



APPENDIX A

GEOTECHNICAL REPORTS

ENGINEERING CONSULTING SERVICES

GEOTECHNICAL INVESTIGATION REPORT

CANADIAN FORCES BASE (CFB) KINGSTON, ON. (SITE-1)



Project No.: CCO-242687-00

Prepared for:

EastPoint

1801 Hollis Street

Suite 1500

Halifax, Nova Scotia B3J 3N4

Prepared by:

Egis Canada Limited (formerly McIntosh Perry Consulting Engineers Ltd.)

6240 Highway 7, Suite 200, Woodbridge, ON

Egis Contact: Esam Deif, P. Eng.

esam.deif@egis-group.com

Direct Line: 289.319.3167 Mobile: 647.970.3291

Table of Content

1.0 INTRODUCTION 4

2.0 PROJECT UNDERSTANDING 4

3.0 SITE AND PROJECT DESCRIPTION 6

 3.1 Existing Site Conditions..... 6

 3.2 Site Geology 6

4.0 GEOTECHNICAL FIELD INVESTIGATION AND TESTING..... 7

5.0 GEOTECHNICAL LABORATORY TESTING..... 7

6.0 SUBSURFACE CONDITIONS 8

 6.1 Overview 8

 6.2 Native Silt and Clay to Sandy Clayey Silt Layer 8

 6.3 Bedrock..... 9

 6.5 Groundwater Level Observation.....10

 6.6 Chemical Test Results10

7.0 GEOTECHNICAL DISCUSSION AND RECOMMENDATIONS..... 10

 7.1 General.....10

 7.2 Site Preparation11

 7.3 Excavation12

 7.3.1 Overburden Excavation.....12

 7.3.2 Bedrock Excavation.....13

 7.3.3 Engineered Shoring.....13

 7.4 Temporary Construction Dewatering.....14

 7.5 Frost Depth and Frost Susceptibility.....14

 7.6 Foundations (Slab on Grade Option)15

 7.7 Site Classification for Seismic Site Response.....15

 7.8 Lateral Earth Pressures15

 7.9 Waterproofing and Permanent Drainage.....16

 7.10 Backfill.....16

 7.11 Underground Utilities17

 7.11.1 Bedding and Cover17

7.11.2

Trench Backfill

17

7.11.3

Clay Seals.....

18

8.0

CEMENT TYPE AND CORROSION POTENTIAL.....

18

9.0

PAVEMENT STRUCTURE.....

19

10.0

ENVIRONMENTAL SOIL SAMPLING AND ANALYSIS.....

20

10.1

Scope of Investigation.....

21

11.0

CONSTRUCTION CONSIDERATIONS.....

25

12.0

IMPORTANT INFORMATION AND LIMITATIONS OF THIS REPORT

26

13.0

CLOSURE

27

APPENDIX A

Borehole Location Plan and Borehole Logs

APPENDIX B

Laboratory Test Results

APPENDIX C

Rock Cores Photos

March 19, 2024

EastPoint
1801 Hollis Street,
Suite 1500
Halifax, Nova Scotia B3J 3N4
Attention: Andy Noble, P.Eng. and Ben Valiquette. P.Eng.

1.0 INTRODUCTION

Egis Canada Limited (Egis) *formerly McIntosh Perry Consulting Engineers Ltd. (MPCE)* was retained by EastPoint (the Client) to prepare a geotechnical investigation for the provide a geotechnical soil investigation, environmental soil sampling and analysis for the installation of back flow valves into the existing lines for the four sites in Kingston, Ontario. The four sites are located along Hwy 2, starting with the intersection with Navy Way to the intersection with Craftsman Blvd. In this report the first site will be addressed, the other three sites will be provided under separate reports. The first Site is located at 7 Craftsman Blvd, Kingston, ON. (CFB Kingston (DND) property), approximately 300m southeast the intersection between Craftsman Blvd and Hwy 15, Kingston Ontario as indicated in Figure -1.

The geotechnical investigation was completed in general accordance with proposal No. PCO-242687-00, dated November 2, 2023.

Authorization to proceed with the updating was given by Andy Noble, P.Eng. November 17, 2023.

The purpose of the of the geotechnical investigation was to determine the subsurface conditions of the property at 7 Craftsman Blvd, Kingston, Ontario to obtain the geotechnical and engineering parameters and provide recommendations for the design and construction of the proposed back flow valves into the existing lines by means of drilling two boreholes, carrying out field testing/observation and laboratory testing.

