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**2017 Aquatic Baseline Study
Inventus Mining Corporation
Pardo Gold Project**



FINAL REPORT

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INVENTUS

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1 INTRODUCTION

DST Consulting Engineers Inc. (DST) was retained by Inventus Mining Corporation (Inventus; also referred to as 'the Client') to conduct environmental baseline studies at the Pardo Gold Project, located approximately 65 km northeast of Sudbury and 25 km north-northwest of River Valley, Ontario. The Project location is shown in Figure 1.

Inventus is currently exploring the Pardo Gold Project and is proposing to proceed to advanced exploration with the extraction of a bulk sample from a paleo-placer gold deposit hosted in conglomerate rocks of the Huronian Supergroup. An area including approximately three proposed bulk sample sites has been identified as the likely project area for the advanced exploration project. The centroid of the approximate Project area is shown in Figure 2.

In anticipation of the advanced exploration project, environmental baseline studies have been completed by DST to describe the current environmental conditions at the proposed Project and surrounding area. The environmental baseline studies completed in 2017 include the following components, provided as separate reports:

- 1) Physical Environment Baseline Study
 - Geochemistry for acid rock drainage and metal leaching prediction
 - Hydrogeology
 - Hydrology

- 2) Aquatic Environment Baseline Study
 - Surface Water Quality
 - Sediment Quality
 - Benthic Invertebrate Community
 - Fish Habitat and Community

- 3) Terrestrial Environment Baseline Study
 - Vegetation and Soils
 - Species at Risk
 - Wildlife (including mammals, avifauna, bats and herpetofauna).

The following report provides the results of the 2017 aquatic baseline study with respect to surface water and sediment quality, fish habitat and community, and fish muscle metals concentrations prior to project development.

1.1 Environmental Setting

The Pardo Gold Project is situated on the Precambrian Shield at an elevation of approximately 300 to 330 metres above sea level. The topography is generally rugged with modest topographic relief. The Project is located in the Lake Temagami Ecoregion (Ecoregion 4E), within the Great Lakes-St. Lawrence Forest Region and south of the divide between the Hudson Bay and Great Lakes Watersheds (*Crins et al.* 2009). The ecoregion is described as the Humid Low Boreal Ecoclimatic Region, with its boundaries largely delineated based on characteristic climatic variables (Ecoregion Working Group 1989). Within the Ecoregion 4E the terrestrial baseline study area can be found along the southern boundary of the Temagami Forest section (i.e. 4E-4).

The area is undeveloped, with forested areas comprised of mostly white pine (*Pinus strobus*), white birch (*Betula papyrifera*) and red maple (*Acer rubrum*). The groundcover includes a variety of shrub species, dominated by bracken fern (*Pteridium aquilinum var. latiusculum*), balsam fir (*Abies balsamea*), and mountain maple (*Acer spicatum*). Vegetation in the Project area reflects a history of forestry operations, and the recent exploration activities on the property.

1.2 Aquatic Baseline Study Area

Although no permanent natural waterbodies are located within the immediate area of the proposed advanced exploration project, baseline studies of the lakes and streams located downgradient of the project area were investigated to provide documentation of their current conditions. The Pardo Gold Project is located in the vicinity of a local drainage divide, with runoff from the Project expected to flow south into a low-lying area that drains southward approximately 2.5 km into Tee Lake, or west approximately 1.5 into the south-flowing McNish Creek system. The study area was therefore defined by four natural waterbodies from the two local drainage basins, including an “Unnamed Pond” and the downgradient Tee Lake, an unnamed “gooseneck”-shaped lake north of McNish Lake, and McNish Lake. The regional drainage of all waterbodies in the current investigation flow southwards towards Lake Nipissing. The location of each of these waterbodies and corresponding local drainage basins are illustrated in Figure 2.

2 ACTIVITIES AND METHODOLOGIES

The activities and the associated methodologies to complete the 2017 aquatic baseline study are presented in the following subsections.

2.1 Literature Review

Prior to the commencement of the field aquatic studies, DST completed a literature review of various information sources for the water bodies within the Pardo Project surrounding area. The literature review was used to aid in the selection of sampling areas, to identify aquatic species, including Species at Risk (SAR), and to identify potential fish habitat. Resources consulted included the following:

- Fisheries and Oceans Canada (DFO) Aquatic Species at Risk Map (online)
- Ontario Ministry of Natural Resources and Forestry (MNRF) Natural Heritage Information Centre (NHIC) online database
- MNRF Fish ON-line
- Land Information Ontario Satellite Imagery

2.2 Field Activities

All field activities related to the aquatic baseline studies were completed by DST scientists accompanied by a representative of Inventus, Mr. Winston Whymark. The majority of the locations for the studies were accessed by boat, with the exception of the surface water and sediment sampling location at the Unnamed Pond which was accessed from the shoreline. Surface water and sediment sampling locations are illustrated in Figure 3.

Two surface water sampling events were completed, including one during mid-summer, completed on August 16, 2017, and the second during the fall, completed on October 20, 2017. Sediment sampling was completed at the same locations as surface water samples during the fall sampling event. The weather conditions at the time of the surface water and sediment sampling event were clear and sunny, with daytime temperatures of approximately 19 to 22 °C.

Fish community and habitat surveys were completed over two days from August 30 to 31, 2017. The weather conditions at the time of the survey was clear to rainy, with daytime temperatures of 14 to 22 °C.

Photographs taken at the time of the field studies are provided in Appendix A.

2.3 Surface Water Sampling Methodology

Surface water quality samples were collected in the summer and fall from two locations in the northern bays of Tee Lake (SW3 and SW4), one location in the Unnamed Pond (SW1), and one location at the northern point of the unnamed “gooseneck” lake west of the Project location (SW2). The surface water sampling locations are illustrated in Figure 3.

Prior to sampling, new, disposable nitrile gloves were donned and field measurements were collected using a Hanna HI 98194 water quality meter. Parameters measured include pH, dissolved oxygen (DO), temperature, electric conductivity (EC) and oxidation reduction potential (ORP). Prior to field measurement collection, the instrument was rinsed with lake water to avoid cross-contamination between sites.

The surface water samples were collected from within 0.5 m below the water surface using a clean polyethylene bailer. The bailer was rinsed three times with water from the waterbody being sampled prior to collection, and the sample was transferred directly into laboratory supplied bottles. The approximate depth of the water column at each sampling location was measured with the aid of a measuring tape.

All surface water samples were stored and transported in ice packed coolers to maintain a temperature of less than 10°C and were submitted under chain of custody protocols to AGAT Laboratories (AGAT) for chemical analysis of general chemistry, nutrients and metals. Samples requiring filtration (i.e. aluminum and mercury) were collected as unpreserved samples and submitted to AGAT with the instruction for lab filtration followed by sample preservation. AGAT is ISO/IEC 17025 certified, and is accredited by the Standards Council of Canada and the Canadian Association for Laboratory Accreditation Inc. All samples were analyzed within a regular turnaround time. Analytical results were compared to the Ministry of the Environment and Energy (1999) document entitled *Water Management, Policies, Guidelines, Provincial Water Quality Objectives* (PWQO, 1994, reprinted 1999).

One blind field duplicate was collected during each sampling event for quality assurance/quality control (QA/QC) purposes. In addition, a blind field blank was included during the summer sampling event.

2.4 Sediment Sampling Methodology

Sediment samples were collected during the fall sampling event from the same locations as the surface water samples. The sediment sampling locations are illustrated in Figure 3.

All sediment samples were collected as composite samples from the upper 0.10 m of the waterbody bottom substrate using a Petite Ponar sampler. To acquire a representative sample, the ponar was allowed to drop to the bottom of the waterbody in three separate areas approximately 1 m apart. The subsamples were homogenized and the composite sample was subsequently transferred directly into a clean laboratory supplied jar. Each sample was stored and transported in an ice packed cooler and submitted under chain of custody protocols to AGAT for analysis of nutrients, metals and particle size distribution. One blind field duplicate was included for QA/QC purposes and all samples were analyzed within regular turnaround times. The sediment analytical results were compared to the Provincial Sediment Quality Guidelines (PSQG) Lowest Effect Level (LEL) and Severe Effect Level (SEL) identified in the MOE (2008) document *Guidelines for Identifying, Assessing and Managing Contaminated Sediments in Ontario*. A blind field duplicate was included for QA/QC purposes.

2.5 Benthic Invertebrate Sampling

Benthic invertebrate sampling was completed in the fall at the same locations as the surface water and sediment samples. Fall is the preferred season to collect benthic invertebrates, as many of the invertebrates are in adult stage and easier to identify.

Samples were collected as three composite samples using a Petite Ponar Sampler from the upper sediment layer, according to the protocols outlined in the Ontario Benthos Biomonitoring Network. The samples were combined to obtain an approximate 500 mL volume of sediment matrix, and placed into 1 L laboratory supplied containers to which ethanol supplied by the laboratory was added as a preservative. The samples were stored and transported in ice-packed coolers and maintained at approximately 4°C.

At the time of sampling, the DST field scientist suspected that an insufficient number of benthic invertebrates were being collected to warrant laboratory identification of the samples. Therefore, DST transported the samples to the DST Sudbury office for further inspection. For each sample, DST placed small subsamples of the sediment matrix onto glass plates, which were viewed using a light-transmitting microscope at up to 40x magnification. Of the multiple subsamples viewed, no

benthic invertebrate specimens were identified. It was therefore determined to not proceed with laboratory identification, and the samples were discarded. It is noted that although benthic invertebrates were not obtained during the 2017 field survey, benthic invertebrates are not necessarily absent from the waterbodies.

2.6 Fish Habitat and Community Surveys

The scope of the fish habitat and community surveys was intended to characterize potential fish habitat in the waterbodies downgradient of the Pardo Gold Project, and to provide baseline data on metal concentrations in fish tissue. The study design for fish tissue sampling targeted species that are sought after for recreational fishing purposes and did not include forage species at lower trophic levels or all species that may be present within the waterbody. The waterbodies selected for fish tissue sampling, Tee Lake and McNish Lake, were chosen based on their known fisheries resources and inferred use by local cottagers and users.

Prior to sampling, DST obtained a Scientific Collector's Permit (Licence No.:1087610) from the North Bay District MNRF to allow for the lethal collection of up to five fish from each of the two lakes. DST's Scientific Collector's Permit and catch report is provided in Appendix B. Fish were collected using a combination of gill nets (2", 3" and 4" mesh) and angling. The gill nets were allowed to fish for approximately one to two hours. The gill net and angling locations are illustrated in Figure 4 and Figure 5.

Upon collection, each fish was identified to the species level, and individuals were weighed using a handheld digital scale and measured (both fork length and total length). Relative condition was estimated for the individuals captured in each lake as the residuals of the *log mass x log length* relationship (Kauffman *et al.* 2007). This methodology provides a comparison of the observed mass of an individual relative to a predicted mass based on sample-specific mass-length regression (Kauffman *et al.* 2007). The slope of the mass x length relationship was further compared to the isometric growth value of $b=3$ (Rickers 1975; Edwards 1976). When the value of b is other than 3, weight increase is allometric (positive allometric if $b>3$; negative allometric if $b<3$).

Muscle tissue was removed from beneath the dorsal fin of each fish, and placed into a clean, labelled plastic bag for metals analysis. The tissue was maintained in ice packed coolers and transported frozen under chain of custody protocols to AGAT for chemical analysis of metals. Fish

tissue mercury concentrations were compared to the Canadian Council of Ministers of the Environment (CCME, 2000) *Canadian Tissue Residue Guidelines for the Protection of Wildlife Consumers of Aquatic Biota* and the MOECC fish consumption guideline limit for children and women of child-bearing age and for the general population.

Field surveys for fish habitat characterization were completed primarily by visual observation. Each lake was surveyed by boat with a particular focus on the littoral zone (shoreline) and areas that may represent important habitat for spawning, rearing, foraging, migrating or other uses. The substrate type, shoreline composition, vegetation type and other points of interest were noted.

2.7 Quality Assurance/Quality Control

DST maintains a standard Quality Assurance/Quality Control (QA/QC) program for all field programs. All project documentation was maintained and controlled under each specific work site and sampling area by the appointed site supervisor. All sampling was completed in accordance with industry standards, and applicable provincial standards/guidance. DST operates under Certificates of Authorization issued by the Professional Engineers of Ontario (PEO) and the Association of Professional Geoscientists of Ontario (APGO) and all work was carried out with due regard to PEO and APGO standards for professional practice.

Field QA/QC samples were included in this investigation for the surface water and sediment sampling, as detailed above. Field and laboratory QA/QC results are described in Section 6.7

3 RESULTS

The results of the aquatic baseline sampling program are summarized in the following section. Laboratory Certificates of Analysis for the analytical data is provided in Appendix C.

3.1 Waterbody Characteristics

The characteristics of each studied waterbody based on field observations and the literature review is summarized in the following subsections.

3.1.1 Unnamed Pond

The Unnamed Pond is a small waterbody located approximately 1 km south of the Pardo Gold Project. The pond drains into an unnamed creek that eventually flows into Tee Lake located approximately 1 km further south. The total surface area of the waterbody is estimated to be 6 ha in size. The north portion of the Unnamed Pond has characteristics typical of a bog with the surrounding ground cover dominated by *Sphagnum* spp., cotton grass (*Eriophorum vaginatum*), pitcher plants (*Sarracenia purpurea*), and tamarck (*Larix laricina*). Exposed bedrock outcrops were observed along the western shoreline and the substrate throughout was generally organic with an abundance of riparian vegetation. The vegetation surrounding this waterbody was dominated by coniferous tree species including black spruce (*Picea mariana*), red pine (*Pinus resinosa*), and white pine (*Pinus strobus*).

3.1.2 McNish Lake and unnamed “gooseneck” lake

McNish Lake and the unnamed “gooseneck” lake are located approximately 1.2 km southwest, and downgradient, of the Project. The vegetation surrounding these waterbodies is dominated by coniferous tree species including white pine and spruce (*Picea spp*).

The unnamed “gooseneck lake” is an approximately 17 ha waterbody connected to the north (upgradient) of McNish Lake by a 500-m creek. This waterbody is relatively shallow (approximately 2 metres deep) and has characteristics of a marsh habitat with a predominately organic substrate, an abundance of water lilies (*Nymphaea* spp), and riparian vegetation. The unnamed “gooseneck lake” drains southward into the deeper water of McNish Lake, which is inferred to be utilized by local cottagers and users for it’s fisheries resources.

McNish Lake to the south is approximately 18 ha in size, with a maximum depth of 26 m (MNRF Fish ON-Line, 2015). Species that are known to be present in McNish Lake include smallmouth

bass (*Micropterus dolomieu*), white sucker (*Catostomus commersonii*), yellow perch (*Perca flavescens*) and northern pike (*Esox lucius*) (MNRF Fish ON-Line, 2015). Although these species may migrate to the shallow “gooseneck lake” connected to the north, the deeper water of McNish Lake is presumed to provide a greater diversity of habitats to support reproduction and nursery. The northern bay, which receives drainage from the unnamed “gooseneck” lake, was generally shallow with low shrub marsh areas, an abundance of riparian vegetation, and an organic substrate. The northern bay opens into deeper water with a rocky shoreline. Several fallen trees were observed along the McNish Lake shoreline during the 2017 field studies and are expected to provide cover for several fish species.

3.1.3 Tee Lake

Tee Lake is approximately 135 ha in size, and is located 1 km south of the Unnamed Pond and approximately 2.5 km south of the Pardo Gold Project. The lake has two northern bays – the northwestern bay receives drainage from the Unnamed Pond, and the northeastern bay receives drainage from a low-lying area of wetland and ponds that flows from the southeastern Project area. Tee Lake is utilized by local cottagers and users for its fisheries resources and is known to provide habitat to species such as pumpkinseed (*Lepomis gibbosus*), rock bass (*Ambloplites rupestris*), walleye (*Sander vitreus*), white sucker, yellow perch, and northern pike (MNRF 2015). Several other vertebrate classes were observed in this waterbody during the 2017 field studies including mammals (i.e. beaver, *Castor canadensis*), reptiles (i.e. snapping turtle, *Chelydra serpentina*), and amphibians (i.e. green frog, *Lithobates clamitans*). Bird species were observed adjacent to the waterbody including great-horned owl (*Bubo virginianus*), belted kingfisher (*Megaceryle alcyon*) and bald eagle (*Haliaeetus leucocephalus*). Two species observed, the bald eagle and snapping turtle, are currently listed as special concern under the Endangered Species Act, S.O. 2007, c.6 (ESA, 2007).

A diverse number of aquatic habitats were observed during the 2017 field investigations. This includes rocky shoals along the southern shoreline that are expected to provide spawning habitat to species such as walleye (described further in Section 3.4.2 below). The northwest bay is shallow (approximately 2 metres) and marshy with dark, organic substrate and an abundance of riparian vegetation. The northeast bay is deep (>20 metres) and predominately sandy. The vegetation surrounding this waterbody is dominated by coniferous species including white pine and spruce (*Picea spp*). Areas of exposed bedrock outcrops are evident along the shoreline, particularly surrounding the northwestern bay.

3.2 Surface Water Quality

3.2.1 Surface Water Field Measurements

Locations of all surface water samples collected are provided in Figure 3. The field parameter measurements from the 2017 surface water sampling events are summarized in Table 1.

The pH of the surface water samples was circumneutral ranging from 5.78 (SW3, August) to 8.13 (SW 3, October). Water temperature was similar across waterbodies, from 19.98 °C (SW2) to 22.12°C (SW1) in the summer and from 11.71 °C (SW2, SW4) to 12.24°C (SW3) in the fall. Conductivity was generally low, ranging from 14 µS/cm (SW1, August) to 33 µS/cm (SW2, October), suggesting that the waterbodies have low concentrations of dissolved solids. Dissolved oxygen ranged from 4.71 mg/L (SW1) to 6.68 mg/L (SW3) during the summer sampling event and from 2.72 mg/L (SW1) to 4.95 (SW2) during the fall sampling event.

3.2.2 Analytical Results

The analytical results from the surface water samples are provided in Table 2. The results for the unnamed 'gooseneck' lake and Tee Lake are characterized by circumneutral pH, low alkalinity, which indicates low buffering capacity, and water quality that meets the PWQO for all parameters analysed in 2017.

One sampling location at the Unnamed Pond, SW1 exhibited pH, aluminum, copper and vanadium concentrations in the surface water that do not meet the PWQO. These elevated parameter concentrations were observed during both the summer and fall sampling events. All other surface water samples exhibited parameter concentrations that met the PWQO.

The waterbodies were further characterized by plotting the major cation and anion concentrations on a Piper plot using the AqQA water quality software. The water chemistry in the Unnamed Pond (SW1) demonstrated calcium- sulphate type water. In contrast, the unnamed 'gooseneck lake' (SW2) and the northeastern bay (SW3) and northwestern bay of Tee Lake (SW4) are calcium-magnesium-bicarbonate dominant. The Piper plot of the chemical data is provided below in Figure 3.1.

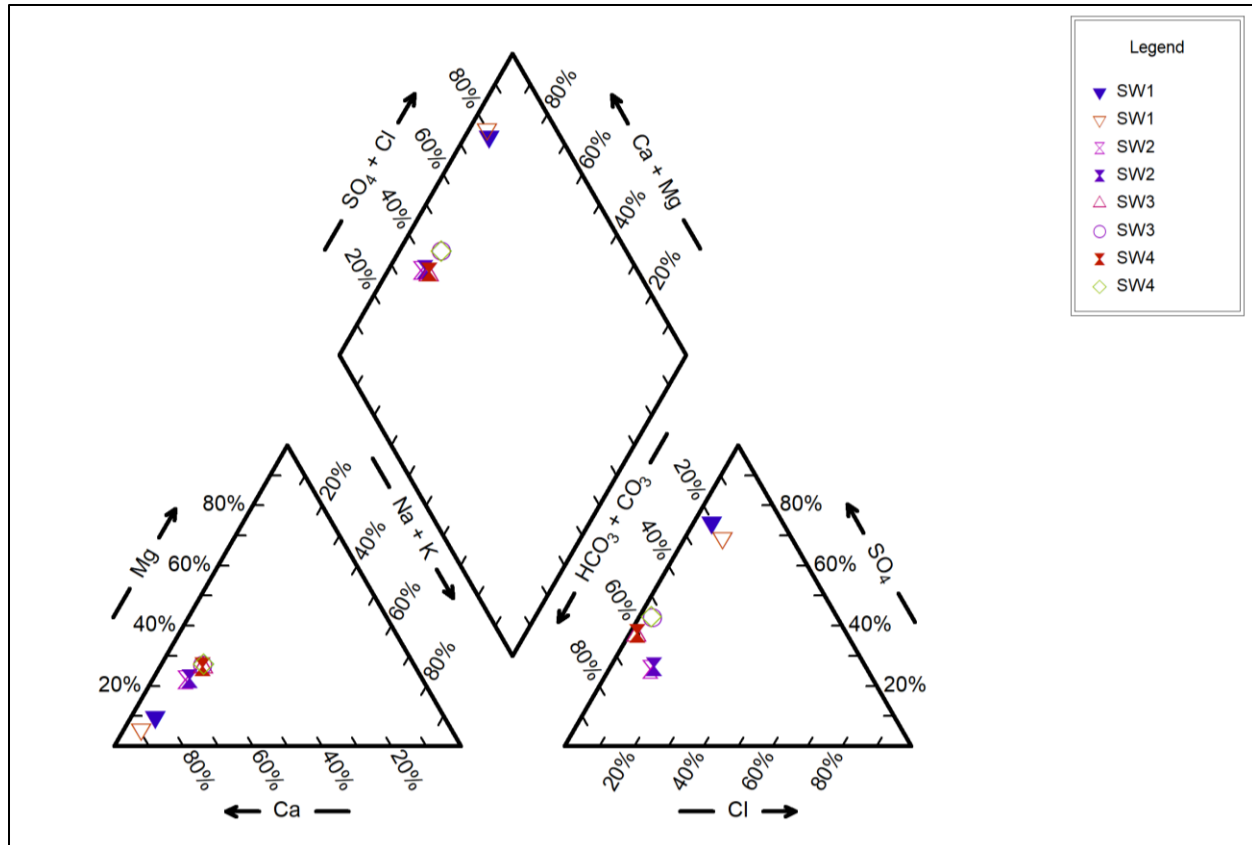


Figure 3.1. Piper diagram showing the general chemistry of the surface water samples collected at Unnamed Pond (SW1), the unnamed “gooseneck” lake (SW2), and the northwestern bay (SW3) and northeastern bay (SW4) of Tee Lake.

