		95	%	60 - 140
			o-Xylene	2017/10/24		96	%	60 - 140
			p+m-Xylene	2017/10/24		96	%	60 - 140
			Styrene	2017/10/24		95	%	60 - 140
			Tetrachloroethylene	2017/10/24		96	%	60 - 140
			Toluene	2017/10/24		99	%	60 - 140
			trans-1,2-Dichloroethylene	2017/10/24		99	%	60 - 140
			trans-1,3-Dichloropropene	2017/10/24		86	%	60 - 140
			Trichloroethylene	2017/10/24		99	%	60 - 140
			Trichlorofluoromethane (FREON 11)	2017/10/24		86	%	60 - 140
			Vinyl Chloride	2017/10/24		91	%	60 - 140
5227338	ASL	Spiked Blank	4-Bromofluorobenzene	2017/10/24		102	%	60 - 140
			D10-o-Xylene	2017/10/24		111	%	60 - 130
			D4-1,2-Dichloroethane	2017/10/24		100	%	60 - 140
			D8-Toluene	2017/10/24		101	%	60 - 140
			1,1,1-Trichloroethane	2017/10/24		117	%	60 - 130
			1,1,2,2-Tetrachloroethane	2017/10/24		101	%	60 - 130
			1,1,2-Trichloroethane	2017/10/24		105	%	60 - 130
			1,1-Dichloroethane	2017/10/24		114	%	60 - 130
			1,1-Dichloroethylene	2017/10/24		118	%	60 - 130
			1,2-Dichlorobenzene	2017/10/24		101	%	60 - 130
			1,2-Dichloroethane	2017/10/24		107	%	60 - 130
			1,2-Dichloropropane	2017/10/24		106	%	60 - 130
			1,3-Dichlorobenzene	2017/10/24		105	%	60 - 130
			1,4-Dichlorobenzene	2017/10/24		102	%	60 - 130

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Benzene	2017/10/24		109	%	60 - 130
			Bromodichloromethane	2017/10/24		110	%	60 - 130
			Bromoform	2017/10/24		105	%	60 - 130
			Bromomethane	2017/10/24		104	%	60 - 140
			Carbon Tetrachloride	2017/10/24		115	%	60 - 130
			Chlorobenzene	2017/10/24		110	%	60 - 130
			Chloroethane	2017/10/24		103	%	60 - 140
			Chloroform	2017/10/24		104	%	60 - 130
			cis-1,2-Dichloroethylene	2017/10/24		113	%	60 - 130
			cis-1,3-Dichloropropene	2017/10/24		111	%	60 - 130
			Dibromochloromethane	2017/10/24		108	%	60 - 130
			Ethylbenzene	2017/10/24		118	%	60 - 130
			Ethylene Dibromide	2017/10/24		104	%	60 - 130
			Methyl t-butyl ether (MTBE)	2017/10/24		126	%	60 - 130
			Methylene Chloride(Dichloromethane)	2017/10/24		113	%	60 - 130
			o-Xylene	2017/10/24		115	%	60 - 130
			p+m-Xylene	2017/10/24		117	%	60 - 130
			Styrene	2017/10/24		114	%	60 - 130
			Tetrachloroethylene	2017/10/24		117	%	60 - 130
			Toluene	2017/10/24		116	%	60 - 130
			trans-1,2-Dichloroethylene	2017/10/24		115	%	60 - 130
			trans-1,3-Dichloropropene	2017/10/24		96	%	60 - 130
			Trichloroethylene	2017/10/24		117	%	60 - 130
			Trichlorofluoromethane (FREON 11)	2017/10/24		109	%	60 - 140
			Vinyl Chloride	2017/10/24		113	%	60 - 140
5227338	ASL	Method Blank	4-Bromofluorobenzene	2017/10/24		100	%	60 - 140
			D10-o-Xylene	2017/10/24		111	%	60 - 130
			D4-1,2-Dichloroethane	2017/10/24		95	%	60 - 140
			D8-Toluene	2017/10/24		103	%	60 - 140
			1,1,1-Trichloroethane	2017/10/24	<25		ug/kg	
			1,1,2,2-Tetrachloroethane	2017/10/24	<25		ug/kg	
			1,1,2-Trichloroethane	2017/10/24	<25		ug/kg	
			1,1-Dichloroethane	2017/10/24	<25		ug/kg	
			1,1-Dichloroethylene	2017/10/24	<25		ug/kg	
			1,2-Dichlorobenzene	2017/10/24	<25		ug/kg	
			1,2-Dichloroethane	2017/10/24	<25		ug/kg	
			1,2-Dichloropropane	2017/10/24	<25		ug/kg	
			1,3-Dichlorobenzene	2017/10/24	<25		ug/kg	
			1,4-Dichlorobenzene	2017/10/24	<25		ug/kg	
			Benzene	2017/10/24	<25		ug/kg	
			Bromodichloromethane	2017/10/24	<25		ug/kg	
			Bromoform	2017/10/24	<25		ug/kg	
			Bromomethane	2017/10/24	<50		ug/kg	
			Carbon Tetrachloride	2017/10/24	<25		ug/kg	
			Chlorobenzene	2017/10/24	<25		ug/kg	
			Chloroethane	2017/10/24	<200		ug/kg	
			Chloroform	2017/10/24	<25		ug/kg	
			cis-1,2-Dichloroethylene	2017/10/24	<25		ug/kg	
			cis-1,3-Dichloropropene	2017/10/24	<25		ug/kg	
			Dibromochloromethane	2017/10/24	<25		ug/kg	
			Ethylbenzene	2017/10/24	<25		ug/kg	
			Ethylene Dibromide	2017/10/24	<25		ug/kg	

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Methyl t-butyl ether (MTBE)	2017/10/24	<25		ug/kg	
			Methylene Chloride(Dichloromethane)	2017/10/24	<30 (2)		ug/kg	
			o-Xylene	2017/10/24	<25		ug/kg	
			p+m-Xylene	2017/10/24	<25		ug/kg	
			Styrene	2017/10/24	<25		ug/kg	
			Tetrachloroethylene	2017/10/24	<25		ug/kg	
			Toluene	2017/10/24	<25		ug/kg	
			Total Xylenes	2017/10/24	<50		ug/kg	
			trans-1,2-Dichloroethylene	2017/10/24	<25		ug/kg	
			trans-1,3-Dichloropropene	2017/10/24	<25		ug/kg	
			Trichloroethylene	2017/10/24	<10		ug/kg	
			Trichlorofluoromethane (FREON 11)	2017/10/24	<25		ug/kg	
			Vinyl Chloride	2017/10/24	<20		ug/kg	
5227338	ASL	RPD - Sample/Sample Dup	1,1,1-Trichloroethane	2017/10/24	NC		%	50
			1,1,2,2-Tetrachloroethane	2017/10/24	NC		%	50
			1,1,2-Trichloroethane	2017/10/24	NC		%	50
			1,1-Dichloroethane	2017/10/24	NC		%	50
			1,1-Dichloroethylene	2017/10/24	NC		%	50
			1,2-Dichlorobenzene	2017/10/24	NC		%	50
			1,2-Dichloroethane	2017/10/24	NC		%	50
			1,2-Dichloropropane	2017/10/24	NC		%	50
			1,3-Dichlorobenzene	2017/10/24	NC		%	50
			1,4-Dichlorobenzene	2017/10/24	NC		%	50
			Benzene	2017/10/24	NC		%	50
			Bromodichloromethane	2017/10/24	NC		%	50
			Bromoform	2017/10/24	NC		%	50
			Bromomethane	2017/10/24	NC		%	50
			Carbon Tetrachloride	2017/10/24	NC		%	50
			Chlorobenzene	2017/10/24	NC		%	50
			Chloroethane	2017/10/24	NC		%	50
			Chloroform	2017/10/24	NC		%	50
			cis-1,2-Dichloroethylene	2017/10/24	NC		%	50
			cis-1,3-Dichloropropene	2017/10/24	NC		%	50
			Dibromochloromethane	2017/10/24	NC		%	50
			Ethylbenzene	2017/10/24	NC		%	50
			Ethylene Dibromide	2017/10/24	NC		%	50
			Methyl t-butyl ether (MTBE)	2017/10/24	NC		%	50
			Methylene Chloride(Dichloromethane)	2017/10/24	NC (2)		%	50
			o-Xylene	2017/10/24	NC		%	50
			p+m-Xylene	2017/10/24	NC		%	50
			Styrene	2017/10/24	NC		%	50
			Tetrachloroethylene	2017/10/24	NC		%	50
			Toluene	2017/10/24	NC		%	50
			Total Xylenes	2017/10/24	NC		%	50
			trans-1,2-Dichloroethylene	2017/10/24	NC		%	50
			trans-1,3-Dichloropropene	2017/10/24	NC		%	50
			Trichloroethylene	2017/10/24	NC		%	50
			Trichlorofluoromethane (FREON 11)	2017/10/24	NC		%	50
			Vinyl Chloride	2017/10/24	NC		%	50
5227396	BAN	Matrix Spike	Acid Extractable Antimony (Sb)	2017/10/25		97	%	75 - 125
			Acid Extractable Arsenic (As)	2017/10/25		101	%	75 - 125
			Acid Extractable Barium (Ba)	2017/10/25		NC	%	75 - 125

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Acid Extractable Beryllium (Be)	2017/10/25		104	%	75 - 125
			Acid Extractable Bismuth (Bi)	2017/10/25		102	%	75 - 125
			Acid Extractable Boron (B)	2017/10/25		99	%	75 - 125
			Acid Extractable Cadmium (Cd)	2017/10/25		101	%	75 - 125
			Acid Extractable Chromium (Cr)	2017/10/25		95	%	75 - 125
			Acid Extractable Cobalt (Co)	2017/10/25		101	%	75 - 125
			Acid Extractable Copper (Cu)	2017/10/25		93	%	75 - 125
			Acid Extractable Lead (Pb)	2017/10/25		86	%	75 - 125
			Acid Extractable Lithium (Li)	2017/10/25		105	%	75 - 125
			Acid Extractable Manganese (Mn)	2017/10/25		NC	%	75 - 125
			Acid Extractable Mercury (Hg)	2017/10/25		100	%	75 - 125
			Acid Extractable Molybdenum (Mo)	2017/10/25		103	%	75 - 125
			Acid Extractable Nickel (Ni)	2017/10/25		95	%	75 - 125
			Acid Extractable Rubidium (Rb)	2017/10/25		102	%	75 - 125
			Acid Extractable Selenium (Se)	2017/10/25		105	%	75 - 125
			Acid Extractable Silver (Ag)	2017/10/25		101	%	75 - 125
			Acid Extractable Strontium (Sr)	2017/10/25		102	%	75 - 125
			Acid Extractable Thallium (Tl)	2017/10/25		103	%	75 - 125
			Acid Extractable Tin (Sn)	2017/10/25		99	%	75 - 125
			Acid Extractable Uranium (U)	2017/10/25		105	%	75 - 125
			Acid Extractable Vanadium (V)	2017/10/25		98	%	75 - 125
			Acid Extractable Zinc (Zn)	2017/10/25		NC	%	75 - 125
5227396	BAN	Spiked Blank	Acid Extractable Antimony (Sb)	2017/10/25		105	%	75 - 125
			Acid Extractable Arsenic (As)	2017/10/25		102	%	75 - 125
			Acid Extractable Barium (Ba)	2017/10/25		103	%	75 - 125
			Acid Extractable Beryllium (Be)	2017/10/25		105	%	75 - 125
			Acid Extractable Bismuth (Bi)	2017/10/25		103	%	75 - 125
			Acid Extractable Boron (B)	2017/10/25		105	%	75 - 125
			Acid Extractable Cadmium (Cd)	2017/10/25		103	%	75 - 125
			Acid Extractable Chromium (Cr)	2017/10/25		102	%	75 - 125
			Acid Extractable Cobalt (Co)	2017/10/25		104	%	75 - 125
			Acid Extractable Copper (Cu)	2017/10/25		103	%	75 - 125
			Acid Extractable Lead (Pb)	2017/10/25		102	%	75 - 125
			Acid Extractable Lithium (Li)	2017/10/25		100	%	75 - 125
			Acid Extractable Manganese (Mn)	2017/10/25		104	%	75 - 125
			Acid Extractable Mercury (Hg)	2017/10/25		107	%	75 - 125
			Acid Extractable Molybdenum (Mo)	2017/10/25		105	%	75 - 125
			Acid Extractable Nickel (Ni)	2017/10/25		106	%	75 - 125
			Acid Extractable Rubidium (Rb)	2017/10/25		102	%	75 - 125
			Acid Extractable Selenium (Se)	2017/10/25		107	%	75 - 125
			Acid Extractable Silver (Ag)	2017/10/25		104	%	75 - 125
			Acid Extractable Strontium (Sr)	2017/10/25		102	%	75 - 125
			Acid Extractable Thallium (Tl)	2017/10/25		105	%	75 - 125
			Acid Extractable Tin (Sn)	2017/10/25		108	%	75 - 125
			Acid Extractable Uranium (U)	2017/10/25		106	%	75 - 125
			Acid Extractable Vanadium (V)	2017/10/25		103	%	75 - 125
			Acid Extractable Zinc (Zn)	2017/10/25		107	%	75 - 125
5227396	BAN	Method Blank	Acid Extractable Aluminum (Al)	2017/10/25	<10		mg/kg	
			Acid Extractable Antimony (Sb)	2017/10/25	<2.0		mg/kg	
			Acid Extractable Arsenic (As)	2017/10/25	<2.0		mg/kg	
			Acid Extractable Barium (Ba)	2017/10/25	<5.0		mg/kg	
			Acid Extractable Beryllium (Be)	2017/10/25	<2.0		mg/kg	

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Acid Extractable Bismuth (Bi)	2017/10/25	<2.0		mg/kg	
			Acid Extractable Boron (B)	2017/10/25	<50		mg/kg	
			Acid Extractable Cadmium (Cd)	2017/10/25	<0.30		mg/kg	
			Acid Extractable Chromium (Cr)	2017/10/25	<2.0		mg/kg	
			Acid Extractable Cobalt (Co)	2017/10/25	<1.0		mg/kg	
			Acid Extractable Copper (Cu)	2017/10/25	<2.0		mg/kg	
			Acid Extractable Iron (Fe)	2017/10/25	<50		mg/kg	
			Acid Extractable Lead (Pb)	2017/10/25	<0.50		mg/kg	
			Acid Extractable Lithium (Li)	2017/10/25	<2.0		mg/kg	
			Acid Extractable Manganese (Mn)	2017/10/25	<2.0		mg/kg	
			Acid Extractable Mercury (Hg)	2017/10/25	<0.10		mg/kg	
			Acid Extractable Molybdenum (Mo)	2017/10/25	<2.0		mg/kg	
			Acid Extractable Nickel (Ni)	2017/10/25	<2.0		mg/kg	
			Acid Extractable Rubidium (Rb)	2017/10/25	<2.0		mg/kg	
			Acid Extractable Selenium (Se)	2017/10/25	<1.0		mg/kg	
			Acid Extractable Silver (Ag)	2017/10/25	<0.50		mg/kg	
			Acid Extractable Strontium (Sr)	2017/10/25	<5.0		mg/kg	
			Acid Extractable Thallium (Tl)	2017/10/25	<0.10		mg/kg	
			Acid Extractable Tin (Sn)	2017/10/25	<2.0		mg/kg	
			Acid Extractable Uranium (U)	2017/10/25	<0.10		mg/kg	
			Acid Extractable Vanadium (V)	2017/10/25	<2.0		mg/kg	
			Acid Extractable Zinc (Zn)	2017/10/25	<5.0		mg/kg	
5227396	BAN	RPD - Sample/Sample Dup	Acid Extractable Aluminum (Al)	2017/10/25	0.057		%	35
			Acid Extractable Antimony (Sb)	2017/10/25	NC		%	35
			Acid Extractable Arsenic (As)	2017/10/25	NC		%	35
			Acid Extractable Barium (Ba)	2017/10/25	8.7		%	35
			Acid Extractable Beryllium (Be)	2017/10/25	NC		%	35
			Acid Extractable Bismuth (Bi)	2017/10/25	NC		%	35
			Acid Extractable Boron (B)	2017/10/25	NC		%	35
			Acid Extractable Cadmium (Cd)	2017/10/25	NC		%	35
			Acid Extractable Chromium (Cr)	2017/10/25	19		%	35
			Acid Extractable Cobalt (Co)	2017/10/25	5.2		%	35
			Acid Extractable Copper (Cu)	2017/10/25	11		%	35
			Acid Extractable Iron (Fe)	2017/10/25	3.3		%	35
			Acid Extractable Lead (Pb)	2017/10/25	70 (3)		%	35
			Acid Extractable Lithium (Li)	2017/10/25	4.1		%	35
			Acid Extractable Manganese (Mn)	2017/10/25	1.3		%	35
			Acid Extractable Mercury (Hg)	2017/10/25	NC		%	35
			Acid Extractable Molybdenum (Mo)	2017/10/25	NC		%	35
			Acid Extractable Nickel (Ni)	2017/10/25	24		%	35
			Acid Extractable Rubidium (Rb)	2017/10/25	4.8		%	35
			Acid Extractable Selenium (Se)	2017/10/25	NC		%	35
			Acid Extractable Silver (Ag)	2017/10/25	NC		%	35
			Acid Extractable Strontium (Sr)	2017/10/25	0.42		%	35
			Acid Extractable Thallium (Tl)	2017/10/25	0.66		%	35
			Acid Extractable Tin (Sn)	2017/10/25	NC		%	35
			Acid Extractable Uranium (U)	2017/10/25	6.8		%	35
			Acid Extractable Vanadium (V)	2017/10/25	2.4		%	35
			Acid Extractable Zinc (Zn)	2017/10/25	5.0		%	35
5227738	BAN	Matrix Spike(FJP568)	Acid Extractable Antimony (Sb)	2017/10/25		83	%	75 - 125
			Acid Extractable Arsenic (As)	2017/10/25		92	%	75 - 125
			Acid Extractable Barium (Ba)	2017/10/25		NC	%	75 - 125

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Acid Extractable Beryllium (Be)	2017/10/25		98	%	75 - 125
			Acid Extractable Bismuth (Bi)	2017/10/25		107	%	75 - 125
			Acid Extractable Boron (B)	2017/10/25		96	%	75 - 125
			Acid Extractable Cadmium (Cd)	2017/10/25		101	%	75 - 125
			Acid Extractable Chromium (Cr)	2017/10/25		99	%	75 - 125
			Acid Extractable Cobalt (Co)	2017/10/25		95	%	75 - 125
			Acid Extractable Copper (Cu)	2017/10/25		93	%	75 - 125
			Acid Extractable Lead (Pb)	2017/10/25		100	%	75 - 125
			Acid Extractable Lithium (Li)	2017/10/25		99	%	75 - 125
			Acid Extractable Manganese (Mn)	2017/10/25		NC	%	75 - 125
			Acid Extractable Mercury (Hg)	2017/10/25		100	%	75 - 125
			Acid Extractable Molybdenum (Mo)	2017/10/25		104	%	75 - 125
			Acid Extractable Nickel (Ni)	2017/10/25		97	%	75 - 125
			Acid Extractable Rubidium (Rb)	2017/10/25		103	%	75 - 125
			Acid Extractable Selenium (Se)	2017/10/25		86	%	75 - 125
			Acid Extractable Silver (Ag)	2017/10/25		103	%	75 - 125
			Acid Extractable Strontium (Sr)	2017/10/25		104	%	75 - 125
			Acid Extractable Thallium (Tl)	2017/10/25		106	%	75 - 125
			Acid Extractable Tin (Sn)	2017/10/25		101	%	75 - 125
			Acid Extractable Uranium (U)	2017/10/25		100	%	75 - 125
			Acid Extractable Vanadium (V)	2017/10/25		NC	%	75 - 125
			Acid Extractable Zinc (Zn)	2017/10/25		NC	%	75 - 125
5227738	BAN	Spiked Blank	Acid Extractable Antimony (Sb)	2017/10/25		106	%	75 - 125
			Acid Extractable Arsenic (As)	2017/10/25		102	%	75 - 125
			Acid Extractable Barium (Ba)	2017/10/25		103	%	75 - 125
			Acid Extractable Beryllium (Be)	2017/10/25		99	%	75 - 125
			Acid Extractable Bismuth (Bi)	2017/10/25		104	%	75 - 125
			Acid Extractable Boron (B)	2017/10/25		100	%	75 - 125
			Acid Extractable Cadmium (Cd)	2017/10/25		102	%	75 - 125
			Acid Extractable Chromium (Cr)	2017/10/25		96	%	75 - 125
			Acid Extractable Cobalt (Co)	2017/10/25		97	%	75 - 125
			Acid Extractable Copper (Cu)	2017/10/25		93	%	75 - 125
			Acid Extractable Lead (Pb)	2017/10/25		100	%	75 - 125
			Acid Extractable Lithium (Li)	2017/10/25		102	%	75 - 125
			Acid Extractable Manganese (Mn)	2017/10/25		103	%	75 - 125
			Acid Extractable Mercury (Hg)	2017/10/25		105	%	75 - 125
			Acid Extractable Molybdenum (Mo)	2017/10/25		103	%	75 - 125
			Acid Extractable Nickel (Ni)	2017/10/25		97	%	75 - 125
			Acid Extractable Rubidium (Rb)	2017/10/25		102	%	75 - 125
			Acid Extractable Selenium (Se)	2017/10/25		102	%	75 - 125
			Acid Extractable Silver (Ag)	2017/10/25		103	%	75 - 125
			Acid Extractable Strontium (Sr)	2017/10/25		101	%	75 - 125
			Acid Extractable Thallium (Tl)	2017/10/25		102	%	75 - 125
			Acid Extractable Tin (Sn)	2017/10/25		108	%	75 - 125
			Acid Extractable Uranium (U)	2017/10/25		100	%	75 - 125
			Acid Extractable Vanadium (V)	2017/10/25		97	%	75 - 125
			Acid Extractable Zinc (Zn)	2017/10/25		102	%	75 - 125
5227738	BAN	Method Blank	Acid Extractable Aluminum (Al)	2017/10/25	<10		mg/kg	
			Acid Extractable Antimony (Sb)	2017/10/25	<2.0		mg/kg	
			Acid Extractable Arsenic (As)	2017/10/25	<2.0		mg/kg	
			Acid Extractable Barium (Ba)	2017/10/25	<5.0		mg/kg	
			Acid Extractable Beryllium (Be)	2017/10/25	<2.0		mg/kg	

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Acid Extractable Bismuth (Bi)	2017/10/25	<2.0		mg/kg	
			Acid Extractable Boron (B)	2017/10/25	<50		mg/kg	
			Acid Extractable Cadmium (Cd)	2017/10/25	<0.30		mg/kg	
			Acid Extractable Chromium (Cr)	2017/10/25	<2.0		mg/kg	
			Acid Extractable Cobalt (Co)	2017/10/25	<1.0		mg/kg	
			Acid Extractable Copper (Cu)	2017/10/25	<2.0		mg/kg	
			Acid Extractable Iron (Fe)	2017/10/25	<50		mg/kg	
			Acid Extractable Lead (Pb)	2017/10/25	<0.50		mg/kg	
			Acid Extractable Lithium (Li)	2017/10/25	<2.0		mg/kg	
			Acid Extractable Manganese (Mn)	2017/10/25	<2.0		mg/kg	
			Acid Extractable Mercury (Hg)	2017/10/25	<0.10		mg/kg	
			Acid Extractable Molybdenum (Mo)	2017/10/25	<2.0		mg/kg	
			Acid Extractable Nickel (Ni)	2017/10/25	<2.0		mg/kg	
			Acid Extractable Rubidium (Rb)	2017/10/25	<2.0		mg/kg	
			Acid Extractable Selenium (Se)	2017/10/25	<1.0		mg/kg	
			Acid Extractable Silver (Ag)	2017/10/25	<0.50		mg/kg	
			Acid Extractable Strontium (Sr)	2017/10/25	<5.0		mg/kg	
			Acid Extractable Thallium (Tl)	2017/10/25	<0.10		mg/kg	
			Acid Extractable Tin (Sn)	2017/10/25	<2.0		mg/kg	
			Acid Extractable Uranium (U)	2017/10/25	<0.10		mg/kg	
			Acid Extractable Vanadium (V)	2017/10/25	<2.0		mg/kg	
			Acid Extractable Zinc (Zn)	2017/10/25	<5.0		mg/kg	
5227738	BAN	RPD - Sample/Sample Dup	Acid Extractable Aluminum (Al)	2017/10/25	0.25		%	35
			Acid Extractable Antimony (Sb)	2017/10/25	NC		%	35
			Acid Extractable Arsenic (As)	2017/10/25	NC		%	35
			Acid Extractable Barium (Ba)	2017/10/25	0.88		%	35
			Acid Extractable Beryllium (Be)	2017/10/25	NC		%	35
			Acid Extractable Bismuth (Bi)	2017/10/25	NC		%	35
			Acid Extractable Boron (B)	2017/10/25	NC		%	35
			Acid Extractable Cadmium (Cd)	2017/10/25	NC		%	35
			Acid Extractable Chromium (Cr)	2017/10/25	5.9		%	35
			Acid Extractable Cobalt (Co)	2017/10/25	2.2		%	35
			Acid Extractable Copper (Cu)	2017/10/25	1.8		%	35
			Acid Extractable Iron (Fe)	2017/10/25	3.3		%	35
			Acid Extractable Lead (Pb)	2017/10/25	4.1		%	35
			Acid Extractable Lithium (Li)	2017/10/25	3.9		%	35
			Acid Extractable Manganese (Mn)	2017/10/25	2.8		%	35
			Acid Extractable Mercury (Hg)	2017/10/25	NC		%	35
			Acid Extractable Molybdenum (Mo)	2017/10/25	NC		%	35
			Acid Extractable Nickel (Ni)	2017/10/25	3.8		%	35
			Acid Extractable Rubidium (Rb)	2017/10/25	1.5		%	35
			Acid Extractable Selenium (Se)	2017/10/25	NC		%	35
			Acid Extractable Silver (Ag)	2017/10/25	NC		%	35
			Acid Extractable Strontium (Sr)	2017/10/25	0.79		%	35
			Acid Extractable Thallium (Tl)	2017/10/25	1.0		%	35
			Acid Extractable Tin (Sn)	2017/10/25	NC		%	35
			Acid Extractable Uranium (U)	2017/10/25	0.73		%	35
			Acid Extractable Vanadium (V)	2017/10/25	6.3		%	35
			Acid Extractable Zinc (Zn)	2017/10/25	19		%	35
5227759	ASL	Matrix Spike(FJP647)	4-Bromofluorobenzene	2017/10/25		101	%	60 - 140
			D10-o-Xylene	2017/10/25		99	%	60 - 130
			D4-1,2-Dichloroethane	2017/10/25		100	%	60 - 140

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			D8-Toluene	2017/10/25		101	%	60 - 140
			1,1,1-Trichloroethane	2017/10/25		104	%	60 - 140
			1,1,2,2-Tetrachloroethane	2017/10/25		93	%	60 - 140
			1,1,2-Trichloroethane	2017/10/25		96	%	60 - 140
			1,1-Dichloroethane	2017/10/25		104	%	60 - 140
			1,1-Dichloroethylene	2017/10/25		104	%	60 - 140
			1,2-Dichlorobenzene	2017/10/25		89	%	60 - 140
			1,2-Dichloroethane	2017/10/25		97	%	60 - 140
			1,2-Dichloropropane	2017/10/25		95	%	60 - 140
			1,3-Dichlorobenzene	2017/10/25		92	%	60 - 140
			1,4-Dichlorobenzene	2017/10/25		90	%	60 - 140
			Benzene	2017/10/25		98	%	60 - 140
			Bromodichloromethane	2017/10/25		99	%	60 - 140
			Bromoform	2017/10/25		94	%	60 - 140
			Bromomethane	2017/10/25		91	%	60 - 140
			Carbon Tetrachloride	2017/10/25		102	%	60 - 140
			Chlorobenzene	2017/10/25		98	%	60 - 140
			Chloroethane	2017/10/25		91	%	60 - 140
			Chloroform	2017/10/25		94	%	60 - 140
			cis-1,2-Dichloroethylene	2017/10/25		103	%	60 - 140
			cis-1,3-Dichloropropene	2017/10/25		95	%	60 - 140
			Dibromochloromethane	2017/10/25		97	%	60 - 140
			Ethylbenzene	2017/10/25		104	%	60 - 140
			Ethylene Dibromide	2017/10/25		93	%	60 - 140
			Methyl t-butyl ether (MTBE)	2017/10/25		116	%	60 - 140
			Methylene Chloride(Dichloromethane)	2017/10/25		100	%	60 - 140
			o-Xylene	2017/10/25		101	%	60 - 140
			p+m-Xylene	2017/10/25		103	%	60 - 140
			Styrene	2017/10/25		100	%	60 - 140
			Tetrachloroethylene	2017/10/25		102	%	60 - 140
			Toluene	2017/10/25		103	%	60 - 140
			trans-1,2-Dichloroethylene	2017/10/25		102	%	60 - 140
			trans-1,3-Dichloropropene	2017/10/25		83	%	60 - 140
			Trichloroethylene	2017/10/25		103	%	60 - 140
			Trichlorofluoromethane (FREON 11)	2017/10/25		91	%	60 - 140
			Vinyl Chloride	2017/10/25		95	%	60 - 140
5227759	ASL	Spiked Blank	4-Bromofluorobenzene	2017/10/25		100	%	60 - 140
			D10-o-Xylene	2017/10/25		111	%	60 - 130
			D4-1,2-Dichloroethane	2017/10/25		100	%	60 - 140
			D8-Toluene	2017/10/25		101	%	60 - 140
			1,1,1-Trichloroethane	2017/10/25		116	%	60 - 130
			1,1,2,2-Tetrachloroethane	2017/10/25		102	%	60 - 130
			1,1,2-Trichloroethane	2017/10/25		107	%	60 - 130
			1,1-Dichloroethane	2017/10/25		114	%	60 - 130
			1,1-Dichloroethylene	2017/10/25		118	%	60 - 130
			1,2-Dichlorobenzene	2017/10/25		101	%	60 - 130
			1,2-Dichloroethane	2017/10/25		108	%	60 - 130
			1,2-Dichloropropane	2017/10/25		106	%	60 - 130
			1,3-Dichlorobenzene	2017/10/25		104	%	60 - 130
			1,4-Dichlorobenzene	2017/10/25		101	%	60 - 130
			Benzene	2017/10/25		109	%	60 - 130
			Bromodichloromethane	2017/10/25		110	%	60 - 130

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Bromoform	2017/10/25		104	%	60 - 130
			Bromomethane	2017/10/25		99	%	60 - 140
			Carbon Tetrachloride	2017/10/25		114	%	60 - 130
			Chlorobenzene	2017/10/25		109	%	60 - 130
			Chloroethane	2017/10/25		102	%	60 - 140
			Chloroform	2017/10/25		104	%	60 - 130
			cis-1,2-Dichloroethylene	2017/10/25		113	%	60 - 130
			cis-1,3-Dichloropropene	2017/10/25		103	%	60 - 130
			Dibromochloromethane	2017/10/25		107	%	60 - 130
			Ethylbenzene	2017/10/25		116	%	60 - 130
			Ethylene Dibromide	2017/10/25		103	%	60 - 130
			Methyl t-butyl ether (MTBE)	2017/10/25		127	%	60 - 130
			Methylene Chloride(Dichloromethane)	2017/10/25		112	%	60 - 130
			o-Xylene	2017/10/25		113	%	60 - 130
			p+m-Xylene	2017/10/25		115	%	60 - 130
			Styrene	2017/10/25		113	%	60 - 130
			Tetrachloroethylene	2017/10/25		116	%	60 - 130
			Toluene	2017/10/25		116	%	60 - 130
			trans-1,2-Dichloroethylene	2017/10/25		114	%	60 - 130
			trans-1,3-Dichloropropene	2017/10/25		88	%	60 - 130
			Trichloroethylene	2017/10/25		115	%	60 - 130
			Trichlorofluoromethane (FREON 11)	2017/10/25		107	%	60 - 140
			Vinyl Chloride	2017/10/25		109	%	60 - 140
5227759	ASL	Method Blank	4-Bromofluorobenzene	2017/10/25		100	%	60 - 140
			D10-o-Xylene	2017/10/25		108	%	60 - 130
			D4-1,2-Dichloroethane	2017/10/25		98	%	60 - 140
			D8-Toluene	2017/10/25		101	%	60 - 140
			1,1,1-Trichloroethane	2017/10/25	<25		ug/kg	
			1,1,2,2-Tetrachloroethane	2017/10/25	<25		ug/kg	
			1,1,2-Trichloroethane	2017/10/25	<25		ug/kg	
			1,1-Dichloroethane	2017/10/25	<25		ug/kg	
			1,1-Dichloroethylene	2017/10/25	<25		ug/kg	
			1,2-Dichlorobenzene	2017/10/25	<25		ug/kg	
			1,2-Dichloroethane	2017/10/25	<25		ug/kg	
			1,2-Dichloropropane	2017/10/25	<25		ug/kg	
			1,3-Dichlorobenzene	2017/10/25	<25		ug/kg	
			1,4-Dichlorobenzene	2017/10/25	<25		ug/kg	
			Benzene	2017/10/25	<25		ug/kg	
			Bromodichloromethane	2017/10/25	<25		ug/kg	
			Bromoform	2017/10/25	<25		ug/kg	
			Bromomethane	2017/10/25	<50		ug/kg	
			Carbon Tetrachloride	2017/10/25	<25		ug/kg	
			Chlorobenzene	2017/10/25	<25		ug/kg	
			Chloroethane	2017/10/25	<200		ug/kg	
			Chloroform	2017/10/25	<25		ug/kg	
			cis-1,2-Dichloroethylene	2017/10/25	<25		ug/kg	
			cis-1,3-Dichloropropene	2017/10/25	<25		ug/kg	
			Dibromochloromethane	2017/10/25	<25		ug/kg	
			Ethylbenzene	2017/10/25	<25		ug/kg	
			Ethylene Dibromide	2017/10/25	<25		ug/kg	
			Methyl t-butyl ether (MTBE)	2017/10/25	<25		ug/kg	
			Methylene Chloride(Dichloromethane)	2017/10/25	<25		ug/kg	

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			o-Xylene	2017/10/25	<25		ug/kg	
			p+m-Xylene	2017/10/25	<25		ug/kg	
			Styrene	2017/10/25	<25		ug/kg	
			Tetrachloroethylene	2017/10/25	<25		ug/kg	
			Toluene	2017/10/25	<25		ug/kg	
			Total Xylenes	2017/10/25	<50		ug/kg	
			trans-1,2-Dichloroethylene	2017/10/25	<25		ug/kg	
			trans-1,3-Dichloropropene	2017/10/25	<25		ug/kg	
			Trichloroethylene	2017/10/25	<10		ug/kg	
			Trichlorofluoromethane (FREON 11)	2017/10/25	<25		ug/kg	
			Vinyl Chloride	2017/10/25	<20		ug/kg	
5227759	ASL	RPD - Sample/Sample Dup	1,1,1-Trichloroethane	2017/10/25	NC		%	50
			1,1,2,2-Tetrachloroethane	2017/10/25	NC		%	50
			1,1,2-Trichloroethane	2017/10/25	NC		%	50
			1,1-Dichloroethane	2017/10/25	NC		%	50
			1,1-Dichloroethylene	2017/10/25	NC		%	50
			1,2-Dichlorobenzene	2017/10/25	NC		%	50
			1,2-Dichloroethane	2017/10/25	NC		%	50
			1,2-Dichloropropane	2017/10/25	NC		%	50
			1,3-Dichlorobenzene	2017/10/25	NC		%	50
			1,4-Dichlorobenzene	2017/10/25	NC		%	50
			Benzene	2017/10/25	NC		%	50
			Bromodichloromethane	2017/10/25	NC		%	50
			Bromoform	2017/10/25	NC		%	50
			Bromomethane	2017/10/25	NC		%	50
			Carbon Tetrachloride	2017/10/25	NC		%	50
			Chlorobenzene	2017/10/25	NC		%	50
			Chloroethane	2017/10/25	NC		%	50
			Chloroform	2017/10/25	NC		%	50
			cis-1,2-Dichloroethylene	2017/10/25	NC		%	50
			cis-1,3-Dichloropropene	2017/10/25	NC		%	50
			Dibromochloromethane	2017/10/25	NC		%	50
			Ethylbenzene	2017/10/25	NC		%	50
			Ethylene Dibromide	2017/10/25	NC		%	50
			Methyl t-butyl ether (MTBE)	2017/10/25	NC		%	50
			Methylene Chloride(Dichloromethane)	2017/10/25	NC		%	50
			o-Xylene	2017/10/25	NC		%	50
			p+m-Xylene	2017/10/25	NC		%	50
			Styrene	2017/10/25	NC		%	50
			Tetrachloroethylene	2017/10/25	NC		%	50
			Toluene	2017/10/25	NC		%	50
			Total Xylenes	2017/10/25	NC		%	50
			trans-1,2-Dichloroethylene	2017/10/25	NC		%	50
			trans-1,3-Dichloropropene	2017/10/25	NC		%	50
			Trichloroethylene	2017/10/25	NC		%	50
			Trichlorofluoromethane (FREON 11)	2017/10/25	NC		%	50
			Vinyl Chloride	2017/10/25	NC		%	50
5228079	LGE	Matrix Spike	Decachlorobiphenyl	2017/10/26		88	%	30 - 130
			Aroclor 1254	2017/10/26		96	%	30 - 130
5228079	LGE	Spiked Blank	Decachlorobiphenyl	2017/10/26		91	%	30 - 130
			Aroclor 1254	2017/10/26		99	%	30 - 130
5228079	LGE	Method Blank	Decachlorobiphenyl	2017/10/26		91	%	30 - 130

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Aroclor 1016	2017/10/26	<0.050		ug/g	
			Aroclor 1221	2017/10/26	<0.050		ug/g	
			Aroclor 1232	2017/10/26	<0.050		ug/g	
			Aroclor 1248	2017/10/26	<0.050		ug/g	
			Aroclor 1242	2017/10/26	<0.050		ug/g	
			Aroclor 1254	2017/10/26	<0.050		ug/g	
			Aroclor 1260	2017/10/26	<0.050		ug/g	
5228079	LGE	RPD - Sample/Sample Dup	Aroclor 1016	2017/10/26	NC		%	50
			Aroclor 1221	2017/10/26	NC		%	50
			Aroclor 1232	2017/10/26	NC		%	50
			Aroclor 1248	2017/10/26	NC		%	50
			Aroclor 1242	2017/10/26	NC		%	50
			Aroclor 1254	2017/10/26	NC		%	50
			Aroclor 1260	2017/10/26	NC		%	50
5229745	DBF	RPD - Sample/Sample Dup	Moisture	2017/10/25	15		%	25
5229780	JHY	RPD - Sample/Sample Dup	Moisture	2017/10/25	0		%	25
5229883	ASL	Matrix Spike(FJP707)	4-Bromofluorobenzene	2017/10/26		101	%	60 - 140
			D10-o-Xylene	2017/10/26		99 (1)	%	60 - 130
			D4-1,2-Dichloroethane	2017/10/26		103	%	60 - 140
			D8-Toluene	2017/10/26		96	%	60 - 140
			1,1,1-Trichloroethane	2017/10/26		115	%	60 - 140
			1,1,2,2-Tetrachloroethane	2017/10/26		110	%	60 - 140
			1,1,2-Trichloroethane	2017/10/26		111	%	60 - 140
			1,1-Dichloroethane	2017/10/26		118	%	60 - 140
			1,1-Dichloroethylene	2017/10/26		115	%	60 - 140
			1,2-Dichlorobenzene	2017/10/26		97	%	60 - 140
			1,2-Dichloroethane	2017/10/26		106	%	60 - 140
			1,2-Dichloropropane	2017/10/26		107	%	60 - 140
			1,3-Dichlorobenzene	2017/10/26		98	%	60 - 140
			1,4-Dichlorobenzene	2017/10/26		97	%	60 - 140
			Benzene	2017/10/26		108	%	60 - 140
			Bromodichloromethane	2017/10/26		111	%	60 - 140
			Bromoform	2017/10/26		113	%	60 - 140
			Bromomethane	2017/10/26		104	%	60 - 140
			Carbon Tetrachloride	2017/10/26		115	%	60 - 140
			Chlorobenzene	2017/10/26		103	%	60 - 140
			Chloroethane	2017/10/26		103	%	60 - 140
			Chloroform	2017/10/26		105	%	60 - 140
			cis-1,2-Dichloroethylene	2017/10/26		118	%	60 - 140
			cis-1,3-Dichloropropene	2017/10/26		102	%	60 - 140
			Dibromochloromethane	2017/10/26		113	%	60 - 140
			Ethylbenzene	2017/10/26		101	%	60 - 140
			Ethylene Dibromide	2017/10/26		108	%	60 - 140
			Methyl t-butyl ether (MTBE)	2017/10/26		104	%	60 - 140
			Methylene Chloride(Dichloromethane)	2017/10/26		120	%	60 - 140
			o-Xylene	2017/10/26		104	%	60 - 140
			p+m-Xylene	2017/10/26		102	%	60 - 140
			Styrene	2017/10/26		101	%	60 - 140
			Tetrachloroethylene	2017/10/26		115	%	60 - 140
			Toluene	2017/10/26		105	%	60 - 140
			trans-1,2-Dichloroethylene	2017/10/26		117	%	60 - 140
			trans-1,3-Dichloropropene	2017/10/26		87	%	60 - 140

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Trichloroethylene	2017/10/26		114	%	60 - 140
			Trichlorofluoromethane (FREON 11)	2017/10/26		106	%	60 - 140
			Vinyl Chloride	2017/10/26		113	%	60 - 140
5229883	ASL	Spiked Blank	4-Bromofluorobenzene	2017/10/26		102	%	60 - 140
			D10-o-Xylene	2017/10/26		98	%	60 - 130
			D4-1,2-Dichloroethane	2017/10/26		100	%	60 - 140
			D8-Toluene	2017/10/26		97	%	60 - 140
			1,1,1-Trichloroethane	2017/10/26		115	%	60 - 130
			1,1,2,2-Tetrachloroethane	2017/10/26		105	%	60 - 130
			1,1,2-Trichloroethane	2017/10/26		104	%	60 - 130
			1,1-Dichloroethane	2017/10/26		115	%	60 - 130
			1,1-Dichloroethylene	2017/10/26		115	%	60 - 130
			1,2-Dichlorobenzene	2017/10/26		96	%	60 - 130
			1,2-Dichloroethane	2017/10/26		102	%	60 - 130
			1,2-Dichloropropane	2017/10/26		104	%	60 - 130
			1,3-Dichlorobenzene	2017/10/26		96	%	60 - 130
			1,4-Dichlorobenzene	2017/10/26		95	%	60 - 130
			Benzene	2017/10/26		106	%	60 - 130
			Bromodichloromethane	2017/10/26		107	%	60 - 130
			Bromoform	2017/10/26		108	%	60 - 130
			Bromomethane	2017/10/26		106	%	60 - 140
			Carbon Tetrachloride	2017/10/26		115	%	60 - 130
			Chlorobenzene	2017/10/26		102	%	60 - 130
			Chloroethane	2017/10/26		102	%	60 - 140
			Chloroform	2017/10/26		102	%	60 - 130
			cis-1,2-Dichloroethylene	2017/10/26		114	%	60 - 130
			cis-1,3-Dichloropropene	2017/10/26		104	%	60 - 130
			Dibromochloromethane	2017/10/26		108	%	60 - 130
			Ethylbenzene	2017/10/26		102	%	60 - 130
			Ethylene Dibromide	2017/10/26		103	%	60 - 130
			Methyl t-butyl ether (MTBE)	2017/10/26		101	%	60 - 130
			Methylene Chloride(Dichloromethane)	2017/10/26		116	%	60 - 130
			o-Xylene	2017/10/26		104	%	60 - 130
			p+m-Xylene	2017/10/26		103	%	60 - 130
			Styrene	2017/10/26		100	%	60 - 130
			Tetrachloroethylene	2017/10/26		116	%	60 - 130
			Toluene	2017/10/26		104	%	60 - 130
			trans-1,2-Dichloroethylene	2017/10/26		116	%	60 - 130
			trans-1,3-Dichloropropene	2017/10/26		89	%	60 - 130
			Trichloroethylene	2017/10/26		113	%	60 - 130
			Trichlorofluoromethane (FREON 11)	2017/10/26		107	%	60 - 140
			Vinyl Chloride	2017/10/26		114	%	60 - 140
5229883	ASL	Method Blank	4-Bromofluorobenzene	2017/10/26		99	%	60 - 140
			D10-o-Xylene	2017/10/26		99	%	60 - 130
			D4-1,2-Dichloroethane	2017/10/26		103	%	60 - 140
			D8-Toluene	2017/10/26		96	%	60 - 140
			1,1,1-Trichloroethane	2017/10/26	<25		ug/kg	
			1,1,2,2-Tetrachloroethane	2017/10/26	<25		ug/kg	
			1,1,2-Trichloroethane	2017/10/26	<25		ug/kg	
			1,1-Dichloroethane	2017/10/26	<25		ug/kg	
			1,1-Dichloroethylene	2017/10/26	<25		ug/kg	
			1,2-Dichlorobenzene	2017/10/26	<25		ug/kg	

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			1,2-Dichloroethane	2017/10/26	<25		ug/kg	
			1,2-Dichloropropane	2017/10/26	<25		ug/kg	
			1,3-Dichlorobenzene	2017/10/26	<25		ug/kg	
			1,4-Dichlorobenzene	2017/10/26	<25		ug/kg	
			Benzene	2017/10/26	<25		ug/kg	
			Bromodichloromethane	2017/10/26	<25		ug/kg	
			Bromoform	2017/10/26	<25		ug/kg	
			Bromomethane	2017/10/26	<50		ug/kg	
			Carbon Tetrachloride	2017/10/26	<25		ug/kg	
			Chlorobenzene	2017/10/26	<25		ug/kg	
			Chloroethane	2017/10/26	<200		ug/kg	
			Chloroform	2017/10/26	<25		ug/kg	
			cis-1,2-Dichloroethylene	2017/10/26	<25		ug/kg	
			cis-1,3-Dichloropropene	2017/10/26	<25		ug/kg	
			Dibromochloromethane	2017/10/26	<25		ug/kg	
			Ethylbenzene	2017/10/26	<25		ug/kg	
			Ethylene Dibromide	2017/10/26	<25		ug/kg	
			Methyl t-butyl ether (MTBE)	2017/10/26	<25		ug/kg	
			Methylene Chloride(Dichloromethane)	2017/10/26	<25		ug/kg	
			o-Xylene	2017/10/26	<25		ug/kg	
			p+m-Xylene	2017/10/26	<25		ug/kg	
			Styrene	2017/10/26	<25		ug/kg	
			Tetrachloroethylene	2017/10/26	<25		ug/kg	
			Toluene	2017/10/26	<25		ug/kg	
			Total Xylenes	2017/10/26	<50		ug/kg	
			trans-1,2-Dichloroethylene	2017/10/26	<25		ug/kg	
			trans-1,3-Dichloropropene	2017/10/26	<25		ug/kg	
			Trichloroethylene	2017/10/26	<10		ug/kg	
			Trichlorofluoromethane (FREON 11)	2017/10/26	<25		ug/kg	
			Vinyl Chloride	2017/10/26	<20		ug/kg	
5229883	ASL	RPD - Sample/Sample Dup	1,1,1-Trichloroethane	2017/10/26	NC		%	50
			1,1,2,2-Tetrachloroethane	2017/10/26	NC		%	50
			1,1,2-Trichloroethane	2017/10/26	NC		%	50
			1,1-Dichloroethane	2017/10/26	NC		%	50
			1,1-Dichloroethylene	2017/10/26	NC		%	50
			1,2-Dichlorobenzene	2017/10/26	NC		%	50
			1,2-Dichloroethane	2017/10/26	NC		%	50
			1,2-Dichloropropane	2017/10/26	NC		%	50
			1,3-Dichlorobenzene	2017/10/26	NC		%	50
			1,4-Dichlorobenzene	2017/10/26	NC		%	50
			Benzene	2017/10/26	NC		%	50
			Bromodichloromethane	2017/10/26	NC		%	50
			Bromoform	2017/10/26	NC		%	50
			Bromomethane	2017/10/26	NC		%	50
			Carbon Tetrachloride	2017/10/26	NC		%	50
			Chlorobenzene	2017/10/26	NC		%	50
			Chloroethane	2017/10/26	NC		%	50
			Chloroform	2017/10/26	NC		%	50
			cis-1,2-Dichloroethylene	2017/10/26	NC		%	50
			cis-1,3-Dichloropropene	2017/10/26	NC		%	50
			Dibromochloromethane	2017/10/26	NC		%	50
			Ethylbenzene	2017/10/26	NC		%	50

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Ethylene Dibromide	2017/10/26	NC		%	50
			Methyl t-butyl ether (MTBE)	2017/10/26	NC		%	50
			Methylene Chloride(Dichloromethane)	2017/10/26	NC		%	50
			o-Xylene	2017/10/26	NC		%	50
			p+m-Xylene	2017/10/26	NC		%	50
			Styrene	2017/10/26	NC		%	50
			Tetrachloroethylene	2017/10/26	NC		%	50
			Toluene	2017/10/26	NC		%	50
			Total Xylenes	2017/10/26	NC		%	50
			trans-1,2-Dichloroethylene	2017/10/26	NC		%	50
			trans-1,3-Dichloropropene	2017/10/26	NC		%	50
			Trichloroethylene	2017/10/26	NC		%	50
			Trichlorofluoromethane (FREON 11)	2017/10/26	NC		%	50
			Vinyl Chloride	2017/10/26	NC		%	50
5229906	JHY	RPD - Sample/Sample Dup	Moisture	2017/10/25	7.7		%	25
5229955	GTH	Matrix Spike	D10-Anthracene	2017/10/31		86	%	50 - 130
			D14-Terphenyl (FS)	2017/10/31		99	%	50 - 130
			D8-Acenaphthylene	2017/10/31		100	%	50 - 130
			1-Methylnaphthalene	2017/10/31		92	%	30 - 130
			2-Methylnaphthalene	2017/10/31		96	%	30 - 130
			Acenaphthene	2017/10/31		94	%	30 - 130
			Acenaphthylene	2017/10/31		95	%	30 - 130
			Anthracene	2017/10/31		92	%	30 - 130
			Benzo(a)anthracene	2017/10/31		61	%	30 - 130
			Benzo(a)pyrene	2017/10/31		72	%	30 - 130
			Benzo(b)fluoranthene	2017/10/31		81	%	30 - 130
			Benzo(g,h,i)perylene	2017/10/31		82	%	30 - 130
			Benzo(j)fluoranthene	2017/10/31		83	%	30 - 130
			Benzo(k)fluoranthene	2017/10/31		87	%	30 - 130
			Chrysene	2017/10/31		66	%	30 - 130
			Dibenz(a,h)anthracene	2017/10/31		88	%	30 - 130
			Fluoranthene	2017/10/31		NC	%	30 - 130
			Fluorene	2017/10/31		92	%	30 - 130
			Indeno(1,2,3-cd)pyrene	2017/10/31		79	%	30 - 130
			Naphthalene	2017/10/31		88	%	30 - 130
			Perylene	2017/10/31		86	%	30 - 130
			Phenanthrene	2017/10/31		NC	%	30 - 130
			Pyrene	2017/10/31		NC	%	30 - 130
5229955	GTH	Spiked Blank	D10-Anthracene	2017/10/26		75	%	50 - 130
			D14-Terphenyl (FS)	2017/10/26		78	%	50 - 130
			D8-Acenaphthylene	2017/10/26		78	%	50 - 130
			1-Methylnaphthalene	2017/10/26		79	%	30 - 130
			2-Methylnaphthalene	2017/10/26		84	%	30 - 130
			Acenaphthene	2017/10/26		86	%	30 - 130
			Acenaphthylene	2017/10/26		80	%	30 - 130
			Anthracene	2017/10/26		85	%	30 - 130
			Benzo(a)anthracene	2017/10/26		87	%	30 - 130
			Benzo(a)pyrene	2017/10/26		87	%	30 - 130
			Benzo(b)fluoranthene	2017/10/26		90	%	30 - 130
			Benzo(g,h,i)perylene	2017/10/26		90	%	30 - 130
			Benzo(j)fluoranthene	2017/10/26		92	%	30 - 130
			Benzo(k)fluoranthene	2017/10/26		89	%	30 - 130

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Chrysene	2017/10/26		82	%	30 - 130
			Dibenz(a,h)anthracene	2017/10/26		90	%	30 - 130
			Fluoranthene	2017/10/26		90	%	30 - 130
			Fluorene	2017/10/26		82	%	30 - 130
			Indeno(1,2,3-cd)pyrene	2017/10/26		90	%	30 - 130
			Naphthalene	2017/10/26		80	%	30 - 130
			Perylene	2017/10/26		87	%	30 - 130
			Phenanthrene	2017/10/26		86	%	30 - 130
			Pyrene	2017/10/26		87	%	30 - 130
5229955	GTH	Method Blank	D10-Anthracene	2017/10/26		92	%	50 - 130
			D14-Terphenyl (FS)	2017/10/26		92	%	50 - 130
			D8-Acenaphthylene	2017/10/26		89	%	50 - 130
			1-Methylnaphthalene	2017/10/26	<0.010		mg/kg	
			2-Methylnaphthalene	2017/10/26	<0.010		mg/kg	
			Acenaphthene	2017/10/26	<0.010		mg/kg	
			Acenaphthylene	2017/10/26	<0.010		mg/kg	
			Anthracene	2017/10/26	<0.010		mg/kg	
			Benzo(a)anthracene	2017/10/26	<0.010		mg/kg	
			Benzo(a)pyrene	2017/10/26	<0.010		mg/kg	
			Benzo(b)fluoranthene	2017/10/26	<0.010		mg/kg	
			Benzo(g,h,i)perylene	2017/10/26	<0.010		mg/kg	
			Benzo(j)fluoranthene	2017/10/26	<0.010		mg/kg	
			Benzo(k)fluoranthene	2017/10/26	<0.010		mg/kg	
			Chrysene	2017/10/26	<0.010		mg/kg	
			Dibenz(a,h)anthracene	2017/10/26	<0.010		mg/kg	
			Fluoranthene	2017/10/26	<0.010		mg/kg	
			Fluorene	2017/10/26	<0.010		mg/kg	
			Indeno(1,2,3-cd)pyrene	2017/10/26	<0.010		mg/kg	
			Naphthalene	2017/10/26	<0.010		mg/kg	
			Perylene	2017/10/26	<0.010		mg/kg	
			Phenanthrene	2017/10/26	<0.010		mg/kg	
			Pyrene	2017/10/26	<0.010		mg/kg	
5229955	GTH	RPD - Sample/Sample Dup	1-Methylnaphthalene	2017/10/26	182 (4)		%	50
			2-Methylnaphthalene	2017/10/26	182 (4)		%	50
			Acenaphthene	2017/10/26	190 (4)		%	50
			Acenaphthylene	2017/10/26	179 (4)		%	50
			Anthracene	2017/10/26	185 (4)		%	50
			Benzo(a)anthracene	2017/10/26	179 (4)		%	50
			Benzo(a)pyrene	2017/10/26	173 (4)		%	50
			Benzo(b)fluoranthene	2017/10/26	174 (4)		%	50
			Benzo(g,h,i)perylene	2017/10/26	166 (4)		%	50
			Benzo(j)fluoranthene	2017/10/26	173 (4)		%	50
			Benzo(k)fluoranthene	2017/10/26	174 (4)		%	50
			Chrysene	2017/10/26	175 (4)		%	50
			Dibenz(a,h)anthracene	2017/10/26	178 (4)		%	50
			Fluoranthene	2017/10/26	183 (4)		%	50
			Fluorene	2017/10/26	192 (4)		%	50
			Indeno(1,2,3-cd)pyrene	2017/10/26	169 (4)		%	50
			Naphthalene	2017/10/26	189 (4)		%	50
			Perylene	2017/10/26	176 (4)		%	50
			Phenanthrene	2017/10/26	188 (4)		%	50
			Pyrene	2017/10/26	180 (4)		%	50

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
5229985	JHY	RPD - Sample/Sample Dup	Moisture	2017/10/25	6.7		%	25
5232111	BAN	Matrix Spike(FJP709)	Acid Extractable Antimony (Sb)	2017/10/26		94	%	75 - 125
			Acid Extractable Arsenic (As)	2017/10/26		102	%	75 - 125
			Acid Extractable Barium (Ba)	2017/10/26		94	%	75 - 125
			Acid Extractable Beryllium (Be)	2017/10/26		102	%	75 - 125
			Acid Extractable Bismuth (Bi)	2017/10/26		102	%	75 - 125
			Acid Extractable Boron (B)	2017/10/26		98	%	75 - 125
			Acid Extractable Cadmium (Cd)	2017/10/26		99	%	75 - 125
			Acid Extractable Chromium (Cr)	2017/10/26		110	%	75 - 125
			Acid Extractable Cobalt (Co)	2017/10/26		99	%	75 - 125
			Acid Extractable Copper (Cu)	2017/10/26		92	%	75 - 125
			Acid Extractable Lead (Pb)	2017/10/26		115	%	75 - 125
			Acid Extractable Lithium (Li)	2017/10/26		105	%	75 - 125
			Acid Extractable Manganese (Mn)	2017/10/26		NC	%	75 - 125
			Acid Extractable Mercury (Hg)	2017/10/26		100	%	75 - 125
			Acid Extractable Molybdenum (Mo)	2017/10/26		99	%	75 - 125
			Acid Extractable Nickel (Ni)	2017/10/26		102	%	75 - 125
			Acid Extractable Rubidium (Rb)	2017/10/26		103	%	75 - 125
			Acid Extractable Selenium (Se)	2017/10/26		104	%	75 - 125
			Acid Extractable Silver (Ag)	2017/10/26		102	%	75 - 125
			Acid Extractable Strontium (Sr)	2017/10/26		104	%	75 - 125
			Acid Extractable Thallium (Tl)	2017/10/26		102	%	75 - 125
			Acid Extractable Tin (Sn)	2017/10/26		102	%	75 - 125
			Acid Extractable Uranium (U)	2017/10/26		99	%	75 - 125
			Acid Extractable Vanadium (V)	2017/10/26		101	%	75 - 125
			Acid Extractable Zinc (Zn)	2017/10/26		NC	%	75 - 125
5232111	BAN	Spiked Blank	Acid Extractable Antimony (Sb)	2017/10/26		99	%	75 - 125
			Acid Extractable Arsenic (As)	2017/10/26		102	%	75 - 125
			Acid Extractable Barium (Ba)	2017/10/26		100	%	75 - 125
			Acid Extractable Beryllium (Be)	2017/10/26		100	%	75 - 125
			Acid Extractable Bismuth (Bi)	2017/10/26		102	%	75 - 125
			Acid Extractable Boron (B)	2017/10/26		104	%	75 - 125
			Acid Extractable Cadmium (Cd)	2017/10/26		101	%	75 - 125
			Acid Extractable Chromium (Cr)	2017/10/26		101	%	75 - 125
			Acid Extractable Cobalt (Co)	2017/10/26		101	%	75 - 125
			Acid Extractable Copper (Cu)	2017/10/26		100	%	75 - 125
			Acid Extractable Lead (Pb)	2017/10/26		99	%	75 - 125
			Acid Extractable Lithium (Li)	2017/10/26		102	%	75 - 125
			Acid Extractable Manganese (Mn)	2017/10/26		104	%	75 - 125
			Acid Extractable Mercury (Hg)	2017/10/26		105	%	75 - 125
			Acid Extractable Molybdenum (Mo)	2017/10/26		101	%	75 - 125
			Acid Extractable Nickel (Ni)	2017/10/26		103	%	75 - 125
			Acid Extractable Rubidium (Rb)	2017/10/26		101	%	75 - 125
			Acid Extractable Selenium (Se)	2017/10/26		103	%	75 - 125
			Acid Extractable Silver (Ag)	2017/10/26		100	%	75 - 125
			Acid Extractable Strontium (Sr)	2017/10/26		103	%	75 - 125
			Acid Extractable Thallium (Tl)	2017/10/26		103	%	75 - 125
			Acid Extractable Tin (Sn)	2017/10/26		104	%	75 - 125
			Acid Extractable Uranium (U)	2017/10/26		99	%	75 - 125
			Acid Extractable Vanadium (V)	2017/10/26		100	%	75 - 125
			Acid Extractable Zinc (Zn)	2017/10/26		103	%	75 - 125
5232111	BAN	Method Blank	Acid Extractable Aluminum (Al)	2017/10/26	<10		mg/kg	

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Acid Extractable Antimony (Sb)	2017/10/26	<2.0		mg/kg	
			Acid Extractable Arsenic (As)	2017/10/26	<2.0		mg/kg	
			Acid Extractable Barium (Ba)	2017/10/26	<5.0		mg/kg	
			Acid Extractable Beryllium (Be)	2017/10/26	<2.0		mg/kg	
			Acid Extractable Bismuth (Bi)	2017/10/26	<2.0		mg/kg	
			Acid Extractable Boron (B)	2017/10/26	<50		mg/kg	
			Acid Extractable Cadmium (Cd)	2017/10/26	<0.30		mg/kg	
			Acid Extractable Chromium (Cr)	2017/10/26	<2.0		mg/kg	
			Acid Extractable Cobalt (Co)	2017/10/26	<1.0		mg/kg	
			Acid Extractable Copper (Cu)	2017/10/26	<2.0		mg/kg	
			Acid Extractable Iron (Fe)	2017/10/26	<50		mg/kg	
			Acid Extractable Lead (Pb)	2017/10/26	<0.50		mg/kg	
			Acid Extractable Lithium (Li)	2017/10/26	<2.0		mg/kg	
			Acid Extractable Manganese (Mn)	2017/10/26	<2.0		mg/kg	
			Acid Extractable Mercury (Hg)	2017/10/26	<0.10		mg/kg	
			Acid Extractable Molybdenum (Mo)	2017/10/26	<2.0		mg/kg	
			Acid Extractable Nickel (Ni)	2017/10/26	<2.0		mg/kg	
			Acid Extractable Rubidium (Rb)	2017/10/26	<2.0		mg/kg	
			Acid Extractable Selenium (Se)	2017/10/26	<1.0		mg/kg	
			Acid Extractable Silver (Ag)	2017/10/26	<0.50		mg/kg	
			Acid Extractable Strontium (Sr)	2017/10/26	<5.0		mg/kg	
			Acid Extractable Thallium (Tl)	2017/10/26	<0.10		mg/kg	
			Acid Extractable Tin (Sn)	2017/10/26	<2.0		mg/kg	
			Acid Extractable Uranium (U)	2017/10/26	<0.10		mg/kg	
			Acid Extractable Vanadium (V)	2017/10/26	<2.0		mg/kg	
			Acid Extractable Zinc (Zn)	2017/10/26	<5.0		mg/kg	
5232111	BAN	RPD - Sample/Sample Dup	Acid Extractable Aluminum (Al)	2017/10/26	1.4		%	35
			Acid Extractable Antimony (Sb)	2017/10/26	NC		%	35
			Acid Extractable Arsenic (As)	2017/10/26	11		%	35
			Acid Extractable Barium (Ba)	2017/10/26	3.9		%	35
			Acid Extractable Beryllium (Be)	2017/10/26	NC		%	35
			Acid Extractable Bismuth (Bi)	2017/10/26	NC		%	35
			Acid Extractable Boron (B)	2017/10/26	NC		%	35
			Acid Extractable Cadmium (Cd)	2017/10/26	6.7		%	35
			Acid Extractable Chromium (Cr)	2017/10/26	1.2		%	35
			Acid Extractable Cobalt (Co)	2017/10/26	8.6		%	35
			Acid Extractable Copper (Cu)	2017/10/26	0.20		%	35
			Acid Extractable Iron (Fe)	2017/10/26	5.4		%	35
			Acid Extractable Lead (Pb)	2017/10/26	3.4		%	35
			Acid Extractable Lithium (Li)	2017/10/26	4.3		%	35
			Acid Extractable Manganese (Mn)	2017/10/26	17		%	35
			Acid Extractable Mercury (Hg)	2017/10/26	NC		%	35
			Acid Extractable Molybdenum (Mo)	2017/10/26	NC		%	35
			Acid Extractable Nickel (Ni)	2017/10/26	4.6		%	35
			Acid Extractable Rubidium (Rb)	2017/10/26	10		%	35
			Acid Extractable Selenium (Se)	2017/10/26	NC		%	35
			Acid Extractable Silver (Ag)	2017/10/26	NC		%	35
			Acid Extractable Strontium (Sr)	2017/10/26	20		%	35
			Acid Extractable Thallium (Tl)	2017/10/26	1.2		%	35
			Acid Extractable Tin (Sn)	2017/10/26	NC		%	35
			Acid Extractable Uranium (U)	2017/10/26	26		%	35
			Acid Extractable Vanadium (V)	2017/10/26	1.3		%	35

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Acid Extractable Zinc (Zn)	2017/10/26	2.1		%	35
5232147	BAN	Matrix Spike(FJP712)	Acid Extractable Antimony (Sb)	2017/10/26		98	%	75 - 125
			Acid Extractable Arsenic (As)	2017/10/26		98	%	75 - 125
			Acid Extractable Barium (Ba)	2017/10/26		NC	%	75 - 125
			Acid Extractable Beryllium (Be)	2017/10/26		102	%	75 - 125
			Acid Extractable Bismuth (Bi)	2017/10/26		100	%	75 - 125
			Acid Extractable Boron (B)	2017/10/26		100	%	75 - 125
			Acid Extractable Cadmium (Cd)	2017/10/26		98	%	75 - 125
			Acid Extractable Chromium (Cr)	2017/10/26		90	%	75 - 125
			Acid Extractable Cobalt (Co)	2017/10/26		96	%	75 - 125
			Acid Extractable Copper (Cu)	2017/10/26		89	%	75 - 125
			Acid Extractable Lead (Pb)	2017/10/26		92	%	75 - 125
			Acid Extractable Lithium (Li)	2017/10/26		98	%	75 - 125
			Acid Extractable Manganese (Mn)	2017/10/26		NC	%	75 - 125
			Acid Extractable Mercury (Hg)	2017/10/26		97	%	75 - 125
			Acid Extractable Molybdenum (Mo)	2017/10/26		103	%	75 - 125
			Acid Extractable Nickel (Ni)	2017/10/26		91	%	75 - 125
			Acid Extractable Rubidium (Rb)	2017/10/26		96	%	75 - 125
			Acid Extractable Selenium (Se)	2017/10/26		101	%	75 - 125
			Acid Extractable Silver (Ag)	2017/10/26		97	%	75 - 125
			Acid Extractable Strontium (Sr)	2017/10/26		97	%	75 - 125
			Acid Extractable Thallium (Tl)	2017/10/26		100	%	75 - 125
			Acid Extractable Tin (Sn)	2017/10/26		NC	%	75 - 125
			Acid Extractable Uranium (U)	2017/10/26		100	%	75 - 125
			Acid Extractable Vanadium (V)	2017/10/26		91	%	75 - 125
			Acid Extractable Zinc (Zn)	2017/10/26		NC	%	75 - 125
5232147	BAN	Spiked Blank	Acid Extractable Antimony (Sb)	2017/10/26		101	%	75 - 125
			Acid Extractable Arsenic (As)	2017/10/26		103	%	75 - 125
			Acid Extractable Barium (Ba)	2017/10/26		102	%	75 - 125
			Acid Extractable Beryllium (Be)	2017/10/26		105	%	75 - 125
			Acid Extractable Bismuth (Bi)	2017/10/26		105	%	75 - 125
			Acid Extractable Boron (B)	2017/10/26		109	%	75 - 125
			Acid Extractable Cadmium (Cd)	2017/10/26		103	%	75 - 125
			Acid Extractable Chromium (Cr)	2017/10/26		104	%	75 - 125
			Acid Extractable Cobalt (Co)	2017/10/26		102	%	75 - 125
			Acid Extractable Copper (Cu)	2017/10/26		100	%	75 - 125
			Acid Extractable Lead (Pb)	2017/10/26		101	%	75 - 125
			Acid Extractable Lithium (Li)	2017/10/26		104	%	75 - 125
			Acid Extractable Manganese (Mn)	2017/10/26		104	%	75 - 125
			Acid Extractable Mercury (Hg)	2017/10/26		106	%	75 - 125
			Acid Extractable Molybdenum (Mo)	2017/10/26		110	%	75 - 125
			Acid Extractable Nickel (Ni)	2017/10/26		105	%	75 - 125
			Acid Extractable Rubidium (Rb)	2017/10/26		101	%	75 - 125
			Acid Extractable Selenium (Se)	2017/10/26		105	%	75 - 125
			Acid Extractable Silver (Ag)	2017/10/26		103	%	75 - 125
			Acid Extractable Strontium (Sr)	2017/10/26		105	%	75 - 125
			Acid Extractable Thallium (Tl)	2017/10/26		104	%	75 - 125
			Acid Extractable Tin (Sn)	2017/10/26		107	%	75 - 125
			Acid Extractable Uranium (U)	2017/10/26		104	%	75 - 125
			Acid Extractable Vanadium (V)	2017/10/26		103	%	75 - 125
			Acid Extractable Zinc (Zn)	2017/10/26		112	%	75 - 125
5232147	BAN	Method Blank	Acid Extractable Aluminum (Al)	2017/10/26	<10		mg/kg	

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Acid Extractable Antimony (Sb)	2017/10/26	<2.0		mg/kg	
			Acid Extractable Arsenic (As)	2017/10/26	<2.0		mg/kg	
			Acid Extractable Barium (Ba)	2017/10/26	<5.0		mg/kg	
			Acid Extractable Beryllium (Be)	2017/10/26	<2.0		mg/kg	
			Acid Extractable Bismuth (Bi)	2017/10/26	<2.0		mg/kg	
			Acid Extractable Boron (B)	2017/10/26	<50		mg/kg	
			Acid Extractable Cadmium (Cd)	2017/10/26	<0.30		mg/kg	
			Acid Extractable Chromium (Cr)	2017/10/26	<2.0		mg/kg	
			Acid Extractable Cobalt (Co)	2017/10/26	<1.0		mg/kg	
			Acid Extractable Copper (Cu)	2017/10/26	<2.0		mg/kg	
			Acid Extractable Iron (Fe)	2017/10/26	<50		mg/kg	
			Acid Extractable Lead (Pb)	2017/10/26	<0.50		mg/kg	
			Acid Extractable Lithium (Li)	2017/10/26	<2.0		mg/kg	
			Acid Extractable Manganese (Mn)	2017/10/26	<2.0		mg/kg	
			Acid Extractable Mercury (Hg)	2017/10/26	<0.10		mg/kg	
			Acid Extractable Molybdenum (Mo)	2017/10/26	<2.0		mg/kg	
			Acid Extractable Nickel (Ni)	2017/10/26	<2.0		mg/kg	
			Acid Extractable Rubidium (Rb)	2017/10/26	<2.0		mg/kg	
			Acid Extractable Selenium (Se)	2017/10/26	<1.0		mg/kg	
			Acid Extractable Silver (Ag)	2017/10/26	<0.50		mg/kg	
			Acid Extractable Strontium (Sr)	2017/10/26	<5.0		mg/kg	
			Acid Extractable Thallium (Tl)	2017/10/26	<0.10		mg/kg	
			Acid Extractable Tin (Sn)	2017/10/26	<2.0		mg/kg	
			Acid Extractable Uranium (U)	2017/10/26	<0.10		mg/kg	
			Acid Extractable Vanadium (V)	2017/10/26	<2.0		mg/kg	
			Acid Extractable Zinc (Zn)	2017/10/26	<5.0		mg/kg	
5232147	BAN	RPD - Sample/Sample Dup	Acid Extractable Aluminum (Al)	2017/10/26	15		%	35
			Acid Extractable Antimony (Sb)	2017/10/26	NC		%	35
			Acid Extractable Arsenic (As)	2017/10/26	2.7		%	35
			Acid Extractable Barium (Ba)	2017/10/26	11		%	35
			Acid Extractable Beryllium (Be)	2017/10/26	NC		%	35
			Acid Extractable Bismuth (Bi)	2017/10/26	NC		%	35
			Acid Extractable Boron (B)	2017/10/26	NC		%	35
			Acid Extractable Cadmium (Cd)	2017/10/26	12		%	35
			Acid Extractable Chromium (Cr)	2017/10/26	20		%	35
			Acid Extractable Cobalt (Co)	2017/10/26	2.3		%	35
			Acid Extractable Copper (Cu)	2017/10/26	3.0		%	35
			Acid Extractable Iron (Fe)	2017/10/26	9.6		%	35
			Acid Extractable Lead (Pb)	2017/10/26	11		%	35
			Acid Extractable Lithium (Li)	2017/10/26	19		%	35
			Acid Extractable Manganese (Mn)	2017/10/26	9.5		%	35
			Acid Extractable Mercury (Hg)	2017/10/26	10		%	35
			Acid Extractable Molybdenum (Mo)	2017/10/26	NC		%	35
			Acid Extractable Nickel (Ni)	2017/10/26	34		%	35
			Acid Extractable Rubidium (Rb)	2017/10/26	11		%	35
			Acid Extractable Selenium (Se)	2017/10/26	NC		%	35
			Acid Extractable Silver (Ag)	2017/10/26	NC		%	35
			Acid Extractable Strontium (Sr)	2017/10/26	19		%	35
			Acid Extractable Thallium (Tl)	2017/10/26	NC		%	35
			Acid Extractable Tin (Sn)	2017/10/26	5.1		%	35
			Acid Extractable Uranium (U)	2017/10/26	12		%	35
			Acid Extractable Vanadium (V)	2017/10/26	14		%	35

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Acid Extractable Zinc (Zn)	2017/10/26	17		%	35
5232173	CBR	Matrix Spike(FJP575)	Decachlorobiphenyl	2017/10/27		100	%	30 - 130
			Aroclor 1254	2017/10/27		105	%	30 - 130
5232173	CBR	Spiked Blank	Decachlorobiphenyl	2017/10/27		102	%	30 - 130
			Aroclor 1254	2017/10/27		108	%	30 - 130
5232173	CBR	Method Blank	Decachlorobiphenyl	2017/10/27		102	%	30 - 130
			Aroclor 1016	2017/10/27	<0.050		ug/g	
			Aroclor 1221	2017/10/27	<0.050		ug/g	
			Aroclor 1232	2017/10/27	<0.050		ug/g	
			Aroclor 1248	2017/10/27	<0.050		ug/g	
			Aroclor 1242	2017/10/27	<0.050		ug/g	
			Aroclor 1254	2017/10/27	<0.050		ug/g	
			Aroclor 1260	2017/10/27	<0.050		ug/g	
5232173	CBR	RPD - Sample/Sample Dup	Aroclor 1016	2017/10/27	NC		%	50
			Aroclor 1221	2017/10/27	NC		%	50
			Aroclor 1232	2017/10/27	NC		%	50
			Aroclor 1248	2017/10/27	NC		%	50
			Aroclor 1242	2017/10/27	NC		%	50
			Aroclor 1254	2017/10/27	NC		%	50
			Aroclor 1260	2017/10/27	NC		%	50
5232257	BAN	Matrix Spike(FJP682)	Acid Extractable Antimony (Sb)	2017/10/26		83	%	75 - 125
			Acid Extractable Arsenic (As)	2017/10/26		96	%	75 - 125
			Acid Extractable Barium (Ba)	2017/10/26		NC	%	75 - 125
			Acid Extractable Beryllium (Be)	2017/10/26		96	%	75 - 125
			Acid Extractable Bismuth (Bi)	2017/10/26		103	%	75 - 125
			Acid Extractable Boron (B)	2017/10/26		97	%	75 - 125
			Acid Extractable Cadmium (Cd)	2017/10/26		94	%	75 - 125
			Acid Extractable Chromium (Cr)	2017/10/26		98	%	75 - 125
			Acid Extractable Cobalt (Co)	2017/10/26		92	%	75 - 125
			Acid Extractable Copper (Cu)	2017/10/26		94	%	75 - 125
			Acid Extractable Lead (Pb)	2017/10/26		100	%	75 - 125
			Acid Extractable Lithium (Li)	2017/10/26		NC	%	75 - 125
			Acid Extractable Manganese (Mn)	2017/10/26		NC	%	75 - 125
			Acid Extractable Mercury (Hg)	2017/10/26		96	%	75 - 125
			Acid Extractable Molybdenum (Mo)	2017/10/26		NC	%	75 - 125
			Acid Extractable Nickel (Ni)	2017/10/26		97	%	75 - 125
			Acid Extractable Rubidium (Rb)	2017/10/26		102	%	75 - 125
			Acid Extractable Selenium (Se)	2017/10/26		97	%	75 - 125
			Acid Extractable Silver (Ag)	2017/10/26		97	%	75 - 125
			Acid Extractable Strontium (Sr)	2017/10/26		96	%	75 - 125
			Acid Extractable Thallium (Tl)	2017/10/26		101	%	75 - 125
			Acid Extractable Tin (Sn)	2017/10/26		99	%	75 - 125
			Acid Extractable Uranium (U)	2017/10/26		98	%	75 - 125
			Acid Extractable Vanadium (V)	2017/10/26		NC	%	75 - 125
			Acid Extractable Zinc (Zn)	2017/10/26		NC	%	75 - 125
5232257	BAN	Spiked Blank	Acid Extractable Antimony (Sb)	2017/10/26		98	%	75 - 125
			Acid Extractable Arsenic (As)	2017/10/26		102	%	75 - 125
			Acid Extractable Barium (Ba)	2017/10/26		102	%	75 - 125
			Acid Extractable Beryllium (Be)	2017/10/26		103	%	75 - 125
			Acid Extractable Bismuth (Bi)	2017/10/26		103	%	75 - 125
			Acid Extractable Boron (B)	2017/10/26		105	%	75 - 125
			Acid Extractable Cadmium (Cd)	2017/10/26		101	%	75 - 125

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Acid Extractable Chromium (Cr)	2017/10/26		101	%	75 - 125
			Acid Extractable Cobalt (Co)	2017/10/26		101	%	75 - 125
			Acid Extractable Copper (Cu)	2017/10/26		99	%	75 - 125
			Acid Extractable Lead (Pb)	2017/10/26		101	%	75 - 125
			Acid Extractable Lithium (Li)	2017/10/26		102	%	75 - 125
			Acid Extractable Manganese (Mn)	2017/10/26		103	%	75 - 125
			Acid Extractable Mercury (Hg)	2017/10/26		106	%	75 - 125
			Acid Extractable Molybdenum (Mo)	2017/10/26		103	%	75 - 125
			Acid Extractable Nickel (Ni)	2017/10/26		104	%	75 - 125
			Acid Extractable Rubidium (Rb)	2017/10/26		100	%	75 - 125
			Acid Extractable Selenium (Se)	2017/10/26		105	%	75 - 125
			Acid Extractable Silver (Ag)	2017/10/26		102	%	75 - 125
			Acid Extractable Strontium (Sr)	2017/10/26		102	%	75 - 125
			Acid Extractable Thallium (Tl)	2017/10/26		104	%	75 - 125
			Acid Extractable Tin (Sn)	2017/10/26		104	%	75 - 125
			Acid Extractable Uranium (U)	2017/10/26		103	%	75 - 125
			Acid Extractable Vanadium (V)	2017/10/26		102	%	75 - 125
			Acid Extractable Zinc (Zn)	2017/10/26		101	%	75 - 125
5232257	BAN	Method Blank	Acid Extractable Aluminum (Al)	2017/10/26	<10		mg/kg	
			Acid Extractable Antimony (Sb)	2017/10/26	<2.0		mg/kg	
			Acid Extractable Arsenic (As)	2017/10/26	<2.0		mg/kg	
			Acid Extractable Barium (Ba)	2017/10/26	<5.0		mg/kg	
			Acid Extractable Beryllium (Be)	2017/10/26	<2.0		mg/kg	
			Acid Extractable Bismuth (Bi)	2017/10/26	<2.0		mg/kg	
			Acid Extractable Boron (B)	2017/10/26	<50		mg/kg	
			Acid Extractable Cadmium (Cd)	2017/10/26	<0.30		mg/kg	
			Acid Extractable Chromium (Cr)	2017/10/26	<2.0		mg/kg	
			Acid Extractable Cobalt (Co)	2017/10/26	<1.0		mg/kg	
			Acid Extractable Copper (Cu)	2017/10/26	<2.0		mg/kg	
			Acid Extractable Iron (Fe)	2017/10/26	<50		mg/kg	
			Acid Extractable Lead (Pb)	2017/10/26	<0.50		mg/kg	
			Acid Extractable Lithium (Li)	2017/10/26	<2.0		mg/kg	
			Acid Extractable Manganese (Mn)	2017/10/26	<2.0		mg/kg	
			Acid Extractable Mercury (Hg)	2017/10/26	<0.10		mg/kg	
			Acid Extractable Molybdenum (Mo)	2017/10/26	<2.0		mg/kg	
			Acid Extractable Nickel (Ni)	2017/10/26	<2.0		mg/kg	
			Acid Extractable Rubidium (Rb)	2017/10/26	<2.0		mg/kg	
			Acid Extractable Selenium (Se)	2017/10/26	<1.0		mg/kg	
			Acid Extractable Silver (Ag)	2017/10/26	<0.50		mg/kg	
			Acid Extractable Strontium (Sr)	2017/10/26	<5.0		mg/kg	
			Acid Extractable Thallium (Tl)	2017/10/26	<0.10		mg/kg	
			Acid Extractable Tin (Sn)	2017/10/26	<2.0		mg/kg	
			Acid Extractable Uranium (U)	2017/10/26	<0.10		mg/kg	
			Acid Extractable Vanadium (V)	2017/10/26	<2.0		mg/kg	
			Acid Extractable Zinc (Zn)	2017/10/26	<5.0		mg/kg	
5232257	BAN	RPD - Sample/Sample Dup	Acid Extractable Aluminum (Al)	2017/10/26	10		%	35
			Acid Extractable Antimony (Sb)	2017/10/26	NC		%	35
			Acid Extractable Arsenic (As)	2017/10/26	2.6		%	35
			Acid Extractable Barium (Ba)	2017/10/26	13		%	35
			Acid Extractable Beryllium (Be)	2017/10/26	NC		%	35
			Acid Extractable Bismuth (Bi)	2017/10/26	NC		%	35
			Acid Extractable Boron (B)	2017/10/26	NC		%	35

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Acid Extractable Cadmium (Cd)	2017/10/26	12		%	35
			Acid Extractable Chromium (Cr)	2017/10/26	12		%	35
			Acid Extractable Cobalt (Co)	2017/10/26	10		%	35
			Acid Extractable Copper (Cu)	2017/10/26	0.093		%	35
			Acid Extractable Iron (Fe)	2017/10/26	7.3		%	35
			Acid Extractable Lead (Pb)	2017/10/26	14		%	35
			Acid Extractable Lithium (Li)	2017/10/26	12		%	35
			Acid Extractable Manganese (Mn)	2017/10/26	10		%	35
			Acid Extractable Mercury (Hg)	2017/10/26	NC		%	35
			Acid Extractable Molybdenum (Mo)	2017/10/26	49 (5)		%	35
			Acid Extractable Nickel (Ni)	2017/10/26	9.9		%	35
			Acid Extractable Rubidium (Rb)	2017/10/26	12		%	35
			Acid Extractable Selenium (Se)	2017/10/26	NC		%	35
			Acid Extractable Silver (Ag)	2017/10/26	NC		%	35
			Acid Extractable Strontium (Sr)	2017/10/26	6.3		%	35
			Acid Extractable Thallium (Tl)	2017/10/26	14		%	35
			Acid Extractable Tin (Sn)	2017/10/26	12		%	35
			Acid Extractable Uranium (U)	2017/10/26	7.3		%	35
			Acid Extractable Vanadium (V)	2017/10/26	6.8		%	35
			Acid Extractable Zinc (Zn)	2017/10/26	2.4		%	35
5232258	GTH	Matrix Spike(FJP563)	D10-Anthracene	2017/11/01		79	%	50 - 130
			D14-Terphenyl (FS)	2017/11/01		90	%	50 - 130
			D8-Acenaphthylene	2017/11/01		106	%	50 - 130
			1-Methylnaphthalene	2017/11/01		93	%	30 - 130
			2-Methylnaphthalene	2017/11/01		99	%	30 - 130
			Acenaphthene	2017/11/01		97	%	30 - 130
			Acenaphthylene	2017/11/01		99	%	30 - 130
			Anthracene	2017/11/01		84	%	30 - 130
			Benzo(a)anthracene	2017/11/01		84	%	30 - 130
			Benzo(a)pyrene	2017/11/01		96	%	30 - 130
			Benzo(b)fluoranthene	2017/11/01		103	%	30 - 130
			Benzo(g,h,i)perylene	2017/11/01		95	%	30 - 130
			Benzo(j)fluoranthene	2017/11/01		96	%	30 - 130
			Benzo(k)fluoranthene	2017/11/01		99	%	30 - 130
			Chrysene	2017/11/01		83	%	30 - 130
			Dibenz(a,h)anthracene	2017/11/01		97	%	30 - 130
			Fluoranthene	2017/11/01		91	%	30 - 130
			Fluorene	2017/11/01		99	%	30 - 130
			Indeno(1,2,3-cd)pyrene	2017/11/01		99	%	30 - 130
			Naphthalene	2017/11/01		96	%	30 - 130
			Perylene	2017/11/01		93	%	30 - 130
			Phenanthrene	2017/11/01		93	%	30 - 130
			Pyrene	2017/11/01		83	%	30 - 130
5232258	GTH	Spiked Blank	D10-Anthracene	2017/11/01		88	%	50 - 130
			D14-Terphenyl (FS)	2017/11/01		102	%	50 - 130
			D8-Acenaphthylene	2017/11/01		103	%	50 - 130
			1-Methylnaphthalene	2017/11/01		93	%	30 - 130
			2-Methylnaphthalene	2017/11/01		98	%	30 - 130
			Acenaphthene	2017/11/01		94	%	30 - 130
			Acenaphthylene	2017/11/01		98	%	30 - 130
			Anthracene	2017/11/01		89	%	30 - 130
			Benzo(a)anthracene	2017/11/01		88	%	30 - 130

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Benzo(a)pyrene	2017/11/01		98	%	30 - 130
			Benzo(b)fluoranthene	2017/11/01		104	%	30 - 130
			Benzo(g,h,i)perylene	2017/11/01		99	%	30 - 130
			Benzo(j)fluoranthene	2017/11/01		99	%	30 - 130
			Benzo(k)fluoranthene	2017/11/01		101	%	30 - 130
			Chrysene	2017/11/01		87	%	30 - 130
			Dibenz(a,h)anthracene	2017/11/01		100	%	30 - 130
			Fluoranthene	2017/11/01		95	%	30 - 130
			Fluorene	2017/11/01		98	%	30 - 130
			Indeno(1,2,3-cd)pyrene	2017/11/01		101	%	30 - 130
			Naphthalene	2017/11/01		94	%	30 - 130
			Perylene	2017/11/01		97	%	30 - 130
			Phenanthrene	2017/11/01		93	%	30 - 130
			Pyrene	2017/11/01		90	%	30 - 130
5232258	GTH	Method Blank	D10-Anthracene	2017/11/01		98	%	50 - 130
			D14-Terphenyl (FS)	2017/11/01		116	%	50 - 130
			D8-Acenaphthylene	2017/11/01		112	%	50 - 130
			1-Methylnaphthalene	2017/11/01	<0.010		mg/kg	
			2-Methylnaphthalene	2017/11/01	<0.010		mg/kg	
			Acenaphthene	2017/11/01	<0.010		mg/kg	
			Acenaphthylene	2017/11/01	<0.010		mg/kg	
			Anthracene	2017/11/01	<0.010		mg/kg	
			Benzo(a)anthracene	2017/11/01	<0.010		mg/kg	
			Benzo(a)pyrene	2017/11/01	<0.010		mg/kg	
			Benzo(b)fluoranthene	2017/11/01	<0.010		mg/kg	
			Benzo(g,h,i)perylene	2017/11/01	<0.010		mg/kg	
			Benzo(j)fluoranthene	2017/11/01	<0.010		mg/kg	
			Benzo(k)fluoranthene	2017/11/01	<0.010		mg/kg	
			Chrysene	2017/11/01	<0.010		mg/kg	
			Dibenz(a,h)anthracene	2017/11/01	<0.010		mg/kg	
			Fluoranthene	2017/11/01	<0.010		mg/kg	
			Fluorene	2017/11/01	<0.010		mg/kg	
			Indeno(1,2,3-cd)pyrene	2017/11/01	<0.010		mg/kg	
			Naphthalene	2017/11/01	<0.010		mg/kg	
			Perylene	2017/11/01	<0.010		mg/kg	
			Phenanthrene	2017/11/01	<0.010		mg/kg	
			Pyrene	2017/11/01	<0.010		mg/kg	
5232258	GTH	RPD - Sample/Sample Dup	1-Methylnaphthalene	2017/11/01	NC		%	50
			2-Methylnaphthalene	2017/11/01	NC		%	50
			Acenaphthene	2017/11/01	NC		%	50
			Acenaphthylene	2017/11/01	NC		%	50
			Anthracene	2017/11/01	NC		%	50
			Benzo(a)anthracene	2017/11/01	NC		%	50
			Benzo(a)pyrene	2017/11/01	NC		%	50
			Benzo(b)fluoranthene	2017/11/01	NC		%	50
			Benzo(g,h,i)perylene	2017/11/01	NC		%	50
			Benzo(j)fluoranthene	2017/11/01	NC		%	50
			Benzo(k)fluoranthene	2017/11/01	NC		%	50
			Chrysene	2017/11/01	NC		%	50
			Dibenz(a,h)anthracene	2017/11/01	NC		%	50
			Fluoranthene	2017/11/01	NC		%	50
			Fluorene	2017/11/01	NC		%	50

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Indeno(1,2,3-cd)pyrene	2017/11/01	NC		%	50
			Naphthalene	2017/11/01	NC		%	50
			Perylene	2017/11/01	NC		%	50
			Phenanthrene	2017/11/01	NC		%	50
			Pyrene	2017/11/01	NC		%	50
5232260	GTH	Matrix Spike(FJP587)	D10-Anthracene	2017/10/27		98	%	50 - 130
			D14-Terphenyl (FS)	2017/10/27		96	%	50 - 130
			D8-Acenaphthylene	2017/10/27		96	%	50 - 130
			1-Methylnaphthalene	2017/10/27		90	%	30 - 130
			2-Methylnaphthalene	2017/10/27		102	%	30 - 130
			Acenaphthene	2017/10/27		101	%	30 - 130
			Acenaphthylene	2017/10/27		86	%	30 - 130
			Anthracene	2017/10/27		99	%	30 - 130
			Benzo(a)anthracene	2017/10/27		104	%	30 - 130
			Benzo(a)pyrene	2017/10/27		99	%	30 - 130
			Benzo(b)fluoranthene	2017/10/27		100	%	30 - 130
			Benzo(g,h,i)perylene	2017/10/27		105	%	30 - 130
			Benzo(j)fluoranthene	2017/10/27		102	%	30 - 130
			Benzo(k)fluoranthene	2017/10/27		98	%	30 - 130
			Chrysene	2017/10/27		104	%	30 - 130
			Dibenz(a,h)anthracene	2017/10/27		101	%	30 - 130
			Fluoranthene	2017/10/27		103	%	30 - 130
			Fluorene	2017/10/27		102	%	30 - 130
			Indeno(1,2,3-cd)pyrene	2017/10/27		102	%	30 - 130
			Naphthalene	2017/10/27		100	%	30 - 130
			Perylene	2017/10/27		100	%	30 - 130
			Phenanthrene	2017/10/27		98	%	30 - 130
			Pyrene	2017/10/27		100	%	30 - 130
5232260	GTH	Spiked Blank	D10-Anthracene	2017/10/27		94	%	50 - 130
			D14-Terphenyl (FS)	2017/10/27		89	%	50 - 130
			D8-Acenaphthylene	2017/10/27		90	%	50 - 130
			1-Methylnaphthalene	2017/10/27		79	%	30 - 130
			2-Methylnaphthalene	2017/10/27		87	%	30 - 130
			Acenaphthene	2017/10/27		94	%	30 - 130
			Acenaphthylene	2017/10/27		82	%	30 - 130
			Anthracene	2017/10/27		94	%	30 - 130
			Benzo(a)anthracene	2017/10/27		96	%	30 - 130
			Benzo(a)pyrene	2017/10/27		96	%	30 - 130
			Benzo(b)fluoranthene	2017/10/27		96	%	30 - 130
			Benzo(g,h,i)perylene	2017/10/27		103	%	30 - 130
			Benzo(j)fluoranthene	2017/10/27		98	%	30 - 130
			Benzo(k)fluoranthene	2017/10/27		96	%	30 - 130
			Chrysene	2017/10/27		91	%	30 - 130
			Dibenz(a,h)anthracene	2017/10/27		99	%	30 - 130
			Fluoranthene	2017/10/27		99	%	30 - 130
			Fluorene	2017/10/27		95	%	30 - 130
			Indeno(1,2,3-cd)pyrene	2017/10/27		101	%	30 - 130
			Naphthalene	2017/10/27		89	%	30 - 130
			Perylene	2017/10/27		96	%	30 - 130
			Phenanthrene	2017/10/27		93	%	30 - 130
			Pyrene	2017/10/27		98	%	30 - 130
5232260	GTH	Method Blank	D10-Anthracene	2017/10/27		108	%	50 - 130

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			D14-Terphenyl (FS)	2017/10/27		105	%	50 - 130
			D8-Acenaphthylene	2017/10/27		105	%	50 - 130
			1-Methylnaphthalene	2017/10/27	<0.010		mg/kg	
			2-Methylnaphthalene	2017/10/27	<0.010		mg/kg	
			Acenaphthene	2017/10/27	<0.010		mg/kg	
			Acenaphthylene	2017/10/27	<0.010		mg/kg	
			Anthracene	2017/10/27	<0.010		mg/kg	
			Benzo(a)anthracene	2017/10/27	<0.010		mg/kg	
			Benzo(a)pyrene	2017/10/27	<0.010		mg/kg	
			Benzo(b)fluoranthene	2017/10/27	<0.010		mg/kg	
			Benzo(g,h,i)perylene	2017/10/27	<0.010		mg/kg	
			Benzo(j)fluoranthene	2017/10/27	<0.010		mg/kg	
			Benzo(k)fluoranthene	2017/10/27	<0.010		mg/kg	
			Chrysene	2017/10/27	<0.010		mg/kg	
			Dibenz(a,h)anthracene	2017/10/27	<0.010		mg/kg	
			Fluoranthene	2017/10/27	<0.010		mg/kg	
			Fluorene	2017/10/27	<0.010		mg/kg	
			Indeno(1,2,3-cd)pyrene	2017/10/27	<0.010		mg/kg	
			Naphthalene	2017/10/27	<0.010		mg/kg	
			Perylene	2017/10/27	<0.010		mg/kg	
			Phenanthrene	2017/10/27	<0.010		mg/kg	
			Pyrene	2017/10/27	<0.010		mg/kg	
5232260	GTH	RPD - Sample/Sample Dup	1-Methylnaphthalene	2017/10/27	NC		%	50
			2-Methylnaphthalene	2017/10/27	NC		%	50
			Acenaphthene	2017/10/27	NC		%	50
			Acenaphthylene	2017/10/27	NC		%	50
			Anthracene	2017/10/27	NC		%	50
			Benzo(a)anthracene	2017/10/27	NC		%	50
			Benzo(a)pyrene	2017/10/27	NC		%	50
			Benzo(b)fluoranthene	2017/10/27	NC		%	50
			Benzo(g,h,i)perylene	2017/10/27	NC		%	50
			Benzo(j)fluoranthene	2017/10/27	NC		%	50
			Benzo(k)fluoranthene	2017/10/27	NC		%	50
			Chrysene	2017/10/27	NC		%	50
			Dibenz(a,h)anthracene	2017/10/27	NC		%	50
			Fluoranthene	2017/10/27	35		%	50
			Fluorene	2017/10/27	NC		%	50
			Indeno(1,2,3-cd)pyrene	2017/10/27	NC		%	50
			Naphthalene	2017/10/27	NC		%	50
			Perylene	2017/10/27	NC		%	50
			Phenanthrene	2017/10/27	NC		%	50
			Pyrene	2017/10/27	27		%	50
5232295	GTH	Matrix Spike	Benzo(j)fluoranthene	2017/10/31		58	%	30 - 130
			D10-Anthracene	2017/10/31		78	%	50 - 130
			D14-Terphenyl	2017/10/31		89	%	50 - 130
			D8-Acenaphthylene	2017/10/31		76	%	50 - 130
			1-Methylnaphthalene	2017/10/31		54	%	30 - 130
			2-Methylnaphthalene	2017/10/31		60	%	30 - 130
			Acenaphthene	2017/10/31		65	%	30 - 130
			Acenaphthylene	2017/10/31		66	%	30 - 130
			Acridine	2017/10/31		67	%	30 - 130
			Anthracene	2017/10/31		66	%	30 - 130

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Benzo(a)anthracene	2017/10/31		73	%	30 - 130
			Benzo(a)pyrene	2017/10/31		57	%	30 - 130
			Benzo(b)fluoranthene	2017/10/31		63	%	30 - 130
			Benzo(g,h,i)perylene	2017/10/31		65	%	30 - 130
			Benzo(k)fluoranthene	2017/10/31		52	%	30 - 130
			Chrysene	2017/10/31		75	%	30 - 130
			Dibenz(a,h)anthracene	2017/10/31		62	%	30 - 130
			Fluoranthene	2017/10/31		72	%	30 - 130
			Fluorene	2017/10/31		67	%	30 - 130
			Indeno(1,2,3-cd)pyrene	2017/10/31		62	%	30 - 130
			Naphthalene	2017/10/31		55	%	30 - 130
			Perylene	2017/10/31		59	%	30 - 130
			Phenanthrene	2017/10/31		64	%	30 - 130
			Pyrene	2017/10/31		71	%	30 - 130
			Quinoline	2017/10/31		48 (6)	%	30 - 130
5232295	GTH	Spiked Blank	Benzo(j)fluoranthene	2017/10/28		72	%	30 - 130
			D10-Anthracene	2017/10/28		89	%	50 - 130
			D14-Terphenyl	2017/10/28		84	%	50 - 130
			D8-Acenaphthylene	2017/10/28		85	%	50 - 130
			1-Methylnaphthalene	2017/10/28		64	%	30 - 130
			2-Methylnaphthalene	2017/10/28		68	%	30 - 130
			Acenaphthene	2017/10/28		74	%	30 - 130
			Acenaphthylene	2017/10/28		73	%	30 - 130
			Acridine	2017/10/28		59	%	30 - 130
			Anthracene	2017/10/28		71	%	30 - 130
			Benzo(a)anthracene	2017/10/28		69	%	30 - 130
			Benzo(a)pyrene	2017/10/28		66	%	30 - 130
			Benzo(b)fluoranthene	2017/10/28		65	%	30 - 130
			Benzo(g,h,i)perylene	2017/10/28		68	%	30 - 130
			Benzo(k)fluoranthene	2017/10/28		68	%	30 - 130
			Chrysene	2017/10/28		69	%	30 - 130
			Dibenz(a,h)anthracene	2017/10/28		58	%	30 - 130
			Fluoranthene	2017/10/28		71	%	30 - 130
			Fluorene	2017/10/28		71	%	30 - 130
			Indeno(1,2,3-cd)pyrene	2017/10/28		64	%	30 - 130
			Naphthalene	2017/10/28		68	%	30 - 130
			Perylene	2017/10/28		66	%	30 - 130
			Phenanthrene	2017/10/28		71	%	30 - 130
			Pyrene	2017/10/28		71	%	30 - 130
			Quinoline	2017/10/28		51	%	30 - 130
5232295	GTH	Method Blank	Benzo(j)fluoranthene	2017/10/28	<0.010		ug/L	
			D10-Anthracene	2017/10/28		71	%	50 - 130
			D14-Terphenyl	2017/10/28		70	%	50 - 130
			D8-Acenaphthylene	2017/10/28		70	%	50 - 130
			1-Methylnaphthalene	2017/10/28	<0.050		ug/L	
			2-Methylnaphthalene	2017/10/28	<0.050		ug/L	
			Acenaphthene	2017/10/28	<0.010		ug/L	
			Acenaphthylene	2017/10/28	<0.010		ug/L	
			Acridine	2017/10/28	<0.050		ug/L	
			Anthracene	2017/10/28	<0.010		ug/L	
			Benzo(a)anthracene	2017/10/28	<0.010		ug/L	
			Benzo(a)pyrene	2017/10/28	<0.010		ug/L	

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Benzo(b)fluoranthene	2017/10/28	<0.010		ug/L	
			Benzo(g,h,i)perylene	2017/10/28	<0.010		ug/L	
			Benzo(k)fluoranthene	2017/10/28	<0.010		ug/L	
			Chrysene	2017/10/28	<0.010		ug/L	
			Dibenz(a,h)anthracene	2017/10/28	<0.010		ug/L	
			Fluoranthene	2017/10/28	<0.010		ug/L	
			Fluorene	2017/10/28	<0.010		ug/L	
			Indeno(1,2,3-cd)pyrene	2017/10/28	<0.010		ug/L	
			Naphthalene	2017/10/28	<0.20		ug/L	
			Perylene	2017/10/28	<0.010		ug/L	
			Phenanthrene	2017/10/28	<0.010		ug/L	
			Pyrene	2017/10/28	<0.010		ug/L	
			Quinoline	2017/10/28	<0.050		ug/L	
5232295	GTH	RPD - Sample/Sample Dup	Benzo(j)fluoranthene	2017/10/28	NC		%	40
			1-Methylnaphthalene	2017/10/28	NC		%	40
			2-Methylnaphthalene	2017/10/28	NC		%	40
			Acenaphthene	2017/10/28	NC		%	40
			Acenaphthylene	2017/10/28	NC		%	40
			Acridine	2017/10/28	NC		%	40
			Anthracene	2017/10/28	NC		%	40
			Benzo(a)anthracene	2017/10/28	NC		%	40
			Benzo(a)pyrene	2017/10/28	NC		%	40
			Benzo(b)fluoranthene	2017/10/28	NC		%	40
			Benzo(g,h,i)perylene	2017/10/28	NC		%	40
			Benzo(k)fluoranthene	2017/10/28	NC		%	40
			Chrysene	2017/10/28	NC		%	40
			Dibenz(a,h)anthracene	2017/10/28	NC		%	40
			Fluoranthene	2017/10/28	NC		%	40
			Fluorene	2017/10/28	NC		%	40
			Indeno(1,2,3-cd)pyrene	2017/10/28	NC		%	40
			Naphthalene	2017/10/28	NC		%	40
			Perylene	2017/10/28	NC		%	40
			Phenanthrene	2017/10/28	NC		%	40
			Pyrene	2017/10/28	NC		%	40
			Quinoline	2017/10/28	NC		%	40
5232820	JZ	Matrix Spike	2,4,5,6-Tetrachloro-m-xylene	2017/10/27		96	%	50 - 130
			Decachlorobiphenyl	2017/10/27		127	%	50 - 130
			Aldrin	2017/10/27		99	%	50 - 130
			a-Chlordane	2017/10/27		103	%	50 - 130
			g-Chlordane	2017/10/27		104	%	50 - 130
			o,p-DDD	2017/10/27		96	%	50 - 130
			p,p-DDD	2017/10/27		113	%	50 - 130
			o,p-DDE	2017/10/27		113	%	50 - 130
			p,p-DDE	2017/10/27		126	%	50 - 130
			o,p-DDT	2017/10/27		96	%	50 - 130
			p,p-DDT	2017/10/27		107	%	50 - 130
			Dieldrin	2017/10/27		108	%	50 - 130
			Lindane	2017/10/27		81	%	50 - 130
			Endosulfan I (alpha)	2017/10/27		96	%	50 - 130
			Endosulfan II (beta)	2017/10/27		120	%	50 - 130
			Endrin	2017/10/27		110	%	50 - 130
			Heptachlor	2017/10/27		84	%	50 - 130

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Heptachlor epoxide	2017/10/27		90	%	50 - 130
			Hexachlorobenzene	2017/10/27		105	%	50 - 130
			Methoxychlor	2017/10/27		84	%	50 - 130
			alpha-BHC	2017/10/27		91	%	30 - 130
			beta-BHC	2017/10/27		90	%	30 - 130
			delta-BHC	2017/10/27		94	%	30 - 130
			Endosulfan sulfate	2017/10/27		116	%	30 - 130
			Endrin aldehyde	2017/10/27		123	%	30 - 130
			Endrin ketone	2017/10/27		100	%	30 - 130
			Mirex	2017/10/27		108	%	30 - 130
			Octachlorostyrene	2017/10/27		101	%	30 - 130
5232820	JZ	Spiked Blank	2,4,5,6-Tetrachloro-m-xylene	2017/10/27		89	%	50 - 130
			Decachlorobiphenyl	2017/10/27		122	%	50 - 130
			Aldrin	2017/10/27		93	%	50 - 130
			a-Chlordane	2017/10/27		103	%	50 - 130
			g-Chlordane	2017/10/27		90	%	50 - 130
			o,p-DDD	2017/10/27		98	%	50 - 130
			p,p-DDD	2017/10/27		105	%	50 - 130
			o,p-DDE	2017/10/27		101	%	50 - 130
			p,p-DDE	2017/10/27		117	%	50 - 130
			o,p-DDT	2017/10/27		82	%	50 - 130
			p,p-DDT	2017/10/27		95	%	50 - 130
			Dieldrin	2017/10/27		112	%	50 - 130
			Lindane	2017/10/27		80	%	50 - 130
			Endosulfan I (alpha)	2017/10/27		97	%	50 - 130
			Endosulfan II (beta)	2017/10/27		106	%	50 - 130
			Endrin	2017/10/27		96	%	50 - 130
			Heptachlor	2017/10/27		81	%	50 - 130
			Heptachlor epoxide	2017/10/27		91	%	50 - 130
			Hexachlorobenzene	2017/10/27		97	%	50 - 130
			Methoxychlor	2017/10/27		90	%	50 - 130
			alpha-BHC	2017/10/27		86	%	30 - 130
			beta-BHC	2017/10/27		92	%	30 - 130
			delta-BHC	2017/10/27		95	%	30 - 130
			Endosulfan sulfate	2017/10/27		109	%	30 - 130
			Endrin aldehyde	2017/10/27		116	%	30 - 130
			Endrin ketone	2017/10/27		99	%	30 - 130
			Mirex	2017/10/27		97	%	30 - 130
			Octachlorostyrene	2017/10/27		92	%	30 - 130
5232820	JZ	Spiked Blank DUP	2,4,5,6-Tetrachloro-m-xylene	2017/10/27		88	%	50 - 130
			Decachlorobiphenyl	2017/10/27		118	%	50 - 130
			Aroclor 1242	2017/10/27		93	%	60 - 130
			Toxaphene	2017/10/27		124	%	30 - 130
5232820	JZ	RPD	Aroclor 1242	2017/10/27	200 (7)		%	40
			Toxaphene	2017/10/27	200 (7)		%	50
5232820	JZ	Method Blank	2,4,5,6-Tetrachloro-m-xylene	2017/10/27		81	%	50 - 130
			Decachlorobiphenyl	2017/10/27		111	%	50 - 130
			Aldrin	2017/10/27	<0.0020		ug/g	
			a-Chlordane	2017/10/27	<0.0020		ug/g	
			g-Chlordane	2017/10/27	<0.0020		ug/g	
			o,p-DDD	2017/10/27	<0.0020		ug/g	
			p,p-DDD	2017/10/27	<0.0020		ug/g	

