

**FINAL REPORT: LONG-TERM
MONITORING (YEAR 1) –
GORDON LAKE GROUP OF
SITES**



Prepared for:
Public Services and Procurement
Canada on behalf of
Crown-Indigenous Relations and
Northern Affairs Canada

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Executive Summary

Public Services and Procurement Canada (PSPC), on behalf of Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC), was responsible for the environmental remediation of several former mine and advanced exploration sites collectively known as the Gordon Lake Group (GLG) of Sites (GLG Sites or the Sites).

The nine sites are located on or near Gordon Lake, approximately 80 kilometres (km) northeast of Yellowknife, Northwest Territories (NT). Remedial work, which occurred over several field seasons, was completed in early 2019 and the Project has now transitioned to long-term monitoring. Stantec Consulting Ltd. (Stantec) was retained by PSPC, on behalf of CIRNAC, to complete Year 1 of the Phase I Long-Term Monitoring (LTM) Plan for the Sites.

The purpose of the Phase I LTM Plan is to verify that the selected remedial/risk management measures implemented during the remediation program remain protective of human health and the environment by monitoring the potential for residual risks remaining at the nine former mine and mineral exploration sites following the completion of the Gordon Lake remediation program.

The Phase I LTM Plan will provide sufficient data to characterize post-remediation conditions. Consistent with other northern contaminated sites, this is accomplished with a monitoring program conducted for a period of five years following remediation.

LTM components for the GLG project include areas that pose a potential risk following the completion of the remediation program. These components were assessed to evaluate the progress toward site closure and include the following:

- Monitoring of backfilled or covered areas with potential high risk for erosion/washout to down-gradient water, both physical and chemical.
- Performance monitoring of the Tailings and Soil Containment Area (TSCA) to verify that conditions of the TSCA are stable, both chemically and physically.
- Visual monitoring of mine opening closures that were backfilled and/or capped to verify stability.
- Monitoring of moderate risk waste rock left in place to verify no visual signs of ARD.
- Visual monitoring of vegetation growth to verify growth and/or stability.

During Phase I of the LTM, exit criteria will be considered met and monitoring can be concluded in the absence of major erosion concerns, contaminants of concerns reflect stable or decreasing trends and/or remain below applicable guidelines, and the TSCA remains stable over three consecutive biennial monitoring events.

Data from ongoing monitoring is required to develop a trend analysis and evaluate overall program management. Stantec recommends continued long-term monitoring in Year 2 in accordance with the Phase I schedule with the following deviations:



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- Additional work was completed at the Kidney Pond Portal to rectify slumping and erosion concerns. This area should be monitored in Year 2 to confirm manual backfilling is stable and sufficient to eliminate the hazard and control erosion.
- The West Bay Open Pit barrier openings between the fence and ground surface should be addressed as it is not fulfilling its intended purpose. Stantec recommends a chain link skirting be attached to eliminate the potential risk of access to the Open Pit hazard to humans and/or animals.
- Verify no visual signs of ARD down-gradient of the waste rock areas that were not accounted for in Year 1 (i.e. GOO_WR_02). The remaining waste rock monitoring areas are recommended to continue with the LTM schedule (quinquennially).

The statements made in this Executive Summary text are subject to the limitations included in Section 6.0 and are to be read in conjunction with the remainder of this report.



Abbreviations

AHJ	authorities having jurisdiction
ARD	acid rock drainage
BGM	bituminous geomembrane
CCME	Canadian Council of Ministers of the Environment
CIRNAC	Crown-Indigenous Relations and Northern Affairs Canada
COC	contaminant of concern
CPCM	Construction and Post-Construction Monitoring
DNV	Delta Engineering and Nahanni Construction, in Joint Venture
FAL	Freshwater Aquatic Life
FCSAP	Federal Contaminated Sites Action Plan
FIGQG	Federal Interim Groundwater Quality Guidelines
GLG	Gordon Lake Group
km	kilometre
LTM	long-term monitoring
m	metre
NT	Northwest Territories
PHC	petroleum hydrocarbon
PSPC	Public Services and Procurement Canada
RAP	remedial action plan
R/RM	remedial/risk management
SSRT	site-specific remedial target
Stantec	Stantec Consulting Ltd.
WL	Water Licence



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1.0 INTRODUCTION

The Gordon Lake Group (GLG) of sites (GLG Sites or the Sites) encompasses nine former mine and advanced exploration sites located approximately 80 kilometres (km) northeast of Yellowknife, NT, northwest of the East Arm of Great Slave Lake. The GLG Sites fall within the asserted Akaitcho Territory and are also located in the Mowhi Gogha De Niitlèè boundary within the Wek'èezhii management area of the Tlicho settlement area. All nine sites fall under the custodial responsibility of Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC), and site remediation has been coordinated by Public Services and Procurement Canada (PSPC). The area is asserted as a traditional use area for Métis people of the Great Slave Lake area, who are represented by the Northwest Territory Métis Nation and the North Slave Métis Alliance. The GLG sites include:

- Burnt Island (mine site)
- Camlaren (mine site)
- Goodrock (mine site)
- Kidney Pond (mine site)
- Murray Lake (advanced exploration site)
- Storm Property (advanced exploration site)
- Treacy (mine site)
- Try Me (advanced exploration site)
- West Bay (mine site)

Figure A1, Appendix A, shows the relative location of each site around Gordon Lake.

Delta Engineering and Nahanni Construction, in Joint Venture (DNV) was contracted to complete the remediation of the Sites (which occurred between 2017 and 2019) and Stantec Consulting Ltd. (Stantec) was engaged to provide construction contract supervision. In 2019, construction/remedial activities at the mine sites were completed and Stantec was retained to complete monitoring associated with Year 1 of the Phase I Long-Term Monitoring (LTM) Plan for the Sites. This report documents the monitoring completed during Year 1 (i.e. 2019) of the Phase I LTM Plan for the Gordon Lake Project.

1.1 PURPOSE

The purpose of the Phase I LTM Plan is to verify that the selected remedial/risk management measures implemented during the remediation program remain protective of human health and the environment by monitoring the potential for residual risks remaining at the nine Sites following the completion of the Gordon Lake remediation program.

The Phase I LTM Plan will provide sufficient data to characterize post-remediation conditions. Consistent with other northern contaminated sites, this is accomplished with a monitoring program conducted for a period of five years following remediation. At the completion of this phase, results will be evaluated within a Performance Assessment Report to determine if monitoring is concluded (i.e. site closure), or if additional monitoring is required at a reduced frequency. Should monitoring results indicate remedial



activities have failed to meet LTM objectives or monitoring endpoints, additional remedial effort may be required. The current Phase I LTM contains only those requirements of the initial phase of LTM (Year 1-5). The design of the next phase of monitoring, if deemed necessary, will be founded on an adaptive management approach.

Within federal LTM Guidance (Environmental Sciences Group [ESG] and Franz Environmental [Franz], 2013), “adaptive management” specific to the LTM phase refers to a process that should be used to “adjust the monitoring program design, the level of effort for sampling, and/or the remedial strategy throughout the post-remediation monitoring period as the monitoring data are collected.”

Adaptive management is a cyclic process which is perpetuated by the acquisition of LTM data. Through the structured review and analysis of collected data and examination of monitoring event outcomes, the Phase I LTM Plan has the ability to improve and adapt to unforeseen changes to site conditions, which can lead to less frequent monitoring requirements. The identification of transient increases to contaminant of concern (COC) concentrations as a result of construction activities that reduce to steady-state conditions is a key element of monitoring during the adaptive management phase.

This Phase I LTM Plan will be further developed as the monitoring program proceeds, depending on the specific conditions observed during monitoring. Due to the nature of the adaptive management approach, the overall schedule of the Phase I LTM Plan will depend heavily on results of early steady-state monitoring events. Although monitoring results and observations will be reviewed after each monitoring event, at the end of five years a Performance Assessment report will be prepared. This report will outline the findings of the first five years of monitoring, anticipated to include the transient stage and early steady-state conditions, and provide recommendations on LTM activities to be executed moving forward as appropriate.

In addition to the Phase I LTM Plan, an Operations, Maintenance and Surveillance (OMS) Plan was developed for the Project during the final construction phase of the Project, at the end of the Construction and Post Construction Monitoring (CPCM) period. As a result, the OMS Plan is based significantly on the content outlined in the Phase I LTM Plan. The surveillance (i.e. monitoring) requirements outlined in the Phase I LTM Plan were incorporated together with operations and maintenance requirements of the Project to form the OMS Plan.

Operations and maintenance requirements presented in the OMS Plan focus on the Tailings and Soil Containment Area (TSCA) at Camlaren – the primary engineered facility constructed as part of the remediation program. Other remedial components are included as part of LTM activities, but only remediation components associated with mine openings require planned operations and maintenance activities. For further details, refer to the OMS Plan (Stantec 2020b).

1.2 OBJECTIVES

The LTM Plan has been broken up into two phases; an initial phase (i.e. Phase I) which covers the first five years after remediation (including post-construction) in accordance with Federal Contaminated Sites Action Plan (FCSAP) Long-Term Monitoring Planning Guidance (ESG and Franz, 2013), and then reconsideration to develop an LTM which covers activities for year six onward as necessary. Both phases



incorporate adaptive management which allows for continual evaluation of the remedial strategies and monitoring plans to confirm the continued achievement of the established remedial objectives of the GLG Project.

The Phase I LTM Plan provides a comprehensive monitoring plan based on the initial versions of the CPCM and LTM plans, Water Licence (WL) requirements, and FCSAP guidance.

2.0 BACKGROUND

The GLG Sites were active between the late 1930s and 2008 with several companies involved in the mining operations at the Sites. Activities ranged from open-pit mining to exploratory drilling and were generally undertaken independently between the mine sites. With the mine sites abandoned, several environmental concerns arose from materials and debris left on-site including:

- Petroleum hydrocarbon (PHC) and/or metal impacted soil/tailings, sediment/submerged tailings, and surface water;
- Tailings and waste rock piles with the potential to produce acid rock drainage (ARD); and
- Hazardous and non-hazardous debris and physical hazards (mine openings and trenches).

These concerns were remediated over several field seasons between 2017 and 2019, and the LTM Plan is now in place to monitor the effectiveness of these efforts. The Phase I LTM components for each site are outlined in Tables B-1, B-2 and B-3 (Appendix B). Site-specific identification information is displayed in Table 2.1 and a summary of the Year 1 Phase I Hazard Components are summarized in Table 2.2.



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Table 2.1 Site Identification Information

	Burnt Island	Camlaren	Goodrock	Kidney Pond	Murray Lake	Storm Property	Treacy	Try Me	West Bay
FCSI No. of Contaminated Site	23547	162	351	24120	24158	24145	24141	24155	C1037001
Exact Site Name as listed in IDEA	Burnt Island Mine Site	Camlaren Mine	Goodrock Mine	Kidney Pond / Knights Bay	Murray Lake Exploration Site	Storm Property	Treacy Mine	Try Me Exploration Site	West Bay / Black Ridge
Reporting Organization	CIRNAC	CIRNAC	CIRNAC	CIRNAC	CIRNAC	CIRNAC	CIRNAC	CIRNAC	CIRNAC
Legal description or metes and bounds	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Approximate Site Area (ha)	12.9	12	2.67	10	3.2	2.4	0.5	2.5	2.5
Centre of Site Coordinates Lat/Long (degrees, min, sec)	63°3'49" N 113°10'6" W	62°59'8" N 113°12'19" W	63°01'51" N 113°08'1" W	62°57'20" N 113°20'9" W	63°00'45" N 113°24'30" W	63°00'21" N 113°07'29" W	63°56'28" N 113°20'14" W	63°04'09" N 113°28'32" W	62°55'1" N 113°14'4" W
Centre of Site Coordinates UTM	6994531 m N 390423 m E	6985896 m N 388258 m E	6990816 m N 392056 m E	6982742 m N 381430 m E	6989573 m N 278251 m E	6988017 m N 392413 m E	6981182 m N 381894 m E	6995654 m N 374744 m E	6978287 m N 386523 m E
NWT Contaminated / Waste Site Database Number	220	205	466	474	490	471	475	488	211/302

FCSI = Federal Contaminated Sites Inventory

IDEA = Interdepartmental Data Exchange Application



Table 2.2 Hazard Components of Year 1 Phase I LTM

Hazard Category	Monitoring Objective
Mine Openings	Verify backfill material is stable with no significant resulting erosion or settlement.
Tailings	Verify cover material is stable with no significant resulting erosion or washout.
Moderate Risk Waste Rock	Verify no visual signs of ARD down-gradient of remaining impacts.
Metals Impacted Soil	Verify excavation backfill material is stable with no significant resulting erosion or washout into down-gradient water.
PHC Impacted Soil	Verify excavation backfill material is stable with no significant resulting erosion or washout into down-gradient water.
Co-Mingled Impacted Soil	Verify excavation backfill material is stable with no significant resulting erosion or washout into down-gradient water. Visually monitor vegetative health to confirm stable or increasing growth.

2.1 PROJECT ENVIRONMENT

This section provides a summary description of the project environment. This information is drawn from the Gordon Lake Gap Assessment Report (Stantec, 2016a).

2.1.1 Climate

Gordon Lake is in Northern Canada and although it is south of the Arctic Circle, it is subject to extreme weather. According to historical averages provided by the Government of Canada's Climate Normals Station Data (1981-2010) Station ID 2204100 (located in Yellowknife, NT), Gordon Lake's temperatures typically reach subzero daily averages for seven months of the year (October to April). Temperatures in this area have historically reached below -50°C in these winter months. In the remaining five months of the year, the average daily temperature is above the freezing point. The daily average temperature is below 10°C for the months of May and September, while between June and August, the daily average temperature ranges from 13-17°C. The total average annual precipitation is 288.6 millimeters (mm) (Station ID 2204100). Rainfall averages (approximately 170.7 mm) are higher than snowfall averages (156 centimeters (cm) or approximately 117.9 mm precipitation); snowfall can occur during any month of the year but has a very low likelihood in the months of June to August (EC, 2015).

2.1.2 Hydrology

The watershed surrounding the GLG sites is difficult to define as the area is encompassed by a vast number of smaller water bodies. The Cameron River system, which is located near the West Bay site, has been defined as the location to which the Lake's water outlets. Seven months of the year, typically subzero temperatures cause the surface water to freeze. This may cause a flux in precipitation infiltration, which results in either surface water runoff or a greater accumulation on the surface (Humphries, 2005).



2.1.3 Surficial Geology and Mineralization

The GLG Sites lie within the Slave Province, an Archean granite-greenstone terrane located in the northwestern Canadian Shield. The supracrustal rocks of this terrane comprise sedimentary and volcanic rocks intruded by granitic bodies that have undergone multiple phased deformation events and date between 2.71 and 2.65 Ga (1×10^9 years ago) (Mortensen *et al.*, 1988). The Sites occur within the Burwash Formation, part of the Duncan Lake Group, assigned to the Yellowknife Supergroup (Bleeker and Villeneuve, 1995). The metasedimentary rocks of the Burwash Formation are dominantly low to high grade metamorphosed turbidite (metaturbite) sequences of well-preserved mudstone grading to greywacke. The GLG Sites are situated on two members of the Burwash Formation, Atl and Atm, low-grade and medium-grade metaturbites, respectively.

The Slave Province is recognized for its province-wide zoning of three major gold deposit types; gold hosted in 1) quartz veins, 2) shear zones, and 3) iron formations. Most gold deposits formed before the intrusion of the major granitic bodies (Ferguson *et al.*, 2005). The GLG Sites feature mainly gold-sulphide bearing white-smoky quartz veins hosted in metaturbites of the Burwash Formation. Sulphide minerals associated with these deposit types include pyrite, pyrrhotite, marcasite, chalcopyrite, arsenopyrite, galena, and sphalerite.

This region was last covered by the Late Wisconsin glaciation event until about 11,000 years before present (BP) and was completely ice-free by 10,000 BP (Dyke and Prest, 1987). Paleo ice flow was generally to the southwest (Kerr, 1990) as apparent by orientation of drumlins and eskers (Othof *et al.*, 2014).

Retreating ice-sheets deposited fine-grained glaciolacustrine sediments below 320 to 350 metre (m) elevation in the Great Bear and Great Slave basins. In the Gordon Lake area, re-worked glacial and glaciofluvial sediments are the dominant surficial material with till thickness and distribution increasing westerly and northwesterly. Till thickness varies but is generally greater than 2 m occurring as silt to gravel blankets, following bedrock topography, and may include patches of till veneer or drumlinoids.

With respect to permafrost, the Gordon Lake area is located within the extensive discontinuous permafrost zone, where permafrost can be found on 50% to 90% of the land (Heginbottom *et al.*, 1995). Within the extensive discontinuous permafrost zone, ground ice content in the upper 10 m of ground is believed to range from low to medium (<10 % to approximately 20% by volume) and consist mainly of frozen pore water (i.e. interstitial ice), ice lenses and ice veins (i.e. segregated ice and reticulated ice). Ice wedges, which are a type of patterned ground resulting from thermal contraction and cracking of the ground surface (ACGR, 1988), might occur locally.

The distribution of the permafrost in the area is related to several interconnected factors such as the local climate, ground surface topography, material types and textures, vegetation coverage and drainage conditions. Similarly, the variation in the amount of ground ice present within the permafrost is found to be directly related to factors such as the nature of the surficial deposits and characteristics of the local terrain.



No data is currently available on the local distribution of the permafrost in the Gordon Lake area; however, our knowledge of northern environments suggests that peat bogs and fine-grained deposits (e.g., silty to clayey lacustrine and/or glaciolacustrine sediments) are likely the only terrain units containing permafrost in the area. Bedrock outcrops and well- to rapidly-drained, coarse-grained deposits such as till and glaciofluvial deposits are likely free of permafrost. Where permafrost is present, the active layer (i.e. the portion of soil that thaws each summer and refreezes in the winter) would typically range between 0.5 m and 1.5 m deep and would vary greatly depending on local ground conditions. `

2.1.4 Bedrock Geology

Most of the bedrock in the Gordon Lake Area is Archean (over 2.5 billion years old) or Paleoproterozoic (1.6 – 2.5 billion years old) in age (ECG, 2008). The bedrock surface is often highly fractured (frost shattered) and subject to extensive frost heave. The borrow assessment completed at the GLG sites identified discontinuous veneers of till and glaciofluvial deposits. The till veneers generally consist of sandy material with variable amounts of angular to sub-rounded gravel to boulder size fragments. The glaciofluvial material, mainly eskers and/or outwash deposits, are predominately sandy material, with localized gravel. Coarse fragments were generally located at the surface (i.e. 0 to 30 cm in depth) and their frequency decreases rapidly with depth. The material is well sorted and contains very low amounts of fines (i.e. silt and clays).

2.1.5 Biological Environment

The GLG sites are located in the Taiga Shield - Great Slave Upland Low Subarctic (LS) Ecoregion of the Northwest Territories (ECG, 2008). The total area of this ecoregion in the NWT is approximately 15,431 km² or 13.5% of the Taiga Shield LS Ecoregion (ECG, 2008). This Ecoregion is known for having a bedrock-dominated landscape that is sloped towards the southwest, which supports scattered black spruce woodland growth on the bedrock outcrops. In areas of till veneers and blankets, it is common to have dense black spruce forests occur. In areas of outwash, white spruce woodlands are common and Jack pine can be found in areas of lower elevation (ECG, 2008).

2.2 SUMMARY OF REMEDIAL/RISK MANAGEMENT ACTIVITIES

Although the GLG sites where remedial/risk management (R/RM) activities were completed are separated geographically, the remedial approaches selected were common amongst most of the GLG sites.

The history of each site and areas requiring remediation was previously presented in the Remedial Action Plan (RAP; Stantec, 2016b). Figures included in Appendix A illustrate current site conditions (i.e. following remediation) and display areas included in the Phase I LTM Plan. Table B-1, Appendix B lists area-specific details such as hazard category, physical description and remedial approach. Table 2.3 (below) summarizes the R/RM options for each identified hazard component.



Table 2.3 Summary of Remediation/Risk Management Options per Hazard Component

Hazard Component	Selected R/RM Option
Surficial Mine Openings	Backfill and/or engineered cap. Institutional/administrative controls.
Non-Hazardous Waste	Demolition waste: Burn unpainted wood, and consolidate remainder at TSCA Debris: Consolidate at TSCA
Hazardous Waste	Containerize for off-site disposal.
Impacted Soil and Tailings (Metal and co-mingled)	Excavate and dispose of at the TSCA
Impacted Soil (PHC)	Excavate and dispose of at the TSCA
High Risk Impacting Waste Rock	Excavate and dispose of at the TSCA
Excavation Areas (including remedial excavations, mine openings, tailings cover and sumps)	Backfilling and/or covering and/or regrading (depending on the hazard component).

2.2.1 Target Contaminants of Concern for Long-Term Monitoring

COCs were identified during previous assessment work in comparison to generic environmental quality guidelines. Site-Specific Remedial Targets (SSRTs) were developed based on representative exposure conditions for receptors. The SSRTs represent the target levels for maximum allowable concentration of COCs monitored. The SSRTs are specific to terrestrial (i.e. soil) COCs and are thresholds for significant risk. During the Project, the SSRTs were applied to the results of the confirmatory soil samples as outlined in the CPCM Plan. The soil SSRTs pertinent to LTM objectives focus on metals COCs and are summarized in Table 2.4.

Table 2.4 Site-Specific Remedial Targets for Soil

COC	SSRT (mg/kg)
Arsenic	69
Cobalt	130
Lead	332
Mercury, inorganic	13

2.2.1.1 Other Guidelines

Other reference guidelines that are to be used during the Phase I LTM Plan include Canadian Council of Ministers of the Environment (CCME) Canadian Environmental Quality Guidelines (CEQG online tables) and Federal Interim Groundwater Quality Guidelines for Federal Contaminated Sites (FIGQG) further detailed below.



CCME Canadian Environmental Quality Guidelines

The CCME CEQG provide limits for contaminants in surface water and are intended to maintain, improve, and/or protect environmental quality and human health at contaminated sites in general. Environmental water quality guidelines are derived using toxicological data to determine the threshold level to the most sensitive receptors. The latest updates of these CCME CEQG are now kept on-line through the CCME website. The analytical results of samples collected as part of the Phase I LTM Plan will be compared to the CCME Freshwater Aquatic Life (FAL) long-term guidelines (CCME, 1999, on-line summary tables).

Federal Interim Groundwater Quality Guidelines

Developed under the FCSAP, the FIGQG are a tiered approach to evaluating groundwater quality. The FIGQG are based on the consideration of several exposure pathway scenarios and receptors. For the purposes of the GLG Phase I LTM, monitoring results will be compared to the Tier 1 FIGQG for agriculture land use for coarse grained soil types. Groundwater was not identified as having receptors of concern for the GLG Project; however, groundwater migration to surface water is a pathway of concern and is therefore addressed within the surface water receptor risk.

2.3 SURVEILLANCE NETWORK PROGRAM

As outlined in Annex A, Part B of the WL, continued sampling of SNP stations is required at the GLG Sites. It should be noted that SNP Stations 2016-7, 2016-8, and 2016-11 are post-construction monitoring activities (and would be considered further during adaptive management) and are carried forward for consideration during post-construction and LTM:

- SNP Station 2016-7: Groundwater sampling at the TSCA at Camlaren
- SNP Station 2016-8: Water discharge sampling from the TSCA at Camlaren
- SNP Station 2016-11: Surface water sampling in areas proximate (within 30 m) to significant excavation areas including TSCA at Camlaren, Burnt Island, Kidney Pond, Treacy, and West Bay

Over time, the sampling requirements of the SNP program may be adjusted or reduced (e.g. frequency, parameters, number of samples, etc.) based on the results of the monitoring activities. The adjustments or reductions in sampling requirements would be completed in consultation with the MVLWB. SNP Stations 2016-7 and 8 will be tailored specifically to long-term TSCA performance monitoring. Approximate SNP monitoring locations have been included on the figures presented in Appendix A, however discussion is presented under a separate cover.

3.0 LTM PLAN SCOPE

The scope of the Phase I LTM Plan includes the following activities:

1. Monitoring to confirm the effectiveness of the R/RM strategies
2. Performance monitoring of the engineered facility (TSCA)
3. Surveillance Network Program



Data collection methods during monitoring will consist of intrusive and non-intrusive activities, including visual observations. Tables B-2 and B-3 in Appendix B include data collection details such as monitoring driver, frequency, and parameters. Details pertaining to monitoring methodology and data collection are included in the following sections.

3.1 GENERAL METHODS

3.1.1 Visual Monitoring

Non-intrusive visual monitoring activities will include taking photos from established locations to track physical changes, collecting measurements of component features being inspected, and recording observations pertaining to the established decision rules.

Field personnel will use field logs to record details such as date, field personnel, weather, site component, GPS coordinates, observations, photographs taken, and other relevant information. Field notes will include measurements and observations associated with erosion, turbidity, settlement, physical deformations/cracking/depressions (including depths), vegetation health, proximity to site features, and other relevant information.

A photograph log will be maintained to identify photographs taken and the components that each log is meant to document. The information in the photograph log will include: the photograph's unique identifier, the date and time the photograph was taken, the location the photograph was taken from, the direction the camera was facing, and a brief description of the contents of the photograph.

The visual monitoring should be conducted at a similar time of year to be seasonally consistent for comparison purposes (e.g. vegetation growth in August). Photographic logs and detailed observation records will be collected and used to support management decisions regarding monitoring requirements / modifications. Photo reference points are presented graphically in Appendix A.

3.1.2 Soil Sampling Methodology

If soil sampling is required, it will be a combination of surface and subsurface samples. In general, soil samples will be collected to characterize soil quality to verify that no risk is posed to the surrounding environment from the remaining material.

Grab samples will be collected using clean gloves. A hand shovel, pickaxe and/or hand auger will be used as needed. To limit cross-contamination, samples will be chosen that did not come into direct contact with equipment. After sample collection, the equipment will be cleaned using a solution of distilled water and a biodegradable soap (or similar) and subsequently rinsed with distilled water. Sample locations will be recorded using a designated GPS unit. Samples will be placed into laboratory supplied jars and selectively analyzed for the COCs presented in Table 2.4.



3.1.3 Surface Water Sampling Methodology

If surface water sampling is required (i.e. areas of water drainage or seepage), samples will be collected as grab samples. To limit cross-contamination, sample bottles will not come into contact with any surface that may potentially contaminate the sample. Each sample will be collected using clean gloves and the sample bottle completely submerged to obtain a representative sample.

A multi-probe will be used to record field parameters (including temperature, conductivity, pH, oxidation reduction potential (ORP), dissolved oxygen (DO), total dissolved solids (TDS)) for sample locations, as required or applicable. It should be noted that sample locations may be adjusted based on field conditions (e.g. water availability, dry conditions, seepage locations, etc.). If the sample(s) deviates from predetermined locations, the location it will be recorded using a designated GPS unit. Samples will be placed into laboratory supplied jars and selectively analyzed for the COCs presented in Table B-3, Appendix B. Seasonally-consistent monitoring should be undertaken for comparison purposes between years.

3.1.4 Groundwater Sampling Methodology

Groundwater samples will be collected from monitoring wells using an appropriate sampling method (e.g. peristaltic pump). In addition to water elevation measurements, a YSI multi-probe will be used to record field parameters (including temperature, conductivity, pH, ORP, DO, TDS) for sample locations, as required or applicable. It should be noted that groundwater sample locations may be dry depending on seasonal variation. Samples will be placed into laboratory supplied jars and selectively analyzed for the COCs presented in Table B-3, Appendix B. Seasonally-consistent monitoring should be undertaken for comparison purposes between years.

3.1.5 Overall Monitoring Requirements

Overall monitoring details include the following:

- Checking equipment calibration and calibrate as needed
- Following Quality Assurance/Quality Control (QA/QC) procedures
- Taking photographs regularly and as needed
- Recording actual sample locations (and other relevant points) using a GPS unit
- Using a total station survey to record locations, elevations or details requiring additional accuracy if needed

The samples will be collected using Standard Operating Procedures (SOPs) and quality management protocols in accordance with CCME *Guidance Manual for Environmental Site Characterization in Support of Environmental and Human Health Risk Assessment* (CCME, 2016), and other relevant guidance. Appropriate equipment and tools (e.g. pump, surface water sampling tools, etc.) will be selected based on field conditions and professional judgment.



3.1.6 Quality Assurance/Quality Control (QA/QC)

Best practice Standard Operating Procedures (SOPs), as part of a Quality Management System (QMS), includes work procedures and instructions that are developed for technical work. QMS and associated SOPs allow control of the quality of work throughout the project program. Selected SOPs will be reviewed by field personnel prior to mobilizing to site. Best practices will be applied, and the SOPs will be modified as required to reflect conducting work in a remote environment in the north. However, overall these SOPs will provide guidance to conduct field processes in accordance with industry standards.

During sampling, efforts will be made to reduce the potential for cross-contamination to obtain representative samples. As a check on the field methodology, laboratory analytical methods, and sample precision, the following quality control procedures will be followed:

- A new pair of disposable nitrile gloves will be used for each sample
- Soil, groundwater, and surface water samples will be placed into laboratory-supplied sample containers
- Samples will be preserved according to laboratory specifications
- Samples will be stored in ice-packed coolers for shipment to laboratory
- Each sample will be provided with a unique identifier
- Samples will be controlled using laboratory chain of custody forms
- Samples will be analyzed within laboratory recommended hold times
- Blind field duplicate (BFD) samples will be submitted for 10% of all soil and water samples, as well as trip blanks and field blanks, as appropriate
- Samples will be submitted to an accredited laboratory (Canadian Association for Laboratory Accreditation (CALA) or Standards Council of Canada (SCC)) who use CCME-recognized methods to conduct laboratory analyses.
- The chosen laboratory will conduct routine internal QA/QC tests, which include method blanks, control standards samples, certified reference material standards, method spikes, replicates, duplicates and instrument blanks.

3.2 ESTABLISHING MONITORING DECISION RULES

Decision rules are quantitative pass/fail conditions that form the basis of concluding that a specified condition has been and/or is being met. These rules also aid in Adaptive Management for monitoring activities and improve decision-making. Decision rules are predominantly based on statistically significant trends (increasing, decreasing, or stable) at the steady-state phase. Steady state is defined as the point in which the transient effects from remedial and construction activities are no longer physically or chemically observed, which will also be statistically defined for each data set. Phase I LTM decision rules for the monitoring requirements for the GLG Project are provided in sections below.



3.3 ESTABLISHING LTM EXIT CRITERIA

To evaluate the progress toward site closure, action levels are established that represent the attainment of a desired condition. These site closure action levels are associated with specific monitoring objectives and are used to determine when monitoring can be concluded. Exit criteria are provided for each monitoring objective in Table B-2, Appendix B, and can be summarized as follows:

- Visual monitoring of backfilled or covered areas with potential high risk for erosion/washout to down-gradient water.
- Performance monitoring of the TSCA to verify that conditions of the TSCA are stable, both chemically and physically.
- Visual monitoring of mine openings backfilled and/or capped to verify stability.
- Monitoring of moderate risk waste rock left in place to verify no visual signs of ARD.
- Through monitoring and statistical analysis of COC concentrations down-gradient of remedial components and residual waste locations, it can be determined if exit criteria have been met. Overall it should be shown that risk to human health and the surrounding environment continues to be reduced to acceptable levels.

3.4 DATA ANALYSIS

Physical changes occurring over time at each of the areas to be monitored will be captured by a photo log for each monitoring event. Through the comparison of these event-specific photographic logs, one will be better able to identify physical changes occurring over extended periods of time. Additionally, measurements of quantifiable physical changes such as settlement, slumping, erosion, and vegetation will be collected and compared to previously collected data.

Analytical results from media sampled during monitoring events will be tabulated and statistically analyzed. Trend analysis will be completed from three consecutive bi-annual monitoring events to determine statistical significance and distinguish steady-state phase from transient phase. These analyses will help determine if the expected outcomes and objectives of remedial activities will be achieved and if closure is likely.

3.4.1 Statistical Analysis

Although there are several potential methodologies for statistical trend analysis, the most likely approaches that will be adopted are the Mann-Kendall test and regression analysis, both further described below. To determine the more appropriate methodology of the two, distribution fit testing will be conducted using an appropriate program (e.g. ProUCL); if a distribution does not fit the given data set then the Mann-Kendall test will be used, otherwise regression analysis will be used.

The Mann-Kendall test is a statistical method used to identify trends in the concentrations of individual monitored parameters at an individual monitoring point. *Practical Handbook of Environmental Site Characterization and Groundwater Monitoring* (CRC, 2006) describes the Mann-Kendall analysis as “a test for zero slope of time-ordered data that is based on a non-parametric analog of linear regression”. In executing the analysis, concentration results are ordered chronologically. Starting with the first data point,



each subsequent data point is compared to the first data point, and a +1 (if the latter point is greater than the first), -1 (if the latter point is less than the first), or 0 (if the points are equal) is entered into a matrix. This is repeated starting with the second, then third, etc. data points. A value of “0” is given to any data point that was identified as “non-detect”, as it is known that these data points would either be less than or equal to the value before, whether it was a detectable concentration or another non-detect value, respectively. Upon completion of the matrix, the rows in the matrix are summed, and these sums are then summed to generate the Mann-Kendall statistic (S). A positive value indicates an increasing trend, and a negative value indicates a decreasing trend. The S value is then used in the Null Probabilities for the Mann-Kendall Statistic table to look up the corresponding significance level. A confidence level for the identified trend can then be determined, and a decision on its defensibility made.

A standard parametric regression (e.g. bivariate linear regression) is also a statistical method used to identify trends in the concentrations of individual monitored parameters at an individual monitoring point. However, unlike Mann-Kendall, standard regression uses a parametric approach that involves assumptions associated with the distribution of data. The regression analysis uses predictions for the data distribution to determine the linear equation ($Y = mX + b$) that best fits the data to minimize the squared deviations of the parameters and maximize the R-squared value. The data is analyzed based on the linear equation of the data set as well as appropriate levels of confidence to determine statistical significance. The slope of the line (m) indicates if the trend is increasing (positive slope), decreasing (negative slope) or stable (neither increase nor decreasing based on appropriate confidence level). The use of regression analysis can also allow for interpretation of the underlying nature of the data, which may be better expressed by several lines as opposed to one line. Stantec has access to statistical programs (e.g. Systat or R) to conduct regression analysis and implement methods for thorough statistical interpretation of data.

A statistically significant result is one which is unlikely to have occurred by chance. In practice, the confidence level selected to assess statistical significance is an arbitrary value of either 0.05 (95% confidence) or 0.1 (90% confidence). Although it is assumed that a confidence level of 95% will be selected for assessing statistical significance, it will be dependent on and adjusted appropriately for each data set.

Although a trend can technically be obtained from three data points, different statistical approaches have different data limits. For example, Mann-Kendall has been demonstrated to be effective in identifying trends in data sets with between 4 and 40 sampling events. Regression analysis can be conducted on 3 data points for a given data set; however, as per most statistical methods, more data points are preferred to more accurately interpret a given dataset.

Methodology for statistical analysis will be revisited annually (at a minimum) for consideration of applicability of the statistical methodology. For a given dataset (e.g. COC, media, etc.), the statistical approach may change over time as additional data is obtained to further characterize the nature of the data if it is determined that an alternate statistical approach is better suited to interpret the data set.



3.5 BACKFILLED/COVERED AREA MONITORING

Excavation areas, as described in the MVLWB WL conditions, are considered hazard components that are part of the remediation program and will result in disturbance to areas of the site. Such areas include backfilled remedial excavations with high potential for erosion risk (i.e. in close proximity to water bodies), the hotspot covered at Goodrock (GOO_HS_01), and tailings cover (Burnt Island). Activities that included backfilling, regrading and covering could potentially result in effects such as erosion and washout over time.

During Phase I of the LTM, if no significant erosion or washout of backfill or cover material is observed over three consecutive biennial monitoring events, the action level will be considered met and monitoring can be concluded. The following conditions will result in the action level not being considered met:

- If backfill or cover material has settled, eroded, or washed out resulting in rills greater than 10 cm.
- If erosion/washout concerns are identified in water down-gradient of backfilled excavations.
- If erosion/washout exposes the tailings underlying the cover at Burnt Island.
- If erosion/washout exposes the soil underlying the cover at the Goodrock hotspot.

These scenarios will constitute a trigger for action, and review and/or modification of the remedial / reclamation approach will be required. Monitoring associated with SNP Station 2016-11 includes total suspended solids (TSS) and aligns with the backfilled remedial excavations with potentially high erosion risk.

It should be noted that there are no exit criteria associated with performance monitoring; however, the frequency of monitoring will be adjusted (e.g. decreased) after the Phase I LTM is completed to a minimum of once every 5 years. The performance monitoring associated with the TSCA is expected to continue until deemed no longer necessary, which will be based on long-term results of performance monitoring (i.e. data obtained over decades).

3.6 MINE OPENING MONITORING

Each mine opening remediated either through backfilling and/or capping, or through installation of a barrier, will be visually inspected for backfill settlement and structural stability of the engineered cap / barrier.

If quinquennial inspections indicate that the backfill material has not settled more than a total of 0.5 m (from the original elevation) and the cap is structurally stable (e.g. no deformation or cracking observed), the action levels will be considered met (i.e. no action required). Otherwise, the action levels will not be considered met and this will constitute a trigger for action, and review and/or modification of the remedial design components will be required.

It should be noted that there are no exit criteria associated with mine openings unless otherwise authorized by authorities having jurisdiction (AHJs).



3.7 MONITORING OF MODERATE RISK WASTE ROCK LEFT IN PLACE

Each of the waste rock areas classified as having moderate risk (i.e. that have been identified but not remediated) will be visually assessed for signs of ARD-related impacts. The action levels will be considered met when quinquennial visual inspections of these areas indicate ARD is not impacting the down-gradient environment. If action levels are not met (i.e. visual signs of ARD are observed) during a single monitoring event, this will constitute an immediate trigger for action as visual signs of ARD (e.g. new loss in vegetation, stressed vegetation, discoloration, etc.) would not be expected to recover once observed. If potentially impacted areas are identified, the action will be to collect surface water and/or soil samples in the area to determine if resulting ARD is negatively impacting the surrounding environment (i.e. down-gradient).

The West Bay waste rock piles were previously classified as high risk and a remedial design to address potential risk was considered. Additional data indicated that a remedial design would not be required to address potential risk resulting from these waste rock piles. However, it was recommended that follow-up water quality monitoring be conducted in accordance with LTM requirements. Therefore, the West Bay waste rock piles have similar requirements to moderate risk waste rock but with known required surface water monitoring to verify chemistry of water bodies down-gradient of remaining impacts. Additional details are provided in Tables B-2 and B-4, Appendix B.

For areas that require monitoring, only soil samples will be collected from areas with no down-gradient surface water body in close proximity (i.e. approximately 30 m; with the exception of West Bay, as noted above and in Section 3.12). Surface water samples will be collected from areas of water drainage or seepage observed in the field. COC concentration data will be collected and used to establish trends from which management decisions can be made. Action levels will be considered met when surface water COC concentrations remain stable or below those observed after construction is completed and/or remain below applicable guidelines. A trigger for action and review and/or modification of the monitoring frequency and/or remedial design components may be required if COC concentrations, after having obtained sufficient data to establish a trend, are observed to be increasing and/or above applicable guidelines for three consecutive bi-annual monitoring events. Any soil collected will be compared to the soil SSRTs for metals.

3.8 VEGETATION MONITORING

The long-term vegetation monitoring proposed in the Phase I LTM Plan will be implemented with the objective of evaluating vegetation sustainability success (MVLWB, 2014; GNWT, 2015). The areas to be monitored include the TSCA at Camlaren, Camlaren Mine Area South shoreline, Zenith Island, Kidney Pond Portal area, Kidney Pond Exploration Camp area, and Treacy Mill Area. The vegetated locations will be monitored to record observations regarding vegetation health to confirm stable or increasing growth. Except for performance monitoring associated with the TSCA, specific action levels/exit criteria have not been specified for vegetated areas as there was no specific requirement to do so.



The following plant species were planted at the GLG sites: green alder (*Alnus viridis*), kinnikinnick (*Arctostaphylos uva-ursi*), wild rose (*Rosa* sp.), raspberry (*Rubus idaeus*), soapberry (*Shpherdia canadensis*), lingonberry (*Vaccinium vitis-idaea*), fireweed (*Chamerion angustifolium*), common yarrow (*Achillea millefolium*), slender wild rye (*Elymus trachycaulus*), fox-tailed Barley (*Hordeum jubatum*), sedge (*Carex* sp.), rush (*Juncus* sp.), field horsetail (*Equisetum arvense*), and willows (*Salix* sp.) (Flat River Consulting, 2018).

3.8.1 TSCA Vegetation

Tree species that typically develop deeper roots (more than 0.3 m depth) were not proposed for planting on the TSCA and will require removal if they become naturally established (e.g. black spruce, white spruce, tamarack, poplar, and white birch). These species can potentially grow roots deep enough through the capping materials and penetrate the liner thereby posing a risk to liner integrity. In addition, the tree species have a higher likelihood of blowing over, which would result in the roots pulling up and exposing the lower layers of the capping material to erosion forces, and potentially could expose the liner if enough capping material is pulled up.

During the bi-annual monitoring activities at the TSCA, vegetation monitoring will be completed simultaneously as part of the performance monitoring (e.g. erosion). The vegetation at the TSCA will be visually monitored for vegetative health to confirm stable or increasing growth. Photographs will also be collected for reference purposes.

3.8.2 Other Vegetation Areas

The other areas (Camlaren South Muir Island Shoreline, Zenith Island, Kidney Pond Portal area, Kidney Pond Dock site, and Treacy Mill Area) that were vegetated at the GLG Sites will be monitored for verification purposes. The vegetated locations will be monitored on a biennial basis (simultaneously with erosion inspections) to record observations regarding vegetation health to confirm stable or increasing growth. Photographs will also be collected for reference purposes.

3.9 RISK MANAGEMENT APPROACH (LAND USE)

Confirmation that the land uses defined in the risk management evaluation are maintained (i.e. traditional use duration, frequency, food collection, and areas frequented) is required. This is an administrative land use monitoring process that the proponent can undertake through its ongoing land stewardship process. Should proposed land use be changed to a more restrictive (i.e. higher use) form, then the risks associated with the COCs left in place would need to be revisited through an update to the risk assessment, with appropriate mitigation actions undertaken for any significant risks determined at that stage as appropriate.



3.10 TAILINGS AND SOIL CONTAINMENT AREA

The TSCA is an engineered mine waste containment facility that encompasses the Camlaren mine tailings formerly part of the TCA, as well as impacted material (soil, tailings, waste rock) and non-hazardous debris (metal, wood, etc.) from the other GLG Sites. Impacted material and non-hazardous waste from the GLG Sites were transported to Camlaren in the winter of 2018 (majority from February 4 to March 13, 2018). Some of the waste was transported via helicopter in the summer of 2018. Construction of the TSCA was completed between July and September 2018.

The detailed design for the TSCA was presented in the updated Design Basis Report (DBR) dated September 11, 2018. The mine waste was stabilized by regrading slopes and provision of the engineered cover, as follows:

- Slopes were stabilized by regrading of the perimeter dams and regrading slopes to between 3.1H:1V to 3.3H:1V.
- The engineered composite cover with Bituminous Geomembrane (BGM) was placed to prevent infiltration from entering the waste; the composite cover included the BGM placed on bedding, and 0.5 m of sand cover over the BGM.
- Erosion protection was provided by placement of vegetation on the top (willow stems/cuttings) and coarse sand with rockfill on the slopes, the slopes were also protected with semi-circle shaped coco-mats.
- Lined surface runoff ditches were constructed on the northwest and south perimeters to control drainage away from the TSCA and prevent pooling against the embankment.
- Toe drains were incorporated into low-lying areas to the northeast and southeast.

The TSCA is the primary engineered facility constructed as part of the GLG remediation program and monitoring associated with this facility is detailed in the Phase I LTM Plan and the OMS Plan (refer to Section 1.1).

3.10.1 Performance Monitoring

Bi-annual inspections will be conducted to assess the TSCA performance; the inspection will include a thorough visual inspection of the top cover, slopes, toes, ditches and instrumentation for signs of erosion, settlement, seepage, structural failure and/or compromised liner and/or cap integrity. If bi-annual visual inspections of the TSCA confirm no or acceptable signs of erosion, settlement, seepage, structural failure and/or compromised liner and/or cap integrity outlined below, the action levels will be considered met (i.e. no action required). The actions are triggered if the total threshold values outlined below are exceeded during the LTM program as compared to the original baseline measurements:

- Differential settlement of greater than 0.5 m (including for instrumentation stick-ups).
- Slopes slumping with horizontal cracks/movement of greater than 0.3 m.
- Slopes or cover erosion resulting in greater than 25% loss of material thickness.
- Frost heave effects greater than 0.2 m.
- Vegetation (primarily tree species) observed that typically develop roots deeper than 0.3 m. See Section 3.8.1 for additional details.
- Animal activities, such as burrowing, resulting in depth greater than 0.3 m.



- Erosion control coconut matting (full semi-circle, approximate length of 5 m) is no longer deemed effective.
- Ditch erosion exposes any amount of bituminous geomembrane (BGM; i.e. visible liner).
- Ditch blockage of any debris/object that impedes flow or causes ponding.
- Seepage at the toe of the facility. Seepage will also require sampling via the SNP monitoring and should be quantified, if possible.

These scenarios will constitute a trigger for action, and review and/or modification of the remedial / reclamation approach will be required. Potential mitigative actions are summarized in Table B-2, Appendix B.

In addition to the bi-annual inspections noted above, annual geotechnical inspections of the TSCA will be conducted by a qualified geotechnical engineer registered in NT. Analysis of instrumentation data will also be performed as part of these inspections. The results of the geotechnical inspections will be reported separately, but key information from these inspections will be incorporated into annual LTM reports.

3.10.2 TSCA Instrumentation

TSCA instrumentation includes two thermistors, two standpipe monitoring wells, and three locations for vibrating wire piezometers with double-nested vibrating wire sensors. In addition, there are four monitoring wells outside of the TSCA footprint installed as part of the TSCA perimeter monitoring for the SNP sampling. The locations of instrumentation are illustrated on Figures A2.1 and A2.2 and Table 3.1 provides a general overview of the TSCA instrumentation.

Table 3.1 Overview of TSCA Instrumentation

ID	Type of Installation	Northing	Easting	Ground Surface Elevation (m)
VT1	Thermistor String	6986005	388351	298.89
VT2	Thermistor String	6986055	388352	298.84
VB1	Vibrating Wire Piezometers	6985957	388335	298.11
VB2	Vibrating Wire Piezometers	6986026	388381	297.99
VB3	Vibrating Wire Piezometers	6986079	388353	298.48
MW1	Monitoring Well	6986005	388356	298.73
MW2	Monitoring Well	6986051	388352	298.96
MW3*	Monitoring Well	6986073	388393	292.41
MW4*	Monitoring Well	6985962	388376	294.52
MW5*	Monitoring Well	6985922	388236	296.58
MW6*	Monitoring Well	6986066	388238	295.45
*Monitoring well outside of the TSCA footprint				



3.10.2.1 Thermistors

Thermistor sensors are installed at 0.5 m intervals to monitor thermal conditions with depth throughout the TSCA mine waste. The temperature readings will facilitate the establishment of long-term trends and whether permafrost will establish in the deposited waste. The temperature in the waste is also used for calibration of the vibrating wire piezometers. Table 3.2 provides installation details for thermistors.

Table 3.2 Thermistors Installation Details

ID	Serial Number	Borehole Depth (m)	Depth of lowest thermistor (m)	Elevation of lowest Thermistor (m)
VT1	4773	5.9	5.8	293.09
VT2	4774	7.0	7	291.84

3.10.2.2 Vibrating Wire Piezometers

Vibrating wire piezometers are installed to measure pore pressures. The top piezometer measures pore pressures in tailings, the bottom piezometer measures pore pressures at the bottom of the borehole near bedrock or native soil. Table 3.3 provides installation details for vibrating wire piezometers.

Table 3.3 Vibrating Wire Piezometers Installation Details

ID	Serial Number	Borehole Depth (m)	Depth of piezometer (m)	Elevation of Piezometer (m)
VB1	52115	6.4	4.95	293.16
	52116		5.95	292.16
VB2	52117	6.1	4.8	293.19
	52118		5.8	292.19
VB3	52119	7.0	5.7	292.78
	52120		6.7	291.78

3.10.3 TSCA Groundwater Monitoring

Groundwater elevation within the TSCA will be recorded using the three vibrating wire piezometers and two groundwater monitoring wells. Thermal conditions within the TSCA will be recorded using installed ground thermistors (primarily to calibrate the vibrating wire piezometer readings affected by temperature). A water level tape will also be used to record the depths to grade and top of casing/piping as potential settlement will be noted. This recorded data will be collected / downloaded during each monitoring event with current groundwater elevations being verified by taking manual measurements.

Groundwater level is an exogenous variable that will likely influence contaminant concentration; therefore, tests are required to be completed for both contaminant concentration with time as well as water level with time.



Groundwater monitoring wells (i.e. up-gradient and down-gradient) will be sampled and analyzed for COCs presented in Table B-3, Appendix B to verify that contaminants contained within the engineered structure remain isolated from the surrounding environment. Groundwater monitoring down-gradient of the TSCA is anticipated to demonstrate a transient increase in contaminant concentrations resulting from the construction disturbance, and then to fall back to a steady-state. Action levels will be considered met if groundwater COC concentrations within the TSCA remain stable or below those observed after construction is completed and/or remain below applicable guidelines. Although the focus will be on contaminant concentrations down-gradient of the TSCA, the contaminant concentrations in monitoring wells within the TSCA will also be monitored for reference purposes. Groundwater COC concentrations will also be used as indicators for potential COCs in the down-gradient surface water. A trigger for action and review and/or modification of the monitoring frequency and/or remedial design components may be required if COC concentrations, after having obtained sufficient data to establish a trend, are observed to be increasing and/or above applicable guidelines for three consecutive bi-annual monitoring events.

Action levels will be considered met when groundwater elevations within the TSCA remain stable or below those observed after construction is completed. Although the focus will be on the groundwater elevations within the TSCA, the groundwater elevations in monitoring wells down-gradient of the TSCA will also be monitored for reference purposes. Action levels will be considered to not be met if groundwater elevations within the TSCA increase above those observed after construction is completed. A trigger for action and review and/or modification of the monitoring frequency and/or remedial design components may be required if groundwater level trends within the TSCA, after having obtained sufficient data to establish a trend, are observed to be increasing for three consecutive bi-annual monitoring events after construction. Table 3.4 provides installation details from monitoring wells including screen horizons.

Table 3.4 Monitoring Wells Installation Details

Borehole ID	Northing	Easting	Borehole Depth	Top of Screen		Bottom of Screen	
				Depth	Elevation	Depth	Elevation
MW#1	6986005	388356	5.3	2.1	291.33	5.2	286.13
MW#2	6986051	388352	7.1	4	287.86	7	280.86
MW#3*	6986073	388393	7.2	5.7	279.51	7.2	272.31
MW#4*	6985962	388376	3.8	2.3	288.42	3.8	284.62
MW#5*	6985922	388236	4.8	3.2	288.58	4.75	283.83
MW#6*	6986066	388238	5.4	3.9	286.15	5.4	280.75
*Monitoring well outside of the TSCA footprint and part of the SNP sampling							



3.10.4 TSCA Surface Water Sampling

SNP Station 2016-8 includes locations of potential discharge from the TSCA that are expected to discharge towards Gordon Lake. These stations encompass monitoring requirements to assess TSCA performance and identify associated potential environmental impacts. Section 3.11 provides specific information regarding SNP sampling.

3.10.5 Settlement

Monitoring of differential settlements is part of bi-annual inspections and should be evaluated visually by inspecting the TSCA top cover for any depressions exceeding 0.5 m (trigger level). In the event of a depression, the area should be clearly marked for future monitoring and the BGM liner should be tested for any failures. It is also recommended that settlement be monitored by measuring the instrumentation stick-ups of pipes and casings. As-built instrumentation stick-ups are listed in Table 3.5.

Table 3.5 Instrumentation Stick-Up Details

ID	Type of Installation	Pipe		Casing	
		Stickup Length (m)	Top Elevation (m)	Stickup Length (m)	Top Elevation (m)
VT1	Thermistor String	0.20	299.09	1.00	299.89
VT2	Thermistor String	0.35	299.19	1.00	299.84
VB1	Vibrating Wire Piezometer	0.73	298.84	1.00	299.11
VB2	Vibrating Wire Piezometer	0.60	298.59	0.87	298.86
VB3	Vibrating Wire Piezometer	0.62	299.10	0.99	299.47
MW1	Monitoring Well	0.87	299.60	1.00	299.73
MW2	Monitoring Well	0.87	299.83	0.96	299.92

3.11 SNP MONITORING

SNP monitoring includes the TSCA as well as areas down-gradient of significant remedial excavations as established by MVLWB as presented in Annex A, Part B of the WL issued for the Project. SNP Stations 2016-7, 2016-8 and 2016-11 are applicable to the Phase I LTM. SNP Stations 2016-7 and 2016-8 are associated with the TSCA (groundwater and discharge monitoring) and encompass monitoring requirements to assess TSCA performance and identify associated potential environmental impacts. SNP Station 2016-11 is associated with surface water sampling down-gradient of significant remedial excavations.



The decision rules for the SNP monitoring have been developed to consider the TSCA performance / monitoring requirements and the significant construction activities completed at the GLG Sites. For the purpose of establishing decision rules associated with SNP monitoring, decisions will be predominantly based on statistically significant trends (increasing, decreasing, or stable). COC concentration data will be collected and used to establish trends from which management decisions can be made. In general, a trigger for action and review and/or modification of the monitoring frequency and/or remedial design components may be required if COC concentrations, after having obtained sufficient data to establish a trend, are observed to be increasing and/or above applicable guidelines for three consecutive bi-annual monitoring events.

It should be noted that SNP Station 2016-11 will be monitored bi-annually to account for seasonality. The frequency will be re-evaluated after four sampling events (prior to Year 3) in correlation with erosion monitoring. Down-gradient surface water sampling may be completed if potential concerns are identified. SNP Stations 2016-7 and 2016-8 have been adjusted to a bi-annual frequency to align the SNP monitoring as practically as possible. Furthermore, the action levels and exit criteria for SNP Stations 2016-7, 2016-8, and 2016-11 are intended to be similar for consistent decision-making.

Any exogenous variables that will likely influence contaminant concentrations will be evaluated (e.g., seasonality, water level, total suspended solids), including considerations for both contaminant concentration with time as well as influencing exogenous variables with time. Potential mitigative actions are summarized in Table B-2, Appendix B.

Specific SNP monitoring details are summarized in Table 3.6 with additional details outlined in Table B-3, Appendix B. SNP stations have been included on the figures in Appendix A as approximate locations based on previous sampling and anticipated locations (e.g. TSCA discharge locations).

Table 3.6 SNP Sampling Locations

Description	SNP Station	Location	LTM Sampling Frequency	Parameters
Station 7 Monitoring Well Locations at TSCA	2016-7a	Camlaren	Adjusted from monthly to bi-annually*	<ul style="list-style-type: none"> Nutrients^a Standard^b Major Ions^c Solids^d Total Metals^e Hydrocarbons^f
	2016-7b	Camlaren		
	2016-7c	Camlaren		
	2016-7d	Camlaren		
Station 8 Discharge Locations at TSCA	2016-8a	Camlaren	Adjusted from monthly to bi-annually*	<ul style="list-style-type: none"> Ammonia as N Nitrate as N Nitrite as N TSS TDS Extractable Petroleum Hydrocarbons Standard^b Major Ions^c Total Metals^e
	2016-8b	Camlaren		
	2016-8c	Camlaren		



Table 3.6 SNP Sampling Locations

Description	SNP Station	Location	LTM Sampling Frequency	Parameters
Station 11 Surface Water Sample Locations (downgradient of significant excavation areas)	2016-11a	Burnt Island	Bi-annual monitoring to account for seasonality*	<ul style="list-style-type: none">• Ammonia as N• Nitrate as N• Nitrite as N• TSS• TDS• Extractable Petroleum Hydrocarbons Standard^b• Major Ions^c• Total Metals^e
	2016-11b1	Camlaren	Re-evaluate frequency after 4 sampling events (prior to Year 3) in correlation with erosion monitoring. The confirmatory sampling was meant to be specific for post-construction for the short-term. The backfilled areas will continue to be monitored as planned and down-gradient surface water sampling may be completed if potential concerns are identified.	
	2016-11b2	Camlaren		
	2016-11b3	Camlaren		
	2016-11b4	Camlaren		
	2016-11c	Zenith Island		
	2016-11d	Kidney Pond		
	2016-11e	Tracey		
2016-11f	West Bay			

Notes:

- * Adjusted to align the SNP monitoring as practically as possible. The action levels and exit criteria for SNP Stations 2016-7, 8, and 11 are intended to be similar for consistent decision-making.
- a. Total ammonia (NH₃ + NH₄⁺ -N), Total Nitrate + Nitrite (NO₃ + NO₂), Total Phosphorous, Orthophosphate, and Total Organic Carbon.
- b. pH, Temperature, and Conductivity. These parameters should be measured both in the field as well as in the laboratory.
- c. Alkalinity, Calcium, Chloride, Hardness, Magnesium, Potassium, Sodium, and Sulphate (SO₄).
- d. Total Suspended Solids (TSS) and Total Dissolved Solids (TDS).
- e. Full = Total elemental analysis by ICP-Metal Scan of: ICP-MS 24 element scan: includes all elements in Total Metals plus Antimony, Arsenic, Barium, Bismuth, Cesium, Chromium, Lithium, Thallium, Titanium, Uranium, & Vanadium.
- f. Extractable Hydrocarbons, and Benzene, Toluene, Ethyl-benzene, and Xylenes (BTEX).

3.12 SURFACE WATER SAMPLING – WEST BAY

Surface water samples for West Bay were incorporated into the Phase I LTM to monitor any effects from the waste rock piles (refer to Section 3.7). Sample locations and parameters analyzed are outlined in Table 3.7.



Table 3.7 Surface Water Sampling

LTM Station	Sampling Frequency	Parameters
PIT1	Semi-annually (beginning of summer and end of fall)	<ul style="list-style-type: none">• Ammonia as N• Nitrate as N• Nitrite as N• TSS• TDS• Extractable Petroleum Hydrocarbons• Standard^a• Major Ions^b• Total Metals^c
PIT2		
WET1		
WET2		
GL1		
GL2		
GL3		
PIT1		
PIT2		

Notes:

a. pH, Temperature, and Conductivity. These parameters should be measured both in the field as well as by the laboratory.

b. Alkalinity, Calcium, Chloride, Hardness, Magnesium, Potassium, Sodium, and Sulphate (SO₄).

c. Full = Total elemental analysis by ICP-Metal Scan of: ICP-MS 24 element scan: includes all elements in Total Metals plus Antimony, Arsenic, Barium, Bismuth, Cesium, Chromium, Lithium, Thallium, Titanium, Uranium, & Vanadium.

4.0 YEAR ONE RESULTS

Year One LTM Phase I site visits were conducted at the GLG Sites on July 8 through 10, and September 10 and 11, 2019 by Stantec for the purpose of data collection to assess hazard components of the LTM and support characterization of post-remediation conditions. The results are outlined in the sections below.

4.1 VISUAL MONITORING

4.1.1 Backfilled/Covered Area Monitoring

Backfilled/covered areas identified for LTM were visually inspected for settlement, erosion and structural stability (e.g. deformation, cracking), where applicable. No major concerns were identified. Detailed Inspections Records and Photographic Logs are presented in Appendix C and Appendix D, respectively. A summary of the results of the Backfilled/Covered Areas Monitoring component of the LTM is provided in Table 4.1.

In addition to visual inspections, surface water monitoring was completed down-gradient of backfilled remedial excavations with potentially high erosion risk (associated with SNP Station 2016-11) and included total suspended solids (TSS). Refer to Section 4.3 for results of the SNP sampling.



Table 4.1 Summary of Backfilled/Covered Areas Monitoring Results

Site Name	Hazard Name	Area Description	Figure in Appendix A / Photograph ID in Appendix D	Monitoring Results
Burnt Island	Tailings	Covered with granular fill	A1.2 / BUR-2 through BUR-6	Minor slumping and several shallow animal burrows identified during July 2019 site visit.
Camlaren ¹	CAM_SO_01	PHC impacts excavated and covered with granular fill	A2.2	No concerns identified.
	CAM_SO_03	PHC impacts excavated and covered with granular fill	A2.2	No concerns identified.
	CAM_SO_04	Metals impacts excavated and covered with granular fill	A2.2 / CAM-4, CAM-6	No concerns identified.
	CAM_SO_05	PHC impacts excavated and covered with granular fill	A2.2 / CAM-4, CAM-6	No concerns identified.
	CAM_SO_06	Metals impacts excavated and covered with granular fill	A2.2 / CAM-4, CAM-6	No concerns identified.
	CAM_SO_07	Metals impacts excavated and covered with granular fill	A2.2 / CAM-4, CAM-6	No concerns identified.
	CAM_SO_08	Metals impacts excavated and partially covered with granular fill	A2.2 / CAM-3, CAM-4, CAM-6	No concerns identified.
	CAM_SO_12	Metals impacts excavated and partially covered with granular fill	A2.2	No concerns identified.
	CAM_SO_14	PHC impacts excavated and covered with granular fill	A2.3	No concerns identified.
	CAM_SO_20	Metals impacts excavated and backfilled with granular fill	A2.3 / CAM-5, CAM-6	No concerns identified.
	CAM_SO_23	Metals impacts excavated and partially covered with granular fill	A2.4 / ZEN-2, ZEN-3	No concerns identified.
Goodrock	GOO_HS_01	Metals impacts excavated and partially covered with granular fill	A3.3 / GOO-4	No concerns identified.
Kidney Pond	KID_SO_07	Co-mingled metals and PHC impacts excavated and covered with granular fill	A4.3 / KID-4	No concerns identified.
	KID_SO_10	PHC impacts excavated and covered with granular fill	A4.3	No concerns identified.
	KID_SO_11	Co-mingled metals and PHC impacts excavated and covered with granular fill	A4.3 / KID-4	No concerns identified.



Table 4.1 Summary of Backfilled/Covered Areas Monitoring Results

Site Name	Hazard Name	Area Description	Figure in Appendix A / Photograph ID in Appendix D	Monitoring Results
	KID_WR_01	Waste rock excavated and area covered with granular fill	A4.3 / KID-3, KID-4	Minor movement of granular fill observed during July 2019 site visit in small area underlain by bedrock in the southern portion of KID_WR_01. No additional work was deemed necessary; area will be monitored in subsequent site visits.
Treacy	TRE_SO_01	Metals impacts excavated and partially covered with granular fill and armour stone	A7.2 / TRE-1	No concerns identified.
	TRE_SO_02	PHC impacts excavated and partially covered with granular fill and local material	A7.2	No concerns identified.
	East Trench	Trench backfilled with granular fill	A7.2	No concerns identified.
	West Trench	Trench backfilled with granular fill	A7.2	No concerns identified.
<p>Note:</p> <p>¹During long-term monitoring at Camlaren in July 2019, Stantec also completed a general site assessment of the area around the TSCA. Surficial staining was noted in various locations (including near CAM_SO_01 and CAM_SO_04). These surficial stains were removed by DNV, using shovels and buckets. However, following clean-up by DNV, some staining was still visible, and two samples were collected. Refer to the Updated Post-Construction Report (Stantec, 2020a) for additional details.</p>				

4.1.2 Mine Opening Monitoring

Closures of mine openings identified for LTM were visually inspected for settlement, erosion and structural stability (e.g. deformation, cracking) where applicable.

Detailed Inspection Records and Photographic Logs are presented in Appendix C and Appendix D, respectively. A summary of results from the Mine Opening Monitoring component of the LTM is presented in Table 4.2.



Table 4.2 Summary of Mine Opening Monitoring Results

Site Name	Hazard Name	Area Description	Figure in Appendix A / Photograph ID in Appendix D	Monitoring Results
Burnt Island	Mine Shaft	The shaft was closed with a polyurethane foam plug, reinforced concrete cap and covered with granular fill	A1.3 / BUR-7	No concerns identified.
Burnt Island (continued)	Portal	The portal opening and mine tunnel were closed with granular fill.	A1.4 / BUR-1	No concerns identified.
Zenith Island	Mine Shaft	The shaft was closed with granular fill, capped with reinforced pre-cast concrete panels and covered with granular fill.	A2.4	No concerns identified.
Goodrock	South Pit	The pit was closed with a polyurethane foam plug and covered with granular fill.	A3.3 / GOO-2	No concerns identified.
	North Mine Shaft	The shaft was closed with a polyurethane foam plug and covered with granular fill.	A3.3 / GOO-1	No concerns identified.
Kidney Pond	Portal	The portal opening and mine tunnel were closed with granular fill.	A4.3 / KID-1, KID-2, KID-4	Slumping and minor erosion of granular fill was identified following remediation. Fill was manually placed in slump area and wattles installed for erosion control during the July 2019 site visit. Slumping was noted to be more severe during the September site visit.
Murray Lake	Main Shaft	The shaft was closed with a polyurethane foam plug and covered with granular fill.	A5.2 / MUR-1	No concerns identified.
	Deep Trench/Shaft	The trench/shaft was closed with a polyurethane foam plug and covered with local material.	A5.2	Unable to locate.
Storm	South Mine Shaft	The shaft was closed with a polyurethane foam plug and covered with granular fill.	A6.2 / STO-4	No concerns identified.
	North Mine Shaft	The shaft was closed with a polyurethane foam plug and covered with granular fill.	A6.2 / STO-2, STO-3, STO-6	No concerns identified.
Try Me	Mine Shaft	The shaft was closed with a polyurethane foam plug and covered with granular fill.	A8.2 / TRY-1	No concerns identified.



Table 4.2 Summary of Mine Opening Monitoring Results

Site Name	Hazard Name	Area Description	Figure in Appendix A / Photograph ID in Appendix D	Monitoring Results
West Bay	Open Pit	The pit was barricaded with a perimeter fence.	A9.2 / WES-4	Some large openings under the fence were identified during the July 2019 site visit, allowing access to the open pit.

4.1.3 Moderate Risk Waste Rock Left in Place Monitoring

Moderate risk waste rock left in place was visually inspected for ARD-related impacts. No concerns were identified; therefore, no soil or surface water samples were collected. Detailed Inspection Records and Photographic Logs are presented in Appendix C and Appendix D, respectively. A summary of monitoring results is presented in Table 4.3.

Table 4.3 Summary of Results - Moderate Risk Waste Rock Left in Place Monitoring

Site Name	Hazard Name	Description	Figure in Appendix A / Photograph ID in Appendix D	Monitoring Results
Burnt Island	BUR_WR_01	Waste rock resulting from trenching near the Old Mill Area	A1.5 / BUR-8	No signs of ARD-related impacts were identified
Good Rock	GOO_WR_01	Scattered waste rock near Goodrock Camp Area trenches	A3.2	No signs of ARD-related impacts were identified
	GOO_WR_02	Scattered waste rock near Goodrock Mill Area trenches	A3.3	Due to time and logistical limitations, this area was not inspected in 2019 but will be inspected in 2020.
Kidney Pond	KID_WR_01	Waste rock near Portal Area excavated and area covered with granular fill	A4 / KID-4	No signs of ARD-related impacts were identified
	KID_WR_03	Scattered waste rock near Portal Area	A4.3	No signs of ARD-related impacts were identified
	KID_WR_04	Waste rock near Exploration Camp	A4.2 / KID-5, KID-6, KID-7	No signs of ARD-related impacts were identified
Murray Lake	MUR_WR_01	Scattered waste rock near the Trench Area	A5.2	No signs of ARD-related impacts were identified
	MUR_WR_02	Scattered waste rock near the Trench Area	A5.2	No signs of ARD-related impacts were identified



Table 4.3 Summary of Results - Moderate Risk Waste Rock Left in Place Monitoring

Site Name	Hazard Name	Description	Figure in Appendix A / Photograph ID in Appendix D	Monitoring Results
Storm	STO_WR_01	Waste rock piles near the north and south shafts	A6.2 / STO-7	No signs of ARD-related impacts were identified
	STO_WR_02	Waste rock piles near Shaft Area	A6.2 / STO-5	No signs of ARD-related impacts were identified
West Bay	WES_WR_01	East waste rock pile south of open pit	A9.2 / WES-2, WES-3, WES-5	No signs of ARD-related impacts were identified
	WES_WR_02	West waste rock pile south of open pit	A9.2 / WES-2	No signs of ARD-related impacts were identified

4.1.4 Vegetation Monitoring

To evaluate vegetation success, visual inspections were completed for areas in which vegetation efforts were completed by Flat River Consulting in 2018. Increased growth was observed for select species in monitoring areas. Photographic logs are presented in Appendix D and a summary of results is presented in Table 4.4.

Table 4.4 Summary of Results - Vegetation Monitoring

Site Name	Revegetation Efforts Completed by Flat River Consulting (Flat River Consulting, 2018)	Monitoring Results (Photograph ID, Appendix D)
Camlaren Mine Area South Shoreline	<ul style="list-style-type: none"> Willow stems: planted 3m long stems in the former wattle trench. Sedges: planted in bare areas. Seedlings: alder, fireweed, juniper berries, rose hips, raspberry and juniper planted in bare areas. 	<ul style="list-style-type: none"> Growth observed along shoreline (CAM-3).
Zenith Island	<ul style="list-style-type: none"> Willow stems: planted along the crest of the steepest part of the slope. Sedges: transplanted along the shoreline in bare areas. Rough and loose (near CAM_SO_23): seeded alder cones, fireweed and juniper. 	<ul style="list-style-type: none"> Growth observed in willow stems (ZEN-1).
Kidney Pond Portal Area	<ul style="list-style-type: none"> No revegetation efforts completed. Site used as a control. 	<ul style="list-style-type: none"> No natural germination was observed on granular fill cover.



Table 4.4 Summary of Results - Vegetation Monitoring

Site Name	Revegetation Efforts Completed by Flat River Consulting (Flat River Consulting, 2018)	Monitoring Results (Photograph ID, Appendix D)
Kidney Pond Exploration Camp	<ul style="list-style-type: none"> Rough and loose, Upper (near KID_SO_04): transplanted willow cuttings, grass, fox-tailed barley, raspberry, and spread alder and bearberry berries. Rough and loose, Lower (near site access): transplanted willow cuttings, covered with willow cuttings, and seeded alder cones and bearberry. 	<ul style="list-style-type: none"> Due to time limitations, this site was not observed.
Treacy Mill Area	<ul style="list-style-type: none"> Willow stems: planted in two trenches. Transplants: grass, raspberry, corydalis, ferns, lichens, moss and reindeer lichen. Seeds: Alder. Slash: Dead spruce placed perpendicular to the slope. 	<ul style="list-style-type: none"> Growth observed in transplanted grasses (TRE-3). Natural germination of field horsetails was observed on northwest bank (TRE-2).
TSCA	<ul style="list-style-type: none"> Smiles: 11m ECM placed on slopes held in place with metal stakes. Willow stakes: willow stems were cut and planted on the down gradient side of the Smiles and in trenches in the northeast corner of the TSCA. Transplants: grass was planted in the Smiles on the north slope. Seeds: Broken alder cones, lingonberry, soapberry, common yarrow, rose, fireweed, bearberry, raspberry, juniper, gooseberry and slender wild seeds were spread across the TSCA. Slash: salvaged trees and shrubs randomly spread perpendicular to the shallow sloped top of the cell. 	<ul style="list-style-type: none"> Smiles in good condition (TSCA-8 through TSCA-13, TSCA-15). Growth observed in willow stakes (TSCA-9). No deep root species were identified at the TSCA.

4.1.5 Risk Management Approach (Land Use) Monitoring

There have been no changes in land uses as those defined in the risk management evaluation.

4.2 TAILINGS AND SOIL CONTAINMENT AREA

In addition to LTM activities at the TSCA conducted in July 2019, a bi-annual geotechnical site inspection was completed on September 10, 2019. The following sections include results from both the July LTM site visit and the geotechnical inspection. For complete details regarding the geotechnical inspection, refer to the 2019 Geotechnical Inspection report (Stantec 2020c).

In addition to these site visits, Stantec evaluated the TSCA embankments to determine if they should be classified as mine waste structures (MWS), landforms, or dams. The results of this evaluation were summarized in a report dated February 28, 2020 (Camlaren TSCA Embankments – Classification Assessment; Stantec 2020d). This report concluded that the TSCA embankments should be classified as dams until additional information can be obtained to justify an alternative classification. Information from the TSCA embankment classification is included in the following sections as appropriate.



4.2.1 Performance Monitoring

4.2.1.1 July 2019

During the July 2019 site visit, a thorough visual inspection of the TSCA top cover, slopes, toes, ditches and instrumentation was completed to identify potential signs of erosion, settlement, seepage and/or structural failure.

No major deficiencies were observed regarding TSCA performance. The TSCA top cover and slopes were in good condition and there were no visible indicators of any adverse conditions, erosion or seepage observed at the toe of the slopes. A Photographic Log is presented in Appendix D and a summary of monitoring results based on the threshold values outlined in Section 3.10.1 is provided in Table 4.5.

Table 4.5 TSCA Performance Monitoring Summary

Threshold Description	Observations
Differential settlement of greater than 0.5 m (including for instrumentation stick-ups).	No concerns identified.
Slopes slumping with horizontal cracks/movement of greater than 0.3 m.	No concerns identified.
Slopes or cover erosion resulting in greater than 25% loss of material thickness.	No concerns identified.
Frost heave effects greater than 0.2 m	No concerns identified.
Vegetation (primarily tree species) observed that typically develop roots deeper than 0.3 m.	No concerns identified.
Animal activities, such as burrowing, resulting in depth greater than 0.3 m.	Two animal burrows were identified on the south and southeast slope of the TSCA and measured at a depth of 0.4 m (refer to Photograph IDs TSCA-2 and TSCA-3, Appendix D). These were filled in by hand on July 8, 2019 (refer to Erosion and Settlement Inspection forms in Appendix C).
Erosion control coconut matting (full semi-circle, approximate length of 5 m) is no longer deemed effective.	No concerns identified.
Ditch erosion exposes any amount of BGM (i.e. visible liner).	A small portion of the outside edge of the liner was identified on the northwest side of the TSCA.
Ditch blockage of any debris/object that impedes flow or causes ponding.	No concerns identified.
Seepage	No seepage areas identified.



4.2.1.2 September 2019 Geotechnical Inspection

No issues or concerns with respect to dam safety were observed by Stantec at the time of the geotechnical inspection on September 10, 2019, but the following observations were made:

- In general, the TSCA cover and slopes were in good condition.
- The TSCA top, crest, slopes, perimeter ditches (Ditches 1 and 2) and downslope toe areas were in good condition and no concerning deficiencies were observed, except for localized areas of minor settlement and erosion as noted below.
- The toe drains on the north and the southeast corner were dry and no seepage was observed at the time of inspection. Also, no sign of fines accumulation in the toe drains was observed.
- The perimeter ditches on the north and south were clear and no blockages were observed.
- Instrumentation was in good condition, except for damage to wiring on VT1. Damage was done by wildlife, and the repair was commissioned by DNV in September 2019.
- A localized depression covering an area of 10 m x 5 m was observed at the top of the cover towards north perimeter. The depth of the depression was approximately 0.2 m to 0.3 m below surrounding grade level.
- Surface cracks were observed at the top of cover close to the northern perimeter adjacent to the depression zone.
- Some minor erosion was noted on the north and northwest slopes, as the finer material was washed out exposing coarse material.
- No significant vegetation has established itself on the slopes. However early growth in willow plant was observed.
- Holes made by a burrowing animal were noted on the southwest slope and northeast embankment.

No erosion was observed at the top of cover of TSCA and the perimeter slopes on the east, south and the west. However, some erosion on the north and northwest perimeter slopes was observed. The erosion was caused by surface runoff; as a result of the erosion all the fines were washed out and coarse material remained.

Two animal burrows were identified on the slope near the southwestern corner of the TSCA, as well as on the northeast embankment. Based on visual assessment, the holes were approximately 0.3 m deep, although an accurate measurement was difficult to obtain.

The above noted settlements and erosion did not trigger the LTM Plan action targets.

4.2.2 TSCA Instrumentation

TSCA instrumentation includes two (2) thermistors, two (2) standpipe monitoring wells, and three (3) locations for vibrating wire piezometers with double nested vibrating wire sensors. In addition, there are four (4) monitoring wells outside of the TSCA footprint installed as part of the TSCA perimeter monitoring for the SNP sampling (refer to Section 3.10.2 for further details). Instrumentation data is discussed in detail in the 2019 Geotechnical Inspection Report (Stantec, 2020c), and a summary is provided below.



4.2.2.1 Thermistors

Data from the thermistors and VWP's were downloaded by CIRNAC on September 11, 2019. The thermistor at VT1 was damaged and the temperature record was only available to December 23, 2018.

The VT1 profiles indicate a range of temperature near the surface between approximately 2°C and -16°C during September 2018 to December 2018. The monthly average temperatures below surface generally indicate an active zone to about 5 m below the ground surface or to elevation 295.0 m (VT1) or 294.0 m (VT2). Within the active zone the temperature fluctuates between -20°C in the winter to about +15°C in the summer months, close to the surface. Below the active zone, the temperatures are generally constant just above the freezing point.

4.2.2.2 Vibrating Wire Piezometers

Piezometer readings in terms of total pore pressure for each VWP at three (3) locations (VB1, VB2 and VB3) were analyzed for a period between September 13, 2018 and September 10, 2019. At each location the top piezometer measures pore pressures in the tailings, and the bottom piezometer measures pore pressures at the bottom of the borehole near the bedrock or native soil. In general, the top and bottom piezometers showed similar trends throughout this period.

The recorded piezometric levels were generally constant from September 2018 to February 2019 and then gradually decreased from March to July 2019. During that time, negative pore pressures were observed in VB2. An increase in water level was observed at all three locations from mid-July 2019 through the most recent readings in September 2019.

In addition, it was observed that there is a strong downward vertical gradient in VB2, which could indicate a potential drainage pathway through bedrock at this location. In 2018, there was a similar slight gradient in other VWP locations, but this has disappeared during 2019. Downward gradient indicates a dissipation of the pore pressures in the TSCA, however, may contribute to the contaminant release through groundwater.

4.2.2.3 Monitoring Wells

Since installation in September 2018, there have been three monitoring events: September 2018, July 2019, and September 2019.

4.2.2.3.1 Water Levels

The readings from monitoring wells appear consistent with that from the VWP's, indicating that levels dropped in July of 2019 and then rose in September of 2019. The maximum recorded water level in the TSCA, 296.4 m, was recorded in MW1 in September 2019. Table 4.6 presents the water level monitoring data from the two piezometers installed within the TSCA impoundment, MW1 and MW2.



Table 4.6 Groundwater Levels in Monitoring Wells

Monitoring Well	September 14, 2018	September 16, 2018	July 8-10, 2019	September 10-11, 2019
MW1	295.94	295.90	Frozen	296.35 m
MW2	Dry	-	293.37 m	293.87 m
MW3*	290.97	290.35	291.07 m	291.06 m
MW4*	290.57	292.56	292.85 m	292.86 m
MW5*	-	292.34	292.82 m	293.12 m
MW6*	-	290.90	294.15 m	294.07 m
*Monitoring well outside the TSCA footprint				

The 1 year of available VWP readings show a slow decrease from approximately January to July of 2018 followed by an increase in July of 2019. Overall, the fluctuation in piezometric level is on the order of 1 m. The available MW data appears consistent, showing an increase in piezometric levels from July 2019 to September of 2019 on the order of 1 m. At piezometer VW2, the measured heads from March through July of 2018 are below the reported tip elevations for the piezometer and there is an approximately 1 m difference in measured head between these two nested piezometers.

The measured water levels at MW1 are the highest measured in the vicinity of the facility and indicate a mounded water level in that area. The following is noted regarding the available piezometric data:

- Due to the placement of a cover system over the TSCA, it was anticipated that piezometric levels would likely decrease with time. However, both the VWP and the GW piezometers indicate increasing water levels. This increase may be due to an increase in the local groundwater level, which may be a seasonal variation and/or could be influenced by changes in overall water levels in the lake.
- Some increase of water levels may be attributed to melting of ice and snow inclusions in the waste rock fill which was placed during the winter months of 2018.
- Settlement of the fill may cause squeezing the water out of the pores in one area and pushing the water into other adjacent areas. The water level rise in VB3 could be the example, as it is located adjacent to the settlement area near the north perimeter. It is noted that in VB3, the water level increase was 1.3 m between July and September 2019, vs. 1.0 m for VB2 and about 0.6 m for VB1.
- However, this increase could also indicate damage to the TSCA cover and increased surface water infiltration. Continued monitoring of these piezometers may assist in further evaluating this. Additionally, a review of historical groundwater data from this area could also be useful to evaluate if this increase is seasonal or due to changed infiltration conditions. The difference in head at piezometer MW2 is indicative of a downward seepage gradient. However, a similar gradient is not seen at MW1 or MW3. This may indicate increased seepage due to more permeable foundation conditions at MW2 than at the two other piezometers. A downward gradient at this location could also indicate that the rising piezometric levels are due to increased surface water infiltration, not a ground water level increase (as a groundwater level increase would be associated with decrease of downward gradient).



It is noted that the described above causes and processes that may influence water levels are very complex, and interpretation of these is beyond the scope of the geotechnical inspection report. However, overall increase in piezometric levels could indicate poor performance of the liner and this could have impact on the TSCA slopes stability.

Currently, overall piezometric levels are acceptable and do not trigger any action. The water levels and pore pressures should continue to be monitored to assess the performance of the TSCA. It is recommended that the water levels are reviewed and assessed bi-annually, to confirm that there is no unusual water level rise that could have impact on TSCA slopes stability.

4.2.2.3.2 Groundwater Monitoring and Sampling

Groundwater monitoring and sampling activities were completed at the monitoring wells inside the TSCA on July 8, July 9, and September 10, 2019 (Table 4.7).

Table 4.7 Summary of Groundwater Samples Collected in 2019

Sample ID	Sample Location	Sample Date	Submittal Date	COA
CAM_GW_MW2_2019_01	Monitoring Well 2	July 9, 2019	July 9, 2019	B956373V2R
CAM_GW_MW1_2019_02	Monitoring Well 1	September 10, 2019	September 12, 2019	B977474V1
DUP1_GW_2019_02	Field Duplicate of CAM_GW_MW1_2019_02	September 10, 2019	September 12, 2019	B977474V1
CAM_GW_MW2_2019_02	Monitoring Well 2	September 10, 2019	September 12, 2019	B977474V1

As outlined in Section 2.2.1.1, the groundwater analytical results were compared to the FIGQGs. Analytical results are presented in Table E-1 in Appendix E and laboratory certificates of analysis (COAs) are included in Appendix F. A summary of the groundwater levels and analytical results at the TSCA is outlined in Table 4.8 below.



Table 4.8 Summary of TSCA Groundwater Results

Monitoring Well ID	Date (Y/M/D)	Depth to Product (m)	Depth to Water (m)	Depth to Bottom (m)	Analytical Results
MW1	2019/07/08	-	-	4.48	No sample collected
	2019/09/10	-	3.39	4.36	Concentrations of pH, sulfate, dissolved iron, dissolved manganese, aluminum, cadmium, cobalt, copper, iron, manganese, nickel and zinc detected in sample CAM_GW_MW1_2019_02 (and its field duplicate DUP1_GW_2019_02) exceeded FIGQG.
MW2	2019/07/09	-	6.55	8.09	Concentrations of chloride, sulfate, total dissolved solids (TDS), dissolved iron, dissolved manganese, aluminum, arsenic, cadmium, chromium (July only), cobalt, copper (July only), iron, lead (July only), manganese, nickel (July only), titanium (July only) and zinc (July only) detected in samples CAM_GW_MW2_2019_01 and/or CAM_GW_MW2_2019_02 exceeded FIGQG.
	2019/09/10	-	6.05	8.09	

In situ field data is presented in Table E-4, Appendix E. Groundwater levels are anticipated to remain stable or below those observed after construction completion. Trend analysis will be completed after having obtained sufficient data indicating water levels from three consecutive bi-annual monitoring events (i.e. before Year 3 of the Phase I LTM).

In addition to MWs 1 and 2, SNP monitoring includes groundwater monitoring downgradient of the TSCA (SNP Station 2016-7). MWs 3-6 (i.e. SNP Station 2016-7) are applicable to the Phase I LTM and encompass monitoring requirements to assess TSCA performance and identify associated potential environmental impacts. Section 4.3 outlines the results of the SNP sampling.

4.2.3 TSCA Surface Water Sampling

There was no surface water present at any of the locations associated with SNP Station 2016-8 in July or September 2019, therefore no samples were collected.

4.2.4 Settlement

Settlement was monitored by measuring the instrumentation stick ups of pipes and casings and observing depressions. The field and as-built instrumentation stickups measurements are provided in Table 4.9. As noted in the table, no settlement was observed in relation to the stick ups.



Table 4.9 Instrumentation Stickups

ID	Type of Installation	As-Built Measurement		July 2019 Measurement		September 2019 Measurement	
		Stickup Length (m)	Top Elevation (m)	Stickup Length (m)	Elevation Change (m)	Stickup Length (m)	Elevation Change (m)
MW1	Monitoring Well	1.00	299.73	1.00	0.00	1.00	0.00
MW2	Monitoring Well	0.96	299.92	0.96	0.00	0.96	0.00
VB1	Vibrating Wire Piezometer	1.00	299.11	1.00	0.00	1.00	0.00
VB2	Vibrating Wire Piezometer	0.87	298.86	0.87	0.00	0.87	0.00
VB3	Vibrating Wire Piezometer	0.99	299.47	0.99	0.00	0.99	0.00
VT1	Thermistor String	1.00	299.89	1.00	0.00	1.00	0.00
VT2	Thermistor String	1.00	299.84	1.00	0.00	1.00	0.00

During the geotechnical inspection on September 10, a ground depression up to 0.3 m deep was observed at the top of cover of the TSCA near the North perimeter. The depression zone was approximately 10 m x 5 m and was bounded by surface cracks in an oval shape. The settlement could be related to consolidation of tailings or melting of the ice within waste rock, which could have been placed during construction in 2018. As described in the DBR, this type of settlement was anticipated. The identified settlement does not meet the trigger level identified in the OMS. This area of settlement should be monitored in upcoming bi-annual inspections. No settlement was observed at perimeter slopes and the areas close to the toe drain during the inspection.

4.3 SNP MONITORING

SNP monitoring and sampling activities were completed between July 8-10, and September 10, 2019. SNP Stations 2016-7, 2016-8 and 2016-11 are applicable to the Phase I LTM, which include the TSCA and areas down-gradient of significant remedial excavations. SNP Stations 2016-7 and 2016-8 encompass monitoring requirements to assess TSCA performance and identify associated potential environmental impacts. Station 2016-7 includes the monitoring wells around the TSCA and Station 2016-8 includes locations of potential discharge from the TSCA that are expected to discharge towards Gordon Lake. SNP Station 2016-11 encompasses monitoring requirements down-gradient of significant remedial excavations to identify associated potential environmental impacts.

Refer to the Surveillance Network Program Monthly Reports for July and September 2019 for analytical results, laboratory COAs, and a more detailed discussion of SNP sampling results. A summary is provided in the following sections.



4.3.1 Groundwater

SNP Station 2016-7 includes the groundwater monitoring wells located downgradient of the TSCA (MW3, MW4, MW5 and MW6). As an indicator associated with TSCA performance, groundwater levels are anticipated to remain stable or below those observed after construction completion. Trend analysis will be completed after having obtained sufficient data indicating water levels from three consecutive bi-annual monitoring events. Groundwater levels are presented in Table 4.10.

Table 4.10 SNP Groundwater Level Measurements

SNP Station (Monitoring Well ID)	Date (Y/M/D)	Depth to Water (m)	Depth to Bottom (m)
SNP2016-7A (MW3)	2019/07/09	2.42	7.88
	2019/09/10	2.24	7.88
SNP2016-7B (MW4)	2019/07/09	2.48	4.62
	2019/09/10	2.69	4.62
SNP2016-7C (MW5)	2019/07/10	5.17	5.53
	2019/09/10	4.36	5.52
SNP2016-7D (MW6)	2019/07/09	5.25	6.15
	2019/09/10	2.34	6.15

In addition to water level stability, groundwater monitoring is anticipated to demonstrate a transient increase in contaminant concentrations resulting from the construction disturbance, and then to fall back to a steady state. As outlined in Section 2.2.1.1, the groundwater analytical results were compared to the FIGQGs. A summary of the results is outlined in Table 4.11 below. Trend analysis will be completed after having obtained sufficient data indicating COC concentrations from three consecutive bi-annual monitoring events. In situ field data is presented in Table E-4, Appendix E. Analytical results are presented in Table E-2 (Appendix E) and laboratory COAs are included in Appendix F.



Table 4.11 SNP Groundwater Monitoring Results

SNP Station (Monitoring Well ID)	Date (Y/M/D)	Exceedances
SNP2016-7A (MW3)	2019/07/09	Concentrations of sulfate, dissolved iron, dissolved manganese, aluminum, copper, iron, manganese, and zinc indicated in sample CAM_GW_SNP_7A_2019_01 exceeded FIGQG.
	2019/09/10	Concentrations of dissolved manganese, arsenic, iron, and manganese CAM_GW_SNP_7A_2019_02 exceeded FIGQG.
SNP2016-7B (MW4)	2019/07/09	Concentrations of dissolved iron, dissolved manganese, aluminum, chromium, copper, iron, manganese, and zinc indicated in sample CAM_GW_SNP_7B_2019_01 exceeded FIGQG.
	2019/09/10	Concentrations of sulfate, dissolved manganese, cadmium, cobalt, copper, iron, and manganese indicated in sample CAM_GW_SNP_7B_2019_02 exceeded FIGQG.
SNP2016-7C (MW5)	2019/07/10	Concentrations of sulfate, dissolved manganese, aluminum, arsenic, chromium, copper, iron, lead, manganese, silver and zinc indicated in sample CAM_GW_SNP_7C_2019_01 exceeded FIGQG.
	2019/09/10	Concentrations of sulfate, dissolved manganese, arsenic, cadmium, iron and manganese indicated in sample CAM_GW_SNP_7C_2019_02 exceeded FIGQG.
SNP2016-7D (MW6)	2019/07/09	Concentrations of dissolved iron, dissolved manganese, aluminum, arsenic, copper, iron, lead, manganese, and zinc indicated in sample CAM_GW_SNP_7D_2019_01 exceeded FIGQG.
	2019/09/10	Concentrations of dissolved manganese, arsenic, iron and manganese indicated in sample CAM_GW_SNP_7D_2019_02 exceeded FIGQG.

4.3.2 Surface Water Sampling

SNP Station 2016-8 includes locations of potential discharge from the TSCA that are expected to discharge towards Gordon Lake. There was no surface water present at any of the locations associated with SNP Station 2016-8 in July or September 2019, therefore no samples were collected.

Monitoring associated with SNP Station 2016-11 includes total suspended solids (TSS) and aligns with the backfilled remedial excavations with potentially high erosion risk. A summary of the analytical TSS results in the surface water samples is provided in Table 4.12. As outlined in Section 2.2.1.1, surface water analytical results were compared to the CCME CEQGs (FAL). Full analytical results are included in the July and September 2019 SNP reports issued for the Project (Stantec 2019b, 2019c). In situ field data is presented in Table E-5 (Appendix E).



Table 4.12 SNP Surface Water Sampling Results

Station ID	Location	Sample Date (Y/M/D)	Sample ID	TSS (mg/L)
SNP2016-8A	Camlaren	2019/07/08	No sample collected	-
		2019/09/10	No sample collected	
SNP2016-8B	Camlaren	2019/07/08	No sample collected	-
		2019/09/10	No sample collected	
SNP2016-8C	Camlaren	2019/07/08	No sample collected	-
		2019/09/10	No sample collected	
SNP2016-11A	Burnt Island	2019/07/10	BUR_SW_SNP_11A_2019_01	10
		2019/09/11	BUR_SW_SNP_11A_2019_02	1.3
SNP2016-11B1	Camlaren	2019/07/10	CAM_SW_SNP_11B1_2019_01	160
		2019/09/11	CAM_SW_SNP_11B1_2019_02; DUP1_SW_SNP_2019_02	7.3 <1.0
SNP2016-11B2	Camlaren	2019/07/08	CAM_SW_SNP_11B2_2019_01	5.3
		2019/09/10	CAM_SW_SNP_1B2_2019_02	1.3
SNP2016-11B3	Camlaren	2019/07/08	CAM_SW_SNP_11B3_2019_01	4.7
		2019/09/10	CAM_SW_SNP_1B3_2019_02	2.0
SNP2016-11B4	Camlaren	2019/07/08	CAM_SW_SNP_11B4_2019_01	2.0
		2019/09/10	CAM_SW_SNP_1B4_2019_02	1.3
SNP2016-11C	Zenith Island	2019/07/08	CAM_SW_SNP_11C_2019_01	11.0
		2019/09/11	CAM_SW_SNP_11C_2019_02	2.0
SNP2016-11D	Kidney Pond	2019/07/09	KID_SW_SNP_11D_2019_01; DUP1_SW_SNP_2019_01	5.3
		2019/09/11	KID_SW_SNP_11D_2019_02	10.0
SNP2016-11E	Treacy	2019/07/09	TRE_SW_SNP_11E_2019_01	<1.0
		2019/09/11	TRE_SW_SNP_11E_2019_02	1.3
SNP2016-11F	West Bay	2019/07/10	WES_SW_SNP_11F_2019_01	1.3
		2019/09/11	WES_SW_SNP_11F_2019_02	2.7

4.4 SURFACE WATER SAMPLING – WEST BAY

Samples collected in 2019 are summarized in Table 4.13. Results were compared to CCME Freshwater Aquatic Life (FAL) long-term guidelines. Analytical results are presented in Table E-3 (Appendix E) and laboratory COAs can be found in Appendix F.



Table 4.13 Surface Water Sampling Results

Station ID	Sample Location	Sample Date ¹ (Y/M/D)	Results
PIT1	West Bay Open Pit	2019/09/11	Sample exceeded CCME FWAL guidelines for total arsenic, cadmium, copper, iron and zinc
PIT2	West Bay Open Pit	2019/09/11	Sample exceeded CCME FWAL guidelines for total copper and zinc
WET1	Inland near GD-37 access at West Bay	2019/09/11	No exceedances
WET2	Inland near GD-37 access at West Bay	2019/09/11	Sample exceeded CCME FWAL guidelines for total iron
GL1	Lake shore near GD-37 access at West Bay	2019/09/11	No exceedances
GL2	Lake shore near GD-37 access at West Bay	2019/09/11	No exceedances
GL3	Lake shore near GD-37 access at West Bay	2019/09/11	No exceedances
Note: 1: Samples were submitted for laboratory analysis on September 12, 2019 and reported in COA B977474			

4.5 QUALITY ASSURANCE AND QUALITY CONTROL

Best practices as per relevant SOPs were applied during sampling, including the following:

- A new pair of disposable nitrile gloves was used for each sample
- Samples were placed into laboratory-supplied sample containers and preserved according to laboratory specifications
- Samples were stored in ice-packed coolers for shipment to laboratory
- Each sample was provided with a unique identifier and was controlled using laboratory chain of custody forms
- Samples were analyzed within laboratory recommended hold times (exceptions are noted below)
- Blind field duplicate (BFD) samples were submitted for 10% of all samples, and trip blanks and field blanks were analyzed, as appropriate
- Laboratory analysis of samples collected during the field program was performed by Maxxam Analytics International Corporation and Bureau Veritas Laboratories (BV; formerly Maxxam Analytics). BV is accredited by the Standards Council of Canada for the analyses performed and its methodologies conform to Standard CAN-P-4E (ISO/IEC 17025:2005)
- Maxxam/BV conducted routine internal QA/QC tests, which included method blanks, control standards samples, certified reference material standards, method spikes, replicates, duplicates and instrument blanks.

Stantec reviewed the laboratory comments within the COAs for samples discussed in this report, except for the SNP samples, which are discussed in the July and September SNP Reports issued for the Project.



Results of quality control calculations (i.e. matrix spike, spiked blank, method blank and RPD calculations) for the laboratory QA/QC samples are presented in the laboratory analytical reports provided in Appendix F. Recovery and/or RPD values were within the control limits and overall quality control was said to meet acceptability criteria. The following samples were analyzed past the method specified hold times:

COA B956373

- Sample CAM_GW_MW2_2019_01 was analyzed past the method specified hold time for Orthophosphate by Konelab. As noted on the laboratory report “Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised”. This sample was also analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC.

COA B977474

- The following samples were analyzed past the method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. As noted on the laboratory report “Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised”.
 - CAM_GW_MW1_2019_02
 - CAM_GW_MW2_2019_02
 - DUP1_GW_2019_02
 - WES_SW_PIT2_2019_02
 - WES_SW_WET1_2019_02
 - WES_SW_WET2_2019_02
 - WES_SW_GL1_2019_02
 - WES_SW_GL2_2019_02
 - WES_SW_GL3_2019_02
- The reportable detection limit (RDL) for the following samples was raised due to concentration over linear range (sample dilution was required)
 - CAM_GW_MW1_2019_02
 - CAM_GW_MW2_2019_02
 - DUP1_GW_2019_02

5.0 RECOMMENDATIONS

Based on the discussion provided in Section 4.0, Stantec recommends continued long-term monitoring in Year 2 in accordance with Tables B-1 through B-4 (Appendix B). The recommended deviations are discussed below, and Table 5.1 outlines the objectives of Year 2 (i.e. 2020) LTM plan.

- The Kidney Portal slumping repair should be monitored in Year 2 to confirm manual backfilling is stable and sufficient to eliminate the hazard, and to control erosion.
- The West Bay Open Pit barrier openings between the fence and ground surface should be addressed. The fence is not fulfilling its intended purpose in these areas. Stantec recommends a chain link skirting be attached to eliminate the potential risk of access by humans and animals to the Open Pit hazard.



- Verify no visual signs of ARD down-gradient of the waste rock areas that were not accounted for in Year 1 (i.e. GOO_WR_02). The remaining waste rock monitoring areas are recommended to continue with the LTM schedule outlined in Table B-2 (quinquennially).

Table 5.1 Year Two Phase I Components

Hazard Category	Monitoring Objective
Tailings	Verify cover material is stable with no significant resulting erosion or washout.
Moderate Risk Waste Rock	Verify no visual signs of ARD down-gradient of remaining impacts at GOO_WR_02.
Vegetation	Verify vegetation growth and/or stability.
Chemical Monitoring	Verify excavation backfill material is stable with no significant resulting erosion or washout into down-gradient water by examining SNP surface water results
TSCA Performance	<p>Verify stability of cover material and slopes (includes differential settlement, slope slumping, frost heave, vegetation growth and animal activities).</p> <p>Inspect toe of facility and identify potential seepage.</p> <p>Visually monitor vegetative health to confirm stable or increasing growth.</p> <p>Verify TSCA permeability functionality to prevent infiltration.</p> <p>Verify chemical integrity of the TSCA via groundwater sampling.</p> <p>Verify chemical integrity of the TSCA via surface water sampling.</p>
Adaptive Management	Complete a trend analysis of COC and water level data following three consecutive bi-annual monitoring events evaluate management of the LTM.

In addition to the recommendations noted above, additional recommendations specific to the TSCA were presented in the 2019 Geotechnical Inspection report (Stantec, 2020c).

6.0 CLOSURE

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

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



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

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

This report was prepared by Becky Weir, B. Tech., and reviewed by Evelyn Bostwick, M.Eng., P.Eng.