3.2.3 Quality Assurance and Quality Control Results

DST collected and submitted blind field duplicate samples (labelled SW-200 and SW-20) for laboratory analysis during each sampling event and one blind field blank during the summer sampling event. The surface water field duplicates during both sampling events were obtained from SW2.

Relative percent difference (RPD) calculations were completed to evaluate precisions of sampling and laboratory analyses using the following formula:

$$RPD = \frac{(\text{Sample Result} - \text{Duplicate Result}) \times 100}{(\text{Sample Result} + \text{Duplicate Result})/2}$$

Relative percent differences are considered applicable when the concentration of the parent sample and its duplicate are both greater than five times the reportable detection limit (RDL) (Maxxam, 2012). Applicable RPDs between the samples and their duplicates for surface water were reviewed and compared to alert limits derived from Maxxam (2012) as summarized in Table 3 at the end of the report. All applicable RPDs were less than the alert limits derived from Maxxam (2012), indicating that there were no field QA/QC discrepancies that would materially affect the conclusions of the report.

All surface water samples were submitted using containers and preservation methods consistent with laboratory procedures and applicable regulations and guidelines. All samples were analyzed within the recommended hold times. Review of the laboratory quality data indicated that there were no laboratory quality issues that would materially affect the conclusions of the report.

3.3 Sediment Quality

Sediment samples were obtained from the same locations as the surface water samples during the fall 2017 sampling event. Sediment sampling locations are shown in Figure 3. At the Unnamed Pond, the northern portion of the unnamed “gooseneck” lake and the northwestern bay of Tee Lake, the sediment was observed to consist of dark brown, fine organics, while at the northeastern bay of Tee Lake the sediment was observed as fine to medium grained brown sand. A description of the sediment type at each sampling location, as observed in the field, is provided in Table 1.

3.3.1 Sediment Analytical Results

The collected sediment samples were submitted for laboratory analysis of metals, nutrients and particle size distribution. The sediment analytical results are provided in Table 4.

Laboratory results and visual observations support that the primary substrate in the Unnamed Pond (SW1), McNish Lake (SW2) and northwest bay of Tee Lake (SW4) is fine grained, with particles size characterized by silt, with minor clay. The particle size characterization for McNish Lake was completed for the duplicate sample as insufficient material was available from the parent sample. The substrate of the northeast bay of Tee Lake (SW3) had a different composition, made up of primarily fine to coarse sand. Lower total organic carbon values were observed in northeast bay of Tee Lake (SW3) compared to other three waterbodies. Total organic carbon (TOC) concentrations were above the PSQG LEL of 1% at SW3, and greater than the PSQG SEL of 10% at the three other sampling locations (SW1, SW2, SW4).

Several metals were found exhibit concentrations greater than the PSQG LEL and/or SEL in the samples collected at SED1, SED2 and SED4, where fine grained, organic substrates were present. These samples were found to have cadmium and copper in the sediment at concentrations greater than the PSQG LEL (with copper in the field duplicate sample SED-20 also greater than the PSQG SEL), and nickel at concentrations greater than the PSQG SEL. In addition, one or more sampling locations had sediment concentrations of arsenic, chromium, lead and manganese greater than the PSQG LEL.

At sampling location SED3 with the coarse-grained substrate, chromium is the only parameter that exhibited a concentration (34 µg/g) greater than the LEL of 26 µg/g.

3.3.2 Quality Assurance and Quality Control

DST collected and submitted one blind field duplicate sample (labelled SED-20) from SED2 as part of the QA/QC field program

Relative percent difference calculations were completed to evaluate precisions of sampling and laboratory analyses. Applicable RPDs between the samples and their duplicates for sediment were reviewed and compared to alert limits derived from Maxxam (2012) as summarized in Table 5 at the end of the report.

As shown in Table 5, the sulphate concentration in sediment sample SED-2 (84 µg/g) and its field duplicate SED-20 (266 µg/g), exhibited RPDs (104%) slightly greater than the alert limit of 100%. It is interpreted that the discrepancies are related to sample heterogeneity and therefore no field or laboratory quality issues are suspected. All other RPD calculations were within their respective alert criteria.

All sediment samples were submitted using containers and preservation methods consistent with laboratory procedures and applicable regulations and guidelines. All samples were analyzed within the recommended hold times.

Due to a high water-absorbing capacity of the sample the extraction for sulphate determination was prepared at 10:1 deionized water ratio (10 parts deionized water:1-part soil) instead of the routine 2:1 ratio. This would result in raised detection limits for this parameter. Elevated RDLs

indicate the degree of sample dilutions prior to the analysis to keep analytes within the calibration range, reduce matrix interferences and/or avoid contaminating the instrument. As all RDLS were less than the comparative criteria the discrepancy observed is not expected to materially affect the information presented in this study.

3.4 Fish Habitat and Community

Two waterbodies, McNish Lake and Tee Lake, were included in the fish habitat and community study due to their known fisheries resources and frequent use by local cottagers and users. Prior to the field surveys, DST completed a desktop review of information from various sources (listed in Section 2.1) to identify the potential presence or absence of aquatic species, SAR and/or their habitat. According to the DFO aquatic SAR map and the NHIC database, there are no known occurrences of aquatic SAR within 1km of the waterbodies. The waterbodies within the 2017 aquatic baseline study area are all located within MNRF Fisheries Management Zone 11 (MNRF Fish ON-Line, 2015).

3.4.1 McNish Lake

As described in Section 3.1.2, the fish species identified in McNish Lake during the desktop review are representative of a cool water species assemblage and include smallmouth bass, white sucker, yellow perch and northern pike. In addition, the MNRF has previously stocked yearling splake (*Salvelinus fontinalis* × *Salvelinus namaycush*) in this waterbody as recently as 2013 (MNRF Fish ON-Line, 2015).

Fisheries data was collected from this waterbody in shallow northern bays adjacent to local cottages. Three mesh gill nets were deployed at nearshore locations indicated in Figure 4, with a cumulative set time of 7.5 hours. No fish were produced from any of the three gill nets. Angling was completed simultaneously by use of two rods. A total of five individuals were captured by angling, including four northern pike and one yellow perch. Representative photographs of the species caught are illustrated below in Figure 3.1. The total catch per unit effort (CPUE) for both sampling methods is summarized in Table 6 at the end of this report.

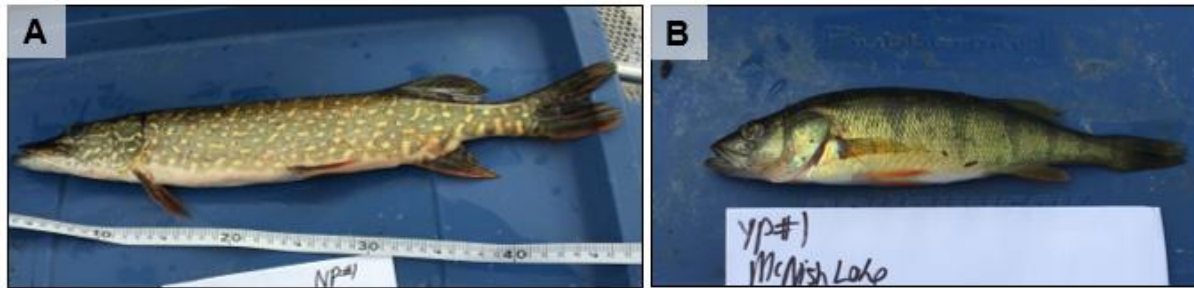


Figure 3.1. Representative specimens of the fish species captured in McNish Lake, including A) Northern Pike (*Esox lucius*); and B) Yellow Perch (*Perca flavescens*). (August 31, 2017).

The field measured parameters for the individuals sampled are summarized in Table 3.1. The fork length of the northern pike individuals captured ranged from 41.2 cm to 58.2 cm, and the yellow perch had a fork length of 17.80cm.

Table 3.1. Field measured parameters of individuals captured in McNish Lake

Fish ID		NP1	NP2	NP3	NP4	YP1
Species		Northern Pike				Yellow Perch
Date		31-Aug-17				
Parameter	Units					
Total Weight	grams	510	400	1,210	1,230	60
Fork Length	cm	42.8	41.2	53.4	58.2	17.8
Total Length	cm	44.9	42.0	59.1	61.4	18.6

The slope of the *log mass* and *log weight* relationship was lower ($b = 2.599$) than the isometric growth value (i.e. 3), suggesting that the individuals in this waterbody demonstrate allometric growth. Additional data would be required to understand species-specific growth and condition within the waterbody. The *log mass* and *log weight* relationship of the individuals captured is illustrated below in Figure 3.2.

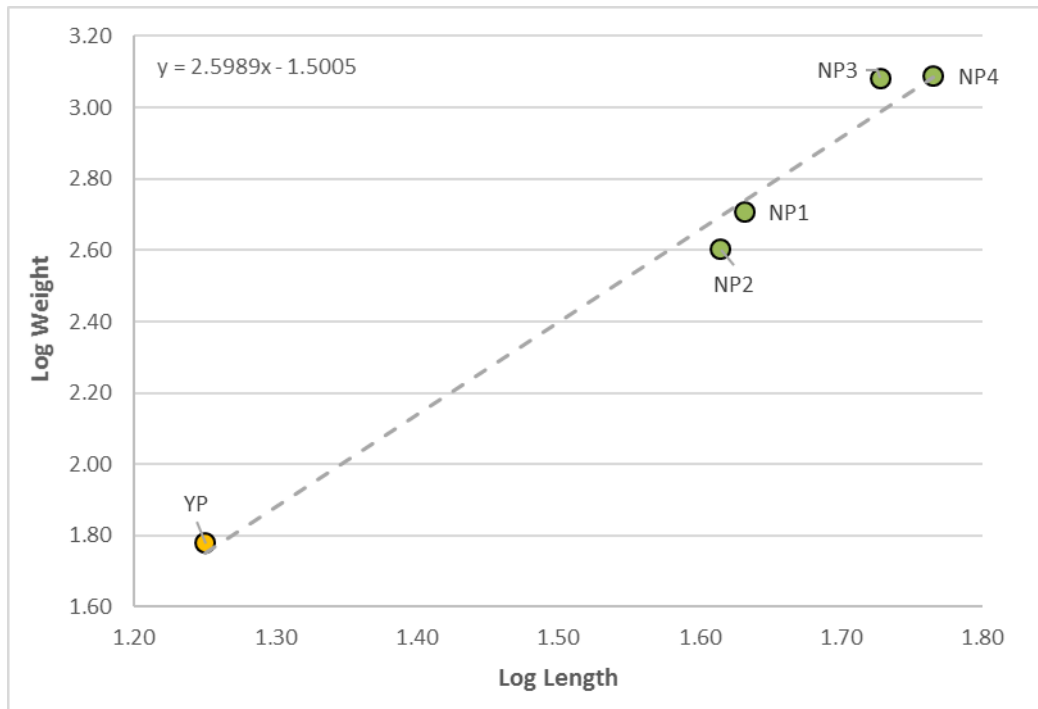


Figure 3.2 – Log mass versus log length relationship of yellow perch (YP) and northern pike (NP) individuals captured from McNish Lake.

Dorsal epaxial muscle from each of the five individuals was submitted to AGAT for analysis of metals. Analytical results are provided in Table 7 at the end of this report. Mercury was measured at detectable concentrations from all five individuals, ranging from 0.04 µg/g to 0.25 µg/g in the northern pike and at 0.20 µg/g in the yellow perch. These concentrations are greater than the CCME (2000) *Canadian Tissue Residue* guideline of 0.033 µg/g, but lower than the MOECC *Fish Consumption Guideline* limit for children and women of child-bearing age (1.8 µg/g) and the general population (0.5 µg/g). Other metals of interest that are known to bioaccumulate in fish tissue included copper, manganese, and zinc (Authman *et al.* 2015). The concentrations were generally low and inferred to be indicative of baseline conditions.

3.4.2 Tee Lake

The fish species identified in Tee Lake during the desktop review are representative of a cool water species assemblage and include pumpkinseed, rock bass, smallmouth bass, walleye, white sucker, yellow perch, and northern pike (refer to Section 3.1.3). Potential walleye spawning habitat was identified during the 2017 field investigation along the south shore near the narrows where the lake drains into a small bay. The habitat was characterized by a rocky shoal extending

into deeper water. The locations of the angling activities and gill net locations Tee 2 and Tee 3 identified on Figure 5 are centred on this potential walleye spawning habitat.

Fisheries data from this waterbody was obtained from both nearshore and offshore locations. The eastern shoreline consists of boulders and rocky substrate, while low shrub marsh areas are concentrated to the western bay. Mesh gill nets were deployed at three nearshore locations, with a cumulative set time of 8.0 hours. Two of the locations successfully captured a total of four individuals, including two white suckers, one walleye, and one smallmouth bass. Angling was completed simultaneously by two rods, with four individuals captured including two pumpkinseeds and one smallmouth bass. The locations of the angling and gill netting efforts are shown in Figure 5. Representative specimens of the species of fish captured are illustrated below in Figure 3.3. The total CPUE for both methods is summarized in Table 1 at the end of this report.

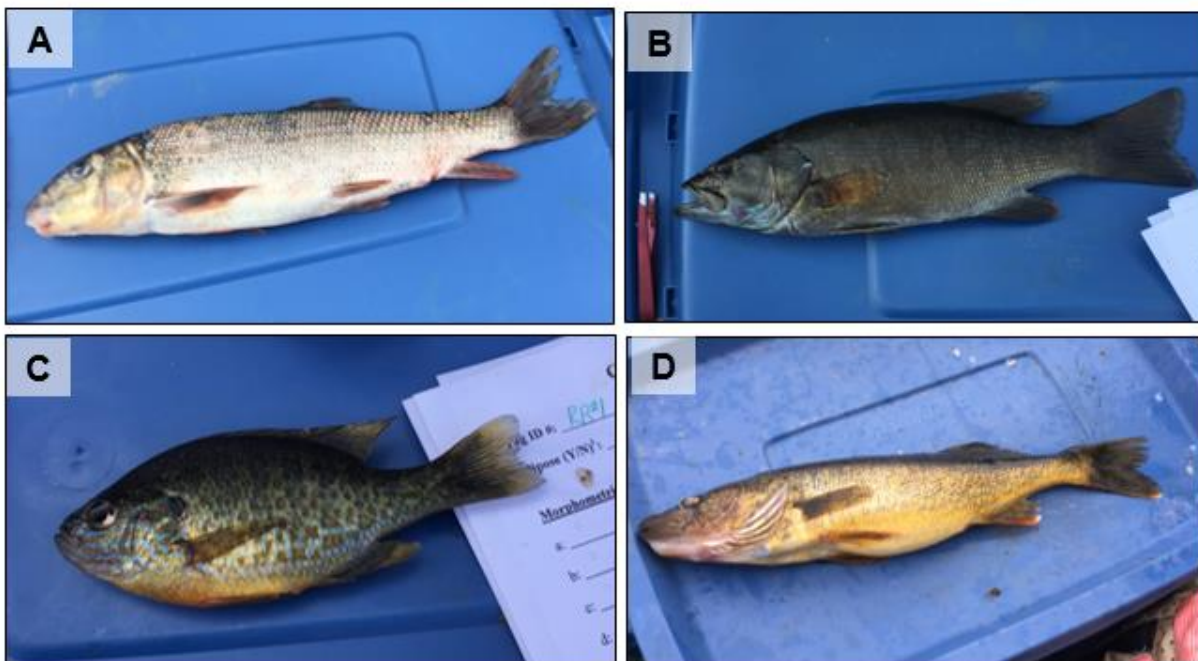


Figure 3.3 –Representative specimens of fish species captured in Tee Lake, including A) Common White Sucker (*Catostomus commersonii*); B) Smallmouth Bass (*Micropterus dolomieu*); C) Pumpkinseed (*Lepomis gibbosus*); and, D) Walleye (*Sander vitreus*) (August 30, 2017).

The field measured parameters for the individuals sampled are summarized below in Table 3.2. The largest individual captured was the walleye with a fork length of 43.10 cm and the smallest was the pumpkinseed with a fork length of 14.10 cm.

Table 3.2. Field measured parameters of individuals captured in Tee Lake.

Fish ID		WALLY	WS1	WS2	RB1	PS1	SM1
Species		Walleye	White Sucker		Pumpkinseed		Smallmouth Bass
Date		30-Aug-17					
Parameter	Units						
Total Weight	grams	730	400	790	40	50	210
Fork Length	cm	43.1	33.0	41.6	14.1	14.6	26.3
Total Length	cm	44.7	35.0	46.0	15.0	14.9	27.3

The slope of the \log mass and \log weight relationship was lower ($b = 2.481$) than the isometric growth value (i.e. 3), suggesting that the individuals in this waterbody demonstrate allometric growth. Additional data is required to understand species-specific growth and condition within the waterbody. The \log mass and \log weight relationship of the individuals captured is illustrated below in Figure 3.2.

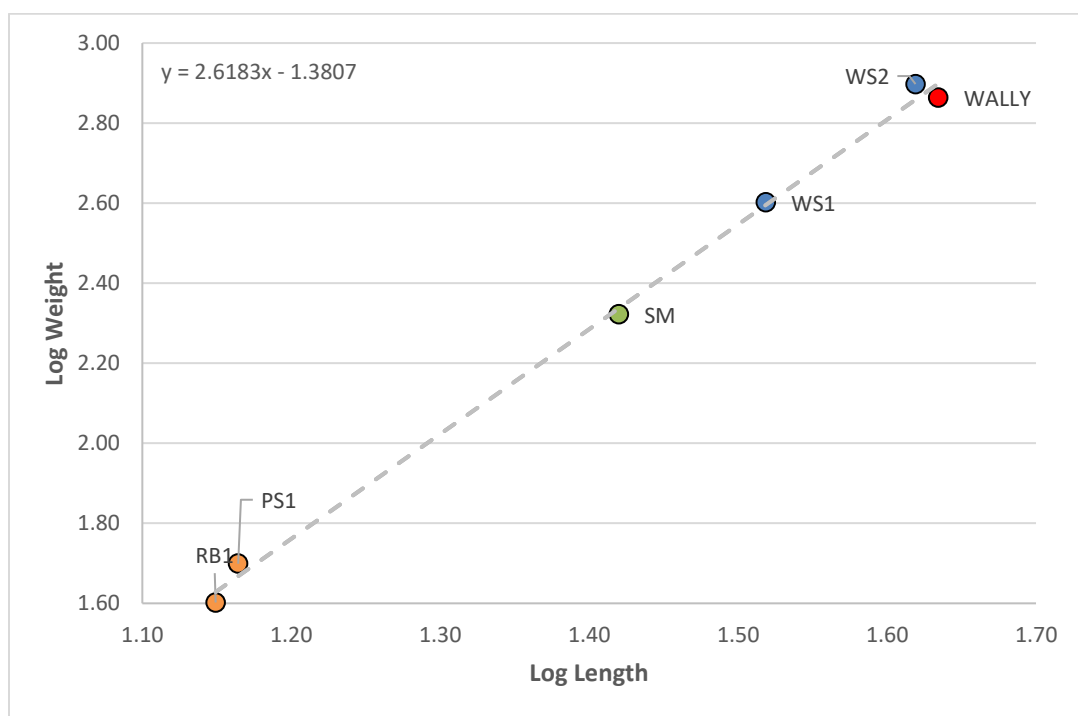


Figure 3.4. \log_e mass versus \log_e length relationship of pumpkinseed (RB, PS), smallmouth bass (SM), white sucker (WS), and walleye (WALLY) individuals captured from Tee Lake.

Laboratory analytical results of metals from the dorsal epaxial muscle fillets are provided in Table 7. Mercury was measured at detectable concentrations from all individuals, ranging from 0.02 mg/kg (WS1) to 0.56 mg/kg (WALLY). Three individuals had concentrations greater than

the CCME (2000) *Canadian Tissue Residue* guideline of 0.033 µg/g, including the walleye (WALLY), smallmouth bass (SM1) and a white sucker (WS2). The walleye mercury concentration additionally exceeded the MOECC *Fish Consumption Guideline* limit for children and women of child-bearing age (1.8 µg/g) and the general population (0.5 µg/g). Other metals of interest that are known to bioaccumulate in fish tissue included copper, manganese, and zinc (Authman *et al.* 2015). The concentrations were generally low and inferred to be indicative of baseline conditions.

4 DISCUSSION

The present investigation provides preliminary data on the aquatic baseline environmental conditions with respect to surface water and sediment quality, and fish habitat and community prior to development of the Pardo Gold Project. Although no permanent natural waterbodies are located within the immediate area of the proposed advanced exploration project, DST investigated waterbodies located downgradient of the Project area to provide documentation of their current, pre-development conditions.

4.1 Surface Water Quality

The surface water sampling results from the lakes investigated during the 2017 aquatic field studies, including the unnamed “gooseneck” lake and Tee Lake, appear typical of mesotrophic lakes, as demonstrated by the narrow range of nutrient content (e.g. total phosphorus, nitrate) and supported by the cool water fish assemblages found within these lake systems. The differences observed in water chemistry between sampling locations likely reflect the natural characteristics of the waterbody and the sampling location. These lakes are also characterized by circumneutral pH, low alkalinity, which indicates low buffering capacity, and water quality that meets the PWQO for all parameters analysed in 2017.