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			o,p-DDE	2017/10/27	<0.0020		ug/g	
			p,p-DDE	2017/10/27	<0.0020		ug/g	
			o,p-DDT	2017/10/27	<0.0020		ug/g	
			p,p-DDT	2017/10/27	<0.0020		ug/g	
			Dieldrin	2017/10/27	<0.0020		ug/g	
			Lindane	2017/10/27	<0.0020		ug/g	
			Endosulfan I (alpha)	2017/10/27	<0.0020		ug/g	
			Endosulfan II (beta)	2017/10/27	<0.0020		ug/g	
			Endrin	2017/10/27	<0.0020		ug/g	
			Heptachlor	2017/10/27	<0.0020		ug/g	
			Heptachlor epoxide	2017/10/27	<0.0020		ug/g	
			Hexachlorobenzene	2017/10/27	<0.0020		ug/g	
			Methoxychlor	2017/10/27	<0.0050		ug/g	
			Aroclor 1016	2017/10/27	<0.015		ug/g	
			Aroclor 1221	2017/10/27	<0.015		ug/g	
			Aroclor 1232	2017/10/27	<0.015		ug/g	
			Aroclor 1242	2017/10/27	<0.015		ug/g	
			Aroclor 1248	2017/10/27	<0.015		ug/g	
			Aroclor 1254	2017/10/27	<0.015		ug/g	
			Aroclor 1260	2017/10/27	<0.015		ug/g	
			Aroclor 1262	2017/10/27	<0.015		ug/g	
			Aroclor 1268	2017/10/27	<0.015		ug/g	
			alpha-BHC	2017/10/27	<0.0020		ug/g	
			beta-BHC	2017/10/27	<0.0020		ug/g	
			delta-BHC	2017/10/27	<0.0020		ug/g	
			Endosulfan sulfate	2017/10/27	<0.0020		ug/g	
			Endrin aldehyde	2017/10/27	<0.0020		ug/g	
			Endrin ketone	2017/10/27	<0.0020		ug/g	
			Mirex	2017/10/27	<0.0020		ug/g	
			Octachlorostyrene	2017/10/27	<0.0020		ug/g	
			Toxaphene	2017/10/27	<0.080		ug/g	
5232820	JZ	RPD - Sample/Sample Dup	Aldrin	2017/10/27	NC		%	40
			a-Chlordane	2017/10/27	NC		%	40
			g-Chlordane	2017/10/27	NC		%	40
			o,p-DDD	2017/10/27	NC		%	40
			p,p-DDD	2017/10/27	NC		%	40
			o,p-DDE	2017/10/27	NC		%	40
			p,p-DDE	2017/10/27	NC		%	40
			o,p-DDT	2017/10/27	NC		%	40
			p,p-DDT	2017/10/27	NC		%	40
			Dieldrin	2017/10/27	NC		%	40
			Lindane	2017/10/27	NC		%	40
			Endosulfan I (alpha)	2017/10/27	NC		%	40
			Endosulfan II (beta)	2017/10/27	NC		%	40
			Endrin	2017/10/27	NC		%	40
			Heptachlor	2017/10/27	NC		%	40
			Heptachlor epoxide	2017/10/27	NC		%	40
			Hexachlorobenzene	2017/10/27	NC		%	40
			Methoxychlor	2017/10/27	NC		%	40
			Aroclor 1016	2017/10/27	NC		%	40
			Aroclor 1221	2017/10/27	NC		%	40
			Aroclor 1232	2017/10/27	NC		%	40

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Aroclor 1242	2017/10/27	NC		%	40
			Aroclor 1248	2017/10/27	NC		%	40
			Aroclor 1254	2017/10/27	NC		%	40
			Aroclor 1260	2017/10/27	NC		%	40
			alpha-BHC	2017/10/27	NC		%	50
			beta-BHC	2017/10/27	NC		%	50
			delta-BHC	2017/10/27	NC		%	50
			Endosulfan sulfate	2017/10/27	NC		%	50
			Endrin aldehyde	2017/10/27	NC		%	50
			Endrin ketone	2017/10/27	NC		%	50
			Mirex	2017/10/27	NC		%	50
			Octachlorostyrene	2017/10/27	NC		%	50
			Toxaphene	2017/10/27	NC		%	50
5234500	BAN	Matrix Spike	Acid Extractable Antimony (Sb)	2017/10/27		92	%	75 - 125
			Acid Extractable Arsenic (As)	2017/10/27		110	%	75 - 125
			Acid Extractable Barium (Ba)	2017/10/27		NC	%	75 - 125
			Acid Extractable Beryllium (Be)	2017/10/27		101	%	75 - 125
			Acid Extractable Bismuth (Bi)	2017/10/27		103	%	75 - 125
			Acid Extractable Boron (B)	2017/10/27		97	%	75 - 125
			Acid Extractable Cadmium (Cd)	2017/10/27		102	%	75 - 125
			Acid Extractable Chromium (Cr)	2017/10/27		102	%	75 - 125
			Acid Extractable Cobalt (Co)	2017/10/27		100	%	75 - 125
			Acid Extractable Copper (Cu)	2017/10/27		100	%	75 - 125
			Acid Extractable Lead (Pb)	2017/10/27		102	%	75 - 125
			Acid Extractable Lithium (Li)	2017/10/27		104	%	75 - 125
			Acid Extractable Manganese (Mn)	2017/10/27		NC	%	75 - 125
			Acid Extractable Mercury (Hg)	2017/10/27		100	%	75 - 125
			Acid Extractable Molybdenum (Mo)	2017/10/27		103	%	75 - 125
			Acid Extractable Nickel (Ni)	2017/10/27		102	%	75 - 125
			Acid Extractable Rubidium (Rb)	2017/10/27		102	%	75 - 125
			Acid Extractable Selenium (Se)	2017/10/27		103	%	75 - 125
			Acid Extractable Silver (Ag)	2017/10/27		105	%	75 - 125
			Acid Extractable Strontium (Sr)	2017/10/27		104	%	75 - 125
			Acid Extractable Thallium (Tl)	2017/10/27		104	%	75 - 125
			Acid Extractable Tin (Sn)	2017/10/27		102	%	75 - 125
			Acid Extractable Uranium (U)	2017/10/27		100	%	75 - 125
			Acid Extractable Vanadium (V)	2017/10/27		102	%	75 - 125
			Acid Extractable Zinc (Zn)	2017/10/27		107	%	75 - 125
5234500	BAN	Spiked Blank	Acid Extractable Antimony (Sb)	2017/10/27		103	%	75 - 125
			Acid Extractable Arsenic (As)	2017/10/27		102	%	75 - 125
			Acid Extractable Barium (Ba)	2017/10/27		97	%	75 - 125
			Acid Extractable Beryllium (Be)	2017/10/27		98	%	75 - 125
			Acid Extractable Bismuth (Bi)	2017/10/27		104	%	75 - 125
			Acid Extractable Boron (B)	2017/10/27		98	%	75 - 125
			Acid Extractable Cadmium (Cd)	2017/10/27		100	%	75 - 125
			Acid Extractable Chromium (Cr)	2017/10/27		100	%	75 - 125
			Acid Extractable Cobalt (Co)	2017/10/27		99	%	75 - 125
			Acid Extractable Copper (Cu)	2017/10/27		98	%	75 - 125
			Acid Extractable Lead (Pb)	2017/10/27		99	%	75 - 125
			Acid Extractable Lithium (Li)	2017/10/27		100	%	75 - 125
			Acid Extractable Manganese (Mn)	2017/10/27		102	%	75 - 125
			Acid Extractable Mercury (Hg)	2017/10/27		102	%	75 - 125

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Acid Extractable Molybdenum (Mo)	2017/10/27		101	%	75 - 125
			Acid Extractable Nickel (Ni)	2017/10/27		101	%	75 - 125
			Acid Extractable Rubidium (Rb)	2017/10/27		102	%	75 - 125
			Acid Extractable Selenium (Se)	2017/10/27		101	%	75 - 125
			Acid Extractable Silver (Ag)	2017/10/27		100	%	75 - 125
			Acid Extractable Strontium (Sr)	2017/10/27		101	%	75 - 125
			Acid Extractable Thallium (Tl)	2017/10/27		103	%	75 - 125
			Acid Extractable Tin (Sn)	2017/10/27		103	%	75 - 125
			Acid Extractable Uranium (U)	2017/10/27		98	%	75 - 125
			Acid Extractable Vanadium (V)	2017/10/27		98	%	75 - 125
			Acid Extractable Zinc (Zn)	2017/10/27		104	%	75 - 125
5234500	BAN	Method Blank	Acid Extractable Aluminum (Al)	2017/10/27	<10		mg/kg	
			Acid Extractable Antimony (Sb)	2017/10/27	<2.0		mg/kg	
			Acid Extractable Arsenic (As)	2017/10/27	<2.0		mg/kg	
			Acid Extractable Barium (Ba)	2017/10/27	<5.0		mg/kg	
			Acid Extractable Beryllium (Be)	2017/10/27	<2.0		mg/kg	
			Acid Extractable Bismuth (Bi)	2017/10/27	<2.0		mg/kg	
			Acid Extractable Boron (B)	2017/10/27	<50		mg/kg	
			Acid Extractable Cadmium (Cd)	2017/10/27	<0.30		mg/kg	
			Acid Extractable Chromium (Cr)	2017/10/27	<2.0		mg/kg	
			Acid Extractable Cobalt (Co)	2017/10/27	<1.0		mg/kg	
			Acid Extractable Copper (Cu)	2017/10/27	<2.0		mg/kg	
			Acid Extractable Iron (Fe)	2017/10/27	<50		mg/kg	
			Acid Extractable Lead (Pb)	2017/10/27	<0.50		mg/kg	
			Acid Extractable Lithium (Li)	2017/10/27	<2.0		mg/kg	
			Acid Extractable Manganese (Mn)	2017/10/27	<2.0		mg/kg	
			Acid Extractable Mercury (Hg)	2017/10/27	<0.10		mg/kg	
			Acid Extractable Molybdenum (Mo)	2017/10/27	<2.0		mg/kg	
			Acid Extractable Nickel (Ni)	2017/10/27	<2.0		mg/kg	
			Acid Extractable Rubidium (Rb)	2017/10/27	<2.0		mg/kg	
			Acid Extractable Selenium (Se)	2017/10/27	<1.0		mg/kg	
			Acid Extractable Silver (Ag)	2017/10/27	<0.50		mg/kg	
			Acid Extractable Strontium (Sr)	2017/10/27	<5.0		mg/kg	
			Acid Extractable Thallium (Tl)	2017/10/27	<0.10		mg/kg	
			Acid Extractable Tin (Sn)	2017/10/27	<2.0		mg/kg	
			Acid Extractable Uranium (U)	2017/10/27	<0.10		mg/kg	
			Acid Extractable Vanadium (V)	2017/10/27	<2.0		mg/kg	
			Acid Extractable Zinc (Zn)	2017/10/27	<5.0		mg/kg	
5234500	BAN	RPD - Sample/Sample Dup	Acid Extractable Aluminum (Al)	2017/10/27	0.37		%	35
			Acid Extractable Antimony (Sb)	2017/10/27	NC		%	35
			Acid Extractable Arsenic (As)	2017/10/27	30		%	35
			Acid Extractable Barium (Ba)	2017/10/27	2.8		%	35
			Acid Extractable Beryllium (Be)	2017/10/27	NC		%	35
			Acid Extractable Bismuth (Bi)	2017/10/27	NC		%	35
			Acid Extractable Boron (B)	2017/10/27	NC		%	35
			Acid Extractable Cadmium (Cd)	2017/10/27	NC		%	35
			Acid Extractable Chromium (Cr)	2017/10/27	0.18		%	35
			Acid Extractable Cobalt (Co)	2017/10/27	6.1		%	35
			Acid Extractable Copper (Cu)	2017/10/27	3.2		%	35
			Acid Extractable Iron (Fe)	2017/10/27	1.4		%	35
			Acid Extractable Lead (Pb)	2017/10/27	1.5		%	35
			Acid Extractable Lithium (Li)	2017/10/27	4.4		%	35

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Acid Extractable Manganese (Mn)	2017/10/27	9.6		%	35
			Acid Extractable Mercury (Hg)	2017/10/27	NC		%	35
			Acid Extractable Molybdenum (Mo)	2017/10/27	NC		%	35
			Acid Extractable Nickel (Ni)	2017/10/27	6.6		%	35
			Acid Extractable Rubidium (Rb)	2017/10/27	4.0		%	35
			Acid Extractable Selenium (Se)	2017/10/27	NC		%	35
			Acid Extractable Silver (Ag)	2017/10/27	NC		%	35
			Acid Extractable Strontium (Sr)	2017/10/27	24		%	35
			Acid Extractable Thallium (Tl)	2017/10/27	NC		%	35
			Acid Extractable Tin (Sn)	2017/10/27	NC		%	35
			Acid Extractable Uranium (U)	2017/10/27	1.4		%	35
			Acid Extractable Vanadium (V)	2017/10/27	3.5		%	35
			Acid Extractable Zinc (Zn)	2017/10/27	4.0		%	35
5234526	CBR	Matrix Spike(FJP708)	Decachlorobiphenyl	2017/10/27		110	%	30 - 130
			Aroclor 1254	2017/10/27		116	%	30 - 130
5234526	CBR	Spiked Blank	Decachlorobiphenyl	2017/10/27		106	%	30 - 130
			Aroclor 1254	2017/10/27		100	%	30 - 130
5234526	CBR	Method Blank	Decachlorobiphenyl	2017/10/27		105	%	30 - 130
			Aroclor 1016	2017/10/27	<0.050		ug/g	
			Aroclor 1221	2017/10/27	<0.050		ug/g	
			Aroclor 1232	2017/10/27	<0.050		ug/g	
			Aroclor 1248	2017/10/27	<0.050		ug/g	
			Aroclor 1242	2017/10/27	<0.050		ug/g	
			Aroclor 1254	2017/10/27	<0.050		ug/g	
			Aroclor 1260	2017/10/27	<0.050		ug/g	
5234526	CBR	RPD - Sample/Sample Dup	Aroclor 1016	2017/10/27	NC		%	50
			Aroclor 1221	2017/10/27	NC		%	50
			Aroclor 1232	2017/10/27	NC		%	50
			Aroclor 1248	2017/10/27	NC		%	50
			Aroclor 1242	2017/10/27	NC		%	50
			Aroclor 1254	2017/10/27	NC		%	50
			Aroclor 1260	2017/10/27	NC		%	50
5234534	GTH	Matrix Spike(FJP694)	D10-Anthracene	2017/10/29		105	%	50 - 130
			D14-Terphenyl (FS)	2017/10/29		110	%	50 - 130
			D8-Acenaphthylene	2017/10/29		100	%	50 - 130
			1-Methylnaphthalene	2017/10/29		87	%	30 - 130
			2-Methylnaphthalene	2017/10/29		95	%	30 - 130
			Acenaphthene	2017/10/29		97	%	30 - 130
			Acenaphthylene	2017/10/29		98	%	30 - 130
			Anthracene	2017/10/29		95	%	30 - 130
			Benzo(a)anthracene	2017/10/29		94	%	30 - 130
			Benzo(a)pyrene	2017/10/29		97	%	30 - 130
			Benzo(b)fluoranthene	2017/10/29		98	%	30 - 130
			Benzo(g,h,i)perylene	2017/10/29		100	%	30 - 130
			Benzo(j)fluoranthene	2017/10/29		101	%	30 - 130
			Benzo(k)fluoranthene	2017/10/29		102	%	30 - 130
			Chrysene	2017/10/29		93	%	30 - 130
			Dibenz(a,h)anthracene	2017/10/29		94	%	30 - 130
			Fluoranthene	2017/10/29		100	%	30 - 130
			Fluorene	2017/10/29		95	%	30 - 130
			Indeno(1,2,3-cd)pyrene	2017/10/29		96	%	30 - 130
			Naphthalene	2017/10/29		87	%	30 - 130

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Perylene	2017/10/29		98	%	30 - 130
			Phenanthrene	2017/10/29		107	%	30 - 130
			Pyrene	2017/10/29		99	%	30 - 130
5234534	GTH	Spiked Blank	D10-Anthracene	2017/10/29		104	%	50 - 130
			D14-Terphenyl (FS)	2017/10/29		105	%	50 - 130
			D8-Acenaphthylene	2017/10/29		102	%	50 - 130
			1-Methylnaphthalene	2017/10/29		88	%	30 - 130
			2-Methylnaphthalene	2017/10/29		91	%	30 - 130
			Acenaphthene	2017/10/29		99	%	30 - 130
			Acenaphthylene	2017/10/29		99	%	30 - 130
			Anthracene	2017/10/29		103	%	30 - 130
			Benzo(a)anthracene	2017/10/29		93	%	30 - 130
			Benzo(a)pyrene	2017/10/29		97	%	30 - 130
			Benzo(b)fluoranthene	2017/10/29		95	%	30 - 130
			Benzo(g,h,i)perylene	2017/10/29		99	%	30 - 130
			Benzo(j)fluoranthene	2017/10/29		105	%	30 - 130
			Benzo(k)fluoranthene	2017/10/29		99	%	30 - 130
			Chrysene	2017/10/29		90	%	30 - 130
			Dibenz(a,h)anthracene	2017/10/29		94	%	30 - 130
			Fluoranthene	2017/10/29		101	%	30 - 130
			Fluorene	2017/10/29		96	%	30 - 130
			Indeno(1,2,3-cd)pyrene	2017/10/29		95	%	30 - 130
			Naphthalene	2017/10/29		87	%	30 - 130
			Perylene	2017/10/29		97	%	30 - 130
			Phenanthrene	2017/10/29		101	%	30 - 130
			Pyrene	2017/10/29		96	%	30 - 130
5234534	GTH	Method Blank	D10-Anthracene	2017/10/29		100	%	50 - 130
			D14-Terphenyl (FS)	2017/10/29		98	%	50 - 130
			D8-Acenaphthylene	2017/10/29		94	%	50 - 130
			1-Methylnaphthalene	2017/10/29	<0.010		mg/kg	
			2-Methylnaphthalene	2017/10/29	<0.010		mg/kg	
			Acenaphthene	2017/10/29	<0.010		mg/kg	
			Acenaphthylene	2017/10/29	<0.010		mg/kg	
			Anthracene	2017/10/29	<0.010		mg/kg	
			Benzo(a)anthracene	2017/10/29	<0.010		mg/kg	
			Benzo(a)pyrene	2017/10/29	<0.010		mg/kg	
			Benzo(b)fluoranthene	2017/10/29	<0.010		mg/kg	
			Benzo(g,h,i)perylene	2017/10/29	<0.010		mg/kg	
			Benzo(j)fluoranthene	2017/10/29	<0.010		mg/kg	
			Benzo(k)fluoranthene	2017/10/29	<0.010		mg/kg	
			Chrysene	2017/10/29	<0.010		mg/kg	
			Dibenz(a,h)anthracene	2017/10/29	<0.010		mg/kg	
			Fluoranthene	2017/10/29	<0.010		mg/kg	
			Fluorene	2017/10/29	<0.010		mg/kg	
			Indeno(1,2,3-cd)pyrene	2017/10/29	<0.010		mg/kg	
			Naphthalene	2017/10/29	<0.010		mg/kg	
			Perylene	2017/10/29	<0.010		mg/kg	
			Phenanthrene	2017/10/29	<0.010		mg/kg	
			Pyrene	2017/10/29	<0.010		mg/kg	
5234534	GTH	RPD - Sample/Sample Dup	1-Methylnaphthalene	2017/10/29	NC		%	50
			2-Methylnaphthalene	2017/10/29	NC		%	50
			Acenaphthene	2017/10/29	NC		%	50

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Acenaphthylene	2017/10/29	NC		%	50
			Anthracene	2017/10/29	NC		%	50
			Benzo(a)anthracene	2017/10/29	NC		%	50
			Benzo(a)pyrene	2017/10/29	NC		%	50
			Benzo(b)fluoranthene	2017/10/29	NC		%	50
			Benzo(g,h,i)perylene	2017/10/29	NC		%	50
			Benzo(j)fluoranthene	2017/10/29	NC		%	50
			Benzo(k)fluoranthene	2017/10/29	NC		%	50
			Chrysene	2017/10/29	NC		%	50
			Dibenz(a,h)anthracene	2017/10/29	NC		%	50
			Fluoranthene	2017/10/29	NC		%	50
			Fluorene	2017/10/29	NC		%	50
			Indeno(1,2,3-cd)pyrene	2017/10/29	NC		%	50
			Naphthalene	2017/10/29	NC		%	50
			Perylene	2017/10/29	NC		%	50
			Phenanthrene	2017/10/29	NC		%	50
			Pyrene	2017/10/29	NC		%	50
5234588	BAN	Matrix Spike(FJP582)	Acid Extractable Antimony (Sb)	2017/10/27		NC	%	75 - 125
			Acid Extractable Arsenic (As)	2017/10/27		96	%	75 - 125
			Acid Extractable Barium (Ba)	2017/10/27		90	%	75 - 125
			Acid Extractable Beryllium (Be)	2017/10/27		98	%	75 - 125
			Acid Extractable Bismuth (Bi)	2017/10/27		99	%	75 - 125
			Acid Extractable Boron (B)	2017/10/27		96	%	75 - 125
			Acid Extractable Cadmium (Cd)	2017/10/27		98	%	75 - 125
			Acid Extractable Chromium (Cr)	2017/10/27		90	%	75 - 125
			Acid Extractable Cobalt (Co)	2017/10/27		94	%	75 - 125
			Acid Extractable Copper (Cu)	2017/10/27		NC	%	75 - 125
			Acid Extractable Lead (Pb)	2017/10/27		83	%	75 - 125
			Acid Extractable Lithium (Li)	2017/10/27		101	%	75 - 125
			Acid Extractable Manganese (Mn)	2017/10/27		NC	%	75 - 125
			Acid Extractable Mercury (Hg)	2017/10/27		110	%	75 - 125
			Acid Extractable Molybdenum (Mo)	2017/10/27		124	%	75 - 125
			Acid Extractable Nickel (Ni)	2017/10/27		93	%	75 - 125
			Acid Extractable Rubidium (Rb)	2017/10/27		97	%	75 - 125
			Acid Extractable Selenium (Se)	2017/10/27		98	%	75 - 125
			Acid Extractable Silver (Ag)	2017/10/27		98	%	75 - 125
			Acid Extractable Strontium (Sr)	2017/10/27		99	%	75 - 125
			Acid Extractable Thallium (Tl)	2017/10/27		98	%	75 - 125
			Acid Extractable Tin (Sn)	2017/10/27		98	%	75 - 125
			Acid Extractable Uranium (U)	2017/10/27		96	%	75 - 125
			Acid Extractable Vanadium (V)	2017/10/27		91	%	75 - 125
			Acid Extractable Zinc (Zn)	2017/10/27		NC	%	75 - 125
5234588	BAN	Spiked Blank	Acid Extractable Antimony (Sb)	2017/10/27		100	%	75 - 125
			Acid Extractable Arsenic (As)	2017/10/27		100	%	75 - 125
			Acid Extractable Barium (Ba)	2017/10/27		98	%	75 - 125
			Acid Extractable Beryllium (Be)	2017/10/27		98	%	75 - 125
			Acid Extractable Bismuth (Bi)	2017/10/27		102	%	75 - 125
			Acid Extractable Boron (B)	2017/10/27		106	%	75 - 125
			Acid Extractable Cadmium (Cd)	2017/10/27		100	%	75 - 125
			Acid Extractable Chromium (Cr)	2017/10/27		98	%	75 - 125
			Acid Extractable Cobalt (Co)	2017/10/27		97	%	75 - 125
			Acid Extractable Copper (Cu)	2017/10/27		97	%	75 - 125

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Acid Extractable Lead (Pb)	2017/10/27		97	%	75 - 125
			Acid Extractable Lithium (Li)	2017/10/27		99	%	75 - 125
			Acid Extractable Manganese (Mn)	2017/10/27		99	%	75 - 125
			Acid Extractable Mercury (Hg)	2017/10/27		112	%	75 - 125
			Acid Extractable Molybdenum (Mo)	2017/10/27		101	%	75 - 125
			Acid Extractable Nickel (Ni)	2017/10/27		99	%	75 - 125
			Acid Extractable Rubidium (Rb)	2017/10/27		100	%	75 - 125
			Acid Extractable Selenium (Se)	2017/10/27		101	%	75 - 125
			Acid Extractable Silver (Ag)	2017/10/27		98	%	75 - 125
			Acid Extractable Strontium (Sr)	2017/10/27		101	%	75 - 125
			Acid Extractable Thallium (Tl)	2017/10/27		102	%	75 - 125
			Acid Extractable Tin (Sn)	2017/10/27		104	%	75 - 125
			Acid Extractable Uranium (U)	2017/10/27		97	%	75 - 125
			Acid Extractable Vanadium (V)	2017/10/27		97	%	75 - 125
			Acid Extractable Zinc (Zn)	2017/10/27		102	%	75 - 125
5234588	BAN	Method Blank	Acid Extractable Aluminum (Al)	2017/10/27	<10		mg/kg	
			Acid Extractable Antimony (Sb)	2017/10/27	<2.0		mg/kg	
			Acid Extractable Arsenic (As)	2017/10/27	<2.0		mg/kg	
			Acid Extractable Barium (Ba)	2017/10/27	<5.0		mg/kg	
			Acid Extractable Beryllium (Be)	2017/10/27	<2.0		mg/kg	
			Acid Extractable Bismuth (Bi)	2017/10/27	<2.0		mg/kg	
			Acid Extractable Boron (B)	2017/10/27	<50		mg/kg	
			Acid Extractable Cadmium (Cd)	2017/10/27	<0.30		mg/kg	
			Acid Extractable Chromium (Cr)	2017/10/27	<2.0		mg/kg	
			Acid Extractable Cobalt (Co)	2017/10/27	<1.0		mg/kg	
			Acid Extractable Copper (Cu)	2017/10/27	<2.0		mg/kg	
			Acid Extractable Iron (Fe)	2017/10/27	<50		mg/kg	
			Acid Extractable Lead (Pb)	2017/10/27	<0.50		mg/kg	
			Acid Extractable Lithium (Li)	2017/10/27	<2.0		mg/kg	
			Acid Extractable Manganese (Mn)	2017/10/27	<2.0		mg/kg	
			Acid Extractable Mercury (Hg)	2017/10/27	<0.10		mg/kg	
			Acid Extractable Molybdenum (Mo)	2017/10/27	<2.0		mg/kg	
			Acid Extractable Nickel (Ni)	2017/10/27	<2.0		mg/kg	
			Acid Extractable Rubidium (Rb)	2017/10/27	<2.0		mg/kg	
			Acid Extractable Selenium (Se)	2017/10/27	<1.0		mg/kg	
			Acid Extractable Silver (Ag)	2017/10/27	<0.50		mg/kg	
			Acid Extractable Strontium (Sr)	2017/10/27	<5.0		mg/kg	
			Acid Extractable Thallium (Tl)	2017/10/27	<0.10		mg/kg	
			Acid Extractable Tin (Sn)	2017/10/27	<2.0		mg/kg	
			Acid Extractable Uranium (U)	2017/10/27	<0.10		mg/kg	
			Acid Extractable Vanadium (V)	2017/10/27	<2.0		mg/kg	
			Acid Extractable Zinc (Zn)	2017/10/27	<5.0		mg/kg	
5234588	BAN	RPD - Sample/Sample Dup	Acid Extractable Aluminum (Al)	2017/10/27	0.0077		%	35
			Acid Extractable Antimony (Sb)	2017/10/27	18		%	35
			Acid Extractable Arsenic (As)	2017/10/27	2.8		%	35
			Acid Extractable Barium (Ba)	2017/10/27	5.2		%	35
			Acid Extractable Beryllium (Be)	2017/10/27	NC		%	35
			Acid Extractable Bismuth (Bi)	2017/10/27	NC		%	35
			Acid Extractable Boron (B)	2017/10/27	NC		%	35
			Acid Extractable Cadmium (Cd)	2017/10/27	NC		%	35
			Acid Extractable Chromium (Cr)	2017/10/27	24		%	35
			Acid Extractable Cobalt (Co)	2017/10/27	7.4		%	35

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Acid Extractable Copper (Cu)	2017/10/27	4.3		%	35
			Acid Extractable Iron (Fe)	2017/10/27	0.71		%	35
			Acid Extractable Lead (Pb)	2017/10/27	58 (8)		%	35
			Acid Extractable Lithium (Li)	2017/10/27	5.9		%	35
			Acid Extractable Manganese (Mn)	2017/10/27	3.9		%	35
			Acid Extractable Mercury (Hg)	2017/10/27	5.8		%	35
			Acid Extractable Molybdenum (Mo)	2017/10/27	NC		%	35
			Acid Extractable Nickel (Ni)	2017/10/27	6.0		%	35
			Acid Extractable Rubidium (Rb)	2017/10/27	5.1		%	35
			Acid Extractable Selenium (Se)	2017/10/27	NC		%	35
			Acid Extractable Silver (Ag)	2017/10/27	NC		%	35
			Acid Extractable Strontium (Sr)	2017/10/27	8.5		%	35
			Acid Extractable Thallium (Tl)	2017/10/27	19		%	35
			Acid Extractable Tin (Sn)	2017/10/27	NC		%	35
			Acid Extractable Uranium (U)	2017/10/27	9.3		%	35
			Acid Extractable Vanadium (V)	2017/10/27	8.4		%	35
			Acid Extractable Zinc (Zn)	2017/10/27	6.2		%	35
5234665	GTH	Matrix Spike(FJP642)	D10-Anthracene	2017/10/29		100	%	50 - 130
			D14-Terphenyl	2017/10/29		91	%	50 - 130
			D8-Acenaphthylene	2017/10/29		90	%	50 - 130
			1-Methylnaphthalene	2017/10/29		72	%	30 - 130
			2-Methylnaphthalene	2017/10/29		79	%	30 - 130
			Acenaphthene	2017/10/29		79	%	30 - 130
			Acenaphthylene	2017/10/29		73	%	30 - 130
			Anthracene	2017/10/29		74	%	30 - 130
			Benzo(a)anthracene	2017/10/29		77	%	30 - 130
			Benzo(a)pyrene	2017/10/29		50	%	30 - 130
			Benzo(b)fluoranthene	2017/10/29		62	%	30 - 130
			Benzo(g,h,i)perylene	2017/10/29		40 (9)	%	30 - 130
			Benzo(j)fluoranthene	2017/10/29		58	%	30 - 130
			Benzo(k)fluoranthene	2017/10/29		63	%	30 - 130
			Chrysene	2017/10/29		80	%	30 - 130
			Dibenz(a,h)anthracene	2017/10/29		49 (9)	%	30 - 130
			Fluoranthene	2017/10/29		76	%	30 - 130
			Fluorene	2017/10/29		81	%	30 - 130
			Indeno(1,2,3-cd)pyrene	2017/10/29		44 (9)	%	30 - 130
			Naphthalene	2017/10/29		73	%	30 - 130
			Perylene	2017/10/29		49 (9)	%	30 - 130
			Phenanthrene	2017/10/29		85	%	30 - 130
			Pyrene	2017/10/29		72	%	30 - 130
5234665	GTH	Spiked Blank	D10-Anthracene	2017/10/29		100	%	50 - 130
			D14-Terphenyl	2017/10/29		108	%	50 - 130
			D8-Acenaphthylene	2017/10/29		105	%	50 - 130
			1-Methylnaphthalene	2017/10/29		82	%	30 - 130
			2-Methylnaphthalene	2017/10/29		83	%	30 - 130
			Acenaphthene	2017/10/29		91	%	30 - 130
			Acenaphthylene	2017/10/29		88	%	30 - 130
			Anthracene	2017/10/29		92	%	30 - 130
			Benzo(a)anthracene	2017/10/29		93	%	30 - 130
			Benzo(a)pyrene	2017/10/29		84	%	30 - 130
			Benzo(b)fluoranthene	2017/10/29		97	%	30 - 130
			Benzo(g,h,i)perylene	2017/10/29		88	%	30 - 130

Maxxam Job #: B7N4148
Report Date: 2018/03/29

SNC-Lavalin Inc
Client Project #: 649806
Site Location: CAPE MAKKOVIK
Sampler Initials: JG

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Benzo(j)fluoranthene	2017/10/29		91	%	30 - 130
			Benzo(k)fluoranthene	2017/10/29		87	%	30 - 130
			Chrysene	2017/10/29		97	%	30 - 130
			Dibenz(a,h)anthracene	2017/10/29		84	%	30 - 130
			Fluoranthene	2017/10/29		98	%	30 - 130
			Fluorene	2017/10/29		91	%	30 - 130
			Indeno(1,2,3-cd)pyrene	2017/10/29		80	%	30 - 130
			Naphthalene	2017/10/29		82	%	30 - 130
			Perylene	2017/10/29		86	%	30 - 130
			Phenanthrene	2017/10/29		104	%	30 - 130
			Pyrene	2017/10/29		94	%	30 - 130
5234665	GTH	Method Blank	D10-Anthracene	2017/10/29		90	%	50 - 130
			D14-Terphenyl	2017/10/29		82	%	50 - 130
			D8-Acenaphthylene	2017/10/29		89	%	50 - 130
			1-Methylnaphthalene	2017/10/29	<0.0050		mg/kg	
			2-Methylnaphthalene	2017/10/29	<0.0050		mg/kg	
			Acenaphthene	2017/10/29	<0.0050		mg/kg	
			Acenaphthylene	2017/10/29	<0.0050		mg/kg	
			Anthracene	2017/10/29	<0.0050		mg/kg	
			Benzo(a)anthracene	2017/10/29	<0.0050		mg/kg	
			Benzo(a)pyrene	2017/10/29	<0.0050		mg/kg	
			Benzo(b)fluoranthene	2017/10/29	<0.0050		mg/kg	
			Benzo(g,h,i)perylene	2017/10/29	<0.0050		mg/kg	
			Benzo(j)fluoranthene	2017/10/29	<0.0050		mg/kg	
			Benzo(k)fluoranthene	2017/10/29	<0.0050		mg/kg	
			Chrysene	2017/10/29	<0.0050		mg/kg	
			Dibenz(a,h)anthracene	2017/10/29	<0.0050		mg/kg	
			Fluoranthene	2017/10/29	<0.0050		mg/kg	
			Fluorene	2017/10/29	<0.0050		mg/kg	
			Indeno(1,2,3-cd)pyrene	2017/10/29	<0.0050		mg/kg	
			Naphthalene	2017/10/29	<0.0050		mg/kg	
			Perylene	2017/10/29	<0.0050		mg/kg	
			Phenanthrene	2017/10/29	<0.0050		mg/kg	
			Pyrene	2017/10/29	<0.0050		mg/kg	
5234665	GTH	RPD - Sample/Sample Dup	1-Methylnaphthalene	2017/10/29	NC		%	50
			2-Methylnaphthalene	2017/10/29	NC		%	50
			Acenaphthene	2017/10/29	NC		%	50
			Acenaphthylene	2017/10/29	NC		%	50
			Anthracene	2017/10/29	NC		%	50
			Benzo(a)anthracene	2017/10/29	NC		%	50
			Benzo(a)pyrene	2017/10/29	NC		%	50
			Benzo(b)fluoranthene	2017/10/29	NC		%	50
			Benzo(g,h,i)perylene	2017/10/29	NC		%	50
			Benzo(j)fluoranthene	2017/10/29	NC		%	50
			Benzo(k)fluoranthene	2017/10/29	NC		%	50
			Chrysene	2017/10/29	NC		%	50
			Dibenz(a,h)anthracene	2017/10/29	NC		%	50
			Fluoranthene	2017/10/29	NC		%	50
			Fluorene	2017/10/29	NC		%	50
			Indeno(1,2,3-cd)pyrene	2017/10/29	NC		%	50
			Naphthalene	2017/10/29	NC		%	50
			Perylene	2017/10/29	NC		%	50

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Phenanthrene	2017/10/29	NC		%	50
			Pyrene	2017/10/29	NC		%	50
5234745	DBF	RPD - Sample/Sample Dup	Moisture	2017/10/27	8.5		%	25
5234764	CBR	Matrix Spike	Decachlorobiphenyl	2017/10/31		102	%	30 - 130
			Aroclor 1254	2017/10/31		105	%	30 - 130
5234764	CBR	Spiked Blank	Decachlorobiphenyl	2017/10/31		99	%	30 - 130
			Aroclor 1254	2017/10/31		104	%	30 - 130
5234764	CBR	Method Blank	Decachlorobiphenyl	2017/10/31		96	%	30 - 130
			Aroclor 1016	2017/10/31	<0.050		ug/g	
			Aroclor 1221	2017/10/31	<0.050		ug/g	
			Aroclor 1232	2017/10/31	<0.050		ug/g	
			Aroclor 1248	2017/10/31	<0.050		ug/g	
			Aroclor 1242	2017/10/31	<0.050		ug/g	
			Aroclor 1254	2017/10/31	<0.050		ug/g	
			Aroclor 1260	2017/10/31	<0.050		ug/g	
5234764	CBR	RPD - Sample/Sample Dup	Aroclor 1016	2017/10/31	NC		%	50
			Aroclor 1221	2017/10/31	NC		%	50
			Aroclor 1232	2017/10/31	NC		%	50
			Aroclor 1248	2017/10/31	NC		%	50
			Aroclor 1242	2017/10/31	NC		%	50
			Aroclor 1254	2017/10/31	NC		%	50
			Aroclor 1260	2017/10/31	NC		%	50
5234901	MYI	Matrix Spike(FJP581)	2-Fluorobiphenyl	2017/10/27		90	%	30 - 130
			Bendiocarb	2017/10/27		84	%	30 - 130
			D14-Terphenyl (FS)	2017/10/27		87	%	30 - 130
			D5-Nitrobenzene	2017/10/27		84	%	30 - 130
			Dimethoate	2017/10/27		67	%	30 - 130
			Fenchlorphos (Ronnel)	2017/10/27		85	%	30 - 130
			Fonofos	2017/10/27		87	%	30 - 130
			Metolachlor	2017/10/27		91	%	30 - 130
			Mevinphos	2017/10/27		74	%	30 - 130
			Triallate	2017/10/27		89	%	30 - 130
			Trifluralin	2017/10/27		84	%	30 - 130
			Demeton-S	2017/10/27		74	%	30 - 130
			Dichlorvos	2017/10/27		84	%	30 - 130
			Phosmet	2017/10/27		77	%	30 - 130
			Fenthion	2017/10/27		80	%	30 - 130
			Ethion	2017/10/27		87	%	30 - 130
			Guthion (Azinphos-methyl)	2017/10/27		102	%	30 - 130
			Phorate	2017/10/27		83	%	30 - 130
			Terbufos	2017/10/27		81	%	30 - 130
			Aldicarb	2017/10/27		79	%	30 - 130
			Atrazine	2017/10/27		98	%	30 - 130
			Carbaryl	2017/10/27		76	%	30 - 130
			Carbofuran	2017/10/27		84	%	30 - 130
			Cyanazine (Bladex)	2017/10/27		89	%	30 - 130
			Diazinon	2017/10/27		82	%	30 - 130
			Parathion Ethyl	2017/10/27		80	%	30 - 130
			Parathion Methyl	2017/10/27		82	%	30 - 130
			Prometryne	2017/10/27		68	%	30 - 130
			Malathion	2017/10/27		89	%	30 - 130
			Simazine	2017/10/27		75	%	30 - 130

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Chlorpyrifos (Dursban)	2017/10/27		91	%	30 - 130
5234901	MYI	Spiked Blank	2-Fluorobiphenyl	2017/10/27		93	%	30 - 130
			Bendiocarb	2017/10/27		83	%	30 - 130
			D14-Terphenyl (FS)	2017/10/27		91	%	30 - 130
			D5-Nitrobenzene	2017/10/27		91	%	30 - 130
			Dimethoate	2017/10/27		80	%	30 - 130
			Fenchlorphos (Ronnel)	2017/10/27		92	%	30 - 130
			Fonofos	2017/10/27		90	%	30 - 130
			Metolachlor	2017/10/27		94	%	30 - 130
			Mevinphos	2017/10/27		82	%	30 - 130
			Triallate	2017/10/27		89	%	30 - 130
			Trifluralin	2017/10/27		80	%	30 - 130
			Demeton-S	2017/10/27		80	%	30 - 130
			Dichlorvos	2017/10/27		95	%	30 - 130
			Phosmet	2017/10/27		69	%	30 - 130
			Fenthion	2017/10/27		85	%	30 - 130
			Ethion	2017/10/27		78	%	30 - 130
			Guthion (Azinphos-methyl)	2017/10/27		85	%	30 - 130
			Phorate	2017/10/27		83	%	30 - 130
			Terbufos	2017/10/27		81	%	30 - 130
			Aldicarb	2017/10/27		78	%	30 - 130
			Atrazine	2017/10/27		91	%	30 - 130
			Carbaryl	2017/10/27		70	%	30 - 130
			Carbofuran	2017/10/27		83	%	30 - 130
			Cyanazine (Bladex)	2017/10/27		85	%	30 - 130
			Diazinon	2017/10/27		85	%	30 - 130
			Parathion Ethyl	2017/10/27		79	%	30 - 130
			Parathion Methyl	2017/10/27		77	%	30 - 130
			Prometryne	2017/10/27		92	%	30 - 130
			Malathion	2017/10/27		81	%	30 - 130
			Simazine	2017/10/27		81	%	30 - 130
			Chlorpyrifos (Dursban)	2017/10/27		94	%	30 - 130
5234901	MYI	Method Blank	2-Fluorobiphenyl	2017/10/27		93	%	30 - 130
			Bendiocarb	2017/10/27	<5.0		ug/g	
			D14-Terphenyl (FS)	2017/10/27		90	%	30 - 130
			D5-Nitrobenzene	2017/10/27		91	%	30 - 130
			Dimethoate	2017/10/27	<5.0		ug/g	
			Fenchlorphos (Ronnel)	2017/10/27	<5.0		ug/g	
			Fonofos	2017/10/27	<5.0		ug/g	
			Metolachlor	2017/10/27	<10		ug/g	
			Mevinphos	2017/10/27	<5.0		ug/g	
			Triallate	2017/10/27	<5.0		ug/g	
			Trifluralin	2017/10/27	<5.0		ug/g	
			Demeton-S	2017/10/27	<5.0		ug/g	
			Dichlorvos	2017/10/27	<5.0		ug/g	
			Phosmet	2017/10/27	<5.0		ug/g	
			Fenthion	2017/10/27	<5.0		ug/g	
			Ethion	2017/10/27	<5.0		ug/g	
			Guthion (Azinphos-methyl)	2017/10/27	<5.0		ug/g	
			Phorate	2017/10/27	<5.0		ug/g	
			Terbufos	2017/10/27	<5.0		ug/g	
			Aldicarb	2017/10/27	<5.0		ug/g	

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Atrazine	2017/10/27	<5.0		ug/g	
			Carbaryl	2017/10/27	<5.0		ug/g	
			Carbofuran	2017/10/27	<5.0		ug/g	
			Cyanazine (Bladex)	2017/10/27	<5.0		ug/g	
			Diazinon	2017/10/27	<5.0		ug/g	
			Parathion Ethyl	2017/10/27	<5.0		ug/g	
			Parathion Methyl	2017/10/27	<5.0		ug/g	
			Prometryne	2017/10/27	<5.0		ug/g	
			Malathion	2017/10/27	<5.0		ug/g	
			Simazine	2017/10/27	<5.0		ug/g	
			Chlorpyrifos (Dursban)	2017/10/27	<5.0		ug/g	
5234901	MYI	RPD - Sample/Sample Dup	Bendiocarb	2017/10/27	NC		%	40
			Dimethoate	2017/10/27	NC		%	50
			Fenchlorphos (Ronnel)	2017/10/27	NC		%	50
			Fonofos	2017/10/27	NC		%	50
			Metolachlor	2017/10/27	NC		%	50
			Mevinphos	2017/10/27	NC		%	50
			Triallate	2017/10/27	NC		%	50
			Trifluralin	2017/10/27	NC		%	50
			Demeton-S	2017/10/27	NC		%	50
			Dichlorvos	2017/10/27	NC		%	50
			Phosmet	2017/10/27	NC		%	50
			Fenthion	2017/10/27	NC		%	50
			Ethion	2017/10/27	NC		%	50
			Guthion (Azinphos-methyl)	2017/10/27	NC		%	50
			Phorate	2017/10/27	NC		%	50
			Terbufos	2017/10/27	NC		%	50
			Aldicarb	2017/10/27	NC		%	50
			Atrazine	2017/10/27	NC		%	50
			Carbaryl	2017/10/27	NC		%	50
			Carbofuran	2017/10/27	NC		%	50
			Cyanazine (Bladex)	2017/10/27	NC		%	50
			Diazinon	2017/10/27	NC		%	50
			Parathion Ethyl	2017/10/27	NC		%	50
			Parathion Methyl	2017/10/27	NC		%	50
			Prometryne	2017/10/27	NC		%	50
			Malathion	2017/10/27	NC		%	50
			Simazine	2017/10/27	NC		%	50
			Chlorpyrifos (Dursban)	2017/10/27	NC		%	50
5235180	MAK	Matrix Spike	2,4,5,6-Tetrachloro-m-xylene	2017/10/30		82	%	50 - 130
			Decachlorobiphenyl	2017/10/30		111	%	50 - 130
			Aldrin	2017/10/30		95	%	50 - 130
			a-Chlordane	2017/10/30		101	%	50 - 130
			g-Chlordane	2017/10/30		91	%	50 - 130
			o,p-DDD	2017/10/30		96	%	50 - 130
			p,p-DDD	2017/10/30		95	%	50 - 130
			o,p-DDE	2017/10/30		102	%	50 - 130
			p,p-DDE	2017/10/30		125	%	50 - 130
			o,p-DDT	2017/10/30		83	%	50 - 130
			p,p-DDT	2017/10/30		87	%	50 - 130
			Dieldrin	2017/10/30		105	%	50 - 130
			Lindane	2017/10/30		77	%	50 - 130

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Endosulfan I (alpha)	2017/10/30		91	%	50 - 130
			Endosulfan II (beta)	2017/10/30		88	%	50 - 130
			Endrin	2017/10/30		88	%	50 - 130
			Heptachlor	2017/10/30		82	%	50 - 130
			Heptachlor epoxide	2017/10/30		86	%	50 - 130
			Hexachlorobenzene	2017/10/30		96	%	50 - 130
			Methoxychlor	2017/10/30		79	%	50 - 130
			alpha-BHC	2017/10/30		86	%	30 - 130
			beta-BHC	2017/10/30		87	%	30 - 130
			delta-BHC	2017/10/30		92	%	30 - 130
			Endosulfan sulfate	2017/10/30		104	%	30 - 130
			Endrin aldehyde	2017/10/30		102	%	30 - 130
			Endrin ketone	2017/10/30		95	%	30 - 130
			Mirex	2017/10/30		98	%	30 - 130
			Octachlorostyrene	2017/10/30		97	%	30 - 130
5235180	MAK	Spiked Blank	2,4,5,6-Tetrachloro-m-xylene	2017/10/30		80	%	50 - 130
			Decachlorobiphenyl	2017/10/30		106	%	50 - 130
			Aldrin	2017/10/30		89	%	50 - 130
			a-Chlordane	2017/10/30		94	%	50 - 130
			g-Chlordane	2017/10/30		84	%	50 - 130
			o,p-DDD	2017/10/30		88	%	50 - 130
			p,p-DDD	2017/10/30		86	%	50 - 130
			o,p-DDE	2017/10/30		95	%	50 - 130
			p,p-DDE	2017/10/30		115	%	50 - 130
			o,p-DDT	2017/10/30		77	%	50 - 130
			p,p-DDT	2017/10/30		81	%	50 - 130
			Dieldrin	2017/10/30		99	%	50 - 130
			Lindane	2017/10/30		72	%	50 - 130
			Endosulfan I (alpha)	2017/10/30		84	%	50 - 130
			Endosulfan II (beta)	2017/10/30		82	%	50 - 130
			Endrin	2017/10/30		81	%	50 - 130
			Heptachlor	2017/10/30		79	%	50 - 130
			Heptachlor epoxide	2017/10/30		81	%	50 - 130
			Hexachlorobenzene	2017/10/30		91	%	50 - 130
			Methoxychlor	2017/10/30		76	%	50 - 130
			alpha-BHC	2017/10/30		83	%	30 - 130
			beta-BHC	2017/10/30		79	%	30 - 130
			delta-BHC	2017/10/30		82	%	30 - 130
			Endosulfan sulfate	2017/10/30		95	%	30 - 130
			Endrin aldehyde	2017/10/30		93	%	30 - 130
			Endrin ketone	2017/10/30		88	%	30 - 130
			Mirex	2017/10/30		93	%	30 - 130
			Octachlorostyrene	2017/10/30		89	%	30 - 130
5235180	MAK	Spiked Blank DUP	2,4,5,6-Tetrachloro-m-xylene	2017/10/30		78	%	50 - 130
			Decachlorobiphenyl	2017/10/30		112	%	50 - 130
			Aroclor 1242	2017/10/30		90	%	60 - 130
			Toxaphene	2017/10/30		129	%	30 - 130
5235180	MAK	RPD	Aroclor 1242	2017/10/30	200 (7)		%	40
			Toxaphene	2017/10/30	200 (7)		%	50
5235180	MAK	Method Blank	2,4,5,6-Tetrachloro-m-xylene	2017/10/30		84	%	50 - 130
			Decachlorobiphenyl	2017/10/30		112	%	50 - 130
			Aldrin	2017/10/30	<0.0020		ug/g	

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			a-Chlordane	2017/10/30	<0.0020		ug/g	
			g-Chlordane	2017/10/30	<0.0020		ug/g	
			o,p-DDD	2017/10/30	<0.0020		ug/g	
			p,p-DDD	2017/10/30	<0.0020		ug/g	
			o,p-DDE	2017/10/30	<0.0020		ug/g	
			p,p-DDE	2017/10/30	<0.0020		ug/g	
			o,p-DDT	2017/10/30	<0.0020		ug/g	
			p,p-DDT	2017/10/30	<0.0020		ug/g	
			Dieldrin	2017/10/30	<0.0020		ug/g	
			Lindane	2017/10/30	<0.0020		ug/g	
			Endosulfan I (alpha)	2017/10/30	<0.0020		ug/g	
			Endosulfan II (beta)	2017/10/30	<0.0020		ug/g	
			Endrin	2017/10/30	<0.0020		ug/g	
			Heptachlor	2017/10/30	<0.0020		ug/g	
			Heptachlor epoxide	2017/10/30	<0.0020		ug/g	
			Hexachlorobenzene	2017/10/30	<0.0020		ug/g	
			Methoxychlor	2017/10/30	<0.0050		ug/g	
			Aroclor 1016	2017/10/30	<0.015		ug/g	
			Aroclor 1221	2017/10/30	<0.015		ug/g	
			Aroclor 1232	2017/10/30	<0.015		ug/g	
			Aroclor 1242	2017/10/30	<0.015		ug/g	
			Aroclor 1248	2017/10/30	<0.015		ug/g	
			Aroclor 1254	2017/10/30	<0.015		ug/g	
			Aroclor 1260	2017/10/30	<0.015		ug/g	
			Aroclor 1262	2017/10/30	<0.015		ug/g	
			Aroclor 1268	2017/10/30	<0.015		ug/g	
			alpha-BHC	2017/10/30	<0.0020		ug/g	
			beta-BHC	2017/10/30	<0.0020		ug/g	
			delta-BHC	2017/10/30	<0.0020		ug/g	
			Endosulfan sulfate	2017/10/30	<0.0020		ug/g	
			Endrin aldehyde	2017/10/30	<0.0020		ug/g	
			Endrin ketone	2017/10/30	<0.0020		ug/g	
			Mirex	2017/10/30	<0.0020		ug/g	
			Octachlorostyrene	2017/10/30	<0.0020		ug/g	
			Toxaphene	2017/10/30	<0.080		ug/g	
5235180	MAK	RPD - Sample/Sample Dup	Aldrin	2017/10/30	NC		%	40
			a-Chlordane	2017/10/30	NC		%	40
			g-Chlordane	2017/10/30	NC		%	40
			o,p-DDD	2017/10/30	NC		%	40
			p,p-DDD	2017/10/30	NC		%	40
			o,p-DDE	2017/10/30	NC		%	40
			p,p-DDE	2017/10/30	NC		%	40
			o,p-DDT	2017/10/30	NC		%	40
			p,p-DDT	2017/10/30	NC		%	40
			Dieldrin	2017/10/30	NC		%	40
			Lindane	2017/10/30	NC		%	40
			Endosulfan I (alpha)	2017/10/30	NC		%	40
			Endosulfan II (beta)	2017/10/30	NC		%	40
			Endrin	2017/10/30	NC		%	40
			Heptachlor	2017/10/30	NC		%	40
			Heptachlor epoxide	2017/10/30	NC		%	40
			Hexachlorobenzene	2017/10/30	NC		%	40

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Methoxychlor	2017/10/30	NC		%	40
			Aroclor 1016	2017/10/30	NC		%	40
			Aroclor 1221	2017/10/30	NC		%	40
			Aroclor 1232	2017/10/30	NC		%	40
			Aroclor 1242	2017/10/30	NC		%	40
			Aroclor 1248	2017/10/30	NC		%	40
			Aroclor 1254	2017/10/30	NC		%	40
			Aroclor 1260	2017/10/30	NC		%	40
			Aroclor 1262	2017/10/30	NC		%	40
			Aroclor 1268	2017/10/30	NC		%	40
			alpha-BHC	2017/10/30	NC		%	50
			beta-BHC	2017/10/30	NC		%	50
			delta-BHC	2017/10/30	NC		%	50
			Endosulfan sulfate	2017/10/30	NC		%	50
			Endrin aldehyde	2017/10/30	NC		%	50
			Endrin ketone	2017/10/30	NC		%	50
			Mirex	2017/10/30	NC		%	50
			Octachlorostyrene	2017/10/30	NC		%	50
			Toxaphene	2017/10/30	NC		%	50
5235390	ZZ	Matrix Spike	o-Terphenyl	2017/10/28		99	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2017/10/28		99	%	50 - 130
			F3 (C16-C34 Hydrocarbons)	2017/10/28		94	%	50 - 130
			F4 (C34-C50 Hydrocarbons)	2017/10/28		95	%	50 - 130
5235390	ZZ	Spiked Blank	o-Terphenyl	2017/10/28		102	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2017/10/28		89	%	60 - 130
			F3 (C16-C34 Hydrocarbons)	2017/10/28		88	%	60 - 130
			F4 (C34-C50 Hydrocarbons)	2017/10/28		93	%	60 - 130
5235390	ZZ	Method Blank	o-Terphenyl	2017/10/28		99	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2017/10/28	<100		ug/L	
			F3 (C16-C34 Hydrocarbons)	2017/10/28	<200		ug/L	
			F4 (C34-C50 Hydrocarbons)	2017/10/28	<200		ug/L	
5235390	ZZ	RPD - Sample/Sample Dup	F2 (C10-C16 Hydrocarbons)	2017/10/28	NC		%	30
			F3 (C16-C34 Hydrocarbons)	2017/10/28	NC		%	30
			F4 (C34-C50 Hydrocarbons)	2017/10/28	NC		%	30
5235711	H_W	Matrix Spike	1,4-Difluorobenzene	2017/10/27		102	%	70 - 130
			4-Bromofluorobenzene	2017/10/27		99	%	70 - 130
			D10-Ethylbenzene	2017/10/27		99	%	70 - 130
			D4-1,2-Dichloroethane	2017/10/27		104	%	70 - 130
			Benzene	2017/10/27		96	%	70 - 130
			Toluene	2017/10/27		95	%	70 - 130
			Ethylbenzene	2017/10/27		97	%	70 - 130
			o-Xylene	2017/10/27		101	%	70 - 130
			p+m-Xylene	2017/10/27		98	%	70 - 130
			F1 (C6-C10)	2017/10/27		79	%	70 - 130
5235711	H_W	Spiked Blank	1,4-Difluorobenzene	2017/10/27		103	%	70 - 130
			4-Bromofluorobenzene	2017/10/27		102	%	70 - 130
			D10-Ethylbenzene	2017/10/27		101	%	70 - 130
			D4-1,2-Dichloroethane	2017/10/27		106	%	70 - 130
			Benzene	2017/10/27		99	%	70 - 130
			Toluene	2017/10/27		96	%	70 - 130
			Ethylbenzene	2017/10/27		97	%	70 - 130
			o-Xylene	2017/10/27		99	%	70 - 130

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			p+m-Xylene	2017/10/27		100	%	70 - 130
			F1 (C6-C10)	2017/10/27		90	%	70 - 130
5235711	H_W	Method Blank	1,4-Difluorobenzene	2017/10/27		101	%	70 - 130
			4-Bromofluorobenzene	2017/10/27		100	%	70 - 130
			D10-Ethylbenzene	2017/10/27		102	%	70 - 130
			D4-1,2-Dichloroethane	2017/10/27		105	%	70 - 130
			Benzene	2017/10/27	<0.20		ug/L	
			Toluene	2017/10/27	<0.20		ug/L	
			Ethylbenzene	2017/10/27	<0.20		ug/L	
			o-Xylene	2017/10/27	<0.20		ug/L	
			p+m-Xylene	2017/10/27	<0.40		ug/L	
			Total Xylenes	2017/10/27	<0.40		ug/L	
			F1 (C6-C10)	2017/10/27	<25		ug/L	
			F1 (C6-C10) - BTEX	2017/10/27	<25		ug/L	
5235711	H_W	RPD - Sample/Sample Dup	F1 (C6-C10)	2017/10/27	NC		%	30
			F1 (C6-C10) - BTEX	2017/10/27	NC		%	30
5237768	BBD	QC Standard	Sieve - #200 (>0.075mm)	2017/10/30		99	%	90 - 110
5237768	BBD	Method Blank	Sieve - #200 (>0.075mm)	2017/10/30	<1		%	
			Sieve - Pan	2017/10/30	100, RDL=1		%	
5237768	BBD	RPD - Sample/Sample Dup	Sieve - #200 (>0.075mm)	2017/10/30	1.1		%	25
			Sieve - Pan	2017/10/30	6.7		%	25
5237942	CBR	Matrix Spike	Decachlorobiphenyl	2017/10/31		99	%	30 - 130
			Aroclor 1254	2017/10/31		128	%	30 - 130
5237942	CBR	Spiked Blank	Decachlorobiphenyl	2017/10/31		99	%	30 - 130
			Aroclor 1254	2017/10/31		111	%	30 - 130
5237942	CBR	Method Blank	Decachlorobiphenyl	2017/10/31		99	%	30 - 130
			Aroclor 1016	2017/10/31	<0.050		ug/g	
			Aroclor 1221	2017/10/31	<0.050		ug/g	
			Aroclor 1232	2017/10/31	<0.050		ug/g	
			Aroclor 1248	2017/10/31	<0.050		ug/g	
			Aroclor 1242	2017/10/31	<0.050		ug/g	
			Aroclor 1254	2017/10/31	<0.050		ug/g	
			Aroclor 1260	2017/10/31	<0.050		ug/g	
5237942	CBR	RPD - Sample/Sample Dup	Aroclor 1016	2017/10/31	NC		%	50
			Aroclor 1221	2017/10/31	NC		%	50
			Aroclor 1232	2017/10/31	NC		%	50
			Aroclor 1248	2017/10/31	NC		%	50
			Aroclor 1242	2017/10/31	NC		%	50
			Aroclor 1254	2017/10/31	NC		%	50
			Aroclor 1260	2017/10/31	32		%	50
5239637	BBD	QC Standard	Sieve - #200 (>0.075mm)	2017/11/01		98	%	90 - 110
5239637	BBD	Method Blank	Sieve - #200 (>0.075mm)	2017/11/01	<1		%	
			Sieve - Pan	2017/11/01	100, RDL=1		%	
5239637	BBD	RPD - Sample/Sample Dup	Sieve - #200 (>0.075mm)	2017/11/01	13		%	25
			Sieve - Pan	2017/11/01	17		%	25
5254226	BAN	Matrix Spike	Acid Extractable Antimony (Sb)	2017/11/09		NC	%	75 - 125
			Acid Extractable Arsenic (As)	2017/11/09		97	%	75 - 125
			Acid Extractable Barium (Ba)	2017/11/09		NC	%	75 - 125
			Acid Extractable Beryllium (Be)	2017/11/09		98	%	75 - 125
			Acid Extractable Bismuth (Bi)	2017/11/09		102	%	75 - 125

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Acid Extractable Boron (B)	2017/11/09		98	%	75 - 125
			Acid Extractable Cadmium (Cd)	2017/11/09		97	%	75 - 125
			Acid Extractable Chromium (Cr)	2017/11/09		94	%	75 - 125
			Acid Extractable Cobalt (Co)	2017/11/09		93	%	75 - 125
			Acid Extractable Copper (Cu)	2017/11/09		92	%	75 - 125
			Acid Extractable Lead (Pb)	2017/11/09		104	%	75 - 125
			Acid Extractable Lithium (Li)	2017/11/09		103	%	75 - 125
			Acid Extractable Manganese (Mn)	2017/11/09		NC	%	75 - 125
			Acid Extractable Mercury (Hg)	2017/11/09		96	%	75 - 125
			Acid Extractable Molybdenum (Mo)	2017/11/09		94	%	75 - 125
			Acid Extractable Nickel (Ni)	2017/11/09		92	%	75 - 125
			Acid Extractable Rubidium (Rb)	2017/11/09		100	%	75 - 125
			Acid Extractable Selenium (Se)	2017/11/09		96	%	75 - 125
			Acid Extractable Silver (Ag)	2017/11/09		96	%	75 - 125
			Acid Extractable Strontium (Sr)	2017/11/09		120	%	75 - 125
			Acid Extractable Thallium (Tl)	2017/11/09		99	%	75 - 125
			Acid Extractable Tin (Sn)	2017/11/09		109	%	75 - 125
			Acid Extractable Uranium (U)	2017/11/09		103	%	75 - 125
			Acid Extractable Vanadium (V)	2017/11/09		102	%	75 - 125
			Acid Extractable Zinc (Zn)	2017/11/09		NC	%	75 - 125
5254226	BAN	Spiked Blank	Acid Extractable Antimony (Sb)	2017/11/08		101	%	75 - 125
			Acid Extractable Arsenic (As)	2017/11/08		96	%	75 - 125
			Acid Extractable Barium (Ba)	2017/11/08		100	%	75 - 125
			Acid Extractable Beryllium (Be)	2017/11/08		97	%	75 - 125
			Acid Extractable Bismuth (Bi)	2017/11/08		102	%	75 - 125
			Acid Extractable Boron (B)	2017/11/08		108	%	75 - 125
			Acid Extractable Cadmium (Cd)	2017/11/08		97	%	75 - 125
			Acid Extractable Chromium (Cr)	2017/11/08		93	%	75 - 125
			Acid Extractable Cobalt (Co)	2017/11/08		92	%	75 - 125
			Acid Extractable Copper (Cu)	2017/11/08		90	%	75 - 125
			Acid Extractable Lead (Pb)	2017/11/08		99	%	75 - 125
			Acid Extractable Lithium (Li)	2017/11/08		100	%	75 - 125
			Acid Extractable Manganese (Mn)	2017/11/08		97	%	75 - 125
			Acid Extractable Mercury (Hg)	2017/11/08		103	%	75 - 125
			Acid Extractable Molybdenum (Mo)	2017/11/08		97	%	75 - 125
			Acid Extractable Nickel (Ni)	2017/11/08		91	%	75 - 125
			Acid Extractable Rubidium (Rb)	2017/11/08		97	%	75 - 125
			Acid Extractable Selenium (Se)	2017/11/08		99	%	75 - 125
			Acid Extractable Silver (Ag)	2017/11/08		100	%	75 - 125
			Acid Extractable Strontium (Sr)	2017/11/08		100	%	75 - 125
			Acid Extractable Thallium (Tl)	2017/11/08		100	%	75 - 125
			Acid Extractable Tin (Sn)	2017/11/08		102	%	75 - 125
			Acid Extractable Uranium (U)	2017/11/08		100	%	75 - 125
			Acid Extractable Vanadium (V)	2017/11/08		95	%	75 - 125
			Acid Extractable Zinc (Zn)	2017/11/08		94	%	75 - 125
5254226	BAN	Method Blank	Acid Extractable Aluminum (Al)	2017/11/08	<10		mg/kg	
			Acid Extractable Antimony (Sb)	2017/11/08	<2.0		mg/kg	
			Acid Extractable Arsenic (As)	2017/11/08	<2.0		mg/kg	
			Acid Extractable Barium (Ba)	2017/11/08	<5.0		mg/kg	
			Acid Extractable Beryllium (Be)	2017/11/08	<2.0		mg/kg	
			Acid Extractable Bismuth (Bi)	2017/11/08	<2.0		mg/kg	
			Acid Extractable Boron (B)	2017/11/08	<50		mg/kg	

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Acid Extractable Cadmium (Cd)	2017/11/08	<0.30		mg/kg	
			Acid Extractable Chromium (Cr)	2017/11/08	<2.0		mg/kg	
			Acid Extractable Cobalt (Co)	2017/11/08	<1.0		mg/kg	
			Acid Extractable Copper (Cu)	2017/11/08	<2.0		mg/kg	
			Acid Extractable Iron (Fe)	2017/11/08	<50		mg/kg	
			Acid Extractable Lead (Pb)	2017/11/08	<0.50		mg/kg	
			Acid Extractable Lithium (Li)	2017/11/08	<2.0		mg/kg	
			Acid Extractable Manganese (Mn)	2017/11/08	<2.0		mg/kg	
			Acid Extractable Mercury (Hg)	2017/11/08	<0.10		mg/kg	
			Acid Extractable Molybdenum (Mo)	2017/11/08	<2.0		mg/kg	
			Acid Extractable Nickel (Ni)	2017/11/08	<2.0		mg/kg	
			Acid Extractable Rubidium (Rb)	2017/11/08	<2.0		mg/kg	
			Acid Extractable Selenium (Se)	2017/11/08	<1.0		mg/kg	
			Acid Extractable Silver (Ag)	2017/11/08	<0.50		mg/kg	
			Acid Extractable Strontium (Sr)	2017/11/08	<5.0		mg/kg	
			Acid Extractable Thallium (Tl)	2017/11/08	<0.10		mg/kg	
			Acid Extractable Tin (Sn)	2017/11/08	<2.0		mg/kg	
			Acid Extractable Uranium (U)	2017/11/08	<0.10		mg/kg	
			Acid Extractable Vanadium (V)	2017/11/08	<2.0		mg/kg	
			Acid Extractable Zinc (Zn)	2017/11/08	<5.0		mg/kg	
5254226	BAN	RPD - Sample/Sample Dup	Acid Extractable Aluminum (Al)	2017/11/09	21		%	35
			Acid Extractable Antimony (Sb)	2017/11/09	160 (5)		%	35
			Acid Extractable Arsenic (As)	2017/11/09	NC		%	35
			Acid Extractable Barium (Ba)	2017/11/09	23		%	35
			Acid Extractable Beryllium (Be)	2017/11/09	NC		%	35
			Acid Extractable Bismuth (Bi)	2017/11/09	NC		%	35
			Acid Extractable Boron (B)	2017/11/09	NC		%	35
			Acid Extractable Cadmium (Cd)	2017/11/09	30		%	35
			Acid Extractable Chromium (Cr)	2017/11/09	66 (5)		%	35
			Acid Extractable Cobalt (Co)	2017/11/09	7.4		%	35
			Acid Extractable Copper (Cu)	2017/11/09	30		%	35
			Acid Extractable Iron (Fe)	2017/11/09	31		%	35
			Acid Extractable Lead (Pb)	2017/11/09	62 (5)		%	35
			Acid Extractable Lithium (Li)	2017/11/09	15		%	35
			Acid Extractable Manganese (Mn)	2017/11/09	22		%	35
			Acid Extractable Mercury (Hg)	2017/11/09	NC		%	35
			Acid Extractable Molybdenum (Mo)	2017/11/09	NC		%	35
			Acid Extractable Nickel (Ni)	2017/11/09	20		%	35
			Acid Extractable Rubidium (Rb)	2017/11/09	8.9		%	35
			Acid Extractable Selenium (Se)	2017/11/09	NC		%	35
			Acid Extractable Silver (Ag)	2017/11/09	NC		%	35
			Acid Extractable Strontium (Sr)	2017/11/09	17		%	35
			Acid Extractable Thallium (Tl)	2017/11/09	NC		%	35
			Acid Extractable Tin (Sn)	2017/11/09	NC		%	35
			Acid Extractable Uranium (U)	2017/11/09	20		%	35
			Acid Extractable Vanadium (V)	2017/11/09	61 (5)		%	35
			Acid Extractable Zinc (Zn)	2017/11/09	27		%	35
5278896	AGU	Matrix Spike	C13-1234678 HeptaCDD	2017/11/23		99	%	30 - 130
			C13-1234678 HeptaCDF	2017/11/23		87	%	30 - 130
			C13-123678 HexaCDD	2017/11/23		83	%	30 - 130
			C13-123678 HexaCDF	2017/11/23		74	%	30 - 130
			C13-12378 PentaCDD	2017/11/23		118	%	30 - 130

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			C13-12378 PentaCDF	2017/11/23		77	%	30 - 130
			C13-2378 TetraCDD	2017/11/23		73	%	30 - 130
			C13-2378 TetraCDF	2017/11/23		62	%	30 - 130
			C13-OCDD	2017/11/23		112	%	30 - 130
			2,3,7,8-Tetra CDD	2017/11/23		98	%	80 - 140
			1,2,3,7,8-Penta CDD	2017/11/23		103	%	80 - 140
			1,2,3,4,7,8-Hexa CDD	2017/11/23		110	%	80 - 140
			1,2,3,6,7,8-Hexa CDD	2017/11/23		96	%	80 - 140
			1,2,3,7,8,9-Hexa CDD	2017/11/23		105	%	80 - 140
			1,2,3,4,6,7,8-Hepta CDD	2017/11/23		102	%	80 - 140
			Octa CDD	2017/11/23		100	%	80 - 140
			2,3,7,8-Tetra CDF	2017/11/23		93	%	80 - 140
			1,2,3,7,8-Penta CDF	2017/11/23		98	%	80 - 140
			2,3,4,7,8-Penta CDF	2017/11/23		106	%	80 - 140
			1,2,3,4,7,8-Hexa CDF	2017/11/23		107	%	80 - 140
			1,2,3,6,7,8-Hexa CDF	2017/11/23		91	%	80 - 140
			2,3,4,6,7,8-Hexa CDF	2017/11/23		102	%	80 - 140
			1,2,3,7,8,9-Hexa CDF	2017/11/23		102	%	80 - 140
			1,2,3,4,6,7,8-Hepta CDF	2017/11/23		104	%	80 - 140
			1,2,3,4,7,8,9-Hepta CDF	2017/11/23		105	%	80 - 140
			Octa CDF	2017/11/23		97	%	80 - 140
5278896	AGU	Spiked Blank	C13-1234678 HeptaCDD	2017/11/23		99	%	30 - 130
			C13-1234678 HeptaCDF	2017/11/23		88	%	30 - 130
			C13-123678 HexaCDD	2017/11/23		87	%	30 - 130
			C13-123678 HexaCDF	2017/11/23		76	%	30 - 130
			C13-12378 PentaCDD	2017/11/23		124	%	30 - 130
			C13-12378 PentaCDF	2017/11/23		81	%	30 - 130
			C13-2378 TetraCDD	2017/11/23		75	%	30 - 130
			C13-2378 TetraCDF	2017/11/23		62	%	30 - 130
			C13-OCDD	2017/11/23		117	%	30 - 130
			2,3,7,8-Tetra CDD	2017/11/23		103	%	80 - 140
			1,2,3,7,8-Penta CDD	2017/11/23		99	%	80 - 140
			1,2,3,4,7,8-Hexa CDD	2017/11/23		112	%	80 - 140
			1,2,3,6,7,8-Hexa CDD	2017/11/23		97	%	80 - 140
			1,2,3,7,8,9-Hexa CDD	2017/11/23		104	%	80 - 140
			1,2,3,4,6,7,8-Hepta CDD	2017/11/23		109	%	80 - 140
			Octa CDD	2017/11/23		97	%	80 - 140
			2,3,7,8-Tetra CDF	2017/11/23		95	%	80 - 140
			1,2,3,7,8-Penta CDF	2017/11/23		96	%	80 - 140
			2,3,4,7,8-Penta CDF	2017/11/23		108	%	80 - 140
			1,2,3,4,7,8-Hexa CDF	2017/11/23		109	%	80 - 140
			1,2,3,6,7,8-Hexa CDF	2017/11/23		91	%	80 - 140
			2,3,4,6,7,8-Hexa CDF	2017/11/23		103	%	80 - 140
			1,2,3,7,8,9-Hexa CDF	2017/11/23		105	%	80 - 140
			1,2,3,4,6,7,8-Hepta CDF	2017/11/23		106	%	80 - 140
			1,2,3,4,7,8,9-Hepta CDF	2017/11/23		105	%	80 - 140
			Octa CDF	2017/11/23		94	%	80 - 140
5278896	AGU	Spiked Blank DUP	C13-1234678 HeptaCDD	2017/11/23		97	%	30 - 130
			C13-1234678 HeptaCDF	2017/11/23		90	%	30 - 130
			C13-123678 HexaCDD	2017/11/23		84	%	30 - 130
			C13-123678 HexaCDF	2017/11/23		77	%	30 - 130
			C13-12378 PentaCDD	2017/11/23		117	%	30 - 130

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			C13-12378 PentaCDF	2017/11/23		83	%	30 - 130
			C13-2378 TetraCDD	2017/11/23		81	%	30 - 130
			C13-2378 TetraCDF	2017/11/23		65	%	30 - 130
			C13-OCDD	2017/11/23		118	%	30 - 130
			2,3,7,8-Tetra CDD	2017/11/23		97	%	80 - 140
			1,2,3,7,8-Penta CDD	2017/11/23		110	%	80 - 140
			1,2,3,4,7,8-Hexa CDD	2017/11/23		111	%	80 - 140
			1,2,3,6,7,8-Hexa CDD	2017/11/23		102	%	80 - 140
			1,2,3,7,8,9-Hexa CDD	2017/11/23		112	%	80 - 140
			1,2,3,4,6,7,8-Hepta CDD	2017/11/23		111	%	80 - 140
			Octa CDD	2017/11/23		100	%	80 - 140
			2,3,7,8-Tetra CDF	2017/11/23		98	%	80 - 140
			1,2,3,7,8-Penta CDF	2017/11/23		97	%	80 - 140
			2,3,4,7,8-Penta CDF	2017/11/23		106	%	80 - 140
			1,2,3,4,7,8-Hexa CDF	2017/11/23		106	%	80 - 140
			1,2,3,6,7,8-Hexa CDF	2017/11/23		93	%	80 - 140
			2,3,4,6,7,8-Hexa CDF	2017/11/23		100	%	80 - 140
			1,2,3,7,8,9-Hexa CDF	2017/11/23		105	%	80 - 140
			1,2,3,4,6,7,8-Hepta CDF	2017/11/23		108	%	80 - 140
			1,2,3,4,7,8,9-Hepta CDF	2017/11/23		108	%	80 - 140
			Octa CDF	2017/11/23		98	%	80 - 140
5278896	AGU	RPD	2,3,7,8-Tetra CDD	2017/11/23	6.0		%	25
			1,2,3,7,8-Penta CDD	2017/11/23	11		%	25
			1,2,3,4,7,8-Hexa CDD	2017/11/23	0.90		%	25
			1,2,3,6,7,8-Hexa CDD	2017/11/23	5.0		%	25
			1,2,3,7,8,9-Hexa CDD	2017/11/23	7.4		%	25
			1,2,3,4,6,7,8-Hepta CDD	2017/11/23	1.8		%	25
			Octa CDD	2017/11/23	3.0		%	25
			2,3,7,8-Tetra CDF	2017/11/23	3.1		%	25
			1,2,3,7,8-Penta CDF	2017/11/23	1.0		%	25
			2,3,4,7,8-Penta CDF	2017/11/23	1.9		%	25
			1,2,3,4,7,8-Hexa CDF	2017/11/23	2.8		%	25
			1,2,3,6,7,8-Hexa CDF	2017/11/23	2.2		%	25
			2,3,4,6,7,8-Hexa CDF	2017/11/23	3.0		%	25
			1,2,3,7,8,9-Hexa CDF	2017/11/23	0		%	25
			1,2,3,4,6,7,8-Hepta CDF	2017/11/23	1.9		%	25
			1,2,3,4,7,8,9-Hepta CDF	2017/11/23	2.8		%	25
			Octa CDF	2017/11/23	4.2		%	25
5278896	AGU	Method Blank	C13-1234678 HeptaCDD	2017/11/22		112	%	30 - 130
			C13-1234678 HeptaCDF	2017/11/22		98	%	30 - 130
			C13-123678 HexaCDD	2017/11/22		91	%	30 - 130
			C13-123678 HexaCDF	2017/11/22		85	%	30 - 130
			C13-12378 PentaCDD	2017/11/22		125	%	30 - 130
			C13-12378 PentaCDF	2017/11/22		84	%	30 - 130
			C13-2378 TetraCDD	2017/11/22		77	%	30 - 130
			C13-2378 TetraCDF	2017/11/22		65	%	30 - 130
			C13-OCDD	2017/11/22		131 (10)		30 - 130
			2,3,7,8-Tetra CDD	2017/11/22	<0.118, EDL=0.118		pg/g	
			1,2,3,7,8-Penta CDD	2017/11/22	<0.0910, EDL=0.0910		pg/g	

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			1,2,3,4,7,8-Hexa CDD	2017/11/22	<0.101, EDL=0.101		pg/g	
			1,2,3,6,7,8-Hexa CDD	2017/11/22	<0.101, EDL=0.101		pg/g	
			1,2,3,7,8,9-Hexa CDD	2017/11/22	<0.0906, EDL=0.0906		pg/g	
			1,2,3,4,6,7,8-Hepta CDD	2017/11/22	<0.107, EDL=0.107		pg/g	
			Octa CDD	2017/11/22	<0.205, EDL=0.205 (11)		pg/g	
			Total Tetra CDD	2017/11/22	<0.118, EDL=0.118		pg/g	
			Total Penta CDD	2017/11/22	<0.0910, EDL=0.0910		pg/g	
			Total Hexa CDD	2017/11/22	<0.0973, EDL=0.0973		pg/g	
			Total Hepta CDD	2017/11/22	<0.107, EDL=0.107		pg/g	
			2,3,7,8-Tetra CDF	2017/11/22	<0.0836, EDL=0.0836		pg/g	
			1,2,3,7,8-Penta CDF	2017/11/22	<0.121, EDL=0.121		pg/g	
			2,3,4,7,8-Penta CDF	2017/11/22	<0.120, EDL=0.120		pg/g	
			1,2,3,4,7,8-Hexa CDF	2017/11/22	<0.0517, EDL=0.0517		pg/g	
			1,2,3,6,7,8-Hexa CDF	2017/11/22	<0.0503, EDL=0.0503		pg/g	
			2,3,4,6,7,8-Hexa CDF	2017/11/22	<0.0565, EDL=0.0565		pg/g	
			1,2,3,7,8,9-Hexa CDF	2017/11/22	<0.0619, EDL=0.0619		pg/g	
			1,2,3,4,6,7,8-Hepta CDF	2017/11/22	<0.0561, EDL=0.0561		pg/g	
			1,2,3,4,7,8,9-Hepta CDF	2017/11/22	<0.0747, EDL=0.0747		pg/g	
			Octa CDF	2017/11/22	<0.100, EDL=0.100		pg/g	
			Total Tetra CDF	2017/11/22	<0.0836, EDL=0.0836		pg/g	
			Total Penta CDF	2017/11/22	<0.121, EDL=0.121		pg/g	
			Total Hexa CDF	2017/11/22	<0.0548, EDL=0.0548		pg/g	
			Total Hepta CDF	2017/11/22	<0.0641, EDL=0.0641		pg/g	
5278896	AGU	RPD - Sample/Sample Dup	2,3,7,8-Tetra CDD	2017/11/26	NC		%	25
			1,2,3,7,8-Penta CDD	2017/11/26	NC		%	25
			1,2,3,4,7,8-Hexa CDD	2017/11/26	NC		%	25
			1,2,3,6,7,8-Hexa CDD	2017/11/26	NC		%	25
			1,2,3,7,8,9-Hexa CDD	2017/11/26	NC		%	25
			1,2,3,4,6,7,8-Hepta CDD	2017/11/26	NC		%	25

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Octa CDD	2017/11/26	NC		%	25
			Total Tetra CDD	2017/11/26	NC (12)		%	25
			Total Penta CDD	2017/11/26	NC (12)		%	25
			Total Hexa CDD	2017/11/26	NC (12)		%	25
			Total Hepta CDD	2017/11/26	NC		%	25
			2,3,7,8-Tetra CDF	2017/11/26	NC		%	25
			1,2,3,7,8-Penta CDF	2017/11/26	NC		%	25
			2,3,4,7,8-Penta CDF	2017/11/26	NC		%	25
			1,2,3,4,7,8-Hexa CDF	2017/11/26	NC		%	25
			1,2,3,6,7,8-Hexa CDF	2017/11/26	NC		%	25
			2,3,4,6,7,8-Hexa CDF	2017/11/26	NC		%	25
			1,2,3,7,8,9-Hexa CDF	2017/11/26	NC		%	25
			1,2,3,4,6,7,8-Hepta CDF	2017/11/26	NC		%	25
			1,2,3,4,7,8,9-Hepta CDF	2017/11/26	NC		%	25
			Octa CDF	2017/11/26	NC		%	25
			Total Tetra CDF	2017/11/26	NC (12)		%	25
			Total Penta CDF	2017/11/26	NC		%	25
			Total Hexa CDF	2017/11/26	NC		%	25
			Total Hepta CDF	2017/11/26	NC		%	25
5292455	CXU	Matrix Spike	C13-1234678 HeptaCDD	2017/12/02		70	%	30 - 130
			C13-1234678 HeptaCDF	2017/12/02		69	%	30 - 130
			C13-123678 HexaCDD	2017/12/02		70	%	30 - 130
			C13-123678 HexaCDF	2017/12/02		69	%	30 - 130
			C13-12378 PentaCDD	2017/12/02		63	%	30 - 130
			C13-12378 PentaCDF	2017/12/02		60	%	30 - 130
			C13-2378 TetraCDD	2017/12/02		83	%	30 - 130
			C13-2378 TetraCDF	2017/12/02		66	%	30 - 130
			C13-OCDD	2017/12/02		76	%	30 - 130
			2,3,7,8-Tetra CDD	2017/12/02		101	%	80 - 140
			1,2,3,7,8-Penta CDD	2017/12/02		104	%	80 - 140
			1,2,3,4,7,8-Hexa CDD	2017/12/02		115	%	80 - 140
			1,2,3,6,7,8-Hexa CDD	2017/12/02		98	%	80 - 140
			1,2,3,7,8,9-Hexa CDD	2017/12/02		113	%	80 - 140
			1,2,3,4,6,7,8-Hepta CDD	2017/12/02		104	%	80 - 140
			Octa CDD	2017/12/02		112	%	80 - 140
			2,3,7,8-Tetra CDF	2017/12/02		101	%	80 - 140
			1,2,3,7,8-Penta CDF	2017/12/02		101	%	80 - 140
			2,3,4,7,8-Penta CDF	2017/12/02		102	%	80 - 140
			1,2,3,4,7,8-Hexa CDF	2017/12/02		114	%	80 - 140
			1,2,3,6,7,8-Hexa CDF	2017/12/02		107	%	80 - 140
			2,3,4,6,7,8-Hexa CDF	2017/12/02		110	%	80 - 140
			1,2,3,7,8,9-Hexa CDF	2017/12/02		118	%	80 - 140
			1,2,3,4,6,7,8-Hepta CDF	2017/12/02		109	%	80 - 140
			1,2,3,4,7,8,9-Hepta CDF	2017/12/02		119	%	80 - 140
			Octa CDF	2017/12/02		106	%	80 - 140
5292455	CXU	Spiked Blank	C13-1234678 HeptaCDD	2017/12/02		79	%	30 - 130
			C13-1234678 HeptaCDF	2017/12/02		85	%	30 - 130
			C13-123678 HexaCDD	2017/12/02		84	%	30 - 130
			C13-123678 HexaCDF	2017/12/02		87	%	30 - 130
			C13-12378 PentaCDD	2017/12/02		80	%	30 - 130
			C13-12378 PentaCDF	2017/12/02		73	%	30 - 130
			C13-2378 TetraCDD	2017/12/02		101	%	30 - 130

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			C13-2378 TetraCDF	2017/12/02		82	%	30 - 130
			C13-OCDD	2017/12/02		77	%	30 - 130
			2,3,7,8-Tetra CDD	2017/12/02		105	%	80 - 140
			1,2,3,7,8-Penta CDD	2017/12/02		105	%	80 - 140
			1,2,3,4,7,8-Hexa CDD	2017/12/02		117	%	80 - 140
			1,2,3,6,7,8-Hexa CDD	2017/12/02		101	%	80 - 140
			1,2,3,7,8,9-Hexa CDD	2017/12/02		121	%	80 - 140
			1,2,3,4,6,7,8-Hepta CDD	2017/12/02		109	%	80 - 140
			Octa CDD	2017/12/02		111	%	80 - 140
			2,3,7,8-Tetra CDF	2017/12/02		105	%	80 - 140
			1,2,3,7,8-Penta CDF	2017/12/02		105	%	80 - 140
			2,3,4,7,8-Penta CDF	2017/12/02		107	%	80 - 140
			1,2,3,4,7,8-Hexa CDF	2017/12/02		116	%	80 - 140
			1,2,3,6,7,8-Hexa CDF	2017/12/02		111	%	80 - 140
			2,3,4,6,7,8-Hexa CDF	2017/12/02		116	%	80 - 140
			1,2,3,7,8,9-Hexa CDF	2017/12/02		122	%	80 - 140
			1,2,3,4,6,7,8-Hepta CDF	2017/12/02		114	%	80 - 140
			1,2,3,4,7,8,9-Hepta CDF	2017/12/02		116	%	80 - 140
			Octa CDF	2017/12/02		112	%	80 - 140
5292455	CXU	Spiked Blank DUP	C13-1234678 HeptaCDD	2017/12/02		78	%	30 - 130
			C13-1234678 HeptaCDF	2017/12/02		87	%	30 - 130
			C13-123678 HexaCDD	2017/12/02		85	%	30 - 130
			C13-123678 HexaCDF	2017/12/02		84	%	30 - 130
			C13-12378 PentaCDD	2017/12/02		67	%	30 - 130
			C13-12378 PentaCDF	2017/12/02		64	%	30 - 130
			C13-2378 TetraCDD	2017/12/02		104	%	30 - 130
			C13-2378 TetraCDF	2017/12/02		85	%	30 - 130
			C13-OCDD	2017/12/02		80	%	30 - 130
			2,3,7,8-Tetra CDD	2017/12/02		102	%	80 - 140
			1,2,3,7,8-Penta CDD	2017/12/02		105	%	80 - 140
			1,2,3,4,7,8-Hexa CDD	2017/12/02		111	%	80 - 140
			1,2,3,6,7,8-Hexa CDD	2017/12/02		98	%	80 - 140
			1,2,3,7,8,9-Hexa CDD	2017/12/02		110	%	80 - 140
			1,2,3,4,6,7,8-Hepta CDD	2017/12/02		104	%	80 - 140
			Octa CDD	2017/12/02		108	%	80 - 140
			2,3,7,8-Tetra CDF	2017/12/02		106	%	80 - 140
			1,2,3,7,8-Penta CDF	2017/12/02		103	%	80 - 140
			2,3,4,7,8-Penta CDF	2017/12/02		109	%	80 - 140
			1,2,3,4,7,8-Hexa CDF	2017/12/02		114	%	80 - 140
			1,2,3,6,7,8-Hexa CDF	2017/12/02		110	%	80 - 140
			2,3,4,6,7,8-Hexa CDF	2017/12/02		115	%	80 - 140
			1,2,3,7,8,9-Hexa CDF	2017/12/02		125	%	80 - 140
			1,2,3,4,6,7,8-Hepta CDF	2017/12/02		111	%	80 - 140
			1,2,3,4,7,8,9-Hepta CDF	2017/12/02		115	%	80 - 140
			Octa CDF	2017/12/02		115	%	80 - 140
5292455	CXU	RPD	2,3,7,8-Tetra CDD	2017/12/02	2.9		%	25
			1,2,3,7,8-Penta CDD	2017/12/02	0		%	25
			1,2,3,4,7,8-Hexa CDD	2017/12/02	5.3		%	25
			1,2,3,6,7,8-Hexa CDD	2017/12/02	3.0		%	25
			1,2,3,7,8,9-Hexa CDD	2017/12/02	9.5		%	25
			1,2,3,4,6,7,8-Hepta CDD	2017/12/02	4.7		%	25
			Octa CDD	2017/12/02	2.7		%	25

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			2,3,7,8-Tetra CDF	2017/12/02	0.95		%	25
			1,2,3,7,8-Penta CDF	2017/12/02	1.9		%	25
			2,3,4,7,8-Penta CDF	2017/12/02	1.9		%	25
			1,2,3,4,7,8-Hexa CDF	2017/12/02	1.7		%	25
			1,2,3,6,7,8-Hexa CDF	2017/12/02	0.90		%	25
			2,3,4,6,7,8-Hexa CDF	2017/12/02	0.87		%	25
			1,2,3,7,8,9-Hexa CDF	2017/12/02	2.4		%	25
			1,2,3,4,6,7,8-Hepta CDF	2017/12/02	2.7		%	25
			1,2,3,4,7,8,9-Hepta CDF	2017/12/02	0.87		%	25
			Octa CDF	2017/12/02	2.6		%	25
5292455	CXU	Method Blank	C13-1234678 HeptaCDD	2017/12/01		77	%	30 - 130
			C13-1234678 HeptaCDF	2017/12/01		85	%	30 - 130
			C13-123678 HexaCDD	2017/12/01		87	%	30 - 130
			C13-123678 HexaCDF	2017/12/01		89	%	30 - 130
			C13-12378 PentaCDD	2017/12/01		83	%	30 - 130
			C13-12378 PentaCDF	2017/12/01		73	%	30 - 130
			C13-2378 TetraCDD	2017/12/01		95	%	30 - 130
			C13-2378 TetraCDF	2017/12/01		75	%	30 - 130
			C13-OCDD	2017/12/01		72	%	30 - 130
			2,3,7,8-Tetra CDD	2017/12/01	<0.110, EDL=0.110		pg/g	
			1,2,3,7,8-Penta CDD	2017/12/01	<0.115, EDL=0.115		pg/g	
			1,2,3,4,7,8-Hexa CDD	2017/12/01	<0.115, EDL=0.115		pg/g	
			1,2,3,6,7,8-Hexa CDD	2017/12/01	<0.113, EDL=0.113		pg/g	
			1,2,3,7,8,9-Hexa CDD	2017/12/01	<0.105, EDL=0.105		pg/g	
			1,2,3,4,6,7,8-Hepta CDD	2017/12/01	0.209, EDL=0.113		pg/g	
			Octa CDD	2017/12/01	<1.31, EDL=1.31 (12)		pg/g	
			Total Tetra CDD	2017/12/01	<0.110, EDL=0.110		pg/g	
			Total Penta CDD	2017/12/01	<0.115, EDL=0.115		pg/g	
			Total Hexa CDD	2017/12/01	<0.111, EDL=0.111		pg/g	
			Total Hepta CDD	2017/12/01	0.379, EDL=0.113		pg/g	
			2,3,7,8-Tetra CDF	2017/12/01	<0.113, EDL=0.113		pg/g	
			1,2,3,7,8-Penta CDF	2017/12/01	<0.109, EDL=0.109		pg/g	
			2,3,4,7,8-Penta CDF	2017/12/01	<0.111, EDL=0.111		pg/g	
			1,2,3,4,7,8-Hexa CDF	2017/12/01	<0.112, EDL=0.112		pg/g	
			1,2,3,6,7,8-Hexa CDF	2017/12/01	<0.112, EDL=0.112		pg/g	

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			2,3,4,6,7,8-Hexa CDF	2017/12/01	<0.120, EDL=0.120		pg/g	
			1,2,3,7,8,9-Hexa CDF	2017/12/01	<0.130, EDL=0.130		pg/g	
			1,2,3,4,6,7,8-Hepta CDF	2017/12/01	0.203, EDL=0.0991		pg/g	
			1,2,3,4,7,8,9-Hepta CDF	2017/12/01	<0.119, EDL=0.119		pg/g	
			Octa CDF	2017/12/01	<0.197, EDL=0.197 (12)		pg/g	
			Total Tetra CDF	2017/12/01	<0.113, EDL=0.113		pg/g	
			Total Penta CDF	2017/12/01	<0.110, EDL=0.110		pg/g	
			Total Hexa CDF	2017/12/01	<0.118, EDL=0.118		pg/g	
			Total Hepta CDF	2017/12/01	0.203, EDL=0.108		pg/g	
5292455	CXU	RPD - Sample/Sample Dup	2,3,7,8-Tetra CDD	2017/12/02	NC		%	25
			1,2,3,7,8-Penta CDD	2017/12/02	NC		%	25
			1,2,3,4,7,8-Hexa CDD	2017/12/02	NC		%	25
			1,2,3,6,7,8-Hexa CDD	2017/12/02	NC		%	25
			1,2,3,7,8,9-Hexa CDD	2017/12/02	NC (12)		%	25
			1,2,3,4,6,7,8-Hepta CDD	2017/12/02	NC		%	25
			Octa CDD	2017/12/02	NC		%	25
			Total Tetra CDD	2017/12/02	NC		%	25
			Total Penta CDD	2017/12/02	NC		%	25
			Total Hexa CDD	2017/12/02	NC		%	25
			Total Hepta CDD	2017/12/02	NC		%	25
			2,3,7,8-Tetra CDF	2017/12/02	NC		%	25
			1,2,3,7,8-Penta CDF	2017/12/02	NC		%	25
			2,3,4,7,8-Penta CDF	2017/12/02	NC (13)		%	25
			1,2,3,4,7,8-Hexa CDF	2017/12/02	NC		%	25
			1,2,3,6,7,8-Hexa CDF	2017/12/02	NC		%	25
			2,3,4,6,7,8-Hexa CDF	2017/12/02	NC		%	25
			1,2,3,7,8,9-Hexa CDF	2017/12/02	NC		%	25
			1,2,3,4,6,7,8-Hepta CDF	2017/12/02	NC (12)		%	25
			1,2,3,4,7,8,9-Hepta CDF	2017/12/02	NC		%	25
			Octa CDF	2017/12/02	NC		%	25
			Total Tetra CDF	2017/12/02	NC		%	25
			Total Penta CDF	2017/12/02	NC		%	25
			Total Hexa CDF	2017/12/02	NC		%	25

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	% Recovery	UNITS	QC Limits
			Total Hepta CDF	2017/12/02	NC		%	25

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

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

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

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

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

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

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

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

(1) VOC samples were extracted using a flat-bed shaker instead of the accelerated mechanical shaker due to matrix incompatibility.

(2) Elevated VOC RDL(s) due to detected levels in the method blank.

(3) Poor RPD due to sample inhomogeneity. Results verified by repeat digestion and analysis.

(4) Duplicate: results are outside acceptance limit. Analysis was repeated with similar results.

(5) Poor RPD due to sample inhomogeneity. Result verified by repeat digestion and analysis.

(6) Matrix Spike: < 10 % of compounds in multi-component analysis in violation.

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

(8) Poor RPD due to sample inhomogeneity. Result confirmed by repeat digestion and analysis.

(9) Matrix Spike: results are outside acceptance limit. Analysis was not repeated, sample was past recommended hold time for repeat analysis.

(10) Recovery outside method acceptance criteria. No impact on data

(11) RT > 3 seconds - PCDD/DF analysis - Peak detected exceeds expected retention time (from internal standard) by greater than 3 seconds.RT>2 seconds - PCDD/DF analysis-Peak maxima of monitored ions exceeds 2 seconds

(12) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

(13) RT>2 seconds - PCDD/DF analysis-Peak maxima of monitored ions exceeds 2 seconds

VALIDATION SIGNATURE PAGE

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

Alan G Stewart

Alan Stewart, Organics Manager, Bedford

Brad Newman, Scientific Service Specialist

Branko Vrzic, A.SC.T., Senior Analyst, HRMS Services

CAcker

Colleen Acker, Scientific Service Specialist

Eric Dearman, Scientific Specialist

Mike Mac Gillivray

Mike MacGillivray, Scientific Specialist (Inorganics)

Owen Cosby, BSc.C.Chem, Supervisor, HRMS Services

VALIDATION SIGNATURE PAGE(CONT'D)

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

Philippe Deveau

Phil Deveau, Scientific Specialist (Organics)

RoseMarie MacDonald

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.

Your Project #: 649806
Site Location: CAPE MAKKOVIK
Your C.O.C. #: N/A

Attention:Jason Green

SNC-Lavalin Inc
1090 Topsail Rd
2nd Floor
Mount Pearl, NL
A1N 5E7

Report Date: 2017/12/13
Report #: R4908735
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7R6590
Received: 2017/12/06, 10:42

Sample Matrix: Solid
Samples Received: 12

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Asbestos by PLM - 0.5 RDL (1)	11	N/A	2017/12/13	CAM SOP-00475	EPA 600R-93/116
Asbestos by PLM - 0.5 RDL (1)	1	N/A	N/A	CAM SOP-00475	EPA 600R-93/116

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.

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.

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.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Maxxam Analytics' Asbestos Laboratory is accredited by NVLAP for bulk asbestos analysis by polarized light microscopy, NVLAP Code 600163-0.

This report may not be reproduced, except in full, without the written approval of Maxxam Analytics. This report may not be used by the client to claim product endorsement by NVLAP, NIST or any other agency of the U.S. Government.

Maxxam Analytics' scope of accreditation includes EPA-600/M4-82-020: "Interim Method for the Determination of Asbestos in Bulk Insulation Samples" and EPA-600/R-93/116: "Method for the Determination of Asbestos in Bulk Building Materials".

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) This test was performed by Maxxam Analytics Mississauga

Your Project #: 649806
Site Location: CAPE MAKKOVIK
Your C.O.C. #: N/A

Attention:Jason Green

SNC-Lavalin Inc
1090 Topsail Rd
2nd Floor
Mount Pearl, NL
A1N 5E7

Report Date: 2017/12/13
Report #: R4908735
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7R6590
Received: 2017/12/06, 10:42

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Heather Macumber, Senior Project Manager
Email: HMacumber@maxxam.ca
Phone# (902)420-0203 Ext:226
==
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
A Bureau Veritas Group Company

Maxxam Job #: B7R6590
Report Date: 2017/12/13

SNC-Lavalin Inc
Client Project #: 649806
Site Location: CAPE MAKKOVIK
Sampler Initials: JG

BULK ASBESTOS ANALYSIS (SOLID)

Maxxam ID		FSB199	FSB205	FSB206	FSB207	FSB208	FSB209	FSB210	
Sampling Date		2017/12/04	2017/12/04	2017/12/04	2017/12/04	2017/12/04	2017/12/04	2017/12/04	
COC Number		N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Sample #		A1	A2	A3	A4	A5	A6	A7	
	UNITS	**A1**	**A2**	**A3**	**A4**	**A5**	**A**	**A7**	**QC Batch**
Polarized Light Microscop									
Asbestos PLM	%	ASB RPT	ASB RPT	ASB RPT	ASB RPT	ASB RPT	ASB RPT	ASB RPT	5313325

QC Batch = Quality Control Batch

Maxxam ID		FSB211	FSB212	FSB213	FSB213	FSB214	FSB215	
Sampling Date		2017/12/04	2017/12/04	2017/12/04	2017/12/04	2017/12/04	2017/12/04	
COC Number		N/A	N/A	N/A	N/A	N/A	N/A	
Sample #		A8	A9	A10	A10	A11	A12	
	UNITS	**A8**	**A9**	**A10**	**A10 Lab-Dup**	**A11**	**A12**	**QC Batch**
Polarized Light Microscop								
Asbestos PLM	%	ASB RPT	ASB RPT	ASB RPT	ASB RPT	ASB RPT	ASB RPT	5313325

QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

Maxxam Job #: B7R6590
Report Date: 2017/12/13

SNC-Lavalin Inc
Client Project #: 649806
Site Location: CAPE MAKKOVIK
Sampler Initials: JG

Asbestos Analytical Results

EPA/600R-93/116 by Polarized Light Microscopy

A1

Maxxam ID: FSB199 Date Analyzed: 2017/12/13

	P.O.B	Sample Morphology	Asbestos		Other Fibres		Particulate
Layer 1	100	Homogeneous black foam	Not Detected				Non-Fibrous

A2

Maxxam ID: FSB205 Date Analyzed: 2017/12/13

	P.O.B	Sample Morphology	Asbestos		Other Fibres		Particulate
Layer 1	100	Homogeneous black/white felt	Not Detected		Fibrous Glass	25%	Non-Fibrous

A3

Maxxam ID: FSB206 Date Analyzed: 2017/12/13

	P.O.B	Sample Morphology	Asbestos		Other Fibres		Particulate
Layer 1	100	Homogeneous grey siding	**Chrysotile**	15%			Non-Fibrous

A4

Maxxam ID: FSB207 Date Analyzed: 2017/12/13

	P.O.B	Sample Morphology	Asbestos		Other Fibres		Particulate
Layer 1	100	Homogeneous brown insulation	**Amosite**	20%	Fibreglass	75%	Non-Fibrous

The limit of quantitation is 0.50%, although asbestos may be qualitatively detected at concentrations less than 0.50%. Samples for which asbestos is detected at <0.50% are reported as trace, “<0.50%”. “Not Detected” indicates that no asbestos fibres were observed.

Calibrated Visual Estimate (%)
Date Format : yyyy/mm/dd

Asbestos Analytical Results

EPA/600R-93/116 by Polarized Light Microscopy

A5

Maxxam ID: FSB208 Date Analyzed: 2017/12/13

	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	100	Homogeneous black foam	Not Detected		Non-Fibrous

A

Maxxam ID: FSB209 Date Analyzed: 2017/12/13

	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	100	Homogeneous grey siding	Not Detected		Non-Fibrous

A7

Maxxam ID: FSB210 Date Analyzed: 2017/12/13

	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	100	Homogeneous dark blue rubber	Not Detected		Non-Fibrous

A8

Maxxam ID: FSB211 Date Analyzed: 2017/12/13

	P.O.B	Sample Morphology	Asbestos	Other Fibres	Particulate
Layer 1	85	Homogeneous green vinyl floor tile	**Chrysotile** 1%		Non-Fibrous
Layer 2	15	Homogeneous black mastic	Not Detected		Non-Fibrous

The limit of quantitation is 0.50%, although asbestos may be qualitatively detected at concentrations less than 0.50%. Samples for which asbestos is detected at <0.50% are reported as trace, “<0.50%”. “Not Detected” indicates that no asbestos fibres were observed.

Calibrated Visual Estimate (%)
Date Format : yyyy/mm/dd

Maxxam Job #: B7R6590
Report Date: 2017/12/13

SNC-Lavalin Inc
Client Project #: 649806
Site Location: CAPE MAKKOVIK
Sampler Initials: JG

Asbestos Analytical Results

EPA/600R-93/116 by Polarized Light Microscopy

A9

Maxxam ID: FSB212 Date Analyzed: 2017/12/13

	P.O.B	Sample Morphology	Asbestos		Other Fibres		Particulate
Layer 1	100	Homogeneous black felt	Not Detected		Fibrous Glass	5%	Tar

A10

Maxxam ID: FSB213 Date Analyzed: 2017/12/13

	P.O.B	Sample Morphology	Asbestos		Other Fibres		Particulate
Layer 1	100	Homogeneous black tar	Not Detected				Tar

A11

Maxxam ID: FSB214 Date Analyzed: 2017/12/13

	P.O.B	Sample Morphology	Asbestos		Other Fibres		Particulate
Layer 1	100	Homogeneous black felt	**Chrysotile**	7%	Fibrous Glass	23%	Tar

A12

Maxxam ID: FSB215 Date Analyzed: 2017/12/13

	P.O.B	Sample Morphology	Asbestos		Other Fibres		Particulate
Layer 1	100	Homogeneous grey siding	**Chrysotile**	15%			Non-Fibrous

The limit of quantitation is 0.50%, although asbestos may be qualitatively detected at concentrations less than 0.50%. Samples for which asbestos is detected at <0.50% are reported as trace, “<0.50%”. “Not Detected” indicates that no asbestos fibres were observed.

Calibrated Visual Estimate (%)
Date Format : yyyy/mm/dd

GENERAL COMMENTS

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

Package 1	19.6°C

Results relate only to the items tested.

VALIDATION SIGNATURE PAGE

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

Banu Gurgen-Keough, Supervisor

Appendix D

ANALYTICAL SUMMARY TABLES

Table 1: Summary of Soil Sample Results for Petroleum Hydrocarbons

Sample ID:		**1987-SOIL-1**	**1987-SOIL-2**	**1987-SOIL-3**	**1987-SOIL-4**	**1987-SOIL-5**	**1987-SOIL-6**	**1987-SOIL-7**	**1987-SOIL-8**	**1987-SOIL-9**	**1987-SOIL-10**	RDL	Federal[1]	Federal[2]	Provincial[3]	Provincial[4]
Sample Date:		2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14		CCME	CCME	RBCA	RBCA
Lab ID:		FJL730	FJL968	FJL969	FJL970	FJL971	FJL972	FJL973	FJL974	FJL975	FJL976		Environmental	CWS	Soil	Soil
QA/QC Field Duplicate of:		--	--	--	--	--	--	--	--	--	--		Human Health			
	Units															
BTEX & F1 Hydrocarbons																
Benzene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	0.030	--	2.5	180
Toluene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	0.37	--	10,000	250
Ethylbenzene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	0.082	--	10,000	300
p+m-Xylene	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	--	--	--	--
o-Xylene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	--	--	--	--
Total Xylenes	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	11	--	110	350
F1 (C6-C10)	mg/kg	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	10	--	--	--	--
F1 (C6-C10) - BTEX (Calc.)	mg/kg	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	10	--	320	--	320
F2-F4 Hydrocarbons																
F2 (C10-C16 Hydrocarbons)	mg/kg	<20 (1)	<20 (1)	<20 (1)	<20 (1)	<20 (1)	<20 (1)	<20 (1)	<20 (1)	<20 (1)	<20 (1)	20	--	260	--	260
F3 (C16-C34 Hydrocarbons)	mg/kg	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	50	--	1700	--	1700
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	50	--	3300	--	3300
Reached Baseline at C50	mg/kg	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		--	--	--	--

Table Notes:

[1] Federal Regulatory criteria for the Protection of Environmental and Human Health from the Canadian Council of Ministers for the Environment (CCME), Canadian Environmental Soil Quality Guidelines (updated 2007) - Commercial, Coarse Grained and non-potable water guidelines.

[2] Federal Regulatory criteria for Petroleum Hydrocarbons in Soil, Canada Wide Standards, CCME (Revised January 2008) - Tier 1 Levels for Surface Soil (Commercial, coarse-grained soil criteria).

[3] Reference: Provincial Atlantic Risk Based Corrective Action for Petroleum Impacted Sites In Atlantic Canada (Version 3, updated January 2015) - Tier 1 Risk Based Screening Levels for Soil (Commercial, coarse-grained and Non-potable water criteria).

[4] Reference: Provincial Atlantic Risk Based Corrective Action for Petroleum Impacted Sites In Atlantic Canada (Version 3, updated January 2015) - Commercial Tier 1 Soil Ecological Screening Levels for the Protection of Plants and Soil Invertebrates; Direct Soil Contact.

-- = no guideline available

(1) Elevated fuel oil range due to elevated instrument baseline.

Reported concentrations for particular samples that are in boldface font and in grey highlighted cells exceed applicable guidelines.