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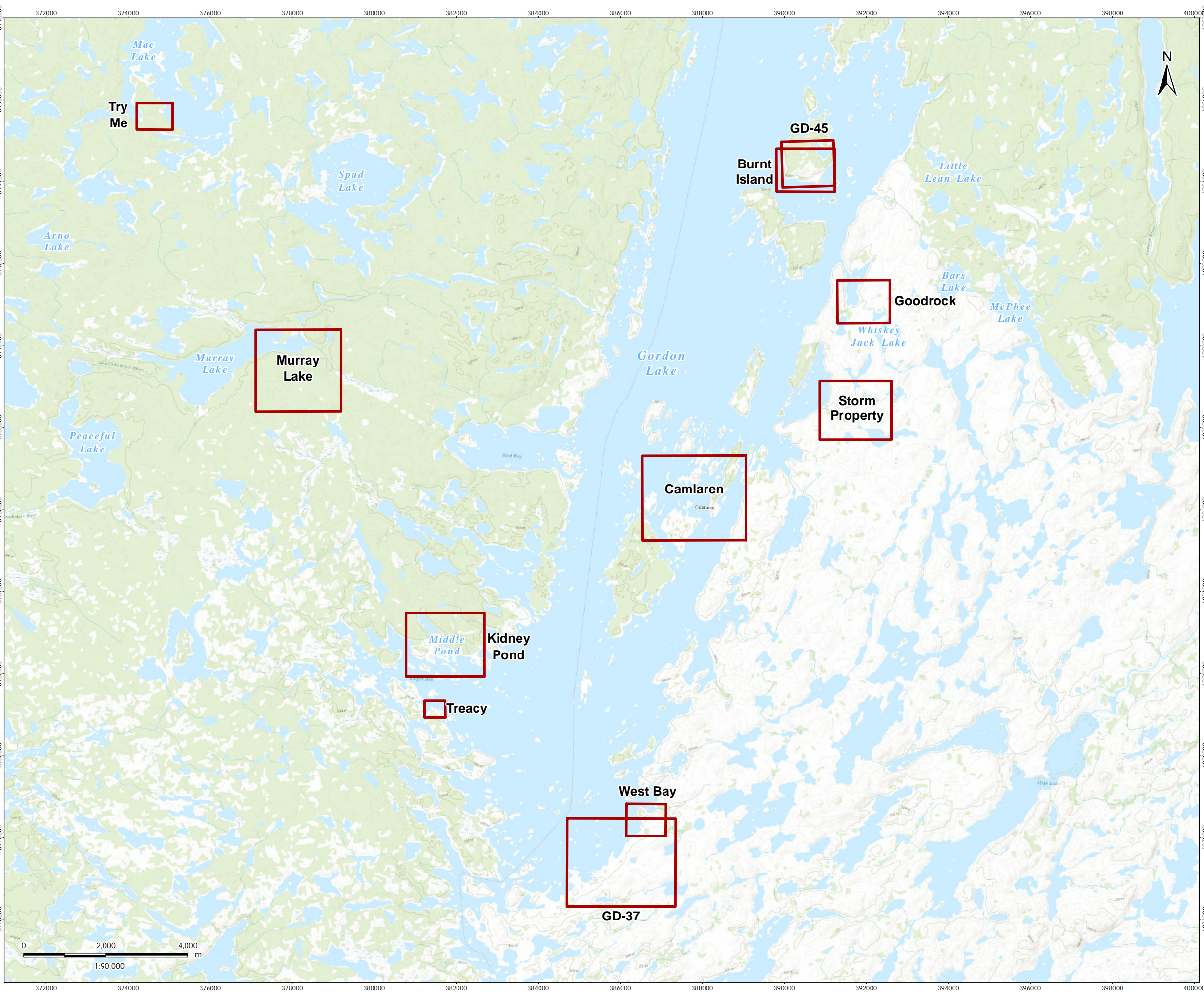
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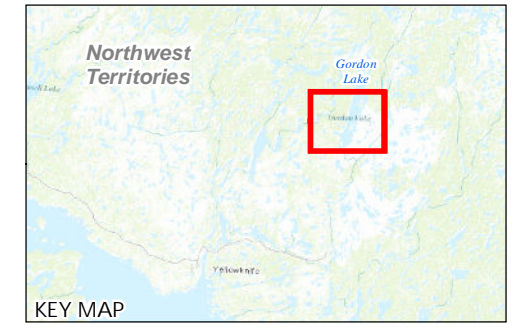
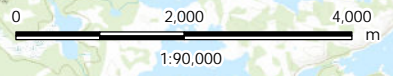
APPENDIX A

Figures

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Legend
[Red Rectangle] Site Location



Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

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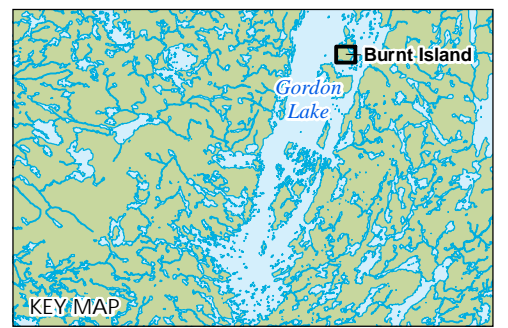
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Title
Gordon Lake Group - Site Locations

January 2020
121414585



- Legend
- ▲ Surface Water Sample Location
 - Watercourse
 - Waterbody
 - Map Extent



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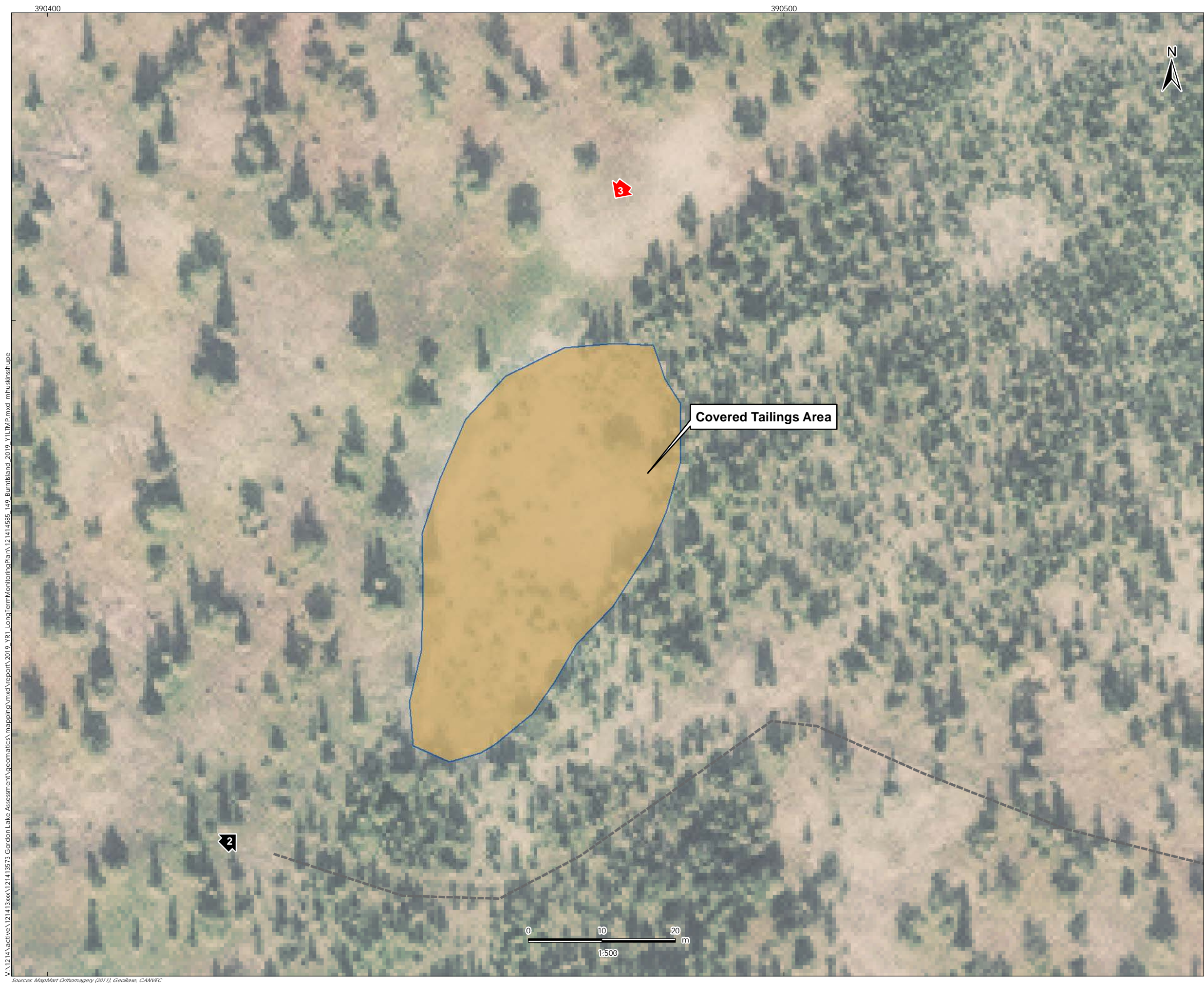
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Burnt Island
Site Overview

January 2020
121414585



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Sources: MapMart Orthomagey (2011), GeoBase, CANVEC



Legend

- Trail
- Tailings
- Aerial Viewpoint
- Viewpoint

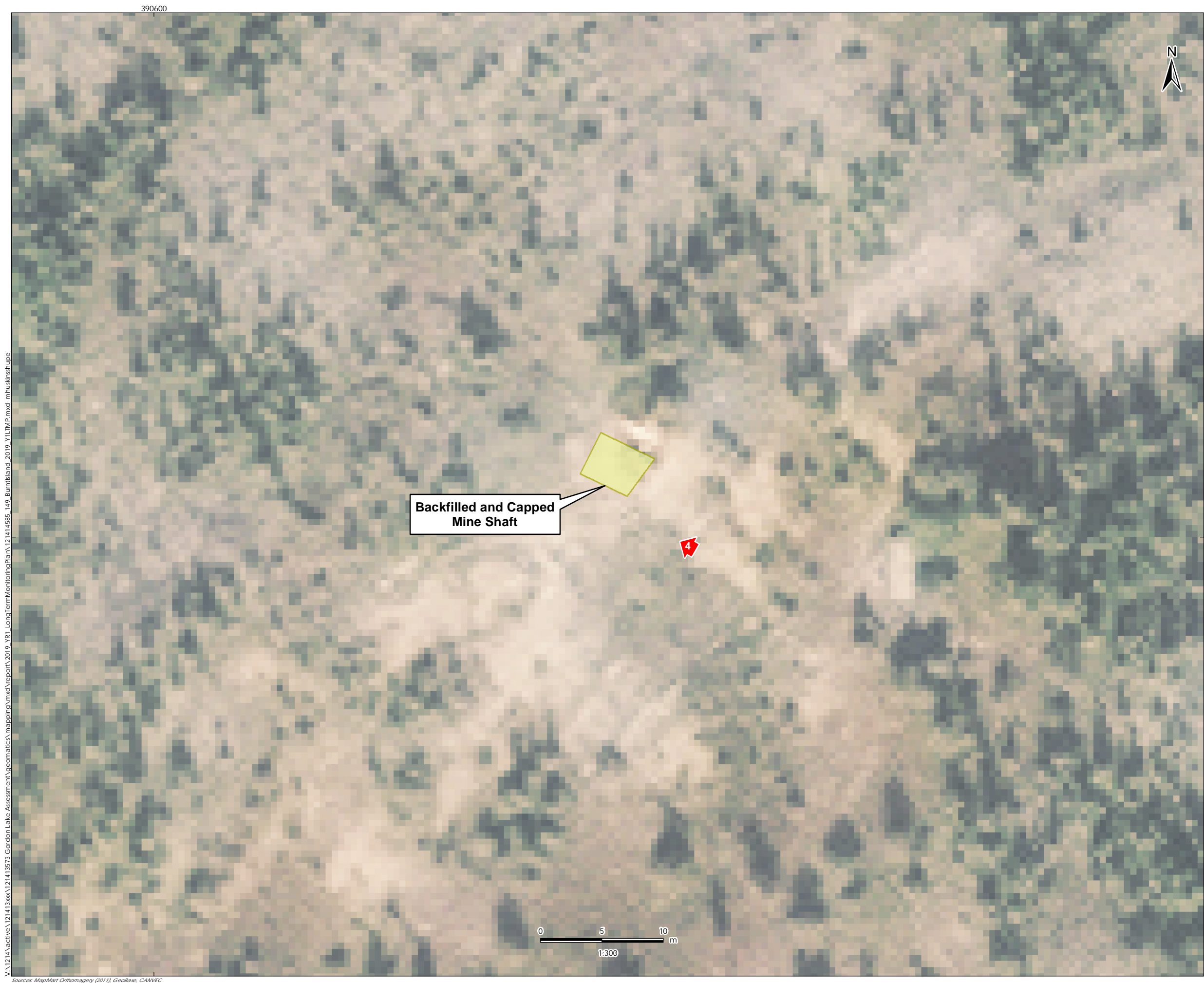


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Figure No.
A1.2

Title
Burnt Island - Tailings Impoundment
Summary of Long Term Monitoring
Components



V:\1214\active\121413xxx\121413573 Gordon Lake Assessment\geomatix\mapping\mxd\report\2019_VR1_LongtermMonitoringPlan\121414585_149_BurntIsland_2019_Y1TMP.mxd mhushinshupe

Sources: MapMart Orthomage (2011), GeoBase, CANVEC



- Legend
- Mine Opening
 - Viewpoint



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Public Services and
Procurement Canada
Phase I Long-Term Monitoring Report

Figure No.
A1.3

Title
Burnt Island - Shaft Area
Summary of Long Term Monitoring
Components



V:\1214\active\121413xxx\121413573 Gordon Lake Assessment\geomatix\mapping\mxds\report\2019_VR1_LongtermMonitoringPlan\121414585_149_BurntIsland_2019_YLTMP.mxd mhskinshupe

Sources: MapMart Orthomagey (2011), GeoBase, CANVEC



Legend

- Trail
- Mine Opening
- Waterbody
- Viewpoint



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Phase I Long-Term Monitoring Report

Figure No.
A1.4

Title
Burnt Island - Waste Rock Area
Summary of Long Term Monitoring
Components



Legend

- ▲ Surface Water Sample Location
- TTT Moderately Risked Waste Rock Trench
- Moderate Risk Impacting Material
- Remedial Excavation
- Trail
- Waterbody
- ▲ Aerial Viewpoint



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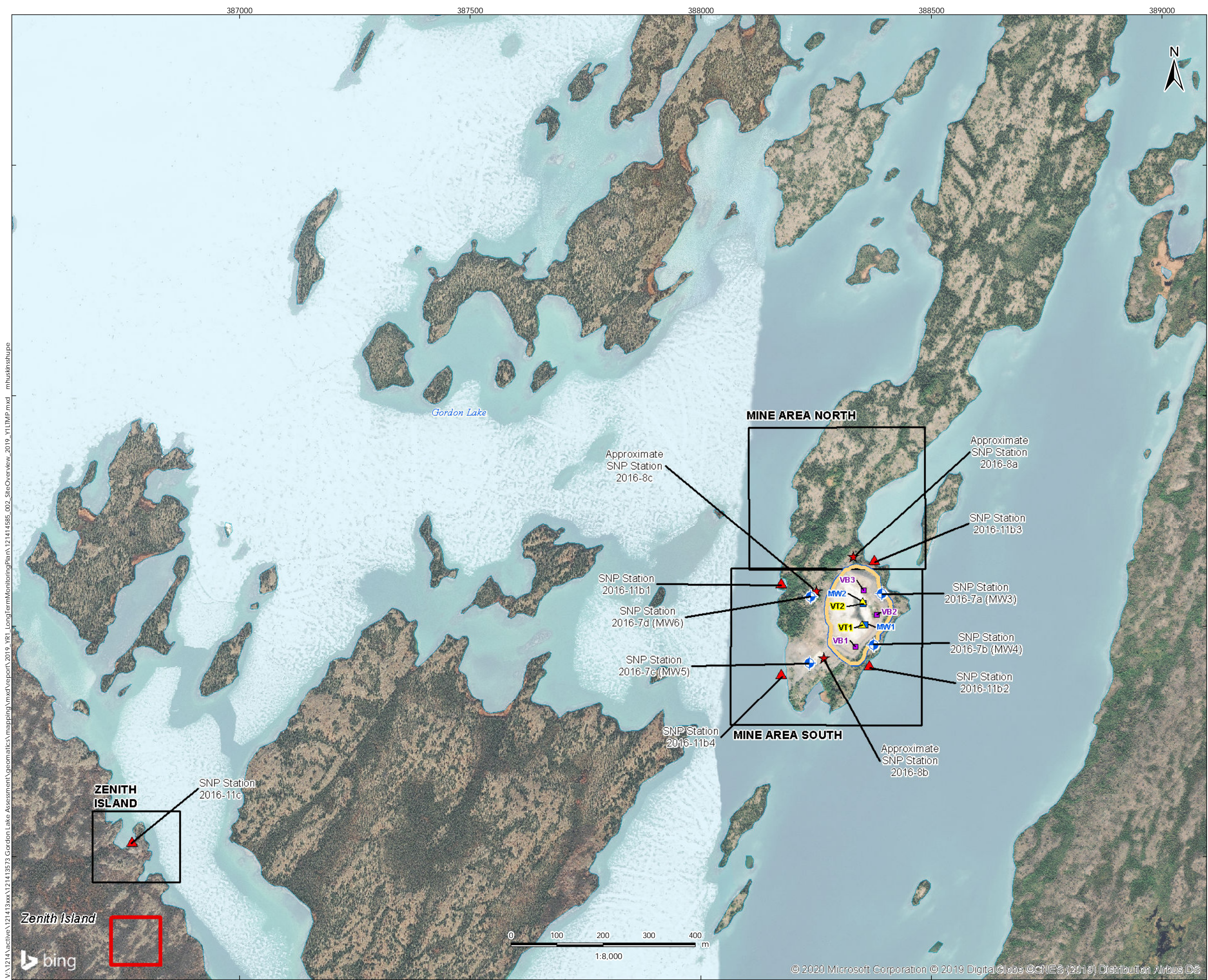
Client/Project
Public Services and
Procurement Canada
Phase I Long-Term Monitoring Report

Figure No.
A1.5

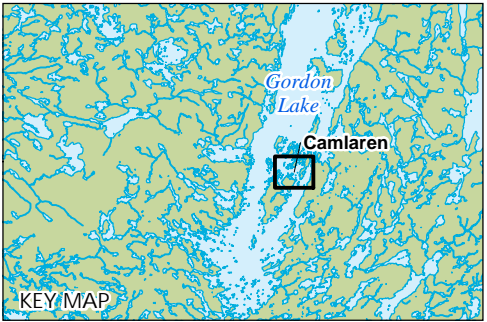
Title
Burnt Island - Old Mill Area
Summary of Long Term Monitoring
Components

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Sources: MapMart Orthomage (2011), GeoBase, CANVEC



- Legend
- ★ Approximate Discharge Location
 - ▲ Surface Water Sample Location
 - ⊕ Groundwater Sample Location
 - TSCA Monitoring Well
 - ▲ TSCA Thermistor
 - TSCA Vibrating Wire Piezometer
 - Approximate Camp Location
 - Approximate Location of TSCA
 - Watercourse
 - Waterbody
 - Map Extent



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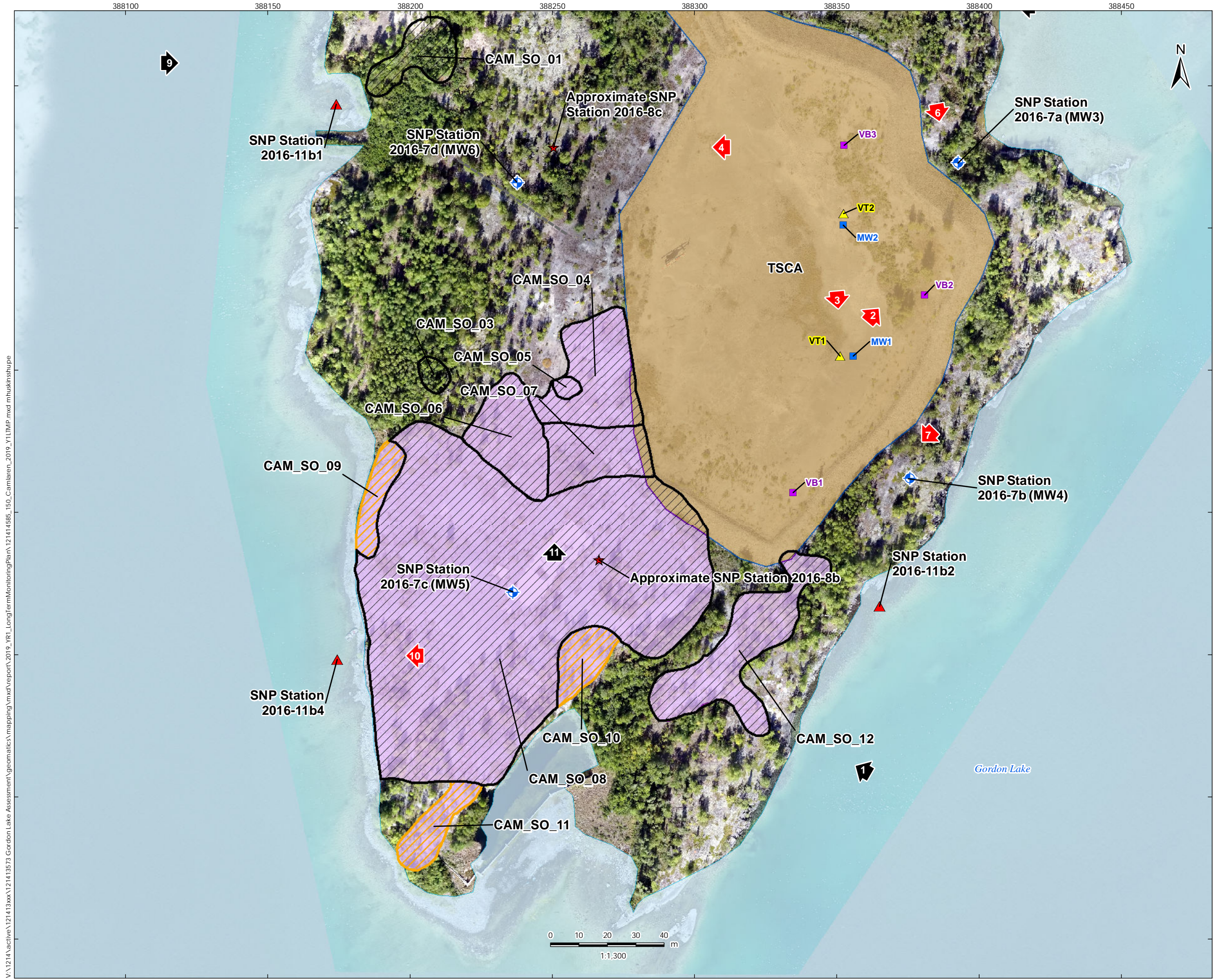
Client/Project
Public Services and
Procurement Canada
Phase I Long-Term Monitoring Report

Figure No.
A2.1

Title
Camlaren
Site Overview

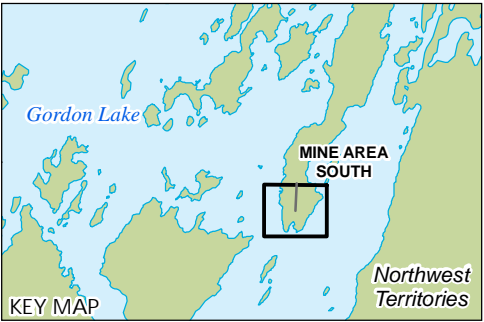
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Legend

- ★ Approximate Discharge Location
- ▲ Surface Water Sample Location
- ⬢ Groundwater Sample Location
- TSCA Monitoring Well
- ▲ TSCA Thermistor
- TSCA Vibrating Wire Piezometer
- ▨ Backfilled Remedial Excavation
- ▨ Remedial Excavation
- Tailings and Soil Containment Area (TSCA)
- Excavated Waste Rock
- Trail
- Waterbody
- ▲ Aerial Viewpoint
- ▲ Viewpoint

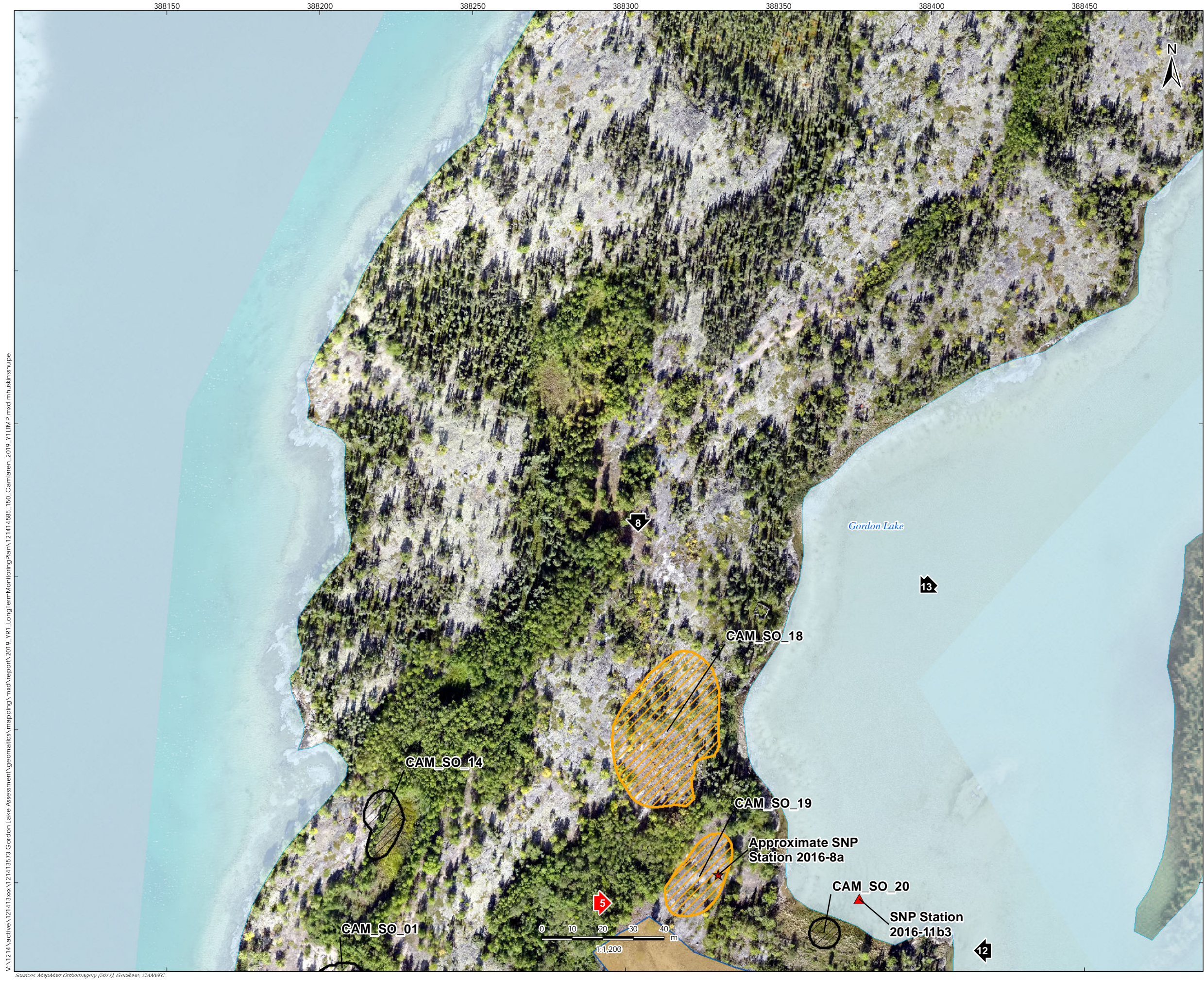


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Phase I Long-Term Monitoring Report

Figure No.
A2.2

Title
Camlaren - Mine Area South
Summary of Long-Term Monitoring
Components



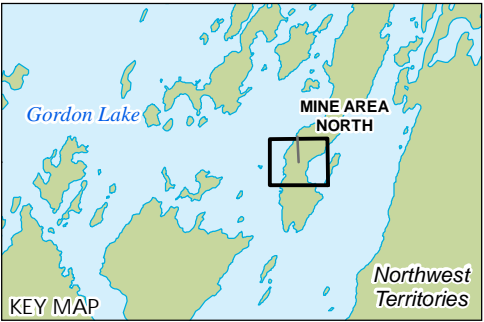
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Sources: MapMart Orthomageary (2011), GeoBase, CANVEC



Legend

- ★ Approximate Discharge Location
- ▲ Surface Water Sample Location
- ▨ Backfilled Remedial Excavation
- ▧ Remedial Excavation
- Tailings and Soil Containment Area (TSCA)
- Waterbody
- ▲ Aerial Viewpoint
- ▲ Viewpoint

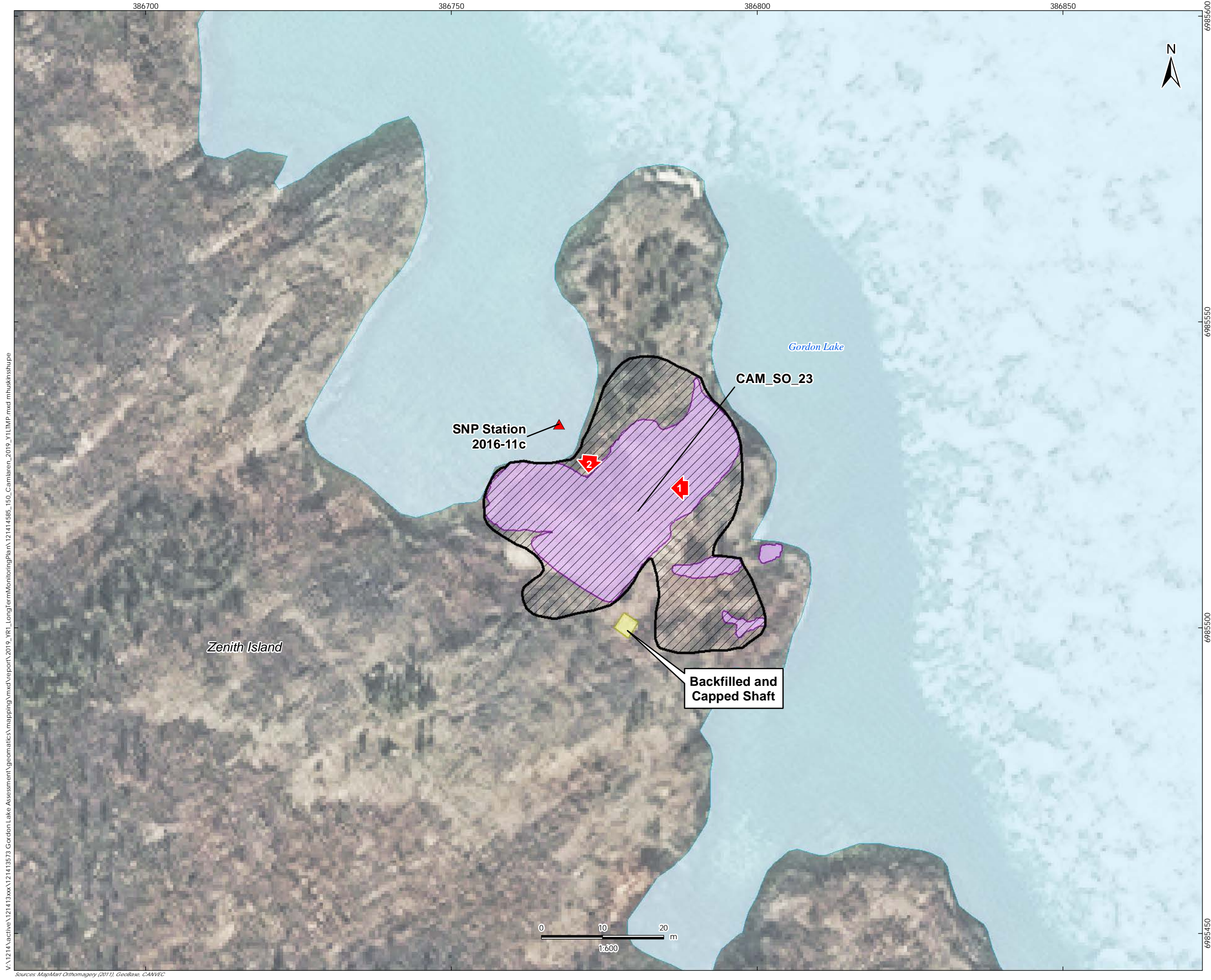


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121414585

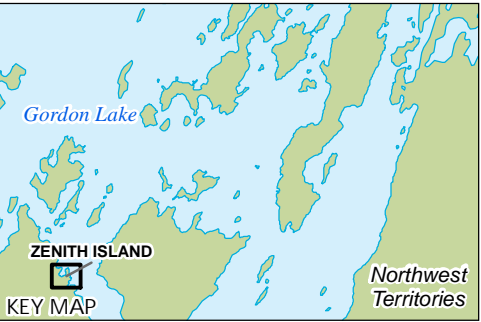
Client/Project
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Procurement Canada
Phase I Long-Term Monitoring Report

Figure No.
A2.3

Title
Camlaren - Mine Area North
Summary of Long-Term Monitoring
Components



- Legend
- Surface Water Sample Location
 - Backfilled Remedial Excavation
 - Mine Opening
 - Excavated Waste Rock
 - Waterbody
 - Viewpoint



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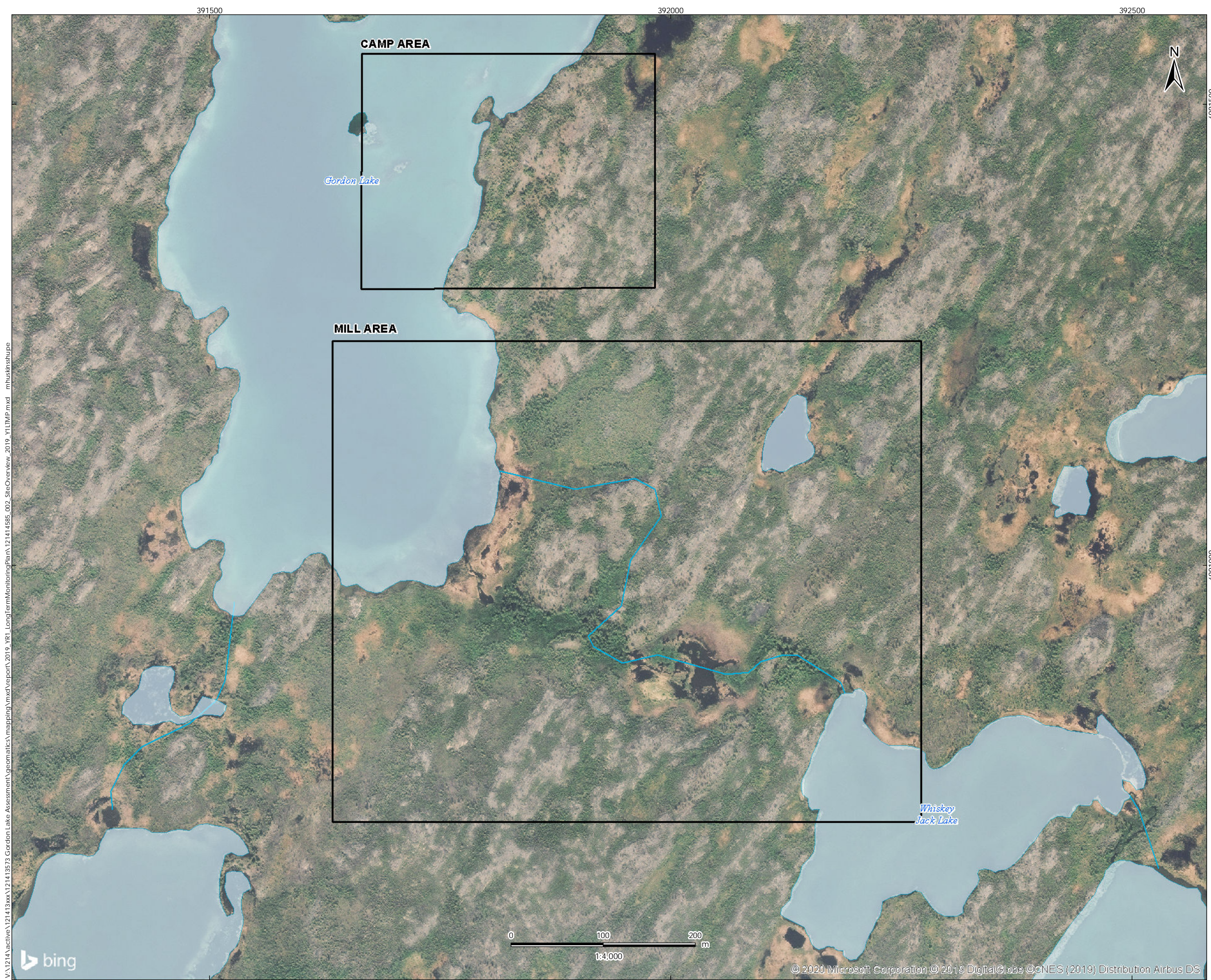
Client/Project
Public Services and
Procurement Canada
Phase I Long-Term Monitoring Report

Figure No.
A2.4

Title
Camlaren - Zenith Island
Summary of Long-Term Monitoring
Components

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Sources: MapMart Orthomage (2011), GeoBase, CANVEC



- Legend
- Watercourse
 - Waterbody
 - Map Extent



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Figure No.

A3.1

Title

Goodrock
Site Overview

V:\1214\active\121413\121413573 Gordon Lake Assessment\geomatrics\mapping\mxd\veport\2019_VR1_LongtermMonitoringPlan\121414585_002_SiteOverview_2019_Y1LIMP.mxd mhusknschupe



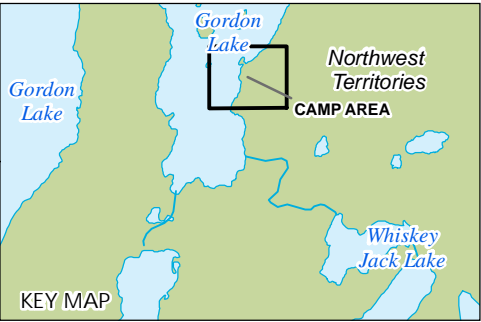


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Sources: MapMart Orthomageary (2011), GeoBase, CANVEC



- Legend
- TTT Moderately Risked Waste Rock Trench
 - Moderate Risk Impacting Material
 - Water body



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Procurement Canada
Phase I Long-Term Monitoring Report

Figure No.

A3.2

Title

Goodrock Mine - Camp Area
Summary of Long-Term Monitoring
Components

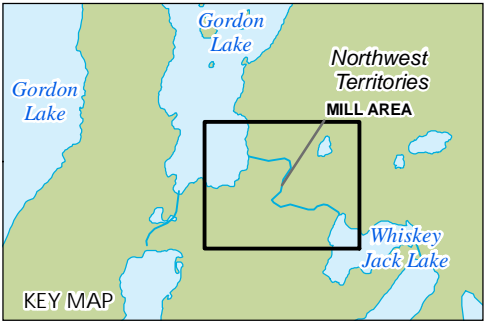


V:\1214\active\121413573 Gordon Lake Assessment\geomatrics\mapping\mxds\report\2019_YR1_LongtermMonitoringPlan\121414585_152_Goodrock_2019_YR1TMP.mxd mhskinshupe

Sources: MapMart Orthomageary (2011), GeoBase, CANVEC

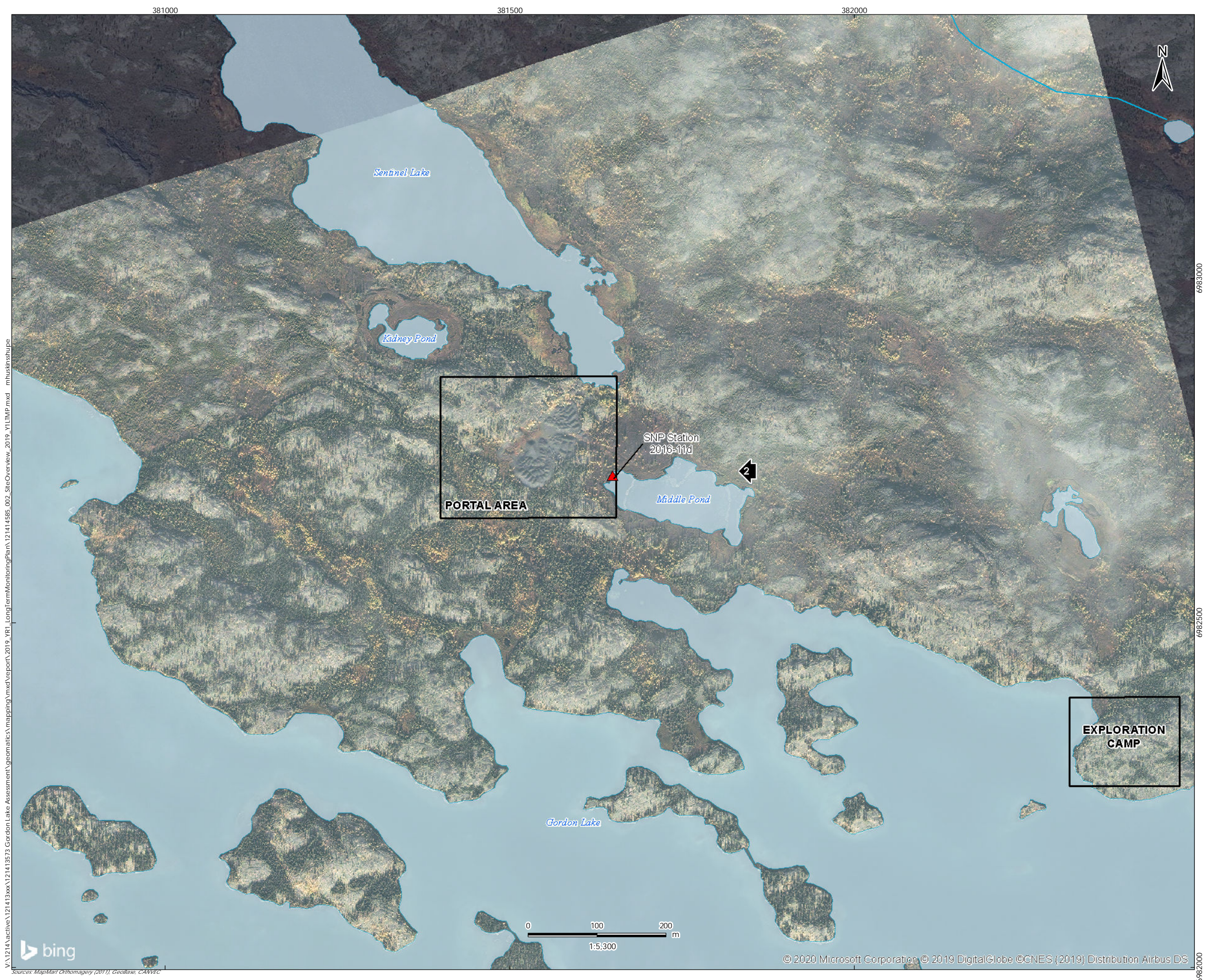


- Legend
- Moderately Risked Waste Rock Trench
 - Moderate Risk Impacting Material
 - Mine Opening
 - Covered Hotspot
 - Watercourse
 - Water body
 - Viewpoint

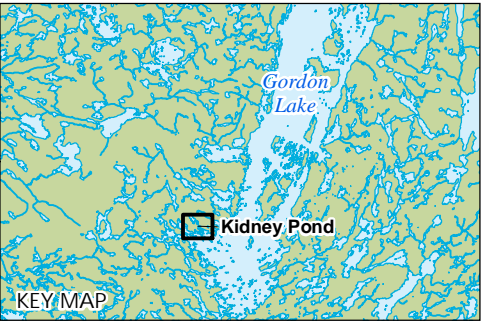


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Phase I Long-Term Monitoring Report
Figure No.
A3.3
Title
Goodrock Mine - Mill Area
Summary of Long-Term Monitoring
Components

January 2020
121414585



- Legend
- ▲ Surface Water Sample Location
 - Watercourse
 - Waterbody
 - Map Extent



NAD 1983 UTM Zone 12N
January 2020
121414585

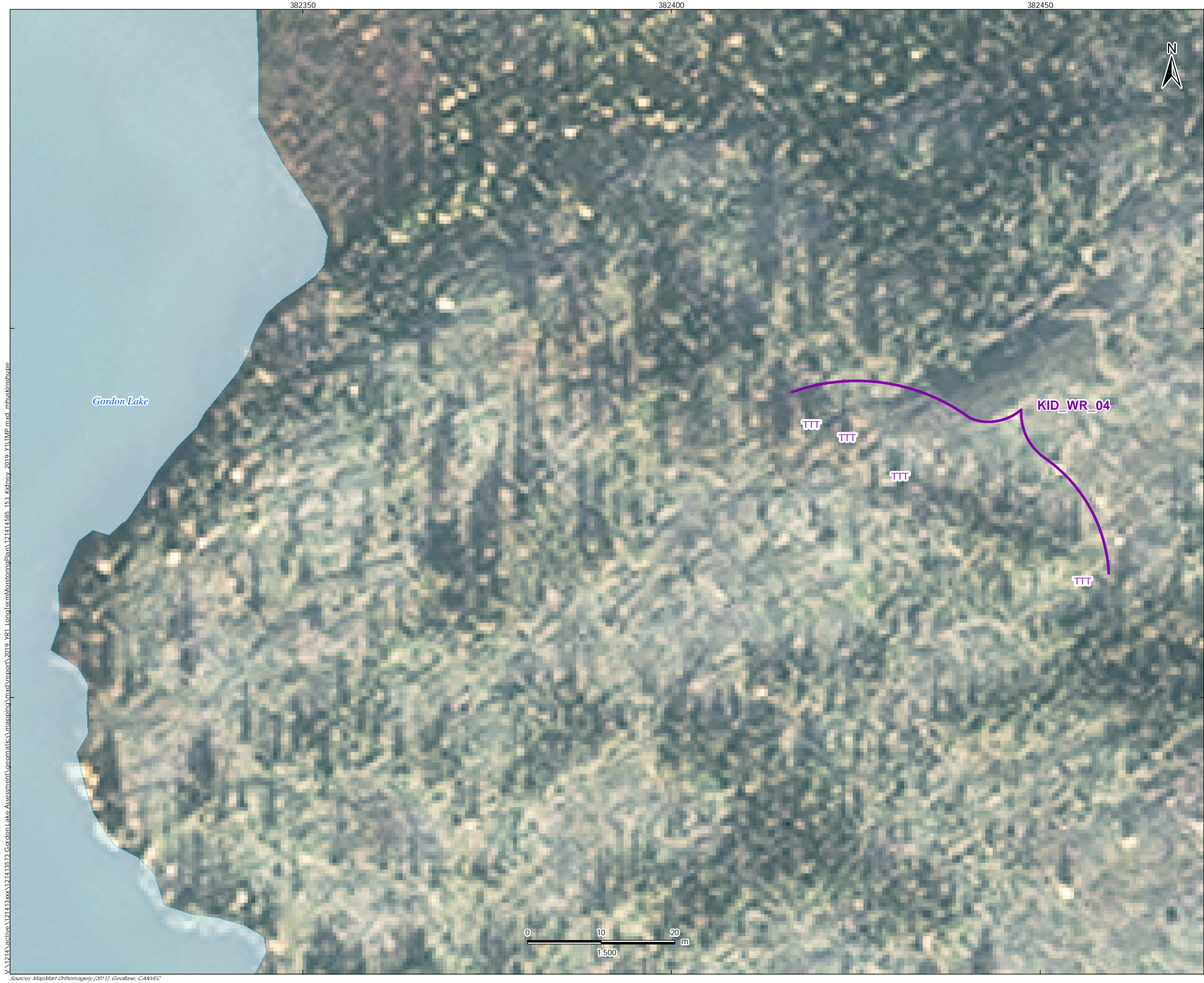
Client/Project
Public Services and
Procurement Canada
Phase I Long-Term Monitoring Report

Figure No.
A4.1

Title
Kidney Pond
Site Overview

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V:\1214\active\121413573 Gordon Lake Assessment\geomatics\mapping\mxd\report\2019_VR1 LongTermMonitoringPlan\121414585_153 Kidney 2019 YLTIMP.mxd mhuskinshupe

Sources: MapMart Orthomageary (2011), GeoBase, CANVEC



Legend

- TTT Moderately Risked Waste Rock Trench
- Moderate Risk Impacting Material
- Waterbody

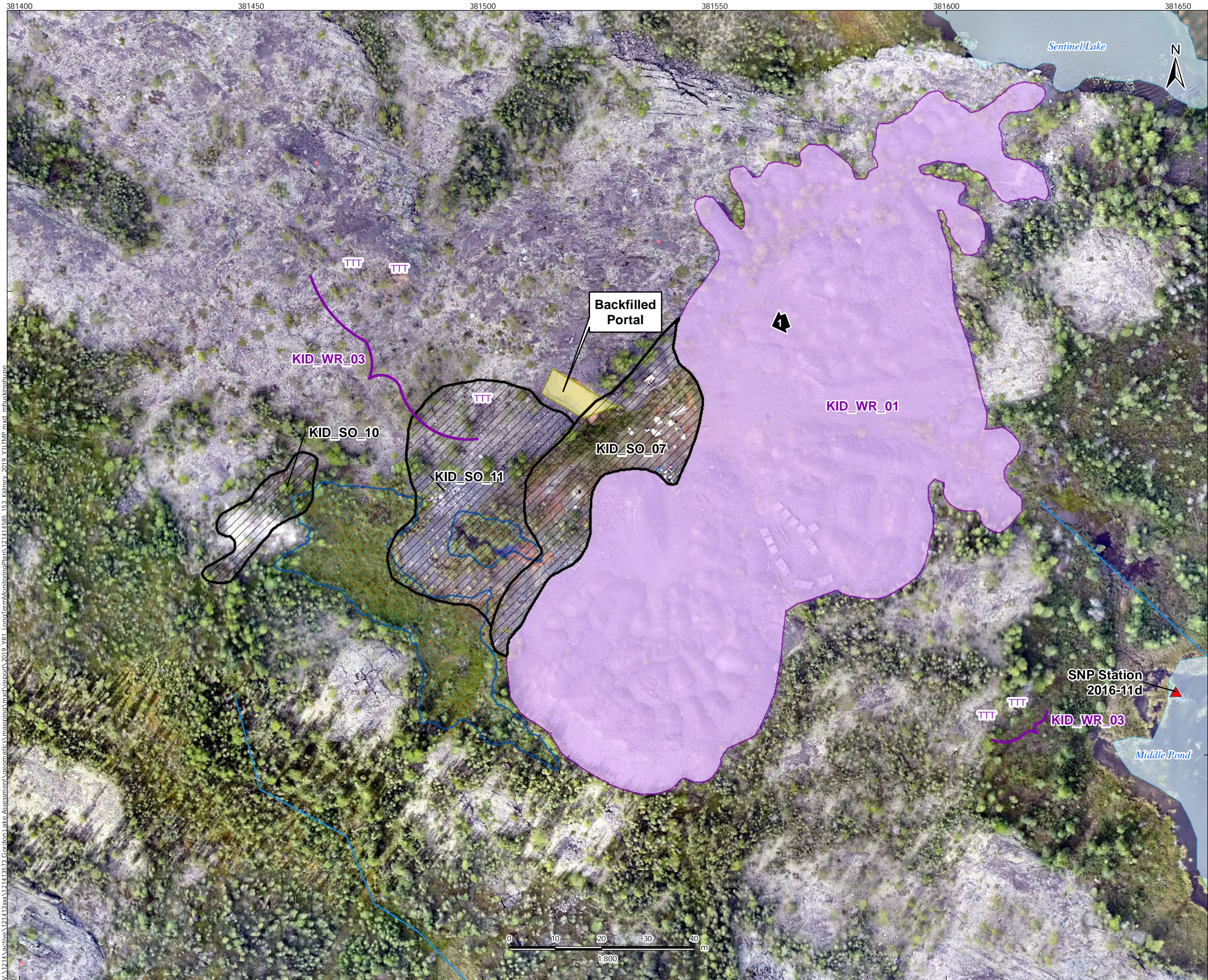


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Public Services and
Procurement Canada
Phase I Long-Term Monitoring Report

Figure No.
A4.2

Title
Kidney Pond - Exploration Camp
Summary of Long-Term Monitoring
Components

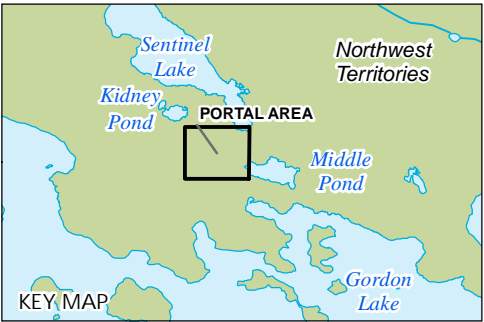


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Sources: MapMart Orthomage (2011), GeoBase, CANVEC



- Legend
- ▲ Surface Water Sample Location
 - TTT Moderately Risked Waste Rock Trench
 - Moderate Risk Impacting Material
 - ▨ Backfilled Remedial Excavation
 - ▤ Wet Area
 - Mine Opening
 - Excavated and Covered Waste Rock
 - Overland Drainage
 - Waterbody
 - ▲ Aerial Viewpoint



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121414585

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Procurement Canada
Phase I Long-Term Monitoring Report

Figure No.
A4.3

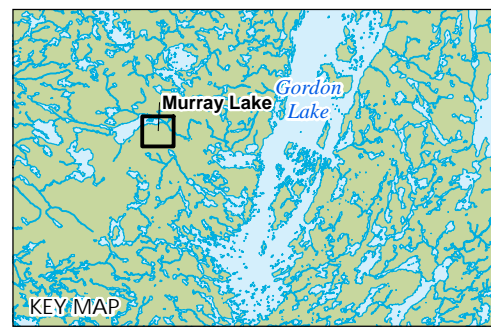
Title
Kidney Pond - Portal Area
Summary of Long-Term Monitoring
Components



V:\1214\active\121413573 Gordon Lake Assessment\geomatrics\mapping\mxd\report\2019_VR1_LongtermMonitoringPlan\121414585_002_SiteOverview_2019_Y1\TMP.mxd mhusknschupe



- Legend
- Watercourse
 - Waterbody
 - Map Extent



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January 2020
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Procurement Canada
Phase I Long-Term Monitoring Report

Figure No.

A5.1

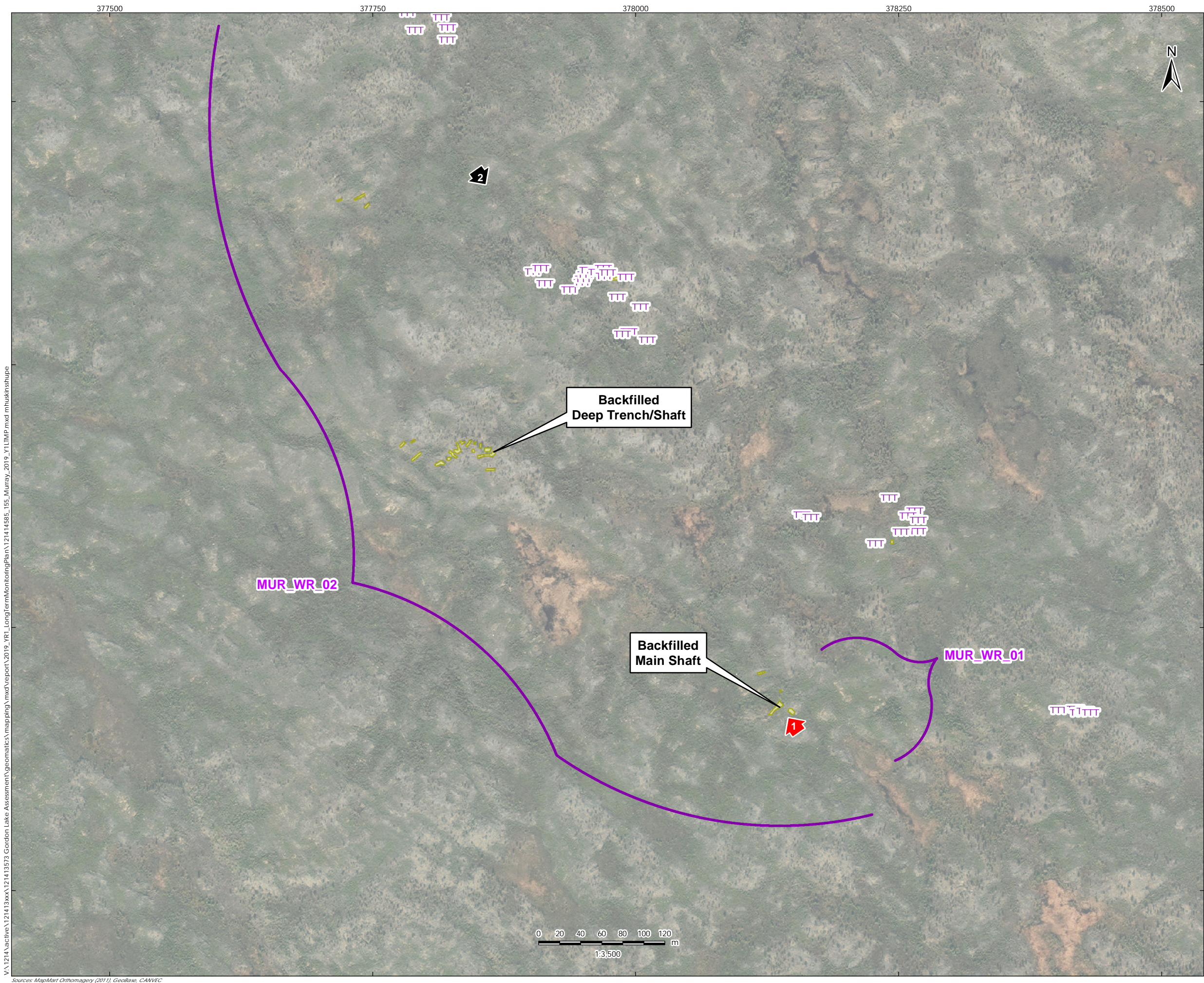
Title

Murray Lake
Site Overview



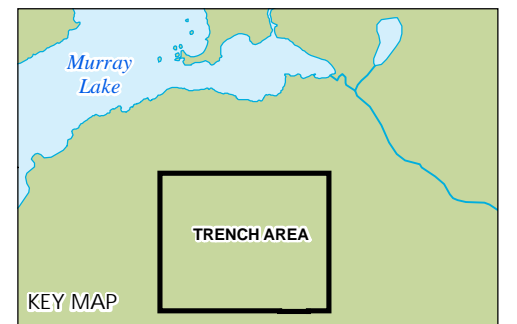
Sources: MapMart Orthomage (2011), GeoBase, CANVEC

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Legend

- Moderately Risked Waste Rock Trench
- Moderate Risk Impacting Material
- Mine Opening
- Watercourse
- Waterbody
- Aerial Viewpoint
- Viewpoint



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Procurement Canada
Phase I Long-Term Monitoring Report

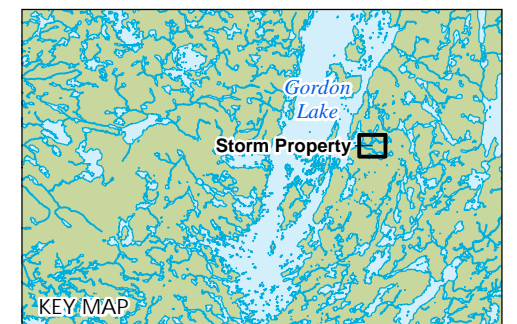
Figure No.
A5.2

Title
Murray Lake - Trench Area
Summary of Long-Term Monitoring
Components



Legend

- Watercourse
- Waterbody
- Map Extent



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121414585

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Phase I Long-Term Monitoring Report

Figure No.
A6.1

Title

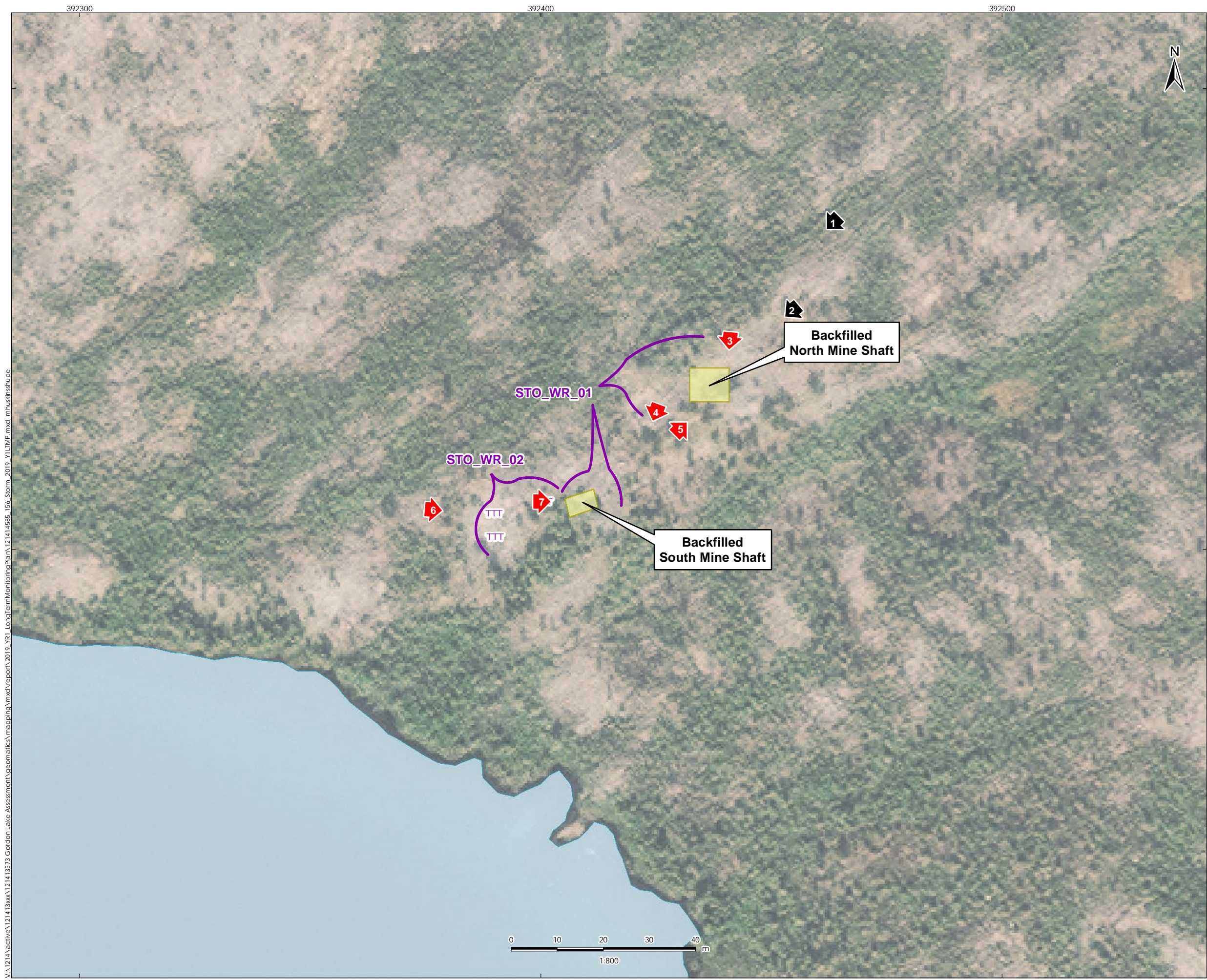
Storm Property
Site Overview

V:\1214\active\121413\121413573 Gordon Lake Assessment\geomatrics\mapping\mxd\veport\2019_VR1_LongtermMonitoringPlan\121414585_002_SiteOverview_2019_Y1L1MP.mxd mhusknschupe

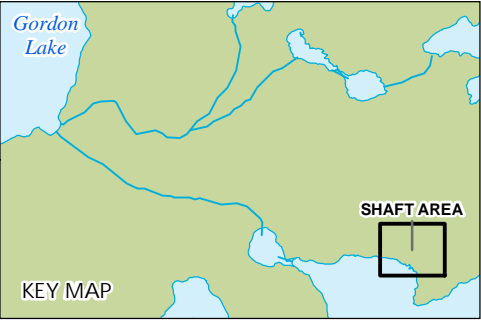


Sources: MapMart Orthomage (2011), Geobase, CANVEC

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- Legend
- TTT Moderately Risked Waste Rock Trench
 - Moderate Risk Impacting Material
 - Mine Opening
 - Watercourse
 - Waterbody
 - Aerial Viewpoint
 - Viewpoint



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Figure No.
A6.2

Title
Storm Property - Shaft Area
Summary of Long-Term Monitoring
Components



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- Legend
- ▲ Surface Water Sample Location
 - Watercourse
 - Waterbody
 - Map Extent



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Figure No.
A7.1

Title
Treacy
Site Overview



Sources: MapMart Orthomage (2011), GeoBase, CANVEC

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V:\1214\active\121413xxx\121413573 Gordon Lake Assessment\geomatrics\mapping\mxs\report\2019_VR1_LongtermMonitoringPlan\121414585_157_Treacy_2019_Y1LIMP.mxd mhuskshupe

Sources: MapMart Orthomagey (2011), GeoBase, CANVEC



Legend

- ▲ Surface Water Sample Location
- ▨ Backfilled Remedial Excavation
- Mine Opening
- Excavated Waste Rock
- Waterbody
- ▲ Viewpoint

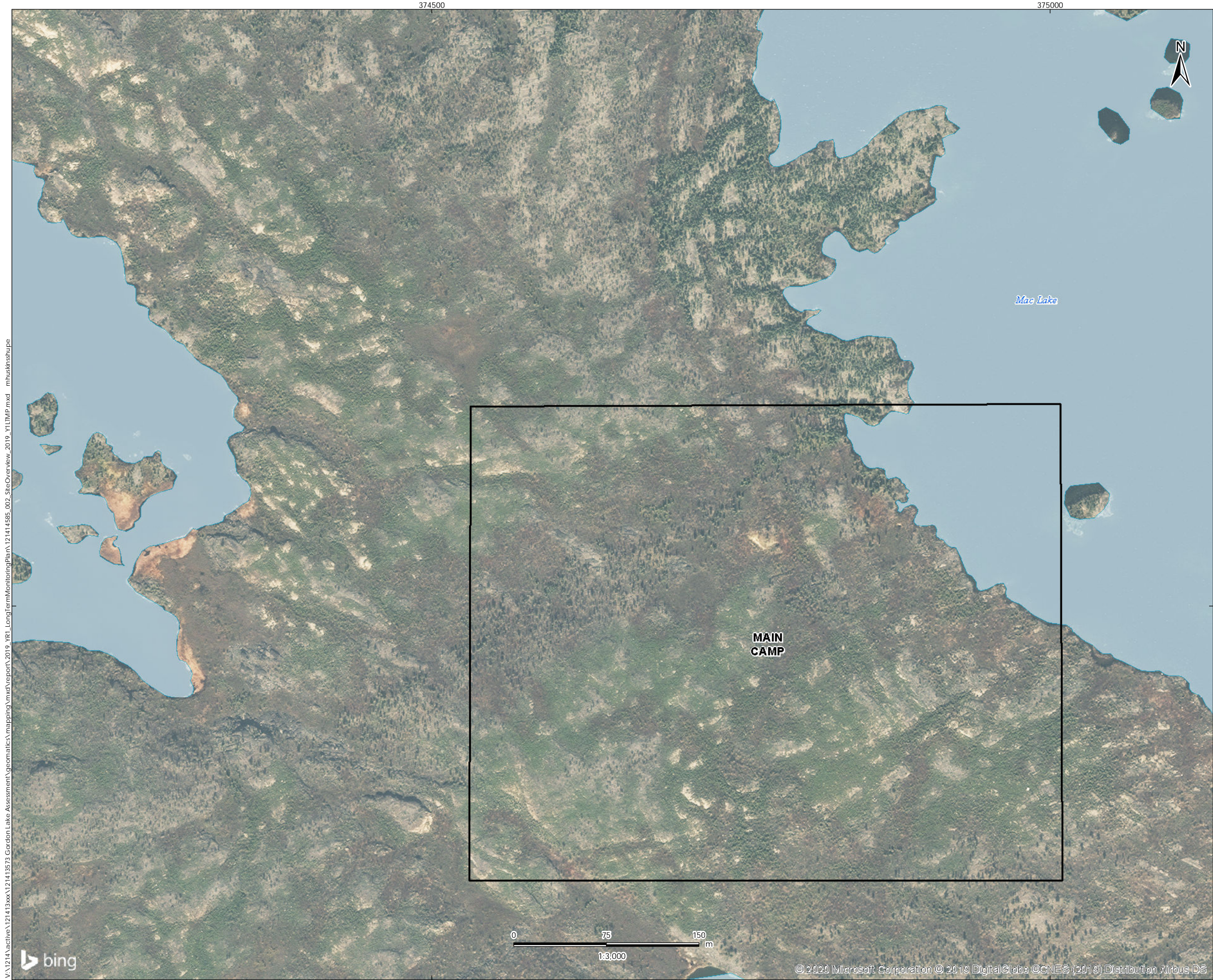


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Figure No.
A7.2

Title
Treacy - Mill Area
Summary of Long-Term Monitoring
Components



V:\1214\active\121413573 Gordon Lake Assessment\geomatrics\mapping\mxds\report\2019_VR1_LongTermMonitoringPlan\121414585_002_SiteOverview_2019_YLTIMP.mxd mhusknschupe



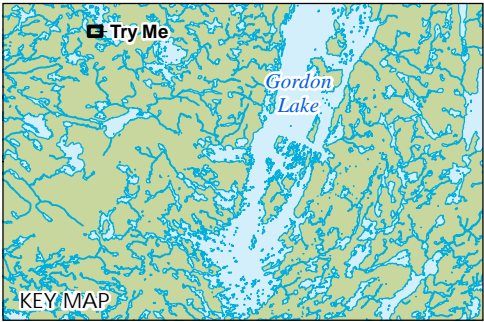
Sources: MapMent Orthomage (2011), GeoBase, CANVEC

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Legend

- Watercourse
- Waterbody
- Map Extent

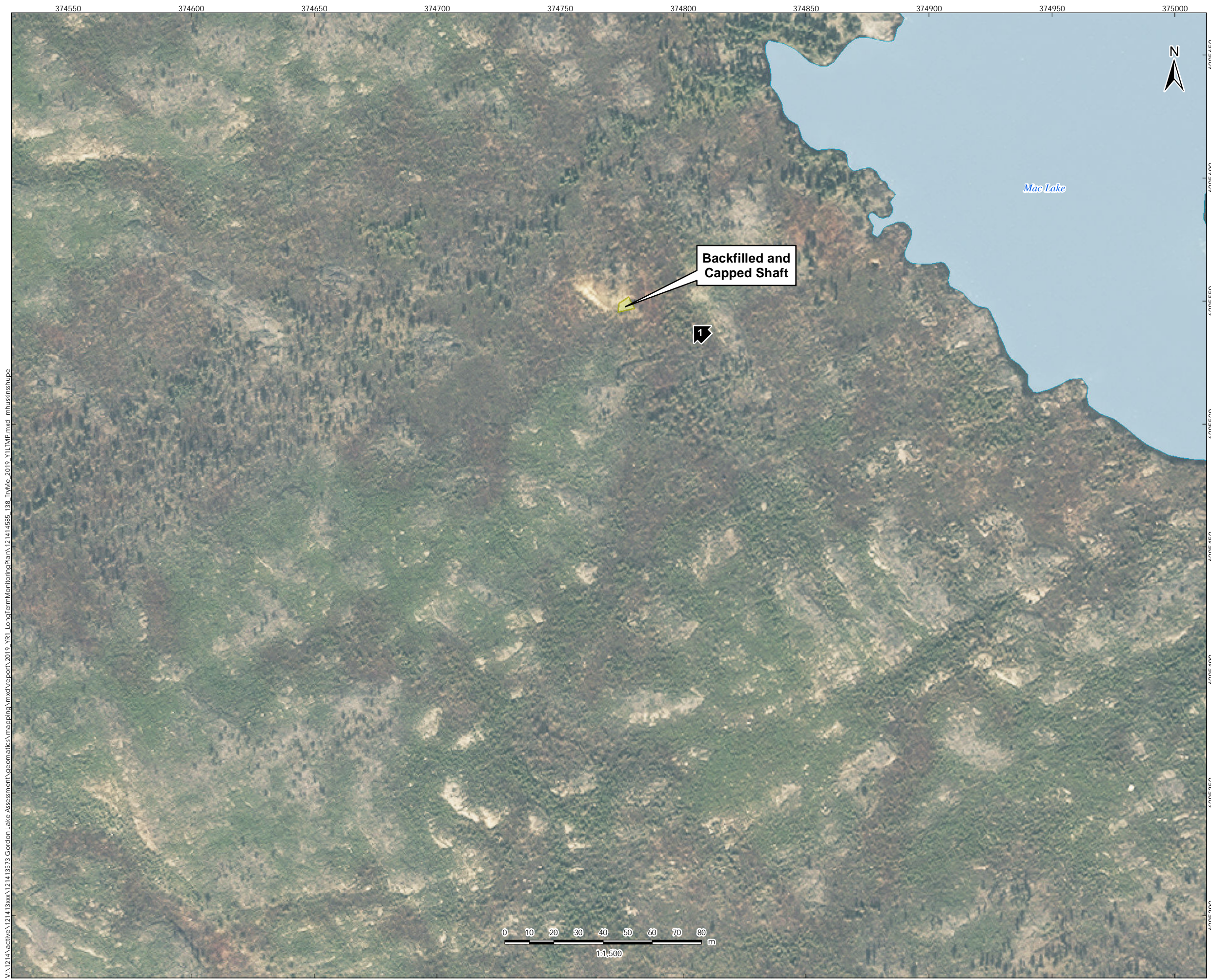


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Figure No.
A8.1

Title
Try Me
Site Overview



V:\1214\active\121413xxx\121413573 Gordon Lake Assessment\geomatrics\mapping\mxs\report\2019_VR1_LongtermMonitoringPlan\121414585_138_TryMe_2019_V1\TMP.mxd mhuskshupe

Sources: MapMart Orthomageary (2011), GeoBase, CANVEC



- Legend
- Mine Opening
 - Watercourse
 - Water body
 - Aerial Viewpoint



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Figure No.
A8.2

Title


Try Me - Main Camp
Summary of Long-Term Monitoring
Components







Stantec

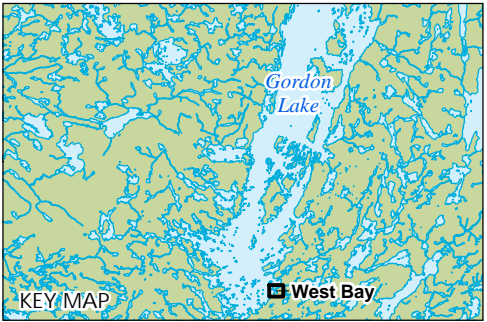
Legend

 Surface Water Sample Location

 Watercourse

 Waterbody

 Map Extent



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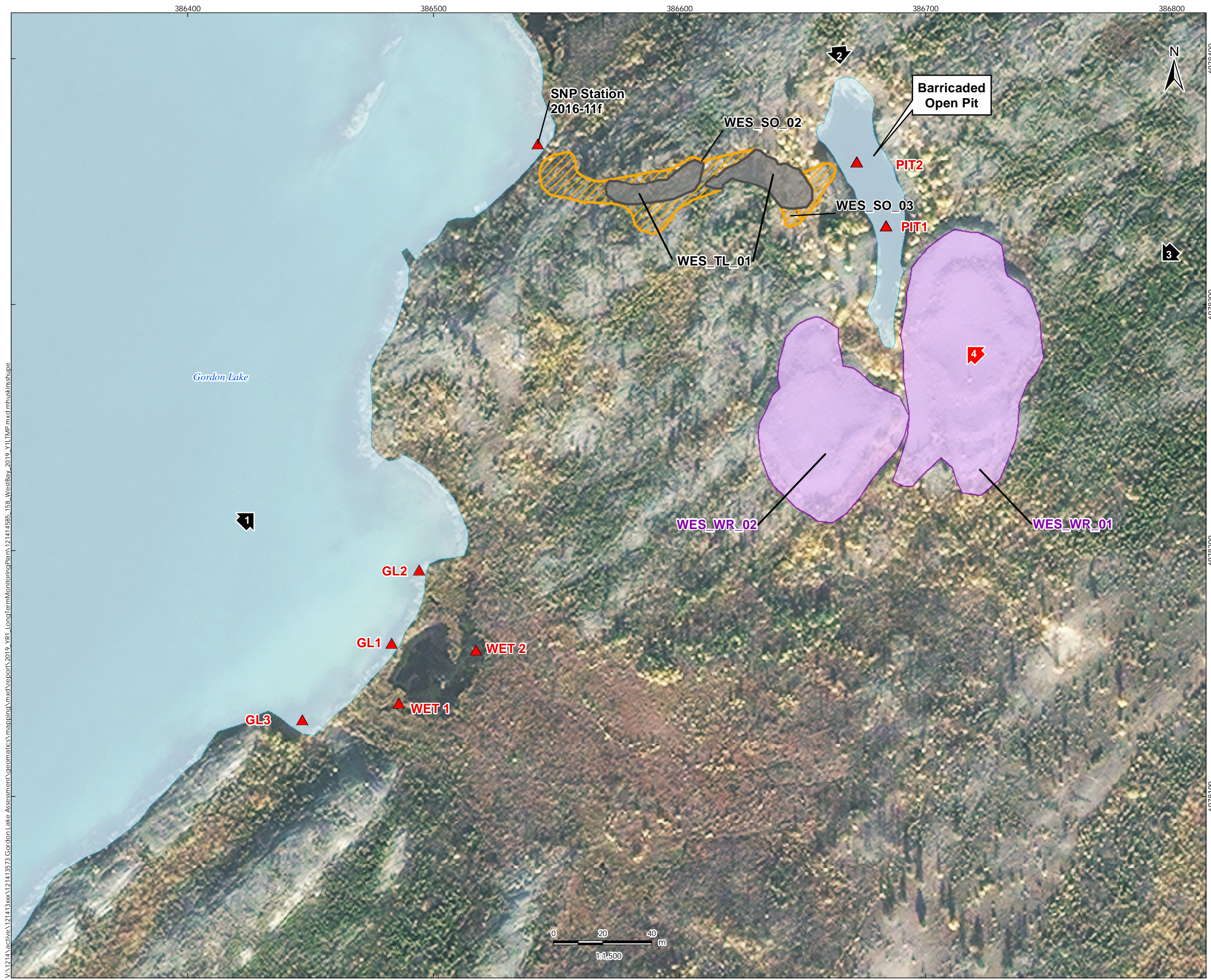
Public Services and
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Phase I Long-Term Monitoring Report

Figure No.

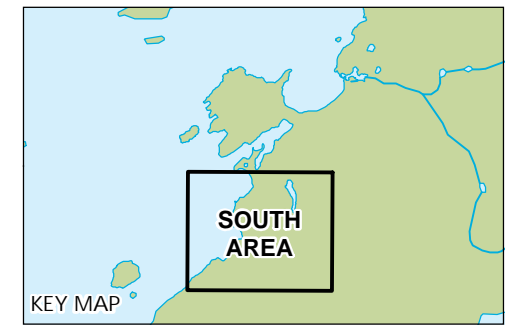
A9.1

Title

West Bay
Site Overview



- Legend
- ▲ Surface Water Sample Location
 - ▨ Remedial Excavation
 - Tailings Excavation
 - Waste Rock Requiring Monitoring
 - Watercourse
 - Water body
 - ➡ Aerial Viewpoint
 - ➡ Viewpoint



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Figure No.
A9.2

Title

**West Bay - South Area
Summary of Long-Term Monitoring
Components**

V:\1214\active\121413xxx\121413573 Gordon Lake Assessment\geomatrics\mapping\mxds\report\2019_VR1_LongtermMonitoringPlan\121414585_158_WestBay_2019_V1\TMP.mxd mhukinshupe

Sources: MapMart Orthomagey (2011), GeoBase, CANVEC

APPENDIX B

Tables

TABLE B-1 **Phase I Long Term Monitoring Hazard Components**
Public Services and Procurement Canada
Gordon Lake Group of Sites
Stantec Consulting Ltd. Project No. 121414585

Site Name	Hazard Category	Hazard Name	Pre-Remediation Physical Description	Remedial Activity Approach (Approach exceptions)	Carried forward into LTM?
Burnt Island	Co-Mingled Impacted Soil	BUR_SO_07	Co-mingled metal and hydrocarbon impacted soil exceeding the applicable regulatory criteria and/or the site specific threshold levels are present within these AECs.	Excavate and consolidate into TSCA	No- no risk remains and not backfilled
Burnt Island	PHC Impacted Soil	BUR_SO_01	Hydrocarbon impacted soil exceeding the applicable regulatory criteria and/or the site specific threshold levels are present within these AECs.	Excavate and consolidate into TSCA	No- no risk remains and low erosion risk
Burnt Island	PHC Impacted Soil	BUR_SO_02	Hydrocarbon impacted soil exceeding the applicable regulatory criteria and/or the site specific threshold levels are present within these AECs.	Excavate and consolidate into TSCA	No- no risk remains and low erosion risk
Burnt Island	PHC Impacted Soil	BUR_SO_03	Hydrocarbon impacted soil exceeding the applicable regulatory criteria and/or the site specific threshold levels are present within these AECs.	Excavate and consolidate into TSCA	No- no risk remains and low erosion risk
Burnt Island	PHC Impacted Soil	BUR_SO_04	Hydrocarbon impacted soil exceeding the applicable regulatory criteria and/or the site specific threshold levels are present within these AECs.	Excavate and consolidate into TSCA	No- no risk remains and low erosion risk
Burnt Island	PHC Impacted Soil	BUR_SO_05	Hydrocarbon impacted soil exceeding the applicable regulatory criteria and/or the site specific threshold levels are present within these AECs.	Excavate and consolidate into TSCA	No- no risk remains and low erosion risk
Burnt Island	Mine Openings	Portal	The portal opening was 4.7 m x 4.7 m in dimension with approximately 2.3 m of bedrock above the portal entrance (i.e. crown pillar). It was partially blocked by a wooden wall and the mine tunnel declined from the portal opening.	Backfill	Yes
Burnt Island	Abandoned Infrastructure	South Sump	Surficial opening containing debris.	Collect material in sumps, burn(as appropriate) and landfill. Regrade.	No- no risk remains and low erosion risk
Burnt Island	Tailings	Tailings	Small isolated tailings area.	Cover in place	Yes
Burnt Island	Mine Openings	Mine Shaft	3.8 m x 3.8 m shaft partially filled with the collapsed wooden cap and drill stem pipe. Depth is approximately 36 m.	Backfill and seal with engineered cap	Yes
Burnt Island	Waste Rock	BUR_WR_01	Waste rock resulting from trenching in the area. Waste rock identified as potentially acid generating and classified as moderate risk.	Leave in place	Yes
Camlaren	Co-Mingled Impacted Soil	CAM_SO_09	Co-mingled metal and hydrocarbon impacted soil exceeding the applicable regulatory criteria and/or the site specific threshold levels are present within these AECs.	Excavate and consolidate into TSCA	No- no risk remains and not backfilled
Camlaren	Metals Impacted Soil	CAM_HS_01	Hotspot impacted with metals	Excavate and consolidate into TSCA	No- no risk remains and low erosion risk
Camlaren	Metals Impacted Soil	CAM_SO_04	This area is impacted with metals.	Excavate and consolidate into TSCA	Yes
Camlaren	Metals Impacted Soil	CAM_SO_06	This area is impacted with metals.	Excavate and consolidate into TSCA	Yes
Camlaren	Metals Impacted Soil	CAM_SO_07	This area is impacted with metals.	Excavate and consolidate into TSCA	Yes
Camlaren	Metals Impacted Soil	CAM_SO_08	This area is impacted with metals.	Excavate and consolidate into TSCA	Yes
Camlaren	Metals Impacted Soil	CAM_SO_10	This area is impacted with metals.	Excavate and consolidate into TSCA	No- no risk remains and not backfilled
Camlaren	Metals Impacted Soil	CAM_SO_11	This area is impacted with metals.	Excavate and consolidate into TSCA	No- no risk remains and not backfilled
Camlaren	Metals Impacted Soil	CAM_SO_12	This area is impacted with metals.	Excavate and consolidate into TSCA	Yes

TABLE B-1 Phase I Long Term Monitoring Hazard Components
Public Services and Procurement Canada
Gordon Lake Group of Sites
Stantec Consulting Ltd. Project No. 121414585

Site Name	Hazard Category	Hazard Name	Pre-Remediation Physical Description	Remedial Activity Approach (Approach exceptions)	Carried forward into LTM?
Camlaren	Metals Impacted Soil	CAM_SO_15	This area is impacted with metals.	Excavate and consolidate into TSCA	No- no risk remains and low erosion risk
Camlaren	Metals Impacted Soil	CAM_SO_18	This area is impacted with metals.	Excavate and consolidate into TSCA	No- no risk remains and not backfilled
Camlaren	Metals Impacted Soil	CAM_SO_20	This area is impacted with metals.	Excavate and consolidate into TSCA	Yes
Camlaren	Metals Impacted Soil	CAM_SO_21	This area is impacted with metals. Area of cobalt exceedance at North Cabin - already vegetated and minor exceedances, therefore previously recommended that it be left in place (discussed in the RAP, Section 5.2.2.1).	Do nothing	No- no risk remains and not backfilled
Camlaren	Metals Impacted Soil	CAM_SO_22	This area is impacted with metals. Area of cobalt exceedance at North Cabin - already vegetated and minor exceedances, therefore previously recommended that it be left in place (discussed in the RAP, Section 5.2.2.1).	Do nothing	No- no risk remains and not backfilled
Camlaren	Metals Impacted Soil	CAM_SO_23	This area is impacted with metals.	Excavate and consolidate into TSCA	Yes
Camlaren	PHC Impacted Soil	CAM_SO_01	This area is impacted with hydrocarbons.	Excavate and consolidate into TSCA	Yes
Camlaren	PHC Impacted Soil	CAM_SO_03	This area is impacted with hydrocarbons.	Excavate and consolidate into TSCA	Yes
Camlaren	PHC Impacted Soil	CAM_SO_05	This area is impacted with hydrocarbons.	Excavate and consolidate into TSCA	Yes
Camlaren	PHC Impacted Soil	CAM_SO_14	This area is impacted with hydrocarbons.	Excavate and consolidate into TSCA	Yes
Camlaren	PHC Impacted Soil	CAM_SO_16	This area is impacted with hydrocarbons.	Excavate and consolidate into TSCA	No- no risk remains and low erosion risk
Camlaren	PHC Impacted Soil	CAM_SO_19	This area is impacted with hydrocarbons.	Excavate and consolidate into TSCA	No- no risk remains and not backfilled
Camlaren	Abandoned Infrastructure	Wooden Culvert	Approximately 4.8 m long, 1 m wide x 1 m deep.	Remove and recontour	No- no risk remains and low erosion risk
Camlaren	Waste Rock	CAM_WR_02B	Waste rock found north of the Shaft.	Excavate and consolidate into TSCA	No- no risk remains
Camlaren	Waste Rock	CAM_WR_02A	Waste rock at Zenith Island was found to have a high acid generating potential.	Excavate and consolidate into TSCA	No- no risk remains
Camlaren	Waste Rock	CAM_WR_01A	Waste rock at south Muir Island that is intermingled in soil and previously determined to be non-PAG	Excavate and consolidate into TSCA	No- no risk remains
Camlaren	Waste Rock	CAM_WR_03	Waste rock resulting from trenching in the area.	Excavate and consolidate into TSCA	No- no risk remains
Camlaren	Waste Rock	CAM_WR_01B	Waste rock found along the perimeter of the TSCA.	Incorporate into the TSCA	No- no risk remains
Camlaren	Tailings	CAM_TL_01	Tailings in AEC 6 are contained within the tailings dyke on-site. However, an overflow ditch on the northwest corner of the dyke may allow for the tailings to impact soil, surface water and sediment down-gradient of the dyke (including Gordon Lake).	Upgrade tailings containment area (TCA) to tailings and soil containment area (TSCA) through consolidation of material in the area and construction of TSCA design (including engineered cover with BGM, covering coco matting, etc.).	No- now covered under TSCA
Camlaren	Mine Openings	Crown Pillar Opening	Stope 3 m deep from the top of the bedrock. Stope is connected to the mined out crown pillar that extends to underwater mine shafts that are at least 105 m extending to a depth of 305 m.	Construct barrier	No- barrier construction removed from specifications
Camlaren	Mine Openings	Mine Shaft Cap	Cap consists of a concrete pad measuring 4.4 m x 3.7 m approximately 150 mm in thickness. Shaft is reportedly backfilled with debris.	Marked prior to remediation and no further action	No- marked and no further action required

TABLE B-1 **Phase I Long Term Monitoring Hazard Components**
Public Services and Procurement Canada
Gordon Lake Group of Sites
Stantec Consulting Ltd. Project No. 121414585

Site Name	Hazard Category	Hazard Name	Pre-Remediation Physical Description	Remedial Activity Approach (Approach exceptions)	Carried forward into LTM?
Camlaren	Mine Openings	Shaft	Capped with timbers 2.8 m x 3.0 m. Backfilled with waste rock. Some minor subsidence in the center of the shaft.	Backfill and seal with engineered cap	Yes
Camlaren	n/a	TSCA	TSCA constructed to contain impacted soil, tailings, and other waste collected during remedial activities.	TSCA containing waste from various sites. Construction	Yes
Goodrock	Metals Impacted Soil	GOO_HS_01	Originally was to be disposed into TSCA, then decided to be left in place due to size. Following further risk assessment, was recommended to be covered in place.	Cover in place	Yes
Goodrock	Mine Openings	South Pit	3 m x 6 m in size, with water present. Steep slopes are present.	Backfill	Yes
Goodrock	Mine Openings	North Mine Shaft	3 m x 4 m in size, with water present.	Backfill and seal with engineered cap	Yes
Goodrock	Waste Rock	GOO_WR_01	Scattered waste rock near Camp Area trenches. Waste rock identified as potentially acid generating and classified as moderate risk.	Leave in place	Yes
Goodrock	Waste Rock	GOO_WR_02	Scattered waste rock near Mill Area trenches. Waste rock identified as potentially acid generating and classified as moderate risk.	Leave in place	Yes
Kidney Pond	Co-Mingled Impacted Soil	KID_SO_07	Co-mingled metal and hydrocarbon impacted soil exceeding the applicable regulatory criteria and/or the site specific threshold levels are present within these AECs.	Excavate and consolidate into TSCA	Yes
Kidney Pond	Co-Mingled Impacted Soil	KID_SO_11	Co-mingled metal and hydrocarbon impacted soil exceeding the applicable regulatory criteria and/or the site specific threshold levels are present within these AECs.	Excavate and consolidate into TSCA	Yes
Kidney Pond	Metals Impacted Soil	KID_SO_05	Metal impacted soil exceeding the applicable regulatory criteria and/or the site specific threshold levels are present within these AECs.	Excavate and consolidate into TSCA	No- no risk remains and low erosion risk
Kidney Pond	Metals Impacted Soil	KID_SO_06	Metal impacted soil exceeding the applicable regulatory criteria and/or the site specific threshold levels are present within these AECs.	Excavate and consolidate into TSCA	No- no risk remains and low erosion risk
Kidney Pond	Metals Impacted Soil	KID_HS_01	Hotspot impacted with metals	Excavate and consolidate into TSCA	No- no risk remains and low erosion risk
Kidney Pond	PHC Impacted Soil	KID_SO_01	Hydrocarbon impacted soil exceeding the applicable regulatory criteria and/or the site specific threshold levels are present within these AECs.	Excavate and consolidate into TSCA	No- no risk remains and low erosion risk
Kidney Pond	PHC Impacted Soil	KID_SO_02	Hydrocarbon impacted soil exceeding the applicable regulatory criteria and/or the site specific threshold levels are present within these AECs.	Excavate and consolidate into TSCA	No- no risk remains and low erosion risk
Kidney Pond	PHC Impacted Soil	KID_SO_03	Hydrocarbon impacted soil exceeding the applicable regulatory criteria and/or the site specific threshold levels are present within these AECs.	Excavate and consolidate into TSCA	No- no risk remains and low erosion risk
Kidney Pond	PHC Impacted Soil	KID_SO_04	Hydrocarbon impacted soil exceeding the applicable regulatory criteria and/or the site specific threshold levels are present within these AECs.	Excavate and consolidate into TSCA	No- no risk remains and low erosion risk
Kidney Pond	PHC Impacted Soil	KID_SO_10	Hydrocarbon impacted soil exceeding the applicable regulatory criteria and/or the site specific threshold levels are present within these AECs.	Excavate and consolidate into TSCA	Yes
Kidney Pond	Waste Rock	KID_WR_01	Waste rock within AEC has been determined to be potentially acid generating.	Excavate and consolidate into TSCA	Yes

TABLE B-1 Phase I Long Term Monitoring Hazard Components
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Site Name	Hazard Category	Hazard Name	Pre-Remediation Physical Description	Remedial Activity Approach (Approach exceptions)	Carried forward into LTM?
Kidney Pond	Waste Rock	KID_WR_02	Waste rock within AEC has been determined to be potentially acid generating.	Excavate and consolidate into TSCA	No- no risk remains
Kidney Pond	Mine Openings	Portal	Approximately 6 m wide by 2.7 m high. 2.5 to 3.0 m of bedrock above the adit entrance.	Backfill and seal with engineered cap (however not sealed with engineered cap)	Yes
Kidney Pond	Waste Rock	KID_WR_03	Scattered waste rock near Portal Area trenches. Waste rock identified as potentially acid generating and classified as moderate risk.	Leave in place	Yes
Kidney Pond	Waste Rock	KID_WR_04	Scattered waste rock near Exploration Camp trenches. Waste rock identified as potentially acid generating and classified as moderate risk.	Leave in place	Yes
Murray Lake	Mine Openings	Main Shaft	Structural and safety hazard; fall-in risk for people & wildlife on site (assumed an average depth of 1.5 m based on previous reports and photos)	Backfill	Yes
Murray Lake	Mine Openings	Deep Trench/Shaft	Structural and safety hazard; fall-in risk for people & wildlife on site	Backfill	Yes
Murray Lake	Abandoned Infrastructure	Sumps	Surficial opening containing debris.	Collect material in sumps, burn(as appropriate) and landfill. Regrade.	No- no risk remains and low erosion risk
Murray Lake	Waste Rock	MUR_WR_01	Scattered waste rock near Trench Area Main Shaft. Waste rock identified as potentially acid generating and classified as moderate risk.	Leave in place	Yes
Murray Lake	Waste Rock	MUR_WR_02	Scattered waste rock near Trench Area various trenches. Waste rock identified as potentially acid generating and classified as moderate risk.	Leave in place	Yes
Storm Property	Mine Openings	South Mine Shaft	Open shaft at the center of the site (~3mx3m). Tripping/falling hazard	Backfill	Yes
Storm Property	Mine Openings	North Mine Shaft	Deep shaft open to the surface (~6m x8m), filled with water and algae; ore pile; metal spool nearby. Tripping/ falling/drowning hazard; cutting hazard	Backfill	Yes
Storm Property	Waste Rock	STO_WR_01	Waste rock piles near Shaft Area North Shaft and South Shaft. Waste rock identified as potentially acid generating and classified as moderate risk.	Leave in place	Yes
Storm Property	Waste Rock	STO_WR_02	Scattered waste rock near Shaft Area trenches. Waste rock identified as potentially acid generating and classified as moderate risk.	Leave in place	Yes
Treacy	Metals Impacted Soil	TRE_SO_01	Metal impacted soil exceeding the applicable regulatory criteria and/or the site specific threshold levels are present within these AECs.	Excavate and consolidate into TSCA	Yes
Treacy	Metals Impacted Soil	TRE_SO_03	Metal impacted soil exceeding the applicable regulatory criteria and/or the site specific threshold levels are present within these AECs.	Excavate and consolidate into TSCA	No- no risk remains and low erosion risk
Treacy	PHC Impacted Soil	TRE_SO_02	Hydrocarbon impacted soil exceeding the applicable regulatory criteria and/or the site specific threshold levels are present within these AECs.	Excavate and consolidate into TSCA	Yes
Treacy	Trenches	East Trench	Filled with water, wood debris; falling or drowning hazard, high metals concentration in water hazard	Backfill	Yes
Treacy	Trenches	West Trench	Contains tailings - high metals concentration hazard (20m ²)	Backfill	Yes
Treacy	Waste Rock	TRE_WR_01	Three ore piles in the Mill Area. Tripping hazard, potentially acid-generating	Excavate and consolidate into TSCA	No- no risk remains

TABLE B-1 Phase I Long Term Monitoring Hazard Components
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Site Name	Hazard Category	Hazard Name	Pre-Remediation Physical Description	Remedial Activity Approach (Approach exceptions)	Carried forward into LTM?
Treacy	Tailings	TRE_TL_01	Located at the base of the west trench in AEC 5. Approximately 10 m3 of tailing that may be potentially acid generating.	Excavate and consolidate into TSCA	No- no risk remains
Try Me	Mine Openings	Shaft	The shaft is approximately 2.0 m x 1.6 m with a depth of 4.5 m. Water was observed at the entrance of the shaft. Dense vegetation is present on the east side of the mine opening. Loose waste rock is present in the area above the opening, and scattered down the steep slope to the entrance of the shaft.	Backfill and seal with engineered cap	Yes
West Bay	Co-Mingled Impacted Soil	WES_SO_03	Co-mingled metal and hydrocarbon impacted soil exceeding the applicable regulatory criteria and/or the site specific threshold levels are present within these AECs.	Excavate and consolidate into TSCA	No- no risk remains and not backfilled
West Bay	Metals Impacted Soil	WES_SO_06	Metal impacted soil exceeding the applicable regulatory criteria and/or the site specific threshold levels are present within these AECs.	Excavate and consolidate into TSCA	No- no risk remains and low erosion risk
West Bay	Metals Impacted Soil	WES_SO_02	Metal impacted soil exceeding the applicable regulatory criteria and/or the site specific threshold levels are present within these AECs.	Excavate and consolidate into TSCA	No- no risk remains and not backfilled
West Bay	Metals Impacted Soil	WES_SO_04	Metal impacted soil exceeding the applicable regulatory criteria and/or the site specific threshold levels are present within these AECs.	Excavate and consolidate into TSCA	No- no risk remains and low erosion risk
West Bay	Metals Impacted Soil	WES_SO_08	Metal impacted soil exceeding the applicable regulatory criteria and/or the site specific threshold levels are present within these AECs.	Excavate and consolidate into TSCA	No- no risk remains and low erosion risk
West Bay	PHC Impacted Soil	WES_SO_05	Hydrocarbon impacted soil exceeding the applicable regulatory criteria and/or the site specific threshold levels are present within these AECs.	Excavate and consolidate into TSCA	No- no risk remains and low erosion risk
West Bay	PHC Impacted Soil	WES_SO_07	Hydrocarbon impacted soil exceeding the applicable regulatory criteria and/or the site specific threshold levels are present within these AECs.	Excavate and consolidate into TSCA	No- no risk remains and low erosion risk
West Bay	Tailings	WES_TL_01	Approximately 650 m ³ of metal impacted tailings	Excavate and consolidate into TSCA	No- no risk remains and not backfilled
West Bay	Mine Openings	Open Pit	12 m deep pit. Walls >50 degrees. Water is present in the pit.	Perimeter barricade	Yes
West Bay	Waste Rock	WES_WR_01	East waste rock pile south of open pit. Waste rock identified as potentially acid generating however classified as moderate risk following further assessment.	Leave in place (considered moderate risk after further assessment)	Yes
West Bay	Waste Rock	WES_WR_02	West waste rock pile south of open pit. Waste rock identified as potentially acid generating however classified as moderate risk following further assessment.	Leave in place (considered moderate risk after further assessment)	Yes
Borrow Sources (GD-18, GD-37 and GD-45)	Borrow Source Development	GD-18, GD-37 and GD-45	Development of borrow material required to facilitate remedial activities.	Borrow source development, as needed	No- inspected and considered closed

TABLE B-2 Phase I Long Term Monitoring Plan Details
Public Services and Procurement Canada
Gordon Lake Group of Sites
Stantec Consulting Ltd. Project No. 121414585

Site Name	Hazard Category	Hazard Name	Phase I LTM Figure No.	Monitoring Driver	Phase I Long Term Monitoring Objectives	Triggers for Adaptive Management	Potential Mitigative Actions	Phase I LTM Frequency	Phase I LTM Duration	Target Dates	Exit Criteria
Burnt Island	Mine Openings	Portal	A1.4	Physical	Verify backfill material is stable with no significant resulting erosion or settlement.	Major subsidence (<0.5m) of backfill is observed and/or structural concerns (e.g. deformation, cracking, etc.).	Investigation to identify cause and/or safety concerns. Completing repairs as needed.	Quinquennially	Years 1 and 5	Frost-free periods	Exit criteria are not applicable for mine openings unless otherwise authorized by authorities having jurisdiction.
Burnt Island	Tailings	Tailings	A1.2	Aesthetic	Verify cover material is stable with no significant resulting erosion or washout.	Erosion/washout which exposes any tailings and/or rills >10cm.	Re-covering/re-grading as needed.	Biennially	Years 1, 3 and 5	Snow-free periods.	Absence of major erosion/tailings exposure concerns over three consecutive monitoring events.
Burnt Island	Mine Openings	Mine Shaft	A1.3	Physical	Verify the backfill material is stable with no significant resulting erosion or settlement. Verify the structural stability of the mine opening cap.	Major subsidence (<0.5m) of backfill is observed and/or structural concerns (e.g. deformation, cracking, etc.).	Investigation to identify cause and/or safety concerns. Completing repairs as needed.	Quinquennially	Years 1 and 5	Frost-free periods	Exit criteria are not applicable for mine openings unless otherwise authorized by authorities having jurisdiction.
Burnt Island	Waste Rock	BUR_WR_01	A1.5	Chemical	Verify no visual signs of ARD down-gradient of remaining impacts.	Down-gradient environment indicates signs of ARD (e.g. new loss of vegetation, stressed vegetation, discoloration, etc.).	Sampling of down-gradient soil and surface water for metals. Trouble-shooting potential sources and addressing waste rock if needed.	Quinquennially	Years 1 and 5	Summer	Future exit criteria as well as triggers for action/monitoring frequency will based on long-term results of monitoring.
Camlaren	Metals Impacted Soil	CAM_SO_04	A2.2	Erosion	Verify excavation backfill material is stable with no significant resulting erosion or washout into down-gradient water.	Erosion/washout concerns in nearby water and/or rills >10cm.	Reviewing SNP surface water results (SNP Station 2016-11 especially for TSS) and increasing frequency and/or adjusting sampling locations if needed. Trouble-shooting of source and sediment/erosion control measures as needed.	Biennially	Years 1, 3 and 5	Frost-free periods	Absence of major erosion concerns over three consecutive monitoring events.
Camlaren	Metals Impacted Soil	CAM_SO_06	A2.2	Erosion	Verify excavation backfill material is stable with no significant resulting erosion or washout into down-gradient water.	Erosion/washout concerns in nearby water and/or rills >10cm.	Reviewing SNP surface water results (SNP Station 2016-11 especially for TSS) and increasing frequency and/or adjusting sampling locations if needed. Trouble-shooting of source and sediment/erosion control measures as needed.	Biennially	Years 1, 3 and 5	Frost-free periods	Absence of major erosion concerns over three consecutive monitoring events.
Camlaren	Metals Impacted Soil	CAM_SO_07	A2.2	Erosion	Verify excavation backfill material is stable with no significant resulting erosion or washout into down-gradient water.	Erosion/washout concerns in nearby water and/or rills >10cm.	Reviewing SNP surface water results (SNP Station 2016-11 especially for TSS) and increasing frequency and/or adjusting sampling locations if needed. Trouble-shooting of source and sediment/erosion control measures as needed.	Biennially	Years 1, 3 and 5	Frost-free periods	Absence of major erosion concerns over three consecutive monitoring events.
Camlaren	Metals Impacted Soil	CAM_SO_08	A2.2	Erosion	Verify excavation backfill material is stable with no significant resulting erosion or washout into down-gradient water. Visually monitor vegetative health to confirm stable or increasing growth.	Erosion/washout concerns in nearby water and/or rills >10cm. Vegetative health observed to be decreasing (and potential erosion concerns as detailed above).	Reviewing SNP surface water results (SNP Station 2016-11 especially for TSS) and increasing frequency and/or adjusting sampling locations if needed. Trouble-shooting of source and sediment/erosion control measures as needed. May consider revegetation or ways to increase vegetative health for the purpose of erosion control.	Biennially	Years 1, 3 and 5	Frost-free periods	Absence of major erosion concerns over three consecutive monitoring events.
Camlaren	Metals Impacted Soil	CAM_SO_12	A2.2	Erosion	Verify excavation backfill material is stable with no significant resulting erosion or washout into down-gradient water.	Erosion/washout concerns in nearby water and/or rills >10cm.	Reviewing SNP surface water results (SNP Station 2016-11 especially for TSS) and increasing frequency and/or adjusting sampling locations if needed. Trouble-shooting of source and sediment/erosion control measures as needed.	Biennially	Years 1, 3 and 5	Frost-free periods	Absence of major erosion concerns over three consecutive monitoring events.
Camlaren	Metals Impacted Soil	CAM_SO_20	A2.3	Erosion	Verify excavation backfill material is stable with no significant resulting erosion or washout into down-gradient water.	Erosion/washout concerns in nearby water and/or rills >10cm.	Reviewing SNP surface water results (SNP Station 2016-11 especially for TSS) and increasing frequency and/or adjusting sampling locations if needed. Trouble-shooting of source and sediment/erosion control measures as needed.	Biennially	Years 1, 3 and 5	Frost-free periods	Absence of major erosion concerns over three consecutive monitoring events.
Camlaren	Metals Impacted Soil	CAM_SO_23	A2.4	Erosion	Verify excavation backfill material is stable with no significant resulting erosion or washout into down-gradient water. Visually monitor vegetative health to confirm stable or increasing growth.	Erosion/washout concerns in nearby water and/or rills >10cm. Vegetative health observed to be decreasing (and potential erosion concerns as detailed above).	Reviewing SNP surface water results (SNP Station 2016-11 especially for TSS) and increasing frequency and/or adjusting sampling locations if needed. Trouble-shooting of source and sediment/erosion control measures as needed. May consider revegetation or ways to increase vegetative health for the purpose of erosion control.	Biennially	Years 1, 3 and 5	Frost-free periods	Absence of major erosion concerns over three consecutive monitoring events.
Camlaren	PHC Impacted Soil	CAM_SO_01	A2.2	Erosion	Verify excavation backfill material is stable with no significant resulting erosion or washout into down-gradient water.	Erosion/washout concerns in nearby water and/or rills >10cm.	Reviewing SNP surface water results (SNP Station 2016-11 especially for TSS) and increasing frequency and/or adjusting sampling locations if needed. Trouble-shooting of source and sediment/erosion control measures as needed.	Biennially	Years 1, 3 and 5	Frost-free periods	Absence of major erosion concerns over three consecutive monitoring events.
Camlaren	PHC Impacted Soil	CAM_SO_03	A2.2	Erosion	Verify excavation backfill material is stable with no significant resulting erosion or washout into down-gradient water.	Erosion/washout concerns in nearby water and/or rills >10cm.	Reviewing SNP surface water results (SNP Station 2016-11 especially for TSS) and increasing frequency and/or adjusting sampling locations if needed. Trouble-shooting of source and sediment/erosion control measures as needed.	Biennially	Years 1, 3 and 5	Frost-free periods	Absence of major erosion concerns over three consecutive monitoring events.
Camlaren	PHC Impacted Soil	CAM_SO_05	A2.2	Erosion	Verify excavation backfill material is stable with no significant resulting erosion or washout into down-gradient water.	Erosion/washout concerns in nearby water and/or rills >10cm.	Reviewing SNP surface water results (SNP Station 2016-11 especially for TSS) and increasing frequency and/or adjusting sampling locations if needed. Trouble-shooting of source and sediment/erosion control measures as needed.	Biennially	Years 1, 3 and 5	Frost-free periods	Absence of major erosion concerns over three consecutive monitoring events.
Camlaren	PHC Impacted Soil	CAM_SO_14	A2.3	Erosion	Verify excavation backfill material is stable with no significant resulting erosion or washout into down-gradient water.	Erosion/washout concerns in nearby water and/or rills >10cm.	Reviewing SNP surface water results (SNP Station 2016-11 especially for TSS) and increasing frequency and/or adjusting sampling locations if needed. Trouble-shooting of source and sediment/erosion control measures as needed.	Biennially	Years 1, 3 and 5	Frost-free periods	Absence of major erosion concerns over three consecutive monitoring events.
Camlaren	Mine Openings	Shaft	A2.4	Physical	Verify backfill material is stable with no significant resulting erosion or settlement. Verify the structural stability of the mine opening cap.	Major subsidence (<0.5m) of backfill is observed and/or structural concerns (e.g. deformation, cracking, etc.).	Investigation to identify cause and/or safety concerns. Completing repairs as needed.	Quinquennially	Years 1 and 5	Frost-free periods	Exit criteria are not applicable for mine openings unless otherwise authorized by authorities having jurisdiction.

TABLE B-2 Phase I Long Term Monitoring Plan Details
Public Services and Procurement Canada
Gordon Lake Group of Sites
Stantec Consulting Ltd. Project No. 121414585

Site Name	Hazard Category	Hazard Name	Phase I LTM Figure No.	Monitoring Driver	Phase I Long Term Monitoring Objectives	Triggers for Adaptive Management	Potential Mitigative Actions	Phase I LTM Frequency	Phase I LTM Duration	Target Dates	Exit Criteria
Camlaren	n/a	TSCA	A2.2	TSCA Performance	Verify stability of cover material and slopes (includes differential settlement, slope slumping, frost heave, vegetation growth and animal activities). Inspect toe of facility and identify potential seepage. Visually monitor vegetative health to confirm stable or increasing growth.	<u>Differential settlement</u> - Differential settlement >0.5 m. <u>Slope Slumping</u> - Horizontal cracks/movement >0.3 m. <u>Surface Erosion</u> - Slopes or cover erosion >25% loss of material thickness. <u>Frost Heave</u> - Effects >0.2 m. <u>Vegetative Cover</u> - Tree species with roots >0.3 m. <u>Animal activities</u> - Animal activities (such as burrowing) >0.3 m depth. <u>Erosion Control</u> - Coco matting (~5 m) is no longer deemed effective. <u>Ditch Erosion</u> - Exposure of any amount of BGM (i.e. visible liner). <u>Ditch Blockage</u> - Any debris/object that impedes flow or causes ponding. Seepage is identified at the toe of the facility. Vegetative health observed to be decreasing (and potential erosion concerns as detailed above).	<u>Differential settlement</u> - Completing repairs, trouble-shooting of source, and/or increasing monitoring frequency as needed. <u>Slope Slumping</u> - Completing repairs, trouble-shooting of source, and/or increasing monitoring frequency as needed. <u>Surface Erosion</u> - Completing repairs, trouble-shooting of source, and/or increasing monitoring frequency as needed. <u>Frost Heave</u> - Completing repairs, trouble-shooting of source (e.g. ponding/settlement), and/or increasing monitoring frequency as needed. <u>Vegetative Cover</u> - Remove tree species and/or repairs as needed. <u>Animal activities</u> - Completing repairs, trouble-shooting of source, and/or increasing monitoring frequency as needed. <u>Erosion Control</u> - Replacing coco matting (~5 m), trouble-shooting of source, and/or increasing monitoring frequency as needed. May consider revegetation/reseeding or ways to increase vegetative health for the purpose of erosion control. <u>Ditch Erosion</u> - Completing repairs, trouble-shooting of source, and/or increasing monitoring frequency as needed. <u>Ditch Blockage</u> - Completing repairs, trouble-shooting of source (e.g. removal of blockage), and/or increasing monitoring frequency as needed. Sample seepage identified at the toe of facility and groundwater/surface water in vicinity (see SNP program details for SNP Station 2016-8/7/11). In the event that COCs consistently exceed the trigger levels and impact the down-gradient surface water, a mitigation action will be recommended, which may involve repairs if the cause can be identified or otherwise consider treatment options.	Bi-Annually (Spring and Summer)	Years 1 to 5	Frost-free periods at the tail end of spring freshet and summer.	Future exit criteria as well as triggers for action/monitoring frequency will be based on long-term results of monitoring.
Camlaren	n/a	TSCA	A2.2	TSCA Groundwater (elevations and contaminant concentrations)	Verify TSCA permeability functionality to prevent infiltration.	Groundwater elevations (masl) within the TSCA show an increasing trend for 3 consecutive monitoring events (after having obtained sufficient data to establish a trend).	Trouble-shooting of cover system performance. Potential increased monitoring and/or completing repairs as needed.	Bi-Annually (Spring and Summer)	Years 1 to 5	Frost-free periods at the tail end of spring freshet and summer.	Future exit criteria as well as triggers for action/monitoring frequency will be based on long-term results of monitoring.
Camlaren	n/a	TSCA	A2.2		Verify chemical integrity of the TSCA via groundwater sampling. Refer to SNP Program for sampling details (SNP Station 2016-7).	Groundwater contaminant concentrations down-gradient of the TSCA show an increasing trend and/or exceed applicable guidelines for three consecutive monitoring events (after having obtained sufficient data to establish a trend).	Reviewing and/or modifying the monitoring frequency and/or remedial design components may be required. Trouble-shooting of TSCA performance. Completing repairs as needed.	Bi-Annually (Spring and Summer)	Years 1 to 5	Frost-free periods at the tail end of spring freshet and summer.	Groundwater contaminant concentrations down-gradient of the TSCA show a stable or decreasing trend and/or remain below applicable guidelines for three consecutive monitoring events (after having obtained sufficient data to establish a trend).
Camlaren	n/a	TSCA	A2.2	TSCA Surface Water	Verify chemical integrity of the TSCA via surface water sampling Refer to SNP Program for sampling details (SNP Station 2016-8 and 11).	Surface water contaminant concentrations down-gradient of the TSCA show an increasing trend and/or exceed applicable guidelines for three consecutive monitoring events (after having obtained sufficient data to establish a trend).	Reviewing and/or modifying the monitoring frequency and/or remedial design components may be required. Trouble-shooting of TSCA performance. Completing repairs as needed.	Bi-Annually (Spring and Summer)	Years 1 to 5	Frost-free periods at the tail end of spring freshet and summer.	Surface water contaminant concentrations down-gradient of the TSCA show a stable or decreasing trend and/or remain below applicable guidelines for three consecutive monitoring events (after having obtained sufficient data to establish a trend).
Goodrock	Metals Impacted Soil	GOO_HS_01	A3.3	Risk	Verify cover material is stable with no significant resulting erosion or washout.	Erosion/washout which exposes any soil and/or rills >10cm.	Re-covering/re-grading as needed.	Biennially	Years 1, 3 and 5	Snow-free periods.	Absence of major erosion/soil exposure concerns over three consecutive monitoring events.
Goodrock	Mine Openings	South Pit	A3.3	Physical	Verify backfill material is stable with no significant resulting erosion or settlement.	Major subsidence (<0.5m) of backfill is observed and/or structural concerns (e.g. deformation, cracking, etc.).	Investigation to identify cause and/or safety concerns. Completing repairs as needed.	Quinquennially	Years 1 and 5	Frost-free periods	Exit criteria are not applicable for mine openings unless otherwise authorized by authorities having jurisdiction.
Goodrock	Mine Openings	North Mine Shaft	A3.3	Physical	Verify backfill material is stable with no significant resulting erosion or settlement. Verify the structural stability of the mine opening cap.	Major subsidence (<0.5m) of backfill is observed and/or structural concerns (e.g. deformation, cracking, etc.).	Investigation to identify cause and/or safety concerns. Completing repairs as needed.	Quinquennially	Years 1 and 5	Frost-free periods	Exit criteria are not applicable for mine openings unless otherwise authorized by authorities having jurisdiction.
Goodrock	Waste Rock	GOO_WR_01	A3.2	Chemical	Verify no visual signs of ARD down-gradient of remaining impacts.	Down-gradient environment indicates signs of ARD (e.g. new loss of vegetation, stressed vegetation, discoloration, etc.).	Sampling of down-gradient soil and surface water for metals. Trouble-shooting potential sources and addressing waste rock if needed.	Quinquennially	Years 1 and 5	Summer	Future exit criteria as well as triggers for action/monitoring frequency will be based on long-term results of monitoring.
Goodrock	Waste Rock	GOO_WR_02	A3.3	Chemical	Verify no visual signs of ARD down-gradient of remaining impacts.	Down-gradient environment indicates signs of ARD (e.g. new loss of vegetation, stressed vegetation, discoloration, etc.).	Sampling of down-gradient soil and surface water for metals. Trouble-shooting potential sources and addressing waste rock if needed.	Quinquennially	Years 1 and 5	Summer	Future exit criteria as well as triggers for action/monitoring frequency will be based on long-term results of monitoring.
Kidney Pond	Co-Mingled Impacted Soil	KID_SO_07	A4.3	Erosion	Verify excavation backfill material is stable with no significant resulting erosion or washout into down-gradient water. Visually monitor vegetative health to confirm stable or increasing growth.	Erosion/washout concerns in nearby water and/or rills >10cm. Vegetative health observed to be decreasing (and potential erosion concerns as detailed above).	Reviewing SNP surface water results (SNP Station 2016-11 especially for TSS) and increasing frequency and/or adjusting sampling locations if needed. Trouble-shooting of source and sediment/erosion control measures as needed. May consider revegetation or ways to increase vegetative health for the purpose of erosion control.	Biennially	Years 1, 3 and 5	Frost-free periods	Absence of major erosion concerns over three consecutive monitoring events.