The Unnamed Pond (SW1), was the only sampling location that exhibited analytical results that did not meet the PWQO. Concentrations of dissolved aluminum, and total copper and vanadium were found to be greater than the PWQO during both summer and fall 2017 sampling events. The Unnamed Pond is also characterized by acidic pH that is below the acceptable PWQO range.

The Unnamed Pond was identified as a predominately wetland environment with a small bog identified in the northern portion. This is further supported by our analytical results as the slightly acidic pH values observed in the Unnamed Pond are typical of wetland environments. While surface water samples from Tee Lake and McNish Lake were sampled from the limnetic zone, the Unnamed Pond was sampled near the littoral zone. The littoral zone is more susceptible to surface water and sediment runoff from the adjacent shoreline and is more likely to accumulate organic material such as vascular plants, leaf litter, and microbial colonization. All of these factors may influence the quality of the water at the sampled location.

4.2 Sediment Quality

Sediment samples were obtained from the same location as the surface water samples during the fall 2017 sampling event. The sediment samples were found to have several metals at concentrations greater than the PSQG LEL or PSQG SEL at all four waterbodies. This included one or more of cadmium, chromium, arsenic, copper, lead and manganese at concentrations greater than the PSQG LEL and nickel at concentrations greater than the PSQG SEL. One location, SW3, characterized by coarse grained (i.e. sand) sediment generally exhibited relatively good sediment quality compared to the other three sampling locations.

Higher concentrations of TOC and percentage of silt and clay were observed from three waterbodies, including the Unnamed Pond (SW1), McNish Lake (SW2) and the northwest bay of Tee Lake (SW4). The higher concentrations of TOC, and fine (i.e. silt with minor clay), organic-rich sediment suggest that these lakes are high in decaying natural organic matter (Coquery and Welbourn 1995), which is supported by field observations. It is widely recognized that sediments less than 63 µm in size, such as silt and clay, are the most important fraction for contaminant and heavy metal adsorption (Stone & Droppo 1994; Strom *et al.* 2011). As such, it is not surprising that the locations consisting of predominately silt (<63µm particles) exhibited more metals in the sediment at concentrations greater than the PSQG LEL and PSQG SEL.

4.3 Fish Habitat and Community

The fish habitat and community surveys in the current investigation were focused on two waterbodies that are known to be utilized by local cottagers and users for their fishery resources, Tee Lake and McNish Lake. The scope of the present investigation was relatively small scale and was intended to provide data on baseline fish tissue metal concentrations and potential fish habitat, rather than fish distribution and abundance. The fish habitat identified included mostly foraging and/or nursery areas characterized by aquatic vegetation and heavy log/brush cover. Potential walleye spawning habitat was identified in Tee Lake, however, the use of this habitat was not confirmed in the current investigation. Additional studies would be required to better understand the use and species distribution within the potential habitats identified.

The assemblage of small and large bodied fish identified in the current investigation at McNish Lake and Tee Lake are typical cool water species that are known to inhabit mesotrophic lakes. The study design targeted species that are sought after for recreational fishing purposes and did not include forage species at lower trophic levels. The slope of the log-mass relationship in both

waterbodies was lower than the critical isometric value ($b=3$) and was also lower than previous studies of similar Ontario fishes (i.e. Northern Pike, Griffiths *et al.* 2004). The overall condition of the individuals captures appeared to be good, suggesting that the waterbodies studied have adequate resources available to facilitate growth. Condition in animals is dependent on an individual's energy or nutrient reserves (Baker 1989), which can then be used to meet the energetic demands of increased fitness (Jakob *et al.* 1996; Kauffman *et al.* 2007). As such, the individuals examined in the current investigation above the log mass-at- log length relationship are expected to have greater probabilities of survival and reproductive success. As the relationship between length and weight differs among species of fish according to their inherited body shape, and within a species according to the robustness of individual fish, more data would be required to establish trends across waterbodies.

The concentrations of metals in the fish from the two waterbodies are interpreted to represent baseline conditions and be indicative of the natural variability of metal concentrations within the sampled species. The majority of fish collected in the current investigation exhibited tissue mercury concentrations greater than the CCME (2000) tissue residue guidelines of 0.033 µg/g. The highest mercury concentration was obtained from the walleye (0.56 µg/g) captured in Tee Lake, which exhibited a concentration in excess of the MOECC *Fish Consumption Guideline* for children and women of child-bearing age (1.8 µg/g) and the general population (0.5 µg/g). Fish can accumulate mercury in their muscles through adsorption from the surrounding water and the prey that they eat. Thus, predatory fish at higher trophic levels, such as walleye, that consume other fish for prey tend to contain high levels of mercury. The concentrations of mercury observed in the current investigation correlates with the trophic ecology of the species and expected bioaccumulation in muscle tissue.

9 LIMITATIONS OF REPORT

The information, conclusions and recommendations given herein are specifically for this project and this Client only, and for the scope of work described herein. It may not be sufficient for other uses. DST does not accept responsibility for use by third parties.

The data, conclusions and recommendations which are presented in this report, and the quality thereof, are based on a scope of work authorized by the Client. Note, however, that no scope of work, no matter how exhaustive, can identify all ecological and/or environmental conditions. This report therefore cannot warranty that all conditions on or off the site are represented by those identified at specific locations.

Any recommendations and conclusions provided that are based on conditions or assumptions reported herein will inherently include any uncertainty associated with those conditions or assumptions. In fact many aspects involving professional judgment contain a degree of uncertainty which cannot be eliminated. This uncertainty should be managed by periodic review and refinement as additional information becomes available.

Note also that standards, guidelines, methodologies and practices related to environmental investigations may change with time. Those which were applied at the time of this investigation may be obsolete or unacceptable at a later date.

Any topographic benchmarks and elevations documented in this report are primarily to establish relative elevation differences between study locations and should not be used for other purposes such as grading, excavation, planning, development, etc.

Any comments given in this report on potential environmental conditions/site ecology are intended only for the guidance of the Client. The scope of work may not be sufficient to determine all of the environmental factors at each site. Contractors bidding on this project should, therefore, make their own interpretation of the factual information presented and draw their own conclusions as to how the conditions may affect their work.

Any results from an analytical laboratory, federal or provincial government agencies, other subcontractor, or any other third party, reported herein have been carried out by others, and DST Consulting Engineers Inc. cannot warranty their accuracy. Similarly, DST cannot warranty the accuracy of information supplied by the Client.

10 CLOSURE

We trust this report meets your present requirements and appreciate this opportunity to provide environmental consulting services to you. If you have any questions or comments, please contact the undersigned.

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Reviewed by:



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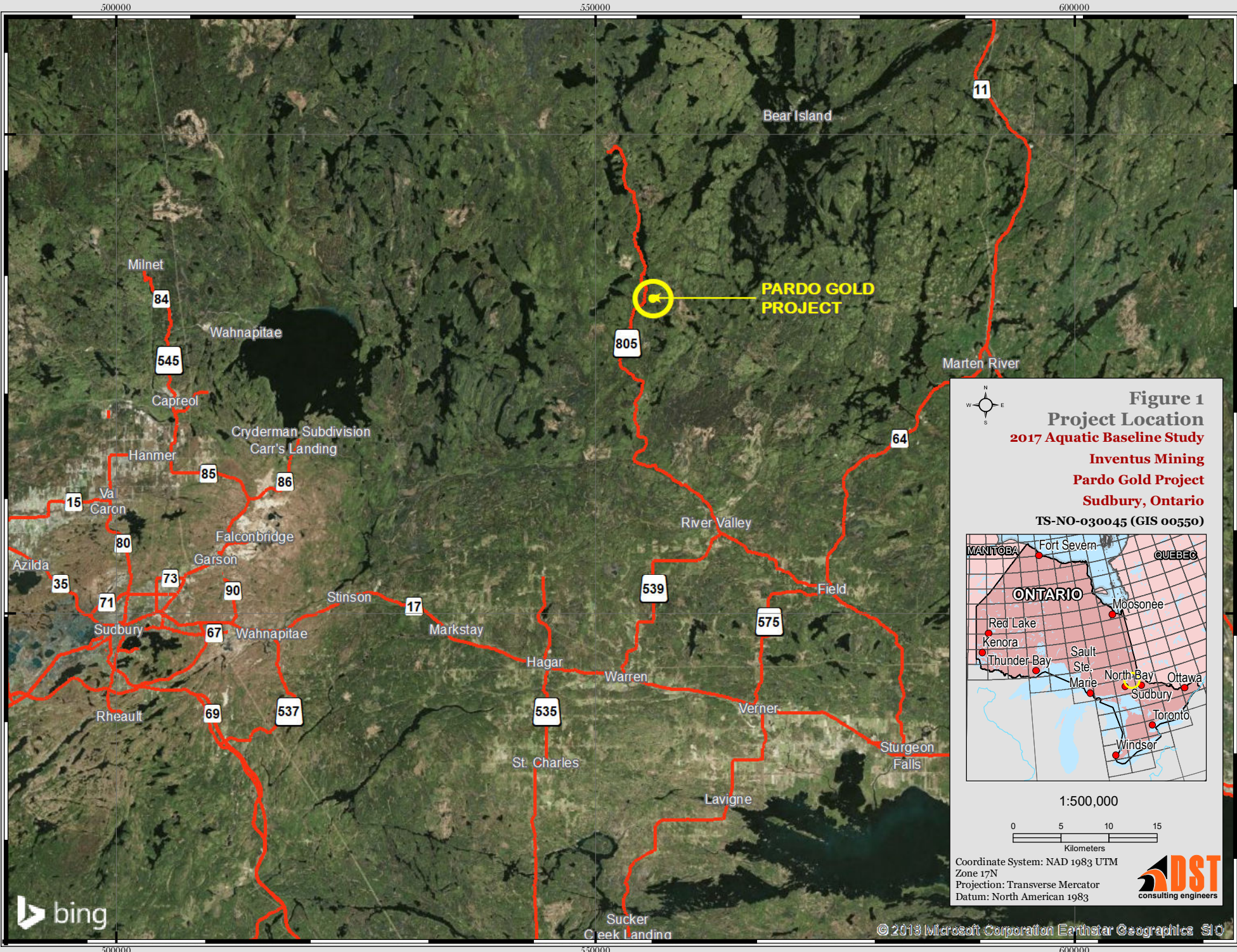
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Figures



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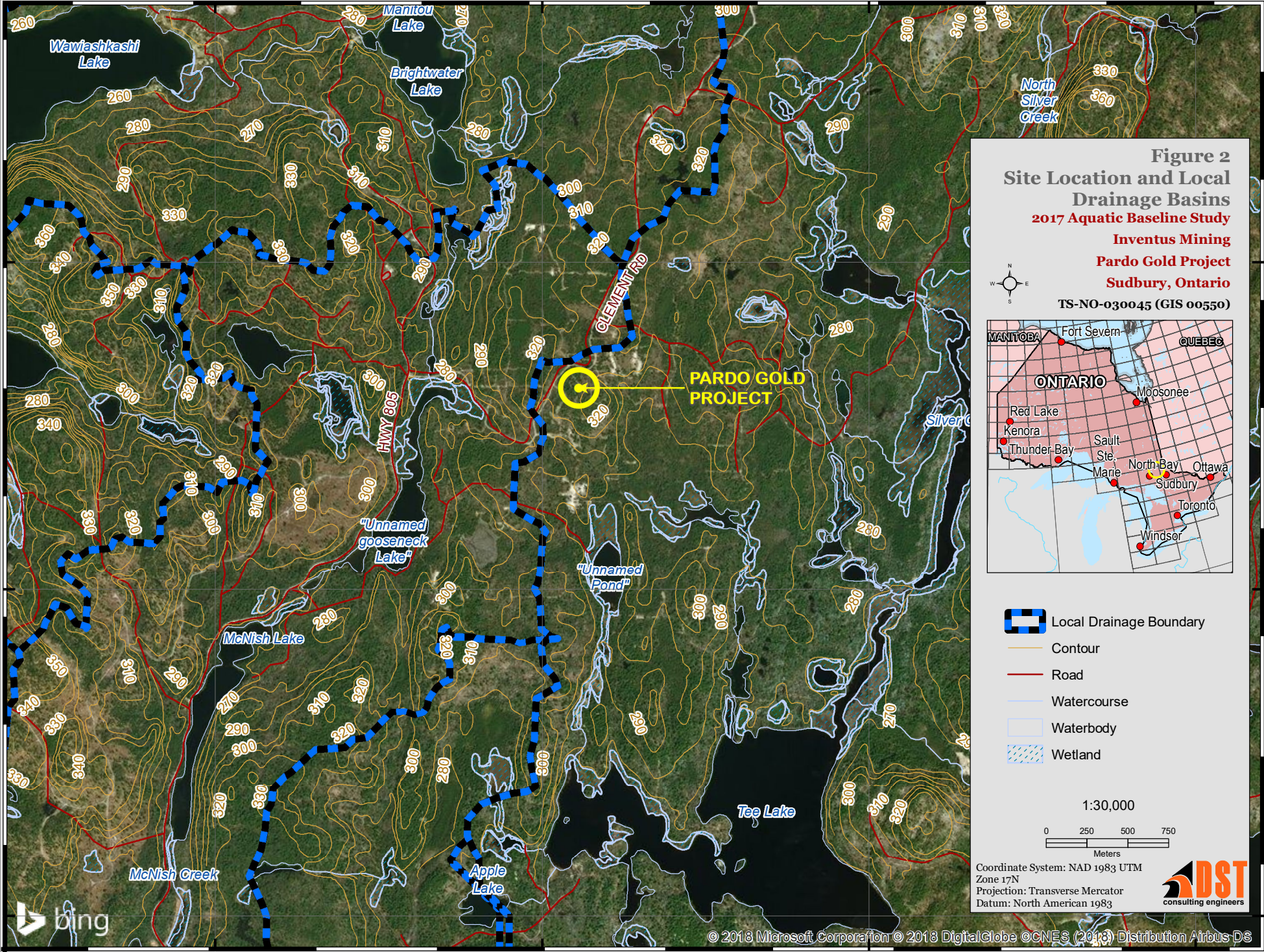
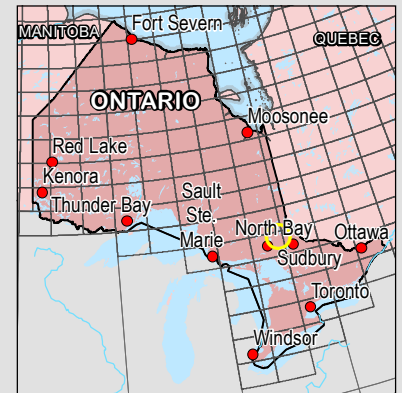






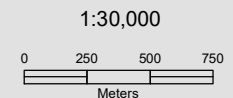


Figure 2
Site Location and Local
Drainage Basins
2017 Aquatic Baseline Study
Inventus Mining
Pardo Gold Project
Sudbury, Ontario
TS-NO-030045 (GIS 00550)



-  Local Drainage Boundary
-  Contour
-  Road
-  Watercourse
-  Waterbody
-  Wetland



Coordinate System: NAD 1983 UTM
 Zone 17N
 Projection: Transverse Mercator
 Datum: North American 1983



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DATE: 2018-04-03 AUTHOR: CHRISTOPHER MITCHELL 0001811C 0001811C 0001811C

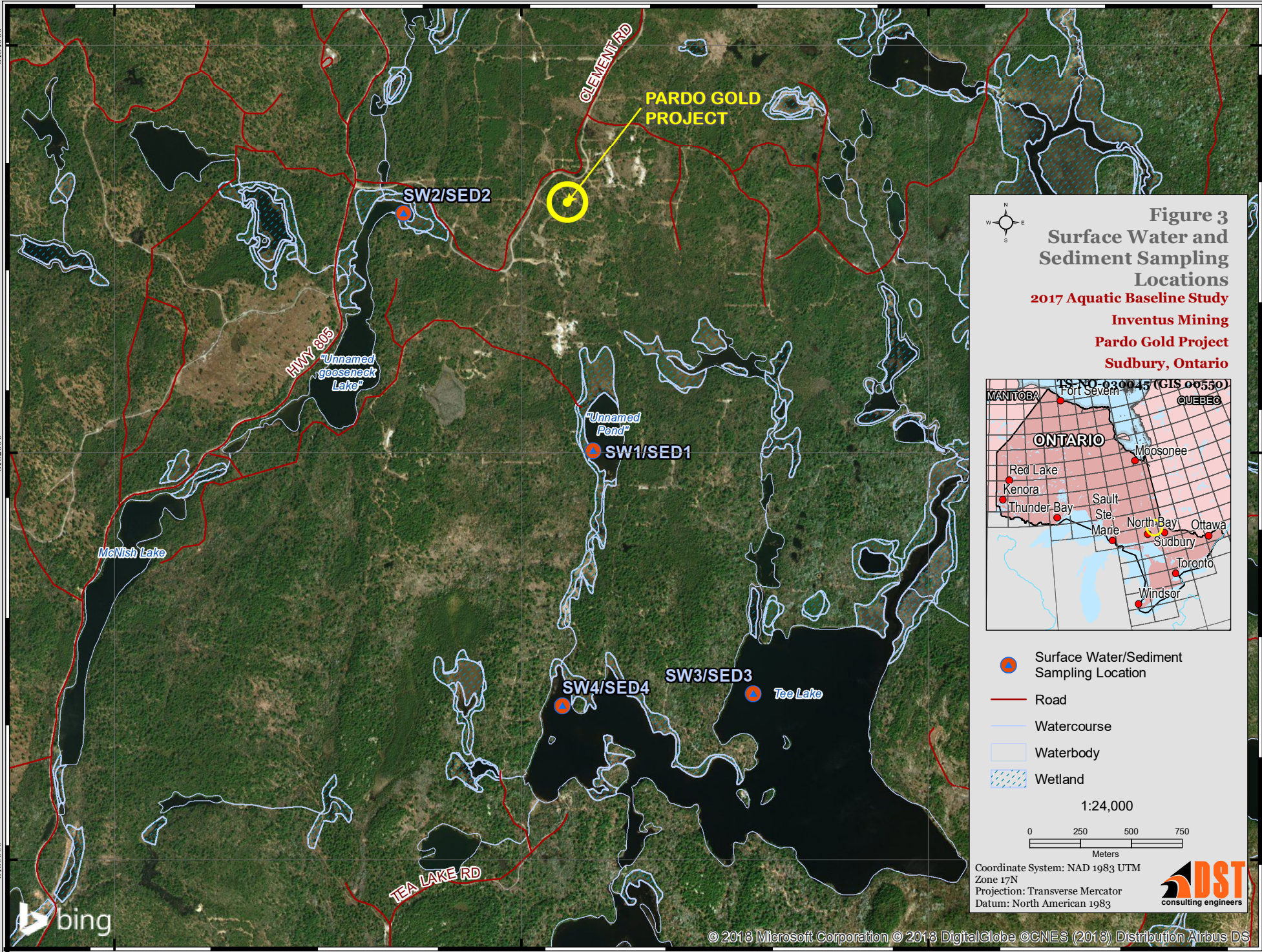


Figure 3
Surface Water and Sediment Sampling Locations
2017 Aquatic Baseline Study
Inventus Mining
Pardo Gold Project
Sudbury, Ontario

IS-NO-030045 (GIS 00550)

MANITOBA Fort Severn ONTARIO MOOSEJONNEE QUEBEC
 Red Lake Kenora Sault Ste. Marie North Bay Ottawa
 Thunder Bay Sudbury Toronto
 Windsor

- Surface Water/Sediment Sampling Location
- Road
- Watercourse
- Waterbody
- Wetland

1:24,000

0 250 500 750
 Meters

Coordinate System: NAD 1983 UTM
 Zone 17N
 Projection: Transverse Mercator
 Datum: North American 1983

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NOTES: 1. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE ASSOCIATED REPORT 2. DO NOT SCALE DRAWING
3. DATA SOURCES: LAND INFORMATION ONTARIO (LAND INFO); ROAD NETWORK; ONTARIO ROAD NETWORK; WETLAND; LAND CONTOUR; HTTPS://WWW.ONTARIO.CA/PAGE/LAND/INFORMATION/ONTARIO_BATHYMETRIC_DATA/DIGITIZED_FROM_DRAWING_NUMBER_17_3534_51611_(08)1.AINED.FROM.LIO.