Table 2: Summary of Soil Sample Results for Petroleum Hydrocarbons

Sample ID:		**1987-SOIL-11**	**1987-SOIL-12**	**UAST-SOIL-1**	**UAST-SOIL-2**	**UAST-SOIL-3**	**UAST-SOIL-4**	**UAST-SOIL-5**	**HEL-SOIL-1**	**HEL-SOIL-2**	**HEL-SOIL-3**	RDL	Federal	Federal	Provincial[3]	Provincial[4]
Sample Date:		2017/10/14	2017/10/14	2017/10/13	2017/10/13	2017/10/13	2017/10/13	2017/10/13	2017/10/13	2017/10/13	2017/10/13		CCME	CCME	RBCA	RBCA
Lab ID:		FJL977	FJL978	FJL979	FJL980	FJL981	FJL982	FJL986	FJL988	FJL989	FJL990		Environmental	CWS	Soil	Soil
QA/QC Field Duplicate of:		**1987-SOIL-2**	**1987-SOIL-3**	--	--	--	--	**USAT-SOIL-2**	--	--	--		Human Health			
	Units															
BTEX & F1 Hydrocarbons																
Benzene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	0.030	--	2.5	180
Toluene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	0.37	--	10,000	250
Ethylbenzene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	0.082	--	10,000	300
p+m-Xylene	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	--	--	--	--
o-Xylene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	--	--	--	--
Total Xylenes	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	11	--	110	350
F1 (C6-C10)	mg/kg	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	10	--	--	--	--
F1 (C6-C10) - BTEX (Calc.)	mg/kg	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	10	--	320	--	320
F2-F4 Hydrocarbons																
F2 (C10-C16 Hydrocarbons)	mg/kg	<20 (1)	<20 (1)	<20 (1)	<20 (1)	<20 (1)	<20 (1)	<20 (1)	<20 (1)	<20 (1)	<20 (1)	20	--	260	--	260
F3 (C16-C34 Hydrocarbons)	mg/kg	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	50	--	1700	--	1700
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	77	<50	<50	<50	<50	<50	<50	<50	<50	50	--	3300	--	3300
Reached Baseline at C50	mg/kg	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	--	--	--	--	--

Table Notes:

[1] Federal Regulatory criteria for the Protection of Environmental and Human Health from the Canadian Council of Ministers for the Environment (CCME), Canadian Environmental Soil Quality Guidelines (updated 2007) - Commercial, Coarse Grained and non-potable water guidelines.

[2] Federal Regulatory criteria for Petroleum Hydrocarbons in Soil, Canada Wide Standards, CCME (Revised January 2008) - Tier 1 Levels for Surface Soil (Commercial, coarse-grained soil criteria).

[3] Reference: Provincial Atlantic Risk Based Corrective Action for Petroleum Impacted Sites In Atlantic Canada (Version 3, updated January 2015) - Tier 1 Risk Based Screening Levels for Soil (Commercial, coarse-grained and Non-potable water criteria).

[4] Reference: Provincial Atlantic Risk Based Corrective Action for Petroleum Impacted Sites In Atlantic Canada (Version 3, updated January 2015) - Commercial Tier 1 Soil Ecological Screening Levels for the Protection of Plants and Soil Invertebrates; Direct Soil Contact.

-- = no guideline available

(1) Elevated fuel oil range due to elevated instrument baseline.

Reported concentrations for particular samples that are in boldface font and in grey highlighted cells exceed applicable guidelines.

Table 3: Summary of Soil Sample Results for Petroleum Hydrocarbons

Sample ID:		**HANGER-SOIL-1**	**HANGER-SOIL-2**	**HANGER-SOIL-3**	**HANGER-SOIL-4**	**SEPTIC-SOIL-1**	**SEPTIC-SOIL-2**	**SEPTIC-SOIL-3**	**HEL-SOIL-4**	**SHACK-SOIL-1**	**SHACK-SOIL-2**	RDL	Federal[1]	Federal[2]	Provincial[3]	Provincial[4]
Sample Date:		2017/10/13	2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14		CCME	CCME	RBCA	RBCA
Lab ID:		FJL991	FJL992	FJL993	FJL994	FJL995	FJL996	FJL997	FJL998	FJL999	FJM000		Environmental	CWS	Soil	Soil
QA/QC Field Duplicate of:		--	--	--	--	--	--	--	**HEL-SOIL-1**	--	--		Human Health			
	Units															
BTEX & F1 Hydrocarbons																
Benzene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	0.030	--	2.5	180
Toluene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	0.37	--	10,000	250
Ethylbenzene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	0.082	--	10,000	300
p+m-Xylene	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	--	--	--	--
o-Xylene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	--	--	--	--
Total Xylenes	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	11	--	110	350
F1 (C6-C10)	mg/kg	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	10	--	--	--	--
F1 (C6-C10) - BTEX (Calc.)	mg/kg	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	10	--	320	--	320
F2-F4 Hydrocarbons																
F2 (C10-C16 Hydrocarbons)	mg/kg	<20 (1)	28 (1)	74 (1)	70 (1)	31 (1)	28 (1)	29 (1)	<20 (1)	<20 (1)	32 (1)	20	--	260	--	260
F3 (C16-C34 Hydrocarbons)	mg/kg	96	180	270	400	480	120	140	<50	68	120	50	--	1700	--	1700
F4 (C34-C50 Hydrocarbons)	mg/kg	110	110	<50	210	770	220	210	<50	<50	<50	50	--	3300	--	3300
Reached Baseline at C50	mg/kg	No[2]	No[2]	Yes	No[2]	No[3]	No[2]	No[2]	Yes	Yes	Yes	--	--	--	--	--

Table Notes:

[1] Federal Regulatory criteria for the Protection of Environmental and Human Health from the Canadian Council of Ministers for the Environment (CCME), Canadian Environmental Soil Quality Guidelines (updated 2007) - Commercial, Coarse Grained and non-potable water guidelines.

[2] Federal Regulatory criteria for Petroleum Hydrocarbons in Soil, Canada Wide Standards, CCME (Revised January 2008) - Tier 1 Levels for Surface Soil (Commercial, coarse-grained soil criteria).

[3] Reference: Provincial Atlantic Risk Based Corrective Action for Petroleum Impacted Sites In Atlantic Canada (Version 3, updated January 2015) - Tier 1 Risk Based Screening Levels for Soil (Commercial, coarse-grained and Non-potable water criteria).

[4] Reference: Provincial Atlantic Risk Based Corrective Action for Petroleum Impacted Sites In Atlantic Canada (Version 3, updated January 2015) - Commercial Tier 1 Soil Ecological Screening Levels for the Protection of Plants and Soil Invertebrates; Direct Soil Contact.

-- = no guideline available
(1) Elevated fuel oil range due to elevated instrument baseline.
(2) No resemblance to petroleum products in fuel oil/lube oil range.
(3) Lube oil fraction

Reported concentrations for particular samples that are in boldface font and in grey highlighted cells exceed applicable guidelines.

Table 4: Summary of Soil Sample Results for Petroleum Hydrocarbons

Sample ID:		**SHACK-SOIL-3**	**SHACK-SOIL-4**	**BG-SOIL-1**	**BG-SOIL-2**	**BG-SOIL-3**	**BG-SOIL-4**	**BG-SOIL-5**	**BG-SOIL-6**	**BG-SOIL-7**	**BG-SOIL-8**	RDL	Federal[1]	Federal[2]	Provincial[3]	Provincial[4]
Sample Date:		2017/10/14	2017/10/14	2017/10/17	2017/10/17	2017/10/17	2017/10/17	2017/10/17	2017/10/17	2017/10/17	2017/10/17		CCME	CCME	RBCA	RBCA
Lab ID:		FJM001	FJM035	FJM002	FJM003	FJM004	FJM005	FJM006	FJM007	FJM008	FJM010		Environmental	CWS	Soil	Soil
QA/QC Field Duplicate of:		--	**SHACK-SOIL-3**	--	--	--	--	--	--	--	--		Human Health			
	Units															
BTEX & F1 Hydrocarbons																
Benzene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	0.030	--	2.5	180
Toluene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	0.37	--	10,000	250
Ethylbenzene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	0.082	--	10,000	300
p+m-Xylene	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	--	--	--	--
o-Xylene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	--	--	--	--
Total Xylenes	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	11	--	110	350
F1 (C6-C10)	mg/kg	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	10	--	--	--	--
F1 (C6-C10) - BTEX (Calc.)	mg/kg	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	10	--	320	--	320
F2-F4 Hydrocarbons																
F2 (C10-C16 Hydrocarbons)	mg/kg	62 (1)	46 (1)	<10	<10	<10	<10	<10	<10	<10	<20 (1)	10	--	260	--	260
F3 (C16-C34 Hydrocarbons)	mg/kg	130	100	440	330	<50	170	460	78	<50	<50	50	--	1700	--	1700
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	<50	<50	<50	<50	<50	150	<50	<50	<50	50	--	3300	--	3300
Reached Baseline at C50	mg/kg	Yes	Yes	Yes[2]	Yes	Yes	Yes[2]	No[2]	Yes	Yes[2]	Yes	--	--	--	--	--

Table Notes:

[1] Federal Regulatory criteria for the Protection of Environmental and Human Health from the Canadian Council of Ministers for the Environment (CCME), Canadian Environmental Soil Quality Guidelines (updated 2007) - Commercial, Coarse Grained and non-potable water guidelines.

[2] Federal Regulatory criteria for Petroleum Hydrocarbons in Soil, Canada Wide Standards, CCME (Revised January 2008) - Tier 1 Levels for Surface Soil (Commercial, coarse-grained soil criteria).

[3] Reference: Provincial Atlantic Risk Based Corrective Action for Petroleum Impacted Sites In Atlantic Canada (Version 3, updated January 2015) - Tier 1 Risk Based Screening Levels for Soil (Commercial, coarse-grained and Non-potable water criteria).

[4] Reference: Provincial Atlantic Risk Based Corrective Action for Petroleum Impacted Sites In Atlantic Canada (Version 3, updated January 2015) - Commercial Tier 1 Soil Ecological Screening Levels for the Protection of Plants and Soil Invertebrates; Direct Soil Contact.

-- = no guideline available
(1) Elevated fuel oil range due to elevated instrument baseline.
(2) No resemblance to petroleum products in fuel oil/lube oil range.

Reported concentrations for particular samples that are in boldface font and in grey highlighted cells exceed applicable guidelines.

Table 5: Summary of Soil Sample Results for Petroleum Hydrocarbons

Sample ID:		**LPUMP-SOIL-1**	**LPUMP-SOIL-2**	**LPUMP-SOIL-3**	**LPUMP-SOIL-4**	RDL	Federal[1]	Federal[2]	Provincial[3]	Provincial[4]
Sample Date:		2017/10/17	2017/10/17	2017/10/17	2017/10/17		CCME	CCME	RBCA	RBCA
Lab ID:		FJM023	FJM021	FJM022	FJM025		Environmental	CWS	Soil	Soil
QA/QC Field Duplicate of:		--	--	--	**UPUMP-SOIL-1**		Human Health			
	Units									
BTEX & F1 Hydrocarbons										
Benzene	mg/kg	<0.020	<0.020	<0.020	<0.020	0.020	0.030	--	2.5	180
Toluene	mg/kg	<0.020	<0.020	<0.020	<0.020	0.020	0.37	--	10,000	250
Ethylbenzene	mg/kg	<0.020	<0.020	<0.020	<0.020	0.020	0.082	--	10,000	300
p+m-Xylene	mg/kg	<0.040	<0.040	<0.040	<0.040	0.040	--	--	--	--
o-Xylene	mg/kg	<0.020	<0.020	<0.020	<0.020	0.020	--	--	--	--
Total Xylenes	mg/kg	<0.040	<0.040	<0.040	<0.040	0.040	11	--	110	350
F1 (C6-C10)	mg/kg	<10	<10	<10	<10	10	--	--	--	--
F1 (C6-C10) - BTEX (Calc.)	mg/kg	<10	<10	<10	<10	10	--	320	--	320
F2-F4 Hydrocarbons										
F2 (C10-C16 Hydrocarbons)	mg/kg	91 (1)	22 (1)	<20 (1)	75 (1)	20	--	260	--	260
F3 (C16-C34 Hydrocarbons)	mg/kg	410	<50	76	510	50	--	1700	--	1700
F4 (C34-C50 Hydrocarbons)	mg/kg	200	<50	<50	220	50	--	3300	--	3300
Reached Baseline at C50	mg/kg	No[5]	Yes	Yes	No[5]	--	--	--	--	--

Table Notes:

[1] Federal Regulatory criteria for the Protection of Environmental and Human Health from the Canadian Council of Ministers for the Environment (CCME), Canadian Environmental Soil Quality Guidelines (updated 2007) - Commercial, Coarse Grained and non-potable water guidelines.

[2] Federal Regulatory criteria for Petroleum Hydrocarbons in Soil, Canada Wide Standards, CCME (Revised January 2008) - Tier 1 Levels for Surface Soil (Commercial, coarse-grained soil criteria).

[3] Reference: Provincial Atlantic Risk Based Corrective Action for Petroleum Impacted Sites In Atlantic Canada (Version 3, updated January 2015) - Tier 1 Risk Based Screening Levels for Soil (Commercial, coarse-grained and Non-potable water criteria).

[4] Reference: Provincial Atlantic Risk Based Corrective Action for Petroleum Impacted Sites In Atlantic Canada (Version 3, updated January 2015) - Commercial Tier 1 Soil Ecological Screening Levels for the Protection of Plants and Soil Invertebrates; Direct Soil Contact.

[5] No resemblance to petroleum products in fuel oil/lube oil range.

-- = no guideline available

(1) Elevated fuel oil range due to elevated instrument baseline.

Reported concentrations for particular samples that are in boldface font and in grey highlighted cells exceed applicable guidelines.

Table 6: Summary of Soil Sample Results for Petroleum Hydrocarbons

Sample ID:		**PIPELINE-SOIL-1**	**PIPELINE-SOIL-2**	**PIPELINE-SOIL-3**	**PIPELINE-SOIL-4**	**PIPELINE-SOIL-5**	**UPUMP-SOIL-1**	**UPUMP-SOIL-2**	**UPUMP-SOIL-3**	**UPUMP-SOIL-4**	**UPUMP-SOIL-5**	RDL	Federal[1]	Federal[2]	Provincial[3]	Provincial[4]
Sample Date:		2017/10/14	2017/10/14	2017/10/17	2017/10/14	2017/10/17	2017/10/17	2017/10/17	2017/10/17	2017/10/17	2017/10/14		CCME	CCME	RBCA	RBCA
Lab ID:		FJM032	FJM033	FJM024	FJM034	FJM030	FJM026	FJM027	FJM028	FJM029	FJM031		Environmental	CWS	Soil	Soil
QA/QC Field Duplicate of:		--	--	--	--	**PIPELINE-SOIL-3**	--	--	--	**UPUMP-SOIL-1**	**UPUMP-SOIL-3**		Human Health			
	Units															
BTEX & F1 Hydrocarbons																
Benzene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	0.030	--	2.5	180
Toluene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	0.37	--	10,000	250
Ethylbenzene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	0.082	--	10,000	300
p+m-Xylene	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	--	--	--	--
o-Xylene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	--	--	--	--
Total Xylenes	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	11	--	110	350
F1 (C6-C10)	mg/kg	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	10	--	--	--	--
F1 (C6-C10) - BTEX (Calc.)	mg/kg	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	10	--	320	--	320
F2-F4 Hydrocarbons																
F2 (C10-C16 Hydrocarbons)	mg/kg	<15 (1)	<15 (1)	23 (1)	<15 (1)	24 (1)	100 (1)	110 (1)	57 (1)	120 (1)	20 (1)	15	--	260	--	260
F3 (C16-C34 Hydrocarbons)	mg/kg	<50	<50	68	<50	55	950	740	390	1700	740	50	--	1700	--	1700
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	<50	<50	<50	<50	330	240	160	720	250	50	--	3300	--	3300
Reached Baseline at C50	mg/kg	Yes	Yes	Yes[5]	Yes	Yes	No[5]	No[5]	No[5]	No[5]	No[5]	--	--	--	--	--

Table Notes:

[1] Federal Regulatory criteria for the Protection of Environmental and Human Health from the Canadian Council of Ministers for the Environment (CCME), Canadian Environmental Soil Quality Guidelines (updated 2007) - Commercial, Coarse Grained and non-potable water guidelines.

[2] Federal Regulatory criteria for Petroleum Hydrocarbons in Soil, Canada Wide Standards, CCME (Revised January 2008) - Tier 1 Levels for Surface Soil (Commercial, coarse-grained soil criteria).

[3] Reference: Provincial Atlantic Risk Based Corrective Action for Petroleum Impacted Sites In Atlantic Canada (Version 3, updated January 2015) - Tier 1 Risk Based Screening Levels for Soil (Commercial, coarse-grained and Non-potable water criteria).

[4] Reference: Provincial Atlantic Risk Based Corrective Action for Petroleum Impacted Sites In Atlantic Canada (Version 3, updated January 2015) - Commercial Tier 1 Soil Ecological Screening Levels for the Protection of Plants and Soil Invertebrates; Direct Soil Contact.

[5] No resemblance to petroleum products in fuel oil/lube oil range.

-- = no guideline available

(1) Elevated fuel oil range due to elevated instrument baseline.

Reported concentrations for particular samples that are in boldface font and in grey highlighted cells exceed applicable guidelines.

Table 7: Summary of Soil Sample Results for Petroleum Hydrocarbons

Sample ID:		**LAST-SOIL-1**	**LAST-SOIL-2**	**LAST-SOIL-3**	**LAST-SOIL-4**	**DRUM-SOIL-1**	**DRUM-SOIL-2**	**DRUM-SOIL-3**	RDL	Federal	Federal	Provincial^3	Provincial^4
Sample Date:		2017/10/15	2017/10/15	2017/10/15	2017/10/15	2017/10/15	2017/10/15	2017/10/15		CCME	CCME	RBCA	RBCA
Lab ID:		FJM036	FJM037	FJM038	FJM039	FJM040	FJM041	FJM042		Environmental	CWS	Soil	Soil
QA/QC Field Duplicate of:		--	--	--	--	--	--	--		Human Health			
	Units												
BTEX & F1 Hydrocarbons													
Benzene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	0.030	--	2.5	180
Toluene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	0.37	--	10,000	250
Ethylbenzene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	0.082	--	10,000	300
p+m-Xylene	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	--	--	--	--
o-Xylene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	--	--	--	--
Total Xylenes	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	11	--	110	350
F1 (C6-C10)	mg/kg	<10	<10	<10	<10	<10	<10	<10	10	--	--	--	--
F1 (C6-C10) - BTEX (Calc.)	mg/kg	<10	<10	<10	<10	<10	<10	<10	10	--	320	--	320
F2-F4 Hydrocarbons													
F2 (C10-C16 Hydrocarbons)	mg/kg	<25 (1)	<25 (1)	<25 (1)	<25 (1)	<25 (1)	<25 (1)	<25 (1)	25	--	260	--	260
F3 (C16-C34 Hydrocarbons)	mg/kg	86	<50	100	89	240	440	170	50	--	1700	--	1700
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	<50	<50	<50	<50	<50	<50	50	--	3300	--	3300
Reached Baseline at C50	mg/kg	Yes	Yes	Yes	Yes	Yes	Yes^5	Yes^5		--	--	--	--

Table Notes:

[1] Federal Regulatory criteria for the Protection of Environmental and Human Health from the Canadian Council of Ministers for the Environment (CCME), Canadian Environmental Soil Quality Guidelines (updated 2007) - Commercial, Coarse Grained and non-potable water guidelines.

[2] Federal Regulatory criteria for Petroleum Hydrocarbons in Soil, Canada Wide Standards, CCME (Revised January 2008) - Tier 1 Levels for Surface Soil (Commercial, coarse-grained soil criteria).

[3] Reference: Provincial Atlantic Risk Based Corrective Action for Petroleum Impacted Sites In Atlantic Canada (Version 3, updated January 2015) - Tier 1 Risk Based Screening Levels for Soil (Commercial, coarse-grained and Non-potable water criteria).

[4] Reference: Provincial Atlantic Risk Based Corrective Action for Petroleum Impacted Sites In Atlantic Canada (Version 3, updated January 2015) - Commercial Tier 1 Soil Ecological Screening Levels for the Protection of Plants and Soil Invertebrates; Direct Soil Contact.

[5] No resemblance to petroleum products in fuel oil/lube oil range.

-- = no guideline available

(1) Elevated fuel oil range due to elevated instrument baseline.

Reported concentrations for particular samples that are in boldface font and in grey highlighted cells exceed applicable guidelines.

Table 8 - PAHs in Soil Laboratory Analytical Results (mg/kg)

Site	Cape Makkovik, Labrador																				
Sampling Program																			Canadian Soil Quality Guidelines[1]		
Sample ID and Depth	1987-SOIL-1	1987-SOIL-2	1987-SOIL-3	1987-SOIL-4	1987-SOIL-5	1987-SOIL-6	1987-SOIL-7	1987-SOIL-8	1987-SOIL-9	1987-SOIL-10	1987-SOIL-11	1987-SOIL-12	UAST-SOIL-1	UAST-SOIL-2	UAST-SOIL-3				Human Health		Environmental Health
Lab Sample ID:	FJP535	FJP536	FJP537	FJP560	FJP561	FJP562	FJP563	FJP564	FJP565	FJP566	FJP567	FJP568	FJP569	FJP570	FJP571				SQG_{DH}[4]		SQG_E
Duplicate Sample of:											**1987-SOIL2**	**1987-SOIL3**									
Sample Date:	2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14				*carcinogenic effects of PAHs*	*non-carcinogenic*	
Is the **sampling location** likely contaminated by **Coal Tar** and/or **Creosote**? (answer "**Y**" or leave blank)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y				direct human contact	guidelines from other jurisdictions[3]	
Is there a drinking water well in the immediate area of the **sampling location**? (answer "**Y**" or leave blank)																					
Is there likely freshwater aquatic life (within a natural freshwater body) on or in the immediate area **of the site** which could be impacted? (answer "**Y**" or leave blank)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y			**RDL**			
1-Methylnaphthalene	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010			0.010	--	--	--
2-Methylnaphthalene	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010			0.010	--	--	--
Acenaphthene[7]	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010			0.010	--	--	0.28
Acenaphthylene[7]	<0.030	<0.040	<0.030	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.040	<0.030	<0.010	<0.010	<0.010			0.010	--	--	320
Anthracene[8]	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010			0.010	--	--	32
Benzo(a)anthracene[9]	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010			0.010	--	--	10
Benzo(a)pyrene[7]	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010			0.010	--	--	72
Benzo(b)fluoranthene[9]	<0.010	0.013	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010			0.010	--	--	10
Benzo(b/j)fluoranthene	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020			0.020			--
Benzo(g,h,i)perylene	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010			0.010	--	--	--
Benzo(j)fluoranthene	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010			0.010	;	--	--
Benzo(k)fluoranthene[9]	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010			0.010	--	--	10
Chrysene	<0.010	0.015	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010			0.010	--	--	--
Dibenz(a,h)anthracene[9]	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010			0.030	--	--	10
Fluoranthene[8]	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010			0.010	--	--	180
Fluorene[7]	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010			0.010	--	--	0.25
Indeno(1,2,3-cd)pyrene[9]	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010			0.25	--	--	10
Naphthalene[6]	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010			0.010	--	--	22
Perylene	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010			0.010	--	--	--
Phenanthrene[6]	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010			0.010	--	--	50
Pyrene[9]	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010			0.010	--	--	100
Benzo[a]pyrene Total Potency Equivalents [2]	0.1038	0.1065	0.1038	0.1038	0.1038	0.1038	0.1038	0.1038	0.1038	0.1038	0.1038	0.1038	0.1038	0.1038	0.1038			--	5.3	--	--
Initial B[a]P TPE before Factor of Safety of 3 is applied	0.03	0.04	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			--	--	--	--
IACR[5]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			--	--	--	--

Bold and grey highlighted values exceed applicable criteria;

ND - Not detected above RDL (reportable detection limit); NA – Not applicable;

"--"= no guideline available or parameter not analyzed;

[1] CCME Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health, PAHs (2010), Commercial. SQG_{DH} = human health-based soil quality guideline for direct contact; SQG_E = soil quality guideline for environmental health

[2] Where applicable, the Calculated B[a]P TPE is multiplied by a Safety Factor of 3 for cases where soil contamination by Coal Tar and/or Creosote mixtures is suspected. (1/2 RDL used to calculate B[a]P TPE).

[3] The 2010 Canadian Soil Quality Guidelines indicate that protection of human health from non-carcinogenic effects of PAHs was not assessed, and recommends that guidelines from other jurisdictions be consulted. For the purpose of this report, no comparisons to guidelines from other jurisdictions have been made.

[4] SQG_{DH} is based on an incremental lifetime cancer risk (ILCR) of 1 in 100,000 (10^{-5})

[5] IACR = Index of Additive Cancer Risk assesses potential threats to potable groundwater water quality from leaching carcinogenic unsubstituted PAHs. When groundwater is not used on site or on the adjacent site for drinking water, then IACR is assigned a value of zero.

[6] The lowest of the two SQG_E for this parameter is for protection of freshwater life. If impact to surface water is not a concern, the higher SQG_E (i.e. 1997 rovisional SQG_E for naphthalene and 1991 Interim Soil Quality Criteria for phenanthrene) is applied automatically.

[7] Protection of freshwater life guideline

[8] SQGE = soil quality guideline for environmental health

[9] Interim Soil Quality Criteria (CCME 1991)

Table 9 - PAHs in Soil Laboratory Analytical Results (mg/kg)

Site	Cape Makkovik, Labrador																		
Sampling Program																RDL	Canadian Soil Quality Guidelines[1]		
Sample ID and Depth	UAST-4	UAST-5	HEL-SOIL-1	HEL-SOIL-2	HEL-SOIL-3	HANGER-SOIL-1	HANGER-SOIL-2	HANGER-SOIL-3	HANGER-SOIL-4	SEPTIC-SOIL-1	SEPTIC-SOIL-2	SEPTIC-SOIL-3	HEL-SOIL-4	SHACK-SOIL-1	SHACK-SOIL-2		Human Health		Environmental Health
Lab Sample ID:	FJP572	FJP573	FJP574	FJP575	FJP576	FJP577	FJP578	FJP580	FJP581	FJP582	FJP583	FJP584	FJP585	FJP586	FJP587		**SQG_{DH}[4]**		**SQG_E**
Duplicate Sample of:		UAST-2											**HEL-SOIL-1**						
Sample Date:	2017/10/13	2017/10/13	2017/10/13	2017/10/13	2017/10/13	2017/10/13	2017/10/13	2017/10/13	2017/10/13	2017/10/18	2017/10/18	2017/10/18	2017/10/13	2017/10/14	2017/10/14		*carcinogenic effects of PAHs*	*non-carcinogenic*	
Is the **sampling location** likely contaminated by **Coal Tar** and/or **Creosote**? (answer "**Y**" or leave blank)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		direct human contact	guidelines from other jurisdictions[3]	
Is there a drinking water well in the immediate area of the **sampling location**? (answer "**Y**" or leave blank)																			
Is there likely freshwater aquatic life (within a natural freshwater body) on or in the immediate area **of the site** which could be impacted? (answer "**Y**" or leave blank)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y				
1-Methylnaphthalene	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	--	--	--
2-Methylnaphthalene	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	--	--	--
Acenaphthene[7]	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.1	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	--	--	0.28
Acenaphthylene[7]	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.040 (1)	<0.010	0.010	--	--	320
Anthracene[8]	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.21	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	--	--	32
Benzo(a)anthracene[9]	<0.010	<0.010	<0.010	<0.010	<0.010	0.023	0.66	0.092	0.022	0.073	<0.010	0.023	<0.010	<0.010	<0.010	0.010	--	--	10
Benzo(a)pyrene[7]	<0.010	<0.010	<0.010	<0.010	<0.010	0.052	0.6	0.11	0.038	0.16	<0.010	0.032	<0.010	<0.010	<0.010	0.010	--	--	72
Benzo(b)fluoranthene[9]	<0.010	<0.010	<0.010	<0.010	<0.010	0.039	0.630	0.12	0.046	0.28	<0.010	0.031	<0.010	<0.010	<0.010	0.010	--	--	10
Benzo(b/j)fluoranthene	<0.020	<0.020	<0.020	<0.020	<0.020	0.054	0.94	0.18	0.065	0.39	<0.020	0.044	<0.020	<0.020	<0.020	0.020			--
Benzo(g,h,i)perylene	<0.010	<0.010	<0.010	<0.010	<0.010	0.1	0.3	0.068	0.041	0.19	<0.010	0.022	<0.010	<0.010	<0.010	0.010	--	--	--
Benzo(j)fluoranthene	<0.010	<0.010	<0.010	<0.010	<0.010	0.015	0.31	0.068	0.019	0.11	<0.010	0.013	<0.010	<0.010	<0.010	0.010	;	--	--
Benzo(k)fluoranthene[9]	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.31	0.058	0.017	0.10	<0.010	0.014	<0.010	<0.010	<0.010	0.010	--	--	10
Chrysene	<0.010	<0.010	<0.010	<0.010	<0.010	0.054	0.640	0.12	0.042	0.26	<0.010	0.023	<0.010	<0.010	<0.010	0.010	--	--	--
Dibenz(a,h)anthracene[9]	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.084	0.018	<0.010	0.042	<0.010	<0.010	<0.010	<0.010	<0.010	0.030	--	--	10
Fluoranthene[8]	<0.010	<0.010	<0.010	<0.010	<0.010	0.017	1.8	0.25	0.052	0.13	<0.010	0.043	<0.010	<0.010	0.014	0.010	--	--	180
Fluorene[7]	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.079	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	--	--	0.25
Indeno(1,2,3-cd)pyrene[9]	<0.010	<0.010	<0.010	<0.010	<0.010	0.03	0.28	0.051	0.030	0.14	<0.010	0.016	<0.010	<0.010	<0.010	0.25	--	--	10
Naphthalene[6]	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	--	--	22
Perylene	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.15	0.035	<0.010	0.043	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	--	--	--
Phenanthrene[6]	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	1.1	0.14	0.03	<0.010	<0.010	0.014	<0.010	<0.010	<0.010	0.010	--	--	50
Pyrene[9]	<0.010	<0.010	<0.010	<0.010	<0.010	0.038	1.3	0.18	0.041	0.14	<0.010	0.035	<0.010	<0.010	0.013	0.010	--	--	100
Benzo[a]pyrene Total Potency Equivalents [2]	0.1038	0.1038	0.1038	0.1038	0.1038	0.23922	2.7372	0.45909	0.22599	0.71325	0.1038	0.17145	0.1038	0.1038	0.1038	--	5.3	--	--
Initial B[a]P TPE before Factor of Safety of 3 is applied	0.03	0.03	0.03	0.03	0.03	0.08	0.91	0.15	0.08	0.24	0.03	0.06	0.03	0.03	0.03	--	--	--	--
IACR[5]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	--	--	--	--

Bold and grey highlighted values exceed applicable criteria;

ND - Not detected above RDL (reportable detection limit); NA – Not applicable;

"--"= no guideline available or parameter not analyzed;

[1] CCME Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health, PAHs (2010), Commercial. SQG_{DH} = human health-based soil quality guideline for direct contact; SQG_E = soil quality guideline for environmental health

[2] Where applicable, the Calculated B[a]P TPE is multiplied by a Safety Factor of 3 for cases where soil contamination by Coal Tar and/or Creosote mixtures is suspected. (1/2 RDL used to calculate B[a]P TPE).

[3] The 2010 Canadian Soil Quality Guidelines indicate that protection of human health from non-carcinogenic effects of PAHs was not assessed, and recommends that guidelines from other jurisdictions be consulted. For the purpose of this report, no comparisons to guidelines from other jurisdictions have been made.

[4] SQG_{DH} is based on an incremental lifetime cancer risk (ILCR) of 1 in 100,000 (10^{-5})

[5] IACR = Index of Additive Cancer Risk assesses potential threats to potable groundwater water quality from leaching carcinogenic unsubstituted PAHs. When groundwater is not used on site or on the adjacent site for drinking water, then IACR is assigned a value of zero.

[6] Two criteria are embeded in this table. The lowest of the two SQG_E is for protection of freshwater life. If impact to surface water is not a concern, the higher SQG_E (i.e. 1997 provisional SQG_E for naphthalene and 1991 Interim Soil Quality Criteria for phenanthrene) is applied automatically.

[7] Protection of freshwater life guideline

[8] SQGE = soil quality guideline for environmental health

[9] Interim Soil Quality Criteria (CCME 1991)

Table 10 - PAHs in Soil Laboratory Analytical Results (mg/kg)

Site	Cape Makkovik, Labrador																		
Sampling Program																			
Sample ID and Depth	SHACK-SOIL-3	BG-SOIL-1	BG-SOIL-2	BG-SOIL-3	BG-SOIL-4	BG-SOIL-5	BG-SOIL-6	BG-SOIL-7	BG-SOIL-8	LPUMP-SOIL-2	LPUMP-SOIL-3	LPUMP-SOIL-1	PIPELINE-SOIL-3	UPUMP-SOIL-4	UPUMP-SOIL-1		**Canadian Soil Quality Guidelines**[1] **Human Health**		**Environmental Health**
Lab Sample ID:	FJP588	FJP619	FJP620	FJP621	FJP622	FJP623	FJP624	FJP625	FJP626	FJP681	FJP682	FJP683	FJP684	FJP685	FJP686		**SQG_{DH}**[4]		**SQG_E**
Duplicate Sample of:																			
Sample Date:	2017/10/14	2017/10/17	2017/10/17	2017/10/17	2017/10/17	2017/10/17	2017/10/17	2017/10/17	2017/10/17	2017/10/17	2017/10/17	2017/10/17	2017/10/17	2017/10/17	2017/10/17		*carcinogenic effects of PAHs*	*non-carcinogenic effects of PAHs*	
Is the **sampling location** likely contaminated by **Coal Tar** and/or **Creosote**? (answer "**Y**" or leave blank)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y				
Is there a drinking water well in the immediate area of the **sampling location**? (answer "**Y**" or leave blank)																	direct human contact	guidelines from other jurisdictions[3]	
Is there likely freshwater aquatic life (within a natural freshwater body) on or in the immediate area **of the site** which could be impacted? (answer "**Y**" or leave blank)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	**RDL**			
1-Methylnaphthalene	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	--	--	--
2-Methylnaphthalene	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	--	--	--
Acenaphthene[7]	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	--	--	0.28
Acenaphthylene[7]	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	--	--	320
Anthracene[8]	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.02	<0.010	<0.010	<0.010	<0.010	0.010	--	--	32
Benzo(a)anthracene[9]	0.022	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.089	<0.010	<0.010	<0.010	<0.010	0.010	--	--	10
Benzo(a)pyrene[7]	0.064	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.1	<0.010	<0.010	<0.010	<0.010	0.010	--	--	72
Benzo(b)fluoranthene[9]	0.06	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.089	<0.010	<0.010	<0.010	<0.010	0.010	--	--	10
Benzo(b/j)fluoranthene	0.092	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.15	<0.020	<0.020	<0.020	<0.020	0.020	--	--	--
Benzo(g,h,i)perylene	0.044	<0.010	<0.010	<0.010	<0.010	<0.043 (1)	<0.010	<0.010	<0.010	<0.010	0.057	<0.010	<0.010	<0.010	<0.010	0.010	--	--	--
Benzo(j)fluoranthene	0.031	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.057	<0.010	<0.010	<0.010	<0.010	0.010	;	--	--
Benzo(k)fluoranthene[9]	0.028	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.057	<0.010	<0.010	<0.010	<0.010	0.010	--	--	10
Chrysene	0.037	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.1	<0.010	<0.010	<0.010	<0.010	0.010	--	--	--
Dibenz(a,h)anthracene[9]	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.030	--	--	10
Fluoranthene[8]	0.02	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.013	0.25	<0.010	<0.010	<0.010	<0.010	0.010	--	--	180
Fluorene[7]	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	--	--	0.25
Indeno(1,2,3-cd)pyrene[9]	0.044	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.06	<0.010	<0.010	<0.010	<0.010	0.25	--	--	10
Naphthalene[6]	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	--	--	0.013/22
Perylene	<0.010	<0.010	<0.010	<0.010	<0.010	<0.12 (1)	<0.010	<0.010	<0.010	<0.010	0.02	<0.010	<0.010	<0.010	<0.010	0.010	--	--	--
Phenanthrene[6]	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	**0.11**[7]	<0.010	<0.010	<0.010	<0.010	0.010	--	--	0.046/50
Pyrene[9]	0.036	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.2	<0.010	<0.010	<0.010	<0.010	0.010	--	--	100
Benzo[a]pyrene Total Potency Equivalents [2]	0.29493	0.1038	0.1038	0.1038	0.1038	0.1038	0.1038	0.1038	0.1038	0.1038	0.45531	0.1038	0.1038	0.1038	0.1038	--	5.3	--	--
Initial B[a]P TPE before Factor of Safety of 3 is applied	0.10	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.15	0.03	0.03	0.03	0.03	--	--	--	--
IACR[5]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	--	--	--	--

Bold and grey highlighted values exceed applicable criteria;

ND - Not detected above RDL (reportable detection limit); NA – Not applicable;

"--"= no guideline available or parameter not analyzed;

[1] CCME Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health, PAHs (2010), Commercial. SQG_{DH} = human health-based soil quality guideline for direct contact; SQG_E = soil quality guideline for environmental health

[2] Where applicable, the Calculated B[a]P TPE is multiplied by a Safety Factor of 3 for cases where soil contamination by Coal Tar and/or Creosote mixtures is suspected. (1/2 RDL used to calculate B[a]P TPE).

[3] The 2010 Canadian Soil Quality Guidelines indicate that protection of human health from non-carcinogenic effects of PAHs was not assessed, and recommends that guidelines from other jurisdictions be consulted. For the purpose of this report, no comparisons to guidelines from other jurisdictions have been made.

[4] SQG_{DH} is based on an incremental lifetime cancer risk (ILCR) of 1 in 100,000 (10^{-5})

[5] IACR = Index of Additive Cancer Risk assesses potential threats to potable groundwater water quality from leaching carcinogenic unsubstituted PAHs. When groundwater is not used on site or on the adjacent site for drinking water, then IACR is assigned a value of zero.

[6] Two criteria are embeded in this table. The lowest of the two SQG_E is for protection of freshwater life. If impact to surface water is not a concern, the higher SQG_E (i.e. 1997 provisional SQG_E for naphthalene and 1991 Interim Soil Quality Criteria for phenanthrene) is applied automatically.

[7] Protection of freshwater life guideline

[8] SQGE = soil quality guideline for environmental health

[9] Interim Soil Quality Criteria (CCME 1991)

Table 11 - PAHs in Soil Laboratory Analytical Results (mg/kg)

Site	Cape Makkovik, Labrador																				
Sampling Program																			Canadian Soil Quality Guidelines[1]		
Sample ID and Depth	UPUMP-SOIL-2	UPUMP-SOIL-3	PIPELINE-SOIL-5	UPUMP-SOIL-5	PIPELINE-SOIL-1	PIPELINE-SOIL-2	PIPELINE-SOIL-4	SHACK-SOIL-4	LAST-SOIL-1	LAST-SOIL-2	LAST-SOIL-3	LAST-SOIL-4	DRUM-SOIL-1	DRUM-SOIL-2	DRUM-SOIL-3				Human Health		Environmental Health
Lab Sample ID:	FJP687	FJP688	FJP690	FJP691	FJP692	FJP693	FJP694	FJP705	FJP713	FJP714	FJP715	FJP716	FJP684	FJP685	FJP686				SQG_{DH}[4]		SQG_E
Duplicate Sample of:								SHACK-SOIL-3													
Sample Date:	2017/10/17	2017/10/17	2017/10/17	2017/10/17	2017/10/17	2017/10/17	2017/10/17	2017/10/13	2017/10/15	2017/10/15	2017/10/15	2017/10/15	2017/10/15	2017/10/15	2017/10/15				*carcinogenic effects of PAHs*	*non-carcinogenic*	
Is the **sampling location** likely contaminated by **Coal Tar** and/or **Creosote**? (answer "**Y**" or leave blank)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y				direct human contact	guidelines from other jurisdictions[3]	
Is there a drinking water well in the immediate area of the **sampling location**? (answer "**Y**" or leave blank)																					
Is there likely freshwater aquatic life (within a natural freshwater body) on or in the immediate area **of the site** which could be impacted? (answer "**Y**" or leave blank)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y			RDL			
1-Methylnaphthalene	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010			0.010	--	--	--
2-Methylnaphthalene	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010			0.010	--	--	--
Acenaphthene[7]	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010			0.010	--	--	0.28
Acenaphthylene[7]	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010			0.010	--	--	320
Anthracene[8]	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010			0.010	--	--	32
Benzo(a)anthracene[9]	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010			0.010	--	--	10
Benzo(a)pyrene[7]	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.024	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010			0.010	--	--	72
Benzo(b)fluoranthene[9]	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.026	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010			0.010	--	--	10
Benzo(b/j)fluoranthene	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.039	<0.020	<0.020	<0.088	<0.020	<0.020	<0.020	<0.020			0.020	--	--	--
Benzo(g,h,i)perylene	<0.010	<0.010	<0.010	0.099	<0.010	<0.010	<0.010	0.022	0.013	<0.010	0.017	<0.010	0.068	0.082	0.073			0.010	--	--	--
Benzo(j)fluoranthene	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.013	<0.010	<0.010	<0.078	<0.010	<0.010	<0.010	<0.010			0.010	;	--	
Benzo(k)fluoranthene[9]	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010			0.010	--	--	10
Chrysene	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.014	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010			0.010	--	--	--
Dibenz(a,h)anthracene[9]	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.030			0.030	--	--	10
Fluoranthene[8]	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010			0.010	--	--	180
Fluorene[7]	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010			0.010	--	--	0.25
Indeno(1,2,3-cd)pyrene[9]	<0.010	<0.010	<0.029	<0.010	<0.010	<0.010	<0.010	0.018	<0.010	<0.010	<0.010	<0.010	<0.010	<0.052	<0.25			0.25	--	--	10
Naphthalene[6]	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010			0.010	--	--	22
Perylene	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010			0.010	--	--	--
Phenanthrene[6]	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010			0.010	--	--	50
Pyrene[9]	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.017	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010			0.010	--	--	100
Benzo[a]pyrene Total Potency Equivalents [2]	0.1038	0.1038	0.1038	0.10662	0.1038	0.1038	0.1038	0.13578	0.10404	0.1038	0.10416	0.1038	0.10569	0.10611	0.10584			--	5.3	--	--
Initial B[a]P TPE before Factor of Safety of 3 is applied	0.03	0.03	0.03	0.04	0.03	0.03	0.03	0.05	0.03	0.03	0.03	0.03	0.04	0.04	0.04			--	--	--	--
IACR[5]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			--	--	--	--

Bold and grey highlighted values exceed applicable criteria;

ND - Not detected above RDL (reportable detection limit); NA – Not applicable;

"--"= no guideline available or parameter not analyzed;

[1] CCME Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health, PAHs (2010), Commercial. SQG_{DH} = human health-based soil quality guideline for direct contact; SQG_E = soil quality guideline for environmental health

[2] Where applicable, the Calculated B[a]P TPE is multiplied by a Safety Factor of 3 for cases where soil contamination by Coal Tar and/or Creosote mixtures is suspected. (1/2 RDL used to calculate B[a]P TPE).

[3] The 2010 Canadian Soil Quality Guidelines indicate that protection of human health from non-carcinogenic effects of PAHs was not assessed, and recommends that guidelines from other jurisdictions be consulted. For the purpose of this report, no comparisons to guidelines from other jurisdictions have been made.

[4] SQG_{DH} is based on an incremental lifetime cancer risk (ILCR) of 1 in 100,000 (10^{-5})

[5] IACR = Index of Additive Cancer Risk assesses potential threats to potable groundwater water quality from leaching carcinogenic unsubstituted PAHs. When groundwater is not used on site or on the adjacent site for drinking water, then IACR is assigned a value of zero.

[6] Two criteria are embeded in this table. The lowest of the two SQG_E is for protection of freshwater life. If impact to surface water is not a concern, the higher SQG_E (i.e. 1997 provisional SQG_E for naphthalene and 1991 Interim Soil Quality Criteria for phenanthrene) is applied automatically.

[7] Protection of freshwater life guideline

[8] SQGE = soil quality guideline for environmental health

[9] Interim Soil Quality Criteria (CCME 1991)

Table 12: Metals in Soil Laboratory Analytical Results (mg/kg)

Sample ID:		1987-SOIL-1	1987-SOIL-2	1987-SOIL-3	1987-SOIL-4	1987-SOIL-5	1987-SOIL-6	1987-SOIL-7	1987-SOIL-8	1987-SOIL-9	1987-SOIL-10	Federal[1]
Sample Date:		2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14	CCME
Lab ID:		FJP535	FJP536	FJP537	FJP560	FJP561	FJP562	FJP563	FJP564	FJP565	FJP566	CSQG
QA/QC Field Duplicate of:		--	--	--	--	--	--	--	--	--	--	Commercial
	UNITS											
Metals												
Acid Extractable Aluminum (Al)	mg/kg	16000	18000	17000	14000	15000	12000	15000	17000	15000	11000	--
Acid Extractable Antimony (Sb)	mg/kg	<2.0	8.6	4.9	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	40
Acid Extractable Arsenic (As)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	12
Acid Extractable Barium (Ba)	mg/kg	150	160	210	160	200	180	130	220	250	140	2000
Acid Extractable Beryllium (Be)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	8
Acid Extractable Bismuth (Bi)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	--
Acid Extractable Boron (B)	mg/kg	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	--
Acid Extractable Cadmium (Cd)	mg/kg	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	22
Acid Extractable Chromium (Cr)[2]	mg/kg	34	31	32	36	30	37	40	40	45	33	87
Acid Extractable Cobalt (Co)	mg/kg	36	43	42	37	46	43	26	44	46	28	300
Acid Extractable Copper (Cu)	mg/kg	29	35	37	31	39	49	22	42	51	29	91
Acid Extractable Iron (Fe)	mg/kg	75000	82000	81000	78000	80000	78000	76000	82000	86000	65000	--
Acid Extractable Lead (Pb)	mg/kg	8.4	16	11	6.2	2.9	3.5	5.1	8.6	3.5	3.6	260
Acid Extractable Lithium (Li)	mg/kg	15	16	14	12	14	11	11	15	14	10	--
Acid Extractable Manganese (Mn)	mg/kg	610	690	810	650	860	710	560	940	860	490	--
Acid Extractable Mercury (Hg)	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	24
Acid Extractable Molybdenum (Mo)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	3.9	<2.0	<2.0	40
Acid Extractable Nickel (Ni)	mg/kg	23	25	23	24	25	31	17	23	28	22	89
Acid Extractable Rubidium (Rb)	mg/kg	16	21	20	17	18	19	13	10	16	12	--
Acid Extractable Selenium (Se)	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	2.9
Acid Extractable Silver (Ag)	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	40
Acid Extractable Strontium (Sr)	mg/kg	37	43	43	38	44	35	32	31	36	33	--
Acid Extractable Thallium (Tl)	mg/kg	<0.10	0.10	0.12	0.10	<0.10	<0.10	<0.10	0.11	0.11	<0.10	1
Acid Extractable Tin (Sn)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	300
Acid Extractable Uranium (U)	mg/kg	0.28	0.36	0.27	0.19	0.15	0.31	0.24	0.38	<0.10	0.17	33
Acid Extractable Vanadium (V)	mg/kg	**220**	**210**	**210**	**220**	**210**	**230**	**240**	**240**	**240**	**200**	130
Acid Extractable Zinc (Zn)	mg/kg	150	210	180	240	140	140	100	200	160	88	360

[1] Reference: Canadian Council of Ministers for the Environment (CCME), Cananadian Soil Quality Guidelines (CSQG) (Updated 2007) Soil Quality Guidelines for the Protection of Environmental and Human Health (Commercial).

[2] Total Chromium measured only. Chromium Hexavalant was not measured.

Reported concentrations for particular samples that are in boldface font and in grey highlighted cells exceed the CCME CSQGs.

"--" = No guideline available

Table 13: Metals in Soil Laboratory Analytical Results (mg/kg)

Sample ID:		**1987-SOIL-11**	**1987-SOIL-12**	**HEL-SOIL-1**	**HEL-SOIL-2**	**HEL-SOIL-3**	**HANGER-SOIL-1**	**HANGER-SOIL-2**	**HANGER-SOIL-3**	**HANGER-SOIL-4**	**SEPTIC-SOIL-1**	Federal[1]
Sample Date:		2017/10/14	2017/10/14	2017/10/13	2017/10/13	2017/10/13	2017/10/13	2017/10/13	2017/10/18	2017/10/18	2017/10/18	CCME
Lab ID:		FJP567	FJP568	FJP574	FJP575	FJP576	FJP577	FJP578	FJP580	FJP581	FJP582	CSQG
QA/QC Field Duplicate of:		**1987-SOIL-2**	**1987-SOIL-3**	--	--	--	--	--	--	--	--	Commercial
	UNITS											
Metals												
Acid Extractable Aluminum (Al)	mg/kg	15000	15000	8500	8800	10000	7800	8400	8700	8500	7600	--
Acid Extractable Antimony (Sb)	mg/kg	4.5	<2.0	<2.0	<2.0	<2.0	2.6	<2.0	<2.0	<2.0	**43**	40
Acid Extractable Arsenic (As)	mg/kg	<2.0	<2.0	6.6	7.0	**13**	5.5	7.7	5.9	7.0	6.7	12
Acid Extractable Barium (Ba)	mg/kg	120	170	73	54	110	48	70	48	81	47	2000
Acid Extractable Beryllium (Be)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	8
Acid Extractable Bismuth (Bi)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	--
Acid Extractable Boron (B)	mg/kg	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	--
Acid Extractable Cadmium (Cd)	mg/kg	<0.30	<0.30	<0.30	<0.30	<0.30	0.80	4.6	2.3	1.5	<0.30	22
Acid Extractable Chromium (Cr)[2]	mg/kg	35	32	22	22	22	24	23	25	29	31	87
Acid Extractable Cobalt (Co)	mg/kg	36	38	12	11	19	10	11	11	11	14	300
Acid Extractable Copper (Cu)	mg/kg	27	31	57	47	**110**	40	47	64	78	78	91
Acid Extractable Iron (Fe)	mg/kg	74000	75000	20000	19000	27000	18000	19000	21000	22000	23000	--
Acid Extractable Lead (Pb)	mg/kg	6.0	6.5	10	8.7	12	44	39	150	100	46	260
Acid Extractable Lithium (Li)	mg/kg	12	12	15	15	16	13	15	16	14	13	--
Acid Extractable Manganese (Mn)	mg/kg	600	700	280	310	420	270	330	270	280	300	--
Acid Extractable Mercury (Hg)	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	5.0	24
Acid Extractable Molybdenum (Mo)	mg/kg	<2.0	<2.0	2.1	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	40
Acid Extractable Nickel (Ni)	mg/kg	20	21	22	22	32	22	22	26	29	29	89
Acid Extractable Rubidium (Rb)	mg/kg	15	17	14	17	30	11	11	14	15	12	--
Acid Extractable Selenium (Se)	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	2.9
Acid Extractable Silver (Ag)	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	40
Acid Extractable Strontium (Sr)	mg/kg	33	37	24	22	21	60	34	31	41	21	--
Acid Extractable Thallium (Tl)	mg/kg	<0.10	0.10	0.10	0.12	0.27	<0.10	0.10	0.10	0.12	0.13	1
Acid Extractable Tin (Sn)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	300
Acid Extractable Uranium (U)	mg/kg	0.18	0.25	1.2	1.1	2.3	0.76	0.94	0.77	0.80	0.90	33
Acid Extractable Vanadium (V)	mg/kg	**210**	**190**	41	37	44	36	36	36	39	38	130
Acid Extractable Zinc (Zn)	mg/kg	150	170	46	44	76	200	**410**	260	350	130	360

[1] Reference: Canadian Council of Ministers for the Environment (CCME), Cananadian Soil Quality Guidelines (CSQG) (Updated 2007) Soil Quality Guidelines for the Protection of Environmental and Human Health (Commercial).

[2] Total Chromium measured only. Chromium Hexavalant was not measured.

Reported concentrations for particular samples that are in boldface font and in grey highlighted cells exceed the CCME CSQGs.

"--" = No guideline available

Table 14: Metals in Soil Laboratory Analytical Results (mg/kg)

Sample ID:		**SEPTIC-SOIL-2**	**SEPTIC-SOIL-3**	**HEL-SOIL-4**	**SHACK-SOIL-1**	**SHACK-SOIL-2**	**SHACK-SOIL-3**	**BG-SOIL-1**	**BG-SOIL-2**	**BG-SOIL-3**	**BG-SOIL-4**	Federal[1]
Sample Date:		2017/10/18	2017/10/18	2017/10/18	2017/10/18	2017/10/18	2017/10/18	2017/10/14	2017/10/14	2017/10/14	2017/10/14	CCME
Lab ID:		FJP583	FJP584	FJP585	FJP586	FJP587	FJP588	FJP619	FJP620	FJP621	FJP622	CSQG
QA/QC Field Duplicate of:		--	--	**HEL-SOIL-1**	--	--	--	--	--	--	--	Commercial
	UNITS											
Metals												
Acid Extractable Aluminum (Al)	mg/kg	7500	10000	8400	8600	11000	9800	3000	2400	1300	3300	--
Acid Extractable Antimony (Sb)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	40
Acid Extractable Arsenic (As)	mg/kg	6.9	5.7	7.3	4.2	6.8	7.0	2.3	<2.0	<2.0	<2.0	12
Acid Extractable Barium (Ba)	mg/kg	51	230	67	96	63	41	17	18	5.7	10	2000
Acid Extractable Beryllium (Be)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	8
Acid Extractable Bismuth (Bi)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	--
Acid Extractable Boron (B)	mg/kg	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	--
Acid Extractable Cadmium (Cd)	mg/kg	<0.30	<0.30	<0.30	0.49	0.70	<0.30	<0.30	<0.30	<0.30	<0.30	22
Acid Extractable Chromium (Cr)[2]	mg/kg	20	21	24	14	25	20	<2.0	<2.0	3.7	6.2	87
Acid Extractable Cobalt (Co)	mg/kg	13	13	12	9.8	13	10	<1.0	<1.0	<1.0	<1.0	300
Acid Extractable Copper (Cu)	mg/kg	64	54	63	37	49	37	17	4.0	2.0	3.8	91
Acid Extractable Iron (Fe)	mg/kg	18000	26000	20000	21000	23000	22000	3300	5100	1800	5900	--
Acid Extractable Lead (Pb)	mg/kg	9.8	32	9.7	12	**350**	14	19	7.9	12	7.1	260
Acid Extractable Lithium (Li)	mg/kg	14	18	13	16	23	19	<2.0	<2.0	<2.0	3.8	--
Acid Extractable Manganese (Mn)	mg/kg	270	530	290	370	420	270	17	20	28	52	--
Acid Extractable Mercury (Hg)	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.30	0.16	<0.10	<0.10	24
Acid Extractable Molybdenum (Mo)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	2.1	<2.0	<2.0	4.6	6.2	40
Acid Extractable Nickel (Ni)	mg/kg	25	23	23	12	18	15	<2.0	<2.0	<2.0	<2.0	89
Acid Extractable Rubidium (Rb)	mg/kg	14	18	16	15	20	17	<2.0	2.4	<2.0	<2.0	--
Acid Extractable Selenium (Se)	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	<1.0	<1.0	<1.0	2.9
Acid Extractable Silver (Ag)	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	40
Acid Extractable Strontium (Sr)	mg/kg	21	30	36	19	31	23	42	41	7.1	12	--
Acid Extractable Thallium (Tl)	mg/kg	0.12	0.19	0.12	0.11	0.17	0.14	<0.10	<0.10	<0.10	<0.10	1
Acid Extractable Tin (Sn)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	300
Acid Extractable Uranium (U)	mg/kg	0.75	1.9	1.1	1.3	0.94	1.0	2.8	2.8	0.52	2.5	33
Acid Extractable Vanadium (V)	mg/kg	34	42	38	32	42	41	2.1	3.3	6.6	12	130
Acid Extractable Zinc (Zn)	mg/kg	50	100	47	68	110	65	21	19	6.9	14	360

[1] Reference: Canadian Council of Ministers for the Environment (CCME), Cananadian Soil Quality Guidelines (CSQG) (Updated 2007) Soil Quality Guidelines for the Protection of Environmental and Human Health (Commercial).

[2] Total Chromium measured only. Chromium Hexavalant was not measured.

Reported concentrations for particular samples that are in boldface font and in grey highlighted cells exceed the CCME CSQGs.

"--" = No guideline available

Table 15: Metals in Soil Laboratory Analytical Results (mg/kg)

Sample ID:		**BG-SOIL-5**	**BG-SOIL-6**	**BG-SOIL-7**	**BG-SOIL-8**	**LPUMP-SOIL-2**	**LPUMP-SOIL-3**	**LPUMP-SOIL-1**	**LPUMP-SOIL-4**	**UPUMP-SOIL-1**	**UPUMP-SOIL-2**	Federal[1]
Sample Date:		2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/17	2017/10/17	2017/10/17	2017/10/17	2017/10/17	2017/10/17	CCME
Lab ID:		FJP623	FJP624	FJP625	FJP626	FJP681	FJP682	FJP683	FJP685	FJP686	FJP687	CSQG
QA/QC Field Duplicate of:		--	--	--	--	--	--	--	**LPUMP-SOIL-1**	--	--	Commercial
	UNITS											
Metals												
Acid Extractable Aluminum (Al)	mg/kg	3900	8000	4100	3200	5700	21000	6800	3300	2400	4700	--
Acid Extractable Antimony (Sb)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	8.0	6.7	<2.0	<2.0	40
Acid Extractable Arsenic (As)	mg/kg	<2.0	2.7	2.7	2.1	9.0	8.2	4.7	<2.0	<2.0	<2.0	12
Acid Extractable Barium (Ba)	mg/kg	22	21	29	17	21	150	150	89	100	77	2000
Acid Extractable Beryllium (Be)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	8
Acid Extractable Bismuth (Bi)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	--
Acid Extractable Boron (B)	mg/kg	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	--
Acid Extractable Cadmium (Cd)	mg/kg	<0.30	<0.30	<0.30	<0.30	<0.30	0.45	<0.30	<0.30	<0.30	<0.30	22
Acid Extractable Chromium (Cr)[2]	mg/kg	8.7	14	10	7.1	13	38	15	6.2	<2.0	2.5	87
Acid Extractable Cobalt (Co)	mg/kg	1.8	2.5	4.7	1.3	3.7	23	6.2	2.4	2.4	2.8	300
Acid Extractable Copper (Cu)	mg/kg	22	14	15	7.9	7.6	14	3.0	3.4	4.0	4.8	91
Acid Extractable Iron (Fe)	mg/kg	12000	9400	6400	3500	26000	66000	30000	11000	1900	7400	--
Acid Extractable Lead (Pb)	mg/kg	9.5	9.1	6.5	4.4	18	28	7.9	9.7	3.8	4.6	260
Acid Extractable Lithium (Li)	mg/kg	5.0	7.7	7.3	2.5	6.5	83	16	6.1	<2.0	<2.0	--
Acid Extractable Manganese (Mn)	mg/kg	82	120	110	70	450	1800	300	120	33	20	--
Acid Extractable Mercury (Hg)	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.11	0.14	0.17	0.20	24
Acid Extractable Molybdenum (Mo)	mg/kg	4.1	<2.0	5.5	<2.0	11	**57**	14	6.2	<2.0	<2.0	40
Acid Extractable Nickel (Ni)	mg/kg	4.0	5.7	7.3	3.4	7.0	41	5.9	2.9	2.9	3.7	89
Acid Extractable Rubidium (Rb)	mg/kg	2.7	6.6	6.6	2.9	11	54	24	9.0	<2.0	<2.0	--
Acid Extractable Selenium (Se)	mg/kg	1.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.1	2.9
Acid Extractable Silver (Ag)	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	40
Acid Extractable Strontium (Sr)	mg/kg	21	16	12	11	12	16	38	63	50	25	--
Acid Extractable Thallium (Tl)	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10	0.89	0.37	0.16	<0.10	<0.10	1
Acid Extractable Tin (Sn)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	3.1	<2.0	<2.0	<2.0	<2.0	300
Acid Extractable Uranium (U)	mg/kg	6.2	3.8	4.7	2.5	1.7	1.2	0.27	0.16	0.14	0.78	33
Acid Extractable Vanadium (V)	mg/kg	18	29	17	13	33	110	63	21	2.6	3.7	130
Acid Extractable Zinc (Zn)	mg/kg	58	28	47	19	260	**670**	120	150	12	20	360

[1] Reference: Canadian Council of Ministers for the Environment (CCME), Cananadian Soil Quality Guidelines (CSQG) (Updated 2007) Soil Quality Guidelines for the Protection of Environmental and Human Health (Commercial).

[2] Total Chromium measured only. Chromium Hexavalant was not measured.

Reported concentrations for particular samples that are in boldface font and in grey highlighted cells exceed the CCME CSQGs.

"--" = No guideline available

Table 16: Metals in Soil Laboratory Analytical Results (mg/kg)

Sample ID:		**UPUMP-SOIL-3**	**LPUMP-SOIL-5**	**SHACK-SOIL-4**	**RADOME-SOIL-1**	**RADOME-SOIL-2**	**RADOME-SOIL-3**	**TOWER-SOIL-1**	**TOWER-SOIL-2**	**TOWER-SOIL-3**	**TOWER-SOIL-4**	Federal[1]
Sample Date:		2017/10/17	2017/10/17	2017/10/13	2017/10/13	2017/10/13	2017/10/13	2017/10/13	2017/10/13	2017/10/13	2017/10/13	CCME
Lab ID:		FJP688	FJP691	FJP705	FJP706	FJP707	FJP708	FJP709	FJP710	FJP711	FJP712	CSQG
QA/QC Field Duplicate of:		--	**LPUMP-SOIL-3**	**SHACK-SOIL-3**	--	--	--	--	--	--	--	Commercial
	UNITS											
Metals												
Acid Extractable Aluminum (Al)	mg/kg	5100	5200	11000	9500	9000	9300	7700	7500	8500	6400	--
Acid Extractable Antimony (Sb)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	40
Acid Extractable Arsenic (As)	mg/kg	<2.0	<2.0	6.8	6.7	9.4	7.5	2.2	3.8	3.7	2.3	12
Acid Extractable Barium (Ba)	mg/kg	39	84	47	70	61	68	48	55	69	63	2000
Acid Extractable Beryllium (Be)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	8
Acid Extractable Bismuth (Bi)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	--
Acid Extractable Boron (B)	mg/kg	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	--
Acid Extractable Cadmium (Cd)	mg/kg	<0.30	<0.30	0.46	1.3	0.56	0.35	0.53	0.91	1.4	1.2	22
Acid Extractable Chromium (Cr)[2]	mg/kg	6.9	<2.0	24	31	21	25	11	20	18	12	87
Acid Extractable Cobalt (Co)	mg/kg	4.2	2.7	11	15	12	15	9.5	9.7	10	6.0	300
Acid Extractable Copper (Cu)	mg/kg	5.0	5.8	40	**93**	56	71	30	42	48	25	91
Acid Extractable Iron (Fe)	mg/kg	16000	7100	24000	23000	20000	22000	17000	20000	20000	15000	--
Acid Extractable Lead (Pb)	mg/kg	4.8	6.5	29	85	72	19	11	17	25	27	260
Acid Extractable Lithium (Li)	mg/kg	3.9	<2.0	18	18	16	16	13	9.2	16	9.9	--
Acid Extractable Manganese (Mn)	mg/kg	85	15	300	340	290	310	440	310	400	580	--
Acid Extractable Mercury (Hg)	mg/kg	0.13	0.20	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	2.6	24
Acid Extractable Molybdenum (Mo)	mg/kg	3.3	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	40
Acid Extractable Nickel (Ni)	mg/kg	7.8	4.4	17	36	23	32	17	20	22	11	89
Acid Extractable Rubidium (Rb)	mg/kg	5.2	<2.0	17	16	15	18	9.6	8.3	15	6.3	--
Acid Extractable Selenium (Se)	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	2.9
Acid Extractable Silver (Ag)	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	40
Acid Extractable Strontium (Sr)	mg/kg	10	29	23	31	31	25	12	56	25	9.6	--
Acid Extractable Thallium (Tl)	mg/kg	<0.10	<0.10	0.15	0.13	0.12	0.14	0.12	<0.10	0.13	<0.10	1
Acid Extractable Tin (Sn)	mg/kg	<2.0	2.7	<2.0	2.2	<2.0	<2.0	<2.0	<2.0	2.4	8.8	300
Acid Extractable Uranium (U)	mg/kg	0.60	0.75	0.90	1.2	0.92	1.0	0.52	0.99	0.77	0.98	33
Acid Extractable Vanadium (V)	mg/kg	29	3.7	44	43	41	41	20	21	27	19	130
Acid Extractable Zinc (Zn)	mg/kg	17	22	99	**580**	**570**	160	61	56	**690**	**2000**	360

[1] Reference: Canadian Council of Ministers for the Environment (CCME), Cananadian Soil Quality Guidelines (CSQG) (Updated 2007) Soil Quality Guidelines for the Protection of Environmental and Human Health (Commercial).

[2] Total Chromium measured only. Chromium Hexavalant was not measured.

Reported concentrations for particular samples that are in boldface font and in grey highlighted cells exceed the CCME CSQGs.

"--" = No guideline available

Table 17: Metals in Soil Laboratory Analytical Results (mg/kg)

Sample ID:		**DRUM-SOIL-1**	**DRUM-SOIL-2**	**DRUM-SOIL-3**	RDL	Federal[1]
Sample Date:		2017/10/15	2017/10/15	2017/10/15		CCME
Lab ID:		FJP717	FJP718	FJP719		CSQG
QA/QC Field Duplicate of:		--	--	--		Commercial
	UNITS					
Metals						
Acid Extractable Aluminum (Al)	mg/kg	5500	4900	8100	10	--
Acid Extractable Antimony (Sb)	mg/kg	<2.0	<2.0	<2.0	2.0	40
Acid Extractable Arsenic (As)	mg/kg	7.5	3.5	12	2.0	12
Acid Extractable Barium (Ba)	mg/kg	61	48	67	5.0	2000
Acid Extractable Beryllium (Be)	mg/kg	<2.0	<2.0	<2.0	2.0	8
Acid Extractable Bismuth (Bi)	mg/kg	<2.0	<2.0	<2.0	2.0	--
Acid Extractable Boron (B)	mg/kg	<50	<50	<50	50	--
Acid Extractable Cadmium (Cd)	mg/kg	<0.30	0.32	0.38	0.30	22
Acid Extractable Chromium (Cr)[2]	mg/kg	23	24	23	2.0	87
Acid Extractable Cobalt (Co)	mg/kg	5.3	4.4	12	1.0	300
Acid Extractable Copper (Cu)	mg/kg	13	11	38	2.0	91
Acid Extractable Iron (Fe)	mg/kg	15000	14000	22000	50	--
Acid Extractable Lead (Pb)	mg/kg	12	7.1	9.3	0.50	260
Acid Extractable Lithium (Li)	mg/kg	5.6	4.5	11	2.0	--
Acid Extractable Manganese (Mn)	mg/kg	150	95	270	2.0	--
Acid Extractable Mercury (Hg)	mg/kg	<0.10	<0.10	<0.10	0.10	24
Acid Extractable Molybdenum (Mo)	mg/kg	<2.0	<2.0	<2.0	2.0	40
Acid Extractable Nickel (Ni)	mg/kg	11	12	18	2.0	89
Acid Extractable Rubidium (Rb)	mg/kg	9.6	13	16	2.0	--
Acid Extractable Selenium (Se)	mg/kg	<1.0	<1.0	<1.0	1.0	2.9
Acid Extractable Silver (Ag)	mg/kg	<0.50	<0.50	<0.50	0.50	40
Acid Extractable Strontium (Sr)	mg/kg	41	29	33	5.0	--
Acid Extractable Thallium (Tl)	mg/kg	<0.10	<0.10	0.13	0.10	1
Acid Extractable Tin (Sn)	mg/kg	<2.0	<2.0	<2.0	2.0	300
Acid Extractable Uranium (U)	mg/kg	1.1	0.51	1.5	0.10	33
Acid Extractable Vanadium (V)	mg/kg	30	29	45	2.0	130
Acid Extractable Zinc (Zn)	mg/kg	50	46	77	5.0	360

[1] Reference: Canadian Council of Ministers for the Environment (CCME), Cananadian Soil Quality Guidelines (CSQG) (Updated 2007) Soil Quality Guidelines for the Protection of Environmental and Human Health (Commercial).

[2] Total Chromium measured only. Chromium Hexavalant was not measured.

Reported concentrations for particular samples that are in boldface font and in grey highlighted cells exceed the CCME CSQGs.

"--" = No guideline available

Table 18: PCBs in Soil Laboratory Analytical Results (ug/g)

Sample ID:		**1987-SOIL-1**	**1987-SOIL-2**	**1987-SOIL-3**	**1987-SOIL-4**	**1987-SOIL-5**	**1987-SOIL-6**	**1987-SOIL-7**	**1987-SOIL-8**	**1987-SOIL-9**	**1987-SOIL-10**	RDL	Federal[1]
Sample Date:		2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14		CCME
Lab ID:		FJP535	FJP536	FJP537	FJP560	FJP561	FJP562	FJP563	FJP564	FJP565	FJP566		CSQG
QA/QC Field Duplicate of:		--	--	--	--	--	--	--	--	--	--		Commercial
	UNITS												
PCBs													
Aroclor 1016	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	--
Aroclor 1221	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	--
Aroclor 1232	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	--
Aroclor 1248	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	--
Aroclor 1242	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	--
Aroclor 1254	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	--
Aroclor 1260	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	--
Calculated Total PCB	ug/g	<0.050	<0.015	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	33

[1] Reference: Canadian Council of Ministers for the Environment (CCME), Cananadian Soil Quality Guidelines (CSQG) (Updated 2007) Soil Quality Guidelines for the Protection of Environmental and Human Health (Commercial).

Reported concentrations for particular samples that are in boldface font and in grey highlighted cells exceed the CCME CSQGs.

"--" = No guideline available

Table 19: PCBs in Soil Laboratory Analytical Results (ug/g)

Sample ID:		**1987-SOIL-11**	**1987-SOIL-12**	**HEL-SOIL-1**	**HEL-SOIL-2**	**HEL-SOIL-3**	**HANGER-SOIL-1**	**HANGER-SOIL-2**	**HANGER-SOIL-3**	**HANGER-SOIL-4**	**SEPTIC-SOIL-1**	RDL	Federal[1]
Sample Date:		2017/10/14	2017/10/14	2017/10/13	2017/10/13	2017/10/13	2017/10/13	2017/10/13	2017/10/18	2017/10/18	2017/10/18		CCME
Lab ID:		FJP567	FJP568	FJP574	FJP575	FJP576	FJP577	FJP578	FJP580	FJP581	FJP582		CSQG
QA/QC Field Duplicate of:		**1987-SOIL-2**	**1987-SOIL-3**	--	--	--	--	--	--	--	--		Commercial
	UNITS												
PCBs													
Aroclor 1016	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<13	<0.050	<0.050	0.050	--
Aroclor 1221	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<13	<0.050	<0.050	0.050	--
Aroclor 1232	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<13	<0.050	<0.050	0.050	--
Aroclor 1248	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<13	<0.050	<0.050	0.050	--
Aroclor 1242	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<13	<0.050	<0.050	0.050	--
Aroclor 1254	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<13	<0.050	<0.050	0.050	--
Aroclor 1260	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	0.088	<0.050	<13	<0.050	<0.050	0.050	--
Calculated Total PCB	ug/g	<0.015	<0.050	<0.050	<0.050	<0.050	0.088	<0.050	<13	<15	<0.050	0.050	33

[1] Reference: Canadian Council of Ministers for the Environment (CCME), Cananadian Soil Quality Guidelines (CSQG) (Updated 2007) Soil Quality Guidelines for the Protection of Environmental and Human Health (Commercial).

Reported concentrations for particular samples that are in boldface font and in grey highlighted cells exceed the CCME CSQGs.

"--" = No guideline available

Table 20: PCBs in Soil Laboratory Analytical Results (ug/g)

Sample ID:		**SEPTIC-SOIL-2**	**SEPTIC-SOIL-3**	**HEL-SOIL-4**	**RADOME-SOIL-1**	**RADOME-SOIL-2**	**RADOME-SOIL-3**	**TOWER-SOIL-1**	**TOWER-SOIL-2**	**TOWER-SOIL-3**	**TOWER-SOIL-4**	RDL	Federal[1]
Sample Date:		2017/10/18	2017/10/18	2017/10/18	2017/10/13	2017/10/13	2017/10/13	2017/10/13	2017/10/13	2017/10/13	2017/10/13		CCME
Lab ID:		FJP583	FJP584	FJP585	FJP706	FJP707	FJP708	FJP709	FJP710	FJP711	FJP712		CSQG
QA/QC Field Duplicate of:		--	--	**HEL-SOIL-1**	--	--	--	--	--	--	--		Commercial
	UNITS												
PCBs													
Aroclor 1016	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	--
Aroclor 1221	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	--
Aroclor 1232	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	--
Aroclor 1248	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	--
Aroclor 1242	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	--
Aroclor 1254	ug/g	<0.050	0.32	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	--
Aroclor 1260	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	--
Calculated Total PCB	ug/g	<0.050	0.32	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	33

[1] Reference: Canadian Council of Ministers for the Environment (CCME), Cananadian Soil Quality Guidelines (CSQG) (Updated 2007) Soil Quality Guidelines for the Protection of Environmental and Human Health (Commercial).

Reported concentrations for particular samples that are in boldface font and in grey highlighted cells exceed the CCME CSQGs.

"--" = No guideline available

Table 21: VOCs in Soil Laboratory Analytical Results ug/kg)

Sample ID:		**1987-SOIL-1**	**1987-SOIL-2**	**1987-SOIL-3**	**1987-SOIL-4**	**1987-SOIL-5**	**1987-SOIL-6**	**1987-SOIL-7**	**1987-SOIL-8**	**1987-SOIL-9**	**1987-SOIL-10**	RDL	Federal[1]
Sample Date:		2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14		CCME
Lab ID:		FJP535	FJP536	FJP537	FJP560	FJP561	FJP562	FJP563	FJP564	FJP565	FJP566		CSQG
QA/QC Field Duplicate of:		--	--	--	--	--	--	--	--	--	--		Commercial
	UNITS												
Volatile Organics													
1,1,1-Trichloroethane	ug/kg	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	25	50000
1,1,2,2-Tetrachloroethane	ug/kg	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	25	50000
1,1,2-Trichloroethane	ug/kg	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	25	50000
1,1-Dichloroethane	ug/kg	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	25	50000
1,1-Dichloroethylene	ug/kg	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	25	50000
1,2-Dichlorobenzene	ug/kg	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	25	10000
1,2-Dichloroethane	ug/kg	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	25	50000
1,2-Dichloropropane	ug/kg	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	25	50000
1,3-Dichlorobenzene	ug/kg	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	25	10000
1,4-Dichlorobenzene	ug/kg	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	25	10000
Benzene	ug/kg	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	25	30
Bromodichloromethane	ug/kg	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	25	--
Bromoform	ug/kg	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	25	--
Bromomethane	ug/kg	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	50	--
Carbon Tetrachloride	ug/kg	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	25	50000
Chlorobenzene	ug/kg	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	25	--
Chloroethane	ug/kg	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	200	--
Chloroform	ug/kg	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	25	50000
cis-1,2-Dichloroethylene	ug/kg	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	25	--
cis-1,3-Dichloropropene	ug/kg	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	25	--
Dibromochloromethane	ug/kg	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	25	--
Ethylbenzene	ug/kg	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	25	82
Ethylene Dibromide	ug/kg	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	25	--
Methyl t-butyl ether (MTBE)	ug/kg	<25	<25	<25	<25	<25	<25	<25	<25	<25	55	25	--
Methylene Chloride(Dichloromethane)	ug/kg	<25	<25	<25	<25	<25	<25	<30 (1)	<30 (1)	<30 (1)	<25	25	50000
o-Xylene	ug/kg	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	25	--
p+m-Xylene	ug/kg	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	25	--
Styrene	ug/kg	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	25	50000
Tetrachloroethylene	ug/kg	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	25	500
Toluene	ug/kg	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	25	370
Total Xylenes	ug/kg	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	50	11,000
trans-1,2-Dichloroethylene	ug/kg	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	25	--
trans-1,3-Dichloropropene	ug/kg	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	25	--
Trichloroethylene	ug/kg	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	10	10
Trichlorofluoromethane (FREON 11)	ug/kg	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	25	--
Vinyl Chloride	ug/kg	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	20	--

Table Notes:

[1]Reference: Canadian Council of Ministers for the Environment (CCME), Cananadian Soil Quality Guidelines (CSQG) (Updated 2007) Soil Quality Guidelines for the Protection of Environmental and Human Health (Commercial).

Reported concentrations for particular samples that are in boldface font and in grey highlighted cells exceed the CCME CSQGs.

"--" = No guideline available

Table 22: VOCs in Soil Laboratory Analytical Results ug/kg)

Sample ID:		**1987-SOIL-11**	**1987-SOIL-12**	**HANGER-SOIL-1**	**HANGER-SOIL-2**	**HANGER-SOIL-3**	**HANGER-SOIL-4**	**SEPTIC-SOIL-1**	**SEPTIC-SOIL-2**	**SEPTIC-SOIL-3**	**SHACK-SOIL-1**	RDL	Federal[1]
Sample Date:		2017/10/14	2017/10/14	2017/10/13	2017/10/13	2017/10/18	2017/10/18	2017/10/18	2017/10/18	2017/10/18	2017/10/18		CCME
Lab ID:		FJP567	FJP568	FJP577	FJP578	FJP580	FJP581	FJP582	FJP583	FJP584	FJP586		CSQG
QA/QC Field Duplicate of:		**1987-SOIL-2**	**1987-SOIL-3**	--	--	--	--	--	--	--	--		Commercial
	UNITS												
Volatile Organics													
1,1,1-Trichloroethane	ug/kg	<25	<25	<25	<25	<25	<25	<50	<25	<25	<25	25	50000
1,1,2,2-Tetrachloroethane	ug/kg	<25	<25	<25	<25	<25	<25	<50	<25	<25	<25	25	50000
1,1,2-Trichloroethane	ug/kg	<25	<25	<25	<25	<25	<25	<50	<25	<25	<25	25	50000
1,1-Dichloroethane	ug/kg	<25	<25	<25	<25	<25	<25	<50	<25	<25	<25	25	50000
1,1-Dichloroethylene	ug/kg	<25	<25	<25	<25	<25	<25	<50	<25	<25	<25	25	50000
1,2-Dichlorobenzene	ug/kg	<25	<25	<25	<25	<25	<25	<50	<25	<25	<25	25	10000
1,2-Dichloroethane	ug/kg	<25	<25	<25	<25	<25	<25	<50	<25	<25	<25	25	50000
1,2-Dichloropropane	ug/kg	<25	<25	<25	<25	<25	<25	<50	<25	<25	<25	25	50000
1,3-Dichlorobenzene	ug/kg	<25	<25	<25	<25	<25	<25	<50	<25	<25	<25	25	10000
1,4-Dichlorobenzene	ug/kg	<25	<25	<25	<25	<25	<25	<50	<25	<25	<25	25	10000
Benzene	ug/kg	<25	<25	<25	<25	<25	<25	<50	<25	<25	<25	25	30
Bromodichloromethane	ug/kg	<25	<25	<25	<25	<25	<25	<50	<25	<25	<25	25	--
Bromoform	ug/kg	<25	<25	<25	<25	<25	<25	<50	<25	<25	<25	25	--
Bromomethane	ug/kg	<50	<50	<50	<50	<50	<50	<100	<50	<50	<50	50	--
Carbon Tetrachloride	ug/kg	<25	<25	<25	<25	<25	<25	<50	<25	<25	<25	25	50000
Chlorobenzene	ug/kg	<25	<25	<25	<25	<25	<25	<50	<25	<25	<25	25	--
Chloroethane	ug/kg	<200	<200	<200	<200	<200	<200	<400	<200	<200	<200	200	--
Chloroform	ug/kg	<25	<25	<25	<25	<25	<25	<50	<25	<25	<25	25	50000
cis-1,2-Dichloroethylene	ug/kg	<25	<25	<25	<25	<25	<25	<50	<25	<25	<25	25	--
cis-1,3-Dichloropropene	ug/kg	<25	<25	<25	<25	<25	<25	<50	<25	<25	<25	25	--
Dibromochloromethane	ug/kg	<25	<25	<25	<25	<25	<25	<50	<25	<25	<25	25	--
Ethylbenzene	ug/kg	<25	<25	<25	<25	<25	<25	<50	<25	<25	<25	25	82
Ethylene Dibromide	ug/kg	<25	<25	<25	<25	<25	<25	<50	<25	<25	<25	25	--
Methyl t-butyl ether (MTBE)	ug/kg	<25	<25	<25	<25	<31 (2)	88	<50	<25	44	<25	25	--
Methylene Chloride(Dichloromethane)	ug/kg	<30 (1)	<30 (1)	<30 (1)	<25	<25	<25	<50	<25	<25	<25	25	50000
o-Xylene	ug/kg	<25	<25	<25	<25	<25	<25	<50	<25	<25	<25	25	--
p+m-Xylene	ug/kg	<25	<25	<25	<25	<25	<25	<50	<25	<25	<25	25	--
Styrene	ug/kg	<25	<25	<25	<25	<25	<25	<50	<25	<25	<25	25	50000
Tetrachloroethylene	ug/kg	<25	<25	<25	<25	<25	<25	<50	<25	<25	<25	25	500
Toluene	ug/kg	<25	<25	<25	310	<25	<25	<50	<25	<25	<25	25	370
Total Xylenes	ug/kg	<50	<50	<50	<50	<50	<50	<100	<50	<50	<50	50	11,000
trans-1,2-Dichloroethylene	ug/kg	<25	<25	<25	<25	<25	<25	<50	<25	<25	<25	25	--
trans-1,3-Dichloropropene	ug/kg	<25	<25	<25	<25	<25	<25	<50	<25	<25	<25	25	--
Trichloroethylene	ug/kg	<10	<10	<10	<10	<10	<10	<20	<10	<10	<10	10	10
Trichlorofluoromethane (FREON 11)	ug/kg	<25	<25	<25	<25	<25	<25	<50	<25	<25	<25	25	--
Vinyl Chloride	ug/kg	<20	<20	<20	<20	<20	<20	<40	<20	<20	<20	20	--

Table Notes:

[1] Reference: Canadian Council of Ministers for the Environment (CCME), Cananadian Soil Quality Guidelines (CSQG) (Updated 2007) Soil Quality Guidelines for the Protection of Environmental and Human Health (Commercial).

Reported concentrations for particular samples that are in boldface font and in grey highlighted cells exceed the CCME CSQGs.

"--" = No guideline available

Table 23: VOCs in Soil Laboratory Analytical Results ug/kg)

Sample ID:		**SHACK-SOIL-2**	**SHACK-SOIL-3**	**BG-SOIL-1**	**BG-SOIL-2**	**BG-SOIL-3**	**BG-SOIL-4**	**BG-SOIL-5**	**BG-SOIL-6**	**BG-SOIL-7**	**BG-SOIL-8**	RDL	Federal[1]
Sample Date:		2017/10/18	2017/10/18	2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14		CCME
Lab ID:		FJP587	FJP588	FJP619	FJP620	FJP621	FJP622	FJP623	FJP624	FJP625	FJP626		CSQG
QA/QC Field Duplicate of:		--	--	--	--	--	--	--	--	--	--		Commercial
	UNITS												
Volatile Organics													
1,1,1-Trichloroethane	ug/kg	<25	<25	<50	<50	<25	<25	<25	<25	<25	<25	25	50000
1,1,2,2-Tetrachloroethane	ug/kg	<25	<25	<50	<50	<25	<25	<25	<25	<25	<25	25	50000
1,1,2-Trichloroethane	ug/kg	<25	<25	<50	<50	<25	<25	<25	<25	<25	<25	25	50000
1,1-Dichloroethane	ug/kg	<25	<25	<50	<50	<25	<25	<25	<25	<25	<25	25	50000
1,1-Dichloroethylene	ug/kg	<25	<25	<50	<50	<25	<25	<25	<25	<25	<25	25	50000
1,2-Dichlorobenzene	ug/kg	<25	<25	<50	<50	<25	<25	<25	<25	<25	<25	25	10000
1,2-Dichloroethane	ug/kg	<25	<25	<50	<50	<25	<25	<25	<25	<25	<25	25	50000
1,2-Dichloropropane	ug/kg	<25	<25	<50	<50	<25	<25	<25	<25	<25	<25	25	50000
1,3-Dichlorobenzene	ug/kg	<25	<25	<50	<50	<25	<25	<25	<25	<25	<25	25	10000
1,4-Dichlorobenzene	ug/kg	<25	<25	<50	<50	<25	<25	<25	<25	<25	<25	25	10000
Benzene	ug/kg	<25	<25	<50	<50	<25	<25	<25	<25	<25	<25	25	30
Bromodichloromethane	ug/kg	<25	<25	<50	<50	<25	<25	<25	<25	<25	<25	25	--
Bromoform	ug/kg	<25	<25	<50	<50	<25	<25	<25	<25	<25	<25	25	--
Bromomethane	ug/kg	<50	<50	<100	<100	<50	<50	<50	<50	<50	<50	50	--
Carbon Tetrachloride	ug/kg	<25	<25	<50	<50	<25	<25	<25	<25	<25	<25	25	50000
Chlorobenzene	ug/kg	<25	<25	<50	<50	<25	<25	<25	<25	<25	<25	25	--
Chloroethane	ug/kg	<200	<200	<400	<400	<200	<200	<200	<200	<200	<200	200	--
Chloroform	ug/kg	<25	<25	<50	<50	<25	<25	<25	<25	<25	<25	25	50000
cis-1,2-Dichloroethylene	ug/kg	<25	<25	<50	<50	<25	<25	<25	<25	<25	<25	25	--
cis-1,3-Dichloropropene	ug/kg	<25	<25	<50	<50	<25	<25	<25	<25	<25	<25	25	--
Dibromochloromethane	ug/kg	<25	<25	<50	<50	<25	<25	<25	<25	<25	<25	25	--
Ethylbenzene	ug/kg	<25	<25	<50	<50	<25	<25	<25	<25	<25	<25	25	82
Ethylene Dibromide	ug/kg	<25	<25	<50	<50	<25	<25	<25	<25	<25	<25	25	--
Methyl t-butyl ether (MTBE)	ug/kg	<25	<25	<50	<50	<25	<25	<25	<25	<25	<25	25	--
Methylene Chloride(Dichloromethane)	ug/kg	<30 (1)	<30 (1)	<50	<50	<30 (1)	<30 (1)	<30 (1)	<30 (1)	<30 (1)	<30 (1)	25	50000
o-Xylene	ug/kg	<25	<25	<50	<50	<25	<25	<25	<25	<25	<25	25	--
p+m-Xylene	ug/kg	<25	<25	<50	<50	<25	<25	<25	<25	<25	<25	25	--
Styrene	ug/kg	<25	<25	<50	<50	<25	<25	<25	<25	<25	<25	25	50000
Tetrachloroethylene	ug/kg	<25	<25	<50	<50	<25	<25	<25	<25	<25	<25	25	500
Toluene	ug/kg	<25	<25	<50	<50	<25	<25	<25	<25	<25	<25	25	370
Total Xylenes	ug/kg	<50	<50	<100	<100	<50	<50	<50	<50	<50	<50	50	11,000
trans-1,2-Dichloroethylene	ug/kg	<25	<25	<50	<50	<25	<25	<25	<25	<25	<25	25	--
trans-1,3-Dichloropropene	ug/kg	<25	<25	<50	<50	<25	<25	<25	<25	<25	<25	25	--
Trichloroethylene	ug/kg	<10	<10	<20	<20	<10	<10	<10	<10	<10	<10	10	10
Trichlorofluoromethane (FREON 11)	ug/kg	<25	<25	<50	<50	<25	<25	<25	<25	<25	<25	25	--
Vinyl Chloride	ug/kg	<20	<20	<40	<40	<20	<20	<20	<20	<20	<20	20	--

Table Notes:

[1] Reference: Canadian Council of Ministers for the Environment (CCME), Cananadian Soil Quality Guidelines (CSQG) (Updated 2007) Soil Quality Guidelines for the Protection of Environmental and Human Health (Commercial).

Reported concentrations for particular samples that are in boldface font and in grey highlighted cells exceed the CCME CSQGs.

"--" = No guideline available

Table 24: VOCs in Soil Laboratory Analytical Results ug/kg)

Sample ID:		**LPUMP-SOIL-2**	**LPUMP-SOIL-3**	**LPUMP-SOIL-1**	**LPUMP-SOIL-4**	**UPUMP-SOIL-1**	**UPUMP-SOIL-2**	**UPUMP-SOIL-3**	**UPUMP-SOIL-4**	**UPUMP-SOIL-5**	**RADOME-SOIL-1**	RDL	Federal[1]
Sample Date:		2017/10/17	2017/10/17	2017/10/17	2017/10/17	2017/10/17	2017/10/17	2017/10/17	2017/10/17	2017/10/17	2017/10/13		CCME
Lab ID:		FJP681	FJP682	FJP683	FJP685	FJP686	FJP687	FJP688	FJP689	FJP691	FJP706		CSQG
QA/QC Field Duplicate of:		--	--	--	**LPUMP-SOIL-1**	--	--	--	**UPUMP-SOIL-1**	**UPUMP-SOIL-3**	--		Commercial
	UNITS												
Volatile Organics													
1,1,1-Trichloroethane	ug/kg	<25	<25	<50	<50	<50	<25	<50	<50	<50	<25	25	50000
1,1,2,2-Tetrachloroethane	ug/kg	<25	<25	<50	<50	<50	<25	<50	<50	<50	<25	25	50000
1,1,2-Trichloroethane	ug/kg	<25	<25	<50	<50	<50	<25	<50	<50	<50	<25	25	50000
1,1-Dichloroethane	ug/kg	<25	<25	<50	<50	<50	<25	<50	<50	<50	<25	25	50000
1,1-Dichloroethylene	ug/kg	<25	<25	<50	<50	<50	<25	<50	<50	<50	<25	25	50000
1,2-Dichlorobenzene	ug/kg	<25	<25	<50	<50	<50	<25	<50	<50	<50	<25	25	10000
1,2-Dichloroethane	ug/kg	<25	<25	<50	<50	<50	<25	<50	<50	<50	<25	25	50000
1,2-Dichloropropane	ug/kg	<25	<25	<50	<50	<50	<25	<50	<50	<50	<25	25	50000
1,3-Dichlorobenzene	ug/kg	<25	<25	<50	<50	<50	<25	<50	<50	<50	<25	25	10000
1,4-Dichlorobenzene	ug/kg	<25	<25	<50	<50	<50	<25	<50	<50	<50	<25	25	10000
Benzene	ug/kg	<25	<25	<50	<50	<50	<25	<50	<50	<50	<25	25	30
Bromodichloromethane	ug/kg	<25	<25	<50	<50	<50	<25	<50	<50	<50	<25	25	--
Bromoform	ug/kg	<25	<25	<50	<50	<50	<25	<50	<50	<50	<25	25	--
Bromomethane	ug/kg	<50	<50	<100	<100	<100	<50	<100	<100	<100	<50	50	--
Carbon Tetrachloride	ug/kg	<25	<25	<50	<50	<50	<25	<50	<50	<50	<25	25	50000
Chlorobenzene	ug/kg	<25	<25	<50	<50	<50	<25	<50	<50	<50	<25	25	--
Chloroethane	ug/kg	<200	<200	<400	<400	<400	<200	<400	<400	<400	<200	200	--
Chloroform	ug/kg	<25	<25	<50	<50	<50	<25	<50	<50	<50	<25	25	50000
cis-1,2-Dichloroethylene	ug/kg	<25	<25	<50	<50	<50	<25	<50	<50	<50	<25	25	--
cis-1,3-Dichloropropene	ug/kg	<25	<25	<50	<50	<50	<25	<50	<50	<50	<25	25	--
Dibromochloromethane	ug/kg	<25	<25	<50	<50	<50	<25	<50	<50	<50	<25	25	--
Ethylbenzene	ug/kg	<25	<25	<50	<50	<50	<25	<50	<50	<50	<25	25	82
Ethylene Dibromide	ug/kg	<25	<25	<50	<50	<50	<25	<50	<50	<50	<25	25	--
Methyl t-butyl ether (MTBE)	ug/kg	<25	<25	<50	<50	<50	<25	<50	<50	<50	<25	25	--
Methylene Chloride(Dichloromethane)	ug/kg	<25	<25	<50	<50	<50	<25	<50	<50	<50	<25	25	50000
o-Xylene	ug/kg	<25	<25	<50	<50	<50	<25	<50	<50	<50	<25	25	--
p+m-Xylene	ug/kg	<25	<25	<50	<50	<50	<25	<50	<50	<50	<25	25	--
Styrene	ug/kg	<25	<25	<50	<50	<50	<25	<50	<50	<50	<25	25	50000
Tetrachloroethylene	ug/kg	<25	<25	<50	<50	<50	<25	<50	<50	<50	<25	25	500
Toluene	ug/kg	<25	<25	<50	<50	<50	<25	<50	<50	<50	<25	25	370
Total Xylenes	ug/kg	<50	<50	<100	<100	<100	<50	<100	<100	<100	<50	50	11,000
trans-1,2-Dichloroethylene	ug/kg	<25	<25	<50	<50	<50	<25	<50	<50	<50	<25	25	--
trans-1,3-Dichloropropene	ug/kg	<25	<25	<50	<50	<50	<25	<50	<50	<50	<25	25	--
Trichloroethylene	ug/kg	<10	<10	<20	<20	<20	<10	<20	<20	<20	<10	10	10
Trichlorofluoromethane (FREON 11)	ug/kg	<25	<25	<50	<50	<50	<25	<50	<50	<50	<25	25	--
Vinyl Chloride	ug/kg	<20	<20	<40	<40	<40	<20	<40	<40	<40	<20	20	--

Table Notes:

[1] Reference: Canadian Council of Ministers for the Environment (CCME), Cananadian Soil Quality Guidelines (CSQG) (Updated 2007) Soil Quality Guidelines for the Protection of Environmental and Human Health (Commercial).

Reported concentrations for particular samples that are in boldface font and in grey highlighted cells exceed the CCME CSQGs.

"--" = No guideline available

Table 25: VOCs in Soil Laboratory Analytical Results ug/kg)

Sample ID:		**RADOME-SOIL-2**	**RADOME-SOIL-3**	**TOWER-SOIL-1**	**TOWER-SOIL-2**	**TOWER-SOIL-3**	**TOWER-SOIL-4**	RDL	Federal[1]
Sample Date:		2017/10/13	2017/10/13	2017/10/13	2017/10/13	2017/10/13	2017/10/13		CCME
Lab ID:		FJP707	FJP708	FJP709	FJP710	FJP711	FJP712		CSQG
QA/QC Field Duplicate of:		--	--	--	--	--	--		Commercial
	UNITS								
Volatile Organics									
1,1,1-Trichloroethane	ug/kg	<25	<25	<25	<25	<25	<25	25	50000
1,1,2,2-Tetrachloroethane	ug/kg	<25	<25	<25	<25	<25	<25	25	50000
1,1,2-Trichloroethane	ug/kg	<25	<25	<25	<25	<25	<25	25	50000
1,1-Dichloroethane	ug/kg	<25	<25	<25	<25	<25	<25	25	50000
1,1-Dichloroethylene	ug/kg	<25	<25	<25	<25	<25	<25	25	50000
1,2-Dichlorobenzene	ug/kg	<25	<25	<25	<25	<25	<25	25	10000
1,2-Dichloroethane	ug/kg	<25	<25	<25	<25	<25	<25	25	50000
1,2-Dichloropropane	ug/kg	<25	<25	<25	<25	<25	<25	25	50000
1,3-Dichlorobenzene	ug/kg	<25	<25	<25	<25	<25	<25	25	10000
1,4-Dichlorobenzene	ug/kg	<25	<25	<25	<25	<25	<25	25	10000
Benzene	ug/kg	<25	<25	<25	<25	<25	<25	25	30
Bromodichloromethane	ug/kg	<25	<25	<25	<25	<25	<25	25	--
Bromoform	ug/kg	<25	<25	<25	<25	<25	<25	25	--
Bromomethane	ug/kg	<50	<50	<50	<50	<50	<50	50	--
Carbon Tetrachloride	ug/kg	<25	<25	<25	<25	<25	<25	25	50000
Chlorobenzene	ug/kg	<25	<25	<25	<25	<25	<25	25	--
Chloroethane	ug/kg	<200	<200	<200	<200	<200	<200	200	--
Chloroform	ug/kg	<25	<25	<25	<25	<25	<25	25	50000
cis-1,2-Dichloroethylene	ug/kg	<25	<25	<25	<25	<25	<25	25	--
cis-1,3-Dichloropropene	ug/kg	<25	<25	<25	<25	<25	<25	25	--
Dibromochloromethane	ug/kg	<25	<25	<25	<25	<25	<25	25	--
Ethylbenzene	ug/kg	<25	<25	<25	<25	<25	<25	25	82
Ethylene Dibromide	ug/kg	<25	<25	<25	<25	<25	<25	25	--
Methyl t-butyl ether (MTBE)	ug/kg	<25	<25	<25	<25	<25	<25	25	--
Methylene Chloride(Dichloromethane)	ug/kg	<25	<25	<25	<25	<25	<25	25	50000
o-Xylene	ug/kg	<25	<25	<25	<25	<25	<25	25	--
p+m-Xylene	ug/kg	<25	<25	<25	<25	<25	<25	25	--
Styrene	ug/kg	<25	<25	<25	<25	<25	<25	25	50000
Tetrachloroethylene	ug/kg	<25	<25	<25	<25	<25	<25	25	500
Toluene	ug/kg	<25	<25	<25	<25	<25	<25	25	370
Total Xylenes	ug/kg	<50	<50	<50	<50	<50	<50	50	11,000
trans-1,2-Dichloroethylene	ug/kg	<25	<25	<25	<25	<25	<25	25	--
trans-1,3-Dichloropropene	ug/kg	<25	<25	<25	<25	<25	<25	25	--
Trichloroethylene	ug/kg	<10	<10	<10	<10	<10	<10	10	10
Trichlorofluoromethane (FREON 11)	ug/kg	<25	<25	<25	<25	<25	<25	25	--
Vinyl Chloride	ug/kg	<20	<20	<20	<20	<20	<20	20	--

Table Notes:

[1] Reference: Canadian Council of Ministers for the Environment (CCME), Cananadian Soil Quality Guidelines (CSQG) (Updated 2007) Soil Quality Guidelines for the Protection of Environmental and Human Health (Commercial).

Reported concentrations for particular samples that are in boldface font and in grey highlighted cells exceed the CCME CSQGs.

"--" = No guideline available

Table 26: Pesticides in Soil Laboratory Analytical Results (ug/g)

Sample ID:		**1987-SOIL-2**	**1987-SOIL-11**	**HANGER-SOIL-4**	**SHACK-SOIL-1**	Federal[1]	Ontario[2]	Alberta[3]
Sample Date:		2017/10/14	2017/10/14	2017/10/18	2017/10/18	CCME	MOE	
Lab ID:		FJP536	FJP567	FJP581	FJP586	CSQG		
QA/QC Field Duplicate of:		--	**1987-SOIL-2**	--	--	Commercial	Commercial	Commercial
	UNITS							
Pesticides & Herbicides								
Bendiocarb	ug/g	<5.0	<5.0	<5.0	<5.0	--	--	0.21*
Demeton-S	ug/g	<5.0	<5.0	<5.0	<5.0	--	--	--
Dichlorvos	ug/g	<5.0	<5.0	<5.0	<5.0	--	--	--
Dimethoate	ug/g	<5.0	<5.0	<5.0	<5.0	--	--	0.0055*
Fenchlorphos (Ronnel)	ug/g	<5.0	<5.0	<5.0	<5.0	--	--	--
Fonofos	ug/g	<5.0	<5.0	<5.0	<5.0	--	--	--
Metolachlor	ug/g	<10	<10	<10	<10	--	--	0.055*
Mevinphos	ug/g	<5.0	<5.0	<5.0	<5.0	--	--	--
Phosmet	ug/g	<5.0	<5.0	<5.0	<5.0	--	--	--
Triallate	ug/g	<5.0	<5.0	<5.0	<5.0	--	--	0.0092*
Trifluralin	ug/g	<5.0	<5.0	<5.0	<5.0	--	--	0.045*
Fenthion	ug/g	<5.0	<5.0	<5.0	<5.0	--	--	--
Ethion	ug/g	<5.0	<5.0	<5.0	<5.0	--	--	--
Guthion (Azinphos-methyl)	ug/g	<5.0	<5.0	<5.0	<5.0	--	--	0.75*
Phorate	ug/g	<5.0	<5.0	<5.0	<5.0	--	--	0.14*
Terbufos	ug/g	<5.0	<5.0	<5.0	<5.0	--	--	0.15*
Aldicarb	ug/g	<5.0	<5.0	<5.0	<5.0	--	--	0.065*
Atrazine	ug/g	<5.0	<5.0	<5.0	<5.0	--	--	0.01*
Carbaryl	ug/g	<5.0	<5.0	<5.0	<5.0	--	--	3.6*
Carbofuran	ug/g	<5.0	<5.0	<5.0	<5.0	--	--	1.2*
Cyanazine (Bladex)	ug/g	<5.0	<5.0	<5.0	<5.0	--	--	0.21*
Diazinon	ug/g	<5.0	<5.0	<5.0	<5.0	--	--	4.2*
Parathion Ethyl	ug/g	<5.0	<5.0	<5.0	<5.0	--	--	14
Parathion Methyl	ug/g	<5.0	<5.0	<5.0	<5.0	--	--	--
Prometryne	ug/g	<5.0	<5.0	<5.0	<5.0	--	--	--
Malathion	ug/g	<5.0	<5.0	<5.0	<5.0	--	--	1.3*
Simazine	ug/g	<5.0	<5.0	<5.0	<5.0	--	--	0.038*
Chlorpyrifos (Dursban)	ug/g	<5.0	<5.0	<5.0	<5.0	--	--	95
Calculated Parameters						--	--	--
Aldrin + Dieldrin	ug/g	<0.0020	<0.0020	<0.0020	<0.0020	--	--	--
Chlordane (Total)	ug/g	<0.0020	<0.0020	**26**	<0.0020	--	0.05	--
DDT+ Metabolites	ug/g	0.0058	<0.0020	**570**	0.027	12	1.4	12
Heptachlor + Heptachlor epoxide	ug/g	<0.0020	<0.0020	6.9	<0.0020	--	--	--
o,p-DDD + p,p-DDD	ug/g	<0.0020	<0.0020	76	0.0027	--	--	--
o,p-DDE + p,p-DDE	ug/g	<0.0020	<0.0020	<5.5	0.0028	--	--	--
o,p-DDT + p,p-DDT	ug/g	0.0058	<0.0020	490	0.021	--	--	--
Total Endosulfan	ug/g	<0.0020	<0.0020	<0.0020	<0.0020	--	0.3	0.0015*
Total PCB	ug/g	<0.015	<0.015	<15**	<0.015	33	1.1	33
Pesticides & Herbicides								
Aldrin	ug/g	<0.0020	<0.0020	<0.0020	<0.0020	--	0.088	5.1
a-Chlordane	ug/g	<0.0020	<0.0020	13	<0.0020	--	--	--
g-Chlordane	ug/g	<0.0020	<0.0020	14	<0.0020	--	--	--
o,p-DDD	ug/g	<0.0020	<0.0020	10	<0.0020	--	--	--
p,p-DDD	ug/g	<0.0020	<0.0020	66	0.0027	--	--	--
o,p-DDE	ug/g	<0.0020	<0.0020	<5.5	<0.0020	--	--	--
p,p-DDE	ug/g	<0.0020	<0.0020	2.8	0.0028	--	--	--
o,p-DDT	ug/g	<0.0020	<0.0020	84	0.0041	--	--	--
p,p-DDT	ug/g	0.0058	<0.0020	400	0.017	--	--	--
Dieldrin	ug/g	<0.0020	<0.0020	<0.0020	<0.0020	--	0.088	1.1
Lindane	ug/g	<0.0020	<0.0020	<0.0020	<0.0020	--	--	0.6
Endosulfan I (alpha)	ug/g	<0.0020	<0.0020	<0.0020	<0.0020	--	--	--
Endosulfan II (beta)	ug/g	<0.0020	<0.0020	<0.0020	<0.0020	--	--	--
Endrin	ug/g	<0.0020	<0.0020	<0.0020	<0.0020	--	0.04	4.7
Heptachlor	ug/g	<0.0020	<0.0020	**6.9**	<0.0020	--	0.19	--
Heptachlor epoxide	ug/g	<0.0020	<0.0020	<0.0020	<0.0020	--	0.05	0.076
Hexachlorobenzene	ug/g	<0.0020	<0.0020	<0.0021	<0.0020	--	0.66	--
Methoxychlor	ug/g	<0.0050	<0.0050	<0.50	<0.0050	--	1.6	0.056
Aroclor 1016	ug/g	<0.015	<0.015	<15	<0.015	--	--	--
Aroclor 1221	ug/g	<0.015	<0.015	<15	<0.015	--	--	--
Aroclor 1232	ug/g	<0.015	<0.015	<15	<0.015	--	--	--
Aroclor 1242	ug/g	<0.015	<0.015	<15	<0.015	--	--	--
Aroclor 1248	ug/g	<0.015	<0.015	<15	<0.015	--	--	--
Aroclor 1254	ug/g	<0.015	<0.015	<15	<0.015	--	--	--
Aroclor 1260	ug/g	<0.015	<0.015	<15	<0.015	--	--	--
Aroclor 1262	ug/g	<0.015	<0.015	<15	<0.015	--	--	--
Aroclor 1268	ug/g	<0.015	<0.015	<15	<0.015	--	--	--
alpha-BHC	ug/g	<0.0020	<0.0020	<0.0020	<0.0020	--	--	--
beta-BHC	ug/g	<0.0020	<0.0020	<0.0020	<0.0020	--	--	--
delta-BHC	ug/g	<0.0020	<0.0020	<0.0020	<0.0020	--	--	--
Endosulfan sulfate	ug/g	<0.0020	<0.0020	<0.0020	<0.0020	--	--	--
Endrin aldehyde	ug/g	<0.0020	<0.0020	<0.0020	<0.0020	--	--	--
Endrin ketone	ug/g	<0.0020	<0.0020	<0.0020	<0.0020	--	--	--
Mirex	ug/g	<0.0020	<0.0020	<0.0020	<0.0020	--	--	--
Octachlorostyrene	ug/g	<0.0020	<0.0020	<0.0020	<0.0020	--	--	--
Toxaphene	ug/g	<0.080	<0.080	<71	<0.080	--	--	6.3

[1] Reference: Canadian Council of Ministers for the Environment (CCME), Cananadian Soil Quality Guidelines (CSQG) Soil Quality Guidelines for the Protection of Environmental and Human Health for commercial land use (1999 and Updates).

[2] Soil and Groundwater Standards for the Use at Contaminated Sites in Ontario: Table 3 - Full Depth, Non-Potable Water Scenario, Commercial/Industrial Land Use (2011).

[3] Alberta Tier I Soil and Groundwater Remediation Guidelines: Tables A-4 Surface Soil Remediation Guidelines for Commercial Land Use - All Exposure Pathways, coarse-grained soil, non-potable water (2016).