TABLE B-2 Phase I Long Term Monitoring Plan Details
Public Services and Procurement Canada
Gordon Lake Group of Sites
Stantec Consulting Ltd. Project No. 121414585

Site Name	Hazard Category	Hazard Name	Phase I LTM Figure No.	Monitoring Driver	Phase I Long Term Monitoring Objectives	Triggers for Adaptive Management	Potential Mitigative Actions	Phase I LTM Frequency	Phase I LTM Duration	Target Dates	Exit Criteria
Kidney Pond	Co-Mingled Impacted Soil	KID_SO_11	A4.3	Erosion	Verify excavation backfill material is stable with no significant resulting erosion or washout into down-gradient water. Visually monitor vegetative health to confirm stable or increasing growth.	Erosion/washout concerns in nearby water and/or rills >10cm. Vegetative health observed to be decreasing (and potential erosion concerns as detailed above).	Reviewing SNP surface water results (SNP Station 2016-11 especially for TSS) and increasing frequency and/or adjusting sampling locations if needed. Trouble-shooting of source and sediment/erosion control measures as needed. May consider revegetation or ways to increase vegetative health for the purpose of erosion control.	Biennially	Years 1, 3 and 5	Frost-free periods	Absence of major erosion concerns over three consecutive monitoring events.
Kidney Pond	PHC Impacted Soil	KID_SO_10	A4.3	Erosion	Verify excavation backfill material is stable with no significant resulting erosion or washout into down-gradient water. Visually monitor vegetative health to confirm stable or increasing growth.	Erosion/washout concerns in nearby water and/or rills >10cm. Vegetative health observed to be decreasing (and potential erosion concerns as detailed above).	Reviewing SNP surface water results (SNP Station 2016-11 especially for TSS) and increasing frequency and/or adjusting sampling locations if needed. Trouble-shooting of source and sediment/erosion control measures as needed. May consider revegetation or ways to increase vegetative health for the purpose of erosion control.	Biennially	Years 1, 3 and 5	Frost-free periods	Absence of major erosion concerns over three consecutive monitoring events.
Kidney Pond	Waste Rock	KID_WR_01	A4.3	Erosion	Verify excavation backfill and large area of regraded material is stable with no significant resulting erosion or washout, especially into down-gradient water. Visually monitor vegetative health to confirm stable or increasing growth.	Erosion/washout concerns in nearby water and/or rills >10cm. Vegetative health observed to be decreasing (and potential erosion concerns as detailed above).	Reviewing SNP surface water results (SNP Station 2016-11 especially for TSS) and increasing frequency and/or adjusting sampling locations if needed. Trouble-shooting of source and sediment/erosion control measures as needed. May consider revegetation or ways to increase vegetative health for the purpose of erosion control.	Biennially	Years 1, 3 and 5	Frost-free periods	Future exit criteria as well as triggers for action/monitoring frequency will be based on long-term results of monitoring..
Kidney Pond	Mine Openings	Portal	A4.3	Physical	Verify backfill material is stable with no significant resulting erosion or settlement.	Major subsidence (<0.5m) of backfill is observed and/or structural concerns (e.g. deformation, cracking, etc.).	Investigation to identify cause and/or safety concerns. Completing repairs as needed.	Quinquennially	Years 1 and 5	Frost-free periods	Exit criteria are not applicable for mine openings unless otherwise authorized by authorities having jurisdiction.
Kidney Pond	Waste Rock	KID_WR_03	A4.3	Chemical	Verify no visual signs of ARD down-gradient of remaining impacts.	Down-gradient environment indicates signs of ARD (e.g. new loss of vegetation, stressed vegetation, discoloration, etc.).	Sampling of down-gradient soil and surface water for metals. Trouble-shooting potential sources and addressing waste rock if needed.	Quinquennially	Years 1 and 5	Summer	Future exit criteria as well as triggers for action/monitoring frequency will be based on long-term results of monitoring.
Kidney Pond	Waste Rock	KID_WR_04	A4.2	Chemical	Verify no visual signs of ARD down-gradient of remaining impacts.	Down-gradient environment indicates signs of ARD (e.g. new loss of vegetation, stressed vegetation, discoloration, etc.).	Sampling of down-gradient soil and surface water for metals. Trouble-shooting potential sources and addressing waste rock if needed.	Quinquennially	Years 1 and 5	Summer	Future exit criteria as well as triggers for action/monitoring frequency will be based on long-term results of monitoring.
Murray Lake	Mine Openings	Main Shaft	A5.2	Physical	Verify backfill material is stable with no significant resulting erosion or settlement.	Major subsidence (<0.5m) of backfill is observed and/or structural concerns (e.g. deformation, cracking, etc.).	Investigation to identify cause and/or safety concerns. Completing repairs as needed.	Quinquennially	Years 1 and 5	Frost-free periods	Exit criteria are not applicable for mine openings unless otherwise authorized by authorities having jurisdiction.
Murray Lake	Mine Openings	Deep Trench/Shaft	A5.2	Physical	Verify backfill material is stable with no significant resulting erosion or settlement.	Major subsidence (<0.5m) of backfill is observed and/or structural concerns (e.g. deformation, cracking, etc.).	Investigation to identify cause and/or safety concerns. Completing repairs as needed.	Quinquennially	Years 1 and 5	Frost-free periods	Exit criteria are not applicable for mine openings unless otherwise authorized by authorities having jurisdiction.
Murray Lake	Waste Rock	MUR_WR_01	A5.2	Chemical	Verify no visual signs of ARD down-gradient of remaining impacts.	Down-gradient environment indicates signs of ARD (e.g. new loss of vegetation, stressed vegetation, discoloration, etc.).	Sampling of down-gradient soil and surface water for metals. Trouble-shooting potential sources and addressing waste rock if needed.	Quinquennially	Years 1 and 5	Summer	Future exit criteria as well as triggers for action/monitoring frequency will be based on long-term results of monitoring.
Murray Lake	Waste Rock	MUR_WR_02	A5.2	Chemical	Verify no visual signs of ARD down-gradient of remaining impacts.	Down-gradient environment indicates signs of ARD (e.g. new loss of vegetation, stressed vegetation, discoloration, etc.).	Sampling of down-gradient soil and surface water for metals. Trouble-shooting potential sources and addressing waste rock if needed.	Quinquennially	Years 1 and 5	Summer	Future exit criteria as well as triggers for action/monitoring frequency will be based on long-term results of monitoring.
Storm Property	Mine Openings	South Mine Shaft	A6.2	Physical	Verify backfill material is stable with no significant resulting erosion or settlement.	Major subsidence (<0.5m) of backfill is observed and/or structural concerns (e.g. deformation, cracking, etc.).	Investigation to identify cause and/or safety concerns. Completing repairs as needed.	Quinquennially	Years 1 and 5	Frost-free periods	Exit criteria are not applicable for mine openings unless otherwise authorized by authorities having jurisdiction.
Storm Property	Mine Openings	North Mine Shaft	A6.2	Physical	Verify backfill material is stable with no significant resulting erosion or settlement.	Major subsidence (<0.5m) of backfill is observed and/or structural concerns (e.g. deformation, cracking, etc.).	Investigation to identify cause and/or safety concerns. Completing repairs as needed.	Quinquennially	Years 1 and 5	Frost-free periods	Exit criteria are not applicable for mine openings unless otherwise authorized by authorities having jurisdiction.
Storm Property	Waste Rock	STO_WR_01	A6.2	Chemical	Verify no visual signs of ARD down-gradient of remaining impacts.	Down-gradient environment indicates signs of ARD (e.g. new loss of vegetation, stressed vegetation, discoloration, etc.).	Sampling of down-gradient soil and surface water for metals. Trouble-shooting potential sources and addressing waste rock if needed.	Quinquennially	Years 1 and 5	Summer	Future exit criteria as well as triggers for action/monitoring frequency will be based on long-term results of monitoring.
Storm Property	Waste Rock	STO_WR_02	A6.2	Chemical	Verify no visual signs of ARD down-gradient of remaining impacts.	Down-gradient environment indicates signs of ARD (e.g. new loss of vegetation, stressed vegetation, discoloration, etc.).	Sampling of down-gradient soil and surface water for metals. Trouble-shooting potential sources and addressing waste rock if needed.	Quinquennially	Years 1 and 5	Summer	Future exit criteria as well as triggers for action/monitoring frequency will be based on long-term results of monitoring.
Treacy	Metals Impacted Soil	TRE_SO_01	A7.2	Erosion	Verify excavation backfill material is stable with no significant resulting erosion or washout into down-gradient water. Visually monitor vegetative health to confirm stable or increasing growth.	Erosion/washout concerns in nearby water and/or rills >10cm. Vegetative health observed to be decreasing (and potential erosion concerns as detailed above).	Reviewing SNP surface water results (SNP Station 2016-11 especially for TSS) and increasing frequency and/or adjusting sampling locations if needed. Trouble-shooting of source and sediment/erosion control measures as needed. May consider revegetation or ways to increase vegetative health for the purpose of erosion control.	Biennially	Years 1, 3 and 5	Frost-free periods	Absence of major erosion concerns over three consecutive monitoring events.
Treacy	PHC Impacted Soil	TRE_SO_02	A7.2	Erosion	Verify excavation backfill material is stable with no significant resulting erosion or washout into down-gradient water. Visually monitor vegetative health to confirm stable or increasing growth.	Erosion/washout concerns in nearby water and/or rills >10cm. Vegetative health observed to be decreasing (and potential erosion concerns as detailed above).	Reviewing SNP surface water results (SNP Station 2016-11 especially for TSS) and increasing frequency and/or adjusting sampling locations if needed. Trouble-shooting of source and sediment/erosion control measures as needed. May consider revegetation or ways to increase vegetative health for the purpose of erosion control.	Biennially	Years 1, 3 and 5	Frost-free periods	Absence of major erosion concerns over three consecutive monitoring events.
Treacy	Trenches	East Trench	A7.2	Physical	Verify backfill material is stable with no significant resulting erosion or settlement.	Major subsidence (<0.5m) of backfill is observed and/or structural concerns (e.g. deformation, cracking, etc.).	Investigation to identify cause and/or safety concerns. Completing repairs as needed.	Quinquennially	Years 1 and 5	Frost-free periods	Exit criteria are not applicable for mine openings unless otherwise authorized by authorities having jurisdiction.
Treacy	Trenches	West Trench	A7.2	Physical	Verify backfill material is stable with no significant resulting erosion or settlement.	Major subsidence (<0.5m) of backfill is observed and/or structural concerns (e.g. deformation, cracking, etc.).	Investigation to identify cause and/or safety concerns. Completing repairs as needed.	Quinquennially	Years 1 and 5	Frost-free periods	Exit criteria are not applicable for mine openings unless otherwise authorized by authorities having jurisdiction.

TABLE B-2 Phase I Long Term Monitoring Plan Details
Public Services and Procurement Canada
Gordon Lake Group of Sites
Stantec Consulting Ltd. Project No. 121414585

Site Name	Hazard Category	Hazard Name	Phase I LTM Figure No.	Monitoring Driver	Phase I Long Term Monitoring Objectives	Triggers for Adaptive Management	Potential Mitigative Actions	Phase I LTM Frequency	Phase I LTM Duration	Target Dates	Exit Criteria
Try Me	Mine Openings	Shaft	A8.2	Physical	Verify backfill material is stable with no significant resulting erosion or settlement. Verify the structural stability of the mine opening cap.	Major subsidence (<0.5m) of backfill is observed and/or structural concerns (e.g. deformation, cracking, etc.).	Investigation to identify cause and/or safety concerns. Completing repairs as needed.	Quinquennially	Years 1 and 5	Frost-free periods	Exit criteria are not applicable for mine openings unless otherwise authorized by authorities having jurisdiction.
West Bay	Mine Openings	Open Pit	A9.2	Physical	Verify barrier is structurally sound and remains effective.	Barrier is no longer effective due to deterioration or damage.	Completing repairs as needed.	Quinquennially	Years 1 and 5	Frost-free periods	Exit criteria are not applicable for mine openings unless otherwise authorized by authorities having jurisdiction. Opportunity to re-inspect while completing TSCA performance monitoring will be taken as needed.
West Bay	Waste Rock	WES_WR_01	A9.2	Chemical	Verify no visual signs of ARD down-gradient of remaining impacts. Verify chemistry of surrounding water bodies via surface water sampling for metals/general chemistry:	Down-gradient environment indicates signs of ARD (e.g. new loss of vegetation, stressed vegetation, discoloration, etc.). Surface water contaminant concentrations down-gradient of the waste rock areas show an increasing trend and/or exceed applicable guidelines for three consecutive monitoring events (after having obtained sufficient data to establish a trend).	Increased monitoring frequency or sampling of down-gradient soil and/or surface water for metals. Trouble-shooting potential sources and addressing waste rock if needed.	Quinquennially	Years 1 and 5	Frost-Free Periods	Future exit criteria as well as triggers for action/monitoring frequency will be based on long-term results of monitoring. Surface water contaminant concentrations surrounding the waste rock show a stable or decreasing trend and/or remain below applicable guidelines for three consecutive monitoring events (after having obtained sufficient data to establish a trend).
West Bay	Waste Rock	WES_WR_02	A9.2	Chemical	<ul style="list-style-type: none">• Runoff from waste rock (if available)• Pit lake (2 locations)• Wetland (2 locations)• Gordon Lake (3 locations) (locations consistent with previous supplemental assessment sample locations)						

TABLE B-3 Phase I Long Term Monitoring SNP Stations
Public Services and Procurement Canada
Gordon Lake Group of Sites
Stantec Consulting Ltd. Project No. 121414585

SNP Station #	Description	Approximate Anticipated Location	Northing (Y_UTMZ12)	Easting (X_UTMZ12)	Phase I LTM Figure No.	Applicable Sites	Sampling Frequency	Sampling Parameters	Rationale	Current Status
2016-7	Groundwater monitoring around the perimeter of the TSCA	7a: northeast of TSCA (near toe drain)	6986073	388393	A2.1	Camlaren	Adjusted from monthly to bi-annually to align the SNP monitoring as practically as possible. The action levels and exit criteria for SNP Stations 2016-7, 8, and 11 are intended to be similar for consistent decision-making.	Nutrients ^a , Standard ^b , Major Ions ^c , Solids ^d , Metals ^e , Hydrocarbons ^f	To monitor the quality of Groundwater surrounding the TSCA to ensure the facility is functioning properly.	Active
		7b: southeast of TSCA	6985962	388376						
		7c: southwest of TSCA	6985922	388236						
		7d: west of TSCA	6986066	388238						
2016-8	Discharge from the TSCA (Between TSCA and expected discharge towards Gordon Lake)	8a: north	6986153	388330	A2.1	Camlaren	Adjusted from monthly to bi-annually to align the SNP monitoring as practically as possible. The action levels and exit criteria for SNP Stations 2016-7, 8, and 11 are intended to be similar for consistent decision-making.	Ammonia as N, Nitrate as N, Nitrite as N, TSS, TDS, Extractable Petroleum Hydrocarbons, Standard ^b , Major Ions ^c , Total Metals ^e	To monitor the quality of Water Discharge off of the TSCA, to ensure the Engineered Structure is functioning properly.	Active when Water is present
		8b: southwest	6985933	388266						
2016-11	Confirmatory surface water samples from Burnt Island, Camlaren/Zenith Island, Kidney Pond, Treacy, and West Bay, as outlined in the Remedial Action Plan section 7.3.4.1. Goodrock was removed as it was determined to not be a significant concern.	11a: Burnt Island	6994592	390881	A1.1	Various	Assumed to be bi-annual monitoring to account for seasonality. The action levels and exit criteria for SNP Stations 2016-7, 8, and 11 are intended to be similar for consistent decision-making.	Ammonia as N, Nitrate as N, Nitrite as N, TSS, TDS, Extractable Petroleum Hydrocarbons, Standard ^b , Major Ions ^c , Total Metals ^e	To monitor the performance of the remedial activities.	Active during post-remedial monitoring
		11b1: Camlaren (northwest of TSCA)	6986093	388174	A2.1					
		11b2: Camlaren (southeast of TSCA)	6985917	388365						
		11b3: Camlaren (northeast of TSCA)	6986145	388376						
		11b4: Camlaren (southwest of TSCA)	6985898	388174						
	Downgradient from areas with significant remedial work (including TSCA)	11c: Zenith Island (added as Goodrock was removed)	6985533	386768	A2.1		Re-evaluate frequency after 4 sampling events (prior to Year 3) in correlation with erosion monitoring. The confirmatory sampling was meant to be specific for post-construction for the short-term. The backfilled areas will continue to be monitored as planned and down-gradient surface water sampling may be completed if potential concerns are identified.			
		11d: Kidney Pond	6982714	381650	A4.1					
		11e: Treacy	6981168	381411	A7.1					
		11f: West Bay	6978365	386542	A9.1					

Notes:

- a
- Total Ammonia (NH3 + NH4+ - N), Total Nitrate + Nitrite (NO3 + NO2), Total Phosphorous (TP), Orthophosphate (OP), and Total Organic Carbon (TOC).
- b
- pH, Temperature (T), and Conductivity (Cond). These parameters should be measured both in the field as well as in the laboratory.
- c
- Alkalinity (Alk), Calcium (Ca), Chloride (Cl), Hardness, Magnesium (Mg), Potassium (K), Sodium (Na), and Sulphate (SO4).
- d
- Total Suspended Solids (TSS) and Total Dissolved Solids (TDS).
- e
- Full = Total elemental analysis by ICP-Metal Scan of: ICP-MS 24 element scan: includes all elements in Total Metals plus Antimony (Sb), Arsenic (As), Barium (Ba), Bismuth (Bi), Cesium (Cs), Chromium (Cr), Lithium (Li), Thallium (TI), Titanium (Ti), Uranium (U), & Vanadium (V).
- f
- Extractable Hydrocarbons (ExtHC), and Benzene, Toluene, Ethyl-benzene, and Xylene (BTEX).
- g
- Total Cyanide (TCN), Weak Acid Dissociable Cyanide (WAD CN), and Thiocyanate (SCN).
- h
- Quantity of Water in cubic metres (m³).

TABLE B-4 Phase I Long Term Monitoring Stations
Public Services and Procurement Canada
Gordon Lake Group of Sites
Stantec Consulting Ltd. Project No. 121414585

LTM Station	Description	Approximate Anticipated Location	Northing (Y_UTMZ12)	Easting (X_UTMZ12)	Phase I LTM Figure No.	Applicable Sites	Sampling Frequency	Sampling Parameters	Rationale	Current Status
Open Pit	Surface water monitoring around the Open Pit near WES_WR_01 and WES_WR_02	PIT1: South end of Open Pit	6978306	386690	A9.2	West Bay	Bi-annually to align the SNP monitoring as practically as possible.	Nutrients ^a , Standard ^b , Major Ions ^c , Solids ^d , Metals ^e	To monitor the quality of surface water adjacent to moderate risk waste rock left in place.	Active
		PIT2: North end of Open Pit	6978308	386639						
Wetland	Surface water monitoring down gradient of WES_WR_01 and WES_WR_02	WET1: South pond inland from West Bay	6978202	386483	A9.2	West Bay	Bi-annually to align the SNP monitoring as practically as possible.	Ammonia as N, Nitrate as N, Nitrite as N, TSS, TDS, Standard ^b , Major Ions ^c , Total Metals ^e	To monitor the quality of surface water downstream of moderate risk waste rock left in place to test buffer of natural vegetation.	Active when Water is present
		WET2: North pond inland from West Bay	6978202	386483						
Gordon Lake	Confirmatory surface water samples from West Bay in Gordon Lake	GL1: Center of West Bay	6978092	386429	A9.2	West Bay	Bi-annually to align the SNP monitoring as practically as possible.	Ammonia as N, Nitrate as N, Nitrite as N, TSS, TDS, Standard ^b , Major Ions ^c , Total Metals ^e	To monitor the performance of the remedial activities.	Active
		GL2: North end of West Bay	6978090	386479	A9.2					
		GL3: South end of West Bay	6978201	386483	A9.2					

- Notes:**
- a Total Ammonia (NH3 + NH4+ - N), Total Nitrate + Nitrite (NO3 + NO2), Total Phosphorous (TP), Orthophosphate (OP), and Total Organic Carbon (TOC).
 - b pH, Temperature (T), and Conductivity (Cond). These parameters should be measured both in the field as well as in the laboratory.
 - c Alkalinity (Alk), Calcium (Ca), Chloride (Cl), Hardness, Magnesium (Mg), Potassium (K), Sodium (Na), and Sulphate (SO4).
 - d Total Suspended Solids (TSS) and Total Dissolved Solids (TDS).
 - e Full = Total elemental analysis by ICP-Metal Scan of: ICP-MS 24 element scan: includes all elements in Total Metals plus Antimony (Sb), Arsenic (As), Barium (Ba), Bismuth (Bi), Cesium (Cs), Chromium (Cr), Lithium (Li), Thallium (Tl), Titanium (Ti), Uranium (U), & Vanadium (V).

APPENDIX C

Inspection Records

Erosion and Settlement Inspection Forms

Erosion and Settlement Inspection Form			
Project Details			
Mine Site:	Burnt Island	Date (mm/dd/yy):	10-Jul-19
Weather:	12°C, sun and cloud, wind	Time:	8:17
Rainfall in Last 24 Hours (circle one)	YES / NO	Inspected by:	BW/RP
Backfilled Excavation Locations			
Excavation ID	Portal	Tailings Area	Shaft
Location Description	Near SO-03/04/055 Backfilled with sand and armor stone	Large graded area, some slash on	Concrete cap and sand cover
GPS Coordinates:		N: 6994610 E: 390870	
Condition of Backfilled Excavation (circle one)	GOOD / POOR	GOOD / POOR	GOOD / POOR
If POOR - Why?		Minor slumping, some animal burrows	
Evidence of Environmental Concern	YES / NO	YES / NO	YES / NO
If YES - outline concern (e.g. erosion, rutting, settlement, cracking, slumping, ponding, drainage paths, signs of contamination)			
Additional Work Required? (circle one)	YES / NO	YES / NO	YES / NO
Additional Work Completed? (circle one)	YES / NO	YES / NO	YES / NO
Description of Additional Work Completed			
Follow-up Monitoring Required? (circle one)	YES / NO	YES / NO	YES / NO
If YES, provide details on what follow up is required.	LTM requirement for year 5	LTM requirement for year 3 and 5	LTM requirement for year 5

Erosion and Settlement Inspection Form			
Project Details			
Mine Site:	Camlaren	Date (mm/dd/yy):	8-Jul-19
Weather:	7°C, overcast and rain	Time:	8:35
Rainfall in Last 24 Hours (circle one)	YES / NO	Inspected by:	BW, RP
Backfilled Excavation Locations			
Excavation ID	CAM_SO_04	CAM_SO_06	CAM_SO_07
Location Description	Sand cover	Sand cover	Sand cover
GPS Coordinates:	N: 6985998 E: 388265	N: 6985977 E: 388236	N: 6985971 E: 388265
Condition of Backfilled Excavation (circle one)	GOOD / POOR	GOOD / POOR	GOOD / POOR
If POOR - Why?			
Evidence of Environmental Concern	YES / NO	YES / NO	YES / NO
If YES - outline concern (e.g. erosion, rutting, settlement, cracking, slumping, ponding, drainage paths, signs of contamination)			
Additional Work Required? (circle one)	YES / NO	YES / NO	YES / NO
Additional Work Completed? (circle one)	YES / NO	YES / NO	YES / NO
Description of Additional Work Completed	Some staining removed by hand 07/09/19		
Follow-up Monitoring Required? (circle one)	YES / NO	YES / NO	YES / NO
If YES, provide details on what follow up is required.	LTM requirement for year 3 and 5	LTM requirement for year 3 and 5	LTM requirement for year 3 and 5

Erosion and Settlement Inspection Form			
Project Details			
Mine Site:	Camlaren	Date (mm/dd/yy):	8-Jul-19
Weather:	7°C, overcast and rain	Time:	8:35
Rainfall in Last 24 Hours (circle one)	YES / NO	Inspected by:	BW, RP
Backfilled Excavation Locations			
Excavation ID	CAM_SO_09	CAM_SO_12	CAM_SO_20
Location Description	Sand cover	Minimal Sand cover	Sand fill
GPS Coordinates:	N: 6985919 E: 388235	N: 6985901 E: 388316	N: 6986134 E: 388365
Condition of Backfilled Excavation (circle one)	GOOD / POOR	GOOD / POOR	GOOD / POOR
If POOR - Why?			
Evidence of Environmental Concern	YES / NO	YES / NO	YES / NO
If YES - outline concern (e.g. erosion, rutting, settlement, cracking, slumping, ponding, drainage paths, signs of contamination)			
Additional Work Required? (circle one)	YES / NO	YES / NO	YES / NO
Additional Work Completed? (circle one)	YES / NO	YES / NO	YES / NO
Description of Additional Work Completed			
Follow-up Monitoring Required? (circle one)	YES / NO	YES / NO	YES / NO
If YES, provide details on what follow up is required.	LTM requirement for year 3 and 5	LTM requirement for year 3 and 5	LTM requirement for year 3 and 5

Erosion and Settlement Inspection Form			
Project Details			
Mine Site:	Camlaren	Date (mm/dd/yy):	8-Jul-19
Weather:	7°C, overcast and rain	Time:	8:35
Rainfall in Last 24 Hours (circle one)	YES / NO	Inspected by:	BW, RP
Backfilled Excavation Locations			
Excavation ID	CAM_SO_23	CAM_SO_01	CAM_SO_3
Location Description	Minimal sand cover, local cover	Sand fill	Sand fill
GPS Coordinates:	N: 6985520 E: 386780	N: 6986110 E: 388203	N: 6985999 E: 388208
Condition of Backfilled Excavation (circle one)	GOOD / POOR	GOOD / POOR	GOOD / POOR
If POOR - Why?			
Evidence of Environmental Concern	YES / NO	YES / NO	YES / NO
If YES - outline concern (e.g. erosion, rutting, settlement, cracking, slumping, ponding, drainage paths, signs of contamination)			
Additional Work Required? (circle one)	YES / NO	YES / NO	YES / NO
Additional Work Completed? (circle one)	YES / NO	YES / NO	YES / NO
Description of Additional Work Completed		Some staining removed by hand 07/09/19	
Follow-up Monitoring Required? (circle one)	YES / NO	YES / NO	YES / NO
If YES, provide details on what follow up is required.	LTM requirement for year 3 and 5	LTM requirement for year 3 and 5	LTM requirement for year 3 and 5

Erosion and Settlement Inspection Form			
Project Details			
Mine Site:	Camlaren	Date (mm/dd/yy):	8-Jul-19
Weather:	7°C, overcast and rain	Time:	8:35
Rainfall in Last 24 Hours (circle one)	YES / NO	Inspected by:	BW, RP
Backfilled Excavation Locations			
Excavation ID	CAM_SO_05	CAM_SO_14	Shaft (Zenith)
Location Description	Sand cover	Sand cover	Sand backfill, concrete slab, sand cover
GPS Coordinates:	N: 6985994 E: 388255	N: 6986170 E: 388221	
Condition of Backfilled Excavation (circle one)	GOOD / POOR	GOOD / POOR	GOOD / POOR
If POOR - Why?			
Evidence of Environmental Concern	YES / NO	YES / NO	YES / NO
If YES - outline concern (e.g. erosion, rutting, settlement, cracking, slumping, ponding, drainage paths, signs of contamination)			
Additional Work Required? (circle one)	YES / NO	YES / NO	YES / NO
Additional Work Completed? (circle one)	YES / NO	YES / NO	YES / NO
Description of Additional Work Completed			
Follow-up Monitoring Required? (circle one)	YES / NO	YES / NO	YES / NO
If YES, provide details on what follow up is required.	LTM requirement for year 3 and 5	LTM requirement for year 3 and 5	LTM requirement for year 5

Erosion and Settlement Inspection Form			
Project Details			
Mine Site:	Camlaren	Date (mm/dd/yy):	8-Jul-19
Weather:	7°C, overcast and rain	Time:	8:35
Rainfall in Last 24 Hours (circle one)	YES / NO	Inspected by:	BW, RP
Backfilled Excavation Locations			
Excavation ID	TSCA		
Location Description	Sand cover over geoliner. Erosion control and revegetation, toedrain		
GPS Coordinates:			
Condition of Backfilled Excavation (circle one)	N/A		
If POOR - Why?			
Evidence of Environmental Concern	YES / NO		
If YES - outline concern (e.g. erosion, rutting, settlement, cracking, slumping, ponding, drainage paths, signs of contamination)			
Additional Work Required? (circle one)	YES / NO		
Additional Work Completed? (circle one)	YES / NO		
Description of Additional Work Completed	Two animal burrows located on south edge. Filled in by hand - 07/08/19		
Follow-up Monitoring Required? (circle one)	YES / NO		
If YES, provide details on what follow up is required.	LTM requirement for years 1-5		

Erosion and Settlement Inspection Form			
Project Details			
Mine Site:	Goodrock	Date (mm/dd/yy):	10-Jul-19
Weather:	12°C, sun and cloud, wind	Time:	13:05
Rainfall in Last 24 Hours (circle one)	YES / NO	Inspected by:	BW, RP
Backfilled Excavation Locations			
Excavation ID	GOO_H5_01	South Pit	North Mine Shaft
Location Description	Sand cover near crusher foundation	Foam plug with sand and local cover	Foam plug cap with vent riser and sand cover
GPS Coordinates:			
Condition of Backfilled Excavation (circle one)	GOOD / POOR	GOOD / POOR	GOOD / POOR
If POOR - Why?			
Evidence of Environmental Concern	YES / NO	YES / NO	YES / NO
If YES - outline concern (e.g. erosion, rutting, settlement, cracking, slumping, ponding, drainage paths, signs of contamination)			
Additional Work Required? (circle one)	YES / NO	YES / NO	YES / NO
Additional Work Completed? (circle one)	YES / NO	YES / NO	YES / NO
Description of Additional Work Completed			
Follow-up Monitoring Required? (circle one)	YES / NO	YES / NO	YES / NO
If YES, provide details on what follow up is required.	LTM requirement for year 3 and 5	LTM requirement for year 5	LTM requirement for year 5

Erosion and Settlement Inspection Form			
Project Details			
Mine Site:	Kidney Pond	Date (mm/dd/yy):	9-Jul-19
Weather:	10°C, overcast, wind and rain	Time:	15:05
Rainfall in Last 24 Hours (circle one)	YES / NO	Inspected by:	BW, RP
Backfilled Excavation Locations			
Excavation ID	KID_SO_07	KID_SO_11	KID_SO_10
Location Description	Sand cover	Sand cover	Sand cover
GPS Coordinates:	N: 6982785 E: 381571	N: 6982752 E: 381453	N: 6982757 E: 381498
Condition of Backfilled Excavation (circle one)	GOOD / POOR	GOOD / POOR	GOOD / POOR
If POOR - Why?			
Evidence of Environmental Concern	YES / NO	YES / NO	YES / NO
If YES - outline concern (e.g. erosion, rutting, settlement, cracking, slumping, ponding, drainage paths, signs of contamination)			
Additional Work Required? (circle one)	YES / NO	YES / NO	YES / NO
Additional Work Completed? (circle one)	YES / NO	YES / NO	YES / NO
Description of Additional Work Completed			
Follow-up Monitoring Required? (circle one)	YES / NO	YES / NO	YES / NO
If YES, provide details on what follow up is required.	LTM requirement for year 3 and 5	LTM requirement for year 3 and 5	LTM requirement for year 3 and 5

Erosion and Settlement Inspection Form			
Project Details			
Mine Site:	Kidney Pond	Date (mm/dd/yy):	9-Jul-19
Weather:	10°C, overcast, wind and rain	Time:	15:05
Rainfall in Last 24 Hours (circle one)	YES / NO	Inspected by:	BW, RP
Backfilled Excavation Locations			
Excavation ID	KID_WR_01	Kidney Portal	
Location Description	Sand cover, minor slumping at south end near outcrop	Sand backfill, armour stone	
GPS Coordinates:	N: 698276 E: 381558		
Condition of Backfilled Excavation (circle one)	GOOD / POOR	GOOD / POOR	GOOD / POOR
If POOR - Why?		Some slumping	
Evidence of Environmental Concern	YES / NO	YES / NO	YES / NO
If YES - outline concern (e.g. erosion, rutting, settlement, cracking, slumping, ponding, drainage paths, signs of contamination)			
Additional Work Required? (circle one)	YES / NO	YES / NO	YES / NO
Additional Work Completed? (circle one)	YES / NO	YES / NO	YES / NO
Description of Additional Work Completed		Slump filled in by hand and wottles installed	
Follow-up Monitoring Required? (circle one)	YES / NO	YES / NO	YES / NO
If YES, provide details on what follow up is required.	LTM requirement for year 3 and 5	LTM requirement for year 5	

Erosion and Settlement Inspection Form			
Project Details			
Mine Site:	Murray	Date (mm/dd/yy):	10-Jul-19
Weather:	10°C, sun and cloud, wind	Time:	14:42
Rainfall in Last 24 Hours (circle one)	YES / NO	Inspected by:	BW, RP
Backfilled Excavation Locations			
Excavation ID	Main shaft	Deep trench	
Location Description	Foam plug, sand fill, local cover and vent riser	Unable to locate	
GPS Coordinates:			
Condition of Backfilled Excavation (circle one)	GOOD / POOR	GOOD / POOR	
If POOR - Why?			
Evidence of Environmental Concern	YES / NO	YES / NO	
If YES - outline concern (e.g. erosion, rutting, settlement, cracking, slumping, ponding, drainage paths, signs of contamination)			
Additional Work Required? (circle one)	YES / NO	YES / NO	
Additional Work Completed? (circle one)	YES / NO	YES / NO	
Description of Additional Work Completed			
Follow-up Monitoring Required? (circle one)	YES / NO	YES / NO	
If YES, provide details on what follow up is required.	LTM requirement for year 5		

Erosion and Settlement Inspection Form			
Project Details			
Mine Site:	Storm	Date (mm/dd/yy):	10-Jul-19
Weather:	12°C, sun and cloud, wind	Time:	12:50
Rainfall in Last 24 Hours (circle one)	YES / NO	Inspected by:	BW, RP
Backfilled Excavation Locations			
Excavation ID	South shaft	North shaft	
Location Description	Foam plug, sand fill, local cover and vent riser	Foam plug, sand fill, local cover	
GPS Coordinates:			
Condition of Backfilled Excavation (circle one)	GOOD / POOR	GOOD / POOR	
If POOR - Why?			
Evidence of Environmental Concern	YES / NO	YES / NO	
If YES - outline concern (e.g. erosion, rutting, settlement, cracking, slumping, ponding, drainage paths, signs of contamination)			
Additional Work Required? (circle one)	YES / NO	YES / NO	
Additional Work Completed? (circle one)	YES / NO	YES / NO	
Description of Additional Work Completed			
Follow-up Monitoring Required? (circle one)	YES / NO	YES / NO	
If YES, provide details on what follow up is required.	LTM requirement for year 5	LTM requirement for year 5	

Erosion and Settlement Inspection Form			
Project Details			
Mine Site:	Treacy	Date (mm/dd/yy):	9-Jul-19
Weather:		Time:	14:40
Rainfall in Last 24 Hours (circle one)	YES / NO	Inspected by:	BW, RP
Backfilled Excavation Locations			
Excavation ID	TRE_SO_01	TRE_SO_02	East Trench
Location Description	Sand cover on south half, local cover, armour stone	Sand fill, local cover	Sand fill, local cover
GPS Coordinates:	N: 6981177 E: 381390	N: 6981159 E: 381387	N: 6981173 E: 381393
Condition of Backfilled Excavation (circle one)	GOOD / POOR	GOOD / POOR	GOOD / POOR
If POOR - Why?			
Evidence of Environmental Concern	YES / NO	YES / NO	YES / NO
If YES - outline concern (e.g. erosion, rutting, settlement, cracking, slumping, ponding, drainage paths, signs of contamination)			
Additional Work Required? (circle one)	YES / NO	YES / NO	YES / NO
Additional Work Completed? (circle one)	YES / NO	YES / NO	YES / NO
Description of Additional Work Completed			
Follow-up Monitoring Required? (circle one)	YES / NO	YES / NO	YES / NO
If YES, provide details on what follow up is required.	LTM requirement for year 3 and 5	LTM requirement for year 3 and 5	LTM requirement for year 5

Erosion and Settlement Inspection Form			
Project Details			
Mine Site:	Treacy	Date (mm/dd/yy):	9-Jul-19
Weather:		Time:	14:40
Rainfall in Last 24 Hours (circle one)	YES / NO	Inspected by:	BW, RP
Backfilled Excavation Locations			
Excavation ID	West Trench		
Location Description	Sand fill, local cover		
GPS Coordinates:	N: 6981182 E: 381375		
Condition of Backfilled Excavation (circle one)	GOOD / POOR		
If POOR - Why?			
Evidence of Environmental Concern	YES / NO		
If YES - outline concern (e.g. erosion, rutting, settlement, cracking, slumping, ponding, drainage paths, signs of contamination)			
Additional Work Required? (circle one)	YES / NO		
Additional Work Completed? (circle one)	YES / NO		
Description of Additional Work Completed			
Follow-up Monitoring Required? (circle one)	YES / NO		
If YES, provide details on what follow up is required.	LTM requirement for year 5		

Erosion and Settlement Inspection Form			
Project Details			
Mine Site:	Try Me	Date (mm/dd/yy):	10-Jul-19
Weather:	10°C, sun and cloud, wind	Time:	13:35
Rainfall in Last 24 Hours (circle one)	YES / NO	Inspected by:	BW, RP
Backfilled Excavation Locations			
Excavation ID	Shaft		
Location Description	Foam plug, sand fill, local cover, vent riser **Unable to land onsite		
GPS Coordinates:			
Condition of Backfilled Excavation (circle one)	GOOD / POOR		
If POOR - Why?			
Evidence of Environmental Concern	YES / NO		
If YES - outline concern (e.g. erosion, rutting, settlement, cracking, slumping, ponding, drainage paths, signs of contamination)			
Additional Work Required? (circle one)	YES / NO		
Additional Work Completed? (circle one)	YES / NO		
Description of Additional Work Completed			
Follow-up Monitoring Required? (circle one)	YES / NO		
If YES, provide details on what follow up is required.	LTM requirement for year 5		

Environmental Control Inspection Forms

Environmental Control Inspection			
Project Details			
GLG Site:	Kidney Pond	Date (mm/dd/yy):	10-Jul-19
Weather:		Time:	15:30
Rainfall in Last 24 Hours (circle one)	YES / NO	Inspected by:	BW, RP
Environmental Control Locations			
Location ID	Kidney Portal Wottles		
Location Description	NE of KID_SO_11, and NW of KID_SO_07		
GPS Coordinates:	62.9555449°N 113.3358830°W		
Active Runoff? (circle one)	YES / NO		
Inspection Type (circle one)	INITIAL / REGULAR / FINAL		
Type of Environmental Control (e.g. silt fence / wottle)	Wottle, newly installed		
Condition of Environmental Control (circle one)	GOOD / POOR		
If POOR - Why?			
Evidence of Environmental Concern	YES / NO		
If YES - outline concern (e.g. siltation, erosion, washout, rutting, drainage paths, ice damming)	Minor erosion (triggered installation)		
Maintenance Required? (circle one)	YES / NO		
Maintenance Completed? (circle one)	N/A		
Description of Maintenance Completed	Future maintenance required (eg. Removal)		
Follow-up Monitoring Required? (circle one)	YES / NO		
If YES, provide details on what follow up is required.	Adequacy and effectiveness, vegetation growth		

Moderate Risk Waste Rock Inspection Forms

Moderate Risk Waste Rock Excavation Inspection

Project Details

Client:	PSPC	Stantec Project Number:	121414585
Project:	Gordon Lake Remediation Program	PWGSC Project Number:	R.057573.019
Location:	Gordon Lake, NWT	Weather:	
Contractor:	DNV	Rainfall in Last 24 Hours:	
Project Manager:	Allen MacGarvie	Active Storm Runoff?	
Inspected by:		Date:	
Inspection Type:	Regular (year 1)	Time:	
Inspection Site:	Burnt Island	Inspection Location:	BUR_WR_01

Inspection Details

Required Information	Description	Notes
Waste Rock Description:		
Waste Rock Coordinates (center point):		
Approximate Area:	4200m ²	~140 m running east-west and ~30 m north-south (Ref. A1.5)
Approximate Depth:		
Excavation Extended to Bedrock?:		
Bedrock Depth Throughout Excavation:		
Waste Rock Underlain by Soil?:		
Waste Rock Surrounded by Soil?:		
General Observations:		

Confirmatory Soil Sampling (if soil is present)

Soil Observations:		
Signs of Acid Drainage or Leaching:	No	
Soil Samples Collected:		
Soil Sample Coordinates:		
General Observations:		

Follow-Up (If confirmatory soil samples are collected and exceed applicable SSRTs)

Area of Soil Removed:		
Depth of Soil Removed:		
Backfill Required:		
Modifications Required to Related Plans?:		
Follow-Up Monitoring Required:		
Parties Involved/Informed:		

Moderate Risk Waste Rock Excavation Inspection

Project Details

Client:	PSPC	Stantec Project Number:	121414585
Project:	Gordon Lake Remediation Program	PSPC Project Number:	R.057573.019
Location:	Gordon Lake, NWT	Weather:	
Contractor:	DNV	Rainfall in Last 24 Hours:	
Project Manager:	Allen MacGarvie	Active Storm Runoff?	
Inspected by:		Date:	11-Sep-19
Inspection Type:	Regular (year 1)	Time:	
Inspection Site:	Goodrock	Inspection Location:	GOO_WR_01

Inspection Details

Required Information	Description	Notes
Waste Rock Description:		
Waste Rock Coordinates (center point):		
Approximate Area:	5400m ²	~270m running northeast to southwest and ~20m northwest to southeast (Reference Figure A3.2)
Approximate Depth:		
Waste Rock Underlain by Soil?		
Waste Rock Surrounded by Soil?		
General Observations:		

Confirmatory Soil Sampling (if signs of acid drainage/leaching observed)

Soil Observations:		
Signs of Acid Drainage or Leaching:	No	
Soil Samples Collected:		
Soil Sample Coordinates:		
General Observations:		

Follow-Up (If confirmatory soil samples are collected and exceed applicable SSRTs)

Area of Soil Removed:		
Depth of Soil Removed:		
Backfill Required:		
Modifications Required to Related Plans?		
Follow-Up Monitoring Required:		
Parties Involved/Informed:		

Moderate Risk Waste Rock Excavation Inspection

Project Details			
Client:	PSPC	Stantec Project Number:	121414585
Project:	Gordon Lake Remediation Program	PSPC Project Number:	R.057573.019
Location:	Gordon Lake, NWT	Weather:	
Contractor:	DNV	Rainfall in Last 24 Hours:	
Project Manager:	Allen MacGarvie	Active Storm Runoff?	
Inspected by:		Date:	11-Sep-19
Inspection Type:	Regular (year 1)	Time:	
Inspection Site:	Kidney Pond	Inspection Location:	KID_WR_01
Inspection Details			
Required Information	Description	Notes	
Waste Rock Description:			
Waste Rock Coordinates (center point):	N: 698276 E: 381558		
Approximate Area:	8576m ²	Reference Figure A4.3	
Approximate Depth:			
Waste Rock Underlain by Soil?			
Waste Rock Surrounded by Soil?			
General Observations:			
Confirmatory Soil Sampling (if signs of acid drainage/leaching observed)			
Soil Observations:			
Signs of Acid Drainage or Leaching:	No		
Soil Samples Collected:			
Soil Sample Coordinates:			
General Observations:			
Follow-Up (If confirmatory soil samples are collected and exceed applicable SSRTs)			
Area of Soil Removed:			
Depth of Soil Removed:			
Backfill Required:			
Modifications Required to Related Plans?			
Follow-Up Monitoring Required:			
Parties Involved/Informed:			

Moderate Risk Waste Rock Excavation Inspection

Project Details

Client:	PSPC	Stantec Project Number:	121414585
Project:	Gordon Lake Remediation Program	PSPC Project Number:	R.057573.019
Location:	Gordon Lake, NWT	Weather:	
Contractor:	DNV	Rainfall in Last 24 Hours:	
Project Manager:	Allen MacGarvie	Active Storm Runoff?	
Inspected by:		Date:	11-Sep-19
Inspection Type:	Regular (year 1)	Time:	
Inspection Site:	Kidney Pond	Inspection Location:	KID_WR_03

Inspection Details

Required Information	Description	Notes
Waste Rock Description:		
Waste Rock Coordinates (center point):		
Approximate Area:	West area : 600m ² East area: 75m ²	60m x 10 m 15m x 5 m (Ref A4.3)
Approximate Depth:		
Waste Rock Underlain by Soil?		
Waste Rock Surrounded by Soil?		
General Observations:		

Confirmatory Soil Sampling (if signs of acid drainage/leaching observed)

Soil Observations:		
Signs of Acid Drainage or Leaching:	No	
Soil Samples Collected:		
Soil Sample Coordinates:		
General Observations:		

Follow-Up (If confirmatory soil samples are collected and exceed applicable SSRTs)

Area of Soil Removed:		
Depth of Soil Removed:		
Backfill Required:		
Modifications Required to Related Plans?		
Follow-Up Monitoring Required:		
Parties Involved/Informed:		

Moderate Risk Waste Rock Excavation Inspection

Project Details

Client:	PSPC	Stantec Project Number:	121414585
Project:	Gordon Lake Remediation Program	PSPC Project Number:	R.057573.019
Location:	Gordon Lake, NWT	Weather:	
Contractor:	DNV	Rainfall in Last 24 Hours:	
Project Manager:	Allen MacGarvie	Active Storm Runoff?	
Inspected by:		Date:	11-Sep-19
Inspection Type:	Regular (year 1)	Time:	
Inspection Site:	Kidney Pond	Inspection Location:	KID_WR_04

Inspection Details

Required Information	Description	Notes
Waste Rock Description:		
Waste Rock Coordinates (center point):		
Approximate Area:	250m ²	~50m running northwest to southeast by 5m (Reference Figure A4.2)
Approximate Depth:		
Waste Rock Underlain by Soil?		
Waste Rock Surrounded by Soil?		
General Observations:		

Confirmatory Soil Sampling (if signs of acid drainage/leaching observed)

Soil Observations:		
Signs of Acid Drainage or Leaching:	No	
Soil Samples Collected:		
Soil Sample Coordinates:		
General Observations:		

Follow-Up (If confirmatory soil samples are collected and exceed applicable SSRTs)

Area of Soil Removed:		
Depth of Soil Removed:		
Backfill Required:		
Modifications Required to Related Plans?		
Follow-Up Monitoring Required:		
Parties Involved/Informed:		

Moderate Risk Waste Rock Excavation Inspection

Project Details

Client:	PSPC	Stantec Project Number:	121414585
Project:	Gordon Lake Remediation Program	PWGSC Project Number:	R.057573.019
Location:	Gordon Lake, NWT	Weather:	
Contractor:	DNV	Rainfall in Last 24 Hours:	
Project Manager:	Allen MacGarvie	Active Storm Runoff?	
Inspected by:		Date:	
Inspection Type:	Regular (year 1)	Time:	
Inspection Site:	Murray Lake	Inspection Location:	MUR_WR_01

Inspection Details

Required Information	Description	Notes
Waste Rock Description:		
Waste Rock Coordinates (center point):		
Approximate Area:	8800m ²	110m running northwest-southeast by 80m northeast-southwest (Ref A5.2)
Approximate Depth:		
Excavation Extended to Bedrock?:		
Bedrock Depth Throughout Excavation:		
Waste Rock Underlain by Soil?:		
Waste Rock Surrounded by Soil?:		
General Observations:		

Confirmatory Soil Sampling (if soil is present)

Soil Observations:		
Signs of Acid Drainage or Leaching:	No	
Soil Samples Collected:		
Soil Sample Coordinates:		
General Observations:		

Follow-Up (If confirmatory soil samples are collected and exceed applicable SSRTs)

Area of Soil Removed:		
Depth of Soil Removed:		
Backfill Required:		
Modifications Required to Related Plans?:		
Follow-Up Monitoring Required:		
Parties Involved/Informed:		

Moderate Risk Waste Rock Excavation Inspection

Project Details

Client:	PSPC	Stantec Project Number:	121414585
Project:	Gordon Lake Remediation Program	PWGSC Project Number:	R.057573.019
Location:	Gordon Lake, NWT	Weather:	
Contractor:	DNV	Rainfall in Last 24 Hours:	
Project Manager:	Allen MacGarvie	Active Storm Runoff?	
Inspected by:		Date:	
Inspection Type:	Regular (year 1)	Time:	
Inspection Site:	Murray Lake	Inspection Location:	MUR_WR_02

Inspection Details

Required Information	Description	Notes
Waste Rock Description:		
Waste Rock Coordinates (center point):		
Approximate Area:	138750m ²	925 m running northwest-southeast by 150 m northeast - southwest (Ref A5.2)
Approximate Depth:		
Excavation Extended to Bedrock?:		
Bedrock Depth Throughout Excavation:		
Waste Rock Underlain by Soil?:		
Waste Rock Surrounded by Soil?:		
General Observations:		

Confirmatory Soil Sampling (if soil is present)

Soil Observations:		
Signs of Acid Drainage or Leaching:	No	
Soil Samples Collected:		
Soil Sample Coordinates:		
General Observations:		

Follow-Up (If confirmatory soil samples are collected and exceed applicable SSRTs)

Area of Soil Removed:		
Depth of Soil Removed:		
Backfill Required:		
Modifications Required to Related Plans?:		
Follow-Up Monitoring Required:		
Parties Involved/Informed:		

Moderate Risk Waste Rock Excavation Inspection**Project Details**

Client:	PSPC	Stantec Project Number:	121414585
Project:	Gordon Lake Remediation Program	PSPC Project Number:	R.057573.019
Location:	Gordon Lake, NWT	Weather:	
Contractor:	DNV	Rainfall in Last 24 Hours:	
Project Manager:	Allen MacGarvie	Active Storm Runoff?	
Inspected by:		Date:	
Inspection Type:	Regular (year 1)	Time:	
Inspection Site:	Storm	Inspection Location:	STO_WR_01

Inspection Details

Required Information	Description	Notes
Waste Rock Description:		
Waste Rock Coordinates (center point):		Reference Figure A6.2
Approximate Area:	North Mine Shaft = 90m ² South Mine Shaft = 40m ²	North Mine Shaft = 10 m x 9 m South Mine Shaft = 8 m x 5 m
Approximate Depth:		
Waste Rock Underlain by Soil?:		
Waste Rock Surrounded by Soil?:		
General Observations:		

Confirmatory Soil Sampling (if signs of acid drainage/leaching observed)

Soil Observations:		
Signs of Acid Drainage or Leaching:	No	
Soil Samples Collected:		
Soil Sample Coordinates:		
General Observations:		

Follow-Up (If confirmatory soil samples are collected and exceed applicable SSRTs)

Area of Soil Removed:		
Depth of Soil Removed:		
Backfill Required:		
Modifications Required to Related Plans?:		
Follow-Up Monitoring Required:		
Parties Involved/Informed:		

Moderate Risk Waste Rock Excavation Inspection**Project Details**

Client:	PSPC	Stantec Project Number:	121414585
Project:	Gordon Lake Remediation Program	PSPC Project Number:	R.057573.019
Location:	Gordon Lake, NWT	Weather:	
Contractor:	DNV	Rainfall in Last 24 Hours:	
Project Manager:	Allen MacGarvie	Active Storm Runoff?	
Inspected by:		Date:	
Inspection Type:	Regular (year 1)	Time:	
Inspection Site:	Storm	Inspection Location:	STO_WR_02

Inspection Details

Required Information	Description	Notes
Waste Rock Description:		
Waste Rock Coordinates (center point):		
Approximate Area:	200m ²	20 m running northeast to southwest by 10 m northwest to southeast (Reference Figure A6.2)
Approximate Depth:		
Waste Rock Underlain by Soil?		
Waste Rock Surrounded by Soil?		
General Observations:		

Confirmatory Soil Sampling (if signs of acid drainage/leaching observed)

Soil Observations:		
Signs of Acid Drainage or Leaching:	No	
Soil Samples Collected:		
Soil Sample Coordinates:		
General Observations:		

Follow-Up (If confirmatory soil samples are collected and exceed applicable SSRTs)

Area of Soil Removed:		
Depth of Soil Removed:		
Backfill Required:		
Modifications Required to Related Plans?		
Follow-Up Monitoring Required:		
Parties Involved/Informed:		

Moderate Risk Waste Rock Excavation Inspection

Project Details

Client:	PSPC	Stantec Project Number:	121414585
Project:	Gordon Lake Remediation Program	PSPC Project Number:	R.057573.019
Location:	Gordon Lake, NWT	Weather:	
Contractor:	DNV	Rainfall in Last 24 Hours:	
Project Manager:	Allen MacGarvie	Active Storm Runoff?	
Inspected by:		Date:	11-Sep-19
Inspection Type:	Regular (year 1)	Time:	
Inspection Site:	West Bay	Inspection Location:	WES_WR_01

Inspection Details

Required Information	Description	Notes
Waste Rock Description:		
Waste Rock Coordinates (center point):		
Approximate Area:		~100m running north-south and 60m east -west (Reference Figure A9.2)
Approximate Depth:		
Waste Rock Underlain by Soil?		
Waste Rock Surrounded by Soil?		
General Observations:		

Confirmatory Soil Sampling (if signs of acid drainage/leaching observed)

Soil Observations:		
Signs of Acid Drainage or Leaching:	No	
Soil Samples Collected:		
Soil Sample Coordinates:		
General Observations:		

Follow-Up (If confirmatory soil samples are collected and exceed applicable SSRTs)

Area of Soil Removed:		
Depth of Soil Removed:		
Backfill Required:		
Modifications Required to Related Plans?		
Follow-Up Monitoring Required:		
Parties Involved/Informed:		

Moderate Risk Waste Rock Excavation Inspection

Project Details

Client:	PSPC	Stantec Project Number:	121414585
Project:	Gordon Lake Remediation Program	PSPC Project Number:	R.057573.019
Location:	Gordon Lake, NWT	Weather:	
Contractor:	DNV	Rainfall in Last 24 Hours:	
Project Manager:	Allen MacGarvie	Active Storm Runoff?	
Inspected by:		Date:	11-Sep-19
Inspection Type:	Regular (year 1)	Time:	
Inspection Site:	West Bay	Inspection Location:	WES_WR_02

Inspection Details

Required Information	Description	Notes
Waste Rock Description:		
Waste Rock Coordinates (center point):		
Approximate Area:	4800m ²	~80m running north-south by 60 m running east - west (Reference Figure, A9.2)
Approximate Depth:		
Waste Rock Underlain by Soil?		
Waste Rock Surrounded by Soil?		
General Observations:		

Confirmatory Soil Sampling (if signs of acid drainage/leaching observed)



Soil Observations:		
Signs of Acid Drainage or Leaching:	No	
Soil Samples Collected:		
Soil Sample Coordinates:		
General Observations:		

Follow-Up (If confirmatory soil samples are collected and exceed applicable SSRTs)



Area of Soil Removed:		
Depth of Soil Removed:		
Backfill Required:		
Modifications Required to Related Plans?		
Follow-Up Monitoring Required:		
Parties Involved/Informed:		



APPENDIX D



Photographic Logs

Client:	Public Services and Procurement Canada	Project:	121414585
Site Name:	Gordon Lake Group of Sites	Site Location:	Burnt Island
Photograph ID: BUR-1			
Photo Location: Burnt Island Portal			
Direction: Looking southwest			
Survey Date: 7/10/2019			
Comments: Viewpoint 1 (Figure A1.4, Appendix A)			
Photograph ID: BUR-2			
Photo Location: Burnt Island Tailings Area			
Direction: Aerial view looking northeast			
Survey Date: 7/10/2019			
Comments: Aerial Viewpoint 2 (Figure A1.2, Appendix A)			



Client:	Public Services and Procurement Canada	Project:	121414585
Site Name:	Gordon Lake Group of Sites	Site Location:	Burnt Island
Photograph ID: BUR-3			
Photo Location: Burnt Island Tailings Area			
Direction: Looking west towards south end of GD-45 borrow source.			
Survey Date: 7/10/2019			
Comments: Settled area			
Photograph ID: BUR-4			
Photo Location: Burnt Island Tailings Area			
Direction: Looking north towards northwest end of GD-45 borrow source.			
Survey Date: 7/10/2019			
Comments: Abandoned animal burrow.			



Client:	Public Services and Procurement Canada	Project:	121414585
Site Name:	Gordon Lake Group of Sites	Site Location:	Burnt Island
Photograph ID: BUR-5			
Photo Location: Burnt Island Tailings Area			
Direction: Looking north towards northwest end of GD-45 borrow source.			
Survey Date: 7/10/2019			
Comments: Minor settled area			
Photograph ID: BUR-6			
Photo Location: Burnt Island Tailings Area			
Direction: Looking southwest across tailings cover.			
Survey Date: 7/10/2019			
Comments: Viewpoint 3 (Figure A1.2, Appendix A). Slash placed on the left and GD-45 borrow source on the right.			



Client:	Public Services and Procurement Canada	Project:	121414585
Site Name:	Gordon Lake Group of Sites	Site Location:	Burnt Island
Photograph ID: BUR-7			
Photo Location: Burnt Island Mine Shaft			
Direction: Looking northwest			
Survey Date: 7/10/2019			
Comments: Viewpoint 4 (Figure A1.3, Appendix A)			
Photograph ID: BUR-8			
Photo Location: Burnt Island BUR_WR_01			
Direction: Aerial view looking west			
Survey Date: 9/11/2019			
Comments: Aerial Viewpoint 5 (Figure A1.5, Appendix A)			

Client:	Public Services and Procurement Canada	Project:	121414585
Site Name:	Gordon Lake Group of Sites	Site Location:	Camlaren
Photograph ID: CAM-1			
Photo Location: Camlaren Mine Area			
Direction: Aerial view looking south			
Survey Date: 7/10/2019			
Comments: Aerial Viewpoint 8 (Figure A2.3, Appendix A)			
Photograph ID: CAM-2			
Photo Location: Camlaren Mine Area			
Direction: Aerial view looking east			
Survey Date: 7/10/2019			
Comments: Aerial Viewpoint 9 (Figure A2.2, Appendix A)			

Client:	Public Services and Procurement Canada	Project:	121414585
Site Name:	Gordon Lake Group of Sites	Site Location:	Camlaren
Photograph ID: CAM-3			
Photo Location: Camlaren Mine Area South			
Direction: Looking west			
Survey Date: 7/10/2019			
Comments: Viewpoint 10 (Figure A2.2, Appendix A). Vegetation growth near shoreline of CAM_SO_08.			
Photograph ID: CAM-4			
Photo Location: Camlaren Mine Area South			
Direction: Aerial view looking north			
Survey Date: 7/10/2019			
Comments: Aerial Viewpoint 11 (Figure A2.2, Appendix A). View of CAM_SO_08, CAM_SO_06, CAM_SO_07, CAM_SO_05 and CAM_SO_04.			

Client:	Public Services and Procurement Canada	Project:	121414585
Site Name:	Gordon Lake Group of Sites	Site Location:	Camlaren
Photograph ID: CAM-5			
Photo Location: Camlaren Mine Area North			
Direction: Aerial view looking southwest			
Survey Date: 7/10/2019			
Comments: Aerial Viewpoint 12 (Figure A2.3, Appendix A). View of CAM_SO_20.			
Photograph ID: CAM-6			
Photo Location: Camlaren Mine Area			
Direction: Aerial view looking southwest			
Survey Date: 7/10/2019			
Comments: Aerial Viewpoint 13 (Figure A2.3, Appendix A). View of CAM_SO_20, CAM_SO_04, CAM_SO_05, CAM_SO_06, CAM_SO_07, CAM_SO_08, CAM_SO_18 and CAM_SO_19.			

Client:	Public Services and Procurement Canada	Project:	121414585
Site Name:	Gordon Lake Group of Sites	Site Location:	TSCA
Photograph ID: TSCA-1			
Photo Location: Muir Island and TSCA			
Direction: Aerial view looking northwest			
Survey Date: 7/8/2019			
Comments: Aerial Viewpoint 1 (Figure A2.2, Appendix A)			
Photograph ID: TSCA-2			
Photo Location: TSCA			
Direction:			
Survey Date: 7/10/2019			
Comments: Animal burrow on south slope of TSCA 0.4m deep			

Client:	Public Services and Procurement Canda	Project:	121414585
Site Name:	Gordon Lake Group of Sites	Site Location:	TSCA
Photograph ID: TSCA-3			
Photo Location: TSCA			
Direction:			
Survey Date: 7/10/2019			
Comments: Animal burrow on southeast slope of TSCA 0.4m deep			
Photograph ID: TSCA-4			
Photo Location: TSCA			
Direction: looking northeast			
Survey Date: 7/10/2019			
Comments: Top cover of TSCA with VB2 in the background. Viewpoint 2 (Figure 2.2, Appendix A)			

Client:	Public Services and Procurement Canada	Project:	121414585
Site Name:	Gordon Lake Group of Sites	Site Location:	TSCA
Photograph ID: TSCA-5			
Photo Location: TSCA			
Direction: looking south			
Survey Date: 7/10/2019			
Comments: Top cover of TSCA looking towards MW1, VT2 and VB1 in the background. Viewpoint 3 (Figure A2.2, Appendix A)			
Photograph ID: TSCA-6			
Photo Location: TSCA			
Direction: looking west			
Survey Date: 7/9/2019			
Comments: Top cover of TSCA looking towards Camlaren dock area. Viewpoint 4 (Figure A2.2, Appendix A)			



Client:	Public Services and Procurement Canada	Project:	121414585
Site Name:	Gordon Lake Group of Sites	Site Location:	TSCA
Photograph ID: TSCA-7			
Photo Location: TSCA			
Direction: looking north			
Survey Date: 7/10/2019			
Comments: West slope of TSCA			
Photograph ID: TSCA-8			
Photo Location: TSCA			
Direction: looking east			
Survey Date: 7/10/2019			
Comments: Northwest ditch of TSCA. Viewpoint 5 (Figure A2.3, Appendix A)			


Client:	Public Services and Procurement Canada	Project:	121414585
Site Name:	Gordon Lake Group of Sites	Site Location:	TSCA
Photograph ID: TSCA-9			
Photo Location: TSCA			
Direction: looking east			
Survey Date: 7/10/2019			
Comments: Coconut mat erosion control and vegetation growth (i.e. willows) on north slope of TSCA.			
Photograph ID: TSCA-10			
Photo Location: TSCA			
Direction: looking southeast			
Survey Date: 7/10/2019			
Comments: Monitoring well MW3/SNP-7A on north slope of TSCA. Viewpoint 6 (Figure A2.2, Appendix A)			



Client:	Public Services and Procurement Canada	Project:	121414585
Site Name:	Gordon Lake Group of Sites	Site Location:	TSCA
Photograph ID: TSCA-11			
Photo Location: TSCA			
Direction: looking south			
Survey Date: 7/10/2019			
Comments: Coconut mats on east slope of TSCA.			
Photograph ID: TSCA-12			
Photo Location: TSCA			
Direction: looking south southwest			
Survey Date: 7/10/2019			
Comments: Coconut mats on southeast slope of TSCA and monitoring well MW4/SNP-7B to the left. Viewpoint 7 (Figure A2.2, Appendix A)			



Client:	Public Services and Procurement Canada	Project:	121414585
Site Name:	Gordon Lake Group of Sites	Site Location:	TSCA
Photograph ID: TSCA-13			
Photo Location: TSCA			
Direction: looking west			
Survey Date: 7/10/2019			
Comments: South ditch			
Photograph ID: TSCA-14			
Photo Location: TSCA			
Direction: looking south			
Survey Date: 7/10/2019			
Comments: Outlet of south ditch.			



Client:	Public Services and Procurement Canada	Project:	121414585
Site Name:	Gordon Lake Group of Sites	Site Location:	TSCA
Photograph ID: TSCA-15			
Photo Location: TSCA			
Direction: looking east			
Survey Date: 7/10/2019			
Comments: South toe			
Photograph ID: TSCA-16			
Photo Location: TSCA			
Direction: looking northwest			
Survey Date: 7/10/2019			
Comments: Southwest toe of TSCA.			


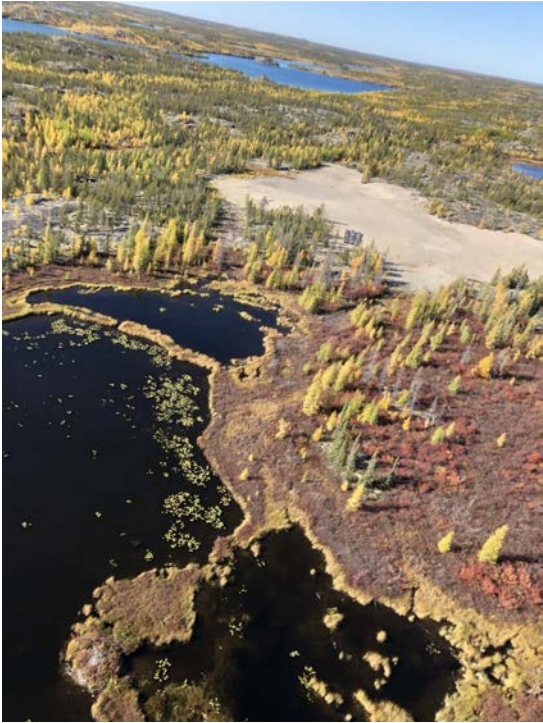
Client:	Public Services and Procurement Canada	Project:	121414585
Site Name:	Gordon Lake Group of Sites	Site Location:	Zenith Island
Photograph ID: ZEN-1			
Photo Location: Zenith Island			
Direction:			
Survey Date: 7/10/2019			
Comments: Vegetation growth observed at willow stems planted at CAM_SO_23			
Photograph ID: ZEN-2			
Photo Location: Zenith Island			
Direction: Looking west			
Survey Date: 7/10/2019			
Comments: Rough and loose at CAM_SO_23 with willow stem growth. Viewpoint 1 (Figure A2.4, Appendix A)			



Client:	Public Services and Procurement Canda	Project:	121414585
Site Name:	Gordon Lake Group of Sites	Site Location:	Zenith Island
Photograph ID: ZEN-3			
Photo Location: Zenith Island			
Direction: Looking south			
Survey Date: 7/10/2019			
Comments: Rough and loose at CAM_SO_23 with willow stem growth. Viewpoint 2 (Figure A2.4, Appendix A)			


Client:	Public Services and Procurement Canada	Project:	121414585
Site Name:	Gordon Lake Group of Sites	Site Location:	Goodrock
Photograph ID: GOO-1			
Photo Location: Goodrock North Mine Shaft			
Direction: Looking southeast			
Survey Date: 7/8/2019			
Comments: Viewpoint 1 (Figure A3.3, Appendix A)			
Photograph ID: GOO-2			
Photo Location: Goodrock South Pit			
Direction: Looking southeast			
Survey Date: 7/10/2019			
Comments: Viewpoint 2 (Figure A3.3, Appendix A)			

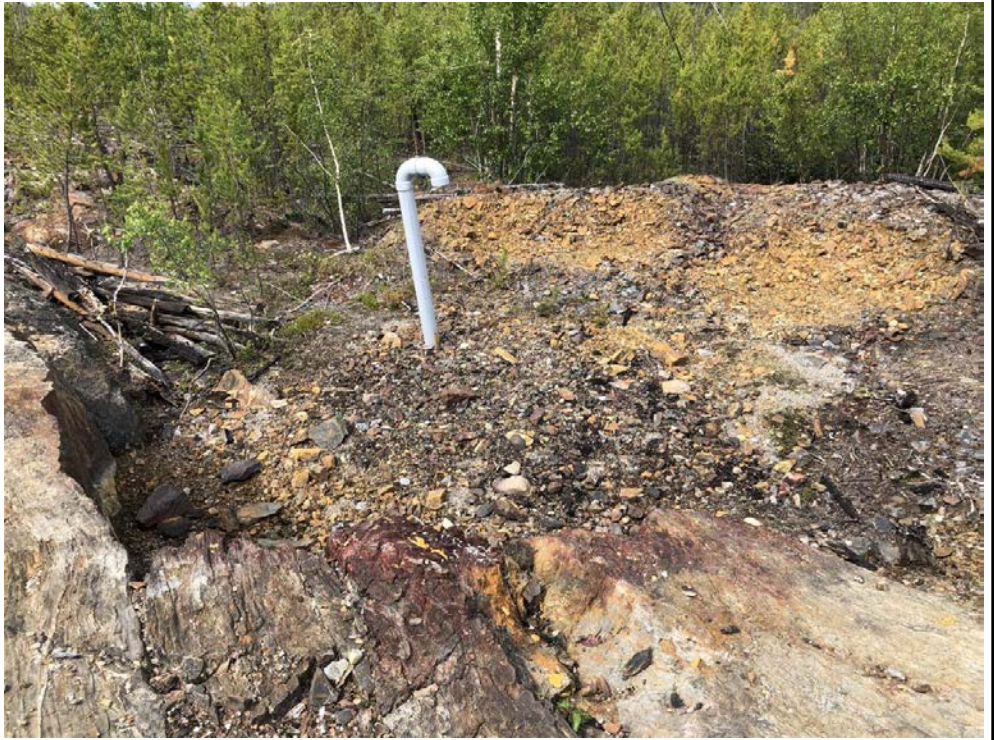

Client:	Public Services and Procurement Canada	Project:	121414585
Site Name:	Gordon Lake Group of Sites	Site Location:	Goodrock
Photograph ID: GOO-3			
Photo Location: Goodrock Moderate Risk Waste Rock			
Direction:			
Survey Date: 7/10/2019			
Comments:			
Photograph ID: GOO-4			
Photo Location: Goodrock GOO_HS_01 cover			
Direction: Looking southeast			
Survey Date: 7/10/2019			
Comments: Viewpoint 3 (Figure A3.3, Appendix A)			



Client:	Public Services and Procurement Canada	Project:	121414585
Site Name:	Gordon Lake Group of Sites	Site Location:	Kidney Pond
Photograph ID: KID-1			
Photo Location: Kidney Pond Portal			
Direction: Looking northwest			
Survey Date: 7/10/2019			
Comments: Aerial view of Kidney Pond portal during manual backfilling of cover slump. Aerial Viewpoint 1 (Figure A4.3, Appendix A)			
Photograph ID: KID-2			
Photo Location: Kidney Pond			
Direction: Looking northwest			
Survey Date: 7/9/2019			
Comments: Coconut mat installed for erosion control at Kidney Pond Portal.			

Client:	Public Services and Procurement Canada	Project:	121414585
Site Name:	Gordon Lake Group of Sites	Site Location:	Kidney Pond
Photograph ID: KID-3			
Photo Location: Kidney Pond			
Direction:			
Survey Date: 7/9/2019			
Comments: Natural vegetation regrowth at camp site near KID_WR_01			
Photograph ID: KID-4			
Photo Location: Kidney Pond			
Direction: Looking west			
Survey Date: 9/11/2019			
Comments: View of Middle Pond and Kidney Pond Portal area (KID_WR_01, KID_SO_07 and KID_SO_11). Aerial Viewpoint 2 (Figure A4.3, Appendix A)			



Client:	Public Services and Procurement Canada	Project:	121414585
Site Name:	Gordon Lake Group of Sites	Site Location:	Kidney Pond
Photograph ID: KID-5			
Photo Location: Kidney Exploration Camp			
Direction:			
Survey Date: 9/11/2019			
Comments: KID_WR_04 trench near KID_SO_06			
Photograph ID: KID-6			
Photo Location: Kidney Exploration Camp			
Direction: Looking northwest			
Survey Date: 9/11/2019			
Comments: KID_WR_04 near KID_SO_06			


Client:	Public Services and Procurement Canda	Project:	121414585
Site Name:	Gordon Lake Group of Sites	Site Location:	Kidney Pond
Photograph ID: KID-7			
Photo Location: Kidney Exploration Camp			
Direction:			
Survey Date: 9/11/2019			
Comments: KID_WR_04 trench and drill hole.			



Client:	Public Services and Procurement Canada	Project:	121414585
Site Name:	Gordon Lake Group of Sites	Site Location:	Murray Lake
Photograph ID: MUR-1			
Photo Location: Murray Lake Main Shaft			
Direction: northwest			
Survey Date: 7/10/2019			
Comments: Viewpoint 1 (Figure A5.2, Appendix A)			
Photograph ID: MUR-2			
Photo Location: Murray Lake trenches			
Direction: looking southeast			
Survey Date: 7/10/2019			
Comments: Aerial Viewpoint 2 (Figure A5.2, Appendix A)			


Client:	Public Services and Procurement Canada	Project:	121414585
Site Name:	Gordon Lake Group of Sites	Site Location:	Storm Property
Photograph ID: STO-1			
Photo Location: Storm Property			
Direction: Aerial view looking southwest			
Survey Date: 7/10/2019			
Comments: Viewpoint 1 (Figure A6.2, Appendix A)			
Photograph ID: STO-2			
Photo Location: Storm North Mine Shaft			
Direction: Aerial view looking southwest			
Survey Date: 7/10/2019			
Comments: Viewpoint 2 (Figure A6.2, Appendix A)			


Client:	Public Services and Procurement Canada	Project:	121414585
Site Name:	Gordon Lake Group of Sites	Site Location:	Storm Property
Photograph ID: STO-3			
Photo Location: Storm North Mine Shaft			
Direction: looking south			
Survey Date: 7/10/2019			
Comments: Viewpoint 3 (Figure A6.2, Appendix A)			
Photograph ID: STO-4			
Photo Location: Storm South Mine Shaft			
Direction: looking east			
Survey Date: 7/10/2019			
Comments: Viewpoint 7 (Figure A6.2, Appendix A)			



Client:	Public Services and Procurement Canada	Project:	121414585
Site Name:	Gordon Lake Group of Sites	Site Location:	Storm Property
Photograph ID: STO-5			
Photo Location: Storm Moderate Risk Waste Rock STO_WR_02			
Direction: looking east			
Survey Date: 7/10/2019			
Comments: Viewpoint 6 (Figure A6.2, Appendix A)			
Photograph ID: STO-6			
Photo Location: Storm North Mine Shaft			
Direction: looking northeast			
Survey Date: 7/10/2019			
Comments: Viewpoint 5 (Figure A6.2, Appendix A)			



Client:	Public Services and Procurement Canda	Project:	121414585
Site Name:	Gordon Lake Group of Sites	Site Location:	Storm Property
Photograph ID: STO-7			
Photo Location: Storm Moderate Risk Waste Rock STO_WR_01			
Direction: looking southeast			
Survey Date: 7/10/2019			
Comments: Viewpoint 4 (Figure A6.2, Appendix A)			


Client:	Public Services and Procurement Canada	Project:	121414585
Site Name:	Gordon Lake Group of Sites	Site Location:	Treacy
Photograph ID: TRE-1			
Photo Location: Treacy Mill Area			
Direction: Looking north			
Survey Date: 7/10/2019			
Comments: View of mainly TRE_SO_01. Viewpoint 1 (Figure A7.2, Appendix A)			
Photograph ID: TRE-2			
Photo Location: Treacy Mill Area Vegetation			
Direction: Looking north			
Survey Date: 7/10/2019			
Comments: Natural germination of horsetail. Viewpoint 2 (Figure A7.2, Appendix A)			

Client:	Public Services and Procurement Canada	Project:	121414585
Site Name:	Gordon Lake Group of Sites	Site Location:	Treacy
Photograph ID: TRE-3			
Photo Location: Treacy Mill Area Vegetation			
Direction: Looking west			
Survey Date: 7/10/2019			
Comments: Grass growth from 2018 revegetation efforts. Viewpoint 3 (Figure A7.2, Appendix A)			

Client:	Public Services and Procurement Canda	Project:	121414585
Site Name:	Gordon Lake Group of Sites	Site Location:	Try Me
Photograph ID: TRY-1			
Photo Location: Try Me Mine Shaft			
Direction: Aerial view looking northwest			
Survey Date: 7/10/2019			
Comments: Aerial Viewpoint 1 (Figure A8.2, Appendix A)			

Client:	Public Services and Procurement Canada	Project:	121414585
Site Name:	Gordon Lake Group of Sites	Site Location:	West Bay
Photograph ID: WES-1			
Photo Location: West Bay			
Direction: Looking northeast			
Survey Date: 7/10/2019			
Comments: View of emergency shelter, open pit and GD-37 in the right background. Aerial Viewpoint 1 (Figure 9.2, Appendix A)			
Photograph ID: WES-2			
Photo Location: West Bay			
Direction: Looking south			
Survey Date: 7/10/2019			
Comments: View of open pit, WES_WR_01, WES_WR_02 and GD-37 in the background. Aerial Viewpoint 2 (Figure 9.2, Appendix A)			

Client:	Public Services and Procurement Canada	Project:	121414585
Site Name:	Gordon Lake Group of Sites	Site Location:	West Bay
Photograph ID: WES-3			
Photo Location: West Bay			
Direction: Looking southwest			
Survey Date: 9/11/2019			
Comments: View of mainly WES_WR_01. Aerial Viewpoint 3 (Figure 9.2, Appendix A)			
Photograph ID: WES-4			
Photo Location: West Bay Open Pit Barrier			
Direction:			
Survey Date: 7/10/2019			
Comments: Example of spacing between bottom of fence barrier and ground surface.			

Client:	Public Services and Procurement Canda	Project:	121414585
Site Name:	Gordon Lake Group of Sites	Site Location:	West Bay
Photograph ID: WES-5			
Photo Location: West Bay Moderate Risk Waste Rock			
Direction: Looking north west			
Survey Date: 9/11/2019			
Comments: View of WES_WR_01. Viewpoint 4 (Figure 9.2, Appendix A)			

APPENDIX E

Analytical and In Situ Data Tables

Table E-1
Summary of Groundwater Analytical Results - Camlaren
Gordon Lake Group Sites, NWT
PSPC

Sample Location				Monitoring Well 1		Monitoring Well 2	
Sample Date				10-Sep-19	10-Sep-19	9-Jul-19	10-Sep-19
Sample ID				CAM_GW_MW1_2019_02	DUP1_GW_2019_02	CAM_GW_MW2_2019_01	CAM_GW_MW2_2019_02
Sampling Company				STANTEC	STANTEC	STANTEC	STANTEC
Laboratory				BV	BV	BV	BV
Laboratory Work Order				B977474	B977474	B956373	B977474
Laboratory Sample ID				WM4537	WM4543	WB9161	WM4538
Sample Type	Units	FIGQG			Field Duplicate		
BTEX and Petroleum Hydrocarbons							
Benzene	µg/L	88 ^A		6.2	6.0	<0.40	0.52
Toluene	µg/L	83 ^A		9.1	8.8	3.1	6.2
Ethylbenzene	µg/L	3,200 ^A		0.42	0.57	<0.40	0.45
Xylene, m & p-	µg/L	s1 ^A		1.8 ST	1.9 ST	<0.80	0.96
Xylene, o-	µg/L	s1 ^A		1.0	1.2	<0.40	0.45
Xylenes, Total	µg/L	3,900 ^A		2.8	3.2	<0.89	1.4
PHC F1 (C6-C10 range)	µg/L	n/v		<100	<100	<100	<100
PHC F1 (C6-C10 range) minus BTEX	µg/L	810 ^A		<100	<100	<100	<100
PHC F2 (>C10-C16 range)	mg/L	1.3 ^A		<0.10	<0.10	<0.10	<0.10
General Chemistry							
Alkalinity (P as CaCO3)	mg/L	n/v		<1.0	<1.0	<1.0	<1.0
Alkalinity, Bicarbonate (as CaCO3)	mg/L	n/v		<1.0	<1.0	950	1,000
Alkalinity, Carbonate (as CaCO3)	mg/L	n/v		<1.0	<1.0	<1.0	<1.0
Alkalinity, Hydroxide (as CaCO3)	mg/L	n/v		<1.0	<1.0	<1.0	<1.0
Alkalinity, Total (as CaCO3)	mg/L	n/v		<1.0	<1.0		
Ammonia	mg/L	0.021-231 ^A _{e.d.var2}		-	-	780	820
Ammonia (as N)	mg/L	0.0173-190 ^A _{e.d.var3}		0.70	0.69	11 CD	10 CD
Ammonium	mg/L	n/v		-	-	14	-
Anion Sum	meq/L	n/v		38	38	55	59
Cation Sum	meq/L	n/v		35	34	56	52
Chloride	mg/L	100 ^A		12	11	130 ^A	140 ^A
Electrical Conductivity, Lab	µS/cm	n/v		2,900	2,900	4,400	4,600
Hardness (as CaCO3)	mg/L	n/v		1,400	1,400	1,700	1,400
Hardness Total (as CaCO3)	mg/L	n/v		1,340	1,390	1,740	1,590
Ion Balance	%	n/v		4.8	4.9	0.84	6.4
Nitrate	mg/L	13 ^A		0.044	0.72	<0.044	<0.044
Nitrate (as N)	mg/L	3s12 ^A		0.010	0.16	<0.010	<0.010
Nitrate + Nitrite (as N)	mg/L	100 ^A		<0.014	0.16	<0.014	<0.014
Nitrite	mg/L	0.20s13 ^A		<0.033	<0.033	<0.033	<0.033
Nitrite (as N)	mg/L	0.06 ^A		<0.010	<0.010	<0.010	<0.010
Orthophosphate (as P)	mg/L	n/v		-	-	0.0047	-
pH, lab	S.U.	6.5-9 ^A		3.41 ^A	3.34 ^A	7.03	6.84
Phosphorus, Total	mg/L	n/v		-	-	0.67 CD	-
Sulfate	mg/L	100 ^A		1,800 CD ^A	1,800 CD ^A	1,700 CD ^A	1,900 CD ^A
Total Dissolved Solids	mg/L	3,000 ^A		3,000	3,000	3,800 ^A	3,300 ^A
Total Dissolved Solids (Calculated)	mg/L	n/v		2,500	2,500	3,500	3,600
Total Organic Carbon	mg/L	n/v		-	-	31 CD	-
Total Suspended Solids	mg/L	n/v		24	23	890	150
Metals, Dissolved							
Calcium	mg/L	n/v		380	380	440	370
Iron	mg/L	0.3 ^A		130 ^A	120 ^A	60 ^A	30 ^A
Magnesium	mg/L	n/v		110	100	130	120
Manganese	mg/L	0.2 ^A		14 ^A	14 ^A	11 ^A	3.4 ^A
Potassium	mg/L	n/v		16	15	53	65
Sodium	mg/L	n/v		25	25	430	480
Metals, Total							
Aluminum	µg/L	5/100 ^A _{e.d.var1}		20,900 ^A	21,800 ^A	31,000 ^A	241 ^A
Antimony	µg/L	2,000 ^A		<2.5	<2.5	2.22	<2.5
Arsenic	µg/L	5 ^A		3.97	3.91	13.0 ^A	36.2 ^A
Barium	µg/L	500 ^A		21.9	23.1	243	53.4
Beryllium	µg/L	5.3 ^A		1.40	1.47	<0.10	<0.50
Bismuth	µg/L	n/v		<5.0	<5.0	<1.0	<5.0
Boron	µg/L	500 ^A		<250	<250	175	<250
Cadmium	µg/L	0.09c ^A		4.71 ^A	5.08 ^A	0.387 ^A	0.129 ^A
Calcium	mg/L	n/v		383	395	443	421
Cesium	µg/L	n/v		<1.0	<1.0	0.61	<1.0
Chromium	µg/L	8.9d,e ^A		<5.0	<5.0	116 ^A	<5.0
Cobalt	µg/L	50 ^A		1,070 ^A	1,160 ^A	129 ^A	68.6 ^A
Copper	µg/L	4d ^A		42.3 ^A	44.9 ^A	52.3 ^A	<2.5
Iron	µg/L	300 ^A		130,000 ^A	136,000 ^A	24,000 ^A	66,700 ^A
Lead	µg/L	7d,# ^A		4.7	4.8	50.9 ^A	1.3
Lithium	µg/L	n/v		123	120	93.8	22
Magnesium	mg/L	n/v		94.3	98.4	155	130
Manganese	µg/L	200 ^A		12,700 ^A	13,300 ^A	9,800 ^A	4,030 ^A
Molybdenum	µg/L	73 ^A		<5.0	<5.0	9.3	<5.0
Nickel	µg/L	150d, ^A **		3,000 ^A	3,160 ^A	203 ^A	113
Potassium	mg/L	n/v		14.1	15.2	60.4	62.8
Selenium	µg/L	1 ^A		<0.50	<0.50	0.31	<0.50
Silicon	µg/L	n/v		19,100	19,800	51,700	11,800
Silver	µg/L	0.25 ^A		0.16	0.18	0.109	<0.10
Sodium	mg/L	n/v		22.3	23.2	532	483
Strontium	µg/L	n/v		902	939	3,970	4,600
Sulfur	mg/L	n/v		572	599	682	610
Thallium	µg/L	0.8 ^A		0.139	0.148	0.672	<0.050
Tin	µg/L	n/v		<25	<25	<5.0	<25
Titanium	µg/L	100 ^A		<25	<25	332 ^A	<25
Uranium	µg/L	10 ^A		2.53	2.70	4.89	6.56
Vanadium	µg/L	100 ^A		<25	<25	63.2	<25
Zinc	µg/L	10 ^A		3,000 ^A	3,160 ^A	39.0 ^A	<25
Zirconium	µg/L	n/v		<0.50	<0.50	11.7	4.10

Notes:		
FIGQG	Guidance Document on Federal Interim Groundwater Quality Guidelines for Federal Contaminated Sites (Government of Canada, June 2016 (version 4) revised November 2016)	
^A	Table 1 Federal Interim Groundwater Guidelines - Generic Guidelines for Agricultural Use - (Tier 1) Lowest Guideline - Coarse	
6.5 ^A	Concentration exceeds the indicated standard.	
15.2	Measured concentration did not exceed the indicated standard.	
<0.50	Laboratory reporting limit was greater than the applicable standard.	
<0.03	Analyte was not detected at a concentration greater than the laboratory reporting limit.	
n/v	No standard/guideline value.	
-	Parameter not analyzed / not available.	
c	Hardness dependent guideline; if hardness of receiving surface water is available can be calculated as 10{0.83(log[hardness])-2.46}	
e	Guideline is the lowest of all applicable pathways.	
d	The freshwater aquatic life guidelines vary depending on water pH, hardness etc. Therefore, see Canadian Water Quality Guidelines for the Protection of Aquatic Life (CCME 1999) to determine the appropriate water quality guideline applicable to the site and calculate the groundwater guidelines using formulas provided in Appendix B.	
s1	Standard is applicable to total xylenes, and m & p-xylenes and o-xylenes should be summed for comparison.	
s12	Added for Nitrate-N as guideline only present for Nitrate. Divided the Nitrate guideline by 4.4.	
s13	Guidelines only provided for Nitrite (as N). Nitrite guideline (as NO2) is calculated by multiplying the Nitrite (as N) guideline by 3.29.	
*	The CWQG for copper is related to water hardness. When the water hardness is 0 to < 82 mg/L, the CWQG is 2 µg/L. At hardness≥82 to ≤180 mg/L the CWQG is calculated using this equation: CWQG (µg/L) = 0.2 * e{0.8545[ln(hardness)]-1.465}. At hardness >180 mg/L, the CWQG is 4 µg/L. If the hardness is unknown, the CWQG is 2 µg/L	
#	The CWQG for lead is related to water hardness. When the hardness is 0 to≤ 60 mg/L, the CWQG is 1 µg/L. At hardness >60 to ≤ 180 mg/L the CWQG is calculated using this equation: CWQG (µg/L)= e{1.273[ln(hardness)]-4.705}. At hardness >180 mg/L, the CWQG is 7 µg/L. If the hardness is unknown, the CWQG is 1 µg/L	
**	The CWQG for nickel is related to water hardness. When the water hardness is 0 to≤ 60 mg/L, the CWQG is 25 µg/L. At hardness > 60 to ≤ 180 mg/L the CWQG is calculated using this equation: CWQG (µg/L) = e{0.76[ln(hardness)]+1.06}. At hardness >180 mg/L, the CWQG is 150 µg/L. If the hardness is unknown, the CWQG is 25 µg/L	
VAR1	Variable, 5 µg/L if pH < 6.5 and 100 µg/L if pH > 6.5	
VAR2	Ammonia is pH and temperature dependent, see CCME guidelines for further instructions.	
VAR3	CCME provides the guideline as ammonia (as NH3), and was converted to ammonia (as N) by multiplying the guideline by 0.8224. Ammonia is pH and temperature dependent, see CCME guidelines for further instructions.	
CD	Detection limits raised due to dilution to bring analyte within the calibrated range.	
ST	Tentatively identified result and may be potentially biased high due to matrix interference.	