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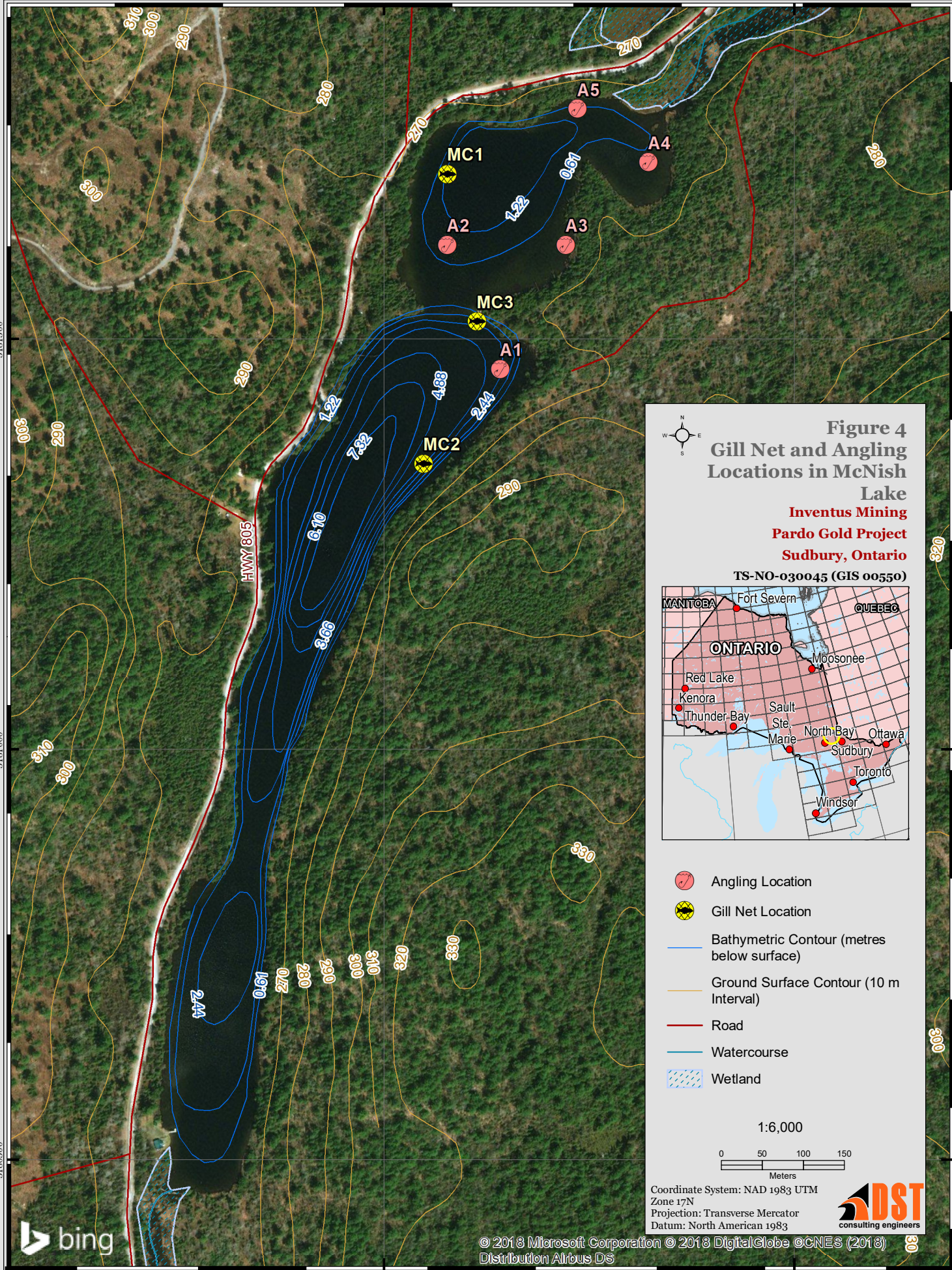


Figure 4
Gill Net and Angling
Locations in McNish
Lake
Inventus Mining
Pardo Gold Project
Sudbury, Ontario
TS-NO-030045 (GIS 00550)

- Angling Location
- Gill Net Location
- Bathymetric Contour (metres below surface)
- Ground Surface Contour (10 m Interval)
- Road
- Watercourse
- Wetland

1:6,000

Coordinate System: NAD 1983 UTM
 Zone 17N
 Projection: Transverse Mercator
 Datum: North American 1983

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5181000
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0050812

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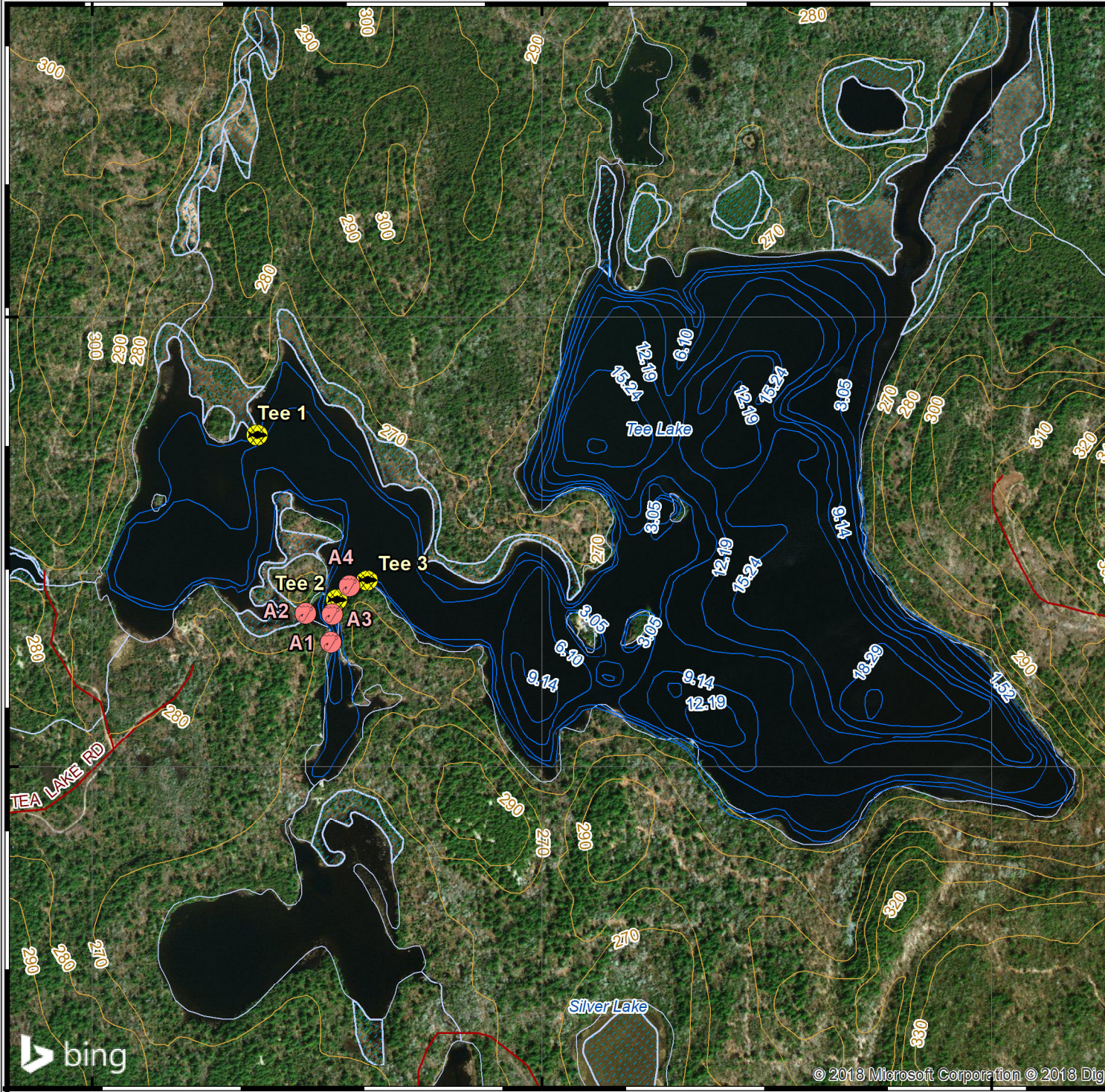


Figure 5
Gill Net and Angling
Locations in Tee Lake
2017 Aquatic Baseline Study
Inventus Mining
Pardo Gold Project
Sudbury, Ontario
TS-NO-030045 (GIS 00550)

- Angling Location
- Gill Net Location
- Bathymetric Contour (feet below surface)
- Ground Surface Contour (10 m Interval)
- Road
- Watercourse
- Waterbody
- Wetland

1:12,500

Coordinate System: NAD 1983 UTM
Zone 17N
Projection: Transverse Mercator
Datum: North American 1983

DATE: 2018-04-03 AUTHOR: CHRISTOPHER MITCHELL 0001812 0001812

Tables

Table 1
Surface Water and Sediment
Field Parameters

Sample ID	UTM ⁽²⁾ Easting NAD83 ⁽³⁾ Zone 17 North +/- <1.0 m X- Coord (m)	UTM Northing NAD83 Zone 17 North +/- <1.0 m Y - Coord (m)	Date (dd-mmm-yy)	Sediment Type	Surface Water				Observations
					pH	Temperature (°C)	Dissolved Oxygen (mg/L)	Electric Conductivity (µS/cm)	
SW1			16-Aug-17	-	6.25	22.12	4.71	14	Sample obtained from shoreline.
			20-Oct-17	A	7.18	12.08	2.72	28	
SW2			16-Aug-17	-	7.45	19.98	5.60	47	Water column approximately 1.525m deep at sampling location.
			20-Oct-17	A	7.20	11.71	4.95	33	
SW3			16-Aug-17	-	8.13	21.85	6.68	28	Water column approximately >20 m deep at sampling location.
			20-Oct-17	B	5.78	12.24	2.77	24	
SW4			16-Aug-17	-	8.12	21.15	6.59	23	Water column approximately 1.921 m deep at sampling location.
			20-Oct-17	A	6.58	11.71	3.33	28	

Notes:

- 1) "UTM" means Universal Transverse Mercator
- 2) "NAD83" means CGRS North American Datum 1983.
- 3) 'Sediment Type 'A' - dark brown to black, fine grained sand with organics
- 4) Sediment Type 'B' - brown, fine to medium grained sand

Table 2
Surface Water
Analytical Results

Parameter	Units	Sample Location Sample ID Date	Unnamed Pond (SW1)		McNish Lake (SW2)				NE Tee Lake (SW3)		NW Tee Lake (SW4)	
			SW1	SW1	SW2	SW-200	SW2	SW-20	SW3	SW3	SW4	SW4
			16-Aug-17	20-Oct-17	16-Aug-17	16-Aug-17	20-Oct-17	SW-20	16-Aug-17	20-Oct-17	16-Aug-17	20-Oct-17
		PWQO ⁽¹⁾				Field Duplicate of SW2		Field Duplicate of SW2				
General Chemistry and Inorganics												
Electrical Conductivity	us/cm	NV ⁽²⁾	21	22	57	57	54	54	34	31	33	32
pH	pH units	6.5 - 8.5	6.00	6.03	7.42	7.50	6.94	7.01	7.29	6.78	7.32	6.77
Total Hardness (as CaCO3)	mg/L	NV	7.60	7.60	23.6	24.1	23.1	23.1	14.30	14.1	13.7	14
Total Suspended Solids	mg/L	NV	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Alkalinity (as CaCO3)	mg/L	NV	<5	<5	18	17	18	18	9	9	9	9
Bicarbonate (as CaCO3)	mg/L	NV	<5	<5	18	17	18	18	9	9	9	9
Carbonate (as CaCO3)	mg/L	NV	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Chloride	mg/L	NV	0.23	0.51	1.87	1.74	1.73	1.73	0.18	0.29	0.19	0.26
Nitrate as N	mg/L	NV	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrite as N	mg/L	NV	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulphate	mg/L	NV	4.27	4.32	5.33	5.33	4.82	4.84	3.82	4.08	3.97	4.07
Ammonia as N	mg/L	NV	0.03	0.07	<0.02	<0.02	0.02	0.02	<0.02	<0.02	<0.02	<0.02
Ammonia-Un-ionized ⁽³⁾	mg/L	NV	0.000018	0.00028	-	-	0.000078	0.000078	-	-	-	-
Total Phosphorus	mg/L	0.02 ⁽⁴⁾	0.02	<0.01	0.01	0.01	<0.01	<0.01	0.01	<0.01	0.02	<0.01
Dissolved Phosphorus	mg/L	NV	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Dissolved Organic Carbon	mg/L	NV	2.04	2.06	6.1	6	7.5	9.4	7.3	7.3	6.9	7.7
Calcium	mg/L	NV	8.9	15.5	7.16	7.31	6.93	6.96	4	3.93	3.83	3.87
Magnesium	mg/L	NV	0.62	0.59	1.4	1.42	1.4	1.39	1.04	1.05	1	1.06
Sodium	mg/L	NV	0.65	0.8	0.93	0.94	1.01	1.01	0.75	0.75	0.72	0.75
Potassium	mg/L	NV	0.39	0.39	0.4	0.42	0.44	0.44	0.34	0.27	0.29	0.26
Metals												
Aluminum (dissolved)	mg/L	0.075 ⁽⁵⁾	0.091	0.103	0.016	0.014	0.03	0.015	0.015	0.025	0.013	0.016
Antimony	mg/L	0.02	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Arsenic	mg/L	0.005	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Barium	mg/L	NV	0.006	0.009	0.004	0.004	0.012	0.008	0.004	0.006	0.004	0.006
Beryllium	mg/L	0.011/1.1 ⁽⁶⁾	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Bismuth	mg/L	NV	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Boron	mg/L	0.2	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Cadmium	mg/L	0.0001/0.0005 ⁽⁷⁾	<0.003	<0.003	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	mg/L	0.089	<0.0001	<0.0001	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Cobalt	mg/L	0.0009	0.0008	0.0006	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper	mg/L	0.001/0.005 ⁽⁸⁾	0.002	0.002	0.001	0.001	0.001	<0.001	0.001	0.001	0.001	0.001
Iron	mg/L	0.3	0.05	0.09	0.03	0.03	0.06	0.04	0.02	<0.01	0.02	0.02
Lead	mg/L	0.001-0.005 ⁽⁹⁾	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	mg/L	NV	0.017	0.013	0.007	0.007	0.007	0.007	0.004	0.012	0.006	0.009
Mercury (dissolved)	mg/L	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum	mg/L	0.04	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Nickel	mg/L	0.025	0.006	0.006	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Selenium	mg/L	0.1	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Silicon	mg/L	NV	0.45	0.79	1.45	1.47	1.98	1.9	1.04	1.53	0.91	1.25
Silver	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Stontium	mg/L	NV	0.008	0.009	0.016	0.017	0.017	0.016	0.013	0.014	0.013	0.014
Thallium	mg/L	0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Tin	mg/L	NV	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Titanium	mg/L	NV	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Uranium	mg/L	0.005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Vanadium	mg/L	0.006	0.007	0.011	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Zinc	mg/L	0.02	<0.002	<0.002	<0.005	<0.005	0.008	<0.005	<0.005	<0.005	<0.005	0.006
Zirconium	mg/L	0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004

Notes

- Values obtained from Ministry of the Environment and Climate Change (MOECC, 1994) Water Management, Policies, Guidelines, Provincial Water Quality Objectives (PWQO) of the MOEE. Where interim values exist, the interim value is used.
- "NV" means no value.
- Calculation based on lab measured pH and temperature. The value was not calculated when ammonia-nitrogen was less than the measured detection limit, indicated by '-'.
- Interim PWQO should not exceed 0.02mg/L for the ice-free period in lakes.
- The PWQO of 0.075 mg/L is based on pH of >6.5 to 9.0, in a clay-free sample.
- PWQO is 0.011 mg/L when sample hardness is <75 mg/L and 1.1 mg/L when sample hardness is >75 mg/L.
- Interim PWQO is 0.0001 mg/L when sample hardness is 0-100 mg/L and 0.0005 mg/L when sample hardness is >100 mg/L.
- Interim PWQO is 0.001 mg/L when sample hardness is 0-20 mg/L and 0.005 mg/L when sample hardness is >20 mg/L.
- Interim PWQO is 0.001 mg/L when sample hardness is <30mg/L; 0.003 mg/L when sample hardness is between 30-80 mg/L; and 0.005 mg/L when sample hardness is >80mg/L.
- Concentrations that exceed the PWQO are illustrated by **bold, underlined and red typeface**.
- If applicable, where the laboratory detection limit is greater than the applicable guideline, it is indicated by *italic and underlined typeface*.

Table 3
Surface Water QA/QC

Sample Location			SW2		RPD	SW2		RPD	Field Blank ⁽³⁾
Parameter	Units	Sample ID	SW2	SW-200		SW2	SW-20		SWB1
		Date Sampled	16-Aug-17	16-Aug-17	20-Oct-17	SW-20	16-Aug-17		
Alert Limit (%) ⁽¹⁾									
General Chemistry and Inorganics									
Electrical Conductivity	us/cm	50	57	57	NA ⁽²⁾	54	54	NA	<2
pH	pH units	50	7.42	7.50	NA	6.94	7.01	NA	5.98
Total Hardness (as CaCO ₃)	mg/L	50	23.6	24.1	NA	23.1	23.1	NA	<0.5
Total Suspended Solids	mg/L	50	<10	<10	NA	<10	<10	NA	<10
Alkalinity (as CaCO ₃)	mg/L	50	18	17	NA	18	18	NA	<5
Bicarbonate (as CaCO ₃)	mg/L	50	18	17	NA	18	18	NA	<5
Carbonate (as CaCO ₃)	mg/L	50	<5	<5	NA	<5	<5	NA	<5
Chloride	mg/L	50	1.87	1.74	NA	1.73	1.73	NA	<0.10
Nitrate as N	mg/L	50	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05
Nitrite as N	mg/L	50	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05
Sulphate	mg/L	50	5.33	5.33	NA	4.82	4.84	NA	<0.10
Ammonia as N	mg/L	50	<0.02	<0.02	NA	0.02	0.02	NA	<0.02
Ammonia-Un-ionized	mg/L	50	-	-	NA	0.000078	0.000078	NA	-
Total Phosphorus	mg/L	50	0.01	0.01	NA	<0.01	<0.01	NA	<0.01
Total Phosphorus (dissolved)	mg/L	50	<0.02	<0.02	NA	<0.02	<0.02	NA	<0.02
Dissolved Organic Carbon	mg/L	50	6.1	6	NA	7.5	9.4	NA	<0.5
Calcium	mg/L	50	7.16	7.31	NA	6.93	6.96	NA	<0.05
Magnesium	mg/L	50	1.4	1.42	NA	1.4	1.39	NA	<0.05
Sodium	mg/L	50	0.93	0.94	NA	1.01	1.01	NA	<0.05
Potassium	mg/L	50	0.4	0.42	NA	0.44	0.44	NA	<0.05
Metals									
Aluminum (dissolved)	mg/L	80	0.016	0.014	NA	0.03	0.015	NA	<0.004
Antimony	mg/L	80	<0.003	<0.003	NA	<0.003	<0.003	NA	<0.003
Arsenic	mg/L	80	<0.003	<0.003	NA	<0.003	<0.003	NA	<0.003
Barium	mg/L	80	0.004	0.004	NA	0.012	0.008	NA	<0.002
Beryllium	mg/L	80	<0.001	<0.001	NA	<0.001	<0.001	NA	<0.001
Bismuth	mg/L	80	<0.002	<0.002	NA	<0.002	<0.002	NA	<0.002
Boron	mg/L	80	<0.010	<0.010	NA	<0.010	<0.010	NA	<0.010
Cadmium	mg/L	80	<0.0001	<0.0001	NA	<0.0001	<0.0001	NA	<0.0001
Chromium	mg/L	80	<0.003	<0.003	NA	<0.003	<0.003	NA	<0.003
Cobalt	mg/L	80	<0.0005	<0.0005	NA	<0.0005	<0.0005	NA	<0.0005
Copper	mg/L	80	0.001	0.001	NA	0.001	<0.001	NA	<0.001
Iron	mg/L	80	0.03	0.03	NA	0.06	0.04	NA	<0.01
Lead	mg/L	80	<0.001	<0.001	NA	<0.001	<0.001	NA	<0.001
Manganese	mg/L	80	0.007	0.007	NA	0.007	0.007	NA	<0.002
Mercury (dissolved)	mg/L	80	<0.0001	<0.0001	NA	<0.0001	<0.0001	NA	<0.0001
Molybdenum	mg/L	80	<0.002	<0.002	NA	<0.002	<0.002	NA	<0.002
Nickel	mg/L	80	<0.003	<0.003	NA	<0.003	<0.003	NA	<0.003
Selenium	mg/L	80	<0.004	<0.004	NA	<0.004	<0.004	NA	<0.004
Silicon	mg/L	80	1.45	1.47	NA	1.98	1.9	NA	<0.05
Silver	mg/L	80	<0.0001	<0.0001	NA	<0.0001	<0.0001	NA	<0.0001
Stontium	mg/L	80	0.016	0.017	NA	0.017	0.016	NA	<0.005
Thallium	mg/L	80	<0.0003	<0.0003	NA	<0.0003	<0.0003	NA	<0.0003
Tin	mg/L	80	<0.002	<0.002	NA	<0.002	<0.002	NA	<0.002
Titanium	mg/L	80	<0.002	<0.002	NA	<0.002	<0.002	NA	<0.002
Uranium	mg/L	80	<0.002	<0.002	NA	<0.002	<0.002	NA	<0.002
Vanadium	mg/L	80	<0.002	<0.002	NA	<0.002	<0.002	NA	<0.002
Zinc	mg/L	80	<0.005	<0.005	NA	0.008	<0.005	NA	<0.005
Zirconium	mg/L	80	<0.004	<0.004	NA	<0.004	<0.004	NA	<0.004

Notes:

- 1) Alert Limits only applicable if both sample values are 5 times greater than the laboratory reportable detection limit (RPD)
- 2) "NA" indicates that the RPD could not be calculated as both analyte concentrations were less than 5 times the reportable detection limit.
- 3) Field Blank alert limit considered applicable when value is greater than 2 times the RDL
- 4) An exceedance of the alert limit, if applicable, is shown as **blue, bold and underlined** text.
- 3) "<" Less than the laboratory Reportable Detection Limit.