Reported concentrations for particular samples that are in boldface font and in grey highlighted cells exceed the applicable guidelines.

"--" = No guideline available

*Guideline below the laboratory detection limit

**The RDL for PCBs was not reached for the Alberta Tier 1 Guideline.

Table 27: Dioxins and Furans in Soil Laboratory Analytical Results (pg/g)

SAMPLE ID	Units	1987-SOIL-1	TEQ(DL)	TEF (2005 WHO)[2]	1987-SOIL-3	TEQ(DL)	TEF (2005 WHO)[2]	1987-SOIL-12	TEQ(DL)	TEF (2005 WHO)[2]	BG-SOIL-1	TEQ(DL)	TEF (2005 WHO)[2]	BG-SOIL-3	TEQ(DL)	TEF (2005 WHO)[2]	2002 CCME CSQG Guideline[3]
SAMPLING DATE		2017/10/14			2017/10/14			2017/10/14			2017/10/17			2017/10/17			
LAB ID		FJP535			FJP537			FJP568			FJP619			FJP619			
DUPLICATE SAMPLE OF:								1987-SOIL-3									
Dioxins & Furans																	
2,3,7,8-Tetra CDD *	pg/g	<0.101	0.101	1.00	<0.104	0.104	1	<0.113	0.113	1.00	<0.113	0.113	1.00	<0.0873	0.0873	1.00	--
1,2,3,7,8-Penta CDD *	pg/g	<0.0881	0.0881	1.00	<0.100	0.100	1.00	<0.315 (1)	0.315	1.00	1.21	1.21	1.00	<0.103	0.103	1.00	--
1,2,3,4,7,8-Hexa CDD *	pg/g	<0.101	0.0101	0.100	<0.0956	0.00956	0.100	1.38	0.138	0.100	1.39	0.139	0.100	<0.110	0.0110	0.100	--
1,2,3,6,7,8-Hexa CDD *	pg/g	<0.101	0.0101	0.100	<0.0961	0.00961	0.100	0.281	0.0281	0.100	2.14	0.214	0.100	<0.111	0.0111	0.100	--
1,2,3,7,8,9-Hexa CDD *	pg/g	<0.0905	0.00905	0.100	<0.0860	0.00860	0.100	0.565	0.0565	0.100	3.85	0.385	0.100	3.000	0.00993	0.100	--
1,2,3,4,6,7,8-Hepta CDD *	pg/g	1.33	0.0133	0.0100	0.308	0.00308	0.0100	3.28	0.0328	0.0100	34.2	0.342	0.0100	0.418	0.00418	0.0100	--
Octa CDD *	pg/g	24.5	0.00735	0.000300	3.80	0.00114	0.000300	101	0.0303	0.000300	733	0.220	0.000300	3.58	0.00107	0.000300	--
Total Tetra CDD *	pg/g	<0.101			<0.104			<0.141 (1)			67.4			<0.0873			--
Total Penta CDD *	pg/g	<0.0881			<0.100			3.09			111			<0.103			--
Total Hexa CDD *	pg/g	<0.0972			<0.0923			19.9			119			0.175			--
Total Hepta CDD *	pg/g	2.46			0.679			13			190			0.921			--
2,3,7,8-Tetra CDF **	pg/g	0.138	0.0138	0.100	<0.0985	0.00985	0.100	<0.105	0.0105	0.100	0.195	0.0195	0.100	<0.107	0.0107	0.100	--
1,2,3,7,8-Penta CDF **	pg/g	<0.0985	0.00296	0.0300	<0.0828	0.00248	0.0300	<0.0973	0.00292	0.0300	<0.111	0.00333	0.0300	<0.0986	0.00296	0.0300	--
2,3,4,7,8-Penta CDF **	pg/g	<0.0979	0.0294	0.300	<0.0823	0.0247	0.300	<0.0967	0.0290	0.300	<0.113	0.0339	0.300	<0.0980	0.0294	0.300	--
1,2,3,4,7,8-Hexa CDF **	pg/g	<0.0927	0.00927	0.100	<0.0850	0.00850	0.100	<0.103	0.0103	0.100	0.260 (2)	0.0260	0.100	<0.0964	0.00964	0.100	--
1,2,3,6,7,8-Hexa CDF **	pg/g	<0.0902	0.00902	0.100	<0.0827	0.00827	0.100	<0.100	0.0100	0.100	<0.107	0.0107	0.100	<0.0938	0.00938	0.100	--
2,3,4,6,7,8-Hexa CDF **	pg/g	<0.101	0.0101	0.100	<0.0928	0.00928	0.100	<0.112	0.0112	0.100	<0.115	0.0115	0.100	<0.105	0.0105	0.100	--
1,2,3,7,8,9-Hexa CDF **	pg/g	<0.111	0.0111	0.100	<0.102	0.0102	0.100	<0.123	0.0123	0.100	<0.125	0.0125	0.100	<0.115	0.0115	0.100	--
1,2,3,4,6,7,8-Hepta CDF **	pg/g	0.681	0.00681	0.0100	0.156	0.00156	0.0100	<0.0888	0.000888	0.0100	0.386	0.00386	0.010	<0.158 (4)	0.00158	0.010	--
1,2,3,4,7,8,9-Hepta CDF **	pg/g	<0.106	0.00106	0.0100	<0.118	0.00118	0.0100	<0.118	0.00118	0.0100	<0.126	0.00126	0.0100	<0.121	0.00121	0.0100	--
Octa CDF **	pg/g	0.405	0.000122	0.000300	<0.102	0.0000306	0.000300	<0.117	0.0000351	0.000300	<0.458 (3)	0.000137	0.000300	0.167	0.0000501	0.000300	--
Total Tetra CDF **	pg/g	0.443			0.131			1.05			53.1			<0.107			--
Total Penta CDF **	pg/g	<0.0982			<0.0826			2.28			12.3			<0.0983			--
Total Hexa CDF **	pg/g	<0.0981			<0.0900			1.15			2.16			<0.102			--
Total Hepta CDF **	pg/g	0.985			0.156			<0.101			0.528			0.129			--
TOTAL TOXIC EQUIVALENCY[1]	pg/g		0.333			0.312			0.802			2.75			0.315		4

Table Notes:

* CDD = Chloro Dibenzo-p-Dioxin, ** CDF = Chloro Dibenzo-p-Furan

TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient, The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

[1] The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.

[2] WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

3 Canadian Soil Quality Commercial Guidelines for the Protection of Environmental and Human Health for dioxins and furans (2002). The guideline is expressed as 4 ng TEQ.kg-1.

(1) RT>2 seconds - PCDD/DF analysis-Peak maxima of monitored ions exceeds 2 seconds

(2) EMPC / Merged Peak

(3) EMPC / DPE - Diphenylether interference present caused dibenzofuran detected to become a "non-detect" with an elevated detection limit.

EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

(4) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

Shaded and bolded concentrations exceed applicable guidelines.

Table 28: Petroleum Hydrocarbons in Sediment Laboratory Analytical Results (mg/kg)

Sample ID:		**BG-SED-1**	**BG-SED-2**	**BG-SED-3**	**SED-1**	**SED-2**	RDL	**SED-3**	**WSUPPLY-SED-1**	**WSUPPLY-SED-2**	**WSUPPLY-SED-3**	RDL	Provincial[1]
Sample Date:		2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14		2017/10/14	2017/10/14	2017/10/14	2017/10/14		RBCA
Lab ID:		FJM011	FJM012	FJM013	FJM014	FJM015		FJM016	FJM017	FJM018	FJM019		Sediment
QA/QC Field Duplicate of:		--	--	--	--	--		--	--	--	--		
	Units												
BTEX & F1 Hydrocarbons													
Benzene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	<0.020	<0.020	<0.020	<0.020	0.020	1.2
Toluene	mg/kg	<0.020	<0.020	<0.020	<0.020	0.10	0.020	<0.020	<0.020	<0.020	<0.020	0.020	1.4
Ethylbenzene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	<0.020	<0.020	<0.020	<0.020	0.020	1.2
p+m-Xylene	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	<0.040	<0.040	<0.040	<0.040	0.040	--
o-Xylene	mg/kg	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	<0.020	<0.020	<0.020	<0.020	0.020	--
Total Xylenes	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	<0.040	<0.040	<0.040	<0.040	0.040	1.3
F1 (C6-C10)	mg/kg	<10	<10	<10	<10	<10	10	<10	<10	<10	<10	10	--
F1 (C6-C10) - BTEX (Calc.)	mg/kg	<10	<10	<10	<10	<10	10	<10	<10	<10	<10	10	--
F2-F4 Hydrocarbons													
F2 (C10-C16 Hydrocarbons)	mg/kg	<20	<20	<20	<20	650	20	<15	<15	<15	<15	15	-
F3 (C16-C34 Hydrocarbons)	mg/kg	620	520	<50	180	2200	50	<50	<50	<50	<50	50	-
F4 (C34-C50 Hydrocarbons)	mg/kg	270	<50	<50	77	590	50	<50	<50	<50	<50	50	-
Reached Baseline at C50	mg/kg	No	Yes	Yes	No	Yes	--	Yes	Yes	Yes	Yes	--	
Modified TPH[2]		**650**[3]	**550**[3]	80	210	**2860**[4]		75	75	75	75		500

Table Notes:

[1] Reference: Provincial Atlantic Risk Based Corrective Action for Petroleum Impacted Sites In Atlantic Canada (Version 3, updated January 2015) - Tier 1 Sediment Ecological Screening Levels for the Protection of Freshwater and Marine Aquatic Life (mg/kg dry weight) - Typical Sediment

[2] Modified TPH calculated by adding F1 (C6-C10) - BTEX (Calc.) + F2 (C10-C16) + F3 (C16-C34). If no concentrations are detected above the laboratory Reported Detection Limits for a particular fraction, the RDL is used.

[3] No resemblance to petroleum products in fuel oil / lube oil range.

[4] Weather fuel oil fraction. No resemblance to petroleum products in lube oil range.

-- = no guideline available

Reported concentrations for particular samples that are bolded and grey shaded exceed the applicable criteria

Table 29: PAHs in Sediment Analytical Results (mg/kg)

Sample ID:		**BG-SED-1**	**BG-SED-2**	**BG-SED-3**	**SED-1**	**SED-2**	**SED-3**	**WSUPPLY-SED-1**	**WSUPPLY-SED-2**	**WSUPPLY-SED-3**	RDL	Federal[1]	Federal[2]
Sample Date:		2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14		CCME ISQG	CCME PEL
Lab ID:		FJP642	FJP643	FJP644	FJP645	FJP646	FJP647	FJP648	FJP649	FJP650		Freshwater	Freshwater
QA/QC Field Duplicate of:		--	--	--	--	--	--	--	--	--		Aquatic life	Aquatic life
Polyaromatic Hydrocarbons	**Units**												
1-Methylnaphthalene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	--	--
2-Methylnaphthalene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	0.0202	0.201
Acenaphthene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	0.00671	0.0889
Acenaphthylene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	0.00587	0.128
Anthracene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	0.0469	0.245
Benzo(a)anthracene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	0.0317	0.385
Benzo(a)pyrene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	0.0319	0.782
Benzo(b)fluoranthene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	--	--
Benzo(b/j)fluoranthene	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	--	--
Benzo(g,h,i)perylene	mg/kg	<0.0050	<0.098	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	--	--
Benzo(j)fluoranthene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	--	--
Benzo(k)fluoranthene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	--	--
Chrysene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.044	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	0.0571	0.862
Dibenz(a,h)anthracene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	0.00622	0.135
Fluoranthene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	0.111	2.355
Fluorene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	0.0212	0.144
Indeno(1,2,3-cd)pyrene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	--	--
Naphthalene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	0.0346	0.391
Perylene	mg/kg	<0.0050	0.093	<0.0050	<0.0050	<0.0050	<0.0050	0.024	0.066	<0.0050	0.0050	--	--
Phenanthrene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.026	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	0.0419	0.515
Pyrene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	0.039	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	0.053	0.875

Table Notes:

[1] Reference: Canadian Council of Ministers for the Environment (CCME), Interim Freshwater Sediment Quality Guidelines (ISQG) for sediment (2002).

[2] Reference: Canadian Council of Ministers for the Environment (CCME), Probable Effects Limit (PEL) for sediment (2002).

Values highlighted in grey exceed ISQG criteria.

Values bolded and highlighted in grey exceed both ISQG and PEL.

"--" = No guideline available

Table 30: Metals in Soil Laboratory Analytical Results (mg/kg)

Sample ID:		**BG-SED-1**	**BG-SED-2**	**BG-SED-3**	**SED-1**	**SED-2**	**SED-3**	**WSUPPLY-SED-1**	**WSUPPLY-SED-2**	**WSUPPLY-SED-3**	RDL	Federal[1]	Federal[2]
Sample Date:		2017/10/17	2017/10/17	2017/10/17	2017/10/17	2017/10/17	2017/10/17	2017/10/17	2017/10/17	2017/10/17		CCME ISQG	CCME PEL
Lab ID:		FJP642	FJP643	FJP644	FJP645	FJP646	FJP647	FJP648	FJP649	FJP650		Freshwater	Freshwater
QA/QC Field Duplicate of:		--	--	--	--	--	--	--	--	--		Aquatic life	Aquatic life
	Units												
Acid Extractable Aluminum (Al)	mg/kg	6600	2800	1400	3000	10000	12000	8700	8400	8000	10	--	--
Acid Extractable Antimony (Sb)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	--	--
Acid Extractable Arsenic (As)	mg/kg	4.8	3.6	<2.0	7.5	2.4	<2.0	3.7	3.7	4.1	2.0	5.9	17
Acid Extractable Barium (Ba)	mg/kg	23	29	5.6	30	74	84	58	75	30	5.0	--	--
Acid Extractable Beryllium (Be)	mg/kg	2.2	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	--	--
Acid Extractable Bismuth (Bi)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	--	--
Acid Extractable Boron (B)	mg/kg	<50	<50	<50	<50	<50	<50	<50	<50	<50	50	--	--
Acid Extractable Cadmium (Cd)	mg/kg	<0.30	1.4	<0.30	<0.30	0.49	<0.30	<0.30	<0.30	<0.30	0.30	0.6	3.5
Acid Extractable Chromium (Cr)	mg/kg	7.3	<2.0	4.1	13	16	30	22	19	**120**	2.0	37.3	90
Acid Extractable Cobalt (Co)	mg/kg	1.1	<1.0	1.5	2.6	10	8.2	8.6	7.4	15	1.0	--	--
Acid Extractable Copper (Cu)	mg/kg	56	17	9.6	16	98	13	18	18	6.7	2.0	35.7	197
Acid Extractable Iron (Fe)	mg/kg	3300	8100	7100	18000	14000	23000	15000	15000	38000	50	--	--
Acid Extractable Lead (Pb)	mg/kg	20	17	16	86	40	6.0	4.3	4.3	13	0.50	35	91.3
Acid Extractable Lithium (Li)	mg/kg	<2.0	<2.0	<2.0	3.0	8.9	8.3	13	11	11	2.0	--	--
Acid Extractable Mercury (Hg)	mg/kg	<0.10	0.16	<0.10	<0.10	0.18	<0.10	<0.10	<0.10	<0.10	0.10	0.17	0.486
Acid Extractable Molybdenum (Mo)	mg/kg	<2.0	3.5	6.0	5.0	3.7	5.1	5.3	4.4	3.6	2.0	--	--
Acid Extractable Nickel (Ni)	mg/kg	4.0	3.5	2.2	6.2	16	14	21	21	150	2.0	--	--
Acid Extractable Rubidium (Rb)	mg/kg	3.3	<2.0	<2.0	7.7	7.8	8.9	6.1	6.6	6.8	2.0	--	--
Acid Extractable Selenium (Se)	mg/kg	1.4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	--	--
Acid Extractable Silver (Ag)	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	--	--
Acid Extractable Strontium (Sr)	mg/kg	39	44	11	14	43	36	19	23	18	5.0	--	--
Acid Extractable Thallium (Tl)	mg/kg	<0.10	<0.10	<0.10	<0.10	0.14	<0.10	<0.10	0.11	<0.10	0.10	--	--
Acid Extractable Tin (Sn)	mg/kg	<2.0	<2.0	<2.0	93	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	--	--
Acid Extractable Uranium (U)	mg/kg	4.9	4.7	10	0.87	4.1	1.8	4.8	4.2	0.59	0.10	--	--
Acid Extractable Vanadium (V)	mg/kg	7.7	3.5	7.6	24	27	110	29	28	130	2.0	--	--
Acid Extractable Zinc (Zn)	mg/kg	49	200	40	37	97	71	77	75	99	5.0	123	315

[1] Reference: Canadian Council of Ministers for the Environment (CCME), Interim Marine Sediment Quality Guidelines (ISQG) for sediment (2002).

[2] Reference: Canadian Council of Ministers for the Environment (CCME), Probably Effects Limit (PEL) for sediment (2002).

Values highlighted in grey exceed ISQG criteria.

Values bolded and highlighted in grey exceed both ISQG and PEL.

"--" = No guideline available

Table 31: PCBs in Sediment Laboratory Analytical Results (mg/kg)

Sample ID:		**SED-1**	**SED-2**	**SED-3**	**WSUPPLY-SED-1**	**WSUPPLY-SED-2**	**WSUPPLY-SED-3**	RDL	Federal[1]	Federal[2]
Sample Date:		2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14		CCME ISQG	CCME PEL
Lab ID:		FJP645	FJP646	FJP647	FJP648	FJP649	FJP650		Freshwater	Freshwater
QA/QC Field Duplicate of:		--	--	--	--	--	--		Aquatic life	Aquatic life
	UNITS									
PCBs										
Aroclor 1016	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	--	--
Aroclor 1221	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	--	--
Aroclor 1232	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	--	--
Aroclor 1248	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	--	--
Aroclor 1242	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	--	--
Aroclor 1254	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	0.06	0.341
Aroclor 1260	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	--	--
Calculated Total PCB	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.030	0.0341	0.277

Table Notes:

[1] Reference: Canadian Council of Ministers for the Environment (CCME), Interim Marine Sediment Quality Guidelines (ISQG) for sediment (2002).

[2] Reference: Canadian Council of Ministers for the Environment (CCME), Probably Effects Limit (PEL) for sediment (2002).

Values highlighted in grey exceed ISQG criteria.

Values bolded and highlighted in grey exceed both ISQG and PEL.

"--" = No guideline available

Table 32: VOCs in Sediment Laboratory Analytical Results (mg/kg)

Sample ID:		**BG-SED-1**	**BG-SED-2**	**BG-SED-3**	**SED-1**	**SED-2**	**SED-3**	**WSUPPLY-SED-1**	**WSUPPLY-SED-2**	**WSUPPLY-SED-3**	RDL	Provincial[1]
Sample Date:		2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14	2017/10/14		RBCA
Lab ID:		FJP642	FJP643	FJP644	FJP645	FJP646	FJP647	FJP648	FJP649	FJP650		Sediment
QA/QC Field Duplicate of:		--	--	--	--	--	--	--	--	--		
	UNITS											
Volatile Organics												
1,1,1-Trichloroethane	ug/kg	<25	<50	<25	<25	<25	<25	<25	<25	<25	25	--
1,1,2,2-Tetrachloroethane	ug/kg	<25	<50	<25	<25	<25	<25	<25	<25	<25	25	--
1,1,2-Trichloroethane	ug/kg	<25	<50	<25	<25	<25	<25	<25	<25	<25	25	--
1,1-Dichloroethane	ug/kg	<25	<50	<25	<25	<25	<25	<25	<25	<25	25	--
1,1-Dichloroethylene	ug/kg	<25	<50	<25	<25	<25	<25	<25	<25	<25	25	--
1,2-Dichlorobenzene	ug/kg	<25	<50	<25	<25	<25	<25	<25	<25	<25	25	--
1,2-Dichloroethane	ug/kg	<25	<50	<25	<25	<25	<25	<25	<25	<25	25	--
1,2-Dichloropropane	ug/kg	<25	<50	<25	<25	<25	<25	<25	<25	<25	25	--
1,3-Dichlorobenzene	ug/kg	<25	<50	<25	<25	<25	<25	<25	<25	<25	25	--
1,4-Dichlorobenzene	ug/kg	<25	<50	<25	<25	<25	<25	<25	<25	<25	25	--
Benzene	ug/kg	<25	<50	<25	<25	<25	<25	<25	<25	<25	25	0.0012
Bromodichloromethane	ug/kg	<25	<50	<25	<25	<25	<25	<25	<25	<25	25	--
Bromoform	ug/kg	<25	<50	<25	<25	<25	<25	<25	<25	<25	25	--
Bromomethane	ug/kg	<50	<100	<50	<50	<50	<50	<50	<50	<50	50	--
Carbon Tetrachloride	ug/kg	<25	<50	<25	<25	<25	<25	<25	<25	<25	25	--
Chlorobenzene	ug/kg	<25	<50	<25	<25	<25	<25	<25	<25	<25	25	--
Chloroethane	ug/kg	<200	<400	<200	<200	<200	<200	<200	<200	<200	200	--
Chloroform	ug/kg	<25	<50	<25	<25	<25	<25	<25	<25	<25	25	--
cis-1,2-Dichloroethylene	ug/kg	<25	<50	<25	<25	<25	<25	<25	<25	<25	25	--
cis-1,3-Dichloropropene	ug/kg	<25	<50	<25	<25	<25	<25	<25	<25	<25	25	--
Dibromochloromethane	ug/kg	<25	<50	<25	<25	<25	<25	<25	<25	<25	25	--
Ethylbenzene	ug/kg	<25	<50	<25	<25	<25	<25	<25	<25	<25	25	0.0012
Ethylene Dibromide	ug/kg	<25	<50	<25	<25	<25	<25	<25	<25	<25	25	--
Methyl t-butyl ether (MTBE)	ug/kg	<25	<50	<25	<25	<25	<25	<25	<25	<25	25	--
Methylene Chloride(Dichloromethane)	ug/kg	<30 (1)	<50	<30 (1)	<30 (1)	<25	<25	<25	<25	<25	25	--
o-Xylene	ug/kg	<25	<50	<25	<25	<25	<25	<25	<25	<25	25	--
p+m-Xylene	ug/kg	<25	<50	<25	<25	<25	<25	<25	<25	<25	25	--
Styrene	ug/kg	<25	<50	<25	<25	<25	<25	<25	<25	<25	25	--
Tetrachloroethylene	ug/kg	<25	<50	<25	<25	<25	<25	<25	<25	<25	25	--
Toluene	ug/kg	<25	<50	<25	<25	<25	<25	<25	<25	<25	25	0.0014
Total Xylenes	ug/kg	<50	<100	<50	<50	<50	<50	<50	<50	<50	50	0.0013
trans-1,2-Dichloroethylene	ug/kg	<25	<50	<25	<25	<25	<25	<25	<25	<25	25	--
trans-1,3-Dichloropropene	ug/kg	<25	<50	<25	<25	<25	<25	<25	<25	<25	25	--
Trichloroethylene	ug/kg	<10	<20	<10	<10	<10	<10	<10	<10	<10	10	--
Trichlorofluoromethane (FREON 11)	ug/kg	<25	<50	<25	<25	<25	<25	<25	<25	<25	25	--
Vinyl Chloride	ug/kg	<20	<40	<20	<20	<20	<20	<20	<20	<20	20	--

Table Notes:

[1] Reference: Provincial Atlantic Risk Based Corrective Action for Petroleum Impacted Sites In Atlantic Canada (Version 3, updated January 2015) - Tier 1 Sediment Ecological Screening Levels for the Protection of Freshwater and Marine Aquatic Life (mg/kg dry weight) - Typical Sediment

-- = no guideline available

Reported concentrations for particular samples that are bolded and grey shaded exceed the applicable criteria

Table 33: Petroleum Hydrocarbons in Surface Water Analytical Results (ug/L)

Sample ID:		**WSUPPLY-SW-1**	**WSUPPLY-SW-2**	**WSUPPLY-SW-3**	**WSUPPLY-SW-4**	**UAST-SW-1**	**SW-1**	**SW-2**	**SW-3**	**BG-SW-1**	**BG-SW-2**	**BG-SW-3**	RDL	Federal[1]	Provincial[2]
Sample Date:		2017/10/17	2017/10/17	2017/10/17	2017/10/17	2017/10/14	2017/10/17	2017/10/17	2017/10/17	2017/10/17	2017/10/17	2017/10/17		CCME	RBCA
Lab ID:		FJM110	FJM111	FJM112	FJM119	FJP720	FJM113	FJM114	FJM115	FJM116	FJM117	FJM118		Freshwater	Freshwater
QA/QC Field Duplicate of:		--	--	--	**WSUPPLY-SW-2**	**--**	--	--	--	--	--	--		Aquatic life	Aquatic life
	Units														
BTEX & F1 Hydrocarbons															
Benzene	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	370	2.1
Toluene	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	2	0.77
Ethylbenzene	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	90	0.32
o-Xylene	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	--	--
p+m-Xylene	ug/L	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	0.40	--	--
Total Xylenes	ug/L	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	0.40	--	0.33[3]
F1 (C6-C10)	ug/L	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	25	--	--
F1 (C6-C10) - BTEX	ug/L	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	25	--	--
F2-F4 Hydrocarbons															
F2 (C10-C16 Hydrocarbons)	ug/L	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	--	--
F3 (C16-C34 Hydrocarbons)	ug/L	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	--	--
F4 (C34-C50 Hydrocarbons)	ug/L	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	--	--
Reached Baseline at C50	ug/L	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	--	--

Table Notes:

[1] Federal Regulatory criteria for the Protection of Freshwater Aquatic Life from the Canadian Council of Ministers for the Environment (CCME), Canadian Environmental Quality Guidelines (updated 2007)

[2] Reference: Provincial Atlantic Risk Based Corrective Action for Petroleum Impacted Sites In Atlantic Canada (Version 3, updated January 2015) - Tier 1 Surface Water and Groundwater Ecological Screening Levels for the Protection of Freshwater and Marine Life (mg/L)

[3] The Atlantic RBCA detection limit for Xylenes could not be met using CCME CWS analysis.

-- = no guideline available

Reported concentrations for particular samples that are bolded and grey shaded exceed the applicable long term CCME Water Quality Guidelines for the Protection of Freshwater Aquatic Life.

Table 34: PAHs in Surface Water Laboratory Analytical Results (ug/L)

Sample ID:		**WSUPPLY-SW-1**	**WSUPPLY-SW-2**	**WSUPPLY-SW-3**	**WSUPPLY-SW-4**	**UAST-SW-1**	**SW-1**	**SW-2**	**SW-3**	**BG-SW-1**	**BG-SW-2**	**BG-SW-3**	RDL	Federal
Sample Date:		2017/10/17	2017/10/17	2017/10/17	2017/10/17	2017/10/14	2017/10/17	2017/10/17	2017/10/17	2017/10/17	2017/10/17	2017/10/17		CCME
Lab ID:		FJM110	FJM111	FJM112	FJM119	FJP720	FJM113	FJM114	FJM115	FJM116	FJM117	FJM118		Freshwater
QA/QC Field Duplicate of:		--	--	--	**WSUPPLY-SW-2**	**--**	--	--	--	--	--	--		Aquatic life[1]
Polyaromatic Hydrocarbons	**Units**													
1-Methylnaphthalene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	--
2-Methylnaphthalene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	--
Acenaphthene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	5.8
Acenaphthylene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	--
Acridine	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	4.4
Anthracene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	0.012
Benzo(a)anthracene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	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	<0.010	<0.010	0.010	0.015
Benzo(b)fluoranthene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	--
Benzo(b/j)fluoranthene	ug/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	--
Benzo(g,h,i)perylene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	--
Benzo(j)fluoranthene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	--
Benzo(k)fluoranthene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	--
Chrysene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	--
Dibenz(a,h)anthracene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	--
Fluoranthene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	0.04
Fluorene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	3
Indeno(1,2,3-cd)pyrene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	--
Naphthalene	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	1.1
Perylene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	--
Phenanthrene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	0.4
Pyrene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	0.025
Quinoline	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	3.4

Table Notes:

[1] Reference: Canadian Council of Ministers for the Environment (CCME), Canadian Water Quality Guidelines (CWQG) for the Protection of Freshwater Aquatic Life (FAL)

Reported concentrations for particular samples that are bolded and grey shaded exceed the applicable long term CCME Water Quality Guidelines for the Protection of Freshwater Aquatic Life.

"--" - no guideline available

Table 35: Metals in Surface Water Laboratory Analytical Results (mg/kg)

Sample ID:		**WSUPPLY-SW-1**	**WSUPPLY-SW-2**	**WSUPPLY-SW-3**	**WSUPPLY-SW-4**	**SW-1**	**SW-2**	**SW-3**	**BG-SW-1**	**BG-SW-2**	**BG-SW-3**	RDL	Federal[1]
Sample Date:		2017/10/17	2017/10/17	2017/10/17	2017/10/17	2017/10/17	2017/10/17	2017/10/17	2017/10/17	2017/10/17	2017/10/17		CCME
Lab ID:		FJM110	FJM111	FJM112	FJM119	FJM113	FJM114	FJM115	FJM116	FJM117	FJM118		Freshwater
QA/QC Field Duplicate of:		--	--	--	**WSUPPLY-SW-2**	--	--	--	--	--	--		Aquatic life
	Units												Long Term
[2]Total Aluminum (Al)	ug/L	89	84	79	83	41	**430**	68	**140**	**240**	85	5.0	5-100
Total Antimony (Sb)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	--
Total Arsenic (As)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	5
Total Barium (Ba)	ug/L	8.6	8.3	8.2	8.2	5.6	5.9	4.7	2.0	3.3	4.7	1.0	--
Total Beryllium (Be)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	--
Total Bismuth (Bi)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	--
Total Boron (B)	ug/L	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	50	1500
Total Cadmium (Cd)	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.027	<0.010	<0.010	0.010	0.09
Total Calcium (Ca)	ug/L	4600	4500	4200	4300	3700	4800	1700	1500	2900	3100	100	--
[3]Total Chromium (Cr)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	1
Total Cobalt (Co)	ug/L	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	0.40	--
[4]Total Copper (Cu)	ug/L	<2.0	<2.0	<2.0	<2.0	**2.9**	**6.4**	<2.0	**2.2**	<2.0	<2.0	2.0	2
Total Iron (Fe)	ug/L	100	110	97	100	180	**540**	59	<50	270	<50	50	300
[5]Total Lead (Pb)	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	1
Total Manganese (Mn)	ug/L	3.8	4.0	3.5	3.9	<2.0	6.1	<2.0	<2.0	2.9	<2.0	2.0	--
Total Mercury	ug/L	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	<0.013	0.013	0.026
Total Molybdenum (Mo)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	73
[6]Total Nickel (Ni)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	25
Total Phosphorus (P)	ug/L	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	100	--
Total Potassium (K)	ug/L	630	590	580	600	1100	870	510	780	430	250	100	--
Total Selenium (Se)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	1
Total Silver (Ag)	ug/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	0.25
Total Sodium (Na)	ug/L	8200	7800	6600	6700	16000	15000	6200	21000	8600	3200	100	--
Total Strontium (Sr)	ug/L	48	46	46	47	27	30	16	20	13	25	2.0	--
Total Thallium (Tl)	ug/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	0.8
Total Tin (Sn)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	--
Total Titanium (Ti)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	6.3	<2.0	<2.0	3.1	<2.0	2.0	--
Total Uranium (U)	ug/L	0.30	0.26	0.26	0.27	<0.10	0.35	<0.10	0.19	0.28	0.32	0.10	15
Total Vanadium (V)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	--
Total Zinc (Zn)	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	6.2	<5.0	14	<5.0	<5.0	5.0	30

Table Notes:

[1] Reference: Canadian Council of Ministers for the Environment (CCME), Canadian Water Quality Guidelines (CWQG) for the Protection of Freshwater Aquatic Life (FAL)

[2] The CWQG for aluminum is related to pH. CWQG is 5 ug/L if pH < 6.5 and 100 ug/L if pH > 6.5.

[3] Total chromium is reported. Hexavalent chromium (VI) or chromium (III)has not been tested for. When total chromium is measured the guideline fro chromium VI takes presedence in case all of the chromium is present.

[4] The CWQG for cooper is related to water hardness (as CaCO3) as described in the CWQG document. When the water hardness is 0 to <82 mg/L, the CWQG is 2 µg/L. All samples presented in this table have a water hardness is this range so the guideline is 2 µg/L.

[5] The CWQG for lead is related to water hardness (as CaCO3) as described in the CWQG document. When the water hardness is 0 to ≤ 60 mg/L, the CWQG is 1 µg/L. All samples presented in this table have a water hardness is this range so the guideline is 1 µg/L.

[6] The CWQG for nickel is related to water hardness (as CaCO3) as described in the CWQG document. When the water hardness is 0 to ≤ 60 mg/L, the CWQG is 25 µg/L. All samples presented in this table have a water hardness in this range so the guideline is 25 µg/L.

Reported concentrations for particular samples that are bolded and grey shaded exceed the applicable long term CCME Water Quality Guidelines for the Protection of Freshwater Aquatic Life.

"--" - no guideline available

Table 36: General Chemistry in Surface Water Laboratory Analytical Results (mg/L)

Sample ID:		**WSUPPLY-SW-1**	**WSUPPLY-SW-2**	**WSUPPLY-SW-3**	**WSUPPLY-SW-4**	**SW-2**	**BG-SW-2**	RDL	**SW-1**	**SW-3**	**BG-SW-1**	**BG-SW-3**	RDL	Federal CCME Freshwater Aquatic life[1]
Sample Date:		2017/10/17	2017/10/17	2017/10/17	2017/10/17	2017/10/17	2017/10/17		2017/10/17	2017/10/17	2017/10/17	2017/10/17		
Lab ID:		FJM110	FJM111	FJM112	FJM119	FJM114	FJM117		FJM113	FJM115	FJM116	FJM118		
QA/QC Field Duplicate of:		--	--	--	**WSUPPLY-SW-2**	--	--		--	--	--	--		
	Units													
Anion Sum	me/L	0.640	0.650	0.650	0.640	1.09	0.640	N/A	1.26	0.500	1.23	0.360	N/A	--
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	14	14	15	14	14	9.2	1.0	16	6.6	<1.0	9.8	1.0	--
Calculated TDS	mg/L	37	37	36	35	64	37	1.0	67	27	71	20	1.0	--
Carb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	<1.0	<1.0	<1.0	<1.0	1.0	--
Cation Sum	me/L	0.730	0.700	0.630	0.640	1.12	0.650	N/A	1.13	0.460	1.19	0.350	N/A	--
Hardness (CaCO3)	mg/L	17	17	16	17	21	12	1.0	20	8.7	13	10	1.0	--
Ion Balance (% Difference)	%	6.57	3.70	1.56	0.00	1.36	0.780	N/A	5.44	4.17	1.65	1.41	N/A	--
Langelier Index (@ 20C)	N/A	-2.29	-2.29	-2.36	-2.21	-2.53	-3.28		-2.37	-3.51	NC	-2.88		--
Langelier Index (@ 4C)	N/A	-2.54	-2.54	-2.61	-2.46	-2.78	-3.53		-2.62	-3.76	NC	-3.14		--
Nitrate (N)	mg/L	<0.050	<0.050	<0.050	0.12	0.052	<0.050	0.050	<0.050	<0.050	<0.050	<0.050	0.050	13
Saturation pH (@ 20C)	N/A	9.48	9.49	9.50	9.51	9.50	9.87		9.55	10.3	NC	9.80		--
Saturation pH (@ 4C)	N/A	9.73	9.74	9.75	9.76	9.75	10.1		9.80	10.5	NC	10.0		--
Inorganics														
Total Alkalinity (Total as CaCO3)	mg/L	14	14	15	14	14	9.2	5.0	16	6.6	<5.0	9.8	5.0	--
Dissolved Chloride (Cl)	mg/L	13	13	13	12	27	16	1.0	31	11	39	5.8	1.0	120
Colour	TCU	54 (1)	56 (1)	59 (1)	53 (1)	190 (1)	120 (1)	25	41	16	50	30	5.0	--
Nitrate + Nitrite (N)	mg/L	<0.050	<0.050	<0.050	0.12	0.052	<0.050	0.050	<0.050	<0.050	<0.050	<0.050	0.050	--
Nitrite (N)	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	<0.010	<0.010	<0.010	<0.010	0.010	0.06
Nitrogen (Ammonia Nitrogen)	mg/L	<0.050	<0.050	0.051	<0.050	<0.050	0.050	0.050	0.094	<0.050	0.064	<0.050	0.050	--
Total Organic Carbon (C)	mg/L	7.4	7.4	7.6	7.6	16	13	0.50	7.8	3.9	4.5	4.5	0.50	--
Orthophosphate (P)	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	<0.010	<0.010	<0.010	<0.010	0.010	--
pH	pH	7.19	7.20	7.15	7.30	6.98	6.59	N/A	7.18	6.74	6.40	6.91	N/A	6.5-9
Reactive Silica (SiO2)	mg/L	1.1	1.0	1.1	1.0	2.3	2.2	0.50	<0.50	<0.50	0.95	1.6	0.50	--
Dissolved Sulphate (SO4)	mg/L	<2.0	<2.0	<2.0	<2.0	2.1	<2.0	2.0	2.7	2.3	5.8	<2.0	2.0	--
Turbidity	NTU	0.60	0.70	0.47	0.40	1.1	0.53	0.10	0.37	0.39	0.28	0.24	0.10	--
Conductivity	uS/cm	72	69	72	71	130	74	1.0	130	54	150	37	1.0	--

Table Notes:

[1] Federal Regulatory criteria for the Protection of Freshwater Aquatic Life from the Canadian Council of Ministers for the Environment (CCME), Canadian Environmental Quality Guidelines (updated 2007)

-- = no guideline available

Reported concentrations for particular samples that are bolded and grey shaded exceed the applicable long term CCME Water Quality Guidelines for the Protection of Freshwater Aquatic Life.

Table 37: Summary of Asbestos Results

Site	Cape Makkovik, Labrador													
Sample ID:	**A1**	**A2**	**A3**	**A4**	**A5**	**A6**	**A7**	**A8**	**A9**	**A10**	**A11**	**A12 (Duplicate of A3)**	**RDL**	**Provincial Guideline NL Occupational Health and Safety Act**[1]
Sample Location:	1987 Disposal Site	1987 Disposal Site	1987 Disposal Site	Former Radome	Former Barracks	Former Barracks	Former Barracks	Former Barracks	Former Heating & Generator Room	Former Barrack Foundation	Former Heating & Generator Room	1987 Disposal Site		
Sample Description:	Black Foam	Black Felt	Grey building siding	Brown insulation	Black Foam	Grey Building Siding	Black Rubber	Green Vinyl Floor Tile	Black Foam	Black Tar	Black Felt	Grey building siding		
Lab Sample ID:	FSB199	FSB205	FSB206	FSB207	FSB208	FSB209	FSB210	FSB211	FSB212	FSB213	FSB214	FSB215		
Bulk Asbestos (%)	ND	ND	Chrysotile 15%	Amosite 20%	ND	ND	ND	Chrysotile 1%	ND	ND	Chrysotile 7%	Chrysotile 15%	0.5	>1%

Table Notes:

[1] Provincial Guideline – Newfoundland and Labrador Regulation 111/98, Abatement Regulations, 1998 under the Occupational Health & Safety Act of >1%

Highlighted values exceed criteria;

ND - Not detected above reportable detection limit

Appendix E

QA/QC PROGRAM

Table 1: Metals in Soil Analytical Results

Parameters	Data Quality Objective	Cape Makkovik						Cape Makkovik					
		Sample Identification			QA/QC Results			Sample Identification			QA/QC Results		
		HEL-SOIL-4 (Dup)	HEL-SOIL-1	RDL	Absolute difference	Average	Relative Percent Difference	SHACK-SOIL-4 (Dup)	SHACK-SOIL-3	RDL	Absolute difference	Average	Relative Percent Difference
Acid Extractable Aluminum (Al)	80%	8400	0	10	8400.00	4200.00	**200.00%**	11000	9800	10	1200.00	10400.00	11.54%
Acid Extractable Antimony (Sb)	60%	1	1	2.0	0.00	0.00	0.00%	1	1	2.0	0.00	1.00	0.00%
Acid Extractable Arsenic (As)	60%	7.3	6.6	2.0	0.70	6.95	10.07%	6.8	7.0	2.0	0.20	6.90	2.90%
Acid Extractable Barium (Ba)	80%	67	73	5.0	6.00	70.00	8.57%	47	41	5.0	6.00	44.00	13.64%
Acid Extractable Beryllium (Be)	60%	1	1	2.0	0.00	0.00	0.00%	1	1	2.0	0.00	0.00	0.00%
Acid Extractable Bismuth (Bi)	60%	1	1	2.0	0.00	0.00	0.00%	1	1	2.0	0.00	0.00	0.00%
Acid Extractable Boron (B)	60%	0.25	0.25	50	0.00	0.00	0.00%	25	25	50	0.00	0.00	0.00%
Acid Extractable Cadmium (Cd)	60%	0.15	0.15	0.30	0.00	0.00	0.00%	0.46	0.15	0.30	0.00	0.15	0.00%
Acid Extractable Chromium (Cr)	60%	24	22	2.0	2.00	23.00	8.70%	24	20	2.0	4.00	22.00	18.18%
Acid Extractable Cobalt (Co)	60%	12	12	1.0	0.00	12.00	0.00%	11	10	1.0	1.00	10.50	9.52%
Acid Extractable Copper (Cu)	60%	63	57	2.0	6.00	60.00	10.00%	40	37	2.0	3.00	38.50	7.79%
Acid Extractable Iron (Fe)	60%	20000	20000	50	0.00	20000.00	0.00%	24000	22000	50	2000.00	23000.00	8.70%
Acid Extractable Lead (Pb)	80%	9.7	10	0.50	0.30	9.85	3.05%	29	14	0.50	15.00	21.50	69.77%
Acid Extractable Lithium (Li)	60%	13	15	2.0	2.00	14.00	14.29%	18	19	2.0	1.00	18.50	5.41%
Acid Extractable Manganese (Mn)	60%	290	280	2.0	10.00	285.00	3.51%	300	270	2.0	30.00	285.00	10.53%
Acid Extractable Mercury (Hg)	80%	0.05	0.05	0.10	0.00	0.00	0.00%	0.05	0.05	0.10	0.00	0.00	0.00%
Acid Extractable Molybdenum (Mo)	80%	1	2.1	2.0	1.10	1.55	70.97%	1	2.1	2.0	1.10	1.55	70.97%
Acid Extractable Nickel (Ni)	60%	23	22	2.0	1.00	22.50	4.44%	17	15	2.0	2.00	16.00	12.50%
Acid Extractable Rubidium (Rb)	60%	16	14	2.0	2.00	15.00	13.33%	17	17	2.0	0.00	17.00	0.00%
Acid Extractable Selenium (Se)	60%	0.5	0.5	1.0	0.00	0.00	0.00%	0.5	0.5	1.0	0.00	0.50	0.00%
Acid Extractable Silver (Ag)	80%	0.25	0.25	0.50	0.00	0.00	0.00%	0.25	0.25	0.50	0.00	0.00	0.00%
Acid Extractable Strontium (Sr)	60%	36	24	5.0	12.00	30.00	40.00%	23	23	5.0	0.00	23.00	0.00%
Acid Extractable Thallium (Tl)	60%	0.12	0.10	0.10	0.02	0.11	18.18%	0.15	0.14	0.10	0.01	0.15	6.90%
Acid Extractable Tin (Sn)	80%	1	1	2.0	0.00	0.00	0.00%	1	1	2.0	0.00	0.00	0.00%
Acid Extractable Uranium (U)	60%	1.1	1.2	0.10	0.10	1.15	8.70%	0.90	1.0	0.10	0.10	0.95	10.53%
Acid Extractable Vanadium (V)	60%	38	41	2.0	3.00	39.50	7.59%	44	41	2.0	3.00	42.50	7.06%
Acid Extractable Zinc (Zn)	60%	47	46	5.0	1.00	46.50	2.15%	99	65	5.0	34.00	82.00	41.46%
						Relative Percent Difference:	**15.69%**					**Relative Percent Difference:**	**11.38%**

BOLD RPD exceeds DQO

Assumptions:

For a difference between a detected value and a non-detected value, the non-detected value is assumed to be 1/2 RDL.

The difference between two non-detected values was considered to be zero

Combined Average % for metals in soil is 21.88

Table 2: Metals in Soil Analytical Results

Parameters	Data Quality Objective	Cape Makkovik						Cape Makkovik					
		Sample Identification			QA/QC Results			Sample Identification			QA/QC Results		
		1987-SOIL-11 (Dup)	1987-SOIL-2	RDL	Absolute difference	Average	Relative Percent Difference	1987-SOIL-12 (Dup)	1987-SOIL-3	RDL	Absolute difference	Average	Relative Percent Difference
Acid Extractable Aluminum (Al)	80%	15000	18000	10	3000.00	16500.00	18.18%	15000	17000	10	2000.00	16000.00	12.50%
Acid Extractable Antimony (Sb)	60%	4.5	8.6	2.0	0.00	0.00	0.00%	1	4.9	2.0	3.90	2.95	132.20%
Acid Extractable Arsenic (As)	60%	1	1	2.0	0.00	1.00	0.00%	1	1.0	2.0	0.00	1.00	0.00%
Acid Extractable Barium (Ba)	80%	120	160	5.0	40.00	140.00	28.57%	170	210	5.0	40.00	190.00	21.05%
Acid Extractable Beryllium (Be)	60%	1	1	2.0	0.00	0.00	0.00%	1	1	2.0	0.00	0.00	0.00%
Acid Extractable Bismuth (Bi)	60%	1	1	2.0	0.00	0.00	0.00%	1	1	2.0	0.00	0.00	0.00%
Acid Extractable Boron (B)	60%	25	25	50	0.00	0.00	0.00%	25	25	50	0.00	0.00	0.00%
Acid Extractable Cadmium (Cd)	60%	0.15	0.15	0.30	0.00	0.00	0.00%	0.15	0.15	0.30	0.00	0.15	0.00%
Acid Extractable Chromium (Cr)	60%	35	31	2.0	4.00	33.00	12.12%	32	32	2.0	0.00	32.00	0.00%
Acid Extractable Cobalt (Co)	60%	36	43	1.0	7.00	39.50	17.72%	38	**42**	1.0	4.00	40.00	10.00%
Acid Extractable Copper (Cu)	60%	27	35	2.0	8.00	31.00	25.81%	31	37	2.0	6.00	34.00	17.65%
Acid Extractable Iron (Fe)	60%	74000	82000	50	8000.00	78000.00	10.26%	75000	81000	50	6000.00	78000.00	7.69%
Acid Extractable Lead (Pb)	80%	6.0	16	0.50	10.00	11.00	**90.91%**	6.5	11	0.50	4.50	8.75	51.43%
Acid Extractable Lithium (Li)	60%	12	16	2.0	4.00	14.00	28.57%	12	14	2.0	2.00	13.00	15.38%
Acid Extractable Manganese (Mn)	60%	600	690	2.0	90.00	645.00	13.95%	700	810	2.0	110.00	755.00	14.57%
Acid Extractable Mercury (Hg)	80%	0.05	0.05	0.10	0.00	0.00	0.00%	0.05	0.05	0.10	0.00	0.00	0.00%
Acid Extractable Molybdenum (Mo)	80%	1.0	1	2.0	0.00	1.00	0.00%	1	1	2.0	0.00	1.00	0.00%
Acid Extractable Nickel (Ni)	60%	20	25	2.0	5.00	22.50	22.22%	21	23	2.0	2.00	22.00	9.09%
Acid Extractable Rubidium (Rb)	60%	15	21	2.0	6.00	18.00	33.33%	17	20	2.0	3.00	18.50	16.22%
Acid Extractable Selenium (Se)	60%	0.5	0.5	1.0	0.00	0.00	0.00%	0.5	0.5	1.0	0.00	0.50	0.00%
Acid Extractable Silver (Ag)	80%	0.25	0.25	0.50	0.00	0.00	0.00%	0.25	0.25	0.50	0.00	0.00	0.00%
Acid Extractable Strontium (Sr)	60%	33	43	5.0	10.00	38.00	26.32%	37	43	5.0	6.00	40.00	15.00%
Acid Extractable Thallium (Tl)	60%	0.05	0.10	0.10	0.05	0.08	66.67%	0.10	0.12	0.10	0.02	0.11	18.18%
Acid Extractable Tin (Sn)	80%	1	1.0	2.0	0.00	0.00	0.00%	1.0	1	2.0	0.00	0.00	0.00%
Acid Extractable Uranium (U)	60%	0.18	0.36	0.10	0.18	0.27	66.67%	0.25	0.27	0.10	0.02	0.26	7.69%
Acid Extractable Vanadium (V)	60%	210	210	2.0	0.00	210.00	0.00%	**190**	**210**	2.0	20.00	200.00	10.00%
Acid Extractable Zinc (Zn)	60%	150	210	5.0	60.00	180.00	33.33%	170	180	5.0	10.00	175.00	5.71%
						Relative Percent Difference:	**18.32%**					**Relative Percent Difference:**	**13.50%**

BOLD **RPD exceeds DQO**

Assumptions:

For a difference between a detected value and a non-detected value, the non-detected value is assumed to be 1/2 RDL.

The difference between two non-detected values was considered to be zero

Combined Average % for metals in soil is 21.88

Table 3: Metals in Soil Analytical Results

Parameters	Data Quality Objective	Cape Makkovik						Cape Makkovik					
		Sample Identification			QA/QC Results			Sample Identification			QA/QC Results		
		LPUMP-SOIL-5 (Dup)	LPUMP-SOIL-3	RDL	Absolute difference	Average	Relative Percent Difference	UPUMP-SOIL-4 (Dup)	UPUMP-SOIL-1	RDL	Absolute difference	Average	Relative Percent Difference
Acid Extractable Aluminum (Al)	80%	5200	5100	10	100.00	5150.00	1.94%	3300	6800	10	3500.00	5050.00	69.31%
Acid Extractable Antimony (Sb)	60%	1	1	2.0	0.00	0.00	0.00%	6.7	8.0	2.0	1.30	7.35	17.69%
Acid Extractable Arsenic (As)	60%	1	1	2.0	0.00	1.00	0.00%	1.0	4.7	2.0	3.70	2.85	129.82%
Acid Extractable Barium (Ba)	80%	84	39	5.0	45.00	61.50	73.17%	89	150	5.0	61.00	119.50	51.05%
Acid Extractable Beryllium (Be)	60%	1	1	2.0	0.00	0.00	0.00%	1	1	2.0	0.00	0.00	0.00%
Acid Extractable Bismuth (Bi)	60%	1	1	2.0	0.00	0.00	0.00%	1	1	2.0	0.00	0.00	0.00%
Acid Extractable Boron (B)	60%	25	25	50	0.00	0.00	0.00%	25	25	50	0.00	0.00	0.00%
Acid Extractable Cadmium (Cd)	60%	0.15	0.15	0.30	0.00	0.00	0.00%	0.15	0.15	0.30	0.00	0.15	0.00%
Acid Extractable Chromium (Cr)	60%	1	6.9	2.0	5.90	3.95	149.37%	6.2	15	2.0	8.80	10.60	83.02%
Acid Extractable Cobalt (Co)	60%	2.7	4.2	1.0	1.50	3.45	43.48%	2.4	6.2	1.0	3.80	4.30	88.37%
Acid Extractable Copper (Cu)	60%	5.8	5.0	2.0	0.80	5.40	14.81%	3.4	3.0	2.0	0.40	3.20	12.50%
Acid Extractable Iron (Fe)	60%	7100	16000	50	8900.00	11550.00	**77.06%**	11000	30000	50	19000.00	20500.00	**92.68%**
Acid Extractable Lead (Pb)	80%	6.5	4.8	0.50	1.70	5.65	30.09%	9.7	7.9	0.50	1.80	8.80	20.45%
Acid Extractable Lithium (Li)	60%	1	3.9	2.0	2.90	2.45	118.37%	6.1	16	2.0	9.90	11.05	89.59%
Acid Extractable Manganese (Mn)	60%	15	85	2.0	70.00	50.00	**140.00%**	120	300	2.0	180.00	210.00	**85.71%**
Acid Extractable Mercury (Hg)	80%	0.20	0.13	0.10	0.00	0.00	0.00%	0.14	0.11	0.10	0.00	0.00	0.00%
Acid Extractable Molybdenum (Mo)	80%	1	3.3	2.0	2.30	2.15	106.98%	**6.2**	**14**	2.0	7.80	10.10	77.23%
Acid Extractable Nickel (Ni)	60%	4.4	7.8	2.0	3.40	6.10	55.74%	2.9	5.9	2.0	3.00	4.40	68.18%
Acid Extractable Rubidium (Rb)	60%	1	5.2	2.0	4.20	3.10	135.48%	9.0	24	2.0	15.00	16.50	**90.91%**
Acid Extractable Selenium (Se)	60%	0.5	0.5	1.0	0.00	0.00	0.00%	0.5	0.5	1.0	0.00	0.50	0.00%
Acid Extractable Silver (Ag)	80%	0.25	0.25	0.50	0.00	0.00	0.00%	0.25	0.25	0.50	0.00	0.00	0.00%
Acid Extractable Strontium (Sr)	60%	29	10	5.0	19.00	19.50	**97.44%**	63	38	5.0	25.00	50.50	49.50%
Acid Extractable Thallium (Tl)	60%	0.05	0.05	0.10	0.00	0.05	0.00%	0.16	0.37	0.10	0.21	0.27	79.25%
Acid Extractable Tin (Sn)	80%	2.7	1	2.0	0.00	0.00	0.00%	1	1	2.0	0.00	0.00	0.00%
Acid Extractable Uranium (U)	60%	0.75	0.60	0.10	0.15	0.68	22.22%	0.16	0.27	0.10	0.11	0.22	51.16%
Acid Extractable Vanadium (V)	60%	3.7	29	2.0	25.30	16.35	154.74%	21	63	2.0	42.00	42.00	**100.00%**
Acid Extractable Zinc (Zn)	60%	22	17	5.0	5.00	19.50	25.64%	150	120	5.0	30.00	135.00	22.22%
						Relative Percent Difference:	**46.17%**					Relative Percent Difference:	**47.36%**

BOLD RPD exceeds DQO

Assumptions:

For a difference between a detected value and a non-detected value, the non-detected value is assumed to be 1/2 RDL.

The difference between two non-detected values was considered to be zero

Combined Average % for metals in soil is 21.88

Table 4: Metals in Surface Water

Parameters	Data Quality Objective	Cape Makkovik					
		Sample Identification			QA/QC Results		
		WSUPPLY-SW-4 (Dup)	WSUPPLY-SW-2	RDL	Absolute difference	Average	Relative Percent Difference
[2]Total Aluminum (Al)	40%	83	84	5.0	1.00	83.50	1.20%
Total Antimony (Sb)	40%	0.5	0.5	1.0	0.00	0.00	0.00%
Total Arsenic (As)	40%	0.5	0.5	1.0	0.00	0.50	0.00%
Total Barium (Ba)	40%	8.2	8.3	1.0	0.10	8.25	1.21%
Total Beryllium (Be)	40%	0.5	0.5	1.0	0.00	0.00	0.00%
Total Bismuth (Bi)	40%	1	1	2.0	0.00	0.00	0.00%
Total Boron (B)	40%	25	25	50	0.00	0.00	0.00%
Total Cadmium (Cd)	40%	0.005	0.005	0.010	0.00	0.00	0.00%
Total Calcium (Ca)	40%	4300	4500	100	200.00	4400.00	4.55%
[3]Total Chromium (Cr)	40%	0.5	0.5	1.0	0.00	0.50	0.00%
Total Cobalt (Co)	40%	0.2	0.2	0.40	0.00	0.20	0.00%
[4]Total Copper (Cu)	40%	1	1	2.0	0.00	1.00	0.00%
Total Iron (Fe)	40%	100	110	50	10.00	105.00	9.52%
[5]Total Lead (Pb)	40%	0.25	0.25	0.50	0.00	0.25	0.00%
Total Magnesium (Mg)	40%	1400	1400	100	0.00	1400.00	0.00%
Total Manganese (Mn)	40%	3.9	4.0	2.0	0.00	0.00	0.00%
Total Mercury	40%	0.0065	0.0065	0.013	0.00	0.01	0.00%
Total Molybdenum (Mo)	40%	1	1	2.0	0.00	1.00	0.00%
[6]Total Nickel (Ni)	40%	1	1	2.0	0.00	1.00	0.00%
Total Phosphorus (P)	40%	50	50	100	0.00	0.00	0.00%
Total Potassium (K)	40%	600	590	100	0.00	0.00	0.00%
Total Selenium (Se)	40%	0.5	0.5	1.0	0.00	0.50	0.00%
Total Silver (Ag)	40%	0.05	0.05	0.10	0.00	0.05	0.00%
Total Sodium (Na)	40%	6700	7800	100	0.00	0.00	0.00%
Total Strontium (Sr)	40%	47	46	2.0	1.00	46.50	2.15%
Total Thallium (Tl)	40%	0.05	0.05	0.10	0.00	0.05	0.00%
Total Tin (Sn)	40%	1	1	2.0	0.00	1.00	0.00%
Total Titanium (Ti)	40%	1	1	2.0	0.00	1.00	0.00%
Total Uranium (U)	40%	0.27	0.26	0.10	0.01	0.27	3.77%
Total Vanadium (V)	40%	1	1	2.0	0.00	1.00	0.00%
Total Zinc (Zn)	40%	2.5	2.5	5.0	0.00	2.50	0.00%
						Relative Percent Difference:	**0.75%**

BOLD RPD exceeds DQO

Assumptions:

For a difference between a detected value and a non-detected value, the non-detected value is assumed to be 1/2 RDL.

The difference between two non-detected values was considered to be zero

Combined Average % for metals in surface water is 0.75

Table 5: QA/QC BTEX/TPH in Soil Analytical Results

Parameters	Data Quality Objective	Sample Identification			QA/QC Results		
		UAST-SOIL-5 (Dup)	UAST-SOIL-2	RDL	Absolute difference	Average	Relative Percent Difference
Benzene	100%	0.010	0.010	0.020	0.00	0.01	0.00%
Toluene	100%	0.010	0.010	0.020	0.00	0.01	0.00%
Ethylbenzene	100%	0.010	0.010	0.020	0.00	0.01	0.00%
p+m-Xylene	100%	0.020	0.020	0.040	0.00	0.02	0.00%
o-Xylene	100%	0.010	0.010	0.020	0.00	0.01	0.00%
Total Xylenes	100%	0.020	0.020	0.040	0.00	0.02	0.00%
F1 (C6-C10)	60%	5	5	10	0.00	5.00	0.00%
F1 (C6-C10) - BTEX (Calc.)	60%	5	5	10	0.00	5.00	0.00%
F2-F4 Hydrocarbons							
F2 (C10-C16 Hydrocarbons)	60%	10	10	20	0.00	10.00	0.00%
F3 (C16-C34 Hydrocarbons)	60%	25	25	50	0.00	25.00	0.00%
F4 (C34-C50 Hydrocarbons)	60%	25	25	50	0.00	25.00	0.0%
						Relative Percent Difference:	**0.00%**

BOLD RPD exceeds DQO

Assumptions:

For a difference between a detected value and a non-detected value, the non-detected value is assumed to be 1/2 RDL.

The difference between two non-detected values was considered to be zero

Combined Average % for petroleum hydrocarbons in soil is 5.3

Table 6: QA/QC BTEX/TPH in Soil Analytical Results

Parameters	Data Quality Objective	Sample Identification			QA/QC Results		
		HEL-SOIL-4 (Dup)	HEL-SOIL-1	RDL	Absolute difference	Average	Relative Percent Difference
Benzene	100%	0.010	0.010	0.020	0.00	0.01	0.00%
Toluene	100%	0.010	0.010	0.020	0.00	0.01	0.00%
Ethylbenzene	100%	0.010	0.010	0.020	0.00	0.01	0.00%
p+m-Xylene	100%	0.020	0.020	0.040	0.00	0.02	0.00%
o-Xylene	100%	0.010	0.010	0.020	0.00	0.01	0.00%
Total Xylenes	100%	0.020	0.020	0.040	0.00	0.02	0.00%
F1 (C6-C10)	60%	5	5	10	0.00	5.00	0.00%
F1 (C6-C10) - BTEX (Calc.)	60%	5	5	10	0.00	5.00	0.00%
F2-F4 Hydrocarbons							
F2 (C10-C16 Hydrocarbons)	60%	10	10	20	0.00	10.00	0.00%
F3 (C16-C34 Hydrocarbons)	60%	25	25	50	0.00	25.00	0.00%
F4 (C34-C50 Hydrocarbons)	60%	25	25	50	0.00	25.00	0.0%
						Relative Percent Difference:	**0.00%**

BOLD RPD exceeds DQO

Assumptions:

For a difference between a detected value and a non-detected value, the non-detected value is assumed to be 1/2 RDL.

The difference between two non-detected values was considered to be zero

Combined Average % for petroleum hydrocarbons in soil is 5.3

Table 7: QA/QC BTEX/TPH in Soil Analytical Results

Parameters	Data Quality Objective	Sample Identification			QA/QC Results		
		SHACK-SOIL-4 (Dup)	SHACK-SOIL-3	RDL	Absolute difference	Average	Relative Percent Difference
Benzene	100%	0.01	0.010	0.020	0.00	0.01	0.00%
Toluene	100%	0.01	0.010	0.020	0.00	0.01	0.00%
Ethylbenzene	100%	0.01	0.010	0.020	0.00	0.01	0.00%
p+m-Xylene	100%	0.02	0.020	0.040	0.00	0.02	0.00%
o-Xylene	100%	0.01	0.010	0.020	0.00	0.01	0.00%
Total Xylenes	100%	0.02	0.020	0.040	0.00	0.02	0.00%
F1 (C6-C10)	60%	5	5	10	0.00	5.00	0.00%
F1 (C6-C10) - BTEX (Calc.)	60%	5	5	10	0.00	5.00	0.00%
F2-F4 Hydrocarbons							
F2 (C10-C16 Hydrocarbons)	60%	46	62	10	16.00	54.00	29.63%
F3 (C16-C34 Hydrocarbons)	60%	100	130	50	30.00	115.00	26.09%
F4 (C34-C50 Hydrocarbons)	60%	25	25	50	0.00	25.00	0.0%
						Relative Percent Difference:	**5.07%**

BOLD RPD exceeds DQO

Assumptions:

For a difference between a detected value and a non-detected value, the non-detected value is assumed to be 1/2 RDL.

The difference between two non-detected values was considered to be zero

Combined Average % for petroleum hydrocarbons in soil is 5.3

Table 8: QA/QC BTEX/TPH in Soil Analytical Results

Parameters	Data Quality Objective	Sample Identification			QA/QC Results		
		1987-SOIL-11 (Dup)	1987-SOIL-2	RDL	Absolute difference	Average	Relative Percent Difference
Benzene	100%	0.010	0.010	0.020	0.00	0.01	0.00%
Toluene	100%	0.010	0.010	0.020	0.00	0.01	0.00%
Ethylbenzene	100%	0.010	0.010	0.020	0.00	0.01	0.00%
p+m-Xylene	100%	0.020	0.020	0.040	0.00	0.02	0.00%
o-Xylene	100%	0.010	0.010	0.020	0.00	0.01	0.00%
Total Xylenes	100%	0.020	0.020	0.040	0.00	0.02	0.00%
F1 (C6-C10)	60%	5	5	10	0.00	5.00	0.00%
F1 (C6-C10) - BTEX (Calc.)	60%	5	5	10	0.00	5.00	0.00%
F2-F4 Hydrocarbons							
F2 (C10-C16 Hydrocarbons)	60%	10	10	20	0.00	10.00	0.00%
F3 (C16-C34 Hydrocarbons)	60%	25	25	50	0.00	25.00	0.00%
F4 (C34-C50 Hydrocarbons)	60%	25	25	50	0.00	25.00	0.0%
						Relative Percent Difference:	**0.00%**

BOLD RPD exceeds DQO

Assumptions:

For a difference between a detected value and a non-detected value, the non-detected value is assumed to be 1/2 RDL.

The difference between two non-detected values was considered to be zero

Combined Average % for petroleum hydrocarbons in soil is 5.3

Table 9: QA/QC BTEX/TPH in Soil Analytical Results

Parameters	Data Quality Objective	Sample Identification			QA/QC Results		
		1987-SOIL-3 (Dup)	1987-SOIL-12	RDL	Absolute difference	Average	Relative Percent Difference
Benzene	100%	0.010	0.010	0.020	0.00	0.01	0.00%
Toluene	100%	0.010	0.010	0.020	0.00	0.01	0.00%
Ethylbenzene	100%	0.010	0.010	0.020	0.00	0.01	0.00%
p+m-Xylene	100%	0.020	0.020	0.040	0.00	0.02	0.00%
o-Xylene	100%	0.010	0.010	0.020	0.00	0.01	0.00%
Total Xylenes	100%	0.020	0.020	0.040	0.00	0.02	0.00%
F1 (C6-C10)	60%	5	5	10	0.00	5.00	0.00%
F1 (C6-C10) - BTEX (Calc.)	60%	5	5	10	0.00	5.00	0.00%
F2-F4 Hydrocarbons							
F2 (C10-C16 Hydrocarbons)	60%	10	10	20	0.00	10.00	0.00%
F3 (C16-C34 Hydrocarbons)	60%	25	25	50	0.00	25.00	0.00%
F4 (C34-C50 Hydrocarbons)	60%	25	77	50	52.00	51.00	102.0%
Relative Percent Difference:							**9.27%**

BOLD RPD exceeds DQO

Assumptions:

For a difference between a detected value and a non-detected value, the non-detected value is assumed to be 1/2 RDL.

The difference between two non-detected values was considered to be zero

Combined Average % for petroleum hydrocarbons in soil is 5.3

Table 10: QA/QC BTEX/TPH in Soil Analytical Results

Parameters	Data Quality Objective	Sample Identification			QA/QC Results		
		LPUMP-SOIL-4 (Dup)	LPUMP-SOIL-1	RDL	Absolute difference	Average	Relative Percent Difference
Benzene	100%	0.010	0.010	0.020	0.00	0.01	0.00%
Toluene	100%	0.010	0.010	0.020	0.00	0.01	0.00%
Ethylbenzene	100%	0.010	0.010	0.020	0.00	0.01	0.00%
p+m-Xylene	100%	0.020	0.020	0.040	0.00	0.02	0.00%
o-Xylene	100%	0.010	0.010	0.020	0.00	0.01	0.00%
Total Xylenes	100%	0.020	0.020	0.040	0.00	0.02	0.00%
F1 (C6-C10)	60%	5	5	10	0.00	5.00	0.00%
F1 (C6-C10) - BTEX (Calc.)	60%	5	5	10	0.00	5.00	0.00%
F2-F4 Hydrocarbons							
F2 (C10-C16 Hydrocarbons)	60%	120	100	20	20.00	110.00	18.18%
F3 (C16-C34 Hydrocarbons)	60%	**1700**	**950**	50	750.00	1325.00	56.60%
F4 (C34-C50 Hydrocarbons)	60%	720	330	50	390.00	525.00	74.3%
Relative Percent Difference:							**13.55%**

BOLD RPD exceeds DQO

Assumptions:

For a difference between a detected value and a non-detected value, the non-detected value is assumed to be 1/2 RDL.

The difference between two non-detected values was considered to be zero

Combined Average % for petroleum hydrocarbons in soil is 5.3

Table 11: QA/QC BTEX/TPH in Soil Analytical Results

Parameters	Data Quality Objective	Sample Identification			QA/QC Results		
		LPUMP-SOIL-5 (Dup)	**LPUMP-SOIL-3**	**RDL**	**Absolute difference**	**Average**	**Relative Percent Difference**
Benzene	100%	0.010	0.010	0.020	0.00	0.01	0.00%
Toluene	100%	0.010	0.010	0.020	0.00	0.01	0.00%
Ethylbenzene	100%	0.010	0.010	0.020	0.00	0.01	0.00%
p+m-Xylene	100%	0.020	0.020	0.040	0.00	0.02	0.00%
o-Xylene	100%	0.010	0.010	0.020	0.00	0.01	0.00%
Total Xylenes	100%	0.020	0.020	0.040	0.00	0.02	0.00%
F1 (C6-C10)	60%	5	5	10	0.00	5.00	0.00%
F1 (C6-C10) - BTEX (Calc.)	60%	5	5	10	0.00	5.00	0.00%
F2-F4 Hydrocarbons							
F2 (C10-C16 Hydrocarbons)	60%	20	57	15	37.00	38.50	96.10%
F3 (C16-C34 Hydrocarbons)	60%	**740**	**390**	50	350.00	565.00	**61.95%**
F4 (C34-C50 Hydrocarbons)	60%	250	160	50	90.00	205.00	43.9%
						Relative Percent Difference:	**18.36%**

BOLD **RPD exceeds DQO**

Assumptions:

For a difference between a detected value and a non-detected value, the non-detected value is assumed to be 1/2 RDL.

The difference between two non-detected values was considered to be zero

Combined Average % for petroleum hydrocarbons in soil is 5.3

Table 12: QA/QC BTEX/TPH in Soil Analytical Results

Parameters	Data Quality Objective	Sample Identification			QA/QC Results		
		UPUMP-SOIL-4 (Dup)	**UPUMP-SOIL-1**	**RDL**	**Absolute difference**	**Average**	**Relative Percent Difference**
Benzene	100%	0.010	0.010	0.020	0.00	0.01	0.00%
Toluene	100%	0.010	0.010	0.020	0.00	0.01	0.00%
Ethylbenzene	100%	0.010	0.010	0.020	0.00	0.01	0.00%
p+m-Xylene	100%	0.020	0.020	0.040	0.00	0.02	0.00%
o-Xylene	100%	0.010	0.010	0.020	0.00	0.01	0.00%
Total Xylenes	100%	0.020	0.020	0.040	0.00	0.02	0.00%
F1 (C6-C10)	60%	5	5	10	0.00	5.00	0.00%
F1 (C6-C10) - BTEX (Calc.)	60%	5	5	10	0.00	5.00	0.00%
F2-F4 Hydrocarbons							
F2 (C10-C16 Hydrocarbons)	60%	75	91	10	16.00	83.00	19.28%
F3 (C16-C34 Hydrocarbons)	60%	**510**	**410**	50	100.00	460.00	21.74%
F4 (C34-C50 Hydrocarbons)	60%	220	200	50	20.00	210.00	9.5%
						Relative Percent Difference:	**4.59%**

BOLD **RPD exceeds DQO**

Assumptions:

For a difference between a detected value and a non-detected value, the non-detected value is assumed to be 1/2 RDL.

The difference between two non-detected values was considered to be zero

Combined Average % for petroleum hydrocarbons in soil is 5.3

Table 13: QA/QC BTEX/TPH in Soil Analytical Results

Parameters	Data Quality Objective	Sample Identification			QA/QC Results		
		PIPELINE-SOIL-5 (Dup)	PIPELINE-SOIL-3	RDL	Absolute difference	Average	Relative Percent Difference
Benzene	100%	0.010	0.010	0.020	0.00	0.01	0.00%
Toluene	100%	0.010	0.010	0.020	0.00	0.01	0.00%
Ethylbenzene	100%	0.010	0.010	0.020	0.00	0.01	0.00%
p+m-Xylene	100%	0.020	0.020	0.040	0.00	0.02	0.00%
o-Xylene	100%	0.010	0.010	0.020	0.00	0.01	0.00%
Total Xylenes	100%	0.020	0.020	0.040	0.00	0.02	0.00%
F1 (C6-C10)	60%	5	5	10	0.00	5.00	0.00%
F1 (C6-C10) - BTEX (Calc.)	60%	5	5	10	0.00	5.00	0.00%
F2-F4 Hydrocarbons							
F2 (C10-C16 Hydrocarbons)	60%	24	23	20	1.00	23.50	4.26%
F3 (C16-C34 Hydrocarbons)	60%	55	68	50	13.00	61.50	21.14%
F4 (C34-C50 Hydrocarbons)	60%	25	25	50	0.00	25.00	0.0%
Relative Percent Difference:							**2.31%**

BOLD RPD exceeds DQO

Assumptions:

For a difference between a detected value and a non-detected value, the non-detected value is assumed to be 1/2 RDL.

The difference between two non-detected values was considered to be zero

Combined Average % for petroleum hydrocarbons in soil is 5.3

Table 14: QA/QC BTEX/TPH in Surface Water Analytical Results

Parameters	Data Quality Objective	Sample Identification			QA/QC Results		
		WSUPPLY-SW-4 (Dup)	WSUPPLY-SW-2	RDL	Absolute difference	Average	Relative Percent Difference
Benzene	60%	0.010	0.010	0.20	0.00	0.01	0.00%
Toluene	60%	0.010	0.010	0.20	0.00	0.01	0.00%
Ethylbenzene	60%	0.010	0.010	0.20	0.00	0.01	0.00%
p+m-Xylene	60%	0.020	0.020	0.20	0.00	0.02	0.00%
o-Xylene	60%	0.010	0.010	0.40	0.00	0.01	0.00%
Total Xylenes	60%	0.020	0.020	0.40	0.00	0.02	0.00%
F1 (C6-C10)	60%	12.5	12.5	25	0.00	12.50	0.00%
F1 (C6-C10) - BTEX (Calc.)	60%	12.5	12.5	25	0.00	12.50	0.00%
F2-F4 Hydrocarbons							
F2 (C10-C16 Hydrocarbons)	60%	50	50	100	0.00	50.00	0.00%
F3 (C16-C34 Hydrocarbons)	60%	100	100	200	0.00	100.00	0.00%
F4 (C34-C50 Hydrocarbons)	60%	100	100	200	0.00	100.00	0.0%
Relative Percent Difference:							**0.00%**

BOLD RPD exceeds DQO

Assumptions:

For a difference between a detected value and a non-detected value, the non-detected value is assumed to be 1/2 RDL.

The difference between two non-detected values was considered to be zero

Combined Average % for petroleum hydrocarbons in surface water is 0.9

Table 15: PAH's in Soil Analytical Results

Parameters	Data Quality Objective	Cape Makkovik						Cape Makkovik					
		Sample Identification			QA/QC Results			Sample Identification			QA/QC Results		
		UAST-SOIL-5 (Dup)	UAST-SOIL-2	RDL	Absolute difference	Average	Relative Percent Difference	HEL-SOIL-4 (Dup)	HEL-SOIL-1	RDL	Absolute difference	Average	Relative Percent Difference
1-Methylnaphthalene	100%	0.005	0.005	0.010	0.00	0.01	0.00%	0.005	0.005	0.010	0.00	0.01	0.00%
2-Methylnaphthalene	100%	0.005	0.005	0.010	0.00	0.00	0.00%	0.005	0.005	0.010	0.00	0.01	0.00%
Acenaphthene	100%	0.005	0.005	0.010	0.00	0.01	0.00%	0.005	0.005	0.010	0.00	0.01	0.00%
Acenaphthylene	100%	0.005	0.005	0.010	0.00	0.01	0.00%	0.005	0.005	0.010	0.00	0.01	0.00%
Anthracene	100%	0.005	0.005	0.010	0.00	0.00	0.00%	0.005	0.005	0.010	0.00	0.00	0.00%
Benzo(a)anthracene	100%	0.005	0.005	0.010	0.00	0.00	0.00%	0.005	0.005	0.010	0.00	0.00	0.00%
Benzo(a)pyrene	100%	0.005	0.005	0.010	0.00	0.00	0.00%	0.005	0.005	0.010	0.00	0.00	0.00%
Benzo(b)fluoranthene	100%	0.005	0.005	0.010	0.00	0.00	0.00%	0.005	0.005	0.010	0.00	0.01	0.00%
Benzo(b/j)fluoranthene	100%	0.010	0.010	0.020	0.00	0.01	0.00%	0.010	0.010	0.020	0.00	0.01	0.00%
Benzo(g,h,i)perylene	100%	0.005	0.005	0.010	0.00	0.01	0.00%	0.005	0.005	0.010	0.00	0.01	0.00%
Benzo(j)fluoranthene	100%	0.005	0.005	0.010	0.00	0.01	0.00%	0.005	0.005	0.010	0.00	0.01	0.00%
Benzo(k)fluoranthene	100%	0.005	0.005	0.010	0.00	0.01	0.00%	0.005	0.005	0.010	0.00	0.01	0.00%
Chrysene	100%	0.005	0.005	0.010	0.00	0.01	0.00%	0.005	0.005	0.010	0.00	0.01	0.00%
Dibenz(a,h)anthracene	100%	0.005	0.005	0.010	0.00	0.01	0.00%	0.005	0.005	0.010	0.00	0.01	0.00%
Fluoranthene	100%	0.005	0.005	0.010	0.00	0.01	0.00%	0.005	0.005	0.010	0.00	0.01	0.00%
Fluorene	100%	0.005	0.005	0.010	0.00	0.00	0.00%	0.005	0.005	0.010	0.00	0.00	0.00%
Indeno(1,2,3-cd)pyrene	100%	0.005	0.005	0.010	0.00	0.01	0.00%	0.005	0.005	0.010	0.00	0.01	0.00%
Naphthalene6	100%	0.005	0.005	0.010	0.00	0.01	0.00%	0.005	0.005	0.010	0.00	0.01	0.00%
Perylene	100%	0.005	0.005	0.010	0.00	0.01	0.00%	0.005	0.005	0.010	0.00	0.01	0.00%
Phenanthrene6	100%	0.005	0.005	0.010	0.00	0.00	0.00%	0.005	0.005	0.010	0.00	0.01	0.00%
Pyrene	100%	0.005	0.005	0.010	0.00	0.00	0.00%	0.005	0.005	0.010	0.00	0.00	0.00%
						Relative Percent Difference:	**0.00%**					**Relative Percent Difference:**	**0.00%**

BOLD RPD exceeds DQO

Assumptions:

For a difference between a detected value and a non-detected value, the non-detected value is assumed to be 1/2 RDL.

The difference between two non-detected values was considered to be zero

Combined Average % for PAHs in soil is 6.74

Table 16: PAH's in Soil Analytical Results

Parameters	Data Quality Objective	Cape Makkovik						Cape Makkovik					
		Sample Identification			QA/QC Results			Sample Identification			QA/QC Results		
		SHACK-SOIL-4 (Dup)	SHACK-SOIL-3	RDL	Absolute difference	Average	Relative Percent Difference	1987-SOIL-11 (Dup)	1987-SOIL-2	RDL	Absolute difference	Average	Relative Percent Difference
1-Methylnaphthalene	100%	0.005	0.005	0.010	0.00	0.01	0.00%	0.005	0.005	0.010	0.00	0.01	0.00%
2-Methylnaphthalene	100%	0.005	0.005	0.010	0.00	0.00	0.00%	0.005	0.005	0.010	0.00	0.01	0.00%
Acenaphthene	100%	0.005	0.005	0.010	0.00	0.01	0.00%	0.005	0.005	0.010	0.00	0.01	0.00%
Acenaphthylene	100%	0.005	0.015	0.010	0.01	0.01	100.00%	0.020	0.020	0.040	0.00	0.02	0.00%
Anthracene	100%	0.005	0.005	0.010	0.00	0.00	0.00%	0.005	0.005	0.010	0.00	0.00	0.00%
Benzo(a)anthracene	100%	0.005	0.022	0.010	0.00	0.00	0.00%	0.005	0.005	0.010	0.00	0.00	0.00%
Benzo(a)pyrene	100%	0.024	0.064	0.010	0.00	0.00	0.00%	0.005	0.005	0.010	0.00	0.00	0.00%
Benzo(b)fluoranthene	100%	0.026	0.060	0.010	0.00	0.00	0.00%	0.005	0.013	0.010	0.01	0.01	88.89%
Benzo(b/j)fluoranthene	100%	0.039	0.092	0.020	0.05	0.07	80.92%	0.010	0.010	0.020	0.00	0.01	0.00%
Benzo(g,h,i)perylene	100%	0.022	0.044	0.010	0.02	0.03	66.67%	0.005	0.005	0.010	0.00	0.01	0.00%
Benzo(j)fluoranthene	100%	0.013	0.031	0.010	0.02	0.02	81.82%	0.005	0.005	0.010	0.00	0.01	0.00%
Benzo(k)fluoranthene	100%	0.005	0.028	0.010	0.02	0.02	139.39%	0.005	0.005	0.010	0.00	0.01	0.00%
Chrysene	100%	0.014	0.037	0.010	0.02	0.03	90.20%	0.005	0.015	0.010	0.01	0.01	100.00%
Dibenz(a,h)anthracene	100%	0.005	0.005	0.010	0.00	0.01	0.00%	0.005	0.005	0.010	0.00	0.01	0.00%
Fluoranthene	100%	0.005	0.020	0.010	0.02	0.01	120.00%	0.005	0.005	0.010	0.00	0.01	0.00%
Fluorene	100%	0.005	0.005	0.010	0.00	0.00	0.00%	0.005	0.005	0.010	0.00	0.00	0.00%
Indeno(1,2,3-cd)pyrene	100%	0.018	0.044	0.010	0.03	0.03	83.87%	0.005	0.005	0.010	0.00	0.01	0.00%
Naphthalene6	100%	0.005	0.005	0.010	0.00	0.01	0.00%	0.005	0.005	0.010	0.00	0.01	0.00%
Perylene	100%	0.005	0.005	0.010	0.00	0.01	0.00%	0.005	0.005	0.010	0.00	0.01	0.00%
Phenanthrene6	100%	0.005	0.005	0.010	0.00	0.00	0.00%	0.005	0.005	0.010	0.00	0.01	0.00%
Pyrene	100%	0.017	0.036	0.010	0.00	0.00	0.00%	0.005	0.005	0.010	0.00	0.00	0.00%
	Relative Percent Difference:						**36.33%**	**Relative Percent Difference:**					**8.99%**

BOLD RPD exceeds DQO

Assumptions:

For a difference between a detected value and a non-detected value, the non-detected value is assumed to be 1/2 RDL.

The difference between two non-detected values was considered to be zero

Combined Average % for PAHs in soil is 6.74

Table 17: PAH's in Soil Analytical Results

Parameters	Data Quality Objective	Cape Makkovik						Cape Makkovik					
		Sample Identification			QA/QC Results			Sample Identification			QA/QC Results		
		1987-SOIL-12 (Dup)	1987-SOIL-3	RDL	Absolute difference	Average	Relative Percent Difference	LPUMP-SOIL-5 (Dup)	LPUMP-SOIL-3	RDL	Absolute difference	Average	Relative Percent Difference
1-Methylnaphthalene	100%	0.005	0.005	0.010	0.00	0.01	0.00%	0.005	0.005	0.010	0.00	0.01	0.00%
2-Methylnaphthalene	100%	0.005	0.005	0.010	0.00	0.00	0.00%	0.005	0.005	0.010	0.00	0.01	0.00%
Acenaphthene	100%	0.005	0.005	0.010	0.00	0.01	0.00%	0.005	0.005	0.010	0.00	0.01	0.00%
Acenaphthylene	100%	0.015	0.015	0.030	0.00	0.02	0.00%	0.005	0.005	0.010	0.00	0.01	0.00%
Anthracene	100%	0.005	0.005	0.010	0.00	0.00	0.00%	0.005	0.005	0.010	0.00	0.00	0.00%
Benzo(a)anthracene	100%	0.005	0.005	0.010	0.00	0.00	0.00%	0.005	0.005	0.010	0.00	0.00	0.00%
Benzo(a)pyrene	100%	0.005	0.005	0.010	0.00	0.00	0.00%	0.005	0.005	0.010	0.00	0.00	0.00%
Benzo(b)fluoranthene	100%	0.005	0.005	0.010	0.00	0.00	0.00%	0.005	0.005	0.010	0.00	0.01	0.00%
Benzo(b/j)fluoranthene	100%	0.010	0.010	0.020	0.00	0.01	0.00%	0.010	0.010	0.020	0.00	0.01	0.00%
Benzo(g,h,i)perylene	100%	0.005	0.005	0.010	0.00	0.01	0.00%	0.099	0.005	0.010	0.09	0.05	180.77%
Benzo(j)fluoranthene	100%	0.005	0.005	0.010	0.00	0.01	0.00%	0.005	0.005	0.010	0.00	0.01	0.00%
Benzo(k)fluoranthene	100%	0.005	0.005	0.010	0.00	0.01	0.00%	0.005	0.005	0.010	0.00	0.01	0.00%
Chrysene	100%	0.005	0.005	0.010	0.00	0.01	0.00%	0.005	0.005	0.010	0.00	0.01	0.00%
Dibenz(a,h)anthracene	100%	0.005	0.005	0.010	0.00	0.01	0.00%	0.005	0.005	0.010	0.00	0.01	0.00%
Fluoranthene	100%	0.005	0.005	0.010	0.00	0.01	0.00%	0.005	0.005	0.010	0.00	0.01	0.00%
Fluorene	100%	0.005	0.005	0.010	0.00	0.00	0.00%	0.005	0.005	0.010	0.00	0.00	0.00%
Indeno(1,2,3-cd)pyrene	100%	0.005	0.005	0.010	0.00	0.01	0.00%	0.005	0.005	0.010	0.00	0.01	0.00%
Naphthalene6	100%	0.005	0.005	0.010	0.00	0.01	0.00%	0.005	0.005	0.010	0.00	0.01	0.00%
Perylene	100%	0.005	0.005	0.010	0.00	0.01	0.00%	0.005	0.005	0.010	0.00	0.01	0.00%
Phenanthrene6	100%	0.005	0.005	0.010	0.00	0.00	0.00%	0.005	0.005	0.010	0.00	0.01	0.00%
Pyrene	100%	0.005	0.005	0.010	0.00	0.00	0.00%	0.005	0.005	0.010	0.00	0.00	0.00%
						Relative Percent Difference:	**0.00%**					**Relative Percent Difference:**	**8.61%**

BOLD RPD exceeds DQO

Assumptions:

For a difference between a detected value and a non-detected value, the non-detected value is assumed to be 1/2 RDL.

The difference between two non-detected values was considered to be zero

Combined Average % for PAHs in soil is 6.74

Table 18: PAH's in Soil Analytical Results

Parameters	Data Quality Objective	Cape Makkovik					
		Sample Identification			QA/QC Results		
		UPUMP-SOIL-4 (Dup)	UPUMP-SOIL-1	RDL	Absolute difference	Average	Relative Percent Difference
1-Methylnaphthalene	100%	0.005	0.005	0.010	0.00	0.01	0.00%
2-Methylnaphthalene	100%	0.005	0.005	0.010	0.00	0.00	0.00%
Acenaphthene	100%	0.005	0.005	0.010	0.00	0.01	0.00%
Acenaphthylene	100%	0.005	0.005	0.010	0.00	0.01	0.00%
Anthracene	100%	0.005	0.005	0.010	0.00	0.00	0.00%
Benzo(a)anthracene	100%	0.005	0.005	0.010	0.00	0.00	0.00%
Benzo(a)pyrene	100%	0.005	0.005	0.010	0.00	0.00	0.00%
Benzo(b)fluoranthene	100%	0.005	0.005	0.010	0.00	0.00	0.00%
Benzo(b/j)fluoranthene	100%	0.010	0.010	0.020	0.00	0.01	0.00%
Benzo(g,h,i)perylene	100%	0.005	0.005	0.010	0.00	0.01	0.00%
Benzo(j)fluoranthene	100%	0.005	0.005	0.010	0.00	0.01	0.00%
Benzo(k)fluoranthene	100%	0.005	0.005	0.010	0.00	0.01	0.00%
Chrysene	100%	0.005	0.005	0.010	0.00	0.01	0.00%
Dibenz(a,h)anthracene	100%	0.005	0.005	0.010	0.00	0.01	0.00%
Fluoranthene	100%	0.005	0.005	0.010	0.00	0.01	0.00%
Fluorene	100%	0.005	0.005	0.010	0.00	0.00	0.00%
Indeno(1,2,3-cd)pyrene	100%	0.005	0.005	0.010	0.00	0.01	0.00%
Naphthalene6	100%	0.005	0.005	0.010	0.00	0.01	0.00%
Perylene	100%	0.005	0.005	0.010	0.00	0.01	0.00%
Phenanthrene6	100%	0.005	0.005	0.010	0.00	0.00	0.00%
Pyrene	100%	0.005	0.005	0.010	0.00	0.00	0.00%
	Relative Percent Difference:						**0.00%**

BOLD RPD exceeds DQO

Assumptions:

For a difference between a detected value and a non-detected value, the non-detected value is assumed to be 1/2 RDL.

The difference between two non-detected values was considered to be zero

Combined Average % for PAHs in soil is 6.74

Table 19: PAH's in Surface Water Analytical Results

Parameters	Data Quality Objective	Cape Makkovik					
		Sample Identification			QA/QC Results		
		WSUPPLY-SW-4 (Dup)	WSUPPLY-SW-2	RDL	Absolute difference	Average	Relative Percent Difference
1-Methylnaphthalene	60%	0.025	0.025	0.050	0.00	0.03	0.00%
2-Methylnaphthalene	60%	0.025	0.025	0.050	0.00	0.03	0.00%
Acenaphthene	60%	0.005	0.005	0.010	0.00	0.01	0.00%
Acenaphthylene	60%	0.005	0.005	0.010	0.00	0.01	0.00%
Acridine	60%	0.025	0.025	0.050	0.00	0.00	0.00%
Anthracene	60%	0.005	0.005	0.010	0.00	0.00	0.00%
Benzo(a)anthracene	60%	0.005	0.005	0.010	0.00	0.00	0.00%
Benzo(a)pyrene	60%	0.005	0.005	0.010	0.00	0.01	0.00%
Benzo(b)fluoranthene	60%	0.005	0.005	0.010	0.00	0.01	0.00%
Benzo(b/j)fluoranthene	60%	0.010	0.010	0.020	0.00	0.01	0.00%
Benzo(g,h,i)perylene	60%	0.005	0.005	0.010	0.00	0.01	0.00%
Benzo(j)fluoranthene	60%	0.005	0.005	0.010	0.00	0.01	0.00%
Benzo(k)fluoranthene	60%	0.005	0.005	0.010	0.00	0.01	0.00%
Chrysene	60%	0.005	0.005	0.010	0.00	0.01	0.00%
Dibenz(a,h)anthracene	60%	0.005	0.005	0.010	0.00	0.01	0.00%
Fluoranthene	60%	0.005	0.005	0.010	0.00	0.00	0.00%
Fluorene	60%	0.005	0.005	0.010	0.00	0.01	0.00%
Indeno(1,2,3-cd)pyrene	60%	0.005	0.005	0.010	0.00	0.01	0.00%
Naphthalene	60%	0.010	0.010	0.20	0.00	0.01	0.00%
Perylene	60%	0.005	0.005	0.010	0.00	0.01	0.00%
Phenanthrene	60%	0.005	0.005	0.010	0.00	0.01	0.00%
Pyrene	60%	0.005	0.005	0.010	0.00	0.01	0.00%
Quinoline	60%	0.025	0.025	0.050	0.00	0.00	0.00%
	Relative Percent Difference:						0.00%

BOLD RPD exceeds DQO

Assumptions:

For a difference between a detected value and a non-detected value, the non-detected value is assumed to be 1/2 RDL.

The difference between two non-detected values was considered to be zero

The relative percent difference for PAHs in surface water is 0

Table 20: PCB's in Soil Analytical Results

Parameters	Data Quality Objective	Cape Makkovik						Cape Makkovik					
		Sample Identification			QA/QC Results			Sample Identification			QA/QC Results		
		HEL-SOIL-4 (Dup)	HEL-SOIL-1	RDL	Absolute difference	Average	Relative Percent Difference	1987-SOIL-11 (Dup)	1987-SOIL-2	RDL	Absolute difference	Average	Relative Percent Difference
Aroclor 1016	100%	0.025	0.025	0.050	0.00	0.03	0.00%	0.025	0.025	0.050	0.00	0.03	0.00%
Aroclor 1221	100%	0.025	0.025	0.050	0.00	0.00	0.00%	0.025	0.025	0.050	0.00	0.03	0.00%
Aroclor 1232	100%	0.025	0.025	0.050	0.00	0.03	0.00%	0.025	0.025	0.050	0.00	0.03	0.00%
Aroclor 1248	100%	0.025	0.025	0.050	0.00	0.03	0.00%	0.025	0.025	0.050	0.00	0.03	0.00%
Aroclor 1242	100%	0.025	0.025	0.050	0.00	0.00	0.00%	0.025	0.025	0.050	0.00	0.00	0.00%
Aroclor 1254	100%	0.025	0.025	0.050	0.00	0.00	0.00%	0.025	0.025	0.050	0.00	0.00	0.00%
Aroclor 1260	100%	0.025	0.025	0.050	0.00	0.00	0.00%	0.025	0.025	0.050	0.00	0.00	0.00%
Calculated Total PCB	100%	0.025	0.025	0.050	0.00	0.00	0.00%	0.0075	0.0075	0.015	0.00	0.01	0.00%
						Relative Percent Difference:	0.00%					Relative Percent Difference:	0.00%

BOLD RPD exceeds DQO

Assumptions:

For a difference between a detected value and a non-detected value, the non-detected value is assumed to be 1/2 RDL.

The difference between two non-detected values was considered to be zero

Combined Average % for PCBs in soil is 0

Table 21: PCB's in Soil Analytical Results

Parameters	Data Quality Objective	Cape Makkovik					
		Sample Identification			QA/QC Results		
		1987-SOIL-12 (Dup)	1987-SOIL-3	RDL	Absolute difference	Average	Relative Percent Difference
Aroclor 1016	100%	0.025	0.025	0.050	0.00	0.03	0.00%
Aroclor 1221	100%	0.025	0.025	0.050	0.00	0.00	0.00%
Aroclor 1232	100%	0.025	0.025	0.050	0.00	0.03	0.00%
Aroclor 1248	100%	0.025	0.025	0.050	0.00	0.03	0.00%
Aroclor 1242	100%	0.025	0.025	0.050	0.00	0.00	0.00%
Aroclor 1254	100%	0.025	0.025	0.050	0.00	0.00	0.00%
Aroclor 1260	100%	0.025	0.025	0.050	0.00	0.00	0.00%
Calculated Total PCB	100%	0.025	0.025	0.050	0.00	0.00	0.00%
						Relative Percent Difference:	0.00%

BOLD RPD exceeds DQO

Assumptions:

For a difference between a detected value and a non-detected value, the non-detected value is assumed to be 1/2 RDL.

The difference between two non-detected values was considered to be zero

Combined Average % for PCBs in soil is 0

Table 22: VOC's in Soil Analytical Results

Parameters	Data Quality Objective	Cape Makkovik						Cape Makkovik					
		Sample Identification			QA/QC Results			Sample Identification			QA/QC Results		
		1987-SOIL-11 (Dup)	1987-SOIL-2	RDL	Absolute difference	Average	Relative Percent Difference	1987-SOIL-12 (Dup)	1987-SOIL-3	RDL	Absolute difference	Average	Relative Percent Difference
1,1,1-Trichloroethane	100%	12.5	12.5	25	0.00	12.50	0.00%	12.5	12.5	25	0.00	12.50	0.00%
1,1,2,2-Tetrachloroethane	100%	12.5	12.5	25	0.00	12.50	0.00%	12.5	12.5	25	0.00	12.50	0.00%
1,1,2-Trichloroethane	100%	12.5	12.5	25	0.00	12.50	0.00%	12.5	12.5	25	0.00	12.50	0.00%
1,1-Dichloroethane	100%	12.5	12.5	25	0.00	12.50	0.00%	12.5	12.5	25	0.00	12.50	0.00%
1,1-Dichloroethylene	100%	12.5	12.5	25	0.00	12.50	0.00%	12.5	12.5	25	0.00	12.50	0.00%
1,2-Dichlorobenzene	100%	12.5	12.5	25	0.00	12.50	0.00%	12.5	12.5	25	0.00	12.50	0.00%
1,2-Dichloroethane	100%	12.5	12.5	25	0.00	12.50	0.00%	12.5	12.5	25	0.00	12.50	0.00%
1,2-Dichloropropane	100%	12.5	12.5	25	0.00	12.50	0.00%	12.5	12.5	25	0.00	12.50	0.00%
1,3-Dichlorobenzene	100%	12.5	12.5	25	0.00	12.50	0.00%	12.5	12.5	25	0.00	12.50	0.00%
1,4-Dichlorobenzene	100%	12.5	12.5	25	0.00	12.50	0.00%	12.5	12.5	25	0.00	12.50	0.00%
Benzene	100%	12.5	12.5	25	0.00	12.50	0.00%	12.5	12.5	25	0.00	12.50	0.00%
Bromodichloromethane	100%	12.5	12.5	25	0.00	12.50	0.00%	12.5	12.5	25	0.00	12.50	0.00%
Bromoform	100%	12.5	12.5	25	0.00	12.50	0.00%	12.5	12.5	25	0.00	12.50	0.00%
Bromomethane	100%	25	25	50	0.00	25.00	0.00%	25	25	50	0.00	25.00	0.00%
Carbon Tetrachloride	100%	12.5	12.5	25	0.00	12.50	0.00%	12.5	12.5	25	0.00	12.50	0.00%
Chlorobenzene	100%	12.5	12.5	25	0.00	12.50	0.00%	12.5	12.5	25	0.00	12.50	0.00%
Chloroethane	100%	100	100	200	0.00	100.00	0.00%	100	100	200	0.00	100.00	0.00%
Chloroform	100%	12.5	12.5	25	0.00	12.50	0.00%	12.5	12.5	25	0.00	12.50	0.00%
cis-1,2-Dichloroethylene	100%	12.5	12.5	25	0.00	12.50	0.00%	12.5	12.5	25	0.00	12.50	0.00%
cis-1,3-Dichloropropene	100%	12.5	12.5	25	0.00	12.50	0.00%	12.5	12.5	25	0.00	12.50	0.00%
Dibromochloromethane	100%	12.5	12.5	25	0.00	12.50	0.00%	12.5	12.5	25	0.00	12.50	0.00%
Ethylbenzene	100%	12.5	12.5	25	0.00	12.50	0.00%	12.5	12.5	25	0.00	12.50	0.00%
Ethylene Dibromide	100%	12.5	12.5	25	0.00	12.50	0.00%	12.5	12.5	25	0.00	12.50	0.00%
Methyl t-butyl ether (MTBE)	100%	12.5	12.5	25	0.00	12.50	0.00%	12.5	12.5	25	0.00	12.50	0.00%
Methylene Chloride(Dichloromethane)	100%	12.5	12.5	25	0.00	12.50	0.00%	12.5	12.5	25	0.00	12.50	0.00%
o-Xylene	100%	12.5	12.5	25	0.00	12.50	0.00%	12.5	12.5	25	0.00	12.50	0.00%
p+m-Xylene	100%	12.5	12.5	25	0.00	12.50	0.00%	12.5	12.5	25	0.00	12.50	0.00%
Styrene	100%	12.5	12.5	25	0.00	12.50	0.00%	12.5	12.5	25	0.00	12.50	0.00%
Tetrachloroethylene	100%	12.5	12.5	25	0.00	12.50	0.00%	12.5	12.5	25	0.00	12.50	0.00%
Toluene	100%	12.5	12.5	25	0.00	12.50	0.00%	12.5	12.5	25	0.00	12.50	0.00%
Total Xylenes	100%	25	25	50	0.00	25.00	0.00%	25	25	50	0.00	25.00	0.00%
trans-1,2-Dichloroethylene	100%	12.5	12.5	25	0.00	12.50	0.00%	12.5	12.5	25	0.00	12.50	0.00%
trans-1,3-Dichloropropene	100%	12.5	12.5	25	0.00	12.50	0.00%	12.5	12.5	25	0.00	12.50	0.00%
Trichloroethylene	100%	5	5	10	0.00	0.00	0.00%	5	5	10	0.00	5.00	0.00%
Trichlorofluoromethane (FREON 11)	100%	12.5	12.5	25	0.00	12.50	0.00%	12.5	12.5	25	0.00	12.50	0.00%
Vinyl Chloride	100%	10	10	20	0.00	10.00	0.00%	10	10	20	0.00	10.00	0.00%
						Relative Percent Difference:	0.00%					Relative Percent Difference:	0.00%

BOLD RPD exceeds DQO

Assumptions:

For a difference between a detected value and a non-detected value, the non-detected value is assumed to be 1/2 RDL.

The difference between two non-detected values was considered to be zero

Combined Average % for VOCs in soil is 0

Table 23: VOC's in Soil Analytical Results

Parameters	Data Quality Objective	Cape Makkovik						Cape Makkovik					
		Sample Identification			QA/QC Results			Sample Identification			QA/QC Results		
		LPUMP-SOIL-4 (Dup)	LPUMP-SOIL-1	RDL	Absolute difference	Average	Relative Percent Difference	LPUMP-SOIL-5 (Dup)	LPUMP-SOIL-3	RDL	Absolute difference	Average	Relative Percent Difference
1,1,1-Trichloroethane	100%	25	25	50	0.00	25.00	0.00%	25	25	50	0.00	25.00	0.00%
1,1,2,2-Tetrachloroethane	100%	25	25	50	0.00	25.00	0.00%	25	25	50	0.00	25.00	0.00%
1,1,2-Trichloroethane	100%	25	25	50	0.00	25.00	0.00%	25	25	50	0.00	25.00	0.00%
1,1-Dichloroethane	100%	25	25	50	0.00	25.00	0.00%	25	25	50	0.00	25.00	0.00%
1,1-Dichloroethylene	100%	25	25	50	0.00	25.00	0.00%	25	25	50	0.00	25.00	0.00%
1,2-Dichlorobenzene	100%	25	25	50	0.00	25.00	0.00%	25	25	50	0.00	25.00	0.00%
1,2-Dichloroethane	100%	25	25	50	0.00	25.00	0.00%	25	25	50	0.00	25.00	0.00%
1,2-Dichloropropane	100%	25	25	50	0.00	25.00	0.00%	25	25	50	0.00	25.00	0.00%
1,3-Dichlorobenzene	100%	25	25	50	0.00	25.00	0.00%	25	25	50	0.00	25.00	0.00%
1,4-Dichlorobenzene	100%	25	25	50	0.00	25.00	0.00%	25	25	50	0.00	25.00	0.00%
Benzene	100%	25	25	50	0.00	25.00	0.00%	25	25	50	0.00	25.00	0.00%
Bromodichloromethane	100%	25	25	50	0.00	25.00	0.00%	25	25	50	0.00	25.00	0.00%
Bromoform	100%	25	25	50	0.00	25.00	0.00%	25	25	50	0.00	25.00	0.00%
Bromomethane	100%	20	20	100	0.00	20.00	0.00%	20	20	100	0.00	20.00	0.00%
Carbon Tetrachloride	100%	25	25	50	0.00	25.00	0.00%	25	25	50	0.00	25.00	0.00%
Chlorobenzene	100%	25	25	50	0.00	25.00	0.00%	25	25	50	0.00	25.00	0.00%
Chloroethane	100%	200	200	400	0.00	200.00	0.00%	200	200	400	0.00	200.00	0.00%
Chloroform	100%	25	25	50	0.00	25.00	0.00%	25	25	50	0.00	25.00	0.00%
cis-1,2-Dichloroethylene	100%	25	25	50	0.00	25.00	0.00%	25	25	50	0.00	25.00	0.00%
cis-1,3-Dichloropropene	100%	25	25	50	0.00	25.00	0.00%	25	25	50	0.00	25.00	0.00%
Dibromochloromethane	100%	25	25	50	0.00	25.00	0.00%	25	25	50	0.00	25.00	0.00%
Ethylbenzene	100%	25	25	50	0.00	25.00	0.00%	25	25	50	0.00	25.00	0.00%
Ethylene Dibromide	100%	25	25	50	0.00	25.00	0.00%	25	25	50	0.00	25.00	0.00%
Methyl t-butyl ether (MTBE)	100%	25	25	50	0.00	25.00	0.00%	25	25	50	0.00	25.00	0.00%
Methylene Chloride(Dichloromethane)	100%	25	25	50	0.00	25.00	0.00%	25	25	50	0.00	25.00	0.00%
o-Xylene	100%	25	25	50	0.00	25.00	0.00%	25	25	50	0.00	25.00	0.00%
p+m-Xylene	100%	25	25	50	0.00	25.00	0.00%	25	25	50	0.00	25.00	0.00%
Styrene	100%	25	25	50	0.00	25.00	0.00%	25	25	50	0.00	25.00	0.00%
Tetrachloroethylene	100%	25	25	50	0.00	25.00	0.00%	25	25	50	0.00	25.00	0.00%
Toluene	100%	25	25	50	0.00	25.00	0.00%	25	25	50	0.00	25.00	0.00%
Total Xylenes	100%	50	50	100	0.00	50.00	0.00%	50	50	100	0.00	50.00	0.00%
trans-1,2-Dichloroethylene	100%	25	25	50	0.00	25.00	0.00%	25	25	50	0.00	25.00	0.00%
trans-1,3-Dichloropropene	100%	25	25	50	0.00	25.00	0.00%	25	25	50	0.00	25.00	0.00%
Trichloroethylene	100%	10	10	20	0.00	0.00	0.00%	10	10	20	0.00	10.00	0.00%
Trichlorofluoromethane (FREON 11)	100%	25	25	50	0.00	25.00	0.00%	25	25	50	0.00	25.00	0.00%
Vinyl Chloride	100%	20	20	40	0.00	20.00	0.00%	20	20	40	0.00	20.00	0.00%
						Relative Percent Difference:	**0.00%**					**Relative Percent Difference:**	**0.00%**

BOLD RPD exceeds DQO

Assumptions:

For a difference between a detected value and a non-detected value, the non-detected value is assumed to be 1/2 RDL.

The difference between two non-detected values was considered to be zero

Combined Average % for VOCs in soil is 0

Table 24: VOC's in Soil Analytical Results

Parameters	Data Quality Objective	Cape Makkovik					
		Sample Identification			QA/QC Results		
		UPUMP-SOIL-4 (Dup)	UPUMP-SOIL-1	RDL	Absolute difference	Average	Relative Percent Difference
1,1,1-Trichloroethane	100%	25	25	50	0.00	25.00	0.00%
1,1,2,2-Tetrachloroethane	100%	25	25	50	0.00	25.00	0.00%
1,1,2-Trichloroethane	100%	25	25	50	0.00	25.00	0.00%
1,1-Dichloroethane	100%	25	25	50	0.00	25.00	0.00%
1,1-Dichloroethylene	100%	25	25	50	0.00	25.00	0.00%
1,2-Dichlorobenzene	100%	25	25	50	0.00	25.00	0.00%
1,2-Dichloroethane	100%	25	25	50	0.00	25.00	0.00%
1,2-Dichloropropane	100%	25	25	50	0.00	25.00	0.00%
1,3-Dichlorobenzene	100%	25	25	50	0.00	25.00	0.00%
1,4-Dichlorobenzene	100%	25	25	50	0.00	25.00	0.00%
Benzene	100%	25	25	50	0.00	25.00	0.00%
Bromodichloromethane	100%	25	25	50	0.00	25.00	0.00%
Bromoform	100%	25	25	50	0.00	25.00	0.00%
Bromomethane	100%	50	50	100	0.00	50.00	0.00%
Carbon Tetrachloride	100%	25	25	50	0.00	25.00	0.00%
Chlorobenzene	100%	25	25	50	0.00	25.00	0.00%
Chloroethane	100%	200	200	400	0.00	200.00	0.00%
Chloroform	100%	25	25	50	0.00	25.00	0.00%
cis-1,2-Dichloroethylene	100%	25	25	50	0.00	25.00	0.00%
cis-1,3-Dichloropropene	100%	25	25	50	0.00	25.00	0.00%
Dibromochloromethane	100%	25	25	50	0.00	25.00	0.00%
Ethylbenzene	100%	25	25	50	0.00	25.00	0.00%
Ethylene Dibromide	100%	25	25	50	0.00	25.00	0.00%
Methyl t-butyl ether (MTBE)	100%	25	25	50	0.00	25.00	0.00%
Methylene Chloride(Dichloromethane)	100%	25	25	50	0.00	25.00	0.00%
o-Xylene	100%	25	25	50	0.00	25.00	0.00%
p+m-Xylene	100%	25	25	50	0.00	25.00	0.00%
Styrene	100%	25	25	50	0.00	25.00	0.00%
Tetrachloroethylene	100%	25	25	50	0.00	25.00	0.00%
Toluene	100%	25	25	50	0.00	25.00	0.00%
Total Xylenes	100%	50	50	100	0.00	50.00	0.00%
trans-1,2-Dichloroethylene	100%	25	25	50	0.00	25.00	0.00%
trans-1,3-Dichloropropene	100%	25	25	50	0.00	25.00	0.00%
Trichloroethylene	100%	10	10	20	0.00	0.00	0.00%
Trichlorofluoromethane (FREON 11)	100%	25	25	50	0.00	25.00	0.00%
Vinyl Chloride	100%	20	20	40	0.00	20.00	0.00%
						Relative Percent Difference:	**0.00%**

BOLD RPD exceeds DQO

Assumptions:

For a difference between a detected value and a non-detected value, the non-detected value is assumed to be 1/2 RDL.