Table E-2
Summary of Groundwater Analytical Results - SNP Station 7
Gordon Lake Group Sites, NWT
PSPC

Sample Location				CAM_GW_SNP_7A		CAM_GW_SNP_7B		CAM_GW_SNP_7C		CAM_GW_SNP_7D	
Sample Date				9-Jul-19	10-Sep-19	9-Jul-19	10-Sep-19	10-Jul-19	10-Sep-19	9-Jul-19	10-Sep-19
Sample ID				CAM_GW_SNP_7A_2019_01	CAM_GW_SNP_7A_2019_02	CAM_GW_SNP_7B_2019_01	CAM_GW_SNP_7B_2019_02	CAM_GW_SNP_7C_2019_01	CAM_GW_SNP_7C_2019_02	CAM_GW_SNP_7D_2019_01	CAM_GW_SNP_7D_2019_02
Sampling Company				STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC	STANTEC
Laboratory				BV	BV	BV	BV	BV	BV	BV	BV
Laboratory Work Order				B956373	B977474	B956373	B977474	B956373	B977474	B956373	B977474
Laboratory Sample ID				WB9158	WM4539	WB9159	WM4540	WB9162	WM4541	WB9160	WM4542
Sample Type	Units	FIGQG	CCME								
BTEX and Petroleum Hydrocarbons											
Benzene	µg/L	88 ^A	370 ^C	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Toluene	µg/L	83 ^A	2 ^C	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Ethylbenzene	µg/L	3,200 ^A	90 ^C	<0.40	<0.40	<0.40	1.2	<0.40	<0.40	<0.40	<0.40
Xylene, m & p-	µg/L	s1 ^A	n/v	<0.80	<0.80	<0.80	1.7	<0.80	<0.80	<0.80	<0.80
Xylene, o-	µg/L	s1 ^A	n/v	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Xylenes, Total	µg/L	3,900 ^A	n/v	<0.89	<0.89	<0.89	1.7	<0.89	<0.89	<0.89	<0.89
PHC F1 (C6-C10 range)	µg/L	n/v	n/v	<100	<100	<100	<100	<100	<100	<100	<100
PHC F1 (C6-C10 range) minus BTEX	µg/L	810 ^A	n/v	<100	<100	<100	<100	<100	<100	<100	<100
PHC F2 (>C10-C16 range)	mg/L	1.3 ^A	n/v	<0.10	<0.10	<0.10	0.42	0.12	<0.10	<0.10	<0.10
General Chemistry											
Alkalinity (P as CaCO3)	mg/L	n/v	n/v	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, Bicarbonate (as CaCO3)	mg/L	n/v	n/v	710	1,100	80	230	430	690	260	280
Alkalinity, Carbonate (as CaCO3)	mg/L	n/v	n/v	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, Hydroxide (as CaCO3)	mg/L	n/v	n/v	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, Total (as CaCO3)	mg/L	n/v	n/v	580	890	66	190	350	570	210	230
Ammonia	mg/L	0.021-231 ^{s.d.var2^A}	TBC ^C	2.84	-	0.142	-	0.797	-	3.92	-
Ammonia (as N)	mg/L	0.0173-190 ^{s.d.var2^A}	TBC ^C	2.3 CD	0.64	0.12	0.26	0.66	0.015	3.2 CD	0.040
Ammonium	mg/L	n/v	n/v	3.0	-	0.15	-	0.84	-	4.2	-
Anion Sum	meq/L	n/v	n/v	21	20	3.4	10	18	19	6.3	6.5
Cation Sum	meq/L	n/v	n/v	23	20	3.4	8.5	19	18	7.1	6.6
Chloride	mg/L	100 ^A	640 ^B 120 ^C	23	24	6.8	6.7	11	10	2.5	2.2
Electrical Conductivity, Lab	µS/cm	n/v	n/v	1,800	1,800	330	820	1,500	1,600	580	600
Hardness (as CaCO3)	mg/L	n/v	n/v	890	790	150	390	820	780	320	310
Hardness, Total (as CaCO3)	mg/L	n/v	n/v	836	771	145	408	771	818	323	277
Ion Balance	%	n/v	n/v	3.7	0.3	0.74	8.0	3.0	3.7	5.5	0.71
Nitrate	mg/L	13 ^A	550 ^B 13 ^C	0.059	<0.044	3.7	1.3	0.12	0.085	0.87	1.1
Nitrate (as N)	mg/L	3s12 ^A	124 ^B 3.0 ^C	0.013	<0.010	0.84	0.28	0.027	0.019	0.20	0.24
Nitrate + Nitrite (as N)	mg/L	100 ^A	n/v	<0.014	<0.014	0.85	0.29	0.037	0.019	0.20	0.24
Nitrite	mg/L	0.20s13 ^A	0.19 ^C	<0.033	<0.033	0.037	0.036	0.034	<0.033	<0.033	<0.033
Nitrite (as N)	mg/L	0.06 ^A	0.06 ^C	<0.010	<0.010	0.011	0.011	0.01	<0.010	<0.010	<0.010
Orthophosphate (as P)	mg/L	n/v	n/v	0.0036	-	0.0039	-	0.0041	-	0.0069	-
pH, lab	S.U.	6.5-9 ^A	6.5-9.0 ^C	7.47	7.52	6.53	6.86	7.82	7.56	7.72	7.67
Phosphorus, Total	mg/L	n/v	n/v	0.10	-	0.11	-	0.29	-	0.16	-
Sulfate	mg/L	100 ^A	n/v	440 CD ^A	93	88	290 CD ^A	500 CD ^A	360 CD ^A	98	87
Total Dissolved Solids	mg/L	3,000 ^A	n/v	1,300	1,200	280	610	1,200	1,200	380	370
Total Dissolved Solids (Calculated)	mg/L	n/v	n/v	1,300	1,000	210	570	1,100	1,100	360	350
Total Organic Carbon	mg/L	n/v	n/v	31 CD	-	17	-	44 CD	-	7.7	-
Total Suspended Solids	mg/L	n/v	SN ^C	45	55	99	4.7	310	17	75	15
Metals, Dissolved											
Calcium	mg/L	n/v	n/v	250	220	50	130	270	260	100	100
Iron	mg/L	0.3 ^A	0.3 ^C	2.7 ^{AC}	0.092	0.54 ^{AC}	0.11	0.13	0.22	1.6 ^{AC}	<0.060
Magnesium	mg/L	n/v	n/v	64	58	5.6	18	34	32	16	13
Manganese	mg/L	0.2 ^A	n/v	3.9 ^A	5.8 ^A	1.5 ^A	8.8 ^A	3.3 ^A	5.0 ^A	2.0 ^A	1.6 ^A
Potassium	mg/L	n/v	n/v	22	18	2.2	3.2	13	12	3.5	2.6
Sodium	mg/L	n/v	n/v	100	93	8.2	9.0	43	39	6.0	4.4
Metals, Total											
Aluminum	µg/L	5/100 ^{e,d,var1^A}	5/100 ^{VAR1^C}	288 ^{AC}	28.6	3,370 ^{AC}	59	4,020 ^{AC}	21.1	2,140 ^{AC}	55
Antimony	µg/L	2,000 ^A	n/v	1.82	<0.50	<0.50	<1.0	1.49	<1.0	5.59	1.89
Arsenic	µg/L	5 ^A	5 ^C	3.89	17.6 ^{AC}	0.64	2.95	6.77 ^{AC}	26.1 ^{AC}	15.4 ^{AC}	18.6 ^{AC}
Barium	µg/L	500 ^A	n/v	415	325	37.7	52.6	83.8	61.4	63.5	29.5
Beryllium	µg/L	5.3 ^A	n/v	<0.10	<0.10	<0.10	<0.20	<0.10	<0.20	<0.10	<0.10
Bismuth	µg/L	n/v	n/v	<1.0	<1.0	<1.0	<2.0	<1.0	<2.0	<1.0	<1.0
Boron	µg/L	500 ^A	29,000 ^B 1,500 ^C	104	91	<50	<100	<50	<100	62	<50
Cadmium	µg/L	0.09 ^C	7.6 ^{STB} 0.37 ^{LTG^C}	0.024	0.017	0.041	0.095 ^A	0.057	0.147 ^A	0.051	0.081
Calcium	mg/L	n/v	n/v	233	214	46.4	134	251	276	103	94.4
Cesium	µg/L	n/v	n/v	<0.20	<0.20	<0.20	<0.40	<0.20	<0.40	<0.20	<0.20
Chromium	µg/L	8.9s ^A	n/v	2.4	<1.0	12.7 ^A	<2.0	12.4 ^A	<2.0	8.8	<1.0
Cobalt	µg/L	50 ^A	n/v	30.4	16.4	31.5	89.6 ^A	16.7	15.7	13.6	3.16
Copper	µg/L	4 ^{e,d,TBC1^A}	4 ^{*C}	5.12 ^{AC}	<0.50	13.9 ^{AC}	5.2 ^{AC}	15.9 ^{AC}	1.1	29.7 ^{AC}	2.04
Iron	µg/L	300 ^A	300 ^C	2,010 ^{AC}	27,400 ^{AC}	1,070 ^{AC}	3,710 ^{AC}	2,730 ^{AC}	9,780 ^{AC}	1,230 ^{AC}	831 ^{AC}
Lead	µg/L	7 ^{e,d,TBC1^A}	7 ^{#C}	0.88	<0.20	2.15	<0.40	17.8 ^{AC}	0.92	15.7 ^{AC}	0.47
Lithium	µg/L	n/v	n/v	24.9	16.2	6.2	<4.0	11.4	<4.0	<2.0	<2.0
Magnesium	mg/L	n/v	n/v	62.0	57.3	7.22	17.7	34.7	31.0	16.0	10.2
Manganese	µg/L	200 ^A	n/v	4,030 ^A	5,640 ^A	1,430 ^A	8,530 ^A	3,360 ^A	4,980 ^A	2,140 ^A	991 ^A
Molybdenum	µg/L	73 ^A	73 ^C	24.3	3.6	<1.0	<2.0	4.4	5.0	6.3	4.1
Nickel	µg/L	150 ^{e,d,TBC1^A}	150 ^{*+C}	36.6	5.2	56.4	75.8	41.4	21.0	34	8.1
Potassium	mg/L	n/v	n/v	22.0	17.8	2.56	3.12	12.8	11.5	3.61	1.97
Selenium	µg/L	1 ^A	1 ^C	0.22	0.35	0.16	<0.20	0.49	0.64	0.70	0.67
Silicon	µg/L	n/v	n/v	6,960	11,500	12,800	6,670	11,700	8,890	8,880	5,430
Silver	µg/L	0.25 ^A	0.25 ^C	0.057	<0.020	0.050	0.045	0.342 ^{AC}	<0.040	0.231	0.028
Sodium	mg/L	n/v	n/v	106	88.6	8.58	8.28	47.1	35.1	5.85	3.53
Strontium	µg/L	n/v	n/v	1,440	1,240	184	406	1,070	1,120	372	313
Sulfur	mg/L	n/v	n/v	175	30.8	30.4	79.7	199	124	37.9	30.5
Thallium	µg/L	0.8 ^A	0.8 ^C	<0.010	<0.010	<0.010	<0.020	0.028	<0.020	0.040	0.025
Tin	µg/L	n/v	n/v	<5.0	<5.0	<5.0	<10	<5.0	<10	<5.0	<5.0
Titanium	µg/L	100 ^A	n/v	6.1	<5.0	7.0	<10	40.9	<10	29.1	<5.0
Uranium	µg/L	10 ^A	33 ^B 15 ^C	4.60	8.57	0.34	1.44	9.27	7.19	6.38	3.47
Vanadium	µg/L	100 ^A	n/v	<5.0	<5.0	<5.0	<10	6.2	<10	<5.0	<5.0
Zinc	µg/L	10 ^A	37 ^{EQ1} 7.0 ^{EQ2^C}	11.5 ^{AC}	<5.0	24.7 ^{AC}	<10	7.4 ^C	<10	26.9 ^{AC}	<5.0
Zirconium	µg/L	n/v	n/v	5.82	4.62	1.13	<0.20	2.60	1.26	1.11	0.16

Notes:	
FIGQG	Guidance Document on Federal Interim Groundwater Quality Guidelines for Federal Contaminated Sites (Government of Canada, June 2016 (version 4) revised November 2016)
^A	Table 1 Federal Interim Groundwater Guidelines - Generic Guidelines for Agricultural Use - (Tier 1) Lowest Guideline - Coarse
CCME	Canadian Council of Ministers of the Environment
^B	Canadian Environmental Quality Guidelines, Canadian Water Quality Guidelines for the Protection of Aquatic Life - Freshwater Aquatics Short Term
^C	Canadian Environmental Quality Guidelines, Canadian Water Quality Guidelines for the Protection of Aquatic Life - Freshwater Aquatics Long Term
6.5 ^A	Concentration exceeds the indicated standard.
15.2	Measured concentration did not exceed the indicated standard.
<0.50	Laboratory reporting limit was greater than the applicable standard; right-justified in cell for improved readability.
<0.03	Analyte was not detected at a concentration greater than the laboratory reporting limit; right-justified in cell for improved readability.
n/v	No standard/guideline value.
-	Parameter not analyzed / not available.
^c	Hardness dependent guideline; if hardness of receiving surface water is available can be calculated as 10{0.83(log[hardness])-2.46}
^e	Guideline is the lowest of all applicable pathways.
^d	The freshwater aquatic life guidelines vary depending on water pH, hardness etc. Therefore, see Canadian Water Quality Guidelines for the Protection of Aquatic Life (CCME 1999) to determine the appropriate water quality guideline applicable to the site and calculate the groundwater guidelines using formulas provided in Appendix B.
s1	Standard is applicable to total xylenes, and m & p-xylenes and o-xylenes should be summed for comparison.
s12	Added for Nitrate-N as guideline only present for Nitrate. Divided the Nitrate guideline by 4.4.
s13	Guidelines only provided for Nitrite (as N). Nitrite guideline (as NO2) is calculated by multiplying the Nitrite (as N) guideline by 3.29.
EQ1	The short-term benchmark is for dissolved zinc and is calculated using the following equation: Benchmark = exp(0.833[ln(hardness mg·L ⁻¹)] + 0.240[ln(DOC mg·L ⁻¹)] + 0.526). The value in the table is for surface water of 50 mg CaCO3·L ⁻¹ hardness and 0.5 mg·L ⁻¹ dissolved organic carbon (DOC). The benchmark equation is valid between hardness 13.8 and 250.5 mg CaCO3·L ⁻¹ and DOC 0.3 and 17.3 mg·L ⁻¹ .
EQ2	The long-term CWQG is for dissolved zinc and is calculated using the following equation: CWQG = exp(0.947[ln(hardness mg·L ⁻¹)] - 0.815[pH] + 0.398[ln(DOC mg·L ⁻¹)] + 4.625). The value in the table is for surface water of 50 mg CaCO3·L ⁻¹ hardness, pH of 7.5 and 0.5 mg·L ⁻¹ DOC. The CWQG equation is valid between hardness 23.4 and 399 mg CaCO3·L ⁻¹ , pH 6.5 and 8.13 and DOC 0.3 to 22.9 mg·L ⁻¹ .
LTG	The CWQG for cadmium (i.e. long-term guideline) of 0.09 µg·L ⁻¹ is for waters of 50 mg CaCO3·L ⁻¹ hardness. The CWQG for cadmium is related to water hardness (as CaCO3): At hardness ≥ 17 to ≤ 280 mg/L, the CWQG is calculated using this equation (CWQG (µg/L) = 10{0.83(log[hardness]) – 2.46 }); At hardness > 280 mg/L, the CWQG is 0.37 µg/L.
STB	The short-term benchmark concentration of 1.0 µg·L ⁻¹ is for waters of 50 mg CaCO3·L ⁻¹ hardness. The short-term benchmark for cadmium is related to water hardness (as CaCO3): When the water hardness is 0 to < 5.3 mg/L, the short-term benchmark is 0.11 µg/L. At hardness ≥ 5.3 to ≤ 360 mg/L, the short-term benchmark is calculated using this equation (Short-term benchmark (µg/L) = 10{1.016(log[hardness]) – 1.71 }); At hardness > 360 mg/L, the short-term benchmark is 7.7 µg/L.
*	The CWQG for copper is related to water hardness. When the water hardness is 0 to < 82 mg/L, the CWQG is 2 µg/L. At hardness ≥82 to ≤180 mg/L the CWQG is calculated using this equation: CWQG (µg/L) = 0.2 * e{0.8545[ln(hardness)]-1.465}. At hardness >180 mg/L, the CWQG is 4 µg/L. If the hardness is unknown, the CWQG is 2 µg/L
#	The CWQG for lead is related to water hardness. When the hardness is 0 to ≤ 60 mg/L, the CWQG is 1 µg/L. At hardness >60 to ≤ 180 mg/L the CWQG is calculated using this equation: CWQG (µg/L)= e{1.273[ln(hardness)]-4.705}. At hardness >180 mg/L, the CWQG is 7 µg/L. If the hardness is unknown, the CWQG is 1 µg/L
**	The CWQG for nickel is related to water hardness. When the water hardness is 0 to ≤ 60 mg/L, the CWQG is 25 µg/L. At hardness > 60 to ≤ 180 mg/L the CWQG is calculated using this equation: CWQG (µg/L) = e{0.76[ln(hardness)]+1.06}. At hardness >180 mg/L, the CWQG is 150 µg/L. If the hardness is unknown, the CWQG is 25 µg/L
SN	see Narrative
TBC1	To be calculated (equation).
VAR1	Variable, 5 µg/L if pH <

Table E-3
Summary of Surface Water Analytical Results - West Bay
Gordon Lake Group Sites, NWT
PSPC

Sample Location			WES_SW_GL1_ 2019_02 11-Sep-19 WES_SW_GL1_ 2019_02 STANTEC BV B977474 WM4557	WES_SW_GL2_ 2019_02 11-Sep-19 WES_SW_GL2_ 2019_02 STANTEC BV B977474 WM4558	WES_SW_GL3_ 2019_02 11-Sep-19 WES_SW_GL3_ 2019_02 STANTEC BV B977474 WM4559	WES_SW_PIT1_ 2019_02 11-Sep-19 WES_SW_PIT1_ 2019_02 STANTEC BV B977474 WM4553	WES_SW_PIT2_ 2019_02 11-Sep-19 WES_SW_PIT2_ 2019_02 STANTEC BV B977474 WM4554	WES_SW_WET1_ 2019_02 11-Sep-19 WES_SW_WET1_ 2019_02 STANTEC BV B977474 WM4555	WES_SW_WET2_ 2019_02 11-Sep-19 WES_SW_WET2_ 2019_02 STANTEC BV B977474 WM4556	FIELD BLANK 10-Sep-19 FB_SW_2019_02 STANTEC BV B977474 WM4561 Field Blank	TRIP BLANK 10-Sep-19 TB_SW_2019_02 STANTEC BV B977474 WM4560 Trip Blank
Sample Date											
Sample ID											
Sampling Company											
Laboratory											
Laboratory Work Order											
Laboratory Sample ID											
Sample Type	Units	CCME									
BTEX and Petroleum Hydrocarbons											
Benzene	µg/L	370 ^A	-	-	-	-	-	-	-	<0.40	<0.40
Toluene	µg/L	2 ^A	-	-	-	-	-	-	-	<0.40	<0.40
Ethylbenzene	µg/L	90 ^A	-	-	-	-	-	-	-	<0.40	<0.40
Xylene, m & p-	µg/L	n/v	-	-	-	-	-	-	-	<0.80	<0.80
Xylene, o-	µg/L	n/v	-	-	-	-	-	-	-	<0.40	<0.40
Xylenes, Total	µg/L	n/v	-	-	-	-	-	-	-	<0.89	<0.89
PHC F1 (C6-C10 range)	µg/L	n/v	-	-	-	-	-	-	-	<100	<100
PHC F1 (C6-C10 range) minus BTEX	µg/L	n/v	-	-	-	-	-	-	-	<100	<100
PHC F2 (>C10-C16 range)	µg/L	n/v	-	-	-	-	-	-	-	<0.10	<0.10
General Chemistry											
Alkalinity (P as CaCO3)	mg/L	n/v	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, Bicarbonate (as CaCO3)	mg/L	n/v	47	50	47	21	25	49	35	<1.0	<1.0
Alkalinity, Carbonate (as CaCO3)	mg/L	n/v	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, Hydroxide (as CaCO3)	mg/L	n/v	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, Total (as CaCO3)	mg/L	n/v	39	41	38	17	20	40	29	<1.0	<1.0
Ammonia (as N)	mg/L	^A _{TBC2}	-	-	-	-	-	-	-	0.026	0.029
Anion Sum	meq/L	n/v	1.0	1.0	0.97	1.4	1.4	1.3	1.7	0.0000	0.0000
Cation Sum	meq/L	n/v	0.94	0.95	0.94	1.5	1.4	1.4	1.7	0.0070	0.0060
Chloride	mg/L	120 ^A	1.8	1.8	1.5	<1.0	<1.0	1.6	1.8	<1.0	<1.0
Electrical Conductivity, Lab	µS/cm	n/v	98	100	97	160	160	140	180	<2.0	<2.0
Hardness (as CaCO3)	mg/L	n/v	40	40	40	70	65	57	70	<0.50	<0.50
Hardness Total (as CaCO3)	mg/L	n/v	40.8	43.3	41.5	61.4	63.6	52.8	74.6	<0.50	<0.50
Ion Balance	%	n/v	3.6	4.9	1.9	1.9	0.32	2.5	1.1	NC	NC
Nitrate	mg/L	13 ^A	<0.044	<0.044	<0.044	0.096	<0.044	<0.044	<0.044	<0.044	<0.044
Nitrate (as N)	mg/L	3.0 ^A	<0.010	<0.010	<0.010	0.022	<0.010	<0.010	<0.010	<0.010	<0.010
Nitrate + Nitrite (as N)	mg/L	n/v	<0.014	<0.014	<0.014	0.022	<0.014	<0.014	<0.014	<0.014	<0.014
Nitrite	mg/L	0.197 ^A	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033
Nitrite (as N)	mg/L	0.06 ^A	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
pH, lab	S.U.	6.5-9.0 ^A	7.74	7.78	7.73	7.36	7.42	7.16	7.28	5.26 ^A	5.42 ^A
Sulfate	mg/L	n/v	8.5	8.5	7.9	52	48	21	52	<1.0	<1.0
Total Dissolved Solids	mg/L	n/v	-	-	-	-	-	-	-	<10	<10
Total Dissolved Solids (Calculated)	mg/L	n/v	52	53	50	89	86	72	100	<10	<10
Total Suspended Solids	mg/L	^A _{SN}	-	-	-	-	-	-	-	<1.0	<1.0
Metals, Dissolved											
Calcium	mg/L	n/v	11	11	11	17	15	15	18	<0.30	<0.30
Iron	mg/L	0.3 ^A	<0.060	<0.060	<0.060	<0.060	<0.060	0.063	<0.060	<0.060	<0.060
Magnesium	mg/L	n/v	2.9	3.0	2.9	6.7	6.6	4.6	6.1	<0.20	<0.20
Manganese	mg/L	n/v	<0.0040	<0.0040	<0.0040	0.0086	0.0083	<0.0040	<0.0040	<0.0040	<0.0040
Potassium	mg/L	n/v	1.4	1.4	1.5	1.8	1.8	0.61	0.52	<0.30	<0.30
Sodium	mg/L	n/v	2.5	2.5	2.5	1.2	1.4	4.5	7.5	<0.50	<0.50
Metals, Total											
Aluminum	µg/L	5/100 ^A _{VAR1}	67	59.7	11.9	69.7	21.5	59.4	38.2	<3.0	<3.0
Antimony	µg/L	n/v	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Arsenic	µg/L	5 ^A	0.27	0.29	0.25	6.01 ^A	1.26	0.51	0.49	<0.10	<0.10
Barium	µg/L	n/v	4.7	4.9	4.2	5.5	5.1	9.4	12.8	<1.0	<1.0
Beryllium	µg/L	n/v	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Bismuth	µg/L	n/v	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Boron	µg/L	1,500 ^A	<50	<50	<50	<50	<50	<50	<50	<50	<50
Cadmium	µg/L	0.09 ^A _{LTG}	<0.010	<0.010	<0.010	0.112 ^A	0.082	<0.010	<0.010	<0.010	<0.010
Calcium	mg/L	n/v	11.8	12.6	12.1	14.8	15.6	14.1	20.1	<0.050	<0.050
Cesium	µg/L	n/v	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Chromium	µg/L	n/v	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Cobalt	µg/L	n/v	<0.20	<0.20	<0.20	2.28	0.27	0.21	0.34	<0.20	<0.20
Copper	µg/L	2 ^A	0.58	0.61	1.14	8.18 ^A	5.89 ^A	0.87	0.98	<0.50	<0.50
Iron	µg/L	300 ^A	82	96	11	352 ^A	30	162	306 ^A	<10	<10
Lead	µg/L	1# ^A	<0.20	<0.20	<0.20	0.65	<0.20	<0.20	<0.20	<0.20	<0.20
Lithium	µg/L	n/v	<2.0	<2.0	<2.0	2.3	2.3	2.1	3.5	<2.0	<2.0
Magnesium	mg/L	n/v	2.75	2.89	2.76	5.90	6.00	4.28	5.92	<0.050	<0.050
Manganese	µg/L	n/v	3.9	4.3	1.8	38.0	8.8	16.1	15.3	<1.0	<1.0
Molybdenum	µg/L	73 ^A	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Nickel	µg/L	25** ^A	<1.0	<1.0	<1.0	18.5	16.8	1.2	1.6	<1.0	<1.0
Potassium	mg/L	n/v	1.43	1.47	1.41	1.69	1.79	0.775	0.588	<0.050	<0.050
Selenium	µg/L	1 ^A	<0.10	<0.10	<0.10	0.27	<0.10	<0.10	<0.10	<0.10	<0.10
Silicon	µg/L	n/v	201	224	123	533	502	229	1,140	<100	<100
Silver	µg/L	0.25 ^A	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Sodium	mg/L	n/v	2.18	2.24	2.16	1.10	1.17	4.41	7.14	<0.050	<0.050
Strontium	µg/L	n/v	42.8	44.6	43.8	37.5	38.3	46.2	66.7	<1.0	<1.0
Sulfur	mg/L	n/v	<3.0	<3.0	<3.0	15.7	16.1	6.4	17.8	<3.0	<3.0
Thallium	µg/L	0.8 ^A	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Tin	µg/L	n/v	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Titanium	µg/L	n/v	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Uranium	µg/L	15 ^A	<0.10	0.10	<0.10	<0.10	<0.10	0.10	0.11	<0.10	<0.10
Vanadium	µg/L	n/v	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Zinc	µg/L	7.0 ^A _{EQ2}	<5.0	<5.0	<5.0	19.6 ^A	16.6 ^A	<5.0	<5.0	<5.0	<5.0
Zirconium	µg/L	n/v	<0.10	<0.10	<0.10	<0.10	<0.10	0.18	0.20	<0.10	<0.10

Notes:	CCME	Canadian Council of Ministers of the Environment
	^A	Canadian Environmental Quality Guidelines, Canadian Water Quality Guidelines for the Protection of Aquatic Life - Freshwater Aquatics Short Term
	^B	Canadian Environmental Quality Guidelines, Canadian Water Quality Guidelines for the Protection of Aquatic Life - Freshwater Aquatics Long Term
6.5 ^A		Concentration exceeds the indicated standard.
15.2		Measured concentration did not exceed the indicated standard.
<0.50		Laboratory reporting limit was greater than the applicable standard.
<0.03		Analyte was not detected at a concentration greater than the laboratory reporting limit.
n/v		No standard/guideline value.
-		Parameter not analyzed / not available.
EQ2		The long-term CWQG is for dissolved zinc and is calculated using the following equation: CWQG = exp(0.947[ln(hardness mg·L ⁻¹)] - 0.815[pH] + 0.398[ln(DOC mg·L ⁻¹)] + 4.625). The value in the table is for surfa 23.4 and 399 mg CaCO3·L ⁻¹ , pH 6.5 and 8.13 and DOC 0.3 to 22.9 mg·L ⁻¹ .
	LTG	The CWQG for cadmium (long-term guideline) of 0.09 µg·L ⁻¹ is for waters of 50 mg CaCO3·L ⁻¹ hardness. The CWQG for cadmium is related to water hardness (as CaCO3): At hardness≥ 17 to ≤ 280 mg/L, the C
	SN	see Narrative
	VAR1	Variable, 5 µg/L if pH < 6.5 and 100 µg/L if pH > 6.5
	TBC2	To be calculated (equation), then the present guideline values (mg/L NH3) can be converted to mg/L total ammonia-N by multiplying the corresponding guideline value by 0.8224.
*		The CWQG for copper is related to water hardness. When the water hardness is 0 to < 82 mg/L, the CWQG is 2 µg/L. At hardness≥82 to ≤180 mg/L the CWQG is calculated using this equation: CWQG (µg/L) = (
#		The CWQG for lead is related to water hardness. When the hardness is 0 to≤ 60 mg/L, the CWQG is 1 µg/L. At hardness >60 to ≤ 180 mg/L the CWQG is calculated using this equation: CWQG (µg/L)= e{1.273[ln
**		The CWQG for nickel is related to water hardness. When the water hardness is 0 to≤ 60 mg/L, the CWQG is 25 µg/L. At hardness > 60 to ≤ 180 mg/L the CWQG is calculated using this equation: CWQG (µg/L) =
NC		Not calculated.

Table E-4
In Situ Groundwater Data
Gordon Lake Group Sites, NWT
PSPC

Site	Sample Type	Media	Sample Station	Date	Depth to Product (m)	Depth to Water (m)	Depth to Bottom (m)	Temperature (°C)	Conductivity (mS/cm)	Conductivity (µS/cm)	SPC (mS/cm)	DO (mg/L)	DO %	pH	ORP	Turbidity (NTU)
TSCA	Verification Sampling	Groundwater	CAM_GW_MW1_2019_01	20190708	-	Frozen	4.48	-	-	-	-	-	-	-	-	-
TSCA	Verification Sampling	Groundwater	CAM_GW_MW2_2019_01	20190709	-	6.55	8.09	2.95	-	2322	-	187.10		8.12	-13.7	-
Camlaren	Compliance Sampling	Groundwater	CAM_GW_SNP_7A_2019_01	20190709	-	2.42	7.88	3.38	-	1690	-	57.00		8.89	-126.9	-
Camlaren	Compliance Sampling	Groundwater	CAM_GW_SNP_7B_2019_01; DUP1_GW_2019_01	20190709	-	2.48	4.62	7.26	-	349	-	52.00		8.64	-158.2	-
Camlaren	Compliance Sampling	Groundwater	CAM_GW_SNP_7C_2019_01	20190710	-	5.17	5.53	-	-	-	-	-	-	-	-	-
Camlaren	Compliance Sampling	Groundwater	CAM_GW_SNP_7D_2019_01	20190709	-	5.25	6.15	3.92		608		50.40		7.91	-166.2	
TSCA	Verification Sampling	Groundwater	CAM_GW_MW1_2019_02; DUP1_GW_2019_02	20191010	-	3.39	4.36	3.50	1.578	-	2.673	0.45		4.22	228.9	0.0
TSCA	Verification Sampling	Groundwater	CAM_GW_MW2_2019_02	20191010	-	6.05	8.09	5.94	2.95	-	4.630	0.98		6.45	-12.1	17.6
Camlaren	Compliance Sampling	Groundwater	CAM_GW_SNP_7A_2019_02	20191010	-	2.24	7.88	8.58	1.19	-	1.733	0.50		7.17	-105.2	1.5
Camlaren	Compliance Sampling	Groundwater	CAM_GW_SNP_7B_2019_02	20191010	-	2.69	4.62	9.26	0.546	-	0.781	0.60		6.49	21.0	3.0
Camlaren	Compliance Sampling	Groundwater	CAM_GW_SNP_7C_2019_02	20191010	-	4.36	5.52	9.00	1.043	-	1.501	0.70		7.06	-56.5	0.8
Camlaren	Compliance Sampling	Groundwater	CAM_GW_SNP_7D_2019_02	20191010	-	2.34	6.15	8.75	0.387	-	0.561	3.75		7.27	-19.0	0.0

Notes:
m - metres
°C - degrees centigrade
mS/cm - millisiemens per centimetre
µS/cm - microsiemens per centimetre
DO % - dissolved oxygen percent
pH - Potential hydrogen
ORP - Oxidation reduction potential
NTU - Nephelometric Turbidity Units
- - data not recorded

Table E-5
In Situ Surface Water Data
Gordon Lake Group Sites
PSPC

Site	Sample Type	Media	Sample ID	Date (YMD)	Temperature (°C)	Conductivity (mS/cm)	Conductivity (µS/cm)	Specific Conductance (mS/cm)	Turbidity (NTU)	DO %	DO mg/L	pH	ORP (mV)
Burnt Island	Compliance Sampling	Surface Water	CAM_SW_SNP_11A_2019_01	20190710	13.13		75			87.7		7	-212.6
Camlaren	Compliance Sampling	Surface Water	CAM_SW_SNP_11B1_2019_01	20190708	12.82	-	87	-	-	102.6	-	6.22	-99.2
Camlaren	Compliance Sampling	Surface Water	CAM_SW_SNP_11B2_2019_01	20190708	12.84	-	135	-	-	97.5	-	6.01	-104.7
Camlaren	Compliance Sampling	Surface Water	CAM_SW_SNP_11B3_2019_01	20190708	13.16	-	121	-	-	101.7	-	7.99	-104.3
Camlaren	Compliance Sampling	Surface Water	CAM_SW_SNP_11B4_2019_01	20190708	12.81	-	81	-	-	99.1	-	6.01	-28.6
Camlaren	Compliance Sampling	Surface Water	CAM_SW_SNP_11C_2019_01	20190708	13.63	-	145			108.3	-	10.44	-188.5
Kidney Pond	Compliance Sampling	Surface Water	CAM_SW_SNP_11D_2019_01 DUP1_SW_SNP_2019_01	20190709	13.35	-	80	-	-	102.8	-	7.01	-222
Treacy	Compliance Sampling	Surface Water	CAM_SW_SNP_11E_2019_01	20190709	14.5	-	161	-	-	85.8	-	7.73	-248.4
West Bay	Compliance Sampling	Surface Water	CAM_SW_SNP_11F_2019_01	20190710	14.15	-	71	-	-	102.4	-	7.29	-230.9
Burnt Island	Compliance Sampling	Surface Water	BUR_SW_SNP_11A_2019_02	20190911	11.84	0.072	-	0.097	0	-	13.45	8.01	134.8
Camlaren	Compliance Sampling	Surface Water	CAM_SW_SNP_11B1_2019_02	20190910	12.25	0.071	-	0.092	0.0	-	11.58	7.87	63.2
Camlaren	Compliance Sampling	Surface Water	CAM_SW_SNP_11B2_2019_02	20190910	12.76	0.071	-	0.019	0.0	-	11.63	7.9	52.5
Camlaren	Compliance Sampling	Surface Water	CAM_SW_SNP_11B3_2019_02	20190910	17.5	0.154	-	0.18	5.6	-	13.17	8.17	55.4
Camlaren	Compliance Sampling	Surface Water	CAM_SW_SNP_11B4_2019_02 DUP1_SW_SNP_2019_02	20190910	13.12	0.072	-	0.093	0.2	-	11.7	7.95	0.2
Camlaren	Compliance Sampling	Surface Water	CAM_SW_SNP_11C_2019_02	20190910	9.78	0.068	-	0.096	11.2	-	12.22	7.66	68.8
Kidney Pond	Compliance Sampling	Surface Water	KID_SW_SNP_11D_2019_02	20190911	9.1	0.147	-	0.21	10.9	-	7.16	6.8	88.4
Treacy	Compliance Sampling	Surface Water	TRE_SW_SNP_11E_2019_02	20190911	11.81	0.069	-	0.093	0	-	12	7.9	94.2
West Bay	Compliance Sampling	Surface Water	WES_SW_SNP_11F_2019_02	20190911	13.2	0.072	-	0.093	1.9	-	13.62	7.9	110.5
West Bay	Verification Sampling	Surface Water	WES_SW_PIT1_2019_02	20190911	11.31	0.111	-	0.15	0.0	-	11.5	7.81	102.7
West Bay	Verification Sampling	Surface Water	WES_SW_PIT2_2019_02	20190911	11.18	0.112	-	0.152	0.2	-	11.59	7.58	104.7
West Bay	Verification Sampling	Surface Water	WES_SW_WET1_2019_02	20190911	15.16	0.084	-	0.103	18.7	-	13.39	8.2	103.5
West Bay	Verification Sampling	Surface Water	WES_SW_WET2_2019_02	20190911	14.96	0.128	-	0.158	0.0	-	17.99	7.94	118.8
West Bay	Verification Sampling	Surface Water	WES_SW_GL1_2019_02	20190911	13.73	0.072	-	0.092	0.0	-	13.21	7.94	116.9
West Bay	Verification Sampling	Surface Water	WES_SW_GL2_2019_02	20190911	14.37	0.0745	-	0.094	1.1	-	12.91	7.97	108.1
West Bay	Verification Sampling	Surface Water	WES_SW_GL3_2019_02	20190911	12.82	0.07	-	0.092	0.0	-	13.39	7.92	115.1

Notes:
m - metres
mS/cm - millisiemens per centimetre
µS/cm - microsiemens per centimetre
g/L - grams per litre
DO % - dissolved oxygen percent
mg/L - milligrams per litre
ORP - Oxidation reduction potential
TDB - to be determined
mV - millivolts
NTU - Nephelometric Turbidity Units
- - data not recorded

APPENDIX F

Laboratory COAs



Your Project #: 121414585
 Site Location: Gordon Lake
 Your C.O.C. #: 15386

Attention: Laya Bou-Karam

STANTEC CONSULTING LTD
 PO BOX 1777
 4910-53 Street
 Yellowknife, NT
 CANADA X1A 2P4

Report Date: 2019/08/01
 Report #: R2761539
 Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BV LABS JOB #: B956373

Received: 2019/07/09, 11:11

Sample Matrix: Ground Water
 # Samples Received: 5

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity @25C (pp, total), CO ₃ ,HCO ₃ ,OH	4	N/A	2019/07/15	AB SOP-00005	SM 23 2320 B m
Alkalinity @25C (pp, total), CO ₃ ,HCO ₃ ,OH	1	N/A	2019/07/16	AB SOP-00005	SM 23 2320 B m
BTEX/F1 in Water by HS GC/MS/FID	5	N/A	2019/07/14	AB SOP-00039	CCME CWS/EPA 8260d m
F1-BTEX	5	N/A	2019/07/15		Auto Calc
Chloride/Sulphate by Auto Colourimetry	5	N/A	2019/07/15	AB SOP-00020 / AB SOP-00018	SM23-4500-Cl/SO ₄ -E m
Conductivity @25C	4	N/A	2019/07/15	AB SOP-00005	SM 23 2510 B m
Conductivity @25C	1	N/A	2019/07/16	AB SOP-00005	SM 23 2510 B m
CCME Hydrocarbons in Water (F2; C10-C16) (2)	5	2019/07/13	2019/07/13	AB SOP-00037 / AB SOP-00040	CCME PHC-CWS m
Hardness	4	N/A	2019/07/16		Auto Calc
Hardness	1	N/A	2019/07/17		Auto Calc
Hardness Total (calculated as CaCO ₃) (1, 3)	5	N/A	2019/07/18	BBY WI-00033	Auto Calc
Elements by ICP - Dissolved (4)	3	N/A	2019/07/15	AB SOP-00042	EPA 6010d R5 m
Elements by ICP - Dissolved (4)	1	N/A	2019/07/19	AB SOP-00042	EPA 6010d R5 m
Elements by ICP-Dissolved-Lab Filtered (4)	1	N/A	2019/07/15	AB SOP-00042	EPA 6010d R5 m
Ion Balance	5	N/A	2019/07/13		Auto Calc
Sum of cations, anions	4	N/A	2019/07/16		Auto Calc
Sum of cations, anions	1	N/A	2019/07/17		Auto Calc
Na, K, Ca, Mg, S by CRC ICPMS (total) (1)	5	2019/07/12	2019/07/18		Auto Calc
Elements by CRC ICPMS (total) (1)	5	2019/07/16	2019/07/17	CAL SOP-00265	EPA 6020 m
Ammonia Calculation (as NH ₃)	5	N/A	2019/07/14		Auto Calc
Ammonia-N (Total)	5	N/A	2019/07/14	AB SOP-00007	SM 23 4500 NH ₃ A G m
Ammonium Calculation (as NH ₄)	5	N/A	2019/07/14		Auto Calc
Nitrate and Nitrite	5	N/A	2019/07/14		Auto Calc
Nitrate + Nitrite-N (calculated)	5	N/A	2019/07/14		Auto Calc
Nitrogen (Nitrite - Nitrate) by IC	5	N/A	2019/07/13	AB SOP-00023	SM 23 4110 B m
pH @25°C (5)	4	N/A	2019/07/15	AB SOP-00005	SM 23 4500 H+ B m
pH @25°C (5)	1	N/A	2019/07/16	AB SOP-00005	SM 23 4500 H+ B m
Orthophosphate by Konelab (6)	5	N/A	2019/07/13	AB SOP-00025	SM 23 4500-P A,F m
Total Dissolved Solids (Filt. Residue)	5	2019/07/14	2019/07/15	AB SOP-00065	SM 23 2540 C m



Your Project #: 121414585
 Site Location: Gordon Lake
 Your C.O.C. #: 15386

Attention: Laya Bou-Karam

STANTEC CONSULTING LTD
 PO BOX 1777
 4910-53 Street
 Yellowknife, NT
 CANADA X1A 2P4

Report Date: 2019/08/01
 Report #: R2761539
 Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BV LABS JOB #: B956373

Received: 2019/07/09, 11:11

Sample Matrix: Ground Water
 # Samples Received: 5

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Total Dissolved Solids (Calculated)	4	N/A	2019/07/16		Auto Calc
Total Dissolved Solids (Calculated)	1	N/A	2019/07/17		Auto Calc
Carbon (Total Organic) (7)	5	N/A	2019/07/19	AB SOP-00087	MMCW 119 1996 m
Total Phosphorus	5	2019/07/17	2019/07/18	AB SOP-00024	SM 23 4500-P A,B,F m
Total Suspended Solids (NFR)	5	2019/07/14	2019/07/15	AB SOP-00061	SM 23 2540 D m

Sample Matrix: Soil
 # Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
BTEX/F1 by HS GC/MS/FID (MeOH extract)	1	2019/07/13	2019/07/15	AB SOP-00039	CCME CWS/EPA 8260d m
BTEX/F1 by HS GC/MS/FID (MeOH extract)	2	2019/07/13	2019/07/16	AB SOP-00039	CCME CWS/EPA 8260d m
F1-BTEX	3	N/A	2019/07/16		Auto Calc
CCME Hydrocarbons (F2-F4 in soil) (8)	3	2019/07/13	2019/07/14	AB SOP-00036 / AB SOP-00040	CCME PHC-CWS m
Moisture	3	N/A	2019/07/14	AB SOP-00002	CCME PHC-CWS m

Sample Matrix: Surface Water
 # Samples Received: 12

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity @25C (pp, total), CO ₃ ,HCO ₃ ,OH	12	N/A	2019/07/15	AB SOP-00005	SM 23 2320 B m
BTEX/F1 in Water by HS GC/MS/FID	12	N/A	2019/07/14	AB SOP-00039	CCME CWS/EPA 8260d m
F1-BTEX	12	N/A	2019/07/15		Auto Calc
Chloride/Sulphate by Auto Colourimetry	12	N/A	2019/07/15	AB SOP-00020 / AB SOP-00018	SM23-4500-Cl/SO ₄ -E m
Conductivity @25C	12	N/A	2019/07/15	AB SOP-00005	SM 23 2510 B m
CCME Hydrocarbons in Water (F2; C10-C16) (2)	8	2019/07/13	2019/07/13	AB SOP-00037 / AB SOP-00040	CCME PHC-CWS m
CCME Hydrocarbons in Water (F2; C10-C16) (2)	4	2019/07/13	2019/07/14	AB SOP-00037 / AB SOP-00040	CCME PHC-CWS m
Hardness	12	N/A	2019/07/16		Auto Calc
Hardness Total (calculated as CaCO ₃) (1, 3)	12	N/A	2019/07/18	BBY WI-00033	Auto Calc



Your Project #: 121414585
Site Location: Gordon Lake
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Attention: Laya Bou-Karam

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CERTIFICATE OF ANALYSIS – REVISED REPORT

BV LABS JOB #: B956373

Received: 2019/07/09, 11:11

Sample Matrix: Surface Water
Samples Received: 12

Analyses	Quantity	Date	Date	Laboratory Method	Analytical Method
		Extracted	Analyzed		
Elements by ICP - Dissolved (4)	11	N/A	2019/07/15	AB SOP-00042	EPA 6010d R5 m
Elements by ICP - Dissolved (4)	1	N/A	2019/07/19	AB SOP-00042	EPA 6010d R5 m
Ion Balance	12	N/A	2019/07/14		Auto Calc
Sum of cations, anions	12	N/A	2019/07/16		Auto Calc
Na, K, Ca, Mg, S by CRC ICPMS (total) (1)	12	2019/07/12	2019/07/18		Auto Calc
Elements by CRC ICPMS (total) (1)	12	2019/07/16	2019/07/17	CAL SOP-00265	EPA 6020 m
Ammonia-N (Total)	10	N/A	2019/07/14	AB SOP-00007	SM 23 4500 NH3 A G m
Ammonia-N (Total)	2	N/A	2019/07/19	AB SOP-00007	SM 23 4500 NH3 A G m
Nitrate and Nitrite	12	N/A	2019/07/14		Auto Calc
Nitrate + Nitrite-N (calculated)	12	N/A	2019/07/14		Auto Calc
Nitrogen (Nitrite - Nitrate) by IC	12	N/A	2019/07/13	AB SOP-00023	SM 23 4110 B m
pH @25°C (5)	12	N/A	2019/07/15	AB SOP-00005	SM 23 4500 H+ B m
Total Dissolved Solids (Filt. Residue)	12	2019/07/14	2019/07/15	AB SOP-00065	SM 23 2540 C m
Total Dissolved Solids (Calculated)	12	N/A	2019/07/16		Auto Calc
Total Suspended Solids (NFR)	12	2019/07/14	2019/07/15	AB SOP-00061	SM 23 2540 D m

Remarks:

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

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

BV Labs liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. BV Labs 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 BV Labs, unless otherwise agreed in writing. BV Labs is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.



Your Project #: 121414585
Site Location: Gordon Lake
Your C.O.C. #: 15386

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Yellowknife, NT
CANADA X1A 2P4

Report Date: 2019/08/01
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CERTIFICATE OF ANALYSIS – REVISED REPORT

BV LABS JOB #: B956373

Received: 2019/07/09, 11:11

Results relate to samples tested. When sampling is not conducted by BV Labs, results relate to the supplied samples tested.

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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) This test was performed by BV Labs Calgary Environmental
- (2) Silica gel clean up employed.
- (3) "Total Hardness" was calculated from Total Ca and Mg concentrations and may be biased high (Hardness, or Dissolved Hardness, calculated from Dissolved Ca and Mg, should be used for compliance if available).
- (4) Dissolved > Total Imbalance: When applicable, Dissolved and Total results were reviewed and data quality meets acceptable levels unless otherwise noted.
- (5) The CCME method requires pH to be analysed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the CCME holding time. Bureau Veritas Laboratories endeavours to analyze samples as soon as possible after receipt.
- (6) Orthophosphate > Total Phosphorus Imbalance: When applicable, Orthophosphate, Total Phosphorus and dissolved Phosphorus results were reviewed and data quality meets acceptable levels unless otherwise noted.
- (7) TOC present in the sample should be considered as non-purgeable TOC.
- (8) All CCME results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Bureau Veritas Laboratories 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.

Geraldyn Gouthro, Key Account Specialist

Email: GGouthro@bvlabs.com

Phone# (403)735-2230

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BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



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BV Labs Job #: B956373

Report Date: 2019/08/01

STANTEC CONSULTING LTD

Client Project #: 121414585

Site Location: Gordon Lake

Sampler Initials: BW

AT1 BTEX AND F1-F2 IN WATER (GROUND WATER)

BV Labs ID		WB9158	WB9159	WB9160	WB9161		
Sampling Date		2019/07/09	2019/07/09	2019/07/09	2019/07/09		
COC Number		15386	15386	15386	15386		
	UNITS	CAM_GW_SNP_7A_2019_01	CAM_GW_SNP_7B_2019_01	CAM_GW_SNP_7D_2019_01	CAM_GW_MW2_2019_01	RDL	QC Batch
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	<0.10	<0.10	<0.10	0.10	9505940
Volatiles							
Benzene	ug/L	<0.40	<0.40	<0.40	<0.40	0.40	9506386
Toluene	ug/L	<0.40	<0.40	<0.40	3.1	0.40	9506386
Ethylbenzene	ug/L	<0.40	<0.40	<0.40	<0.40	0.40	9506386
m & p-Xylene	ug/L	<0.80	<0.80	<0.80	<0.80	0.80	9506386
o-Xylene	ug/L	<0.40	<0.40	<0.40	<0.40	0.40	9506386
Xylenes (Total)	ug/L	<0.89	<0.89	<0.89	<0.89	0.89	9505303
F1 (C6-C10) - BTEX	ug/L	<100	<100	<100	<100	100	9505303
F1 (C6-C10)	ug/L	<100	<100	<100	<100	100	9506386
Surrogate Recovery (%)							
1,4-Difluorobenzene (sur.)	%	103	104	102	103	N/A	9506386
4-Bromofluorobenzene (sur.)	%	98	97	96	98	N/A	9506386
D4-1,2-Dichloroethane (sur.)	%	103	101	112	104	N/A	9506386
O-TERPHENYL (sur.)	%	106	101	108	105	N/A	9505940
RDL = Reportable Detection Limit							
N/A = Not Applicable							



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BV Labs Job #: B956373
Report Date: 2019/08/01

STANTEC CONSULTING LTD
Client Project #: 121414585
Site Location: Gordon Lake
Sampler Initials: BW

AT1 BTEX AND F1-F2 IN WATER (GROUND WATER)

BV Labs ID		WB9162		
Sampling Date		2019/07/10		
COC Number		15386		
	UNITS	CAM_GW_SNP_7C_2019_01	RDL	QC Batch
Ext. Pet. Hydrocarbon				
F2 (C10-C16 Hydrocarbons)	mg/L	0.12	0.10	9505940
Volatiles				
Benzene	ug/L	<0.40	0.40	9506386
Toluene	ug/L	<0.40	0.40	9506386
Ethylbenzene	ug/L	<0.40	0.40	9506386
m & p-Xylene	ug/L	<0.80	0.80	9506386
o-Xylene	ug/L	<0.40	0.40	9506386
Xylenes (Total)	ug/L	<0.89	0.89	9505303
F1 (C6-C10) - BTEX	ug/L	<100	100	9505303
F1 (C6-C10)	ug/L	<100	100	9506386
Surrogate Recovery (%)				
1,4-Difluorobenzene (sur.)	%	104	N/A	9506386
4-Bromofluorobenzene (sur.)	%	99	N/A	9506386
D4-1,2-Dichloroethane (sur.)	%	104	N/A	9506386
O-TERPHENYL (sur.)	%	103	N/A	9505940
RDL = Reportable Detection Limit				
N/A = Not Applicable				

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Report Date: 2019/08/01STANTEC CONSULTING LTD
Client Project #: 121414585
Site Location: Gordon Lake
Sampler Initials: BW**AT1 BTEX AND F1-F2 IN WATER (SURFACE WATER)**

BV Labs ID		WB9150	WB9150	WB9151	WB9152		
Sampling Date		2019/07/08	2019/07/08	2019/07/08	2019/07/08		
COC Number		15386	15386	15386	15386		
	UNITS	CAM_SW_SNP_11B1_2019_01	CAM_SW_SNP_11B1_2019_01 Lab-Dup	CAM_SW_SNP_11B2_2019_01	CAM_SW_SNP_11B3_2019_01	RDL	QC Batch
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	<0.10	<0.10	<0.10	0.10	9505940
Volatiles							
Benzene	ug/L	<0.40	N/A	<0.40	<0.40	0.40	9506386
Toluene	ug/L	<0.40	N/A	<0.40	<0.40	0.40	9506386
Ethylbenzene	ug/L	<0.40	N/A	<0.40	<0.40	0.40	9506386
m & p-Xylene	ug/L	<0.80	N/A	<0.80	<0.80	0.80	9506386
o-Xylene	ug/L	<0.40	N/A	<0.40	<0.40	0.40	9506386
Xylenes (Total)	ug/L	<0.89	N/A	<0.89	<0.89	0.89	9505303
F1 (C6-C10) - BTEX	ug/L	<100	N/A	<100	<100	100	9505303
F1 (C6-C10)	ug/L	<100	N/A	<100	<100	100	9506386
Surrogate Recovery (%)							
1,4-Difluorobenzene (sur.)	%	104	N/A	104	104	N/A	9506386
4-Bromofluorobenzene (sur.)	%	100	N/A	98	97	N/A	9506386
D4-1,2-Dichloroethane (sur.)	%	104	N/A	103	103	N/A	9506386
O-TERPHENYL (sur.)	%	104	111	103	106	N/A	9505940
RDL = Reportable Detection Limit							
Lab-Dup = Laboratory Initiated Duplicate							
N/A = Not Applicable							

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Report Date: 2019/08/01STANTEC CONSULTING LTD
Client Project #: 121414585
Site Location: Gordon Lake
Sampler Initials: BW**AT1 BTEX AND F1-F2 IN WATER (SURFACE WATER)**

BV Labs ID		WB9153	WB9153	WB9154	WB9155		
Sampling Date		2019/07/08	2019/07/08	2019/07/08	2019/07/08		
COC Number		15386	15386	15386	15386		
	UNITS	CAM_SW_SNP_11B4_2019_01	CAM_SW_SNP_11B4_2019_01 Lab-Dup	CAM_SW_SNP_11C_2019_01	TB_SW_SNP_2019_01	RDL	QC Batch
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	N/A	<0.10	<0.10	0.10	9505940
Volatiles							
Benzene	ug/L	<0.40	<0.40	<0.40	<0.40	0.40	9506386
Toluene	ug/L	<0.40	<0.40	<0.40	<0.40	0.40	9506386
Ethylbenzene	ug/L	<0.40	<0.40	<0.40	<0.40	0.40	9506386
m & p-Xylene	ug/L	<0.80	<0.80	<0.80	<0.80	0.80	9506386
o-Xylene	ug/L	<0.40	<0.40	<0.40	<0.40	0.40	9506386
Xylenes (Total)	ug/L	<0.89	N/A	<0.89	<0.89	0.89	9505303
F1 (C6-C10) - BTEX	ug/L	<100	N/A	<100	<100	100	9505303
F1 (C6-C10)	ug/L	<100	<100	<100	<100	100	9506386
Surrogate Recovery (%)							
1,4-Difluorobenzene (sur.)	%	103	104	105	104	N/A	9506386
4-Bromofluorobenzene (sur.)	%	98	98	97	99	N/A	9506386
D4-1,2-Dichloroethane (sur.)	%	102	101	103	102	N/A	9506386
O-TERPHENYL (sur.)	%	108	N/A	102	105	N/A	9505940
RDL = Reportable Detection Limit Lab-Dup = Laboratory Initiated Duplicate N/A = Not Applicable							



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Client Project #: 121414585

Site Location: Gordon Lake

Sampler Initials: BW

AT1 BTEX AND F1-F2 IN WATER (SURFACE WATER)

BV Labs ID		WB9156	WB9157	WB9163	WB9164		
Sampling Date		2019/07/08	2019/07/09	2019/07/10	2019/07/10		
COC Number		15386	15386	15386	15386		
	UNITS	FB_SW_SNP_2019_01	DUP1_SW_SNP_2019_01	BUR_SW_SNP_11A_2019_01	WES_SW_SNP_11F_2019_01	RDL	QC Batch
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	<0.10	<0.10	<0.10	0.10	9505940
Volatiles							
Benzene	ug/L	<0.40	<0.40	<0.40	<0.40	0.40	9506386
Toluene	ug/L	<0.40	<0.40	<0.40	<0.40	0.40	9506386
Ethylbenzene	ug/L	<0.40	<0.40	<0.40	<0.40	0.40	9506386
m & p-Xylene	ug/L	<0.80	<0.80	<0.80	<0.80	0.80	9506386
o-Xylene	ug/L	<0.40	<0.40	<0.40	<0.40	0.40	9506386
Xylenes (Total)	ug/L	<0.89	<0.89	<0.89	<0.89	0.89	9505303
F1 (C6-C10) - BTEX	ug/L	<100	<100	<100	<100	100	9505303
F1 (C6-C10)	ug/L	<100	<100	<100	<100	100	9506386
Surrogate Recovery (%)							
1,4-Difluorobenzene (sur.)	%	103	105	105	106	N/A	9506386
4-Bromofluorobenzene (sur.)	%	97	99	96	97	N/A	9506386
D4-1,2-Dichloroethane (sur.)	%	101	104	101	103	N/A	9506386
O-TERPHENYL (sur.)	%	99	104	104	101	N/A	9505940
RDL = Reportable Detection Limit							
N/A = Not Applicable							



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BV Labs Job #: B956373
Report Date: 2019/08/01

STANTEC CONSULTING LTD
Client Project #: 121414585
Site Location: Gordon Lake
Sampler Initials: BW

AT1 BTEX AND F1-F2 IN WATER (SURFACE WATER)

BV Labs ID		WB9168	WB9169		
Sampling Date		2019/07/09	2019/07/09		
COC Number		15386	15386		
	UNITS	KID_SW_SNP_11D_20 19_01	TRE_SW_SNP_11E_20 19_01	RDL	QC Batch
Ext. Pet. Hydrocarbon					
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	<0.10	0.10	9505940
Volatiles					
Benzene	ug/L	<0.40	<0.40	0.40	9506386
Toluene	ug/L	<0.40	<0.40	0.40	9506386
Ethylbenzene	ug/L	<0.40	<0.40	0.40	9506386
m & p-Xylene	ug/L	<0.80	<0.80	0.80	9506386
o-Xylene	ug/L	<0.40	<0.40	0.40	9506386
Xylenes (Total)	ug/L	<0.89	<0.89	0.89	9505303
F1 (C6-C10) - BTEX	ug/L	<100	<100	100	9505303
F1 (C6-C10)	ug/L	<100	<100	100	9506386
Surrogate Recovery (%)					
1,4-Difluorobenzene (sur.)	%	105	104	N/A	9506386
4-Bromofluorobenzene (sur.)	%	97	96	N/A	9506386
D4-1,2-Dichloroethane (sur.)	%	106	102	N/A	9506386
O-TERPHENYL (sur.)	%	109	102	N/A	9505940
RDL = Reportable Detection Limit					
N/A = Not Applicable					



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BV Labs Job #: B956373

Report Date: 2019/08/01

STANTEC CONSULTING LTD

Client Project #: 121414585

Site Location: Gordon Lake

Sampler Initials: BW

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

BV Labs ID		WB9165	WB9166	WB9166	WB9167	WB9167		
Sampling Date		2019/07/09	2019/07/10	2019/07/10	2019/07/10	2019/07/10		
COC Number		15386	15386	15386	15386	15386		
	UNITS	ZEN_SO_2019_1	CAM_SO_2019_2	CAM_SO_2019_2 Lab-Dup	CAM_SO_2019_3	CAM_SO_2019_3 Lab-Dup	RDL	QC Batch
Ext. Pet. Hydrocarbon								
F2 (C10-C16 Hydrocarbons)	mg/kg	<10	3500	N/A	<10	<10	10	9506362
F3 (C16-C34 Hydrocarbons)	mg/kg	<50	1300	N/A	<50	<50	50	9506362
F4 (C34-C50 Hydrocarbons)	mg/kg	<50	<50	N/A	<50	<50	50	9506362
Reached Baseline at C50	mg/kg	Yes	Yes	N/A	Yes	Yes	N/A	9506362
Physical Properties								
Moisture	%	5.8	4.9	N/A	5.3	N/A	0.30	9505505
Volatiles								
Benzene	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	N/A	0.0050	9506368
Toluene	mg/kg	<0.050	<0.050	<0.050	<0.050	N/A	0.050	9506368
Ethylbenzene	mg/kg	<0.010	0.012	0.014	<0.010	N/A	0.010	9506368
m & p-Xylene	mg/kg	<0.040	<0.040	<0.040	<0.040	N/A	0.040	9506368
o-Xylene	mg/kg	<0.020	0.19	0.20	<0.020	N/A	0.020	9506368
Xylenes (Total)	mg/kg	<0.045	0.19	N/A	<0.045	N/A	0.045	9505714
F1 (C6-C10) - BTEX	mg/kg	<10	60	N/A	<10	N/A	10	9505714
F1 (C6-C10)	mg/kg	<10	60	46	<10	N/A	10	9506368
Surrogate Recovery (%)								
1,4-Difluorobenzene (sur.)	%	97	97	97	96	N/A	N/A	9506368
4-Bromofluorobenzene (sur.)	%	104	102	109	105	N/A	N/A	9506368
D10-o-Xylene (sur.)	%	112	109	113	116	N/A	N/A	9506368
D4-1,2-Dichloroethane (sur.)	%	103	92	97	102	N/A	N/A	9506368
O-TERPHENYL (sur.)	%	103	112	N/A	109	92	N/A	9506362
RDL = Reportable Detection Limit								
Lab-Dup = Laboratory Initiated Duplicate								
N/A = Not Applicable								



BV Labs Job #: B956373
Report Date: 2019/08/01

STANTEC CONSULTING LTD
Client Project #: 121414585
Site Location: Gordon Lake
Sampler Initials: BW

ROUTINE WATER (GROUND WATER)

BV Labs ID		WB9158			WB9159		
Sampling Date		2019/07/09			2019/07/09		
COC Number		15386			15386		
	UNITS	CAM_GW_SNP_7A_2019_01	RDL	QC Batch	CAM_GW_SNP_7B_2019_01	RDL	QC Batch
Calculated Parameters							
Anion Sum	meq/L	21	N/A	9504059	3.4	N/A	9504059
Cation Sum	meq/L	23	N/A	9504059	3.4	N/A	9504059
Hardness (CaCO ₃)	mg/L	890	0.50	9505135	150	0.50	9505135
Ion Balance (% Difference)	%	3.7	N/A	9505427	0.74	N/A	9505427
Dissolved Nitrate (NO ₃)	mg/L	0.059	0.044	9505428	3.7	0.044	9505428
Nitrate plus Nitrite (N)	mg/L	<0.014	0.014	9505431	0.85	0.014	9505431
Dissolved Nitrite (NO ₂)	mg/L	<0.033	0.033	9505428	0.037	0.033	9505428
Calculated Total Dissolved Solids	mg/L	1300	5.0	9505434	210	1.0	9505434
Misc. Inorganics							
Conductivity	uS/cm	1800	2.0	9507334	330	2.0	9506780
pH	pH	7.47	N/A	9507331	6.53	N/A	9506777
Anions							
Alkalinity (PP as CaCO ₃)	mg/L	<1.0	1.0	9507333	<1.0	1.0	9506779
Alkalinity (Total as CaCO ₃)	mg/L	580	1.0	9507333	66	1.0	9506779
Bicarbonate (HCO ₃)	mg/L	710	1.0	9507333	80	1.0	9506779
Carbonate (CO ₃)	mg/L	<1.0	1.0	9507333	<1.0	1.0	9506779
Hydroxide (OH)	mg/L	<1.0	1.0	9507333	<1.0	1.0	9506779
Dissolved Chloride (Cl)	mg/L	23	1.0	9507375	6.8	1.0	9507375
Dissolved Sulphate (SO ₄)	mg/L	440 (1)	5.0	9507375	88	1.0	9507375
Nutrients							
Dissolved Nitrite (N)	mg/L	<0.010	0.010	9505871	0.011	0.010	9505871
Dissolved Nitrate (N)	mg/L	0.013	0.010	9505871	0.84	0.010	9505871
Elements							
Dissolved Calcium (Ca)	mg/L	250	0.30	9506285	50	0.30	9506285
Dissolved Iron (Fe)	mg/L	2.7	0.060	9506285	0.54	0.060	9506285
Dissolved Magnesium (Mg)	mg/L	64	0.20	9506285	5.6	0.20	9506285
Dissolved Manganese (Mn)	mg/L	3.9	0.0040	9506285	1.5	0.0040	9506285
Dissolved Potassium (K)	mg/L	22	0.30	9506285	2.2	0.30	9506285
Dissolved Sodium (Na)	mg/L	100	0.50	9506285	8.2	0.50	9506285
RDL = Reportable Detection Limit							
N/A = Not Applicable							
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.							



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BV Labs Job #: B956373

Report Date: 2019/08/01

STANTEC CONSULTING LTD

Client Project #: 121414585

Site Location: Gordon Lake

Sampler Initials: BW

ROUTINE WATER (GROUND WATER)

BV Labs ID		WB9160			WB9161		
Sampling Date		2019/07/09			2019/07/09		
COC Number		15386			15386		
	UNITS	CAM_GW_SNP_7D_2019_01	RDL	QC Batch	CAM_GW_MW2_2019_01	RDL	QC Batch

Calculated Parameters

Anion Sum	meq/L	6.3	N/A	9504059	55	N/A	9504059
Cation Sum	meq/L	7.1	N/A	9504059	56	N/A	9504059
Hardness (CaCO ₃)	mg/L	320	0.50	9505135	1700	0.50	9505135
Ion Balance (% Difference)	%	5.5	N/A	9505427	0.84	N/A	9505427
Dissolved Nitrate (NO ₃)	mg/L	0.87	0.044	9505428	<0.044	0.044	9505428
Nitrate plus Nitrite (N)	mg/L	0.20	0.014	9505431	<0.014	0.014	9505431
Dissolved Nitrite (NO ₂)	mg/L	<0.033	0.033	9505428	<0.033	0.033	9505428
Calculated Total Dissolved Solids	mg/L	360	1.0	9505434	3500	10	9505434

Misc. Inorganics

Conductivity	uS/cm	580	2.0	9507273	4400	2.0	9508878
pH	pH	7.72	N/A	9507269	7.03	N/A	9508874

Anions

Alkalinity (PP as CaCO ₃)	mg/L	<1.0	1.0	9507272	<1.0	1.0	9508877
Alkalinity (Total as CaCO ₃)	mg/L	210	1.0	9507272	780	1.0	9508877
Bicarbonate (HCO ₃)	mg/L	260	1.0	9507272	950	1.0	9508877
Carbonate (CO ₃)	mg/L	<1.0	1.0	9507272	<1.0	1.0	9508877
Hydroxide (OH)	mg/L	<1.0	1.0	9507272	<1.0	1.0	9508877
Dissolved Chloride (Cl)	mg/L	2.5	1.0	9507375	130	1.0	9507375
Dissolved Sulphate (SO ₄)	mg/L	98	1.0	9507375	1700 (1)	10	9507375

Nutrients

Dissolved Nitrite (N)	mg/L	<0.010	0.010	9505871	<0.010	0.010	9505871
Dissolved Nitrate (N)	mg/L	0.20	0.010	9505871	<0.010	0.010	9505871

Elements

Dissolved Calcium (Ca)	mg/L	100	0.30	9506285	440	0.30	9514650
Dissolved Iron (Fe)	mg/L	1.6	0.060	9506285	60	0.060	9514650
Dissolved Magnesium (Mg)	mg/L	16	0.20	9506285	130	0.20	9514650
Dissolved Manganese (Mn)	mg/L	2.0	0.0040	9506285	11	0.0040	9514650
Dissolved Potassium (K)	mg/L	3.5	0.30	9506285	53	0.30	9514650
Dissolved Sodium (Na)	mg/L	6.0	0.50	9506285	430	0.50	9514650

RDL = Reportable Detection Limit

N/A = Not Applicable

(1) Detection limits raised due to dilution to bring analyte within the calibrated range.



ROUTINE WATER (GROUND WATER)

BV Labs ID		WB9161		
Sampling Date		2019/07/09		
COC Number		15386		
	UNITS	CAM_GW_MW2_2019_01 Lab-Dup	RDL	QC Batch
Elements				
Dissolved Calcium (Ca)	mg/L	450	0.30	9514650
Dissolved Iron (Fe)	mg/L	60	0.060	9514650
Dissolved Magnesium (Mg)	mg/L	130	0.20	9514650
Dissolved Manganese (Mn)	mg/L	11	0.0040	9514650
Dissolved Potassium (K)	mg/L	54	0.30	9514650
Dissolved Sodium (Na)	mg/L	440	0.50	9514650
RDL = Reportable Detection Limit				
Lab-Dup = Laboratory Initiated Duplicate				



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BV Labs Job #: B956373
Report Date: 2019/08/01

STANTEC CONSULTING LTD
Client Project #: 121414585
Site Location: Gordon Lake
Sampler Initials: BW

ROUTINE WATER (SURFACE WATER)

BV Labs ID		WB9150	WB9150	WB9151		
Sampling Date		2019/07/08	2019/07/08	2019/07/08		
COC Number		15386	15386	15386		
	UNITS	CAM_SW_SNP_11B1_2019_01	CAM_SW_SNP_11B1_2019_01 Lab-Dup	CAM_SW_SNP_11B2_2019_01	RDL	QC Batch
Calculated Parameters						
Anion Sum	meq/L	1.0	N/A	1.0	N/A	9505728
Cation Sum	meq/L	1.2	N/A	1.1	N/A	9505728
Hardness (CaCO ₃)	mg/L	47	N/A	43	0.50	9505135
Ion Balance (% Difference)	%	7.4	N/A	5.8	N/A	9505427
Dissolved Nitrate (NO ₃)	mg/L	<0.044	N/A	<0.044	0.044	9505428
Nitrate plus Nitrite (N)	mg/L	<0.014	N/A	<0.014	0.014	9505431
Dissolved Nitrite (NO ₂)	mg/L	<0.033	N/A	<0.033	0.033	9505428
Calculated Total Dissolved Solids	mg/L	59	N/A	55	1.0	9505434
Misc. Inorganics						
Conductivity	uS/cm	100	100	94	2.0	9506780
pH	pH	7.68	7.59	7.64	N/A	9506777
Anions						
Alkalinity (PP as CaCO ₃)	mg/L	<1.0	<1.0	<1.0	1.0	9506779
Alkalinity (Total as CaCO ₃)	mg/L	38	41	38	1.0	9506779
Bicarbonate (HCO ₃)	mg/L	46	50	47	1.0	9506779
Carbonate (CO ₃)	mg/L	<1.0	<1.0	<1.0	1.0	9506779
Hydroxide (OH)	mg/L	<1.0	<1.0	<1.0	1.0	9506779
Dissolved Chloride (Cl)	mg/L	1.4	N/A	2.0	1.0	9507375
Dissolved Sulphate (SO ₄)	mg/L	12	N/A	8.8	1.0	9507375
Nutrients						
Dissolved Nitrite (N)	mg/L	<0.010	N/A	<0.010	0.010	9504830
Dissolved Nitrate (N)	mg/L	<0.010	N/A	<0.010	0.010	9504830
Elements						
Dissolved Calcium (Ca)	mg/L	14	14	12	0.30	9506285
Dissolved Iron (Fe)	mg/L	<0.060	<0.060	<0.060	0.060	9506285
Dissolved Magnesium (Mg)	mg/L	3.1	3.1	3.0	0.20	9506285
Dissolved Manganese (Mn)	mg/L	0.0052	0.0053	<0.0040	0.0040	9506285
Dissolved Potassium (K)	mg/L	1.5	1.5	1.5	0.30	9506285
Dissolved Sodium (Na)	mg/L	2.5	2.4	2.4	0.50	9506285
RDL = Reportable Detection Limit Lab-Dup = Laboratory Initiated Duplicate N/A = Not Applicable						



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VERITAS

BV Labs Job #: B956373

Report Date: 2019/08/01

STANTEC CONSULTING LTD

Client Project #: 121414585

Site Location: Gordon Lake

Sampler Initials: BW

ROUTINE WATER (SURFACE WATER)

BV Labs ID		WB9152	WB9153		WB9154		
Sampling Date		2019/07/08	2019/07/08		2019/07/08		
COC Number		15386	15386		15386		
	UNITS	CAM_SW_SNP_11B3_2019_01	CAM_SW_SNP_11B4_2019_01	QC Batch	CAM_SW_SNP_11C_2019_01	RDL	QC Batch
Calculated Parameters							
Anion Sum	meq/L	1.3	0.99	9505728	1.0	N/A	9504059
Cation Sum	meq/L	1.7	1.2	9505728	1.1	N/A	9504059
Hardness (CaCO ₃)	mg/L	58	44	9505135	43	0.50	9505135
Ion Balance (% Difference)	%	13	9.1	9505427	2.3	N/A	9505427
Dissolved Nitrate (NO ₃)	mg/L	<0.044	<0.044	9505428	<0.044	0.044	9505428
Nitrate plus Nitrite (N)	mg/L	<0.014	<0.014	9505431	<0.014	0.014	9505431
Dissolved Nitrite (NO ₂)	mg/L	<0.033	<0.033	9505428	<0.033	0.033	9505428
Calculated Total Dissolved Solids	mg/L	79	56	9505434	54	1.0	9505434
Misc. Inorganics							
Conductivity	uS/cm	120	95	9506780	95	2.0	9506780
pH	pH	7.63	7.65	9506777	7.66	N/A	9506777
Anions							
Alkalinity (PP as CaCO ₃)	mg/L	<1.0	<1.0	9506779	<1.0	1.0	9506779
Alkalinity (Total as CaCO ₃)	mg/L	38	38	9506779	39	1.0	9506779
Bicarbonate (HCO ₃)	mg/L	47	46	9506779	48	1.0	9506779
Carbonate (CO ₃)	mg/L	<1.0	<1.0	9506779	<1.0	1.0	9506779
Hydroxide (OH)	mg/L	<1.0	<1.0	9506779	<1.0	1.0	9506779
Dissolved Chloride (Cl)	mg/L	1.8	1.3	9507375	1.6	1.0	9507375
Dissolved Sulphate (SO ₄)	mg/L	23	9.4	9507375	8.8	1.0	9507375
Nutrients							
Dissolved Nitrite (N)	mg/L	<0.010	<0.010	9504830	<0.010	0.010	9504830
Dissolved Nitrate (N)	mg/L	<0.010	<0.010	9504830	<0.010	0.010	9504830
Elements							
Dissolved Calcium (Ca)	mg/L	17	13	9506285	12	0.30	9506285
Dissolved Iron (Fe)	mg/L	<0.060	<0.060	9506285	<0.060	0.060	9506285
Dissolved Magnesium (Mg)	mg/L	3.9	2.9	9506285	2.9	0.20	9506285
Dissolved Manganese (Mn)	mg/L	0.0051	0.015	9506285	<0.0040	0.0040	9506285
Dissolved Potassium (K)	mg/L	1.6	1.5	9506285	1.5	0.30	9506285
Dissolved Sodium (Na)	mg/L	3.7	2.4	9506285	2.4	0.50	9506285
RDL = Reportable Detection Limit							
N/A = Not Applicable							



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VERITAS

BV Labs Job #: B956373

Report Date: 2019/08/01

STANTEC CONSULTING LTD

Client Project #: 121414585

Site Location: Gordon Lake

Sampler Initials: BW

ROUTINE WATER (SURFACE WATER)

BV Labs ID		WB9155		WB9156	WB9156		
Sampling Date		2019/07/08		2019/07/08	2019/07/08		
COC Number		15386		15386	15386		
	UNITS	TB_SW_SNP_2019_01	QC Batch	FB_SW_SNP_2019_01	FB_SW_SNP_2019_01 Lab-Dup	RDL	QC Batch

Calculated Parameters

Anion Sum	meq/L	0.0000	9504059	0.0000	N/A	N/A	9504059
Cation Sum	meq/L	0.014	9504059	0.0040	N/A	N/A	9504059
Hardness (CaCO ₃)	mg/L	<0.50	9505135	<0.50	N/A	0.50	9505135
Ion Balance (% Difference)	%	NC	9505427	NC	N/A	N/A	9505427
Dissolved Nitrate (NO ₃)	mg/L	<0.044	9505428	<0.044	N/A	0.044	9505428
Nitrate plus Nitrite (N)	mg/L	<0.014	9505431	<0.014	N/A	0.014	9505431
Dissolved Nitrite (NO ₂)	mg/L	<0.033	9505428	<0.033	N/A	0.033	9505428
Calculated Total Dissolved Solids	mg/L	<1.0	9505434	<1.0	N/A	1.0	9505434

Misc. Inorganics

Conductivity	uS/cm	<2.0	9506780	<2.0	N/A	2.0	9507273
pH	pH	4.87	9506777	5.37	N/A	N/A	9507269

Anions

Alkalinity (PP as CaCO ₃)	mg/L	<1.0	9506779	<1.0	N/A	1.0	9507272
Alkalinity (Total as CaCO ₃)	mg/L	<1.0	9506779	<1.0	N/A	1.0	9507272
Bicarbonate (HCO ₃)	mg/L	<1.0	9506779	<1.0	N/A	1.0	9507272
Carbonate (CO ₃)	mg/L	<1.0	9506779	<1.0	N/A	1.0	9507272
Hydroxide (OH)	mg/L	<1.0	9506779	<1.0	N/A	1.0	9507272
Dissolved Chloride (Cl)	mg/L	<1.0	9507375	<1.0	<1.0	1.0	9507375
Dissolved Sulphate (SO ₄)	mg/L	<1.0	9507375	<1.0	<1.0	1.0	9507375

Nutrients

Dissolved Nitrite (N)	mg/L	<0.010	9505871	<0.010	N/A	0.010	9505871
Dissolved Nitrate (N)	mg/L	<0.010	9505871	<0.010	N/A	0.010	9505871

Elements

Dissolved Calcium (Ca)	mg/L	<0.30	9506285	<0.30	N/A	0.30	9506285
Dissolved Iron (Fe)	mg/L	<0.060	9506285	<0.060	N/A	0.060	9506285
Dissolved Magnesium (Mg)	mg/L	<0.20	9506285	<0.20	N/A	0.20	9506285
Dissolved Manganese (Mn)	mg/L	<0.0040	9506285	<0.0040	N/A	0.0040	9506285
Dissolved Potassium (K)	mg/L	<0.30	9506285	<0.30	N/A	0.30	9506285
Dissolved Sodium (Na)	mg/L	<0.50	9506285	<0.50	N/A	0.50	9506285

RDL = Reportable Detection Limit

Lab-Dup = Laboratory Initiated Duplicate

N/A = Not Applicable



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VERITAS

BV Labs Job #: B956373

Report Date: 2019/08/01

STANTEC CONSULTING LTD

Client Project #: 121414585

Site Location: Gordon Lake

Sampler Initials: BW

ROUTINE WATER (SURFACE WATER)

BV Labs ID		WB9157		WB9163	WB9164		
Sampling Date		2019/07/09		2019/07/10	2019/07/10		
COC Number		15386		15386	15386		
	UNITS	DUP1_SW_SNP_2019_01	QC Batch	BUR_SW_SNP_11A_2019_01	WES_SW_SNP_11F_2019_01	RDL	QC Batch

Calculated Parameters

Anion Sum	meq/L	1.3	9504059	0.96	0.99	N/A	9504059
Cation Sum	meq/L	1.5	9504059	1.1	1.1	N/A	9504059
Hardness (CaCO ₃)	mg/L	62	9505135	43	43	0.50	9505135
Ion Balance (% Difference)	%	7.4	9505427	4.8	4.1	N/A	9505427
Dissolved Nitrate (NO ₃)	mg/L	<0.044	9505428	<0.044	<0.044	0.044	9505428
Nitrate plus Nitrite (N)	mg/L	<0.014	9505431	<0.014	<0.014	0.014	9505431
Dissolved Nitrite (NO ₂)	mg/L	<0.033	9505428	<0.033	<0.033	0.033	9505428
Calculated Total Dissolved Solids	mg/L	71	9505434	53	54	1.0	9505434

Misc. Inorganics

Conductivity	uS/cm	130	9507334	95	96	2.0	9506780
pH	pH	7.75	9507331	7.64	7.69	N/A	9506777

Anions

Alkalinity (PP as CaCO ₃)	mg/L	<1.0	9507333	<1.0	<1.0	1.0	9506779
Alkalinity (Total as CaCO ₃)	mg/L	54	9507333	37	38	1.0	9506779
Bicarbonate (HCO ₃)	mg/L	66	9507333	45	47	1.0	9506779
Carbonate (CO ₃)	mg/L	<1.0	9507333	<1.0	<1.0	1.0	9506779
Hydroxide (OH)	mg/L	<1.0	9507333	<1.0	<1.0	1.0	9506779
Dissolved Chloride (Cl)	mg/L	<1.0	9507375	1.5	1.5	1.0	9507375
Dissolved Sulphate (SO ₄)	mg/L	11	9507375	9.0	8.7	1.0	9507375

Nutrients

Dissolved Nitrite (N)	mg/L	<0.010	9505871	<0.010	<0.010	0.010	9505871
Dissolved Nitrate (N)	mg/L	<0.010	9505871	<0.010	<0.010	0.010	9505871

Elements

Dissolved Calcium (Ca)	mg/L	16	9506285	12	12	0.30	9506285
Dissolved Iron (Fe)	mg/L	<0.060	9506285	<0.060	<0.060	0.060	9506285
Dissolved Magnesium (Mg)	mg/L	5.3	9506285	3.0	3.0	0.20	9506285
Dissolved Manganese (Mn)	mg/L	0.0052	9506285	<0.0040	<0.0040	0.0040	9506285
Dissolved Potassium (K)	mg/L	2.4	9506285	1.5	1.5	0.30	9506285
Dissolved Sodium (Na)	mg/L	4.3	9506285	2.5	2.5	0.50	9506285

RDL = Reportable Detection Limit

N/A = Not Applicable



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BV Labs Job #: B956373
Report Date: 2019/08/01

STANTEC CONSULTING LTD
Client Project #: 121414585
Site Location: Gordon Lake
Sampler Initials: BW

ROUTINE WATER (SURFACE WATER)

BV Labs ID		WB9168		WB9169	WB9169		
Sampling Date		2019/07/09		2019/07/09	2019/07/09		
COC Number		15386		15386	15386		
	UNITS	KID_SW_SNP_11D_20 19_01	QC Batch	TRE_SW_SNP_11E_20 19_01	TRE_SW_SNP_11E_20 19_01 Lab-Dup	RDL	QC Batch
Calculated Parameters							
Anion Sum	meq/L	1.3	9504059	0.98	N/A	N/A	9504059
Cation Sum	meq/L	1.6	9504059	1.3	N/A	N/A	9504059
Hardness (CaCO ₃)	mg/L	63	9505135	40	N/A	0.50	9505135
Ion Balance (% Difference)	%	7.7	9505427	14	N/A	N/A	9505427
Dissolved Nitrate (NO ₃)	mg/L	<0.044	9505428	<0.044	N/A	0.044	9505428
Nitrate plus Nitrite (N)	mg/L	<0.014	9505431	<0.014	N/A	0.014	9505431
Dissolved Nitrite (NO ₂)	mg/L	<0.033	9505428	<0.033	N/A	0.033	9505428
Calculated Total Dissolved Solids	mg/L	73	9505434	58	N/A	1.0	9505434
Misc. Inorganics							
Conductivity	uS/cm	130	9506780	92	N/A	2.0	9506780
pH	pH	7.55	9506777	7.63	N/A	N/A	9506777
Anions							
Alkalinity (PP as CaCO ₃)	mg/L	<1.0	9506779	<1.0	N/A	1.0	9506779
Alkalinity (Total as CaCO ₃)	mg/L	54	9506779	38	N/A	1.0	9506779
Bicarbonate (HCO ₃)	mg/L	66	9506779	46	N/A	1.0	9506779
Carbonate (CO ₃)	mg/L	<1.0	9506779	<1.0	N/A	1.0	9506779
Hydroxide (OH)	mg/L	<1.0	9506779	<1.0	N/A	1.0	9506779
Dissolved Chloride (Cl)	mg/L	1.3	9507375	1.6	N/A	1.0	9507375
Dissolved Sulphate (SO ₄)	mg/L	11	9507375	8.7	N/A	1.0	9507375
Nutrients							
Dissolved Nitrite (N)	mg/L	<0.010	9505871	<0.010	<0.010	0.010	9505871
Dissolved Nitrate (N)	mg/L	<0.010	9505871	<0.010	<0.010	0.010	9505871
Elements							
Dissolved Calcium (Ca)	mg/L	16	9506285	11	N/A	0.30	9514650
Dissolved Iron (Fe)	mg/L	<0.060	9506285	<0.060	N/A	0.060	9514650
Dissolved Magnesium (Mg)	mg/L	5.4	9506285	2.7	N/A	0.20	9514650
Dissolved Manganese (Mn)	mg/L	0.0054	9506285	<0.0040	N/A	0.0040	9514650
Dissolved Potassium (K)	mg/L	2.5	9506285	1.4	N/A	0.30	9514650
Dissolved Sodium (Na)	mg/L	4.4	9506285	2.3	N/A	0.50	9514650
RDL = Reportable Detection Limit							
Lab-Dup = Laboratory Initiated Duplicate							
N/A = Not Applicable							



ROUTINE WATER -LAB FILTERED (GROUND WATER)

BV Labs ID		WB9162		
Sampling Date		2019/07/10		
COC Number		15386		
	UNITS	CAM_GW_SNP_7C_20 19_01	RDL	QC Batch
Calculated Parameters				
Anion Sum	meq/L	18	N/A	9505724
Cation Sum	meq/L	19	N/A	9505724
Hardness (CaCO ₃)	mg/L	820	0.50	9505493
Ion Balance (% Difference)	%	3.0	N/A	9505721
Dissolved Nitrate (NO ₃)	mg/L	0.12	0.044	9505495
Nitrate plus Nitrite (N)	mg/L	0.037	0.014	9505497
Dissolved Nitrite (NO ₂)	mg/L	0.034	0.033	9505495
Calculated Total Dissolved Solids	mg/L	1100	5.0	9505739
Misc. Inorganics				
Conductivity	uS/cm	1500	2.0	9506780
pH	pH	7.82	N/A	9506777
Anions				
Alkalinity (PP as CaCO ₃)	mg/L	<1.0	1.0	9506779
Alkalinity (Total as CaCO ₃)	mg/L	350	1.0	9506779
Bicarbonate (HCO ₃)	mg/L	430	1.0	9506779
Carbonate (CO ₃)	mg/L	<1.0	1.0	9506779
Hydroxide (OH)	mg/L	<1.0	1.0	9506779
Dissolved Chloride (Cl)	mg/L	11	1.0	9507375
Dissolved Sulphate (SO ₄)	mg/L	500 (1)	5.0	9507375
Nutrients				
Dissolved Nitrite (N)	mg/L	0.010	0.010	9505871
Dissolved Nitrate (N)	mg/L	0.027	0.010	9505871
Lab Filtered Elements				
Dissolved Calcium (Ca)	mg/L	270	0.30	9506951
Dissolved Iron (Fe)	mg/L	0.13	0.060	9506951
Dissolved Magnesium (Mg)	mg/L	34	0.20	9506951
Dissolved Manganese (Mn)	mg/L	3.3	0.0040	9506951
Dissolved Potassium (K)	mg/L	13	0.30	9506951
Dissolved Sodium (Na)	mg/L	43	0.50	9506951
RDL = Reportable Detection Limit				
N/A = Not Applicable				
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.				



BUREAU
VERITAS

BV Labs Job #: B956373

Report Date: 2019/08/01

STANTEC CONSULTING LTD

Client Project #: 121414585

Site Location: Gordon Lake

Sampler Initials: BW

RESULTS OF CHEMICAL ANALYSES OF GROUND WATER

BV Labs ID		WB9158			WB9159	WB9159		
Sampling Date		2019/07/09			2019/07/09	2019/07/09		
COC Number		15386			15386	15386		
	UNITS	CAM_GW_SNP_7A_2019_01	RDL	QC Batch	CAM_GW_SNP_7B_2019_01	CAM_GW_SNP_7B_2019_01 Lab-Dup	RDL	QC Batch

Calculated Parameters								
Total Hardness (CaCO ₃)	mg/L	836	0.50	9504459	145	N/A	0.50	9504459
Misc. Inorganics								
Total Organic Carbon (C)	mg/L	31 (1)	1.0	9512960	17	N/A	0.50	9512960
Total Dissolved Solids	mg/L	1300	10	9506457	280	N/A	10	9506457
Total Suspended Solids	mg/L	45	1.0	9506455	99	N/A	1.0	9506455
Nutrients								
Total Ammonia (N)	mg/L	2.3 (1)	0.075	9506491	0.12	0.11	0.015	9506533
Ammonia (NH ₃)	mg/L	2.84	0.091	9505730	0.142	N/A	0.018	9505730
Ammonium (NH ₄)	mg/L	3.0	0.097	9505735	0.15	N/A	0.019	9505735
Orthophosphate (P)	mg/L	0.0036	0.0030	9505936	0.0039	0.0036	0.0030	9505936
Total Phosphorus (P)	mg/L	0.10	0.0030	9511192	0.11	N/A	0.0030	9511192
RDL = Reportable Detection Limit								
Lab-Dup = Laboratory Initiated Duplicate								
N/A = Not Applicable								
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.								

BV Labs ID		WB9160		WB9161		
Sampling Date		2019/07/09		2019/07/09		
COC Number		15386		15386		
	UNITS	CAM_GW_SNP_7D_2019_01	RDL	CAM_GW_MW2_2019_01	RDL	QC Batch
Calculated Parameters						
Total Hardness (CaCO ₃)	mg/L	323	0.50	1740	0.50	9504459
Misc. Inorganics						
Total Organic Carbon (C)	mg/L	7.7	0.50	31 (1)	1.0	9512960
Total Dissolved Solids	mg/L	380	10	3800 (2)	25	9506457
Total Suspended Solids	mg/L	75	1.0	890 (2)	3.0	9506455
Nutrients						
Total Ammonia (N)	mg/L	3.2 (1)	0.075	11 (1)	0.30	9506533
Ammonia (NH ₃)	mg/L	3.92	0.091	12.9	0.36	9505730
Ammonium (NH ₄)	mg/L	4.2	0.097	14	0.39	9505735
Orthophosphate (P)	mg/L	0.0069	0.0030	0.0047	0.0030	9505936
Total Phosphorus (P)	mg/L	0.16	0.0030	0.67 (1)	0.0060	9511192
RDL = Reportable Detection Limit						
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.						
(2) Detection limit raised based on sample volume used and sample matrix						



RESULTS OF CHEMICAL ANALYSES OF GROUND WATER

BV Labs ID		WB9162		
Sampling Date		2019/07/10		
COC Number		15386		
	UNITS	CAM_GW_SNP_7C_20 19_01	RDL	QC Batch
Calculated Parameters				
Total Hardness (CaCO ₃)	mg/L	771	0.50	9504459
Misc. Inorganics				
Total Organic Carbon (C)	mg/L	44 (1)	1.0	9512960
Total Dissolved Solids	mg/L	1200 (2)	25	9506457
Total Suspended Solids	mg/L	310	1.0	9506455
Nutrients				
Total Ammonia (N)	mg/L	0.66	0.015	9506491
Ammonia (NH ₃)	mg/L	0.797	0.018	9505730
Ammonium (NH ₄)	mg/L	0.84	0.019	9505735
Orthophosphate (P)	mg/L	0.0041	0.0030	9505936
Total Phosphorus (P)	mg/L	0.29	0.0030	9511183
RDL = Reportable Detection Limit				
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.				
(2) Detection limit raised based on sample volume used and sample matrix				



BUREAU
VERITAS

BV Labs Job #: B956373
Report Date: 2019/08/01

STANTEC CONSULTING LTD
Client Project #: 121414585
Site Location: Gordon Lake
Sampler Initials: BW

ELEMENTS BY ATOMIC SPECTROSCOPY (GROUND WATER)

BV Labs ID		WB9158	WB9159	WB9160	WB9161		
Sampling Date		2019/07/09	2019/07/09	2019/07/09	2019/07/09		
COC Number		15386	15386	15386	15386		
	UNITS	CAM_GW_SNP_7A_2019_01	CAM_GW_SNP_7B_2019_01	CAM_GW_SNP_7D_2019_01	CAM_GW_MW2_2019_01	RDL	QC Batch
Total Metals by ICPMS							
Total Aluminum (Al)	ug/L	288	3370	2140	31000	3.0	9508203
Total Antimony (Sb)	ug/L	1.82	<0.50	5.59	2.22	0.50	9508203
Total Arsenic (As)	ug/L	3.89	0.64	15.4	13.0	0.10	9508203
Total Barium (Ba)	ug/L	415	37.7	63.5	243	1.0	9508203
Total Beryllium (Be)	ug/L	<0.10	<0.10	<0.10	<0.10	0.10	9508203
Total Bismuth (Bi)	ug/L	<1.0	<1.0	<1.0	<1.0	1.0	9508203
Total Boron (B)	ug/L	104	<50	62	175	50	9508203
Total Cadmium (Cd)	ug/L	0.024	0.041	0.051	0.387	0.010	9508203
Total Cesium (Cs)	ug/L	<0.20	<0.20	<0.20	0.61	0.20	9508203
Total Chromium (Cr)	ug/L	2.4	12.7	8.8	116	1.0	9508203
Total Cobalt (Co)	ug/L	30.4	31.5	13.6	129	0.20	9508203
Total Copper (Cu)	ug/L	5.12	13.9	29.7	52.3	0.50	9508203
Total Iron (Fe)	ug/L	2010	1070	1230	24000	10	9508203
Total Lead (Pb)	ug/L	0.88	2.15	15.7	50.9	0.20	9508203
Total Lithium (Li)	ug/L	24.9	6.2	<2.0	93.8	2.0	9508203
Total Manganese (Mn)	ug/L	4030	1430	2140	9800	1.0	9508203
Total Molybdenum (Mo)	ug/L	24.3	<1.0	6.3	9.3	1.0	9508203
Total Nickel (Ni)	ug/L	36.6	56.4	34.0	203	1.0	9508203
Total Selenium (Se)	ug/L	0.22	0.16	0.70	0.31	0.10	9508203
Total Silicon (Si)	ug/L	6960	12800	8880	51700	100	9508203
Total Silver (Ag)	ug/L	0.057	0.050	0.231	0.109	0.020	9508203
Total Strontium (Sr)	ug/L	1440	184	372	3970	1.0	9508203
Total Thallium (Tl)	ug/L	<0.010	<0.010	0.040	0.672	0.010	9508203
Total Tin (Sn)	ug/L	<5.0	<5.0	<5.0	<5.0	5.0	9508203
Total Titanium (Ti)	ug/L	6.1	7.0	29.1	332	5.0	9508203
Total Uranium (U)	ug/L	4.60	0.34	6.38	4.89	0.10	9508203
Total Vanadium (V)	ug/L	<5.0	<5.0	<5.0	63.2	5.0	9508203
Total Zinc (Zn)	ug/L	11.5	24.7	26.9	39.0	5.0	9508203
Total Zirconium (Zr)	ug/L	5.82	1.13	1.11	11.7	0.10	9508203
Total Calcium (Ca)	mg/L	233	46.4	103	443	0.050	9505712
Total Magnesium (Mg)	mg/L	62.0	7.22	16.0	155	0.050	9505712
Total Potassium (K)	mg/L	22.0	2.56	3.61	60.4	0.050	9505712
RDL = Reportable Detection Limit							



BUREAU
VERITAS

BV Labs Job #: B956373
Report Date: 2019/08/01

STANTEC CONSULTING LTD
Client Project #: 121414585
Site Location: Gordon Lake
Sampler Initials: BW

ELEMENTS BY ATOMIC SPECTROSCOPY (GROUND WATER)

BV Labs ID		WB9158	WB9159	WB9160	WB9161		
Sampling Date		2019/07/09	2019/07/09	2019/07/09	2019/07/09		
COC Number		15386	15386	15386	15386		
	UNITS	CAM_GW_SNP_7A_2019_01	CAM_GW_SNP_7B_2019_01	CAM_GW_SNP_7D_2019_01	CAM_GW_MW2_2019_01	RDL	QC Batch
Total Sodium (Na)	mg/L	106	8.58	5.85	532	0.050	9505712
Total Sulphur (S)	mg/L	175	30.4	37.9	682	3.0	9505712
RDL = Reportable Detection Limit							



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VERITAS

BV Labs Job #: B956373
Report Date: 2019/08/01

STANTEC CONSULTING LTD
Client Project #: 121414585
Site Location: Gordon Lake
Sampler Initials: BW

ELEMENTS BY ATOMIC SPECTROSCOPY (GROUND WATER)

BV Labs ID		WB9162		
Sampling Date		2019/07/10		
COC Number		15386		
	UNITS	CAM_GW_SNP_7C_20 19_01	RDL	QC Batch
Total Metals by ICPMS				
Total Aluminum (Al)	ug/L	4020	3.0	9508203
Total Antimony (Sb)	ug/L	1.49	0.50	9508203
Total Arsenic (As)	ug/L	6.77	0.10	9508203
Total Barium (Ba)	ug/L	83.8	1.0	9508203
Total Beryllium (Be)	ug/L	<0.10	0.10	9508203
Total Bismuth (Bi)	ug/L	<1.0	1.0	9508203
Total Boron (B)	ug/L	<50	50	9508203
Total Cadmium (Cd)	ug/L	0.057	0.010	9508203
Total Cesium (Cs)	ug/L	<0.20	0.20	9508203
Total Chromium (Cr)	ug/L	12.4	1.0	9508203
Total Cobalt (Co)	ug/L	16.7	0.20	9508203
Total Copper (Cu)	ug/L	15.9	0.50	9508203
Total Iron (Fe)	ug/L	2730	10	9508203
Total Lead (Pb)	ug/L	17.8	0.20	9508203
Total Lithium (Li)	ug/L	11.4	2.0	9508203
Total Manganese (Mn)	ug/L	3360	1.0	9508203
Total Molybdenum (Mo)	ug/L	4.4	1.0	9508203
Total Nickel (Ni)	ug/L	41.4	1.0	9508203
Total Selenium (Se)	ug/L	0.49	0.10	9508203
Total Silicon (Si)	ug/L	11700	100	9508203
Total Silver (Ag)	ug/L	0.342	0.020	9508203
Total Strontium (Sr)	ug/L	1070	1.0	9508203
Total Thallium (Tl)	ug/L	0.028	0.010	9508203
Total Tin (Sn)	ug/L	<5.0	5.0	9508203
Total Titanium (Ti)	ug/L	40.9	5.0	9508203
Total Uranium (U)	ug/L	9.27	0.10	9508203
Total Vanadium (V)	ug/L	6.2	5.0	9508203
Total Zinc (Zn)	ug/L	7.4	5.0	9508203
Total Zirconium (Zr)	ug/L	2.60	0.10	9508203
Total Calcium (Ca)	mg/L	251	0.050	9505712
Total Magnesium (Mg)	mg/L	34.7	0.050	9505712
Total Potassium (K)	mg/L	12.8	0.050	9505712
RDL = Reportable Detection Limit				



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VERITAS

BV Labs Job #: B956373
Report Date: 2019/08/01

STANTEC CONSULTING LTD
Client Project #: 121414585
Site Location: Gordon Lake
Sampler Initials: BW

ELEMENTS BY ATOMIC SPECTROSCOPY (GROUND WATER)

BV Labs ID		WB9162		
Sampling Date		2019/07/10		
COC Number		15386		
	UNITS	CAM_GW_SNP_7C_20 19_01	RDL	QC Batch
Total Sodium (Na)	mg/L	47.1	0.050	9505712
Total Sulphur (S)	mg/L	199	3.0	9505712
RDL = Reportable Detection Limit				



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VERITAS

BV Labs Job #: B956373

Report Date: 2019/08/01

STANTEC CONSULTING LTD

Client Project #: 121414585

Site Location: Gordon Lake

Sampler Initials: BW

RESULTS OF CHEMICAL ANALYSES OF SURFACE WATER

BV Labs ID		WB9150	WB9151		WB9152		
Sampling Date		2019/07/08	2019/07/08		2019/07/08		
COC Number		15386	15386		15386		
	UNITS	CAM_SW_SNP_11B1_2019_01	CAM_SW_SNP_11B2_2019_01	RDL	CAM_SW_SNP_11B3_2019_01	RDL	QC Batch

Calculated Parameters

Total Hardness (CaCO ₃)	mg/L	42.5	41.3	0.50	66.3	0.50	9504459
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Misc. Inorganics

Total Dissolved Solids	mg/L	76	76	10	110	10	9506457
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Total Suspended Solids	mg/L	160	5.3	1.0	4.7	1.0	9506455
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Nutrients

Total Ammonia (N)	mg/L	1.6	1.7	0.015	4.1 (1)	0.075	9506533
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RDL = Reportable Detection Limit

(1) Detection limits raised due to dilution to bring analyte within the calibrated range.

BV Labs ID		WB9153		WB9154		WB9155		
Sampling Date		2019/07/08		2019/07/08		2019/07/08		
COC Number		15386		15386		15386		
	UNITS	CAM_SW_SNP_11B4_2019_01	RDL	CAM_SW_SNP_11C_2019_01	QC Batch	TB_SW_SNP_2019_01	RDL	QC Batch

Calculated Parameters

Total Hardness (CaCO ₃)	mg/L	40.8	0.50	40.6	9504459	<0.50	0.50	9504459
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Misc. Inorganics

Total Dissolved Solids	mg/L	72	10	64	9506457	<10	10	9506457
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Total Suspended Solids	mg/L	2.0	1.0	11	9506455	<1.0	1.0	9506455
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Nutrients

Total Ammonia (N)	mg/L	2.5 (1)	0.075	0.91	9506533	<0.015	0.015	9514827
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RDL = Reportable Detection Limit

(1) Detection limits raised due to dilution to bring analyte within the calibrated range.

BV Labs ID		WB9156		WB9157		WB9163		
Sampling Date		2019/07/08		2019/07/09		2019/07/10		
COC Number		15386		15386		15386		
	UNITS	FB_SW_SNP_2019_01	QC Batch	DUP1_SW_SNP_2019_01	BUR_SW_SNP_11A_2019_01	RDL	QC Batch	

Calculated Parameters

Total Hardness (CaCO ₃)	mg/L	<0.50	9504459	58.3	38.7	0.50	9504459	
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Misc. Inorganics

Total Dissolved Solids	mg/L	<10	9506457	130	80	10	9506457	
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Total Suspended Solids	mg/L	<1.0	9506455	5.3	10	1.0	9506455	
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Nutrients

Total Ammonia (N)	mg/L	<0.015	9514827	0.33	0.86	0.015	9506491	
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RDL = Reportable Detection Limit



BUREAU
VERITAS

BV Labs Job #: B956373
Report Date: 2019/08/01

STANTEC CONSULTING LTD
Client Project #: 121414585
Site Location: Gordon Lake
Sampler Initials: BW

RESULTS OF CHEMICAL ANALYSES OF SURFACE WATER

BV Labs ID		WB9164	WB9168			WB9169		
Sampling Date		2019/07/10	2019/07/09			2019/07/09		
COC Number		15386	15386			15386		
	UNITS	WES_SW_SNP_11F_20 19_01	KID_SW_SNP_11D_20 19_01	RDL	QC Batch	TRE_SW_SNP_11E_20 19_01	RDL	QC Batch
Calculated Parameters								
Total Hardness (CaCO ₃)	mg/L	37.9	54.5	0.50	9504459	37.4	0.50	9504459
Misc. Inorganics								
Total Dissolved Solids	mg/L	72	130	10	9506457	72	10	9506457
Total Suspended Solids	mg/L	1.3	4.7	1.0	9506455	<1.0	1.0	9506455
Nutrients								
Total Ammonia (N)	mg/L	0.94	0.71	0.015	9506491	5.5 (1)	0.075	9506533
RDL = Reportable Detection Limit								
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.								

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VERITASBV Labs Job #: B956373
Report Date: 2019/08/01STANTEC CONSULTING LTD
Client Project #: 121414585
Site Location: Gordon Lake
Sampler Initials: BW**ELEMENTS BY ATOMIC SPECTROSCOPY (SURFACE WATER)**

BV Labs ID		WB9150	WB9150	WB9151	WB9152		
Sampling Date		2019/07/08	2019/07/08	2019/07/08	2019/07/08		
COC Number		15386	15386	15386	15386		
	UNITS	CAM_SW_SNP_11B1_2019_01	CAM_SW_SNP_11B1_2019_01 Lab-Dup	CAM_SW_SNP_11B2_2019_01	CAM_SW_SNP_11B3_2019_01	RDL	QC Batch

Total Metals by ICPMS							
Total Aluminum (Al)	ug/L	23.5	23.0	20.6	30.8	3.0	9508203
Total Antimony (Sb)	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	9508203
Total Arsenic (As)	ug/L	0.47	0.48	0.36	0.38	0.10	9508203
Total Barium (Ba)	ug/L	4.7	4.7	4.5	5.8	1.0	9508203
Total Beryllium (Be)	ug/L	<0.10	<0.10	<0.10	<0.10	0.10	9508203
Total Bismuth (Bi)	ug/L	<1.0	<1.0	<1.0	<1.0	1.0	9508203
Total Boron (B)	ug/L	<50	<50	<50	<50	50	9508203
Total Cadmium (Cd)	ug/L	0.011	0.011	<0.010	<0.010	0.010	9508203
Total Cesium (Cs)	ug/L	<0.20	<0.20	<0.20	<0.20	0.20	9508203
Total Chromium (Cr)	ug/L	<1.0	<1.0	<1.0	<1.0	1.0	9508203
Total Cobalt (Co)	ug/L	0.24	0.23	<0.20	0.53	0.20	9508203
Total Copper (Cu)	ug/L	0.56	0.60	<0.50	0.85	0.50	9508203
Total Iron (Fe)	ug/L	<10	<10	24	57	10	9508203
Total Lead (Pb)	ug/L	<0.20	<0.20	<0.20	<0.20	0.20	9508203
Total Lithium (Li)	ug/L	3.8	<2.0	5.7	<2.0	2.0	9508203
Total Manganese (Mn)	ug/L	5.6	5.5	1.9	8.8	1.0	9508203
Total Molybdenum (Mo)	ug/L	<1.0	<1.0	<1.0	<1.0	1.0	9508203
Total Nickel (Ni)	ug/L	<1.0	<1.0	<1.0	1.4	1.0	9508203
Total Selenium (Se)	ug/L	<0.10	<0.10	<0.10	<0.10	0.10	9508203
Total Silicon (Si)	ug/L	205	205	143	279	100	9508203
Total Silver (Ag)	ug/L	<0.020	<0.020	<0.020	<0.020	0.020	9508203
Total Strontium (Sr)	ug/L	48.8	50.3	45.6	77.7	1.0	9508203
Total Thallium (Tl)	ug/L	<0.010	<0.010	<0.010	<0.010	0.010	9508203
Total Tin (Sn)	ug/L	<5.0	<5.0	<5.0	<5.0	5.0	9508203
Total Titanium (Ti)	ug/L	<5.0	<5.0	<5.0	<5.0	5.0	9508203
Total Uranium (U)	ug/L	0.11	0.12	<0.10	0.26	0.10	9508203
Total Vanadium (V)	ug/L	<5.0	<5.0	<5.0	<5.0	5.0	9508203
Total Zinc (Zn)	ug/L	<5.0	<5.0	<5.0	<5.0	5.0	9508203
Total Zirconium (Zr)	ug/L	<0.10	<0.10	<0.10	0.12	0.10	9508203
Total Calcium (Ca)	mg/L	12.2	N/A	11.8	19.1	0.050	9505712
Total Magnesium (Mg)	mg/L	2.95	N/A	2.90	4.49	0.050	9505712

RDL = Reportable Detection Limit

Lab-Dup = Laboratory Initiated Duplicate

N/A = Not Applicable



ELEMENTS BY ATOMIC SPECTROSCOPY (SURFACE WATER)

BV Labs ID		WB9150	WB9150	WB9151	WB9152		
Sampling Date		2019/07/08	2019/07/08	2019/07/08	2019/07/08		
COC Number		15386	15386	15386	15386		
	UNITS	CAM_SW_SNP_11B1_2019_01	CAM_SW_SNP_11B1_2019_01 Lab-Dup	CAM_SW_SNP_11B2_2019_01	CAM_SW_SNP_11B3_2019_01	RDL	QC Batch
Total Potassium (K)	mg/L	1.45	N/A	1.51	1.73	0.050	9505712
Total Sodium (Na)	mg/L	2.32	N/A	2.43	4.55	0.050	9505712
Total Sulphur (S)	mg/L	3.9	N/A	<3.0	11.5	3.0	9505712

RDL = Reportable Detection Limit

Lab-Dup = Laboratory Initiated Duplicate

N/A = Not Applicable



BV Labs Job #: B956373
Report Date: 2019/08/01

STANTEC CONSULTING LTD
Client Project #: 121414585
Site Location: Gordon Lake
Sampler Initials: BW

ELEMENTS BY ATOMIC SPECTROSCOPY (SURFACE WATER)

BV Labs ID		WB9153	WB9154	WB9155	WB9156		
Sampling Date		2019/07/08	2019/07/08	2019/07/08	2019/07/08		
COC Number		15386	15386	15386	15386		
	UNITS	CAM_SW_SNP_11B4_2019_01	CAM_SW_SNP_11C_2019_01	TB_SW_SNP_2019_01	FB_SW_SNP_2019_01	RDL	QC Batch

Total Metals by ICPMS							
Total Aluminum (Al)	ug/L	24.7	<3.0	<3.0	<3.0	3.0	9508203
Total Antimony (Sb)	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	9508203
Total Arsenic (As)	ug/L	0.56	0.53	<0.10	<0.10	0.10	9508203
Total Barium (Ba)	ug/L	4.7	4.3	<1.0	<1.0	1.0	9508203
Total Beryllium (Be)	ug/L	<0.10	<0.10	<0.10	<0.10	0.10	9508203
Total Bismuth (Bi)	ug/L	<1.0	<1.0	<1.0	<1.0	1.0	9508203
Total Boron (B)	ug/L	<50	<50	<50	<50	50	9508203
Total Cadmium (Cd)	ug/L	<0.010	<0.010	<0.010	<0.010	0.010	9508203
Total Cesium (Cs)	ug/L	<0.20	<0.20	<0.20	<0.20	0.20	9508203
Total Chromium (Cr)	ug/L	<1.0	<1.0	<1.0	<1.0	1.0	9508203
Total Cobalt (Co)	ug/L	0.32	<0.20	<0.20	<0.20	0.20	9508203
Total Copper (Cu)	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	9508203
Total Iron (Fe)	ug/L	47	18	<10	<10	10	9508203
Total Lead (Pb)	ug/L	<0.20	<0.20	<0.20	<0.20	0.20	9508203
Total Lithium (Li)	ug/L	<2.0	<2.0	<2.0	<2.0	2.0	9508203
Total Manganese (Mn)	ug/L	9.3	3.1	<1.0	<1.0	1.0	9508203
Total Molybdenum (Mo)	ug/L	<1.0	<1.0	<1.0	<1.0	1.0	9508203
Total Nickel (Ni)	ug/L	<1.0	<1.0	<1.0	<1.0	1.0	9508203
Total Selenium (Se)	ug/L	<0.10	<0.10	<0.10	<0.10	0.10	9508203
Total Silicon (Si)	ug/L	160	187	<100	<100	100	9508203
Total Silver (Ag)	ug/L	<0.020	<0.020	<0.020	<0.020	0.020	9508203
Total Strontium (Sr)	ug/L	47.1	48.0	<1.0	<1.0	1.0	9508203
Total Thallium (Tl)	ug/L	<0.010	<0.010	<0.010	<0.010	0.010	9508203
Total Tin (Sn)	ug/L	<5.0	<5.0	<5.0	<5.0	5.0	9508203
Total Titanium (Ti)	ug/L	<5.0	<5.0	<5.0	<5.0	5.0	9508203
Total Uranium (U)	ug/L	0.11	0.10	<0.10	<0.10	0.10	9508203
Total Vanadium (V)	ug/L	<5.0	<5.0	<5.0	<5.0	5.0	9508203
Total Zinc (Zn)	ug/L	<5.0	<5.0	<5.0	<5.0	5.0	9508203
Total Zirconium (Zr)	ug/L	<0.10	<0.10	<0.10	<0.10	0.10	9508203
Total Calcium (Ca)	mg/L	11.7	11.5	<0.050	<0.050	0.050	9505712
Total Magnesium (Mg)	mg/L	2.83	2.88	<0.050	<0.050	0.050	9505712
Total Potassium (K)	mg/L	1.49	1.51	<0.050	<0.050	0.050	9505712

RDL = Reportable Detection Limit



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BV Labs Job #: B956373
Report Date: 2019/08/01

STANTEC CONSULTING LTD
Client Project #: 121414585
Site Location: Gordon Lake
Sampler Initials: BW

ELEMENTS BY ATOMIC SPECTROSCOPY (SURFACE WATER)

BV Labs ID		WB9153	WB9154	WB9155	WB9156		
Sampling Date		2019/07/08	2019/07/08	2019/07/08	2019/07/08		
COC Number		15386	15386	15386	15386		
	UNITS	CAM_SW_SNP_11B4_2019_01	CAM_SW_SNP_11C_2019_01	TB_SW_SNP_2019_01	FB_SW_SNP_2019_01	RDL	QC Batch
Total Sodium (Na)	mg/L	2.44	2.43	<0.050	<0.050	0.050	9505712
Total Sulphur (S)	mg/L	<3.0	3.1	<3.0	<3.0	3.0	9505712
RDL = Reportable Detection Limit							



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BV Labs Job #: B956373
Report Date: 2019/08/01

STANTEC CONSULTING LTD
Client Project #: 121414585
Site Location: Gordon Lake
Sampler Initials: BW

ELEMENTS BY ATOMIC SPECTROSCOPY (SURFACE WATER)

BV Labs ID		WB9157	WB9163	WB9164	WB9168		
Sampling Date		2019/07/09	2019/07/10	2019/07/10	2019/07/09		
COC Number		15386	15386	15386	15386		
	UNITS	DUP1_SW_SNP_2019_01	BUR_SW_SNP_11A_2 019_01	WES_SW_SNP_11F_20 19_01	KID_SW_SNP_11D_20 19_01	RDL	QC Batch

Total Metals by ICPMS							
Total Aluminum (Al)	ug/L	48.0	11.3	<3.0	28.0	3.0	9508203
Total Antimony (Sb)	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	9508203
Total Arsenic (As)	ug/L	0.93	0.55	0.26	1.08	0.10	9508203
Total Barium (Ba)	ug/L	10.7	4.2	4.0	9.9	1.0	9508203
Total Beryllium (Be)	ug/L	<0.10	<0.10	<0.10	<0.10	0.10	9508203
Total Bismuth (Bi)	ug/L	<1.0	<1.0	<1.0	<1.0	1.0	9508203
Total Boron (B)	ug/L	<50	<50	<50	<50	50	9508203
Total Cadmium (Cd)	ug/L	<0.010	<0.010	<0.010	<0.010	0.010	9508203
Total Cesium (Cs)	ug/L	<0.20	<0.20	<0.20	<0.20	0.20	9508203
Total Chromium (Cr)	ug/L	<1.0	<1.0	<1.0	<1.0	1.0	9508203
Total Cobalt (Co)	ug/L	<0.20	<0.20	<0.20	<0.20	0.20	9508203
Total Copper (Cu)	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	9508203
Total Iron (Fe)	ug/L	16	32	<10	13	10	9508203
Total Lead (Pb)	ug/L	<0.20	<0.20	<0.20	<0.20	0.20	9508203
Total Lithium (Li)	ug/L	<2.0	<2.0	<2.0	<2.0	2.0	9508203
Total Manganese (Mn)	ug/L	5.9	2.9	1.6	4.9	1.0	9508203
Total Molybdenum (Mo)	ug/L	<1.0	<1.0	<1.0	<1.0	1.0	9508203
Total Nickel (Ni)	ug/L	5.1	<1.0	<1.0	4.4	1.0	9508203
Total Selenium (Se)	ug/L	<0.10	<0.10	<0.10	<0.10	0.10	9508203
Total Silicon (Si)	ug/L	158	164	104	156	100	9508203
Total Silver (Ag)	ug/L	<0.020	<0.020	<0.020	<0.020	0.020	9508203
Total Strontium (Sr)	ug/L	74.3	43.7	43.1	66.2	1.0	9508203
Total Thallium (Tl)	ug/L	<0.010	<0.010	<0.010	<0.010	0.010	9508203
Total Tin (Sn)	ug/L	<5.0	<5.0	<5.0	<5.0	5.0	9508203
Total Titanium (Ti)	ug/L	<5.0	<5.0	<5.0	<5.0	5.0	9508203
Total Uranium (U)	ug/L	<0.10	0.16	<0.10	<0.10	0.10	9508203
Total Vanadium (V)	ug/L	<5.0	<5.0	<5.0	<5.0	5.0	9508203
Total Zinc (Zn)	ug/L	<5.0	<5.0	<5.0	<5.0	5.0	9508203
Total Zirconium (Zr)	ug/L	<0.10	<0.10	<0.10	<0.10	0.10	9508203
Total Calcium (Ca)	mg/L	14.9	11.1	10.9	14.0	0.050	9505712
Total Magnesium (Mg)	mg/L	5.10	2.69	2.61	4.72	0.050	9505712
Total Potassium (K)	mg/L	2.44	1.39	1.38	2.30	0.050	9505712

RDL = Reportable Detection Limit



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BV Labs Job #: B956373
Report Date: 2019/08/01

STANTEC CONSULTING LTD
Client Project #: 121414585
Site Location: Gordon Lake
Sampler Initials: BW

ELEMENTS BY ATOMIC SPECTROSCOPY (SURFACE WATER)

BV Labs ID		WB9157	WB9163	WB9164	WB9168		
Sampling Date		2019/07/09	2019/07/10	2019/07/10	2019/07/09		
COC Number		15386	15386	15386	15386		
	UNITS	DUP1_SW_SNP_2019_01	BUR_SW_SNP_11A_2019_01	WES_SW_SNP_11F_2019_01	KID_SW_SNP_11D_2019_01	RDL	QC Batch
Total Sodium (Na)	mg/L	4.20	2.19	2.17	3.93	0.050	9505712
Total Sulphur (S)	mg/L	<3.0	<3.0	<3.0	3.6	3.0	9505712
RDL = Reportable Detection Limit							

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Report Date: 2019/08/01STANTEC CONSULTING LTD
Client Project #: 121414585
Site Location: Gordon Lake
Sampler Initials: BW**ELEMENTS BY ATOMIC SPECTROSCOPY (SURFACE WATER)**

BV Labs ID		WB9169		
Sampling Date		2019/07/09		
COC Number		15386		
	UNITS	TRE_SW_SNP_11E_20 19_01	RDL	QC Batch
Total Metals by ICPMS				
Total Aluminum (Al)	ug/L	6.6	3.0	9508203
Total Antimony (Sb)	ug/L	<0.50	0.50	9508203
Total Arsenic (As)	ug/L	0.36	0.10	9508203
Total Barium (Ba)	ug/L	4.2	1.0	9508203
Total Beryllium (Be)	ug/L	<0.10	0.10	9508203
Total Bismuth (Bi)	ug/L	<1.0	1.0	9508203
Total Boron (B)	ug/L	<50	50	9508203
Total Cadmium (Cd)	ug/L	<0.010	0.010	9508203
Total Cesium (Cs)	ug/L	<0.20	0.20	9508203
Total Chromium (Cr)	ug/L	<1.0	1.0	9508203
Total Cobalt (Co)	ug/L	<0.20	0.20	9508203
Total Copper (Cu)	ug/L	<0.50	0.50	9508203
Total Iron (Fe)	ug/L	16	10	9508203
Total Lead (Pb)	ug/L	<0.20	0.20	9508203
Total Lithium (Li)	ug/L	<2.0	2.0	9508203
Total Manganese (Mn)	ug/L	2.3	1.0	9508203
Total Molybdenum (Mo)	ug/L	<1.0	1.0	9508203
Total Nickel (Ni)	ug/L	<1.0	1.0	9508203
Total Selenium (Se)	ug/L	<0.10	0.10	9508203
Total Silicon (Si)	ug/L	195	100	9508203
Total Silver (Ag)	ug/L	<0.020	0.020	9508203
Total Strontium (Sr)	ug/L	41.6	1.0	9508203
Total Thallium (Tl)	ug/L	<0.010	0.010	9508203
Total Tin (Sn)	ug/L	<5.0	5.0	9508203
Total Titanium (Ti)	ug/L	<5.0	5.0	9508203
Total Uranium (U)	ug/L	<0.10	0.10	9508203
Total Vanadium (V)	ug/L	<5.0	5.0	9508203
Total Zinc (Zn)	ug/L	7.5	5.0	9508203
Total Zirconium (Zr)	ug/L	<0.10	0.10	9508203
Total Calcium (Ca)	mg/L	10.6	0.050	9505712
Total Magnesium (Mg)	mg/L	2.65	0.050	9505712
Total Potassium (K)	mg/L	1.37	0.050	9505712
RDL = Reportable Detection Limit				



BUREAU
VERITAS

BV Labs Job #: B956373
Report Date: 2019/08/01

STANTEC CONSULTING LTD
Client Project #: 121414585
Site Location: Gordon Lake
Sampler Initials: BW

ELEMENTS BY ATOMIC SPECTROSCOPY (SURFACE WATER)

BV Labs ID		WB9169		
Sampling Date		2019/07/09		
COC Number		15386		
	UNITS	TRE_SW_SNP_11E_20 19_01	RDL	QC Batch
Total Sodium (Na)	mg/L	2.17	0.050	9505712
Total Sulphur (S)	mg/L	<3.0	3.0	9505712
RDL = Reportable Detection Limit				



GENERAL COMMENTS

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

Package 1	6.5°C
Package 2	8.0°C
Package 3	4.2°C

Revised Report: Criteria removed from report.