Table 4
Sediment Analytical Results

Sample Location				SED1	SED2		SED3	SED5
Sample ID				SED-1	SED-2	SED-20	SED-3	SED-4
Date				20-Oct-17	20-Oct-17	20-Oct-17	20-Oct-17	20-Oct-17
Parameter	Units	PSQG LEL ⁽¹⁾	PSQG SEL ⁽²⁾			Field Duplicate of SED-2		
Particle Size Distribution								
Gravel	%	NV	NV	0.07	-	0.21	2.61	0.00
Coarse Sand	%	NV	NV	0.78	-	0.31	33.63	0.18
Fine Sand	%	NV	NV	2.40	-	0.31	59.98	2.26
Silt	%	NV	NV	82.89	-	84.87	3.17	75.46
Clay	%	NV	NV	13.46	-	13.22	0.61	22.15
Inorganic Chemistry								
Sulphate (10:1)	µg/g	NV	NV	160	84	266	11	64
Ammonia as N (KCl Extr)	µg/g	NV	NV	75	113	60	6	80
Phosphorus, Total	µg/g	600	2000	576	419	450	59	513
Total Organic Carbon	%	1	10	<u>24.1</u>	<u>20.98</u>	<u>21.45</u>	<u>1.53</u>	<u>16.83</u>
Metals								
Aluminum	µg/g	NV	NV	4280	5060	4460	8600	10600
Antimony	µg/g	NV	NV	<0.8	<0.8	<0.8	<0.8	<0.8
Arsenic	µg/g	6	33	3	3	4	3	<u>11</u>
Barium	µg/g	NV	NV	69	48	51	29	70
Beryllium	µg/g	NV	NV	<0.5	<0.5	<0.5	<0.5	<0.5
Bismuth	µg/g	NV	NV	0.6	0.9	0.9	<0.1	0.8
Boron	µg/g	NV	NV	<5	<5	<5	<5	<5
Cadmium	µg/g	0.6	10	<u>1.4</u>	<u>2.7</u>	<u>2.3</u>	<0.5	<u>2.3</u>
Calcium	µg/g	NV	NV	6310	5920	6020	2160	4570
Chromium	µg/g	26	110	11	14	14	<u>34</u>	<u>34</u>
Cobalt	µg/g	NV	NV	3.5	23	22.3	7.9	24.9
Copper	µg/g	16	110	<u>86</u>	<u>108</u>	<u>119</u>	8	<u>79</u>
Iron	µg/g	20,000	40,000	2200	3130	4920	17100	14300
Lead	µg/g	31	250	31	<u>52</u>	<u>51</u>	4	<u>50</u>
Lithium	µg/g	NV	NV	1.2	1.3	1.4	12.7	6
Magnesium	µg/g	NV	NV	37	911	840	5430	2310
Manganese	µg/g	469	1100	<u>898</u>	48	43	344	468
Mercury	µg/g	0.2	2	0.19	0.14	0.14	<0.10	0.16
Molybdenum	µg/g	NV	NV	0.9	1.9	1.6	<0.5	1.1
Nickel	µg/g	16	75	<u>89</u>	<u>97</u>	<u>107</u>	30	<u>97</u>
Phosphorus	µg/g	NV	NV	625	451	489	66	546
Potassium	µg/g	NV	NV	200	413	306	209	363
Selenium	µg/g	NV	NV	2.5	3.5	3.1	<0.8	2.1
Silicon	µg/g	NV	NV	631	<u>795</u>	881	842	860
Silver	µg/g	NV	NV	<0.4	<0.4	<0.4	<0.4	<0.4
Sodium	µg/g	NV	NV	84	250	94	166	112
Strontium	µg/g	NV	NV	28	17	19	9	19
Thallium	µg/g	NV	NV	1	<0.4	<0.4	<0.4	<0.4
Tin	µg/g	NV	NV	<0.4	1	1	<1	1
Titanium	µg/g	NV	NV	40	46	51	490	148
Uranium	µg/g	NV	NV	0.55	1.37	1.12	<0.50	1.4
Vanadium	µg/g	NV	NV	3	11	8	24	22
Zinc	µg/g	NV	NV	46	153	141	47	169
Zirconium	µg/g	NV	NV	0.7	0.9	1.3	4.2	1.4

Notes

- 1) Values obtained from Ministry of the Environment and Climate Change (MOECC, 2008) Provincial Sediment Quality Guidelines (PSQG) Lower Effect Level (LEL)
- 2) Values obtained from Ministry of the Environment and Climate Change (MOECC, 2008) Provincial Sediment Quality Guidelines (PSQG) Severe Effect Level (SEL)
- 3) NV means no value
- 4) Concentrations that exceed the PSQG LEL are illustrated by **bold, underlined and red typeface**, and concentrations that exceed the PSQG SEL are illustrated by **bold, blue, underlined typeface**.

**Table 5
 Sediment QA/QC**

Sample Location			SW2		RPD
Parameter	Units	Sample ID	SED-2	SED-20	
		Date	20-Oct-17	20-Oct-17	
		Alert Limit % (2)			
Inorganic Chemistry					
Sulphate (10:1)	µg/g	100	84	266	<u>104%</u>
Ammonia as N (KCl Extr)	µg/g	100	113	60	61%
Phosphorus, Total	µg/g	100	419	450	7%
Total Organic Carbon	%	100	20.98	21.45	2%
Metals					
Aluminum	µg/g	100	5060	4460	13%
Antimony	µg/g	100	<0.8	<0.8	NA
Arsenic	µg/g	100	3	4	NA
Barium	µg/g	100	48	51	6%
Beryllium	µg/g	100	<0.5	<0.5	NA
Bismuth	µg/g	100	0.9	0.9	0%
Boron	µg/g	100	<5	<5	NA
Cadmium	µg/g	100	2.7	2.3	16%
Calcium	µg/g	100	5920	6020	2%
Chromium	µg/g	100	14	14	0%
Cobalt	µg/g	100	23	22.3	3%
Copper	µg/g	100	108	119	10%
Iron	µg/g	100	3130	4920	44%
Lead	µg/g	100	52	51	2%
Lithium	µg/g	100	1.3	1.4	NA
Magnesium	µg/g	100	911	840	8%
Manganese	µg/g	100	48	43	11%
Mercury	µg/g	100	0.14	0.14	NA
Molybdenum	µg/g	100	1.9	1.6	NA
Nickel	µg/g	100	97	107	10%
Phosphorus	µg/g	100	451	489	8%
Potassium	µg/g	100	413	306	30%
Selenium	µg/g	100	3.5	3.1	12%
Silicon	µg/g	100	795	881	10%
Silver	µg/g	100	<0.4	<0.4	NA
Sodium	µg/g	100	250	94	91%
Strontium	µg/g	100	17	19	NA
Thallium	µg/g	100	<0.4	<0.4	NA
Tin	µg/g	100	1	1	NA
Titanium	µg/g	100	46	51	NA
Uranium	µg/g	100	1.37	1.12	NA
Vanadium	µg/g	100	11	8	32%
Zinc	µg/g	100	153	141	8%
Zirconium	µg/g	100	0.9	1.3	NA

Notes:

- 1) Alert Limits only applicable if both sample values are 5 times greater than the laboratory reportable detection limit (RPD)
- 2) "NA" indicates that the RPD could not be calculated as both analyte concentrations were less than 5 times the reportable detection limit.
- 3) "<" Less than the laboratory Reportable Detection Limit.
- 4) An exceedance of the alert limit, if applicable, is shown as **blue, bold and underlined** text.

Table 6
Catch per Unit Effort Summary

Gill Net Summary										
Waterbody	Sampling Date	Location ID	Mesh Size (mm)	Number of Sets	Total Effort (hours)	Species-Specific Catch			Total Catch Number	CPUE ⁽¹⁾
						Walleye	White Sucker	Smallmouth Bass		
Tee Lake	30-Aug-17	TEE1	76	2	4.5	0	2	1	3	0.67
		TEE2	100	1	1	0	0	0	0	0
		TEE3	100	1	2.5	1	0	0	1	0.4
McNish Lake	31-Aug-17	MC1	76	2	3.5	0	0	0	0	0
		MC2	100	1	1	0	0	0	0	0
		MC3	50	2	3	0	0	0	0	0
Angling Summary										
Waterbody	Sampling Date	Effort (# of rods)	Duration (hour)	Sampling Effort (rod x hours)	Species-Specific Catch				Total Catch Number	CPUE
					Pumpkinseed	Smallmouth Bass	Northern Pike	Yellow Perch		
Tee Lake	30-Aug-17	2	6	12	2	1	0	0	3	0.25
McNish Lake	31-Aug-17	2	4	8	0	0	4	1	5	0.63

Notes:

1) "CPUE" means catch per unit effort

Table 7
Fish Tissue Metal
Analytical Results

Location Sample ID Species Date				Tee Lake					McNish Lake				
				WALLY1	WS1	WS2	RB1	SM1	NP1	NP2	NP3	NP4	YP1
				Walleye	White Sucker		Pumpkinseed	Smallmouth Bass	Northern Pike				Yellow Perch
				30-Aug-17	30-Aug-17	30-Aug-17	30-Aug-17	30-Aug-17	31-Aug-17	31-Aug-17	31-Aug-17	31-Aug-17	31-Aug-17
Parameter	Units	CCME ⁽¹⁾	MOECC ⁽²⁾										
Metals													
Aluminum	µg/g	NV	NV	<5.0	<5.0	25.3	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	
Antimony	µg/g	NV	NV	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	
Arsenic	µg/g	NV	NV	<0.1	<0.1	<0.1	<0.1	1.5	<0.1	<0.1	<0.1	<0.1	
Cadmium	µg/g	NV	NV	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.02	<0.02	<0.02	
Calcium	µg/g	NV	NV	7490	172	242	6790	2930	2250	2580	3790	1320	
Chromium	µg/g	NV	NV	0.7	<0.6	<0.6	<0.6	0.6	<0.6	<0.6	<0.6	<0.6	
Cobalt	µg/g	NV	NV	<0.3	<0.3	<0.3	<0.3	0.3	<0.3	<0.3	<0.3	<0.3	
Copper	µg/g	NV	NV	9.9	1.1	1.8	0.8	2.1	0.5	0.4	0.6	0.5	
Iron	µg/g	NV	NV	<50	<50	55	<50	<50	<50	<50	<50	<50	
Lead	µg/g	NV	NV	0.2	<0.1	<0.1	<0.1	0.4	<0.1	<0.1	<0.1	<0.1	
Lithium	µg/g	NV	NV	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Magnesium	µg/g	NV	NV	424	363	321	412	380	386	430	428	361	
Manganese	µg/g	NV	NV	2.1	<1.0	1.7	1.2	1.1	1	1.8	2.5	1.5	
Mercury	µg/g	0.033	0.5 / 1.8 ⁽³⁾	<u>0.56</u>	0.02	<u>0.07</u>	0.03	<u>0.15</u>	<u>0.04</u>	<u>0.16</u>	<u>0.17</u>	<u>0.25</u>	
Molybdenum	µg/g	NV	NV	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Nickel	µg/g	NV	NV	<1	<1	<1	<1	<1	<1	<1	<1	<1	
Phosphorus	µg/g	NV	NV	6290	2440	2390	5760	4140	4110	4480	4400	2790	
Potassium	µg/g	NV	NV	3990	4450	4550	3730	4410	4560	4600	4190	4460	
Selenium	µg/g	NV	NV	0.5	0.6	0.6	0.7	2.1	0.5	0.7	0.7	0.6	
Silver	µg/g	NV	NV	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
Sodium	µg/g	NV	NV	520	333	373	692	517	490	440	548	448	
Strontium	µg/g	NV	NV	<5	<5	<5	7	<5	<5	<5	<5	<5	
Tin	µg/g	NV	NV	<1	<1	<1	<1	<1	<1	<1	<1	<1	
Uranium	µg/g	NV	NV	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
Vanadium	µg/g	NV	NV	<0.4	<0.4	<0.4	<0.4	0.4	<0.4	<0.4	<0.4	<0.4	
Zinc	µg/g	NV	NV	13.3	41.3	10.1	12.5	9.6	12.8	10.8	16.2	17.0	

Notes

- 1) Value obtained from Canadian Council of Ministers of the Environment (2000) Canadian Tissue Residue
- 2) Values obtained from Ministry of Environment and Climate Change (MOECC) Fish Consumption Guideline Limit.
- 3) Value is 0.5mg/kg for children and women of child-bearing age; value is 1.8 mg/kg for the general population.
- 4) Exceedances to the CCME guidelines are indicated in **red, bold, underlined typeface**
- 5) Exceedances to both the MOECC and CCME guidelines are indicated in **blue, bold and underlined typeface**.

Appendix A

Site Photographs



Photograph 1 – Vegetation surrounding the Unnamed Pond (SW1) looking north (August 16, 2017)



Photograph 2 – Vegetation adjacent to surface water and sediment sampling location in Unnamed Pond (SW1) (August 16, 2017)



Photograph 3 – View of wetland habitat observed in the northern bay of the Unnamed Pond. (September 7, 2017)



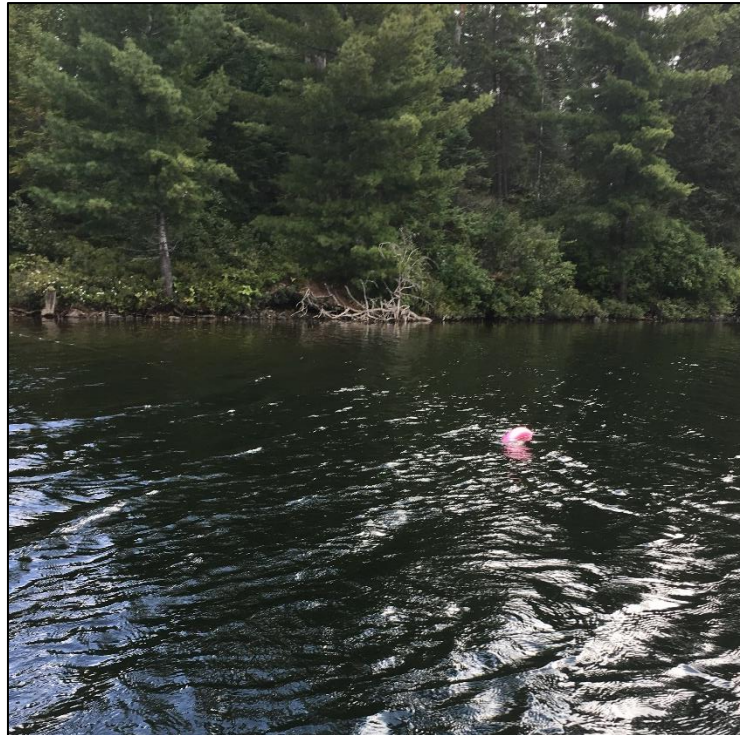
Photograph 4 – Vegetation surrounding surface water and sediment sampling location in the northern bay of unnamed 'gooseneck' lake (SW2) north of McNish Lake (August 16, 2017)



Photograph 5 – View of the unnamed gooseneck lake (SW2) looking south towards the creek drainage into McNish Lake (August 31, 2017)



Photograph 6 –Vegetation surrounding the southern bays of McNish Lake (August 31, 2017)



Photograph 8 – Location of gill net (MC3) deployed at a nearshore location in McNish Lake. (August 31, 2018)



Photograph 9 – Bedrock outcrops observed along the southern shoreline of Tee Lake (August 16, 2017)



Photograph 10 - Aquatic vegetation observed adjacent to surface water sampling location along the northwest bay of Tee Lake (SW4) (August 16, 2017)



Photograph 11 – Vegetation and rock substrate observed near angling locations in Tee Lake. (August 31, 2018)



Photograph 12 – Snapping Turtle observed backing on a bedrock outcrop near gill net location Tee1 on Tee Lake (August 16, 2017)



Photograph 10 – Northern Pike captured from McNish Lake by angling (August 31, 2017).

Appendix B

Scientific Collectors Permit



Ontario

Ministry of Natural Resources

Ministère des Richesses naturelles

Licence to Collect Fish for Scientific Purposes

Permis pour faire la collecte de poissons à des fins scientifiques

Licence No. N° de permis	1087610
Local Reference No. N° de référence local	
Issuer Account No. N° de compte du délivreur de permis	10003092

This licence is issued under Part I of the Fish Licensing Regulation made under the Fish and Wildlife Conservation Act, 1997 to:

Ce permis est délivré en vertu de la Partie I du règlement sur la délivrance de permis de pêche formulé conformément à la Loi sur la protection du poisson et de la faune de 1997 à:

Name of Licence Nom du titulaire du permis	Last Name / Nom de famille Ms. Haring	First Name / Prénom Michaela	Middle Name / Second Prénom W
Name of Business/Organization/Affiliation (if applicable) / Nom de l'entreprise/de l'organisme/de l'affiliation (le cas échéant) DST Consulting Engineers			
Mailing address of Licence Adresse postale du titulaire du permis	Street Name & No / PO Box/RR#/Gen Del / N° rue/C.P./R.R (poste restante) Unit 3-1B, 885 Regent Street		Province/State Province/État ON
	City/Town/Municipality / Ville/village/municipalité Sudbury		Postal Code/Zip Code Code Postal/Zip P3B 5M4

to collect the species, size and quantities of fish from the waters as set out below.

Pour faire la collecte des espèces suivantes (stade et nombre indiqués ci-dessous):

Species Espèces	Eggs Oeuf X	Juvenile Fretin X	Adults Adulte X	Numbers Nombre	Name of Waterbody Nom de l'étendue d'eau
Rock Bass		X	X	5	Tee Lake
Walleye		X	X	5	Tee Lake
White Sucker		X	X	5	McNish Lake and Tee Lake
Yellow Perch		X	X	5	McNish Lake and Tee Lake
Northern Pike		X	X	5	McNish Lake and Tee Lake

Yes/Oui Additional species/Waterbody list attached / Liste d'espèces/d'étendue d'eau additionnelles ci-jointe

Purpose of collection
But de la collecte
Evaluating current aquatic conditions with respect to surface water and sediment quality, fish habitat and fisheries resources prior to project development.

Licence Dates Dates du permis	Effective Date / Date d'entrée en vigueur (YYYY-MM-DD) 2017-08-17	Expiry Date / Date d'expiration (YYYY-MM-DD) 2017-10-27
---	---	---

Licence conditions This licence is subject to the conditions contained in Schedule A if included. / Ce permis doit respecter les conditions de l'annexe A si celle-ci est jointe.

Conditions du permis Yes/Oui No/Non Schedule A included. / Annexe A ci-jointe

Issued by (please print) Délivré par (veuillez écrire en caractères d'imprimerie) Julia Hancock	Signature of issuer / Signature du délivreur 	Date of Issue/Date de délivrance (YYYY-MM-DD) 2017-08-17
Signature of Licencee / Signature du titulaire du permis Michaela Haring		Date (YYYY-MM-DD) 2017-08-17

Personal information contained on this form is collected under the authority of the Fish and Wildlife Conservation Act, 1997 and will be used for the purpose of licensing, identification, enforcement, resource management and customer service surveys. Please direct further inquiries to the District Manager of the MNR issuing district.

Les renseignements personnels dans ce formulaire sont recueillis conformément à la Loi sur la protection du poisson et de la faune, 1997 et ils seront utilisés aux fins de délivrance de permis, d'identification, d'application des règlements, de gestion des ressources et de partage sur les services à la clientèle. Veuillez communiquer avec le chef du district du MNR qui délivre le permis si vous avez des questions.

Additional Species/Waterbody List
DST Consulting Engineers

Licence No. 1087610

Species	Eggs	Juvenile	Adults	Numbers	Name of Waterbody
Small Mouth Bass		X	X	5	McNish Lake and Tee Lake
All other species encountered		X	X	5	McNish Lake and Tee Lake

Licence to Collect Fish for Scientific Purposes
Pour faire la collecte de poissons a des fins scientifiques
Schedule A – Licence Conditions
Annexe A – Conditions du permis

Licence No./No de permis #
1087610

This licence is subject to the conditions listed below.

1. The licence is valid only for the persons, species, numbers, areas and calendar year indicated. A written report covering the operation of the preceding year must be submitted to the licence issuer within 30 days of the termination date, but in no case later than January 31 next following the year of issue. The report shall contain a statement outlining the objectives of the operations, the methods used, the number and species of fish caught, and their fate, as well as a map indicating where the collections took place. An analysis is not required. The submission of a satisfactory report is a prerequisite to any subsequent renewals.
2. Before carrying out any operation under the licence in any area, the licenced person shall inform **Kim Tremblay at 705-475-5502** of his or her intentions at least a week before commencing work, and include information as to the type of operation, location, duration, and the name or names of personnel involved.
3. A copy of the original licence must be carried by the licenced person when working at the designated sites. An assistant of the licenced person who is carrying out activities under this licence during the absence of the licenced person shall carry a copy of the licence on his or her person.
4. All collection gear shall be clearly marked with the licenced person's and the organization's name.
5. This licence is not valid in Provincial Parks or Conservation Reserves without a written Research Authorization issued under the Provincial Parks and Conservation Reserves Act (<http://www.ontarioparks.ca/science-research>).
6. Capture gear shall be inspected regularly and live holding traps must be inspected at least once daily. **Capture gear and live holding gear must be disinfected when moving from one waterbody to the next waterbody.**
7. This licence does not allow access to any property without permission of the landowner.

Signature of Licencee/Signature du titulaire du permis



Date

2017-08-18

8. All live fish other than an individual of any species that are required for further identification **must be released at their location of capture upon completion of sampling.**
9. Provide a record of number of each species caught, released, and that died.
10. The following capture equipment may be used: Seine net, dip net, trap net, minnow traps and gill nets. Name of assistant covered under this licence is Winston Whymark. Any changes to assistants must be confirmed in writing.
11. Licence to collect Fish for Scientific Purposes Report – Part 1 & Part 2 (Site Collection Report) must be submitted to this office at the completion of this project. Please submit a **copy to Kim Tremblay**, Management Biologist, by mail to the Ministry of Natural Resources and Forestry, 3301 Trout Lake Road North Bay, ON P1A 4L7, or by e-mail at kim.tremblay@ontario.ca.
12. Unless specifically authorized by a separate Endangered Species Act (ESA) authorization (i.e. registry or permit) and/or Federal Species at Risk Act (SARA) permit, no person shall attempt to catch a Species at Risk.
13. Unless specifically authorized by a separate Endangered Species Act (ESA) authorization (i.e. registry or permit) and/or Federal Species at Risk Act (SARA) permit, any Species at Risk that are incidentally captured must be photographed and immediately released alive at the point of capture (including, but not limited to: redbreast, dace, black redbreast, river redbreast, eastern sand darter, northern or American brook lamprey). The photographs, including capture coordinates and date caught, must be forwarded to the local Ministry of Natural Resources and Forestry District office for identification and confirmation.
14. Unless specifically authorized by a separate Endangered Species Act (ESA) authorization (i.e. registry or permit) and/or Federal Species at Risk Act (SARA) permit, sampling must cease immediately in an area when a Species at Risk is caught.
15. All aquatic Species at Risk must also be reported to the Ministry of Natural Resources and Forestry Natural Heritage Information Centre on the appropriate form at:
<https://www.ontario.ca/environment-and-energy/natural-heritage-information-centre>.