The difference between two non-detected values was considered to be zero

Combined Average % for VOCs in soil is 0

Table 25: Pesticides in Soil Analytical Results

Parameters	Data Quality Objective	Cape Makkovik					
		Sample Identification			QA/QC Results		
		1987-SOIL-11 (Dup)	1987-SOIL-2	RDL	Absolute difference	Average	Relative Percent Difference
Bendiocarb	100%	2.5	2.5	5.0	0.00	2.50	0.00%
Demeton-S	100%	2.5	2.5	5.0	0.00	2.50	0.00%
Dichlorvos	100%	2.5	2.5	5.0	0.00	2.50	0.00%
Dimethoate	100%	2.5	2.5	5.0	0.00	2.50	0.00%
Fenchlorphos (Ronnel)	100%	2.5	2.5	5.0	0.00	2.50	0.00%
Fonofos	100%	2.5	2.5	5.0	0.00	2.50	0.00%
Metolachlor	100%	5	5	10	0.00	5.00	0.00%
Mevinphos	100%	2.5	2.5	5.0	0.00	2.50	0.00%
Phosmet	100%	2.5	2.5	5.0	0.00	2.50	0.00%
Triallate	100%	2.5	2.5	5.0	0.00	2.50	0.00%
Trifluralin	100%	2.5	2.5	5.0	0.00	2.50	0.00%
Fenthion	100%	2.5	2.5	5.0	0.00	2.50	0.00%
Ethion	100%	2.5	2.5	5.0	0.00	2.50	0.00%
Guthion (Azinphos-methyl)	100%	2.5	2.5	5.0	0.00	2.50	0.00%
Phorate	100%	2.5	2.5	5.0	0.00	2.50	0.00%
Terbufos	100%	2.5	2.5	5.0	0.00	2.50	0.00%
Aldicarb	100%	2.5	2.5	5.0	0.00	2.50	0.00%
Atrazine	100%	2.5	2.5	5.0	0.00	2.50	0.00%
Carbaryl	100%	2.5	2.5	5.0	0.00	2.50	0.00%
Carbofuran	100%	2.5	2.5	5.0	0.00	2.50	0.00%
Cyanazine (Bladex)	100%	2.5	2.5	5.0	0.00	2.50	0.00%
Diazinon	100%	2.5	2.5	5.0	0.00	2.50	0.00%
Parathion Ethyl	100%	2.5	2.5	5.0	0.00	2.50	0.00%
Parathion Methyl	100%	2.5	2.5	5.0	0.00	2.50	0.00%
Prometryne	100%	2.5	2.5	5.0	0.00	2.50	0.00%
Malathion	100%	2.5	2.5	5.0	0.00	2.50	0.00%
Simazine	100%	2.5	2.5	5.0	0.00	2.50	0.00%
Chlorpyrifos (Dursban)	100%	2.5	2.5	5.0	0.00	2.50	0.00%
	Relative Percent Difference:						**0.00%**

BOLD **RPD exceeds DQO**

Assumptions:

For a difference between a detected value and a non-detected value, the non-detected value is assumed to be 1/2 RDL.

The difference between two non-detected values was considered to be zero

The relative percent difference for pesticides in soil is 0

Table 26: Dioxins & Furans in Soil Analytical Results

Parameters	Data Quality Objective	Cape Makkovik					
		Sample Identification			QA/QC Results		
		1987-SOIL-12 (Dup)	1987-SOIL-3	RDL	Absolute difference	Average	Relative Percent Difference
2,3,7,8-Tetra CDD *	80%	0.497	0.497	0.994	0.00	0.50	0.00%
1,2,3,7,8-Penta CDD *	80%	0.497	0.497	0.994	0.00	0.50	0.00%
1,2,3,4,7,8-Hexa CDD *	80%	1.38	0.497	0.994	0.88	0.94	94.09%
1,2,3,6,7,8-Hexa CDD *	80%	0.281	0.497	0.994	0.22	0.39	55.53%
1,2,3,7,8,9-Hexa CDD *	80%	0.565	0.497	0.994	0.07	0.53	12.81%
1,2,3,4,6,7,8-Hepta CDD *	80%	3.28	0.308	0.994	2.97	1.79	165.66%
Octa CDD *	80%	101	3.80	9.94	97.20	52.40	185.50%
Total Tetra CDD *	80%	0.497	0.497	0.994	0.00	0.50	0.00%
Total Penta CDD *	80%	3.09	0.497	0.994	2.59	1.79	144.58%
Total Hexa CDD *	80%	19.9	0.497	0.994	19.40	10.20	190.25%
Total Hepta CDD *	80%	13.0	0.679	0.994	12.32	6.84	180.14%
2,3,7,8-Tetra CDF **	80%	0.497	0.497	0.994	0.00	0.50	0.00%
1,2,3,7,8-Penta CDF **	80%	0.497	0.497	0.994	0.00	0.50	0.00%
2,3,4,7,8-Penta CDF **	80%	0.497	0.497	0.994	0.00	0.50	0.00%
1,2,3,4,7,8-Hexa CDF **	80%	0.497	0.497	0.994	0.00	0.50	0.00%
1,2,3,6,7,8-Hexa CDF **	80%	0.497	0.497	0.994	0.00	0.50	0.00%
2,3,4,6,7,8-Hexa CDF **	80%	0.497	0.497	0.994	0.00	0.50	0.00%
1,2,3,7,8,9-Hexa CDF **	80%	0.497	0.497	0.994	0.00	0.50	0.00%
1,2,3,4,6,7,8-Hepta CDF **	80%	0.497	0.156	0.994	0.34	0.33	104.44%
1,2,3,4,7,8,9-Hepta CDF **	80%	0.497	0.497	0.994	0.00	0.50	0.00%
Octa CDF **	80%	4.97	0.497	9.94	4.47	2.73	163.64%
Total Tetra CDF **	80%	1.05	0.131	0.994	0.92	0.59	155.63%
Total Penta CDF **	80%	2.28	0.497	0.994	1.78	1.39	128.41%
Total Hexa CDF **	80%	1.15	0.497	0.994	0.65	0.82	79.30%
Total Hepta CDF **	80%	0.497	0.156	0.994	0.34	0.33	104.44%
						Relative Percent Difference:	**70.58%**

BOLD RPD exceeds DQO

Assumptions:

For a difference between a detected value and a non-detected value, the non-detected value is assumed to be 1/2 RDL.

The difference between two non-detected values was considered to be zero

The relative percent difference for Dioxins and Furans in soil is 70.58

Table 27: RCAP in Surface Water Analytical Results

Parameters	Data Quality Objective	Cape Makkovik					
		Sample Identification			QA/QC Results		
		WSUPPLY-SW-4 (Dup)	WSUPPLY-SW-2	RDL	Absolute difference	Average	Relative Percent Difference
Anion Sum	na	0.640	0.650	N/A	0.01	0.65	1.55%
Bicarb. Alkalinity (calc. as CaCO3)	na	14	14	1.0	0.00	14.00	0.00%
Calculated TDS	40%	35	37	1.0	2.00	36.00	5.56%
Carb. Alkalinity (calc. as CaCO3)	na	0.5	0.5	1.0	0.00	0.50	0.00%
Cation Sum	na	0.640	0.700	N/A	0.06	0.67	8.96%
Hardness (CaCO3)	na	17	17	1.0	0.00	17.00	0.00%
Ion Balance (% Difference)	na	0.00	3.70	N/A	3.70	1.85	200.00%
Langelier Index (@ 20C)	na	-2.21	-2.29		0.08	-2.25	-3.56%
Langelier Index (@ 4C)	na	-2.46	-2.54		0.08	-2.50	-3.20%
Nitrate (N)	40%	0.12	0.025	0.050	0.10	0.07	131.03%
Saturation pH (@ 20C)	na	9.51	9.49		0.02	9.50	0.21%
Saturation pH (@ 4C)	na	9.76	9.74		0.02	9.75	0.21%
Inorganics							
Total Alkalinity (Total as CaCO3)	na	14	14	5.0	0.00	14.00	0.00%
Dissolved Chloride (Cl)	40%	12	13	1.0	1.00	12.50	8.00%
Colour	40%	53	56	25	3.00	54.50	5.50%
Nitrate + Nitrite (N)	40%	0.12	0.025	0.050	0.10	0.07	131.03%
Nitrite (N)	40%	0.005	0.005	0.010	0.00	0.01	0.00%
Nitrogen (Ammonia Nitrogen)	40%	0.025	0.025	0.050	0.00	0.03	0.00%
Total Organic Carbon (C)	40%	7.6	7.4	0.50	0.20	7.50	2.67%
Orthophosphate (P)	na	0.005	0.005	0.010	0.00	0.01	0.00%
pH	+-0.06	7.30	7.20	N/A	0.10	7.25	1.38%
Reactive Silica (SiO2)	na	1.0	1.0	0.50	0.00	1.00	0.00%
Dissolved Sulphate (SO4)	40%	1	1	2.0	0.00	1.00	0.00%
Turbidity	40%	0.40	0.70	0.10	0.30	0.55	54.55%
Conductivity	40%	71	69	1.0	2.00	70.00	2.86%
	Relative Percent Difference:						**21.87%**

BOLD **RPD exceeds DQO**

na **Not applicable - Laboratory DQO not specified by CCME (2016b) or calculated parameter**

Assumptions:

For a difference between a detected value and a non-detected value, the non-detected value is assumed to be 1/2 RDL.

The difference between two non-detected values was considered to be zero

The relative percent difference for RCAp in Surface Water is 21.87

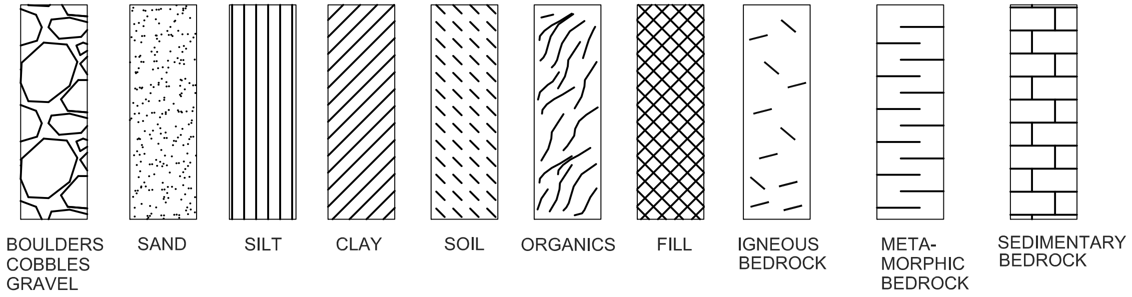
Appendix F

TEST PIT LOGS

TEST PIT LOG

LEGEND

SYMBOL



SAMPLE TYPE

GS – GROUND SAMPLE

HYDROCARBON ODOUR

0 – NONE

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TEST PIT LOG

1

CLIENT	DCC	PROJECT NO.	649806
LOCATION	CAPE MAKKOVIK	BOREHOLE NO.	1
DATE (dd/mm/yy) 13/10/17	EXCAVATION METHOD MANUAL	LOGGED BY:	JASON GREEN

DEPTH (M)	DESCRIPTION	SYMBOL	SAMPLE TYPE	# OF SAMPLES	HYDROCARBON ODOUR PPM	SAMPLE INFORMATION
0	BROWN GRAVEL AND SAND, SOME COBBLES, ORGANICS, COARSE GRAINED, NO ODOUR OR STAINING	▨	GS	1	0	HEL- SOIL - 1 (0 - 0.3m)
0.20		▨				
	END OF TEST PIT (0.3m)					
0.40						
0.60						
0.80						
1.00						

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TEST PIT LOG

2

CLIENT DCC

PROJECT NO. 649806

LOCATION CAPE MAKKOVIK

BOREHOLE NO. 2

DATE (dd/mm/yy) 13/10/17

EXCAVATION METHOD MANUAL

LOGGED BY: JASON GREEN

DEPTH (M)	DESCRIPTION	SYMBOL	SAMPLE TYPE	# OF SAMPLES	HYDROCARBON ODOUR PPM	SAMPLE INFORMATION
0	BROWN GRAVEL AND SAND, SOME COBBLES, ORGANICS, COARSE GRAINED, NO ODOUR OR STAINING	▨	GS	1	0	HEL- SOIL - 2 (0 - 0.3m)
0.20		▨				
	END OF TEST PIT (0.3m)					
0.40						
0.60						
0.80						
1.00						

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TEST PIT LOG

3

CLIENT	DCC	PROJECT NO.	649806
LOCATION	CAPE MAKKOVIK	BOREHOLE NO.	3
DATE (dd/mm/yy)	13/10/17	EXCAVATION METHOD	MANUAL
LOGGED BY:	JASON GREEN		

DEPTH (M)	DESCRIPTION	SYMBOL	SAMPLE TYPE	# OF SAMPLES	HYDROCARBON ODOUR PPM	SAMPLE INFORMATION
0	BROWN GRAVEL AND COARSE GRAINED SAND, DAMP, ORGANICS, NO ODOUR OR STAINING	▨	GS	1	0	HEL- SOIL - 3 (0 - 0.3m)
0.20		▨				
	END OF TEST PIT (0.3m)					
0.40						
0.60						
0.80						
1.00						

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TEST PIT LOG

4

CLIENT	DCC	PROJECT NO.	649806
LOCATION	CAPE MAKKOVIK	BOREHOLE NO.	4
DATE (dd/mm/yy) 13/10/17	EXCAVATION METHOD MANUAL	LOGGED BY:	JASON GREEN

DEPTH (M)	DESCRIPTION	SYMBOL	SAMPLE TYPE	# OF SAMPLES	HYDROCARBON ODOUR PPM	SAMPLE INFORMATION
0	BROWN GRAVEL AND COARSE GRAINED SAND, DAMP, ORGANICS, NO ODOUR OR STAINING	▨	GS	1	0	UAST- SOIL - 1 (0 - 0.3m)
0.20		▨				
	END OF TEST PIT (0.3m)					
0.40						
0.60						
0.80						
1.00						

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TEST PIT LOG

5

CLIENT DCC

PROJECT NO. 649806

LOCATION CAPE MAKKOVIK

BOREHOLE NO. 5

DATE (dd/mm/yy) 13/10/17

EXCAVATION METHOD MANUAL

LOGGED BY: JASON GREEN

DEPTH (M)	DESCRIPTION	SYMBOL	SAMPLE TYPE	# OF SAMPLES	HYDROCARBON ODOUR PPM	SAMPLE INFORMATION
0	BROWN GRAVEL AND COARSE GRAINED SAND, DAMP, ORGANICS, NO ODOUR OR STAINING	▨	GS	1	0	UAST- SOIL - 2 (0 - 0.3m)
0.20		▨				
	END OF TEST PIT (0.3m)					
0.40						
0.60						
0.80						
1.00						

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TEST PIT LOG

6

CLIENT DCC

PROJECT NO. 649806

LOCATION CAPE MAKKOVIK

BOREHOLE NO. 6

DATE (dd/mm/yy) 13/10/17

EXCAVATION METHOD MANUAL

LOGGED BY: JASON GREEN

DEPTH (m)	DESCRIPTION	SYMBOL	SAMPLE TYPE	# OF SAMPLES	HYDROCARBON ODOUR PPM	SAMPLE INFORMATION
0	BROWN GRAVEL AND COARSE GRAINED SAND, WET, ORGANICS, NO ODOUR OR STAINING, SURFACE WATER MIGRATED INTO TEST PIT	▨	GS	1	0	UAST- SOIL - 3 (0 - 0.3m)
0.20						
	END OF TEST PIT (0.3m)					
0.40						
0.60						
0.80						
1.00						

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TEST PIT LOG

7

CLIENT DCC

PROJECT NO. 649806

LOCATION CAPE MAKKOVIK

BOREHOLE NO. 7

DATE (dd/mm/yy) 13/10/17

EXCAVATION METHOD MANUAL

LOGGED BY: JASON GREEN

DEPTH (M)	DESCRIPTION	SYMBOL	SAMPLE TYPE	# OF SAMPLES	HYDROCARBON ODOUR PPM	SAMPLE INFORMATION
0 0.20	BROWN GRAVEL AND COARSE GRAINED SAND, DAMP, NO ODOUR OR STAINING	▨	GS	1	0	UAST- SOIL - 4 (0 - 0.3m)
0.40 0.60 0.80 1.00	END OF TEST PIT (0.3m)					

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TEST PIT LOG

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CLIENT DCC

PROJECT NO. 649806

LOCATION CAPE MAKKOVIK

BOREHOLE NO. 8

DATE (dd/mm/yy) 13/10/17

EXCAVATION METHOD MANUAL

LOGGED BY: JASON GREEN

DEPTH (m)	DESCRIPTION	SYMBOL	SAMPLE TYPE	# OF SAMPLES	HYDROCARBON ODOUR PPM	SAMPLE INFORMATION
0	BROWN GRAVEL AND COARSE GRAINED SAND, DAMP, NO ODOUR OR STAINING	▨	GS	1	0	HANGER- SOIL - 1 (0 - 0.3m)
0.20		▨				
	END OF TEST PIT (0.3m)					
0.40						
0.60						
0.80						
1.00						

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CLIENT DCC

PROJECT NO. 649806

LOCATION CAPE MAKKOVIK

BOREHOLE NO. 9

DATE (dd/mm/yy) 13/10/17

EXCAVATION METHOD MANUAL

LOGGED BY: JASON GREEN

DEPTH (M)	DESCRIPTION	SYMBOL	SAMPLE TYPE	# OF SAMPLES	HYDROCARBON ODOUR PPM	SAMPLE INFORMATION
0	BROWN GRAVEL AND COARSE GRAINED SAND, DAMP, NO ODOUR OR STAINING	▨	GS	1	0	HANGER- SOIL - 2 (0 - 0.3m)
0.20		▨				
	END OF TEST PIT (0.3m)					
0.40						
0.60						
0.80						
1.00						

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TEST PIT LOG

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CLIENT DCC

PROJECT NO. 649806

LOCATION CAPE MAKKOVIK

BOREHOLE NO. 10

DATE (dd/mm/yy) 13/10/17

EXCAVATION METHOD MANUAL

LOGGED BY: JASON GREEN

DEPTH (M)	DESCRIPTION	SYMBOL	SAMPLE TYPE	# OF SAMPLES	HYDROCARBON ODOUR PPM	SAMPLE INFORMATION
0	BROWN GRAVEL AND COARSE GRAINED SAND, DAMP, NO ODOUR OR STAINING	▨	GS	1	0	HANGER- SOIL - 3 (0 - 0.3m)
0.20						
	END OF TEST PIT (0.3m)					
0.40						
0.60						
0.80						
1.00						

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CLIENT DCC

PROJECT NO. 649806

LOCATION CAPE MAKKOVIK

BOREHOLE NO. 11

DATE (dd/mm/yy) 13/10/17

EXCAVATION METHOD MANUAL

LOGGED BY: JASON GREEN

DEPTH (M)	DESCRIPTION	SYMBOL	SAMPLE TYPE	# OF SAMPLES	HYDROCARBON ODOUR PPM	SAMPLE INFORMATION
0	BROWN GRAVEL AND COARSE GRAINED SAND, DAMP, NO ODOUR OR STAINING	▨	GS	1	0	HANGER- SOIL - 4 (0 - 0.3m)
0.20		▨				
	END OF TEST PIT (0.3m)					
0.40						
0.60						
0.80						
1.00						

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CLIENT DCC

PROJECT NO. 649806

LOCATION CAPE MAKKOVIK

BOREHOLE NO. 12

DATE (dd/mm/yy) 13/10/17

EXCAVATION METHOD MANUAL

LOGGED BY: JASON GREEN

DEPTH (M)	DESCRIPTION	SYMBOL	SAMPLE TYPE	# OF SAMPLES	HYDROCARBON ODOUR PPM	SAMPLE INFORMATION
0	BROWN GRAVEL AND COARSE GRAINED SAND, DAMP, NO ODOUR OR STAINING	▨	GS	1	0	RADOME- SOIL - 1 (0 - 0.3m)
0.20		▨				
	END OF TEST PIT (0.3m)					
0.40						
0.60						
0.80						
1.00						

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CLIENT DCC

PROJECT NO. 649806

LOCATION CAPE MAKKOVIK

BOREHOLE NO. 13

DATE (dd/mm/yy) 13/10/17

EXCAVATION METHOD MANUAL

LOGGED BY: JASON GREEN

DEPTH (m)	DESCRIPTION	SYMBOL	SAMPLE TYPE	# OF SAMPLES	HYDROCARBON ODOUR PPM	SAMPLE INFORMATION
0	BROWN GRAVEL AND COARSE GRAINED SAND, DAMP, NO ODOUR OR STAINING	▨	GS	1	0	RADOME- SOIL - 2 (0 - 0.3m)
0.20						
	END OF TEST PIT (0.3m)					
0.40						
0.60						
0.80						
1.00						

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CLIENT DCC

PROJECT NO. 649806

LOCATION CAPE MAKKOVIK

BOREHOLE NO. 14

DATE (dd/mm/yy) 13/10/17

EXCAVATION METHOD MANUAL

LOGGED BY: JASON GREEN

DEPTH (M)	DESCRIPTION	SYMBOL	SAMPLE TYPE	# OF SAMPLES	HYDROCARBON ODOUR PPM	SAMPLE INFORMATION
0	BROWN GRAVEL AND COARSE GRAINED SAND, DAMP, NO ODOUR OR STAINING	▨	GS	1	0	RADOME- SOIL - 3 (0 - 0.3m)
0.20						
	END OF TEST PIT (0.3m)					
0.40						
0.60						
0.80						
1.00						

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CLIENT DCC

PROJECT NO. 649806

LOCATION CAPE MAKKOVIK

BOREHOLE NO. 15

DATE (dd/mm/yy) 13/10/17

EXCAVATION METHOD MANUAL

LOGGED BY: JASON GREEN

DEPTH (m)	DESCRIPTION	SYMBOL	SAMPLE TYPE	# OF SAMPLES	HYDROCARBON ODOUR PPM	SAMPLE INFORMATION
0	BROWN COARSE GRAINED SAND AND PEBBLES, SOME GRAVEL, TRACE ORGANICS, DAMP, NO ODOUR OR STAINING	▨	GS	1	0	TOWER- SOIL - 1 (0 - 0.3m)
0.20		▨				
	END OF TEST PIT (0.3m)					
0.40						
0.60						
0.80						
1.00						

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CLIENT DCC

PROJECT NO. 649806

LOCATION CAPE MAKKOVIK

BOREHOLE NO. 16

DATE (dd/mm/yy) 13/10/17

EXCAVATION METHOD MANUAL

LOGGED BY: JASON GREEN

DEPTH (m)	DESCRIPTION	SYMBOL	SAMPLE TYPE	# OF SAMPLES	HYDROCARBON ODOUR PPM	SAMPLE INFORMATION
0	BROWN COARSE GRAINED SAND, PEBBLE AND GRAVEL, DAMP, NO ODOUR OR STAINING	▨	GS	1	0	TOWER- SOIL - 2 (0 - 0.3m)
0.20						
	END OF TEST PIT (0.3m)					
0.40						
0.60						
0.80						
1.00						

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CLIENT DCC

PROJECT NO. 649806

LOCATION CAPE MAKKOVIK

BOREHOLE NO. 17

DATE (dd/mm/yy) 13/10/17

EXCAVATION METHOD MANUAL

LOGGED BY: JASON GREEN

DEPTH (M)	DESCRIPTION	SYMBOL	SAMPLE TYPE	# OF SAMPLES	HYDROCARBON ODOUR PPM	SAMPLE INFORMATION
0	DARK BROWN COARSE GRAINED SAND, PEBBLES AND GRAVEL, TRACE ORGANICS, DAMP, NO ODOUR OR STAINING	▨	GS	1	0	TOWER- SOIL - 3 (0 - 0.3m)
0.20		▨				
	END OF TEST PIT (0.3m)					
0.40						
0.60						
0.80						
1.00						

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CLIENT DCC

PROJECT NO. 649806

LOCATION CAPE MAKKOVIK

BOREHOLE NO. 18

DATE (dd/mm/yy) 13/10/17

EXCAVATION METHOD MANUAL

LOGGED BY: JASON GREEN

DEPTH (m)	DESCRIPTION	SYMBOL	SAMPLE TYPE	# OF SAMPLES	HYDROCARBON ODOUR PPM	SAMPLE INFORMATION
0	BROWN COARSE GRAINED SAND, GRAVEL AND COBBLE, DAMP, NO ODOUR OR STAINING	▨	GS	1	0	TOWER- SOIL - 4 (0 - 0.3m)
0.20		▨				
	END OF TEST PIT (0.3m)					
0.40						
0.60						
0.80						
1.00						

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CLIENT DCC

PROJECT NO. 649806

LOCATION CAPE MAKKOVIK

BOREHOLE NO. 19

DATE (dd/mm/yy) 13/10/17

EXCAVATION METHOD MANUAL

LOGGED BY: JASON GREEN

DEPTH (m)	DESCRIPTION	SYMBOL	SAMPLE TYPE	# OF SAMPLES	HYDROCARBON ODOUR PPM	SAMPLE INFORMATION
0	DARK BROWN COARSE GRAINED SAND WITH PEBBLES AND GRAVEL, DAMP,ORGANICS, NO ODOUR OR STAINING	▨	GS	1	0	SHACK - SOIL - 1 (0 - 0.3m)
0.20						
	END OF TEST PIT (0.3m)					
0.40						
0.60						
0.80						
1.00						

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CLIENT DCC

PROJECT NO. 649806

LOCATION CAPE MAKKOVIK

BOREHOLE NO. 20

DATE (dd/mm/yy) 13/10/17

EXCAVATION METHOD MANUAL

LOGGED BY: JASON GREEN

DEPTH (M)	DESCRIPTION	SYMBOL	SAMPLE TYPE	# OF SAMPLES	HYDROCARBON ODOUR PPM	SAMPLE INFORMATION
0	DARK BROWN COARSE GRAINED SAND WITH PEBBLES AND GRAVEL, DAMP,ORGANICS, NO ODOUR OR STAINING	▨	GS	1	0	SHACK - SOIL - 2 (0 - 0.3m)
0.20		▨				
	END OF TEST PIT (0.3m)					
0.40						
0.60						
0.80						
1.00						

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CLIENT DCC

PROJECT NO. 649806

LOCATION CAPE MAKKOVIK

BOREHOLE NO. 21

DATE (dd/mm/yy) 13/10/17

EXCAVATION METHOD MANUAL

LOGGED BY: JASON GREEN

DEPTH (M)	DESCRIPTION	SYMBOL	SAMPLE TYPE	# OF SAMPLES	HYDROCARBON ODOUR PPM	SAMPLE INFORMATION
0	DARK BROWN COARSE GRAINED SAND WITH PEBBLES AND GRAVEL, DAMP,ORGANICS, NO ODOUR OR STAINING	▨	GS	1	0	SHACK - SOIL - 3 (0 - 0.3m)
0.20		▨				
	END OF TEST PIT (0.3m)					
0.40						
0.60						
0.80						
1.00						

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CLIENT	DCC	PROJECT NO.	649806
LOCATION	CAPE MAKKOVIK	BOREHOLE NO.	22
DATE (dd/mm/yy)	14/10/17	EXCAVATION METHOD	MANUAL
LOGGED BY:	JASON GREEN		

DEPTH (M)	DESCRIPTION	SYMBOL	SAMPLE TYPE	# OF SAMPLES	HYDROCARBON ODOUR PPM	SAMPLE INFORMATION
0	BROWN SILTY SAND WITH COBBLE, DAMP, ORGANICS, NO ODOUR OR STAINING	▨	GS	1	0	1987 - SOIL - 1 (0 - 0.5m)
0.20						
0.40						
	END OF TEST PIT DUE TO BURIED DEBRIS (0.5m)					
0.60						
0.80						
1.00						

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CLIENT	DCC	PROJECT NO.	649806
LOCATION	CAPE MAKKOVIK	BOREHOLE NO.	23
DATE (dd/mm/yy)	14/10/17	EXCAVATION METHOD	MANUAL
LOGGED BY:	JASON GREEN		

DEPTH (M)	DESCRIPTION	SYMBOL	SAMPLE TYPE	# OF SAMPLES	HYDROCARBON ODOUR PPM	SAMPLE INFORMATION
0	BROWN SILTY SAND WITH COBBLE, DAMP, ORGANICS, NO ODOUR OR STAINING		GS	1	0	1987 - SOIL - 2 (0 - 0.5m)
0.20						
0.40						
	END OF TEST PIT DUE TO BURIED DEBRIS (0.5m)					
0.60						
0.80						
1.00						

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CLIENT	DCC	PROJECT NO.	649806
LOCATION	CAPE MAKKOVIK	BOREHOLE NO.	24
DATE (dd/mm/yy)	14/10/17	EXCAVATION METHOD	MANUAL
LOGGED BY:	JASON GREEN		

DEPTH (M)	DESCRIPTION	SYMBOL	SAMPLE TYPE	# OF SAMPLES	HYDROCARBON ODOUR PPM	SAMPLE INFORMATION
0 0.20 0.40	BROWN SILTY SAND AND COARSE GRAINED SAND, TRACE ORGANICS, DAMP, NO ODOUR OR STAINING	▨	GS	1	0	1987 - SOIL - 3 (0 - 0.5m)
0.60 0.80 1.00	END OF TEST PIT DUE TO BURIED DEBRIS (0.5m)					

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CLIENT DCC

PROJECT NO. 649806

LOCATION CAPE MAKKOVIK

BOREHOLE NO. 25

DATE (dd/mm/yy) 14/10/17

EXCAVATION METHOD MANUAL

LOGGED BY: JASON GREEN

DEPTH (M)	DESCRIPTION	SYMBOL	SAMPLE TYPE	# OF SAMPLES	HYDROCARBON ODOUR PPM	SAMPLE INFORMATION
0	BROWN SILTY SAND AND COARSE GRAINED SAND, TRACE ORGANICS, DAMP, NO ODOUR OR STAINING	▨	GS	1	0	1987 - SOIL - 4 (0 - 0.5m)
0.20						
0.40						
	END OF TEST PIT DUE TO BURIED DEBRIS (0.5m)					
0.60						
0.80						
1.00						

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CLIENT: DCC

PROJECT NO.: 649806

LOCATION: CAPE MAKKOVIK

BOREHOLE NO.: 26

DATE (dd/mm/yy): 14/10/17

EXCAVATION METHOD: MANUAL

LOGGED BY: JASON GREEN

DEPTH (M)	DESCRIPTION	SYMBOL	SAMPLE TYPE	# OF SAMPLES	HYDROCARBON ODOUR PPM	SAMPLE INFORMATION
0	BROWN SILTY SAND AND COARSE GRAINED SAND, TRACE ORGANICS, DAMP, NO ODOUR OR STAINING	▨	GS	1	0	1987 - SOIL - 5 (0 - 0.5m)
0.20		▨				
0.40		▨				
	END OF TEST PIT DUE TO BURIED DEBRIS (0.5m)					
0.60						
0.80						
1.00						

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CLIENT DCC

PROJECT NO. 649806

LOCATION CAPE MAKKOVIK

BOREHOLE NO. 27

DATE (dd/mm/yy) 14/10/17

EXCAVATION METHOD MANUAL

LOGGED BY: JASON GREEN

DEPTH (M)	DESCRIPTION	SYMBOL	SAMPLE TYPE	# OF SAMPLES	HYDROCARBON ODOUR PPM	SAMPLE INFORMATION
0	BROWN SILTY SAND AND COARSE GRAINED SAND, TRACE ORGANICS, DAMP, NO ODOUR OR STAINING		GS	1	0	1987 - SOIL - 6 (0 - 0.6m)
0.20						
0.40						
0.60	END OF TEST PIT (0.6m)					
0.80						
1.00						

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CLIENT DCC

PROJECT NO. 649806

LOCATION CAPE MAKKOVIK

BOREHOLE NO. 28

DATE (dd/mm/yy) 14/10/17

EXCAVATION METHOD MANUAL

LOGGED BY: JASON GREEN

DEPTH (M)	DESCRIPTION	SYMBOL	SAMPLE TYPE	# OF SAMPLES	HYDROCARBON ODOUR PPM	SAMPLE INFORMATION
0	BROWN SILTY SAND AND COARSE GRAINED SAND, TRACE ORGANICS, DAMP, NO ODOUR OR STAINING	▨	GS	1	0	1987 - SOIL - 7 (0 - 0.6m)
0.20		▨				
0.40		▨				
0.60	END OF TEST PIT (0.6m)					
0.80						
1.00						

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CLIENT DCC

PROJECT NO. 649806

LOCATION CAPE MAKKOVIK

BOREHOLE NO. 29

DATE (dd/mm/yy) 14/10/17

EXCAVATION METHOD MANUAL

LOGGED BY: JASON GREEN

DEPTH (M)	DESCRIPTION	SYMBOL	SAMPLE TYPE	# OF SAMPLES	HYDROCARBON ODOUR PPM	SAMPLE INFORMATION
0	BROWN SILTY SAND AND COARSE GRAINED SAND, TRACE ORGANICS, DAMP, NO ODOUR OR STAINING	▨	GS	1	0	1987 - SOIL - 8 (0 - 0.6m)
0.20						
0.40						
0.60	END OF TEST PIT (0.6m)					
0.80						
1.00						

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CLIENT	DCC	PROJECT NO.	649806
LOCATION	CAPE MAKKOVIK	BOREHOLE NO.	30
DATE (dd/mm/yy)	14/10/17	EXCAVATION METHOD	MANUAL
LOGGED BY:	JASON GREEN		

DEPTH (M)	DESCRIPTION	SYMBOL	SAMPLE TYPE	# OF SAMPLES	HYDROCARBON ODOUR PPM	SAMPLE INFORMATION
0	BROWN SILTY SAND AND COARSE GRAINED SAND, TRACE ORGANICS, DAMP, NO ODOUR OR STAINING	▨	GS	1	0	1987 - SOIL - 9 (0 - 0.6m)
0.20		▨				
0.40		▨				
0.60	END OF TEST PIT (0.6m)					
0.80						
1.00						

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CLIENT DCC

PROJECT NO. 649806

LOCATION CAPE MAKKOVIK

BOREHOLE NO. 31

DATE (dd/mm/yy) 14/10/17

EXCAVATION METHOD MANUAL

LOGGED BY: JASON GREEN

DEPTH (M)	DESCRIPTION	SYMBOL	SAMPLE TYPE	# OF SAMPLES	HYDROCARBON ODOUR PPM	SAMPLE INFORMATION
0	BROWN SILTY SAND AND COARSE GRAINED SAND, TRACE ORGANICS, DAMP, NO ODOUR OR STAINING	▨	GS	1	0	1987 - SOIL - 10 (0 - 0.6m)
0.20						
0.40						
0.60	END OF TEST PIT (0.6m)					
0.80						
1.00						

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CLIENT	DCC	PROJECT NO.	649806
LOCATION	CAPE MAKKOVIK	BOREHOLE NO.	32
DATE (dd/mm/yy) 14/10/17	EXCAVATION METHOD MANUAL	LOGGED BY:	JASON GREEN

DEPTH (M)	DESCRIPTION	SYMBOL	SAMPLE TYPE	# OF SAMPLES	HYDROCARBON ODOUR PPM	SAMPLE INFORMATION
0	BROWN / GREY COARSE GRAIN SAND WITH PEBBLE AND GRAVEL, ORGANICS, DAMP, NO ODOUR OR STAINING	▨	GS	1	0	SEPTIC - SOIL - 1 (0 - 0.3m)
0.20						
	END OF TEST PIT (0.3m)					
0.40						
0.60						
0.80						
1.00						

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CLIENT DCC

PROJECT NO. 649806

LOCATION CAPE MAKKOVIK

BOREHOLE NO. 33

DATE (dd/mm/yy) 14/10/17

EXCAVATION METHOD MANUAL

LOGGED BY: JASON GREEN

DEPTH (M)	DESCRIPTION	SYMBOL	SAMPLE TYPE	# OF SAMPLES	HYDROCARBON ODOUR PPM	SAMPLE INFORMATION
0	BROWN / GREY COARSE GRAIN SAND WITH PEBBLE AND GRAVEL, ORGANICS, DAMP, NO ODOUR OR STAINING	▨	GS	1	0	SEPTIC - SOIL - 2 (0 - 0.3m)
0.20		▨				
	END OF TEST PIT (0.3m)					
0.40						
0.60						
0.80						
1.00						

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CLIENT DCC

PROJECT NO. 649806

LOCATION CAPE MAKKOVIK

BOREHOLE NO. 34

DATE (dd/mm/yy) 14/10/17

EXCAVATION METHOD MANUAL

LOGGED BY: JASON GREEN

DEPTH (M)	DESCRIPTION	SYMBOL	SAMPLE TYPE	# OF SAMPLES	HYDROCARBON ODOUR PPM	SAMPLE INFORMATION
0	BROWN COARSE GRAIN SAND WITH PEBBLE AND GRAVEL, ORGANICS, DAMP, NO ODOUR OR STAINING	▨	GS	1	0	SEPTIC - SOIL - 3 (0 - 0.3m)
0.20		▨				
	END OF TEST PIT (0.3m)					
0.40						
0.60						
0.80						
1.00						

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CLIENT	DCC	PROJECT NO.	649806
LOCATION	CAPE MAKKOVIK	BOREHOLE NO.	35
DATE (dd/mm/yy) 14/10/17	EXCAVATION METHOD MANUAL	LOGGED BY:	JASON GREEN

DEPTH (M)	DESCRIPTION	SYMBOL	SAMPLE TYPE	# OF SAMPLES	HYDROCARBON ODOUR PPM	SAMPLE INFORMATION
0	BROWN / GREY COARSE GRAIN SAND WITH PEBBLE, GRAVEL AND COBBLE, DAMP, TRACE ORGANICS, NO ODOUR OR STAINING	▨	GS	1	0	PIPELINE - SOIL - 1 (0 - 0.3m)
0.20						
	END OF TEST PIT (0.3m)					
0.40						
0.60						
0.80						
1.00						

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CLIENT DCC

PROJECT NO. 649806

LOCATION CAPE MAKKOVIK

BOREHOLE NO. 36

DATE (dd/mm/yy) 14/10/17

EXCAVATION METHOD MANUAL

LOGGED BY: JASON GREEN

DEPTH (M)	DESCRIPTION	SYMBOL	SAMPLE TYPE	# OF SAMPLES	HYDROCARBON ODOUR PPM	SAMPLE INFORMATION
0	BROWN / GREY COARSE GRAIN SAND WITH PEBBLE, GRAVEL AND COBBLE, DAMP, TRACE ORGANICS, NO ODOUR OR STAINING	▨	GS	1	0	PIPELINE - SOIL - 2 (0 - 0.3m)
0.20		▨				
	END OF TEST PIT (0.3m)					
0.40						
0.60						
0.80						
1.00						

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CLIENT DCC

PROJECT NO. 649806

LOCATION CAPE MAKKOVIK

BOREHOLE NO. 37

DATE (dd/mm/yy) 15/10/17

EXCAVATION METHOD MANUAL

LOGGED BY: JASON GREEN

DEPTH (M)	DESCRIPTION	SYMBOL	SAMPLE TYPE	# OF SAMPLES	HYDROCARBON ODOUR PPM	SAMPLE INFORMATION
0	GREY COARSE GRAIN SAND WITH PEBBLE, GRAVEL AND COBBLE, DAMP, ORGANICS, NO ODOUR OR STAINING	▨	GS	1	0	LAST - SOIL - 1 (0 - 0.3m)
0.20		▨				
	END OF TEST PIT (0.3m)					
0.40						
0.60						
0.80						
1.00						

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TEST PIT LOG

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CLIENT	DCC	PROJECT NO.	649806
LOCATION	CAPE MAKKOVIK	BOREHOLE NO.	38
DATE (dd/mm/yy) 15/10/17	EXCAVATION METHOD MANUAL	LOGGED BY:	JASON GREEN

DEPTH (M)	DESCRIPTION	SYMBOL	SAMPLE TYPE	# OF SAMPLES	HYDROCARBON ODOUR PPM	SAMPLE INFORMATION
0	GREY COARSE GRAIN SAND WITH PEBBLE, GRAVEL AND COBBLE, DAMP, ORGANICS, NO ODOUR OR STAINING	▨	GS	1	0	LAST - SOIL - 2 (0 - 0.3m)
0.20						
	END OF TEST PIT (0.3m)					
0.40						
0.60						
0.80						
1.00						

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CLIENT DCC

PROJECT NO. 649806

LOCATION CAPE MAKKOVIK

BOREHOLE NO. 39

DATE (dd/mm/yy) 15/10/17

EXCAVATION METHOD MANUAL

LOGGED BY: JASON GREEN

DEPTH (M)	DESCRIPTION	SYMBOL	SAMPLE TYPE	# OF SAMPLES	HYDROCARBON ODOUR PPM	SAMPLE INFORMATION
0	GREY COARSE GRAIN SAND WITH PEBBLE, GRAVEL AND COBBLE, DAMP, ORGANICS, NO ODOUR OR STAINING	▨	GS	1	0	LAST - SOIL - 3 (0 - 0.3m)
0.20						
	END OF TEST PIT (0.3m)					
0.40						
0.60						
0.80						
1.00						

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CLIENT DCC

PROJECT NO. 649806

LOCATION CAPE MAKKOVIK

BOREHOLE NO. 40

DATE (dd/mm/yy) 15/10/17

EXCAVATION METHOD MANUAL

LOGGED BY: JASON GREEN

DEPTH (M)	DESCRIPTION	SYMBOL	SAMPLE TYPE	# OF SAMPLES	HYDROCARBON ODOUR PPM	SAMPLE INFORMATION
0	GREY COARSE GRAIN SAND WITH PEBBLE, GRAVEL AND COBBLE, DAMP, ORGANICS, NO ODOUR OR STAINING	▨	GS	1	0	LAST - SOIL - 4 (0 - 0.3m)
0.20		▨				
	END OF TEST PIT (0.3m)					
0.40						
0.60						
0.80						
1.00						

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CLIENT DCC

PROJECT NO. 649806

LOCATION CAPE MAKKOVIK

BOREHOLE NO. 41

DATE (dd/mm/yy) 15/10/17

EXCAVATION METHOD MANUAL

LOGGED BY: JASON GREEN

DEPTH (M)	DESCRIPTION	SYMBOL	SAMPLE TYPE	# OF SAMPLES	HYDROCARBON ODOUR PPM	SAMPLE INFORMATION
0	DARK BROWN COARSE GRAIN AND SILTY SAND WITH COBBLE, ORGANICS, DAMP, NO ODOUR OR STAINING	▨	GS	1	0	DRUM - SOIL - 1 (0 - 0.3m)
0.20		▨				
	END OF TEST PIT (0.3m)					
0.40						
0.60						
0.80						
1.00						

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CLIENT	DCC	PROJECT NO.	649806
LOCATION	CAPE MAKKOVIK	BOREHOLE NO.	42
DATE (dd/mm/yy) 15/10/17	EXCAVATION METHOD MANUAL	LOGGED BY:	JASON GREEN

DEPTH (M)	DESCRIPTION	SYMBOL	SAMPLE TYPE	# OF SAMPLES	HYDROCARBON ODOUR PPM	SAMPLE INFORMATION
0	DARK BROWN COARSE GRAIN AND SILTY SAND WITH TRACE GRAVEL, ORGANICS, DAMP, NO ODOUR OR STAINING	▨	GS	1	0	DRUM - SOIL - 2 (0 - 0.3m)
0.20		▨				
	END OF TEST PIT (0.3m)					
0.40						
0.60						
0.80						
1.00						

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CLIENT DCC

PROJECT NO. 649806

LOCATION CAPE MAKKOVIK

BOREHOLE NO. 43

DATE (dd/mm/yy) 15/10/17

EXCAVATION METHOD MANUAL

LOGGED BY: JASON GREEN

DEPTH (M)	DESCRIPTION	SYMBOL	SAMPLE TYPE	# OF SAMPLES	HYDROCARBON ODOUR PPM	SAMPLE INFORMATION
0	DARK BROWN COARSE GRAIN AND SILTY SAND WITH TRACE GRAVEL, ORGANICS, DAMP, NO ODOUR OR STAINING	▨	GS	1	0	DRUM - SOIL - 3 (0 - 0.3m)
0.20						
	END OF TEST PIT (0.3m)					
0.40						
0.60						
0.80						
1.00						

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CLIENT DCC

PROJECT NO. 649806

LOCATION CAPE MAKKOVIK

BOREHOLE NO. 44

DATE (dd/mm/yy) 15/10/17

EXCAVATION METHOD MANUAL

LOGGED BY: JASON GREEN

DEPTH (M)	DESCRIPTION	SYMBOL	SAMPLE TYPE	# OF SAMPLES	HYDROCARBON ODOUR PPM	SAMPLE INFORMATION
0	BROWN COARSE AND SILTY SAND WITH PEBBLE AND GRAVEL, ORGANICS, DAMP, NO ODOUR OR STAINING	▨	GS	1	0	PIPELINE - SOIL - 4 (0 - 0.3m)
0.20						
	END OF TEST PIT (0.3m)					
0.40						
0.60						
0.80						
1.00						

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CLIENT DCC

PROJECT NO. 649806

LOCATION CAPE MAKKOVIK

BOREHOLE NO. 45

DATE (dd/mm/yy) 17/10/17

EXCAVATION METHOD MANUAL

LOGGED BY: JASON GREEN

DEPTH (M)	DESCRIPTION	SYMBOL	SAMPLE TYPE	# OF SAMPLES	HYDROCARBON ODOUR PPM	SAMPLE INFORMATION
0	MIXTURE OF BROWN MOSS, COARSE GRAIN SAND AND GRAVEL, ORGANICS, DAMP, NO ODOUR OR STAINING	▨	GS	1	0	UPUMP - SOIL - 1 (0 - 0.3m)
0.20		▨				
	END OF TEST PIT (0.3m)					
0.40						
0.60						
0.80						
1.00						

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CLIENT DCC

PROJECT NO. 649806

LOCATION CAPE MAKKOVIK

BOREHOLE NO. 46

DATE (dd/mm/yy) 17/10/17

EXCAVATION METHOD MANUAL

LOGGED BY: JASON GREEN

DEPTH (M)	DESCRIPTION	SYMBOL	SAMPLE TYPE	# OF SAMPLES	HYDROCARBON ODOUR PPM	SAMPLE INFORMATION
0	BROWN COARSE GRAIN AND SILTY SAND AND GRAVEL, ORGANICS, DAMP, NO ODOUR OR STAINING	▨	GS	1	0	UPUMP - SOIL - 2 (0 - 0.3m)
0.20		▨				
	END OF TEST PIT (0.3m)					
0.40						
0.60						
0.80						
1.00						

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CLIENT	DCC	PROJECT NO.	649806
LOCATION	CAPE MAKKOVIK	BOREHOLE NO.	47
DATE (dd/mm/yy) 17/10/17	EXCAVATION METHOD MANUAL	LOGGED BY:	JASON GREEN

DEPTH (M)	DESCRIPTION	SYMBOL	SAMPLE TYPE	# OF SAMPLES	HYDROCARBON ODOUR PPM	SAMPLE INFORMATION
0	BROWN COARSE GRAIN AND SILTY SAND AND GRAVEL, ORGANICS, DAMP, NO ODOUR OR STAINING	▨	GS	1	0	UPUMP - SOIL - 3 (0 - 0.3m)
0.20		▨				
	END OF TEST PIT (0.3m)					
0.40						
0.60						
0.80						
1.00						

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CLIENT DCC

PROJECT NO. 649806

LOCATION CAPE MAKKOVIK

BOREHOLE NO. 48

DATE (dd/mm/yy) 17/10/17

EXCAVATION METHOD MANUAL

LOGGED BY: JASON GREEN

DEPTH (M)	DESCRIPTION	SYMBOL	SAMPLE TYPE	# OF SAMPLES	HYDROCARBON ODOUR PPM	SAMPLE INFORMATION
0	BROWN / GREY COARSE GRAIN SAND WITH PEBBLE AND GRAVEL, DAMP, ORGANICS, NO ODOUR OR STAINING	▨	GS	1	0	PIPELINE - SOIL - 3 (0 - 0.3m)
0.20		▨				
	END OF TEST PIT (0.3m)					
0.40						
0.60						
0.80						
1.00						

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CLIENT DCC

PROJECT NO. 649806

LOCATION CAPE MAKKOVIK

BOREHOLE NO. 49

DATE (dd/mm/yy) 17/10/17

EXCAVATION METHOD MANUAL

LOGGED BY: JASON GREEN

DEPTH (M)	DESCRIPTION	SYMBOL	SAMPLE TYPE	# OF SAMPLES	HYDROCARBON ODOUR PPM	SAMPLE INFORMATION
0	MIXTURE OF BROWN MOSS, COARSE GRAIN SAND AND PEBBLE, ORGANICS, DAMP, NO ODOUR OR STAINING	▨	GS	1	0	LPUMP - SOIL - 1 (0 - 0.3m)
0.20						
	END OF TEST PIT (0.3m)					
0.40						
0.60						
0.80						
1.00						

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CLIENT DCC

PROJECT NO. 649806

LOCATION CAPE MAKKOVIK

BOREHOLE NO. 50

DATE (dd/mm/yy) 17/10/17

EXCAVATION METHOD MANUAL

LOGGED BY: JASON GREEN

DEPTH (M)	DESCRIPTION	SYMBOL	SAMPLE TYPE	# OF SAMPLES	HYDROCARBON ODOUR PPM	SAMPLE INFORMATION
0 0.20	MIXTURE OF BROWN MOSS, COARSE GRAIN SAND AND PEBBLE, ORGANICS, DAMP, NO ODOUR OR STAINING	▨	GS	1	0	LPUMP - SOIL - 2 (0 - 0.3m)
0.40 0.60 0.80 1.00	END OF TEST PIT (0.3m)					

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CLIENT DCC

PROJECT NO. 649806

LOCATION CAPE MAKKOVIK

BOREHOLE NO. 51

DATE (dd/mm/yy) 17/10/17

EXCAVATION METHOD MANUAL

LOGGED BY: JASON GREEN

DEPTH (M)	DESCRIPTION	SYMBOL	SAMPLE TYPE	# OF SAMPLES	HYDROCARBON ODOUR PPM	SAMPLE INFORMATION
0	MIXTURE OF BROWN MOSS, COARSE GRAIN SAND AND PEBBLE, ORGANICS, DAMP, NO ODOUR OR STAINING	▨	GS	1	0	LPUMP - SOIL - 3 (0 - 0.3m)
0.20						
	END OF TEST PIT (0.3m)					
0.40						
0.60						
0.80						
1.00						

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CLIENT DCC

PROJECT NO. 649806

LOCATION CAPE MAKKOVIK

BOREHOLE NO. 52

DATE (dd/mm/yy) 17/10/17

EXCAVATION METHOD MANUAL

LOGGED BY: JASON GREEN

DEPTH (M)	DESCRIPTION	SYMBOL	SAMPLE TYPE	# OF SAMPLES	HYDROCARBON ODOUR PPM	SAMPLE INFORMATION
0	BROWN MOSS AND COARSE GRAIN SAND WITH PEBBLE AND GRAVEL, ORGANICS, DAMP, NO ODOUR OR STAINING	▨	GS	1	0	BG - SOIL - 1 (0 - 0.3m)
0.20		▨				
	END OF TEST PIT (0.3m)					
0.40						
0.60						
0.80						
1.00						

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CLIENT DCC

PROJECT NO. 649806

LOCATION CAPE MAKKOVIK

BOREHOLE NO. 53

DATE (dd/mm/yy) 17/10/17

EXCAVATION METHOD MANUAL

LOGGED BY: JASON GREEN

DEPTH (M)	DESCRIPTION	SYMBOL	SAMPLE TYPE	# OF SAMPLES	HYDROCARBON ODOUR PPM	SAMPLE INFORMATION
0	BROWN MOSS AND COARSE GRAIN SAND WITH PEBBLE AND GRAVEL, ORGANICS, DAMP, NO ODOUR OR STAINING	▨	GS	1	0	BG - SOIL - 2 (0 - 0.3m)
0.20						
	END OF TEST PIT (0.3m)					
0.40						
0.60						
0.80						
1.00						

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CLIENT DCC

PROJECT NO. 649806

LOCATION CAPE MAKKOVIK

BOREHOLE NO. 54

DATE (dd/mm/yy) 17/10/17

EXCAVATION METHOD MANUAL

LOGGED BY: JASON GREEN

DEPTH (M)	DESCRIPTION	SYMBOL	SAMPLE TYPE	# OF SAMPLES	HYDROCARBON ODOUR PPM	SAMPLE INFORMATION
0	GREY / BROWN SILTY AND COARSE GRAIN SAND, WET, ORGANICS, NO ODOUR OR STAINING	▨	GS	1	0	BG - SOIL - 3 (0 - 0.3m)
0.20						
	END OF TEST PIT (0.3m)					
0.40						
0.60						
0.80						
1.00						

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CLIENT DCC

PROJECT NO. 649806

LOCATION CAPE MAKKOVIK

BOREHOLE NO. 55

DATE (dd/mm/yy) 17/10/17

EXCAVATION METHOD MANUAL

LOGGED BY: JASON GREEN

DEPTH (M)	DESCRIPTION	SYMBOL	SAMPLE TYPE	# OF SAMPLES	HYDROCARBON ODOUR PPM	SAMPLE INFORMATION
0	BROWN COARSE GRAIN SAND, ORGANICS, WET, NO ODOUR OR STAINING	▨	GS	1	0	BG - SOIL - 4 (0 - 0.3m)
0.20		▨				
	END OF TEST PIT (0.3m)					
0.40						
0.60						
0.80						
1.00						

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CLIENT	DCC	PROJECT NO.	649806
LOCATION	CAPE MAKKOVIK	BOREHOLE NO.	56
DATE (dd/mm/yy) 17/10/17	EXCAVATION METHOD MANUAL	LOGGED BY:	JASON GREEN

DEPTH (M)	DESCRIPTION	SYMBOL	SAMPLE TYPE	# OF SAMPLES	HYDROCARBON ODOUR PPM	SAMPLE INFORMATION
0 0.20	BROWN / GREY SILTY AND COARSE GRAIN SAND, TRACE GRAVEL, WET, ORGANICS, NO ODOUR OR STAINING	▨	GS	1	0	BG - SOIL - 5 (0 - 0.3m)
0.40 0.60 0.80 1.00	END OF TEST PIT (0.3m)					

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CLIENT	DCC	PROJECT NO.	649806
LOCATION	CAPE MAKKOVIK	BOREHOLE NO.	57
DATE (dd/mm/yy) 17/10/17	EXCAVATION METHOD MANUAL	LOGGED BY:	JASON GREEN

DEPTH (M)	DESCRIPTION	SYMBOL	SAMPLE TYPE	# OF SAMPLES	HYDROCARBON ODOUR PPM	SAMPLE INFORMATION
0	BROWN / GREY SILTY AND COARSE GRAIN SAND, TRACE GRAVEL, WET, ORGANICS, NO ODOUR OR STAINING	▨	GS	1	0	BG - SOIL - 6 (0 - 0.3m)
0.20		▨				
	END OF TEST PIT (0.3m)					
0.40						
0.60						
0.80						
1.00						

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CLIENT DCC

PROJECT NO. 649806

LOCATION CAPE MAKKOVIK

BOREHOLE NO. 58

DATE (dd/mm/yy) 17/10/17

EXCAVATION METHOD MANUAL

LOGGED BY: JASON GREEN

DEPTH (M)	DESCRIPTION	SYMBOL	SAMPLE TYPE	# OF SAMPLES	HYDROCARBON ODOUR PPM	SAMPLE INFORMATION
0	BROWN / BLACK SILTY AND COARSE GRAIN SAND WITH PEBBLE AND GRAVEL, ORGANICS, WET, NO ODOUR OR STAINING	▨	GS	1	0	BG - SOIL - 7 (0 - 0.3m)
0.20						
	END OF TEST PIT (0.3m)					
0.40						
0.60						
0.80						
1.00						

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CLIENT DCC

PROJECT NO. 649806

LOCATION CAPE MAKKOVIK

BOREHOLE NO. 59

DATE (dd/mm/yy) 17/10/17

EXCAVATION METHOD MANUAL

LOGGED BY: JASON GREEN

DEPTH (M)	DESCRIPTION	SYMBOL	SAMPLE TYPE	# OF SAMPLES	HYDROCARBON ODOUR PPM	SAMPLE INFORMATION
0	BROWN COARSE GRAIN SAND WITH PEBBLE AND GRAVEL, ORGANICS, WET, NO ODOUR OR STAINING	▨	GS	1	0	BG - SOIL - 8 (0 - 0.3m)
0.20						
	END OF TEST PIT (0.3m)					
0.40						
0.60						
0.80						
1.00						

Appendix G

PHASE I ESA (GHD, 2016)

Phase I Environmental Site Assessment

Former United States Military Site
Cape Makkovik (Aillik), NL

Department of Environment and Conservation

1118 Topsail Road, PO Box 8353 Station A St. John’s NL A1B 3N7 Canada

089758 | Report No 4 | March 2016

EXECUTIVE SUMMARY

GHD Limited (GHD, formally Conestoga-Rovers & Associates (CRA)) was retained by the Government of Newfoundland & Labrador, Department of Environment and Conservation (ENVC) to complete a Phase I Environmental Site Assessment (ESA) of the former United States (US) Military Site known as Cape Makkovik (Aillik) (Site or Property) located approximately 230 kilometers northeast of the Town of Goose Bay, Newfoundland and Labrador (NL). Based on the information provided to GHD as part of the initial call-up for services under the Impacted Sites Liability Assessment Program, the Site was part of the Pinetree Line.

Around 1951, the US military began construction of the Pinetree Line that was a network of Aircraft Control and Warning (AC&W) stations that acted as a radar curtain to detect Soviet aircraft flying toward potential US and Canadian targets during the Cold War. Construction of the AC&W stations began in 1951 and by the fall of 1953, the 923d Aircraft Control and Warning Squadron was established at USAF Hopedale Air Station (N-28). This squadron had one Gap Filler Detachment within its overall area of responsibility, which was Cape Makkovik N-28A (Call Sign Memorial), established in 1957 as a manned radar station. The Pinetree Line acted as a back-up for the Distant Early Warning (DEW) Line radar curtain located further north across the Arctic of North America.

As a manned Gap Filler radar station, the squadron's role was to provide low-altitude coverage where it was deemed necessary between manned long range radar stations, ultimately to guide interceptor aircraft towards unidentified intruders picked up by the unit's radar scopes. The facility formerly contained a two story/5-unit building housing a garage (i.e. motor pool), a heating and power plant, barracks, office space, and a dining hall. The tower housing the radar and radio equipment (radome) was connected to the main building via a covered corridor. The station was also equipped with two Communication Antennae, a water pumping station, a disaster shack, a large aboveground storage tank (AST), and a helicopter pad, all of which were connected via gravel access roads (see Figure 3). Personnel assigned to the Site ranged from approximately 35 during regular operations in the winter to approximately 50 during the summer due to contractors coming to complete additional work at the Site.

In addition to the Cape Makkovik (Aillik) station facilities on top of the hill (i.e. upper Site), a 2.7 kilometer gravel roadway was constructed to connect the upper portion of the Site to the lower dock area (known as the lower Site). The roadway was used to transport supplies from the dock area to the station (see Figure 2). A second large AST was located near the dock (known as the lower tank farm) and a pipeline was

constructed which pumped diesel fuel from the dock to lower tank farm, which in turn supplied fuel to the AST located at the station (known as the upper tank farm). The pipeline from the lower to the upper tank farm followed the gravel access road (see Figure 4). The fuel was then pumped via a network of aboveground pipelines at the station to supply diesel generators used to power the station.

Other facilities associated with the Cape Makkovik (Aillik) station included a former dump to the northeast of the upper Site (see Figure 2) and a former pumphouse/water supply located to the south of the upper Site. Access to the pumphouse area was via a gravel access road that extended south from the former helipad (see Figure 2). The pumphouse building was equipped with water filtration and purification equipment. A concrete dam was constructed along the north edge of the pond (see Figure 5). Potable water was pumped from the pond via an aboveground pipeline to the upper Site building.

USAF Cape Makkovik (Aillik) station closed on June 28, 1961 along with the other Gap Filler Stations after the installation of new radar equipment at the Hopedale Air Station. The facility was transferred to the Canadian Armed Forces; it was deactivated and closed shortly after. The former buildings and equipment remained abandoned until the Provincial government tendered a contract to dismantle and decommission the remaining structures at the Site in 1987. The concrete foundations of the former buildings and radar towers, along with the gravel roadways, still remain at the Site.

The purpose of the Phase I ESA was to identify, through a non-intrusive investigation, the existence of any significant actual or potential areas of environmental impairment associated with the Property. The Phase I ESA was conducted in general accordance with the Canadian Standard Association (CSA) Standard Z768-01 for conducting ESAs that included a review of Site history, document review, interviews with individuals knowledgeable of the Site operations, and correspondence with regulatory agencies. As indicated in the request for proposal, and given the location and time of year, a Site visit was not completed as part of the Phase I ESA. Based on the Phase I ESA findings, the following potential environmental impairment issues were identified with respect to the Site:

- **Historic Handlings, Use, and Storage of Petroleum Hydrocarbons:** As a self-sufficient Gap Filler radar station in a remote location, significant quantities of fuel was formerly stored at the Site in ASTs, as well as in thousands of Petroleum, Oils and Lubricants (POL) drums. The Site also formerly contained a garage (i.e. motor pool) that was used to service on-Site vehicles and heavy equipment, and a helicopter landing pad that contained drum storage and a portable fuel tank used for refueling helicopters. The potential for petroleum hydrocarbon impacts exist as a result of the historical petroleum storage and distribution activities conducted at the Site. The main areas of concern would include the former upper Site area, former AST areas (upper and lower tank farms), along with the former product pipelines, the former helicopter landing area, and the former drum storage area, as well as in the former landfill area.

- **Solid Waste/Recyclables:** During the operation of the facility from 1957 to 1961 solid waste was historically disposed in an unlined landfill located near the dock facilities, west and downgradient of the upper Site. Based on historical activities at the Site, the landfill may contain former asbestos containing materials (ACM) in the former building supplies; material with painted surfaces containing lead and/or mercury based paint, former electrical equipment containing polychlorinated biphenyls (PCBs), mechanical equipment debris, motor repair wastes and/or drums formerly containing POLs as well as other solvents. The Site decommissioning program was completed under the approval of ENVC in 1987, and included the razing of all remaining structures and the burning of all materials on Site, followed by the burying and covering of the debris and other remaining materials. It is noted that the contractor typically buried the debris in at least two locations when the Site contained an upper and lower site. This was completed due to the distance and effort required to transport metal/other debris from the lower Site to the upper Site. As documented in the Site Restoration Status Report dated August 17, 1987, this was the case during the Site decommissioning at Cape Makkovik (Aillik). As a Site visit was not part of the scope, it is unknown if these areas remain covered as reported in the 1987 field program. A surveillance flyover of the Site completed on September 5, 1996 by the Department of Environment and Conservation confirmed all debris on both upper and lower Sites remained buried. As outlined in the "*Environmental Inspection Abandoned Military Sites in Labrador*" report, dated October 1996, a former drum/barrel dump was located on a beach approximately one kilometre south of the lower Site, which was not previously identified. However, an interview with a local resident revealed this area was not associated with past USAF activities; rather debris left behind by the British Newfoundland Development Corporation (Brinco) during past exploration activities near the Site.
- **Heavy Metals:** Possible sources of heavy metals may be associated with vehicle repairs at the former motor pool building and helicopter repairs at the former helicopter pad area. In addition, the former on-Site buildings were constructed in the early 1950s; therefore, the potential exists that lead/mercury based paint was used on the interior and exterior surfaces which may have potentially impacted the surface soils.

- **Polychlorinated Biphenyls (PCBs):** Past uses of PCBs were identified through the records review and regulatory responses. PCBs were historically used as an insulator and coolant in electrical transformers and capacitors at the Site. PCBs were commonly used because they are chemically inert, not affected by acids and corrosive chemicals, do not conduct electricity and will not burn (only at extremely high temperatures). Although the US banned the use of PCBs in 1972, the Cape Makkovik (Aillik) station was operated from 1957 to 1961; therefore they may have been used at the Site.

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1.0 INTRODUCTION

GHD Limited (GHD, formally Conestoga-Rovers & Associates (CRA)) was retained by the Government of Newfoundland & Labrador, Department of Environment and Conservation (ENVC) to complete a Phase I Environmental Site Assessment (ESA) of the former United States (US) Military Site known as Cape Makkovik (Aillik) (Site or Property) located approximately 230 kilometers northeast of the Town of Goose Bay, Newfoundland and Labrador (NL). Based on the information provided to GHD as part of the initial call-up for services under the Impacted Sites Liability Assessment Program, the Site was part of the Pinetree Line.

The purpose of the Phase I ESA was to identify, through non-intrusive investigation, the existence of any significant actual or potential areas of environmental impairment associated with the Property. A Site Location Map is included as Figure 1, a Site Overview is shown as Figure 2, and Site Plans detailing the three separate areas are included as Figure 3 (Upper Site), Figure 4 (Lower Site) and Figure 5 (Pumphouse).

The Phase I ESA was conducted in general accordance with the Canadian Standard Association (CSA) Standard Z768-01 for conducting ESAs. The qualifications of the GHD personnel who completed the Phase I ESA are provided in Appendix A. The Phase I ESA included a review of Site history, document review, interviews with individuals knowledgeable of the Site operations, and correspondence with regulatory agencies. As indicated in the request for proposal, and given the location and time of year, a Site visit was not completed as part of the Phase I ESA. The following tasks were conducted during this assessment:

- Review of an electronic environmental database search
- Review of available fire insurance plans and aerial photographs
- Review of any available previous environmental reports and company files
- Review of past and current Property usage and adjacent property occupancy
- Observations of any conditions that represented potential environmental concerns
- Review of chemical usage and storage and spill/release incidents
- Review of underground and aboveground storage tank records
- Review of air emissions and wastewater discharges
- Review of waste handling, storage, and disposal practices
- Review of equipment that potentially contains polychlorinated biphenyls (PCBs)
- Observations of potential asbestos-containing materials (ACM)

- Inquiries with regulatory agencies and discussions with persons knowledgeable of the Site and Site operations

GHD relied on information received from all parties as accurate, unless contradicted by field observations or written documentation.

The following report summarizes the information gathered by GHD during the Phase I ESA and identifies any significant actual or potential environmental impairment issues associated with the related Property.

This Phase I ESA has been prepared for the use of ENVC and may not be relied upon by others without the written concurrence of GHD and ENVC.

2.0 BACKGROUND

Around 1951, the US military began construction of the Pinetree Line that was a network of Aircraft Control and Warning (AC&W) stations that acted as a radar curtain to detect Soviet aircraft flying toward potential US and Canadian targets during the Cold War. Construction of the AC&W stations began in 1951 and by the fall of 1953, the 923d Aircraft Control and Warning Squadron was established at USAF Hopedale Air Station (N-28). This squadron had one Gap Filler Detachment within its overall area of responsibility, which was Cape Makkovik N-28A (Call Sign "Memorial"), established in 1957 as a manned radar station. The Pinetree Line acted as a back-up for the DEW Line radar curtain located further north across the Arctic of North America.

As a manned Gap Filler radar station, the squadron's role was to provide low-altitude coverage where it was deemed necessary between manned long range radar stations, ultimately to guide interceptor aircraft towards unidentified intruders picked up by the unit's radar scopes. The facility formerly contained a two story building housing a garage (i.e. motor pool), a heating and power plant, barracks, office space, and a dining hall. The tower housing the radar and radio equipment was connected to the main building via a covered corridor. The station was also equipped with two Communication Antennae, a water pumping station, a disaster shack, a large aboveground storage tank (AST), and a helicopter pad, all of which were connected via gravel access roads (see Figure 3). Personnel assigned to the Site ranged from approximately 35 during regular operations in the winter to approximately 50 during the summer due to contractors coming to complete additional work at the Site.

In addition to the Cape Makkovik (Aillik) station facilities on top of the hill (i.e. upper Site), a 2.7 kilometer gravel roadway was constructed to connect the upper portion of the Site to the lower dock area (known as the lower Site). The roadway was used to transport supplies from the dock area to the station (see Figure 2). A second large AST was located near the dock (known as the lower tank farm) and a pipeline was constructed which pumped diesel fuel from the dock to lower tank farm, which in turn supplied fuel to the AST located at the station (known as the upper tank farm). The pipeline from the lower to the upper tank farm followed the gravel access road (see Figure 4). The fuel was then pumped via a network of aboveground pipelines at the station to supply diesel generators used to power the station.

Other facilities associated with the Cape Makkovik (Aillik) station included a former dump to the northeast of the upper Site (see Figure 2) and a former pumphouse/water supply located to the south of the upper Site. Access to the pumphouse area was via a gravel access road that extended south from the former helipad (see Figure 2). The pumphouse building was equipped with water filtration and purification equipment. A concrete dam was constructed along the north edge of the pond (see Figure 5). Potable water was pumped from the pond via an aboveground pipeline to the upper Site building.

USAF Cape Makkovik (Aillik) station closed on June 28, 1961 along with the other Gap Filler Stations after the installation of new radar equipment at the Hopedale Air Station. The facility was transferred to the Canadian Armed Forces; it was deactivated and closed shortly after. The former buildings and equipment remained abandoned until the Provincial government tendered a contract to dismantle and decommission the remaining structures at the Site in 1987. The concrete foundations of the former buildings and radar towers, along with the gravel roadways, still remain at the Site.

3.0 HISTORICAL RECORDS

Historical land use of the Property was investigated by GHD through a review of regulatory correspondence, Property title documents, aerial photographs, and available documents or reports pertaining to the Site.

3.1 REGULATORY CORRESPONDENCE

The Government of Newfoundland and Labrador – Service NL (Service NL) were requested to undertake a search of their records for documentation pertaining to environmental issues at the Site. In their letter response dated March 4, 2015, Service

NL indicated to the best of their knowledge and on a search of the files they have reviewed, they are not aware of any outstanding environmental concerns with regards the property.

The Newfoundland and Labrador Department of Environment and Conservation (ENVC) completed a file review and provided the following relevant information:

- Report on "*PCB Spills and General Environmental Mismanagement at EX-USAF Bases in Labrador*", Resource Program Division, Intergovernmental Affairs Secretariat, Government of Newfoundland and Labrador, dated April 15, 1981.
- Correspondence between the Government of Newfoundland & Labrador and the Government of Canada regarding the clean up and funding of the abandon radar sites.
- Demolition and Site Restoration, Former Radar Sites Contract Package, February 2, 1987.
- Correspondence between the Government of Newfoundland & Labrador and the sub-contractor (Labrador Construction Limited) awarded the contract to decommission the Site.
- Site restoration status report, July 31, 1987.
- Correspondence between the BAE Group and the Government of Newfoundland & Labrador, Department of Environment outlining the contractors (Labrador Construction Limited) non conformances regarding the tender package for the demolition and restoration of the Site.
- Report on "E*nvironmental Inspection Abandoned Military Sites in Labrador*", Environmental Management Division, Department of Environment and Labour, NL, dated October, 1996.
- Historical photographs.

Environment Canada (EC) was requested to undertake a search of their records with respect to documentation of environmental issues regarding the subject Property. Receipt acknowledgement letters were issued by EC (received by GHD on March 9 and April 8, 2015), indicating the request was being processed and a response will be provided as soon as possible.

Copies of the requests by GHD along with relevant correspondence from Service NL, ENVC, and EC are provided in Appendix B.

3.2 PROPERTY TITLE SEARCH

Property title information was obtained from the Government of Newfoundland and Labrador Crown Land Division. In addition, a review of ENVC archived files (most notably the 1981 report on *"PCB Spills and General Management at EX-USAF Bases in Labrador"*) as well as information taken from a website outlining the history of the 44 former Pinetree Line sites (http://web.archive.org/web/20090221163100/http://www.pinetreeline.org/), which provided some supplemental information regarding title of the Property, which is included below.

To Canada:	M.C. 697 - '57 (M. & R. 39 (c) –'57)	1957 (1957)
To NL:	M.C. 203 - '63	1963

Two pieces of land transferred to Canada for use by Department of National Defense (DND) in connection with Mid Canada Line (MCL). Area A is 16.64 acres; Area B is 104.23 acres. Conditions included mineral and gas rights for the Province and a return clause stating that when lands are no longer used by DND, they will be assumed by Newfoundland & Labrador.

Reference is in Federal Reservation Book (FRB) Vol. 1, Folio 60.

The results of the Property title search are included in Appendix C.

3.3 AERIAL PHOTOGRAPHS

Aerial photographs from 1968 and 2005 were reviewed during the Phase I ESA. The observations of the aerial photograph review are presented below. Copies of the aerial photographs are included as Appendix D.

The 1968 aerial photograph shows the Site as developed with structures (buildings, radar, and communication towers, AST, etc.) comprising the main part of the station (i.e. upper Site). A Gravel roadway is constructed to the northwest toward the lower portion of the Site. Side roads to the east, south and west off the main gravel access road are also visible. These side roads include access to the adjacent freshwater pond (dam and spillway), the helicopter pad, and what appears to be the domestic landfill. In addition, two large ASTs are also visible, one to the southwest of the main building and a second near the dock.

The 2005 aerial photograph shows the former Site as decommissioned with only the concrete foundations from the former structures and the gravel roadway and helicopter pad remaining.

3.4 PREVIOUS ENVIRONMENTAL REPORTS

The following historical reports were provided regarding the general issues associated with the former military sites in Labrador. The following details the reports reviewed pertaining to the Site.

The Government of Newfoundland and Labrador (Resource Program Division, Intergovernmental Affairs Secretariat) completed a report entitled: "*PCB Spills and General Environmental Mismanagement at EX-USAF Bases in Labrador",* dated April 15, 1981. The report discusses the history of the former US military installations (including Cape Makkovik (Aillik) station), details of land transfers for the various sites, the potential for PCB impacts at these former radar locations, inventories of equipment/debris remaining at the Site, as well as provides a discussion on responsible parties for the impacts at the sites.

The Government of Newfoundland and Labrador (Environmental Management Division, Department of Environment and Labour) also completed a report in 1996 entitled: "*Environmental Inspection Abandoned Military Sites in Labrador"*. The purpose of this report was to conduct a file review and preliminary site assessment at selected former US military sites. The inspection of these sites provided an update to the 1986 cleanup contracts and to respond to media and public concerns. Based on a review of the report, the following information was obtained for the Cape Makkovik (Aillik) station:

- Site closed in 1962
- Assets on-Site were sold to British Newfoundland Corporation Limited.
- Comprised of two parcels of land (16.64 acres and 104.34 acres)
- Infrastructure at the upper and lower Sites were decommissioned in 1986 including a 5-unit complex building and two ASTs.
- Residual fuel in the ASTs was burned off during the decommissioning program
- All debris was buried on-Site
- Only concrete foundations of building, AST dyke walls and concrete dam/spillway remain.
- Several rusted drums were noted at the lower Site
- Three rusted drums/barrels were noted in former pumphouse area

- Northwest of the lower Site, a drum dump was noted on a beach area (known as the head of Banana Lake). Approximately 63 drums/barrels were scattered around the beach/marsh area.

3.5 INTERVIEWS

Mr. Barry Anderson, a resident of Makkovik was interviewed by telephone on April 28, 2015 and provided information regarding the Site. Mr. Anderson informed GHD the Site operated as a communications station by USAF from the late 1950s to the early 1960's. He confirmed the former air station landfill was located off the main gravel roadway to the left near the top of the hill, north of the former main Site (i.e. upper Site). Mr. Anderson confirmed the aboveground fuel pipeline travelled along the gravel roadway from the lower AST all the way to the former station. He also remembers during the Site decommissioning in the 1980's several barges removing steel from the area. In addition, he recalls the drum dump at the head of Banana Lake as outlined in the "*Environmental Inspection Abandoned Military Sites in Labrador*" report; however, he believed it is not associated with past USAF activities, rather debris left behind by the British Newfoundland Development Corporation (Brinco) during past exploration activities near the Site in the 1950s and 1960s. Mr. Anderson stated that he is unaware of any environmental issues or concerns with regards to the Site.

In addition to interviews, GHD reviewed personal accounts posted by former USAF personnel stationed at Cape Makkovik (Aillik) during operation of the facility between 1957 and 1961. The personal accounts were taken from a website outlining the history of the 44 former Pinetree Line sites (http://web.archive.org/web/20090221163100/http://www.pinetreeline.org/). Below is a summary of the relevant issues noted in each former employees personal account:

- **Grover Blalock (1956-1957 – USAF)** – Mr. Blalock was assigned with the 923rd AC&W Squadron at Hopedale when he was advised of his re-assignment to the Gap Filler site located at Cape Makkovik (Aillik). He recalls flying from Hopedale to Cape Makkovik in a helicopter and found that he was one of the first to arrive at this location. The Site operational call sign was "Memorial". Mr. Blalock added that they had an establishment of one officer (the Commander), 14 enlisted men, and three men who took care of the generators and the facility. He departed Cape Makkovik (Aillik) in August 1957.

- **Dave Houston (1959 – 1960 USAF)** – Mr. Houston arrived at Cape Makkovik (Aillik) in September 1959 as an Airman Second Class (A/2C) Radar Operator. He recalls there were approximately 20 to 25 USAF personnel assigned to this

> Gap Filler and an additional 5 to 7 civilian personnel operating the power plant. For recreation activities, they set up a basketball court in the motor pool/garage. Mr. Houston recalls the village of Makkovik was about 20 miles from the Site and the only way to get from one to the other was by boat or dogsled. The only road they had was from the living area to the water (ocean) which was at the bottom of the hill. This road was about 1.5 miles long and was used to carry supplies from the supply boat to the living area. There was really nowhere to drive, except down the hill to the water supply. He departed Cape Makkovik (Aillik) in September 1960.

The complete personal accounts are located in Appendix E.

4.0 ENVIRONMENTAL PROPERTY ASSESSMENT

At the request of ENVC, a Site visit was not completed as part of the Phase I ESA; the efforts of the environmental assessment was to complete a desk-top review of available documents and summarize the findings in a stand-alone report. A summary of all information taken from an internet search of the Site is included in Appendix F.

4.1 PROPERTY OVERVIEW

The Site is located approximately 230 kilometers northeast of the Town of Goose Bay, NL and approximately 16 kilometers north of Makkovik, NL. The facility formerly contained a two story/5-unit building housing a garage (i.e. motor pool), a heating and power plant, barracks, office space, and a dining hall. The tower housing the radar and radio equipment was connected to the main building via a covered corridor. The station was also equipped with two Communication Antennae, a water pumping station, a disaster shack, a large aboveground storage tank (AST), and a helicopter pad, all of which were connected via gravel access roads (see Figure 3). Personnel assigned to the Site ranged from approximately 35 during regular operations in the winter to approximately 50 during the summer due to contractors coming to complete additional work at the Site.

In addition to the Cape Makkovik (Aillik) station facilities on top of the hill (i.e. upper Site), a 2.7 kilometer gravel roadway was constructed to connect the upper portion of the Site to the lower dock area (known as the lower Site). The roadway was used to transport supplies from the dock area to the station (see Figure 2). A second large AST was located near the dock (known as the lower tank farm) and a pipeline was constructed which pumped diesel fuel from the dock to lower tank farm, which in turn supplied fuel to the AST located at the station (known as the upper tank farm). The pipeline from the lower to the upper tank farm followed the gravel access road (see Figure 4). The fuel was then pumped via a network of aboveground pipelines at the station to supply diesel generators used to power the station.

Other facilities associated with the Cape Makkovik (Aillik) station included a former dump to the northeast of the upper Site (see Figure 2) and a former pumphouse/water supply located to the south of the upper Site. Access to the pumphouse area was via a gravel access road that extended south from the former helipad (see Figure 2). The pumphouse building was equipped with water filtration and purification equipment. A concrete dam was constructed along the north edge of the pond (see Figure 5). Potable water was pumped from the pond via an aboveground pipeline to the upper Site building.

USAF Cape Makkovik (Aillik) station closed on June 28, 1961 along with the other Gap Filler Stations after the installation of new radar equipment at the Hopedale Air Station. The facility was transferred to the Canadian Armed Forces; it was deactivated and closed shortly after. The former buildings and equipment remained abandoned until the Provincial government tendered a contract to dismantle and decommission the remaining structures at the Site in 1987. The concrete foundations of the former buildings and radar towers, along with the gravel roadways, still remain at the Site. The Site Plan of the upper Site, lower Site, and pumphouse Site are presented as Figure 3, Figure 4, and Figure 5; respectively.

The Property is comprised of three separate parcels of land covering a total area of approximately 489,144 m^2 (listed as 120.87 acres). The Site is predominantly covered in vegetation/gravel/exposed bedrock (approximately 99 percent), and concrete from the former building structures (approximately 1 percent). Both surface and groundwater are anticipated to follow the surface contours in the area and flow north/northwest toward the Atlantic Ocean in the upper Site and pumphouse areas, and flow west/northwest toward the Atlantic Ocean (Aillik Bay) in the area of the lower Site. The elevation at the upper portion of the Site is approximately 129 metres above sea level (masl), while the elevation at the lower is approximately 3 masl. Historical photographs taken of the former Site are included in Appendix G.

Although the Site is not currently serviced with water or sewer, historically water was pumped to the Site from a nearby water supply (see Figure 5) and septic was discharged via an above ground pipeline to a septic tank (see Figure 3). Surrounding properties are not serviced by municipal water or sewer systems.

Based on existing land use, the Site is classified under the Atlantic RBCA as a commercial property with non-potable groundwater and coarse-grained soil.

4.2 ENVIRONMENTAL SETTING/ADJACENT LAND USE

The Site is not zoned as it is not located within municipal boundaries; however, would be considered commercial in nature. The Property is bordered to the south by undeveloped land and to the north, east and west by the Atlantic Ocean (see Figure 1).

A review of the “Granular-Aggregate Resources of the Makkovik Map Area”, issued by the Government of Newfoundland and Labrador, Department of Natural Resources, Geological Survey (Map 2011-34) indicates that the Site surficial geology consists of commonly thin (less than 2 metres) or discontinuous granular materials. A soil sample collected from the south of Cape Makkovik (Aillik), located on the south side of Makkovik Bay was analyzed for grain size analysis and indicated the material is 88% gravel, 11.3% sand and less than 1% silt and clay, otherwise coarse grained.

A review of the “Geological Map of Labrador”, Geology Survey Branch, Department of Mines and Energy, Government of Newfoundland and Labrador (Map 97-07) and the “Map of the Geology of the Makkovik Area, Labrador”, issued by the Government of Newfoundland and Labrador, Department of Natural Resources, Geological Survey (Map 2013-07) indicates that the bedrock in the vicinity of the Site consists of middle to late Paleoproterozoic of the Proterozoic age granite, quartz monzonite, and granodiorite, syenite and minor quartz diorite of rhyolite, ash-flow tuff, breccia and hypabyssal rhyolite intrusions volcaniclastic siltstone and sandstone with minor basalt. Also consisting of thin bedded to laminated metasandstone, interbedded with lesser grey-green-pink metasiltstone and minor marble; primary structures are locally preserved and aplitic to locally feldspar-porphyritic granite dykes and sills. Supracrustal rocks comprise the deformed and metamorphosed Allik group. These types of bedrock are found in the Southeastern Churchill, Nain, Grenville, and Makkovic Provinces.

4.3 UNDERGROUND STORAGE TANKS (USTs)

Past use of USTs was not revealed from the records review, historical searches, interviews, or regulatory responses.

4.4 ABOVEGROUND STORAGE TANKS (ASTs)

Evidence of ASTs was revealed from the records review, historical searches, photo searches, interviews, or regulatory responses.

The following ASTs were previously located on-Site:

- One large steel AST (1,832,000 Litre (L)), located at the upper Site to the southwest of the former main station building (see figure 3). The AST was located in a concrete dyke and contained diesel fuel.
- One large steel AST (3,053,000 L), located at the lower Site near the former dock (see Figure 4). The AST was located in a concrete dyke and contained diesel fuel.

Based on the 1981 report entitled: "*PCB Spills and General Environmental Mismanagement at EX-USAF Bases in Labrador*" the 1980 Site inspection revealed a number of 45 gallon drums at the lower Site, approximately 20 of these drums displayed signs of leaking.

In addition to the ASTs noted above, Site records also indicate the supply and use of portable ASTs as well as drums for the storage of fuel. Below are known locations in which drums were used/stored to supply fuel:

- Heating of stand-alone water pumphouse building
- Portable AST and drums for refueling of helicopters at the helicopter pad,
- Refueling of equipment near the garage (i.e. motor pool) area
- Drum unloading/storage area near the dock (i.e. lower Site)

The 1980 Site inspection discussed above also revealed a drum dump of 45 gallon fuel oil barrels scattered throughout the lower Site (see Appendix B).

Past use of other ASTs was not revealed from the records review, historical searches, interviews, or regulatory responses.

4.5 UTILITY SERVICES

The Site is no longer serviced with water or sewer; nor is any of the surrounding properties. The Site was originally serviced by a pumphouse with a water filtration and purification plant. Water was pumped from a freshwater pond located to the south and downgradient of the main building at the upper Site (see Figure 2). The on-Site latrines were equipped with septic tanks. Location of the former septic tanks, and or septic field was located east of the main building at the upper Site (See Figure 3). All facilities were removed as part of the Site decommissioning activities in 1987. Historically electricity was supplied by on-Site diesel generators.

4.6 CHEMICAL USE AND STORAGE

Past use of chemicals and storage may have existed with past operations, however; were not revealed from the records review, historical searches, interviews, or regulatory responses. Based on the historical activities at the Site (i.e. garage/motor pool/maintenance of equipment, etc.), it is assumed that various petroleum lubricants, cleaners, degreasers, solvents, etc. were used and stored at the facility.

4.7 SOLID WASTE/RECYCLABLES

During the operation of the facility from 1957 to 1961 solid waste was historically disposed in an unlined landfill located northeast of the upper Site (see Figure 2). Based on historical activities at the Site, the landfill may contain former ACM building materials; material with painted surfaces containing lead and/or mercury based paint, former electrical equipment containing PCBs, mechanical equipment debris, motor repair wastes and/or drums formerly containing POLs as well as other solvents. The Site decommissioning program was completed under the approval of ENVC in 1987, and included the razing of all remaining structures and the burning of all materials on Site, followed by the burying and covering of the debris and other remaining materials. It is noted that the contractor typically buried the debris in at least two locations when the Site contained an upper and lower site. This was completed due to the distance and effort required to transport metal/other debris from the lower Site to the upper Site. As documented in the Site Restoration Status Report dated August 17, 1987, this was the case during the Site decommissioning at Cape Makkovik (Aillik). As a Site visit was not part of the scope, it is unknown if these areas remain covered as reported in the 1987 field program. A surveillance flyover of the Site completed on September 5, 1996 by the

Department of Environment and Conservation confirmed all debris on both upper and lower Sites remained buried.

As outlined in the "*Environmental Inspection Abandoned Military Sites in Labrador*" report dated October 1996, a former drum/barrel dump was located on a beach approximately one kilometer south of the lower Site, which was not previously identified. However, an interview with a local resident revealed this area was not associated with past USAF activities; rather debris left behind by the British Newfoundland Development Corporation (Brinco) during past exploration activities near the Site.

4.8 HAZARDOUS WASTE

Past use/disposal of hazardous wastes may have existed with past operations, however; use/disposal of these substances was not revealed from the records review, historical searches, interviews, or regulatory responses.

4.9 WASTEWATER

Past disposal of wastewater existed during the operation of the Site from 1957 to 1961. Washrooms with toilets, sinks, and showers were present in the former building at the upper Site that produced wastewater, which were discharged into the on-Site septic tanks. Other wastewater disposal activities were not revealed from the records review, historical searches, interviews, or regulatory responses.

4.10 STORMWATER

Stormwater run-off from the upper Site is mainly directed north/northwest by overland flow toward the Atlantic Ocean. Stormwater run-off in the lower Site is mainly directed west/northwest by overland flow to the adjacent Atlantic Ocean (Aillik Bay). Sources of adverse impacts from stormwater run-off were not revealed from the records review, historical searches, interviews, or regulatory responses.

4.11 ASBESTOS-CONTAINING MATERIALS (ACM)

Past use/disposal of ACM may have existed with historic operations at the Site; however, with the exception of the concrete foundations, no visible building materials remain on-Site. Possible ACM containing building materials noted in the historical Site photographs included floor tiles, roofing materials, piping insulation, and ceiling tiles. ACMs would also be expected to be in the boilers and piping associated with the former heating plant. As a result, potential ACM in the form of discarded building materials may be present in the former landfill and/or debris pits completed during the 1987 Site decommissioning program.

Sources of ACM were not revealed from the records review, historical searches, interviews, or regulatory responses.

4.12 POLYCHLORINATED BIPHENYLS (PCBs)

Past use of PCBs were identified through the records review and regulatory responses. PCBs were historically used as an insulator and coolant in electrical transformers and capacitors at the Site. PCBs were commonly used because they were chemically inert, not affected by acids and corrosive chemicals, did not conduct electricity and would not burn (only at extremely high temperatures). Although the US banned the use of PCBs in 1972, the Cape Makkovik (Aillik) station was in operation from 1957 to 1961.

Other sources of adverse impacts from PCBs were not revealed from the records review, historical searches, interviews, or regulatory responses.

4.13 HEAVY METALS

Past use/disposal of heavy metals wastes may have existed with past operations. Possible sources of heavy metals (lead) may be associated with vehicle repairs at the former garage (i.e, motor pool). In addition, the former on-Site buildings were constructed in the 1950s; therefore, the potential exists that lead/mercury based paint on the interior and exterior surfaces may have potentially impacted the surface soils.

4.14 OZONE-DEPLETING SUBSTANCES (ODS)

Past use/disposal of ODS may have existed with past operations, however; were not revealed from the records review, historical searches, interviews, or regulatory responses.

4.15 AIR EMISSIONS

Air emissions may have existed with past operations, however; were not revealed from the records review, historical searches, interviews, or regulatory responses.

4.16 IONIZING RADIATION

Based on the geology of the area, sources of ionizing radiation are not suspect at the Site and were not revealed from the records review, historical searches, interviews, or regulatory responses.

4.17 CHEMICAL SPILLS/RELEASES

Past chemical spills/releases may have occurred with past operations, however; no past spills/releases were revealed from the records review, historical searches, interviews, or regulatory responses.

4.18 OTHER ISSUES OF POTENTIAL ENVIRONMENTAL CONCERN

Other issues of potential environmental concern were not identified through the record reviews, historical searches, interviews, or regulatory responses.

5.0 CONCLUSIONS

Based on the Phase I ESA, including the historical records review, and interviews, the following potential environmental impairment issues were identified with respect to the Site:

- **Historic Handlings, Use, and Storage of Petroleum Hydrocarbons:** As a self-sufficient Gap Filler radar station in a remote location, significant quantities of fuel was formerly stored at the Site in ASTs, as well as in thousands of Petroleum, Oils and Lubricants (POL) drums. The Site also formerly contained a garage (i.e. motor pool) that was used to service on Site vehicles and heavy equipment, and a helicopter landing pad that contained drum storage and a portable fuel tank used for refueling helicopters. The potential for petroleum hydrocarbon impacts exist as a result of the historical petroleum storage and distribution activities conducted at the Site. The main areas of concern would include the former upper

Site area, former AST areas (upper and lower tank farms), along with the former product pipelines, the former helicopter landing area, and the former drum storage area, as well as in the former landfill area.

- **Solid Waste/Recyclables**: During the operation of the facility from 1957 to 1961 solid waste was historically disposed in an unlined landfill located near the dock facilities, west and downgradient of the upper Site. Based on historical activities at the Site, the landfill may contain former ACM building materials; material with painted surfaces containing lead and/or mercury based paint, former electrical equipment containing PCBs, mechanical equipment debris, motor repair wastes and/or drums formerly containing POLs as well as other solvents. The Site decommissioning program was completed under the approval of ENVC in 1987, and included the razing of all remaining structures and the burning of all materials on Site, followed by the burying and covering of the debris and other remaining materials. It is noted that the contractor typically buried the debris in at least two locations when the Site contained an upper and lower site. This was completed due to the distance and effort required to transport metal/other debris from the lower Site to the upper Site. As documented in the Site Restoration Status Report dated August 17, 1987, this was the case during the Site decommissioning at the former Cape Makkovik (Aillik) station. As a Site visit was not part of the scope, it is unknown if these areas remain covered as reported in the 1987 field program. A surveillance flyover of the Site completed on September 5, 1996 by the Department of Environment and Conservation confirmed all debris on both upper and lower Sites remained buried. As outlined in the "*Environmental Inspection Abandoned Military Sites in Labrador*" report, dated October 1996, a former drum/barrel dump was located on a beach approximately one kilometre south of the lower Site, which was not previously identified. However, an interview with a local resident revealed this area was not associated with past USAF activities; rather debris left behind by the British Newfoundland Development Corporation (Brinco) during past exploration activities near the Site.
- **Heavy Metals:** Possible sources of heavy metals may be associated with vehicle repairs at the former motor pool building and helicopter repairs at the former helicopter pad area. In addition, the former on Site buildings were constructed in the early 1950s; therefore, the potential exists that lead/mercury based paint was used on the interior and exterior surfaces which may have potentially impacted the surface soils.

- **Polychlorinated Biphenyls (PCBs)**: Past uses of PCBs were identified through the records review and regulatory responses. PCBs were historically used as an insulator and coolant in electrical transformers and capacitors at the Site. PCBs were commonly used because they are chemically inert, not affected by acids and corrosive chemicals, do not conduct electricity and will not burn (only at extremely high temperatures). Although the US banned the use of PCBs in 1972, the Cape Makkovik (Aillik) station was operated from 1957 to 1961; therefore they may have been used at the Site.

All of Which is Respectfully Submitted,

GHD Limited

James O'Neill H. Anderson

James O’Neill, P. Eng. Hubert Anderson

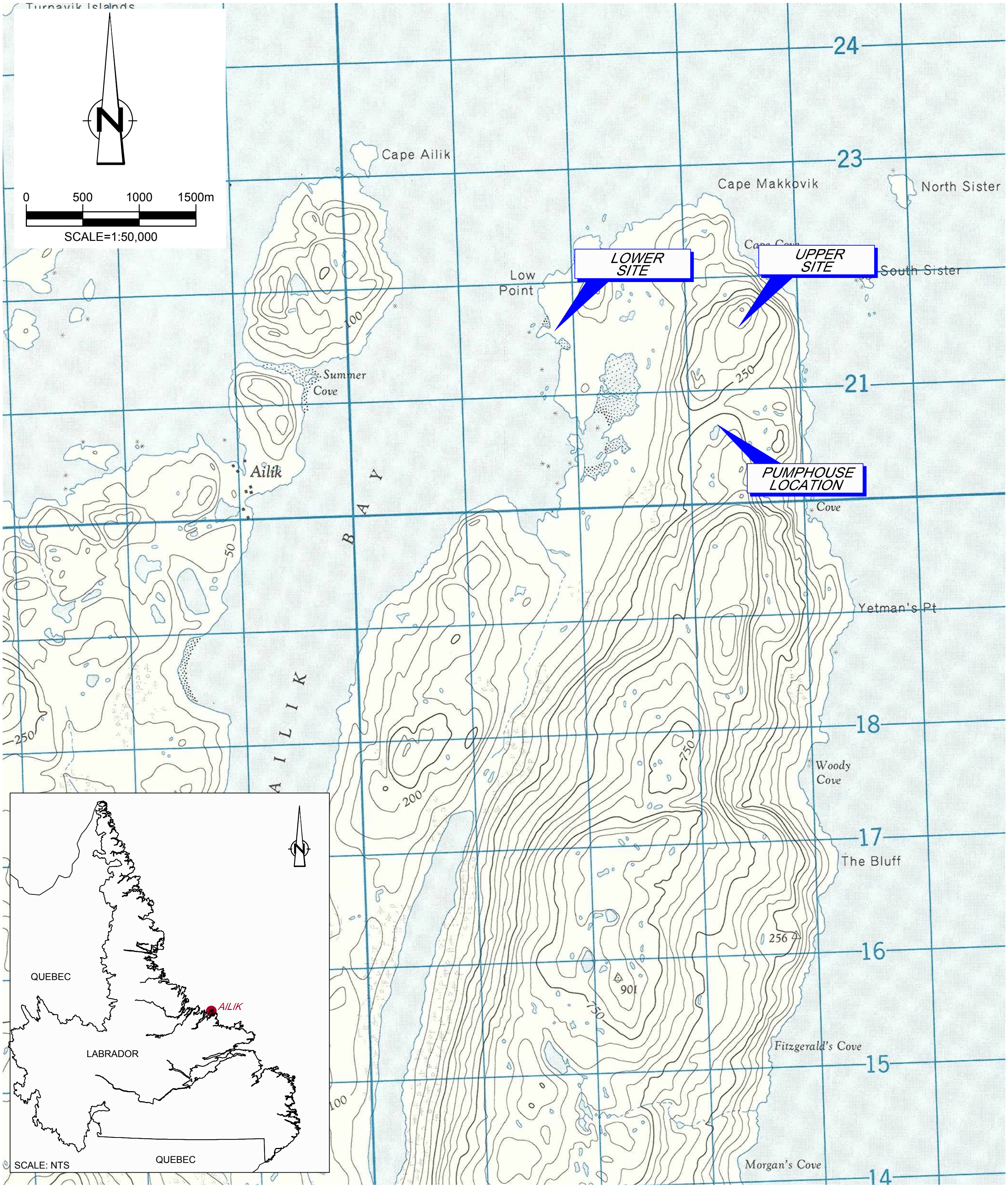


figure 1

SITE LOCATION MAP
PHASE I ENVIRONMENTAL SITE ASSESSMENT
FORMER UNITED STATES MILITARY SITE
Cape Makkovik - Aillik, Labrador, NL

089758-00(004) GN-NL001

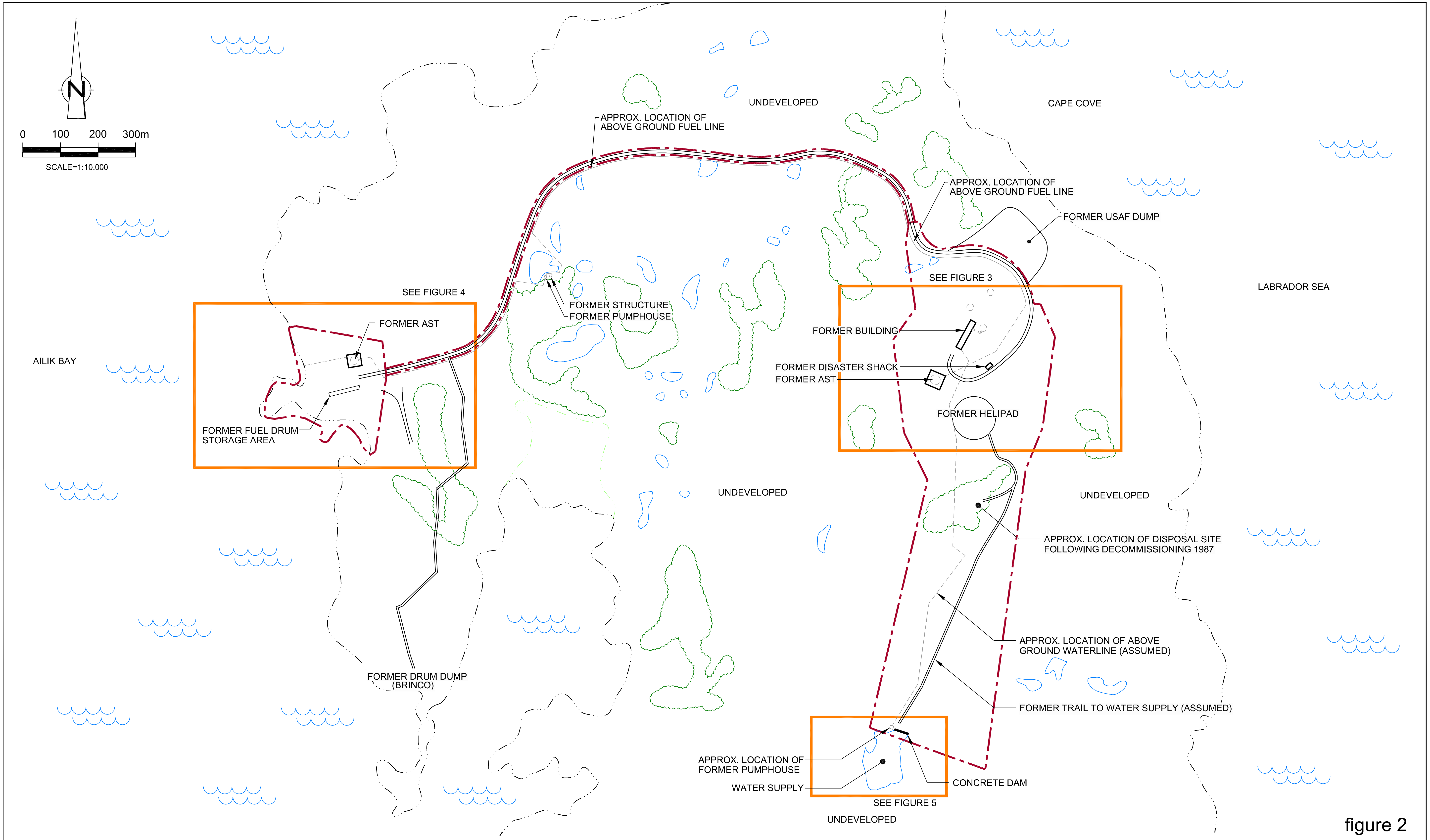
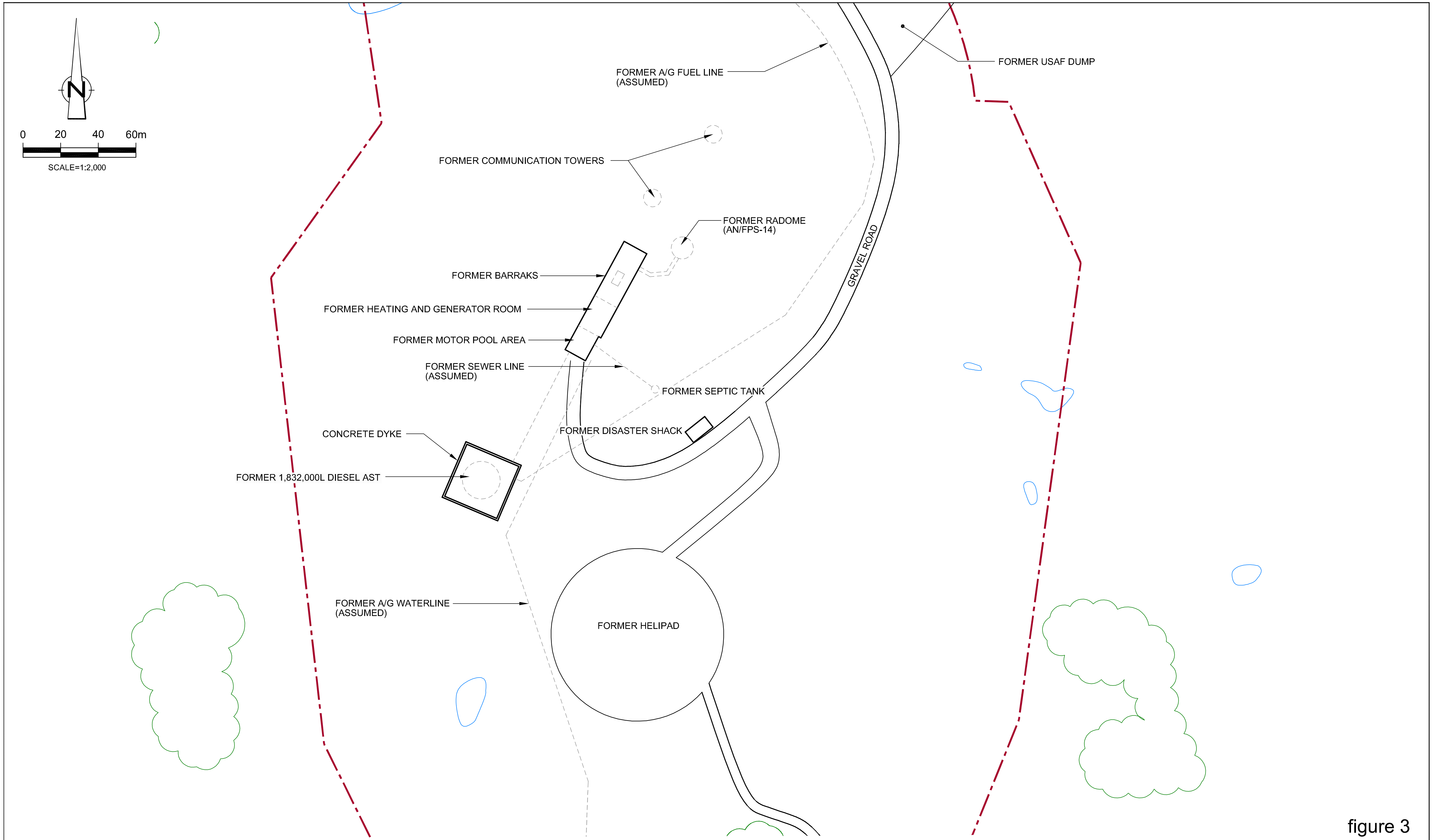


figure 2

SITE OVERVIEW
PHASE I ENVIRONMENTAL SITE ASSESSMENT
FORMER UNITED STATES MILITARY SITE
Cape Makkovik - Aillik, Labrador, NL



LEGEND:

- APPROXIMATE PROPERTY BOUNDARY
- FORMER STRUCTURE
- POND
- WOODED/SHRUB AREA

figure 3

SITE PLAN - UPPER SITE
PHASE I ENVIRONMENTAL SITE ASSESSMENT
FORMER UNITED STATES MILITARY SITE
Cape Makkovik - Aillik, Labrador, NL

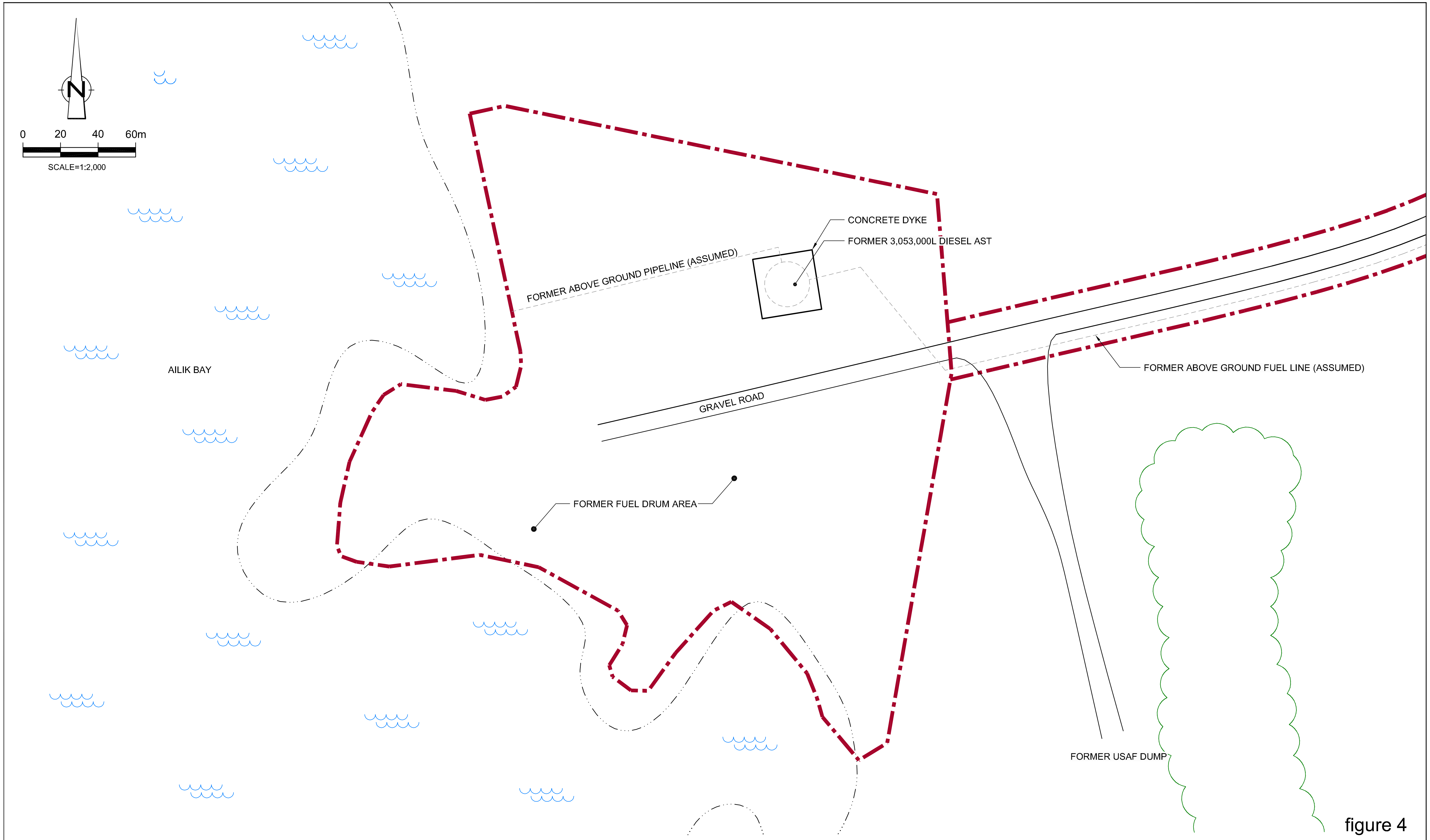
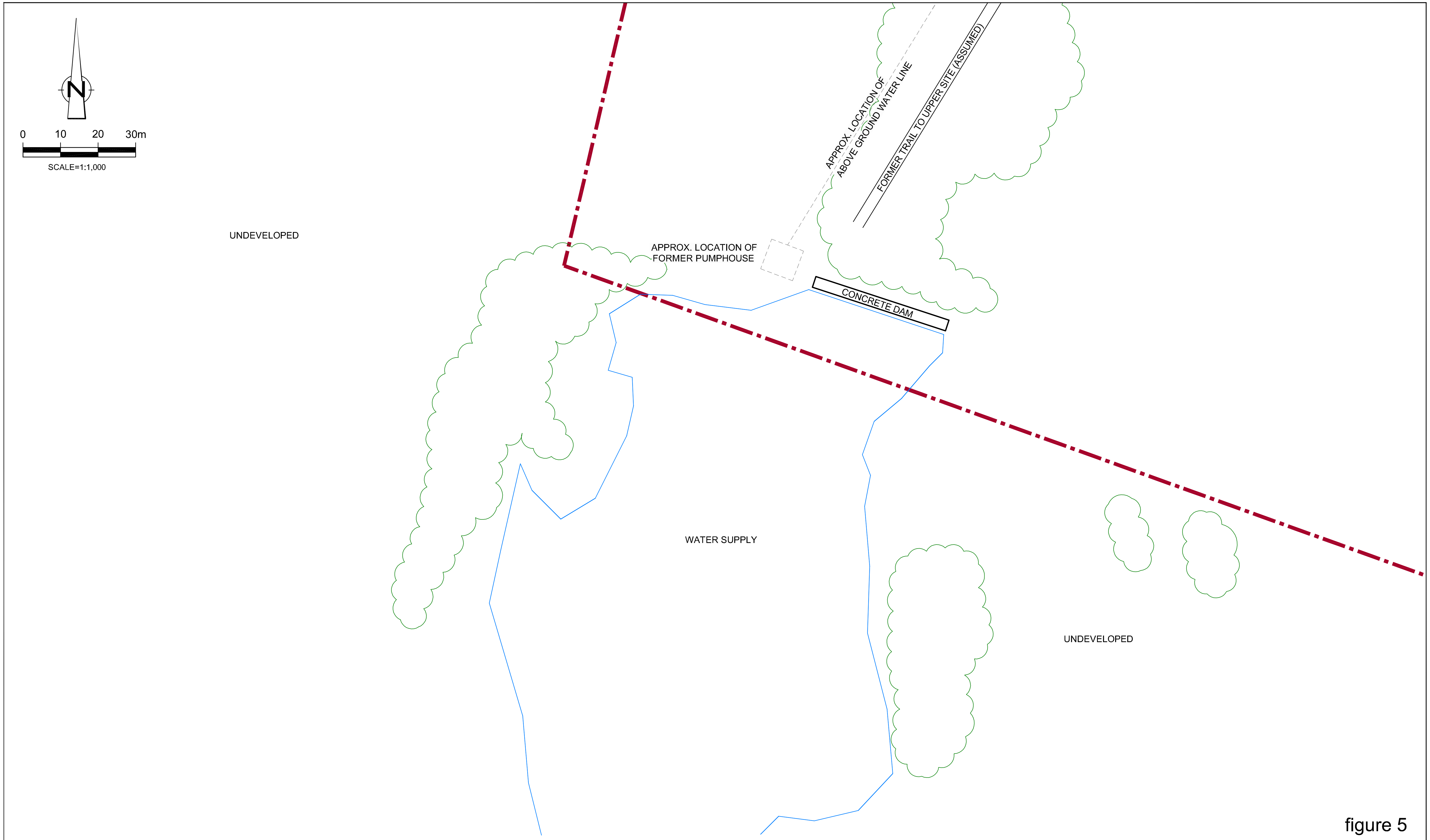


figure 4

SITE PLAN - LOWER SITE
PHASE I ENVIRONMENTAL SITE ASSESSMENT
FORMER UNITED STATES MILITARY SITE
Cape Makkovik - Aillik, Labrador, NL

089758-00(004) GN-NL004



LEGEND:

- ‐·‐·‐ APPROXIMATE PROPERTY BOUNDARY
- ‐ ‐ ‐ FORMER STUCTURE
- ⌒⌒⌒ WOODED/SHRUB AREA

figure 5

SITE PLAN - PUMPHOUSE
PHASE I ENVIRONMENTAL SITE ASSESSMENT
FORMER UNITED STATES MILITARY SITE
Cape Makkovik - Aillik, Labrador, NL

Appendices

Appendix A
Qualifications of Site Assessors

QUALIFICATIONS OF SITE ASSESSOR

Name: James O'Neill, P. Eng.