Sample WB9150 [CAM_SW_SNP_11B1_2019_01] : Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample WB9151 [CAM_SW_SNP_11B2_2019_01] : Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample WB9152 [CAM_SW_SNP_11B3_2019_01] : Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample WB9153 [CAM_SW_SNP_11B4_2019_01] : Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample WB9154 [CAM_SW_SNP_11C_2019_01] : Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample WB9155 [TB_SW_SNP_2019_01] : Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample WB9156 [FB_SW_SNP_2019_01] : Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample WB9157 [DUP1_SW_SNP_2019_01] : Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample WB9158 [CAM_GW_SNP_7A_2019_01] : Sample was analyzed past method specified hold time for Orthophosphate by Konelab. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised. Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC.

Sample WB9159 [CAM_GW_SNP_7B_2019_01] : Sample was analyzed past method specified hold time for Orthophosphate by Konelab. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised. Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC.

Sample WB9160 [CAM_GW_SNP_7D_2019_01] : Sample was analyzed past method specified hold time for Orthophosphate by Konelab. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised. Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC.

Sample WB9161 [CAM_GW_MW2_2019_01] : Sample was analyzed past method specified hold time for Orthophosphate by Konelab. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised. Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC.

Sample WB9165 [ZEN_SO_2019_1] : Sample received was not in compliance with CCME sampling requirements for VOC/BTEX/F1 in soil.

Sample WB9166 [CAM_SO_2019_2] : Sample received was not in compliance with CCME sampling requirements for VOC/BTEX/F1 in soil.

Sample WB9167 [CAM_SO_2019_3] : Sample received was not in compliance with CCME sampling requirements for VOC/BTEX/F1 in soil.



BUREAU
VERITAS

BV Labs Job #: B956373
Report Date: 2019/08/01

STANTEC CONSULTING LTD
Client Project #: 121414585
Site Location: Gordon Lake
Sampler Initials: BW

Sample WB9168 [KID_SW_SNP_11D_2019_01] : Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample WB9169 [TRE_SW_SNP_11E_2019_01] : Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Results relate only to the items tested.



BUREAU
VERITAS

BV Labs Job #: B956373
Report Date: 2019/08/01

STANTEC CONSULTING LTD
Client Project #: 121414585
Site Location: Gordon Lake
Sampler Initials: BW

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
9504830	KD5	Matrix Spike	Dissolved Nitrite (N)	2019/07/12		102	%	80 - 120
			Dissolved Nitrate (N)	2019/07/12		102	%	80 - 120
9504830	KD5	Spiked Blank	Dissolved Nitrite (N)	2019/07/12		100	%	80 - 120
			Dissolved Nitrate (N)	2019/07/12		100	%	80 - 120
9504830	KD5	Method Blank	Dissolved Nitrite (N)	2019/07/12	<0.010		mg/L	
			Dissolved Nitrate (N)	2019/07/12	<0.010		mg/L	
9504830	KD5	RPD	Dissolved Nitrite (N)	2019/07/12	NC		%	20
			Dissolved Nitrate (N)	2019/07/12	NC		%	20
9505505	ARW	Method Blank	Moisture	2019/07/14	<0.30		%	
9505505	ARW	RPD	Moisture	2019/07/14	0.77		%	20
9505871	KD5	Matrix Spike [WB9169-01]	Dissolved Nitrite (N)	2019/07/13		111	%	80 - 120
			Dissolved Nitrate (N)	2019/07/13		111	%	80 - 120
9505871	KD5	Spiked Blank	Dissolved Nitrite (N)	2019/07/13		100	%	80 - 120
			Dissolved Nitrate (N)	2019/07/13		100	%	80 - 120
9505871	KD5	Method Blank	Dissolved Nitrite (N)	2019/07/13	<0.010		mg/L	
			Dissolved Nitrate (N)	2019/07/13	<0.010		mg/L	
9505871	KD5	RPD [WB9169-01]	Dissolved Nitrite (N)	2019/07/13	NC		%	20
			Dissolved Nitrate (N)	2019/07/13	NC		%	20
9505936	CH7	Matrix Spike [WB9159-01]	Orthophosphate (P)	2019/07/13		102	%	80 - 120
9505936	CH7	Spiked Blank	Orthophosphate (P)	2019/07/13		101	%	80 - 120
9505936	CH7	Method Blank	Orthophosphate (P)	2019/07/13	<0.0030		mg/L	
9505936	CH7	RPD [WB9159-01]	Orthophosphate (P)	2019/07/13	7.4		%	20
9505940	REE	Matrix Spike [WB9151-06]	O-TERPHENYL (sur.)	2019/07/13		102	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2019/07/13		106	%	60 - 140
9505940	REE	Spiked Blank	O-TERPHENYL (sur.)	2019/07/13		103	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2019/07/13		108	%	60 - 140
9505940	REE	Method Blank	O-TERPHENYL (sur.)	2019/07/13		105	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2019/07/13	<0.10		mg/L	
9505940	REE	RPD [WB9150-06]	F2 (C10-C16 Hydrocarbons)	2019/07/13	NC		%	30
9506285	MSD	Matrix Spike [WB9150-05]	Dissolved Calcium (Ca)	2019/07/15		101	%	80 - 120
			Dissolved Iron (Fe)	2019/07/15		103	%	80 - 120
			Dissolved Magnesium (Mg)	2019/07/15		104	%	80 - 120
			Dissolved Manganese (Mn)	2019/07/15		102	%	80 - 120
			Dissolved Potassium (K)	2019/07/15		105	%	80 - 120
			Dissolved Sodium (Na)	2019/07/15		108	%	80 - 120
9506285	MSD	Spiked Blank	Dissolved Calcium (Ca)	2019/07/15		103	%	80 - 120
			Dissolved Iron (Fe)	2019/07/15		103	%	80 - 120
			Dissolved Magnesium (Mg)	2019/07/15		104	%	80 - 120
			Dissolved Manganese (Mn)	2019/07/15		103	%	80 - 120
			Dissolved Potassium (K)	2019/07/15		104	%	80 - 120
			Dissolved Sodium (Na)	2019/07/15		107	%	80 - 120
9506285	MSD	Method Blank	Dissolved Calcium (Ca)	2019/07/15	<0.30		mg/L	
			Dissolved Iron (Fe)	2019/07/15	<0.060		mg/L	
			Dissolved Magnesium (Mg)	2019/07/15	<0.20		mg/L	
			Dissolved Manganese (Mn)	2019/07/15	<0.0040		mg/L	
			Dissolved Potassium (K)	2019/07/15	<0.30		mg/L	
			Dissolved Sodium (Na)	2019/07/15	<0.50		mg/L	
9506285	MSD	RPD [WB9150-05]	Dissolved Calcium (Ca)	2019/07/15	0.27		%	20
			Dissolved Iron (Fe)	2019/07/15	NC		%	20



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9506362	RBN	Matrix Spike [WB9167-01]	Dissolved Magnesium (Mg)	2019/07/15	0.86		%	20
			Dissolved Manganese (Mn)	2019/07/15	2.6		%	20
			Dissolved Potassium (K)	2019/07/15	0.20		%	20
			Dissolved Sodium (Na)	2019/07/15	0.76		%	20
			O-TERPHENYL (sur.)	2019/07/14		70	%	60 - 140
9506362	RBN	Spiked Blank	F2 (C10-C16 Hydrocarbons)	2019/07/14		76	%	60 - 140
			F3 (C16-C34 Hydrocarbons)	2019/07/14		79	%	60 - 140
			F4 (C34-C50 Hydrocarbons)	2019/07/14		82	%	60 - 140
			O-TERPHENYL (sur.)	2019/07/14		97	%	60 - 140
9506362	RBN	Method Blank	F2 (C10-C16 Hydrocarbons)	2019/07/14		118	%	60 - 140
			F3 (C16-C34 Hydrocarbons)	2019/07/14		126	%	60 - 140
			F4 (C34-C50 Hydrocarbons)	2019/07/14		117	%	60 - 140
			O-TERPHENYL (sur.)	2019/07/14		115	%	60 - 140
9506362	RBN	RPD [WB9167-01]	F2 (C10-C16 Hydrocarbons)	2019/07/14	<10		mg/kg	
			F3 (C16-C34 Hydrocarbons)	2019/07/14	<50		mg/kg	
			F4 (C34-C50 Hydrocarbons)	2019/07/14	<50		mg/kg	
			F2 (C10-C16 Hydrocarbons)	2019/07/14	NC		%	40
9506368	MF3	Matrix Spike [WB9166-01]	F3 (C16-C34 Hydrocarbons)	2019/07/14	NC		%	40
			F4 (C34-C50 Hydrocarbons)	2019/07/14	NC		%	40
			1,4-Difluorobenzene (sur.)	2019/07/15		96	%	50 - 140
			4-Bromofluorobenzene (sur.)	2019/07/15		112	%	50 - 140
9506368	MF3	Spiked Blank	D10-o-Xylene (sur.)	2019/07/15		102	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2019/07/15		95	%	50 - 140
			Benzene	2019/07/15		98	%	50 - 140
			Toluene	2019/07/15		101	%	50 - 140
			Ethylbenzene	2019/07/15		103	%	50 - 140
			m & p-Xylene	2019/07/15		98	%	50 - 140
			o-Xylene	2019/07/15		96	%	50 - 140
			F1 (C6-C10)	2019/07/15		89	%	60 - 140
			1,4-Difluorobenzene (sur.)	2019/07/15		98	%	50 - 140
			4-Bromofluorobenzene (sur.)	2019/07/15		106	%	50 - 140
			D10-o-Xylene (sur.)	2019/07/15		111	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2019/07/15		93	%	50 - 140
			Benzene	2019/07/15		88	%	60 - 130
			Toluene	2019/07/15		96	%	60 - 130
			Ethylbenzene	2019/07/15		99	%	60 - 130
			m & p-Xylene	2019/07/15		97	%	60 - 130
9506368	MF3	Method Blank	o-Xylene	2019/07/15		92	%	60 - 130
			F1 (C6-C10)	2019/07/15		129	%	60 - 140
			1,4-Difluorobenzene (sur.)	2019/07/15		98	%	50 - 140
			4-Bromofluorobenzene (sur.)	2019/07/15		103	%	50 - 140
			D10-o-Xylene (sur.)	2019/07/15		111	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2019/07/15		90	%	50 - 140
			Benzene	2019/07/15	<0.0050		mg/kg	
			Toluene	2019/07/15	<0.050		mg/kg	
			Ethylbenzene	2019/07/15	<0.010		mg/kg	
			m & p-Xylene	2019/07/15	<0.040		mg/kg	
			o-Xylene	2019/07/15	<0.020		mg/kg	
			F1 (C6-C10)	2019/07/15	<10		mg/kg	
9506368	MF3	RPD [WB9166-01]	Benzene	2019/07/15	NC		%	50
			Toluene	2019/07/15	NC		%	50



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9506386	MF3	Matrix Spike [WB9154-07]	Ethylbenzene	2019/07/15	19		%	50
			m & p-Xylene	2019/07/15	NC		%	50
			o-Xylene	2019/07/15	3.3		%	50
			F1 (C6-C10)	2019/07/15	27		%	40
			1,4-Difluorobenzene (sur.)	2019/07/14		100	%	50 - 140
			4-Bromofluorobenzene (sur.)	2019/07/14		97	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2019/07/14		101	%	50 - 140
			Benzene	2019/07/14		97	%	50 - 140
			Toluene	2019/07/14		99	%	50 - 140
			Ethylbenzene	2019/07/14		101	%	50 - 140
9506386	MF3	Spiked Blank	m & p-Xylene	2019/07/14		104	%	50 - 140
			o-Xylene	2019/07/14		99	%	50 - 140
			F1 (C6-C10)	2019/07/14		98	%	60 - 140
			1,4-Difluorobenzene (sur.)	2019/07/14		101	%	50 - 140
			4-Bromofluorobenzene (sur.)	2019/07/14		99	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2019/07/14		99	%	50 - 140
			Benzene	2019/07/14		98	%	60 - 130
			Toluene	2019/07/14		100	%	60 - 130
			Ethylbenzene	2019/07/14		104	%	60 - 130
			m & p-Xylene	2019/07/14		105	%	60 - 130
9506386	MF3	Method Blank	o-Xylene	2019/07/14		101	%	60 - 130
			F1 (C6-C10)	2019/07/14		104	%	60 - 140
			1,4-Difluorobenzene (sur.)	2019/07/14		107	%	50 - 140
			4-Bromofluorobenzene (sur.)	2019/07/14		99	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2019/07/14		102	%	50 - 140
			Benzene	2019/07/14	<0.40		ug/L	
			Toluene	2019/07/14	<0.40		ug/L	
			Ethylbenzene	2019/07/14	<0.40		ug/L	
			m & p-Xylene	2019/07/14	<0.80		ug/L	
			o-Xylene	2019/07/14	<0.40		ug/L	
9506386	MF3	RPD [WB9153-07]	F1 (C6-C10)	2019/07/14	<100		ug/L	
			Benzene	2019/07/14	NC		%	30
			Toluene	2019/07/14	NC		%	30
			Ethylbenzene	2019/07/14	NC		%	30
			m & p-Xylene	2019/07/14	NC		%	30
			o-Xylene	2019/07/14	NC		%	30
9506455	LCA	Matrix Spike	F1 (C6-C10)	2019/07/14	NC		%	30
			Total Suspended Solids	2019/07/15		103	%	80 - 120
9506455	LCA	Spiked Blank	Total Suspended Solids	2019/07/15		86	%	80 - 120
9506455	LCA	Method Blank	Total Suspended Solids	2019/07/15	<1.0		mg/L	
9506455	LCA	RPD	Total Suspended Solids	2019/07/15	NC		%	20
9506457	AAZ	Matrix Spike	Total Dissolved Solids	2019/07/15		NC	%	80 - 120
9506457	AAZ	Spiked Blank	Total Dissolved Solids	2019/07/15		102	%	80 - 120
9506457	AAZ	Method Blank	Total Dissolved Solids	2019/07/15	<10		mg/L	
9506457	AAZ	RPD	Total Dissolved Solids	2019/07/15	0.60		%	20
9506491	MRD	Matrix Spike	Total Ammonia (N)	2019/07/14		97	%	80 - 120
9506491	MRD	Spiked Blank	Total Ammonia (N)	2019/07/14		112	%	80 - 120
9506491	MRD	Method Blank	Total Ammonia (N)	2019/07/14	<0.015		mg/L	
9506491	MRD	RPD	Total Ammonia (N)	2019/07/14	1.2		%	20
9506533	MRD	Matrix Spike [WB9159-08]	Total Ammonia (N)	2019/07/14		90	%	80 - 120
9506533	MRD	Spiked Blank	Total Ammonia (N)	2019/07/14		111	%	80 - 120



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9506533	MRD	Method Blank	Total Ammonia (N)	2019/07/14	<0.015		mg/L	
9506533	MRD	RPD [WB9159-08]	Total Ammonia (N)	2019/07/14	3.1		%	20
9506777	MA4	Spiked Blank	pH	2019/07/15		100	%	97 - 103
9506777	MA4	RPD [WB9150-01]	pH	2019/07/15	1.2		%	N/A
9506779	MA4	Spiked Blank	Alkalinity (Total as CaCO ₃)	2019/07/15		98	%	80 - 120
9506779	MA4	Method Blank	Alkalinity (PP as CaCO ₃)	2019/07/15	<1.0		mg/L	
			Alkalinity (Total as CaCO ₃)	2019/07/15	<1.0		mg/L	
			Bicarbonate (HCO ₃)	2019/07/15	<1.0		mg/L	
			Carbonate (CO ₃)	2019/07/15	<1.0		mg/L	
			Hydroxide (OH)	2019/07/15	<1.0		mg/L	
9506779	MA4	RPD [WB9150-01]	Alkalinity (PP as CaCO ₃)	2019/07/15	NC		%	20
			Alkalinity (Total as CaCO ₃)	2019/07/15	8.5		%	20
			Bicarbonate (HCO ₃)	2019/07/15	8.5		%	20
			Carbonate (CO ₃)	2019/07/15	NC		%	20
			Hydroxide (OH)	2019/07/15	NC		%	20
9506780	MA4	Spiked Blank	Conductivity	2019/07/15		99	%	90 - 110
9506780	MA4	Method Blank	Conductivity	2019/07/15	<2.0		uS/cm	
9506780	MA4	RPD [WB9150-01]	Conductivity	2019/07/15	2.0		%	10
9506951	MSD	Matrix Spike	Dissolved Calcium (Ca)	2019/07/15		102	%	80 - 120
			Dissolved Iron (Fe)	2019/07/15		101	%	80 - 120
			Dissolved Magnesium (Mg)	2019/07/15		102	%	80 - 120
			Dissolved Manganese (Mn)	2019/07/15		101	%	80 - 120
			Dissolved Potassium (K)	2019/07/15		101	%	80 - 120
			Dissolved Sodium (Na)	2019/07/15		103	%	80 - 120
9506951	MSD	Spiked Blank	Dissolved Calcium (Ca)	2019/07/15		101	%	80 - 120
			Dissolved Iron (Fe)	2019/07/15		102	%	80 - 120
			Dissolved Magnesium (Mg)	2019/07/15		101	%	80 - 120
			Dissolved Manganese (Mn)	2019/07/15		100	%	80 - 120
			Dissolved Potassium (K)	2019/07/15		101	%	80 - 120
			Dissolved Sodium (Na)	2019/07/15		104	%	80 - 120
9506951	MSD	Method Blank	Dissolved Calcium (Ca)	2019/07/16	<0.30		mg/L	
			Dissolved Iron (Fe)	2019/07/16	<0.060		mg/L	
			Dissolved Magnesium (Mg)	2019/07/16	<0.20		mg/L	
			Dissolved Manganese (Mn)	2019/07/16	<0.0040		mg/L	
			Dissolved Potassium (K)	2019/07/16	<0.30		mg/L	
			Dissolved Sodium (Na)	2019/07/16	<0.50		mg/L	
9506951	MSD	RPD	Dissolved Calcium (Ca)	2019/07/15	NC		%	20
			Dissolved Iron (Fe)	2019/07/15	NC		%	20
			Dissolved Magnesium (Mg)	2019/07/15	NC		%	20
			Dissolved Manganese (Mn)	2019/07/15	NC		%	20
			Dissolved Potassium (K)	2019/07/15	NC		%	20
			Dissolved Sodium (Na)	2019/07/15	NC		%	20
9507269	MA4	Spiked Blank	pH	2019/07/15		100	%	97 - 103
9507269	MA4	RPD	pH	2019/07/15	0.38		%	N/A
9507272	MA4	Spiked Blank	Alkalinity (Total as CaCO ₃)	2019/07/15		100	%	80 - 120
9507272	MA4	Method Blank	Alkalinity (PP as CaCO ₃)	2019/07/15	<1.0		mg/L	
			Alkalinity (Total as CaCO ₃)	2019/07/15	<1.0		mg/L	
			Bicarbonate (HCO ₃)	2019/07/15	<1.0		mg/L	
			Carbonate (CO ₃)	2019/07/15	<1.0		mg/L	
			Hydroxide (OH)	2019/07/15	<1.0		mg/L	
9507272	MA4	RPD	Alkalinity (PP as CaCO ₃)	2019/07/15	NC		%	20
			Alkalinity (Total as CaCO ₃)	2019/07/15	NC		%	20
			Bicarbonate (HCO ₃)	2019/07/15	NC		%	20



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9507273	MA4	Spiked Blank	Carbonate (CO ₃)	2019/07/15	NC		%	20
			Hydroxide (OH)	2019/07/15	NC		%	20
			Conductivity	2019/07/15		99	%	90 - 110
			Conductivity	2019/07/15	<2.0		uS/cm	
9507273	MA4	RPD	Conductivity	2019/07/15	NC		%	10
9507331	MA4	Spiked Blank	pH	2019/07/15		100	%	97 - 103
9507331	MA4	RPD	pH	2019/07/15	0.0026		%	N/A
9507333	MA4	Spiked Blank	Alkalinity (Total as CaCO ₃)	2019/07/15		100	%	80 - 120
9507333	MA4	Method Blank	Alkalinity (PP as CaCO ₃)	2019/07/15	<1.0		mg/L	
			Alkalinity (Total as CaCO ₃)	2019/07/15	<1.0		mg/L	
			Bicarbonate (HCO ₃)	2019/07/15	<1.0		mg/L	
			Carbonate (CO ₃)	2019/07/15	<1.0		mg/L	
			Hydroxide (OH)	2019/07/15	<1.0		mg/L	
			Alkalinity (PP as CaCO ₃)	2019/07/15	NC		%	20
			Alkalinity (Total as CaCO ₃)	2019/07/15	0.026		%	20
			Bicarbonate (HCO ₃)	2019/07/15	0.026		%	20
			Carbonate (CO ₃)	2019/07/15	NC		%	20
			Hydroxide (OH)	2019/07/15	NC		%	20
			Conductivity	2019/07/15		100	%	90 - 110
			Conductivity	2019/07/15	<2.0		uS/cm	
9507334	MA4	Method Blank	Conductivity	2019/07/15	0		%	10
9507375	MRD	Matrix Spike [WB9156-01]	Dissolved Chloride (Cl)	2019/07/15		109	%	80 - 120
9507375	MRD	Spiked Blank	Dissolved Sulphate (SO ₄)	2019/07/15		112	%	80 - 120
			Dissolved Chloride (Cl)	2019/07/15		107	%	80 - 120
			Dissolved Sulphate (SO ₄)	2019/07/15		109	%	80 - 120
9507375	MRD	Method Blank	Dissolved Chloride (Cl)	2019/07/15	<1.0		mg/L	
			Dissolved Sulphate (SO ₄)	2019/07/15	<1.0		mg/L	
9507375	MRD	RPD [WB9156-01]	Dissolved Chloride (Cl)	2019/07/15	NC		%	20
			Dissolved Sulphate (SO ₄)	2019/07/15	NC		%	20
9508203	PC5	Matrix Spike [WB9151-04]	Total Aluminum (Al)	2019/07/17		112	%	80 - 120
			Total Antimony (Sb)	2019/07/17		111	%	80 - 120
			Total Arsenic (As)	2019/07/17		109	%	80 - 120
			Total Barium (Ba)	2019/07/17		109	%	80 - 120
			Total Beryllium (Be)	2019/07/17		108	%	80 - 120
			Total Bismuth (Bi)	2019/07/17		111	%	80 - 120
			Total Boron (B)	2019/07/17		109	%	80 - 120
			Total Cadmium (Cd)	2019/07/17		108	%	80 - 120
			Total Cesium (Cs)	2019/07/17		115	%	80 - 120
			Total Chromium (Cr)	2019/07/17		113	%	80 - 120
			Total Cobalt (Co)	2019/07/17		111	%	80 - 120
			Total Copper (Cu)	2019/07/17		110	%	80 - 120
			Total Iron (Fe)	2019/07/17		120	%	80 - 120
			Total Lead (Pb)	2019/07/17		110	%	80 - 120
			Total Lithium (Li)	2019/07/17		95	%	80 - 120
			Total Manganese (Mn)	2019/07/17		114	%	80 - 120
			Total Molybdenum (Mo)	2019/07/17		104	%	80 - 120
			Total Nickel (Ni)	2019/07/17		111	%	80 - 120
			Total Selenium (Se)	2019/07/17		105	%	80 - 120
			Total Silicon (Si)	2019/07/17		114	%	80 - 120
			Total Silver (Ag)	2019/07/17		107	%	80 - 120
			Total Strontium (Sr)	2019/07/17		126 (1)	%	80 - 120



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9508203	PC5	Spiked Blank	Total Thallium (Tl)	2019/07/17		111	%	80 - 120
			Total Tin (Sn)	2019/07/17		107	%	80 - 120
			Total Titanium (Ti)	2019/07/17		110	%	80 - 120
			Total Uranium (U)	2019/07/17		118	%	80 - 120
			Total Vanadium (V)	2019/07/17		114	%	80 - 120
			Total Zinc (Zn)	2019/07/17		107	%	80 - 120
			Total Zirconium (Zr)	2019/07/17		118	%	80 - 120
			Total Aluminum (Al)	2019/07/17		98	%	80 - 120
			Total Antimony (Sb)	2019/07/17		98	%	80 - 120
			Total Arsenic (As)	2019/07/17		100	%	80 - 120
			Total Barium (Ba)	2019/07/17		96	%	80 - 120
			Total Beryllium (Be)	2019/07/17		101	%	80 - 120
			Total Bismuth (Bi)	2019/07/17		99	%	80 - 120
			Total Boron (B)	2019/07/17		117	%	80 - 120
			Total Cadmium (Cd)	2019/07/17		96	%	80 - 120
			Total Cesium (Cs)	2019/07/17		101	%	80 - 120
			Total Chromium (Cr)	2019/07/17		100	%	80 - 120
			Total Cobalt (Co)	2019/07/17		99	%	80 - 120
			Total Copper (Cu)	2019/07/17		98	%	80 - 120
			Total Iron (Fe)	2019/07/17		112	%	80 - 120
			Total Lead (Pb)	2019/07/17		98	%	80 - 120
			Total Lithium (Li)	2019/07/17		86	%	80 - 120
			Total Manganese (Mn)	2019/07/17		103	%	80 - 120
			Total Molybdenum (Mo)	2019/07/17		102	%	80 - 120
			Total Nickel (Ni)	2019/07/17		99	%	80 - 120
			Total Selenium (Se)	2019/07/17		96	%	80 - 120
			Total Silicon (Si)	2019/07/17		104	%	80 - 120
			Total Silver (Ag)	2019/07/17		96	%	80 - 120
			Total Strontium (Sr)	2019/07/17		108	%	80 - 120
			Total Thallium (Tl)	2019/07/17		100	%	80 - 120
			Total Tin (Sn)	2019/07/17		96	%	80 - 120
			Total Titanium (Ti)	2019/07/17		88	%	80 - 120
			Total Uranium (U)	2019/07/17		104	%	80 - 120
			Total Vanadium (V)	2019/07/17		100	%	80 - 120
			Total Zinc (Zn)	2019/07/17		96	%	80 - 120
			Total Zirconium (Zr)	2019/07/17		104	%	80 - 120
9508203	PC5	Method Blank	Total Aluminum (Al)	2019/07/17	<3.0		ug/L	
			Total Antimony (Sb)	2019/07/17	<0.50		ug/L	
			Total Arsenic (As)	2019/07/17	<0.10		ug/L	
			Total Barium (Ba)	2019/07/17	<1.0		ug/L	
			Total Beryllium (Be)	2019/07/17	<0.10		ug/L	
			Total Bismuth (Bi)	2019/07/17	<1.0		ug/L	
			Total Boron (B)	2019/07/17	<50		ug/L	
			Total Cadmium (Cd)	2019/07/17	<0.010		ug/L	
			Total Cesium (Cs)	2019/07/17	<0.20		ug/L	
			Total Chromium (Cr)	2019/07/17	<1.0		ug/L	
			Total Cobalt (Co)	2019/07/17	<0.20		ug/L	
			Total Copper (Cu)	2019/07/17	<0.50		ug/L	
			Total Iron (Fe)	2019/07/17	<10		ug/L	
			Total Lead (Pb)	2019/07/17	<0.20		ug/L	
			Total Lithium (Li)	2019/07/17	<2.0		ug/L	
			Total Manganese (Mn)	2019/07/17	<1.0		ug/L	
			Total Molybdenum (Mo)	2019/07/17	<1.0		ug/L	



BUREAU
VERITAS

BV Labs Job #: B956373
Report Date: 2019/08/01

STANTEC CONSULTING LTD
Client Project #: 121414585
Site Location: Gordon Lake
Sampler Initials: BW

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
9508203	PC5	RPD [WB9150-04]	Total Nickel (Ni)	2019/07/17	<1.0		ug/L	
			Total Selenium (Se)	2019/07/17	<0.10		ug/L	
			Total Silicon (Si)	2019/07/17	<100		ug/L	
			Total Silver (Ag)	2019/07/17	<0.020		ug/L	
			Total Strontium (Sr)	2019/07/17	<1.0		ug/L	
			Total Thallium (Tl)	2019/07/17	<0.010		ug/L	
			Total Tin (Sn)	2019/07/17	<5.0		ug/L	
			Total Titanium (Ti)	2019/07/17	<5.0		ug/L	
			Total Uranium (U)	2019/07/17	<0.10		ug/L	
			Total Vanadium (V)	2019/07/17	<5.0		ug/L	
			Total Zinc (Zn)	2019/07/17	<5.0		ug/L	
			Total Zirconium (Zr)	2019/07/17	<0.10		ug/L	
			Total Aluminum (Al)	2019/07/17	2.0		%	20
			Total Antimony (Sb)	2019/07/17	NC		%	20
			Total Arsenic (As)	2019/07/17	1.9		%	20
			Total Barium (Ba)	2019/07/17	1.4		%	20
			Total Beryllium (Be)	2019/07/17	NC		%	20
			Total Bismuth (Bi)	2019/07/17	NC		%	20
			Total Boron (B)	2019/07/17	NC		%	20
			Total Cadmium (Cd)	2019/07/17	0.34		%	20
			Total Cesium (Cs)	2019/07/17	NC		%	20
			Total Chromium (Cr)	2019/07/17	NC		%	20
			Total Cobalt (Co)	2019/07/17	4.1		%	20
			Total Copper (Cu)	2019/07/17	6.5		%	20
			Total Iron (Fe)	2019/07/17	NC		%	20
			Total Lead (Pb)	2019/07/17	NC		%	20
			Total Lithium (Li)	2019/07/17	NC		%	20
			Total Manganese (Mn)	2019/07/17	1.9		%	20
			Total Molybdenum (Mo)	2019/07/17	NC		%	20
			Total Nickel (Ni)	2019/07/17	NC		%	20
			Total Selenium (Se)	2019/07/17	NC		%	20
			Total Silicon (Si)	2019/07/17	0.36		%	20
			Total Silver (Ag)	2019/07/17	NC		%	20
			Total Strontium (Sr)	2019/07/17	2.9		%	20
			Total Thallium (Tl)	2019/07/17	NC		%	20
			Total Tin (Sn)	2019/07/17	NC		%	20
			Total Titanium (Ti)	2019/07/17	NC		%	20
			Total Uranium (U)	2019/07/17	17		%	20
			Total Vanadium (V)	2019/07/17	NC		%	20
			Total Zinc (Zn)	2019/07/17	NC		%	20
			Total Zirconium (Zr)	2019/07/17	NC		%	20
9508874	MA4	Spiked Blank	pH	2019/07/16		100	%	97 - 103
9508874	MA4	RPD	pH	2019/07/16	0.021		%	N/A
9508877	MA4	Spiked Blank	Alkalinity (Total as CaCO3)	2019/07/16		100	%	80 - 120
9508877	MA4	Method Blank	Alkalinity (PP as CaCO3)	2019/07/16	<1.0		mg/L	
			Alkalinity (Total as CaCO3)	2019/07/16	<1.0		mg/L	
			Bicarbonate (HCO3)	2019/07/16	<1.0		mg/L	
			Carbonate (CO3)	2019/07/16	<1.0		mg/L	
			Hydroxide (OH)	2019/07/16	<1.0		mg/L	
9508877	MA4	RPD	Alkalinity (PP as CaCO3)	2019/07/16	8.1		%	20
			Alkalinity (Total as CaCO3)	2019/07/16	0.52		%	20
			Bicarbonate (HCO3)	2019/07/16	0.91		%	20
			Carbonate (CO3)	2019/07/16	8.1		%	20



BUREAU
VERITAS

BV Labs Job #: B956373
Report Date: 2019/08/01

STANTEC CONSULTING LTD
Client Project #: 121414585
Site Location: Gordon Lake
Sampler Initials: BW

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Hydroxide (OH)	2019/07/16	NC		%	20
9508878	MA4	Spiked Blank	Conductivity	2019/07/16		101	%	90 - 110
9508878	MA4	Method Blank	Conductivity	2019/07/16	<2.0		uS/cm	
9508878	MA4	RPD	Conductivity	2019/07/16	0.072		%	10
9511183	AL2	Matrix Spike	Total Phosphorus (P)	2019/07/18		99	%	80 - 120
9511183	AL2	QC Standard	Total Phosphorus (P)	2019/07/18		93	%	80 - 120
9511183	AL2	Spiked Blank	Total Phosphorus (P)	2019/07/18		103	%	80 - 120
9511183	AL2	Method Blank	Total Phosphorus (P)	2019/07/18	<0.0030		mg/L	
9511183	AL2	RPD	Total Phosphorus (P)	2019/07/18	0.25		%	20
9511192	AL2	Matrix Spike	Total Phosphorus (P)	2019/07/18		112	%	80 - 120
9511192	AL2	QC Standard	Total Phosphorus (P)	2019/07/18		92	%	80 - 120
9511192	AL2	Spiked Blank	Total Phosphorus (P)	2019/07/18		102	%	80 - 120
9511192	AL2	Method Blank	Total Phosphorus (P)	2019/07/18	<0.0030		mg/L	
9511192	AL2	RPD	Total Phosphorus (P)	2019/07/18	2.8		%	20
9512960	FFE	Matrix Spike	Total Organic Carbon (C)	2019/07/19		116	%	80 - 120
9512960	FFE	Spiked Blank	Total Organic Carbon (C)	2019/07/19		105	%	80 - 120
9512960	FFE	Method Blank	Total Organic Carbon (C)	2019/07/19	<0.50		mg/L	
9512960	FFE	RPD	Total Organic Carbon (C)	2019/07/19	6.5		%	20
9514650	ACY	Matrix Spike [WB9161-05]	Dissolved Calcium (Ca)	2019/07/19		NC	%	80 - 120
			Dissolved Iron (Fe)	2019/07/19		NC	%	80 - 120
			Dissolved Magnesium (Mg)	2019/07/19		NC	%	80 - 120
			Dissolved Manganese (Mn)	2019/07/19		NC	%	80 - 120
			Dissolved Potassium (K)	2019/07/19		95	%	80 - 120
			Dissolved Sodium (Na)	2019/07/19		NC	%	80 - 120
9514650	ACY	Spiked Blank	Dissolved Calcium (Ca)	2019/07/19		96	%	80 - 120
			Dissolved Iron (Fe)	2019/07/19		98	%	80 - 120
			Dissolved Magnesium (Mg)	2019/07/19		99	%	80 - 120
			Dissolved Manganese (Mn)	2019/07/19		96	%	80 - 120
			Dissolved Potassium (K)	2019/07/19		99	%	80 - 120
			Dissolved Sodium (Na)	2019/07/19		102	%	80 - 120
9514650	ACY	Method Blank	Dissolved Calcium (Ca)	2019/07/19	<0.30		mg/L	
			Dissolved Iron (Fe)	2019/07/19	<0.060		mg/L	
			Dissolved Magnesium (Mg)	2019/07/19	<0.20		mg/L	
			Dissolved Manganese (Mn)	2019/07/19	<0.0040		mg/L	
			Dissolved Potassium (K)	2019/07/19	<0.30		mg/L	
			Dissolved Sodium (Na)	2019/07/19	<0.50		mg/L	
9514650	ACY	RPD [WB9161-05]	Dissolved Calcium (Ca)	2019/07/19	0.97		%	20
			Dissolved Iron (Fe)	2019/07/19	0.25		%	20
			Dissolved Magnesium (Mg)	2019/07/19	1.5		%	20
			Dissolved Manganese (Mn)	2019/07/19	0.11		%	20
			Dissolved Potassium (K)	2019/07/19	2.1		%	20
			Dissolved Sodium (Na)	2019/07/19	1.6		%	20
9514827	AL2	Matrix Spike	Total Ammonia (N)	2019/07/19		100	%	80 - 120
9514827	AL2	Spiked Blank	Total Ammonia (N)	2019/07/19		99	%	80 - 120
9514827	AL2	Method Blank	Total Ammonia (N)	2019/07/19	<0.015		mg/L	



BUREAU
VERITAS

BV Labs Job #: B956373
Report Date: 2019/08/01

STANTEC CONSULTING LTD
Client Project #: 121414585
Site Location: Gordon Lake
Sampler Initials: BW

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
9514827	AL2	RPD	Total Ammonia (N)	2019/07/19	NC		%	20
<p>N/A = Not Applicable</p> <p>Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.</p> <p>Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.</p> <p>QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.</p> <p>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.</p> <p>Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.</p> <p>Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.</p> <p>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)</p> <p>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).</p> <p>(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.</p>								



BUREAU
VERITAS

BV Labs Job #: B956373
Report Date: 2019/08/01

STANTEC CONSULTING LTD
Client Project #: 121414585
Site Location: Gordon Lake
Sampler Initials: BW

VALIDATION SIGNATURE PAGE

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

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

Justin Geisel, B.Sc., Organics Supervisor

Roland Menard, Analyst II

Suwan Fock, B.Sc., QP, Inorganics Senior Analyst

Sandy Yuan, M.Sc., QP, Inorganics Supervisor

BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports.
For Service Group specific validation please refer to the Validation Signature Page.



Custody Tracking Form

413.



W15386

Please use this form for custody tracking when submitting the work instructions via eTR (electronic Test Requisition). Please ensure your form has a barcode or a BV Labs eTR confirmation number in the top right hand side. This number links your electronic submission to your samples.

First Sample: SNP2016-11b1-2018-1
Last Sample: FB_SW_SNP_2019_01
Sample Count: 7

Relinquished By				Received By			
Rafaelle Pyne	rf Pyne	Date	2019/07/09	WIRNIESHOM	[Signature]	Date	20190710
		Time (24 HR)	07:00			Time (24 HR)	01:11 WYS
		Date				Date	
		Time (24 HR)				Time (24 HR)	
		Date				Date	
		Time (24 HR)				Time (24 HR)	

Submission Triage Information			
Sampled By	# of Coolers/Pkgs:	Rush <input type="checkbox"/>	Food Residue <input type="checkbox"/>
BW/RP	1	Immediate Test <input type="checkbox"/>	Food Chemistry <input type="checkbox"/>
		Micro <input type="checkbox"/>	

*** LAB USE ONLY ***									
Received At	Labeled By	Verified By	Comments	Custody Seal		Cooling Media	Temperature °C		
				Present (Y/N)	Intact (Y/N)		1	2	3
ME02			Received in Yellowknife By: [Signature] JUL 09 2019	Y	Y	Y	2	2	1
			ME02-	WYS	20190710				

Temp: 8.0 7.9 8.1

B956373



Custody Tracking Form

489(2)



W15386

Please use this form for custody tracking when submitting the work instructions via eTR (electronic Test Requisition). Please ensure your form has a barcode or a BV Labs eTR confirmation number in the top right hand side. This number links your electronic submission to your samples.

First Sample: CAM_SW_SNP_11B1_2019_01
Last Sample: SS01
Sample Count: 15

Relinquished By				Received By			
Roxanne Pyne	<i>[Signature]</i>	Date	2019/07/09	DAISE MATHEN	<i>[Signature]</i>	Date	2019/07/11
		Time (24 HR)	18:30			Time (24 HR)	10:29
		Date				Date	
		Time (24 HR)				Time (24 HR)	
		Date				Date	
		Time (24 HR)				Time (24 HR)	

Submission Triage Information			
Sampled By	# of Coolers/Pkgs:	Rush <input type="checkbox"/>	Food Residue <input type="checkbox"/>
RP & BW	2	Immediate Test <input type="checkbox"/>	Food Chemistry <input type="checkbox"/>
		Micro <input type="checkbox"/>	

*** LAB USE ONLY ***						
Received At	Comments:	Custody Seal				
MED2		Present (Y/N)	Intact (Y/N)	Cooling Media	Temperature °C	
Labeled By					1	2
Verified By					3	
		Y	Y	Y	4.3	37
		N	N	Y	7	8
		N	N	Y	9	9

RECEIVED IN YELLOWKNIFE
By: *[Signature]*
2019 -UI- 2 1

Temp: 43.1 / 37.4.6

Secured Seal present
B956373



Custody Tracking Form

537



W15386

Please use this form for custody tracking when submitting the work instructions via eTR (electronic Test Requisition). Please ensure your form has a barcode or a BV Labs eTR confirmation number in the top right hand side. This number links your electronic submission to your samples.

First Sample: CAM_SW_SNP_11B1_2019_01
Last Sample: SS03
Sample Count: 20

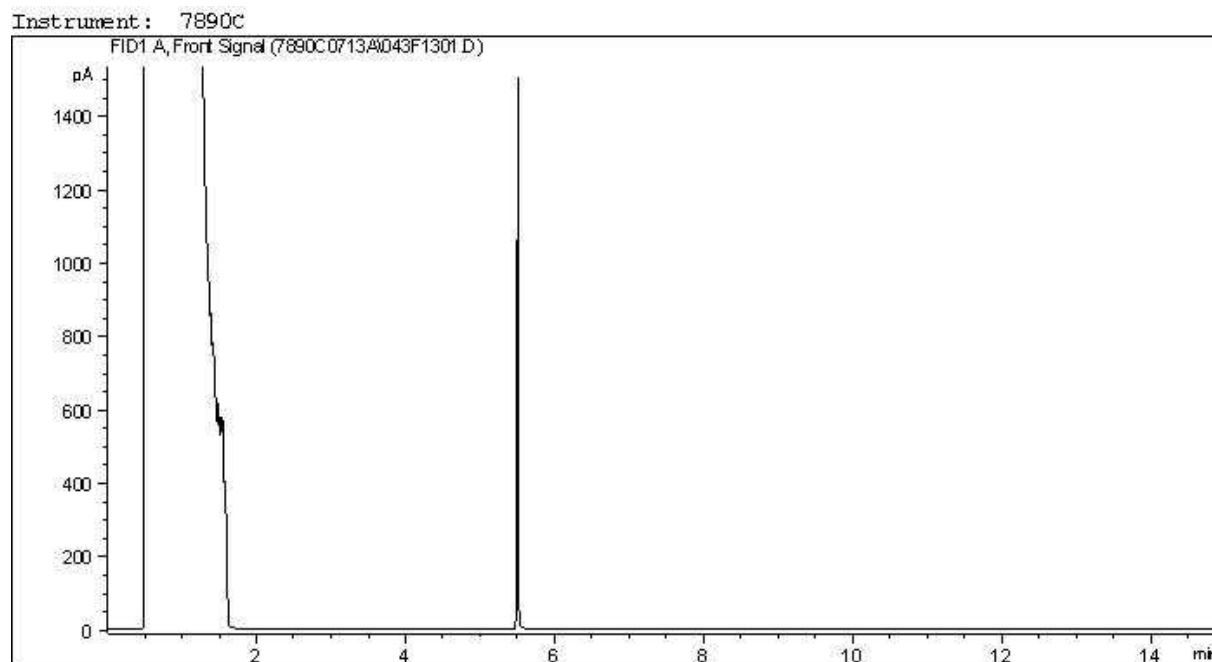
Relinquished By				Received By			
Roxanne Pyke	x Pyke	Date	2019/07/10	JESSICA LEC	WLB	Date	20190712
		Time (24 HR)	17:00			Time (24 HR)	10:17
		Date				Date	
		Time (24 HR)				Time (24 HR)	
		Date				Date	
		Time (24 HR)				Time (24 HR)	

Submission Triage Information			
Sampled By	# of Coolers/Pkgs:	Rush <input type="checkbox"/>	Food Residue <input type="checkbox"/>
RP + BW	1	Immediate Test <input type="checkbox"/>	
		Micro <input type="checkbox"/>	Food Chemistry <input type="checkbox"/>

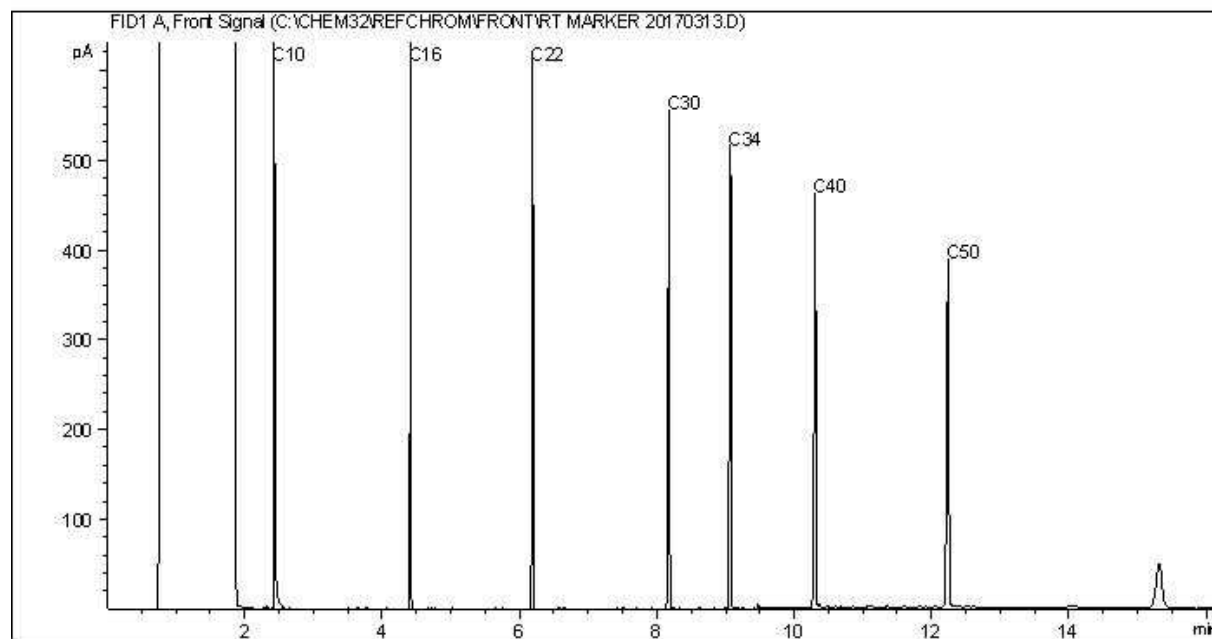
*** LAB USE ONLY ***						
Received At	Comments:	Custody Seal		Cooling Media	Temperature °C	
	Received in Yellowknife	Present (Y/N)	Intact (Y/N)		1	2
Labeled By	By: [Signature]	Y	Y	Y	-1	1
Verified By	JUL 11 2019					
	Temp: 6.4, 6.6, 6.4					

B956373

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram



Carbon Range Distribution - Reference Chromatogram

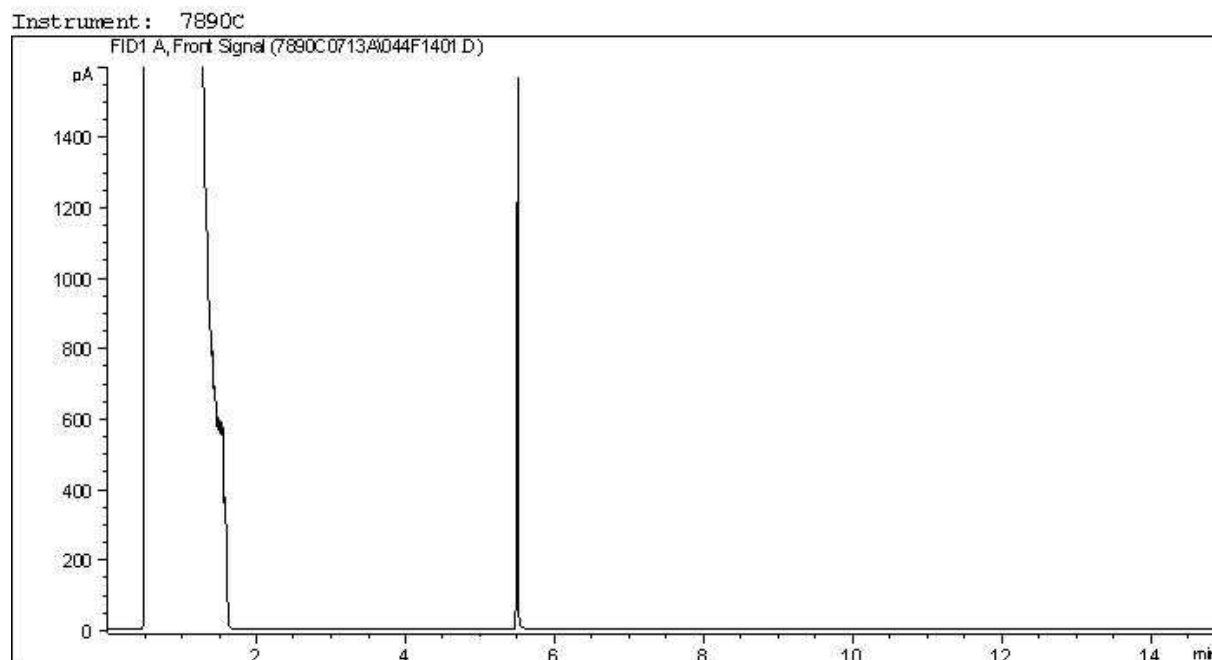


TYPICAL PRODUCT CARBON NUMBER RANGES

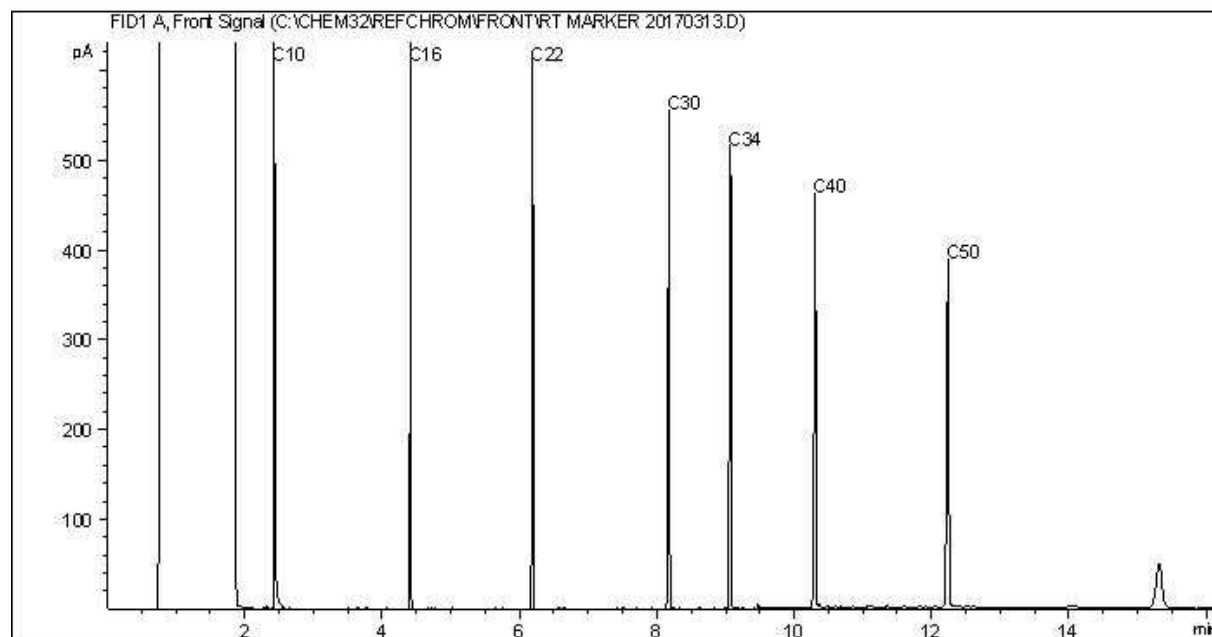
Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

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

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram



Carbon Range Distribution - Reference Chromatogram



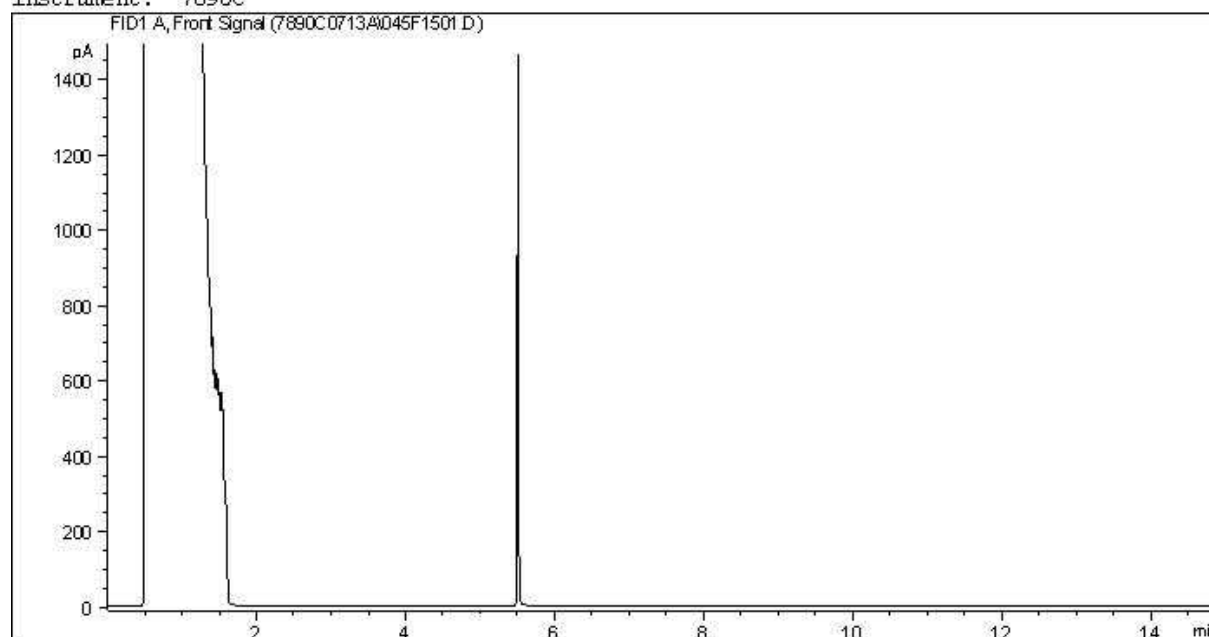
TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

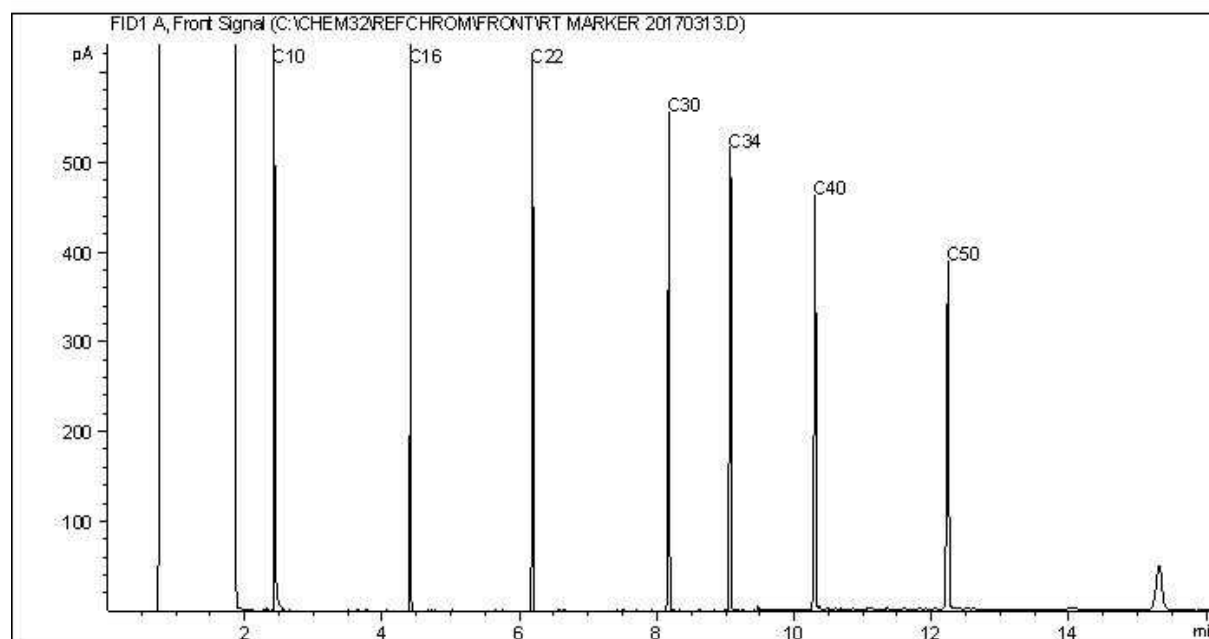
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: 7890C



Carbon Range Distribution - Reference Chromatogram



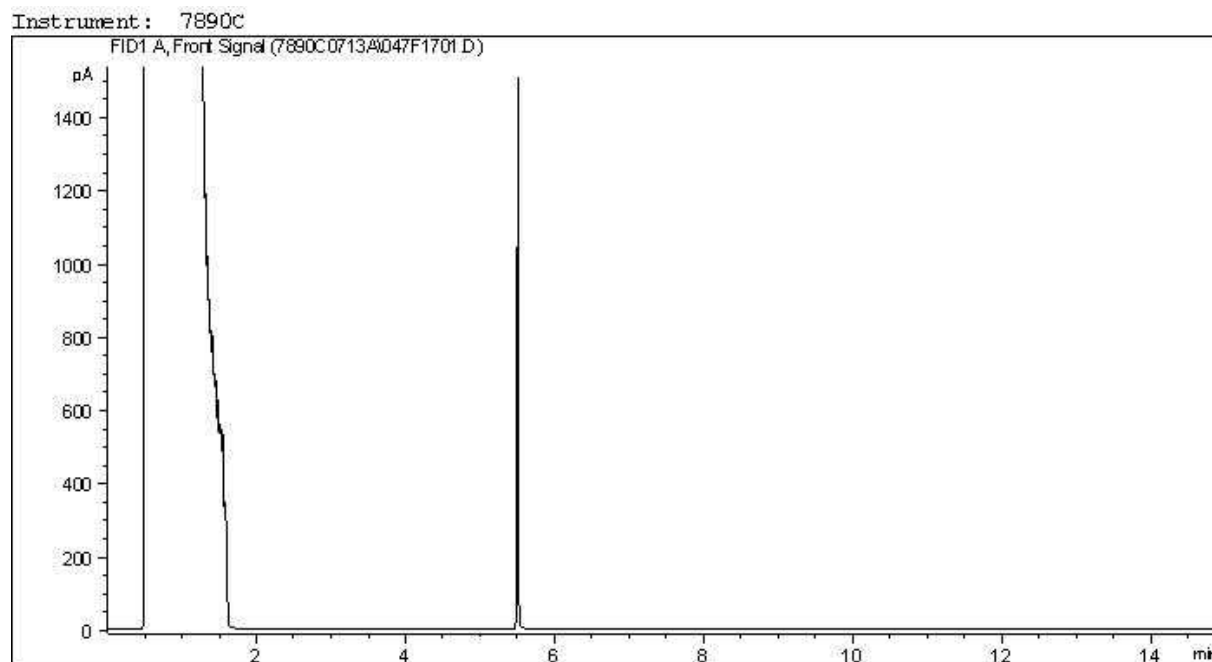
TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline: C4 - C12
 Varsol: C8 - C12
 Kerosene: C7 - C16

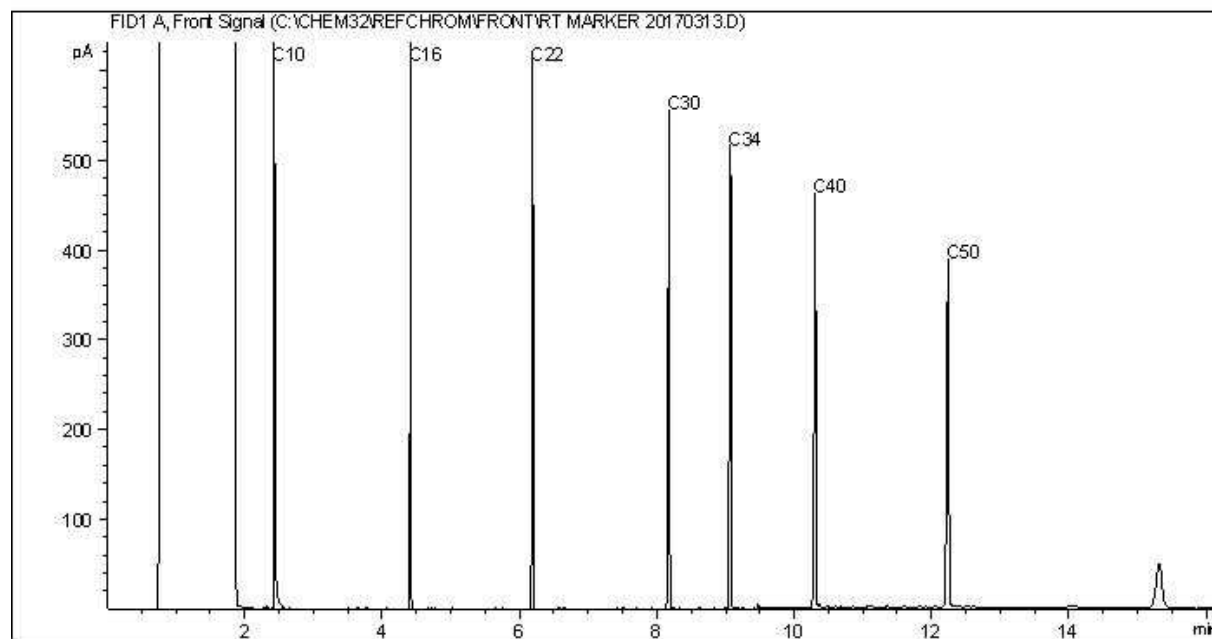
Diesel: C8 - C22
 Lubricating Oils: C20 - C40
 Crude Oils: C3 - C60+

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

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram



Carbon Range Distribution - Reference Chromatogram

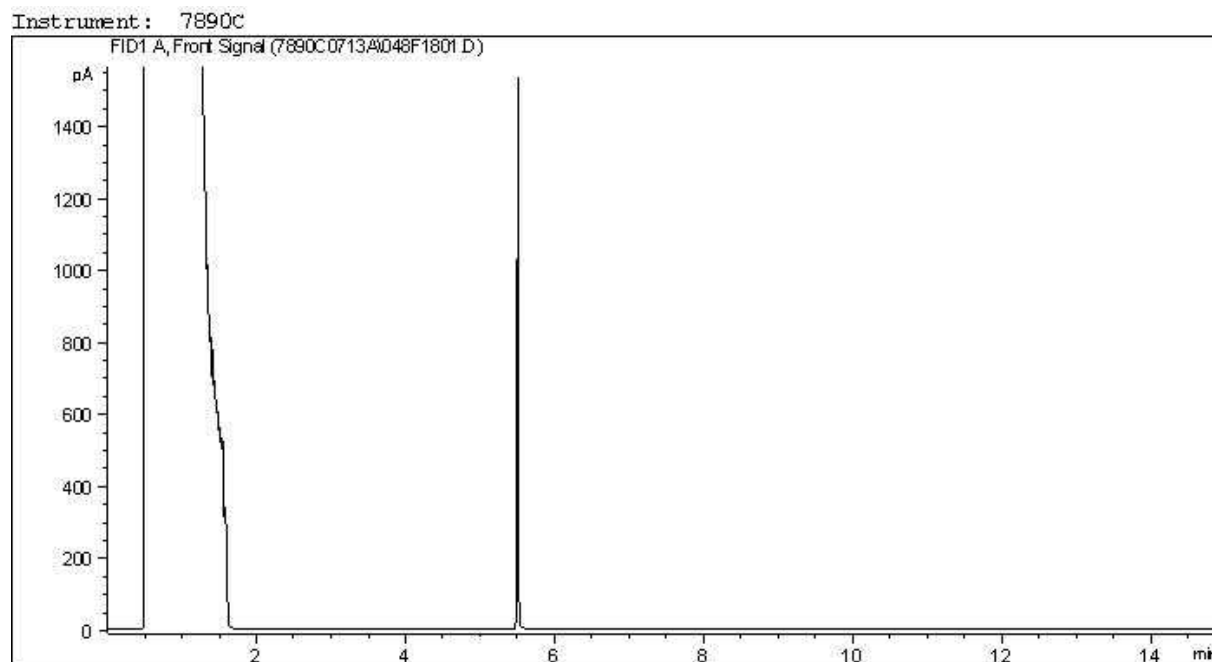


TYPICAL PRODUCT CARBON NUMBER RANGES

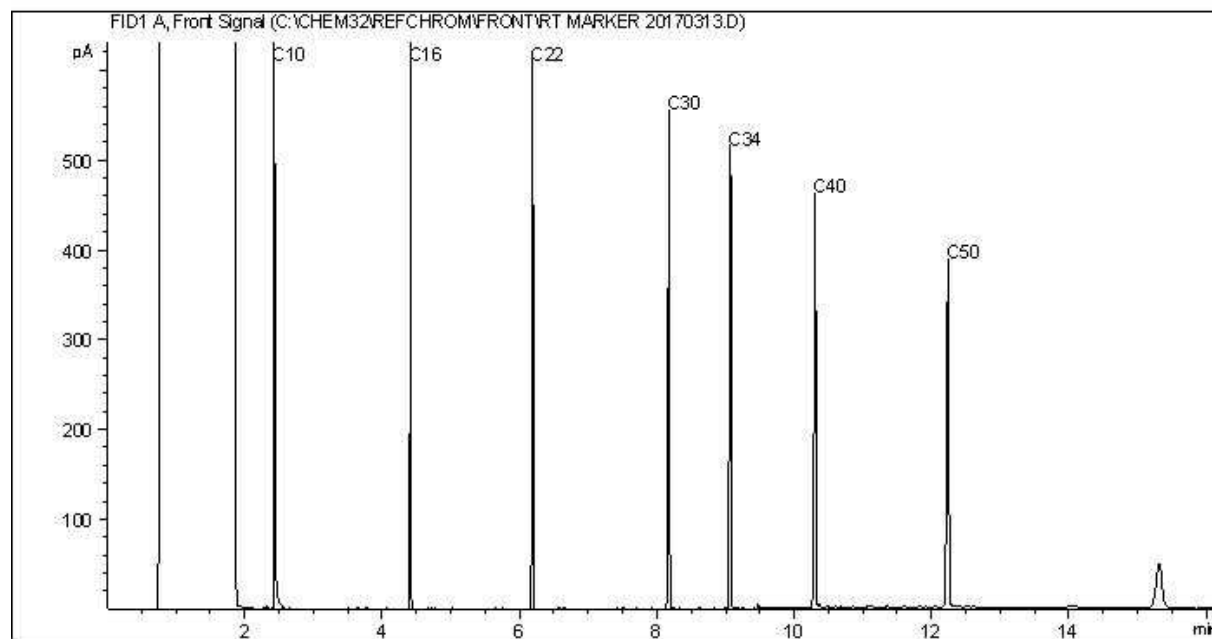
Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

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

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram



Carbon Range Distribution - Reference Chromatogram

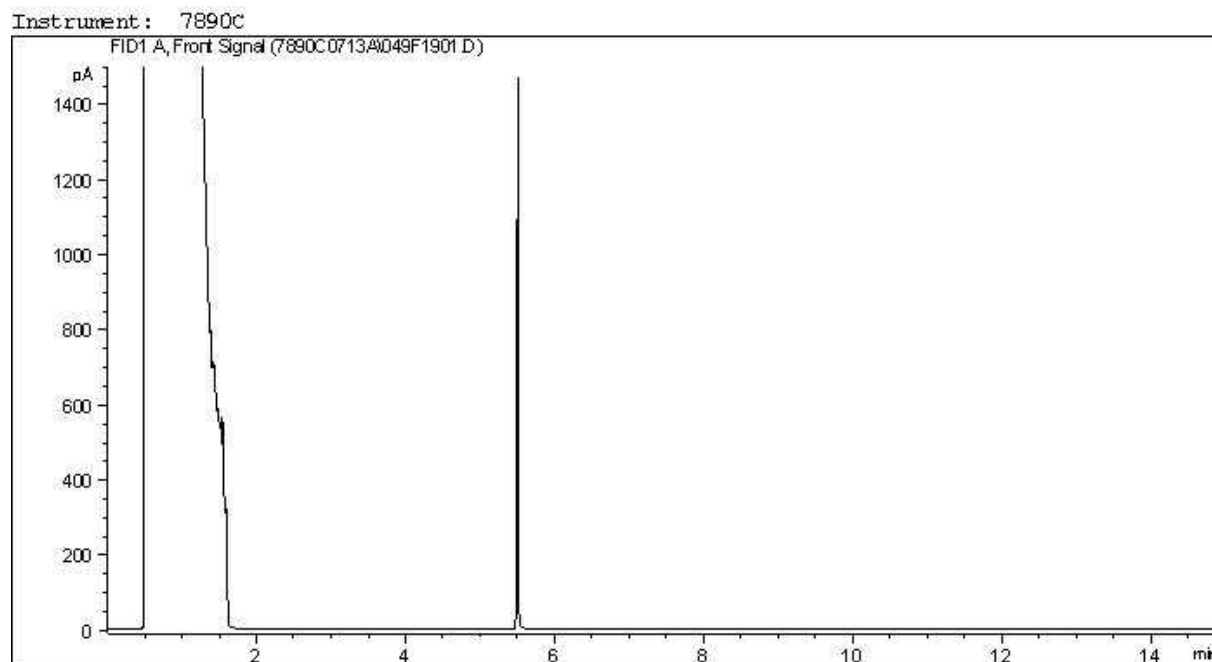


TYPICAL PRODUCT CARBON NUMBER RANGES

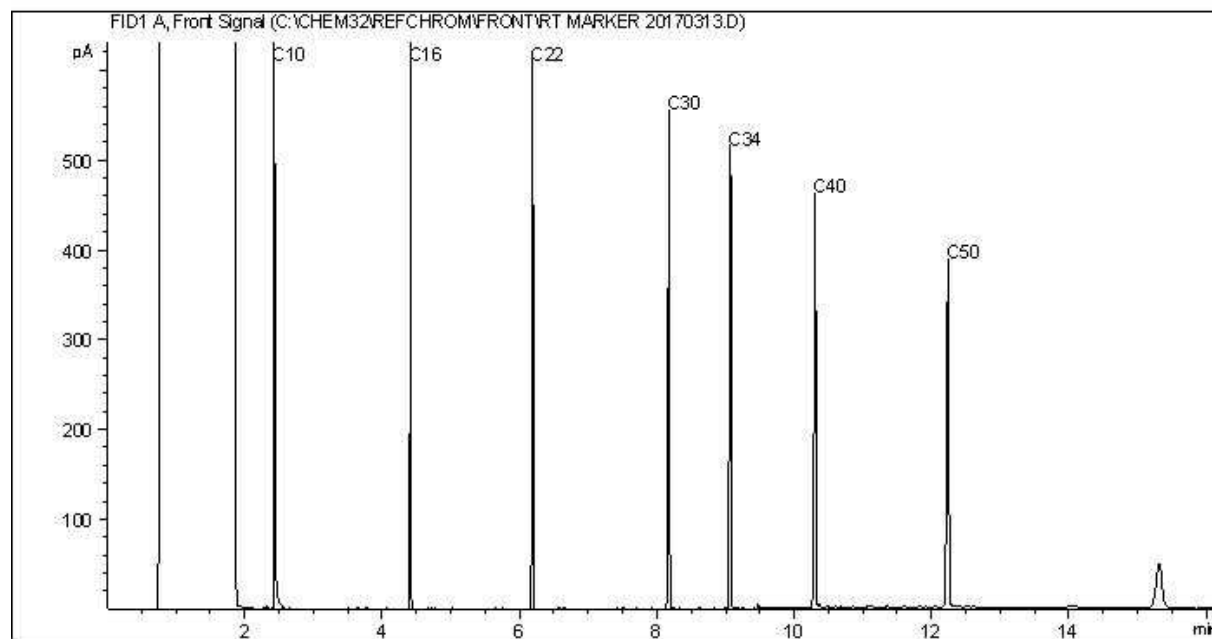
Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

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

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram



Carbon Range Distribution - Reference Chromatogram

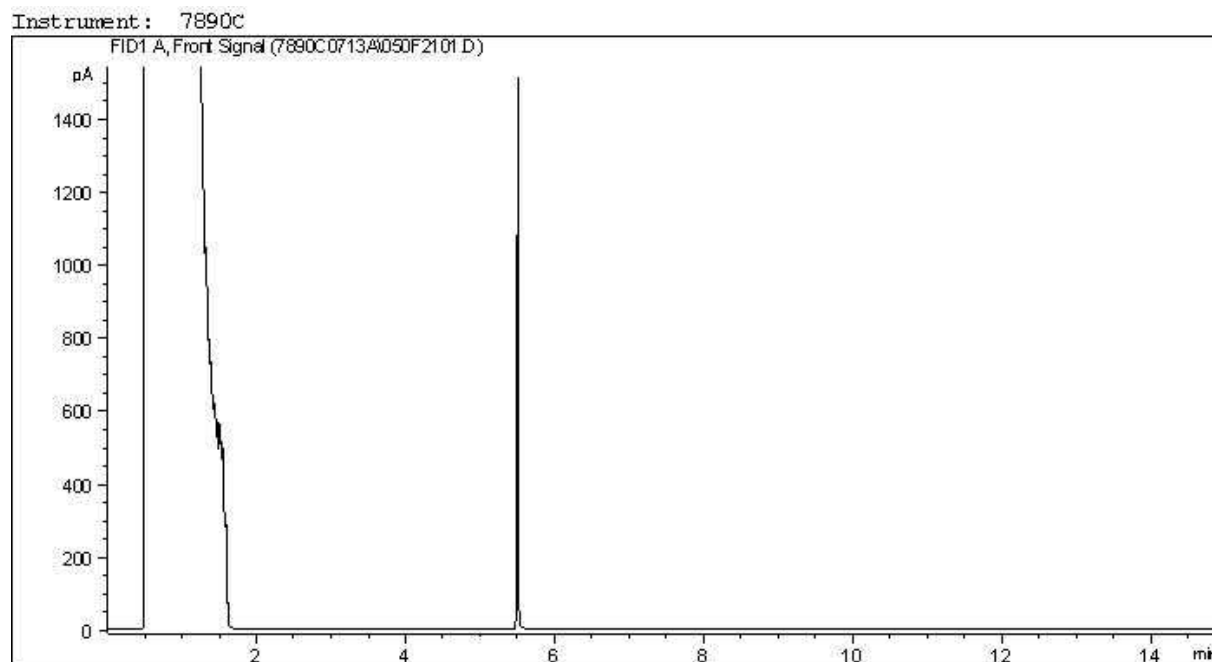


TYPICAL PRODUCT CARBON NUMBER RANGES

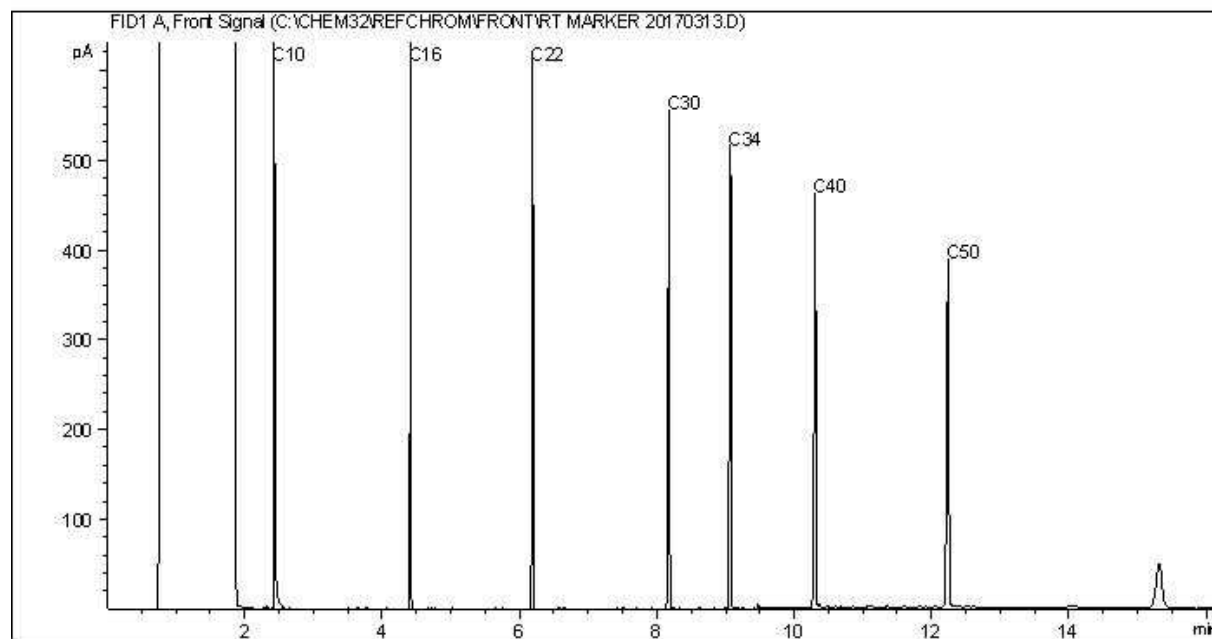
Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

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

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram



Carbon Range Distribution - Reference Chromatogram

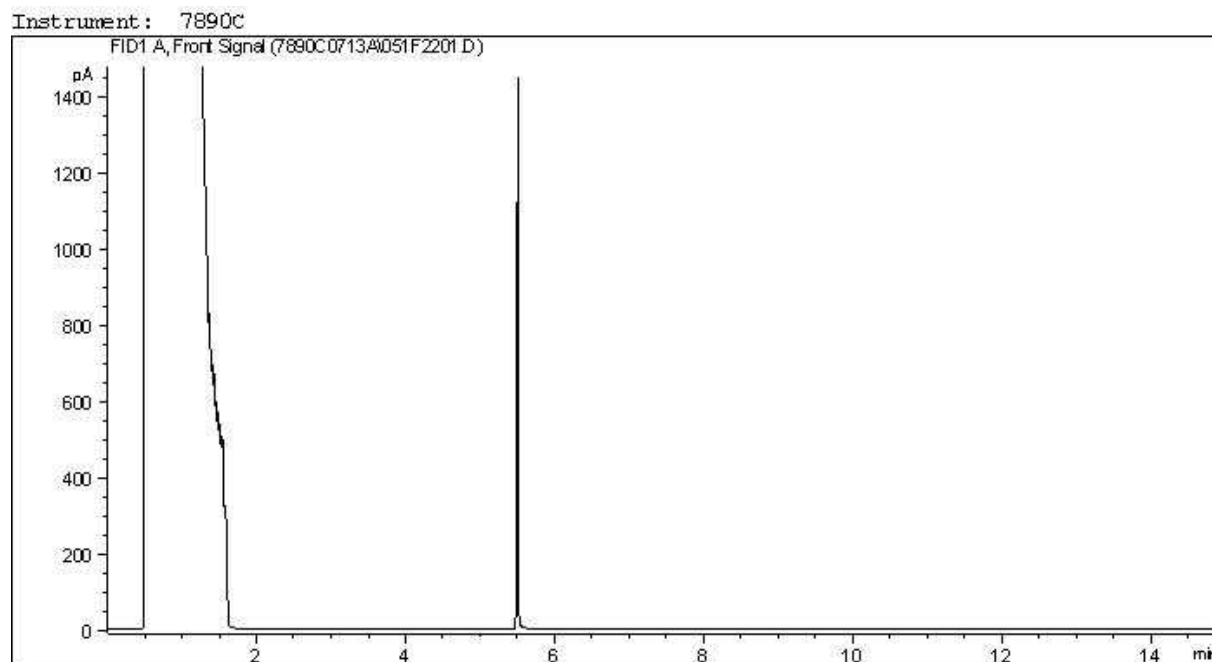


TYPICAL PRODUCT CARBON NUMBER RANGES

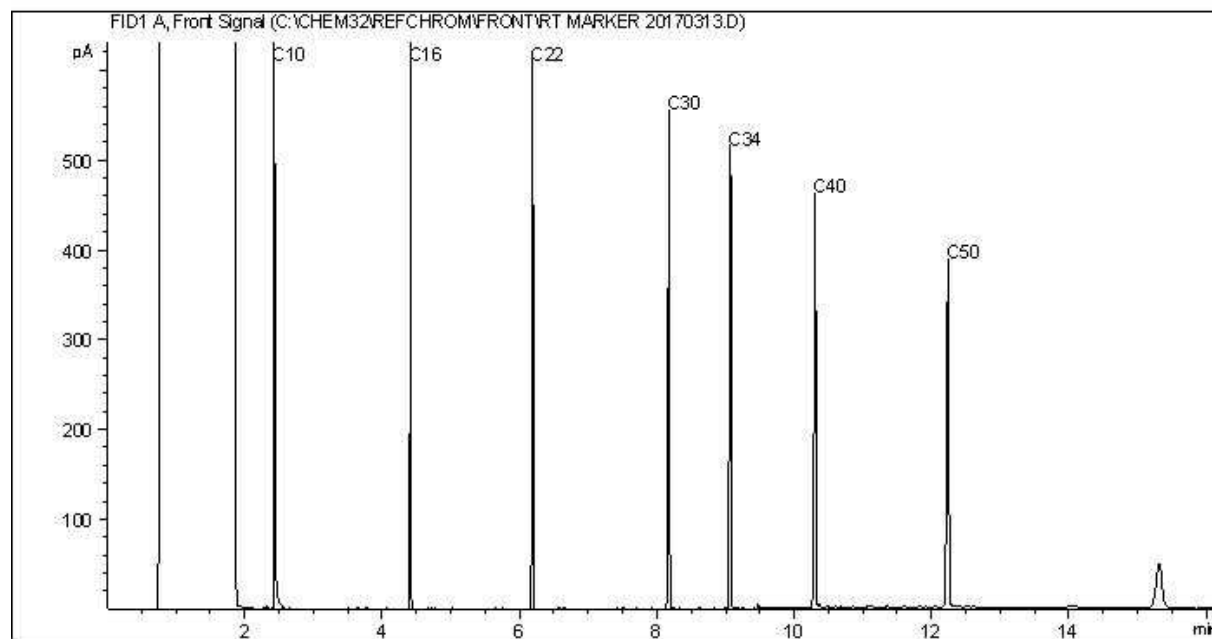
Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

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

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram



Carbon Range Distribution - Reference Chromatogram



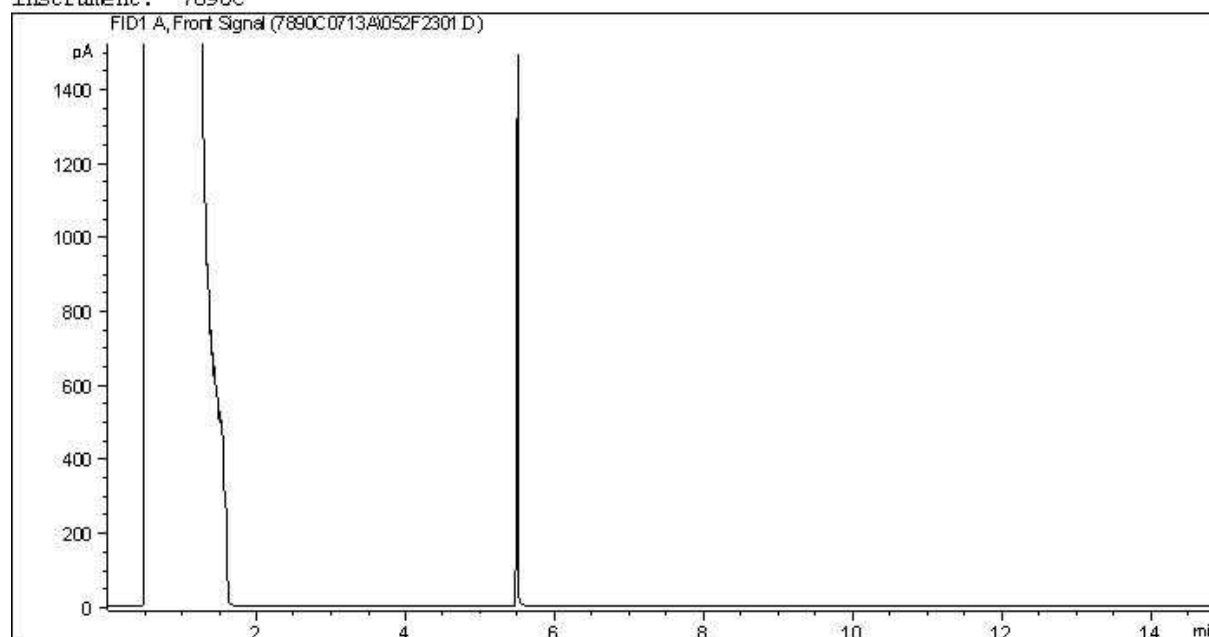
TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

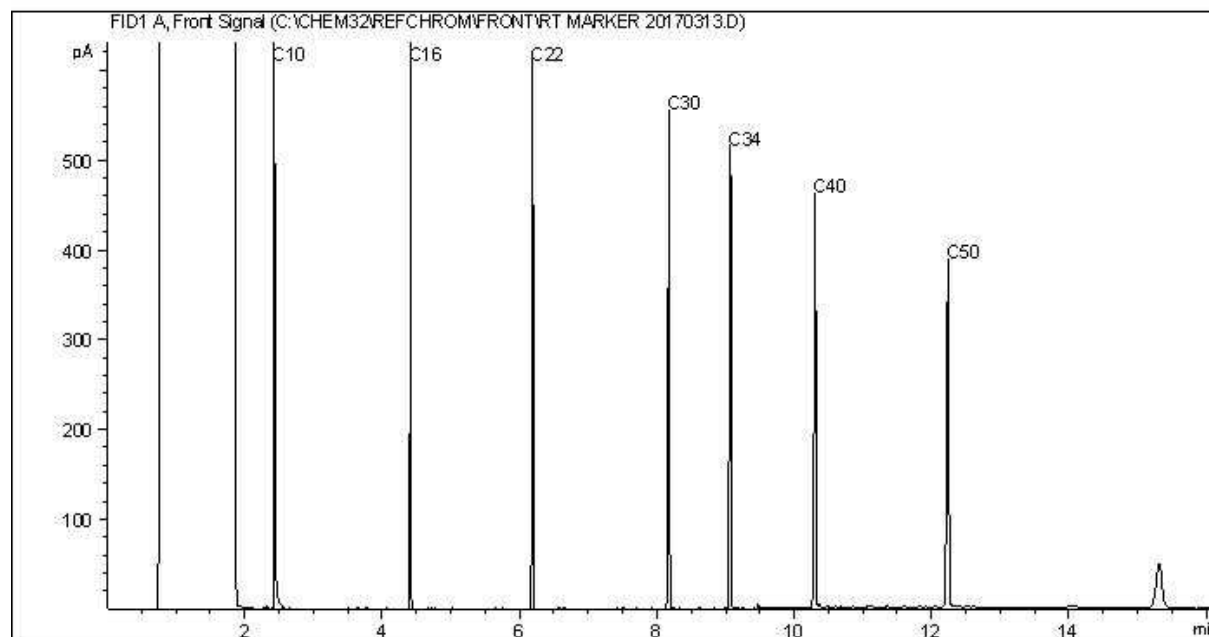
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: 7890C



Carbon Range Distribution - Reference Chromatogram

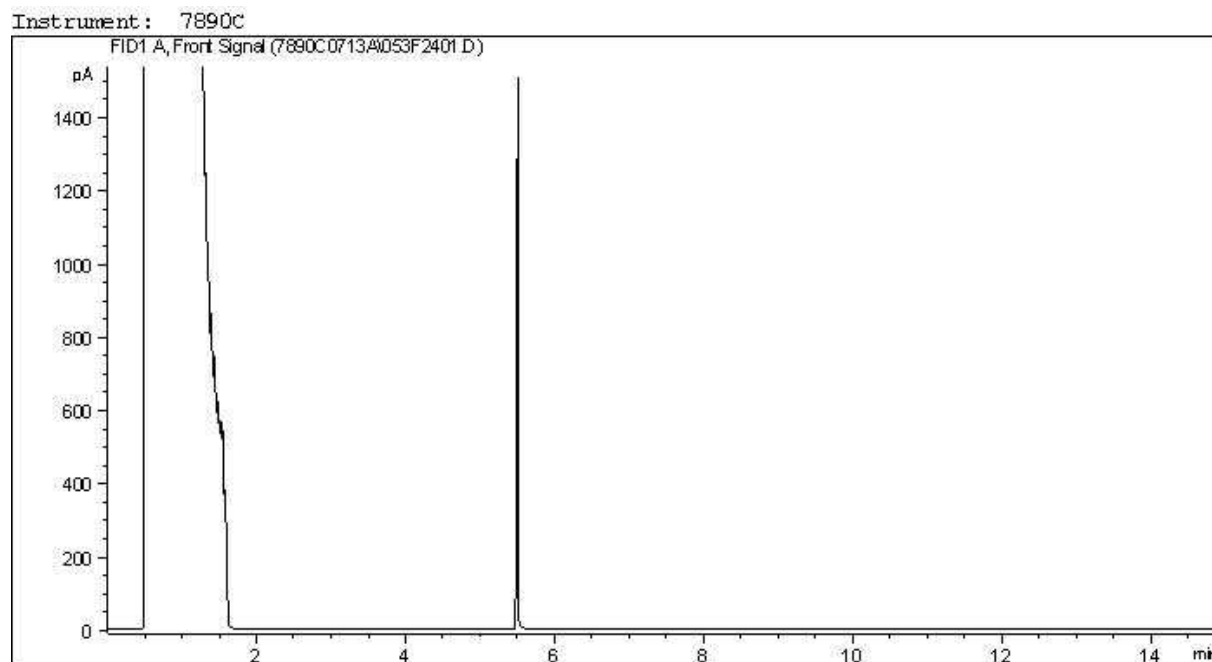


TYPICAL PRODUCT CARBON NUMBER RANGES

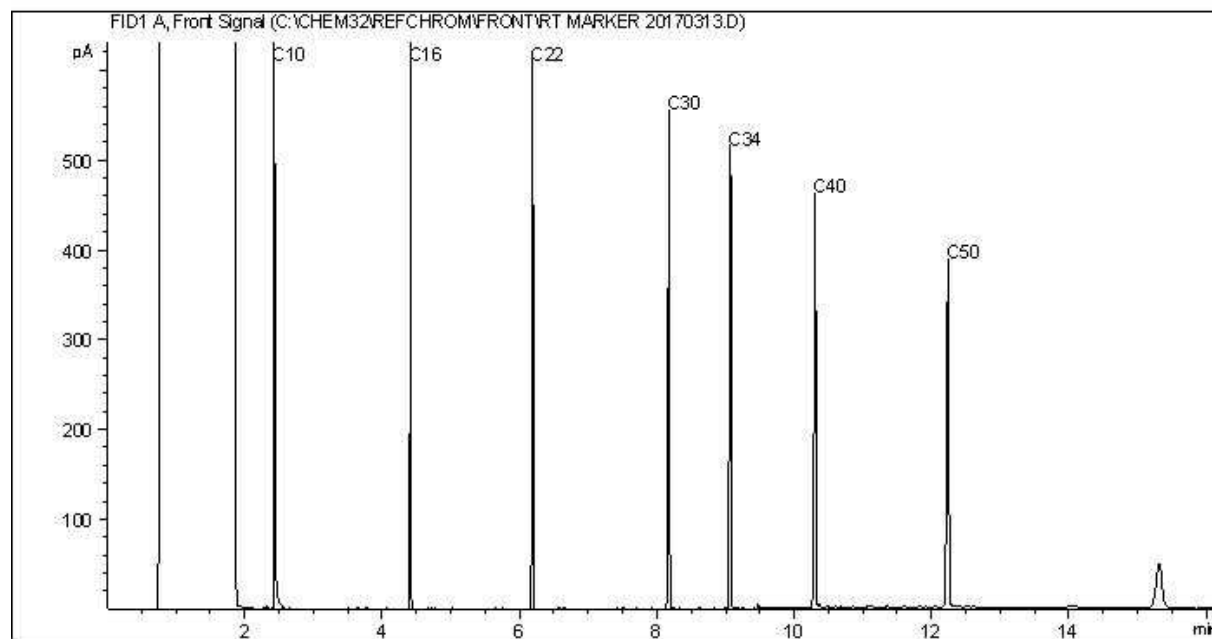
Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

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

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram



Carbon Range Distribution - Reference Chromatogram

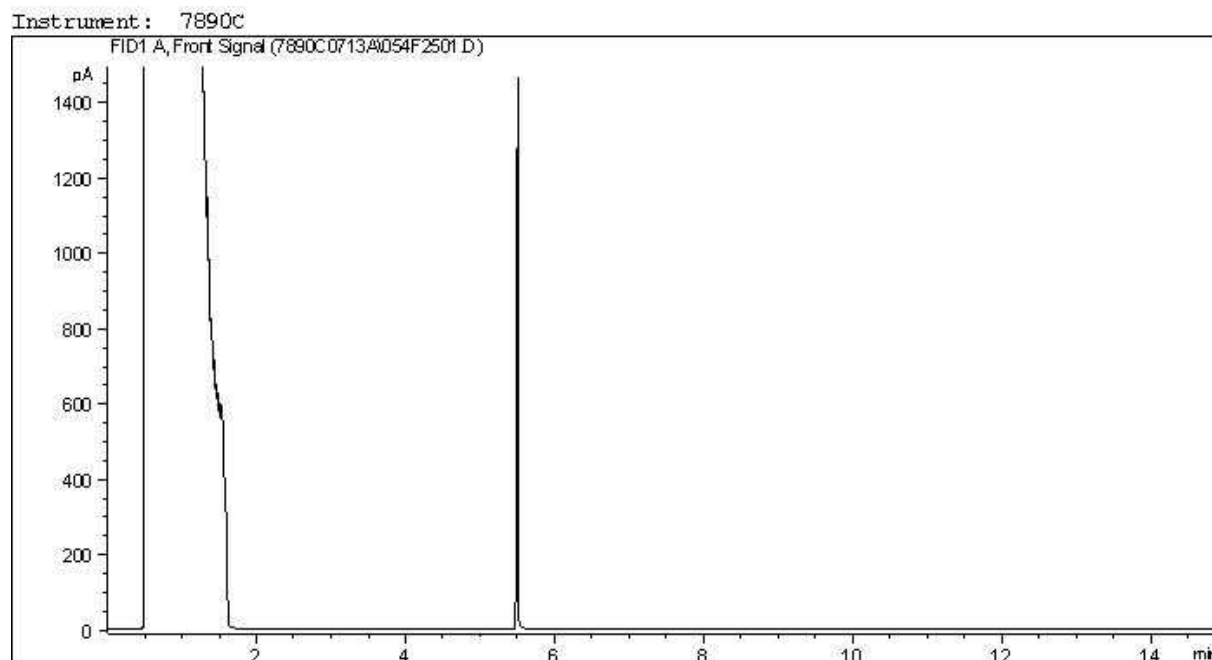


TYPICAL PRODUCT CARBON NUMBER RANGES

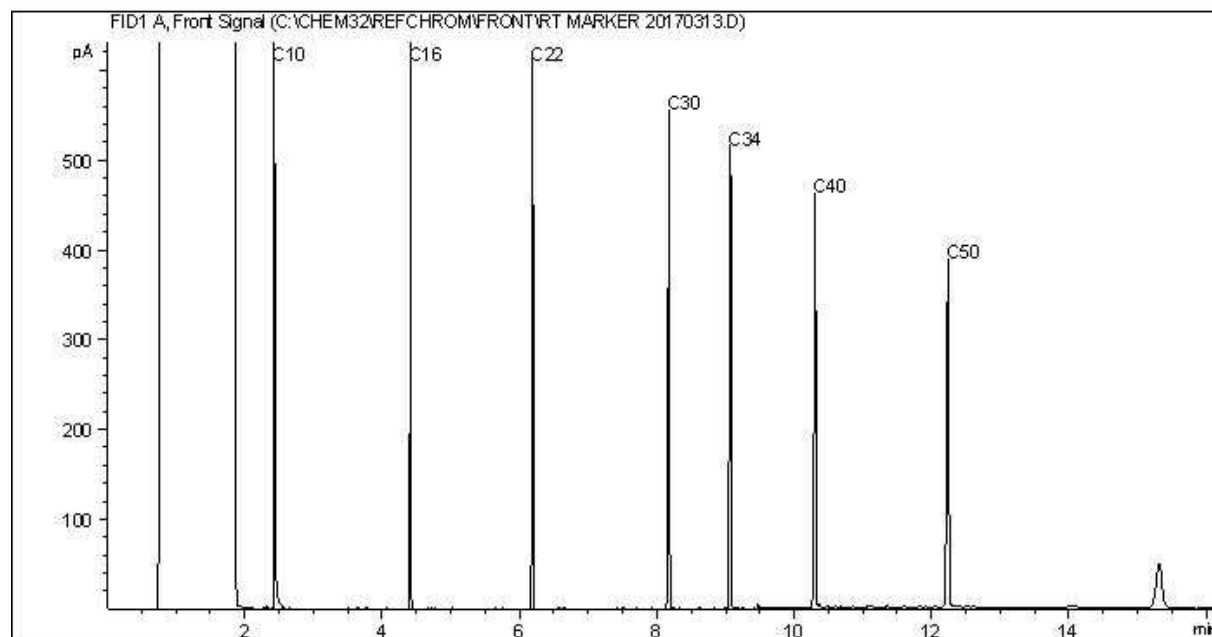
Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

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CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram



Carbon Range Distribution - Reference Chromatogram



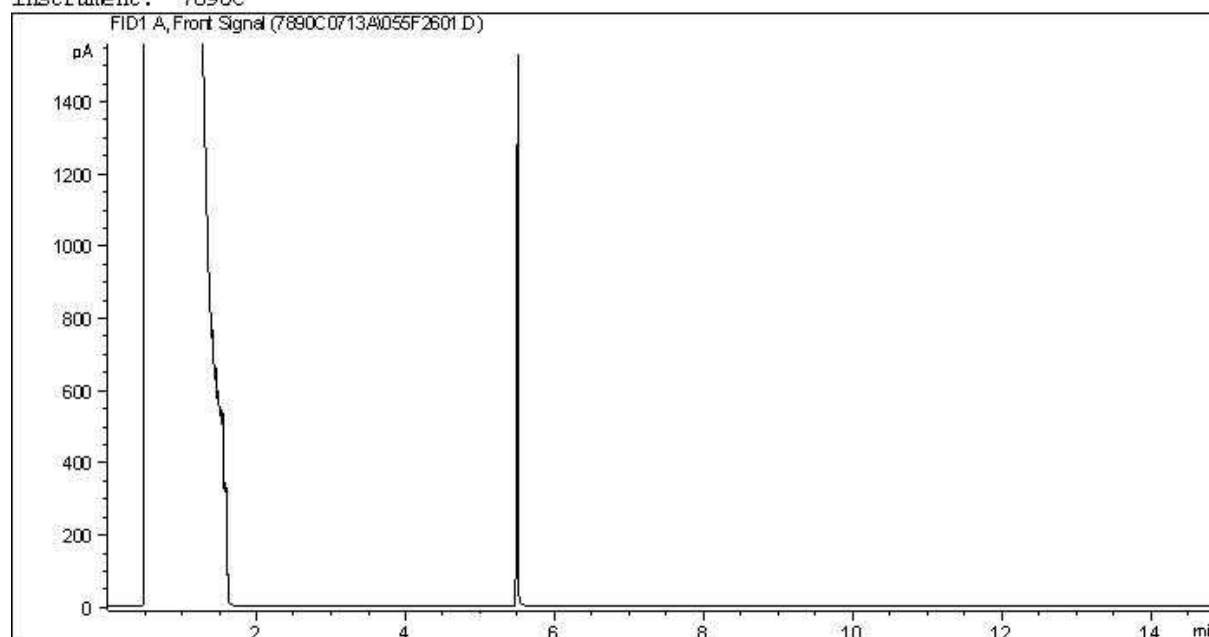
TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

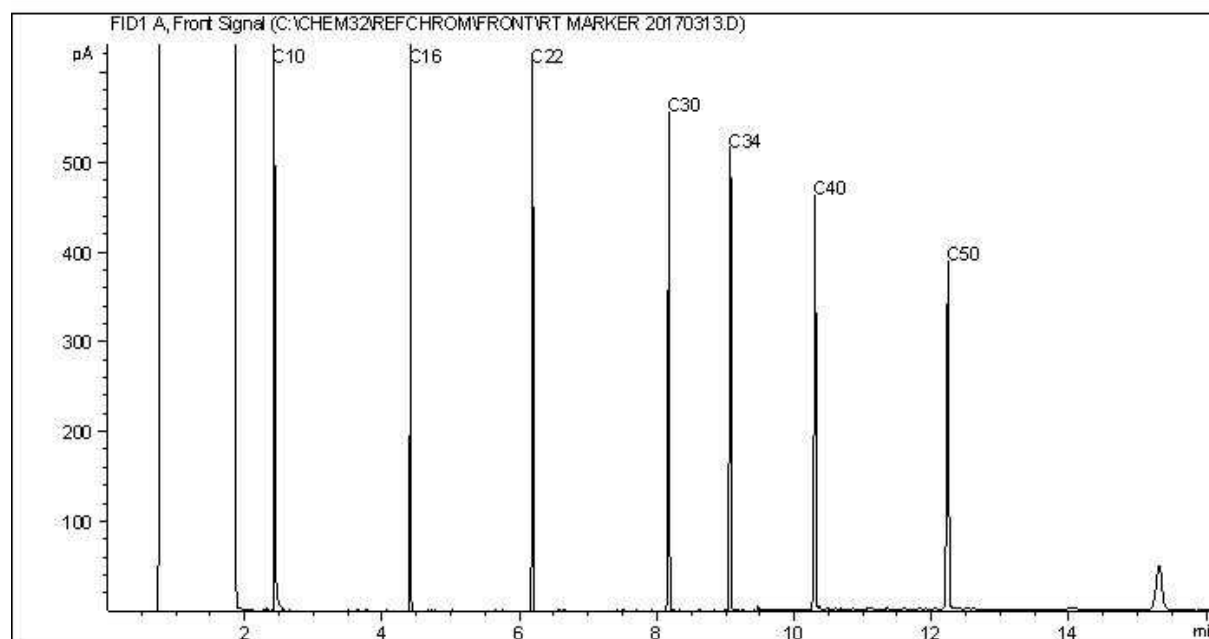
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CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: 7890C



Carbon Range Distribution - Reference Chromatogram



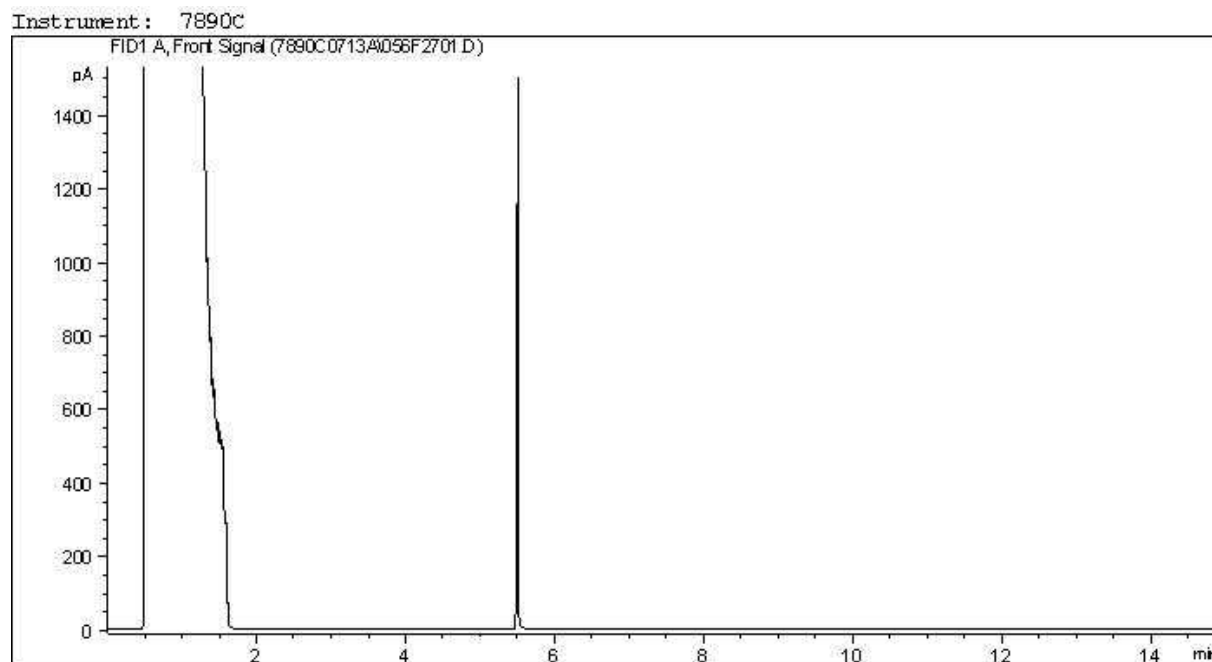
TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline: C4 - C12
 Varsol: C8 - C12
 Kerosene: C7 - C16

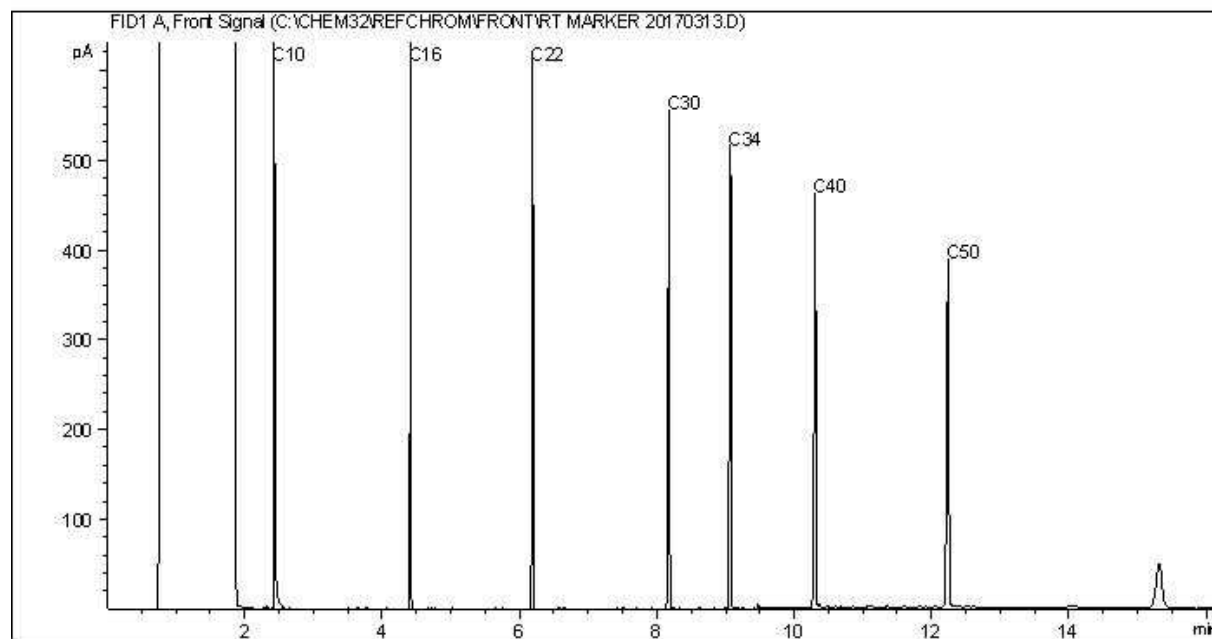
Diesel: C8 - C22
 Lubricating Oils: C20 - C40
 Crude Oils: C3 - C60+