Signature of Licencee/Signature du titulaire du permis



Date



Add Blank Site Report	Copy Site Report	Delete Site Report	Printable Version	Clear
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Part 2: Site Collection Reports - Complete Part 2 for each site surveyed and for each day sampling occurred at a site even if no species were caught at a particular site. Use the buttons above to either add a new site report, copy the current report to a new report, or delete the site report. Attach a digital map of the site directly to the bottom of this form by either pasting a map from the clipboard or inserting a map image from a file.

SECTION A: SITE LOCATION INFORMATION			
Licence No.: 1087610	Survey Site # / Code: 17-5534-51811	Site Code Type: MNR Fish Online	
Waterbody Name: McNish Lake	Waterbody Type: Lake	Stream Permanency: Intermittent	Watercress Present: No
Township / Municipality / Territorial District Name: MCNISH, GEOGRAPHIC TOWNSHIP OF			
Site Location: (fill in coordinates for either UTM, decimal degrees, or degrees minutes seconds)			
UTM (NAD 83): Zone: 17 Easting: 554077 Northing 5181401	Decimal Degrees: Lat: Long: 	Degrees Minutes Seconds (latitude/longitude): Lat: ° ' "N Long: ° ' "W	
Site Location/Access Description: The lake was accessed to the west directly off of Highway 805 from a preexisting boat launch near local cottages. The North portion of the local was the primary focus of this study.			
Site Location Comments: Two gillnets (4" and 3.5") were deployed as depicted below in the site location map.			

SECTION B: SAMPLING INFORMATION			
Sampling Date: 31/08/2017	Sampling Start Time: (24 hour clock) 0945	Sampling End Time: (24 hour clock) 1300	
Water Temperature: (°C) 19.1	Time Taken: (24 hour clock) 1000	Air Temperature: (°C) 18.0	Time Taken: (24 hour clock) 0945
Survey Type: Non-Standard Sampling Presence/Absence Survey		Secchi Depth: (m)	
Gear Types: (select all that apply)		Survey Type/Gear Type Other Description:	
Angling Equipment: Yes	Dipnets: Eel Pots: Gillnets: Yes	- All fish caught by angling; 4" and 3.5" gillnet deployed	
Broadcast Nets:	Piscicide:		
Electrofishing Gear:	Trapnets:		
Fish Ladder:	Trawls:		
Fyke Nets:	Other:		
Minnnow Traps:			
Seine Net:			

SECTION C: ELECTROFISHING (if there was no electrofishing at this site, continue to Section D).			
Number of Electrofisher Seconds Fished: (seconds)	Voltage: (V)	Amperage: (A)	Frequency: (Hz)
Length of Site Electrofished: (m)	Mean Width of Site Surveyed: (m)		
Sampling/Electrofishing Comments:			

SECTION D: FISH, MUSSELS, CRAYFISH OR SNAILS CAPTURED (complete for each site)

Were fish, mussels, crayfish or snails captured at this site?: Yes *If yes, then record details below.

Species Common Name <small>Show: All Fish Species</small>	MNR Species Code	No. Caught	No. Kept	No. Live Release	Adult (y / n)	YOY (y / n)	Length: Fork		Bulk Weight (g)
							Smallest Size (mm)	Largest Size (mm)	
northern pike	131	4	4	0	y	n	412	582	3350
yellow perch	331	1	1	0	y	n	178	178	60
		0							
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Fish Captured Comments:
Each gillnet was deployed perpendicular from the shoreline and was allowed to fish for no longer than 1.5 hours. While gillnets were deployed, the surrounding area was angled. No fish were caught by the gill nets deployed, but rather all were obtained by angling. No bait was used during angling and all equipment was thoroughly disinfected following sampling.

Site Map(s): Insert site map(s) below

Map This Site

Paste Image From Clipboard

Insert Image From File

Remove Image



Add Blank Site Report	Copy Site Report	Delete Site Report	Printable Version	Clear
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Part 2: Site Collection Reports - Complete Part 2 for each site surveyed and for each day sampling occurred at a site even if no species were caught at a particular site. Use the buttons above to either add a new site report, copy the current report to a new report, or delete the site report. Attach a digital map of the site directly to the bottom of this form by either pasting a map from the clipboard or inserting a map image from a file.

SECTION A: SITE LOCATION INFORMATION			
Licence No.: 1087610	Survey Site # / Code: 17-5571-51800	Site Code Type: MNR Fish Online	
Waterbody Name: Tee Lake	Waterbody Type: Lake	Stream Permanency:	Watercress Present:
Township / Municipality / Territorial District Name: PARDO, GEOGRAPHIC TOWNSHIP OF			
Site Location: (fill in coordinates for either UTM, decimal degrees, or degrees minutes seconds)			
UTM (NAD 83): Zone: 17 Easting: 556588 Northing 5180412	Decimal Degrees: Lat: Long:	Degrees Minutes Seconds (latitude/longitude): Lat: ° Long: ° "N "W	
Site Location/Access Description: The Lake was accessed from the south-southwest by an unmarked former logging road. Two gill nets were deployed in the south-southwest lake boundary, as depicted below in the site location map. Four fish were caught by gillnets and one fish was caught by angling.			
Site Location Comments:			

SECTION B: SAMPLING INFORMATION			
Sampling Date: 30/08/2017	Sampling Start Time: (24 hour clock) 0830	Sampling End Time: (24 hour clock) 0300	
Water Temperature: (°C) 20.9	Time Taken: (24 hour clock) 1300	Air Temperature: (°C) 18.0	Time Taken: (24 hour clock) 0900
Survey Type:		Secchi Depth: (m)	
Gear Types: (select all that apply)		Survey Type/Gear Type Other Description:	
Angling Equipment: Yes	Dipnets: Yes	- A 3.5" and 4" gillnet was deployed.	
Broadcast Nets:	Eel Pots:		
Electrofishing Gear:	Gillnets: Yes		
Fish Ladder:	Piscicide:		
Fyke Nets:	Trapnets:		
Minnnow Traps:	Trawls:		
Seine Net:	Other:		

SECTION C: ELECTROFISHING (if there was no electrofishing at this site, continue to Section D).			
Number of Electrofisher	Voltage: (V)	Amperage: (A)	Frequency: (Hz)
Seconds Fished: (seconds)			
Length of Site Electrofished: (m)	Mean Width of Site Surveyed: (m)		
Sampling/Electrofishing Comments:			

SECTION D: FISH, MUSSELS, CRAYFISH OR SNAILS CAPTURED (complete for each site)

Were fish, mussels, crayfish or snails captured at this site?: Yes *If yes, then record details below.

Species Common Name <small>Show: All Fish Species</small>	MNR Species Code	No. Caught	No. Kept	No. Live Release	Adult (y / n)	YOY (y / n)	Length: Fork		Bulk Weight (g)
							Smallest Size (mm)	Largest Size (mm)	
pumpkinseed	311	3	1	2	y	n	141	146	90
white sucker	163	2	2	0	y	n	330	416	1190
walleye	334	1	1	0	y	n	431	431	730
smallmouth bass	316	2	1	1	y	y	263	263	210
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Fish Captured Comments:
 Each gillnet was deployed perpendicular to the shoreline and was checked every 1.5 hours for fish. No net was allowed to fish for longer than 1.5 hours. The area surrounding the nets were additionally angled. The 3.5" gillnet successfully caught the following fish: (1) white sucker; (1) small mouth bass. The 4" gillnet successful caught (1) walleye; and (1) white sucker. The remaining fish (4) rock bass and (2) small mouth bass were caught by angling using worm as bait. Only five fish were kept as part of this study, the remaining were released back into the waterbody.

Site Map(s): Insert site map(s) below

Map This Site

Paste Image From Clipboard

Insert Image From File

Remove Image



Appendix C

Laboratory Certificates of Analysis

**CLIENT NAME: DST CONSULTING ENGINEERS
885 REGENT SREET, UNIT 3-1B
SUDBURY, ON P3E5M4
(705) 523-6680**

ATTENTION TO: Michaela Haring

PROJECT: TS-NO-030045

AGAT WORK ORDER: 17T250722

WATER ANALYSIS REVIEWED BY: Mike Muneswar, BSc (Chem), Senior Inorganic Analyst

DATE REPORTED: Sep 01, 2017

PAGES (INCLUDING COVER): 8

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

*NOTES

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.



Certificate of Analysis

AGAT WORK ORDER: 17T250722

PROJECT: TS-NO-030045

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
<http://www.agatlabs.com>

CLIENT NAME: DST CONSULTING ENGINEERS

ATTENTION TO: Michaela Haring

SAMPLING SITE:

SAMPLED BY:

Surface Water Parameters

DATE RECEIVED: 2017-08-18

DATE REPORTED: 2017-08-24

Parameter	Unit	SAMPLE DESCRIPTION:		SW1	SW2	SW200	SW3	SWB1	SW4	
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	
		DATE SAMPLED:		2017-08-16	2017-08-16	2017-08-16	2017-08-16	2017-08-16	2017-08-16	
		G / S	RDL	8653850	RDL	8653889	8653933	8653957	8653971	8653984
Electrical Conductivity	uS/cm		2	21	2	57	57	34	<2	33
pH	pH Units	6.5-8.5	NA	6.00	NA	7.42	7.50	7.29	5.98	7.32
Total Hardness (as CaCO3)	mg/L		0.5	7.6	0.5	23.6	24.1	14.3	<0.5	13.7
Total Suspended Solids	mg/L		10	<10	10	<10	<10	<10	<10	<10
Alkalinity (as CaCO3)	mg/L		5	<5	5	18	17	9	<5	9
Bicarbonate (as CaCO3)	mg/L		5	<5	5	18	17	9	<5	9
Carbonate (as CaCO3)	mg/L		5	<5	5	<5	<5	<5	<5	<5
Chloride	mg/L		0.10	0.23	0.10	1.87	1.74	0.18	<0.10	0.19
Nitrate as N	mg/L		0.05	<0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrite as N	mg/L		0.05	<0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulphate	mg/L		0.10	4.27	0.10	5.33	5.33	3.82	<0.10	3.97
Ammonia as N	mg/L		0.02	0.03	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Ammonia-Un-ionized	mg/L	0.02	NA	0.000018	NA	NR	NR	NR	NR	NR
Total Phosphorus	mg/L	0.03	0.01	0.02	0.01	0.01	0.01	0.01	<0.01	0.02
Total Phosphorus, Dissolved	mg/L	0.03	0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Dissolved Organic Carbon	mg/L		1.0	8.9	0.5	6.1	6.0	7.3	<0.5	6.9
Calcium	mg/L		0.05	2.04	0.05	7.16	7.31	4.00	<0.05	3.83
Magnesium	mg/L		0.05	0.62	0.05	1.40	1.42	1.04	<0.05	1.00
Sodium	mg/L		0.05	0.65	0.05	0.93	0.94	0.75	<0.05	0.72
Potassium	mg/L		0.05	0.39	0.05	0.40	0.42	0.34	<0.05	0.29
Aluminum (dissolved)	mg/L	0.075	0.004	0.091	0.004	0.016	0.014	0.015	<0.004	0.013
Antimony	mg/L	0.020	0.003	<0.003	0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Arsenic	mg/L	0.1	0.003	<0.003	0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Barium	mg/L		0.002	0.006	0.002	0.004	0.004	0.004	<0.002	0.004
Beryllium	mg/L	0.011	0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Bismuth	mg/L		0.002	<0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Boron	mg/L	0.20	0.010	<0.010	0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Cadmium	mg/L	0.0002	0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	mg/L		0.003	<0.003	0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Cobalt	mg/L	0.0009	0.0005	0.0008	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Certified By:



Certificate of Analysis

AGAT WORK ORDER: 17T250722

PROJECT: TS-NO-030045

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
<http://www.agatlabs.com>

CLIENT NAME: DST CONSULTING ENGINEERS

ATTENTION TO: Michaela Haring

SAMPLING SITE:

SAMPLED BY:

Surface Water Parameters

DATE RECEIVED: 2017-08-18

DATE REPORTED: 2017-08-24

Parameter	Unit	SAMPLE DESCRIPTION:		SW1	SW2	SW200	SW3	SWB1	SW4	
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	
		DATE SAMPLED:		2017-08-16	2017-08-16	2017-08-16	2017-08-16	2017-08-16	2017-08-16	
		G / S	RDL	8653850	RDL	8653889	8653933	8653957	8653971	8653984
Copper	mg/L	0.005	0.001	0.002	0.001	0.001	0.001	0.001	<0.001	0.001
Iron	mg/L	0.3	0.01	0.05	0.01	0.03	0.03	0.02	<0.01	0.02
Lead	mg/L	0.005	0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	mg/L		0.002	0.017	0.002	0.007	0.007	0.004	<0.002	0.006
Dissolved Mercury	mg/L	0.0002	0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum	mg/L	0.04	0.002	<0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Nickel	mg/L	0.025	0.003	0.006	0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Selenium	mg/L	0.1	0.004	<0.004	0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Silicon	mg/L		0.05	0.45	0.05	1.45	1.47	1.04	<0.05	0.91
Silver	mg/L	0.0001	0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Strontium	mg/L		0.005	0.008	0.005	0.016	0.017	0.013	<0.005	0.013
Thallium	mg/L	0.0003	0.0003	<0.0003	0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Tin	mg/L		0.002	<0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Titanium	mg/L		0.002	<0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Uranium	mg/L	0.005	0.002	<0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Vanadium	mg/L	0.006	0.002	<0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Zinc	mg/L	0.02	0.005	0.007	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zirconium	mg/L	0.004	0.004	<0.004	0.004	<0.004	<0.004	<0.004	<0.004	<0.004

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to PWQO (mg/L)
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

8653850 The calculation of Un-ionized Ammonia was based on lab measured parameters (pH and temperature) rather than the field parameters, these were not provided to the lab. The temperature is recorded at the time of pH measurement. Values are reported as calculated.
For samples where the concentration of NH3-N is less than the MDL, Un-ionised Ammonia is reported as NR (Not Reportable).
Sample was prior to analysis for DOC; the RDL was adjusted to reflect the dilution.

8653889-8653984 The calculation of Un-ionized Ammonia was based on lab measured parameters (pH and temperature) rather than the field parameters, these were not provided to the lab. The temperature is recorded at the time of pH measurement. Values are reported as calculated.
For samples where the concentration of NH3-N is less than the MDL, Un-ionised Ammonia is reported as NR (Not Reportable).

Certified By:



Guideline Violation

AGAT WORK ORDER: 17T250722

PROJECT: TS-NO-030045

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
<http://www.agatlabs.com>

CLIENT NAME: DST CONSULTING ENGINEERS

ATTENTION TO: Michaela Haring

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
8653850	SW1	PWQO (mg/L)	Surface Water Parameters	Aluminum (dissolved)	mg/L	0.075	0.091
8653850	SW1	PWQO (mg/L)	Surface Water Parameters	pH	pH Units	6.5-8.5	6.00
8653971	SWB1	PWQO (mg/L)	Surface Water Parameters	pH	pH Units	6.5-8.5	5.98

Quality Assurance

CLIENT NAME: DST CONSULTING ENGINEERS
AGAT WORK ORDER: 17T250722
PROJECT: TS-NO-030045
ATTENTION TO: Michaela Haring
SAMPLING SITE:
SAMPLED BY:

Water Analysis															
RPT Date:			DUPLICATE				Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE		MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Measured Value		Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper

Surface Water Parameters

Electrical Conductivity	8651310		1130	1130	0.0%	< 2	104%	80%	120%	NA			NA	
pH	8651310		8.24	8.16	1.0%	NA	100%	90%	110%	NA			NA	
Total Suspended Solids	8653971	8653971	< 10	<10	NA	< 10	100%	80%	120%	NA			NA	
Alkalinity (as CaCO3)	8651310		494	497	0.6%	< 5	98%	80%	120%	NA			NA	
Bicarbonate (as CaCO3)	8651310		494	497	0.6%	< 5	NA			NA			NA	
Carbonate (as CaCO3)	8651310		<5	<5	NA	< 5	NA			NA			NA	
Chloride	8651394		24.3	24.0	1.2%	< 0.10	94%	90%	110%	108%	90%	110%	108%	80%
Nitrate as N	8651394		0.33	0.33	0.0%	< 0.05	95%	90%	110%	101%	90%	110%	105%	80%
Nitrite as N	8651394		<0.25	<0.25	NA	< 0.05	NA	90%	110%	106%	90%	110%	105%	80%
Sulphate	8651394		3.79	3.71	2.1%	< 0.10	92%	90%	110%	99%	90%	110%	100%	80%
Ammonia as N	8653889	8653889	< 0.02	<0.02	NA	< 0.02	100%	90%	110%	99%	90%	110%	95%	80%
Total Phosphorus	8653850	8653850	0.02	0.02	NA	< 0.01	98%	90%	110%	101%	90%	110%	100%	70%
Total Phosphorus, Dissolved	8653850	8653850	< 0.02	< 0.02	NA	< 0.02	96%	90%	110%	106%	90%	110%	100%	80%
Dissolved Organic Carbon	8653850	8653850	8.9	9.0	1.1%	< 0.5	110%	90%	110%	106%	90%	110%	95%	80%
Calcium	8644884		88.4	86.2	2.5%	< 0.05	103%	90%	110%	104%	90%	110%	108%	70%
Magnesium	8644884		52.3	51.1	2.3%	< 0.05	98%	90%	110%	98%	90%	110%	103%	70%
Sodium	8644884		190	184	3.2%	< 0.05	101%	90%	110%	100%	90%	110%	102%	70%
Potassium	8644884		13.2	12.7	3.9%	< 0.05	98%	90%	110%	97%	90%	110%	100%	70%
Aluminum (dissolved)	8653850	8653850	0.091	0.101	10.4%	< 0.004	100%	90%	110%	101%	90%	110%	89%	70%
Antimony	8653850	8653850	< 0.003	< 0.003	NA	< 0.003	94%	90%	110%	91%	90%	110%	87%	70%
Arsenic	8653850	8653850	< 0.003	< 0.003	NA	< 0.003	94%	90%	110%	96%	90%	110%	95%	70%
Barium	8653850	8653850	0.006	0.006	NA	< 0.002	101%	90%	110%	102%	90%	110%	96%	70%
Beryllium	8653850	8653850	< 0.001	< 0.001	NA	< 0.001	93%	90%	110%	97%	90%	110%	94%	70%
Bismuth	8653850	8653850	< 0.002	< 0.002	NA	< 0.002	103%	90%	110%	105%	90%	110%	101%	70%
Boron	8653850	8653850	< 0.010	< 0.010	NA	< 0.010	100%	90%	110%	101%	90%	110%	98%	70%
Cadmium	8653850	8653850	< 0.0001	< 0.0001	NA	< 0.0001	98%	90%	110%	103%	90%	110%	105%	70%
Chromium	8653850	8653850	< 0.003	< 0.003	NA	< 0.003	97%	90%	110%	98%	90%	110%	96%	70%
Cobalt	8653850	8653850	0.0008	0.0008	NA	< 0.0005	98%	90%	110%	99%	90%	110%	99%	70%
Copper	8653850	8653850	0.002	0.002	NA	< 0.001	101%	90%	110%	106%	90%	110%	102%	70%
Iron	8653850	8653850	0.05	0.05	0.0%	< 0.01	96%	90%	110%	95%	90%	110%	93%	70%
Lead	8653850	8653850	< 0.001	< 0.001	NA	< 0.001	100%	90%	110%	103%	90%	110%	100%	70%
Manganese	8653850	8653850	0.017	0.0164	3.6%	< 0.002	98%	90%	110%	101%	90%	110%	98%	70%
Dissolved Mercury	8654827		<0.0001	<0.0001	NA	< 0.0001	99%	90%	110%	99%	90%	110%	96%	70%
Molybdenum	8653850	8653850	< 0.002	< 0.002	NA	< 0.002	95%	90%	110%	98%	90%	110%	101%	70%
Nickel	8653850	8653850	0.006	0.006	NA	< 0.003	95%	90%	110%	100%	90%	110%	96%	70%
Selenium	8653850	8653850	< 0.004	< 0.004	NA	< 0.004	97%	90%	110%	100%	90%	110%	102%	70%
Silicon	8653850	8653850	0.45	0.44	2.2%	< 0.05	97%	90%	110%	99%	90%	110%	94%	70%
Silver	8653850	8653850	< 0.0001	< 0.0001	NA	< 0.0001	94%	90%	110%	110%	90%	110%	114%	70%
Strontium	8653850	8653850	0.008	0.008	NA	< 0.005	99%	90%	110%	102%	90%	110%	97%	70%

Quality Assurance

CLIENT NAME: DST CONSULTING ENGINEERS
PROJECT: TS-NO-030045
SAMPLING SITE:

AGAT WORK ORDER: 17T250722
ATTENTION TO: Michaela Haring
SAMPLED BY:

Water Analysis (Continued)

RPT Date:			DUPLICATE				Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Measured Value		Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits		
								Lower	Upper		Lower	Upper		Lower	Upper	
Thallium	8653850	8653850	< 0.0003	< 0.0003	NA	< 0.0003	103%	90%	110%	108%	90%	110%	102%	70%	130%	
Tin	8653850	8653850	< 0.002	< 0.002	NA	< 0.002	97%	90%	110%	98%	90%	110%	98%	70%	130%	
Titanium	8653850	8653850	< 0.002	< 0.002	NA	< 0.002	95%	90%	110%	99%	90%	110%	96%	70%	130%	
Uranium	8653850	8653850	< 0.002	< 0.002	NA	< 0.002	100%	90%	110%	100%	90%	110%	97%	70%	130%	
Vanadium	8653850	8653850	< 0.002	< 0.002	NA	< 0.002	94%	90%	110%	96%	90%	110%	95%	70%	130%	
Zinc	8653850	8653850	0.007	0.007	NA	< 0.005	97%	90%	110%	104%	90%	110%	101%	70%	130%	
Zirconium	8653850	8653850	< 0.004	< 0.004	NA	< 0.004	94%	90%	110%	94%	90%	110%	88%	70%	130%	

Comments: NA signifies Not Applicable.