Position: Engineer

Education: B.Eng. (Civil Engineering), Memorial University (1997)

Experience:

James P. O'Neill, P.Eng. is a Senior Project Manager/Engineer with GHD Limited (GHD). He has performed or overseen environmental site assessments at residential, commercial, industrial and public facilities. Mr. O'Neill has completed courses in environmental engineering, hydrology, geology, project management, asbestos awareness, indoor air quality, Standard First Aid/CPR Level C, Automated External Defibrillator, WHMIS, 40-hour HAZWOPER, Powerline Hazards, Leadership in Safety Excellence, and other miscellaneous training. Mr. O'Neill is also a member of the Professional Engineers and Geoscientists of Newfoundland and Labrador (PEGNL) as a Professional Engineer and is registered with the NL Department of Environment and Conservation as a Site Professional. Mr. O'Neill has been directly involved in numerous environmental site assessment and remediation projects concerning hydrocarbon and PCB impacts on residential and/or commercial sites, and is knowledgeable of the current environmental legislation regarding contaminants and hazardous materials.

QUALIFICATIONS OF SITE ASSESSOR

Name: Peter Gillingham, P. Tech.

Position: Environmental Technologist

Education: Environmental Technology (Co-op) Diploma; College of the North Atlantic, Corner Brook, NL, 2007

Fish & Wildlife Technician Diploma; College of the North Atlantic, Bonavista, NL, 2003

Experience:

Peter Gillingham, P. Tech., is an Environmental Technologist with GHD Limited (GHD). Mr. Gillingham has over eight years of experience in various aspects of the environmental sector that included review of environmental site assessments, investigations and remediation of hydrocarbon impacts, hazardous building materials surveys, asbestos management and abatement, drinking water quality, oil storage tank management, and indoor air quality investigations. Mr. Gillingham has also conducted numerous field investigations and projects involving contractor oversight and coordination. He has completed courses in Environmental Site Assessment, Water Quality Analysis, Solid Waste Management, and Air Pollution. Mr. Gillingham is certified in WHMIS, Standard First Aid, Leadership in Safety Excellence, and has completed the 40-hour HAZWOPER course. Mr. Gillingham is also a member of the Association of Engineering Technicians and Technologist of Newfoundland and Labrador (AETTNL). He has completed various environmental site assessments, monitoring programs and site remediation projects where his duties included site supervision, health and safety, soil sampling of excavation boundaries, and groundwater sampling and monitoring. Mr. Gillingham has been a supervisor on numerous petroleum hydrocarbon sites (retail and bulk storage facilities) and supervised drilling, test pitting and soil excavation for various clients in the Province. This Phase I was conducted under the direct supervision of senior staff at GHD.

Appendix B

Regulatory Correspondence

Service NL Responses

CONESTOGA-ROVERS
& ASSOCIATES

1118 Topsail Road, P.O. Box 8353, Station A
St. John's, NL, Canada A1B 3N7
Telephone: (709) 364-5353 Fax: (709) 364-5368
www.CRAworld.com

FACSIMILE

DATE: March 3, 2015

REFERENCE NO.: 089758

TO: Mr. George Blackwood
Service NL

FACSIMILE NO.: 709-896-4340

FROM: Mr. Peter Gillingham

Total Pages (Including Cover Page) 3

☒ **Facsimile is Receiver's Original**

Original Will Follow By:

☐ Mail
☐ Overnight Courier
☐ E-mail

Re: Phase I Environmental Site Assessment, Former United States Military Site N-28A, Cape Makkovik-Ailik, NL (Call Sign Memorial).

MESSAGE

Conestoga-Rovers & Associates Ltd. (CRA) is currently conducting a Phase I Environmental Site Assessment of the former United States Military Site N-28A, Cape Makkovik-Ailik, NL (Call Sign Memorial).

Please review your records for the Site and provide us with any available information, such as the following:

1. underground storage tank registration, or records of tank decommissioning;
2. knowledge or records of past environmental infractions; and/or,
3. any known existing environmental concerns.

I have attached a letter from Ms Christa Curnew, a representative of the Government of Newfoundland & Labrador - Department of Environment and Conservation that provides permission for the release of this information to CRA, along with a Site Location Map to help with your search. Thank-you for your time and please call if you have any questions.

Regards,

Peter Gillingham, P. Tech.

Attachments: Permission Letter
Site Location Map

Newfoundland
Labrador

Government of Newfoundland and Labrador
Department of Environment & Conservation

Pollution Prevention Division
(Environment)

March 3, 2015

RE: **Phase I Environmental Site Assessment**
Government of Newfoundland & Labrador
Former United States (US) Military Site
Site N-28A, Cape Makkovik – Ailik, NL (Call Sign Memorial)

To Whom It May Concern:

As a representative of the primary owner of the above listed property, I certify that Conestoga-Rovers & Associates (CRA) has been contracted to complete a Phase I Environmental Site Assessment on the above-noted property.

The Site was established in 1957 as a manned Gap Filler radar station that was constructed by the United States Air Force under operational control of the Hopedale Air Station and part of the Pinetree Line of Ground-Control Intercept (GCI) radar sites.

The property was originally transferred from the Province of Newfoundland and Labrador to the Government of Canada in the 1950's after which permission was granted to the US Government for their use. Operations ceased in 1961 when the property reverted back to the Government of Canada. It is my understanding the Site was transferred back to the Province of Newfoundland & Labrador in 1986.

The former Site is located at 55° 13′ North Latitude and 59° 13.5′ West Longitude. A site location map illustrating the approximate location of the property is attached.

Please release any information pertaining to this property to CRA.

Sincerely,

Christa

Ms. Christa Curnew, M.Env. Sci., P.Eng.
Project Manager – Impacted Sites
Pollution Prevention Division
Department of Environment and Conservation
Government of Newfoundland & Labrador

c.c. Brian Luffman, CRA

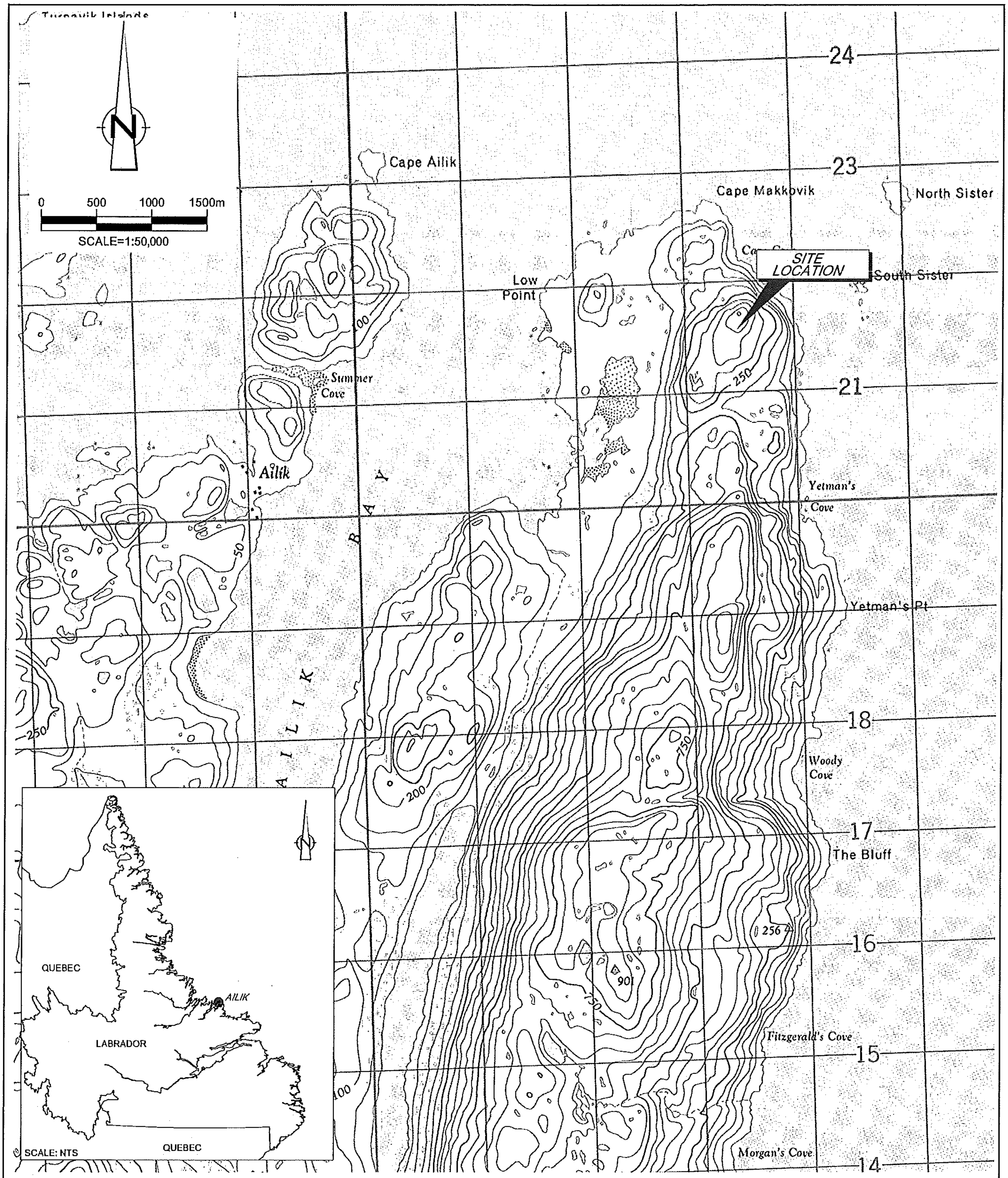


figure 1

SITE LOCATION MAP
PHASE I ENVIRONMENTAL SITE ASSESSMENT
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
Ailik, Cape Makkovik, Labrador, NL

Newfoundland Labrador

Government of Newfoundland and Labrador
Service NL

March 4, 2015

Peter Gillingham, P. Tech.
Conestoga-Rovers & Associates
1118 Topsail Road, P.O. Box 8353, Stn A,
St. John's, NL
A1B 3N7

Attention: Mr. Peter Gillingham

RE: File/Record Search – Former United States Military Site Cape Makkovik-Ailik, NL

This refers to your request dated March 3, 2015, requesting information of an environmental nature on the above-mentioned property.

As we do not possess a departmental central registry of activities affecting the environment on properties in the province, we state that to the best of our knowledge and on a search of the files that we have reviewed, that there is no information contained on file and we are not aware of any outstanding environmental concerns with the above noted property.

In addition, we would like to point out that the information on the above property may be obtained by contacting the Department of Environment and Conservation by telephoning (709) 729-5782. Information on an environmental nature for Labrador, prior to 1990, is located at the Department of Environment and Conservation in St. John's, NL.

The Department makes no representations or warranties on the accuracy or completeness of the information provided.

If you have any questions, please do not hesitate to contact me at (709) 896-5473 or at the address below.

Sincerely,

George Blackwood
Environmental Protection Officer

ENVC Responses

CONFIDENTIAL

REPORT ON PCB SPILLS AND GENERAL ENVIRONMENTAL MISMANAGEMENT AT EX-USAF BASES IN LABRADOR

Resource Programs Division
Intergovernmental Affairs Secretariat
Government of Newfoundland and Labrador

April 15, 1981

Cape Harrison: - This site to the south-east of Makkovik covers a large shoreline area. Remnants of the base installation are evident, but only the footings of buildings remain. An area of one kilometer is littered with debris including two felled towers, a crane, bulldozer, cables, piping and thousands ot rusty, empty 45-gal. drums. Two landing barges on a beach area of the site are badly corroded. One 45-gal. drum, half full is located near the fallen towers. Apart from this, no other contaiminants were discovered.

Aillik: - This site is located just north of Makkovik and is similar in size and layout to the Cut Throat Island site with an upper site complex and lower marine fuel storage facility some miles away.

The upper site complex is partly demolished with exterior walls partially removed. The interior is totally destroyed and contents have no commercial value. One demolished USAF pickup truck is in the garage. The top site fuel storage tank (in excess of 100,000 gal. capacity) is empty and has a concrete dyke around it.

The lower site has no buildings on it. The bulk storage facility is again of 100,000 gal. or more capacity. An old drum dump is located on a beach area. In addition, approximately 20 45-gal. drums are leaking. The contents are unknown but most of these drums are still full.

One fuel 45-gal. drum of lubricating oil was found. Thirty or more alkali batteries, 2 ft. by 1 ft. by 1 ft. are near the radar dome structure. The Canadian Coast Guard beacon station was being refitted at the time of the inspection by two officials. Batteries were dumped next to the station by these officials. Alkali solution from the batteries was permitted to drain out.

Hopedale:- The uppersite is in a partial state of demolition. It is divided into two sections - the BMEWS station (entrance site and building) and TACAN (the main complex with generator building, wharehouses and living quarters). Petro-Canada are presently operating out of a section of the area on the east side (including the wharehouses living and eating facilities of the TACAN area).

Numerous drum dumps are located around the TACAN site. Some of these 45-gal. drums contain helicopter fuels, lube oils and greases for long range and jet ranger helicopter now under charter to PetroCan.

The generator building on the Hopedale topsite contains large generators which have been vandalized, with lube oils covering the concrete floor of the building. There are four large and eight smaller diesel generators with associated electrical equipment in this section of the complex.

A portion of the living quarters, main dining area, theatre, bowling alley facilities has been demolished and is totally destroyed.

Two bulk storage tanks of 30,000 gals. are intact at the edge of the TACAN site. The Northwest side of the TACAN radar dome is partially demolished. A quonset hut containing compressed gas cylinders is located on the northside of the TACAN area. A helicopter pad area just under the lip of the hill (TACAN area) contains many hundreds of 45-gal. drums both full and empty. These are owned and/or controlled by PetroCan, Sealand Helicopter and other groups. They are not dyked.

10/05/95 16:30 ☎204 833 5402 AIRCOM DCOS CE →→→ GOOSEBAY WCEO 003/004

EXECUTIVE COUNCIL
NEWFOUNDLAND AND LABRADOR

CONFEDERATION BLDG.
ST. JOHN'S. NFLD.
A1C 5T7

NDHQ

Sous-Ministre de la Défense Nationale
JAN 30 1958
Deputy Minister of National Defence
10

600444

January 28, 1986

NDHQ/SCDOH 002
Referred to
Transmis à [illegible]

JAN 31 1986

File No.
Dossier No. 1266-3-2
Charged to/Chargé à I.D. 6031

Mr. D. B. Dewar,
Deputy Minister,
Department of National Defence,
National Defence Headquarters,
101 Colonel By Drive,
Ottawa, Ontario.
K1A 0K2

Dear Mr. Dewar:

You will recall our previous correspondence concerning the abandoned military sites in Labrador and our decision to arrange a meeting in St. John's to finalize a mutually acceptable settlement.

The offer of five million dollars to assist in the clean-up of the abandoned sites plus a contingency allowance, not to exceed five hundred thousand dollars, to provide for possible undetected contamination at any site, was informally accepted by the Province on 13 August 1985. I am hereby advising that the Province has now authorized formal acceptance of that offer.

The Government of Newfoundland and Labrador, by acceptance of the payment, will absolve the Government of Canada of any further responsibility and liability for the clean-up of sites identified on the attached list.

Environmental restoration of these sites will be undertaken in a timely manner, bearing in mind the short construction season in Labrador.

Yours truly,

HH Stanley

H. H. Stanley,
Deputy Minister.

④

ABANDONED MILITARY SITES

1. ✓ Cartwright
2. ✓ Hopedale
3. ✓ Spotted Islands x
4. Hopedale Island ?
5. ✓ Cape Makkovik (Allik) [illegible]
6. ✓✓ Cutthroat Island
7. ✓ Cape Harrison
8. N.W. Point (2 sites) x
9. Boa?
10. Harbour Lake?
11. Wild Boar?
12. ✓ Border Beacon
13. ✓ St. Anthony

DEMOLITION AND SITE RESTORATION
FORMER DEW LINE RADAR SITES
CONTRACT PACKAGE - CP3
SECONDARY COASTAL SITES, LABRADOR
86096 - CP#3

BOND ARCHITECTS
TENDER DOCUMENTS
& ENGINEERS LTD.

SPECIFICATIONS FOR
DEMOLITION AND SITE RESTORATION
FORMER DEW LINE RADAR SITES
CONTRACT PACKAGE - CP3
SECONDARY COASTAL SITES, LABRADOR

PROJECT TEAM

OWNER:	Department of Environment Government of Newfoundland and Labrador Confederation Building P.O. Box 4750 St. John's, Newfoundland A1C 5T7
ENGINEER:	Bond Architects and Engineers Limited P.O. Box 6900 53-55 Bond Street St. John's, Newfoundland A1C 6H3
DATE:	February 2, 1987
JOB NO.:	86096

SPECIFICATIONS FOR
DEMOLITION AND SITE RESTORATION
FORMER DEW LINE RADAR SITES
CONTRACT PACKAGE - CP3
SECONDARY COASTAL SITES - LABRADOR

LIST OF DRAWINGS

Project No.	Sheet No.	Description	Date
86096	SK-01	Site Location Plan	November, 1986
86096	SK-A-01	Location Map - Aillik	November, 1986
86096	SK-A-02	Lower Site - Aillik	November, 1986
86096	SK-A-03	Upper Site - Aillik	November, 1986
86096	SK-CH-01	Location Map - Cape Harrison	November, 1986
86096	SK-CH-02	Site Sketch - Cape Harrison	November, 1986
86096	SK-CTI-01	Location Map - Cut Throat Island	November, 1986
86096	SK-CTI-02	Lower Site - Cut Throat Island	January, 1987
86096	SK-CTI-03	Upper Site - Cut Throat Island	November, 1986
86096	SK-SI-01	Location Map - Spotted Island	November, 1986
86096	SK-SI-02	Lower Site - Spotted Island	January, 1987
86096	SK-SI-03	Upper Site - Spotted Island	November, 1986

PART 1 - GENERAL

1.1 Work Included for Aillik

.1 Purpose of clean-up work is to bring the site as close as possible to its original condition within the defined clean-up areas.

.2 Demolition, removal and burial of all building structures located at upper site.

.3 Removal and disposal of by burial of all building contents.

.4 Collection and disposal by burial of all loose scattered debris, fuel drums, small tanks, scrapped materials, equipment and vehicles, within 100 m radius measured from any point of the Operations Building foundation walls, located at the upper site and within 30 m from either side of access road centreline from the lower site up to and around the upper site.

.5 Dismantling, removal and disposal of summit bulk fuel storage tank. Tank approximately 18.0 m diameter x 7.20 m high. Clean up of any loose debris within zone of 30 m from containment dyke.

.6 Removal and disposal of ventilated and non-ventilated pressure gas cylinders and ancillary equipment.

.7 Removal and burial of all former site utilities, power conductors, post delineators, utility poles, pipe lines, water, sewer including septic tank and fuel lines.

  .1 Water line, approx. - 1000 m
  .2 Sewer line, approx. - 300 m
  .3 Fuel line, approx. - 200 m

Corridor width for clean-up purposes to be 30 m for all utility routes.

.8 Demolition and removal of structural steel frame and metal siding water supply pumphouse, and water supply intake structure. Cleanup zone to measure 30 m radius from water supply pumphouse, and corridor width of 30 m along water supply suction pipeline.

.9 Dismantle, remove and dispose of lower site bulk fuel storage tank. Tank approx. 18.0 m diameter by 12.0 m high. Collection and disposal of approx. 200 fuel drums scattered along beach up to 500 m from containment dyke. Remove and dispose of fuel pipeline and supports from the storage tank to the beach head.

.10 Collect and dispose all fuel drums and general debris along former access roads. Cleanup zone to measure 30 m on either side of road centreline.

.11 Dismantle, remove and dispose of structural steel frame storage building, measuring 7.5 x 14.5 m. Cleanup zone to measure 30 m radius from building.

.12 Removal and disposal of steel baseplates and anchor bolts cut flush with top of concrete foundations. Concrete foundations to remain.

.13 Complete burial with suitable fill material, suitably graded to facilitate drainge without significant surface erosion, of all debris and rubbish gathered for disposal within defined clean-up zones.

.14 Any salvaged items must be removed from project site no later than September 30, 1987.

1.2 Work Excluded for Aillik

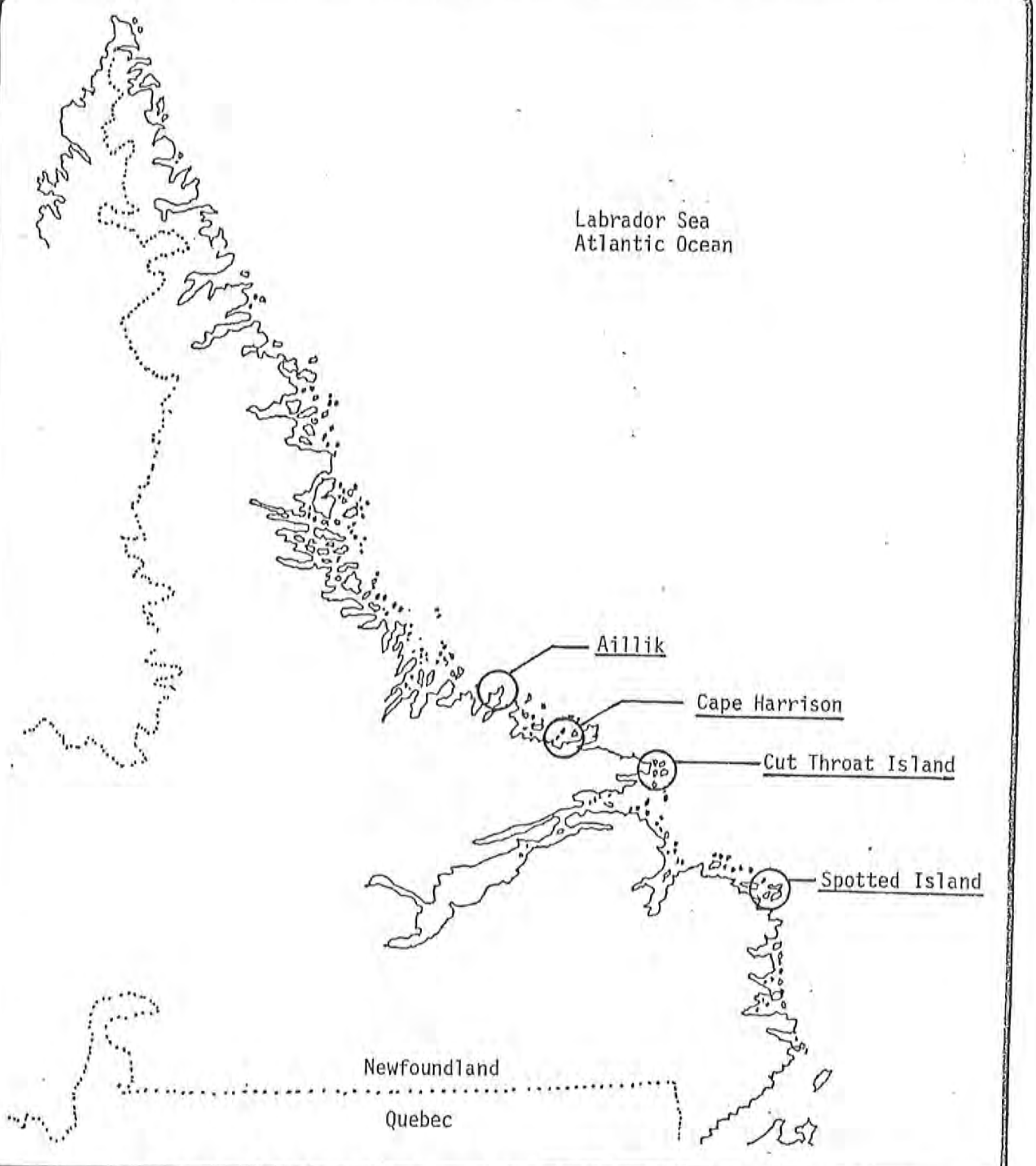
.1 Removal of reinforced concrete footings, piers, beams, structural slabs and slabs on grade.

.2 Collection and removal of all incidental debris outside boundary of clean-up areas.

1.3 Work Included for Cape Harrison

.1 Purpose of cleanup work is to bring the site as close as possible to its original condition within the defined cleanup area.

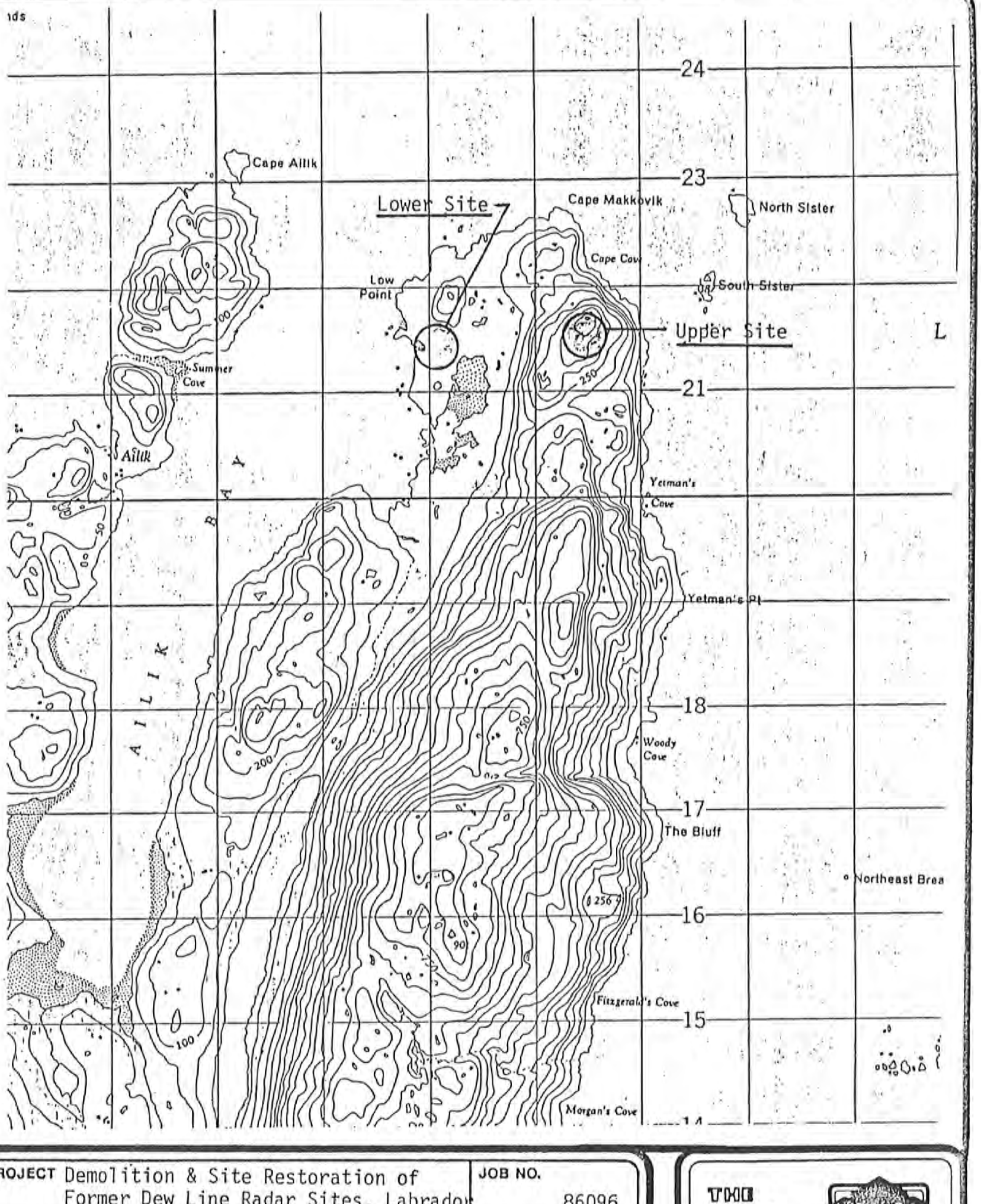
.2 Collection and disposal by burial of all debris including fuel caches, small tanks, scrapped equipment and vehicles, utility poles, water/sewer/fuel pipelines, fallen antennae towers and building structures. Debris also included scattered fuel drums and other related materials located on the peninsula.



PROJECT Demolition & Site Restoration of Former Dew Line Radar Sites, Labrador			JOB NO. 86096
TITLE Site Location Plan			PAGE SK-01
DIVISION Civil	DRAWN G.L.	CHECKED	DATE November, 1986

THE BAE GROUP

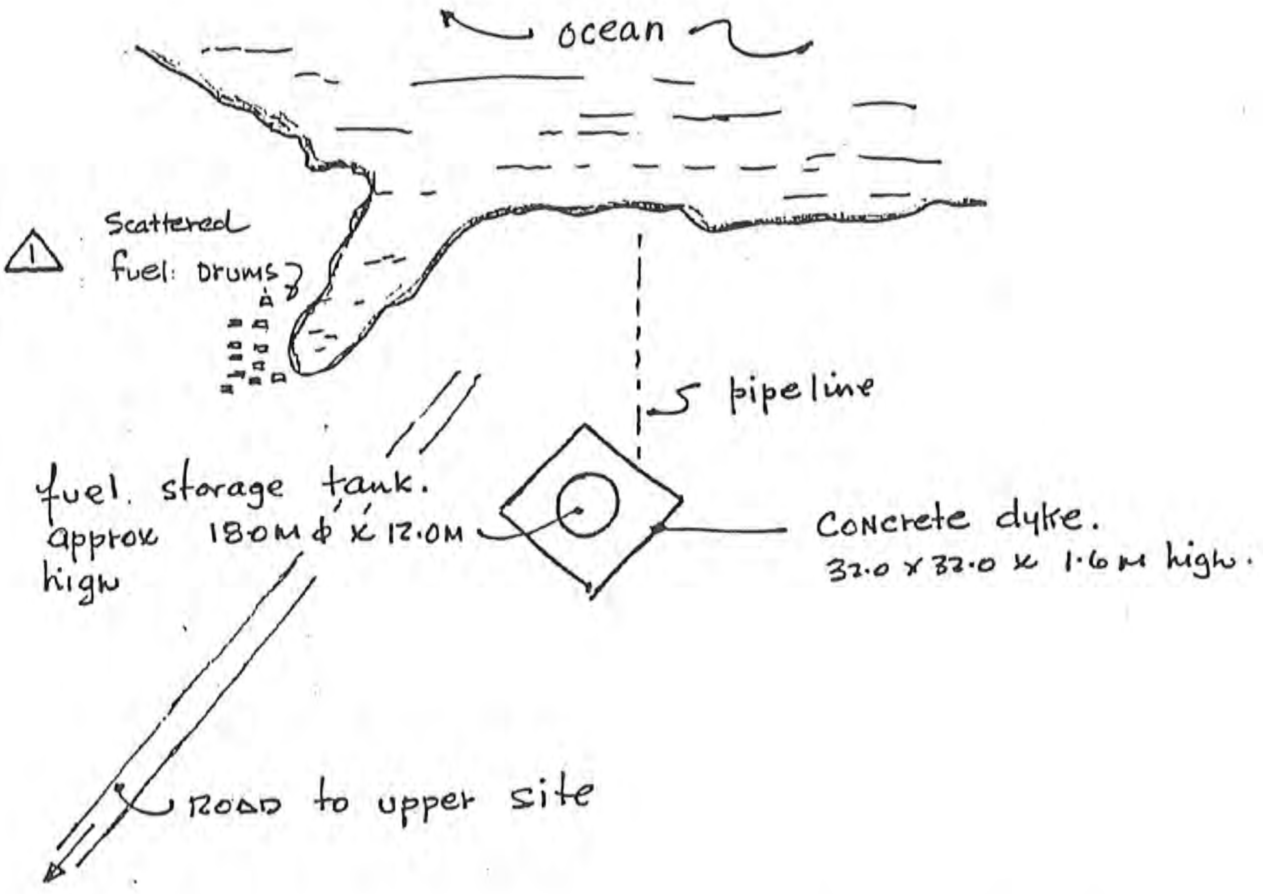
BOND ARCHITECTS and ENGINEERS LIMITED
BOND STREET P O BOX 6900 ST JOHN S NF
A1C-6H3 TLX 016-4676 TEL (709) 722-4622



PROJECT Demolition & Site Restoration of Former Dew Line Radar Sites, Labrador			**JOB NO.** 86096
TITLE Location Map - Aillik			**PAGE** SK-A-01
DIVISION Civil	**DRAWN** G.L.	**CHECKED**	**DATE** November, 1986

THE BAE GROUP

BOND ARCHITECTS and ENGINEERS LIMITED
BOND STREET P O BOX 8900 ST JOHN'S NF
A1C-6H3 TLX 016-4676 TEL (709) 722-4422

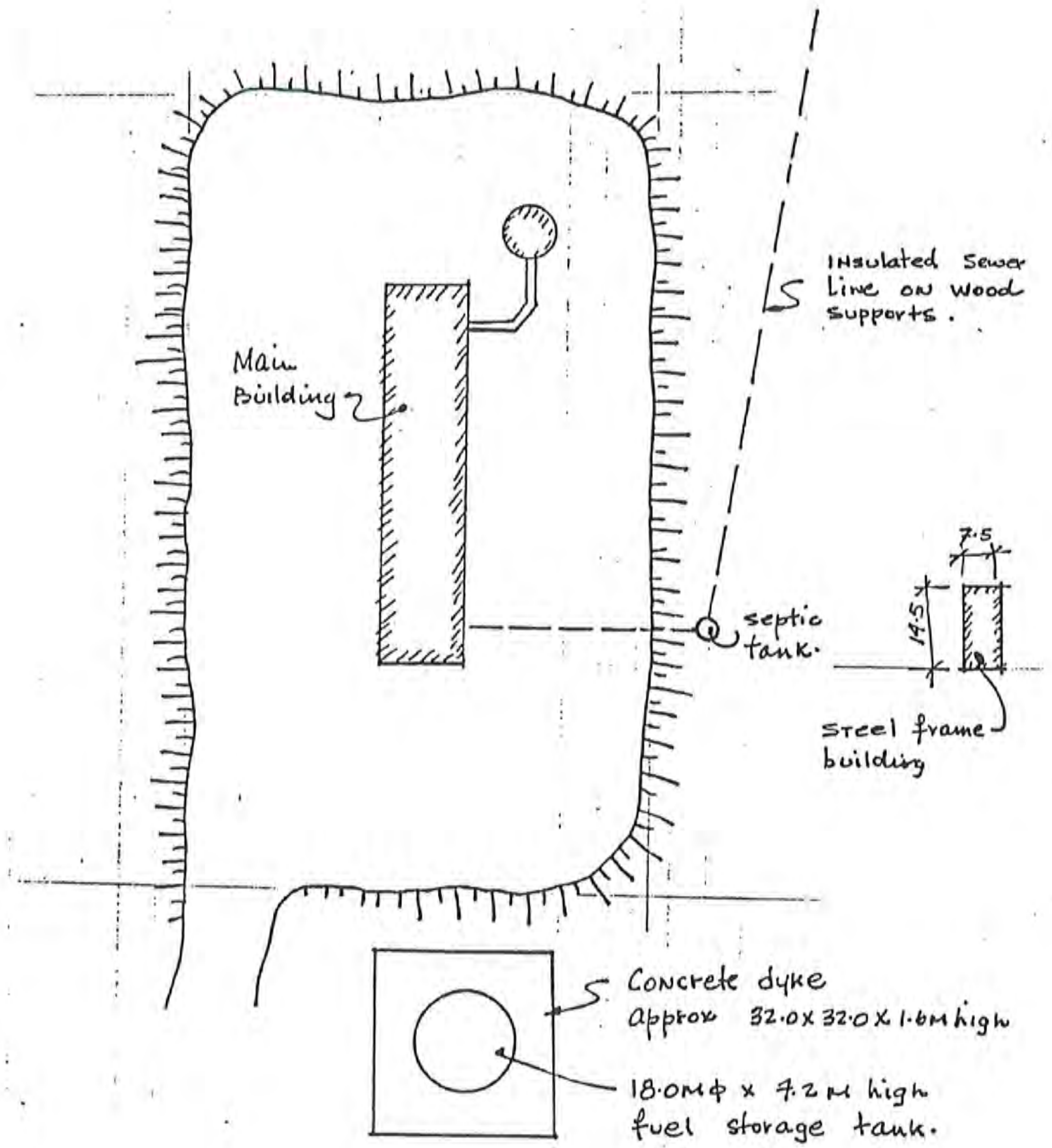


△1 - Revised Jan. 87

PROJECT Demolition & Site Restoration of Former Dew Line Radar Sites, Labrador			**JOB NO.** 86096
TITLE Lower Site - Aillik			SKETCH NO. SK-A-02
DIVISION Civil	**DRAWN** G	**CHECKED**	**DATE** November, 1986

THE BAE GROUP

BOND ARCHITECTS and ENGINEERS LIMITED
BOND STREET P O BOX 6900 ST JOHN S NF
A1C-6H3 TLX 016-4676 TEL (709) 722-4622



PROJECT Demolition & Site Restoration of
Former Dew Line Radar Sites, Labrador

JOB NO. 86096

TITLE Upper Site - Aillik

SKETCH NO. SK-A-03

DIVISION Civil

DRAWN

CHECKED

DATE November, 1986

THE
BAE
GROUP

BOND ARCHITECTS and ENGINEERS LIMITED
BOND STREET P O BOX 6900 ST JOHN'S NF
A1C 6H3 TLX 016-4676 TEL (709) 722-4822

GOVERNMENT OF NEWFOUNDLAND & LABRADOR
Department of Environment

OFFICE OF THE MINISTER

P. O. BOX 4750
ST. JOHN'S, NEWFOUNDLAND
A1C 5T7

1987 04 27

Labrador Construction Limited
P.O. Box 8274, Stn. A
St. John's, NF
A1B 3N4

Attention: Mr. B. Power

Dear Sir:

RE: Demolition and Site Restoration
Former Dew Line Radar Sites
Contract Package - CP3
Spotted Island, Cut Throat Island, Cape Harrison, Aillik, Labrador

Further to our review of tenders submitted for the captioned tender package, I am pleased to inform you that your tender, in the amount of $738,000.00 has been accepted subject to the following conditions:

Letter from Labrador Construction Limited dated 1987 03 27.

- 30-day extension to contract award date.

Please forward the specified bonding and insurance policies to our consultant, The BAE Group, for review. Your bid security will be retained until these documents are received. Upon receipt of bonding and insurances a contract will be executed and a copy forwarded to you. Work will not be permitted to start until the bonding and insurances are received and formally approved by my Department and The BAE Group.

Yours truly,

John C. Butt
Minister

cc: Workmen's Compensation Board

SITE RESTORATION
FORMER DEW LINE RADAR SITES
LABRADOR
STATUS REPORT #1
PERIOD ENDING JULY 31, 1987

MONTHLY STATUS REPORT

Project No. 86096
Report No. 1
From: June, 1987
To: July 31, 1987

Client: Department of Environment
Date Submitted: August 15, 1987

Project: Demolition and Site Restoration - Former Dew Line Radar Sites
Secondary Coastal Sites, Labrador - Contract Package CP-3

Consultant: Bond Architects & Engineers Limited (The BAE Group)

A. Tender Data:

Tender Closing Date: March 2, 1987
Contractor: Labrador Construction Ltd.
Completion Date: October 30, 1987

Contract Award Date: April 27, 1987
Contract Amount: $738,000.00
Change Order Amount: -
Revised Contract Amount: $738,000.00
Revised Completion Date: Sept. 30/87

B. Construction Equipment Resources Deployed During Month:

Aillik	Cape Harrison	Cut Throat Is.	Spotted Is.
(1) 1 - D6 Dozer (2) 1 - Front End Loader (3) 1 - Pick-Up (4) 1 - ATV Quad Runner (5) Welders, Pumps, Etc. (6) 1 - Barge (7) 1 - Ship (Lady Johnson II)	No work in progress.	Not mobilized to date.	Not mobilized to date.

C. Construction Work Force Deployed During Month:

- Aillik

  (1) 1 - Foreman
  (2) 3 - Labourers
  (3) 2 - Equipment Welders

- Cape Harrison

  - No work in progress.

- Cut Throat Island

  - Not mobilized to date.

- Spotted Island

  - Not mobilized to date.

D. Summary of Contemplated Change Order/Change Order to Month End

- No change orders issued under contract to date.

E. Summary of Progress

Aillik

.1 Restoration work at upper and lower sites is approximately 95% complete.

.2 Completion of work on this site is consistent with schedule commitments.

.3 BAE site representative to visit site for final inspection in early August.

Cape Harrison

.1 Initial start of work on Cape Harrison was terminated on June 13, 1987 due to inadequate accommodations, provisions and communication. Also, workmanship was considered substandard.

.2 Workforce/Equipment scheduled to be mobilized to Cape Harrison upon completion of Aillik restoration.

.3 Work completed at Cape Harrison to date will be assessed by BAE site representative prior to recommencement of work.

.4 Contractor has committed to secure proper provisions, accommodations and communication facilities on site.

F. Project Construction Costs

Contract: Secondary Coastal Sites - CP-3

Contract Description	Contract Amount	Change Orders Approved	Anticipated Change Orders	Const. Cost This Month	Const. Cost Month Ending	Percent Complete	Amount to Finish	Total Estimated to Completion
1. Aillik	$210,000.00	-	-	$198,500.00	$198,500.00	94.5	$ 11,500.00	$ 210,000.00
2. Cape Harrison	$150,000.00	-	-	-	-	-	$150,000.00	$ 150,000.00
3. Cut Throat Island	$210,000.00	-	-	-	-	-	$210,000.00	$ 210,000.00
4. Spotted Island	$168,000.00	-	-	-	-	-	$168,000.00	$ 168,000.00
TOTAL	$738,000.00	-	-	$198,500.00	$198,500.00	26.9	$539,500.00	$ 738,000.00

Photo #1: Disposal Site "Aillik"

Photo #2: Cleaver Dismantling Tank "Aillik"

Photo #3: Aillik Dismantled and Restored

Photo #4: "Aillik" Main Complex Being Dismantled

Photo #5: Water Pipeline "Aillik"

Baine Johnston Centre
Third Floor, 10 Fort William Place
P. O. Box 6900, St. John's, NF
A1C 6H3 Tel: (709) 722-4622
Tlx: 016-4676 Fax# (709) 722-2733

THE BAE GROUP

86096.1

September 22, 1987

TELECOPIED: Sept. 22/87
Bond Architects & Engineers Ltd.

Department of Environment
P.O. Box 4750
St. John's, Newfoundland
A1C 5T7

Attention: Mr. Randy Vallis

Dear Sir:

RE: Former Dew Line Radar Sites
Secondary Coastal Sites - CP#3

Subsequent to our findings of September 11, 1987, and our follow-up letter dated September 14, 1987 confirming our dissatisfaction with the performance of Labrador Construction, it has come to my attention that there may be some descention within the NDOE ranks regarding our most recent position taken against Labrador Construction.

The following is a brief recap of the project history:

- Subsequent to tender closing of CP#3, a decision was made to award a contract to the second lowest bidder, Labrador Construction Limited. Our reasons for this decision is clearly covered in our letter dated March 31, 1987.
- On July 14, 1987, threat of default was issued to the Contractor. Reason for this decision was due to the Contractor's non-conformance with requirements of the contract. The items of concern were acknowledged with a plan to remedy per Labrador Construction's letter of July 20, 1987.
- On September 14, 1987, a second default threat was issued to the Contractor. The second default notification was precipitated by the following events:

.../2

On September 10 and 11, 1987 during a site visit of all four (4) sites under CP#3. The following is a brief recap of our findings:

1. Cut Throat Island: (September 10, 1987)

   - Demolition complete.
   - Burial apparently complete, however the General Contractor did not know where the burial sites were located, nor was any approval requested for burial sites selected by the Contractor.
   - Contractor was demobilized with work remaining to complete.

2. Cape Harrison: (September 10, 1987)

   - Demolition substantially complete.
   - Substantial burial of debris remaining.
   - Contractor demobilized from site.

3. Aillik: (September 10, 1987)

   - Work substantially complete.
   - Only minor deficiencies remaining (this work could be handled by hand).

4. Spotted Island: (September 11, 1987)

   - Demolition had commenced.
   - No superintendent on site. The spokesman for the Contractor was an equipment operator (Dennis O'Keefe).
   - We were told by Mr. O'Keefe that "99% of equipment" belonged to Eastern Shredding, and not Labrador Construction.
   - Our site representative, Mr. W. Oakley, advised that based on work-force list provided on site, all site personnel had been employed by Eastern Shredding in Hopedale (CP#1).

.../3

On September 10, 1987 we met with Mr. B. Powers in Hopedale. During our meeting the following questions posed by the Consultant could not be answered:

1. Where is workforce currently mobilized?
2. Who is Labrador Construction's site superintendent?
3. What is current workforce deployed?
4. Confirm exact list of equipment deployed?

In accordance with the Contract Documents, the Contractor must fulfill the following obligations in the best interest of the project:

1. GC.32 - Contractor's Responsibilities and Control of Work (32.1, 32.2, 32.3, 32.4)
2. GC.33 - Superintendence
3. GC.13 - Assignment

The success of this project revolves around the Contractor's Construction Methodology, complete control of the work and provision of competent superintendence to ensure that all requirements of the contract are met, and execution of work is carried out in a safe and effective manner.

In our assessment, the Contractor has displayed non-conformance with the intent of the contract as follows:

- GC.32:
  - Demobilization of specific sites prior to completion.
  - Selection/Use of burial sites without authorization.
  - Contractor's Project Manager's inability to provide critical project control information.
- GC.33:
  - Superintendent not committed to jobsite during construction.
- GC.33 - Assignment:
  - All equipment/manpower on-site was deployed by subcontractor without any evidence of General Contractor's presence.

.../4

Based on the latest events, we have no choice but to find the Contractor in default of contractual obligations.

The foregoing events precipitated our letter of September 14, 1987 requesting the Contractor to cease work until this whole situation was remedied and brought under control.

As we stated at Day One, we felt that Labrador Construction had the resources and capabilities to execute the specified work successfully. Our position on this matter has not changed, however, for some reason we are not receiving co-operation from Labrador Construction realized on past projects. Further, in the best interest of the project we are not creating a case to officially default Labrador Construction, nor do we feel that a default at this stage would be effective.

In the construction industry there are a number of mechanisms to control contractors. It just so happens that GC.10 "Owner's Right to Stop Work/Terminate Contract" is the strongest tool. Without such mechanisms we cannot control the Contractor's insistence on violating contractual responsibilities. In consideration of Labrador Construction's track record on this project, we had no choice but to use the strongest tool at our disposal.

In our opinion, we have demonstrated a sincere effort to regain/maintain a sufficient level of control to ensure that contractual obligations are met. I feel that we have acted promptly and diligently as problems have arisen in the best interest of the Client and the successful completion of this project.

This project may be over-simplified and deemed to be merely an exercise in "knocking down" and burying structures. However, there are a number of concerns which one must not lose site of which are specifically addressed under Section 02060 - 1.14, the major aspects being safety and fulfilling requirements of all regulatory agencies. These aspects, in addition to logistics and performance of effective work, must be carefully controlled at all times in order to ensure that the best finished product is realized.

Normally, we would attempt to resolve problems such as this in a more diplomatic manner. However, the Contractor has been virtually inaccessible day and night since this project commenced. Hence, we have no choice but to take forceful action.

.../5

We trust you concur with our efforts to achieve the best possible results on this project. If you or any NDOE personnel have any concerns, I would be pleased to discuss this matter further at your convenience.

Yours very truly,

THE BAE GROUP

D.J. Holley, P. Eng.

DJH/amj

ENVIRONMENTAL INSPECTION ABANDONED MILITARY SITES IN LABRADOR

Prepared by: Toby Matthews
Environmental Management Division
Department of Environment and Labour
October 1996

Abandoned industrial trailers in the dock area are reportedly the property of a Newfoundland contracting company. An abandoned oil storage tank near the dock is reportedly owned by a now bankrupt oil company.

Recommendations

There are some areas of immediate concern. These are: Sixty-four barrels on the slopes of the town water supply reservoir should be collected and land filled in town's waste disposal site. Due to the rusted condition of these barrels, extreme care must be taken in removal from the steeply sloping hillsides of the reservoir.

A soil and water sampling study (through a consultant contract) is recommended at the debris disposal quarry, the main town quarry area, the town water supply and the pond area situated to the left of the road leading up to BMEWS site.

An electromagnetic survey of the town's reservoir could be conducted during winter (over the ice) to detect any barrels or other objects which maybe in sediments of the reservoir pond.

Sediment sampling (for soil and chemical analysis) of town reservoir and the pond (at lower elevation) near the reservoir is recommended. This may be in conjunction with the other soil and water sampling recommended.

Government Services Centre (GSC) should liaise with the Town of Hopedale in identifying ownership of abandoned trailers and the bulk oil storage tanks near the dock. GSC or the town can order removal/disposal of these abandoned materials.

2.3 Cape Allik (Makkovik)
Situated 55° 15' (Lat), 59° 08' (Long)

Cape Allik was a <u>Terminal</u> site on the Mid Canada Line and is referred to as a GAP FILLER site. It was operated by the Government of the United States and deactivated in 1962. The property was initially turned over to the Federal Crown Assets Disposal Association (CADC) and CCE. Assets on site were sold to a British Newfoundland Corporation Limited.

Two parcels of land (16.64 acres and 104.34 acres) were originally transferred to the Department of National Defense (DND).

In 1986, the Department of Environment commissioned Eastern Demolition to do a cleanup of the site involving demolition and disposal of all residual fuel, buildings and barrels on the two parcels of land. (Upper and Lower Sites). The work involved demolition of a 5-unit complex, dismantling of two large aboveground fuel storage tanks, disposal of residual fuel and burial of debris. Concrete footings and concrete dyke walls (2 sites) were permitted to remain in place.

Inspection
Date: September 5, 1996

A surveillance flyover of the lower site reveals only a few isolated barrels and a concrete dyke at the lower site and area.

A road several kilometres in length leads to the upper site and a water reservoir. The upper site is clean. Only the concrete dyke and concrete building foundations remain. Debris disposal areas were identified. <u>All</u> debris has been backfilled on both upper and lower areas.

A trail leads to the water supply reservoir with a concrete dam. Three barrels were observed, one of which in on a ledge at the water's edge. Contents of barrels is unknown.

North west of the lower site some kilometres distance at position 55°12.58N, 59°10.55W, a drum dump was located on a beach area. Upon examination of this site, 63 rusted empty barrels were counted. The wetlands area above the beach were scattered other barrels and along a bogland (path route) to Makkovik, a motor and scattered other fuel drums were spotted during the flyover. The area is referred to as the head of Banana Lake.

Recommendation

Consider cleanup of empty barrels and debris at the beach site and water supply area. Recover other barrels and isolated debris along route; Banana Lake to Makkovik.

Note 1:

It is not known if beach site was part of Mid Canada Line site operational activity. It appears that the lower site and the barrel littered beach are connected.

2.4 Cape Harrison
Situated: Location is some 65 kilometres generally south of Cape Allik.

Cape Harrison was transferred to Canada in 1951 for use as a radio range station by the Department of Transport. It served as a radar and communications site. The land was formerly occupied by American military who installed the station.

[illegible] [illegible] IEA [illegible]

FACILITY LOCATION	SYSTEM	FINANCED & MANNED	DEACTIVATED	DOCUMENTATION	BUYER	CLEAN-UP PROBLEM
Cartwright Lat 52-44 Long 56-56 (Newfoundland-Labrador)	Pine Tree NEAC	USAF	1968	External Affairs letter 17-14-10 & CADC letter file 615-18-1659	19 Structures were sold to a private individual 7 Dec 72. The remaining structures were sold to Bell Telephone.	Buildings in disrepair and some oil on site.
Saglek Lat 58-12 Long 62-39	Pine Tree NEAC	USAF	1970	S.O. 368136 25 Aug 76	*Eastcan Exploration Ltd. had a temporary MOA to use fuel and equipment storage and base camp. Materials sold to ITT Canada Ltd with clean-up conditions attached to the sale.	Partially demolished buildings. Quantities of oil, grease, fuel. Much debris and a drum dump.
Hopedale Lat 58-58 Long 60-14	Pine Tree NEAC	USAF	1968	S.O. 368136 3 Aug 76	*Eastcan Exploration Ltd had a temporary MOA to use fuel and equipment storage and base camp. Bldg. S-28 sold to MOT. The rest of the building and removables sold to the community of Hopedale.	Partially demolished buildings. Quantities of oil, grease, fuel. Much debris and a drum dump.
Spotted Island Lat 53-31 Long 55-14	NEAC Terminal Mid-Canada Line (Gap Filler)	USAF	1962	Properties CCE/Prop to CADC 716 dated 8 Jan 62 File No. 10-F26	Buildings sold to Newfoundland Construction and Development Co. This company was to make arrangements with the Newfoundland Govt. for use of buildings on site.	Partially demolished buildings, debris, large fuel tank.
Hopedale Island Doppler Sites (Mid-Canada Line) D 201 Hopedale 55-27-52 60-14-30	MCL	Canada		S.O. 197865 25 Jun 64	Land thought to belong to Newfoundland. Fencing, diesel generators, tanks and other facilities sold to Tanny Merchandising Corp. for removal and site was to be restored by Tammy.	
Cape Makkovik (Allik) Lat 55-15 Long 59-08	NEAC Terminal MCL (Gap Filler)	USAF	1962	Properties CCE/Prop to CADC 716 dated 8 Jan 62 File No. 10-F26	Buildings and facilities sold to British Newfoundland Corp. Ltd. The company was to make arrangements with the Newfoundland Gov't. for use of the building on site.	Drum dump, bulk storage fa partially demolished build

* Petro Canada took over from Eastcan

SAGLEK:

To Canada:	M.C. 163-'65	1965
	(M.A.&R. 8-'65)	(1965)
To Nfld:	P.C. 1976-2983	1976
	M.C. 1111-'77	1977

Conveyed along with Hopedale to the Department of National Defense. Conditions included mineral and gas rights for the Province and a return clause stating that when lands no longer used by DND, they will be assumed by Newfoundland.

Reference is in Federal Reservation Book (FRB), Vol. 2 Folio 46/49.

HUNT RIVER - BORDER BEACON (INLAND HOPEDALE):

To Canada:	M.C. 20-'57	1957
	(M.&R. 3-'57)	(1957)
To Nfld:	(M.A.&R. 3(c)-'65)	(1965)
	P.C. 1965-1125	1965

Conveyed to DND in connection with Mid Canada Line Negotiation on Lot 212 indicates it was transferred to the control of the Department of Transport (Federal). The other lots were transferred back to the Province on June 18, 1965 by federal P.C. (See M.A.&R. 3(c)-'65) and approved 29-10-1965 but no M.C. has been found for any of the lots. Conditions of original transfer were that the lands of all times had to be used for the purposes of an in connection with mid Canada Line and were to revert to Newfoundland in the event that they ceased to be used for that purpose.

Reference is in FRB Volume 1, Folio 50.

HOPEDALE

To Canada:	M.C. 163-'65	1965
	(M.A.&R. 8-'65)	(1965)
To Nfld:	P.C. 1976-2983	1976
	M.C. 111-'77	1977

Conveyed along with Saglek to DND. Conditions are same as for Saglek.

Reference is in FRB Volume 2, 46/49.

CHURCH ISLAND: No records available.

CAPE AILLIK (MAKKOVIK):

To Canada:	M.C. 697-'57	1957
	(M.&.R. 39(c)'57)	(1957)
To Nfld:	M.C. 203-'63	1963

Two pieces of land transferred to Canada for use by DND in connection with mid Canada Line. Area A is 16.64 acres; Area B is 104.23 acres. Use and conditions, the same as for Inland Hopedale.

Reference is in FRB Volume 1, Folio 60.

Environment Canada Responses

Newfoundland
Labrador

Government of Newfoundland and Labrador
Department of Environment & Conservation

Pollution Prevention Division
(Environment)

March 3, 2015

RE: Phase I Environmental Site Assessment
Government of Newfoundland & Labrador
Former United States (US) Military Site
Site N-28A, Cape Makkovik – Ailik, NL (Call Sign Memorial)

To Whom It May Concern:

As a representative of the primary owner of the above listed property, I certify that Conestoga-Rovers & Associates (CRA) has been contracted to complete a Phase I Environmental Site Assessment on the above-noted property.

The Site was established in 1957 as a manned Gap Filler radar station that was constructed by the United States Air Force under operational control of the Hopedale Air Station and part of the Pinetree Line of Ground-Control Intercept (GCI) radar sites.

The property was originally transferred from the Province of Newfoundland and Labrador to the Government of Canada in the 1950's after which permission was granted to the US Government for their use. Operations ceased in 1961 when the property reverted back to the Government of Canada. It is my understanding the Site was transferred back to the Province of Newfoundland & Labrador in 1986.

The former Site is located at 55° 13' North Latitude and 59° 13.5' West Longitude. A site location map illustrating the approximate location of the property is attached.

Please release any information pertaining to this property to CRA.

Sincerely,

Christa Curnew

Ms. Christa Curnew, M.Env. Sci., P.Eng.
Project Manager – Impacted Sites
Pollution Prevention Division
Department of Environment and Conservation
Government of Newfoundland & Labrador

c.c. Brian Luffman, CRA

P.O. Box 8700, St. John's, NL, Canada A1B 4J6 Tel: 709-729-2556 Fax: 709-729-6969

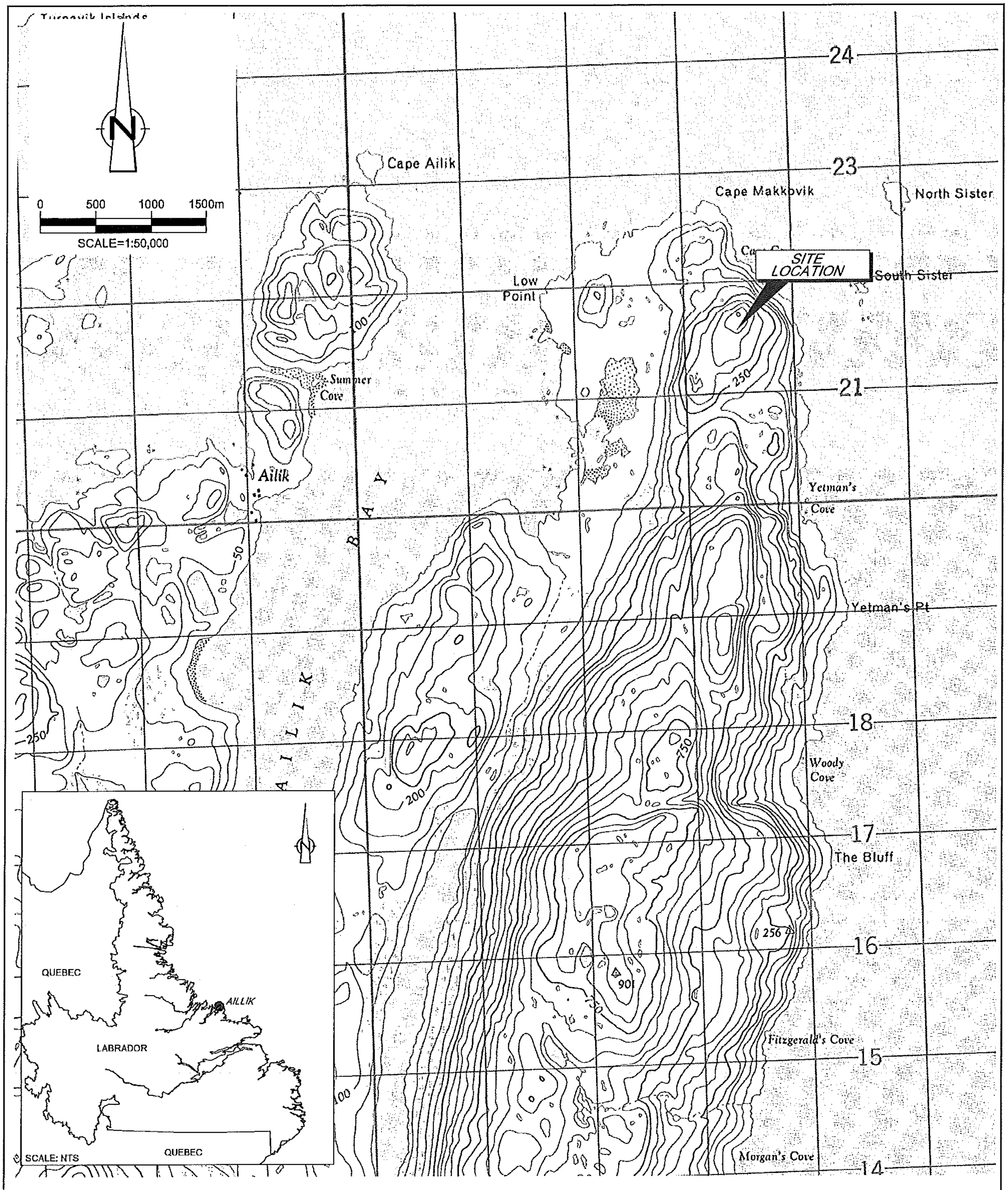


figure 1

SITE LOCATION MAP
PHASE I ENVIRONMENTAL SITE ASSESSMENT
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
Aillik, Cape Makkovik, Labrador, NL

Environment Canada Environnement Canada

Terrasses de la Chaudière
10 Wellington Street, 4th Floor
Gatineau, Québec K1A 0H3

Your File Votre référence
ID: 252716

Our File Notre référence
E-2014-01714 / TL

March 9, 2015

Mr. Peter Gillingham
Conestoga-Rovers & Associates Limited
1118 Topsail Road
P.O. Box: 8353
Mt. Pearl, Newfoundland and Labrador A1B 3N7

Dear Mr. Gillingham,

This is to acknowledge receipt on March 9, 2015 of your request under the *Access to Information Act* for:

> "Owner: Government of Newfoundland and Labrador
>
> Address: The former United States Military Site N-28A, Cape Makkovik-Ailik (Call Sign Memorial), NL
>
> Please review your records and provide any available information pertaining to the environmental status of the property, such as: 1. storage tank registration, or records of tank decommissioning; 2. knowledge or records of past environmental infractions; and/or, 3. any known existing environmental concerns.
>
> Authorized by: {Christa Curnew}"

We have started processing your request and will contact you as soon as possible. Please find enclosed our principles for assisting your request.

If you have any questions regarding this request, do not hesitate to contact me at 819-953-9390. Please quote the above file number on all future correspondence concerning this request.

Yours sincerely,

Travis Lamothe
Access to Information and Privacy Secretariat

Enclosure

Canadä

Our principles for assisting your request

In processing your request under the *Access to Information Act* or *Privacy Act*, we will:

1. Process your request without regard to your identity.
2. Offer reasonable assistance throughout the request process.
3. Provide information on the *Access to Information Act* or *Privacy Act*, including information on the processing of your request and your right to complain to the Information Commissioner of Canada or Privacy Commissioner of Canada.
4. Inform you as appropriate and without undue delay when your request needs to be clarified.
5. Make every reasonable effort to locate and retrieve the requested records/personal information under the control of Environment Canada.
6. Apply limited and specific exemptions to the requested records/personal information.
7. Provide accurate and complete responses.
8. Provide timely access to the requested information/personal information.
9. Provide records/personal information in the format and official language requested, as appropriate.
10. Provide an appropriate location to examine the requested information/personal information.

Environment Canada   Environnement Canada

Terrasses de la Chaudière
10 Wellington Street, 4th Floor
Gatineau, Québec K1A 0H3

Your File Votre référence
ID: 252716
Our File Notre référence
E-2014-01714 / TL

April 8, 2015

Mr. Peter Gillingham
Conestoga-Rovers & Associates Ltd.
1118 Topsail Road
P.O. Box: 8353
Mt. Pearl, Newfoundland and Labrador
A1B 3N7

Dear Mr. Gillingham,

This is further to your request under the *Access to Information Act* (the Act) for:

> **"Owner: Government of Newfoundland and Labrador**
>
> **Address: The former United States Military Site N-28A, Cape Makkovik-Ailik (Call Sign Memorial), NL**
>
> **Please review your records and provide any available information pertaining to the environmental status of the property, such as: 1. storage tank registration, or records of tank decommissioning; 2. knowledge or records of past environmental infractions; and/or, 3. any known existing environmental concerns.**
>
> **Authorized by: {Christa Curnew}"**

Pursuant to paragraphs 9(1)(a) and (c) of the Act (copy attached), an extension of 150 days is required beyond the statutory 30-day limit allowed for the processing of your request. Due to the large number of records/significant search of records involved, meeting the original time limit would unreasonably interfere with the operations of the Department. Notifications to third parties pursuant to subsection 27(1) of the Act are also required and cannot reasonably be completed within the original time limit.

Please note that the notification process pursuant to paragraph 9(1)(c) of the Act approximately takes 60 days but it could be much more if a third party challenges the release of the records in court.

Please be advised that you are entitled to complain to the Information Commissioner concerning the processing of your request within sixty days of the receipt of this notice. In the event you decide to avail yourself of this right, your notice of complaint should be addressed to:

Information Commissioner of Canada
30 Victoria Street
Gatineau, Québec K1A 1H3

.../2

EXTENSION OF TIME LIMITS

9.(1) The head of a government institution may extend the time limit set out in section 7 or subsection 8(1) in respect of a request under this Act for a reasonable period of time, having regard to the circumstances, if

(a) the request is for a large number of records or necessitates a search through a large number of records and meeting the original time limit would unreasonably interfere with the operations of the government institution,

(b) consultations are necessary to comply with the request that cannot reasonably be completed within the original time limit, or

(c) notice of the request is given pursuant to subsection 27(1)

by giving notice of the extension and, in the circumstances set out in paragraph (a) or (b), the length of the extension, to the person who made the request within thirty days after the request is received, which notice shall contain a statement that the person has a right to make a complaint to the Information Commissioner about the extension.

Notice of extension to Information Commissioner

(2) Where the head of a government institution extends a time limit under subsection (1) for more than thirty days, the head of the institution shall give notice of the extension to the Information Commissioner at the same time as notice is given under subsection (1).

Appendix C

Property Title Search Information

SAGLEK:

To Canada:	M.C. 163-'65	1965
	(M.A.&R. 8-'65)	(1965)
To Nfld:	P.C. 1976-2983	1976
	M.C. 1111-'77	1977

Conveyed along with Hopedale to the Department of National Defense. Conditions included mineral and gas rights for the Province and a return clause stating that when lands no longer used by DND, they will be assumed by Newfoundland.

Reference is in Federal Reservation Book (FRB), Vol. 2 Folio 46/49.

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To Canada:	M.C. 20-'57	1957
	(M.&R. 3-'57)	(1957)
To Nfld:	(M.A.&R. 3(c)-'65)	(1965)
	P.C. 1965-1125	1965

Conveyed to DND in connection with Mid Canada Line Negotiation on Lot 212 indicates it was transferred to the control of the Department of Transport (Federal). The other lots were transferred back to the Province on June 18, 1965 by federal P.C. (See M.A.&R. 3(c)-'65) and approved 29-10-1965 but no M.C. has been found for any of the lots. Conditions of original transfer were that the lands of all times had to be used for the purposes of an in connection with mid Canada Line and were to revert to Newfoundland in the event that they ceased to be used for that purpose.

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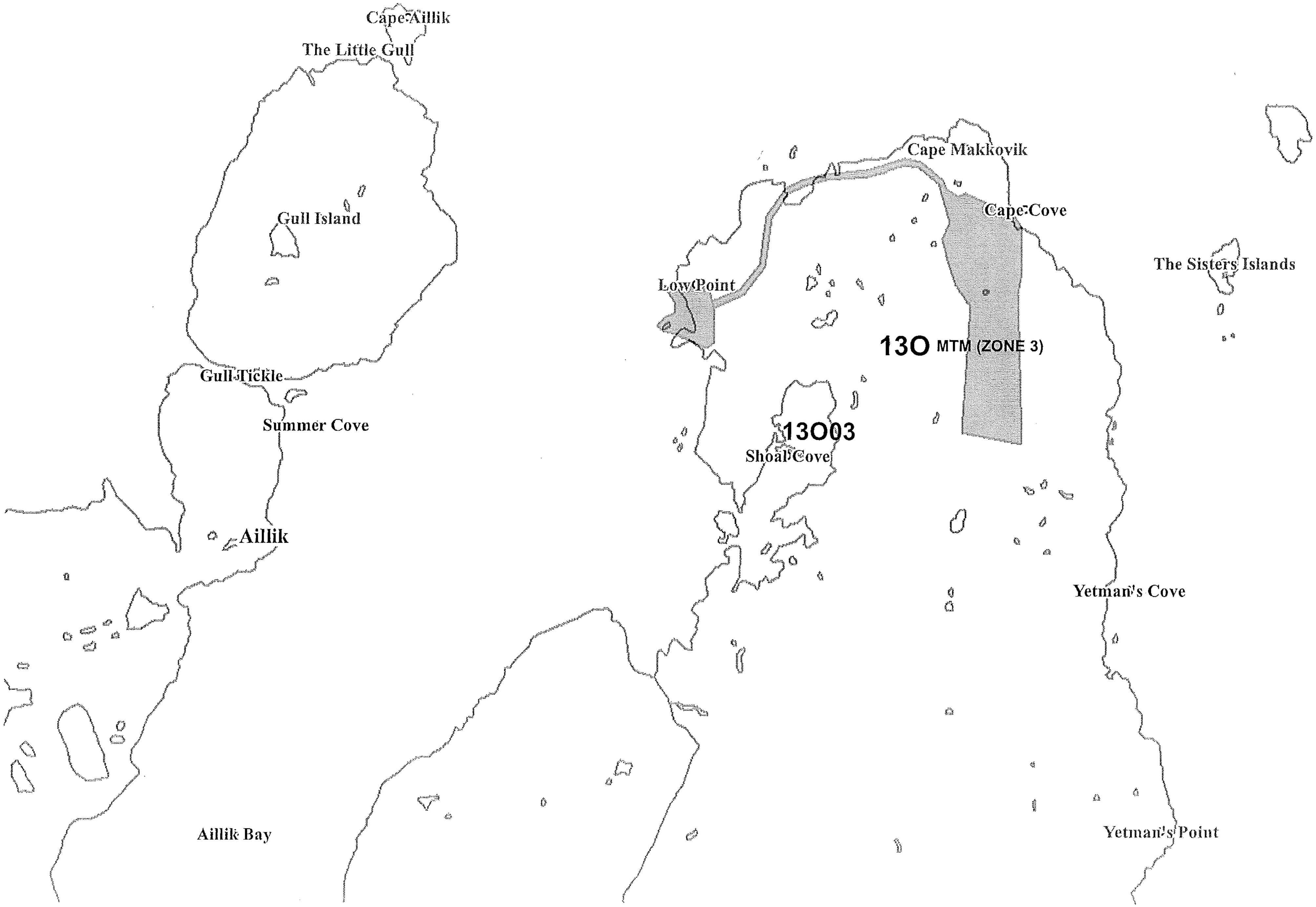

Cape Aillik
The Little Gull
Gull Island
Gull Tickle
Summer Cove
Aillik
Aillik Bay
Low Point
Cape Makkovik
Cape Cove
The Sisters Islands
13O MTM (ZONE 3)
13O03
Shoal Cove
Yetman's Cove
Yetman's Point

LEASE

FROM

Her Majesty the Queen in
right of Newfoundland

TO

British Newfoundland
Exploration Limited

GRANT
#19923

PROVINCE OF NEWFOUNDLAND

CANCELLED

Date April 1994

See folder
amendment # 1078

Fabian O'Dea
Lieutenant-Governor.

LEASE

SECTION 13 OF THE CROWN LANDS ACT, CHAPTER 174 OF THE REVISED STATUTES OF NEWFOUNDLAND, 1952.

Public Lands
Hon. Attorney General

Attorney General

ELIZABETH THE SECOND, by the Grace of God of the United Kingdom, Canada and Her other realms and Territories QUEEN, Head of the Commonwealth, Defender of the Faith.

TO ALL TO WHOM THESE PRESENTS SHALL COME, GREETING:

WHEREAS British Newfoundland Exploration Limited (hereinafter sometimes referred to as "Brinex"), a company organized under the laws of Canada and having its head office in the City of St. John's in the Province of Newfoundland, has applied for a lease of the land hereinafter described;

AND WHEREAS We have deemed it desirable to approve the application and to make such lease, subject to the terms and conditions hereinafter set forth;

NOW KNOW YE ALL MEN BY THESE PRESENTS that in consideration of the rental hereinafter reserved and of the provisions and conditions hereinafter contained and on the part of Brinex to be observed, performed and fulfilled We of Our special grace, certain knowledge and mere motion have leased and demised and by these Presents do for Us, Our Heirs and Successors, lease and demise unto Brinex (hereinafter sometimes called the "Lessee", which expression shall, unless the context otherwise requires, include the successors, sublessees and assigns of the Lessee) for the purpose of Brinex's extablishing and operating thereon a base depot for its exploration activities in Labrador ALL THAT piece or parcel of land situate and being at Cape Makkovik in the Electoral District of Labrador North which said piece or parcel of land is abutted and bounded as follows: Beginning at a point marked by an "X" cut in a prominent rock distant thirty feet from the eastern shoreline of Aillik Bay at ordinary highwater mark; thence running by Crown land north eighty-seven degrees thirty-one minutes east seven hundred and ninety feet; thence running by Crown land south sixteen degrees forty-seven minutes east three hundred and thirty feet; thence running by Crown land south three degrees forty minutes east six hundred and forty-seven feet to a point marked by an "X" cut in a rock near the northern shore of Aillik Bay; thence by Crown land south fifty degrees west for thirty-six feet to a point on the northern shore of Aillik Bay at highwater mark; thence in a general westerly and northerly directions following the sinuosities of the shore at highwater mark of Aillik Bay for a distance of two thousand three hundred and forty feet; thence by Crown land north sixty-five degrees thirteen minutes east thirty feet to the point of beginning and containing an area of sixteen point four six acres shown on the plan annexed hereto as area A.

And also all that piece or parcel of land situate and being at Cape Makkovik in the Electoral District of Labrador North, which said piece or parcel of land may be described as a strip of land lying between two lines drawn parallel to and distant fifty feet on each side of a centre line described as follows: Beginning at a point in the eastern boundary of the land above described which point is the southern end of the line south sixteen degrees forty-seven minutes east three hundred and thirty feet as described in the above mentioned lot; thence running by Crown lands north sixty-three degrees twenty-seven minutes east five hundred and fifty-one feet and five-tenths of a foot; thence along the arc of a ten degree curve to the left for a distance of five hundred and seventy-five feet and eight-tenths of a foot; thence north five degrees fifty-one minutes east eight hundred and fifty feet and three-tenths of a foot; thence running along the arc of a ten degree curve to the right for a distance of five hundred and sixty-two feet and nine-tenths of a foot; thence north sixty-two degrees seven minutes east three hundred and twenty feet and two-tenths of a foot; thence running along the arc of a five degree curve to the right for a distance of four hundred and seventeen feet and three-tenths of a foot; thence north eighty-two degrees fifty-nine minutes east seven hundred and twenty-seven feet and three-tenths of a foot; thence along the arc of a seven degree curve to the left for a distance of two hundred and eighty feet; thence north sixty-two degrees twenty-three minutes east one hundred and six feet and three-tenths of a foot; thence running along the arc of a ten degree curve to the right for a distance of three hundred and fifty-seven feet and seven-tenths of a foot; thence south eighty degrees fifty-one minutes east two hundred and fifty-three feet and nine-tenths of a foot; thence running along the arc of a twelve degree curve to the right for a distance of four hundred and ninety-seven feet and five-tenths of a foot; thence south twenty-one degrees nine minutes east fifty feet more or less to a point in the northern boundary of land described in area B and containing an area of twelve point eight six acres.

And also all that piece or parcel of land situate and being at Cape Makkovik in the Electoral District of Labrador North abutted and bounded as follows: Beginning at a monument set in the southern limit of the strip of land above described; thence running north sixty-eight degrees fifty-one minutes east one hundred feet and thence by Crown lands south twenty-one degrees nine minutes east ninety-nine feet and seven-tenths of a foot; thence along the arc of a twenty-five degree curve to the left for a distance of two hundred and ninety-one feet; thence running north sixty-six degrees three minutes east one hundred and twenty-three feet and nine-tenths of a foot; thence running along the arc of a twelve degree curve to the right nine hundred and thirty-five feet; thence running north seventy-eight degrees fifty-five minutes east sixty feet; thence running south thirty-five degrees thirty-four minutes east three hundred and five feet; thence running south three degrees twenty-five minutes east seven hundred and ninety-one feet; thence running south nine degrees eighteen minutes west three hundred and eighty feet; thence running south three degrees twenty-eight minutes east two thousand six hundred and twenty-six feet; thence running north eighty-one degrees ten minutes west one thousand and sixty-two feet; thence running north one degree forty-nine minutes east two thousand two hundred and three feet; thence running north thirty-six degrees fifty-one minutes west four hundred and fifty feet; thence running north nineteen degrees twenty minutes west four hundred and sixty-six feet; thence running north seventeen degrees fifty-four minutes west three hundred and sixty-eight feet; thence running north twenty-three degrees twenty-two minutes east three hundred and twenty-four feet; thence running north nineteen degrees thirty-eight minutes west five hundred and thirty-four feet; thence running north six degrees twenty-two minutes west two hundred and three feet more or less to the point of beginning and containing an area of one hundred and four point two three acres and being shown as area B on the plan annexed hereto; all bearings are referred to the true meridian, for and during the term of ten years from and including the first day of January, 1964 <u>YIELDING AND PAYING</u> therefor unto Us, Our Heirs and Successors, at the office of Our Minister of Mines, Agriculture and Resources, yearly on the thirty-first day of December in each and every year the clear rental of one hundred dollars ($100.00).

AND We covenant with the Lessee that if the Lessee duly and regularly pays the said rent, and performs all and every the covenants, provisos and agreements herein, and on the part of the Lessee to be paid and performed, We will at the expiration of the said term of ten years and upon the written request of the Lessee delivered to Us at not later than three months before the expiration of the said term grant to the Lessee a renewal lease of the said lands for a further term of a duration to be prescribed by Our Lieutenant-Governor in Council and subject to the same covenants, provisos and agreements as are herein contained with the exception of this covenant for renewal.

If the Lessee shall not prepare and execute the lease for such further term and tender it for execution by Us before the expiry of the then existing term, all rights of the Lessee to such renewal lease shall cease and be null and void, and We may enter into and take possession of the said premises in their first and former estate, discharged from all right and claim of renewal by the Lessee.

PROVIDED THAT the lease of the demised premises granted by these Presents is subject to the following terms and conditions:

1. The Lessee shall during the term of the lease granted by these Presents (hereinafter called "this lease") pay to Our Minister of Mines, Agriculture and Resources the rental hereby reserved at the times and in the manner hereinbefore mentioned without any deduction, defalcation or abatement whatsoever.

2. The Lessee will pay all taxes, rates, duties and assessments whatsoever, whether municipal, provincial, federal or otherwise now charged or hereafter to be charged upon the demised premises.

3. The Lessee shall during the term of this Lease (including any renewal thereof) use the land herein demised for no purpose other than for the establishing and operating thereon of a base depot for the Lessee's exploration activities in Labrador.

4. The Lessee paying the rental hereby reserved and observing, performing and fulfilling the several provisions and conditions herein contained and on the part of the Lessee to be paid, observed, performed and fulfilled shall peaceably hold and enjoy the demised premises during the term of this Lease without any interruption by Us, Our Heirs and Successors or any person claiming under or in trust for Us or them.

5. The Lessee may at any time determine the tenancy hereby created by giving to Our Minister of Mines, Agriculture and Resources six calendar months previous notice to that effect and thereupon provided the Lessee shall up to the time of such determination pay the rental and observe and perform and fulfil the provisions and conditions on the part of the Lessee to be paid, observed, performed and fulfilled, the present demise and everything herein contained shall cease and be void save in respect of anything which ought to be paid, observed and performed upon or before the determination of the tenancy.

6. If any part of the rental hereby reserved shall be unpaid for thirty days after becoming payable then and in such event it shall be lawful for Our Minister of Mines, Agriculture and Resources upon giving sixty days notice in writing to the Lessee that such rental is unpaid and demanding payment thereof, if such payment is not made within such period of notice, at any time thereafter upon the demised premises or any part of them in the name of the whole to re-enter and thereupon this Lease shall absolutely determine but without prejudice to Our right of action in respect of any breach by the Lessee of the conditions herein contained.

7. If the Lessee fails to observe, perform or fulfil any of the provisions, terms and conditions of this Lease other than the payment of rental then upon thirty days notice by Our Minister of Mines, Agriculture and Resources to the Lessee to remedy its default this Lease shall, if the default is not remedied within the time prescribed by the notice, be forthwith determined and the demised premises shall revert to Us, Our Heirs and Successors.

8. If We shall at any time and from time to time be desirous of acquiring any part of the demised premises for the purpose of building, making or erecting railways, roads, bridges, wharves, public buildings or other public works or for the purpose of assuring such land to any religious denomination or School Board for the erection

or laying out of churches, schools, religious establishments or cemeteries, We shall be entitled to expropriate all or any of the demised premises necessary for the purpose of such acquisition, in accordance with the procedure prescribed for expropriation under The Expropriation Act, 1964, as now or hereafter amended, but We shall not be required to pay any compensation for or in respect of damage or loss of any kind whatsoever resulting to the Lessee from such expropriation, except reasonable compensation for the expropriation, removal, obstruction of or damage to any improvements of the Lessee on or in the demised premises, and the compensation in respect of improvements shall, in default of agreement be determined in accordance with the said The Expropriation Act, 1964, as now or hereafter amended.

9. Whenever any of the rights reserved under these Presents are duly exercised and thereby the Lessee suffers loss by reason of the removal or obstruction of or damage to any of the improvements of the Lessee on or in the demised premises, We shall pay or arrange for the payment to the Lessee of reasonable compensation for the loss so suffered in respect of such improvements and such compensation shall in default of agreement, be determined in accordance with The Expropriation Act, 1964, as now or hereafter amended, but no compensation shall be payable to the Lessee in respect of damage or loss of any other kind whatsoever resulting to the Lessee from the exercise of any such rights.

10. At any time during the tenancy (including the renewal period, if any) and within six months after the expiration or sooner determination of the tenancy Brinex may remove any or all of the improvements on the demised land (including installations acquired by Brinex from War Assets Disposal Corporation), and upon the demised land reverting to Us at the expiration of the tenancy (including the renewal period, if any) or at the sooner determination of the tenancy, all improvements on the demised land (including installations acquired by Brinex from War Assets Disposal Corporation) and not removed by Brinex from the demised land within six months after the said expiration or sooner determination of the tenancy (Brinex to have full right of access to the demised land for such purposes) shall upon the expiration of the said six months period become Our property absolutely, without compensation of any kind being payable therefor to the Lessee, and, with respect to any such removal, Brinex shall in the removal do as little damage as may be to the demised land and any remaining improvements.

11. Any notice required to be given under this Lease shall be sufficiently served on Us if the Notice is addressed to Our Minister of Mines, Agriculture and Resources, Department of Mines, Agriculture and Resources, Confederation Building, St. John's, Newfoundland, and served on Our said Minister personally or sent to him by registered mail, and on the Lessee if the Notice is addressed to the Lessee at its head office in the City of St. John's aforesaid, and delivered personally at or sent by registered post to such office.

GIVEN under the Great Seal of Our Province of Newfoundland this 25th day of May in the year of Our Lord one thousand nine hundred and sixty-six and in the fifteenth year of Our Reign.

WITNESS: Our trusty and well-beloved the Honourable Fabian O'Dea, one of Our Counsel, learned in the law, Commander on the Retired List of Our Naval Reserve, Lieutenant-Governor in Our Province of Newfoundland.

AT OUR GOVERNMENT HOUSE in Our City of St. John's, this 25th day of May in the year of Our Lord one thousand nine hundred and sixty-six and in the fifteenth year of Our Reign.

BY COMMAND

G.A. Frecker
Minister of Provincial Affairs.

The Common Seal of British Newfoundland Exploration Limited was hereunto affixed in the presence of its proper officers and in the presence of

President

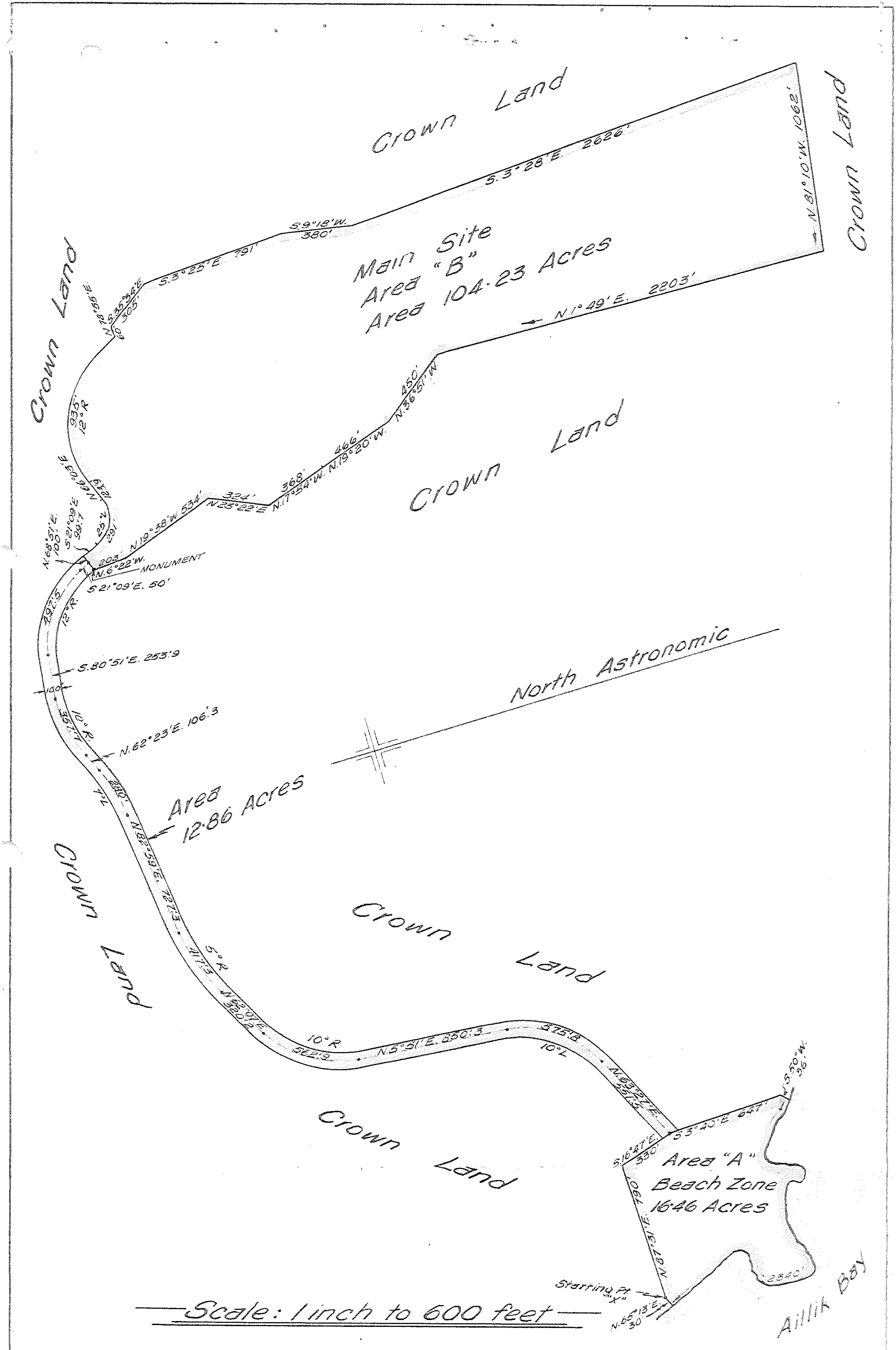
Secretary

Witness.

Registered Volume No. Special Grant 3 Folio 143

W J Kemp

Minister of Mines, Agriculture
and Resources.



Crown Lands + Surveys Division, D M A + R, Nov 1963

Cape Makkovik, Labrador

National Archives of Canada

697-'57

M and R 39(c)-'57. Ordered that, under authority of The Crown Lands Act, Chapter 174 of The Revised Statutes of Newfoundland, 1952, as amended, the administration, management and control of the surface rights in pieces of land situate at Cape Makkovik in the District of Labrador North, as more particularly described hereafter, be transferred to Her Majesty the Queen in the right of Canada for use in connection with the Mid-Canada Line; the said lands to be at all times used for the purpose of and in connection with the Mid-Canada Line and to revert to Her Majesty the Queen in the right of the Province of Newfoundland in the event that they cease to be used for such purposes at any time:-

DESCRIPTION

All that piece or parcel of land situate and being at Cape Makkovik in the Electoral District of Labrador North which said piece or parcel of land is abutted and bounded as follows: beginning at a point marked by an "X" cut in a prominent rock distant thirty feet from the easter shore-line of Aillik Bay at ordinary highwater mark; thence running by Corwn Land north eight-seven degrees thirty-one minutes east seven hundred and ninety feet; thence running by Crown Land sout sixteen degrees forty-seven minutes east three hundred and thirty feet; thence running suth three degrees forty minutes east six hundred and forty-seven feet to a point marked by an "X" cut in a rock near the northern shore of Aillik Bay ; thence south fifty degrees west for thirty-six feet to a point on the northern shore of Aillik Bay at highwater mark; thence following the sinuosities of the shore at highwater mark of Aillik Bay for a distance of two thousand three hundred and forty feet; thence north sixty-five degrees thirteen minutes east thirty feet to the point of beginning and containning an area of sixteen point four six acres.

And also all that piece or parcel of land situate and being at Cape Makkovik in the Electoral District of Labrador North, whish said piece or parcel of land may be described as a strip of land lying between two lines drawn parallel to and distant fifty feet on each side of a centre line described as follows: beginning at a point in the eastern boundary of the land above described which point is distant fifty feet and seven-tenths of a foot on a course north sixteen degrees forty-seven minutes west from the southern end of the line south sixteen degrees forty-seven minutes east as described in the above mentioned lot; thence running north sixty-three degrees twenty-seven minutes east five hundred and fifty-one feet and five-tenths of a foot; thence along the arc of a ten degree curve to the left for a distance of five hundred and seventy-five feet and eight- tenths of a foot; thence north five degrees fifty-one minutes east eight hundred and fifty feet and three-tenths of a foot; thence running along the arc of a ten degree curve to the right for a distance of five hundred and sixty-two feet and nine-tenths of a foot; thence north sixty-two degrees seven minutes east three hundred and twenty feet and two-tenths of a foot; thence running along the arc of a five degree curve to the right for a distance of four hundred and seventeen feet and three-tenths of a foot; thence north eighty-two degrees fifty-nine minutes east seven hundred and twenty-seven feet and three-tenths of a foot; thence along the arc of a seven degree curve to the left for a distance of two hundred and eighty feet; thence north sixty-two degrees twenty-three minutes east one hundred and six feet and three-tenths of a foot; thence running along the arc of a ten degree curve to the right for a distance of three hundred and fifty-seven feet and seven-tenths of a foot; thence south eighty degrees fifty-one minutes east two hundred and fifty-three feet and nine-tenths of a foot; thence running along the arc of a twelve degree curve to the right for a distance of four hundred and ninety-seven feet and five-tenths of a foot; thence south twenty-one degrees nine minutes east fifty feet more or less to a point in the northern boundary of land described in lot 3 and containing an area of twelve point eight six acres.

And also all that piece or parcel of land situate and being at Cape Makkovik in the Electoral District of Labrador North abutted and bounded as follows: beginning at a monument sent in the southern limit of the right-of-way above described; thence running north sixty-eight degrees fifty-one minutes east one hundred feet and thence south twenty-one degrees nine minutes east ninety-nine feet and seven-tenths of a foot; thence along the arc of a twenty-five degree curve to the left for a distance of two hundred and ninety-one feet; thence running south sixty-six degrees three minutes east one hundred and twenty-three feet and nine tenths of a foot; thence running along the arc of a twelve degree curve to the right nine hundred and thirty-five feet; thence running north seventy-eight degrees fifty-five minutes east sixty feet; thence south thirty-five degrees thirty-four minutes east three hundred and five feet; thence running south three degrees twenty-five minutes east seven hundred and ninety-one feet; thence running south nine degrees eighteen minutes west three hundred and eighty feet; thence south three degrees twenty-eight minutes east two thousand six hundred and twenty-six feet; thence running north eighty-one degree ten minutes west one thousand and sixty-two feet; thence north one degree forty-nine minutes east two thousand two hundred and three feet; thence north thirty-six degrees fifty-one minutes west four hundred and fifty feet; thence north nineteen degrees twenty minutes west four hundred and sixty-six feet; thence north seventeen degrees fifty-four minutes west three hundred and sixty-eight feet; thence north twenty-three degrees twenty-two minutes east three hundred and twenty-four feet; thence north nineteen degrees thirty-eight minutes west five hundred and thirty-four feet; thence north six degrees twenty-two minutes west two hundred and three feet more or less to the point of beginning and containing an area of one hundred and four point two three acres.

(signed) JG Manning or similar
Clerk of the Executive Council

Appendix D
Aerial Photographs

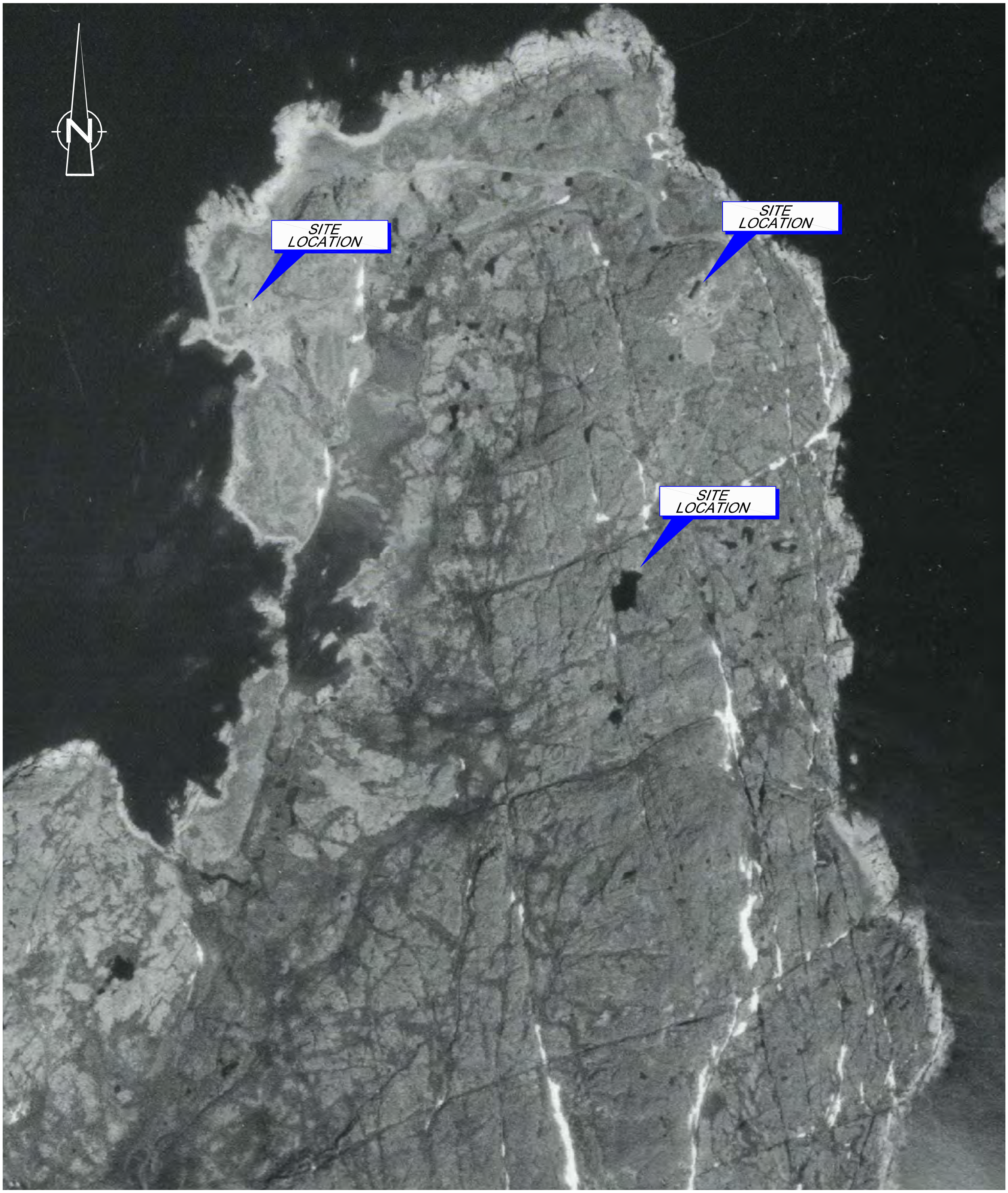


figure D1

AERIAL PHOTOGRAPH - 1968
PHASE I ENVIRONMENTAL SITE ASSESSMENT
FORMER UNITED STATES MILITARY SITE
Cape Makkovik - Aillik, Labrador, NL

figure D2

AERIAL PHOTOGRAPH - 2005
PHASE I ENVIRONMENTAL SITE ASSESSMENT
FORMER UNITED STATES MILITARY SITE
Cape Makkovik - Aillik, Labrador, NL

Appendix E
Personal Accounts

Cape Makkovik, Labrador

1959 - Memories of Cape Makkovik - Dave Houston

I had been at Otis AFB, on Cape Cod in Massachussets as an airborne radar operator when notified that I had been assigned to Cape Makkovik. After a 30 day leave at home, I flew to McGuire AFB in New Jersey and then to Goose Bay. From Goose Bay I flew by helicopter to Cape Makkovik.

I arrived at Cape Makkovik in September 1959 as an Airman Second Class (A/2C) Radar Operator.

There were approximately 20 to 25 USAF personnel assigned to this Gap Filler and an additional 5 to 7 civilian personnel operated the Power Plant. The power plant seemed very effective and I don't remember any down time during my stay. Our rooms in the barracks were private rooms approximately 10 feet by 12 feet with a bed, table and a chair.

If I remember correctly, there were four Radar Operators assigned to Cape Makkovik and we maintained 24 hour surveillance. When I was Airborne Radar, we switched off every two hours. However, at Makkovik, all we had was the scope. Didn't have plotting board or height finder. During our shift on the scope, someone would relieve you for lunch or dinner. The rest of the time you were in the bubble by yourself watching the scope. A lot of times, someone would visit with you. If we picked up any air activity (which wasn't very often) it was reported to the long range radar station at Hopedale. We did not have any equipment for determining aircraft height at Makkovik. In my opinion, the search radar equipment that we had was inadequate. I remember not having to track very many aircraft. Maybe this is why Cape Makkovik was a short lived operation. The only unknown that I remember was a visual sighting of a large aircraft flying over at about 1,000 feet. We didn't have it on radar nor did Hopedale. Our troposcatter communications were linked to Hopedale and this system was very effective.

We had set up a basketball court in the motor pool area. We also had an area with a pool table and a ping pong table. Off duty hours were spent in these locations. Other forms of recreation included playing cards, fishing (weather permiting), reading, and listening to music. Every evening we could watch a movie. Sometimes we had to watch the same movie more than once because new movies could not be brought in due of inclement weather. We didn't go outside too much in the winter time. Didn't have skis or other winter sports equipment. There was no area big enough for playing baseball or anything else in the short summer months.

Once you arrived at Cape Makkovik, there was no way to leave except by helicopter when you were reassigned.

The weather at Cape Makkovik was very cold. I remember some days when the temperatures were 50 to 60 degrees below zero. I was used to some cold weather living in Indiana, but not that cold. I remember white-outs where you could not see a foot in front of you. The food at the site was good. The cooks could do a better job than at a regular base because there were fewer to prepare for. There was a lot of beer drinking but there wasn't much access to hard liquor. I don't remember any problems or any fights the whole time that I was there.

The only entertainment that we had was the movies that I had mentioned before. Mail delivery and getting personnel in and out was dependent upon the weather. This was all done by chopper from Goose Bay. Sometimes we would go over a month without mail delivery.