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

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram



Carbon Range Distribution - Reference Chromatogram



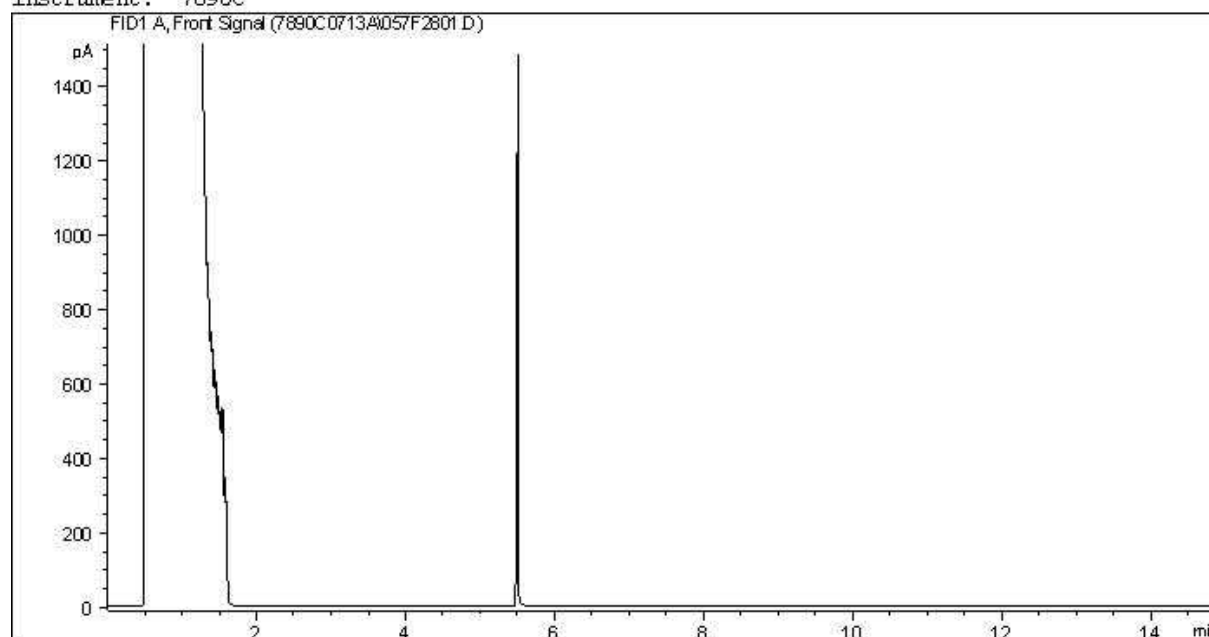
TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

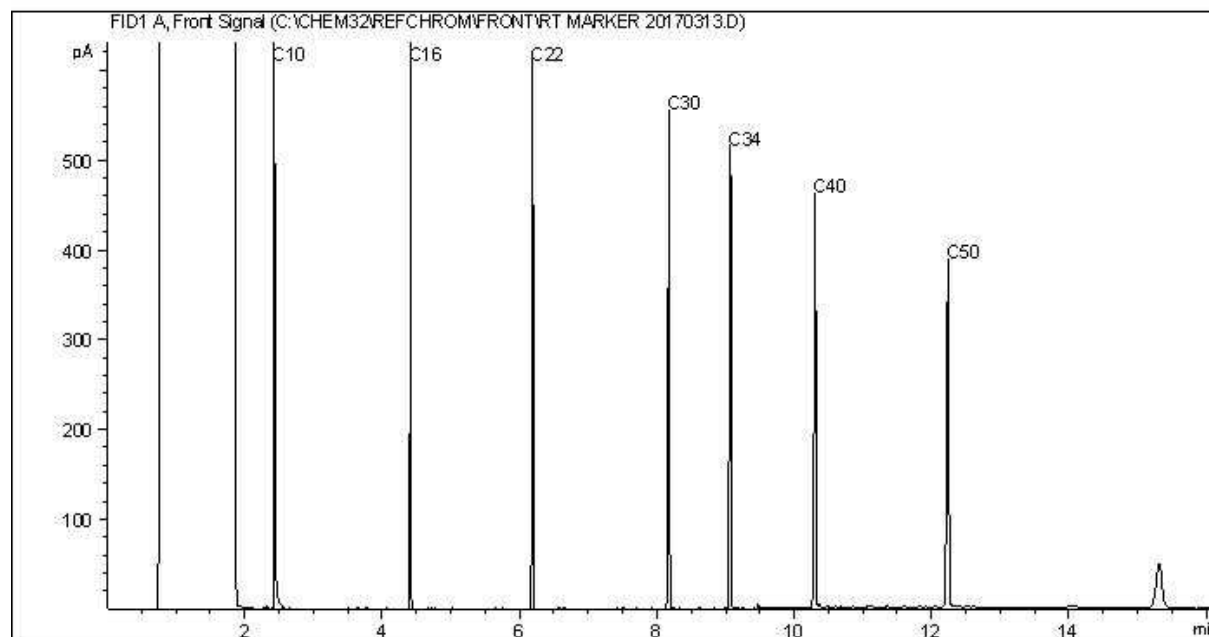
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: 7890C



Carbon Range Distribution - Reference Chromatogram

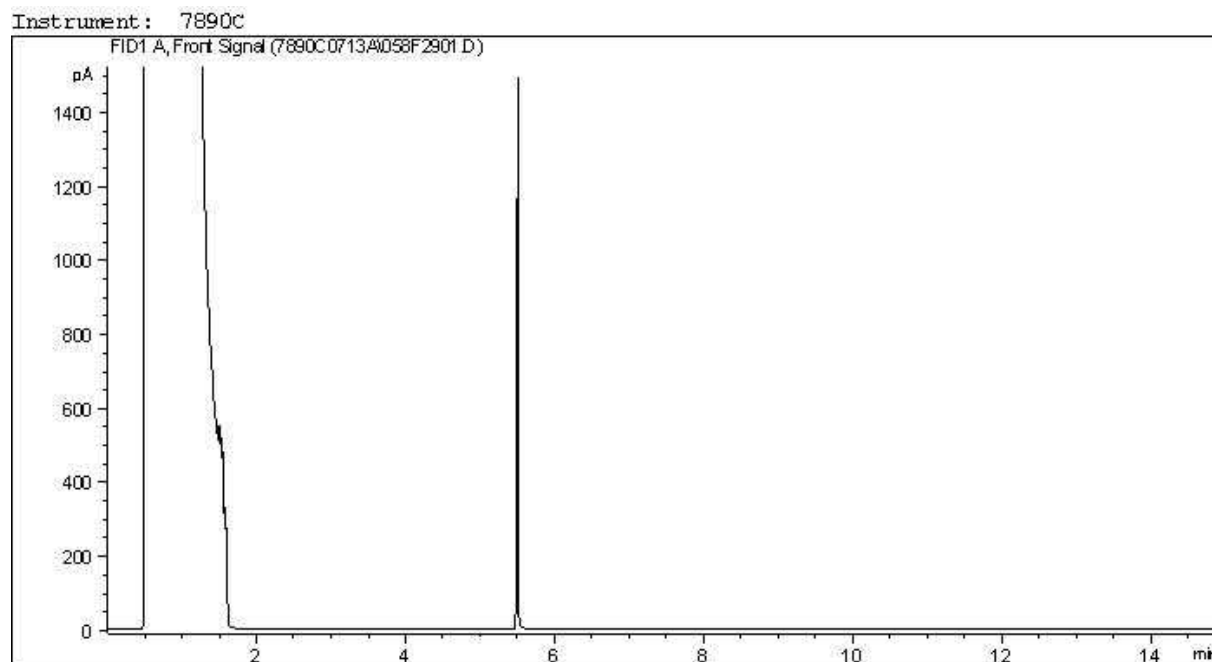


TYPICAL PRODUCT CARBON NUMBER RANGES

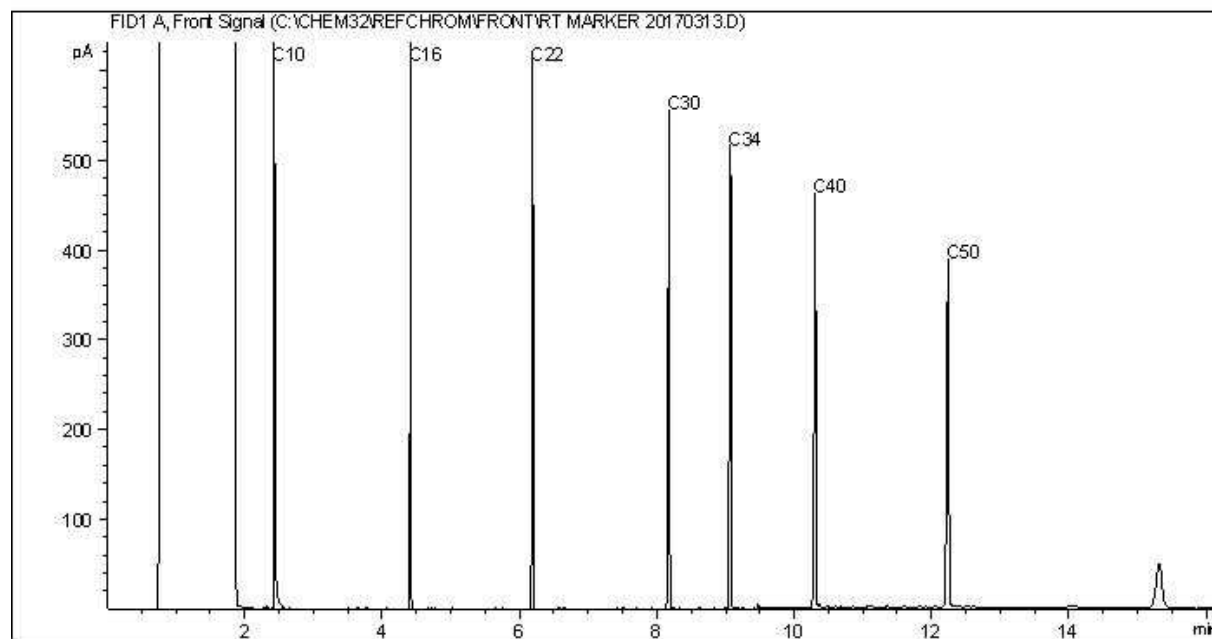
Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

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

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram



Carbon Range Distribution - Reference Chromatogram

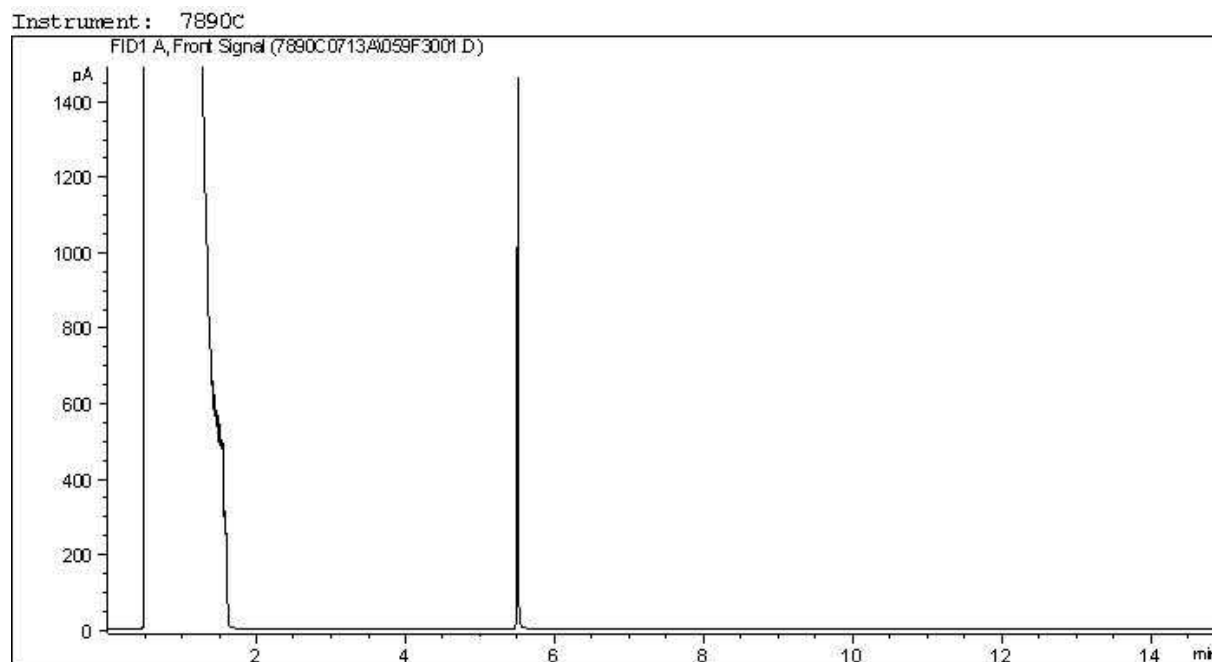


TYPICAL PRODUCT CARBON NUMBER RANGES

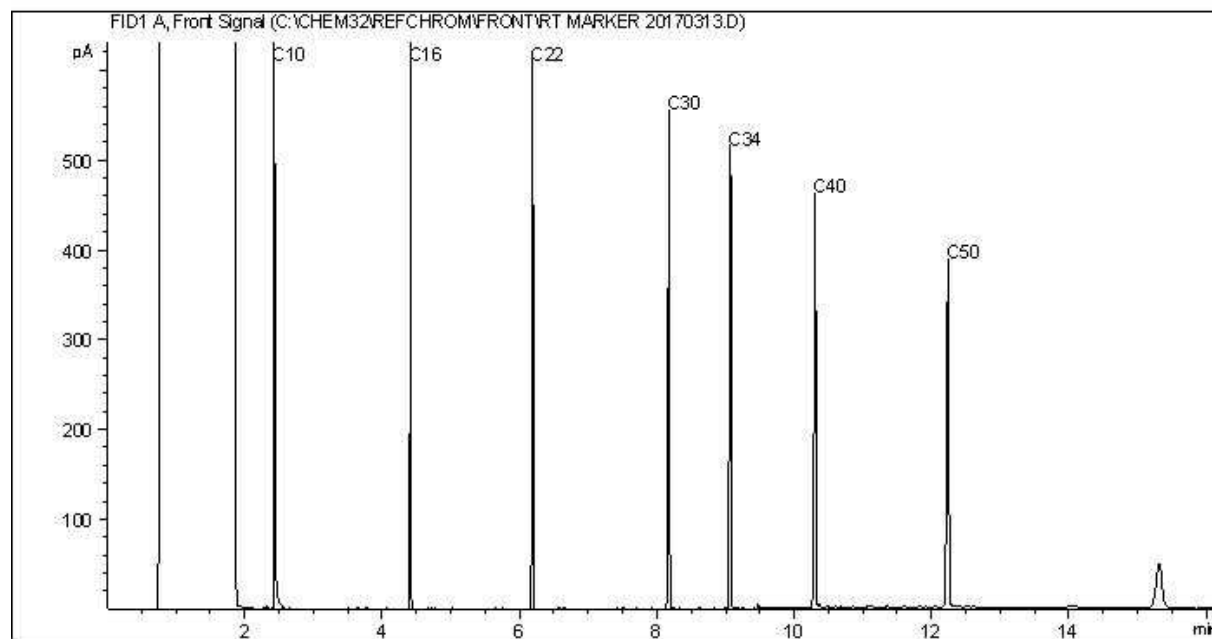
Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

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

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram



Carbon Range Distribution - Reference Chromatogram



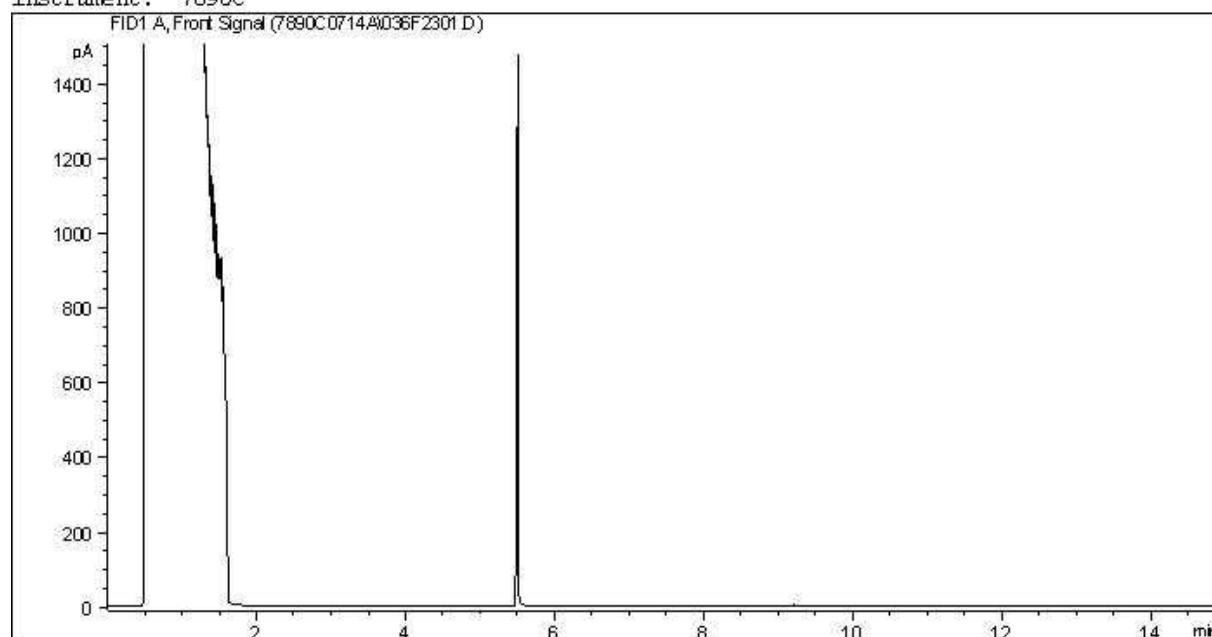
TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

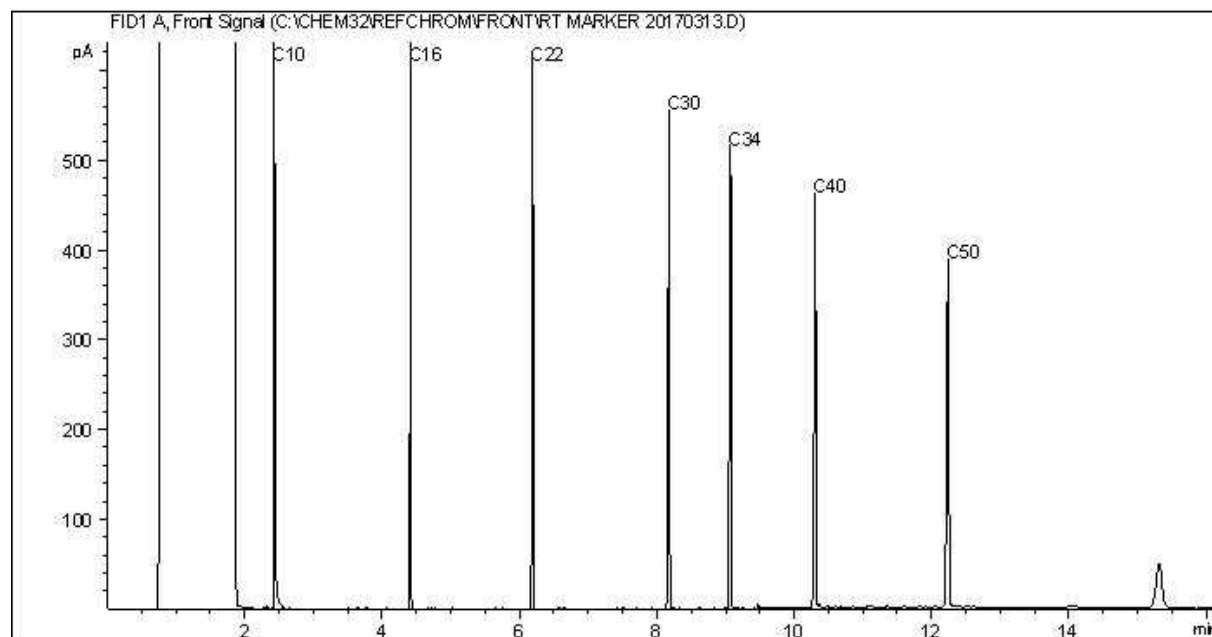
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons (F2-F4 in soil) Chromatogram

Instrument: 7890C



Carbon Range Distribution - Reference Chromatogram

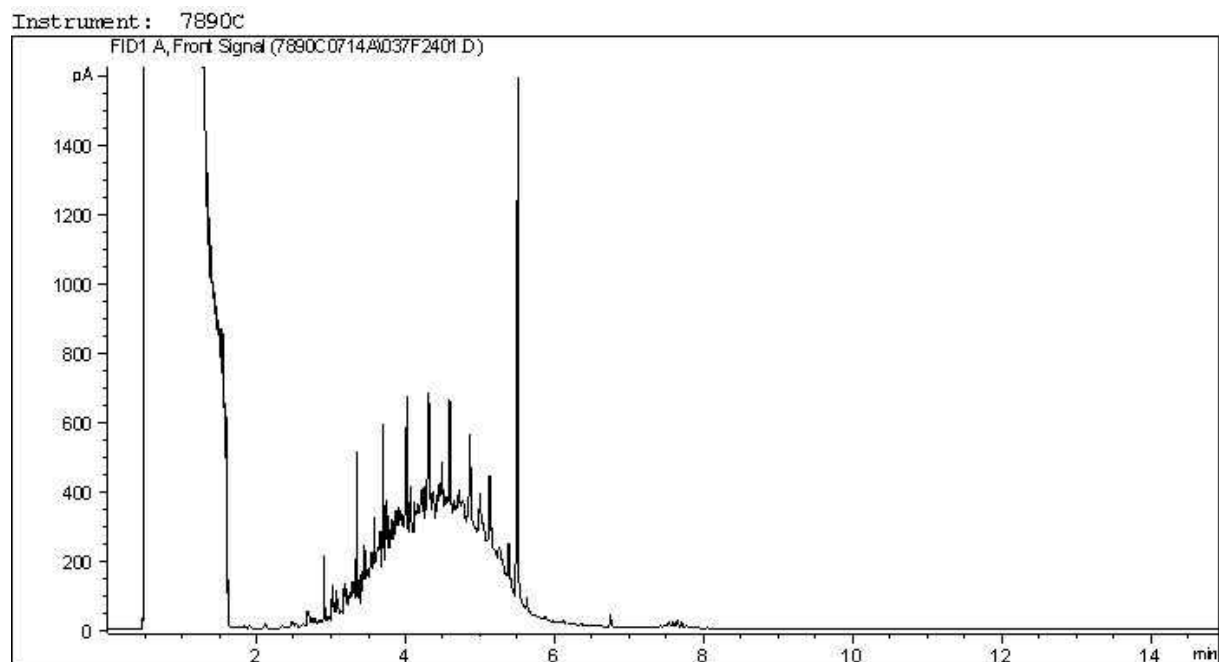


TYPICAL PRODUCT CARBON NUMBER RANGES

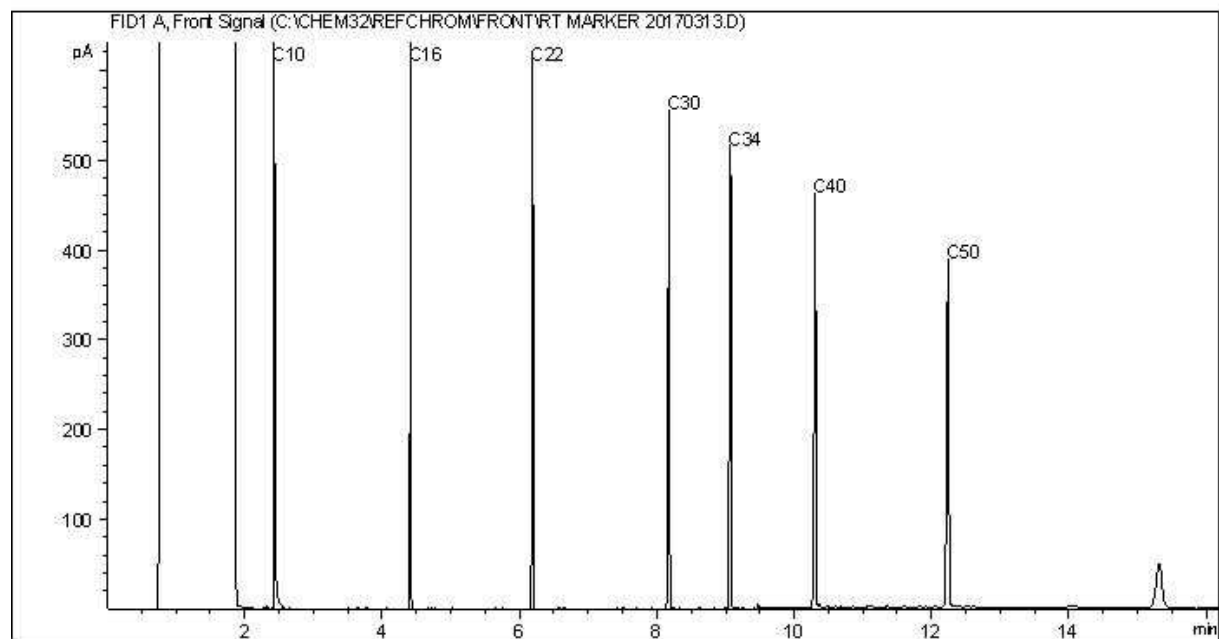
Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

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

CCME Hydrocarbons (F2-F4 in soil) Chromatogram



Carbon Range Distribution - Reference Chromatogram

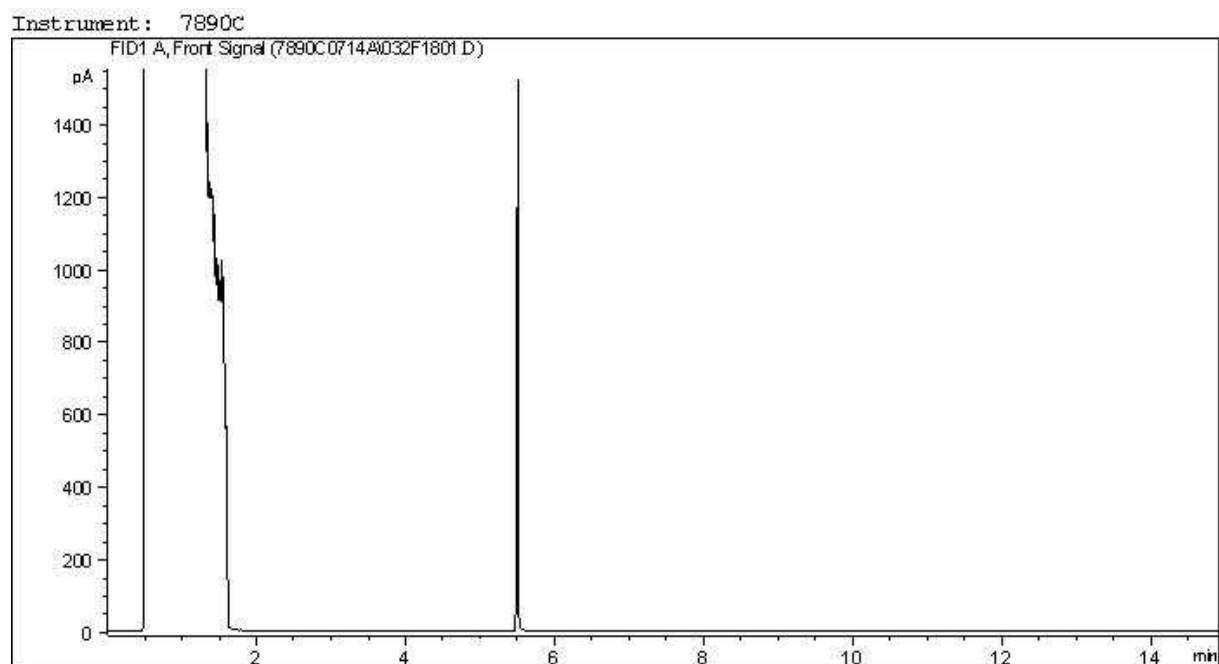


TYPICAL PRODUCT CARBON NUMBER RANGES

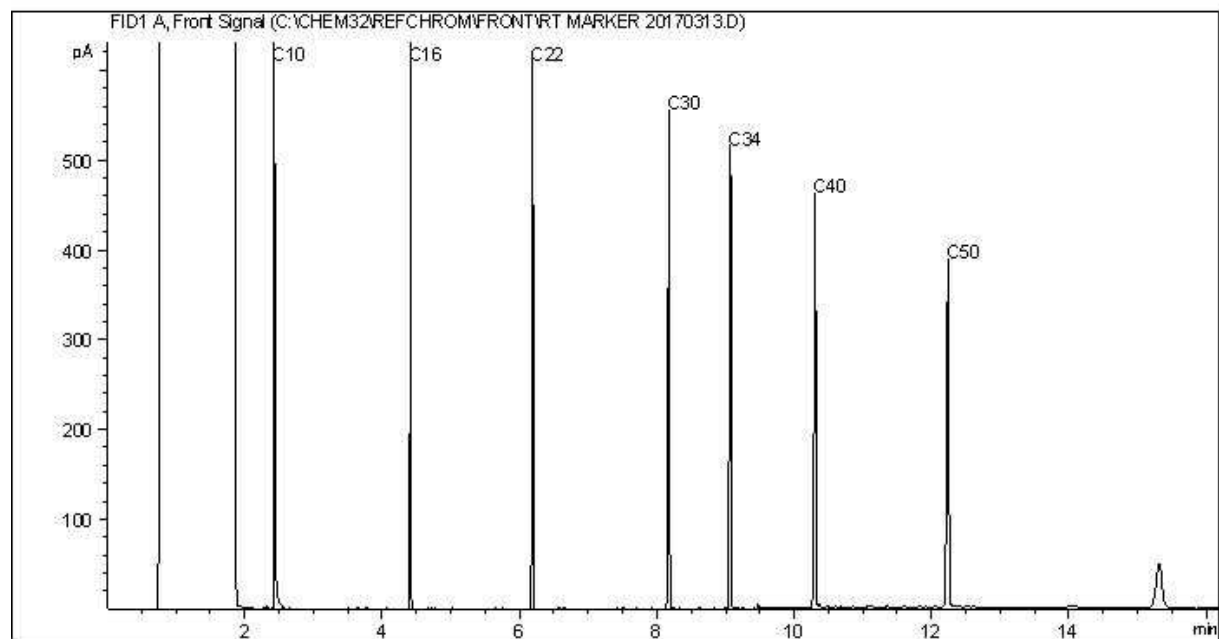
Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

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CCME Hydrocarbons (F2-F4 in soil) Chromatogram



Carbon Range Distribution - Reference Chromatogram

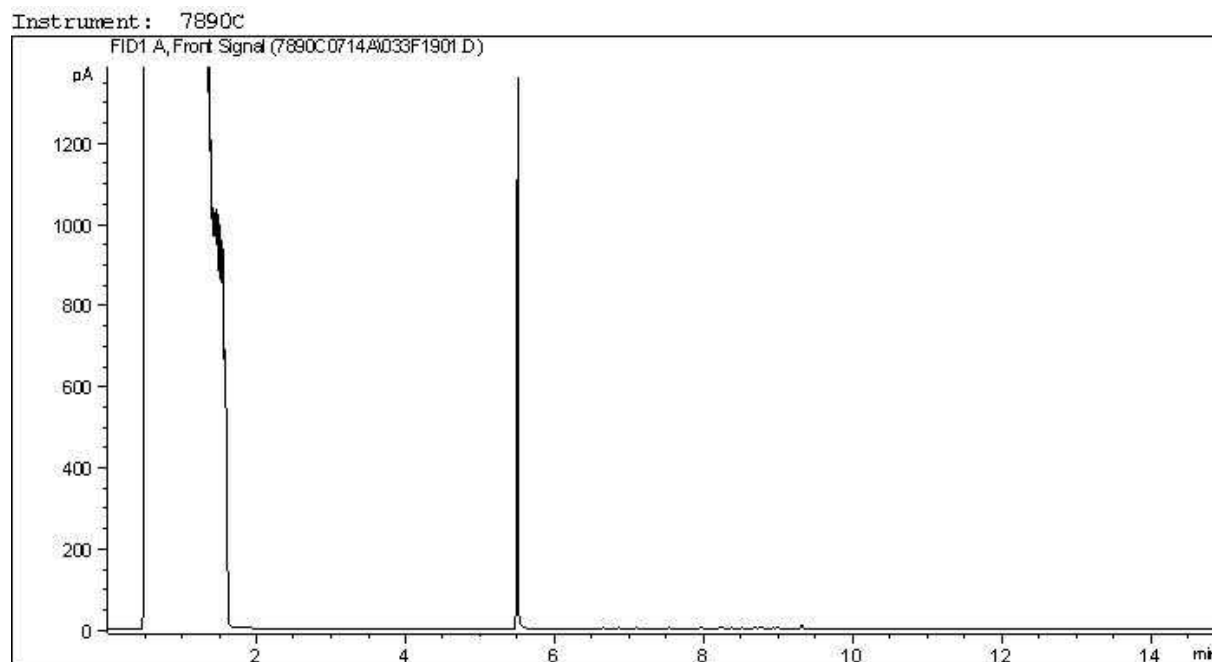


TYPICAL PRODUCT CARBON NUMBER RANGES

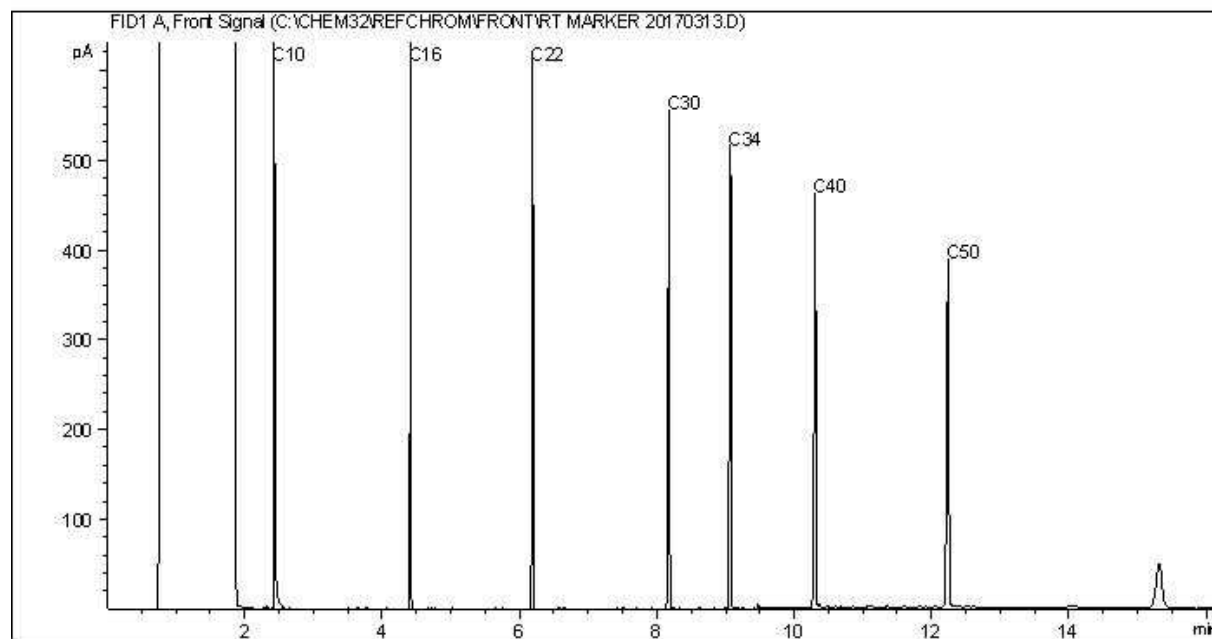
Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

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

CCME Hydrocarbons (F2-F4 in soil) Chromatogram



Carbon Range Distribution - Reference Chromatogram

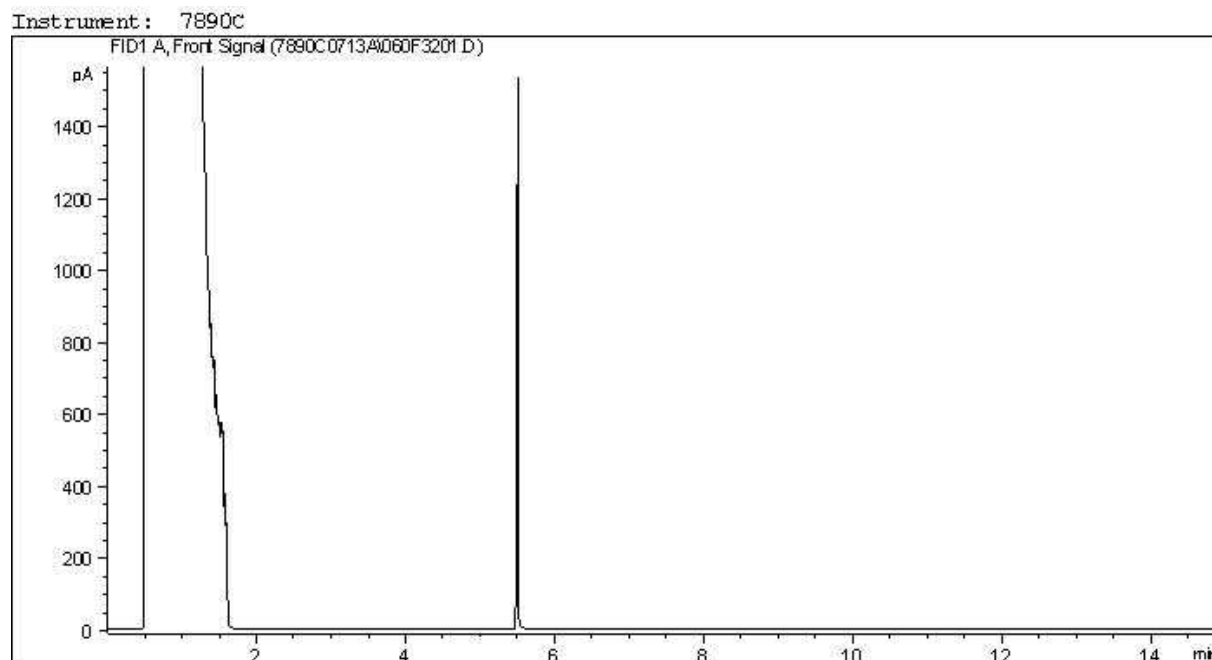


TYPICAL PRODUCT CARBON NUMBER RANGES

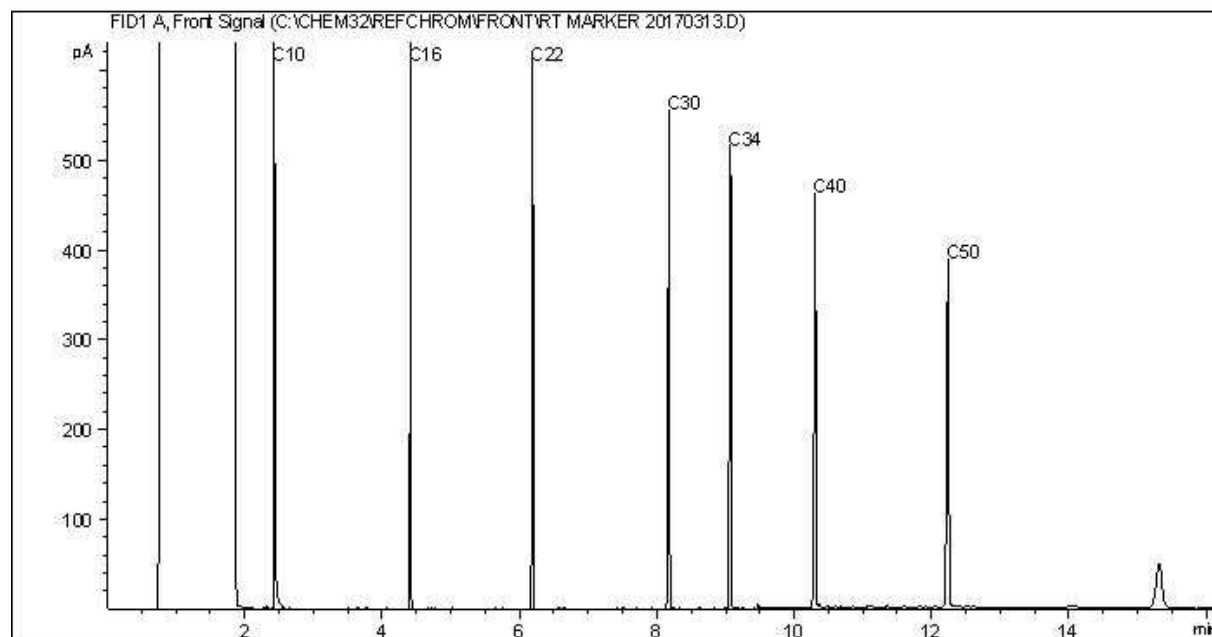
Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

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CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram



Carbon Range Distribution - Reference Chromatogram



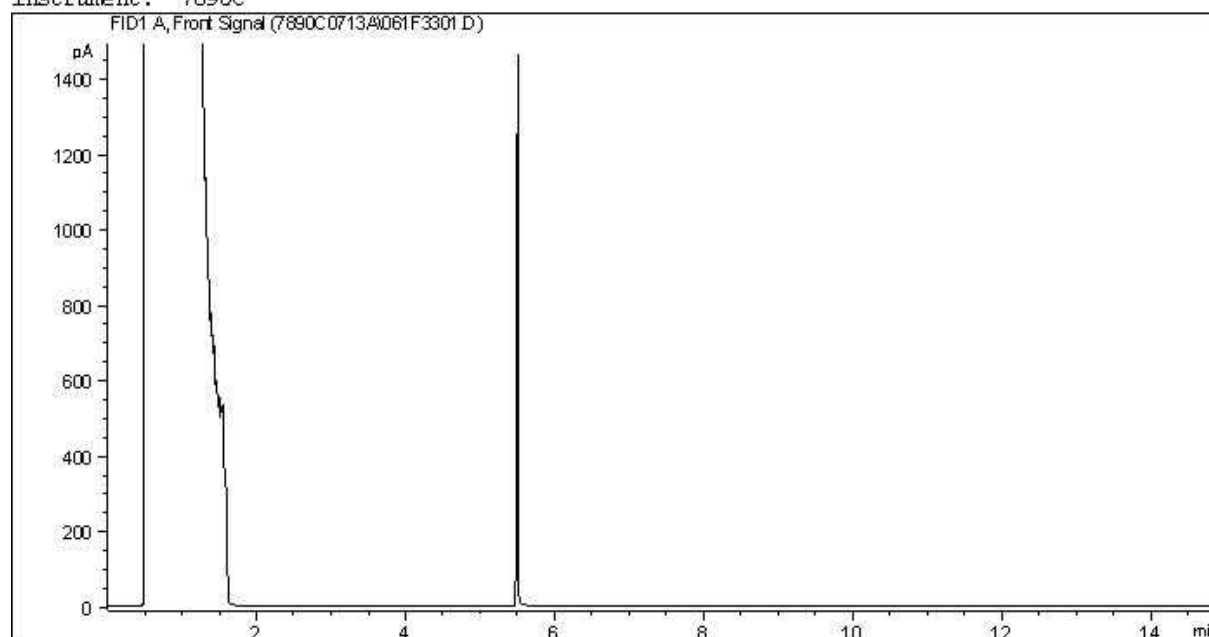
TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

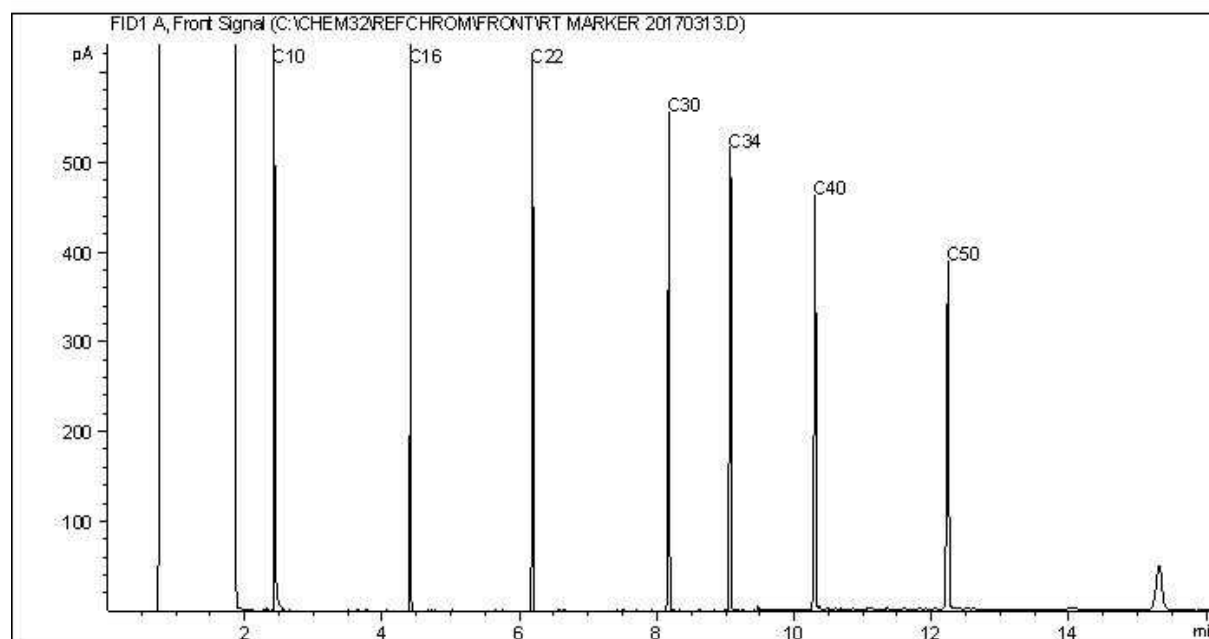
Note: This information is provided for reference purposes only. Should detailed chemist interpretation or fingerprinting be required, please contact the laboratory.

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: 7890C



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

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



Your Project #: 121414585
 Site Location: GORDON LAKE
 Your C.O.C. #: 17075

Attention: Allen MacGarvie

STANTEC CONSULTING LTD
 PO BOX 1777
 4910-53 Street
 Yellowknife, NT
 CANADA X1A 2P4

Report Date: 2019/09/23
 Report #: R2785058
 Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B977474

Received: 2019/09/12, 15:15

Sample Matrix: Ground Water
 # Samples Received: 7

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity @25C (pp, total), CO ₃ ,HCO ₃ ,OH	2	N/A	2019/09/17	AB SOP-00005	SM 23 2320 B m
Alkalinity @25C (pp, total), CO ₃ ,HCO ₃ ,OH	5	N/A	2019/09/18	AB SOP-00005	SM 23 2320 B m
BTEX/F1 in Water by HS GC/MS/FID	7	N/A	2019/09/15	AB SOP-00039	CCME CWS/EPA 8260d m
F1-BTEX	7	N/A	2019/09/16		Auto Calc
Chloride/Sulphate by Auto Colourimetry	7	N/A	2019/09/18	AB SOP-00020 / AB SOP-00018	SM23-4500-Cl/SO4-E m
Conductivity @25C	2	N/A	2019/09/17	AB SOP-00005	SM 23 2510 B m
Conductivity @25C	5	N/A	2019/09/18	AB SOP-00005	SM 23 2510 B m
CCME Hydrocarbons in Water (F2; C10-C16) (2)	7	2019/09/16	2019/09/16	AB SOP-00037 / AB SOP-00040	CCME PHC-CWS m
Hardness	7	N/A	2019/09/16		Auto Calc
Hardness Total (calculated as CaCO ₃) (1, 3)	7	N/A	2019/09/20	BBY WI-00033	Auto Calc
Elements by ICP-Dissolved-Lab Filtered (4)	5	N/A	2019/09/14	AB SOP-00042	EPA 6010d R5 m
Elements by ICP-Dissolved-Lab Filtered (4)	2	N/A	2019/09/16	AB SOP-00042	EPA 6010d R5 m
Ion Balance	7	N/A	2019/09/16		Auto Calc
Sum of cations, anions	7	N/A	2019/09/16		Auto Calc
Na, K, Ca, Mg, S by CRC ICPMS (total) (1)	7	2019/09/14	2019/09/20	BBY WI-00033	Auto Calc
Elements by CRC ICPMS (total) (1)	7	2019/09/18	2019/09/20	BBY7SOP-00003 / BBY7SOP-00002	EPA 6020b R2 m
Ammonia-N (Total)	7	N/A	2019/09/16	AB SOP-00007	SM 23 4500 NH3 A G m
Nitrate and Nitrite	7	N/A	2019/09/16		Auto Calc
Nitrate + Nitrite-N (calculated)	7	N/A	2019/09/16		Auto Calc
Nitrogen (Nitrite - Nitrate) by IC	7	N/A	2019/09/14	AB SOP-00023	SM 23 4110 B m
pH @25°C (5)	2	N/A	2019/09/17	AB SOP-00005	SM 23 4500 H+ B m
pH @25°C (5)	5	N/A	2019/09/18	AB SOP-00005	SM 23 4500 H+ B m
Total Dissolved Solids (Filt. Residue)	7	2019/09/15	2019/09/16	AB SOP-00065	SM 23 2540 C m
Total Dissolved Solids (Calculated)	6	N/A	2019/09/18		Auto Calc
Total Dissolved Solids (Calculated)	1	N/A	2019/09/19		Auto Calc
Total Suspended Solids (NFR)	7	2019/09/15	2019/09/17	AB SOP-00061	SM 23 2540 D m



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 CANADA X1A 2P4

Report Date: 2019/09/23
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 Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B977474

Received: 2019/09/12, 15:15

Sample Matrix: Surface Water
 # Samples Received: 19

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity @25C (pp, total), CO ₃ ,HCO ₃ ,OH	6	N/A	2019/09/15	AB SOP-00005	SM 23 2320 B m
Alkalinity @25C (pp, total), CO ₃ ,HCO ₃ ,OH	9	N/A	2019/09/16	AB SOP-00005	SM 23 2320 B m
Alkalinity @25C (pp, total), CO ₃ ,HCO ₃ ,OH	4	N/A	2019/09/18	AB SOP-00005	SM 23 2320 B m
BTEX/F1 in Water by HS GC/MS/FID	12	N/A	2019/09/15	AB SOP-00039	CCME CWS/EPA 8260d m
F1-BTEX	12	N/A	2019/09/16		Auto Calc
Chloride/Sulphate by Auto Colourimetry	1	N/A	2019/09/17	AB SOP-00020 / AB SOP-00018	SM23-4500-Cl/SO ₄ -E m
Chloride/Sulphate by Auto Colourimetry	18	N/A	2019/09/18	AB SOP-00020 / AB SOP-00018	SM23-4500-Cl/SO ₄ -E m
Conductivity @25C	6	N/A	2019/09/15	AB SOP-00005	SM 23 2510 B m
Conductivity @25C	9	N/A	2019/09/16	AB SOP-00005	SM 23 2510 B m
Conductivity @25C	4	N/A	2019/09/18	AB SOP-00005	SM 23 2510 B m
CCME Hydrocarbons in Water (F2; C10-C16) (2)	12	2019/09/16	2019/09/16	AB SOP-00037 / AB SOP-00040	CCME PHC-CWS m
Hardness	18	N/A	2019/09/16		Auto Calc
Hardness	1	N/A	2019/09/17		Auto Calc
Hardness Total (calculated as CaCO ₃) (1, 3)	2	N/A	2019/09/19	BBY WI-00033	Auto Calc
Hardness Total (calculated as CaCO ₃) (1, 3)	12	N/A	2019/09/20	BBY WI-00033	Auto Calc
Hardness Total (calculated as CaCO ₃) (1, 3)	5	N/A	2019/09/23	BBY WI-00033	Auto Calc
Elements by ICP-Dissolved-Lab Filtered (4)	15	N/A	2019/09/14	AB SOP-00042	EPA 6010d R5 m
Elements by ICP-Dissolved-Lab Filtered (4)	4	N/A	2019/09/16	AB SOP-00042	EPA 6010d R5 m
Ion Balance	6	N/A	2019/09/15		Auto Calc
Ion Balance	13	N/A	2019/09/16		Auto Calc
Sum of cations, anions	18	N/A	2019/09/16		Auto Calc
Sum of cations, anions	1	N/A	2019/09/17		Auto Calc
Na, K, Ca, Mg, S by CRC ICPMS (total) (1)	2	2019/09/14	2019/09/19	BBY WI-00033	Auto Calc
Na, K, Ca, Mg, S by CRC ICPMS (total) (1)	12	2019/09/14	2019/09/20	BBY WI-00033	Auto Calc
Na, K, Ca, Mg, S by CRC ICPMS (total) (1)	5	2019/09/14	2019/09/23	BBY WI-00033	Auto Calc
Elements by CRC ICPMS (total) (1)	2	2019/09/18	2019/09/18	BBY7SOP-00003 / BBY7SOP-00002	EPA 6020b R2 m



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 Site Location: GORDON LAKE
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CERTIFICATE OF ANALYSIS

BV LABS JOB #: B977474

Received: 2019/09/12, 15:15

Sample Matrix: Surface Water
 # Samples Received: 19

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Elements by CRC ICPMS (total) (1)	12	2019/09/18	2019/09/20	BBY7SOP-00003 / BBY7SOP-00002	EPA 6020b R2 m
Elements by CRC ICPMS (total) (1)	5	2019/09/18	2019/09/21	BBY7SOP-00003 / BBY7SOP-00002	EPA 6020b R2 m
Ammonia-N (Total)	12	N/A	2019/09/16	AB SOP-00007	SM 23 4500 NH3 A G m
Nitrate and Nitrite	19	N/A	2019/09/16		Auto Calc
Nitrate + Nitrite-N (calculated)	19	N/A	2019/09/16		Auto Calc
Nitrogen (Nitrite - Nitrate) by IC	13	N/A	2019/09/14	AB SOP-00023	SM 23 4110 B m
Nitrogen (Nitrite - Nitrate) by IC	6	N/A	2019/09/15	AB SOP-00023	SM 23 4110 B m
pH @25°C (5)	6	N/A	2019/09/15	AB SOP-00005	SM 23 4500 H+ B m
pH @25°C (5)	9	N/A	2019/09/16	AB SOP-00005	SM 23 4500 H+ B m
pH @25°C (5)	4	N/A	2019/09/18	AB SOP-00005	SM 23 4500 H+ B m
Total Dissolved Solids (Filt. Residue)	7	2019/09/15	2019/09/16	AB SOP-00065	SM 23 2540 C m
Total Dissolved Solids (Filt. Residue)	1	2019/09/17	2019/09/18	AB SOP-00065	SM 23 2540 C m
Total Dissolved Solids (Filt. Residue)	4	2019/09/17	2019/09/19	AB SOP-00065	SM 23 2540 C m
Total Dissolved Solids (Calculated)	1	N/A	2019/09/17		Auto Calc
Total Dissolved Solids (Calculated)	17	N/A	2019/09/18		Auto Calc
Total Dissolved Solids (Calculated)	1	N/A	2019/09/19		Auto Calc
Total Suspended Solids (NFR)	12	2019/09/15	2019/09/17	AB SOP-00061	SM 23 2540 D m

Remarks:

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

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

BV Labs liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. BV Labs 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 BV Labs, unless otherwise agreed in writing.



Your Project #: 121414585
Site Location: GORDON LAKE
Your C.O.C. #: 17075

Attention: Allen MacGarvie

STANTEC CONSULTING LTD
PO BOX 1777
4910-53 Street
Yellowknife, NT
CANADA X1A 2P4

Report Date: 2019/09/23
Report #: R2785058
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B977474

Received: 2019/09/12, 15:15

BV Labs is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by BV Labs, results relate to the supplied samples tested.

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

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

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

(1) This test was performed by BV Labs Vancouver

(2) Silica gel clean up employed.

(3) "Total Hardness" was calculated from Total Ca and Mg concentrations and may be biased high (Hardness, or Dissolved Hardness, calculated from Dissolved Ca and Mg, should be used for compliance if available).

(4) Dissolved > Total Imbalance: When applicable, Dissolved and Total results were reviewed and data quality meets acceptable levels unless otherwise noted.

(5) The CCME method requires pH to be analysed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the CCME holding time. Bureau Veritas Laboratories endeavours to analyze samples as soon as possible after receipt.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Geraldlyn Gouthro, Key Account Specialist

Email: geraldlyn.gouthro@bvlabs.com

Phone# (780)577-7173

=====
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BUREAU
VERITAS

BV Labs Job #: B977474
Report Date: 2019/09/23

STANTEC CONSULTING LTD
Client Project #: 121414585
Site Location: GORDON LAKE
Sampler Initials: BW

AT1 BTEX AND F1-F2 IN WATER (GROUND WATER)

BV Labs ID		WM4537	WM4538	WM4538		
Sampling Date		2019/09/10 10:30	2019/09/10 11:20	2019/09/10 11:20		
COC Number		17075	17075	17075		
	UNITS	CAM_GW_MW1_2019_02	CAM_GW_MW2_2019_02	CAM_GW_MW2_2019_02 Lab-Dup	RDL	QC Batch
Ext. Pet. Hydrocarbon						
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	<0.10	N/A	0.10	9589306
Volatiles						
Benzene	ug/L	6.2	0.52	0.41	0.40	9589348
Toluene	ug/L	9.1	6.2	6.5	0.40	9589348
Ethylbenzene	ug/L	0.42	0.45	0.49	0.40	9589348
m & p-Xylene	ug/L	1.8 (1)	0.96	1.0	0.80	9589348
o-Xylene	ug/L	1.0	0.45	0.54	0.40	9589348
Xylenes (Total)	ug/L	2.8	1.4	N/A	0.89	9588364
F1 (C6-C10) - BTEX	ug/L	<100	<100	N/A	100	9588364
F1 (C6-C10)	ug/L	<100	<100	<100	100	9589348
Surrogate Recovery (%)						
1,4-Difluorobenzene (sur.)	%	106	104	110	N/A	9589348
4-Bromofluorobenzene (sur.)	%	87	99	97	N/A	9589348
D4-1,2-Dichloroethane (sur.)	%	96	95	98	N/A	9589348
O-TERPHENYL (sur.)	%	104	105	N/A	N/A	9589306
RDL = Reportable Detection Limit						
Lab-Dup = Laboratory Initiated Duplicate						
N/A = Not Applicable						
(1) Tentatively identified result and may be potentially biased high due to matrix interference.						

BUREAU
VERITASBV Labs Job #: B977474
Report Date: 2019/09/23STANTEC CONSULTING LTD
Client Project #: 121414585
Site Location: GORDON LAKE
Sampler Initials: BW**AT1 BTEX AND F1-F2 IN WATER (GROUND WATER)**

BV Labs ID		WM4539	WM4540	WM4541	WM4542		
Sampling Date		2019/09/10 12:10	2019/09/10 13:00	2019/09/10 13:50	2019/09/10 14:40		
COC Number		17075	17075	17075	17075		
	UNITS	CAM_GW_SNP_7A_20 19_02	CAM_GW_SNP_7B_20 19_02	CAM_GW_SNP_7C_20 19_02	CAM_GW_SNP_7D_20 19_02	RDL	QC Batch
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	0.42	<0.10	<0.10	0.10	9589306
Volatiles							
Benzene	ug/L	<0.40	<0.40	<0.40	<0.40	0.40	9589348
Toluene	ug/L	<0.40	<0.40	<0.40	<0.40	0.40	9589348
Ethylbenzene	ug/L	<0.40	1.2	<0.40	<0.40	0.40	9589348
m & p-Xylene	ug/L	<0.80	1.7	<0.80	<0.80	0.80	9589348
o-Xylene	ug/L	<0.40	<0.40	<0.40	<0.40	0.40	9589348
Xylenes (Total)	ug/L	<0.89	1.7	<0.89	<0.89	0.89	9588364
F1 (C6-C10) - BTEX	ug/L	<100	<100	<100	<100	100	9588364
F1 (C6-C10)	ug/L	<100	<100	<100	<100	100	9589348
Surrogate Recovery (%)							
1,4-Difluorobenzene (sur.)	%	102	110	111	111	N/A	9589348
4-Bromofluorobenzene (sur.)	%	97	103	101	104	N/A	9589348
D4-1,2-Dichloroethane (sur.)	%	95	101	98	104	N/A	9589348
O-TERPHENYL (sur.)	%	111	98	99	102	N/A	9589306
RDL = Reportable Detection Limit N/A = Not Applicable							



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BV Labs Job #: B977474
Report Date: 2019/09/23

STANTEC CONSULTING LTD
Client Project #: 121414585
Site Location: GORDON LAKE
Sampler Initials: BW

AT1 BTEX AND F1-F2 IN WATER (GROUND WATER)

BV Labs ID		WM4543		
Sampling Date		2019/09/10		
COC Number		17075		
	UNITS	DUP1_GW_2019_02	RDL	QC Batch
Ext. Pet. Hydrocarbon				
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	0.10	9589306
Volatiles				
Benzene	ug/L	6.0	0.40	9589348
Toluene	ug/L	8.8	0.40	9589348
Ethylbenzene	ug/L	0.57	0.40	9589348
m & p-Xylene	ug/L	1.9 (1)	0.80	9589348
o-Xylene	ug/L	1.2	0.40	9589348
Xylenes (Total)	ug/L	3.2	0.89	9588364
F1 (C6-C10) - BTEX	ug/L	<100	100	9588364
F1 (C6-C10)	ug/L	<100	100	9589348
Surrogate Recovery (%)				
1,4-Difluorobenzene (sur.)	%	107	N/A	9589348
4-Bromofluorobenzene (sur.)	%	99	N/A	9589348
D4-1,2-Dichloroethane (sur.)	%	99	N/A	9589348
O-TERPHENYL (sur.)	%	100	N/A	9589306
RDL = Reportable Detection Limit N/A = Not Applicable (1) Tentatively identified result and may be potentially biased high due to matrix interference.				

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VERITASBV Labs Job #: B977474
Report Date: 2019/09/23STANTEC CONSULTING LTD
Client Project #: 121414585
Site Location: GORDON LAKE
Sampler Initials: BW**AT1 BTEX AND F1-F2 IN WATER (SURFACE WATER)**

BV Labs ID		WM4544	WM4545	WM4546	WM4547		
Sampling Date		2019/09/10 16:00	2019/09/10 15:30	2019/09/10 15:45	2019/09/10 15:00		
COC Number		17075	17075	17075	17075		
	UNITS	CAM_SW_SNP_11B1_ 2019_02	CAM_SW_SNP_11B2_ 2019_02	CAM_SW_SNP_11B3_ 2019_02	CAM_SW_SNP_11B4_ 2019_02	RDL	QC Batch
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	<0.10	<0.10	<0.10	0.10	9589306
Volatiles							
Benzene	ug/L	<0.40	<0.40	<0.40	<0.40	0.40	9589348
Toluene	ug/L	<0.40	<0.40	<0.40	<0.40	0.40	9589348
Ethylbenzene	ug/L	<0.40	<0.40	<0.40	<0.40	0.40	9589348
m & p-Xylene	ug/L	<0.80	<0.80	<0.80	<0.80	0.80	9589348
o-Xylene	ug/L	<0.40	<0.40	<0.40	<0.40	0.40	9589348
Xylenes (Total)	ug/L	<0.89	<0.89	<0.89	<0.89	0.89	9588364
F1 (C6-C10) - BTEX	ug/L	<100	<100	<100	<100	100	9588364
F1 (C6-C10)	ug/L	<100	<100	<100	<100	100	9589348
Surrogate Recovery (%)							
1,4-Difluorobenzene (sur.)	%	115	112	112	105	N/A	9589348
4-Bromofluorobenzene (sur.)	%	97	104	103	88	N/A	9589348
D4-1,2-Dichloroethane (sur.)	%	102	101	102	93	N/A	9589348
O-TERPHENYL (sur.)	%	107	101	104	100	N/A	9589306
RDL = Reportable Detection Limit							
N/A = Not Applicable							



BUREAU
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BV Labs Job #: B977474
Report Date: 2019/09/23

STANTEC CONSULTING LTD
Client Project #: 121414585
Site Location: GORDON LAKE
Sampler Initials: BW

AT1 BTEX AND F1-F2 IN WATER (SURFACE WATER)

BV Labs ID		WM4548	WM4549	WM4550	WM4551		
Sampling Date		2019/09/11 17:00	2019/09/11 10:30	2019/09/11 11:40	2019/09/11 12:50		
COC Number		17075	17075	17075	17075		
	UNITS	BUR_SW_SNP_11A_2 019_02	CAM_SW_SNP_11C_2 019_02	KID_SW_SNP_11D_20 19_02	TRE_SW_SNP_11E_20 19_02	RDL	QC Batch
Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	<0.10	<0.10	<0.10	0.10	9589306
Volatiles							
Benzene	ug/L	<0.40	<0.40	<0.40	<0.40	0.40	9589348
Toluene	ug/L	<0.40	<0.40	<0.40	<0.40	0.40	9589348
Ethylbenzene	ug/L	<0.40	<0.40	<0.40	<0.40	0.40	9589348
m & p-Xylene	ug/L	<0.80	<0.80	<0.80	<0.80	0.80	9589348
o-Xylene	ug/L	<0.40	<0.40	<0.40	<0.40	0.40	9589348
Xylenes (Total)	ug/L	<0.89	<0.89	<0.89	<0.89	0.89	9589034
F1 (C6-C10) - BTEX	ug/L	<100	<100	<100	<100	100	9589034
F1 (C6-C10)	ug/L	<100	<100	<100	<100	100	9589348
Surrogate Recovery (%)							
1,4-Difluorobenzene (sur.)	%	102	105	111	112	N/A	9589348
4-Bromofluorobenzene (sur.)	%	97	95	99	95	N/A	9589348
D4-1,2-Dichloroethane (sur.)	%	92	94	101	100	N/A	9589348
O-TERPHENYL (sur.)	%	102	109	107	102	N/A	9589306
RDL = Reportable Detection Limit							
N/A = Not Applicable							



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BV Labs Job #: B977474

Report Date: 2019/09/23

STANTEC CONSULTING LTD

Client Project #: 121414585

Site Location: GORDON LAKE

Sampler Initials: BW

AT1 BTEX AND F1-F2 IN WATER (SURFACE WATER)

BV Labs ID		WM4552	WM4552	WM4560	WM4561		
Sampling Date		2019/09/11 15:45	2019/09/11 15:45	2019/09/10	2019/09/10 12:30		
COC Number		17075	17075	17075	17075		
	UNITS	WES_SW_SNP_11F_20 19_02	WES_SW_SNP_11F_20 19_02 Lab-Dup	TB_SW_2019_02	FB_SW_2019_02	RDL	QC Batch

Ext. Pet. Hydrocarbon							
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	<0.10	<0.10	<0.10	0.10	9589306
Volatiles							
Benzene	ug/L	<0.40	N/A	<0.40	<0.40	0.40	9589348
Toluene	ug/L	<0.40	N/A	<0.40	<0.40	0.40	9589348
Ethylbenzene	ug/L	<0.40	N/A	<0.40	<0.40	0.40	9589348
m & p-Xylene	ug/L	<0.80	N/A	<0.80	<0.80	0.80	9589348
o-Xylene	ug/L	<0.40	N/A	<0.40	<0.40	0.40	9589348
Xylenes (Total)	ug/L	<0.89	N/A	<0.89	<0.89	0.89	9589034
F1 (C6-C10) - BTEX	ug/L	<100	N/A	<100	<100	100	9589034
F1 (C6-C10)	ug/L	<100	N/A	<100	<100	100	9589348
Surrogate Recovery (%)							
1,4-Difluorobenzene (sur.)	%	115	N/A	103	107	N/A	9589348
4-Bromofluorobenzene (sur.)	%	101	N/A	98	97	N/A	9589348
D4-1,2-Dichloroethane (sur.)	%	103	N/A	92	94	N/A	9589348
O-TERPHENYL (sur.)	%	98	109	100	97	N/A	9589306

RDL = Reportable Detection Limit

Lab-Dup = Laboratory Initiated Duplicate

N/A = Not Applicable



AT1 BTEX AND F1-F2 IN WATER (SURFACE WATER)

BV Labs ID		WM4562		
Sampling Date		2019/09/10		
COC Number		17075		
	UNITS	DUP1_SW_SNP_2019_02	RDL	QC Batch
Ext. Pet. Hydrocarbon				
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	0.10	9589306
Volatiles				
Benzene	ug/L	<0.40	0.40	9589348
Toluene	ug/L	<0.40	0.40	9589348
Ethylbenzene	ug/L	<0.40	0.40	9589348
m & p-Xylene	ug/L	<0.80	0.80	9589348
o-Xylene	ug/L	<0.40	0.40	9589348
Xylenes (Total)	ug/L	<0.89	0.89	9589034
F1 (C6-C10) - BTEX	ug/L	<100	100	9589034
F1 (C6-C10)	ug/L	<100	100	9589348
Surrogate Recovery (%)				
1,4-Difluorobenzene (sur.)	%	104	N/A	9589348
4-Bromofluorobenzene (sur.)	%	97	N/A	9589348
D4-1,2-Dichloroethane (sur.)	%	94	N/A	9589348
O-TERPHENYL (sur.)	%	100	N/A	9589306
RDL = Reportable Detection Limit N/A = Not Applicable				

**ROUTINE WATER -LAB FILTERED (GROUND WATER)**

BV Labs ID		WM4537	WM4537		
Sampling Date		2019/09/10 10:30	2019/09/10 10:30		
COC Number		17075	17075		
	UNITS	CAM_GW_MW1_2019_02	CAM_GW_MW1_2019_02 Lab-Dup	RDL	QC Batch
Calculated Parameters					
Anion Sum	meq/L	38	N/A	N/A	9588456
Cation Sum	meq/L	35	N/A	N/A	9588456
Hardness (CaCO ₃)	mg/L	1400	N/A	0.50	9588942
Ion Balance (% Difference)	%	4.8	N/A	N/A	9588368
Dissolved Nitrate (NO ₃)	mg/L	0.044	N/A	0.044	9588369
Nitrate plus Nitrite (N)	mg/L	<0.014	N/A	0.014	9588370
Dissolved Nitrite (NO ₂)	mg/L	<0.033	N/A	0.033	9588369
Calculated Total Dissolved Solids	mg/L	2500	N/A	20	9588457
Misc. Inorganics					
Conductivity	uS/cm	2900	N/A	2.0	9592774
pH	pH	3.41	N/A	N/A	9592771
Anions					
Alkalinity (PP as CaCO ₃)	mg/L	<1.0	N/A	1.0	9592773
Alkalinity (Total as CaCO ₃)	mg/L	<1.0	N/A	1.0	9592773
Bicarbonate (HCO ₃)	mg/L	<1.0	N/A	1.0	9592773
Carbonate (CO ₃)	mg/L	<1.0	N/A	1.0	9592773
Hydroxide (OH)	mg/L	<1.0	N/A	1.0	9592773
Dissolved Chloride (Cl)	mg/L	12	N/A	1.0	9592761
Dissolved Sulphate (SO ₄)	mg/L	1800 (1)	N/A	20	9592761
Nutrients					
Dissolved Nitrite (N)	mg/L	<0.010	<0.010	0.010	9589064
Dissolved Nitrate (N)	mg/L	0.010	<0.010	0.010	9589064
Lab Filtered Elements					
Dissolved Calcium (Ca)	mg/L	380	N/A	0.30	9589117
Dissolved Iron (Fe)	mg/L	130	N/A	0.060	9589117
Dissolved Magnesium (Mg)	mg/L	110	N/A	0.20	9589117
Dissolved Manganese (Mn)	mg/L	14	N/A	0.0040	9589117
Dissolved Potassium (K)	mg/L	16	N/A	0.30	9589117
Dissolved Sodium (Na)	mg/L	25	N/A	0.50	9589117
RDL = Reportable Detection Limit					
Lab-Dup = Laboratory Initiated Duplicate					
N/A = Not Applicable					
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.					



BUREAU
VERITAS

BV Labs Job #: B977474
Report Date: 2019/09/23

STANTEC CONSULTING LTD
Client Project #: 121414585
Site Location: GORDON LAKE
Sampler Initials: BW

ROUTINE WATER -LAB FILTERED (GROUND WATER)

BV Labs ID		WM4538			WM4539		
Sampling Date		2019/09/10 11:20			2019/09/10 12:10		
COC Number		17075			17075		
	UNITS	CAM_GW_MW2_2019_02	RDL	QC Batch	CAM_GW_SNP_7A_2019_02	RDL	QC Batch
Calculated Parameters							
Anion Sum	meq/L	59	N/A	9588456	20	N/A	9588456
Cation Sum	meq/L	52	N/A	9588456	20	N/A	9588456
Hardness (CaCO ₃)	mg/L	1400	0.50	9588942	790	0.50	9588942
Ion Balance (% Difference)	%	6.4	N/A	9588368	0.30	N/A	9588368
Dissolved Nitrate (NO ₃)	mg/L	<0.044	0.044	9588369	<0.044	0.044	9588369
Nitrate plus Nitrite (N)	mg/L	<0.014	0.014	9588370	<0.014	0.014	9588370
Dissolved Nitrite (NO ₂)	mg/L	<0.033	0.033	9588369	<0.033	0.033	9588369
Calculated Total Dissolved Solids	mg/L	3600	20	9588457	1000	10	9588457
Misc. Inorganics							
Conductivity	uS/cm	4600	2.0	9591434	1800	2.0	9593545
pH	pH	6.84	N/A	9591431	7.52	N/A	9593543
Anions							
Alkalinity (PP as CaCO ₃)	mg/L	<1.0	1.0	9591432	<1.0	1.0	9593544
Alkalinity (Total as CaCO ₃)	mg/L	820	1.0	9591432	890	1.0	9593544
Bicarbonate (HCO ₃)	mg/L	1000	1.0	9591432	1100	1.0	9593544
Carbonate (CO ₃)	mg/L	<1.0	1.0	9591432	<1.0	1.0	9593544
Hydroxide (OH)	mg/L	<1.0	1.0	9591432	<1.0	1.0	9593544
Dissolved Chloride (Cl)	mg/L	140	1.0	9592750	24	1.0	9592761
Dissolved Sulphate (SO ₄)	mg/L	1900 (1)	20	9592750	93	1.0	9592761
Nutrients							
Dissolved Nitrite (N)	mg/L	<0.010	0.010	9589064	<0.010	0.010	9589064
Dissolved Nitrate (N)	mg/L	<0.010	0.010	9589064	<0.010	0.010	9589064
Lab Filtered Elements							
Dissolved Calcium (Ca)	mg/L	370	0.30	9589117	220	0.30	9590110
Dissolved Iron (Fe)	mg/L	30	0.060	9589117	0.092	0.060	9590110
Dissolved Magnesium (Mg)	mg/L	120	0.20	9589117	58	0.20	9590110
Dissolved Manganese (Mn)	mg/L	3.4	0.0040	9589117	5.8	0.0040	9590110
Dissolved Potassium (K)	mg/L	65	0.30	9589117	18	0.30	9590110
Dissolved Sodium (Na)	mg/L	480	0.50	9589117	93	0.50	9590110
RDL = Reportable Detection Limit							
N/A = Not Applicable							
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.							



BV Labs Job #: B977474
Report Date: 2019/09/23

STANTEC CONSULTING LTD
Client Project #: 121414585
Site Location: GORDON LAKE
Sampler Initials: BW

ROUTINE WATER -LAB FILTERED (GROUND WATER)

BV Labs ID		WM4540		WM4541		
Sampling Date		2019/09/10 13:00		2019/09/10 13:50		
COC Number		17075		17075		
	UNITS	CAM_GW_SNP_7B_20 19_02	QC Batch	CAM_GW_SNP_7C_20 19_02	RDL	QC Batch
Calculated Parameters						
Anion Sum	meq/L	10	9588456	19	N/A	9588456
Cation Sum	meq/L	8.5	9588456	18	N/A	9588456
Hardness (CaCO ₃)	mg/L	390	9588942	780	0.50	9588942
Ion Balance (% Difference)	%	8.0	9589036	3.7	N/A	9589036
Dissolved Nitrate (NO ₃)	mg/L	1.3	9588369	0.085	0.044	9588369
Nitrate plus Nitrite (N)	mg/L	0.29	9588370	0.019	0.014	9588370
Dissolved Nitrite (NO ₂)	mg/L	0.036	9588369	<0.033	0.033	9588369
Calculated Total Dissolved Solids	mg/L	570	9588457	1100	10	9588457
Misc. Inorganics						
Conductivity	uS/cm	820	9591434	1600	2.0	9592774
pH	pH	6.86	9591431	7.56	N/A	9592771
Anions						
Alkalinity (PP as CaCO ₃)	mg/L	<1.0	9591432	<1.0	1.0	9592773
Alkalinity (Total as CaCO ₃)	mg/L	190	9591432	570	1.0	9592773
Bicarbonate (HCO ₃)	mg/L	230	9591432	690	1.0	9592773
Carbonate (CO ₃)	mg/L	<1.0	9591432	<1.0	1.0	9592773
Hydroxide (OH)	mg/L	<1.0	9591432	<1.0	1.0	9592773
Dissolved Chloride (Cl)	mg/L	6.7	9592761	10	1.0	9592761
Dissolved Sulphate (SO ₄)	mg/L	290 (1)	9592761	360 (1)	5.0	9592761
Nutrients						
Dissolved Nitrite (N)	mg/L	0.011	9589064	<0.010	0.010	9589064
Dissolved Nitrate (N)	mg/L	0.28	9589064	0.019	0.010	9589064
Lab Filtered Elements						
Dissolved Calcium (Ca)	mg/L	130	9589117	260	0.30	9589117
Dissolved Iron (Fe)	mg/L	0.11	9589117	0.22	0.060	9589117
Dissolved Magnesium (Mg)	mg/L	18	9589117	32	0.20	9589117
Dissolved Manganese (Mn)	mg/L	8.8	9589117	5.0	0.0040	9589117
Dissolved Potassium (K)	mg/L	3.2	9589117	12	0.30	9589117
Dissolved Sodium (Na)	mg/L	9.0	9589117	39	0.50	9589117
RDL = Reportable Detection Limit						
N/A = Not Applicable						
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.						



BV Labs Job #: B977474
Report Date: 2019/09/23

STANTEC CONSULTING LTD
Client Project #: 121414585
Site Location: GORDON LAKE
Sampler Initials: BW

ROUTINE WATER -LAB FILTERED (GROUND WATER)

BV Labs ID		WM4542			WM4543		
Sampling Date		2019/09/10 14:40			2019/09/10		
COC Number		17075			17075		
	UNITS	CAM_GW_SNP_7D_20 19_02	RDL	QC Batch	DUP1_GW_2019_02	RDL	QC Batch
Calculated Parameters							
Anion Sum	meq/L	6.5	N/A	9588456	38	N/A	9588456
Cation Sum	meq/L	6.6	N/A	9588456	34	N/A	9588456
Hardness (CaCO ₃)	mg/L	310	0.50	9588942	1400	0.50	9588942
Ion Balance (% Difference)	%	0.71	N/A	9589036	4.9	N/A	9589036
Dissolved Nitrate (NO ₃)	mg/L	1.1	0.044	9588369	0.72	0.044	9589040
Nitrate plus Nitrite (N)	mg/L	0.24	0.014	9588370	0.16	0.014	9589042
Dissolved Nitrite (NO ₂)	mg/L	<0.033	0.033	9588369	<0.033	0.033	9589040
Calculated Total Dissolved Solids	mg/L	350	10	9588457	2500	20	9588457
Misc. Inorganics							
Conductivity	uS/cm	600	2.0	9593172	2900	2.0	9593172
pH	pH	7.67	N/A	9593167	3.34	N/A	9593167
Anions							
Alkalinity (PP as CaCO ₃)	mg/L	<1.0	1.0	9593171	<1.0	1.0	9593171
Alkalinity (Total as CaCO ₃)	mg/L	230	1.0	9593171	<1.0	1.0	9593171
Bicarbonate (HCO ₃)	mg/L	280	1.0	9593171	<1.0	1.0	9593171
Carbonate (CO ₃)	mg/L	<1.0	1.0	9593171	<1.0	1.0	9593171
Hydroxide (OH)	mg/L	<1.0	1.0	9593171	<1.0	1.0	9593171
Dissolved Chloride (Cl)	mg/L	2.2	1.0	9592761	11	1.0	9592761
Dissolved Sulphate (SO ₄)	mg/L	87	1.0	9592761	1800 (1)	20	9592761
Nutrients							
Dissolved Nitrite (N)	mg/L	<0.010	0.010	9589064	<0.010	0.010	9589064
Dissolved Nitrate (N)	mg/L	0.24	0.010	9589064	0.16	0.010	9589064
Lab Filtered Elements							
Dissolved Calcium (Ca)	mg/L	100	0.30	9590110	380	0.30	9589117
Dissolved Iron (Fe)	mg/L	<0.060	0.060	9590110	120	0.060	9589117
Dissolved Magnesium (Mg)	mg/L	13	0.20	9590110	100	0.20	9589117
Dissolved Manganese (Mn)	mg/L	1.6	0.0040	9590110	14	0.0040	9589117
Dissolved Potassium (K)	mg/L	2.6	0.30	9590110	15	0.30	9589117
Dissolved Sodium (Na)	mg/L	4.4	0.50	9590110	25	0.50	9589117
RDL = Reportable Detection Limit							
N/A = Not Applicable							
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.							

BUREAU
VERITASBV Labs Job #: B977474
Report Date: 2019/09/23STANTEC CONSULTING LTD
Client Project #: 121414585
Site Location: GORDON LAKE
Sampler Initials: BW

ROUTINE WATER -LAB FILTERED (SURFACE WATER)

BV Labs ID		WM4544	WM4544		WM4545		
Sampling Date		2019/09/10 16:00	2019/09/10 16:00		2019/09/10 15:30		
COC Number		17075	17075		17075		
	UNITS	CAM_SW_SNP_11B1_ 2019_02	CAM_SW_SNP_11B1_ 2019_02 Lab-Dup	QC Batch	CAM_SW_SNP_11B2_ 2019_02	RDL	QC Batch

Calculated Parameters

Anion Sum	meq/L	0.99	N/A	9588456	1.0	N/A	9588456
Cation Sum	meq/L	0.93	N/A	9588456	0.94	N/A	9588456
Hardness (CaCO ₃)	mg/L	39	N/A	9588942	40	0.50	9588942
Ion Balance (% Difference)	%	3.3	N/A	9589036	3.6	N/A	9589036
Dissolved Nitrate (NO ₃)	mg/L	<0.044	N/A	9589040	<0.044	0.044	9589040
Nitrate plus Nitrite (N)	mg/L	<0.014	N/A	9589042	<0.014	0.014	9589042
Dissolved Nitrite (NO ₂)	mg/L	<0.033	N/A	9589040	<0.033	0.033	9589040
Calculated Total Dissolved Solids	mg/L	51	N/A	9588457	52	10	9588457

Misc. Inorganics

Conductivity	uS/cm	97	N/A	9592774	99	2.0	9590055
pH	pH	7.73	N/A	9592771	7.74	N/A	9590050

Anions

Alkalinity (PP as CaCO ₃)	mg/L	<1.0	N/A	9592773	<1.0	1.0	9590054
Alkalinity (Total as CaCO ₃)	mg/L	40	N/A	9592773	39	1.0	9590054
Bicarbonate (HCO ₃)	mg/L	48	N/A	9592773	47	1.0	9590054
Carbonate (CO ₃)	mg/L	<1.0	N/A	9592773	<1.0	1.0	9590054
Hydroxide (OH)	mg/L	<1.0	N/A	9592773	<1.0	1.0	9590054
Dissolved Chloride (Cl)	mg/L	1.4	1.6	9592761	2.8	1.0	9592761
Dissolved Sulphate (SO ₄)	mg/L	7.8	7.8	9592761	7.8	1.0	9592761

Nutrients

Dissolved Nitrite (N)	mg/L	<0.010	N/A	9589064	<0.010	0.010	9589064
Dissolved Nitrate (N)	mg/L	<0.010	N/A	9589064	<0.010	0.010	9589064

Lab Filtered Elements

Dissolved Calcium (Ca)	mg/L	11	11	9589117	11	0.30	9589117
Dissolved Iron (Fe)	mg/L	<0.060	<0.060	9589117	<0.060	0.060	9589117
Dissolved Magnesium (Mg)	mg/L	2.9	2.9	9589117	3.0	0.20	9589117
Dissolved Manganese (Mn)	mg/L	<0.0040	<0.0040	9589117	<0.0040	0.0040	9589117
Dissolved Potassium (K)	mg/L	1.4	1.4	9589117	1.5	0.30	9589117
Dissolved Sodium (Na)	mg/L	2.5	2.5	9589117	2.5	0.50	9589117

RDL = Reportable Detection Limit

Lab-Dup = Laboratory Initiated Duplicate

N/A = Not Applicable



BUREAU
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BV Labs Job #: B977474
Report Date: 2019/09/23

STANTEC CONSULTING LTD
Client Project #: 121414585
Site Location: GORDON LAKE
Sampler Initials: BW

ROUTINE WATER -LAB FILTERED (SURFACE WATER)

BV Labs ID		WM4546		WM4547		WM4548		
Sampling Date		2019/09/10 15:45		2019/09/10 15:00		2019/09/11 17:00		
COC Number		17075		17075		17075		
	UNITS	CAM_SW_SNP_11B3_2019_02	QC Batch	CAM_SW_SNP_11B4_2019_02	QC Batch	BUR_SW_SNP_11A_2019_02	RDL	QC Batch
Calculated Parameters								
Anion Sum	meq/L	1.9	9588456	1.0	9588456	1.1	N/A	9588456
Cation Sum	meq/L	1.9	9588456	0.94	9588456	0.98	N/A	9588456
Hardness (CaCO ₃)	mg/L	76	9588942	40	9588942	42	0.50	9588942
Ion Balance (% Difference)	%	1.4	9589036	3.4	9589036	4.8	N/A	9589036
Dissolved Nitrate (NO ₃)	mg/L	<0.044	9589040	<0.044	9589040	<0.044	0.044	9589040
Nitrate plus Nitrite (N)	mg/L	<0.014	9589042	<0.014	9589042	<0.014	0.014	9589042
Dissolved Nitrite (NO ₂)	mg/L	<0.033	9589040	<0.033	9589040	<0.033	0.033	9589040
Calculated Total Dissolved Solids	mg/L	110	9588457	51	9588457	55	10	9588457
Misc. Inorganics								
Conductivity	uS/cm	200	9590055	99	9589200	100	2.0	9589200
pH	pH	7.95	9590050	7.76	9589196	7.89	N/A	9589196
Anions								
Alkalinity (PP as CaCO ₃)	mg/L	<1.0	9590054	<1.0	9589199	<1.0	1.0	9589199
Alkalinity (Total as CaCO ₃)	mg/L	42	9590054	38	9589199	42	1.0	9589199
Bicarbonate (HCO ₃)	mg/L	51	9590054	46	9589199	52	1.0	9589199
Carbonate (CO ₃)	mg/L	<1.0	9590054	<1.0	9589199	<1.0	1.0	9589199
Hydroxide (OH)	mg/L	<1.0	9590054	<1.0	9589199	<1.0	1.0	9589199
Dissolved Chloride (Cl)	mg/L	2.9	9592761	2.8	9592761	1.8	1.0	9592750
Dissolved Sulphate (SO ₄)	mg/L	48	9592761	8.2	9592761	9.0	1.0	9592750
Nutrients								
Dissolved Nitrite (N)	mg/L	<0.010	9589064	<0.010	9589064	<0.010	0.010	9589064
Dissolved Nitrate (N)	mg/L	<0.010	9589064	<0.010	9589064	<0.010	0.010	9589064
Lab Filtered Elements								
Dissolved Calcium (Ca)	mg/L	21	9589117	11	9589117	12	0.30	9589117
Dissolved Iron (Fe)	mg/L	<0.060	9589117	<0.060	9589117	<0.060	0.060	9589117
Dissolved Magnesium (Mg)	mg/L	5.5	9589117	3.0	9589117	3.0	0.20	9589117
Dissolved Manganese (Mn)	mg/L	0.0050	9589117	<0.0040	9589117	<0.0040	0.0040	9589117
Dissolved Potassium (K)	mg/L	2.1	9589117	1.4	9589117	1.4	0.30	9589117
Dissolved Sodium (Na)	mg/L	6.8	9589117	2.5	9589117	2.5	0.50	9589117
RDL = Reportable Detection Limit								
N/A = Not Applicable								

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VERITASBV Labs Job #: B977474
Report Date: 2019/09/23STANTEC CONSULTING LTD
Client Project #: 121414585
Site Location: GORDON LAKE
Sampler Initials: BW

ROUTINE WATER -LAB FILTERED (SURFACE WATER)

BV Labs ID		WM4549		WM4550	WM4551		
Sampling Date		2019/09/11 10:30		2019/09/11 11:40	2019/09/11 12:50		
COC Number		17075		17075	17075		
	UNITS	CAM_SW_SNP_11C_2 019_02	QC Batch	KID_SW_SNP_11D_20 19_02	TRE_SW_SNP_11E_20 19_02	RDL	QC Batch

Calculated Parameters							
Anion Sum	meq/L	1.0	9588456	2.2	0.94	N/A	9588456
Cation Sum	meq/L	1.0	9588456	2.2	0.94	N/A	9588456
Hardness (CaCO ₃)	mg/L	44	9588942	98	40	0.50	9588942
Ion Balance (% Difference)	%	0.063	9589036	1.2	0.26	N/A	9589036
Dissolved Nitrate (NO ₃)	mg/L	<0.044	9589040	<0.044	<0.044	0.044	9589040
Nitrate plus Nitrite (N)	mg/L	<0.014	9589042	<0.014	<0.014	0.014	9589042
Dissolved Nitrite (NO ₂)	mg/L	<0.033	9589040	<0.033	<0.033	0.033	9589040
Calculated Total Dissolved Solids	mg/L	54	9588457	130	49	10	9588457
Misc. Inorganics							
Conductivity	uS/cm	100	9590055	230	100	2.0	9590055
pH	pH	7.72	9590050	7.45	7.76	N/A	9590050
Anions							
Alkalinity (PP as CaCO ₃)	mg/L	<1.0	9590054	<1.0	<1.0	1.0	9590054
Alkalinity (Total as CaCO ₃)	mg/L	41	9590054	54	36	1.0	9590054
Bicarbonate (HCO ₃)	mg/L	50	9590054	66	44	1.0	9590054
Carbonate (CO ₃)	mg/L	<1.0	9590054	<1.0	<1.0	1.0	9590054
Hydroxide (OH)	mg/L	<1.0	9590054	<1.0	<1.0	1.0	9590054
Dissolved Chloride (Cl)	mg/L	1.7	9592761	1.9	1.8	1.0	9592761
Dissolved Sulphate (SO ₄)	mg/L	7.8	9592761	50	7.8	1.0	9592761
Nutrients							
Dissolved Nitrite (N)	mg/L	<0.010	9589064	<0.010	<0.010	0.010	9589064
Dissolved Nitrate (N)	mg/L	<0.010	9589064	<0.010	<0.010	0.010	9589064
Lab Filtered Elements							
Dissolved Calcium (Ca)	mg/L	13	9590110	25	11	0.30	9589117
Dissolved Iron (Fe)	mg/L	<0.060	9590110	0.065	<0.060	0.060	9589117
Dissolved Magnesium (Mg)	mg/L	3.1	9590110	8.9	3.0	0.20	9589117
Dissolved Manganese (Mn)	mg/L	<0.0040	9590110	0.027	<0.0040	0.0040	9589117
Dissolved Potassium (K)	mg/L	1.4	9590110	2.7	1.5	0.30	9589117
Dissolved Sodium (Na)	mg/L	2.3	9590110	4.7	2.5	0.50	9589117
RDL = Reportable Detection Limit							
N/A = Not Applicable							



BV Labs Job #: B977474
Report Date: 2019/09/23

STANTEC CONSULTING LTD
Client Project #: 121414585
Site Location: GORDON LAKE
Sampler Initials: BW

ROUTINE WATER -LAB FILTERED (SURFACE WATER)

BV Labs ID		WM4552		WM4553		
Sampling Date		2019/09/11 15:45		2019/09/11 14:45		
COC Number		17075		17075		
	UNITS	WES_SW_SNP_11F_20 19_02	QC Batch	WES_SW_PIT1_2019_02	RDL	QC Batch
Calculated Parameters						
Anion Sum	meq/L	1.0	9588456	1.4	N/A	9588456
Cation Sum	meq/L	0.94	9588456	1.5	N/A	9588456
Hardness (CaCO ₃)	mg/L	40	9588942	70	0.50	9588942
Ion Balance (% Difference)	%	4.6	9589036	1.9	N/A	9589036
Dissolved Nitrate (NO ₃)	mg/L	<0.044	9589040	0.096	0.044	9589040
Nitrate plus Nitrite (N)	mg/L	<0.014	9589042	0.022	0.014	9589042
Dissolved Nitrite (NO ₂)	mg/L	<0.033	9589040	<0.033	0.033	9589040
Calculated Total Dissolved Solids	mg/L	52	9588457	89	10	9588457
Misc. Inorganics						
Conductivity	uS/cm	99	9589200	160	2.0	9589200
pH	pH	7.70	9589196	7.36	N/A	9589196
Anions						
Alkalinity (PP as CaCO ₃)	mg/L	<1.0	9589199	<1.0	1.0	9589199
Alkalinity (Total as CaCO ₃)	mg/L	40	9589199	17	1.0	9589199
Bicarbonate (HCO ₃)	mg/L	49	9589199	21	1.0	9589199
Carbonate (CO ₃)	mg/L	<1.0	9589199	<1.0	1.0	9589199
Hydroxide (OH)	mg/L	<1.0	9589199	<1.0	1.0	9589199
Dissolved Chloride (Cl)	mg/L	2.2	9592761	<1.0	1.0	9592750
Dissolved Sulphate (SO ₄)	mg/L	8.0	9592761	52	1.0	9592750
Nutrients						
Dissolved Nitrite (N)	mg/L	<0.010	9589064	<0.010	0.010	9589064
Dissolved Nitrate (N)	mg/L	<0.010	9589064	0.022	0.010	9589064
Lab Filtered Elements						
Dissolved Calcium (Ca)	mg/L	11	9589117	17	0.30	9590110
Dissolved Iron (Fe)	mg/L	<0.060	9589117	<0.060	0.060	9590110
Dissolved Magnesium (Mg)	mg/L	2.9	9589117	6.7	0.20	9590110
Dissolved Manganese (Mn)	mg/L	<0.0040	9589117	0.0086	0.0040	9590110
Dissolved Potassium (K)	mg/L	1.4	9589117	1.8	0.30	9590110
Dissolved Sodium (Na)	mg/L	2.4	9589117	1.2	0.50	9590110
RDL = Reportable Detection Limit N/A = Not Applicable						



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BV Labs Job #: B977474
Report Date: 2019/09/23

STANTEC CONSULTING LTD
Client Project #: 121414585
Site Location: GORDON LAKE
Sampler Initials: BW

ROUTINE WATER -LAB FILTERED (SURFACE WATER)

BV Labs ID		WM4554	WM4554		WM4555		
Sampling Date		2019/09/11 14:50	2019/09/11 14:50		2019/09/11 15:45		
COC Number		17075	17075		17075		
	UNITS	WES_SW_PIT2_2019_02	WES_SW_PIT2_2019_02 Lab-Dup	QC Batch	WES_SW_WET1_2019_02	RDL	QC Batch

Calculated Parameters

Anion Sum	meq/L	1.4	N/A	9588456	1.3	N/A	9588456
Cation Sum	meq/L	1.4	N/A	9588456	1.4	N/A	9588456
Hardness (CaCO ₃)	mg/L	65	N/A	9588942	57	0.50	9588942
Ion Balance (% Difference)	%	0.32	N/A	9589036	2.5	N/A	9589036
Dissolved Nitrate (NO ₃)	mg/L	<0.044	N/A	9589040	<0.044	0.044	9589040
Nitrate plus Nitrite (N)	mg/L	<0.014	N/A	9589042	<0.014	0.014	9589042
Dissolved Nitrite (NO ₂)	mg/L	<0.033	N/A	9589040	<0.033	0.033	9589040
Calculated Total Dissolved Solids	mg/L	86	N/A	9588457	72	10	9588457

Misc. Inorganics

Conductivity	uS/cm	160	N/A	9589200	140	2.0	9589200
pH	pH	7.42	N/A	9589196	7.16	N/A	9589196

Anions

Alkalinity (PP as CaCO ₃)	mg/L	<1.0	N/A	9589199	<1.0	1.0	9589199
Alkalinity (Total as CaCO ₃)	mg/L	20	N/A	9589199	40	1.0	9589199
Bicarbonate (HCO ₃)	mg/L	25	N/A	9589199	49	1.0	9589199
Carbonate (CO ₃)	mg/L	<1.0	N/A	9589199	<1.0	1.0	9589199
Hydroxide (OH)	mg/L	<1.0	N/A	9589199	<1.0	1.0	9589199
Dissolved Chloride (Cl)	mg/L	<1.0	N/A	9591856	1.6	1.0	9592750
Dissolved Sulphate (SO ₄)	mg/L	48	N/A	9591856	21	1.0	9592750

Nutrients

Dissolved Nitrite (N)	mg/L	<0.010	<0.010	9589076	<0.010	0.010	9589076
Dissolved Nitrate (N)	mg/L	<0.010	<0.010	9589076	<0.010	0.010	9589076

Lab Filtered Elements

Dissolved Calcium (Ca)	mg/L	15	N/A	9589117	15	0.30	9590110
Dissolved Iron (Fe)	mg/L	<0.060	N/A	9589117	0.063	0.060	9590110
Dissolved Magnesium (Mg)	mg/L	6.6	N/A	9589117	4.6	0.20	9590110
Dissolved Manganese (Mn)	mg/L	0.0083	N/A	9589117	<0.0040	0.0040	9590110
Dissolved Potassium (K)	mg/L	1.8	N/A	9589117	0.61	0.30	9590110
Dissolved Sodium (Na)	mg/L	1.4	N/A	9589117	4.5	0.50	9590110

RDL = Reportable Detection Limit

Lab-Dup = Laboratory Initiated Duplicate

N/A = Not Applicable



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VERITAS

BV Labs Job #: B977474
Report Date: 2019/09/23

STANTEC CONSULTING LTD
Client Project #: 121414585
Site Location: GORDON LAKE
Sampler Initials: BW

ROUTINE WATER -LAB FILTERED (SURFACE WATER)

BV Labs ID		WM4556		WM4557		
Sampling Date		2019/09/11 15:50		2019/09/11 15:35		
COC Number		17075		17075		
	UNITS	WES_SW_WET2_2019_02	QC Batch	WES_SW_GL1_2019_02	RDL	QC Batch
Calculated Parameters						
Anion Sum	meq/L	1.7	9588456	1.0	N/A	9589038
Cation Sum	meq/L	1.7	9588456	0.94	N/A	9589038
Hardness (CaCO ₃)	mg/L	70	9588942	40	0.50	9588942
Ion Balance (% Difference)	%	1.1	9589036	3.6	N/A	9589036
Dissolved Nitrate (NO ₃)	mg/L	<0.044	9589040	<0.044	0.044	9589040
Nitrate plus Nitrite (N)	mg/L	<0.014	9589042	<0.014	0.014	9589042
Dissolved Nitrite (NO ₂)	mg/L	<0.033	9589040	<0.033	0.033	9589040
Calculated Total Dissolved Solids	mg/L	100	9588457	52	10	9589047
Misc. Inorganics						
Conductivity	uS/cm	180	9593545	98	2.0	9592774
pH	pH	7.28	9593543	7.74	N/A	9592771
Anions						
Alkalinity (PP as CaCO ₃)	mg/L	<1.0	9593544	<1.0	1.0	9592773
Alkalinity (Total as CaCO ₃)	mg/L	29	9593544	39	1.0	9592773
Bicarbonate (HCO ₃)	mg/L	35	9593544	47	1.0	9592773
Carbonate (CO ₃)	mg/L	<1.0	9593544	<1.0	1.0	9592773
Hydroxide (OH)	mg/L	<1.0	9593544	<1.0	1.0	9592773
Dissolved Chloride (Cl)	mg/L	1.8	9592761	1.8	1.0	9592761
Dissolved Sulphate (SO ₄)	mg/L	52	9592761	8.5	1.0	9592761
Nutrients						
Dissolved Nitrite (N)	mg/L	<0.010	9589076	<0.010	0.010	9589076
Dissolved Nitrate (N)	mg/L	<0.010	9589076	<0.010	0.010	9589076
Lab Filtered Elements						
Dissolved Calcium (Ca)	mg/L	18	9589117	11	0.30	9589117
Dissolved Iron (Fe)	mg/L	<0.060	9589117	<0.060	0.060	9589117
Dissolved Magnesium (Mg)	mg/L	6.1	9589117	2.9	0.20	9589117
Dissolved Manganese (Mn)	mg/L	<0.0040	9589117	<0.0040	0.0040	9589117
Dissolved Potassium (K)	mg/L	0.52	9589117	1.4	0.30	9589117
Dissolved Sodium (Na)	mg/L	7.5	9589117	2.5	0.50	9589117
RDL = Reportable Detection Limit						
N/A = Not Applicable						



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BV Labs Job #: B977474
Report Date: 2019/09/23

STANTEC CONSULTING LTD
Client Project #: 121414585
Site Location: GORDON LAKE
Sampler Initials: BW

ROUTINE WATER -LAB FILTERED (SURFACE WATER)

BV Labs ID		WM4558		WM4559		WM4560		
Sampling Date		2019/09/11 15:25		2019/09/11 15:40		2019/09/10		
COC Number		17075		17075		17075		
	UNITS	WES_SW_GL2_2019_02	QC Batch	WES_SW_GL3_2019_02	QC Batch	TB_SW_2019_02	RDL	QC Batch
Calculated Parameters								
Anion Sum	meq/L	1.0	9589038	0.97	9589038	0.0000	N/A	9588456
Cation Sum	meq/L	0.95	9589038	0.94	9589038	0.0060	N/A	9588456
Hardness (CaCO ₃)	mg/L	40	9588942	40	9588942	<0.50	0.50	9588942
Ion Balance (% Difference)	%	4.9	9589036	1.9	9589036	NC	N/A	9589036
Dissolved Nitrate (NO ₃)	mg/L	<0.044	9589040	<0.044	9589040	<0.044	0.044	9589040
Nitrate plus Nitrite (N)	mg/L	<0.014	9589042	<0.014	9589042	<0.014	0.014	9589042
Dissolved Nitrite (NO ₂)	mg/L	<0.033	9589040	<0.033	9589040	<0.033	0.033	9589040
Calculated Total Dissolved Solids	mg/L	53	9589047	50	9589047	<10	10	9588457
Misc. Inorganics								
Conductivity	uS/cm	100	9590055	97	9592774	<2.0	2.0	9590055
pH	pH	7.78	9590050	7.73	9592771	5.42	N/A	9590050
Anions								
Alkalinity (PP as CaCO ₃)	mg/L	<1.0	9590054	<1.0	9592773	<1.0	1.0	9590054
Alkalinity (Total as CaCO ₃)	mg/L	41	9590054	38	9592773	<1.0	1.0	9590054
Bicarbonate (HCO ₃)	mg/L	50	9590054	47	9592773	<1.0	1.0	9590054
Carbonate (CO ₃)	mg/L	<1.0	9590054	<1.0	9592773	<1.0	1.0	9590054
Hydroxide (OH)	mg/L	<1.0	9590054	<1.0	9592773	<1.0	1.0	9590054
Dissolved Chloride (Cl)	mg/L	1.8	9592750	1.5	9592761	<1.0	1.0	9592761
Dissolved Sulphate (SO ₄)	mg/L	8.5	9592750	7.9	9592761	<1.0	1.0	9592761
Nutrients								
Dissolved Nitrite (N)	mg/L	<0.010	9589076	<0.010	9589076	<0.010	0.010	9589064
Dissolved Nitrate (N)	mg/L	<0.010	9589076	<0.010	9589076	<0.010	0.010	9589064
Lab Filtered Elements								
Dissolved Calcium (Ca)	mg/L	11	9589117	11	9589117	<0.30	0.30	9590191
Dissolved Iron (Fe)	mg/L	<0.060	9589117	<0.060	9589117	<0.060	0.060	9590191
Dissolved Magnesium (Mg)	mg/L	3.0	9589117	2.9	9589117	<0.20	0.20	9590191
Dissolved Manganese (Mn)	mg/L	<0.0040	9589117	<0.0040	9589117	<0.0040	0.0040	9590191
Dissolved Potassium (K)	mg/L	1.4	9589117	1.5	9589117	<0.30	0.30	9590191
Dissolved Sodium (Na)	mg/L	2.5	9589117	2.5	9589117	<0.50	0.50	9590191
RDL = Reportable Detection Limit N/A = Not Applicable								



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BV Labs Job #: B977474

Report Date: 2019/09/23

STANTEC CONSULTING LTD

Client Project #: 121414585

Site Location: GORDON LAKE

Sampler Initials: BW

ROUTINE WATER -LAB FILTERED (SURFACE WATER)

BV Labs ID		WM4561	WM4562		
Sampling Date		2019/09/10 12:30	2019/09/10		
COC Number		17075	17075		
	UNITS	FB_SW_2019_02	DUP1_SW_SNP_2019_02	RDL	QC Batch
Calculated Parameters					
Anion Sum	meq/L	0.0000	0.99	N/A	9588456
Cation Sum	meq/L	0.0070	0.93	N/A	9588456
Hardness (CaCO ₃)	mg/L	<0.50	39	0.50	9588942
Ion Balance (% Difference)	%	NC	3.1	N/A	9589036
Dissolved Nitrate (NO ₃)	mg/L	<0.044	<0.044	0.044	9589040
Nitrate plus Nitrite (N)	mg/L	<0.014	<0.014	0.014	9589042
Dissolved Nitrite (NO ₂)	mg/L	<0.033	<0.033	0.033	9589040
Calculated Total Dissolved Solids	mg/L	<10	51	10	9588457
Misc. Inorganics					
Conductivity	uS/cm	<2.0	100	2.0	9590055
pH	pH	5.26	7.79	N/A	9590050
Anions					
Alkalinity (PP as CaCO ₃)	mg/L	<1.0	<1.0	1.0	9590054
Alkalinity (Total as CaCO ₃)	mg/L	<1.0	39	1.0	9590054
Bicarbonate (HCO ₃)	mg/L	<1.0	48	1.0	9590054
Carbonate (CO ₃)	mg/L	<1.0	<1.0	1.0	9590054
Hydroxide (OH)	mg/L	<1.0	<1.0	1.0	9590054
Dissolved Chloride (Cl)	mg/L	<1.0	1.5	1.0	9592761
Dissolved Sulphate (SO ₄)	mg/L	<1.0	8.1	1.0	9592761
Nutrients					
Dissolved Nitrite (N)	mg/L	<0.010	<0.010	0.010	9589064
Dissolved Nitrate (N)	mg/L	<0.010	<0.010	0.010	9589064
Lab Filtered Elements					
Dissolved Calcium (Ca)	mg/L	<0.30	11	0.30	9589117
Dissolved Iron (Fe)	mg/L	<0.060	<0.060	0.060	9589117
Dissolved Magnesium (Mg)	mg/L	<0.20	2.9	0.20	9589117
Dissolved Manganese (Mn)	mg/L	<0.0040	<0.0040	0.0040	9589117
Dissolved Potassium (K)	mg/L	<0.30	1.4	0.30	9589117
Dissolved Sodium (Na)	mg/L	<0.50	2.5	0.50	9589117
RDL = Reportable Detection Limit					
N/A = Not Applicable					

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VERITASBV Labs Job #: B977474
Report Date: 2019/09/23STANTEC CONSULTING LTD
Client Project #: 121414585
Site Location: GORDON LAKE
Sampler Initials: BW**RESULTS OF CHEMICAL ANALYSES OF GROUND WATER**

BV Labs ID		WM4537	WM4537		WM4538		
Sampling Date		2019/09/10 10:30	2019/09/10 10:30		2019/09/10 11:20		
COC Number		17075	17075		17075		
	UNITS	CAM_GW_MW1_2019_02	CAM_GW_MW1_2019_02 Lab-Dup	RDL	CAM_GW_MW2_2019_02	RDL	QC Batch

Calculated Parameters

Total Hardness (CaCO ₃)	mg/L	1340	N/A	0.50	1590	0.50	9589051
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Misc. Inorganics

Total Dissolved Solids	mg/L	3000 (1)	N/A	25	3300	10	9589221
Total Suspended Solids	mg/L	24	N/A	1.0	150	1.0	9589219

Nutrients

Total Ammonia (N)	mg/L	0.70	0.69	0.015	10 (2)	0.15	9589474
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RDL = Reportable Detection Limit

Lab-Dup = Laboratory Initiated Duplicate

N/A = Not Applicable

(1) Detection limit raised based on sample volume used and sample matrix

(2) Detection limits raised due to dilution to bring analyte within the calibrated range.