Duplicate Qualifier: As the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Certified By: _____



Method Summary

CLIENT NAME: DST CONSULTING ENGINEERS
AGAT WORK ORDER: 17T250722
PROJECT: TS-NO-030045
ATTENTION TO: Michaela Haring
SAMPLING SITE:
SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Analysis			
Electrical Conductivity	INOR-93-6000	SM 2510 B	PC TITRATE
pH	INOR-93-6000	SM 4500-H+ B	PC TITRATE
Total Hardness (as CaCO ₃)	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Total Suspended Solids	INOR-93-6028	SM 2540 D	BALANCE
Alkalinity (as CaCO ₃)	INOR-93-6000	SM 2320 B	PC TITRATE
Bicarbonate (as CaCO ₃)	INOR-93-6000	SM 2320 B	PC TITRATE
Carbonate (as CaCO ₃)	INOR-93-6000	SM 2320 B	PC TITRATE
Chloride	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Nitrate as N	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Nitrite as N	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Sulphate	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Ammonia as N	INOR-93-6059	QuikChem 10-107-06-1-J & SM 4500 NH ₃ -F	LACHAT FIA
Ammonia-Un-ionized		MOE REFERENCE, PWQOs Tab 2	CALCULATION
Total Phosphorus	INOR-93-6022	SM 4500-P B&E	SPECTROPHOTOMETER
Total Phosphorus, Dissolved	INOR-93-6022	SM 4500-P B&E	SPECTROPHOTOMETER
Dissolved Organic Carbon	INOR-93-6049	EPA 415.1 & SM 5310 B	SHIMADZU CARBON ANALYZER
Calcium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Magnesium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Sodium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Potassium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Aluminum (dissolved)	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Antimony	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Arsenic	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Barium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Beryllium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Bismuth	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Boron	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Cadmium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Chromium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Cobalt	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Copper	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Iron	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Lead	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Manganese	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Dissolved Mercury	MET-93-6100	EPA SW 846 7470 & 245.1	CVAAS
Molybdenum	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Nickel	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Selenium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Silicon	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Silver	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Strontium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Thallium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Tin	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Titanium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Uranium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Vanadium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Zinc	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Zirconium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS



17T250722

2Lc

LABORATORY USE ONLY

Arrival Condition: Good Poor (complete "Notes")
Arrival Temperature: 18899' 2 878583
AGAT Job Number: _____
Notes: _____

CHAIN OF CUSTODY RECORD

Client Information

Company: DST Consulting Engineers Inc.

Contact: Michaela Haring

Address: 885 Regent St.
Sudbury Ontario P3E 5M4

Phone: 705-523-6680 Fax: _____

PO#: _____

Client Project #: TS-NO-030045

AGAT Quotation #: 177549

Report Information

1. Name: Michaela Haring
Email: mharing@dstgroup.com

2. Name: Laura Ritchie
Email: lritchie@dstgroup.com

3. Name: _____
Email: _____

4. Name: _____
Email: _____

Report Format
(Please "x" those that apply)

Single sample per page

Multiple samples per page

Results by Fax

Turnaround Time (TAT)*
(Please "x" the applicable box below)

Regular TAT:
 5 to 7 working days

Rush TAT (Rush Surcharges Apply):

3 to 5 days
 48 to 72 hours
 24 to 48 hours

Date Required (Rush surcharges may apply)

Regulatory Guideline Required: (Please "x" those that apply)

Reg 153 Table (indicate one) Sewer Use PWQO

Ind/Com Region Reg 558

Res/Park (Indicate one) CCME

Ag Sanitary Other (indicate)

Med/Fine Coarse Storm

Is this a drinking water sample (potable water intended for human consumption)?
 Yes No

If "Yes" please use the Drinking Water Chain of Custody Record

ALK, PH, COND	Bicarb, Carbonate	Ammonia, unionized NH3	T Phos, dissolved TP	low level TSS, DOC	Hardness	Cl, NO2, NO3, SO4	CA, MG, Na, K	Metals full scan	Dissolved AL and HG										
---------------	-------------------	------------------------	----------------------	--------------------	----------	-------------------	---------------	------------------	---------------------	--	--	--	--	--	--	--	--	--	--

Sample Identification	Date Sampled	Time Sampled	Sample Matrix	# of Containers	Comments - Site/Sample Info, Sample Containment	ALK, PH, COND	Bicarb, Carbonate	Ammonia, unionized NH3	T Phos, dissolved TP	low level TSS, DOC	Hardness	Cl, NO2, NO3, SO4	CA, MG, Na, K	Metals full scan	Dissolved AL and HG				
SW1	Aug 16-17	1130 a.m.	SW	8	3 samples were NOT for ALI, filtered	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
SW2	↑	1215 p.m.	↑	1		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
SW200	↑	1230 p.m.	↑	1		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
SW3	↑	2:30 p.m.	↓	↓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
SWB1	↓	3:00 p.m.	↓	↓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
SW4	Aug 16-17	4:30 p.m.	SW	8		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				

TOTAL # OF CONTAINERS 0 * Samples received after 2:00 PM will be logged in for the next business day. TAT is exclusive of weekends and statutory holidays.

Sample Relinquished By (print name & sign) <u>M. Haring</u>	Date/Time <u>12:30 Aug 17-17</u>	Samples Received By (print name and sign) <u>Holly Sands</u>	Date/Time <u>17 AUG 17 1200</u>	Special Instructions <u>1200</u>
Sample Relinquished By (print name & sign)	Date/Time	Samples Received By (print name and sign) <u>Sima Z</u>	Date/Time <u>17/8/18 951</u>	



CLIENT NAME: DST CONSULTING ENGINEERS
82 RICHMOND ST. EAST
TORONTO, ON M5C 1P1
416-214-5952

ATTENTION TO: Michaela Haring

PROJECT: TS-NO-030045

AGAT WORK ORDER: 17T250722

WATER ANALYSIS REVIEWED BY: Mike Muneswar, BSc (Chem), Senior Inorganic Analyst

DATE REPORTED: Sep 01, 2017

PAGES (INCLUDING COVER): 8

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

*NOTES

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.



Certificate of Analysis

AGAT WORK ORDER: 17T250722

PROJECT: TS-NO-030045

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
<http://www.agatlabs.com>

CLIENT NAME: DST CONSULTING ENGINEERS

ATTENTION TO: Michaela Haring

SAMPLING SITE:

SAMPLED BY:

Surface Water Parameters

DATE RECEIVED: 2017-08-18

DATE REPORTED: 2017-09-01

Parameter	Unit	SAMPLE DESCRIPTION:		SW1	SW2	SW200	SW3	SW4	
		SAMPLE TYPE:		Water	Water	Water	Water	Water	
		DATE SAMPLED:		2017-08-16	2017-08-16	2017-08-16	2017-08-16	2017-08-16	
		G / S	RDL	8653850	RDL	8653889	8653933	8653957	8653984
Electrical Conductivity	uS/cm		2	21	2	57	57	34	33
pH	pH Units	6.5-8.5	NA	6.00	NA	7.42	7.50	7.29	7.32
Total Hardness (as CaCO3)	mg/L		0.5	7.6	0.5	23.6	24.1	14.3	13.7
Total Suspended Solids	mg/L		10	<10	10	<10	<10	<10	<10
Alkalinity (as CaCO3)	mg/L		5	<5	5	18	17	9	9
Bicarbonate (as CaCO3)	mg/L		5	<5	5	18	17	9	9
Carbonate (as CaCO3)	mg/L		5	<5	5	<5	<5	<5	<5
Chloride	mg/L		0.10	0.23	0.10	1.87	1.74	0.18	0.19
Nitrate as N	mg/L		0.05	<0.05	0.05	<0.05	<0.05	<0.05	<0.05
Nitrite as N	mg/L		0.05	<0.05	0.05	<0.05	<0.05	<0.05	<0.05
Sulphate	mg/L		0.10	4.27	0.10	5.33	5.33	3.82	3.97
Ammonia as N	mg/L		0.02	0.03	0.02	<0.02	<0.02	<0.02	<0.02
Ammonia-Un-ionized	mg/L	0.02	NA	0.000018	NA	NR	NR	NR	NR
Total Phosphorus	mg/L	0.030	0.01	0.02	0.01	0.01	0.01	0.01	0.02
Total Phosphorus, Dissolved	mg/L	0.030	0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02
Dissolved Organic Carbon	mg/L		1.0	8.9	0.5	6.1	6.0	7.3	6.9
Calcium	mg/L		0.05	2.04	0.05	7.16	7.31	4.00	3.83
Magnesium	mg/L		0.05	0.62	0.05	1.40	1.42	1.04	1.00
Sodium	mg/L		0.05	0.65	0.05	0.93	0.94	0.75	0.72
Potassium	mg/L		0.05	0.39	0.05	0.40	0.42	0.34	0.29
Aluminum (dissolved)	mg/L	0.075	0.004	0.091	0.004	0.016	0.014	0.015	0.013
Antimony	mg/L	0.020	0.003	<0.003	0.003	<0.003	<0.003	<0.003	<0.003
Arsenic	mg/L	0.1	0.003	<0.003	0.003	<0.003	<0.003	<0.003	<0.003
Barium	mg/L		0.002	0.006	0.002	0.004	0.004	0.004	0.004
Beryllium	mg/L	0.011	0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001
Bismuth	mg/L		0.002	<0.002	0.002	<0.002	<0.002	<0.002	<0.002
Boron	mg/L	0.20	0.010	<0.010	0.010	<0.010	<0.010	<0.010	<0.010
Cadmium	mg/L	0.0002	0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	mg/L		0.003	<0.003	0.003	<0.003	<0.003	<0.003	<0.003
Cobalt	mg/L	0.0009	0.0005	0.0008	0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Certified By:



Certificate of Analysis

AGAT WORK ORDER: 17T250722

PROJECT: TS-NO-030045

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
<http://www.agatlabs.com>

CLIENT NAME: DST CONSULTING ENGINEERS

ATTENTION TO: Michaela Haring

SAMPLING SITE:

SAMPLED BY:

Surface Water Parameters

DATE RECEIVED: 2017-08-18

DATE REPORTED: 2017-09-01

Parameter	Unit	SAMPLE DESCRIPTION:		SW1	SW2	SW200	SW3	SW4	
		SAMPLE TYPE:		Water	Water	Water	Water	Water	
		DATE SAMPLED:		2017-08-16	2017-08-16	2017-08-16	2017-08-16	2017-08-16	
		G / S	RDL	8653850	RDL	8653889	8653933	8653957	8653984
Copper	mg/L	0.005	0.001	0.002	0.001	0.001	0.001	0.001	0.001
Iron	mg/L	0.3	0.01	0.05	0.01	0.03	0.03	0.02	0.02
Lead	mg/L	0.005	0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001
Manganese	mg/L		0.002	0.017	0.002	0.007	0.007	0.004	0.006
Dissolved Mercury	mg/L	0.0002	0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum	mg/L	0.04	0.002	<0.002	0.002	<0.002	<0.002	<0.002	<0.002
Nickel	mg/L	0.025	0.003	0.006	0.003	<0.003	<0.003	<0.003	<0.003
Selenium	mg/L	0.1	0.004	<0.004	0.004	<0.004	<0.004	<0.004	<0.004
Silicon	mg/L		0.05	0.45	0.05	1.45	1.47	1.04	0.91
Silver	mg/L	0.0001	0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Strontium	mg/L		0.005	0.008	0.005	0.016	0.017	0.013	0.013
Thallium	mg/L	0.0003	0.0003	<0.0003	0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Tin	mg/L		0.002	<0.002	0.002	<0.002	<0.002	<0.002	<0.002
Titanium	mg/L		0.002	<0.002	0.002	<0.002	<0.002	<0.002	<0.002
Uranium	mg/L	0.005	0.002	<0.002	0.002	<0.002	<0.002	<0.002	<0.002
Vanadium	mg/L	0.006	0.002	<0.002	0.002	<0.002	<0.002	<0.002	<0.002
Zinc	mg/L	0.02	0.005	0.007	0.005	<0.005	<0.005	<0.005	<0.005
Zirconium	mg/L	0.004	0.004	<0.004	0.004	<0.004	<0.004	<0.004	<0.004

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to PWQO (mg/L)
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

8653850 The calculation of Un-ionized Ammonia was based on lab measured parameters (pH and temperature) rather than the field parameters, these were not provided to the lab. The temperature is recorded at the time of pH measurement. Values are reported as calculated.
For samples where the concentration of NH3-N is less than the MDL, Un-ionised Ammonia is reported as NR (Not Reportable).
Sample was prior to analysis for DOC; the RDL was adjusted to reflect the dilution.

8653889-8653984 The calculation of Un-ionized Ammonia was based on lab measured parameters (pH and temperature) rather than the field parameters, these were not provided to the lab. The temperature is recorded at the time of pH measurement. Values are reported as calculated.
For samples where the concentration of NH3-N is less than the MDL, Un-ionised Ammonia is reported as NR (Not Reportable).

Certified By:



Guideline Violation

AGAT WORK ORDER: 17T250722

PROJECT: TS-NO-030045

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
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<http://www.agatlabs.com>

CLIENT NAME: DST CONSULTING ENGINEERS

ATTENTION TO: Michaela Haring

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
8653850	SW1	ON PWQO (mg/L)	Surface Water Parameters	Aluminum (dissolved)	mg/L	0.075	0.091
8653850	SW1	ON PWQO (mg/L)	Surface Water Parameters	pH	pH Units	6.5-8.5	6.00

Quality Assurance

CLIENT NAME: DST CONSULTING ENGINEERS
 PROJECT: TS-NO-030045
 SAMPLING SITE:

AGAT WORK ORDER: 17T250722
 ATTENTION TO: Michaela Haring
 SAMPLED BY:

Water Analysis															
RPT Date: Sep 01, 2017			DUPLICATE				Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE		MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Measured Value		Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper

Surface Water Parameters

Electrical Conductivity	8651310		1130	1130	0.0%	< 2	104%	80%	120%	NA			NA		
pH	8651310		8.24	8.16	1.0%	NA	100%	90%	110%	NA			NA		
Total Suspended Solids	8653971	8653971	< 10	<10	NA	< 10	100%	80%	120%	NA			NA		
Alkalinity (as CaCO3)	8651310		494	497	0.6%	< 5	98%	80%	120%	NA			NA		
Bicarbonate (as CaCO3)	8651310		494	497	0.6%	< 5	NA			NA			NA		
Carbonate (as CaCO3)	8651310		<5	<5	NA	< 5	NA			NA			NA		
Chloride	8651394		24.3	24.0	1.2%	< 0.10	94%	90%	110%	108%	90%	110%	108%	80%	120%
Nitrate as N	8651394		0.33	0.33	0.0%	< 0.05	95%	90%	110%	101%	90%	110%	105%	80%	120%
Nitrite as N	8651394		<0.25	<0.25	NA	< 0.05	NA	90%	110%	106%	90%	110%	105%	80%	120%
Sulphate	8651394		3.79	3.71	2.1%	< 0.10	92%	90%	110%	99%	90%	110%	100%	80%	120%
Ammonia as N	8653889	8653889	< 0.02	<0.02	NA	< 0.02	100%	90%	110%	99%	90%	110%	95%	80%	120%
Total Phosphorus	8653850	8653850	0.02	0.02	NA	< 0.01	98%	90%	110%	101%	90%	110%	100%	70%	130%
Total Phosphorus, Dissolved	8653850	8653850	< 0.02	< 0.02	NA	< 0.02	96%	90%	110%	106%	90%	110%	100%	80%	120%
Dissolved Organic Carbon	8653850	8653850	8.9	9.0	1.1%	< 0.5	110%	90%	110%	106%	90%	110%	95%	80%	120%
Calcium	8644884		88.4	86.2	2.5%	< 0.05	103%	90%	110%	104%	90%	110%	108%	70%	130%
Magnesium	8644884		52.3	51.1	2.3%	< 0.05	98%	90%	110%	98%	90%	110%	103%	70%	130%
Sodium	8644884		190	184	3.2%	< 0.05	101%	90%	110%	100%	90%	110%	102%	70%	130%
Potassium	8644884		13.2	12.7	3.9%	< 0.05	98%	90%	110%	97%	90%	110%	100%	70%	130%
Aluminum (dissolved)	8653850	8653850	0.091	0.101	10.4%	< 0.004	100%	90%	110%	101%	90%	110%	89%	70%	130%
Antimony	8653850	8653850	< 0.003	< 0.003	NA	< 0.003	94%	90%	110%	91%	90%	110%	87%	70%	130%
Arsenic	8653850	8653850	< 0.003	< 0.003	NA	< 0.003	94%	90%	110%	96%	90%	110%	95%	70%	130%
Barium	8653850	8653850	0.006	0.006	NA	< 0.002	101%	90%	110%	102%	90%	110%	96%	70%	130%
Beryllium	8653850	8653850	< 0.001	< 0.001	NA	< 0.001	93%	90%	110%	97%	90%	110%	94%	70%	130%
Bismuth	8653850	8653850	< 0.002	< 0.002	NA	< 0.002	103%	90%	110%	105%	90%	110%	101%	70%	130%
Boron	8653850	8653850	< 0.010	< 0.010	NA	< 0.010	100%	90%	110%	101%	90%	110%	98%	70%	130%
Cadmium	8653850	8653850	< 0.0001	< 0.0001	NA	< 0.0001	98%	90%	110%	103%	90%	110%	105%	70%	130%
Chromium	8653850	8653850	< 0.003	< 0.003	NA	< 0.003	97%	90%	110%	98%	90%	110%	96%	70%	130%
Cobalt	8653850	8653850	0.0008	0.0008	NA	< 0.0005	98%	90%	110%	99%	90%	110%	99%	70%	130%
Copper	8653850	8653850	0.002	0.002	NA	< 0.001	101%	90%	110%	106%	90%	110%	102%	70%	130%
Iron	8653850	8653850	0.05	0.05	0.0%	< 0.01	96%	90%	110%	95%	90%	110%	93%	70%	130%
Lead	8653850	8653850	< 0.001	< 0.001	NA	< 0.001	100%	90%	110%	103%	90%	110%	100%	70%	130%
Manganese	8653850	8653850	0.017	0.0164	3.6%	< 0.002	98%	90%	110%	101%	90%	110%	98%	70%	130%
Dissolved Mercury	8654827		<0.0001	<0.0001	NA	< 0.0001	99%	90%	110%	99%	90%	110%	96%	70%	130%
Molybdenum	8653850	8653850	< 0.002	< 0.002	NA	< 0.002	95%	90%	110%	98%	90%	110%	101%	70%	130%
Nickel	8653850	8653850	0.006	0.006	NA	< 0.003	95%	90%	110%	100%	90%	110%	96%	70%	130%
Selenium	8653850	8653850	< 0.004	< 0.004	NA	< 0.004	97%	90%	110%	100%	90%	110%	102%	70%	130%
Silicon	8653850	8653850	0.45	0.44	2.2%	< 0.05	97%	90%	110%	99%	90%	110%	94%	70%	130%
Silver	8653850	8653850	< 0.0001	< 0.0001	NA	< 0.0001	94%	90%	110%	110%	90%	110%	114%	70%	130%
Strontium	8653850	8653850	0.008	0.008	NA	< 0.005	99%	90%	110%	102%	90%	110%	97%	70%	130%



Quality Assurance

CLIENT NAME: DST CONSULTING ENGINEERS
 PROJECT: TS-NO-030045
 SAMPLING SITE:

AGAT WORK ORDER: 17T250722
 ATTENTION TO: Michaela Haring
 SAMPLED BY:

Water Analysis (Continued)

RPT Date: Sep 01, 2017			DUPLICATE				Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Measured Value		Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits		
								Lower	Upper		Lower	Upper		Lower	Upper	
Thallium	8653850	8653850	< 0.0003	< 0.0003	NA	< 0.0003	103%	90%	110%	108%	90%	110%	102%	70%	130%	
Tin	8653850	8653850	< 0.002	< 0.002	NA	< 0.002	97%	90%	110%	98%	90%	110%	98%	70%	130%	
Titanium	8653850	8653850	< 0.002	< 0.002	NA	< 0.002	95%	90%	110%	99%	90%	110%	96%	70%	130%	
Uranium	8653850	8653850	< 0.002	< 0.002	NA	< 0.002	100%	90%	110%	100%	90%	110%	97%	70%	130%	
Vanadium	8653850	8653850	< 0.002	< 0.002	NA	< 0.002	94%	90%	110%	96%	90%	110%	95%	70%	130%	
Zinc	8653850	8653850	0.007	0.007	NA	< 0.005	97%	90%	110%	104%	90%	110%	101%	70%	130%	
Zirconium	8653850	8653850	< 0.004	< 0.004	NA	< 0.004	94%	90%	110%	94%	90%	110%	88%	70%	130%	

Comments: NA signifies Not Applicable.