I Think the village of Makkovik was about 20 miles from our site. The only way to get from one to the other was by boat or dogsled. Once or twice a year, three or four men from the village would come to the site by dogsled to pick up some supplies. After staying a day or two they would head back to the village. The only road that we had was from the living area to the water (ocean) which was at the bottom of the hill. This was a dirt road that we used to haul supplies from the boat to the living area. This road was about 1.5 miles long and was used to carry supplies from the supply boat to the living area.

Besides the two vehicles that you saw in the photos, we had one with tracks that we could get around in the snow better with. There was really nowhere to drive, except down the hill to the water supply. There wasn't much maintenance on the road as it wasn't driven on that much.

I eventually left Cape Makkovik in September, 1960. When I left Cape Makkovik, I had the option of being discharged four months earlier than my original date or re-enlisting for an additional two years. I chose to get discharged. From Cape Makkovik I flew by chopper to Goose Bay. After a few days in Goose I flew by military aircraft to McGuire AFB in New Jersey. After two days there I was discharged and flew by commercial airlines back to Indiana.

Cape Makkovik, Labrador

1961 - Cape Makkovik Revisited - James R Andersen, Sr.

The radar station was located some 11 miles east of the town on the edge of the point at Cape Makkovik, Labrador, at an altitude of about 1500 feet. It took about two years to build. They had to blast a road to the hill and helicopters were used during the construction period to bring in supplies.

There was one large building which was a combined facility for everything that was needed by the people that worked there. This building included the radar area, living quarters and the diesel which provided the required electricity. The radar equipment had a radome for protection from the elements.

The site was only operational for about two or three years. It was staffed by about 40-45 GI's and about 10 civilians during its operational days. Almost everything was left behind when the base closed down and I was hired to be the caretaker for about 11 months. The remains were eventually dismantled in the 60's and all of the parts were shipped out. Nothing remains today - with the exception of the cement blocks that were once used as a base for the buildings.

-- *James R Andersen, Sr.* - Resident, Makkovik, Labrador - February 21, 1998

Appendix F
Internet Search Information

FOR COMMCEN/SIGNALS USE

MESSAGE FORM

FILE S10-136-80/7
NUMBER
(CCE/Prop)

PRECEDENCE - ACTION: PRIORITY
PRECEDENCE - INFO: DEFERRED
DATE - TIME GROUP: 27 1800Z
MESSAGE INSTRUCTIONS:
PREFIX: GR
SECURITY CLASSIFICATION: UNCLAS
ORIGINATOR'S NUMBER: CE 61 27 JUL

FROM CANAIRHED

TO STN GOOSE BAY

INFO CANAIRLIFT

COMPLETE GAP FILLER SITE AT CAPE MAKKOVIK HAS BEEN SOLD TO BRITISH NEWFOUNDLAND EXPLORATION COMPANY BY CADC PD MR PILOSKI OF EXPLORATION COMPANY EXPECTED TO CONTACT S/L WOODSIDE FOR KEYS TO SITE SOONEST PD WHEN KEYS ARE HANDED OVER CIVILIAN CARETAKER MAY BE RELIEVED OF WATCHKEEPING DUTIES

PAGE OF PAGES
REFERS TO MESSAGE
CLASSIFIED YES ☐ NO ☐
DRAFTER'S NAME: WH McConnell) F/L
OFFICE: CCE/Prop-2-2
TEL.: 2-6281

FOR OPR'S USE

R	DATE	TIME	SYSTEM	OPERATOR	D	DATE	TIME	SYSTEM	OPERATOR

RELEASING OFFICER'S SIGNATURE
WH McConnell
(JF Brennagh)W/C (1962)

DND 983
7530-21-562-1855

COPY 2

No. 58788

DEPARTMENT OF TRANSPORT

DEED
(O.C.)

HER MAJESTY THE QUEEN IN RIGHT OF THE PROVINCE OF NEWFOUNDLAND

to

HER MAJESTY THE QUEEN IN RIGHT OF CANADA

e - Oct.10,1957

lic Work Concerned - D.N.D.

cription - Transfer of the administration, control and management of the surface rights in pieces of land situate at Cape Makkovik in the Dist. of Labrador North, in connection with the Mid-Canada Line.

PARTMENTAL REFERENCE

REFERENCE No. 1651-709

MEMORANDA

REAL ESTATE, FACILITIES, INSTALLED EQUIPMENT AND OTHER EQUIPMENT OR MATERIALS TO BE TRANSFERRED TO RCAF

Cape Makkovik - Det. #1, 923 ACW Sq.

No.	Facility No.	Description	Unit	Total Cost
	00001	Gap Filler Consisting of: 24 Airman Dormatory, 40 Man Dining Hall, 5 Man OQ, 500 KW Elec Prime Power, 5355 MB Heating Plant	28,882 SF	*$1,926,000
	00002	Dispensary "B" Mil	1,152 SF	37,000
	00003	Tower, Navaid	1 Ea	*Incl Above
	00004	Liquid Fuel Pump Station	24 SF	7,000
	00005	Water Pump Station	379 SF	18,000
	00006	Liquid Fuel Pump Station	360 SF	65,000
	00100	Covered Walkway	75 SY	6,000
	00101	Diesel Storage	10,000 BL	85,000
	00102	Diesel Storage	10,000 BL	85,000
	00106	Liquid Fuel Pipeline	10,651 Ft	80,000
	00107	Helicopter Pad	3,491 SY	64,000
	00108	10086 Ft of Road	13,448 SY	226,000
	00109	Sewage Septic Tank	3,182 YD	117,000
	00110	Water Mains	3,922 Ft	320,000
	00111	UG Elec Distribution Lines	15,343 Ft	103,000

Cape Makkovik - Det. #1, 923 ACW Sq.

cility No.	Description	Unit	Total C
	INSTALLED EQUIPMENT		
N/A	Power Generation Equipment, 100KW, Diesel-Electric Generator Sets, w/Auxiliary Equip and Switchboard	5 Ea	$100,000
N/A	Refrigeration System Recip. Compressor Frick Co. Model FBW-150H, Four cy, 1 3/4 Bore, 1 1/2 HP, 208V, 3 phase motor	2 Ea	5,000
N/A	Recip Compressor Frick Co. Model FBW-750 FL - 3 cyl. 4" Bore, 4 1/4" Stroke, 7 1/2 HP, 208V, 60 cy, 3 ph Motor	1 Ea	4,000
N/A	Steam Generators, York-Shipley "Steam Pak" Model 3FL, 53-80 Low Pressure 15 PSI Operating Pressure	2 Ea	16,000
N/A	Oil Burner, Pressure Atomizing Type, Combustion Air Supplied by Centrifugal Fan driven by 208V, 3ph, 60cy, 5 HP Motor	1 Ea	1,800
N/A	Fire Alarm System, Fire Alarm is manual and automatic, Non Coded, Elect Supervised, Fire Detector Cable Type	1 Ea	1,200
N/A	Fire Protection System, Manual, Incl 60,000 gal Water Storage Tank and 500 gpm cent. Fire Pump, Piping sys supplies eight stations	1 Ea	40,000
N/A	Engine, 10 1/2 HP, Fairbanks Morse Model 45B-4 1/8 FA27	1 Ea	*Cost I
N/A	Direct Connected Generator, 5KW, 120V, 1-ph, 60cy, 1800 RPM	1 Ea	* 2,00
N/A	Oil Fired Space Heaters	4 Ea	40

OTHER EQUIPMENT OR MATERIALS

CAPE NEWENHAM - DET. #1, 923 ACW Sq.

Item No.	FSN	Description	Quantity	Total Cost
26	3220-028-4278	Sander	1	$ 141.00
27	3220-032-9304	Saw, Band	1	152.00
28	3220-204-2230	Lathe, Wood	1	79.00
29	3220-204-2540	Jointer, Wood	1	156.00
30	3220-204-3684	Saw, Circular. Table Model	1	263.00
31	3413-222-2146	Drilling Mach.	1	193.00
32	3415-541-7241	Grinder, Bench	2	104.00
33	3419-618-9274	Mach., Pipe Thread	1	650.00
34	3431-248-9238	Mach., Welding	1	1,040.00
35	3432-212-1744	Kit, Welding, AH-1	1	124.00
36	3441-243-2648	Mach., Pipe Bending	1	262.00
37	3441-529-0952	Mach., Pipe Bending	1	285.00
38	3441-NL	Flaring Tool	1	5.00
39	3445-254-8650	Mach., Shearing Thro	1	40.50
40	3510-293-4322	Mach., Washing	2	650.00
41	3510-293-4338	Dryer	2	250.00
42	3920-243-5170	Truck, Hand 2 Wheel	1	11.00
43	3920-641-2582	Truck, Hand 2 Wheel	1	18.00

CAPE NAKENVIK - DET. #1, 923 ACW Sq.

Item No.	FSN	Description	Quantity	Total Cost
44	3920-329-4292	Truck, Hand	1	$ 18.00
45	4110-170-1433	Mach., Ice Cream	1	284.60
46	4110-202-9844	Dispenser, Drinking Water	1	285.00
47	4110-170-8233	Freezer, Ice Cream Plant	1	350.00
48	4110-274-5751	Refrigerator	2	361.18
49	4110-287-5188	Refrigerator, Reach-in	1	460.55
50	4210-270-4385	Extinguisher, Water 5 gal	6	816.00
51	4210-270-4386	Extinguisher, Fire Soda Acid 2½ gal	6	100.98
52	4210-270-4405	Extinguisher, Fire Carbon Dioxide 15 lb	11	266.75
53	4210-270-4512	Extinguisher, CO2 5 lb	5	57.50
54	4210-278-9643	Extinguisher, Fire Foam 2½ lb	5	61.75
55	4210-288-9052	Extinguisher, Fire CO2 50 lb 2 Wheel Cart	9	1,215.00
56	4210-491-0454	Extension, Assy	6	109.50
57	4240-330-5457	Mask, Oxygen	2	216.24
58	4310-368-5214	Compressor Recip	1	86.75
59	4320-516-4068	Pump, Hyd. Hand Driven	1	59.00
60	4910-204-2547	Gauge, Tire	1	11.00
61	4910-294-6484	Jack, Dolly 10 Ton	1	127.05
62	4910-517-0815	Tow Bar, MV Bumper Type	1	50.00

CAPE MAKKOVIK - DET #1, 923 ACW Sq.

Item No.	FSN	Description	Quantity	Total Cost
63	4910-561-5764	Jack, Hyd 2 Ton	1	$ 16.00
64	4920-351-3488	Kit, Tube	1	80.00
65	4920-512-9188	Light, Timing	1	12.00
66	4930-200-1842	Pumping Unit	2	64.00
67	4930-395-2764	Pumping Unit	1	33.00
68	4930-490-0959	Pump, Refueling Type A-6	1	247.00
69	4930-693-2709	Receptacle, Oil Drain	1	45.50
70	4940-355-2369	Spray Gun	1	21.60
71	5120-188-1182	Vise	1	15.00
72	5130-038-4353	Grinder, Floor Elect.	1	172.00
73	5130-288-7746	Drill Hm	1	152.00
74	5130-293-1847	Drill, Elect ¼	4	80.00
75	5130-293-1849	Drill, Elect	1	25.00
76	5130-293-2342	Cleaner, Pipe	1	386.00
77	5130-340-0131	Saw, Port 8"	1	82.89
78	5130-596-4111	Sander, Disc. 7"	1	54.50
79	5180-547-0737	Kit, Re-seating	1	62.00
80	5180-596-1486	Kit, Tool	1	15.00
81	5440-223-6026	Ladder, Ext. WD Type 30'	1	30.46
82	5440-869-5076	Ladder, Step Alum.	2	30.92

CAPE [illegible] - DET #1, 923 ACW Sq.

Item No.	FSN	Description	Quantity	Total Cost
83	6115-329-3596	Generator, C-21A Gas	1	$3,833.00
84	6130-NL-1603	Charger, Batt.	1	48.00
85	6230-266-8646	Light, Ext. 100'	1	29.50
86	6665-557-3150	Radiac Set	1	252.00
87	6670-526-4921	Scale, Comm. Baker	1	78.00
88	6670-526-6231	Scale, Plant	1	79.50
89	6680-526-6783	Meter, Vel	1	45.00
90	6680-561-5724	Vellometer, Aliner	1	161.00
91	6740-090-1190	Splicer, Port	1	251.00
92	6740-525-6471	Lamp Assy	1	15.00
93	6740-526-1789	Dryer, Photo	1	60.42
94	6740-527-2054	Printer, Proj Photo-	1	476.00
95	7105-269-5065	Table, Dining 50" close 60"	1	36.00
96	7105-275-6228	Table, Dining (Wood Plad top lacquered)	7	186.69
97	7105-282-5124	Bed Spring Open Style W/Felt Cotton Ticking (Hollywood)	25	950.00
98	7105-291-0393	Bookshelf, Standing	2	36.00
99	7105-559-6212	Book Case	1	44.00
100	7105-576-3457	Chair Metal	14	224.00
101	7110-132-6564	Stand	1	26.00
102	7110-132-8298	Chair Rot W/O Arms	2	36.56

CAPE MAKKOVIK - DET #1, 923 ACW Sq.

Item No.	FSN	Description	Quantity	Total Cost
103	7110-141-5340	File	2	$ 110.00
104	7110-262-6650	Book Case	8	196.80
105	7110-266-6673	Book Case	1	11.15
106	7110-267-6981	Table	2	71.50
107	7110-273-8782	Chair	1	15.00
108	7110-241-4469	Chair Drafting	3	45.00
109	7110-579-9782	File, Invisible	4	708.76
110	7110-663-6360	Cabinet, Filing	1	127.00
111	7125-264-4939	Cabinet, Steel Storage	12	444.00
112	7125-269-8534	Cabinet, Storage Steel	3	138.00
113	7125-335-3428	Rack, Storage Steel	4	665.28
114	7125-559-6381	Bin, Storage & Display	3	105.00
115	7125-559-6382	Bin, Storage	7	245.00
116	7195-285-5924	Bench, Work	4	223.80
117	7195-298-7525	Displayer	1	45.08
118	7290-663-7300	Ironing Board	2	25.90
119	7310-263-8691	Fryer, Deep Fat	1	128.16
120	7310-264-5377	Coffee, Single W/Water Jacket, 5 Gal	1	175.00
121	7310-272-7091	Toaster, Elec. Pop-up	1	72.26

CAPE MAKKOVIK - DET #1, 923 ACW Sq.

Item No.	FSN	Description	Quantity	Total Cost
122	7110-281-4469	Chair	2	$ 38.00
123	7110-579-9786	Cabinet	1	46.00
124	7125-264-4909	Bin	1	125.00
125	7330-205-1407	Jug Thermos	1	18.75
126	7310-286-5698	Range, Kitchen Elec.	1	441.00
127	7310-634-0129	Griddle, Sectional	1	79.71
128	7320-222-4664	Mixing Mach. Food Elec.	1	350.00
129	7320-223-7877	Cab. Rinse Spray	2	159.70
130	7320-269-9226	Table, Cooks	1	115.00
131	7320-269-9227	Table, Cooks	1	90.00
132	7330-184-0082	Cutter, French Fry	1	19.50
133	7330-234-8830	Pot, Cooking W/Cover	2	28.54
134	7330-241-8168	Bowl, Food Mixing	1	11.69
135	7330-263-8504	Pan Baking	2	24.28
136	7330-567-9515	Strainer, Pot Metal	1	15.50
137	7420-281-7003	Mach., Calculating	2	1,316.18
138	7420-281-7063	Typewriter	1	128.45
139	7430-634-5062	Typewriter, Port-Non	2	256.90
140	7430-634-5064	Typewriter, Nonport	1	122.00

CAPE MAKKOVIK - DET #1, 923 ACW Sq.

Item No.	FSN	Description	Quantity	Total Cost
141	7490-164-0541	Stencil, Cutting Mach.	1	168.00
142	7730-346-2705	Radio-Phono Comb	1	284.95
143	7810-242-4428	Table, Tennis	2	75.92
144	7810-286-9885	Tackle, Fishing Salt	3	40.29
145	7830-205-1458	Table, Pool	1	427.70
146	7830-242-4450	Bar, Stall Gym	1	50.00
147	7830-244-7812	Bar, Bell Gym 200 lb	1	43.56
148	7830-246-2335	Mat-Gym Tumbling	1	123.93
149	7830-713-0650	Rowing Mach.	1	110.66
150	7910-223-7681	Cleaner, Vacuum Port.	2	394.00
151	7910-250-8039	Cleaner, Vacuum Port.	1	197.00
152	7910-526-3799	Polisher Floor	2	168.56
153	8415-526-9045	Hood, Fireman	12	582.00
154	8415-641-6008	Coat, Fireman	3	66.90
155	8415-290-0553	Trousers, Fireman	2	36.50
156	8415-290-0556	Trousers, Fireman	1	18.25
157	9140-286-5283	Fuel Oil, Diesel, Grade DFA	2,600 bbl	9,100.00
158	9150-NL	Miscellaneous Residual Petroleum Products, FSC 91	Sinking Residual	350.00 (2)

CAPE MAKKOVIK - DET #1, 923 ACW Sq.

	Description	Quan
9092	Carrier, Cargo, Reg No. 45C408	1
8517	Truck, Cargo, 3/4Ton, Reg No. 5387556	1
8227	Trailer, Amphibious, Reg No. 5382245	1
3022	Truck, Forklift, 3500 lbs, Reg No. 5381105	1
[illegible]	Consisting of: Spare parts for end items listed above	L
	Consisting of: Scrap ferrous and non-ferrous metals, used batteries, rubber products, junk vehicles, empty steel drums, textiles, special services equipment and miscellaneous scrap and waste.	
Allied ipment	Consisting of: Condemned and obsolete electronic equipment associated spares and test equipment.	
	GRAND TOTAL	
	* Not included in Grand Total.	

Cape Makkovik, Labrador

Cape Makkovik, Labrador

Site #:	N-28A	
AC&W #:	Detachment 1, 923rd Squadron, Hopedale, Labrador	
Callsign:	Memorial	
Construction Dates:	Start:	1955
	End:	1957
Operational Date:	February, 1957	
Location:	55 13 30 N Latitude	59 08 45 W Longitude
Radar Equipment:	Search:	FPS-14
	Height:	None
Closure Date:	28 June, 1961	

Additional Comments:

Please click on the **Photos**, **Area Map** and **History** buttons below for additional information about this location.

Photos Area Map History

Hopedale

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Updated: December 23, 2003

Cape Makkovik AS, NL, CN Personnel Roster

Click here to change your email address

Add To Roster

Return to Search Page

Last Name	First Name	MI	Rank	Tour at site	AFSC	Email
Bellows	[Don] ald	W	A3C	12/58-3/59	27350A Rdr Opr.	dbell3663@yahoo.com
Blalock	Grover	P	A1C	1-8/57	27350 Rdr Opr.	blalockg@msn.com
Houston	David	A	A2C	9/59-9/60	27350 Rdr Opr.	dhouston38@comcast.net
Rachal	Ezra	C	SSG	6-9/61	64173 Shut Site.	ecrachal@yahoo.com

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Additional Radar Stations on the Labrador Coast

Canadian External Relations - 1955

Volume #21 - 339.

CHAPTER IV

RELATIONS WITH THE UNITED STATES

PART 2

DEFENCE ISSUES

SECTION D

RADAR DEFENCE SYSTEM: PINETREE LINE AND MID-CANADA LINE

339.

PCO

Extract from Cabinet Conclusions
Top Secret

[Ottawa], May 6th, 1955

ADDITIONAL RADAR STATIONS ON THE LABRADOR COAST

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4. *The Secretary of State for External Affairs*, referring to the decision by the Cabinet on June 30th, 1954, that Canada should construct and operate the mid-Canada warning line, reported that, subsequently, the United States had expressed the desire to extend the line from Hopedale, its eastern terminus, down the Labrador and Newfoundland coasts to Cape Race.[66] Since the U.S. already operated a chain of radar stations on this coast, as part of the Pinetree project, the proposal really meant the insertion of a number of gap-filler radars at appropriate points. In the circumstances, the Chiefs of Staff Committee had agreed that the project might

be handled by the U.S. as a supplement to the existing Pinetree installations.

Surveys had been carried out by the North East Air Command of the U.S. Air Force and it was recommended that these gap-filler radars be established at six sites near Cape Makkovik, Cut Throat Island, Spotted Isle, Fox Harbor, La Scie and Elliston Ridge. There would be accommodation at each for thirty people, although the permanent staff would probably amount to twenty per station. Not more than 50 acres would be required per station although, for technical reasons, larger areas might be needed in some instances.

The U.S. Air Force had delayed requesting permission to begin construction because it had been waiting for the conclusion of the D.E.W. Line agreement on the assumption that this would serve as a model for the agreement to authorize the construction of these stations in Labrador and Newfoundland. The D.E.W. Line negotiations, however, had taken longer than anticipated. The U.S. fiscal year ended on June 30th, 1955, and part of the funds allocated for the Labrador extension, if not obligated at that time, would revert to the Treasury. This might delay construction of the stations and prevent their being operational by January 1957, when it was expected that the mid-Canada line would be completed. For this reason, Canada had been asked to consider allowing the U.S. Air Force to begin construction immediately, pending the conclusion of mutually acceptable terms and conditions between the two countries. The Minister recommended, with the concurrence of the Minister of National Defence, that the U.S. government be allowed to construct and operate the gap-filler radar stations mentioned, subject to the conclusion of an appropriate exchange of notes.

An explanatory memorandum had been circulated.

(Minister's memorandum, May 2, 1955 - Cab. Doc. 89-55†)

5. *In the course of discussion* the following points emerged:

(a) It was the usual practice for Canada to acquire and hold title to land needed for U.S. defence installations on Canadian soil. The Department of Transport acted as agents for the Department of National Defence and the provinces usually made their crown land available without charge.

(b) The proper provincial authorities should be kept as fully informed as possible about defence projects which involved the use of land belonging to the Crown in the right of a province. In acquiring such land, methods should be followed which did not offend the susceptibilities of the provinces who had the constitutional right to the land in question. If private property was required, normal expropriation methods were of course followed. It was pointed out that, as far as Newfoundland was concerned, the province had been kept informed, as a rule, about proposals to construct defence installations.

(c) As much consideration as possible should be given to Canadian contractors in the matter of supplying equipment and erecting buildings and living quarters. For installations in the Maritime Provinces, the work should be done by contractors from the area when this was feasible. In this connection, it was observed that, under the proposed conditions governing the establishment of the project, Canadian contractors would receive equal consideration with U.S. contractors and preference would be given to qualified Canadian labour.

6. *The Cabinet* noted the report of the Secretary of State for External Affairs and agreed:

(a) that the United States be authorized to construct and operate gap-filler radar stations in Labrador and Newfoundland as the following six sites:

Site number and name	**Parent Pinetree station**
N-28A-Cape Makkovik	**N-28, Hopedale**
N-27A-Cut Throat Island	**N-27, Cartwright**
N-27B-Spotted Isle	**N-27, Cartwright**
N-26A-Fox Harbor	**N-26, St. Anthony**
N-26B-La Scie	**N-26, St. Anthony**
N-22B-Elliston Ridge	**N-22, Redcliff**

subject to the conclusion of an exchange of notes along the same general lines as the exchange for the Distant Early Warning System,[67] and that, pending the conclusion of the agreement, the U.S. could proceed with preliminary procurement, shipment and placement of materials and other measures for the construction of these stations;

(b) that the Department of External Affairs be authorized to inform the U.S. Department of State of this decision; and,

(c) that every effort be made to ensure that proper and tactful methods be followed when acquiring land belonging to the Crown in the right of a province. ...

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[66] Voir/See Volume 20, Document 466.

[67] Voir Canada, *Recueil des traités*, 1955, N° 29.
See Canada, *Treaty Series*, 1955, No. 29.

USAF Gap Fillers - Labrador/Newfoundland

National Archives of Canada

S10-100-80/11 (DCEA)

SECRET

8 July 55

USAF Central Co-ordinating Staff - Canada,
1327A Wellington Street,
Ottawa, Ontario

Construction - Gap Filler Radar Stations

As you are aware, by an exchange of Notes d/13 Jun 55, an agreement has been entered into between our respective Governments for the establishment and operation of the USAF of Gap Filler Radar Stations in the Newfoundland-Labrador area. This letter is written in connection with the acquisition of property and the arrangements made for the actual construction of the stations.

In connection with the location and acquisitions of lands required for those stations, the above-noted agreement, as is usual in other similar cases in the past, states that Canada shall acquire and retain title to the lands. Having acquired title to the lands, the Canadian Government will then, without charge, grant to the United States such rights of access, use and occupancy as may be required for the proposed construction and operation of the stations.

The RCAF is the Canadian Government agency which will process the acquisition of the property. To date, no information has been received regarding the actual property which is desired. The initial action required is the obtaining by us from the Government of the Province of Newfoundland, general approval for the survey and construction of these stations on provincial lands. In order to do this we will require, in duplicate, a large-scale map indicating, approximately, the proposed locations. We would also ask for the approximate latitutude and longitude for each site. Having obtained the provincial Government's approval, arrangements would then be made by the USAF, similarly to the previously constructed Pinetree stations in this area, to obtain through the employment of Newfoundland Provincial Land Surveyors survey plans and descriptions of the individual properties required. These should be provided to us for further action in the actual acquisition of the properties.

The agreement further states that construction will be the responsibility of the United States and that the USAF or its designated agent will consult with the appropriate Canadian Government agencies through the RCAF. It is our assumption that you propose to carry out the construction under similar arrangement to that in effect for the original Pinetree stations and that your construction agency, Corps of Engineers, will be calling tenders and arranging contracts directly. In arranging these contracts, Canadian contractors and Canadian suppliers of material will be extended equal consideration with US contractors or suppliers. Also, under the agreement, Canadian labour is to be given preference for the construction.

These arrangements will be satisfactory but in order that the RCAF may perform its liaison function and also be generally familiar with the class of construction and the facilities which are being built, it is requested that copies of all plans and specifications for the construction work involved, be provided to us in duplicate.

Communications regarding construction and property for these stations should be forwarded to this headquarters, marked for the attention of the Directorate of Construction Engineering Administration. Wing Commander WD Martin in this directorate will, at least initially, be acting as the liaison officer for these purposes.

(CL Ingles) G/C
for CAS.

CLI/PB
DCEA

USAF Gap Fillers - Labrador/Newfoundland

National Archives of Canada

CONFIDENTIAL

S-10-100-80/11 (DCEA)

November 18, 1955

The Honourable Joseph R Smallwood
Premier of the Province of Newfoundland,
St Johns, Newfoundland.

My Dear Premier:

In order to increase the reliability of the Pinetree Radar Chain, this department has a requirement for six additional "gap filler" sites at the localities and approximate latitudes and longitudes set out hereunder:

Location	Latitude	Longitude
(1) N-28A Cape Makkovik	55° 15' North	59° 8' 30" West
(2) N-27A Cut Throat Island	54° 30' North	57° 7' 25" West
(3) N-27B Spotted Isle	53° 30' 55" North	55° 45' 20" West
(4) N-26A Fox Harbour	52° 21' 50" North	55° 40' West
(5) N-26B La Scie	49° 59' 24" North	55° 33' 24" West
(6) N-22B Elliston Ridge	48° 36' 48" North	53° 2' 12" West

An area of 20 to 25 acres will be required at each site and advance information indicates that private owners will be involved only at La Scie and Elliston Ridge. All other sites are believed to be located on Newfoundland Provincial Crown Land.

Would be kind enough to advise whether your government will grant permission to proceed with land surveys and construction of this project upon the same terms and conditions as applied to other Pinetree installations located in your Province. When property surveys have been completed you will be supplied with copies in order that consideration may be given to a formal reservation of the Provincial lands involved.

Your cooperation in the past in matters of this nature is sincerely appreciated.

Sincerely yours,

Original signed by Ralph Campney

Minister

USAF Gap Fillers - Labrador/Newfoundland

National Archives of Canada

SECRET

ANNEX

Conditions to Govern the Establishment
and Operations of Gap Filler Radar Stations
in the Newfoundland-Labrador Area.

(In this Statement of Conditions, unless the context otherwise requires, "Canada" means the Government of Canada, and "United States" means the Government of the United States of America.)

1. Sites

   The location and size of all airstrips and location of all sites, roads, wharves and jetties, required in Canada shall be a matter of mutual agreement by the appropriate agencies of the two Governments. Canda shall acquire and retain title to all lands required for the stations. Canada grants and assures to the United States, without charge, such rights of access, use and occupancy as may be required for the construction, equipment and operation of the stations.

2. Liaison Arrangements

   Construction will be the responsibility of the United States. The United States Air Force or its designated agent will consult fully at all stages with appropriate agencies of the Canadian Government through the Royal Canadian Air Force.

3. Plans

   Plans of buildings, airstrips, roads (including access roads) and similar facilities, information concerning use of local materials, such as rock fill, and sand and gravel, and information concerning other arrangements related to construction and major items of equipment, shall, if requested, by supplied to the appropriate Canadian authorities in sufficient detail to give an adequate idea of the scope of the proposed construction. Canadian officials have the right of inspection during construction. Proposal for subsequent construction, or major alterations, shall be discussed with the appropriate Canadian authorities.

4. Provision of Electronic Equipment

   The Canadian Government reaffirms the principle that electronic equipment at installations on Canadian territory should, as far as possible, be manufactured in Canada. The question of practicability must, in each case, be a matter for consultation between the appropriate Canadian and Unted States agencies to determine the application of the principle. The factors to be taken into account shall include availability at the time period required, cost and performance. For the purpose of carrying ot these principles, consultation shall take place between representatives of the United States Air Force, and the Royal Canadian Air Force and the Canadian Department of Defence Production.

5. Construction and Procurement (other than Electronic Equipment)

    a. Canadian contractors shall be extended equal consideration with United States contractors in the awarding of construction contracts, and Canadian and United States contractors shall have equal consideration in the procurement of materials, equipment and supplies in either Canada or the United States.

    b. Contractors awarded a contract for construction in Canada shall be required to give preference to qualified Canadian labour for such construction. The rates of pay and working conditions for this labour shall be set after consultation with the Canadian Federal Department of Labour in accordance with the Canadian Fair Wages and Hours of Labour Act.

6. Candian Law

Nothing in this Agreement shall derogate from the application of Canadian law in Canada, provided that, if in unusual circmstances its application may lead to unreasonable delay or difficulty in construction or operation, the United States authorities concerned may request the assistance of Canadian authorities in seeking appropriate alleviation. In order to facilitate the rapid and efficient construction of the stations, Canadian authorites will give sympathetic consideration to any such request submitted by United States Government authorities.

7. Financing

The costs of construction and operation of these stations shall be the responsibility of the United States, with the exception of Canadian military personnel costs if Canada should man any of the stations at a later date.

8. Manning

The United States may station personnel at the sites under the control and command of United States military authorities, provided that upon reasonable notice Canada may take over the manning of any or all of the installations. Canada will ensure the effective operation, in association with the United States, of any installation it takes over.

9. Period of Operation of the Station

Canada and the United States agree that, subject to the availability of funds, the stations shall be maintained in operation for a period of ten years or such shorter period as shall be agreed by both countries in the light of their mutual defence interests. Thereafter, in the event that either Government concludes that any of the installations are no longer requried, and the other Government does not agree, the question of continuing need will be referred to the Permanent Joint Board on Defence. In considering the question of need, the Permanent Joint Board on Defence will take into account the relationship of these stations to other radar installations established in the mutual defence interest of the two countries. Following consideration by the Permanent Joint Board on Defence, as provided above, either Government may decide that the station or stations in question shall be closed, in which case the arrangements shown in paragraph 10 below regarding ownership and dispostion of the installation shall apply.

10. Ownership of Removable Property

Ownership of all removable property brought into Canada or purchased in Canada, and placed on the sites, including readily demountable structures, shall remain in the United States. The United States shall have the unrestricted right of removing or disposing of all such property, PROVIDED that the removal or dispostion shall not impair the operation of any installation whose discontinuance had not been determined in accordance with the provisions of paragraph 9 above, and PROVIDED further that removal or disposition takes place within a reasonable time after the date on which the operation of the installation has been discontinued. The disposal of United States excess property in Canada shall be carried out in accordance with the provisions of the Exchange of Notes of April 11 and 18, 1951, between the Secretary of State for External Affairs and the United States Ambassador in Ottawa, concerning the disposal of excess property.

11. Telecommunications

The United States military authorities shall obtain the approval of the Canadian Department of Transport, through the Royal Canadian Air Force, for the establishment and operation (including the assignment of frequencies) of radio stations in Canadian territory. The provision of telecommunications circuits (both radio and land-line) required during the construction period and thereafter will be the subject of consultation between the appropriate authorities of the two governments, having regard to the desirability of using existing circuits and existing Canadian public carriers where this may be feasible.

12. Scientific Information

Any geological, topographical, hydrographical, geo-physical, or other scientific data obtained in the course of construction or operation of the stations shall be transmitted to the Canadian Government.

13. Canadian Immigration and Customs Regulations

a. Except as otherwise agreed, the direct entry of United States personnel from outside Canada shall be in accordance with Canadian customs and immigration procedures which will be administrered by local Canadian officials designated by Canada.

b. Canada will take the necessary steps to facilitate the admission into the territory of Canada of such United States citizens as may be employed on the construction or operation of the stations, it being understood that the United States will undertake to repatriate, *(with expense to Canada), any such persons if the contractors fail to do so.

Note: * hand written note states that another copy reads ", at its expense".

14. Use of Air Landing Facilities

Airstrips (including helicopter pads) at the installation shall be used by the United States solely for the support of the stations. If it should be desired at any times by the United States to use an airstrip for other purposes, a request shall be forwarded through appropriate channels. The airstrips shall be available for use by the RCAF as required. The airstrips shall also be available for use by Canadian civil air carriers operating into or through the area, whenever such use would not conflict with military requirements, and SUBJECT to the understanding that the United States Air Force shall not be responsible for the provision of accommodation, fuel, or servicing facilities of any kind. Proposals and arrangements for such use of USAF-operated airstrips by Canadian Air Carriers shall be submitted to the RCAF, which shall consult the USAF before granting any such permission.

15. Landing Facilities

Landing facilities at any of the stations on tide-water shall be available for use by Canadian Government ships and ships employed on Canadian Government business.

16. Taxes

The Canadian Government shall grant remission of customs duties and excise taxes on goods imported and of federal sales and excise taxes on good purchased in Canada which are or are to become the property of the United States Government and are to be used in the construction and/or operation of the installations, as well as refunds by way of drawback of the customs duty paid on goods imported by Canadian manufacturers and used in the manufacture or production of goods purchased by or on behalf of the United States Government and to become the property of the United States Government for the construction or operation of the installations.

17. Status of Forces

The "Agreement between the Parties to the North Atlantic Treaty regarding the Status of their Forces", signed in London on June 19, 1951, shall apply.

18. Supplementary Arrangements and Administrative Agreements

Supplementary arrangements or administrative agreements between authorized agencies of the two Governments may be made from time to time for the purpose of carrying out the interest of this agreement.

USAF Gap Fillers - Labrador/Newfoundland

National Archives of Canada

Headquarters
64th AIR DIVISION (DEFENSE)
United States Air Force
Stewart Air Force Base, New York

7 Aug 1961

Reply to Attn of: 64MSS

Subject: Discontinuance of Three Prime and Six Gap Filler Radar Stations in Canada

TO: Department of National Defense
125 Elgin Street
Ottawa, Canada

The purpose of this correspondence is to outline certain specific details in the transfer of certain United States Air Force facilities and associated equipment from the United States Air Force to a designated agency of the Canadian Government. Agreement for the transfer was effected by United States Diplomatic Note 546, 1 April 1961, and Canadian Diplomatic Note of Acceptance, 4 May 1961. Diplomatic Notes which were originally the subject of agreement concerning these facilities are Canadian Notes 454 and D-155, 1 August 1951 and 13 June 1955, respectively. A meeting regarding Group 1, GAP-Pine phase-out held in Ottawa, Ontario, Canada, 22 June 1961, resulted in designation of the Royal Canadian Air Force as the action agency within the Canadian Government for this transfer.

The facilities and associated equipment which are the subject of this correspondence are defined as United States Air Force assets presently located at:

Det #1	642nd ACWSq	Elliston Ridge, Newfoundland
Det #2	921st ACWSq	La Scie, Newfoundland
Det #1	922nd ACWSq	Cut Throat Island, Labrador
Det #2	922nd ACWSq	Spotted Island, Labrador
Det #3	922nd ACWSq	Fox Harbour, Labrador
Det #1	923rd ACWSq	Cape Makkovik, Labrador

Transfer of all residual facilities and associated equipment will be on "as-is, where-is" basis and will be without cost to the United Sates Government.

The "target" date for complete withdrawal of USAF personnel is 1 October 1961; however, the actual withdrawal date must be considered flexible due to the logistics complexities involved in these remote locations. This matter will be coordinated precisely with your designated representative, in order that the RCAF may effect necessary security measures concurrent with the complete withdrawal of the USAF personnel.

The residual facilities and associated equipment to be transferred to the RCAF and now physically located at the 642d ACW Squadron, Redcliff, Newfoundland, and the 926th ACW Squadron, Frobisher Bay, Baffin Island, Northwest Territories, will be the subject of subsequent correspondence as soon as the residual items can be identified, which is estimated to be within the next 60 to 90 days.

Continuing United States Air Force interests in the immediate area of the 920th ACW Squadron, Resolution Island, Northwest Territories, preclude any transfer at this time, of the residual facilities and associated equipment located at that installation.

In conjunction with this transfer, the USAF has made necessary arrangements to remove any equipment that it desires to retain, and such property will be removed by the USAF within a reasonable period of time. The current USAF plan is to remove all assets which it desires to retain during the 1961 open water shipping season; however, in the event this task cannot be accomplished, the USAF will remove all desired items at the earliest possible date during the 1962 open water shipping season.

Certain equipment now physically on-station (s) was sold by the Crown Assets Disposal Corporation prior to cancellation of Canadian Note 100; some of this equipment has not been removed by the purchaser. In the event these items are not removed by the purchaser prior to the withdrawal of US Forces, the USAF will identify such items and submit appropriate listings to the RCAF. It is requestd that the RCAF protect and care for this equipment in a manner commensurate with the degree of protection it would extend to its own property. It being understood that the RCAF will not be pecuniarily liable for loss or damage that might occur to the equipment.

The USAF reserves the right to amend the attachments (Listings of facilities and associated equipment by station) to correct any discrepancies that may occur as a result of additional withdrawals of equipment for USAF utilization or normal accounting and inventory error.

Upon proper notification of your acceptance of this correspondence, the USAF will consider the formal transfer negotiations as being completed.

FOR THE COMMANDER

GEORGE L GRUBER
Colonel, USAF,
Deputy for Materiel

6 Atch

1. Station Listings, Det #1-642ACWSq
2. Station Listings, Det #2-921ACWSq

3. Station Listings, Det #1-922ACWSq
4. Station Listings, Det #2-922ACWSq
5. Station Listings, Det #3-922ACWSq
6. Station Listings, Det #1-923ACWSq

Copies furnished:
CCS-C (Col Larsen)
USAF (AFSSS-CG)
ADC (ADMSS)

USAF Gap Fillers - Labrador/Newfoundland

National Archives of Canada

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10 August, 1961

Mr IM Mackinnon,
Assistant General Manager,
Crown Assets Disposal Corporation,
Trade and Commerce Building,
Ottawa.

Dear Sir;

Under United States Diplomatic Note 546 of April 1, 1961, and the Canadian reply dated May 4, 1961, the United States advised and Canada concurred in a proposal for the inactivation of gap filler radars at Elliston Ridge, Fox Harbour, La Scie, Cut Throat Island, Spotted Island, and Cape Makkovik. Reference was also made to the reduction of operations at aircraft control and warning sites at Baffin Island and Resolution Island to communications functions only. The notification also involved the inactivation of the Redclieff aircraft control and warning site.

Following the cancellation of the Canada-US exchange of notes dated August 1, 1951, and June 13, 1955, governing the disposal of US surpluses in Canada and the introduction of the new exchange of notes which have been under draft for some time, the USAF are faced with the problem of disposing of equipment and materiel associated with the facilities referred to above, which are in the main located in areas in which it will be difficult to exercise security control and at which they do not plan in retaining personnel.

The USAF in a letter dated August 7, 1961, a copy of which is attached, refer to the question of the disposal of the material. The interest of this Department in the buildings and the USAF material which they do not propose removing from the sites is now being examined in order to establish the items that we may be interested in. Following this examination, other interested departments will have to be canvassed. These actions are being taken in order to determine those items that would have to be disposed of through your Corporation.

The USAF have furnished the attached lists in order to facilitiate the examination by this and other Canadian departments and I am forwarding copies of them to you at this time so that you may be aware of the action being taken by the USAF and this Department and also of the USAF intention not to repatriate the equipment referred to in these lists.

You will be advised of the interest of this Department and any other departments in the material on the attached lists and so that the Department of National Revenue may also be aware of the action being taken, I am forwarding to them a copy of this letter, the letter from the USAF dated August 7, 1961, and lists of material.

Yours sincerely,

(RG MacNeill)
Assistant Deputy Minister (Finance)

Encl

USAF Gap Fillers - Labrador/Newfoundland

National Archives of Canada

OTTAWA, August 11th, 1961.

THE MINISTER:

Re: Telegram dated August 10th, 1961,
from the Premier of Newfoundland
to the Prime Minister of Canada

The US Gap Filler Stations in Newfoundland, to which Mr Smallwood refers, appear to be:-

a. Elliston Ridge, Newfoundland
b. La Scie, Newfoundland
c. Cut Throat Island, Labrador
d. Spotted Island, Labrador
e. Fox Harbour, Labrador
f. Cape Makkovik, Labrador

The above Stations have either closed down or are in process of doing so and the "target" date for complete withdrawal of USAF personnel is October 1st, 1961, although the logistic complexities involved in these remote locations may affect the date of actual withdrawal. Among other fixtures at each of the six Stations there are electrical generating plants consisting of 5-100 kw generators with auxiliary equipment and switchboards which cost originally more than $100,000.00. This makes a total of 30 generators whereas Mr Smallwood refers to 40 of these equipments. It may be that there would be 10 more in other US Stations that will be closing but the six Stations listed above are the only ones on which we now have detailed information.

Under arrangements formerly in effect between the US and Canadian Governments covering situations of this kind, but now under review between the two governments, the buildings and fixtures comprising the Stations would pass to Canada and, in the event of any of the assets not being required by Canada, would be disposed of by the Crown Assets Disposal Corporation.

Recently the RCAF has been examining its requirement position with respect to these US Stations and, while the formal report is not yet available, it is understood that there is not likely to be any defence requirement for the buildings or fixtures in situ. It may be, however, that there would be a requirement for the electrical generating plants for use at other locations.

In the event that there is no requirement by DND or other Federal Government departments for these power plants, they would be turned over to the Crown Assets Disposal Corporation for disposal, asuming that the inter-government arrangements formerly in force are reinstated following the current review referred to in paragraph 3 above.

In the light of the foregoing, it is suggested that Mr Smallwood might be told that the Federal Government's requirement position with respect to the electrical generating plants is now under review and in the event that there is no Federal requirement, the plants would probably be turned over to Crown Assets Disposal Corporation with advice of the Province's interest. Incidentally, we are not aware of any dissolution of the Disposal Corporation, but it may be that Mr Smallwood is referring to the fact that Crown Assets Disposal Corporation is not at present handling disposal of US surplus assets in Canada pending results of the current review.

It will be recalled that the giving up by US of the installations referred to above was agreed to in an Exchange of Notes between Canada and the United States, being US Note No 546 dated April 1st, 1961, and Canada Note No 69 of May 4th, 1961.

Original signed by
RG MacNeill

(EB Armstrong)
Deputy Minister.

Cape Makkovik, Labrador

1957-1961 – Historical Report – USAF Historical Division

Documentation pertaining to Gap filler sites has proven to be extremely difficult to locate or obtain. All of the AC&W Squadrons which formed the 64th Air Division (Defense), NEAC, were expected to provide Historical Reports on a quarterly basis. We have not been able to locate any Historical Reports which originated at the Gap Filler Detachments. As a result, we focused our attention to the AC&W Squadron Historical Reports, and in some cases, we were able to find some mention of Gap Filler(s).

The 923rd AC&W Squadron was located at Hopedale, Labrador. This squadron had a Gap Filler Detachment within its overall area of responsibility. This unit was:

Detachment 1 – Cape Makkovik, Labrador – N-28A

The following detail pertaining to this Gap Filler site has been extracted from the 923rd AC&W Squadron Historical Reports – and provides some detail of interest to the reader.

August 1956

Tech Supply – General:
One NCO was sent to Makkovik in August to receipt for and safeguard supplies for Detachment 1.

One Airman, 64151, arrived for assignment at Makkovik. He was detained and employed in the Supply Section at Hopedale pending completion of the facilities in Makkovik.

January 1959

On 14 January, Detachment One's FPS-14 was off the air three hours and 21 minutes before the set was returned to normal. This condition was traceable to the lack of an FPS-14 Minor Stage on order through Supply at Goose AB since March 1958. FPS-14 operation was continued with Xtal Mixer discontinued, leaving only one channel operating at peak performance. The 1958 order for the needed part was cancelled and reordered under a 1959 control number.

1 January 1960 to 31 March 1960

Operationally, the detachment functioned at peak level during the first quarter of 1960 as the number of tracks plotted totaled 1,566.

NOTE:

We are aware that the Detachment #1 Gap Filler Site at Cape Makkovik was only operational between 1957 and 1961. It is unfortunate that we do not have very many quarterly Historical Records for Hopedale during this four year period. It is, however, somewhat unlikely that there would be a great deal of additional detail pertaining to the Gap Filler Detachment in the missing Hopedale Historical Records.

The only recurring detail which was found in all appropriate Historical Records for Hopedale was found in Section 4, as follows:

Subordinate Units
Detachment #1, 923 AC&W Squadron, Cape Makkovik, APO 677, New York, New York.

USAF Gap Fillers - Labrador/Newfoundland

National Archives of Canada

SECRET

April 1/61

No 546

Sir:

I have the honor to refer to Note No 454 of August 1, 1951, from the Canadian Embassy in Washington and my Government's reply of the same date, regarding the extension and coordination of the continental radar defence system within Canada, and to your Government's Note No D-155 of June 13, 1955, and this Embassy's reply of the same date, Note No 255, concerning the construction and operation of certain radar stations in the Newfoundland-Labrador area.

In this connection and in consonance with recent discussions between the United States Air Force and the Royal Canadian Air Force, it is the desire of the United States Government to reduce certain of these radar operations. In particular, it is proposed that operations at the Baffin Island and Resolution Island aircraft control and warning sites by reduced to communications only, and that Redcliff aircraft control and warning site and the following gap filler radars be inactivated: Elliston Ridge, Fox Harbour, La Scie, Cut Throat Island, Spotted Isle, and Cape Makkovi,.

Accordingly, I have been instructed to seek the concurrance of the Government of Canada to these proposed steps, which it is hoped can be taken concurrently with the activation of the Greenland extension of the Distant Early Warning Line in July of this year.

Accept, Sir, the renewed assurance of my highest consideration.

Embassy of the United States of America
Ottawa, Ontario, April 1, 1961.

The Honorable
Howard C Green, PC, QC, MP,
Secretary of State for External Affairs,
Ottawa.

USAF Gap Fillers - Labrador/Newfoundland

National Archives of Canada

SECRET

Ottawa, May 4, 1961

No 69

Excellency:

I have the honour to refer to your Note No 546 of April 1, 1961, in which you informed me of the desire of you Government to reduce the operations of certain radar stations in the Newfoundland-Labrador area established under the terms of the Exhange of Notes between our two Governments of June 13, 1955. In particular you proposed that operations at the Baffin Island and Resolution Island aircraft control and warning sites be reduced to communications only and that the Redcliff aircraft control and warning site and the following gap filler radars be inactivated: Elliston Ridge, Fox Harbour, La Scie, Cut Throat Island, Spotted Isle, and Cape Makkovik. Your Note went on to seek the concurrence of the Canadian Government to these proposed steps.

I have the honour to inform you that my Government concurs in these proposed steps, it being understood that the deactivation of the stations in the manner proposed will take place concurrently with the activation of the Greenland extension of the Distant Early Warning line and the Greenland-Iceland-United Kingdom barrier in July of this year.

The agreement of the Canadian Government indicated above is also subject to the understanding that all releases of information to the public regarding the deactivation of the radar sites will be jointly agreed by the two Governments and that subject to the provisions of paragraph 10 of the Annex to my Government's Note No D-155 of June 13, 1955, the questions of custody and dispostion of the buildings which will remain will be discussed between the appropriate officials of the two Government.

Accept, Excellency, the renewed assurance of my highest consideration.

(sgd) HC Green,
Secretary of State
for External Affairs

His Excellency Livingston T Merchant,
Ambassador of the United States of America,
100 Wellington Street,
OTTAWA

Gap Filler Detail

1961 – Inactivating Radars – National Archives of Canada

SECRET

APPENDIX B
TO: S10-136-80/7(CAS)
Dated: February 1961

A SYNOPSIS OF THE MILITARY IMPLICATIONS OF INACTIVATING CERTAIN RADARS IN THE NORTHEAST AREA

1. The radar warning network in defence of Canada and the United States consists of: a Distant Early Warning Line (DEW) extending along the north shore of North American mainland and terminating at Cape Dyer on Baffin Island; a Mid-Canada Line which is situated along the 55th parallel of north latitude; and to the rearward a contiguous radar system covering virtually the entire populated area of Canada and the United States. This latter radar coverage extends for hundreds of miles to seaward off the east and west coasts of the lower mainland.
2. The line of radars from Frobisher to Red Cliff provides early warning and control of USAF interceptors based at Goose Bay and Harmon in Newfoundland. An Airborne Early Warning barrier between Newfoundland and the Azores provides early warning against attack from the North Atlantic. A similar Airborne Early Warning Line extends across the Pacific Ocean from the Aleutians to Hawaii.
3. In July 1961 four heavy radar sites in Greenland (DEW East) will become operational and the Airborne Electronic Warning (AEW) barrier currently located between Argentia and the Azores will be relocated to close the gaps between Greenland-Iceland-United Kingdom (the G-I-UK barrier). In addition to the AEW aircraft there will be radar picket vessels patrolling the Iceland-United Kingdom Area. Thus, by July 1961 there will be a continuous early warning line against the air supported threat which extends from Hawaii to Europe.
4. Attached as Annex 1 is a map showing the existing radar coverage in the Northeast Area and the improvements to the early warning system becoming operational in July of this year. The radars which the United States desire to inactivate are shown in distinctive coding.
5. The line of prime radars extending from Frobisher to Red Cliff were constructed as an

extension of the DEW Line to provide early warning of an impending attack from the Northeast on the populated and industrial areas of Northeastern Canada and the United States. The radars at Frobisher, and Resolution Island serve as an early warning function only while those on the lower Labrador – Newfoundland coast have an early warning and weapons control capability. Thus, because the function of these two radars is being superseded by the four prime radars comprising DEW East there is no longer any operational requirement to retain them. In addition they are very expensive both in manpower and money to maintain.

6. The six gap filler radars situated below Hopedale and the Labrador-Newfoundland coast were installed to provide warning, from the ground up similar to that being provided by the mid-Canada Line across the 55th parallel. When DEW East and the G-I-UK barrier become operational the initial early warning function for which the gap filler radars were installed will be provided. In fact, the new warning facilities will provide the Goose NORAD Sector with more time in which to react to an attack which will, in effect, reduce the vulnerability of the SAC aircraft at Goose Bay and Harmon to surprise attack.
7. The radar at Red Cliff is the land based radar contiguous with the Airborne Early Warning barrier between Newfoundland and the Azores. At 20,000" altitude this radar provides only 50 miles more coverage than the radar at Gander. In addition, the type of equipment installed at Red Cliff is now obsolescent and if retained would be difficult to maintain. Alternatively replacement with a modern equipment would be costly. The consensus is that the coverage provided by Red Cliff does not warrant either replacement of the existing radar with more modern equipment or the retention of the site in its present configuration when the AEW barrier is deployed to the G-I-UK area.
8. The deactivation of the three prime and six gap filler radars will cause a reduction of approximately 600 United States Military personnel in Canada.
9. In sum, the improvement to the early warning capability, i.e. DEW East and the G-I-UK barrier, becoming operational in July 1961 is such that the limited additional coverage provided by the prime radars at **Frobisher Bay, Resolution Island and Red Cliff and the six gap filler radars in the Goose Sector does not warrant the high cost of operation**.

USAF Gap Fillers - Labrador/Newfoundland

National Archives of Canada

Headquarters,
64th Air Division,
Stewart Air Force Base,
Newburgh, NY USA.

Attention: 64 MSS

Hand-Over of Six Gap Filler Radar Sites

Reference is made to previous exchange of correspondence between our Governments and officers of our respective staffs dealing with the hand-over by the United States Government to the Canadian Government of six Gap Filler Sites along the Coast of Labrador and Newfoundland.

The actual hand-over of the sites has been accomplished and the various hand-over certificates duly executed. However, it has now been ascertained that there is no known requirement by any Canadian Government agency for the materiel which has been left at each of these sites by your personnel. In view of the recent exchange of notes between our Governments dated 28 Aug and 1 Sep 61 there does not appear to be any alternative to the RCAF rejecting the responsibility for reporting this materiel surplus to CADC. It seems clear that the report must be made by your Service in the usual way. It is not considered that this course need create any complication insofar as safe-guarding the materiel is concerned in that the RCAf is providing minimal watch-keeping services at these sites and will continue to do so until such time as they have been disposed of.

Reports of Surplus covering the buildings and installed services are being forwarded to CADC and these reports have been annotated to show that there is a quantity of materiel at each site which will be the subject of a Report of Surplus from your Service.

I trust that this alteration in our orginal understanding will not be too great an inconvenience for you and your staff.

(JF Brennagh) W/C
for CAS

F/L Ga Poupore/jd
CCE-Prop-2-2
2-6281

Gap Filler Detail

1962 – Takeover Gap-Filler Sites – National Archives of Canada

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No. 2-02-08(CTSO)

Department of National Defence

Royal Canadian Air Force

Goose Bay Lab
19 Mar 62

Chief of the Air Staff
Air Force Headquarters
Department of National Defence
Ottawa 4 Ont

<u>Attention</u>: F/L McConnell (CGE/Props)

<u>Takeover Gap-Filler Radar Sites</u>

1. Further to your CE 136 dated 8 Mar and telecon F/L McConnell 9 Mar, the following information relative to the takeover of Gap-Filler radar sites at Spotted Island, Fox Harbour, Cape Makkovik and Cut Throat Island is provided.
2. This project commenced with receipt of ATCHQ letter 10-7-G10(CStaffO) 28 Aug 61 at which time discussions were held with local representatives of USAF Goose Air Defence Sector.
3. A visit was arranged for planning purposes via USAF rented helicopter, to each of the sites concerned, and a recommendation was forwarded under our message T50 dated 14 Sep 61 to provide security via part-time caretaker arrangements.
4. Subsequent authority was received from ATCHQ and personnel were hired in the area of each; Spotted Island, Makkovik, and Fox Harbour to function as part-times caretakers. Due to the extreme remoteness of Cut Throat Island from inhabited area, no caretaker has been hired at that site.
5. The sites were vacated by the USAF in mid-October 1961 and the actual handing over certificates, copies of which it is understood are now in your possession, were signed by respective designates, the CO RCAF Station Goose Bay and the Commander, Goose Air Defence Sector, USAF.
6. It is reminded that, although the handover certificates have been duly signed by the Commanding Officer of this unit, it has not been possible, since the USAF vacated these sites, to accomplish a stocktaking. The accuracy of the material listings therefore cannot

be verified. Should this be considered necessary, transportation can be arranged at a cost of $325.00 per hour, via "The Okanagan Helicopter Group" who are locally employed by USAF. Each inventory list would require approximately two days; and would be most inconvenient to personnel, who would be required to work in unheated buildings under present winter conditions. It may be possible over a period of time to accomplish these visits, depending upon varying conditions of ice, snow, ocean swells, wind etc, via RCAF Goose Bay Otter.

7. With regard to your query on furl oil, it is known that some fuel oil is stored in bulk storage tanks while some is in 45-gal drums. However, it is not possible to state, by site, what quantity is stored in each manner. An accurate statement in this regard would also be subject to stocktaking by Goose Bay RCAF personnel.
8. With the exception of Cut Throat Island, assurance is given that there has been no re-distribution of materials since the RCAF assumed responsibility for these sites. Due to the non-availability of caretaker at Cut Throat Island, it is considered advisable to remove items which would be attractive to rovers in the area, ie, sealers, trappers and fishermen. This material has been kept in custody on this unit. Assurance is given that all items shown on the material listings, subject to confirmation as outlines in para 6, is available for disposition as determined by your HQ.

(P Woodside) S/L
for CO RCAF Stn Goose Bay

cc: CHQ

Gap Filler Detail

1962 – Cancellation of Reservations – National Archives of Canada

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810-136-80/7 TD 2323 (CCE/Prop)
4, Ontario
18 December, 1962

Deputy Minister,
Department of Transport,
Ottawa 4, Ontario.

Dear Sir:

Re: Cancellation of Reservations
Provincial Crown Land
Former Labrador Gap Filler Sites
Your file: 1653-712 (RE)

Further to my letter of even file dated 7 December, 1962, information has now been received from Crown Assets Disposal Corporation that executive authority has been obtained for the sale of all buildings and Crown-owned land at the former Mid Canada Line Gap Filler Sites located at Fox Harbour, Cut Throat Island and Spotted Island, Labrador.

Since the above reservations of Provincial Crown land were to be effective only for such period as they were required for purposed of the Mid-Canada Line, according to the relevant Orders-in-Council made by the Province of Newfoundland, and as there is no further requirement for the lands for these purposes it will now be in order to cancel the reservations.

Yours sincerely,

(EB Armstrong)
Deputy Minister

F/L WH McConnell/mlm
CCE/Prop-4
18 Dec 62
2-6281

Appendix G
Historical Photographic Log

Photo 1: View, looking east, towards the steam shovel used during road construction on the hill near the site circa 1955. Note the POL drums scattered along the roadway.

Photo 2: View, looking northeast, during the refueling of a helicopter from Goose Bay - May 1957.

Photo 3: View, looking west, toward the Site dump - April 1957

Photo 4: View, looking towards the diesels which supplied the power to the Site - December 1959.

Photo 5: View, looking east, towards the fuel drums/barrels being stacked during resupply at the lower Site - August 1959.

Photo 6: View, looking northwest, towards the upper Site - July 1959.

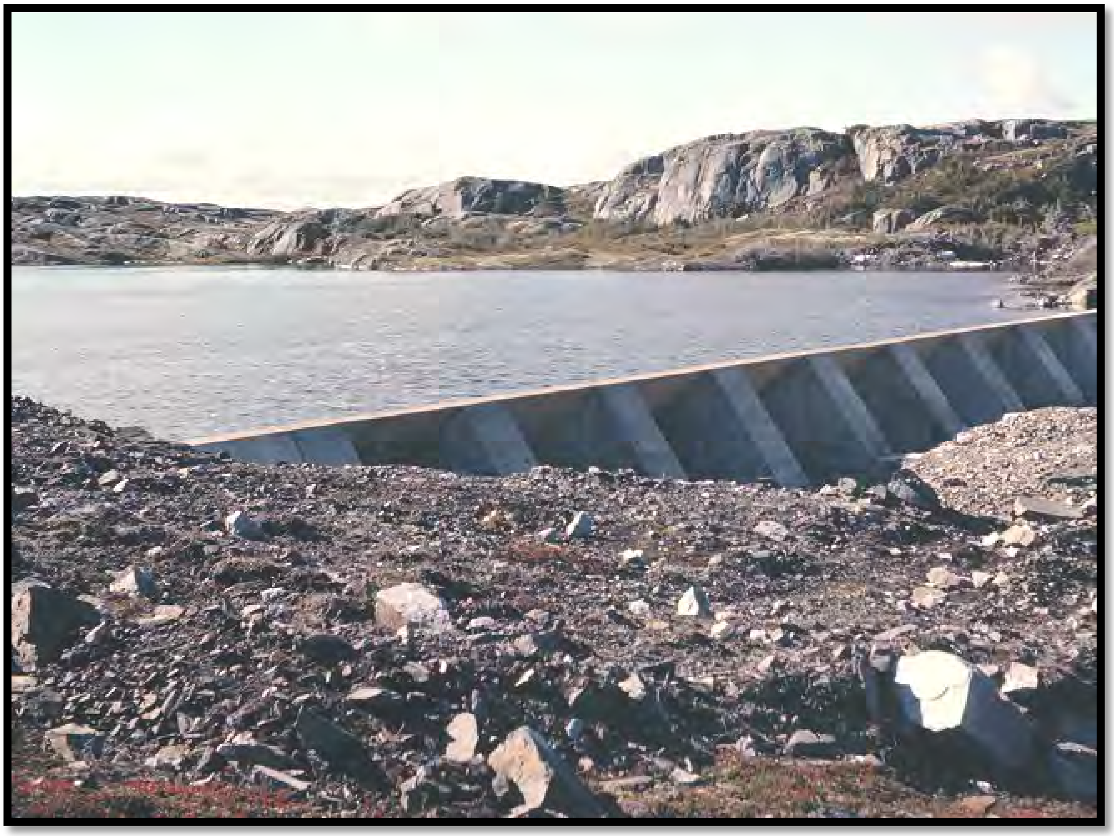

Photo 7: View looking north, towards the pumphouse Site dam for the water supply - July 1959.

Photo 8: View, looking east, along the access road to the site. Note the barrels lining the roadway and the antennas to the left and in front of the radome - July 1959.

Photo 9: View, looking east, towards the Site on the hill as seen from the access road. Note the structures on the far side of the pond - April 1960.

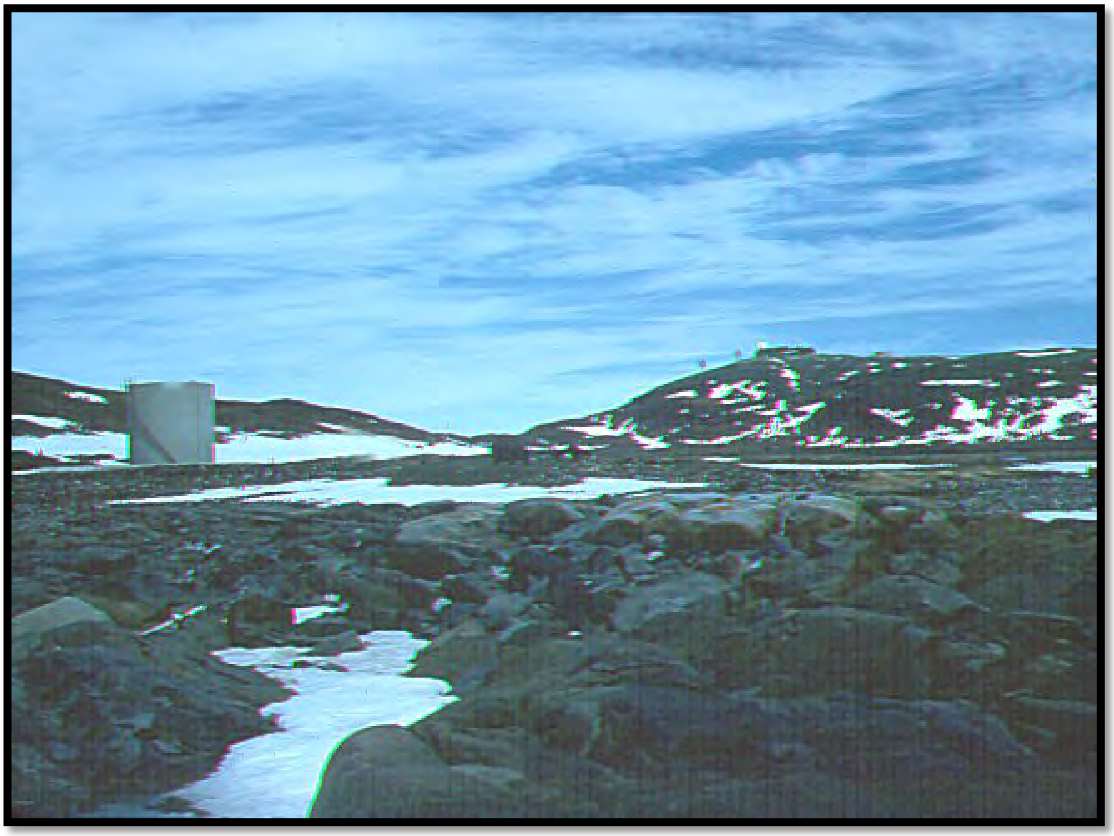

Photo 10: View, looking east, towards the 3,053,000 L AST (lower tank farm) on the left. Note the communications antenna and radome visible on the hill - April 1960.

Photo 11: View, looking northwest, towards the Site from the helicopter pad - February 1960. Note the large amount of POL drums located adjacent to the disaster shack in the background of the photograph.

Photo 12: View, looking northwest, toward the Site. Note the radar tower has been removed - July 1968.

Photo 13: View, looking north, toward the abandon main building with a helicopter parked in front - July 1968.

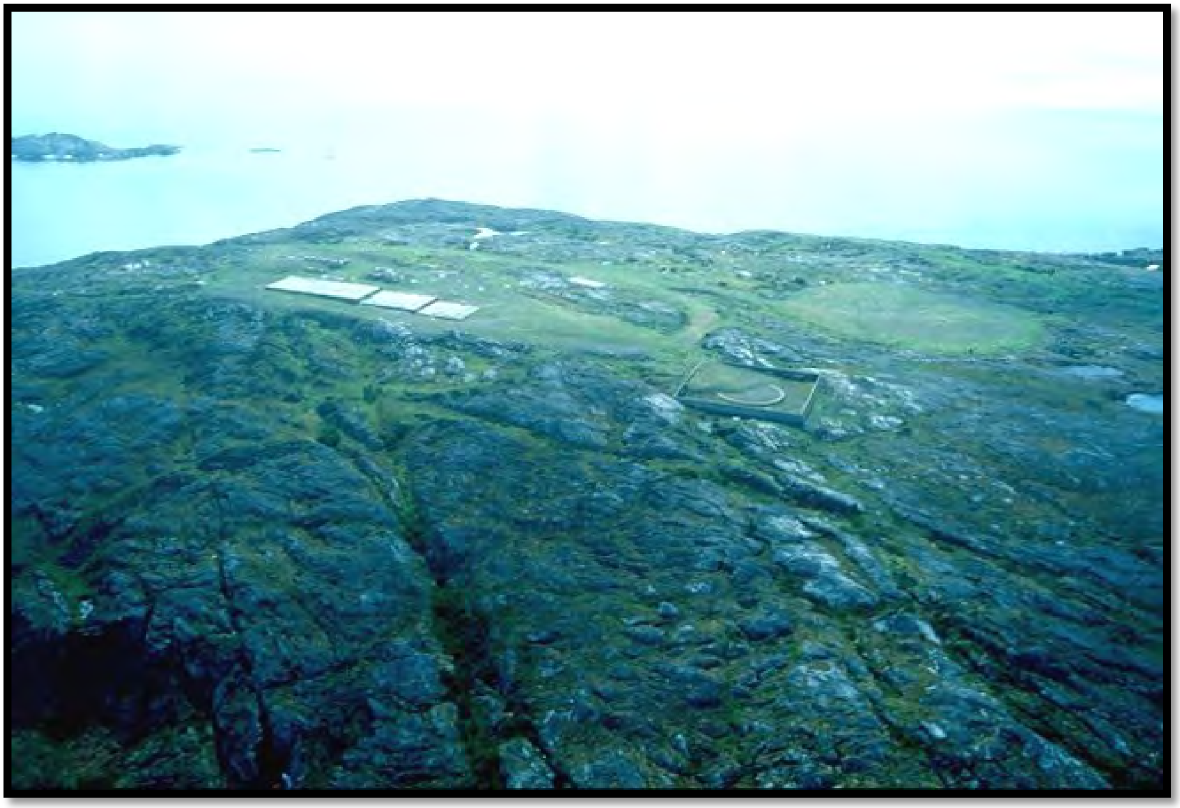

Photo 14: View, looking east, towards the upper Site foundation remains of the main building, disaster shack, and the AST - July 2002.

Photo 15: View, looking southwest, towards the concrete remains of the upper Site at Cape Makkovik - July 2002.

Photo 16: View, looking southwest, towards the concrete remains of the upper Site AST - July 2002. Note the concrete foundation of the disaster shack in the bottom of the photograph.

Table 1: Preliminary Phase II ESA Sampling Plan

Site	APEC	PCOCs	Number of lab soil samples (parameters)	Number of lab surface water samples (parameters)	Additional samples (may be added via CO)
Cape Makkovik	AST (Upper Site)	POLs	4 (each to be analyzed for PHCs , BTEX, PAH)	-	-
	AST (Lower Site)	POLs	4 (each to be analyzed for PHCs , BTEX, PAH)	-	-
	Fuel Drum Storage Area (lower Site)	POLs	3 (each to be analyzed for PHCs , BTEX, PAH)	-	-
	Drum Dump (Brinco)	POLs	3 (each to be analyzed for PHCs , BTEX, PAH)	-	-
	Aboveground Fuel Line	POLs	4 (each to be analyzed for PHCs , BTEX, PAH)	-	-
	USAF Dump (Upper Site)	POLs, ACMs, heavy metals, PCBs	10 (each to be analyzed for PHCs, BTEX, PAH, Metals, PCB)	-	ACM, and other haz. building materials
	USAF Dump (Lower Site)	POLs, ACMs, heavy metals, PCBs	10 (each to be analyzed for PHCs, BTEX, PAH, Metals, PCB)	-	ACM, and other haz. building materials
	1987 Disposal Site	POLs, ACMs, heavy metals, PCBs	10 (each to be analyzed for PHCs, BTEX, PAH, Metals, PCB)	-	ACM, and other haz. building materials
	Helicopter Pad and Drum Cache (Upper Site)	POLs, heavy metals	3 (each to be analyzed for PHCs, BTEX, PAH, Metals)	-	-
	Pump House + Water Source (Upper Site)	POLs	3 (each to be analyzed for PHCs , BTEX, PAH)	1 (each to be analyzed for PHCs , BTEX, PAH, Metals, PCB)	-
	Pump House + Shack(Lower Site)	POLs	3 (each to be analyzed for PHCs , BTEX, PAH)		-
	Main Building and Motor Pool (Upper Site)	POLs, heavy metals	4 (each to be analyzed for PHCs, BTEX, PAH, Metals)	-	-
	Disaster Shack(Upper Site)	POLs, heavy metals	3 (each to be analyzed for PHCs, BTEX, PAH, Metals)	-	-
	Surface Water Location(s)	-	-	3 (each to be analyzed for PHCs , BTEX, PAH, Metals, PCB)	-
	Disaster Shack (Upper Site)	POLs, heavy metals	3 (each to be analyzed for PHCs, BTEX, PAH, Metals)	-	-
	Storage Building	POLs, heavy metals	3 (each to be analyzed for PHCs , BTEX, PAH)	-	-
	Background Surface Water Location(s)	-	-	3 (each to be analyzed for PHCs , BTEX, PAH, Metals, PCB)	-

Appendix H

NCSCS WORKSHEET

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)*	Cape Makkovik, Labrador	
Site Common Name: *(if applicable)*	Former Pinetree Line Radar Station, Cape Makkovik, Labrador	
Code identifier: *(e.g., FCSI 8-digit identifier)*		
Site Owner or Custodian: *(Organization and Contact Person)*	Amanda Eid, DCC	
Legal description *or* metes and bounds:	See site drawings (Appendix A)	
Approximate Site area:	Two parcels of land (Area A - 16.64 Acres & Area B 104.23 Acres)	
Parcel Identifier(s) [PID]: *(or Parcel Identification Numbers [PIN] if untitled Crown land)*		
Centre of site: *(provide latitude/longitude or UTM coordinates)*	Latitude:___55___ degrees ___13___ min ___29___ secs; Longitude:___59___ degrees ___08___ min __43____ secs	
	UTM Coordinate: Northing _____6121912_________ Easting _____363525_________	
Site Land Use:	Current:	The site has not been occupied since 1961. Building foundations are the only structures remaining on site from the former United States military radar station.
	Proposed:	Remain in it's current condition.
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, which is currently owned by the Province of NL, is located along the Labrador coastline approximately 230 kilometers northest of the Town of Happy Valley/Goose Bay, NL and approximately 16 kilometers north of Makkovik, NL. The Site was mainly used as a manned Pinetree Line Gap Filler Radar Station for the Hopedale Air Station and was in operation from 1957 to 1961 and comprises of an Upper and Lower Site. Once operation ceased, the facility which included two parcels of land (Area A – 16.64 acres & Area B – 104.23 acres) was transferred to the Canadian Armed Forces for use by the Department of National Defense (DND) in connection with Mid Canada Line (MCL). The Upper Site formerly contained a two storey, 5-unit building (main building) housing: a garage, a heating and power plant, barracks (30 to 50 personnel), office space and a dining hall. The station was also equipped with two communication antennae, a water pumping station and supply line, a disaster/emergency shack, a large aboveground storage tank (AST) containing diesel and a helicopter pad. In addition to the Upper Site facilities, a 2.7 kilometer gravel roadway was constructed to connect the Upper Site to the lower dock area (Lower Site) where a second large AST was located. The Site decommissioning program was completed under the approval of the Provincial Government of NL in 1987. This reportedly included razing of on-site structures and the burning of all materials on-site, followed by the burying and covering of the debris at the Site. The Site has not been occupied since 1961 and is now predominantly covered in vegetation/gravel/exposed bedrock and concrete from the former building structures.	

CCME National Classification System for Contaminated Sites (2008) version 1.3
Summary of Site Conditions

Affected media and Contaminants of Potential Concern (COPC):	Soil: Analytical results confirmed soil concentrations of pesticides, PAHs and metals that exceeded current guidelines on Site. Sediment: Analytical results confirmed sediment concentrations of petroleum hydrocarbons (Modified TPH) and metals that exceeded current guidelines on Site. Surface Water: Analytical results confirmed surface water concentrations of metals that exceeded current guidelines on Site.

Please fill in the "letter" that best describes the level of information available for the site being assessed:

Site Letter Grade D

If letter grade is F, do not continue, you must have a minimum of a Phase I Environmental Site Assessment or equivalent.

Scoring Completed By:	Jason Green
Date Scoring Completed:	19-Jun-18

CCME National Classification System for Contaminated Sites (2008) version 1.3
User's Guide - Instructions

1) Please review the following overview of contents. The revised CCME National Classification System for Contaminated Sites (NCSCS) consists of a pre-screening checklist, summary of site conditions, summary score sheet, and three instruction/worksheet pages for the user to fill out: Contaminant Characteristics, Migration Potential and Exposure. For ease of printing, the method of evaluation for scoring each section of the worksheet is provided in a separate Instructions tab. Reference material is also provided to assist with the evaluation. A brief description of each sheet is as follows:

Pre-Screening Checklist - Used to determine if the Site can either be considered a Class 1 site (to be remediated immediately) or if more information must be collected before the Site can be classified, or other hazards exist at the Site that must be addressed first before the Site can be classified using the revised NCSCS.

Site Description Sheet - Summarizes Site information. It also indicates the level of information available (Site Letter Grade) for the site to conduct the NCSCS scoring evaluation. The known/potential contaminants of concern and affected media will also be summarized here.

Contaminant Characteristics Instructions & Worksheet - Prompts the user for information related to the contaminants of potential concern (COPC) found at the site.

Migration Potential Instructions & Worksheet - Prompts the user for information related to physical transport processes which may move contamination to neighboring sites or re-distribute contamination within a site. Migration potential includes many of the exposure pathways, but is not limited to exposure pathways. Migration potential does not require clearly defined receptors.

Exposure Instructions & Worksheet - Prompts the user for information related to exposure pathways and receptors which may be located on the site.

Summary Score Sheet - Generates a total site score by adding up the scores generated on each of the three worksheets and provides the corresponding Site Classification. It also provides an estimate of certainty in the score provided (Certainty Percentage).

Reference Material - Additional information which may be useful to refer to when conducting the evaluation.
Contaminant Hazard Ranking
Examples of Persistent Substances
Examples of Substances in the Various Chemical Classes
Chemical-specific Properties
Range of Values of Hydraulic Conductivity and Permeability

The worksheet titles and sub headings are as follows.

I. Contaminant Characteristics

1. Residency Media
2. Chemical Hazard
3. Contaminant Exceedance Factor
4. Contaminant Quantity
5. Modifying Factors

II. Migration Potential

1. Groundwater Movement
2. Surface water Movement
3. Soil
4. Vapour
5. Sediment Movement
6. Modifying Factors

III. Exposure

1. Human Receptors
   A. Known Impact
   B Potential
      a. Land Use
      b. Accessibility
      c. Exposure Route
2. Human Modifying Factors
3. Ecological Receptors
   A. Known Impact
   B. Potential
      a. Terrestrial
      b. Aquatic
4. Ecological Modifying Factors
   a. Species at Risk
   b. Aesthetics
5. Other Receptors
   a. Permafrost

CCME National Classification System for Contaminated Sites (2008) version 1.3
User's Guide - Instructions

2) This is an electronic form which will prompt the user for information. Based on the answers provided, a score is calculated for the contaminated site in question. In most cases, the user will be asked to select amongst two or more choices in a drop down checklist. To access the drop down checklist, move the mouse towards the right side of the "action box". If a drop down is available, an arrow will appear, which must be selected to access the drop down choices. An "action box" requires input from the user. All action boxes have an amber background.

action box

3) When assigning scores for each factor, it is highly recommended to give a rationale (a column has been provided for this purpose in Worksheets I, II and III). Information that would be useful in justifying the scores assigned may include: a statement of any assumptions, a description of site-specific information, and references for any data sources (e.g., site visit, personal interview, site assessment reports, or other documents consulted).

4) The Site Letter Grade is related to the level of information available for the Site (as defined by the User) and provides an indication of completeness of information based on the level of investigation and remediation work that has been carried out at the site. More detailed descriptions of the various categories are provided below.

Site Letter Grade:	*Detailed Descriptions:*
F	***Pre Phase I ESA –*** No environmental investigations have been conducted or there are only partial or incomplete Phase I ESA for the Site. It is not recommended to continue through the NCSCS when insufficient data are available. In these cases, it will generally be necessary to conduct a Phase I ESA or other site investigation tasks in order to complete the NCSCS scoring.
E	***Phase I ESA –*** A preliminary desk-top type study has been conducted, involving non-intrusive data collection to determine whether there is a potential for the Site to be contaminated and to provide information to direct any intrusive investigations. Data collected may include a review of available information on current site conditions and history of the property, a site inspection and interviews with personnel familiar with the Site. [Note: This stage is similar to "Phase I: Site Information Assessment" as described in Guidance Document on the Management of Contaminated Sites in Canada (CCME 1997).]
D	***Limited Phase II ESA –*** An initial intrusive investigation and assessment of the property has been conducted, generally focusing on potential sources of contamination, to determine whether there is contamination present above the relevant screening guidelines or criteria, and to broadly define soil and groundwater conditions; samples have been collected and analyzed to identify, characterize and quantify contamination that may be present in air, soil, groundwater, surface water or building materials. [Note: This stage is similar to "Phase II: Reconnaissance Testing Program" as described in Guidance Document on the Management of Contaminated Sites in Canada (CCME 1997).]
C	***Detailed Phase II ESA –*** Further intrusive investigations have been conducted to characterize and delineate the contamination, to obtain detailed information on the soil and groundwater conditions, to identify the contaminant pathways, and to provide other information required to develop a remediation plan. [Note: This stage is similar to "Phase III: Detailed Testing Program" as described in Guidance Document on the Management of Contaminated Sites in Canada (CCME 1997).]
B	***Risk Assessment with or without Remedial Plan or Risk Management Strategy –*** A risk assessment has been completed, and if the risk was found to be unacceptable, a site-specific remedial action plan has been designed to mitigate environmental and health concerns associated with the Site, or a risk management strategy has been developed.
A	***Confirmation Sampling –*** Remedial work, monitoring, and/or compliance testing have been conducted and confirmatory sampling demonstrates whether contamination has been removed or stabilized effectively and whether cleanup or risk management objectives have been attained.

5) A few terms are used throughout which require definition, they are as follows:

Known - refers to scores that are assigned based on documented scientific and/or technical observations

Potential - refers to scores that are assigned when something is not known, though it may be suspected

Allowed Potential - If, in a given category, known and potential scores are provided by the user, the checklist will typically default to the "known" score. If a "known" score is provided, the "allowed potential" score will equal zero. Exceptions can be found within the Modifying Factors categories in each worksheet where there are often several independent questions. Therefore, "known" and "potential" scores are allowed to contribute to the total modifying factor score.

Raw - refers to score totals which have not been adjusted down to the total maximum score for the given category. In most cases the possible total raw score is greater than the maximum allowed

Note: For some questions in the worksheets, the option selected will determine whether a "known" or "potential" score is assigned. In these cases, if "Do Not Know" is selected, a score will automatically be listed as "potential", whereas all of the other options in the list will provide a "known" score.

6) Certainty Percentage: The ratio of “Known” to “Potential” responses reflects the relative certainty, or confidence, of the resulting final score and the classification. The NCSCS system defines this ratio as the “Certainty Percentage”. The Certainty Percentage is generated from the number of sections assigned scores based on “known” information divided by the total number of sections. A high percentage indicates that more is known about the Site, and therefore there is more confidence in the classification, whereas a low percentage suggests that the classification should be treated with caution.

7) Site Classification Categories: Sites should not be ranked relative to one another. Sites must be classifed on their individual characteristics in order to determine the appropriate classification (Class 1, 2, 3, or N) according to their priority for action, or Class INS (Insufficient Information) for sites that require further information before they can be classifed. The 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.,* futher site characterization, risk management, remediation, etc.) is required to address existing concerns. Typically, Class 1 sites indicate 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 this site is currently not a high concern. However, additional investigation may be carried out to confirm the site classification, and some degree of action may be required.

Class N - Not a Priority for Action (Total NCSCS Score less than 37)
The available information indicates there is probably 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.

Class INS - Insufficient Information (≥15% of Responses are "Do Not Know", or a site letter grade of F has been assigned)
There is insufficient information to classify the site. In this event, additional information is required to address data gaps.

8) Additional Complementary Tools to the NCSCS

The CCME Soil Quality Index (SoQI) is a complementary tool that focuses more on evaluating the relative hazard, by comparing contaminant concentrations with their respective soil quality guidelines. The SoQI uses three factors for its calculations, namely: 1) scope (% of contaminants that do not meet their respective guidelines), 2) frequency (% of individual tests of contaminants that do not meet their respective guidelines), and 3) amplitude (the amount by which the contaminants do not meet their respective guidelines). The soil quality index can be used to compare different contaminated sites with similar types of contamination as well as to see if the jurisdictional requirements have been met after remediation of a particular site.

The NCSCS was not developed for and is not readily applicable for the assessment of sites with a significant marine or aquatic component. Environmental conditions at marine and aquatic sites are best measured in the bed sediments as they act as long-term reservoirs of chemicals to the aquatic environment and to organisms living in or having direct contact with sediments. The CCME Sediment Quality Index (SeQI) provides a convenient means of summarizing sediment quality data and can complement the NCSCS. The SeQI provides a mathematical framework for assessing sediment quality conditions by comparing contaminant concentrations with their respective sediment quality guidelines.

CCME National Classification System (2008) version 1.3

(I) Contaminant Characteristics

Site: Former Pinetree Line Radar Station, Cape Makkovik, Labrador

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		Soil: Analytical results confirmed soil concentrations of Pesticides, PAHs and metals that exceeded applicable guidelines on Site. Sediment: Analytical results confirmed petroleum hydrocarbons and metal concentrations that exceeded current CCME and ARBCA guidelines on Site. Groundwater was not encountered in any of the test pits excavated during the Phase II ESA. As a result, groundwater was not analysed.The provincial Water Resources Management Division of the Municipal Affairs and Environment Department was contacted to determine if any specific data regarding groundwater depths at Cape Makkovik existed. The groundwater resources manager for the Water Resources Management Division stated that no groundwater data for that area was on file.	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	Do Not Know			
Yes No Do Not Know				
C. Surface water	No			
Yes No Do Not Know				
D. Sediment	Yes			
Yes No Do Not Know				
"Known" -score	4			
"Potential" - score	1			
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	DDT and heptachlor are considered high risk.These parameters exceeded applicable guidelines in Site surface soil. Arsenic, lead and mercury also exceeded in sediment.	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	---			

CCME National Classification System (2008) version 1.3

(I) Contaminant Characteristics

Site: Former Pinetree Line Radar Station, Cape Makkovik, Labrador

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")?	High (>100x)	The highest ratio is 520 for chlordane.	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.
NAPL (mobile or immobile) High (>100x) Medium (10x to 100x) Low (1x to 10x) Do Not Know				
"Known" -score	6			
"Potential" - score	---			
4. Contaminant Quantity (known or strongly suspected)				
What is the known or strongly suspected quantity of all contaminants?	<2 ha or 1000 m3	This is a suspected quantity estimate.	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.
>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				
"Known" -score	2			
"Potential" - score	---			

(I) Contaminant Characteristics

Site: Former Pinetree Line Radar Station, Cape Makkovik, Labrador

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	Pesticides and metals considered to be persistant.	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	No	Not expected as no utilities and infrastructure (only buildling foundations) remain at the Site. No future development for the Site is expected.	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	two to four	Metals, PAHs and pesticides in soil. Petroleum Hydrocarbons and metals in sediment.	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	4			
"Potential" - Score	---			

Contaminant Characteristic Total

Raw Total Score- "Known"	24	
Raw Total Score- "Potential"	1	
Raw Combined Total Score (Known + Potential)	25	
Adjusted Total Score (Raw Combined / 40 * 33)	**20.6**	maximum 33

CCME National Classification System (2008) version 1.3

(II) Migration Potential (Evaluation of contaminant migration pathways)

Site: Former Pinetree Line Radar Station, Cape Makkovik, Labrador

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.	12	Groundwater not evaluated and presumed to be primarily located within bedrock. As a result, an operable groundwater pathway within and/or beyond the property boundary is not known or strongly suspected.	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.
ii) Same as (i) except the information is not known but strongly suspected based on indirect observations.	9			
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).	0			
	Go to Potential			
Score	---			
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	Low	Metals and pesticides have low mobility in soil.	Organics Koc (L/kg) / Metals with higher mobility at acidic conditions / Metals with higher mobility at alkaline conditions Koc < 500 (*i.e.,* log Koc < 2.7) / pH < 5 / pH > 8.5 Koc = 500 to 5000 (*i.e.,* log Koc = 2.7 to 3.7) / pH = 5 to 6 / pH = 7.5 to 8.5 Koc = 5,000 to 100,000 (*i.e.,* log Koc = 3.7 to 5) / pH > 6 / pH < 7.5 Koc > 100,000 (*i.e.,* log Koc > 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	1			
b. Presence of engineered sub-surface containment? No containment Partial containment Full containment Do Not Know	No containment	No containment	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	3			
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	Groundwater was not encountered in any of the test pits excavated during the Phase II ESA. As a result, groundwater was not analysed.The provincial Water Resources Management Division of the Municipal Affairs and Environment Department was contacted to determine if any specific data regarding groundwater depths at Cape Makkovik existed. The groundwater resources manager for the Water Resources Management Division stated that no groundwater data for that area was on file. As a result, the depth to groundwater at the site cannot be determined.	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: Former Pinetree Line Radar Station, Cape Makkovik, Labrador

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	<10-6 cm/s	Hydraulic conductivity of confining layer based on the information provided by the Geological Map of Labrador (NL Department of Natural Resources Mines Branch, January 2007) which is assumed to be sandstone.	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			
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	Moderate	Annual precipitation for Cape Makkovik not available. Data from Nain used. Nain is located approximately 215 kms northwest of Cape Makkovik. Annual precipitation for Nain is 925.4 mm. Permeability is 0.6 (sand). 0.56 is assumed moderate.	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	0.6			
f. Hydraulic conductivity of aquifer $>10^{-2}$ cm/s 10^{-2} to 10^{-4} cm/s $<10^{-4}$ cm/s Do Not Know	<10-4 cm/s	Hydraulic conductivity of confining layer (assumed sandstone) based on the information provided by the Geological Map of Labrador (NL Department of Natural Resources Mines Branch, January 2007).	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	0			
Potential groundwater pathway total	5.1			
Allowed Potential score	5.1	Note: If a "known" score is provided, the "potential" score is disallowed.		
Groundwater pathway total	5.1			
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		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/
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.	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
iii) Meets CWQG or absence of surface water exposure pathway (*e.g.,* Distance to nearest surface water is > 5 km.)	0			
	0			
Score	0			
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		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: Former Pinetree Line Radar Station, Cape Makkovik, Labrador

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	Do Not Know		Review available mapping and survey data to determine distance to nearest surface water bodies.	
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 Contaminants above ground level and slope is flat Contaminants at or below ground level and slope is flat Do Not Know	Do Not Know		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.).	
Score	1			
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	Do Not Know		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
Score	0.4			
e. Flood potential 1 in 2 years 1 in 10 years 1 in 50 years not in floodplain Do Not Know	Do Not Know		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.	
Score	0.5			
Potential surface water pathway total	6.9	Note: If a "known" score is provided, the "potential" score is disallowed.		
Allowed Potential score	---			
Surface water pathway total	0			
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	Analytical results confirmed soil concentrations of pesticides and metals that exceeded current CCME guidelines on Site.	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	Do Not Know		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.
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	Do Not Know		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).	
Score	3			
Potential surface soil pathway total	7	Note: If a "known" score is provided, the "potential" score is disallowed.		
Allowed Potential score	---			
Soil pathway total	12			

(II) Migration Potential (Evaluation of contaminant migration pathways)

Site: Former Pinetree Line Radar Station, Cape Makkovik, Labrador

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	Analytical results from the soil sampling program and soil vapour readings at the Site did not reveal any vapour readings that would be considered a risk.	Consult previous investigations, including human health risk assessments, for reports of vapours detected.	
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		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.	
	0			
Score	0			
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	Do Not Know		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
Score	2.5			
b. What is the soil grain size? Fine Coarse Do Not Know	Do Not Know		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).	
Score	3			
c. Is the depth to the source less than 10m? Yes No Do Not Know	Do Not Know		Review groundwater depths below grade for the site.	
Score	1			
d. Are there any preferential pathways? Yes No Do Not Know	Do Not Know		Visit the site during dry summer conditions and/or review available photographs. Where bedrock is present, fractures would likely act as preferential pathways.	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.
Score	1			
Potential vapour pathway total	7.5			
Allowed Potential score	---	Note: If a "known" score is provided, the "potential" score is disallowed.		
Vapour pathway total	0			
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	Sediments in ponds not considered a significant concern.	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: Former Pinetree Line Radar Station, Cape Makkovik, Labrador

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")? Yes No Do Not Know	Do Not Know 2		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.	
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? Yes No Do Not Know	Do Not Know 2		Review existing sediment assessments. If the sediments present at the site are in a river, select "no" for this question.	
c. For rivers, are the contaminated sediments in an area prone to sediment scouring? Yes No Do Not Know	Do Not Know 2		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.	
Potential sediment pathway total	6	Note: If a "known" score is provided, the "potential" score is disallowed.		
Allowed Potential score	---			
Sediment pathway total	**0**			
6. Modifying Factors				
Are there subsurface utility conduits in the area affected by contamination? Yes No Do Not Know	No		Consult existing engineering reports. Subsurface utilities can act as conduits for contaminant migration.	
Known	0			
Potential	---			

Migration Potential Total

Raw Total Score- "Known"	12	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"	5.1	
Raw Combined Total Score (Known + Potential)	17.1	
Adjusted Total Score (Raw Combined / 64 * 33)	**8.8**	maximum 33

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(III) Exposure (Demonstrates the presence of an exposure pathway and receptors)

Site: Former Pinetree Line Radar Station, Cape Makkovik, Labrador

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*) Same as above, but "Strongly Suspected" based on observations or indirect evidence. No quantified or suspected exposures/impacts in humans. Score	22 10 0 Go to Potential ---	Background information including the GHD Phase I ESA did not document any known exposure to contaminants of potential concern that resulted in an adverse effect, injury or harm of the safety to humans as a result of historical activities on site. Phase II ESA site observations also did not reveal any evidence of suspected contaminant exposures resulting in potential adverse impacts to humans.	*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
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 Score	Commercial 1	The site was historically used for commercial purposes.	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).
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 Score	Access, not covered 2		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.	
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 Score	Yes 3	Contaminated soil located at the surface (less than 0.5 meters)	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.
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 Score	No 0	No building structures located on the Site. VOCs not a concern at the Site based on analytical results of Phase II ESA	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
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 Do Not Know Texture Score inhalation total	Coarse 1 1	Sieve analysis was completed on several soil samples throughout the Site. The results of the Sieve analysis indicates the soil at the site is coarse grained.	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.	

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(III) Exposure (Demonstrates the presence of an exposure pathway and receptors)

Site: Former Pinetree Line Radar Station, Cape Makkovik, Labrador

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	Nearest safe drinking water supply (potable water) is located in the community of Makkovik located approximately 16 km south of the Site.	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	Site has not been occupied since 1961.	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	Contaminated soils within within the top 1.5 meters of the subsurface.	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	Evidence of hunting (empty rifle and shotgun shells) were observed on site and at background sampling locations and no change in land use is participated.	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	No			
Human Exposure Modifying Factors - "Known"	0			
Human Exposure Modifying Factors - "Potential"	---			
Raw Human "Known" total	0			
Raw Human "Potential" total	11			
Raw Combined Total Human Score	11			
Adjusted Total Human Score (max 22)	**11**			

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(III) Exposure (Demonstrates the presence of an exposure pathway and receptors)

Site: Former Pinetree Line Radar Station, Cape Makkovik, Labrador

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		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	The Site has been historically used for commercial purposes.	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 Direct Contact - Are plants and/or soil invertebrates likely exposed to contaminated soils at the site? Yes No Do Not Know	Yes	Contaminated soils within within the top 1.5 meters of the subsurface.	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.	
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	No	Surface water at the site contain concentrations of metals exceeding applicable CCME guidelines.	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	0			
Are terrestrial animals likely to be ingesting contaminated soils at the site? Yes No Do Not Know	Yes		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	Yes	Pesticides and metals 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	1			
Distance to sensitive terrestrial ecological area 0 to 300 m 300 m to 1 km 1 to 5 km > 5 km Do Not Know	Do Not Know		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.
Score	1.5			
Raw Terrestrial "Potential" total	5.5	Note if a "Known" Ecological Effects score is provided, the "Potential" score is disallowed.		
Allowed Terrestrial "Potential" total	5.5			

(III) Exposure (Demonstrates the presence of an exposure pathway and receptors)

Site: Former Pinetree Line Radar Station, Cape Makkovik, Labrador

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 i) Classification of aquatic environment Sensitive Typical Not Applicable (no aquatic environment Do Not Know	Typical	Sediment in freshwater ponds adjacent to the Site considered 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.	
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	Do Not Know	Groundwater was not tested.	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	0.5			
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	300 m to 1 km	Atlantic Ocean adjacent to 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	2			
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	Yes	Pesticides and metals 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	1			
Raw Aquatic "Potential" total	4.5	Note if a "Known" Ecological Effects score is provided, the "Potential" score is disallowed.		
Allowed Aquatic "Potential" total	4.5			
4. Ecological Exposure Modifying Factors				
a) Known, or potential, occurrence of a species at risk.		According to the Newfoundland and Labrador Species at Risk list the wolverine (endangered species) and polar bear (vulnerable species) habitat range includes the area of Cape Makkovik.	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. 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.	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			
Yes No	2			
Do Not Know	---			
b) Potential impact of aesthetics (*e.g.,* enrichment of a lake or tainting of food flavour).				
Is there evidence of aesthetic impact to receiving water bodies?	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.
Yes No	0			
Do Not Know	---			
Is there evidence of olfactory impact (*i.e.,* unpleasant smell)?	No		Examples of olfactory change can include the smell of a COPC or an increase in the rate of decay in an aquatic habitat.	
Yes No	0			
Do Not Know	---			
Is there evidence of increase in plant growth in the lake or water body?	No		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.	
Yes No	0			
Do Not Know	---			
Is there evidence that fish or meat taken from or adjacent to the site smells or tastes different?	Do Not Know		Some contaminants can result in a distinctive change in the way food gathered from the site tastes or smells.	
Yes No	---			
Do Not Know	1			
Ecological Modifying Factors Total - Known	2			
Ecological Modifying Factors Total - Potential	1			
Raw Ecological "Known" total	2			
Raw Ecological "Potential" total	11			
Raw Combined Total Ecological Score	13			
Adjusted Total Ecological Score (Max 18)	**13**			

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(III) Exposure (Demonstrates the presence of an exposure pathway and receptors)

Site: Former Pinetree Line Radar Station, Cape Makkovik, Labrador

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)				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? Yes No Do Not Know	No 0 ---		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.	
Is there a physical pathway which can transport soils released by damaged permafrost to a nearby aquatic environment? Yes No Do Not Know	No 0 ---		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.	
Other Potential Receptors Total - Known	0			
Other Potential Receptors Total - Potential	---			

Exposure Total		
Raw Human Health + Ecological Total + Other Receptors - "Known"	2	
Raw Human Health + Ecological Total + Other Receptors - "Potential"	22	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)	24	HH or Eco Total score has not yet been capped at 22 and 18, respectively.
Adjusted Total Score (Adjusted Total Exposure / 46 * 34)	17.7	maximum 34

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Score Summary

Site: Former Pinetree Line Radar Station, Cape Makkovik, Labrador

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	4	1
2. Chemical Hazard	8	---
3. Contaminant Exceedance Factor	6	---
4. Contaminant Quantity	2	---
5. Modifying Factors	4	---
Raw Total Score	24	1
Raw Combined Total Score (Known + Potential)	25	
Adjusted Total Score (Raw Combined Total/40*33)	20.6	(max 33)

II. Migration Potential

	Known	Potential
1. Groundwater Movement	---	5.1
2. Surface Water Movement	0	---
3. Soil	12	---
4. Vapour	0	---
5. Sediment Movement	0	---
6. Modifying Factors	0	---
Raw Total Score	12	5.1
Raw Combined Total Score (Known + Potential)	17.1	
Adjusted Total Score (Raw Combined Total/64*33)	8.8	(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	0	---
Raw Total Human Score	0	11
Raw Combined Total Human Score (Known + Potential)	11	
Adjusted Total Human Score	11	(maximum 22)
3. Ecological Receptors		
A. Known Impact	---	
B. Potential		
a. Terrestrial		5.5
b. Aquatic		4.5
4. Ecological Receptors Modifying Factors	2	1
Raw Total Ecological Score	2	11
Raw Combined Total Ecological Score (Known + Potential)	13	
Adjusted Total Ecological Score	13	(maximum 18)
5. Other Receptors	0	---
Total Other Receptors Score (Known + Potential)	0	
Total Exposure Score (Human + Ecological + Other)	24	
Adjusted Total Score (Total Exposure/46*34)	17.7	(maximum 34)

Site Score

Site Letter Grade	D
Certainty Percentage	81%
% Responses that are "Do Not Know"	9%
Total NCSCS Score for site	47.2
Site Classification Category	3

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.

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Contaminant Hazard Ranking

(Based on the Proposed Hazard Ranking developed for the FCSAP Contaminated Sites Classification System)

This information is used in Sheet I (Contaminant Characteristics), section 2 (Chemical Hazard).

Chemical/Parameter	Hazard	CEPA	Carcinogenicity	Notes
Acetaldehyde	H	*	PHC	
Acetone	L			
Acrolein	H	*		
Acrylonitrile	H	*	PHC	
Alachlor	M			
Aldicarb	H			
Aldrin	H			
Allyl Alcohol	H			
Aluminum	L			
Ammonia	L	*		
Antimony	H			
Arsenic	H	*		
Atrazine	M			
Azinphos-Methyl	H			
Barium	L			
Bendiocarb	H			
Benzene	H	*	CHC	BTEX
Benzidine	H	*	CHC	
Beryllium	H		CHC	
Biphenyl, 1,1-	M			
2,3,4,5-Bis(2-Butylene)tetrahydro-2-furfural	H			
Bis(Chloromethyl)Ether	H	*	CHC	
Bis(2-Chloroethyl)Ether	H		CHC	
Bis(2-Chloroisopropyl)Ether	H			
Bis(2-Ethylhexyl)Phthalate	H	*		PH
Boron	L			
Bromacil	M			
Bromate	M			
Bromochlorodifluoromethane	M	*		HM
Bromochloromethane	H	*		HM
Bromodichloromethane	H			HM
Bromoform (Tribromomethane)	H		PHC	HM
Bromomethane	M			HM
Bromotrifluoromethane	M	*		HM
Bromoxynil	H			
Butadiene, 1,3-	H	*	CHC	
Cadmium	H	*	CHC	
Carbofuran	M			
Carbon Tetrachloride (Tetrachloromethane)	H		PHC	HM
Captafol	M			
Chloramines	M	*		
Chloride	L			

Chemical/Parameter	**Hazard**	**CEPA**	**Carcinogenicity**	**Notes**
Chloroaniline, P-	H			
Chlorobenzene (mono)	M			
Chlorobenzilate	M			
Chlorodimeform	M			
Chloroform	H		PHC	HM
Chloromethane	M			
Chloromethyl Methyl Ether	M	*		
(4-Chlorophenyl)Cyclopropylmethanone, O-((4-Nitrophenyl)Methyl)Oxime	H			
Chlorinated Benzenes				
Monochlorobenzene	M			
Dichlorobenzene, 1,2- (O-DCB)	M			
Dichlorobenzene, 1,3- (M-DCB)	M			
Dichlorobenzene, 1,4- (P-DCB)	H			
Trichlorobenzene, 1,2,3-	M			
Trichlorobenzene, 1,2,4-	M			
Trichlorobenzene, 1,3,5-	M			
Tetrachlorobenzene, 1,2,3,4-	M			
Tetrachlorobenzene, 1,2,3,5-	M			
Tetrachlorobenzene, 1,2,4,5-	M			
Pentachlorobenzene	M			
Hexachlorobenzene	H			
Chlorinated Ethanes				
Dichloroethane, 1,1-	M			
Dichloroethane, 1,2- (Ethylene Dichloride (EDC))	H		PHC	
Trichloroethane, 1,1,1-	H	*		
Trichloroethane, 1,1,2-	M			
Tetrachloroethane, 1,1,1,2-	M			
Tetrachloroethane, 1,1,2,2-	M			
Chlorinated Ethenes				
Monochloroethene (Vinyl Chloride)	H	*	CHC	
Dichloroeth(yl)ene, 1,1-	H			
Dichloroeth(yl)ene, 1,2- (cis or trans)	M			
Trichloroeth(yl)ene (TCE)	H	*		
Tetrachloroeth(yl)ene (PCE)	H	*		
Chlorinated Phenols		*		
Monochlorophenols	M			
Chlorophenol, 2-	M			
Dichlorophenols				
Dichlorophenol, 2,4-	M			
Trichlorophenols				
Trichlorophenol, 2,4,5-	H			
Trichlorophenol, 2,4,6-	H		PHC	
Tetrachlorophenols				
Tetrachlorophenol, 2,3,4,6-	H			
Pentachlorophenol (PCP)	H			
Chloromethane	M			HM
Chlorophenol, 2-	M			CP
Chlorothalonil	H			

Chemical/Parameter	Hazard	CEPA	Carcinogenicity	Notes
Chlorpyrifos	H			
Chromium (Total)	M	*		
Chromium (III)	L	*		
Chromium (VI)	H	*	CHC	
Coal Tar	H		CHC	Refer to PAHs
Cobalt	L			
Copper	L			
Creosote	M	*		Refer to PAHs
Crocidolite	L			
Cyanide (Free)	H			
Cyanazine	M			
Dibenzofuran	H	*		DF
Dibromoethane, 1,2- (Ethylene Dibromide (EDB))	H		PHC	
1,2-Dibromo-3-Chloropropane	H		PHC	
Dibromochloromethane	M	*		HM
Dibromotetrafluoroethane	M			
Dichlorobenzene, 1,2- (O-DCB)	M			CB
Dichlorobenzene, 1,3- (M-DCB)	M			CB
Dichlorobenzene, 1,4- (P-DCB)	H			CB
Dichlorobenzidine, 3,3'-	H		PHC	
DDD	H			
DDE	H			
DDT	H		PHC	
Deltamethrin	M			
Diazinon	M			
Dicamba	H			
Dichloroethane, 1,1-	H			CEA
Dichloroethane, 1,2- (EDC)	H		PHC	CEA
Dichloroeth(yl)ene, 1,1-	H			CEE
Dichloroeth(yl)ene, Cis-1,2-	M			CEE
Dichloroeth(yl)ene, Trans-1,2-	M			CEE
Dichloromethane (Methylene Chloride)	H		PHC	HM
Dichlorophenol, 2,4-	M			CP
Dichloropropane, 1,2-	H			
Dichloropropene, 1,3-	H		PHC	
Diclofop-Methyl	H			
Didecyl Dimethyl Ammonium Chloride	H			
Dieldrin	H			
Dimethoate	H			
Diethyl Phthalate	M			PH
Diethylene Glycol	L			GL
Dimethyl Phthalate	M			PH
Dimethylphenol, 2,4-	L			
Dinitrophenol, 2,4-	M			
Dinitrotoluene, 2,4-	H			
Dinoseb	H			
Di-n-octyl Phthalate	H			
Dioxane, 1,4-	H		PHC	
Dioxins/Furans	H			
Diquat	M			

Chemical/Parameter	**Hazard**	**CEPA**	**Carcinogenicity**	**Notes**
Diuron	M			
Endosulfan	H			
Endrin	H			
Ethylbenzene	M			BTEX
Ethylene Dibromide (EDB)	H		PHC	
Ethylene Glycol	L			GL
Ethylene Oxide	H		CHC	
Fluoroacetamide	M			
Fluorides	L	*		
Glycols				
Ethylene Glycol	L			
Diethylene Glycol	L			
Propylene Glycol	L			
Glyphosate	M			
Halogenated Methanes				
Bromochlorodifluoromethane	M	*		
Bromochloromethane	M	*		
Bromodichloromethane	H		PHC	
Bromomethane	M			
Bromotrifluoromethane	M	*		
Chloroform	M		PHC	HM
Chloromethane	M			
Dibromochloromethane	M			
Dichloromethane (Methylene Chloride)	H		PHC	
Methyl Bromide	M	*		
Tetrachloromethane (Carbon Tetrachloride)	H			
Tribromomethane (Bromoform)	H			
Trihalomethanes (THM)	M			
Heptachlor	H			
Heptachlor Epoxide	H			
Hexachlorobenzene	H		PHC	
Hexachlorobutadiene	H			
Hexachlorocyclohexane, Gamma	H		PHC	
Hexachloroethane	H		PHC	
Hydrobromofluorocarbons (HBFCS)	M	*		
Hydrochlorofluorocarbons (HCFCS)	M	*		
3-Iodo-2-propynyl Butyl Carbamate	H			
Iron	L			
Lead	H	*		neurotoxins / teratogens
Lead Arsenate	H			
Leptophos	H			
Lindane	H			
Linuron	H			
Lithium	L			
Malathion	M			
Manganese	L			

Chemical/Parameter	Hazard	CEPA	Carcinogenicity	Notes
Mercury	H	*		
Methamidophos	H			
Methoxylchlor	H			
Methyl Bromide (Bromomethane)	M	*		
2-Methyl-4-chloro-phenoxy Acetic Acid	M			
Methyl Ethyl Ketone	L			
Methyl Isobutyl Ketone	L			
Methyl Mercury	H			
Methyl-Parathion	H			
Methyl Tert Butyl Ether (MTBE)	M			
Metolachlor	M			
Metribuzin	H			
Molybdenum	L			
Monochloramine	M			
Monocrotophos	H			
Nickel	H	*		CEPA - inhalation
Nitrilotriacetic Acid	H		PHC	
Nitrate	L			
Nitrite	M			
Nonylphenol + Ethoxylates	H	*		
Organotins				
Tributyltin	H			
Tricyclohexyltin	H			
Triphenyltin	H			
Parathion	H			
Paraquat (as Dichloride)	H			
Pentachlorobenzene	M			CB
Pentachlorophenol (PCP)	H			CP
Petroleum Hydrocarbons				Ranking based upon fraction of toxic and mobile components in product. Lighter compounds such as benzene are more toxic and mobile.
Petroleum Hydrocarbons (Gasoline)	H			
Petroleum Hydrocarbons (Kerosene incl. Jet Fuels)	H			
Petroleum Hydrocarbons (Diesel incl Heating Oil)	M			
Petroleum Hydrocarbons (Heavy Oils)	L			
Petroleum Hydrocarbons (CCME F1)	H			
Petroleum Hydrocarbons (CCME F2)	M			
Petroleum Hydrocarbons (CCME F3)	L			
Petroleum Hydrocarbons (CCME F4)	L			
Phenol	L			
Phenoxy Herbicides	M			
Phorate	H			
Phosphamidon	H			
Phthalate Esters				
Bis(2-Ethylhexyl)Phthalate	H	*		
Diethyl Phthalate	H			
Dimethyl Phthalate	H			
Di-n-octyl Phthalate	H			
Polybrominated Biphenyls (PBB)	H	*		
Polychlorinated Biphenyls (PCB)	H			

Chemical/Parameter	Hazard	CEPA	Carcinogenicity	Notes
Polychlorinated Terphenyls	H	*		
Polycyclic Aromatic Hydrocarbons	H	*	PHC	
Acenaphthene	M			
Acenaphthylene	M			
Acridine	H			
Anthracene	M			
Benzo(a)anthracene	H		PHC	
Benzo(a)pyrene	H		PHC	
Benzo(b)fluoranthene	H		PHC	
Benzo(g,h,i)perylene	H			
Benzo(k)fluoranthene	H		PHC	
Chrysene	M			
Dibenzo(a,h)anthracene	H		PHC	
Fluoranthene	M			
Fluorene	M			
Indeno(1,2,3-c,d)pyrene	H		PHC	
Methylnaphthalenes	M			
Naphthalene	M			
Phenanthrene	M			
Pyrene	M			
Quinoline	H			
Propylene Glycol	L			GL
Radium	H			
Radon	H			
Selenium	M			
Silver	L			
Simazine	M			
Sodium	L			
Strontium-90	H			
Strychnine	H			
Styrene	H			
Sulphate	L			
Sulphide	L			
2,3,7,8-Tetrachlorodibenzo-p-dioxins (TCDD)	H	*		DF
Tebuthiuron	H			
Tetrachloroeth(yl)ene (PCE)	H	*		CEE
Tetraethyl Lead	H			
Tetrachlorobenzene, 1,2,3,4-	H			CB
Tetrachlorobenzene, 1,2,3,5-	H			CB
Tetrachlorobenzene, 1,2,4,5-	H			CB
Tetrachloroethane, 1,1,1,2-	M			CEA
Tetrachloroethane, 1,1,2,2-	M			CEA
Tetrachlorophenol, 2,3,4,6-	H			CP
Tetramethyl Lead	H	*		
Thallium	M			
Thiophene	M			
Tin	L			
Toluene	M			BTEX
Toxaphene	H			

Chemical/Parameter	**Hazard**	**CEPA**	**Carcinogenicity**	**Notes**
Triallate	M			
Tribromomethane (Bromoform)	H			HM
Tributyltetradecylphosphonium Chloride	H	*		
Trichlorobenzene, 1,2,3-	H			CB
Trichlorobenzene, 1,2,4-	H			CB
Trichlorobenzene, 1,3,5-	H			CB
Trichloroethane, 1,1,1-	H	*		CEA
Trichloroethane, 1,1,2-	M			CEA
Trichloroeth(yl)ene (TCE)	H	*		CEE
Tricyclohexyltin Hydroxide	H			
Trichlorophenol, 2,4,5-	H			CP
Trichlorophenol, 2,4,6-	H		PHC	CP
Trifluralin	H			
Trihalomethanes (THM)	M			
Tris(2,3-Dibromopropyl)phosphate	H			
Tritium	L			
Uranium (Non-radioactive) / (Radioactive)	M/H			
Vanadium	M			
Vinyl Chloride	H	*	CHC	CEE
Xylenes	M			BTEX
Zinc	L			

H = High Hazard
M = Medium Hazard
L = Low Hazard
Hazard ratings based on a number of factors including potential human and ecological health effects.