BV Labs ID		WM4539	WM4540	WM4541	WM4542		
Sampling Date		2019/09/10 12:10	2019/09/10 13:00	2019/09/10 13:50	2019/09/10 14:40		
COC Number		17075	17075	17075	17075		
	UNITS	CAM_GW_SNP_7A_20 19_02	CAM_GW_SNP_7B_20 19_02	CAM_GW_SNP_7C_20 19_02	CAM_GW_SNP_7D_20 19_02	RDL	QC Batch

Calculated Parameters

Total Hardness (CaCO ₃)	mg/L	771	408	818	277	0.50	9589051
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Misc. Inorganics

Total Dissolved Solids	mg/L	1200	610	1200	370	10	9589221
Total Suspended Solids	mg/L	55	4.7	17	15	1.0	9589219

Nutrients

Total Ammonia (N)	mg/L	0.64	0.26	0.015	0.040	0.015	9589474
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RDL = Reportable Detection Limit



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BV Labs Job #: B977474
Report Date: 2019/09/23

STANTEC CONSULTING LTD
Client Project #: 121414585
Site Location: GORDON LAKE
Sampler Initials: BW

RESULTS OF CHEMICAL ANALYSES OF GROUND WATER

BV Labs ID		WM4543		
Sampling Date		2019/09/10		
COC Number		17075		
	UNITS	DUP1_GW_2019_02	RDL	QC Batch
Calculated Parameters				
Total Hardness (CaCO3)	mg/L	1390	0.50	9589051
Misc. Inorganics				
Total Dissolved Solids	mg/L	3000 (1)	25	9589221
Total Suspended Solids	mg/L	23	1.0	9589219
Nutrients				
Total Ammonia (N)	mg/L	0.69	0.015	9589474
RDL = Reportable Detection Limit				
(1) Detection limit raised based on sample volume used and sample matrix				



BV Labs Job #: B977474
Report Date: 2019/09/23

STANTEC CONSULTING LTD
Client Project #: 121414585
Site Location: GORDON LAKE
Sampler Initials: BW

ELEMENTS BY ATOMIC SPECTROSCOPY (GROUND WATER)

BV Labs ID		WM4537	WM4538		WM4539		
Sampling Date		2019/09/10 10:30	2019/09/10 11:20		2019/09/10 12:10		
COC Number		17075	17075		17075		
	UNITS	CAM_GW_MW1_2019_02	CAM_GW_MW2_2019_02	RDL	CAM_GW_SNP_7A_20 19_02	RDL	QC Batch
Total Metals by ICPMS							
Total Aluminum (Al)	ug/L	20900	241	15	28.6	3.0	9592583
Total Antimony (Sb)	ug/L	<2.5	<2.5	2.5	<0.50	0.50	9592583
Total Arsenic (As)	ug/L	3.97	36.2	0.50	17.6	0.10	9592583
Total Barium (Ba)	ug/L	21.9	53.4	5.0	325	1.0	9592583
Total Beryllium (Be)	ug/L	1.40	<0.50	0.50	<0.10	0.10	9592583
Total Bismuth (Bi)	ug/L	<5.0	<5.0	5.0	<1.0	1.0	9592583
Total Boron (B)	ug/L	<250	<250	250	91	50	9592583
Total Cadmium (Cd)	ug/L	4.71	0.129	0.050	0.017	0.010	9592583
Total Cesium (Cs)	ug/L	<1.0	<1.0	1.0	<0.20	0.20	9592583
Total Chromium (Cr)	ug/L	<5.0	<5.0	5.0	<1.0	1.0	9592583
Total Cobalt (Co)	ug/L	1070	68.6	1.0	16.4	0.20	9592583
Total Copper (Cu)	ug/L	42.3	<2.5	2.5	<0.50	0.50	9592583
Total Iron (Fe)	ug/L	130000	66700	50	27400	10	9592583
Total Lead (Pb)	ug/L	4.7	1.3	1.0	<0.20	0.20	9592583
Total Lithium (Li)	ug/L	123	22	10	16.2	2.0	9592583
Total Manganese (Mn)	ug/L	12700	4030	5.0	5640	1.0	9592583
Total Molybdenum (Mo)	ug/L	<5.0	<5.0	5.0	3.6	1.0	9592583
Total Nickel (Ni)	ug/L	3000	113	5.0	5.2	1.0	9592583
Total Selenium (Se)	ug/L	<0.50	<0.50	0.50	0.35	0.10	9592583
Total Silicon (Si)	ug/L	19100	11800	500	11500	100	9592583
Total Silver (Ag)	ug/L	0.16	<0.10	0.10	<0.020	0.020	9592583
Total Strontium (Sr)	ug/L	902	4600	5.0	1240	1.0	9592583
Total Thallium (Tl)	ug/L	0.139	<0.050	0.050	<0.010	0.010	9592583
Total Tin (Sn)	ug/L	<25	<25	25	<5.0	5.0	9592583
Total Titanium (Ti)	ug/L	<25	<25	25	<5.0	5.0	9592583
Total Uranium (U)	ug/L	2.53	6.56	0.50	8.57	0.10	9592583
Total Vanadium (V)	ug/L	<25	<25	25	<5.0	5.0	9592583
Total Zinc (Zn)	ug/L	3000	<25	25	<5.0	5.0	9592583
Total Zirconium (Zr)	ug/L	<0.50	4.10	0.50	4.62	0.10	9592583
Total Calcium (Ca)	mg/L	383	421	0.25	214	0.050	9589052
Total Magnesium (Mg)	mg/L	94.3	130	0.25	57.3	0.050	9589052
RDL = Reportable Detection Limit							



ELEMENTS BY ATOMIC SPECTROSCOPY (GROUND WATER)

BV Labs ID		WM4537	WM4538		WM4539		
Sampling Date		2019/09/10 10:30	2019/09/10 11:20		2019/09/10 12:10		
COC Number		17075	17075		17075		
	UNITS	CAM_GW_MW1_2019_02	CAM_GW_MW2_2019_02	RDL	CAM_GW_SNP_7A_20 19_02	RDL	QC Batch
Total Potassium (K)	mg/L	14.1	62.8	0.25	17.8	0.050	9589052
Total Sodium (Na)	mg/L	22.3	483	0.25	88.6	0.050	9589052
Total Sulphur (S)	mg/L	572	610	15	30.8	3.0	9589052
RDL = Reportable Detection Limit							

BUREAU
VERITASBV Labs Job #: B977474
Report Date: 2019/09/23STANTEC CONSULTING LTD
Client Project #: 121414585
Site Location: GORDON LAKE
Sampler Initials: BW**ELEMENTS BY ATOMIC SPECTROSCOPY (GROUND WATER)**

BV Labs ID		WM4540	WM4541		WM4542		
Sampling Date		2019/09/10 13:00	2019/09/10 13:50		2019/09/10 14:40		
COC Number		17075	17075		17075		
	UNITS	CAM_GW_SNP_7B_20 19_02	CAM_GW_SNP_7C_20 19_02	RDL	CAM_GW_SNP_7D_20 19_02	RDL	QC Batch
Total Metals by ICPMS							
Total Aluminum (Al)	ug/L	59.0	21.1	6.0	55.0	3.0	9592583
Total Antimony (Sb)	ug/L	<1.0	<1.0	1.0	1.89	0.50	9592583
Total Arsenic (As)	ug/L	2.95	26.1	0.20	18.6	0.10	9592583
Total Barium (Ba)	ug/L	52.6	61.4	2.0	29.5	1.0	9592583
Total Beryllium (Be)	ug/L	<0.20	<0.20	0.20	<0.10	0.10	9592583
Total Bismuth (Bi)	ug/L	<2.0	<2.0	2.0	<1.0	1.0	9592583
Total Boron (B)	ug/L	<100	<100	100	<50	50	9592583
Total Cadmium (Cd)	ug/L	0.095	0.147	0.020	0.081	0.010	9592583
Total Cesium (Cs)	ug/L	<0.40	<0.40	0.40	<0.20	0.20	9592583
Total Chromium (Cr)	ug/L	<2.0	<2.0	2.0	<1.0	1.0	9592583
Total Cobalt (Co)	ug/L	89.6	15.7	0.40	3.16	0.20	9592583
Total Copper (Cu)	ug/L	5.2	1.1	1.0	2.04	0.50	9592583
Total Iron (Fe)	ug/L	3710	9780	20	831	10	9592583
Total Lead (Pb)	ug/L	<0.40	0.92	0.40	0.47	0.20	9592583
Total Lithium (Li)	ug/L	<4.0	<4.0	4.0	<2.0	2.0	9592583
Total Manganese (Mn)	ug/L	8530	4980	2.0	991	1.0	9592583
Total Molybdenum (Mo)	ug/L	<2.0	5.0	2.0	4.1	1.0	9592583
Total Nickel (Ni)	ug/L	75.8	21.0	2.0	8.1	1.0	9592583
Total Selenium (Se)	ug/L	<0.20	0.64	0.20	0.67	0.10	9592583
Total Silicon (Si)	ug/L	6670	8890	200	5430	100	9592583
Total Silver (Ag)	ug/L	0.045	<0.040	0.040	0.028	0.020	9592583
Total Strontium (Sr)	ug/L	406	1120	2.0	313	1.0	9592583
Total Thallium (Tl)	ug/L	<0.020	<0.020	0.020	0.025	0.010	9592583
Total Tin (Sn)	ug/L	<10	<10	10	<5.0	5.0	9592583
Total Titanium (Ti)	ug/L	<10	<10	10	<5.0	5.0	9592583
Total Uranium (U)	ug/L	1.44	7.19	0.20	3.47	0.10	9592583
Total Vanadium (V)	ug/L	<10	<10	10	<5.0	5.0	9592583
Total Zinc (Zn)	ug/L	<10	<10	10	<5.0	5.0	9592583
Total Zirconium (Zr)	ug/L	<0.20	1.26	0.20	0.16	0.10	9592583
Total Calcium (Ca)	mg/L	134	276	0.10	94.4	0.050	9589052
Total Magnesium (Mg)	mg/L	17.7	31.0	0.10	10.2	0.050	9589052
RDL = Reportable Detection Limit							



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BV Labs Job #: B977474
Report Date: 2019/09/23

STANTEC CONSULTING LTD
Client Project #: 121414585
Site Location: GORDON LAKE
Sampler Initials: BW

ELEMENTS BY ATOMIC SPECTROSCOPY (GROUND WATER)

BV Labs ID		WM4540	WM4541		WM4542		
Sampling Date		2019/09/10 13:00	2019/09/10 13:50		2019/09/10 14:40		
COC Number		17075	17075		17075		
	UNITS	CAM_GW_SNP_7B_20 19_02	CAM_GW_SNP_7C_20 19_02	RDL	CAM_GW_SNP_7D_20 19_02	RDL	QC Batch
Total Potassium (K)	mg/L	3.12	11.5	0.10	1.97	0.050	9589052
Total Sodium (Na)	mg/L	8.28	35.1	0.10	3.53	0.050	9589052
Total Sulphur (S)	mg/L	79.7	124	6.0	30.5	3.0	9589052
RDL = Reportable Detection Limit							

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VERITASBV Labs Job #: B977474
Report Date: 2019/09/23STANTEC CONSULTING LTD
Client Project #: 121414585
Site Location: GORDON LAKE
Sampler Initials: BW**ELEMENTS BY ATOMIC SPECTROSCOPY (GROUND WATER)**

BV Labs ID		WM4543		
Sampling Date		2019/09/10		
COC Number		17075		
	UNITS	DUP1_GW_2019_02	RDL	QC Batch
Total Metals by ICPMS				
Total Aluminum (Al)	ug/L	21800	15	9592583
Total Antimony (Sb)	ug/L	<2.5	2.5	9592583
Total Arsenic (As)	ug/L	3.91	0.50	9592583
Total Barium (Ba)	ug/L	23.1	5.0	9592583
Total Beryllium (Be)	ug/L	1.47	0.50	9592583
Total Bismuth (Bi)	ug/L	<5.0	5.0	9592583
Total Boron (B)	ug/L	<250	250	9592583
Total Cadmium (Cd)	ug/L	5.08	0.050	9592583
Total Cesium (Cs)	ug/L	<1.0	1.0	9592583
Total Chromium (Cr)	ug/L	<5.0	5.0	9592583
Total Cobalt (Co)	ug/L	1160	1.0	9592583
Total Copper (Cu)	ug/L	44.9	2.5	9592583
Total Iron (Fe)	ug/L	136000	50	9592583
Total Lead (Pb)	ug/L	4.8	1.0	9592583
Total Lithium (Li)	ug/L	120	10	9592583
Total Manganese (Mn)	ug/L	13300	5.0	9592583
Total Molybdenum (Mo)	ug/L	<5.0	5.0	9592583
Total Nickel (Ni)	ug/L	3160	5.0	9592583
Total Selenium (Se)	ug/L	<0.50	0.50	9592583
Total Silicon (Si)	ug/L	19800	500	9592583
Total Silver (Ag)	ug/L	0.18	0.10	9592583
Total Strontium (Sr)	ug/L	939	5.0	9592583
Total Thallium (Tl)	ug/L	0.148	0.050	9592583
Total Tin (Sn)	ug/L	<25	25	9592583
Total Titanium (Ti)	ug/L	<25	25	9592583
Total Uranium (U)	ug/L	2.70	0.50	9592583
Total Vanadium (V)	ug/L	<25	25	9592583
Total Zinc (Zn)	ug/L	3160	25	9592583
Total Zirconium (Zr)	ug/L	<0.50	0.50	9592583
Total Calcium (Ca)	mg/L	395	0.25	9589052
Total Magnesium (Mg)	mg/L	98.4	0.25	9589052
RDL = Reportable Detection Limit				



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BV Labs Job #: B977474
Report Date: 2019/09/23

STANTEC CONSULTING LTD
Client Project #: 121414585
Site Location: GORDON LAKE
Sampler Initials: BW

ELEMENTS BY ATOMIC SPECTROSCOPY (GROUND WATER)

BV Labs ID		WM4543		
Sampling Date		2019/09/10		
COC Number		17075		
	UNITS	DUP1_GW_2019_02	RDL	QC Batch
Total Potassium (K)	mg/L	15.2	0.25	9589052
Total Sodium (Na)	mg/L	23.2	0.25	9589052
Total Sulphur (S)	mg/L	599	15	9589052
RDL = Reportable Detection Limit				



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BV Labs Job #: B977474
Report Date: 2019/09/23

STANTEC CONSULTING LTD
Client Project #: 121414585
Site Location: GORDON LAKE
Sampler Initials: BW

RESULTS OF CHEMICAL ANALYSES OF SURFACE WATER

BV Labs ID		WM4544	WM4545	WM4546	WM4547		
Sampling Date		2019/09/10 16:00	2019/09/10 15:30	2019/09/10 15:45	2019/09/10 15:00		
COC Number		17075	17075	17075	17075		
	UNITS	CAM_SW_SNP_11B1_2019_02	CAM_SW_SNP_11B2_2019_02	CAM_SW_SNP_11B3_2019_02	CAM_SW_SNP_11B4_2019_02	RDL	QC Batch

Calculated Parameters

Total Hardness (CaCO3)	mg/L	39.1	38.8	75.5	39.1	0.50	9589051
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Misc. Inorganics

Total Dissolved Solids	mg/L	60	64	140	56	10	9589221
Total Suspended Solids	mg/L	7.3	1.3	2.0	1.3	1.0	9589219

Nutrients

Total Ammonia (N)	mg/L	0.022	0.041	0.033	0.017	0.015	9589474
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RDL = Reportable Detection Limit

BV Labs ID		WM4548		WM4549	WM4550		
Sampling Date		2019/09/11 17:00		2019/09/11 10:30	2019/09/11 11:40		
COC Number		17075		17075	17075		
	UNITS	BUR_SW_SNP_11A_2019_02	QC Batch	CAM_SW_SNP_11C_2019_02	KID_SW_SNP_11D_2019_02	RDL	QC Batch

Calculated Parameters

Total Hardness (CaCO3)	mg/L	42.0	9589051	40.4	93.9	0.50	9589051
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Misc. Inorganics

Total Dissolved Solids	mg/L	68	9590976	52	160	10	9590987
Total Suspended Solids	mg/L	1.3	9589219	2.0	10	1.0	9589219

Nutrients

Total Ammonia (N)	mg/L	<0.015	9589474	0.024	0.047	0.015	9589474
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RDL = Reportable Detection Limit

BV Labs ID		WM4551	WM4552	WM4553		
Sampling Date		2019/09/11 12:50	2019/09/11 15:45	2019/09/11 14:45		
COC Number		17075	17075	17075		
	UNITS	TRE_SW_SNP_11E_2019_02	WES_SW_SNP_11F_2019_02	WES_SW_PIT1_2019_02	RDL	QC Batch

Calculated Parameters

Total Hardness (CaCO3)	mg/L	38.9	39.8	61.4	0.50	9589051
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Misc. Inorganics

Total Dissolved Solids	mg/L	52	60	N/A	10	9590987
Total Suspended Solids	mg/L	1.3	2.7	N/A	1.0	9589219

Nutrients

Total Ammonia (N)	mg/L	0.024	<0.015	N/A	0.015	9589474
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RDL = Reportable Detection Limit

N/A = Not Applicable



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BV Labs Job #: B977474
Report Date: 2019/09/23

STANTEC CONSULTING LTD
Client Project #: 121414585
Site Location: GORDON LAKE
Sampler Initials: BW

RESULTS OF CHEMICAL ANALYSES OF SURFACE WATER

BV Labs ID		WM4554	WM4555	WM4556		
Sampling Date		2019/09/11 14:50	2019/09/11 15:45	2019/09/11 15:50		
COC Number		17075	17075	17075		
	UNITS	WES_SW_PIT2_2019_02	WES_SW_WET1_2019_02	WES_SW_WET2_2019_02	RDL	QC Batch

Calculated Parameters

Total Hardness (CaCO ₃)	mg/L	63.6	52.8	74.6	0.50	9589051
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RDL = Reportable Detection Limit

BV Labs ID		WM4557	WM4558	WM4559		
Sampling Date		2019/09/11 15:35	2019/09/11 15:25	2019/09/11 15:40		
COC Number		17075	17075	17075		
	UNITS	WES_SW_GL1_2019_02	WES_SW_GL2_2019_02	WES_SW_GL3_2019_02	RDL	QC Batch

Calculated Parameters

Total Hardness (CaCO ₃)	mg/L	40.8	43.3	41.5	0.50	9589051
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RDL = Reportable Detection Limit

BV Labs ID		WM4560	WM4561	WM4562		
Sampling Date		2019/09/10	2019/09/10 12:30	2019/09/10		
COC Number		17075	17075	17075		
	UNITS	TB_SW_2019_02	FB_SW_2019_02	DUP1_SW_SNP_2019_02	RDL	QC Batch

Calculated Parameters

Total Hardness (CaCO ₃)	mg/L	<0.50	<0.50	43.4	0.50	9589051
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Misc. Inorganics

Total Dissolved Solids	mg/L	<10	<10	64	10	9589221
Total Suspended Solids	mg/L	<1.0	<1.0	<1.0	1.0	9589219

Nutrients

Total Ammonia (N)	mg/L	0.029	0.026	0.022	0.015	9589474
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RDL = Reportable Detection Limit

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Report Date: 2019/09/23STANTEC CONSULTING LTD
Client Project #: 121414585
Site Location: GORDON LAKE
Sampler Initials: BW**ELEMENTS BY ATOMIC SPECTROSCOPY (SURFACE WATER)**

BV Labs ID		WM4544	WM4545	WM4545	WM4546		
Sampling Date		2019/09/10 16:00	2019/09/10 15:30	2019/09/10 15:30	2019/09/10 15:45		
COC Number		17075	17075	17075	17075		
	UNITS	CAM_SW_SNP_11B1_ 2019_02	CAM_SW_SNP_11B2_ 2019_02	CAM_SW_SNP_11B2_ 2019_02 Lab-Dup	CAM_SW_SNP_11B3_ 2019_02	RDL	QC Batch

Total Metals by ICPMS							
Total Aluminum (Al)	ug/L	18.6	17.8	18.6	28.2	3.0	9592583
Total Antimony (Sb)	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	9592583
Total Arsenic (As)	ug/L	0.26	0.26	0.26	0.45	0.10	9592583
Total Barium (Ba)	ug/L	4.5	4.6	4.7	5.6	1.0	9592583
Total Beryllium (Be)	ug/L	<0.10	<0.10	<0.10	<0.10	0.10	9592583
Total Bismuth (Bi)	ug/L	<1.0	<1.0	<1.0	<1.0	1.0	9592583
Total Boron (B)	ug/L	<50	<50	<50	<50	50	9592583
Total Cadmium (Cd)	ug/L	0.092	0.208	0.203	<0.010	0.010	9592583
Total Cesium (Cs)	ug/L	<0.20	<0.20	<0.20	<0.20	0.20	9592583
Total Chromium (Cr)	ug/L	<1.0	<1.0	<1.0	<1.0	1.0	9592583
Total Cobalt (Co)	ug/L	<0.20	<0.20	<0.20	0.85	0.20	9592583
Total Copper (Cu)	ug/L	0.75	0.94	0.94	0.88	0.50	9592583
Total Iron (Fe)	ug/L	19	23	21	38	10	9592583
Total Lead (Pb)	ug/L	<0.20	<0.20	<0.20	<0.20	0.20	9592583
Total Lithium (Li)	ug/L	<2.0	<2.0	<2.0	2.0	2.0	9592583
Total Manganese (Mn)	ug/L	1.7	2.1	2.2	6.7	1.0	9592583
Total Molybdenum (Mo)	ug/L	<1.0	<1.0	<1.0	<1.0	1.0	9592583
Total Nickel (Ni)	ug/L	<1.0	<1.0	<1.0	1.2	1.0	9592583
Total Selenium (Se)	ug/L	<0.10	<0.10	<0.10	<0.10	0.10	9592583
Total Silicon (Si)	ug/L	129	125	123	122	100	9592583
Total Silver (Ag)	ug/L	<0.020	0.069	0.074	<0.020	0.020	9592583
Total Strontium (Sr)	ug/L	41.3	40.1	40.0	87.3	1.0	9592583
Total Thallium (Tl)	ug/L	<0.010	<0.010	<0.010	<0.010	0.010	9592583
Total Tin (Sn)	ug/L	<5.0	<5.0	<5.0	<5.0	5.0	9592583
Total Titanium (Ti)	ug/L	<5.0	<5.0	<5.0	<5.0	5.0	9592583
Total Uranium (U)	ug/L	<0.10	<0.10	<0.10	0.26	0.10	9592583
Total Vanadium (V)	ug/L	<5.0	<5.0	<5.0	<5.0	5.0	9592583
Total Zinc (Zn)	ug/L	<5.0	<5.0	<5.0	<5.0	5.0	9592583
Total Zirconium (Zr)	ug/L	<0.10	<0.10	<0.10	<0.10	0.10	9592583
Total Calcium (Ca)	mg/L	11.1	11.1	N/A	21.9	0.050	9589052

RDL = Reportable Detection Limit

Lab-Dup = Laboratory Initiated Duplicate

N/A = Not Applicable



ELEMENTS BY ATOMIC SPECTROSCOPY (SURFACE WATER)

BV Labs ID		WM4544	WM4545	WM4545	WM4546		
Sampling Date		2019/09/10 16:00	2019/09/10 15:30	2019/09/10 15:30	2019/09/10 15:45		
COC Number		17075	17075	17075	17075		
	UNITS	CAM_SW_SNP_11B1_ 2019_02	CAM_SW_SNP_11B2_ 2019_02	CAM_SW_SNP_11B2_ 2019_02 Lab-Dup	CAM_SW_SNP_11B3_ 2019_02	RDL	QC Batch
Total Magnesium (Mg)	mg/L	2.74	2.67	N/A	5.04	0.050	9589052
Total Potassium (K)	mg/L	1.43	1.44	N/A	1.98	0.050	9589052
Total Sodium (Na)	mg/L	2.22	2.16	N/A	6.12	0.050	9589052
Total Sulphur (S)	mg/L	<3.0	<3.0	N/A	15.8	3.0	9589052
RDL = Reportable Detection Limit Lab-Dup = Laboratory Initiated Duplicate N/A = Not Applicable							

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VERITASBV Labs Job #: B977474
Report Date: 2019/09/23STANTEC CONSULTING LTD
Client Project #: 121414585
Site Location: GORDON LAKE
Sampler Initials: BW**ELEMENTS BY ATOMIC SPECTROSCOPY (SURFACE WATER)**

BV Labs ID		WM4547	WM4548	WM4549	WM4550		
Sampling Date		2019/09/10 15:00	2019/09/11 17:00	2019/09/11 10:30	2019/09/11 11:40		
COC Number		17075	17075	17075	17075		
	UNITS	CAM_SW_SNP_11B4_2019_02	BUR_SW_SNP_11A_2019_02	CAM_SW_SNP_11C_2019_02	KID_SW_SNP_11D_2019_02	RDL	QC Batch

Total Metals by ICPMS							
Total Aluminum (Al)	ug/L	17.5	12.2	11.4	22.9	3.0	9592583
Total Antimony (Sb)	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	9592583
Total Arsenic (As)	ug/L	0.31	0.78	0.31	2.72	0.10	9592583
Total Barium (Ba)	ug/L	4.2	4.7	4.7	14.2	1.0	9592583
Total Beryllium (Be)	ug/L	<0.10	<0.10	<0.10	<0.10	0.10	9592583
Total Bismuth (Bi)	ug/L	<1.0	<1.0	<1.0	<1.0	1.0	9592583
Total Boron (B)	ug/L	<50	<50	<50	<50	50	9592583
Total Cadmium (Cd)	ug/L	0.019	<0.010	<0.010	<0.010	0.010	9592583
Total Cesium (Cs)	ug/L	<0.20	<0.20	<0.20	<0.20	0.20	9592583
Total Chromium (Cr)	ug/L	<1.0	<1.0	<1.0	<1.0	1.0	9592583
Total Cobalt (Co)	ug/L	<0.20	<0.20	<0.20	1.48	0.20	9592583
Total Copper (Cu)	ug/L	0.72	0.53	0.52	<0.50	0.50	9592583
Total Iron (Fe)	ug/L	20	<10	17	205	10	9592583
Total Lead (Pb)	ug/L	<0.20	<0.20	<0.20	<0.20	0.20	9592583
Total Lithium (Li)	ug/L	<2.0	<2.0	<2.0	9.0	2.0	9592583
Total Manganese (Mn)	ug/L	2.3	2.5	2.5	75.7	1.0	9592583
Total Molybdenum (Mo)	ug/L	<1.0	<1.0	<1.0	<1.0	1.0	9592583
Total Nickel (Ni)	ug/L	<1.0	<1.0	<1.0	12.2	1.0	9592583
Total Selenium (Se)	ug/L	<0.10	<0.10	<0.10	<0.10	0.10	9592583
Total Silicon (Si)	ug/L	139	243	113	942	100	9592583
Total Silver (Ag)	ug/L	<0.020	<0.020	<0.020	<0.020	0.020	9592583
Total Strontium (Sr)	ug/L	41.0	47.9	42.7	104	1.0	9592583
Total Thallium (Tl)	ug/L	<0.010	<0.010	<0.010	<0.010	0.010	9592583
Total Tin (Sn)	ug/L	<5.0	<5.0	<5.0	<5.0	5.0	9592583
Total Titanium (Ti)	ug/L	<5.0	<5.0	<5.0	<5.0	5.0	9592583
Total Uranium (U)	ug/L	<0.10	0.25	<0.10	<0.10	0.10	9592583
Total Vanadium (V)	ug/L	<5.0	<5.0	<5.0	<5.0	5.0	9592583
Total Zinc (Zn)	ug/L	<5.0	<5.0	<5.0	<5.0	5.0	9592583
Total Zirconium (Zr)	ug/L	<0.10	<0.10	<0.10	<0.10	0.10	9592583
Total Calcium (Ca)	mg/L	11.2	12.2	11.5	24.4	0.050	9589052
Total Magnesium (Mg)	mg/L	2.67	2.80	2.81	8.00	0.050	9589052

RDL = Reportable Detection Limit



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BV Labs Job #: B977474
Report Date: 2019/09/23

STANTEC CONSULTING LTD
Client Project #: 121414585
Site Location: GORDON LAKE
Sampler Initials: BW

ELEMENTS BY ATOMIC SPECTROSCOPY (SURFACE WATER)

BV Labs ID		WM4547	WM4548	WM4549	WM4550		
Sampling Date		2019/09/10 15:00	2019/09/11 17:00	2019/09/11 10:30	2019/09/11 11:40		
COC Number		17075	17075	17075	17075		
	UNITS	CAM_SW_SNP_11B4_2019_02	BUR_SW_SNP_11A_2019_02	CAM_SW_SNP_11C_2019_02	KID_SW_SNP_11D_2019_02	RDL	QC Batch
Total Potassium (K)	mg/L	1.45	1.39	1.41	2.51	0.050	9589052
Total Sodium (Na)	mg/L	2.18	2.19	2.16	4.23	0.050	9589052
Total Sulphur (S)	mg/L	<3.0	<3.0	<3.0	14.0	3.0	9589052
RDL = Reportable Detection Limit							



BV Labs Job #: B977474
Report Date: 2019/09/23

STANTEC CONSULTING LTD
Client Project #: 121414585
Site Location: GORDON LAKE
Sampler Initials: BW

ELEMENTS BY ATOMIC SPECTROSCOPY (SURFACE WATER)

BV Labs ID		WM4551	WM4552	WM4553		
Sampling Date		2019/09/11 12:50	2019/09/11 15:45	2019/09/11 14:45		
COC Number		17075	17075	17075		
	UNITS	TRE_SW_SNP_11E_20 19_02	WES_SW_SNP_11F_20 19_02	WES_SW_PIT1_2019_02	RDL	QC Batch
Total Metals by ICPMS						
Total Aluminum (Al)	ug/L	10.5	34.0	69.7	3.0	9592583
Total Antimony (Sb)	ug/L	<0.50	<0.50	<0.50	0.50	9592583
Total Arsenic (As)	ug/L	0.24	0.26	6.01	0.10	9592583
Total Barium (Ba)	ug/L	4.3	4.5	5.5	1.0	9592583
Total Beryllium (Be)	ug/L	<0.10	<0.10	<0.10	0.10	9592583
Total Bismuth (Bi)	ug/L	<1.0	<1.0	<1.0	1.0	9592583
Total Boron (B)	ug/L	<50	<50	<50	50	9592583
Total Cadmium (Cd)	ug/L	0.039	<0.010	0.112	0.010	9592583
Total Cesium (Cs)	ug/L	<0.20	<0.20	<0.20	0.20	9592583
Total Chromium (Cr)	ug/L	<1.0	<1.0	<1.0	1.0	9592583
Total Cobalt (Co)	ug/L	<0.20	<0.20	2.28	0.20	9592583
Total Copper (Cu)	ug/L	0.62	0.55	8.18	0.50	9592583
Total Iron (Fe)	ug/L	<10	38	352	10	9592583
Total Lead (Pb)	ug/L	<0.20	<0.20	0.65	0.20	9592583
Total Lithium (Li)	ug/L	<2.0	<2.0	2.3	2.0	9592583
Total Manganese (Mn)	ug/L	2.4	3.1	38.0	1.0	9592583
Total Molybdenum (Mo)	ug/L	<1.0	<1.0	<1.0	1.0	9592583
Total Nickel (Ni)	ug/L	<1.0	<1.0	18.5	1.0	9592583
Total Selenium (Se)	ug/L	<0.10	<0.10	0.27	0.10	9592583
Total Silicon (Si)	ug/L	126	246	533	100	9592583
Total Silver (Ag)	ug/L	<0.020	<0.020	<0.020	0.020	9592583
Total Strontium (Sr)	ug/L	40.5	41.2	37.5	1.0	9592583
Total Thallium (Tl)	ug/L	<0.010	<0.010	<0.010	0.010	9592583
Total Tin (Sn)	ug/L	<5.0	<5.0	<5.0	5.0	9592583
Total Titanium (Ti)	ug/L	<5.0	<5.0	<5.0	5.0	9592583
Total Uranium (U)	ug/L	<0.10	<0.10	<0.10	0.10	9592583
Total Vanadium (V)	ug/L	<5.0	<5.0	<5.0	5.0	9592583
Total Zinc (Zn)	ug/L	<5.0	<5.0	19.6	5.0	9592583
Total Zirconium (Zr)	ug/L	<0.10	<0.10	<0.10	0.10	9592583
Total Calcium (Ca)	mg/L	11.0	11.4	14.8	0.050	9589052
Total Magnesium (Mg)	mg/L	2.75	2.78	5.90	0.050	9589052
RDL = Reportable Detection Limit						



ELEMENTS BY ATOMIC SPECTROSCOPY (SURFACE WATER)

BV Labs ID		WM4551	WM4552	WM4553		
Sampling Date		2019/09/11 12:50	2019/09/11 15:45	2019/09/11 14:45		
COC Number		17075	17075	17075		
	UNITS	TRE_SW_SNP_11E_20 19_02	WES_SW_SNP_11F_20 19_02	WES_SW_PIT1_2019_02	RDL	QC Batch
Total Potassium (K)	mg/L	1.44	1.39	1.69	0.050	9589052
Total Sodium (Na)	mg/L	2.21	2.20	1.10	0.050	9589052
Total Sulphur (S)	mg/L	<3.0	<3.0	15.7	3.0	9589052
RDL = Reportable Detection Limit						



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BV Labs Job #: B977474
Report Date: 2019/09/23

STANTEC CONSULTING LTD
Client Project #: 121414585
Site Location: GORDON LAKE
Sampler Initials: BW

ELEMENTS BY ATOMIC SPECTROSCOPY (SURFACE WATER)

BV Labs ID		WM4554	WM4555		WM4556		
Sampling Date		2019/09/11 14:50	2019/09/11 15:45		2019/09/11 15:50		
COC Number		17075	17075		17075		
	UNITS	WES_SW_PIT2_2019_02	WES_SW_WET1_2019_02	QC Batch	WES_SW_WET2_2019_02	RDL	QC Batch

Total Metals by ICPMS							
Total Aluminum (Al)	ug/L	21.5	59.4	9592583	38.2	3.0	9592755
Total Antimony (Sb)	ug/L	<0.50	<0.50	9592583	<0.50	0.50	9592755
Total Arsenic (As)	ug/L	1.26	0.51	9592583	0.49	0.10	9592755
Total Barium (Ba)	ug/L	5.1	9.4	9592583	12.8	1.0	9592755
Total Beryllium (Be)	ug/L	<0.10	<0.10	9592583	<0.10	0.10	9592755
Total Bismuth (Bi)	ug/L	<1.0	<1.0	9592583	<1.0	1.0	9592755
Total Boron (B)	ug/L	<50	<50	9592583	<50	50	9592755
Total Cadmium (Cd)	ug/L	0.082	<0.010	9592583	<0.010	0.010	9592755
Total Cesium (Cs)	ug/L	<0.20	<0.20	9592583	<0.20	0.20	9592755
Total Chromium (Cr)	ug/L	<1.0	<1.0	9592583	<1.0	1.0	9592755
Total Cobalt (Co)	ug/L	0.27	0.21	9592583	0.34	0.20	9592755
Total Copper (Cu)	ug/L	5.89	0.87	9592583	0.98	0.50	9592755
Total Iron (Fe)	ug/L	30	162	9592583	306	10	9592755
Total Lead (Pb)	ug/L	<0.20	<0.20	9592583	<0.20	0.20	9592755
Total Lithium (Li)	ug/L	2.3	2.1	9592583	3.5	2.0	9592755
Total Manganese (Mn)	ug/L	8.8	16.1	9592583	15.3	1.0	9592755
Total Molybdenum (Mo)	ug/L	<1.0	<1.0	9592583	<1.0	1.0	9592755
Total Nickel (Ni)	ug/L	16.8	1.2	9592583	1.6	1.0	9592755
Total Selenium (Se)	ug/L	<0.10	<0.10	9592583	<0.10	0.10	9592755
Total Silicon (Si)	ug/L	502	229	9592583	1140	100	9592755
Total Silver (Ag)	ug/L	<0.020	<0.020	9592583	<0.020	0.020	9592755
Total Strontium (Sr)	ug/L	38.3	46.2	9592583	66.7	1.0	9592755
Total Thallium (Tl)	ug/L	<0.010	<0.010	9592583	<0.010	0.010	9592755
Total Tin (Sn)	ug/L	<5.0	<5.0	9592583	<5.0	5.0	9592755
Total Titanium (Ti)	ug/L	<5.0	<5.0	9592583	<5.0	5.0	9592755
Total Uranium (U)	ug/L	<0.10	0.10	9592583	0.11	0.10	9592755
Total Vanadium (V)	ug/L	<5.0	<5.0	9592583	<5.0	5.0	9592755
Total Zinc (Zn)	ug/L	16.6	<5.0	9592583	<5.0	5.0	9592755
Total Zirconium (Zr)	ug/L	<0.10	0.18	9592583	0.20	0.10	9592755
Total Calcium (Ca)	mg/L	15.6	14.1	9589052	20.1	0.050	9589052
Total Magnesium (Mg)	mg/L	6.00	4.28	9589052	5.92	0.050	9589052

RDL = Reportable Detection Limit



BUREAU
VERITAS

BV Labs Job #: B977474
Report Date: 2019/09/23

STANTEC CONSULTING LTD
Client Project #: 121414585
Site Location: GORDON LAKE
Sampler Initials: BW

ELEMENTS BY ATOMIC SPECTROSCOPY (SURFACE WATER)

BV Labs ID		WM4554	WM4555		WM4556		
Sampling Date		2019/09/11 14:50	2019/09/11 15:45		2019/09/11 15:50		
COC Number		17075	17075		17075		
	UNITS	WES_SW_PIT2_2019_02	WES_SW_WET1_2019_02	QC Batch	WES_SW_WET2_2019_02	RDL	QC Batch
Total Potassium (K)	mg/L	1.79	0.775	9589052	0.588	0.050	9589052
Total Sodium (Na)	mg/L	1.17	4.41	9589052	7.14	0.050	9589052
Total Sulphur (S)	mg/L	16.1	6.4	9589052	17.8	3.0	9589052
RDL = Reportable Detection Limit							



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VERITAS

BV Labs Job #: B977474
Report Date: 2019/09/23

STANTEC CONSULTING LTD
Client Project #: 121414585
Site Location: GORDON LAKE
Sampler Initials: BW

ELEMENTS BY ATOMIC SPECTROSCOPY (SURFACE WATER)

BV Labs ID		WM4557	WM4558	WM4559		
Sampling Date		2019/09/11 15:35	2019/09/11 15:25	2019/09/11 15:40		
COC Number		17075	17075	17075		
	UNITS	WES_SW_GL1_2019_02	WES_SW_GL2_2019_02	WES_SW_GL3_2019_02	RDL	QC Batch
Total Metals by ICPMS						
Total Aluminum (Al)	ug/L	67.0	59.7	11.9	3.0	9592755
Total Antimony (Sb)	ug/L	<0.50	<0.50	<0.50	0.50	9592755
Total Arsenic (As)	ug/L	0.27	0.29	0.25	0.10	9592755
Total Barium (Ba)	ug/L	4.7	4.9	4.2	1.0	9592755
Total Beryllium (Be)	ug/L	<0.10	<0.10	<0.10	0.10	9592755
Total Bismuth (Bi)	ug/L	<1.0	<1.0	<1.0	1.0	9592755
Total Boron (B)	ug/L	<50	<50	<50	50	9592755
Total Cadmium (Cd)	ug/L	<0.010	<0.010	<0.010	0.010	9592755
Total Cesium (Cs)	ug/L	<0.20	<0.20	<0.20	0.20	9592755
Total Chromium (Cr)	ug/L	<1.0	<1.0	<1.0	1.0	9592755
Total Cobalt (Co)	ug/L	<0.20	<0.20	<0.20	0.20	9592755
Total Copper (Cu)	ug/L	0.58	0.61	1.14	0.50	9592755
Total Iron (Fe)	ug/L	82	96	11	10	9592755
Total Lead (Pb)	ug/L	<0.20	<0.20	<0.20	0.20	9592755
Total Lithium (Li)	ug/L	<2.0	<2.0	<2.0	2.0	9592755
Total Manganese (Mn)	ug/L	3.9	4.3	1.8	1.0	9592755
Total Molybdenum (Mo)	ug/L	<1.0	<1.0	<1.0	1.0	9592755
Total Nickel (Ni)	ug/L	<1.0	<1.0	<1.0	1.0	9592755
Total Selenium (Se)	ug/L	<0.10	<0.10	<0.10	0.10	9592755
Total Silicon (Si)	ug/L	201	224	123	100	9592755
Total Silver (Ag)	ug/L	<0.020	<0.020	<0.020	0.020	9592755
Total Strontium (Sr)	ug/L	42.8	44.6	43.8	1.0	9592755
Total Thallium (Tl)	ug/L	<0.010	<0.010	<0.010	0.010	9592755
Total Tin (Sn)	ug/L	<5.0	<5.0	<5.0	5.0	9592755
Total Titanium (Ti)	ug/L	<5.0	<5.0	<5.0	5.0	9592755
Total Uranium (U)	ug/L	<0.10	0.10	<0.10	0.10	9592755
Total Vanadium (V)	ug/L	<5.0	<5.0	<5.0	5.0	9592755
Total Zinc (Zn)	ug/L	<5.0	<5.0	<5.0	5.0	9592755
Total Zirconium (Zr)	ug/L	<0.10	<0.10	<0.10	0.10	9592755
Total Calcium (Ca)	mg/L	11.8	12.6	12.1	0.050	9589052
Total Magnesium (Mg)	mg/L	2.75	2.89	2.76	0.050	9589052
RDL = Reportable Detection Limit						



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VERITAS

BV Labs Job #: B977474
Report Date: 2019/09/23

STANTEC CONSULTING LTD
Client Project #: 121414585
Site Location: GORDON LAKE
Sampler Initials: BW

ELEMENTS BY ATOMIC SPECTROSCOPY (SURFACE WATER)

BV Labs ID		WM4557	WM4558	WM4559		
Sampling Date		2019/09/11 15:35	2019/09/11 15:25	2019/09/11 15:40		
COC Number		17075	17075	17075		
	UNITS	WES_SW_GL1_2019_02	WES_SW_GL2_2019_02	WES_SW_GL3_2019_02	RDL	QC Batch
Total Potassium (K)	mg/L	1.43	1.47	1.41	0.050	9589052
Total Sodium (Na)	mg/L	2.18	2.24	2.16	0.050	9589052
Total Sulphur (S)	mg/L	<3.0	<3.0	<3.0	3.0	9589052
RDL = Reportable Detection Limit						

BUREAU
VERITASBV Labs Job #: B977474
Report Date: 2019/09/23STANTEC CONSULTING LTD
Client Project #: 121414585
Site Location: GORDON LAKE
Sampler Initials: BW**ELEMENTS BY ATOMIC SPECTROSCOPY (SURFACE WATER)**

BV Labs ID		WM4560	WM4561	WM4561		WM4562		
Sampling Date		2019/09/10	2019/09/10 12:30	2019/09/10 12:30		2019/09/10		
COC Number		17075	17075	17075		17075		
	UNITS	TB_SW_2019_02	FB_SW_2019_02	FB_SW_2019_02 Lab-Dup	QC Batch	DUP1_SW_SNP_2019_02	RDL	QC Batch

Total Metals by ICPMS								
Total Aluminum (Al)	ug/L	<3.0	<3.0	<3.0	9592939	15.3	3.0	9592755
Total Antimony (Sb)	ug/L	<0.50	<0.50	<0.50	9592939	<0.50	0.50	9592755
Total Arsenic (As)	ug/L	<0.10	<0.10	<0.10	9592939	0.34	0.10	9592755
Total Barium (Ba)	ug/L	<1.0	<1.0	<1.0	9592939	4.4	1.0	9592755
Total Beryllium (Be)	ug/L	<0.10	<0.10	<0.10	9592939	<0.10	0.10	9592755
Total Bismuth (Bi)	ug/L	<1.0	<1.0	<1.0	9592939	<1.0	1.0	9592755
Total Boron (B)	ug/L	<50	<50	<50	9592939	<50	50	9592755
Total Cadmium (Cd)	ug/L	<0.010	<0.010	<0.010	9592939	0.010	0.010	9592755
Total Cesium (Cs)	ug/L	<0.20	<0.20	<0.20	9592939	<0.20	0.20	9592755
Total Chromium (Cr)	ug/L	<1.0	<1.0	<1.0	9592939	<1.0	1.0	9592755
Total Cobalt (Co)	ug/L	<0.20	<0.20	<0.20	9592939	<0.20	0.20	9592755
Total Copper (Cu)	ug/L	<0.50	<0.50	<0.50	9592939	0.58	0.50	9592755
Total Iron (Fe)	ug/L	<10	<10	<10	9592939	15	10	9592755
Total Lead (Pb)	ug/L	<0.20	<0.20	<0.20	9592939	<0.20	0.20	9592755
Total Lithium (Li)	ug/L	<2.0	<2.0	<2.0	9592939	<2.0	2.0	9592755
Total Manganese (Mn)	ug/L	<1.0	<1.0	<1.0	9592939	2.2	1.0	9592755
Total Molybdenum (Mo)	ug/L	<1.0	<1.0	<1.0	9592939	<1.0	1.0	9592755
Total Nickel (Ni)	ug/L	<1.0	<1.0	<1.0	9592939	<1.0	1.0	9592755
Total Selenium (Se)	ug/L	<0.10	<0.10	<0.10	9592939	<0.10	0.10	9592755
Total Silicon (Si)	ug/L	<100	<100	<100	9592939	138	100	9592755
Total Silver (Ag)	ug/L	<0.020	<0.020	<0.020	9592939	<0.020	0.020	9592755
Total Strontium (Sr)	ug/L	<1.0	<1.0	<1.0	9592939	45.7	1.0	9592755
Total Thallium (Tl)	ug/L	<0.010	<0.010	<0.010	9592939	<0.010	0.010	9592755
Total Tin (Sn)	ug/L	<5.0	<5.0	<5.0	9592939	<5.0	5.0	9592755
Total Titanium (Ti)	ug/L	<5.0	<5.0	<5.0	9592939	<5.0	5.0	9592755
Total Uranium (U)	ug/L	<0.10	<0.10	<0.10	9592939	<0.10	0.10	9592755
Total Vanadium (V)	ug/L	<5.0	<5.0	<5.0	9592939	<5.0	5.0	9592755
Total Zinc (Zn)	ug/L	<5.0	<5.0	<5.0	9592939	<5.0	5.0	9592755
Total Zirconium (Zr)	ug/L	<0.10	<0.10	<0.10	9592939	<0.10	0.10	9592755
Total Calcium (Ca)	mg/L	<0.050	<0.050	N/A	9589052	12.6	0.050	9589052

RDL = Reportable Detection Limit

Lab-Dup = Laboratory Initiated Duplicate

N/A = Not Applicable



ELEMENTS BY ATOMIC SPECTROSCOPY (SURFACE WATER)

BV Labs ID		WM4560	WM4561	WM4561		WM4562		
Sampling Date		2019/09/10	2019/09/10 12:30	2019/09/10 12:30		2019/09/10		
COC Number		17075	17075	17075		17075		
	UNITS	TB_SW_2019_02	FB_SW_2019_02	FB_SW_2019_02 Lab-Dup	QC Batch	DUP1_SW_SNP_2019_02	RDL	QC Batch
Total Magnesium (Mg)	mg/L	<0.050	<0.050	N/A	9589052	2.91	0.050	9589052
Total Potassium (K)	mg/L	<0.050	<0.050	N/A	9589052	1.48	0.050	9589052
Total Sodium (Na)	mg/L	<0.050	<0.050	N/A	9589052	2.26	0.050	9589052
Total Sulphur (S)	mg/L	<3.0	<3.0	N/A	9589052	<3.0	3.0	9589052

RDL = Reportable Detection Limit

Lab-Dup = Laboratory Initiated Duplicate

N/A = Not Applicable

**GENERAL COMMENTS**

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

Package 1	10.0°C
Package 2	7.4°C
Package 3	5.3°C

Sample WM4537 [CAM_GW_MW1_2019_02] : Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample WM4538 [CAM_GW_MW2_2019_02] : Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample WM4539 [CAM_GW_SNP_7A_2019_02] : Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample WM4540 [CAM_GW_SNP_7B_2019_02] : Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample WM4541 [CAM_GW_SNP_7C_2019_02] : Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample WM4542 [CAM_GW_SNP_7D_2019_02] : Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample WM4543 [DUP1_GW_2019_02] : Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample WM4544 [CAM_SW_SNP_11B1_2019_02] : Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample WM4545 [CAM_SW_SNP_11B2_2019_02] : Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample WM4546 [CAM_SW_SNP_11B3_2019_02] : Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample WM4547 [CAM_SW_SNP_11B4_2019_02] : Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample WM4554 [WES_SW_PIT2_2019_02] : Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample WM4555 [WES_SW_WET1_2019_02] : Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample WM4556 [WES_SW_WET2_2019_02] : Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample WM4557 [WES_SW_GL1_2019_02] : Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample WM4558 [WES_SW_GL2_2019_02] : Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.



Sample WM4559 [WES_SW_GL3_2019_02] : Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample WM4560 [TB_SW_2019_02] : Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample WM4561 [FB_SW_2019_02] : Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

Sample WM4562 [DUP1_SW_SNP_2019_02] : Sample was analyzed past method specified hold time for Nitrogen (Nitrite - Nitrate) by IC. Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised.

ELEMENTS BY ATOMIC SPECTROSCOPY (GROUND WATER) Comments

Matrix Spike Elements by CRC ICPMS (total): RDL raised due to concentration over linear range, sample dilution required.

Sample WM4537 [CAM_GW_MW1_2019_02] Elements by CRC ICPMS (total): RDL raised due to concentration over linear range, sample dilution required.

Sample WM4538 [CAM_GW_MW2_2019_02] Elements by CRC ICPMS (total): RDL raised due to concentration over linear range, sample dilution required.

Sample WM4540 [CAM_GW_SNP_7B_2019_02] Elements by CRC ICPMS (total): RDL raised due to concentration over linear range, sample dilution required.

Sample WM4541 [CAM_GW_SNP_7C_2019_02] Elements by CRC ICPMS (total): RDL raised due to concentration over linear range, sample dilution required.

Sample WM4543 [DUP1_GW_2019_02] Elements by CRC ICPMS (total): RDL raised due to concentration over linear range, sample dilution required.

ELEMENTS BY ATOMIC SPECTROSCOPY (SURFACE WATER) Comments

Matrix Spike Elements by CRC ICPMS (total): RDL raised due to concentration over linear range, sample dilution required.

Results relate only to the items tested.

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VERITASBV Labs Job #: B977474
Report Date: 2019/09/23STANTEC CONSULTING LTD
Client Project #: 121414585
Site Location: GORDON LAKE
Sampler Initials: BW

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
9589064	KD5	Matrix Spike [WM4537-01]	Dissolved Nitrite (N)	2019/09/14		100	%	80 - 120
			Dissolved Nitrate (N)	2019/09/14		107	%	80 - 120
9589064	KD5	Spiked Blank	Dissolved Nitrite (N)	2019/09/14		100	%	80 - 120
			Dissolved Nitrate (N)	2019/09/14		101	%	80 - 120
9589064	KD5	Method Blank	Dissolved Nitrite (N)	2019/09/14	<0.010		mg/L	
			Dissolved Nitrate (N)	2019/09/14	<0.010		mg/L	
9589064	KD5	RPD [WM4537-01]	Dissolved Nitrite (N)	2019/09/14	NC		%	20
			Dissolved Nitrate (N)	2019/09/14	0.24		%	20
9589076	KD5	Matrix Spike [WM4554-01]	Dissolved Nitrite (N)	2019/09/15		99	%	80 - 120
			Dissolved Nitrate (N)	2019/09/15		100	%	80 - 120
9589076	KD5	Spiked Blank	Dissolved Nitrite (N)	2019/09/14		100	%	80 - 120
			Dissolved Nitrate (N)	2019/09/14		102	%	80 - 120
9589076	KD5	Method Blank	Dissolved Nitrite (N)	2019/09/15	<0.010		mg/L	
			Dissolved Nitrate (N)	2019/09/15	<0.010		mg/L	
9589076	KD5	RPD [WM4554-01]	Dissolved Nitrite (N)	2019/09/15	NC		%	20
			Dissolved Nitrate (N)	2019/09/15	NC		%	20
9589117	ACY	Matrix Spike [WM4544-01]	Dissolved Calcium (Ca)	2019/09/14		91	%	80 - 120
			Dissolved Iron (Fe)	2019/09/14		96	%	80 - 120
			Dissolved Magnesium (Mg)	2019/09/14		101	%	80 - 120
			Dissolved Manganese (Mn)	2019/09/14		93	%	80 - 120
			Dissolved Potassium (K)	2019/09/14		100	%	80 - 120
			Dissolved Sodium (Na)	2019/09/14		101	%	80 - 120
9589117	ACY	Spiked Blank	Dissolved Calcium (Ca)	2019/09/14		90	%	80 - 120
			Dissolved Iron (Fe)	2019/09/14		98	%	80 - 120
			Dissolved Magnesium (Mg)	2019/09/14		103	%	80 - 120
			Dissolved Manganese (Mn)	2019/09/14		94	%	80 - 120
			Dissolved Potassium (K)	2019/09/14		103	%	80 - 120
			Dissolved Sodium (Na)	2019/09/14		107	%	80 - 120
9589117	ACY	Method Blank	Dissolved Calcium (Ca)	2019/09/14	<0.30		mg/L	
			Dissolved Iron (Fe)	2019/09/14	<0.060		mg/L	
			Dissolved Magnesium (Mg)	2019/09/14	<0.20		mg/L	
			Dissolved Manganese (Mn)	2019/09/14	<0.0040		mg/L	
			Dissolved Potassium (K)	2019/09/14	<0.30		mg/L	
			Dissolved Sodium (Na)	2019/09/14	<0.50		mg/L	
9589117	ACY	RPD [WM4544-01]	Dissolved Calcium (Ca)	2019/09/14	0.30		%	20
			Dissolved Iron (Fe)	2019/09/14	NC		%	20
			Dissolved Magnesium (Mg)	2019/09/14	0.88		%	20
			Dissolved Manganese (Mn)	2019/09/14	NC		%	20
			Dissolved Potassium (K)	2019/09/14	2.9		%	20
			Dissolved Sodium (Na)	2019/09/14	1.7		%	20
9589196	BJO	Spiked Blank	pH	2019/09/15		100	%	97 - 103
9589196	BJO	RPD	pH	2019/09/15	0.53		%	N/A
9589199	BJO	Spiked Blank	Alkalinity (Total as CaCO3)	2019/09/15		102	%	80 - 120
9589199	BJO	Method Blank	Alkalinity (PP as CaCO3)	2019/09/15	<1.0		mg/L	
			Alkalinity (Total as CaCO3)	2019/09/15	<1.0		mg/L	
			Bicarbonate (HCO3)	2019/09/15	<1.0		mg/L	
			Carbonate (CO3)	2019/09/15	<1.0		mg/L	
			Hydroxide (OH)	2019/09/15	<1.0		mg/L	
9589199	BJO	RPD	Alkalinity (PP as CaCO3)	2019/09/15	NC		%	20
			Alkalinity (Total as CaCO3)	2019/09/15	4.8		%	20



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BV Labs Job #: B977474
Report Date: 2019/09/23

STANTEC CONSULTING LTD
Client Project #: 121414585
Site Location: GORDON LAKE
Sampler Initials: BW

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Bicarbonate (HCO ₃)	2019/09/15	4.8		%	20
			Carbonate (CO ₃)	2019/09/15	NC		%	20
			Hydroxide (OH)	2019/09/15	NC		%	20
9589200	BJO	Spiked Blank	Conductivity	2019/09/15		100	%	90 - 110
9589200	BJO	Method Blank	Conductivity	2019/09/15	<2.0		uS/cm	
9589200	BJO	RPD	Conductivity	2019/09/15	0.45		%	10
9589219	KCB	Matrix Spike	Total Suspended Solids	2019/09/17		107	%	80 - 120
9589219	KCB	Spiked Blank	Total Suspended Solids	2019/09/17		96	%	80 - 120
9589219	KCB	Method Blank	Total Suspended Solids	2019/09/17	<1.0		mg/L	
9589219	KCB	RPD	Total Suspended Solids	2019/09/17	0		%	20
9589221	KCB	Matrix Spike	Total Dissolved Solids	2019/09/16		NC	%	80 - 120
9589221	KCB	Spiked Blank	Total Dissolved Solids	2019/09/16		100	%	80 - 120
9589221	KCB	Method Blank	Total Dissolved Solids	2019/09/16	<10		mg/L	
9589221	KCB	RPD	Total Dissolved Solids	2019/09/16	0.53		%	20
9589306	GG3	Matrix Spike [WM4539-05]	O-TERPHENYL (sur.)	2019/09/16		115	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2019/09/16		133	%	60 - 140
9589306	GG3	Spiked Blank	O-TERPHENYL (sur.)	2019/09/16		101	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2019/09/16		115	%	60 - 140
9589306	GG3	Method Blank	O-TERPHENYL (sur.)	2019/09/16		99	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2019/09/16	<0.10		mg/L	
9589306	GG3	RPD [WM4552-05]	F2 (C10-C16 Hydrocarbons)	2019/09/16	NC		%	30
9589348	MF3	Matrix Spike [WM4539-06]	1,4-Difluorobenzene (sur.)	2019/09/15		110	%	50 - 140
			4-Bromofluorobenzene (sur.)	2019/09/15		101	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2019/09/15		99	%	50 - 140
			Benzene	2019/09/15		81	%	50 - 140
			Toluene	2019/09/15		81	%	50 - 140
			Ethylbenzene	2019/09/15		82	%	50 - 140
			m & p-Xylene	2019/09/15		83	%	50 - 140
			o-Xylene	2019/09/15		82	%	50 - 140
			F1 (C6-C10)	2019/09/15		124	%	60 - 140
9589348	MF3	Spiked Blank	1,4-Difluorobenzene (sur.)	2019/09/15		104	%	50 - 140
			4-Bromofluorobenzene (sur.)	2019/09/15		96	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2019/09/15		99	%	50 - 140
			Benzene	2019/09/15		76	%	60 - 130
			Toluene	2019/09/15		75	%	60 - 130
			Ethylbenzene	2019/09/15		79	%	60 - 130
			m & p-Xylene	2019/09/15		83	%	60 - 130
			o-Xylene	2019/09/15		81	%	60 - 130
			F1 (C6-C10)	2019/09/15		86	%	60 - 140
9589348	MF3	Method Blank	1,4-Difluorobenzene (sur.)	2019/09/15		115	%	50 - 140
			4-Bromofluorobenzene (sur.)	2019/09/15		99	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2019/09/15		101	%	50 - 140
			Benzene	2019/09/15	<0.40		ug/L	
			Toluene	2019/09/15	<0.40		ug/L	
			Ethylbenzene	2019/09/15	<0.40		ug/L	
			m & p-Xylene	2019/09/15	<0.80		ug/L	
			o-Xylene	2019/09/15	<0.40		ug/L	
			F1 (C6-C10)	2019/09/15	<100		ug/L	
9589348	MF3	RPD [WM4538-06]	Benzene	2019/09/15	22		%	30
			Toluene	2019/09/15	3.6		%	30
			Ethylbenzene	2019/09/15	10		%	30



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9589474	AL2	Matrix Spike [WM4537-03]	m & p-Xylene	2019/09/15	4.5		%	30
			o-Xylene	2019/09/15	19		%	30
			F1 (C6-C10)	2019/09/15	NC		%	30
			Total Ammonia (N)	2019/09/16		113	%	80 - 120
9589474	AL2	Spiked Blank	Total Ammonia (N)	2019/09/16		96	%	80 - 120
9589474	AL2	Method Blank	Total Ammonia (N)	2019/09/16	<0.015		mg/L	
9589474	AL2	RPD [WM4537-03]	Total Ammonia (N)	2019/09/16	2.1		%	20
9590050	MA4	Spiked Blank	pH	2019/09/16		100	%	97 - 103
9590050	MA4	RPD	pH	2019/09/16	0.24		%	N/A
9590054	MA4	Spiked Blank	Alkalinity (Total as CaCO3)	2019/09/16		102	%	80 - 120
9590054	MA4	Method Blank	Alkalinity (PP as CaCO3)	2019/09/16	<1.0		mg/L	
			Alkalinity (Total as CaCO3)	2019/09/16	<1.0		mg/L	
			Bicarbonate (HCO3)	2019/09/16	<1.0		mg/L	
			Carbonate (CO3)	2019/09/16	<1.0		mg/L	
			Hydroxide (OH)	2019/09/16	<1.0		mg/L	
			Alkalinity (PP as CaCO3)	2019/09/16	NC		%	20
			Alkalinity (Total as CaCO3)	2019/09/16	0.82		%	20
			Bicarbonate (HCO3)	2019/09/16	0.82		%	20
			Carbonate (CO3)	2019/09/16	NC		%	20
			Hydroxide (OH)	2019/09/16	NC		%	20
9590055	MA4	Spiked Blank	Conductivity	2019/09/16		99	%	90 - 110
9590055	MA4	Method Blank	Conductivity	2019/09/16	<2.0		uS/cm	
9590055	MA4	RPD	Conductivity	2019/09/16	0.41		%	10
9590110	MSD	Matrix Spike	Dissolved Calcium (Ca)	2019/09/16		109	%	80 - 120
			Dissolved Iron (Fe)	2019/09/16		108	%	80 - 120
			Dissolved Magnesium (Mg)	2019/09/16		110	%	80 - 120
			Dissolved Manganese (Mn)	2019/09/16		105	%	80 - 120
			Dissolved Potassium (K)	2019/09/16		108	%	80 - 120
			Dissolved Sodium (Na)	2019/09/16		NC	%	80 - 120
			Dissolved Calcium (Ca)	2019/09/16		99	%	80 - 120
			Dissolved Iron (Fe)	2019/09/16		99	%	80 - 120
9590110	MSD	Spiked Blank	Dissolved Magnesium (Mg)	2019/09/16		102	%	80 - 120
			Dissolved Manganese (Mn)	2019/09/16		97	%	80 - 120
			Dissolved Potassium (K)	2019/09/16		99	%	80 - 120
			Dissolved Sodium (Na)	2019/09/16		100	%	80 - 120
			Dissolved Calcium (Ca)	2019/09/16	<0.30		mg/L	
			Dissolved Iron (Fe)	2019/09/16	<0.060		mg/L	
			Dissolved Magnesium (Mg)	2019/09/16	<0.20		mg/L	
			Dissolved Manganese (Mn)	2019/09/16	<0.0040		mg/L	
9590110	MSD	Method Blank	Dissolved Potassium (K)	2019/09/16	<0.30		mg/L	
			Dissolved Sodium (Na)	2019/09/16	<0.50		mg/L	
			Dissolved Calcium (Ca)	2019/09/16	0.83		%	20
			Dissolved Iron (Fe)	2019/09/16	3.4		%	20
			Dissolved Magnesium (Mg)	2019/09/16	1.4		%	20
			Dissolved Manganese (Mn)	2019/09/16	2.7		%	20
			Dissolved Potassium (K)	2019/09/16	4.5		%	20
			Dissolved Sodium (Na)	2019/09/16	0.18		%	20
9590191	MSD	Matrix Spike	Dissolved Calcium (Ca)	2019/09/16		105	%	80 - 120
			Dissolved Iron (Fe)	2019/09/16		105	%	80 - 120
			Dissolved Magnesium (Mg)	2019/09/16		109	%	80 - 120
			Dissolved Manganese (Mn)	2019/09/16		103	%	80 - 120
			Dissolved Potassium (K)	2019/09/16		106	%	80 - 120



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9590191	MSD	Spiked Blank	Dissolved Sodium (Na)	2019/09/16		106	%	80 - 120
			Dissolved Calcium (Ca)	2019/09/16		100	%	80 - 120
			Dissolved Iron (Fe)	2019/09/16		101	%	80 - 120
			Dissolved Magnesium (Mg)	2019/09/16		103	%	80 - 120
			Dissolved Manganese (Mn)	2019/09/16		97	%	80 - 120
			Dissolved Potassium (K)	2019/09/16		100	%	80 - 120
			Dissolved Sodium (Na)	2019/09/16		101	%	80 - 120
9590191	MSD	Method Blank	Dissolved Calcium (Ca)	2019/09/16	<0.30		mg/L	
			Dissolved Iron (Fe)	2019/09/16	<0.060		mg/L	
			Dissolved Magnesium (Mg)	2019/09/16	<0.20		mg/L	
			Dissolved Manganese (Mn)	2019/09/16	<0.0040		mg/L	
			Dissolved Potassium (K)	2019/09/16	<0.30		mg/L	
			Dissolved Sodium (Na)	2019/09/16	<0.50		mg/L	
9590191	MSD	RPD	Dissolved Calcium (Ca)	2019/09/16	1.7		%	20
			Dissolved Magnesium (Mg)	2019/09/16	0.33		%	20
9590976	MJA	Matrix Spike	Total Dissolved Solids	2019/09/18		101	%	80 - 120
9590976	MJA	Spiked Blank	Total Dissolved Solids	2019/09/18		101	%	80 - 120
9590976	MJA	Method Blank	Total Dissolved Solids	2019/09/18	<10		mg/L	
9590976	MJA	RPD	Total Dissolved Solids	2019/09/18	18		%	20
9590987	LCA	Matrix Spike	Total Dissolved Solids	2019/09/19		99	%	80 - 120
9590987	LCA	Spiked Blank	Total Dissolved Solids	2019/09/19		102	%	80 - 120
9590987	LCA	Method Blank	Total Dissolved Solids	2019/09/19	<10		mg/L	
9590987	LCA	RPD	Total Dissolved Solids	2019/09/19	0		%	20
9591431	MA4	Spiked Blank	pH	2019/09/17		100	%	97 - 103
9591431	MA4	RPD	pH	2019/09/17	0.90		%	N/A
9591432	MA4	Spiked Blank	Alkalinity (Total as CaCO ₃)	2019/09/17		98	%	80 - 120
9591432	MA4	Method Blank	Alkalinity (PP as CaCO ₃)	2019/09/17	<1.0		mg/L	
			Alkalinity (Total as CaCO ₃)	2019/09/17	<1.0		mg/L	
			Bicarbonate (HCO ₃)	2019/09/17	<1.0		mg/L	
			Carbonate (CO ₃)	2019/09/17	<1.0		mg/L	
			Hydroxide (OH)	2019/09/17	<1.0		mg/L	
			Alkalinity (PP as CaCO ₃)	2019/09/17	NC		%	20
			Alkalinity (Total as CaCO ₃)	2019/09/17	2.7		%	20
9591432	MA4	RPD	Bicarbonate (HCO ₃)	2019/09/17	0.63		%	20
			Carbonate (CO ₃)	2019/09/17	NC		%	20
			Hydroxide (OH)	2019/09/17	NC		%	20
9591434	MA4	Spiked Blank	Conductivity	2019/09/17		99	%	90 - 110
9591434	MA4	Method Blank	Conductivity	2019/09/17	<2.0		uS/cm	
9591434	MA4	RPD	Conductivity	2019/09/17	0.25		%	10
9591856	CH7	Matrix Spike	Dissolved Chloride (Cl)	2019/09/17		NC	%	80 - 120
			Dissolved Sulphate (SO ₄)	2019/09/17		NC	%	80 - 120
9591856	CH7	Spiked Blank	Dissolved Chloride (Cl)	2019/09/17		103	%	80 - 120
			Dissolved Sulphate (SO ₄)	2019/09/17		104	%	80 - 120
9591856	CH7	Method Blank	Dissolved Chloride (Cl)	2019/09/17	<1.0		mg/L	
			Dissolved Sulphate (SO ₄)	2019/09/17	<1.0		mg/L	
9591856	CH7	RPD	Dissolved Chloride (Cl)	2019/09/17	0.22		%	20
			Dissolved Sulphate (SO ₄)	2019/09/17	0.038		%	20
9592583	VCN	Matrix Spike [WM4546-04]	Total Aluminum (Al)	2019/09/20		101	%	80 - 120
			Total Antimony (Sb)	2019/09/20		100	%	80 - 120
			Total Arsenic (As)	2019/09/20		102	%	80 - 120
			Total Barium (Ba)	2019/09/20		101	%	80 - 120
			Total Beryllium (Be)	2019/09/20		94	%	80 - 120



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9592583	VCN	Spiked Blank	Total Bismuth (Bi)	2019/09/20		99	%	80 - 120
			Total Boron (B)	2019/09/20		93	%	80 - 120
			Total Cadmium (Cd)	2019/09/20		100	%	80 - 120
			Total Cesium (Cs)	2019/09/20		100	%	80 - 120
			Total Chromium (Cr)	2019/09/20		99	%	80 - 120
			Total Cobalt (Co)	2019/09/20		100	%	80 - 120
			Total Copper (Cu)	2019/09/20		96	%	80 - 120
			Total Iron (Fe)	2019/09/20		101	%	80 - 120
			Total Lead (Pb)	2019/09/20		101	%	80 - 120
			Total Lithium (Li)	2019/09/20		92	%	80 - 120
			Total Manganese (Mn)	2019/09/20		97	%	80 - 120
			Total Molybdenum (Mo)	2019/09/20		105	%	80 - 120
			Total Nickel (Ni)	2019/09/20		97	%	80 - 120
			Total Selenium (Se)	2019/09/20		102	%	80 - 120
			Total Silicon (Si)	2019/09/20		97	%	80 - 120
			Total Silver (Ag)	2019/09/20		100	%	80 - 120
			Total Strontium (Sr)	2019/09/20		NC	%	80 - 120
			Total Thallium (Tl)	2019/09/20		101	%	80 - 120
			Total Tin (Sn)	2019/09/20		100	%	80 - 120
			Total Titanium (Ti)	2019/09/20		102	%	80 - 120
			Total Uranium (U)	2019/09/20		103	%	80 - 120
			Total Vanadium (V)	2019/09/20		99	%	80 - 120
			Total Zinc (Zn)	2019/09/20		99	%	80 - 120
			Total Zirconium (Zr)	2019/09/20		104	%	80 - 120
			Total Aluminum (Al)	2019/09/20		97	%	80 - 120
			Total Antimony (Sb)	2019/09/20		98	%	80 - 120
			Total Arsenic (As)	2019/09/20		99	%	80 - 120
			Total Barium (Ba)	2019/09/20		99	%	80 - 120
			Total Beryllium (Be)	2019/09/20		92	%	80 - 120
			Total Bismuth (Bi)	2019/09/20		101	%	80 - 120
			Total Boron (B)	2019/09/20		90	%	80 - 120
			Total Cadmium (Cd)	2019/09/20		98	%	80 - 120
			Total Cesium (Cs)	2019/09/20		99	%	80 - 120
			Total Chromium (Cr)	2019/09/20		98	%	80 - 120
			Total Cobalt (Co)	2019/09/20		98	%	80 - 120
			Total Copper (Cu)	2019/09/20		97	%	80 - 120
			Total Iron (Fe)	2019/09/20		101	%	80 - 120
			Total Lead (Pb)	2019/09/20		100	%	80 - 120
			Total Lithium (Li)	2019/09/20		93	%	80 - 120
			Total Manganese (Mn)	2019/09/20		96	%	80 - 120
			Total Molybdenum (Mo)	2019/09/20		101	%	80 - 120
			Total Nickel (Ni)	2019/09/20		98	%	80 - 120
			Total Selenium (Se)	2019/09/20		99	%	80 - 120
			Total Silicon (Si)	2019/09/20		98	%	80 - 120
			Total Silver (Ag)	2019/09/20		99	%	80 - 120
			Total Strontium (Sr)	2019/09/20		99	%	80 - 120
			Total Thallium (Tl)	2019/09/20		100	%	80 - 120
			Total Tin (Sn)	2019/09/20		97	%	80 - 120
			Total Titanium (Ti)	2019/09/20		99	%	80 - 120
			Total Uranium (U)	2019/09/20		101	%	80 - 120
			Total Vanadium (V)	2019/09/20		96	%	80 - 120
			Total Zinc (Zn)	2019/09/20		97	%	80 - 120
			Total Zirconium (Zr)	2019/09/20		102	%	80 - 120



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9592583	VCN	Method Blank	Total Aluminum (Al)	2019/09/20	<3.0		ug/L	
			Total Antimony (Sb)	2019/09/20	<0.50		ug/L	
			Total Arsenic (As)	2019/09/20	<0.10		ug/L	
			Total Barium (Ba)	2019/09/20	<1.0		ug/L	
			Total Beryllium (Be)	2019/09/20	<0.10		ug/L	
			Total Bismuth (Bi)	2019/09/20	<1.0		ug/L	
			Total Boron (B)	2019/09/20	<50		ug/L	
			Total Cadmium (Cd)	2019/09/20	<0.010		ug/L	
			Total Cesium (Cs)	2019/09/20	<0.20		ug/L	
			Total Chromium (Cr)	2019/09/20	<1.0		ug/L	
			Total Cobalt (Co)	2019/09/20	<0.20		ug/L	
			Total Copper (Cu)	2019/09/20	<0.50		ug/L	
			Total Iron (Fe)	2019/09/20	<10		ug/L	
			Total Lead (Pb)	2019/09/20	<0.20		ug/L	
			Total Lithium (Li)	2019/09/20	<2.0		ug/L	
			Total Manganese (Mn)	2019/09/20	<1.0		ug/L	
			Total Molybdenum (Mo)	2019/09/20	<1.0		ug/L	
			Total Nickel (Ni)	2019/09/20	<1.0		ug/L	
			Total Selenium (Se)	2019/09/20	<0.10		ug/L	
			Total Silicon (Si)	2019/09/20	<100		ug/L	
			Total Silver (Ag)	2019/09/20	<0.020		ug/L	
			Total Strontium (Sr)	2019/09/20	<1.0		ug/L	
			Total Thallium (Tl)	2019/09/20	<0.010		ug/L	
			Total Tin (Sn)	2019/09/20	<5.0		ug/L	
			Total Titanium (Ti)	2019/09/20	<5.0		ug/L	
			Total Uranium (U)	2019/09/20	<0.10		ug/L	
			Total Vanadium (V)	2019/09/20	<5.0		ug/L	
			Total Zinc (Zn)	2019/09/20	<5.0		ug/L	
			Total Zirconium (Zr)	2019/09/20	<0.10		ug/L	
9592583	VCN	RPD [WM4545-04]	Total Aluminum (Al)	2019/09/20	4.1		%	20
			Total Antimony (Sb)	2019/09/20	NC		%	20
			Total Arsenic (As)	2019/09/20	2.0		%	20
			Total Barium (Ba)	2019/09/20	1.5		%	20
			Total Beryllium (Be)	2019/09/20	NC		%	20
			Total Bismuth (Bi)	2019/09/20	NC		%	20
			Total Boron (B)	2019/09/20	NC		%	20
			Total Cadmium (Cd)	2019/09/20	2.2		%	20
			Total Cesium (Cs)	2019/09/20	NC		%	20
			Total Chromium (Cr)	2019/09/20	NC		%	20
			Total Cobalt (Co)	2019/09/20	NC		%	20
			Total Copper (Cu)	2019/09/20	0.46		%	20
			Total Iron (Fe)	2019/09/20	7.8		%	20
			Total Lead (Pb)	2019/09/20	NC		%	20
			Total Lithium (Li)	2019/09/20	NC		%	20
			Total Manganese (Mn)	2019/09/20	2.2		%	20
			Total Molybdenum (Mo)	2019/09/20	NC		%	20
			Total Nickel (Ni)	2019/09/20	NC		%	20
			Total Selenium (Se)	2019/09/20	NC		%	20
			Total Silicon (Si)	2019/09/20	1.7		%	20
			Total Silver (Ag)	2019/09/20	8.1		%	20
			Total Strontium (Sr)	2019/09/20	0.24		%	20
			Total Thallium (Tl)	2019/09/20	NC		%	20
			Total Tin (Sn)	2019/09/20	NC		%	20



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9592750	CH7	Matrix Spike	Total Titanium (Ti)	2019/09/20	NC		%	20
			Total Uranium (U)	2019/09/20	NC		%	20
			Total Vanadium (V)	2019/09/20	NC		%	20
			Total Zinc (Zn)	2019/09/20	NC		%	20
			Total Zirconium (Zr)	2019/09/20	NC		%	20
9592750	CH7	Spiked Blank	Dissolved Chloride (Cl)	2019/09/18		106	%	80 - 120
			Dissolved Sulphate (SO4)	2019/09/18		NC	%	80 - 120
9592750	CH7	Method Blank	Dissolved Chloride (Cl)	2019/09/18	<1.0		mg/L	
			Dissolved Sulphate (SO4)	2019/09/18	<1.0		mg/L	
9592750	CH7	RPD	Dissolved Chloride (Cl)	2019/09/18	NC		%	20
			Dissolved Sulphate (SO4)	2019/09/18	1.9		%	20
9592755	AA1	Matrix Spike	Total Aluminum (Al)	2019/09/21		97	%	80 - 120
			Total Antimony (Sb)	2019/09/21		104	%	80 - 120
			Total Arsenic (As)	2019/09/21		107	%	80 - 120
			Total Barium (Ba)	2019/09/21		NC	%	80 - 120
			Total Beryllium (Be)	2019/09/21		97	%	80 - 120
			Total Bismuth (Bi)	2019/09/21		95	%	80 - 120
			Total Boron (B)	2019/09/21		102	%	80 - 120
			Total Cadmium (Cd)	2019/09/21		100	%	80 - 120
			Total Cesium (Cs)	2019/09/21		105	%	80 - 120
			Total Chromium (Cr)	2019/09/21		100	%	80 - 120
			Total Cobalt (Co)	2019/09/21		101	%	80 - 120
			Total Copper (Cu)	2019/09/21		93	%	80 - 120
			Total Iron (Fe)	2019/09/21		108	%	80 - 120
			Total Lead (Pb)	2019/09/21		103	%	80 - 120
			Total Lithium (Li)	2019/09/21		102	%	80 - 120
			Total Manganese (Mn)	2019/09/21		106	%	80 - 120
			Total Molybdenum (Mo)	2019/09/21		NC	%	80 - 120
			Total Nickel (Ni)	2019/09/21		94	%	80 - 120
			Total Selenium (Se)	2019/09/21		105	%	80 - 120
			Total Silicon (Si)	2019/09/21		102	%	80 - 120
			Total Silver (Ag)	2019/09/21		99	%	80 - 120
			Total Strontium (Sr)	2019/09/21		NC	%	80 - 120
			Total Thallium (Tl)	2019/09/21		100	%	80 - 120
			Total Tin (Sn)	2019/09/21		104	%	80 - 120
			Total Titanium (Ti)	2019/09/21		106	%	80 - 120
			Total Uranium (U)	2019/09/21		110	%	80 - 120
			Total Vanadium (V)	2019/09/21		102	%	80 - 120
			Total Zinc (Zn)	2019/09/21		93	%	80 - 120
			Total Zirconium (Zr)	2019/09/21		108	%	80 - 120
9592755	AA1	Spiked Blank	Total Aluminum (Al)	2019/09/21		95	%	80 - 120
			Total Antimony (Sb)	2019/09/21		103	%	80 - 120
			Total Arsenic (As)	2019/09/21		101	%	80 - 120
			Total Barium (Ba)	2019/09/21		101	%	80 - 120
			Total Beryllium (Be)	2019/09/21		100	%	80 - 120
			Total Bismuth (Bi)	2019/09/21		103	%	80 - 120
			Total Boron (B)	2019/09/21		103	%	80 - 120
			Total Cadmium (Cd)	2019/09/21		103	%	80 - 120
			Total Cesium (Cs)	2019/09/21		104	%	80 - 120
			Total Chromium (Cr)	2019/09/21		101	%	80 - 120
			Total Cobalt (Co)	2019/09/21		104	%	80 - 120

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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
9592755	AA1	Method Blank	Total Copper (Cu)	2019/09/21		102	%	80 - 120
			Total Iron (Fe)	2019/09/21		106	%	80 - 120
			Total Lead (Pb)	2019/09/21		107	%	80 - 120
			Total Lithium (Li)	2019/09/21		107	%	80 - 120
			Total Manganese (Mn)	2019/09/21		96	%	80 - 120
			Total Molybdenum (Mo)	2019/09/21		103	%	80 - 120
			Total Nickel (Ni)	2019/09/21		102	%	80 - 120
			Total Selenium (Se)	2019/09/21		102	%	80 - 120
			Total Silicon (Si)	2019/09/21		100	%	80 - 120
			Total Silver (Ag)	2019/09/21		103	%	80 - 120
			Total Strontium (Sr)	2019/09/21		107	%	80 - 120
			Total Thallium (Tl)	2019/09/21		103	%	80 - 120
			Total Tin (Sn)	2019/09/21		103	%	80 - 120
			Total Titanium (Ti)	2019/09/21		104	%	80 - 120
			Total Uranium (U)	2019/09/21		107	%	80 - 120
			Total Vanadium (V)	2019/09/21		94	%	80 - 120
			Total Zinc (Zn)	2019/09/21		102	%	80 - 120
			Total Zirconium (Zr)	2019/09/21		104	%	80 - 120
			Total Aluminum (Al)	2019/09/21	<3.0		ug/L	
			Total Antimony (Sb)	2019/09/21	<0.50		ug/L	
			Total Arsenic (As)	2019/09/21	<0.10		ug/L	
			Total Barium (Ba)	2019/09/21	<1.0		ug/L	
			Total Beryllium (Be)	2019/09/21	<0.10		ug/L	
			Total Bismuth (Bi)	2019/09/21	<1.0		ug/L	
			Total Boron (B)	2019/09/21	<50		ug/L	
			Total Cadmium (Cd)	2019/09/21	<0.010		ug/L	
			Total Cesium (Cs)	2019/09/21	<0.20		ug/L	
			Total Chromium (Cr)	2019/09/21	<1.0		ug/L	
			Total Cobalt (Co)	2019/09/21	<0.20		ug/L	
			Total Copper (Cu)	2019/09/21	<0.50		ug/L	
			Total Iron (Fe)	2019/09/21	<10		ug/L	
			Total Lead (Pb)	2019/09/21	<0.20		ug/L	
			Total Lithium (Li)	2019/09/21	<2.0		ug/L	
			Total Manganese (Mn)	2019/09/21	<1.0		ug/L	
			Total Molybdenum (Mo)	2019/09/21	<1.0		ug/L	
			Total Nickel (Ni)	2019/09/21	<1.0		ug/L	
			Total Selenium (Se)	2019/09/21	<0.10		ug/L	
			Total Silicon (Si)	2019/09/21	<100		ug/L	
			Total Silver (Ag)	2019/09/21	<0.020		ug/L	
			Total Strontium (Sr)	2019/09/21	<1.0		ug/L	
			Total Thallium (Tl)	2019/09/21	<0.010		ug/L	
			Total Tin (Sn)	2019/09/21	<5.0		ug/L	
			Total Titanium (Ti)	2019/09/21	<5.0		ug/L	
			Total Uranium (U)	2019/09/21	<0.10		ug/L	
			Total Vanadium (V)	2019/09/21	<5.0		ug/L	
			Total Zinc (Zn)	2019/09/21	<5.0		ug/L	
			Total Zirconium (Zr)	2019/09/21	<0.10		ug/L	
9592755	AA1	RPD	Total Aluminum (Al)	2019/09/21	5.3		%	20
			Total Antimony (Sb)	2019/09/21	NC		%	20
			Total Arsenic (As)	2019/09/21	2.6		%	20
			Total Barium (Ba)	2019/09/21	4.6		%	20
			Total Beryllium (Be)	2019/09/21	NC		%	20
			Total Bismuth (Bi)	2019/09/21	NC		%	20



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			Total Boron (B)	2019/09/21	3.9		%	20
			Total Cadmium (Cd)	2019/09/21	NC		%	20
			Total Chromium (Cr)	2019/09/21	0.016		%	20
			Total Cobalt (Co)	2019/09/21	1.3		%	20
			Total Copper (Cu)	2019/09/21	0.055		%	20
			Total Iron (Fe)	2019/09/21	2.2		%	20
			Total Lead (Pb)	2019/09/21	NC		%	20
			Total Lithium (Li)	2019/09/21	1.9		%	20
			Total Manganese (Mn)	2019/09/21	0.67		%	20
			Total Molybdenum (Mo)	2019/09/21	1.2		%	20
			Total Nickel (Ni)	2019/09/21	0.35		%	20
			Total Selenium (Se)	2019/09/21	0.47		%	20
			Total Silicon (Si)	2019/09/21	1.2		%	20
			Total Silver (Ag)	2019/09/21	NC		%	20
			Total Strontium (Sr)	2019/09/21	2.6		%	20
			Total Thallium (Tl)	2019/09/21	1.4		%	20
			Total Tin (Sn)	2019/09/21	NC		%	20
			Total Titanium (Ti)	2019/09/21	NC		%	20
			Total Uranium (U)	2019/09/21	0.038		%	20
			Total Vanadium (V)	2019/09/21	NC		%	20
			Total Zinc (Zn)	2019/09/21	NC		%	20
			Total Zirconium (Zr)	2019/09/21	NC		%	20
9592761	CH7	Matrix Spike [WM4544-01]	Dissolved Chloride (Cl)	2019/09/18		112	%	80 - 120
			Dissolved Sulphate (SO4)	2019/09/18		91	%	80 - 120
9592761	CH7	Spiked Blank	Dissolved Chloride (Cl)	2019/09/18		108	%	80 - 120
			Dissolved Sulphate (SO4)	2019/09/18		109	%	80 - 120
9592761	CH7	Method Blank	Dissolved Chloride (Cl)	2019/09/18	<1.0		mg/L	
			Dissolved Sulphate (SO4)	2019/09/18	<1.0		mg/L	
9592761	CH7	RPD [WM4544-01]	Dissolved Chloride (Cl)	2019/09/18	13		%	20
			Dissolved Sulphate (SO4)	2019/09/18	1.2		%	20
9592771	MA4	Spiked Blank	pH	2019/09/18		100	%	97 - 103
9592771	MA4	RPD	pH	2019/09/18	0.20		%	N/A
9592773	MA4	Spiked Blank	Alkalinity (Total as CaCO3)	2019/09/18		102	%	80 - 120
9592773	MA4	Method Blank	Alkalinity (PP as CaCO3)	2019/09/18	<1.0		mg/L	
			Alkalinity (Total as CaCO3)	2019/09/18	<1.0		mg/L	
			Bicarbonate (HCO3)	2019/09/18	<1.0		mg/L	
			Carbonate (CO3)	2019/09/18	<1.0		mg/L	
			Hydroxide (OH)	2019/09/18	<1.0		mg/L	
9592773	MA4	RPD	Alkalinity (PP as CaCO3)	2019/09/18	NC		%	20
			Alkalinity (Total as CaCO3)	2019/09/18	1.7		%	20
			Bicarbonate (HCO3)	2019/09/18	1.7		%	20
			Carbonate (CO3)	2019/09/18	NC		%	20
			Hydroxide (OH)	2019/09/18	NC		%	20
9592774	MA4	Spiked Blank	Conductivity	2019/09/18		101	%	90 - 110
9592774	MA4	Method Blank	Conductivity	2019/09/18	<2.0		uS/cm	
9592774	MA4	RPD	Conductivity	2019/09/18	0.50		%	10
9592939	AD5	Matrix Spike [WM4561-04]	Total Aluminum (Al)	2019/09/18		102	%	80 - 120
			Total Antimony (Sb)	2019/09/18		104	%	80 - 120
			Total Arsenic (As)	2019/09/18		103	%	80 - 120
			Total Barium (Ba)	2019/09/18		102	%	80 - 120
			Total Beryllium (Be)	2019/09/18		98	%	80 - 120



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9592939	AD5	Spiked Blank	Total Bismuth (Bi)	2019/09/18		104	%	80 - 120
			Total Boron (B)	2019/09/18		92	%	80 - 120
			Total Cadmium (Cd)	2019/09/18		104	%	80 - 120
			Total Cesium (Cs)	2019/09/18		99	%	80 - 120
			Total Chromium (Cr)	2019/09/18		103	%	80 - 120
			Total Cobalt (Co)	2019/09/18		103	%	80 - 120
			Total Copper (Cu)	2019/09/18		102	%	80 - 120
			Total Iron (Fe)	2019/09/18		104	%	80 - 120
			Total Lead (Pb)	2019/09/18		103	%	80 - 120
			Total Lithium (Li)	2019/09/18		96	%	80 - 120
			Total Manganese (Mn)	2019/09/18		101	%	80 - 120
			Total Molybdenum (Mo)	2019/09/18		105	%	80 - 120
			Total Nickel (Ni)	2019/09/18		102	%	80 - 120
			Total Selenium (Se)	2019/09/18		105	%	80 - 120
			Total Silicon (Si)	2019/09/18		100	%	80 - 120
			Total Silver (Ag)	2019/09/18		101	%	80 - 120
			Total Strontium (Sr)	2019/09/18		102	%	80 - 120
			Total Thallium (Tl)	2019/09/18		105	%	80 - 120
			Total Tin (Sn)	2019/09/18		104	%	80 - 120
			Total Titanium (Ti)	2019/09/18		101	%	80 - 120
			Total Uranium (U)	2019/09/18		105	%	80 - 120
			Total Vanadium (V)	2019/09/18		101	%	80 - 120
			Total Zinc (Zn)	2019/09/18		111	%	80 - 120
			Total Zirconium (Zr)	2019/09/18		106	%	80 - 120
			Total Aluminum (Al)	2019/09/18		103	%	80 - 120
			Total Antimony (Sb)	2019/09/18		105	%	80 - 120
			Total Arsenic (As)	2019/09/18		103	%	80 - 120
			Total Barium (Ba)	2019/09/18		104	%	80 - 120
			Total Beryllium (Be)	2019/09/18		101	%	80 - 120
			Total Bismuth (Bi)	2019/09/18		105	%	80 - 120
			Total Boron (B)	2019/09/18		96	%	80 - 120
			Total Cadmium (Cd)	2019/09/18		105	%	80 - 120
			Total Cesium (Cs)	2019/09/18		101	%	80 - 120
			Total Chromium (Cr)	2019/09/18		104	%	80 - 120
			Total Cobalt (Co)	2019/09/18		104	%	80 - 120
			Total Copper (Cu)	2019/09/18		104	%	80 - 120
			Total Iron (Fe)	2019/09/18		107	%	80 - 120
			Total Lead (Pb)	2019/09/18		105	%	80 - 120
			Total Lithium (Li)	2019/09/18		100	%	80 - 120
			Total Manganese (Mn)	2019/09/18		102	%	80 - 120
			Total Molybdenum (Mo)	2019/09/18		106	%	80 - 120
			Total Nickel (Ni)	2019/09/18		104	%	80 - 120
			Total Selenium (Se)	2019/09/18		105	%	80 - 120
			Total Silicon (Si)	2019/09/18		100	%	80 - 120
			Total Silver (Ag)	2019/09/18		103	%	80 - 120
			Total Strontium (Sr)	2019/09/18		104	%	80 - 120
			Total Thallium (Tl)	2019/09/18		107	%	80 - 120
			Total Tin (Sn)	2019/09/18		107	%	80 - 120
			Total Titanium (Ti)	2019/09/18		102	%	80 - 120
			Total Uranium (U)	2019/09/18		106	%	80 - 120
			Total Vanadium (V)	2019/09/18		103	%	80 - 120
			Total Zinc (Zn)	2019/09/18		109	%	80 - 120
			Total Zirconium (Zr)	2019/09/18		107	%	80 - 120



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9592939	AD5	Method Blank	Total Aluminum (Al)	2019/09/18	<3.0		ug/L	
			Total Antimony (Sb)	2019/09/18	<0.50		ug/L	
			Total Arsenic (As)	2019/09/18	<0.10		ug/L	
			Total Barium (Ba)	2019/09/18	<1.0		ug/L	
			Total Beryllium (Be)	2019/09/18	<0.10		ug/L	
			Total Bismuth (Bi)	2019/09/18	<1.0		ug/L	
			Total Boron (B)	2019/09/18	<50		ug/L	
			Total Cadmium (Cd)	2019/09/18	<0.010		ug/L	
			Total Cesium (Cs)	2019/09/18	<0.20		ug/L	
			Total Chromium (Cr)	2019/09/18	<1.0		ug/L	
			Total Cobalt (Co)	2019/09/18	<0.20		ug/L	
			Total Copper (Cu)	2019/09/18	<0.50		ug/L	
			Total Iron (Fe)	2019/09/18	<10		ug/L	
			Total Lead (Pb)	2019/09/18	<0.20		ug/L	
			Total Lithium (Li)	2019/09/18	<2.0		ug/L	
			Total Manganese (Mn)	2019/09/18	<1.0		ug/L	
			Total Molybdenum (Mo)	2019/09/18	<1.0		ug/L	
			Total Nickel (Ni)	2019/09/18	<1.0		ug/L	
			Total Selenium (Se)	2019/09/18	<0.10		ug/L	
			Total Silicon (Si)	2019/09/18	<100		ug/L	
			Total Silver (Ag)	2019/09/18	<0.020		ug/L	
			Total Strontium (Sr)	2019/09/18	<1.0		ug/L	
			Total Thallium (Tl)	2019/09/18	<0.010		ug/L	
			Total Tin (Sn)	2019/09/18	<5.0		ug/L	
			Total Titanium (Ti)	2019/09/18	<5.0		ug/L	
			Total Uranium (U)	2019/09/18	<0.10		ug/L	
			Total Vanadium (V)	2019/09/18	<5.0		ug/L	
			Total Zinc (Zn)	2019/09/18	<5.0		ug/L	
			Total Zirconium (Zr)	2019/09/18	<0.10		ug/L	
9592939	AD5	RPD [WM4561-04]	Total Aluminum (Al)	2019/09/18	NC		%	20
			Total Antimony (Sb)	2019/09/18	NC		%	20
			Total Arsenic (As)	2019/09/18	NC		%	20
			Total Barium (Ba)	2019/09/18	NC		%	20
			Total Beryllium (Be)	2019/09/18	NC		%	20
			Total Bismuth (Bi)	2019/09/18	NC		%	20
			Total Boron (B)	2019/09/18	NC		%	20
			Total Cadmium (Cd)	2019/09/18	NC		%	20
			Total Cesium (Cs)	2019/09/18	NC		%	20
			Total Chromium (Cr)	2019/09/18	NC		%	20
			Total Cobalt (Co)	2019/09/18	NC		%	20
			Total Copper (Cu)	2019/09/18	NC		%	20
			Total Iron (Fe)	2019/09/18	NC		%	20
			Total Lead (Pb)	2019/09/18	NC		%	20
			Total Lithium (Li)	2019/09/18	NC		%	20
			Total Manganese (Mn)	2019/09/18	NC		%	20
			Total Molybdenum (Mo)	2019/09/18	NC		%	20
			Total Nickel (Ni)	2019/09/18	NC		%	20
			Total Selenium (Se)	2019/09/18	NC		%	20
			Total Silicon (Si)	2019/09/18	NC		%	20
			Total Silver (Ag)	2019/09/18	NC		%	20
			Total Strontium (Sr)	2019/09/18	NC		%	20
			Total Thallium (Tl)	2019/09/18	NC		%	20
			Total Tin (Sn)	2019/09/18	NC		%	20

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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
9592939	AD5	RPD	Total Titanium (Ti)	2019/09/18	NC		%	20
			Total Uranium (U)	2019/09/18	NC		%	20
			Total Vanadium (V)	2019/09/18	NC		%	20
			Total Zinc (Zn)	2019/09/18	NC		%	20
			Total Zirconium (Zr)	2019/09/18	NC		%	20
			Total Aluminum (Al)	2019/09/18	NC		%	20
			Total Antimony (Sb)	2019/09/18	NC		%	20
			Total Arsenic (As)	2019/09/18	NC		%	20
			Total Barium (Ba)	2019/09/18	NC		%	20
			Total Beryllium (Be)	2019/09/18	NC		%	20
			Total Bismuth (Bi)	2019/09/18	NC		%	20
			Total Boron (B)	2019/09/18	NC		%	20
			Total Cadmium (Cd)	2019/09/18	NC		%	20
			Total Chromium (Cr)	2019/09/18	NC		%	20
			Total Cobalt (Co)	2019/09/18	NC		%	20
			Total Copper (Cu)	2019/09/18	NC		%	20
			Total Iron (Fe)	2019/09/18	NC		%	20
			Total Lead (Pb)	2019/09/18	NC		%	20
			Total Lithium (Li)	2019/09/18	NC		%	20
			Total Manganese (Mn)	2019/09/18	NC		%	20
			Total Molybdenum (Mo)	2019/09/18	1.4		%	20
			Total Nickel (Ni)	2019/09/18	NC		%	20
			Total Selenium (Se)	2019/09/18	NC		%	20
			Total Silicon (Si)	2019/09/18	NC		%	20
			Total Silver (Ag)	2019/09/18	NC		%	20
			Total Strontium (Sr)	2019/09/18	NC		%	20
			Total Thallium (Tl)	2019/09/18	NC		%	20
			Total Tin (Sn)	2019/09/18	NC		%	20
			Total Titanium (Ti)	2019/09/18	NC		%	20
			Total Uranium (U)	2019/09/18	NC		%	20
			Total Vanadium (V)	2019/09/18	NC		%	20
			Total Zinc (Zn)	2019/09/18	NC		%	20
			Total Zirconium (Zr)	2019/09/18	NC		%	20
9593167	MA4	Spiked Blank	pH	2019/09/18		100	%	97 - 103
9593167	MA4	RPD	pH	2019/09/18	0.63		%	N/A
9593171	MA4	Spiked Blank	Alkalinity (Total as CaCO3)	2019/09/18		102	%	80 - 120
9593171	MA4	Method Blank	Alkalinity (PP as CaCO3)	2019/09/18	<1.0		mg/L	
			Alkalinity (Total as CaCO3)	2019/09/18	<1.0		mg/L	
			Bicarbonate (HCO3)	2019/09/18	<1.0		mg/L	
			Carbonate (CO3)	2019/09/18	<1.0		mg/L	
			Hydroxide (OH)	2019/09/18	<1.0		mg/L	
9593171	MA4	RPD	Alkalinity (PP as CaCO3)	2019/09/18	NC		%	20
			Alkalinity (Total as CaCO3)	2019/09/18	1.5		%	20
			Bicarbonate (HCO3)	2019/09/18	1.5		%	20
			Carbonate (CO3)	2019/09/18	NC		%	20
			Hydroxide (OH)	2019/09/18	NC		%	20
9593172	MA4	Spiked Blank	Conductivity	2019/09/18		101	%	90 - 110
9593172	MA4	Method Blank	Conductivity	2019/09/18	<2.0		uS/cm	
9593172	MA4	RPD	Conductivity	2019/09/18	0.45		%	10
9593543	MA4	Spiked Blank	pH	2019/09/18		100	%	97 - 103
9593543	MA4	RPD	pH	2019/09/18	0.24		%	N/A
9593544	MA4	Spiked Blank	Alkalinity (Total as CaCO3)	2019/09/18		100	%	80 - 120
9593544	MA4	Method Blank	Alkalinity (PP as CaCO3)	2019/09/18	<1.0		mg/L	



BUREAU
VERITAS

BV Labs Job #: B977474
Report Date: 2019/09/23

STANTEC CONSULTING LTD
Client Project #: 121414585
Site Location: GORDON LAKE
Sampler Initials: BW

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
9593544	MA4	RPD	Alkalinity (Total as CaCO ₃)	2019/09/18	<1.0		mg/L	
			Bicarbonate (HCO ₃)	2019/09/18	<1.0		mg/L	
			Carbonate (CO ₃)	2019/09/18	<1.0		mg/L	
			Hydroxide (OH)	2019/09/18	<1.0		mg/L	
			Alkalinity (PP as CaCO ₃)	2019/09/18	19		%	20
			Alkalinity (Total as CaCO ₃)	2019/09/18	0.095		%	20
			Bicarbonate (HCO ₃)	2019/09/18	0.29		%	20
			Carbonate (CO ₃)	2019/09/18	19		%	20
			Hydroxide (OH)	2019/09/18	NC		%	20
9593545	MA4	Spiked Blank	Conductivity	2019/09/18		98	%	90 - 110
9593545	MA4	Method Blank	Conductivity	2019/09/18	<2.0		uS/cm	
9593545	MA4	RPD	Conductivity	2019/09/18	0.25		%	10

N/A = Not Applicable

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

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

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

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

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

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

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



BUREAU
VERITAS

BV Labs Job #: B977474
Report Date: 2019/09/23

STANTEC CONSULTING LTD
Client Project #: 121414585
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VALIDATION SIGNATURE PAGE

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

Daniel Reslan, cCT, QP, Organics Manager

Justin Geisel, B.Sc., Organics Supervisor

Rob Reinert, B.Sc., Scientific Specialist

Sandy Yuan, M.Sc., QP, Inorganics Supervisor

BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



CHAIN-OF-CUSTODY RECORD

[illegible]



COOLER OBSERVATIONS:				MAXXAM JOB#:			
				BA77474			
CUSTODY SEAL	YES	NO	COOLER ID	CUSTODY SEAL	YES	NO	COOLER ID
PRESENT	<input checked="" type="checkbox"/>	<input type="checkbox"/>	TEMP 9.5 10.1 10.3	PRESENT	<input type="checkbox"/>	<input type="checkbox"/>	TEMP <input type="text"/> <input type="text"/> <input type="text"/>
INTACT	<input checked="" type="checkbox"/>	<input type="checkbox"/>		ICE PRESENT	<input type="checkbox"/>	<input type="checkbox"/>	
ICE PRESENT	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1 2 3	CUSTODY SEAL	YES	NO	COOLER ID
CUSTODY SEAL	YES	NO	COOLER ID	PRESENT	<input checked="" type="checkbox"/>	<input type="checkbox"/>	TEMP <input type="text"/> <input type="text"/> <input type="text"/>
PRESENT	<input checked="" type="checkbox"/>	<input type="checkbox"/>	TEMP 7.8 6.9 7.6	INTACT	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
INTACT	<input checked="" type="checkbox"/>	<input type="checkbox"/>		ICE PRESENT	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICE PRESENT	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1 2 3	CUSTODY SEAL	YES	NO	COOLER ID
CUSTODY SEAL	YES	NO	COOLER ID	PRESENT	<input checked="" type="checkbox"/>	<input type="checkbox"/>	TEMP <input type="text"/> <input type="text"/> <input type="text"/>
PRESENT	<input checked="" type="checkbox"/>	<input type="checkbox"/>	TEMP 5.3 6.1 4.6	INTACT	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
INTACT	<input checked="" type="checkbox"/>	<input type="checkbox"/>		ICE PRESENT	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICE PRESENT	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1 2 3	CUSTODY SEAL	YES	NO	COOLER ID
CUSTODY SEAL	YES	NO	COOLER ID	PRESENT	<input type="checkbox"/>	<input type="checkbox"/>	TEMP <input type="text"/> <input type="text"/> <input type="text"/>
PRESENT	<input type="checkbox"/>	<input type="checkbox"/>	TEMP <input type="text"/> <input type="text"/> <input type="text"/>	INTACT	<input type="checkbox"/>	<input type="checkbox"/>	
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ICE PRESENT	<input type="checkbox"/>	<input type="checkbox"/>	1 2 3	CUSTODY SEAL	YES	NO	COOLER ID
CUSTODY SEAL	YES	NO	COOLER ID	PRESENT	<input type="checkbox"/>	<input type="checkbox"/>	TEMP <input type="text"/> <input type="text"/> <input type="text"/>
PRESENT	<input type="checkbox"/>	<input type="checkbox"/>	TEMP <input type="text"/> <input type="text"/> <input type="text"/>	INTACT	<input type="checkbox"/>	<input type="checkbox"/>	
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ICE PRESENT	<input type="checkbox"/>	<input type="checkbox"/>	1 2 3	CUSTODY SEAL	YES	NO	COOLER ID
CUSTODY SEAL	YES	NO	COOLER ID	PRESENT	<input type="checkbox"/>	<input type="checkbox"/>	TEMP <input type="text"/> <input type="text"/> <input type="text"/>
PRESENT	<input type="checkbox"/>	<input type="checkbox"/>	TEMP <input type="text"/> <input type="text"/> <input type="text"/>	INTACT	<input type="checkbox"/>	<input type="checkbox"/>	
INTACT	<input type="checkbox"/>	<input type="checkbox"/>		ICE PRESENT	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICE PRESENT	<input type="checkbox"/>	<input type="checkbox"/>	1 2 3	CUSTODY SEAL	YES	NO	COOLER ID
CUSTODY SEAL	YES	NO	COOLER ID	PRESENT	<input type="checkbox"/>	<input type="checkbox"/>	TEMP <input type="text"/> <input type="text"/> <input type="text"/>
PRESENT	<input type="checkbox"/>	<input type="checkbox"/>	TEMP <input type="text"/> <input type="text"/> <input type="text"/>	INTACT	<input type="checkbox"/>	<input type="checkbox"/>	
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ICE PRESENT	<input type="checkbox"/>	<input type="checkbox"/>	1 2 3	CUSTODY SEAL	YES	NO	COOLER ID
CUSTODY SEAL	YES	NO	COOLER ID	PRESENT	<input type="checkbox"/>	<input type="checkbox"/>	TEMP <input type="text"/> <input type="text"/> <input type="text"/>
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PRESENT	<input type="checkbox"/>	<input type="checkbox"/>	TEMP <input type="text"/> <input type="text"/> <input type="text"/>	INTACT	<input type="checkbox"/>	<input type="checkbox"/>	
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ICE PRESENT	<input type="checkbox"/>	<input type="checkbox"/>	1 2 3	CUSTODY SEAL	YES	NO	COOLER ID
CUSTODY SEAL	YES	NO	COOLER ID	PRESENT	<input type="checkbox"/>	<input type="checkbox"/>	TEMP <input type="text"/> <input type="text"/> <input type="text"/>
PRESENT	<input type="checkbox"/>	<input type="checkbox"/>	TEMP <input type="text"/> <input type="text"/> <input type="text"/>	INTACT	<input type="checkbox"/>	<input type="checkbox"/>	
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ICE PRESENT	<input type="checkbox"/>	<input type="checkbox"/>	1 2 3	CUSTODY SEAL	YES	NO	COOLER ID
CUSTODY SEAL	YES	NO	COOLER ID	PRESENT	<input type="checkbox"/>	<input type="checkbox"/>	TEMP <input type="text"/> <input type="text"/> <input type="text"/>
PRESENT	<input type="checkbox"/>	<input type="checkbox"/>	TEMP <input type="text"/> <input type="text"/> <input type="text"/>	INTACT	<input type="checkbox"/>	<input type="checkbox"/>	
INTACT	<input type="checkbox"/>	<input type="checkbox"/>		ICE PRESENT	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICE PRESENT	<input type="checkbox"/>	<input type="checkbox"/>	1 2 3	CUSTODY SEAL	YES	NO	COOLER ID
CUSTODY SEAL	YES	NO	COOLER ID	PRESENT	<input type="checkbox"/>	<input type="checkbox"/>	TEMP <input type="text"/> <input type="text"/> <input type="text"/>
PRESENT	<input type="checkbox"/>	<input type="checkbox"/>	TEMP <input type="text"/> <input type="text"/> <input type="text"/>	INTACT	<input type="checkbox"/>	<input type="checkbox"/>	
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ICE PRESENT	<input type="checkbox"/>	<input type="checkbox"/>	1 2 3	CUSTODY SEAL	YES	NO	COOLER ID
CUSTODY SEAL	YES	NO	COOLER ID	PRESENT	<input type="checkbox"/>	<input type="checkbox"/>	TEMP <input type="text"/> <input type="text"/> <input type="text"/>
PRESENT	<input type="checkbox"/>	<input type="checkbox"/>	TEMP <input type="text"/> <input type="text"/> <input type="text"/>	INTACT	<input type="checkbox"/>	<input type="checkbox"/>	
INTACT	<input type="checkbox"/>	<input type="checkbox"/>		ICE PRESENT	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICE PRESENT	<input type="checkbox"/>	<input type="checkbox"/>					

RECEIVED BY (SIGN & PRINT)	DATE (YYYY/MM/DD)	TIME (HH:MM)
J. MERCATO	2019/09/12	15:15

Custody Tracking Form

eCoC Number
W17075

Please use this form for custody tracking when submitting the work instructions via eCoC (electronic Chain of Custody). Please ensure your form has a barcode or a Maxxam eCoC confirmation number in the top right hand side. This number links your electronic submission to your samples. This form should be placed in the cooler with your samples.