Duplicate Qualifier: As the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Certified By: _____

Method Summary

CLIENT NAME: DST CONSULTING ENGINEERS
AGAT WORK ORDER: 17T250722
PROJECT: TS-NO-030045
ATTENTION TO: Michaela Haring
SAMPLING SITE:
SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Analysis			
Electrical Conductivity	INOR-93-6000	SM 2510 B	PC TITRATE
pH	INOR-93-6000	SM 4500-H+ B	PC TITRATE
Total Hardness (as CaCO ₃)	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Total Suspended Solids	INOR-93-6028	SM 2540 D	BALANCE
Alkalinity (as CaCO ₃)	INOR-93-6000	SM 2320 B	PC TITRATE
Bicarbonate (as CaCO ₃)	INOR-93-6000	SM 2320 B	PC TITRATE
Carbonate (as CaCO ₃)	INOR-93-6000	SM 2320 B	PC TITRATE
Chloride	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Nitrate as N	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Nitrite as N	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Sulphate	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Ammonia as N	INOR-93-6059	QuikChem 10-107-06-1-J & SM 4500 NH ₃ -F	LACHAT FIA
Ammonia-Un-ionized		MOE REFERENCE, PWQOs Tab 2	CALCULATION
Total Phosphorus	INOR-93-6022	SM 4500-P B&E	SPECTROPHOTOMETER
Total Phosphorus, Dissolved	INOR-93-6022	SM 4500-P B&E	SPECTROPHOTOMETER
Dissolved Organic Carbon	INOR-93-6049	EPA 415.1 & SM 5310 B	SHIMADZU CARBON ANALYZER
Calcium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Magnesium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Sodium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Potassium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Aluminum (dissolved)	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Antimony	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Arsenic	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Barium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Beryllium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Bismuth	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Boron	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Cadmium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Chromium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Cobalt	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Copper	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Iron	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Lead	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Manganese	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Dissolved Mercury	MET-93-6100	EPA SW 846 7470 & 245.1	CVAAS
Molybdenum	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Nickel	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Selenium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Silicon	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Silver	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Strontium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Thallium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Tin	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Titanium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Uranium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Vanadium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Zinc	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Zirconium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS



17T250722

2Lc

LABORATORY USE ONLY

Arrival Condition: Good Poor (complete "Notes")
Arrival Temperature: 18899' 2 878583
AGAT Job Number: _____
Notes: _____

CHAIN OF CUSTODY RECORD

Client Information

Company: DST Consulting Engineers Inc.

Contact: Michaela Haring

Address: 885 Regent St.
Sudbury Ontario P3E 5M4

Phone: 705-523-6680 Fax: _____

PO#: _____

Client Project #: TS-NO-030045

AGAT Quotation #: 177549

Report Information

1. Name: Michaela Haring
Email: mharing@dstgroup.com

2. Name: Laura Ritchie
Email: lritchie@dstgroup.com

3. Name: _____
Email: _____

4. Name: _____
Email: _____

Report Format
(Please "x" those that apply)

Single sample per page

Multiple samples per page

Results by Fax

Turnaround Time (TAT)*
(Please "x" the applicable box below)

Regular TAT:
 5 to 7 working days

Rush TAT (Rush Surcharges Apply):
 3 to 5 days
 48 to 72 hours
 24 to 48 hours

Date Required (Rush surcharges may apply)

Regulatory Guideline Required: (Please "x" those that apply)

Reg 153 Table (indicate one) Sewer Use PWQO

Ind/Com Region Reg 558

Res/Park (indicate one) CCME

Ag Sanitary Other (indicate)

Med/Fine Coarse Storm

Is this a drinking water sample (potable water intended for human consumption)?
 Yes No

If "Yes" please use the Drinking Water Chain of Custody Record

ALK, PH, COND	Bicarb, Carbonate	Ammonia, unionized NH3	T Phos, dissolved TP	low level TSS, DOC	Hardness	Cl, NO2, NO3, SO4	CA, MG, Na, K	Metals full scan	Dissolved AL and HG											
---------------	-------------------	------------------------	----------------------	--------------------	----------	-------------------	---------------	------------------	---------------------	--	--	--	--	--	--	--	--	--	--	--

Sample Identification	Date Sampled	Time Sampled	Sample Matrix	# of Containers	Comments - Site/Sample Info, Sample Containment	ALK, PH, COND	Bicarb, Carbonate	Ammonia, unionized NH3	T Phos, dissolved TP	low level TSS, DOC	Hardness	Cl, NO2, NO3, SO4	CA, MG, Na, K	Metals full scan	Dissolved AL and HG						
SW1	Aug 16-17	1130 a.m.	SW	8	Samples were	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓						
SW2	↑	1215 p.m.	↑	1	NOT FOR CL, PH, COND	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓						
SW200	↑	1230 p.m.	↑	1		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓						
SW3	↓	2:30 p.m.	↓	1		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓						
SWB1	↓	3:00 p.m.	↓	1		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓						
SW4	Aug 16-17	4:30 p.m.	SW	8		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓						

TOTAL # OF CONTAINERS 0 * Samples received after 2:00 PM will be logged in for the next business day. TAT is exclusive of weekends and statutory holidays.

Sample Relinquished By (print name & sign) <u>M. Haring</u>	Date/Time <u>12:15 p.m. Aug 17-17</u>	Samples Received By (print name and sign) <u>Holly Sands</u>	Date/Time <u>17 AUG 17 1200</u>	Special Instructions <u>1200</u>
Sample Relinquished By (print name & sign)	Date/Time	Samples Received By (print name and sign) <u>Sima Z</u>	Date/Time <u>17/8/18 951</u>	



CLIENT NAME: DST CONSULTING ENGINEERS
885 REGENT SREET, UNIT 3-1B
SUDBURY, ON P3E5M4
(705) 523-6680

ATTENTION TO: LAURA RITCHIE

PROJECT: TS-NO-030045

AGAT WORK ORDER: 17U258529

MISCELLANEOUS ANALYSIS REVIEWED BY: Milithza Silva, Analytical Supervisor (M.Sc. in Analytical Chemistry)

DATE REPORTED: Oct 03, 2017

PAGES (INCLUDING COVER): 6

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

*NOTES

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.



Certificate of Analysis

AGAT WORK ORDER: 17U258529

PROJECT: TS-NO-030045

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
<http://www.agatlabs.com>

CLIENT NAME: DST CONSULTING ENGINEERS

ATTENTION TO: LAURA RITCHIE

SAMPLING SITE:

SAMPLED BY:

Metals Scan + Cations (Tissue)

DATE RECEIVED: 2017-09-07

DATE REPORTED: 2017-09-18

Parameter	Unit	SAMPLE DESCRIPTION:		WALLY#1	WS#1	WS#2	RB#1	SM#1	NP#1	NP#2	NP#3
		SAMPLE TYPE:		Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue
		DATE SAMPLED:		2017-08-30	2017-08-30	2017-08-30	2017-08-30	2017-08-30	2017-08-30	2017-08-31	2017-08-31
		G / S	RDL	8704887	8704889	8704890	8704891	8704892	8704893	8704894	8704895
Aluminum	µg/g	5.0	<5.0	<5.0	25.3	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Antimony	µg/g	0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Arsenic	µg/g	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	1.5	<0.1	<0.1	<0.1
Cadmium	µg/g	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.02	<0.02
Calcium	µg/g	100	7490	172	242	6790	2930	2250	2580	3790	
Chromium	µg/g	0.6	0.7	<0.6	<0.6	<0.6	0.6	<0.6	<0.6	<0.6	
Cobalt	µg/g	0.3	<0.3	<0.3	<0.3	<0.3	0.3	<0.3	<0.3	<0.3	
Copper	µg/g	0.3	9.9	1.1	1.8	0.8	2.1	0.5	0.4	0.6	
Iron	µg/g	50	<50	<50	55	<50	<50	<50	<50	<50	
Lead	µg/g	0.1	0.2	<0.1	<0.1	<0.1	0.4	<0.1	<0.1	<0.1	
Lithium	µg/g	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Magnesium	µg/g	100	424	363	321	412	380	386	430	428	
Manganese	µg/g	1.0	2.1	<1.0	1.7	1.2	1.1	1.0	1.8	2.5	
Mercury	µg/g	0.01	0.56	0.02	0.07	0.03	0.15	0.04	0.16	0.17	
Molybdenum	µg/g	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Nickel	µg/g	1	<1	<1	<1	<1	<1	<1	<1	<1	
Phosphorus	µg/g	50	6290	2440	2390	5760	4140	4110	4480	4400	
Potassium	µg/g	100	3990	4450	4550	3730	4410	4560	4600	4190	
Selenium	µg/g	0.4	0.5	0.6	0.6	0.7	2.1	0.5	0.7	0.7	
Silver	µg/g	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
Sodium	µg/g	100	520	333	373	692	517	490	440	548	
Strontium	µg/g	5	<5	<5	<5	7	<5	<5	<5	<5	
Tin	µg/g	1	<1	<1	<1	<1	<1	<1	<1	<1	
Uranium	µg/g	0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
Vanadium	µg/g	0.4	<0.4	<0.4	<0.4	<0.4	0.4	<0.4	<0.4	<0.4	
Zinc	µg/g	0.1	13.3	41.3	10.1	12.5	9.6	12.8	10.8	16.2	

Certified By:

Militiyya O. Silva



Certificate of Analysis

AGAT WORK ORDER: 17U258529

PROJECT: TS-NO-030045

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
<http://www.agatlabs.com>

CLIENT NAME: DST CONSULTING ENGINEERS

ATTENTION TO: LAURA RITCHIE

SAMPLING SITE:

SAMPLED BY:

Metals Scan + Cations (Tissue)

DATE RECEIVED: 2017-09-07

DATE REPORTED: 2017-09-18

Parameter	Unit	SAMPLE DESCRIPTION:		NP#4	YP#1
		SAMPLE TYPE:		Tissue	Tissue
		DATE SAMPLED:		2017-08-31	2017-08-31
		G / S	RDL	8704896	8704900
Aluminum	µg/g		5.0	<5.0	<5.0
Antimony	µg/g		0.8	<0.8	<0.8
Arsenic	µg/g		0.1	<0.1	<0.1
Cadmium	µg/g		0.02	<0.02	<0.02
Calcium	µg/g		100	1320	6390
Chromium	µg/g		0.6	<0.6	<0.6
Cobalt	µg/g		0.3	<0.3	<0.3
Copper	µg/g		0.3	0.5	0.7
Iron	µg/g		50	<50	<50
Lead	µg/g		0.1	<0.1	<0.1
Lithium	µg/g		0.5	<0.5	<0.5
Magnesium	µg/g		100	361	438
Manganese	µg/g		1.0	1.5	2.5
Mercury	µg/g		0.01	0.25	0.20
Molybdenum	µg/g		0.5	<0.5	<0.5
Nickel	µg/g		1	<1	<1
Phosphorus	µg/g		50	2790	6090
Potassium	µg/g		100	4460	4360
Selenium	µg/g		0.4	0.6	0.6
Silver	µg/g		0.2	<0.2	<0.2
Sodium	µg/g		100	448	696
Strontium	µg/g		5	<5	<5
Tin	µg/g		1	<1	<1
Uranium	µg/g		0.50	<0.50	<0.50
Vanadium	µg/g		0.4	<0.4	<0.4
Zinc	µg/g		0.1	17.0	14.0

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Certified By:

Militiyya O. Silva

Quality Assurance

 CLIENT NAME: DST CONSULTING ENGINEERS
 PROJECT: TS-NO-030045
 SAMPLING SITE:

 AGAT WORK ORDER: 17U258529
 ATTENTION TO: LAURA RITCHIE
 SAMPLED BY:

Miscellaneous Analysis															
RPT Date:			DUPLICATE				Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE		MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Measured Value		Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper

Metals Scan + Cations (Tissue)															
Aluminum	8704887	8704887	<5.0	<5.0	NA	< 5.0	107%	70%	130%	112%	80%	120%	105%	70%	130%
Antimony	8704887	8704887	<0.8	<0.8	NA	< 0.8	101%	70%	130%	100%	80%	120%	101%	70%	130%
Arsenic	8704887	8704887	<0.1	<0.1	NA	< 0.1	100%	70%	130%	104%	80%	120%	106%	70%	130%
Cadmium	8704887	8704887	<0.02	<0.02	NA	< 0.02	100%	70%	130%	101%	80%	120%	121%	70%	130%
Calcium	8704887	8704887	7490	3310	77.3%	< 10	97%	70%	130%	103%	80%	120%	103%	70%	130%
Chromium	8704887	8704887	0.7	0.7	NA	< 0.6	99%	70%	130%	105%	80%	120%	104%	70%	130%
Cobalt	8704887	8704887	<0.3	<0.3	NA	< 0.3	97%	70%	130%	105%	80%	120%	101%	70%	130%
Copper	8704887	8704887	9.8	10.3	5.0%	< 0.3	100%	70%	130%	110%	80%	120%	112%	70%	130%
Iron	8704887	8704887	<50	<50	NA	< 50	100%	70%	130%	108%	80%	120%	95%	70%	130%
Lead	8704887	8704887	0.2	0.2	NA	< 0.1	101%	70%	130%	108%	80%	120%	107%	70%	130%
Lithium	8704887	8704887	<0.5	<0.5	NA	< 0.5	100%	70%	130%	90%	80%	120%	106%	70%	130%
Magnesium	8704887	8704887	424	377	11.7%	< 10	98%	70%	130%	101%	80%	120%	100%	70%	130%
Manganese	8704887	8704887	2.1	1.7	NA	< 1.0	98%	70%	130%	107%	80%	120%	104%	70%	130%
Mercury	8704887	8704887	0.56	0.60	6.1%	< 0.01	100%	90%	110%	104%	90%	110%	102%	80%	120%
Molybdenum	8704887	8704887	< 0.5	< 0.5	0.0%	< 0.5	99%	70%	130%	98%	80%	120%	105%	70%	130%
Nickel	8704887	8704887	<1	<1	NA	< 1	92%	70%	130%	108%	80%	120%	103%	70%	130%
Phosphorus	8704896	8704896	2790	2460	12.6%	< 5	100%	70%	130%	103%	80%	120%	105%	70%	130%
Potassium	8704887	8704887	3990	4070	2.0%	< 10	96%	70%	130%	102%	80%	120%	103%	70%	130%
Selenium	8704887	8704887	0.5	0.5	NA	< 0.4	100%	70%	130%	98%	80%	120%	106%	70%	130%
Silver	8704887	8704887	<0.2	<0.2	NA	< 0.2	85%	70%	130%	101%	80%	120%	108%	70%	130%
Sodium	8704896	8704896	448	438	2.3%	< 10	91%	70%	130%	102%	80%	120%	103%	70%	130%
Strontium	8704887	8704887	<5	<5	NA	< 5	101%	70%	130%	104%	80%	120%	104%	70%	130%
Tin	8704887	8704887	<1	<1	NA	< 1	110%	70%	130%	111%	80%	120%	102%	70%	130%
Uranium	8704887	8704887	<0.50	<0.50	NA	< 0.50	91%	70%	130%	104%	80%	120%	95%	70%	130%
Vanadium	8704887	8704887	<0.4	<0.4	NA	< 0.4	90%	70%	130%	104%	80%	120%	100%	70%	130%
Zinc	8704887	8704887	13.3	12.3	7.3%	< 0.1	100%	70%	130%	108%	80%	120%	122%	70%	130%

Comments: Duplicate Qualifier: As the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

High RPD for sample and duplicate is due to the matrix and heterogeneity of the sample.

Certified By:

Milithya O. Silva



Method Summary

CLIENT NAME: DST CONSULTING ENGINEERS
PROJECT: TS-NO-030045
SAMPLING SITE:

AGAT WORK ORDER: 17U258529
ATTENTION TO: LAURA RITCHIE
SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Miscellaneous Analysis			
Aluminum	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Antimony	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Arsenic	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Cadmium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Calcium	MET-93-6105	EPA SW-846 3050B & 6010C	ICP/OES
Chromium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Cobalt	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Copper	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Iron	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Lead	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Lithium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Magnesium	MET-93-6105	EPA SW-846 3050B & 6010C	ICP/OES
Manganese	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Mercury	MET-93-6101	EPA SW-846 7471A 245.5	CVAAS
Molybdenum	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Nickel	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Phosphorus	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Potassium	MET-93-6105	EPA SW-846 3050B & 6010C	ICP/OES
Selenium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Silver	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Sodium	MET-93-6105	EPA SW-846 3050B & 6010C	ICP/OES
Strontium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Tin	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Uranium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Vanadium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Zinc	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS



AGAT Laboratories

5835 Coopers Avenue
Mississauga, Ontario L4Z 1Y2
Ph: 905.712.5100 Fax: 905.712.5122
webearth.agatlabs.com

1 medium blue

Chain of Custody Record

If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water consumed by humans)

Report Information:

Company: DST Consulting Engineers
Contact: Michaela Kharag
Address: 885 Regent St. Unit 3-1B
Sudbury ON, P3E 5M9
Phone: 705 523 6680 ext 227 Fax: _____
Reports to be sent to:
1. Email: mharag@dstgroup.com
2. Email: L.Ritchie@dstgroup.com

Regulatory Requirements:

No Regulatory Requirement
(Please check all applicable boxes)

Regulation 153/04
Table Indicate One
 Ind/Com
 Res/Park
 Agriculture

Sewer Use
 Sanitary
 Storm

Regulation 558
 CCME
 Prov. Water Quality Objectives (PWQO)
 Other

Soil Texture (Check One)
 Coarse
 Fine

Region Indicate One
 MISA Indicate One

Laboratory Use Only

Work Order #: 04100
Cooler Quantity: 170258529
Arrival Temperatures: 0.1 | 0.1 | 0.2
on ice
Custody Seal Intact: Yes No N/A
Notes:

Project Information:

Project: TS-NO-030095
Site Location: Inventus - Pardo project.
Sampled By: _____
AGAT Quote #: 177656 PO: _____
Please note: If quotation number is not provided, client will be billed full price for analysis.

Is this submission for a Record of Site Condition?

Yes No

Report Guideline on Certificate of Analysis

Yes No

Turnaround Time (TAT) Required:

Regular TAT 5 to 7 Business Days
Rush TAT (Rush Surcharges Apply)
 3 Business Days 2 Business Days Next Business Day
OR Date Required (Rush Surcharges May Apply):

Please provide prior notification for rush TAT
*TAT is exclusive of weekends and statutory holidays
For 'Same Day' analysis, please contact your AGAT CPM

Invoice Information:

Bill To Same: Yes No

Company: Inventus Mining
Contact: Winston Whymark
Address: 82 Richmond St. E. Toronto ON, M5C 1P1
Email: winston.whymark@gmail.com

Sample Matrix Legend

B Biota
GW Ground Water
O Oil
P Paint
S Soil
SD Sediment
SW Surface Water

Field Filtered - Metals, Hg, CYI

Metals and Inorganics		O. Reg 153		Full Metals Scan		Regulation/Custom Metals		Nutrients		Volatiles		CCME Fractions 1 to 4		ABNs		PAHs		PCBs		Organochlorine Pesticides		TCLP		Sewer Use						
<input type="checkbox"/> All Metals	<input type="checkbox"/> 153 Metals (exc. Hydrides)	<input type="checkbox"/> Hydride Metals	<input type="checkbox"/> 153 Metals (incl. Hydrides)	<input type="checkbox"/> ORPs	<input type="checkbox"/> B-HWS	<input type="checkbox"/> C	<input type="checkbox"/> ON	<input type="checkbox"/> C ⁶⁺	<input type="checkbox"/> EC	<input type="checkbox"/> FOC	<input type="checkbox"/> Hg	<input type="checkbox"/> pH	<input type="checkbox"/> SAR	<input type="checkbox"/> TP	<input type="checkbox"/> NH ₃	<input type="checkbox"/> TKN	<input type="checkbox"/> NO ₂	<input type="checkbox"/> NO ₃	<input type="checkbox"/> NO ₃ +NO ₂	<input type="checkbox"/> VOC	<input type="checkbox"/> BTEX	<input type="checkbox"/> THM	<input type="checkbox"/> Total	<input type="checkbox"/> Aroclors	<input type="checkbox"/> M&I	<input type="checkbox"/> VOCs	<input type="checkbox"/> ABNs	<input type="checkbox"/> B(a)P	<input type="checkbox"/> PCBs	<input type="checkbox"/> Metals in Tissue

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Y/N
WALLY #1	Aug 30-17	p.m.	1	B	Fish muscle tissue.	
WS #1	↑	a.m.	1	↑	Tree Lake	
WS #2	↓	p.m.	1	↓	Tree Lake	
RB #1	↓	a.m.	1	↓	Tree Lake	
SM #1	Aug 30-17	a.m.	1	B	Tree Lake	
NP #1	Aug 31-17	a.m.	1	B	McNish	
NP #2	↑	a.m.	1	↑	McNish	
NP #3	↓	a.m.	1	↓	McNish	
NP #4	↓	p.m.	1	↓	McNish	
YP #1	Aug 31-17	p.m.	1	B	McNish	

Samples Relinquished By (Print Name and Sign): <u>Tom Assienc</u>	Date: <u>Sept 7/17</u>	Time: <u>2:30pm</u>	Samples Received By (Print Name and Sign): <u>R. Lawrence</u>	Date: <u>Sept. 7/17</u>	Time: <u>14:45</u>
Samples Relinquished By (Print Name and Sign):	Date:	Time:	Samples Received By (Print Name and Sign): <u>Procella Patel</u>	Date: <u>8/31/17</u>	Time: <u>9:44</u>
Samples Relinquished By (Print Name and Sign):	Date:	Time:	Samples Received By (Print Name and Sign):	Date:	Time:

Page ____ of ____
N^o: **T 049031**