This report is prepared for the sole use of the Client. The use of this report, or any reliance on it by any third party, is the responsibility of such third party. It is understood that the Project will be designed and constructed in accordance with all applicable codes and standards present within its jurisdiction.

2.0 PROJECT UNDERSTANDING

Egis understanding of the Project is based on the correspondence and email from the Client on February 6, 2024. In accordance with Drawing number G-B35-BFP-SITE1 (Figure-3), It is understood that backflow preventer valve will be accommodated within a light weighted enclosure supported on a slab on grade similar to the one shown in Figure-2. An access road will be also constructed to reach to the proposed enclosure as indicated in Figure -3.



Figure -1 Site Location



Figure -2 Example of the Enclosure

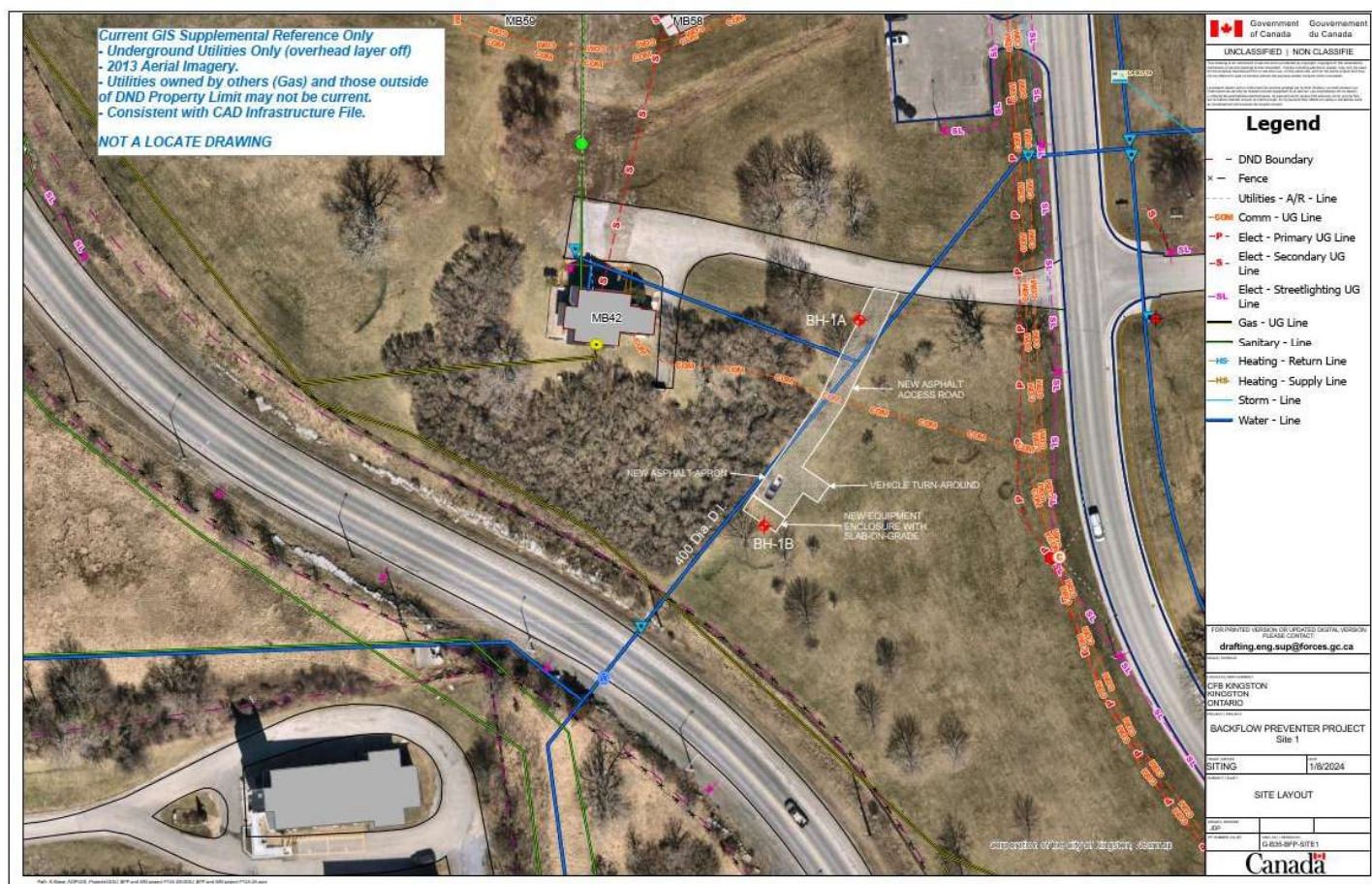


Figure-3 Drawing G-B35-BFP-SITE1

3.0 SITE AND PROJECT DESCRIPTION

3.1 Existing Site Conditions

It is understood the site is currently an active military base known as CFB Kingston, back flow valves are proposed to be installed on the existing water main pipe crossing the property.