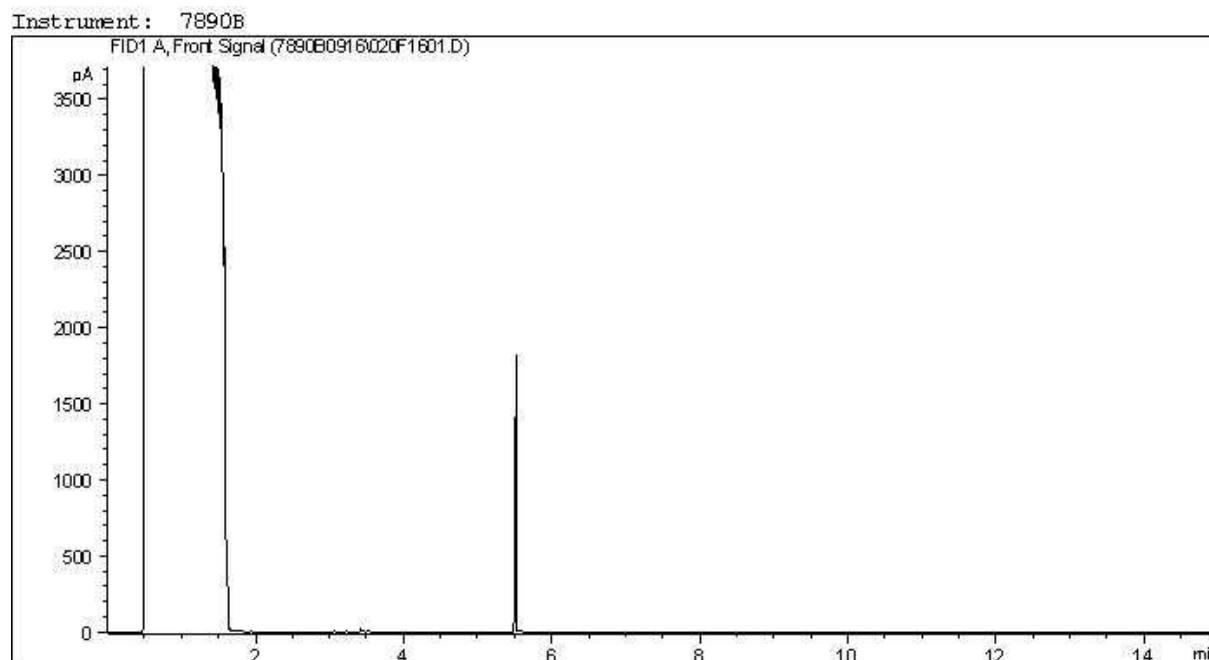
Relinquished By				Received By			
Roxanne Pyke	RX Pyke	Date	2019/09/12	JOSE MEXCANO		Date	2019/09/12
		Time (24 HR)	12:00			Time (24 HR)	15:15
		Date		Kyle VanThournout		Date	2019/09/14
		Time (24 HR)				Time (24 HR)	11:40
		Date				Date	
		Time (24 HR)				Time (24 HR)	

Unless otherwise agreed to, submissions and use of services are governed by Maxxam's standard terms and conditions which can be found at www.maxxam.ca/terms

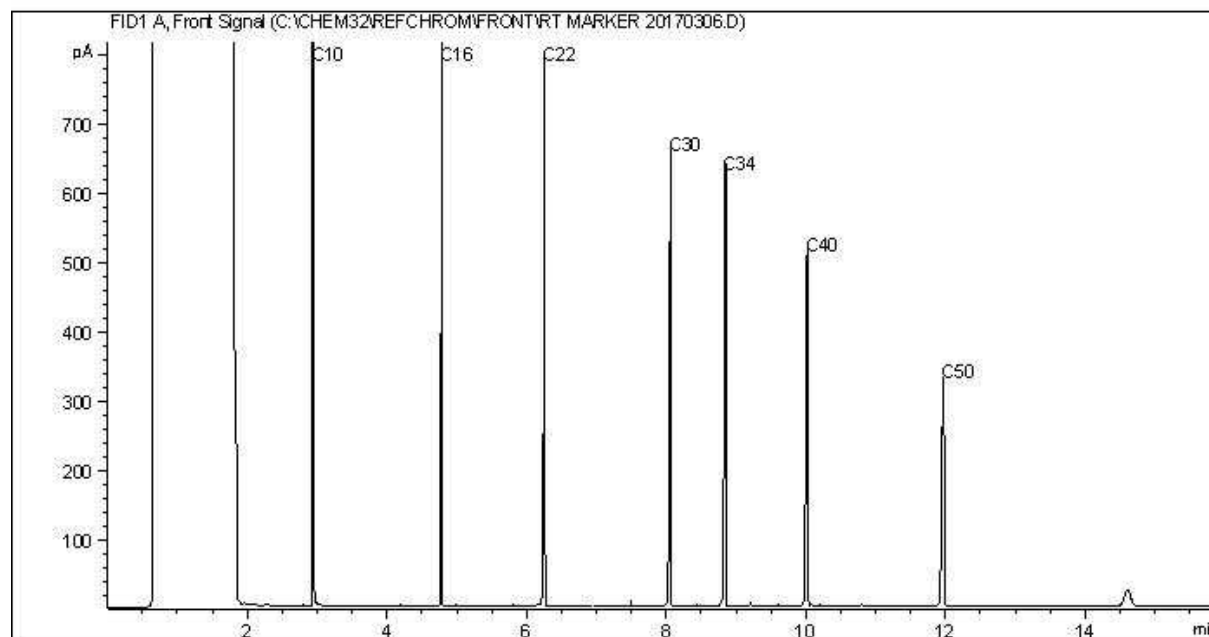
Triage Information					
Sampled By (Print)	# of Coolers/Pkgs	Rush <input type="checkbox"/>	Immediate Test <input type="checkbox"/>	Food Residue <input type="checkbox"/>	
Stantec	3	Micro <input type="checkbox"/>		Food Chemistry <input type="checkbox"/>	

*** Laboratory Use Only ***						
Received At		Lab Comments: B977474	Custody Seal		Cooling Media Present (Y/N)	Temperature °C
Labeled By			Present (Y/N)	Intact (Y/N)		1 2 3
Verified By			Y	Y	Y	5 3 3
			Y	Y	Y	3 3 3

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram



Carbon Range Distribution - Reference Chromatogram

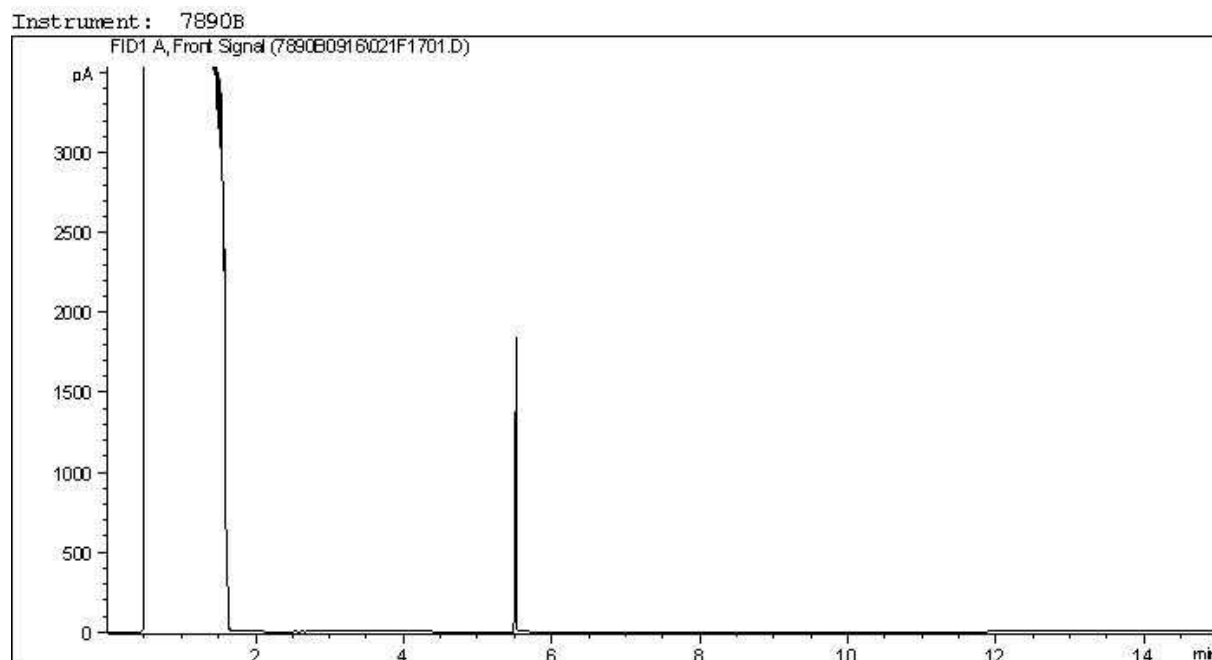


TYPICAL PRODUCT CARBON NUMBER RANGES

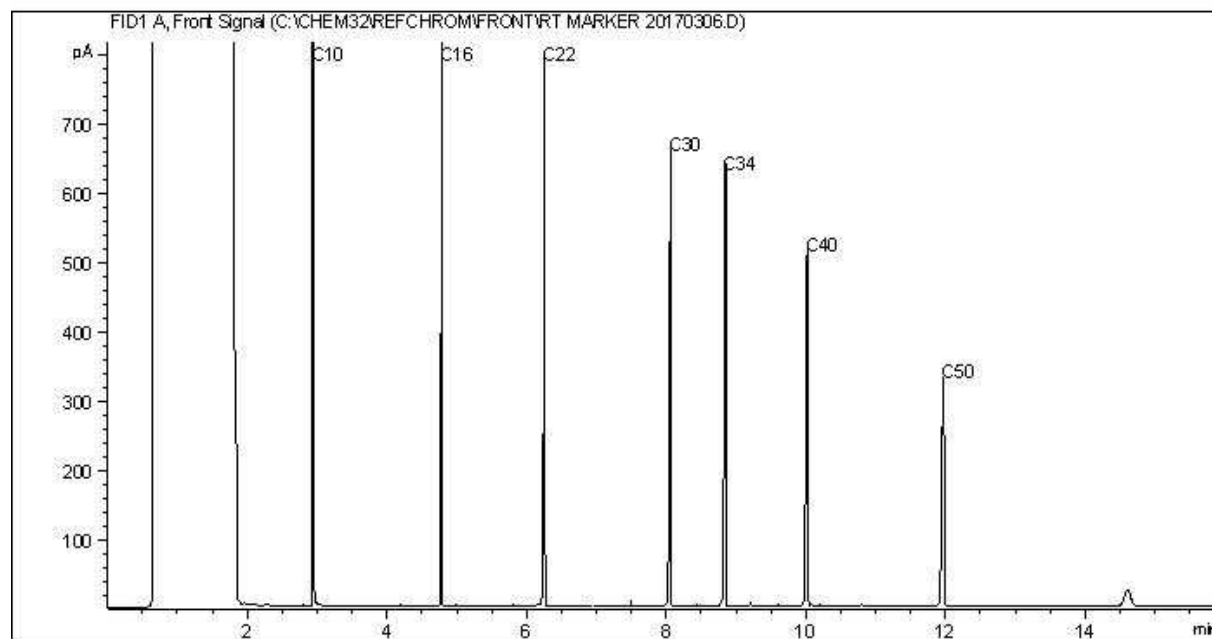
Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

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

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram



Carbon Range Distribution - Reference Chromatogram

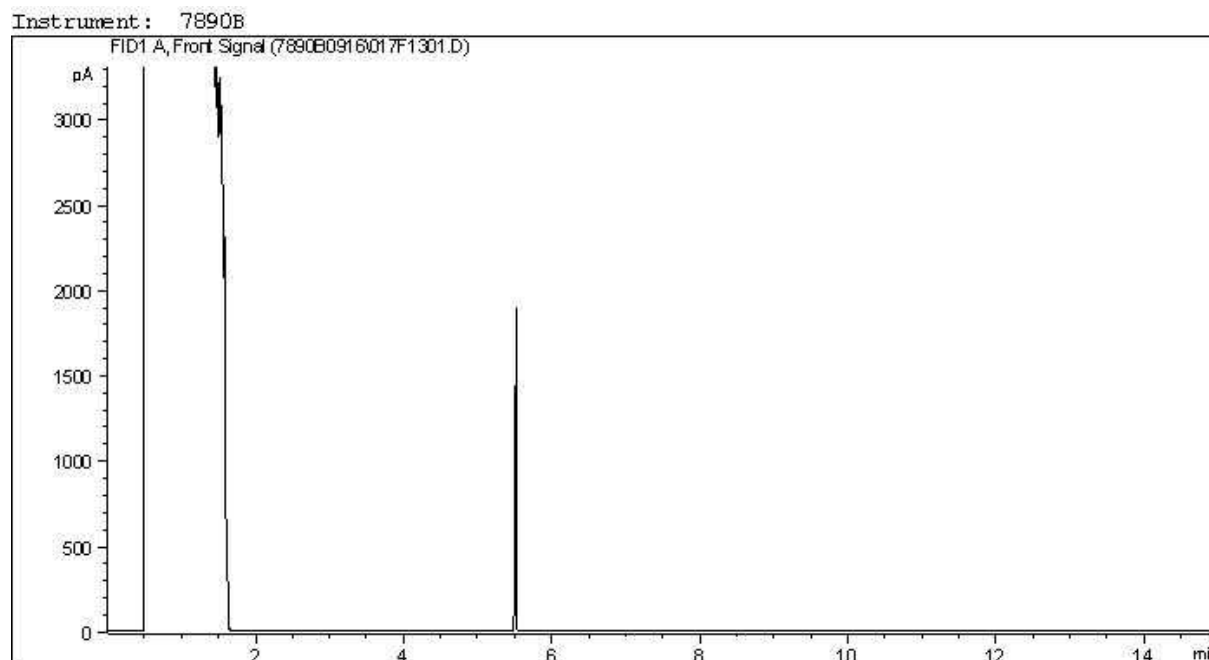


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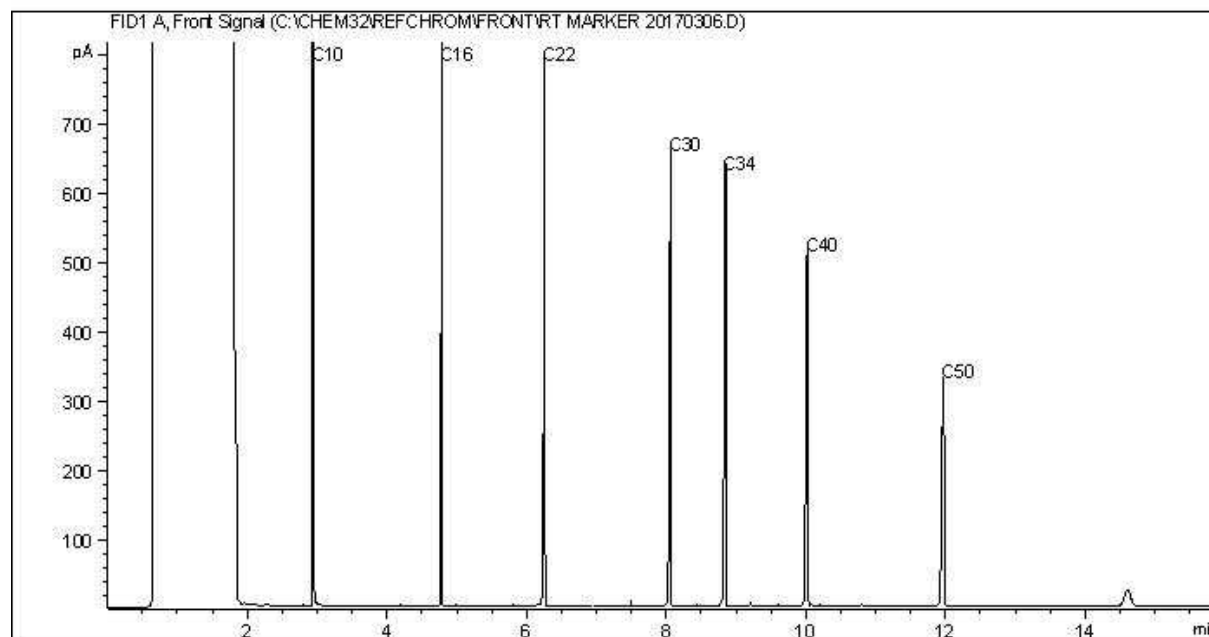
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CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram



Carbon Range Distribution - Reference Chromatogram

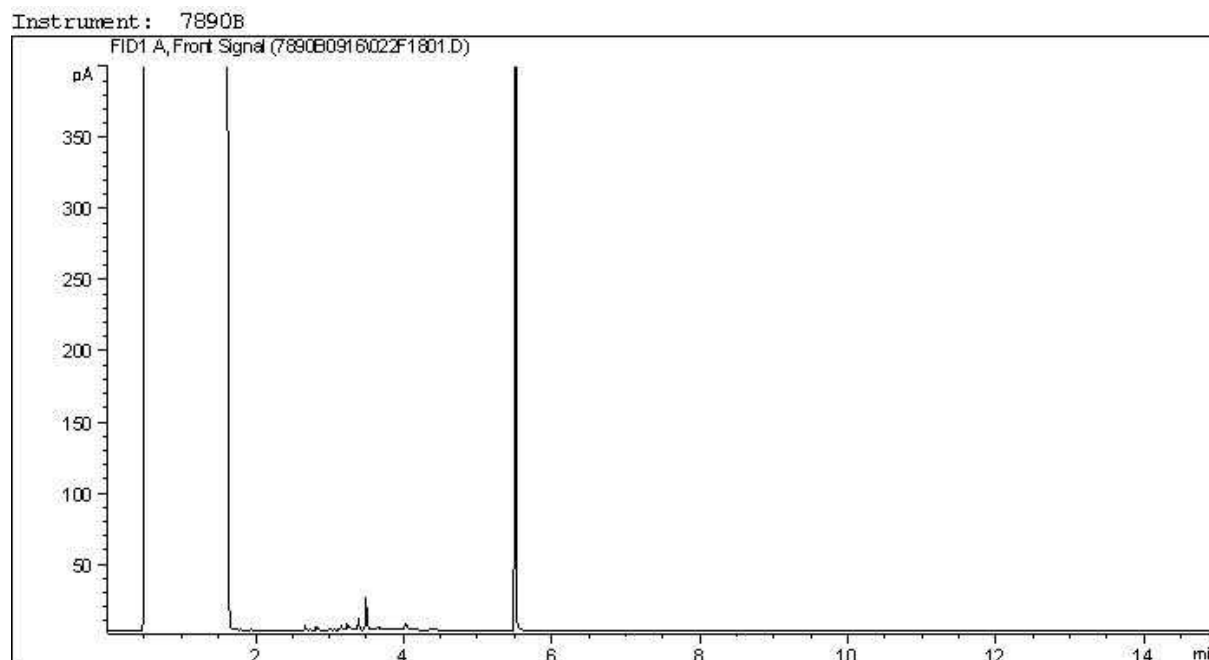


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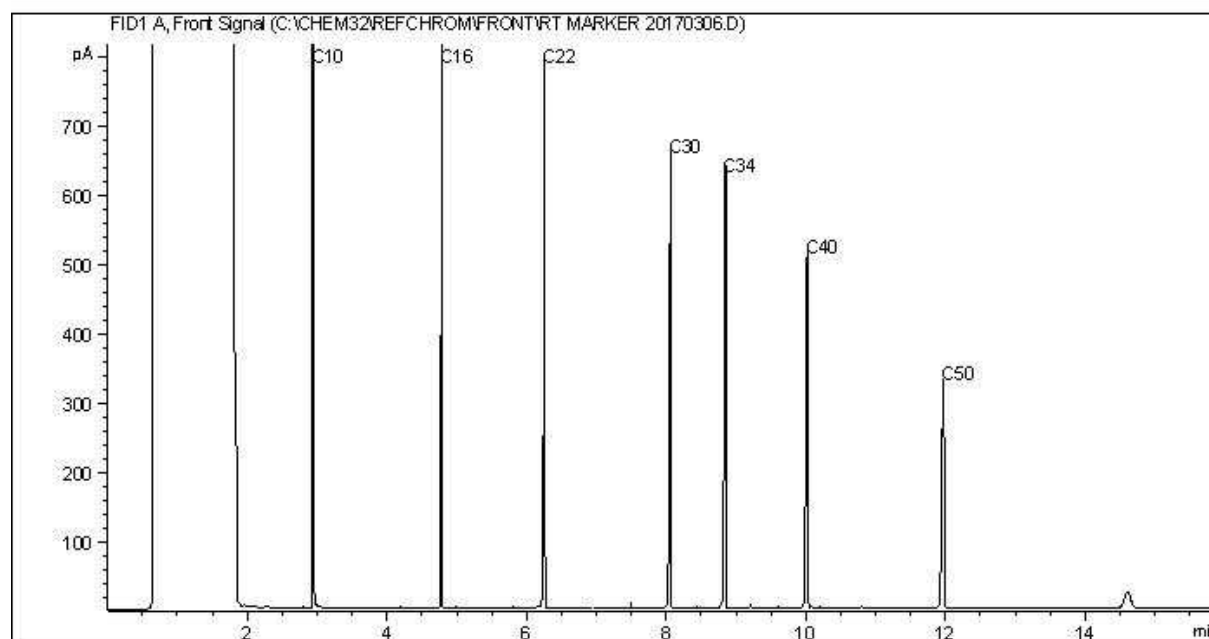
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Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
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CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram



Carbon Range Distribution - Reference Chromatogram

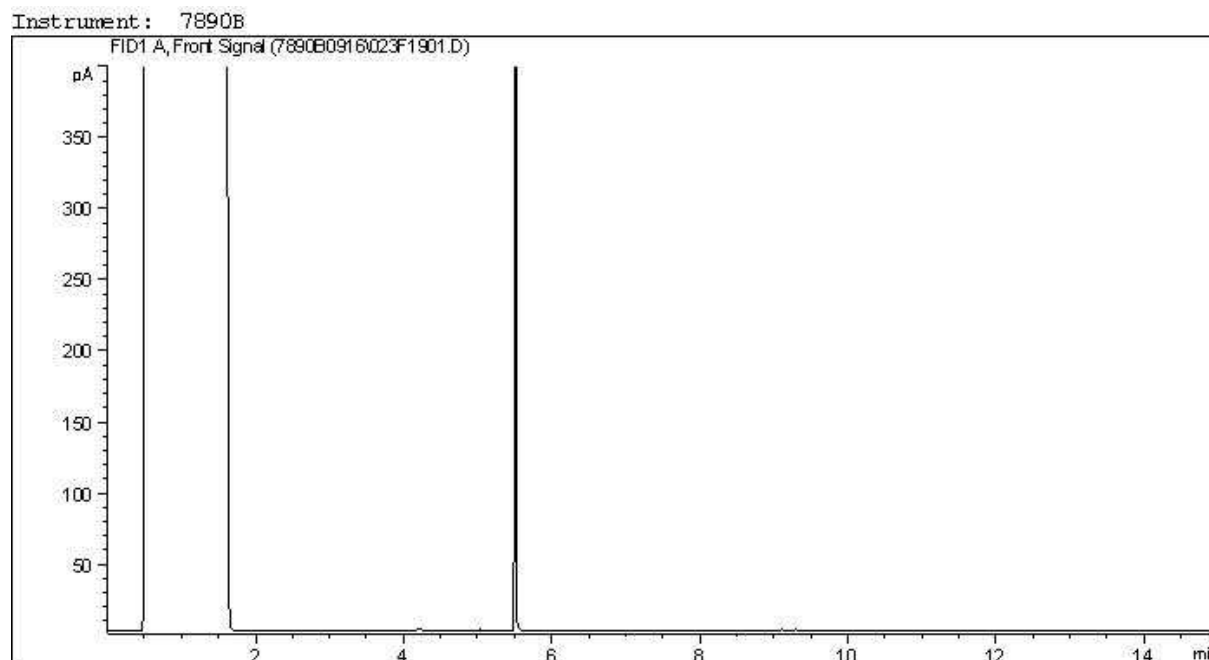


TYPICAL PRODUCT CARBON NUMBER RANGES

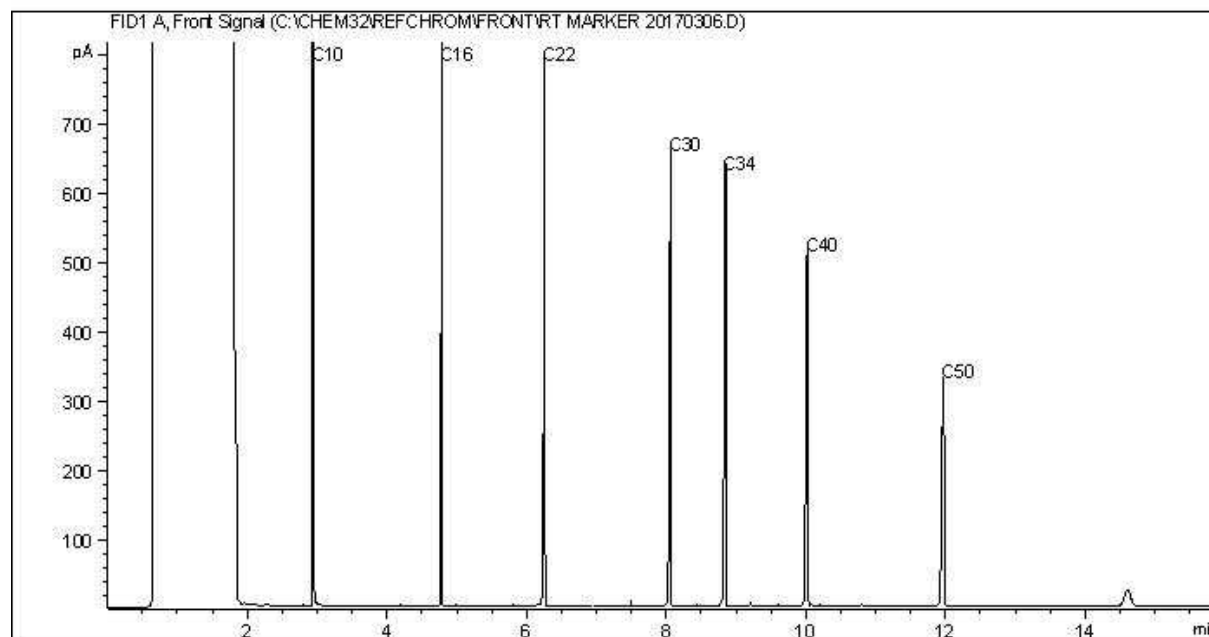
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CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram



Carbon Range Distribution - Reference Chromatogram

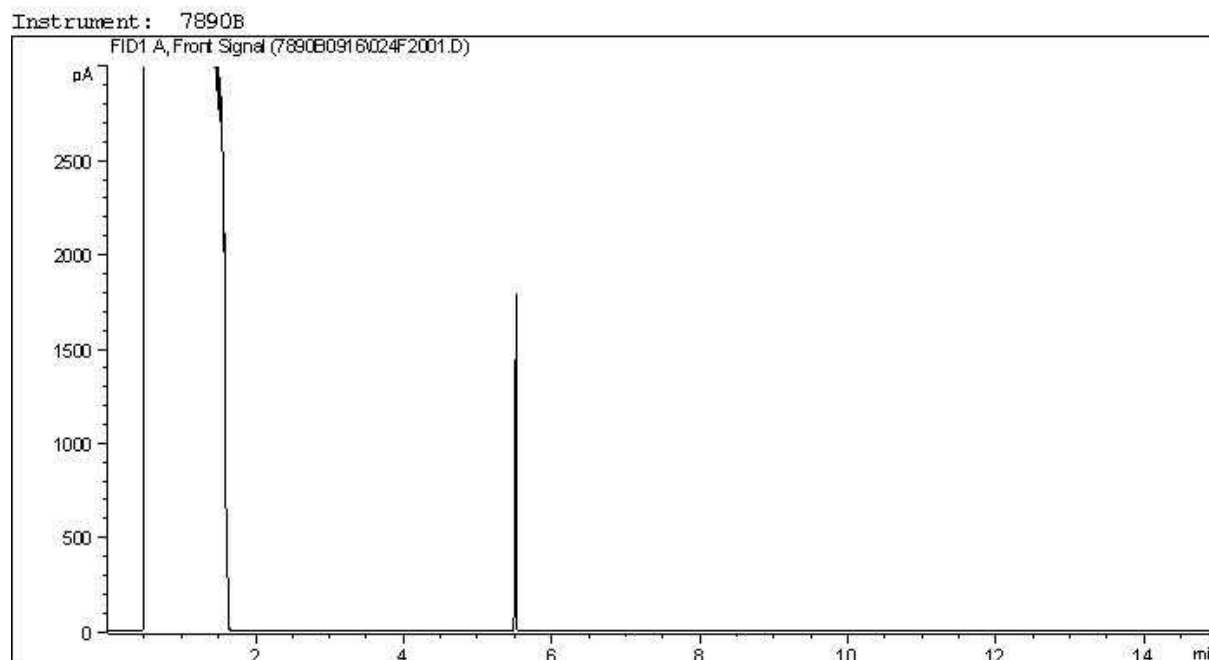


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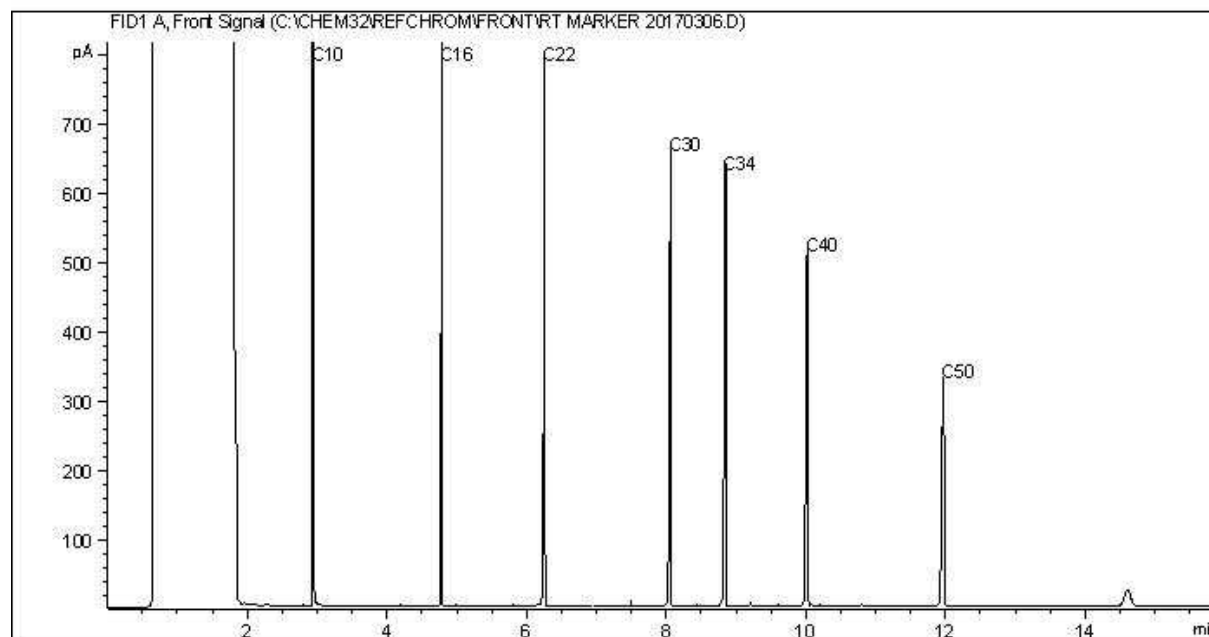
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CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram



Carbon Range Distribution - Reference Chromatogram

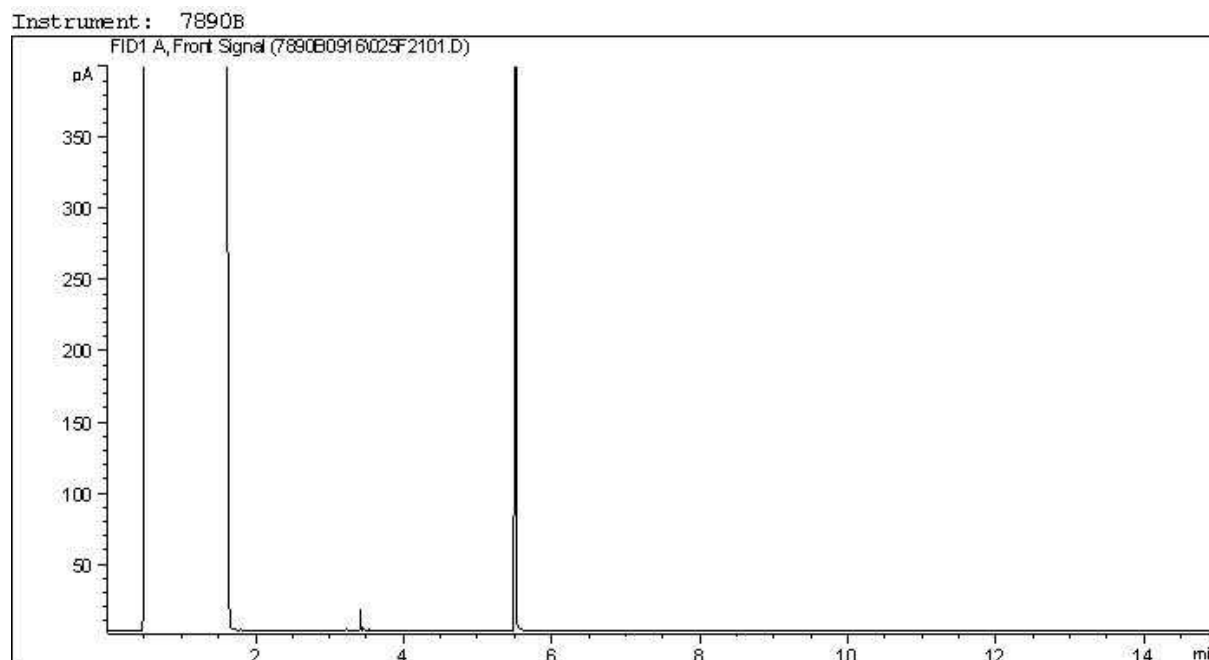


TYPICAL PRODUCT CARBON NUMBER RANGES

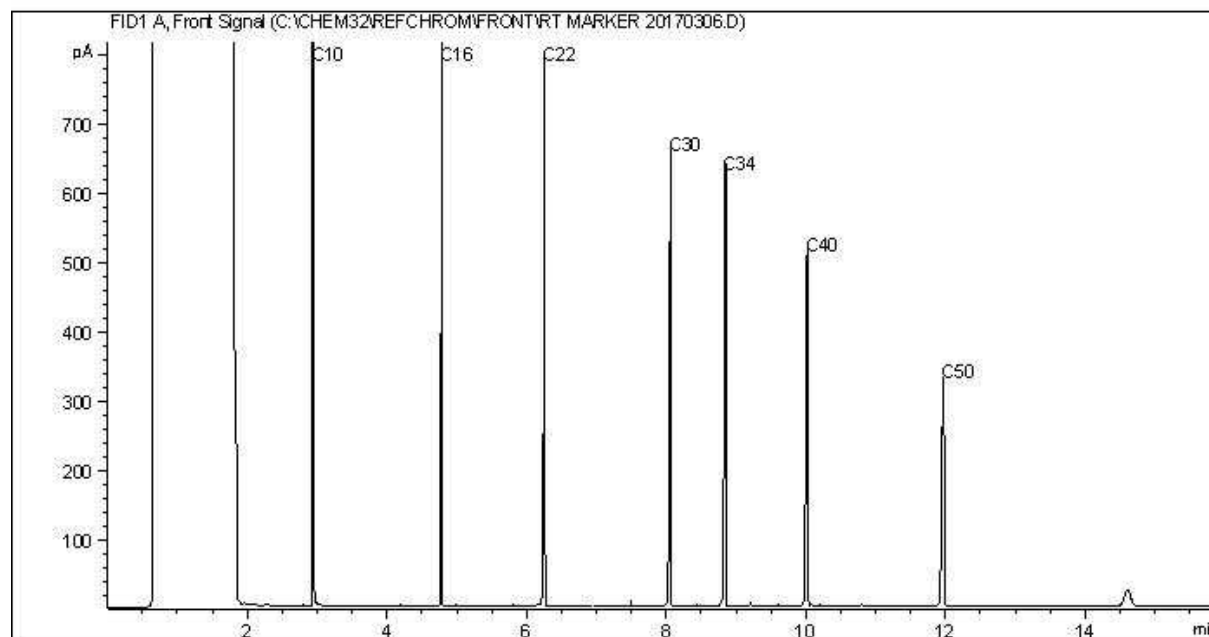
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CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram



Carbon Range Distribution - Reference Chromatogram

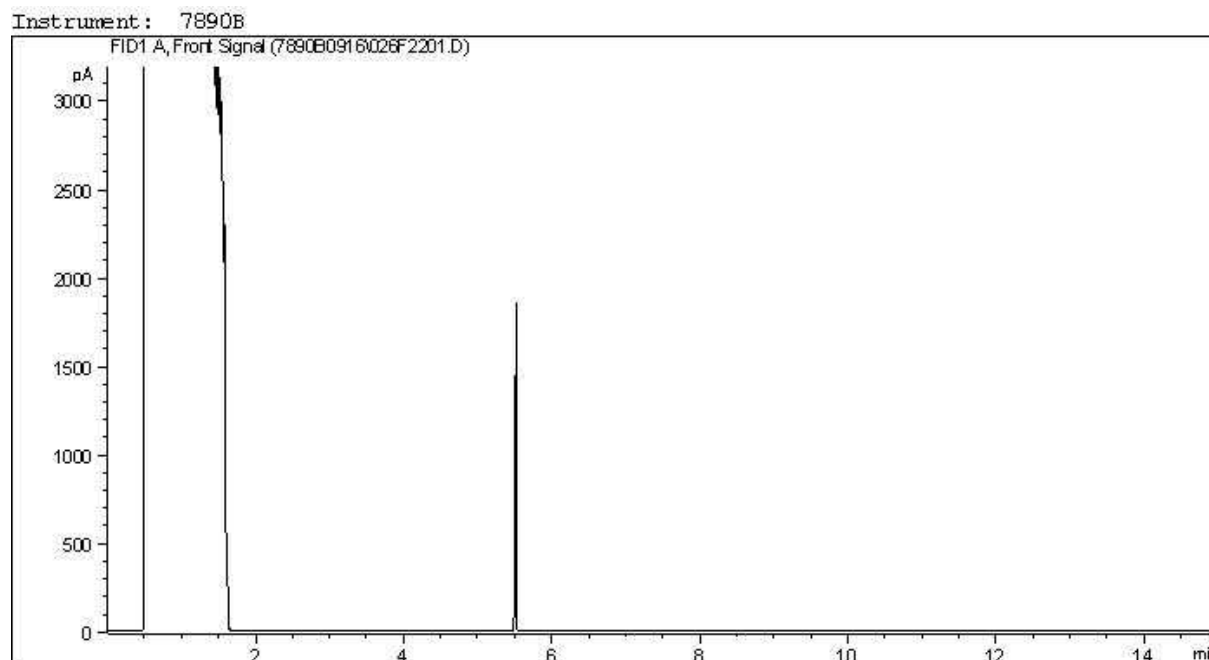


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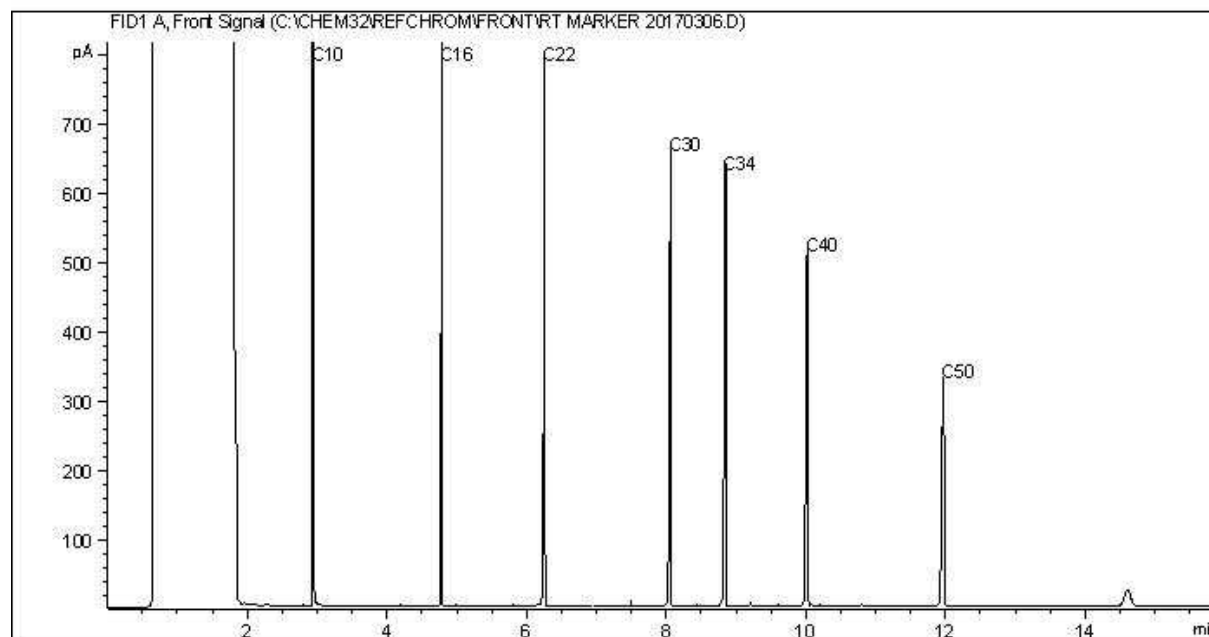
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CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram



Carbon Range Distribution - Reference Chromatogram

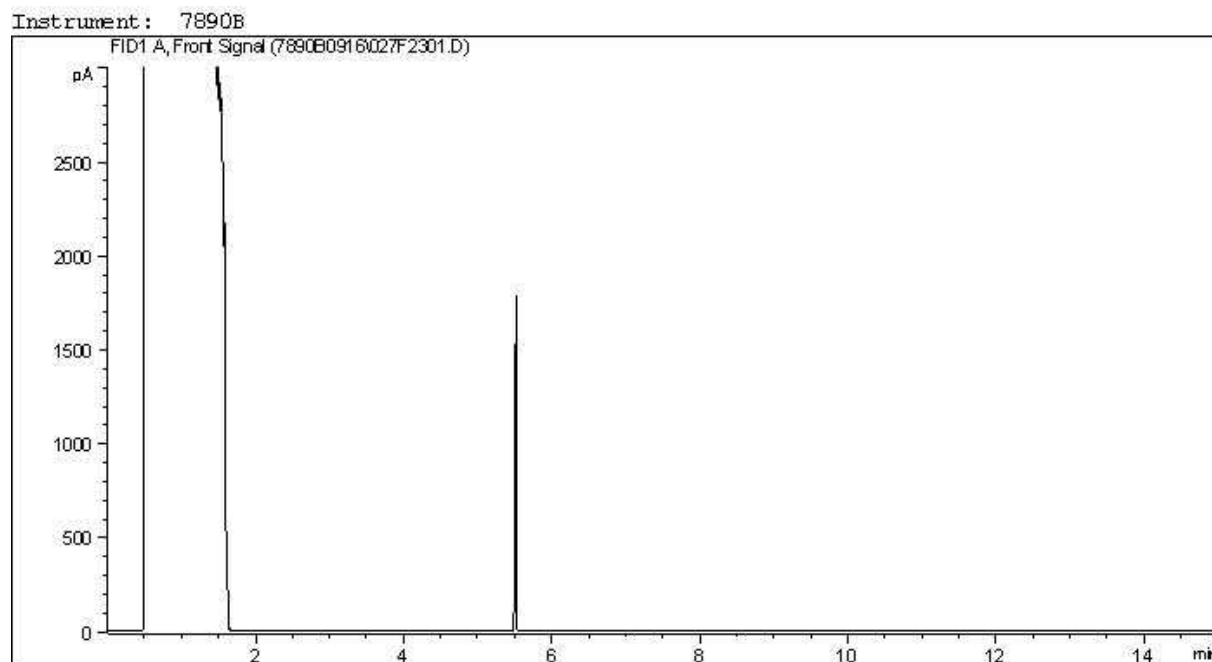


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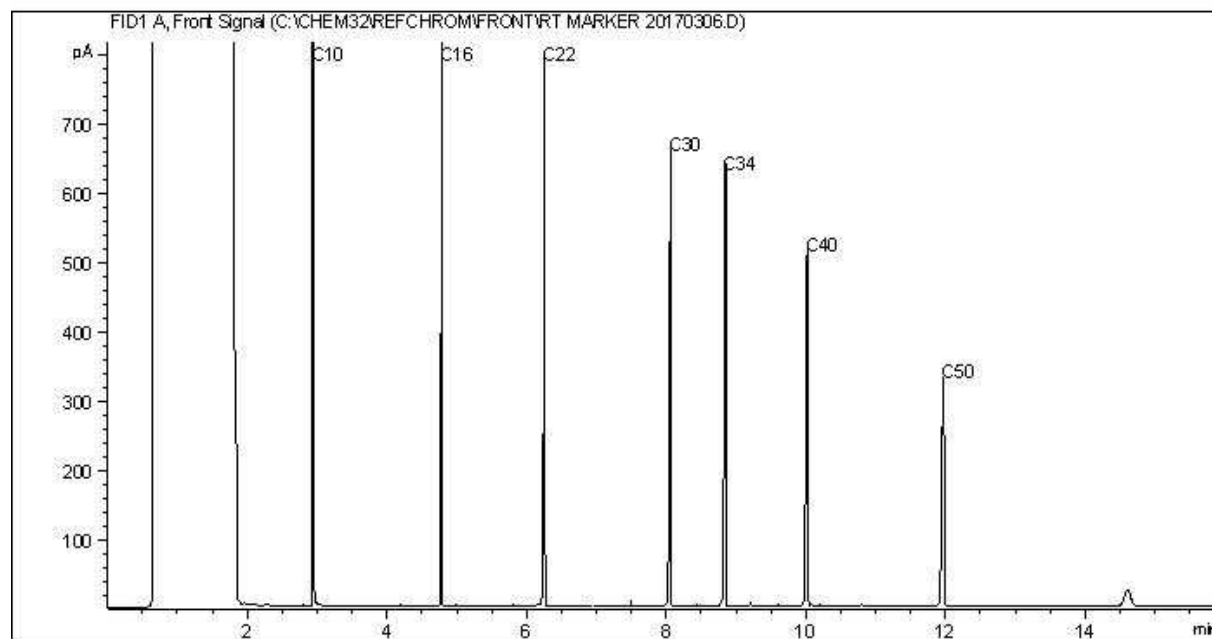
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CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram



Carbon Range Distribution - Reference Chromatogram

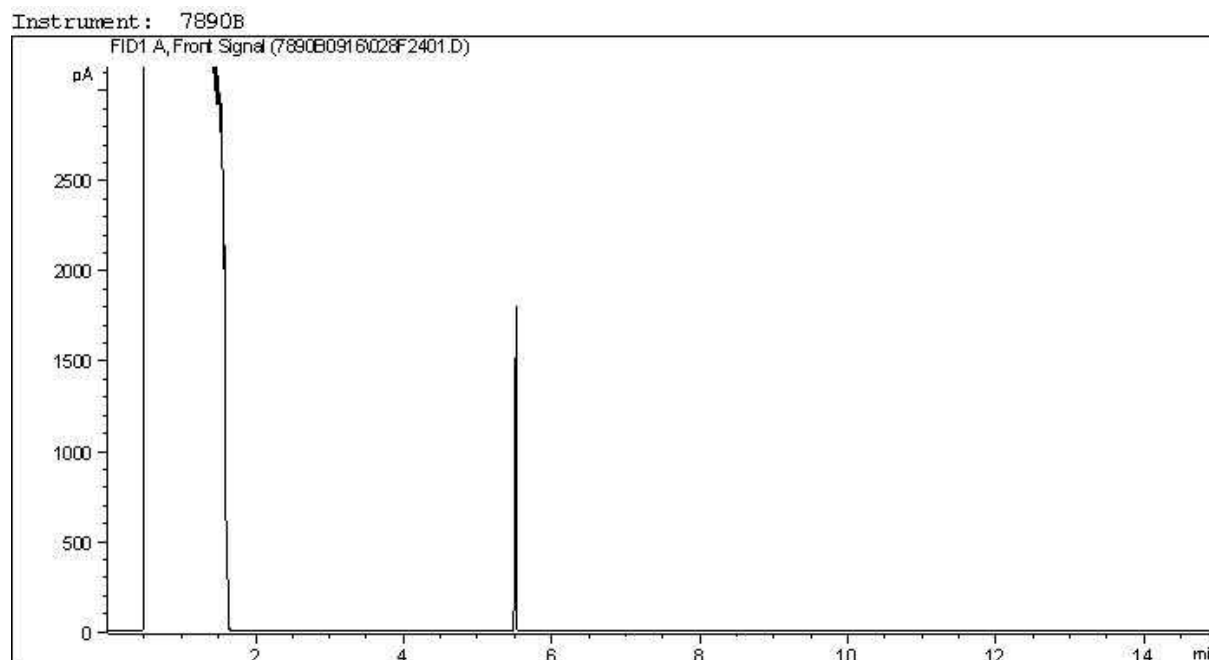


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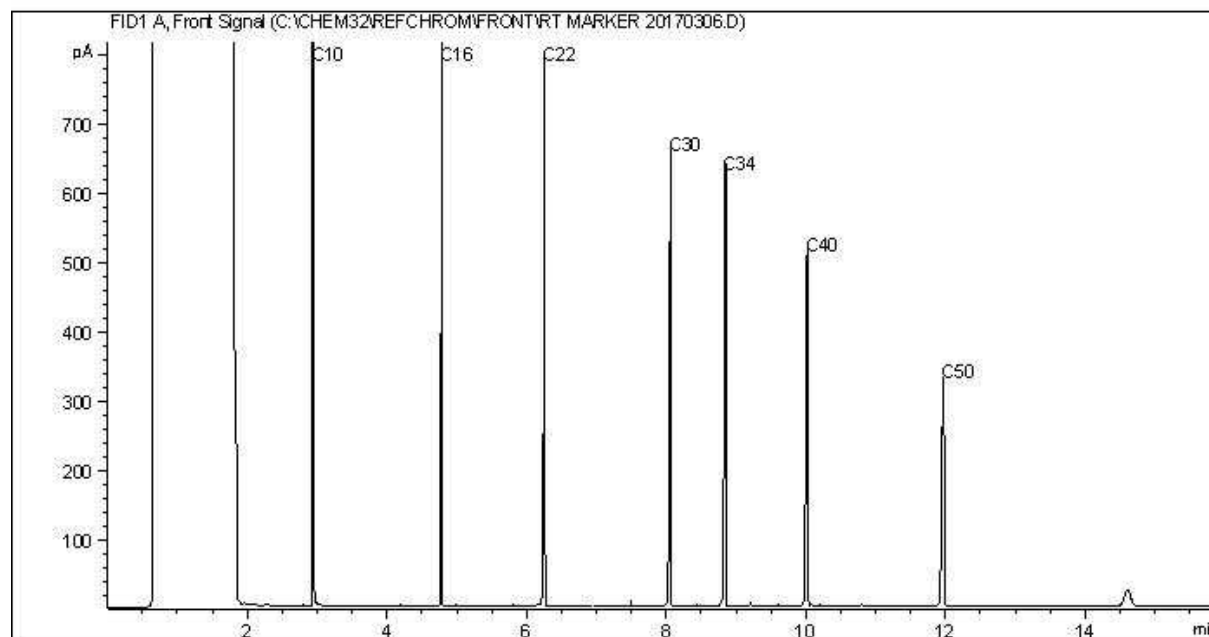
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CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram



Carbon Range Distribution - Reference Chromatogram

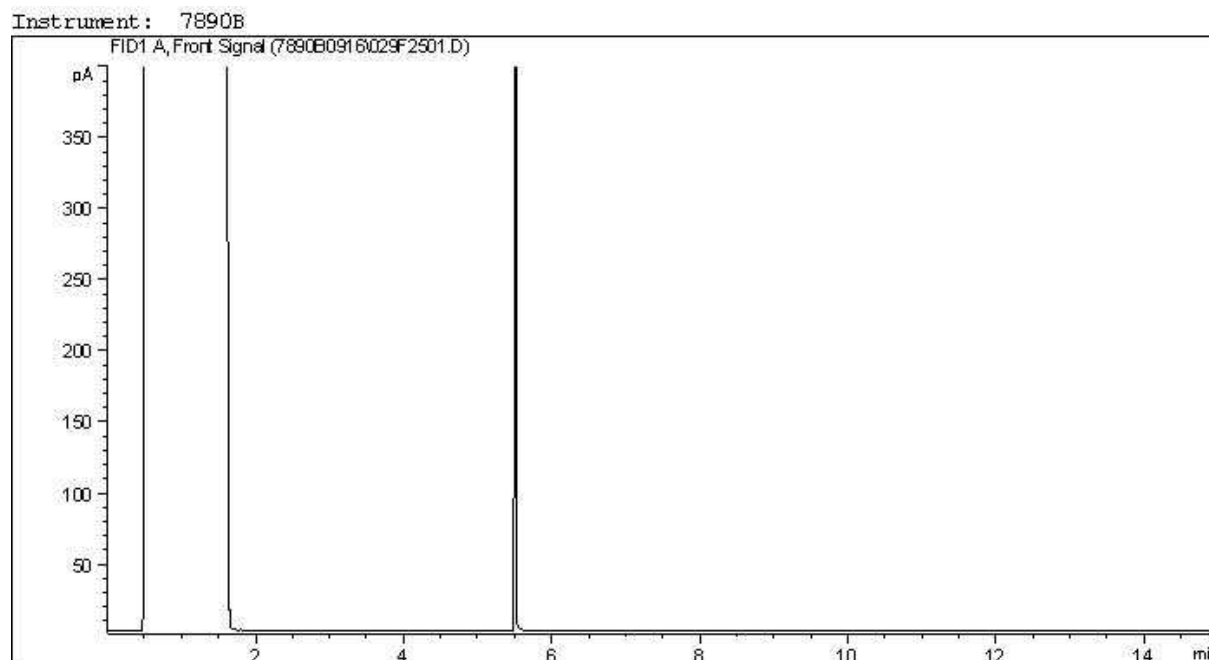


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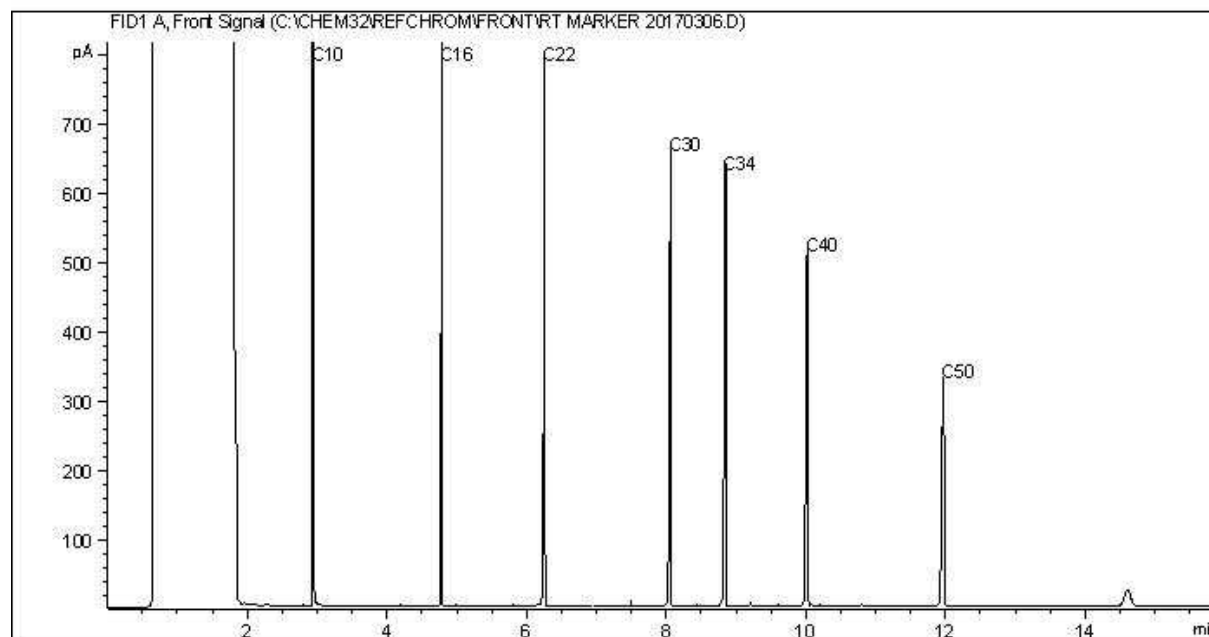
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CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram



Carbon Range Distribution - Reference Chromatogram

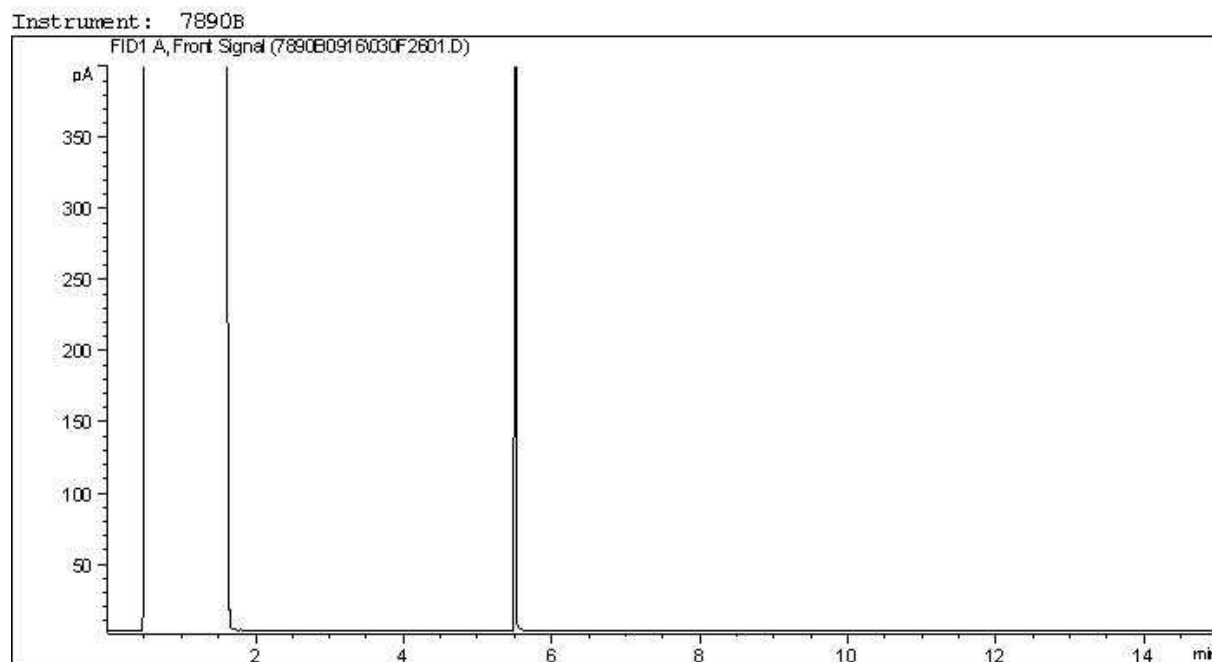


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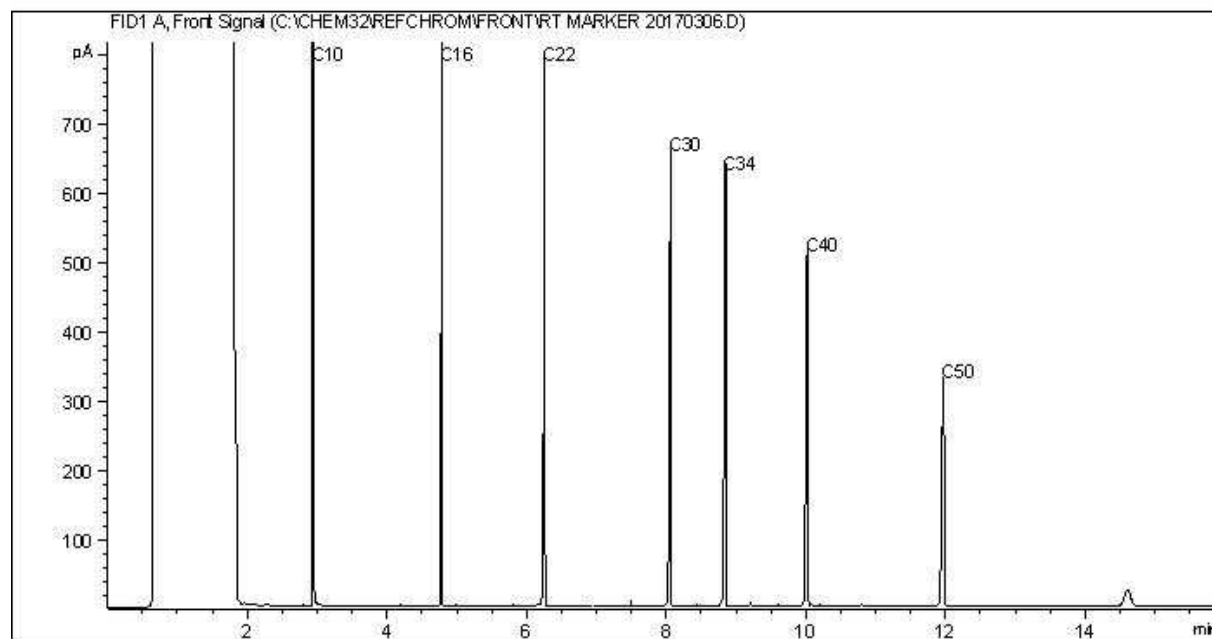
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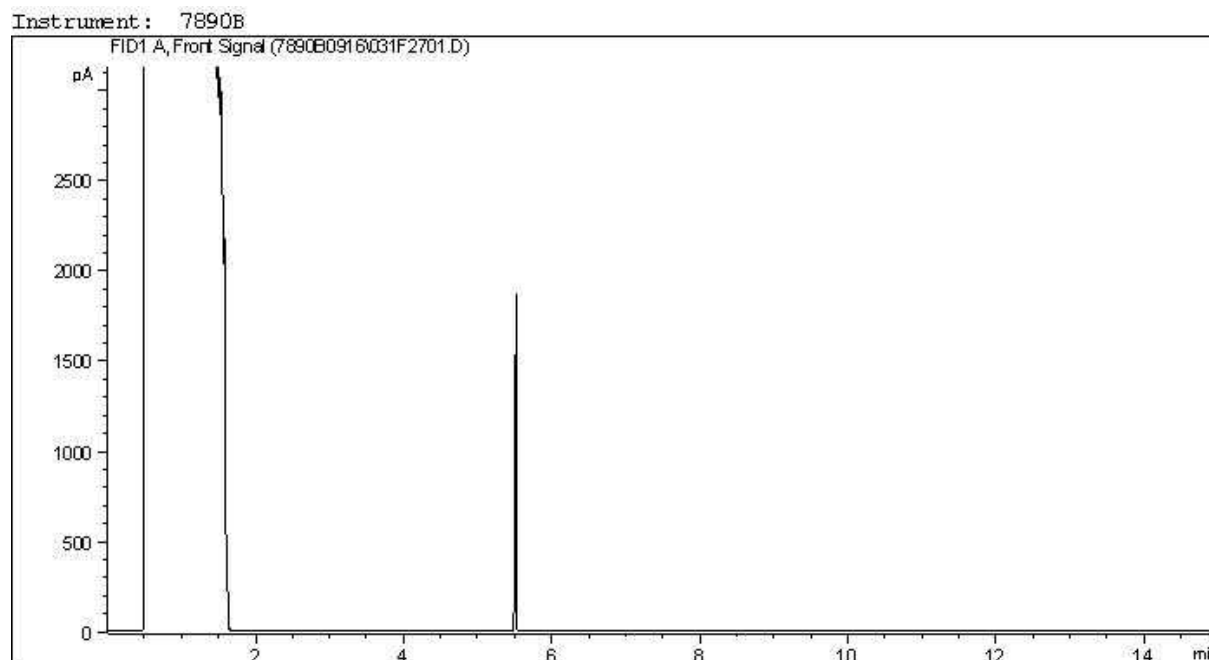


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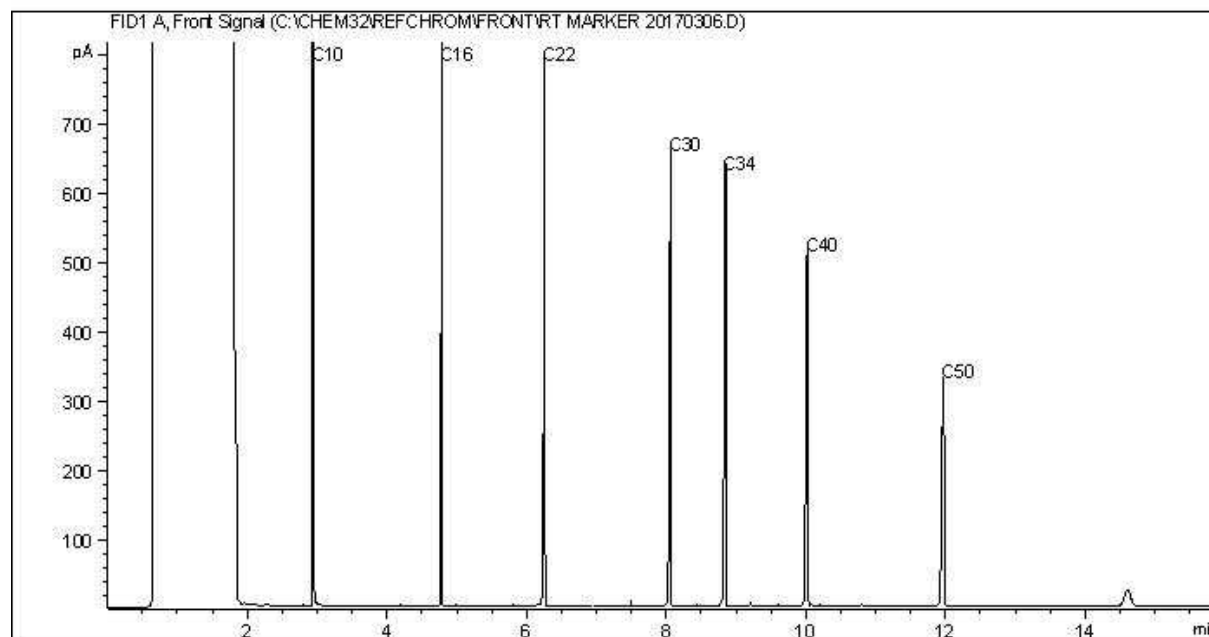
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Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

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CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram



Carbon Range Distribution - Reference Chromatogram

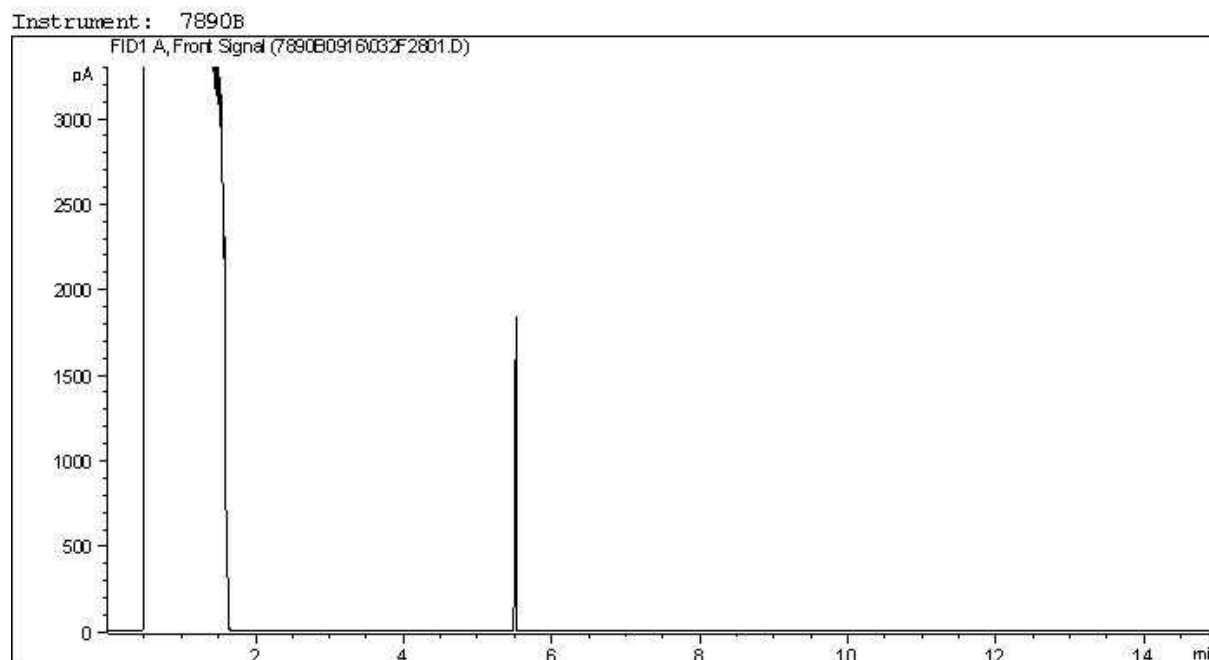


TYPICAL PRODUCT CARBON NUMBER RANGES

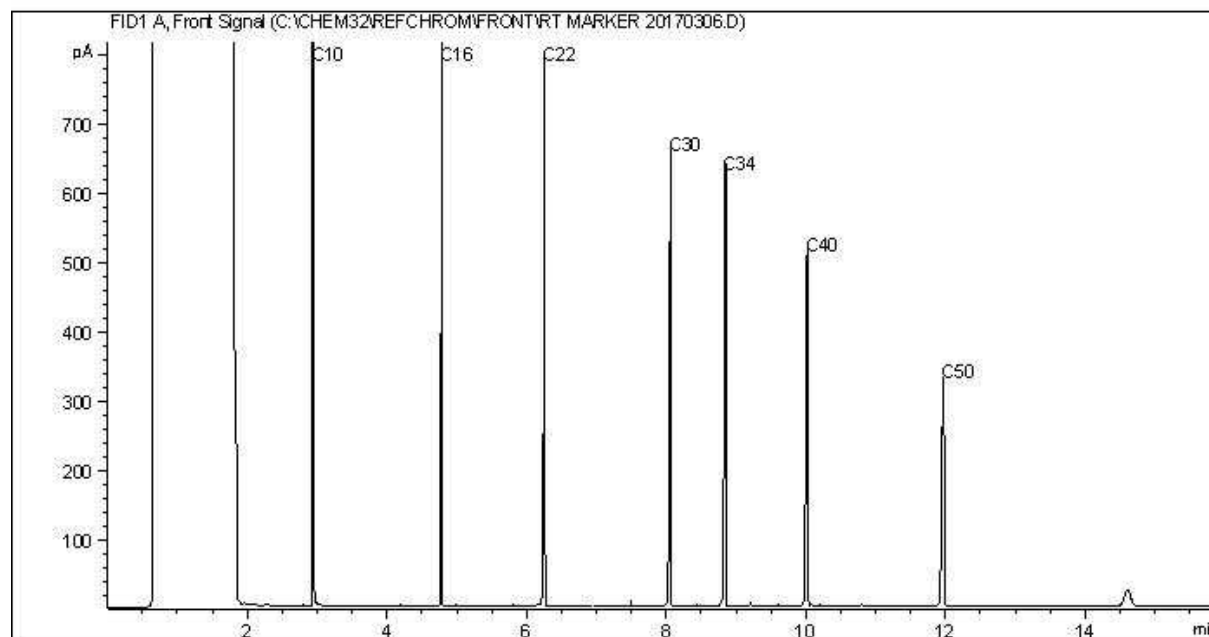
Gasoline:	C4 - C12	Diesel:	C8 - C22
Varsol:	C8 - C12	Lubricating Oils:	C20 - C40
Kerosene:	C7 - C16	Crude Oils:	C3 - C60+

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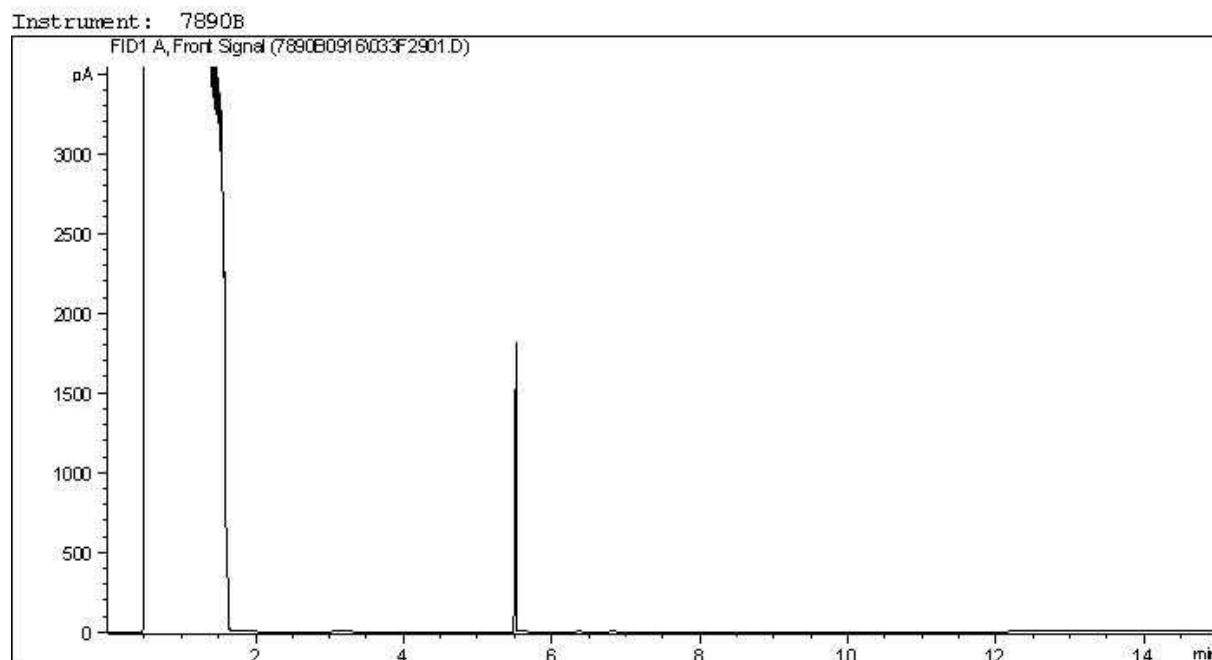


TYPICAL PRODUCT CARBON NUMBER RANGES

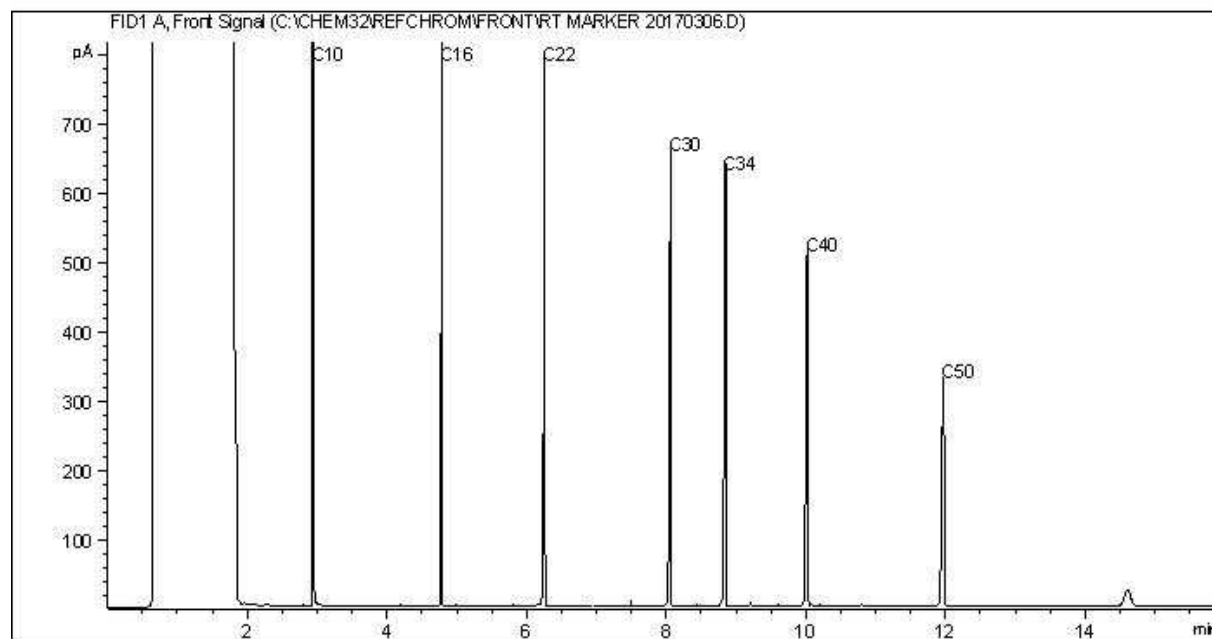
Gasoline:	C4 - C12	Diesel:	C8 - C22
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Carbon Range Distribution - Reference Chromatogram

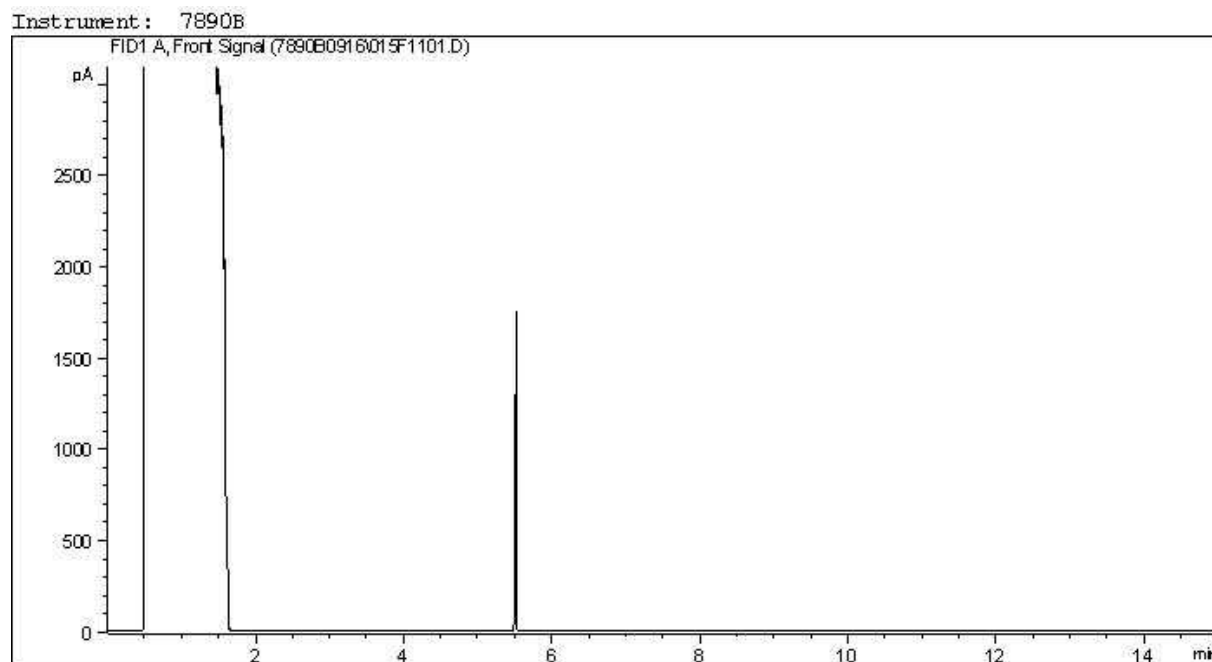


TYPICAL PRODUCT CARBON NUMBER RANGES

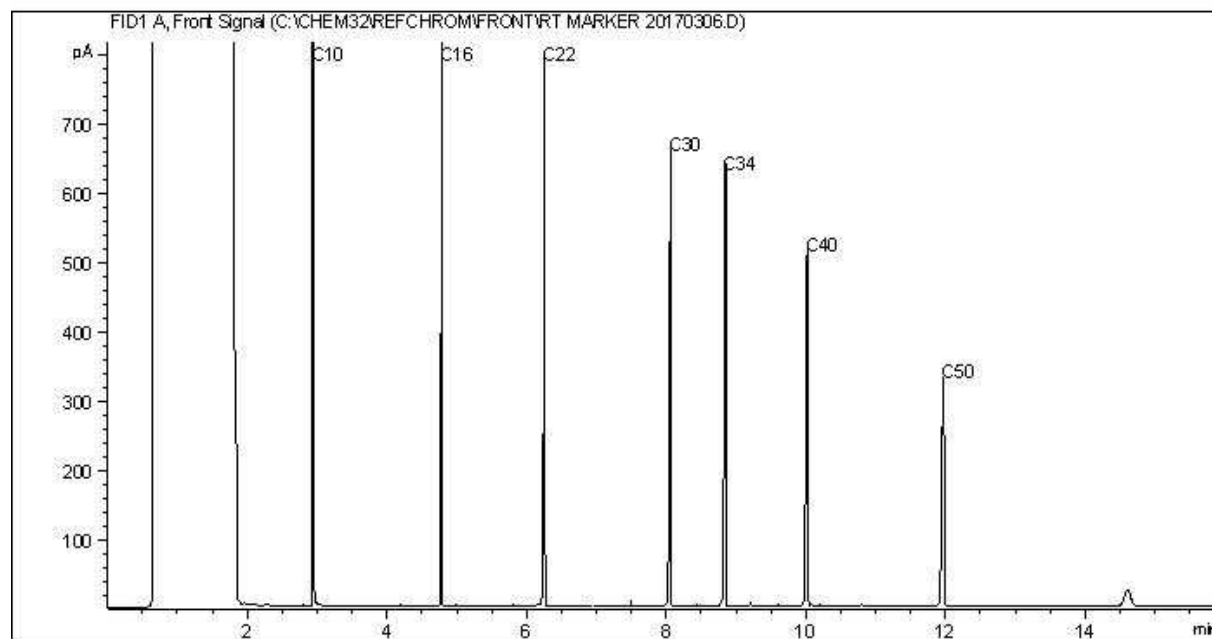
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Carbon Range Distribution - Reference Chromatogram

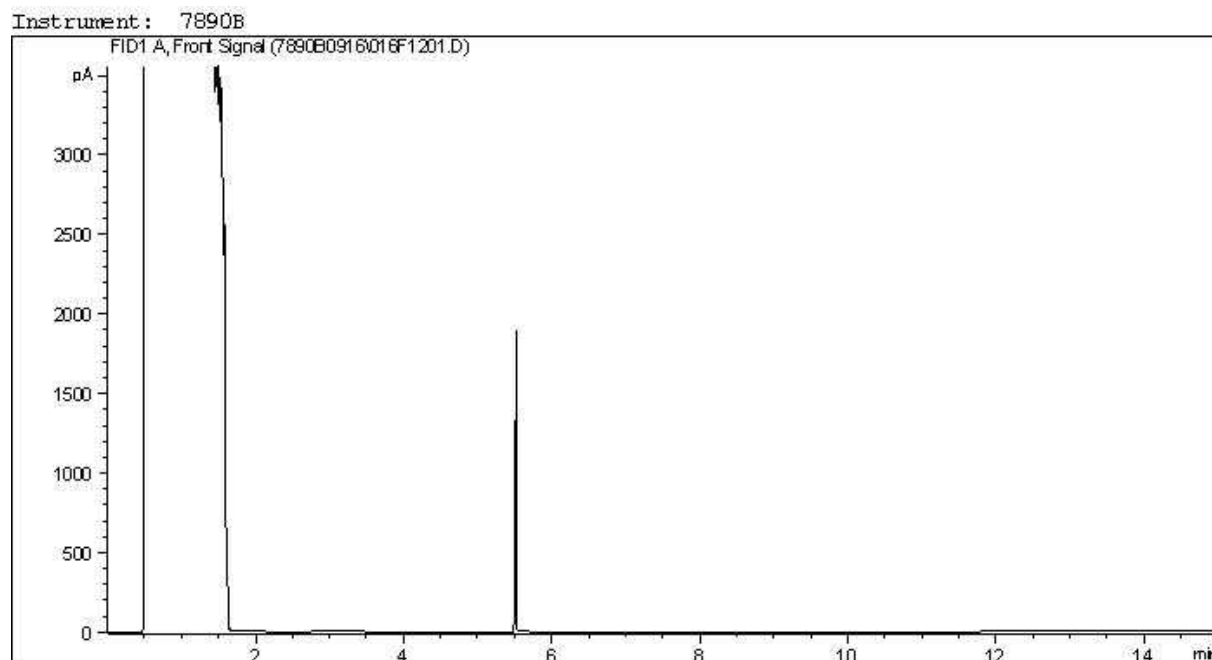


TYPICAL PRODUCT CARBON NUMBER RANGES

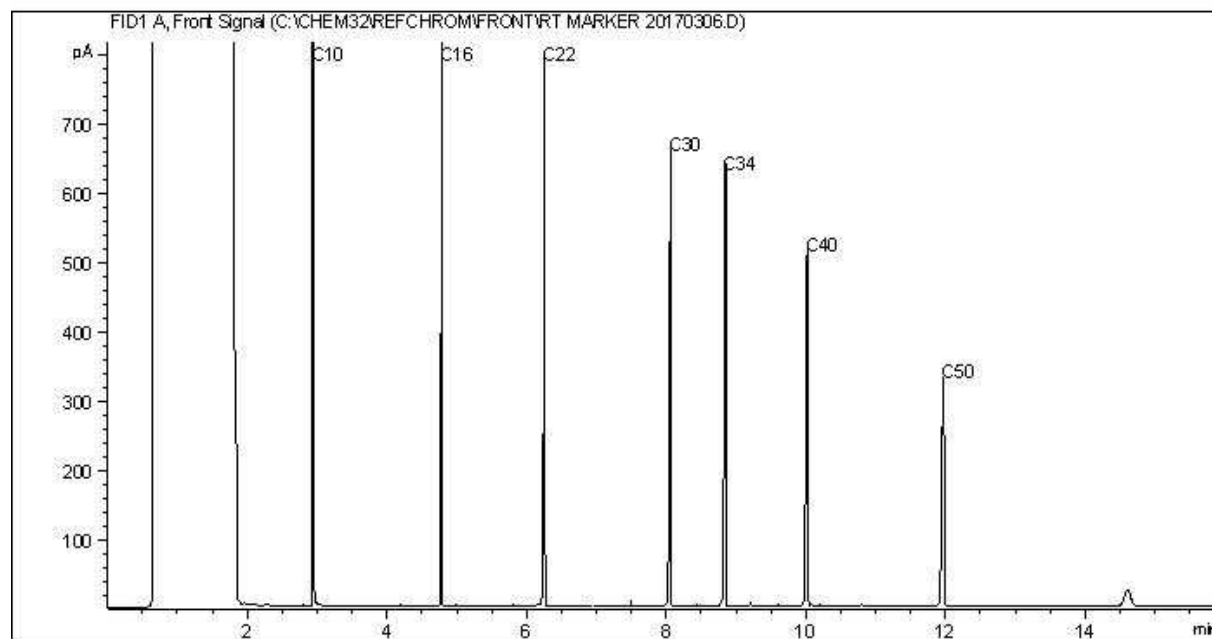
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Carbon Range Distribution - Reference Chromatogram

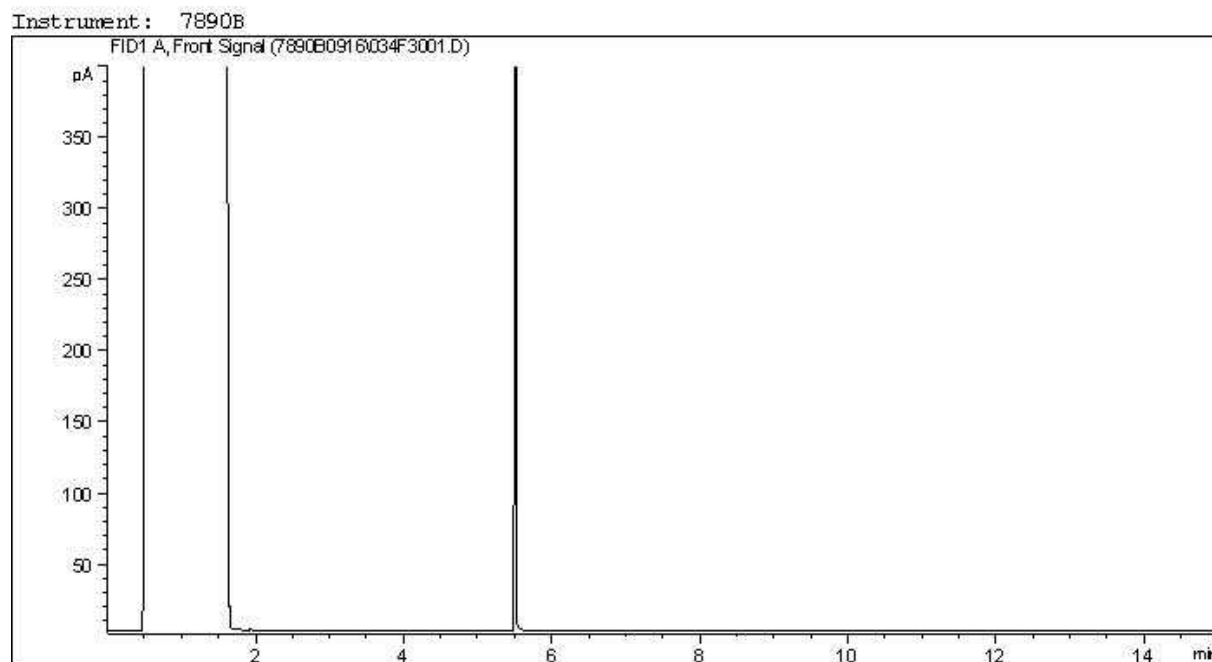


TYPICAL PRODUCT CARBON NUMBER RANGES

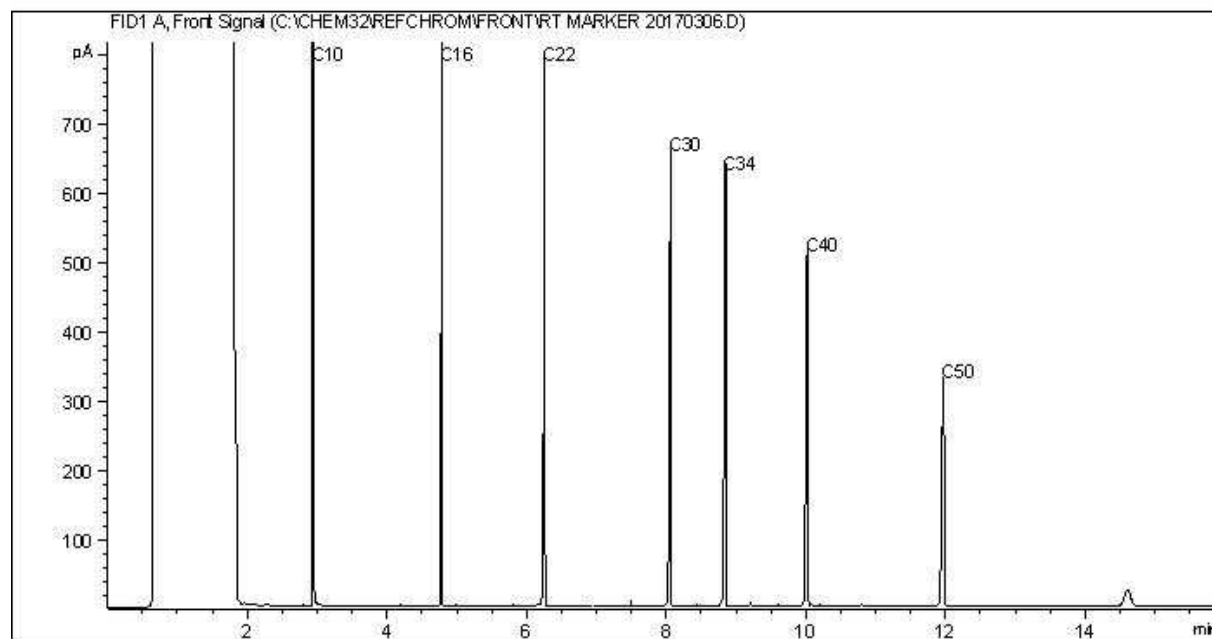
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Carbon Range Distribution - Reference Chromatogram

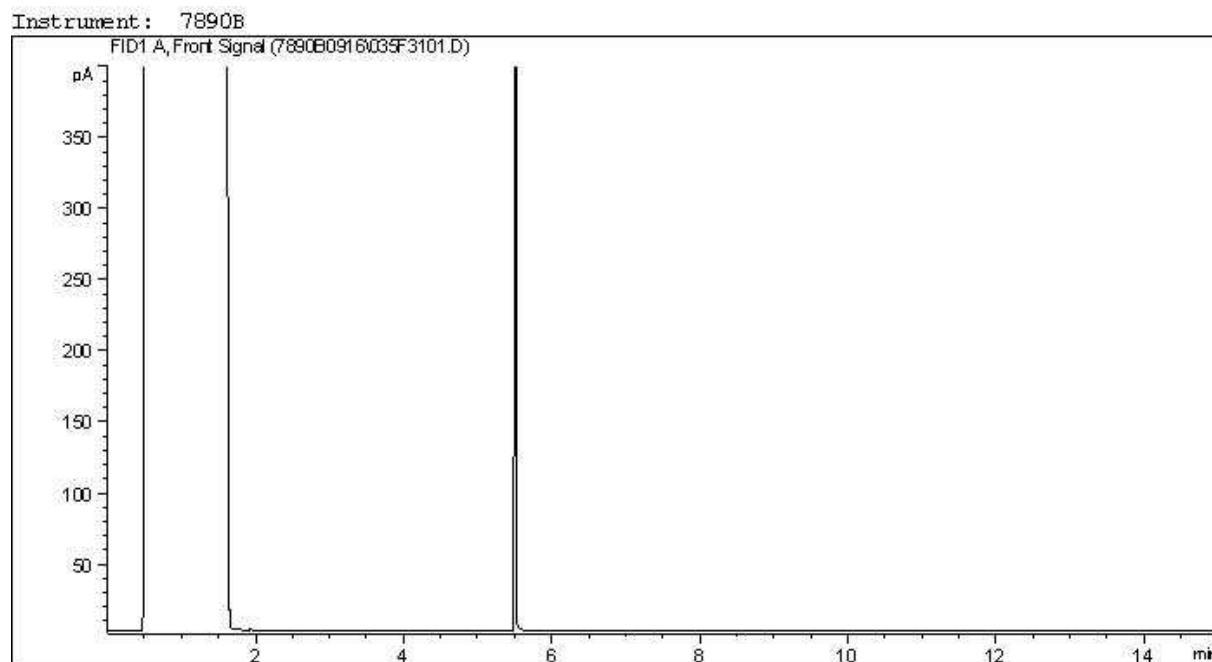


TYPICAL PRODUCT CARBON NUMBER RANGES

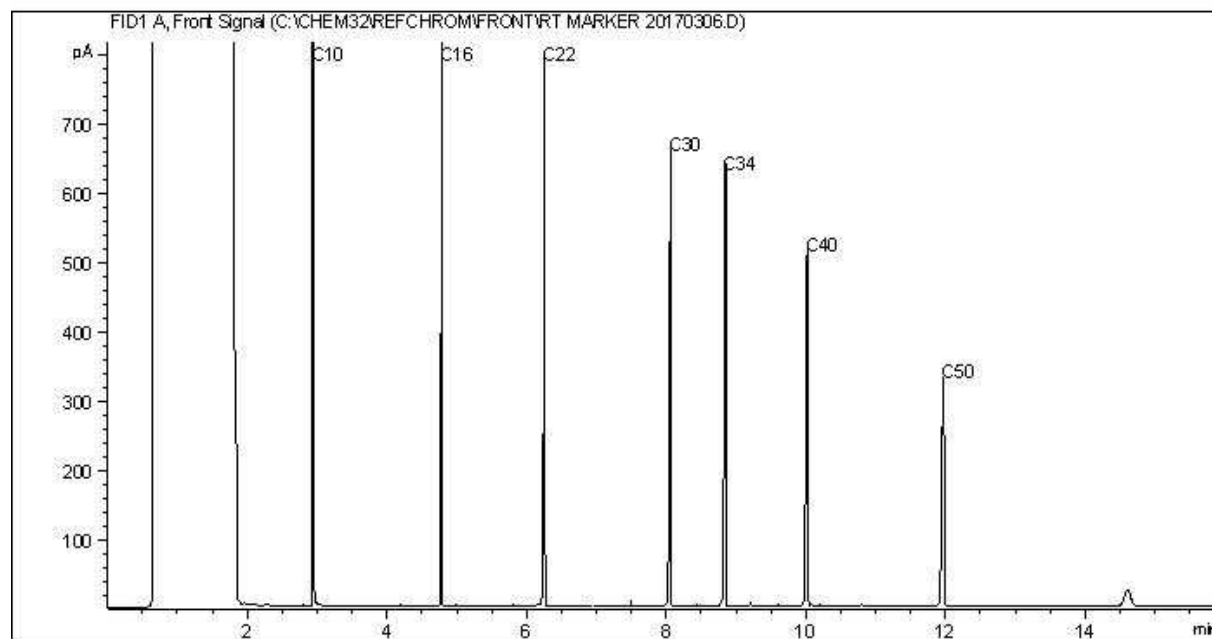
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Carbon Range Distribution - Reference Chromatogram

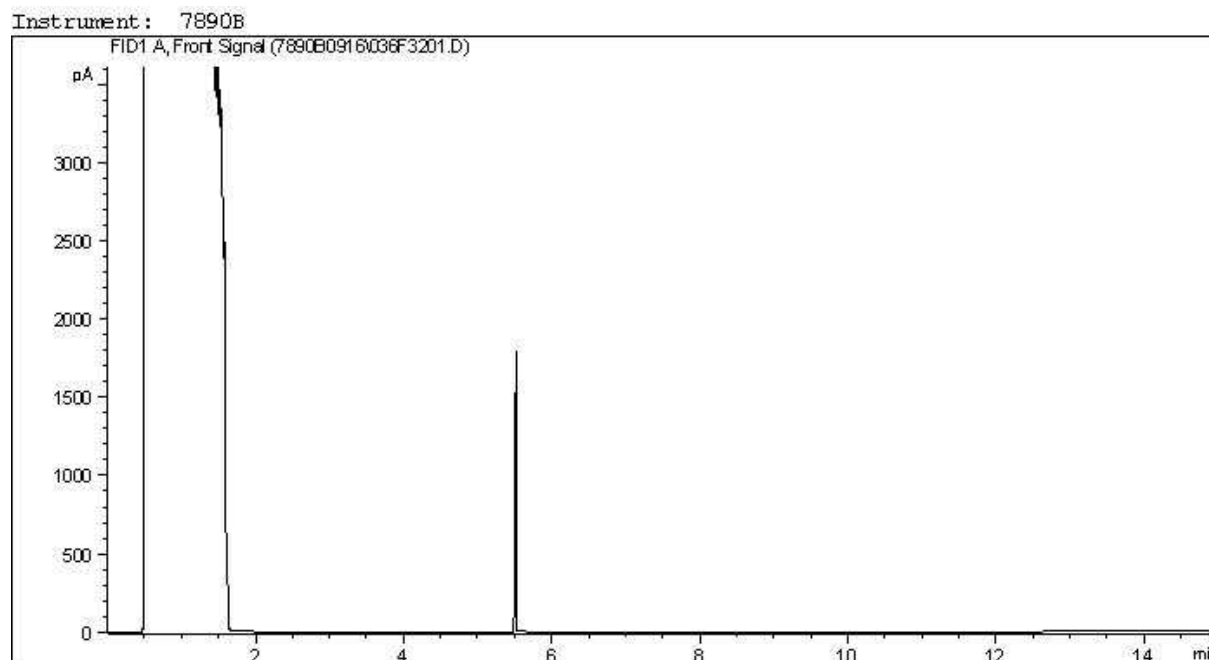


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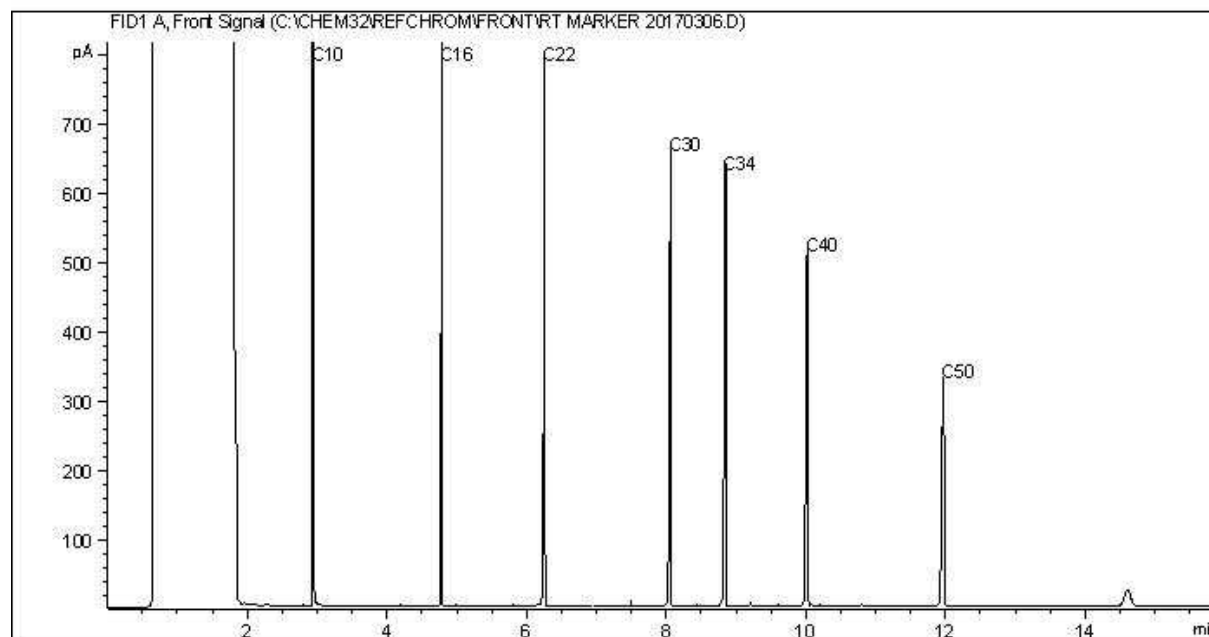
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