PHC = Potential Human Carcinogen
CHC = Confirmed Human Carcinogen

BTEX = benzene, toluene, ethylbenzene, and xylenes
CB = chlorobenzenes
CEA = chlorinated ethanes
CEE = chlorinated ethenes
CP = chlorophenols
DF = dioxins and furans
GL = glycols
HM = halomethanes
PAH = polycyclic aromatic hydrocarbons
PH = phthalate esters

CCME National Classification System (2008) version 1.3

Reference Material (Information to assist in scoring)

Examples of Persistent Substances

This information is used in Sheet I (Chemical Characteristics), section 5 (Modifying Factors).

aldrin
benzo(a)pyrene
chlordane
DDT
DDE
dieldrin
hexachlorobenzene
methylmercury
mirex
octachlorostyrene
PCBs
PCDDs/PCDFs (dioxins and furans)
toxaphene
alkylated lead

Examples of Substances in the Various Chemical Classes

This information is used in Sheet I (Chemical Characteristics), section 5 (Modifying Factors).

Chemical Class	Examples *
inorganic substances (including metals)	arsenic, barium, cadmium, hexavalent chromium, copper, cyanide, fluoride, lead, mercury, nickel, selenium, sulphur, zinc; brines or salts
volatile petroleum hydrocarbons	benzene, toluene, ethylbenzene, xylenes, PHC F1
light extractable petroleum hydrocarbons	PHC F2
heavy extractable petroleum hydrocarbons	PHC F3
PAHs	Benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, dibenz(a,h0anthracene, indeno(1,2,3-c,d)pyrene, naphthalene, phenanthrene, pyrene
phenolic substances	phenol, pentachlorophenol, chlorophenols, nonchlorinated phenols (*e.g.,* 2,4-dinitrophenol, cresol, etc.)
chlorinated hydrocarbons	PCBs, tetrachloroethylene, trichloroethylene, dioxins and furans, trichlorobenzene, tetrachlorobenzene, pentachlorobenzene, hexachlorobenzene
halogenated methanes	carbon tetrachloride, chloroform, dichloromethane
phthalate esters	di-isononyl phthalate (DINP), di-isodecyl phthalate (DIDP), di-2-ethylhexyl phthalate (DEHP)
pesticides	DDT, hexachlorocyclohexane

* Note: Specific chemicals that belong to the various classes are not limited to those listed in this table. These lists are not exhaustive and are meant just to provide examples of substances that are typically encountered.

Chemical-specific Properties
(Adapted from USEPA Soil Screening Criteria)

The information on Koc is used in Sheet II (Migration Potential), section 1,B,a (Relative Mobility).
The information on the dimensionless Henry's law constant is used in Sheet II (Migration Potential), section 4,B,a (Relative Volatility).
The information on log Kow is used in Sheet III (Exposure), section 3,B,a,iii (Potential for Ecological Exposure - terrestrial ingestion), and section 3,B,b,ii (Potential for Ecological Exposure - aquatic uptake potential).

CAS No.	Compound	Solubility in Water @ 20-25°C (mg/L)	Henry's Law Constant (atm-m3/mol)	Dimensionless Henry's law constant (HLC [atm-m3/mol] * 41) (25 °C).	log Kow	Log Koc (L/kg)
83-32-9	Acenaphthene	4.24E+00	1.55E-04	6.36E-03	3.92	3.85
67-64-1	Acetone	1.00E+06	3.88E-05	1.59E-03	-0.24	-0.24
309-00-2	Aldrin	1.80E-01	1.70E-04	6.97E-03	6.5	6.39
120-12-7	Anthracene	4.34E-02	6.50E-05	2.67E-03	4.55	4.47
56-55-3	Benz(a)anthracene	9.40E-03	3.35E-06	1.37E-04	5.7	5.6
71-43-2	Benzene	1.75E+03	5.55E-03	2.28E-01	2.13	1.77
205-99-2	Benzo(b)fluoranthene	1.50E-03	1.11E-04	4.55E-03	6.2	6.09
207-08-9	Benzo(k)fluoranthene	8.00E-04	8.29E-07	3.40E-05	6.2	6.09
65-85-0	Benzoic acid	3.50E+03	1.54E-06	6.31E-05	1.86	—
50-32-8	Benzo(a)pyrene	1.62E-03	1.13E-06	4.63E-05	6.11	6.01
111-44-4	Bis(2-chloroethyl)ether	1.72E+04	1.80E-05	7.38E-04	1.21	1.19
117-81-7	Bis(2-ethylhexyl)phthalate	3.40E-01	1.02E-07	4.18E-06	7.3	7.18
75-27-4	Bromodichloromethane	6.74E+03	1.60E-03	6.56E-02	2.1	1.74
75-25-2	Bromoform	3.10E+03	5.35E-04	2.19E-02	2.35	1.94
71-36-3	Butanol	7.40E+04	8.81E-06	3.61E-04	0.85	0.84
85-68-7	Butyl benzyl phthalate	2.69E+00	1.26E-06	5.17E-05	4.84	4.76
86-74-8	Carbazole	7.48E+00	1.53E-08	6.26E-07	3.59	3.53
75-15-0	Carbon disulfide	1.19E+03	3.03E-02	1.24E+00	2	1.66
56-23-5	Carbon tetrachloride	7.93E+02	3.04E-02	1.25E+00	2.73	2.24
57-74-9	Chlordane	5.60E-02	4.86E-05	1.99E-03	6.32	5.08
106-47-8	*p-Chloroaniline*	5.30E+03	3.31E-07	1.36E-05	1.85	1.82
108-90-7	Chlorobenzene	4.72E+02	3.70E-03	1.52E-01	2.86	2.34
124-48-1	Chlorodibromomethane	2.60E+03	7.83E-04	3.21E-02	2.17	1.8
67-66-3	Chloroform	7.92E+03	3.67E-03	1.50E-01	1.92	1.6
95-57-8	2-Chlorophenol	2.20E+04	3.91E-04	1.60E-02	2.15	—
218-01-9	Chrysene	1.60E-03	9.46E-05	3.88E-03	5.7	5.6
72-54-8	DDD	9.00E-02	4.00E-06	1.64E-04	6.1	6
72-55-9	DDE	1.20E-01	2.10E-05	8.61E-04	6.76	6.65
50-29-3	DDT	2.50E-02	8.10E-06	3.32E-04	6.53	6.42
53-70-3	Dibenz(a,h)anthracene	2.49E-03	1.47E-08	6.03E-07	6.69	6.58
84-74-2	Di-n-butyl phthalate	1.12E+01	9.38E-10	3.85E-08	4.61	4.53
95-50-1	1,2-Dichlorobenzene	1.56E+02	1.90E-03	7.79E-02	3.43	2.79
106-46-7	1,4-Dichlorobenzene	7.38E+01	2.43E-03	9.96E-02	3.42	2.79

CAS No.	Compound	Solubility in Water @ 20-25°C (mg/L)	Henry's Law Constant (atm-m3/mol)	Dimensionless Henry's law constant (HLC [atm-m3/mol] * 41) (25 °C).	log Kow	Log Koc (L/kg)
91-94-1	3,3-Dichlorobenzidine	3.11E+00	4.00E-09	1.64E-07	3.51	2.86
75-34-3	1,1-Dichloroethane	5.06E+03	5.62E-03	2.30E-01	1.79	1.5
107-06-2	1,2-Dichloroethane	8.52E+03	9.79E-04	4.01E-02	1.47	1.24
75-35-4	1,1-Dichloroethylene	2.25E+03	2.61E-02	1.07E+00	2.13	1.77
156-59-2	cis-1,2-Dichloroethylene	3.50E+03	4.08E-03	1.67E-01	1.86	1.55
156-60-5	trans-1,2-Dichloroethylene	6.30E+03	9.38E-03	3.85E-01	2.07	1.72
120-83-2	2,4-Dichlorophenol	4.50E+03	3.16E-06	1.30E-04	3.08	—
78-87-5	1,2-Dichloropropane	2.80E+03	2.80E-03	1.15E-01	1.97	1.64
542-75-6	1,3-Dichloropropene	2.80E+03	1.77E-02	7.26E-01	2	1.66
60-57-1	Dieldrin	1.95E-01	1.51E-05	6.19E-04	5.37	4.33
84-66-2	Diethylphthalate	1.08E+03	4.50E-07	1.85E-05	2.5	2.46
105-67-9	2,4-Dimethylphenol	7.87E+03	2.00E-06	8.20E-05	2.36	2.32
51-28-5	2,4-Dinitrophenol	2.79E+03	4.43E-07	1.82E-05	1.55	—
121-14-2	2,4-Dinitrotoluene	2.70E+02	9.26E-08	3.80E-06	2.01	1.98
606-20-2	2,6-Dinitrotoluene	1.82E+02	7.47E-07	3.06E-05	1.87	1.84
117-84-0	Di-n-octyl phthalate	2.00E-02	6.68E-05	2.74E-03	8.06	7.92
115-29-7	Endosulfan	5.10E-01	1.12E-05	4.59E-04	4.1	3.33
72-20-8	Endrin	2.50E-01	7.52E-06	3.08E-04	5.06	4.09
100-41-4	Ethylbenzene	1.69E+02	7.88E-03	3.23E-01	3.14	2.56
206-44-0	Fluoranthene	2.06E-01	1.61E-05	6.60E-04	5.12	5.03
86-73-7	Fluorene	1.98E+00	6.36E-05	2.61E-03	4.21	4.14
76-44-8	Heptachlor	1.80E-01	1.09E-03	4.47E-02	6.26	6.15
1024-57-3	Heptachlor epoxide	2.00E-01	9.50E-06	3.90E-04	5	4.92
118-74-1	Hexachlorobenzene	6.20E+00	1.32E-03	5.41E-02	5.89	4.74
87-68-3	Hexachloro-1,3-butadiene	3.23E+00	8.15E-03	3.34E-01	4.81	4.73
319-84-6	a-HCH (a-BHC)	2.00E+00	1.06E-05	4.35E-04	3.8	3.09
319-85-7	b-HCH (b-BHC)	2.40E-01	7.43E-07	3.05E-05	3.81	3.1
58-89-9	g -HCH (Lindane)	6.80E+00	1.40E-05	5.74E-04	3.73	3.03
77-47-4	Hexachlorocyclopentadiene	1.80E+00	2.70E-02	1.11E+00	5.39	5.3
67-72-1	Hexachloroethane	5.00E+01	3.89E-03	1.59E-01	4	3.25
193-39-5	Indeno(1,2,3-cd)pyrene	2.20E-05	1.60E-06	6.56E-05	6.65	6.54
78-59-1	Isophorone	1.20E+04	6.64E-06	2.72E-04	1.7	1.67
7439-97-6	Mercury	—	1.14E-02	4.67E-01	—	—
72-43-5	Methoxychlor	4.50E-02	1.58E-05	6.48E-04	5.08	4.99
74-83-9	Methyl bromide	1.52E+04	6.24E-03	2.56E-01	1.19	1.02
75-09-2	Methylene chloride	1.30E+04	2.19E-03	8.98E-02	1.25	1.07
95-48-7	2-Methylphenol	2.60E+04	1.20E-06	4.92E-05	1.99	1.96
91-20-3	Naphthalene	3.10E+01	4.83E-04	1.98E-02	3.36	3.3
98-95-3	Nitrobenzene	2.09E+03	2.40E-05	9.84E-04	1.84	1.81
86-30-6	N-Nitrosodiphenylamine	3.51E+01	5.00E-06	2.05E-04	3.16	3.11

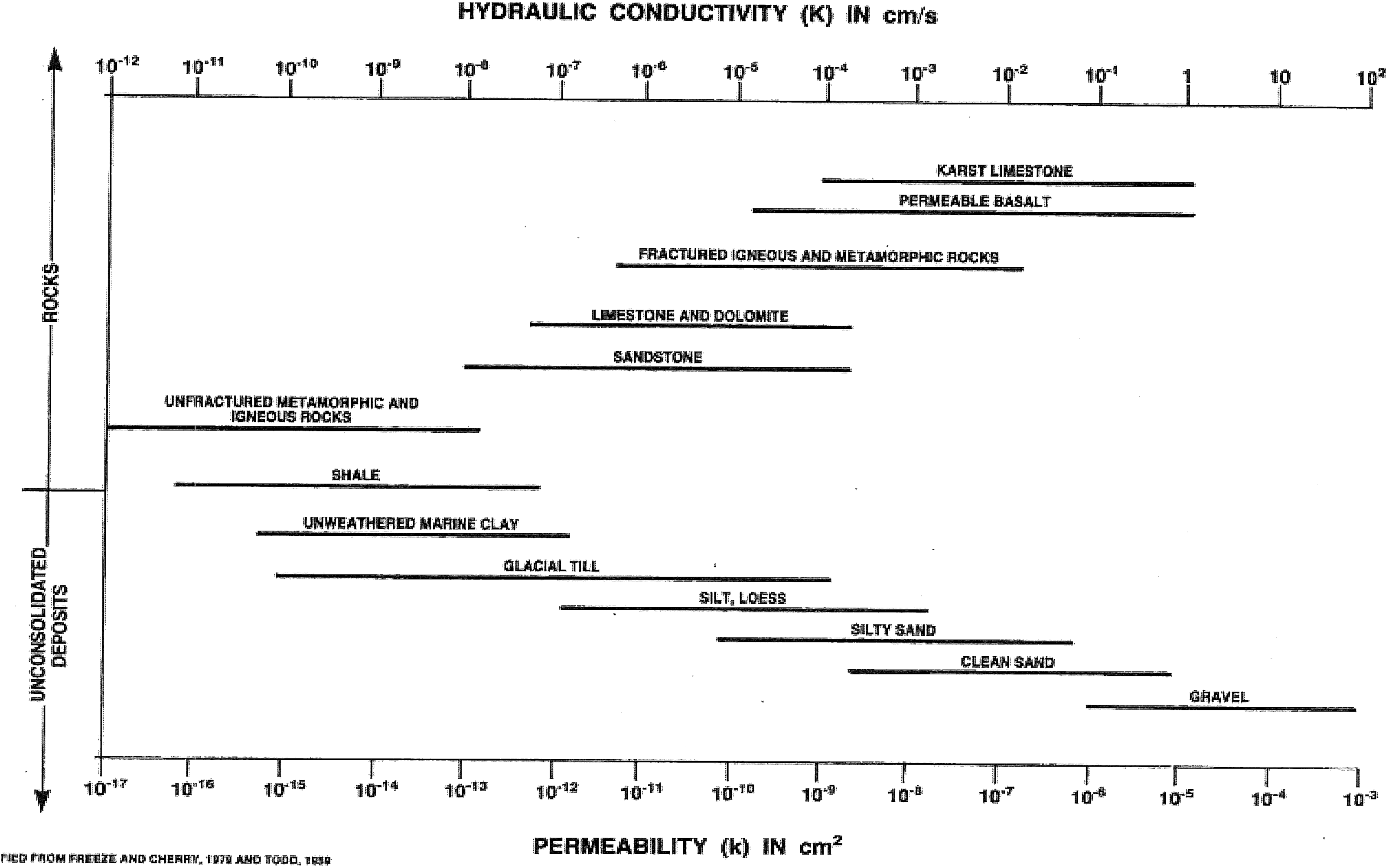
CAS No.	Compound	Solubility in Water @ 20-25°C (mg/L)	Henry's Law Constant (atm-m3/mol)	Dimensionless Henry's law constant (HLC [atm-m3/mol] * 41) (25 °C).	log Kow	Log Koc (L/kg)
621-64-7	N-Nitrosodi-n-propylamine	9.89E+03	2.25E-06	9.23E-05	1.4	1.38
1336-36-3	PCBs	—	—	—	5.58	5.49
87-86-5	Pentachlorophenol	1.95E+03	2.44E-08	1.00E-06	5.09	—
108-95-2	Phenol	8.28E+04	3.97E-07	1.63E-05	1.48	1.46
129-00-0	Pyrene	1.35E-01	1.10E-05	4.51E-04	5.11	5.02
100-42-5	Styrene	3.10E+02	2.75E-03	1.13E-01	2.94	2.89
79-34-5	1,1,2,2-Tetrachloroethane	2.97E+03	3.45E-04	1.41E-02	2.39	1.97
127-18-4	Tetrachloroethylene	2.00E+02	1.84E-02	7.54E-01	2.67	2.19
108-88-3	Toluene	5.26E+02	6.64E-03	2.72E-01	2.75	2.26
8001-35-2	Toxaphene	7.40E-01	6.00E-06	2.46E-04	5.5	5.41
120-82-1	1,2,4-Trichlorobenzene	3.00E+02	1.42E-03	5.82E-02	4.01	3.25
71-55-6	1,1,1-Trichloroethane	1.33E+03	1.72E-02	7.05E-01	2.48	2.04
79-00-5	1,1,2-Trichloroethane	4.42E+03	9.13E-04	3.74E-02	2.05	1.7
79-01-6	Trichloroethylene	1.10E+03	1.03E-02	4.22E-01	2.71	2.22
95-95-4	2,4,5-Trichlorophenol	1.20E+03	4.33E-06	1.78E-04	3.9	—
88-06-2	2,4,6-Trichlorophenol	8.00E+02	7.79E-06	3.19E-04	3.7	—
108-05-4	Vinyl acetate	2.00E+04	5.11E-04	2.10E-02	0.73	0.72
75-01-4	Vinyl chloride	2.76E+03	2.70E-02	1.11E+00	1.5	1.27
108-38-3	m-Xylene	1.61E+02	7.34E-03	3.01E-01	3.2	2.61
95-47-6	o-Xylene	1.78E+02	5.19E-03	2.13E-01	3.13	2.56
106-42-3	p-Xylene	1.85E+02	7.66E-03	3.14E-01	3.17	2.59

Source: United States Environmental Protection Agency. 1996. Soil Screening Guidance: Technical Background Document. EPA/540/R-95/128 (Part 5: Chemical-Specific Parameters)

CAS = Chemical Abstracts Service
Kow = Octanol/water partition coefficient

RANGE OF VALUES OF HYDRAULIC CONDUCTIVITY AND PERMEABILITY

The information on Koc is used in Sheet II (Migration Potential), section 1,B,f (Hydraulic Conductivity)



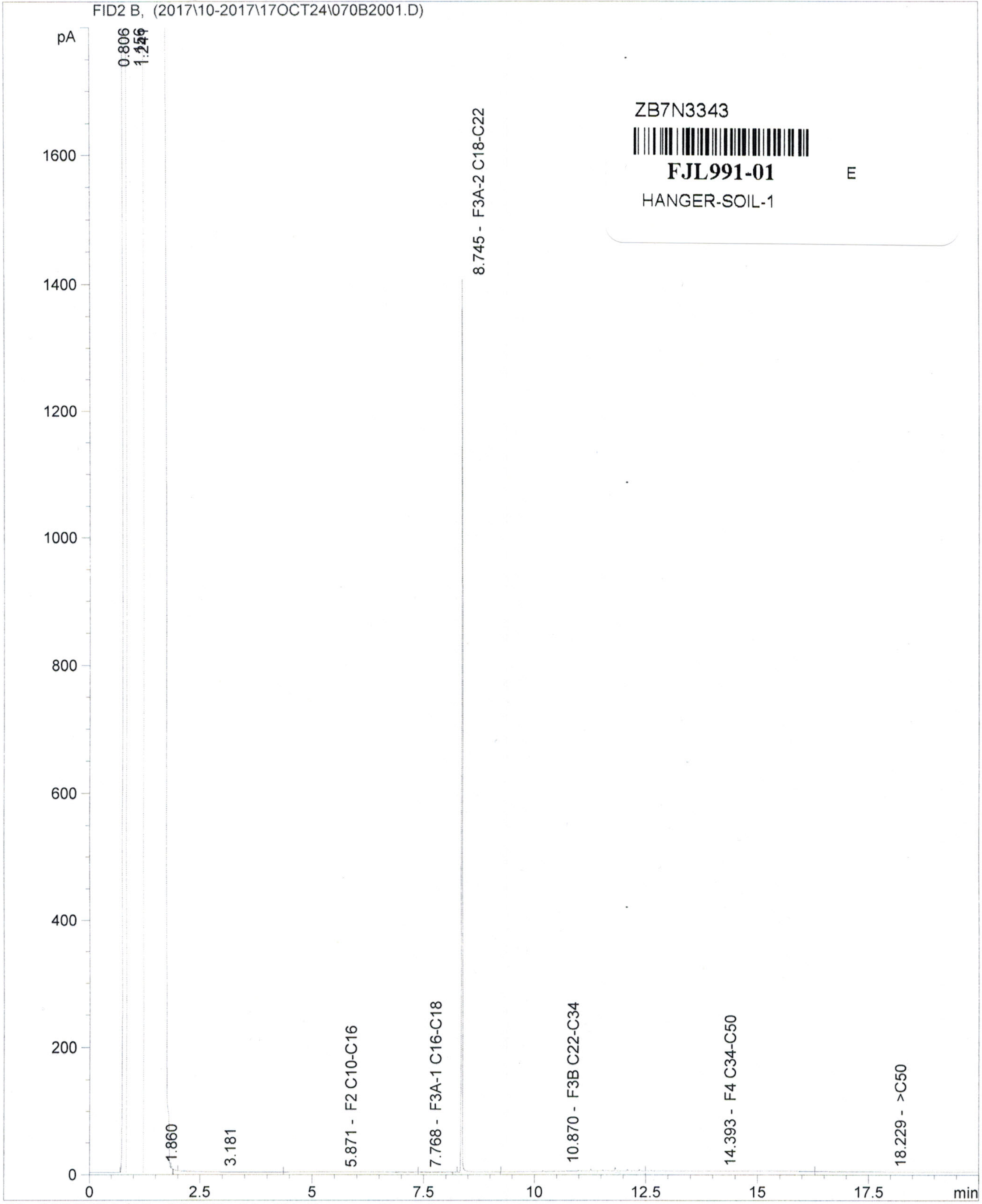
MODIFIED FROM FREEZE AND CHERRY, 1979 AND TODD, 1959

Appendix I

LABORATORY CHROMATOGRAMS

```
Print of window 38: Current Chromatogram(s)
=====================================================================
Injection Date  : 2017/10/25 2:22:51 AM          Seq. Line :  20
Sample Name     : 5227801:FJL99101                Location : Vial 70
Acq. Operator   : Duane Deering                        Inj :   1
                                               Inj Volume : 1 µl
Acq. Method     : C:\HPCHEM\1\METHODS\CCMERU-1.M
Last changed    : 2017/10/24 8:51:13 PM by Duane Deering
Analysis Method : C:\HPCHEM\1\METHODS\F3CCME~2.M
Last changed    : 2018/04/11 10:09:25 AM by Duane Deering
```

Current Chromatogram(s)



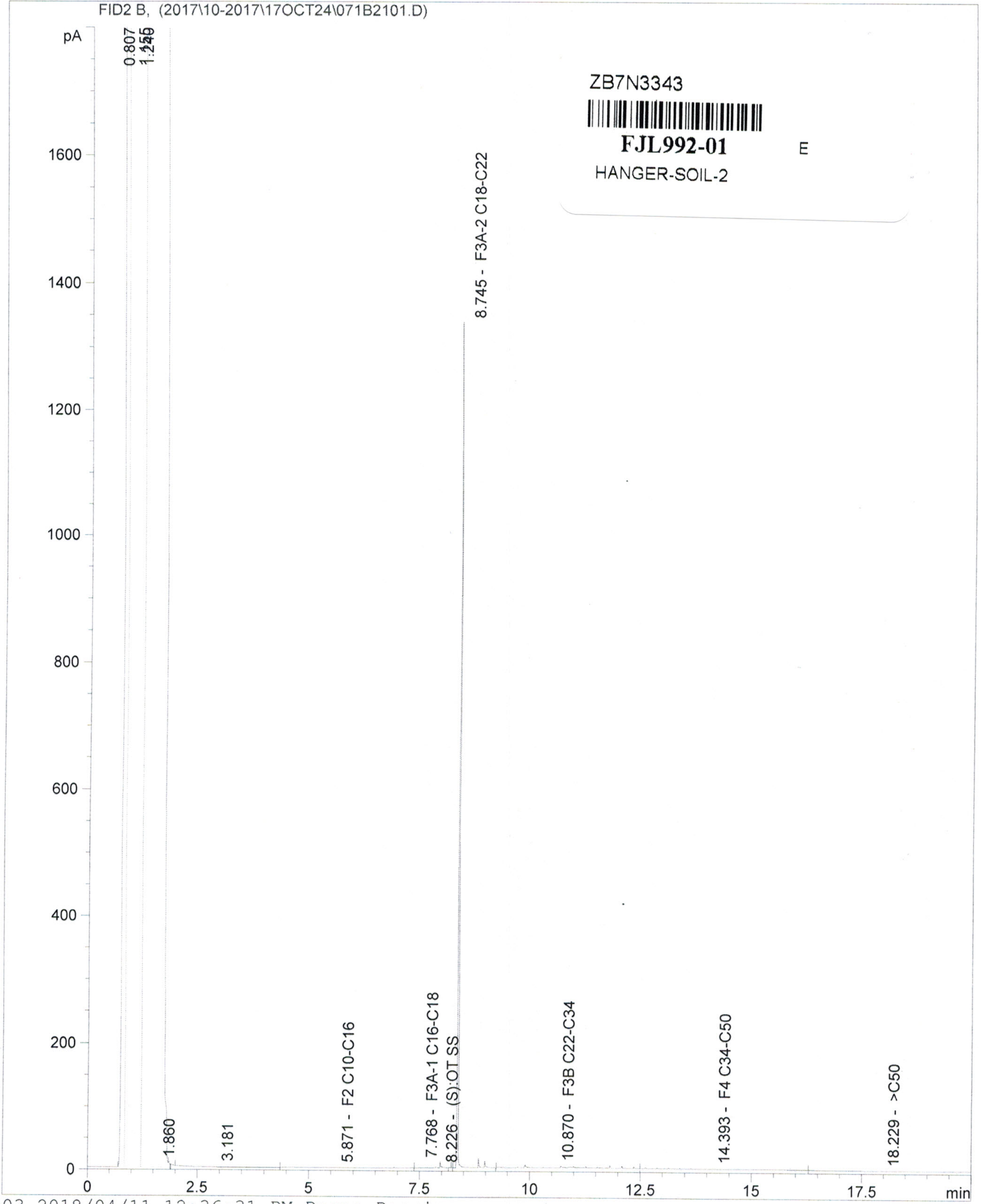
ZB7N3343

FJL991-01 E

HANGER-SOIL-1

```
Print of window 38: Current Chromatogram(s)
==========================================================================
Injection Date  : 2017/10/25 2:55:09 AM          Seq. Line :  21
Sample Name     : 5227801:FJL99201                 Location : Vial 71
Acq. Operator   : Duane Deering                         Inj :   1
                                                 Inj Volume : 1 µl
Acq. Method     : C:\HPCHEM\1\METHODS\CCMERU-1.M
Last changed    : 2017/10/24 8:51:13 PM by Duane Deering
Analysis Method : C:\HPCHEM\1\METHODS\F3CCME~2.M
Last changed    : 2018/04/11 10:09:25 AM by Duane Deering
```

Current Chromatogram(s)



ZB7N3343

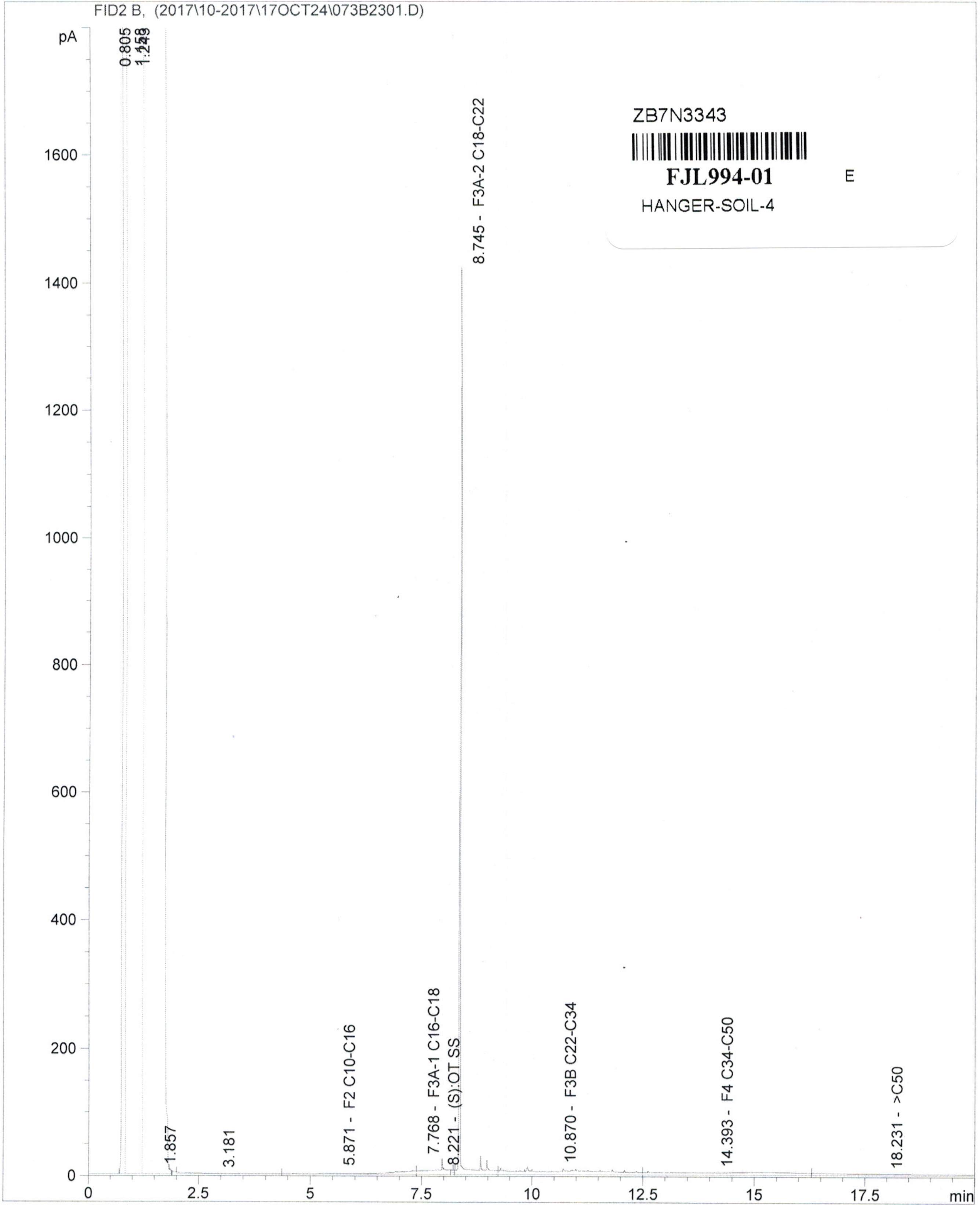
FJL992-01 E

HANGER-SOIL-2

NL_FID003 2018/04/11 12:36:31 PM Duane Deering

```
Print of window 38: Current Chromatogram(s)
=====================================================================
Injection Date  : 2017/10/25 9:00:39 AM         Seq. Line :  23
Sample Name     : 5227801:FJL99401               Location : Vial 73
Acq. Operator   : Duane Deering                       Inj :  1
                                               Inj Volume : 1 µl
Acq. Method     : C:\HPCHEM\1\METHODS\CCMERU-1.M
Last changed    : 2017/10/24 8:51:13 PM by Duane Deering
Analysis Method : C:\HPCHEM\1\METHODS\F3CCME~2.M
Last changed    : 2018/04/11 10:09:25 AM by Duane Deering
```

Current Chromatogram(s)



ZB7N3343

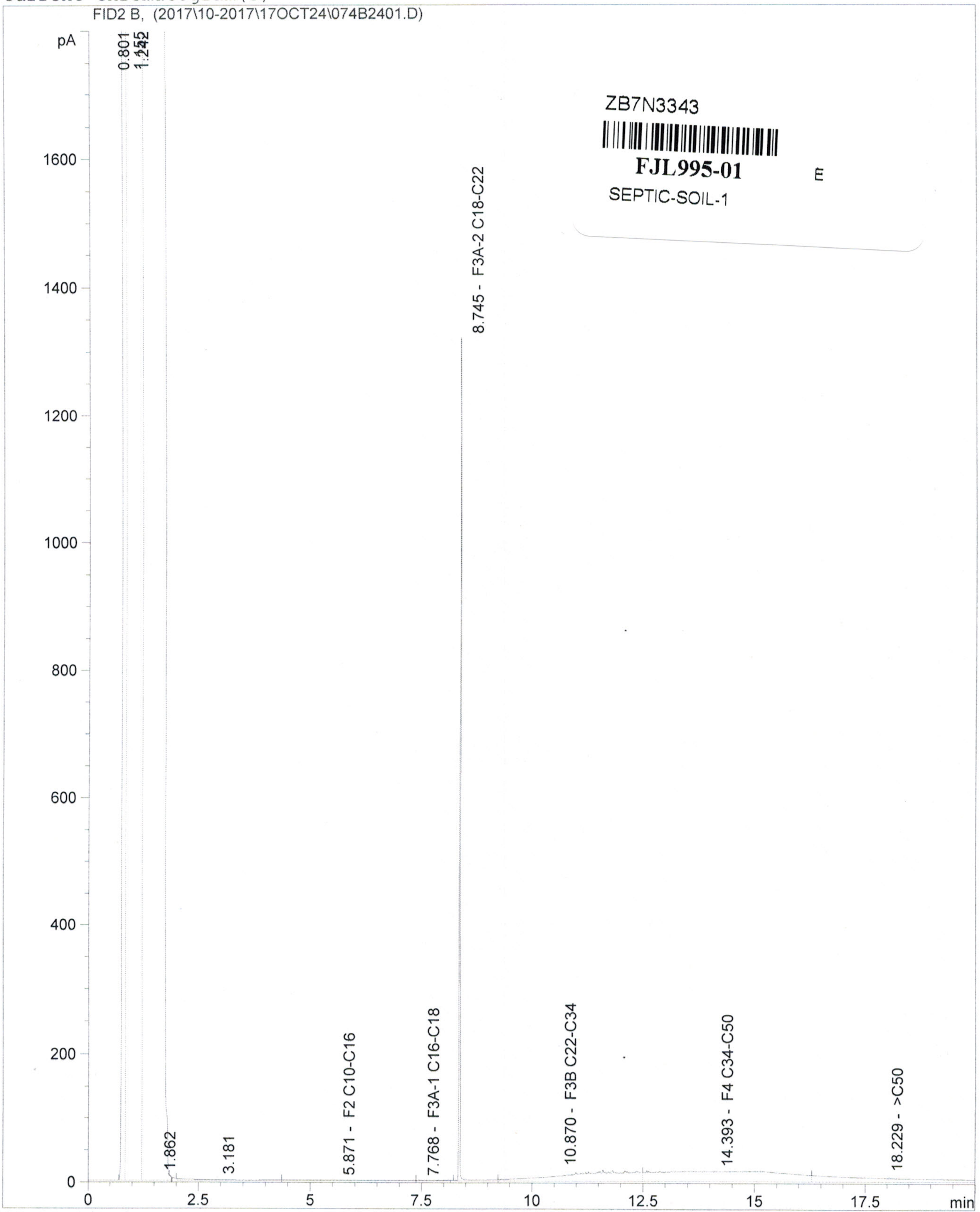
FJL994-01 E

HANGER-SOIL-4

NL_FID003 2018/04/11 12:36:53 PM Duane Deering

```
Print of window 38: Current Chromatogram(s)
======================================================================
Injection Date  : 2017/10/25 9:32:43 AM          Seq. Line :  24
Sample Name     : 5227801:FJL99501                Location : Vial 74
Acq. Operator   : Duane Deering                        Inj :  1
                                                Inj Volume : 1 µl
Acq. Method     : C:\HPCHEM\1\METHODS\CCMERU-1.M
Last changed    : 2017/10/24 8:51:13 PM by Duane Deering
Analysis Method : C:\HPCHEM\1\METHODS\F3CCME~2.M
Last changed    : 2018/04/11 10:09:25 AM by Duane Deering
```

Current Chromatogram(s)



ZB7N3343

FJL995-01

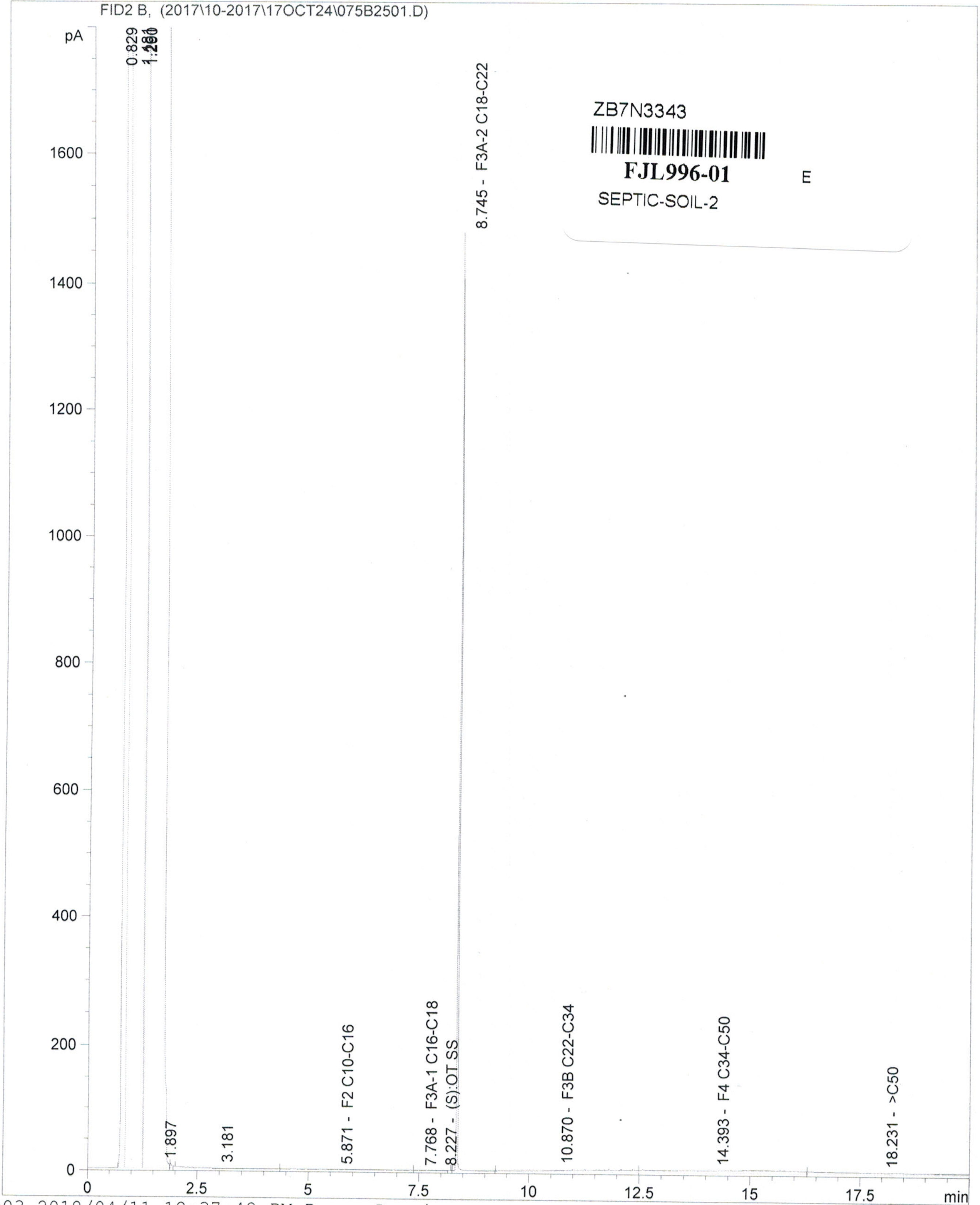
SEPTIC-SOIL-1

E

```
NL_FID003 2018/04/11 12:37:15 PM Duane Deering                        Page 1 of 1
```

```
Print of window 38: Current Chromatogram(s)
=====================================================================
Injection Date  : 2017/10/25 10:05:05 AM        Seq. Line :  25
Sample Name     : 5227801:FJL99601               Location : Vial 75
Acq. Operator   : Duane Deering                       Inj :   1
                                              Inj Volume : 1 µl
Acq. Method     : C:\HPCHEM\1\METHODS\CCMERU-1.M
Last changed    : 2017/10/24 8:51:13 PM by Duane Deering
Analysis Method : C:\HPCHEM\1\METHODS\F3CCME~2.M
Last changed    : 2018/04/11 10:09:25 AM by Duane Deering
```

Current Chromatogram(s)



ZB7N3343

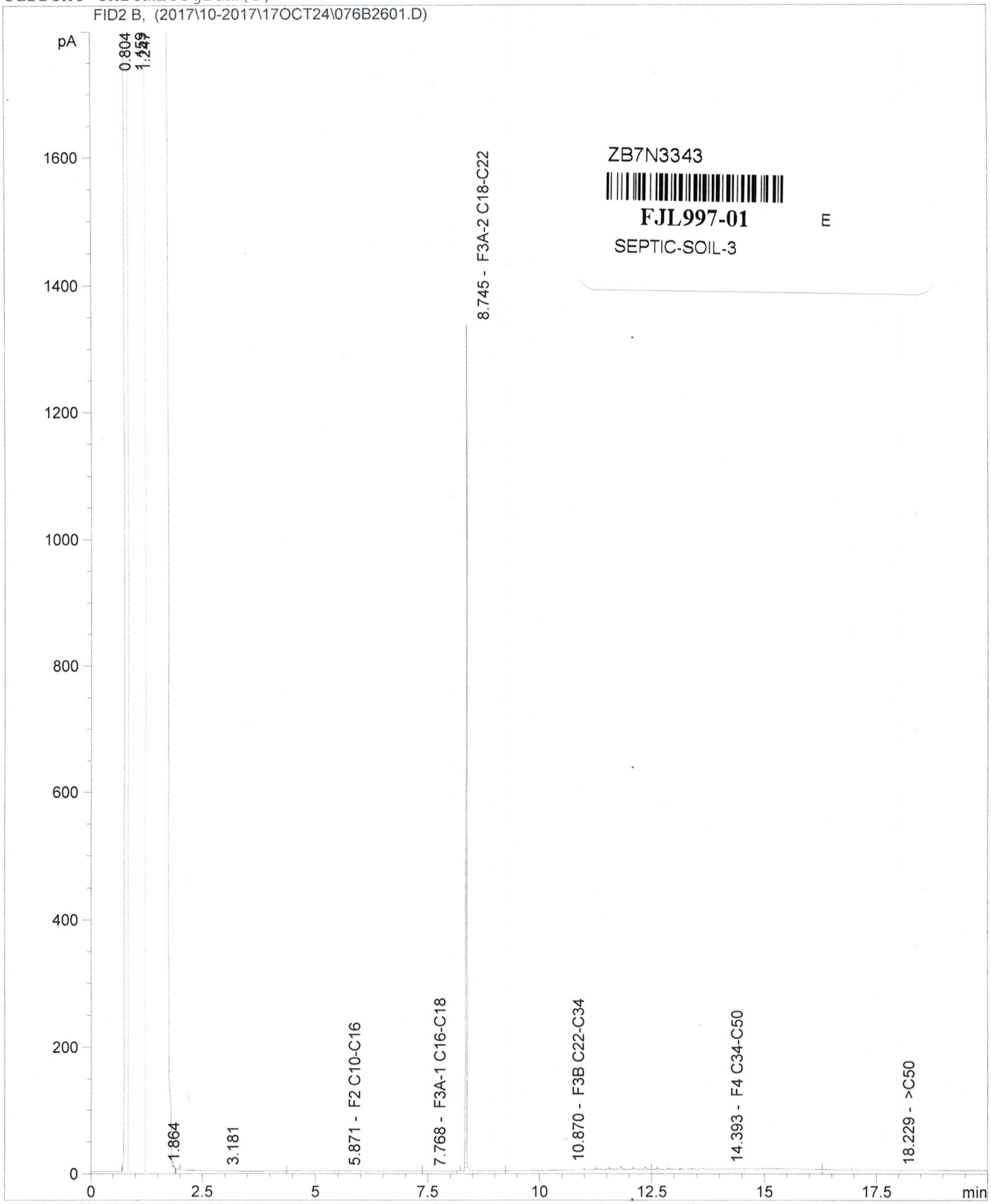
FJL996-01

E

SEPTIC-SOIL-2

```
Print of window 38: Current Chromatogram(s)
======================================================================
Injection Date  : 2017/10/25 10:38:05 AM         Seq. Line :  26
Sample Name     : 5227801:FJL99701                Location : Vial 76
Acq. Operator   : Duane Deering                        Inj :   1
                                                Inj Volume : 1 µl
Acq. Method     : C:\HPCHEM\1\METHODS\CCMERU-1.M
Last changed    : 2017/10/24 8:51:13 PM by Duane Deering
Analysis Method : C:\HPCHEM\1\METHODS\F3CCME~2.M
Last changed    : 2018/04/11 12:38:38 PM by Duane Deering
                  (modified after loading)
```

Current Chromatogram(s)



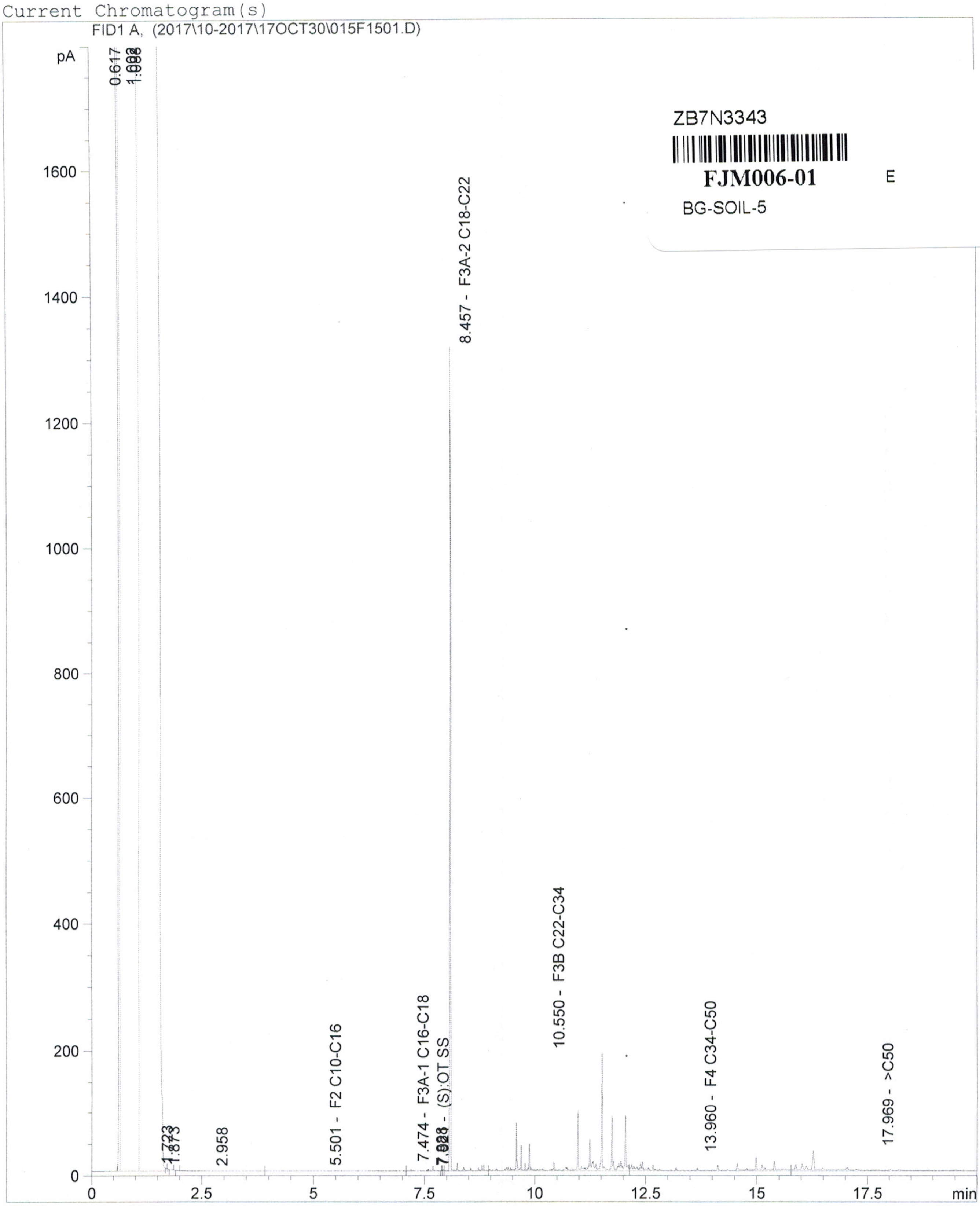
ZB7N3343

FJL997-01 E

SEPTIC-SOIL-3

```
Print of window 38: Current Chromatogram(s)
=====================================================================
Injection Date   : 2017/10/31 2:19:47 AM          Seq. Line :  15
Sample Name      : 5238413:FJM00601                 Location : Vial 15
Acq. Operator    : Duane Deering                         Inj :   1
                                                 Inj Volume : 1 µl
Acq. Method      : C:\HPCHEM\1\METHODS\CCMERU-1.M
Last changed     : 2017/10/30 6:40:48 PM by Duane Deering
Analysis Method : C:\HPCHEM\1\METHODS\F3CCME~1.M
Last changed     : 2018/04/11 12:47:04 PM by Duane Deering
                   (modified after loading)
```

Current Chromatogram(s)



ZB7N3343

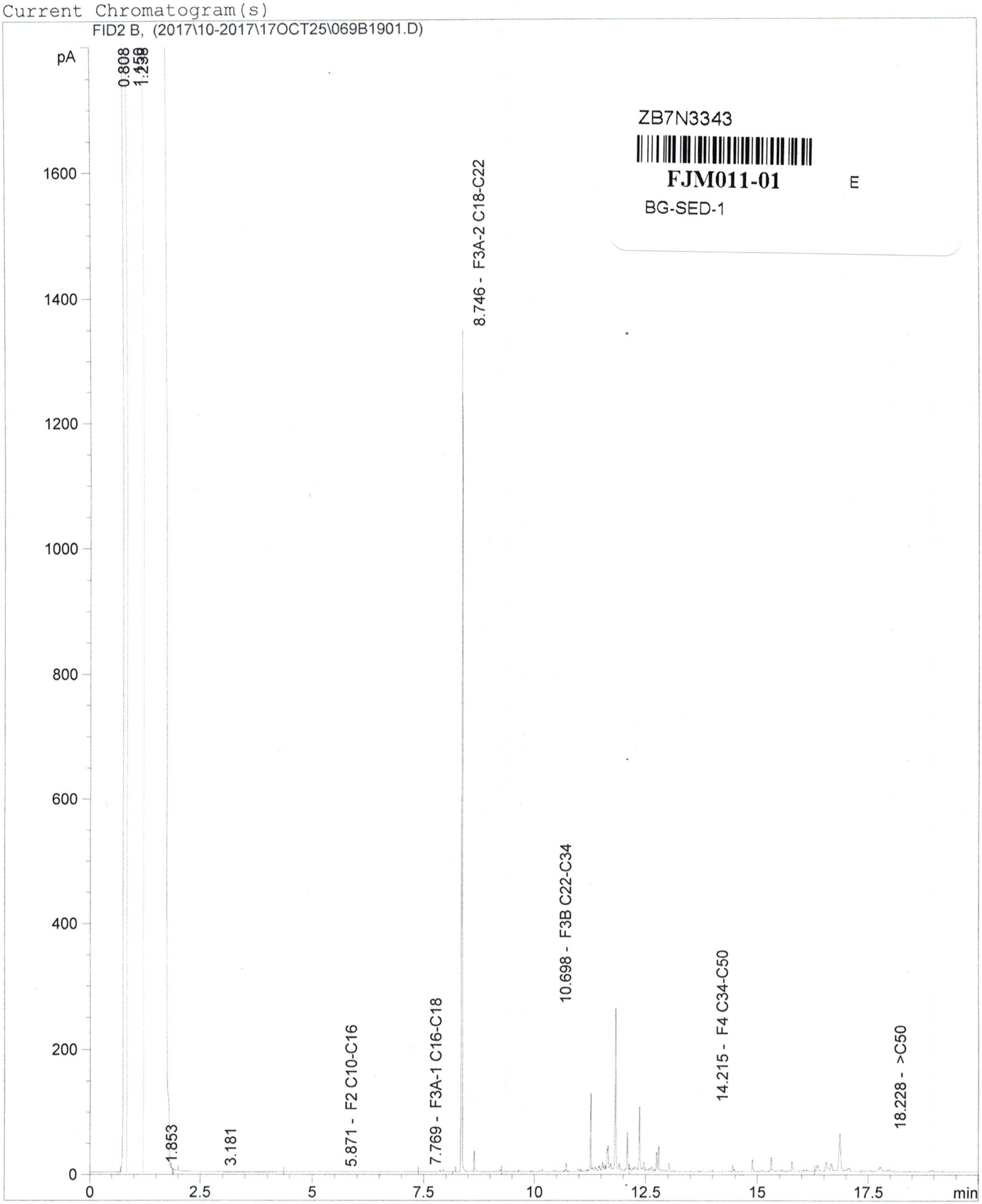
FJM006-01 E

BG-SOIL-5

NL_FID003 2018/04/11 12:48:23 PM Duane Deering

```
Print of window 38: Current Chromatogram(s)
=====================================================================
Injection Date   : 2017/10/26 2:26:42 AM          Seq. Line :  19
Sample Name      : 5229756:FJM01101                Location : Vial 69
Acq. Operator    : Duane Deering                        Inj :  1
                                                Inj Volume : 1 µl
Acq. Method      : C:\HPCHEM\1\METHODS\CCMERU-1.M
Last changed     : 2017/10/24 8:51:13 PM by Duane Deering
Analysis Method : C:\HPCHEM\1\METHODS\F3CCME~2.M
Last changed     : 2018/04/11 3:39:24 PM by Duane Deering
                   (modified after loading)
```

Current Chromatogram(s)



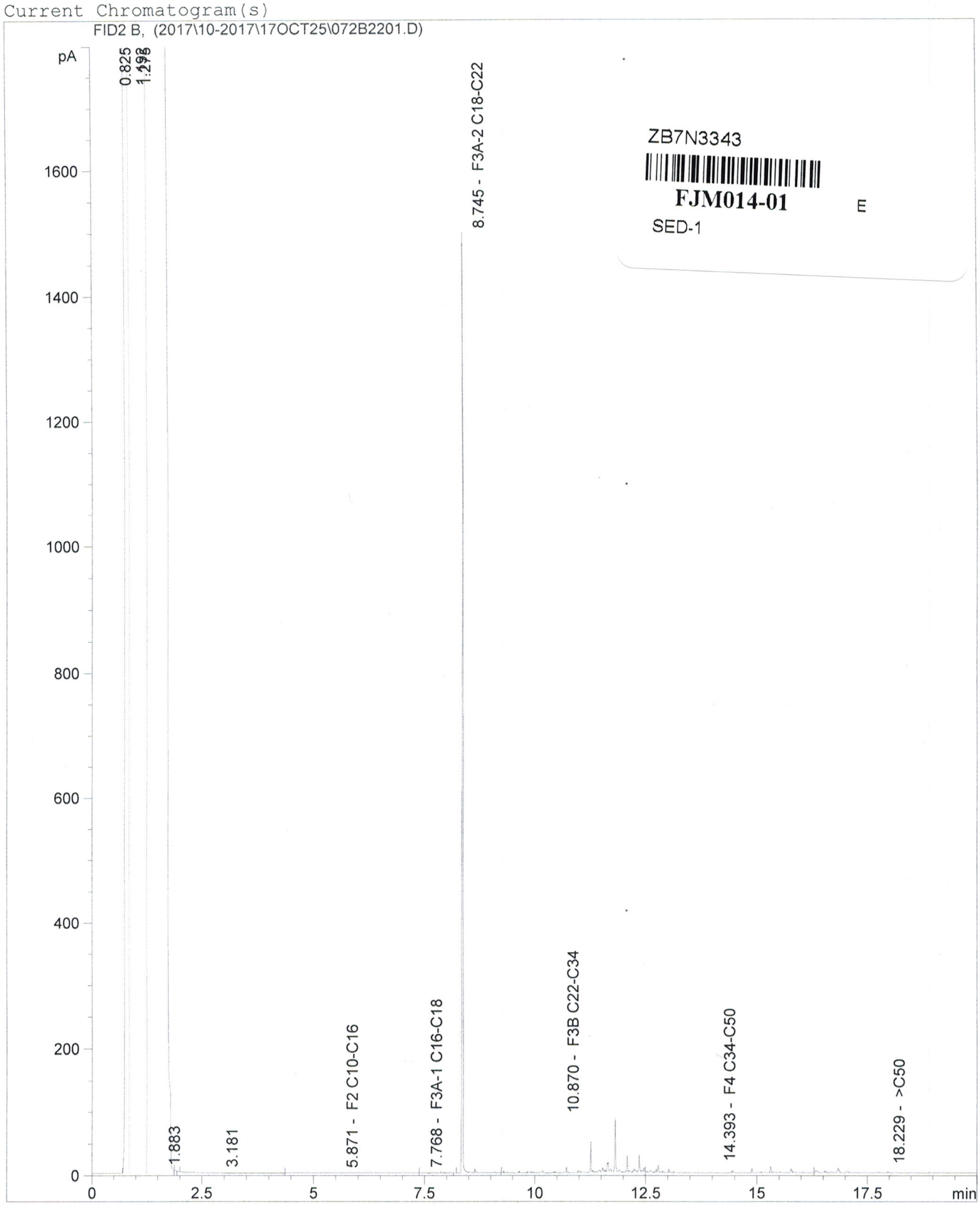
ZB7N3343

FJM011-01 E

BG-SED-1

```
Print of window 38: Current Chromatogram(s)
=======================================================================
Injection Date  : 2017/10/26 4:02:55 AM       Seq. Line :  22
Sample Name     : 5229756:FJM01401             Location : Vial 72
Acq. Operator   : Duane Deering                     Inj :  1
                                             Inj Volume : 1 µl
Acq. Method     : C:\HPCHEM\1\METHODS\CCMERU-1.M
Last changed    : 2017/10/24 8:51:13 PM by Duane Deering
Analysis Method : C:\HPCHEM\1\METHODS\F3CCME~2.M
Last changed    : 2018/04/11 12:38:38 PM by Duane Deering
                  (modified after loading)
```

Current Chromatogram(s)



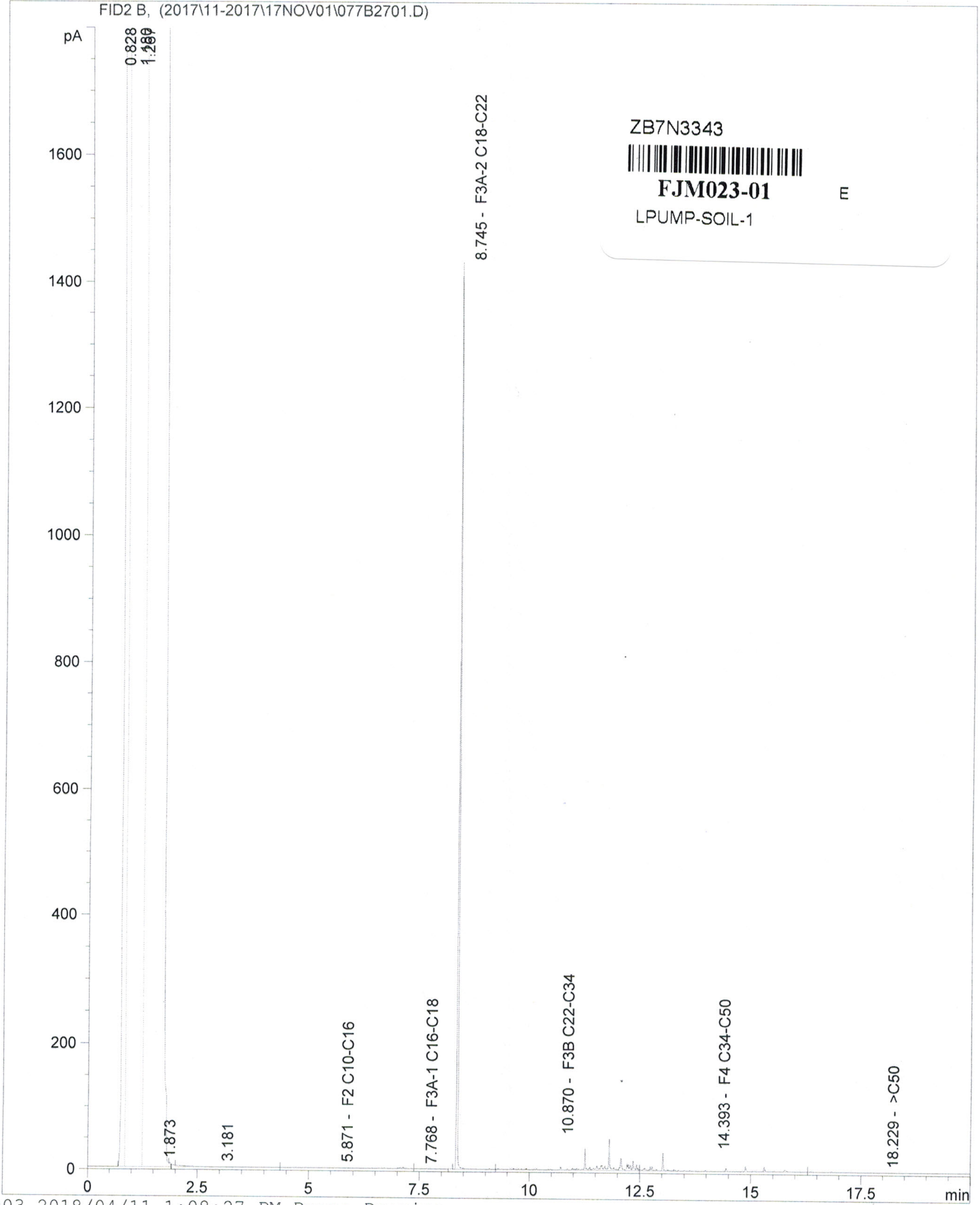
ZB7N3343

FJM014-01 E

SED-1

```
Print of window 38: Current Chromatogram(s)
=======================================================================
Injection Date  : 2017/11/02 12:51:13 AM        Seq. Line :  27
Sample Name     : 5239850:FJM02301               Location : Vial 77
Acq. Operator   : Duane Deering                       Inj :   1
                                              Inj Volume : 1 µl
Acq. Method     : C:\HPCHEM\1\METHODS\CCMERU-1.M
Last changed    : 2017/10/30 6:40:48 PM by Duane Deering
Analysis Method : C:\HPCHEM\1\METHODS\F3CCME~2.M
Last changed    : 2018/04/11 12:42:36 PM by Duane Deering
```

Current Chromatogram(s)



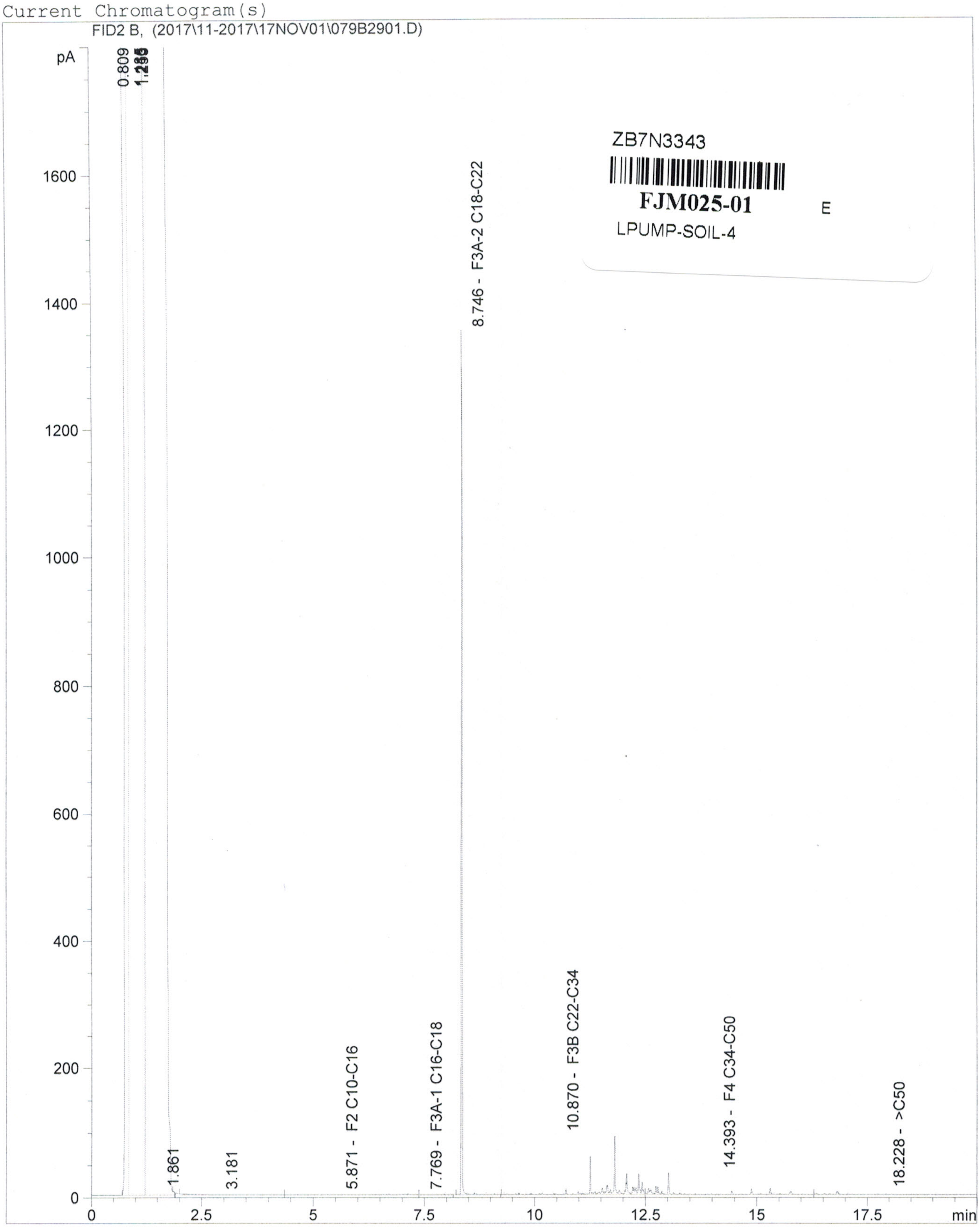
ZB7N3343

FJM023-01 E

LPUMP-SOIL-1

```
Print of window 38: Current Chromatogram(s)
========================================================================
Injection Date  : 2017/11/02 1:54:15 AM          Seq. Line :  29
Sample Name     : 5239850:FJM02501                Location : Vial 79
Acq. Operator   : Duane Deering                        Inj :   1
                                                Inj Volume : 1 µl
Acq. Method     : C:\HPCHEM\1\METHODS\CCMERU-1.M
Last changed    : 2017/10/30 6:40:48 PM by Duane Deering
Analysis Method : C:\HPCHEM\1\METHODS\F3CCME~2.M
Last changed    : 2018/04/11 12:42:36 PM by Duane Deering
```

Current Chromatogram(s)



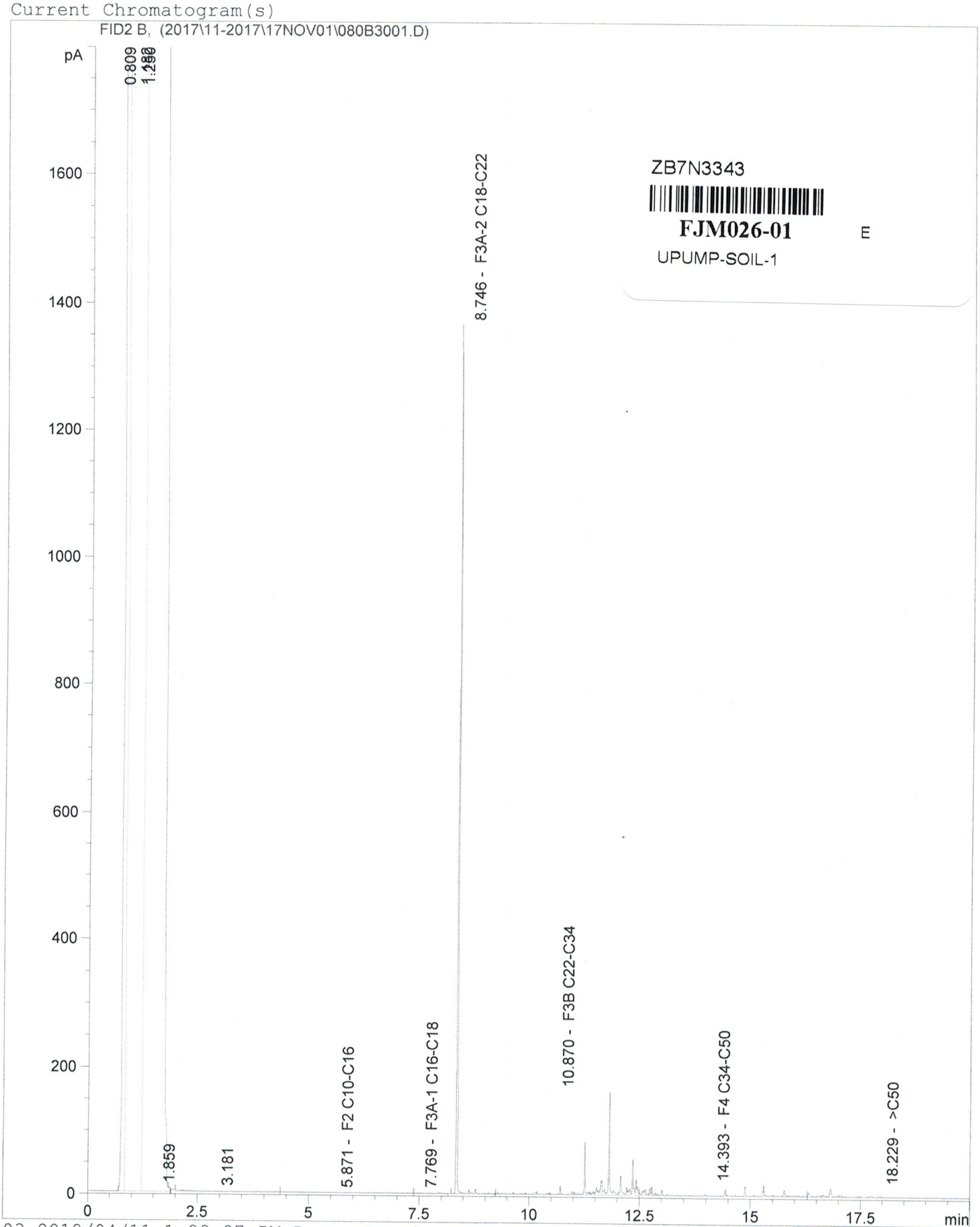
ZB7N3343

FJM025-01

E

LPUMP-SOIL-4

```
Print of window 38: Current Chromatogram(s)
=================================================================
Injection Date  : 2017/11/02 2:25:59 AM          Seq. Line :  30
Sample Name     : 5239850:FJM02601                Location : Vial 80
Acq. Operator   : Duane Deering                        Inj :  1
                                               Inj Volume : 1 µl
Acq. Method     : C:\HPCHEM\1\METHODS\CCMERU-1.M
Last changed    : 2017/10/30 6:40:48 PM by Duane Deering
Analysis Method : C:\HPCHEM\1\METHODS\F3CCME~2.M
Last changed    : 2018/04/11 12:42:36 PM by Duane Deering
```

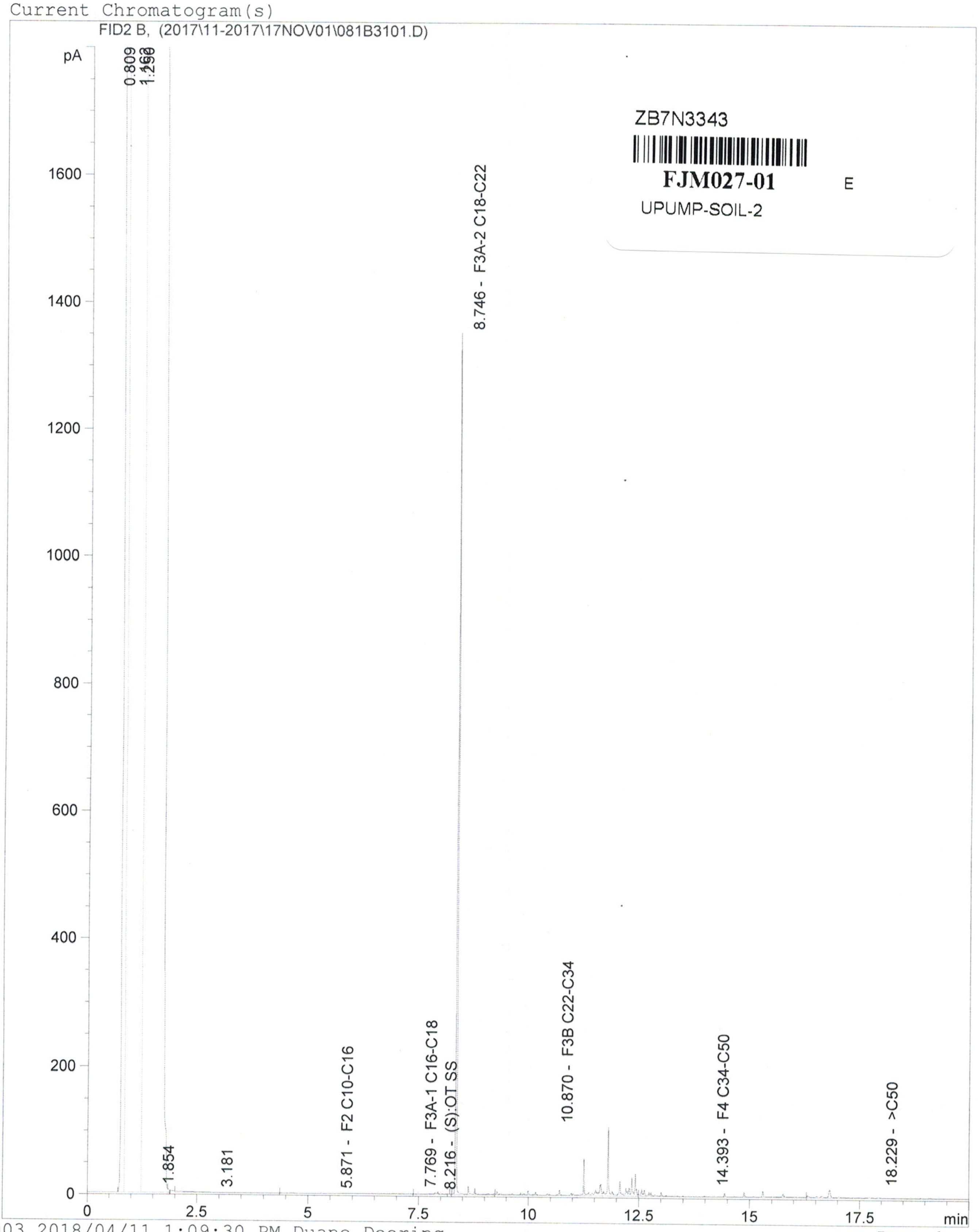


ZB7N3343

FJM026-01 E

UPUMP-SOIL-1

```
Print of window 38: Current Chromatogram(s)
===========================================================================
Injection Date  : 2017/11/02 9:49:44 AM          Seq. Line :  31
Sample Name     : 5239850:FJM02701                Location : Vial 81
Acq. Operator   : Duane Deering                        Inj :   1
                                               Inj Volume : 1 µl
Acq. Method     : C:\HPCHEM\1\METHODS\CCMERU-1.M
Last changed    : 2017/10/30 6:40:48 PM by Duane Deering
Analysis Method : C:\HPCHEM\1\METHODS\F3CCME~2.M
Last changed    : 2018/04/11 12:42:36 PM by Duane Deering
```



ZB7N3343

FJM027-01

E

UPUMP-SOIL-2

```
Print of window 38: Current Chromatogram(s)
=======================================================================
Injection Date  : 2017/11/02 10:20:39 AM        Seq. Line :  32
Sample Name     : 5239850:FJM02801               Location : Vial 82
Acq. Operator   : Duane Deering                       Inj :   1
                                              Inj Volume : 1 µl
Acq. Method     : C:\HPCHEM\1\METHODS\CCMERU-1.M
Last changed    : 2017/10/30 6:40:48 PM by Duane Deering
Analysis Method : C:\HPCHEM\1\METHODS\F3CCME~2.M
Last changed    : 2018/04/11 12:42:36 PM by Duane Deering
```

Current Chromatogram(s)

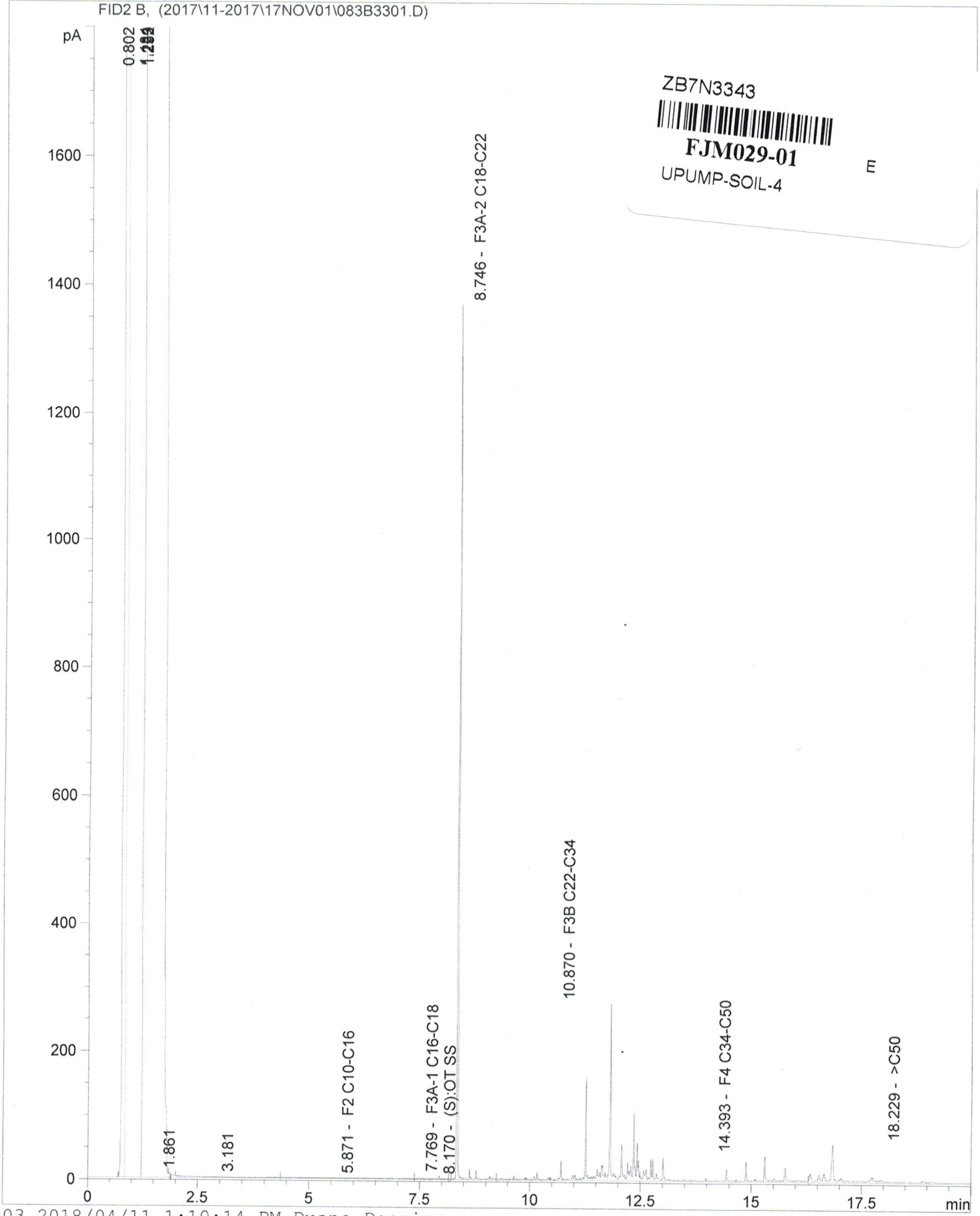
ZB7N3343

FJM028-01 E

UPUMP-SOIL-3

```
Print of window 38: Current Chromatogram(s)
=====================================================================
Injection Date  : 2017/11/02 10:52:16 AM        Seq. Line :  33
Sample Name     : 5239850:FJM02901               Location : Vial 83
Acq. Operator   : Duane Deering                       Inj :  1
                                              Inj Volume : 1 µl
Acq. Method     : C:\HPCHEM\1\METHODS\CCMERU-1.M
Last changed    : 2017/10/30 6:40:48 PM by Duane Deering
Analysis Method : C:\HPCHEM\1\METHODS\F3CCME~2.M
Last changed    : 2018/04/11 12:42:36 PM by Duane Deering
```

Current Chromatogram(s)



ZB7N3343

FJM029-01

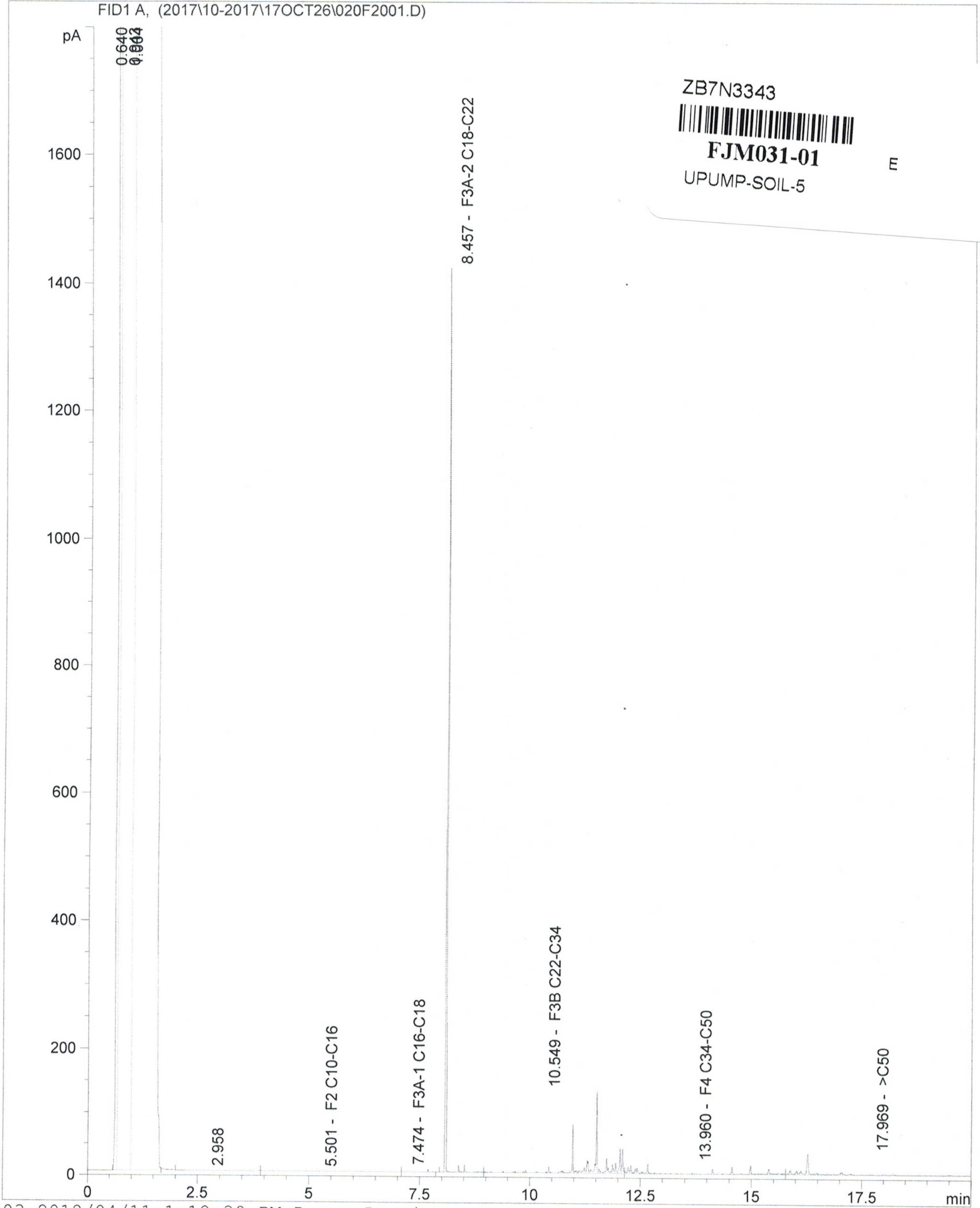
UPUMP-SOIL-4

E

NL_FID003 2018/04/11 1:10:14 PM Duane Deering

```
Print of window 38: Current Chromatogram(s)
================================================================================
Injection Date  : 2017/10/27 4:17:55 AM          Seq. Line :  20
Sample Name     : 5233069:FJM03101                Location : Vial 20
Acq. Operator   : Duane Deering                        Inj :   1
                                              Inj Volume : 1 µl
Acq. Method     : C:\HPCHEM\1\METHODS\CCMERU-1.M
Last changed    : 2017/10/24 8:51:13 PM by Duane Deering
Analysis Method : C:\HPCHEM\1\METHODS\F3CCME~1.M
Last changed    : 2018/04/11 1:08:11 PM by Duane Deering
```

Current Chromatogram(s)



ZB7N3343

FJM031-01

UPUMP-SOIL-5

E

Appendix J

ECOLOGICAL SCREENING PROTOCAL

SUMMARY TABLE - RESULTS OF ECOLOGICAL SCREENING PROTOCOL FOR PETROLEUM IMPACTED SITES

Instructions to Practitioners: This table is intended to summarize the results of the Ecological Screening Protocol and must be completed in consultation with guidance provided in the protocol. Users should include this completed table in their Environmental Assessment or Closure Report. Details and explanations are to be provided in the body of the Report.

Ecological Screening Component	**Yes or No**	**Report name and location of details and explanations**
Part I – Identification of petroleum hydrocarbons in media		
1. Do site characterization data indicate the presence of PHC in site surface soil (depth < 1.5 m) above the appropriate screening levels in Tables 1a and 1b?	No	Surface soil samples did not exceed applicable guidelines for petroleum hydrocarbons.
2. Do site characterization data indicate the presence of PHC in shallow site groundwater (depth <3.0 m) above appropriate ecological screening levels that were derived for the protection of terrestrial plants and soil invertebrates in contact with site groundwater in Table 2?	Unknown	Groundwater not assessed as part of the current investigation.
3. Do existing site characterization data indicate the presence of PHC in site groundwater above appropriate ecological screening levels derived for the protection of aquatic receptors in Table 3a/3b?	Unknown	Groundwater not assessed as part of the current investigation.
4. Do site characterization data indicate the presence of PHC in site surface water above the appropriate screening levels in Table 3?	No	Surface water samples did exceed applicable guidelines.
5. Does site characterization indicate the presence of PHC in on-site or adjacent sediments above the appropriate screening levels in Table 4?	Yes	Exceedances noted in sediment sample (SED-2) collected from pond located on site.
IF ALL ANSWERS IN PART I ARE "NO" THEN NO FURTHER ACTION IS REQUIRED		
Part II – Identification of habitat and ecological receptors		
1. Are the following habitat types of conditions present on the site or proximate to the site within a minimum of 200 metres? • wetland habitats • aquatic habitats • forested habitats • grassland habitats • provincial/national parks or ecological reserves • known rare, threatened or endangered species • other known critical or sensitive habitat • other local or regional receptor or habitat concerns	Yes	The site is surrounded by the marine waters of the Atlantic Ocean. Several freshwater ponds are also located throughout the site.
2a. Are there visible indications of stressed vegetation on the site?	No	None observed
2b. Is there evidence that the site vegetation community differs from what would be expected?	No	None observed

2c. Are there indications that the site soil cannot support a soil invertebrate community?	No	None observed
Ecological Screening Component	**Yes or No**	**Report name and location of details and explanations**
3. Is there evidence that terrestrial plants in the habitats above are likely to be in root contact with site groundwater above screening levels?	No	Shallow bedrock on site. Groundwater below bedrock.
4. Would wildlife receptors be expected to forage on or near the contaminated areas of the site?	Yes	
Part III - Identification of exposure pathways for ecological receptors		
1a. Is it reasonable to conclude that site hydrocarbons in surface soil with concentrations exceeding applicable screening levels, will come into contact with terrestrial plants and invertebrates in a suitable habitat?	No	Surface soil samples did not exceed applicable guidelines for petroleum hydrocarbons.
1b. Is it reasonable to conclude that site Hydrocarbons in surface soil with concentrations exceeding applicable screening levels, will come into contact with mammalian, avian or herptile terrestrial receptors within an agricultural land use in a suitable habitat?	No	Agricultural land is not present within 200 m of the site.
2. Is it reasonable to conclude that dissolved hydrocarbons in site groundwater with concentrations exceeding applicable screening levels will come into contact with plants or soil invertebrates in a suitable habitat?	Unknown	Groundwater not assessed as part of the current investigation.
3. Is it reasonable to conclude that dissolved hydrocarbons in site groundwater with concentrations exceeding applicable screening levels will come into contact with aquatic receptors or aquatic receptor habitat?	Unknown	Groundwater not assessed as part of the current investigation.
4. Is it reasonable to conclude that site petroleum, hydrocarbon contamination could impact aquatic receptors or aquatic habitat in surface water bodies via the following: a. surface runoff (*e.g.* erosion, windblown contaminants) b. groundwater flow c. preferential overland flow pathways (*e.g.* drainage ditch, slope, swale) d. preferential subsurface flow pathways (e.g. culvert, trench, sewer line, pipelines, swales) such that aqueous media concentrations would potentially exceed surface water and/or sediment quality screening levels?	No	Surface soil samples did not exceed applicable guidelines for petroleum hydrocarbons.
Are there site specific conditions present, which were not considered in any section above that should require further ecological assessment?	No	
IF ALL ANSWERS IN PART III ARE "NO" THEN NO FURTHER ACTION IS REQUIRED.		

Appendix K

AREAS OF POTENTIAL ENVIRONMENTAL CONCERN SAMPLING PROGRAM

Table 1: Soil, Sediment & Surface Water Analytical Program by AOPEC

Upper Site				
Media	Sample ID	Easting	Northing	Analyses
Former AST (Upper Site)				
SOIL	UAST-SOIL-1	363474	6121815	BTEX/TPH & PAHs
	UAST-SOIL-2	363457	6121809	BTEX/TPH & PAHs
	UAST-SOIL-3	363451	6121825	BTEX/TPH & PAHs
	UAST-SOIL-4	363473	6121829	BTEX/TPH & PAHs
	UAST-SOIL-5 (Duplicate of UAST-SOIL-2)	363457	6121809	BTEX/TPH & PAHs
Surface Water	UAST-SW-1	363451	6121825	BTEX/TPH & PAHs
Former Helipad Pad & Drum Cache				
SOIL	HEL-SOIL-1	363548	6121715	Metals, BTEX/TPH,PAHS & PCBs
	HEL-SOIL-2	363541	6121736	Metals, BTEX/TPH,PAHS & PCBs
	HEL-SOIL-3	363559	6121733	Metals, BTEX/TPH,PAHS & PCBs
	HEL-SOIL-4 (Duplicate of HEL-SOIL-1)	363548	6121715	Metals, BTEX/TPH,PAHS & PCBs
Former Heating and Generator Room				
SOIL	HANGER-SOIL-1	363537	6121912	Metals, BTEX/TPH,PAHS & PCBs
	HANGER-SOIL-2	363527	6121896	Metals, BTEX/TPH,PAHS, PCBs & VOCs
Former Motor Pool Area				
SOIL	HANGER-SOIL-3	363513	6121904	Metals, BTEX/TPH,PAHS, PCBs & VOCs
	HANGER-SOIL-4	363521	6121919	Metals, BTEX/TPH,PAHS, PCBs,VOCs & Pesticides
Former Radome				
SOIL	RADOME-SOIL-1	363573	6121946	Metals,PCBs & VOCs
	RADOME-SOIL-2	363575	6121955	Metals,PCBs & VOCs
	RADOME-SOIL-3	363584	6121948	Metals,PCBs & VOCs

Former Communication Towers				
SOIL	TOWER-SOIL-1	363570	6121978	Metals,PCBs & VOCs
	TOWER-SOIL-2	363564	6121983	Metals,PCBs & VOCs
	TOWER-SOIL-3	363597	6122018	Metals,PCBs & VOCs
	TOWER-SOIL-4	363603	6122022	Metals,PCBs & VOCs
Former Disaster Shack				
SOIL	SHACK-SOIL-1	363581	6121833	Metals,BTEX/TPH,PAHs, VOCs & Pesticides
	SHACK-SOIL-2	363577	6121840	Metals,BTEX/TPH,PAHs & VOCs
	SHACK-SOIL-3	363586	6121841	Metals,BTEX/TPH,PAHs & VOCs
	SHACK-SOIL-4 (Duplicate of SHACK-SOIL-3)	363586	6121841	Metals,BTEX/TPH & PAHs
Former Septic Tank				
SOIL	SEPTIC-SOIL-1	363564	6121872	Metals,BTEX/TPH,PAHs, PCBs & VOCs
	SEPTIC-SOIL-2	363561	6121871	Metals,BTEX/TPH,PAHs, PCBs & VOCs
	SEPTIC-SOIL-3	363542	6121885	Metals,BTEX/TPH,PAHs, PCBs & VOCs
1987 Disposal Site				
SOIL	1987-SOIL-1	363511	6121586	Metals, BTEX/TPH, PAHs,PCBs,VOCs & Dioxins & Furans
	1987-SOIL-2	363514	6121589	Metals, BTEX/TPH, PAHs,PCBs,VOCs & Pesticides
	1987-SOIL-3	363506	6121584	Metals, BTEX/TPH, PAHs,PCBs,VOCs & Dioxins & Furans
	1987-SOIL-4	363505	6121580	Metals, BTEX/TPH, PAHs,PCBs & VOCs
	1987-SOIL-5	363504	6121589	Metals, BTEX/TPH, PAHs,PCBs & VOCs
SOIL	1987-SOIL-6	363502	6121592	Metals, BTEX/TPH, PAHs,PCBs & VOCs
	1987-SOIL-7	363520	6121592	Metals, BTEX/TPH, PAHs,PCBs & VOCs
	1987-SOIL-8	363524	6121598	Metals, BTEX/TPH, PAHs,PCBs & VOCs
	1987-SOIL-9	363530	6121601	Metals, BTEX/TPH, PAHs,PCBs & VOCs

	1987-SOIL-10	363511	6121593	Metals, BTEX/TPH, PAHs,PCBs & VOCs
	1987-SOIL-11(Duplicate of 1987-SOIL-2)	363514	6121589	Metals, BTEX/TPH, PAHs,PCBs,VOCs & Pesticides
	1987-SOIL-12 (Duplicate of 1987-SOIL-3	363506	6121584	Metals, BTEX/TPH, PAHs,PCBs,VOCs & Dioxins & Furans
Former Upper Pumphouse				
SOIL	UPUMP-SOIL-1	362482	6122117	Metals, BTEX/TPH, PAHs & VOCs
	UPUMP-SOIL-2	362505	6122120	Metals, BTEX/TPH, PAHs & VOCs
	UPUMP-SOIL-3	362520	6122129	Metals, BTEX/TPH, PAHs & VOCs
	UPUMP-SOIL-4 (Duplicate of LPUMP-SOIL-1)	362482	6122117	BTEX/TPH & VOCs
	UPUMP-SOIL-5 (Duplicate of LPUMP-SOIL-3)	362520	6122129	Metals,BTEX/TPH,PAHs & VOCs
Former Water Supply Pond				
Surface Water	WSUPPLY-SW-1	363337	6120918	RCAP,metals,BTEX/TPH & PAHs
	WSUPPLY-SW-2	363307	6120938	RCAP,metals,BTEX/TPH & PAHs
	WSUPPLY-SW-3	363266	6120930	RCAP,metals,BTEX/TPH & PAHs
	WSUPPLY-SW-4 (Duplicate of WSUPPLY-SW-2)	363307	6120938	RCAP,metals,BTEX/TPH & PAHs
Sediment	WSUPPLY-SED-1	363337	6120918	Metals,BTEX/TPH,PAHs,PCBs & VOCs
	WSUPPLY-SED-2	363307	6120938	Metals,BTEX/TPH,PAHs,PCBs & VOCs
	WSUPPLY-SED-3	363266	6120930	Metals,BTEX/TPH,PAHs,PCBs & VOCs
Lower Site				
Media	Sample ID	Easting	Northing	Analyses
Former AST				
SOIL	LAST-SOIL-1	361992	6121918	BTEX/TPH & PAHs
	LAST-SOIL-2	361978	6121926	BTEX/TPH & PAHs
	LAST-SOIL-3	361987	6121942	BTEX/TPH & PAHs
	LAST-SOIL-4	362002	6121928	BTEX/TPH & PAHs
Former Fuel Drum Area				
SOIL	DRUM-SOIL-1	361996	6121836	Metals,BTEX/TPH &PAHs
	DRUM-SOIL-2	361958	6121822	Metals,BTEX/TPH & PAHs
	DRUM-SOIL-3	361923	6121815	Metals,BTEX/TPH &

				PAHs
Former Lower Pumphouse				
SOIL	LPUMP-SOIL-1	363303	6120973	Metals,BTEX/TPH,PAHs & VOCs
	LPUMP-SOIL-2	363309	6120974	Metals,BTEX/TPH,PAHs & VOCs
	LPUMP-SOIL-3	363316	6120972	Metals,BTEX/TPH,PAHs & VOCs
	LPUMP-SOIL-4 (Duplicate of UPUMP-SOIL-1)	363303	6120973	Metals,BTEX/TPH,PAHs & VOCs
Former Pipeline				
SOIL	PIPELINE-SOIL-1	363422	6122154	BTEX/TPH & PAHs
	PIPELINE-SOIL-2	363094	6122387	BTEX/TPH & PAHs
	PIPELINE-SOIL-3	362443	6122219	BTEX/TPH & PAHs
	PIPELINE-SOIL-4	362185	6121917	BTEX/TPH & PAHs
	PIPELINE-SOIL-5 (Duplicate of PIPELINE-SOIL-3)	362443	6122219	BTEX/TPH & PAHs
Site Surface Water & Sediment				
Surface Water	SW-1	362491	6122128	RCAP,metals,BTEX/TPH & PAHs
	SW-2	363108	6122346	RCAP,metals,BTEX/TPH & PAHs
	SW-3	363425	6122092	RCAP,metals,BTEX/TPH & PAHs
Sediment	SED-1	362491	6122128	Metals,BTEX/TPH,PAHs,PCBs & VOCs
	SED-2	363108	6122346	Metals,BTEX/TPH,PAHs,PCBs & VOCs
	SED-3	363425	6122092	Metals,BTEX/TPH,PAHs,PCBs & VOCs
Background Soil Samples				
SOIL	BG-SOIL-1	363079	6122656	Metals,BTEX/TPH,PAHs & VOCs
	BG-SOIL-2	363330	6122699	Metals,BTEX/TPH,PAHs & VOCs
	BG-SOIL-3	361685	6119713	Metals,BTEX/TPH,PAHs & VOCs
	BG-SOIL-4	361056	6119808	Metals,BTEX/TPH,PAHs & VOCs
	BG-SOIL-5	362912	6119686	Metals,BTEX/TPH,PAHs & VOCs
	BG-SOIL-6	362588	6118735	Metals,BTEX/TPH,PAHs & VOCs
	BG-SOIL-7	362242	6117092	Metals,BTEX/TPH,PAHs & VOCs
	BG-SOIL-8	361823	6115314	Metals,BTEX/TPH,PAHs & VOCs

Background Sediment/Surface Water Samples				
Sediment	BG-SED-1	363065	6122582	Metals,BTEX/TPH,PAHs & VOCs
	BG-SED-2	361491	6119526	Metals,BTEX/TPH,PAHs & VOCs
	BG-SED-3	361815	6115283	Metals,BTEX/TPH,PAHs & VOCs
Surface Water	BG-SW-1	363065	6122582	RCAP,metals,BTEX/TPH & PAHs
	BG-SW-2	361491	6119526	RCAP,metals,BTEX/TPH & PAHs
	BG-SW-3	361815	6115283	RCAP,metals,BTEX/TPH & PAHs

Appendix L

Z-SCORE CALCULATION

A step by step process is presented below to illustrate the approach to determine the background estimates and z-scores for parameters that exceed the applicable references. The process is as follows:

1. Gather all available site-specific local background concentrations and site soil concentrations for the area of interest.
2. Determine the background estimate by calculating the mean (m), median (med), standard deviation (S) and count (N) for all the background concentrations.
3. If the following equation is true, then the data set meets the test for a normal distribution:

   $$\frac{m-med}{\frac{S}{\sqrt{N}}} < 1$$

   The background estimate can then be found using the following equation:

   $$Background\ Estimate\ = m + 2S$$

4. If the following equation is true, then the data set meets the test for a log-normal distribution:

   $$\frac{m-med}{\frac{S}{\sqrt{N}}} > 1$$

   The background estimate can then be found using the following equations:

   $$\beta = \sqrt{ln\left(1 + \left(\frac{S}{m}\right)^2\right)}$$

   $$\alpha = ln(m) - \left(\frac{\beta^2}{2}\right)$$

   $$Background\ Estimate = \ exp(\alpha + 2\beta)$$

5. If the maximum site concentration does not exceed the calculated background estimate, then a z-score does not need to be calculated. If the maximum site concentration exceeds the background estimate, a second step is recommended using the Wilcoxon Rank-Sum Test to determine the z-scores of the parameter of interest.
6. Combine the site-specific local background concentrations and site soil concentrations to form a larger group of N samples.
7. Sort the combined data from lowest to highest and assign ranks to the combined data.
8. Evaluate the differences between the two sets, by using the following equation:

$$z = \frac{W - \left({}^{N_1 \times (N_1 + N_2 + 1)}\!/_{2} \right)}{\sqrt{{}^{N_1 \times N_2 \times (N_1 + N_2 + 1)}\!/_{12}}}$$

Where:

W = sum of the ranks of all the data that came from the group with the least number of samples (typically background samples)

N_1 = number of samples from the data set with the least number of samples

N_2 = number of samples from the data set with the least number of samples

9. If the z-score is outside the range of -3 to +3, then there is reasonable evidence to prove that the regional background data and the site data are significantly statistically different. If this is the case, the site cannot be released as a contaminated site due to regional background levels.
10. If the z-score is within the range of -3 to +3, then there is reasonable evidence to prove that there are no significant statistical differences between the regional background data and the site data. If this is the case, the site can be released as contaminated site due to regional background levels.

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