3.2 Site Geology

Based on published geological maps of the area (Ontario Geological Survey), the site is located within the Napanee Plain. Surficial geology maps of southern Ontario indicate that the site is located within Paleozoic bedrock-drift complex in Paleozoic terrain. The bedrock within the area is identified to comprise of Limestone, dolostone, shale, arkose, and sandstone of the Shadow Lake Formation.

4.0 GEOTECHNICAL FIELD INVESTIGATION AND TESTING

Egis cleared the Site before the commencement of any geotechnical drilling. Utility clearance requisitions were submitted to Ontario One Call (ON1Call) to obtain public utility locates. Private utility clearance was performed by a private locator on behalf of Egis, in conjunction with CFB private utility clearance. Public utility owners were informed, and all utility clearance documents were obtained before the commencement of drilling work.

The field work was completed on January 22 and January 23, 2024. Two boreholes in total were marked for drilling. Upon completion of utility locate process, one borehole BH24-1B respectively within proximity of the proposed backflow preventer valve, and the other BH24-1A was at the proposed access road.

BH24-1A was drilled to 0.8 meter below grade surface (mbgs) (El. 99.5m) and BH24-1B was drilled to 4.1 mbgs (El. 100.8 m).

The boreholes were drilled using a Mobile B53 track-mounted drilling rig, outfitted with solid stem augers. The equipment used for drilling was owned and operated by Drilltech Drilling Ltd. Soil samples were obtained at 0.75 m intervals in boreholes using a 51 mm outside diameter split spoon sampler in accordance with the Standard Penetration Test (SPT) procedure. Upon auger refusal, the bedrock was cored and sampled in Borehole BH24-1B to approximately 3.3 m depth from the top of the encountered bedrock surface at El. 100.00 meter above the sea level (masl). In BH23-1. NQ size rock cores were obtained using diamond drilling and wireline tooling. Rock cores were retrieved in double-walled NQ coring methods.

The bedrock core holes were sealed with bentonite hole plug and the boreholes were backfilled with auger cuttings and hole plug and restored to the original ground surface. The boreholes were surveyed with a GPS unit to record their locations and elevations. Borehole locations are shown in Figure- 4, included in Appendix B.

Table 4-1: Borehole Designations, Locations, and Depth

BH No.	Drilling Date	Coordinates Coordinate System: NAD 83		Coordinates Coordinate System: UTM Zone 18T			Borehole Termination	
		Longitude	Latitude	Northing	Easting	Surface El. (m)	Depth (mbgs)	Bottom El. (m)
BH24-1A	Jan. 22, 2024	-76.45984894	44.2441966	4900031.987	383438.672	99.5	0.8	98.7
BH24-1B	Jan. 23, 2024	-76.46020656	44.24379372	4899987.745	383409.321	100.8	4.1	96.8

Field investigation, including drilling and sampling, were supervised on a full-time basis by Egis. All boreholes were logged during the drilling process. All samples were labelled by waterproof paper one by one as they were retrieved. All soil samples were preserved in double plastic bags to mitigate the risk of moisture loss during transportation to the geotechnical laboratory. Rock cores were laid and labelled in specialty boxes made for rock core transferring. The Rock Quality Designation was measured for the first time in the field immediately after drilling to reduce the measurement errors caused by transportation induced damages to the rock cores.

5.0 GEOTECHNICAL LABORATORY TESTING

All soil samples and rock cores obtained during the investigation were transported to Egis's geotechnical laboratory in Nepean, Ontario.

Geotechnical laboratory testing was performed on representative soil samples to determine soil index properties including grain-size analysis tests. Uniaxial compressive strength test was performed on one (1) rock core. The laboratory tests were

performed in accordance with the Ministry of Transportation Ontario (MTO) test procedures, which follow the American Society for Testing Materials (ASTM) test procedures.

Paracel Laboratories Ltd. in Ottawa carried out chemical test on one (1) representative soil samples and consisted of pH, chloride, sulphate, and resistivity. Laboratory test results are included in Appendix B.

The rest of the soil samples recovered will be stored in Egis storage facility for a period of three (3) months after submission of the final report. Samples will be disposed after this period unless otherwise requested in writing by the Client.

6.0 SUBSURFACE CONDITIONS

6.1 Overview

The subsurface conditions encountered in the boreholes are shown on the borehole records provided in Appendix A. The boreholes records include soil stratification at the borehole locations with detailed soil descriptions and selected physical properties for each stratum encountered.

In general, the site stratigraphy consists of Silt and Clay to Sandy Clayey Silt underlain by bedrock. In both of BH24-1A and 24-1B there was a 0.8m thick layer of the native Silt and Clay to Sandy Clayey Silt underlain by the bedrock. Both Boreholes were drilled on the open and gras planted landscape. The bedrock was cored and sampled in Borehole BH24-1B for classification purposes. The subsurface at this site can be divided into two distinguishable zones.

- Native Silt and Clay to Sandy Clayey Silt
- Bedrock

The subsurface soils and bedrock description encountered during the course of the investigation, together with the field and laboratory test results are shown on the borehole records included in Appendix A. Laboratory test results are included in Appendix B. Unless otherwise mentioned, all SPT 'N' results quoted are for SPT spoon penetrations of 300mm as per the subject ASTM. Supplementary information supporting the above overall subsurface observations, where available and indicated below. However, it should be borne in mind the below descriptions are based on and limited to, some generalizations of the actually verified soil information intercepted in the boreholes and documented in the borehole logs. Description of the subsurface strata encountered are given below

6.2 *Native Silt and Clay to Sandy Clayey Silt Layer*

Native Clayey Silt to Silty Clay Layer soil was encountered at the surface of both boreholes. The soil was generally consisting of Silt and Clay to Sandy Clayey Silt with organics overlying the bedrock. The native Silt and Clay to Sandy Clayey Silt layer extends to a depth of 0.8 m below the existing grade at the location of both boreholes.

The native Silt and Clay to Sandy Clayey Silt Layer depth, thickness, composition is given in Table 6-1.

Table 6-1: Location, Thickness, and Compaction of the Native Silt and Clay to Sandy Clayey Silt Layer

BH No.	Layer's Depth (mbgs)	Layer's Top Elevation (masl)	Layer's Bottom Elevation (masl)	Layer's Thickness (m)	Description
BH24-1A	0.0	99.5	98.7	0.8	Silt and Clay some sand and organics
BH24-1B	0.0	100.8	100	0.8	Sandy Clayey Silt, some organics

Grain size analysis test results of two representative samples from the Silt and Clay to Sandy Clayey Silt Soil are shown in Table 6-2, and the corresponding graphical plot is shown in, Appendix B.

Table 6-2: Grain Size Distribution Summary – Silt and Clay to Sandy Clayey Silt Layer

BH No./ SS No.	Size Fraction (%)					Moisture Content (%)
	Gravel	Sand	Silt	Clay	Fines	
BH24-1A / SS1	2	13	46	39	-	36
BH24-1B /SS1	0	24	45	31	--	26

The Standard Penetration Test (SPT) 'N' values widely ranged between 5 to 7 blows per 300 mm penetration, with an average value of 6 blows per 300 mm based on two readings indicating firm consistency. The high SPT 'N' values encountered at both boreholes on the lower part of the layer are due to the underlying bedrock.

6.3 Bedrock

Bedrock was encountered in both boreholes and cored in borehole BH24-1B as described in Table 6-3. The bedrock was observed below the Silt and Clay to Sandy Clayey Silt Layer at El. 98.7 m in BH24-1A and El. 100.0 in BH24-1B. The bedrock was cored and sampled to the bottom of BH24-1B.

During the core drilling, measurements including Total Core Recovery (TCR) and Rock Quality Designation (RQD) were carried out as part of the rock quality classification. TCR is defined as the sum of all recovered rock core pieces from a core run expressed as a percent of the total length of the core run. The RQD is defined as a percentage of the sum of the intact core pieces over 100 mm divided by the total length of core run. The TCR and RQD for the rock cores are presented in the borehole log records in Appendix A.

Based on the retrieved rock cores from borehole within the proposed backflow preventer valve enclosure footprint, the bedrock was identified as limestone with frequent shale parting. The bedrock was closely spaced with horizontal joint discontinuities. The limestone was observed to be strong, grey, thinly bedded, and has fair to excellent quality

based on RQD values (63% to 100%). The rock cores are shown in Appendix C. A summary of bedrock observations is provided in Table 6-3.

Table 6-3: Summary of Bedrock Observations

BH #	Ground Surface El. (m)	Bedrock Surface El. (m)	Weathered Bedrock El. (m)	Sound Bedrock El. (m)	RC #	El. (m)	Rec. (%)	RQD (%)	UCS (MPa)	ISRM classification corresponding to the UCS
BH24-1B	100.8	100.0	--	100.0 – 96.8	RC3	100.0 – 98.9	93	71		
					RC4	98.9 – 97.6	100	63	166.3	Very strong
					RC5	97.6 – 97.3	92	92		
					RC6	97.3 – 96.8	100	100		

6.5 Groundwater Level Observation

No groundwater was observed on both boreholes upon the completion of the auguring up to the elevation of the bedrock. No monitoring wells were installed in the advanced boreholes.

6.6 Chemical Test Results

Chemical analysis was conducted by Paracel Laboratories in Ottawa, ON, to determine the resistivity, pH, sulphate and chloride content of one (1) representative soil samples collected from the boreholes. The laboratory results for the chemical analysis are shown in Table 6-4 and included in Appendix B.

Table 6-4: Soil Chemical Analysis Results

Borehole	Sample	Depth (mbgs)	pH	Sulphate (10 µg/g)	Chloride (10 µg/g)	Resistivity (0.1 Ohm.m)
BH24-1B	SS-2	0.8	7.41	15	<10	58.9

7.0 GEOTECHNICAL DISCUSSION AND RECOMMENDATIONS

7.1 General

Based on the results of the geotechnical field and laboratory investigation performed, the following discussion is provided to assist the Client and the Designer with the proposed backflow preventer valve will be accommodated within a light weighted enclosure supported on a slab on grade. The recommendations provided within this report are based on our

understanding of the proposed project which is summarized above in "Section 2" and through the interpretation of factual information obtained from the boreholes advanced during this subsurface investigation. If any of these understandings change, Egis should be contacted to assess the implications of those changes on the recommendations provided herein. Based on the soil conditions observed in the boreholes, and assuming they are representative of soil condition across the site, the most important geotechnical considerations for the design and construction of the water main backflow prevention assembly, metering and structure enclosure are expected to be the following:

Foundation on slab on grade supported on Adequately Prepared Granular Pad: The water main backflow prevention assembly, metering and structure enclosure will be supported on slab on grade foundation supported on a granular backfill pad and overlies the bedrock at approximately 0.8 m mbgs depth (El. 100.00 \pm 0.5 m). The bedrock subgrade should be cleaned of any loose or unstable rock pieces from the foundation influence zone before the construction of the granular pad. The granular backfill pad must extend a minimum of 0.8 m beyond the edge of the footing and then downward at a 1H:1V. The slab on grade thickness must consider and accommodate any uplift pressure that piping assembly may apply on the slab on grade foundation.

Temporary protection System: Open excavation within proximity of roadways and utility lines may not be possible without a temporary protection system (TPS). The design of the TPS system is the responsibility of the Contractor and shall be performed by an experienced professional Geotechnical engineer. To reduce the lateral deflections, the Designer of the TPS may consider including anchoring and/or internal bracing system.

Temporary Construction Dewatering: Excavation for preventer valve will proceed through the native Silt and Clay to Sandy Clayey Silt Layer down into the bedrock. Although groundwater was not observed upon the completion of the borehole drilling, the contractor should be prepared for any perched groundwater and surface runoff water that may infiltrate and accumulate at the bottom of the excavations due to seasonal changes and rainfall events. Dewatering may be achievable with traditional sump and pump dewatering method. The groundwater disposal should be performed in accordance with applicable regulations. Assessment of the dewatering requirements and the need for registration on the Environmental Activity and Sector Registry (EASR) or a Permit to take Water (PTTW) should be carried out by specialists experienced in this field.

Permanent Drainage and Waterproofing: Since no groundwater was intercepted upon the borehole drilling completion, and provided that the water main backflow prevention assembly, metering and structure enclosure will be founded on a slab on grade supported on a granular backfill platform over the bedrock. Therefore, permanent under-floor drainage will not be required.

The comments made regarding the construction of the proposed preventive valve are intended to highlight those aspects which could impact or affect the detail design of the proposed preventive valve and its enclosure, for which special provisions may be required in the Contract Documents. Comments related to construction aspects are not intended to dictate construction equipment or methods. Relevant parties should make their own interpretation of the factual data presented in the report. Interpretation of the data presented may affect equipment selection, proposed construction methods, and scheduling of construction activities.

7.2 Site Preparation

The site should be graded in the early stages of construction to provide for positive control of surface water and directing it away from excavations and subgrades. The Contractor should take appropriate measurements for collection and disposal of surface and groundwater and runoff including an adequate pumping system. Prior to the site preparation.

Public and private utility owners should be notified prior to the commencement of any construction activities. Existing underground utilities in the vicinity of the proposed excavation should be reviewed before commencing any excavation works to identify potential damage hazards due to the proposed excavation.

Existing utilities that are excavated or exposed as part of the construction will need to be supported and rerouted during the construction. Even with a shoring system, some inward movement of shoring is inevitable. This may cause slight ground settlement which may have an adverse effect on the existing buried utilities. The contractor shall inform owners of all existing utilities before proceeding with excavation. The utility owners may provide the permissible deformation that a particular utility may tolerate. Shoring shop drawings should be stamped by a professional engineer.

7.3 Excavation

Excavations will proceed through native Silt and Clay to Sandy Clayey Silt Layer and bedrock. The excavations for the prevent valve installation will extend to the depth of the existing water main. As per the Technical Standards and Specifications, City of Kingston, the depth of the watermain must not be less than 1.7m therefore the existing watermain was installed within the bedrock layer. Based on the required excavation depth, it is anticipated that excavations for the proposed backflow preventive valves will need to be performed with the confinement of engineered shoring or trench boxes to avoid undermining the adjacent roadways and utilities and to ensure the safety of the working crew.

The excavated materials and any corresponding excess soils and rock should be disposed of in accordance with all applicable environmental legislation. Excess soils management and evaluation of the environmental quality of subsoils will be provided in another section of this report.

7.3.1 Overburden Excavation

Silt and Clay to Sandy Clayey Silt Layer shall be removed from within the footprint of the proposed backflow preventive valve to expose bedrock subgrade.

All excavations must be undertaken in accordance with the requirements of the Occupational Health and Safety Act of Ontario (OHSA), Regulations for Construction O.Reg. 213/91, with specific reference to acceptable size slopes and stabilization requirements. The general stratigraphy outlined herein can be considered an OHSA Type 3 Soil. The excavation for proposed preventive valve should be conducted through a minimum 1H:1V or a flatter slope for Type 3 Soil.

For excavations through multiple soil types, the side slope geometry is governed by the soil with the highest number designation as per OHSA. If the minimum slope requirement cannot be achieved, temporary protection system (TPS) or Engineered Shoring should be used.

Since the proposed excavations will be conducted below 1.2m, it is recommended that the excavations be undertaken within the confines of an Engineered Shoring designed and installed in accordance with OHSA. The shoring will need to support the excavation sidewalls and act as a barrier against any perched groundwater flow into the excavation. However, the removal of water within the shored excavation may still be required. Further discussion on the Engineered Shoring is provided in Section 7.3.3.

The stability of the excavation side slopes is highly dependent on the Contractor's methodology and layout. The excavations of the overburden soils are expected to be performed using conventional hydraulic excavation equipment. Cobbles, and

boulders may be encountered during the excavations. Boulders larger than 0.3 meters in diameter should be removed from the excavation side slopes for workers' safety. No surface surcharges should be placed closer to the edge of the excavation than a distance equal to twice the depth of the excavation, unless a TPS has been designed to accommodate such a surcharge.

7.3.2 Bedrock Excavation

It is understood that the proposed installation of the preventive valve may require bedrock excavation. Therefore, moderate bedrock excavation will be required to achieve the desired elevations which is expected to generate a manageable amount of excavated rock materials.

For planning purposes, a weathered bedrock is recommended to be treated as a Type 2 Soil. Sound rock would generally be self-supporting. All rock excavations should be scaled, to remove loose rock fragments to ensure safe working conditions. All rock faces should be reviewed by the geotechnical engineer to look for loose pieces and wedge failures. Rock bolting for worker safety may be necessary depending on the layout and field condition at that time.

Bedrock excavation will require pneumatic or hydraulic breakers such as hoe-rams or heavy rock excavation equipment capable of breaking and ripping sound limestone bedrock.

7.3.3 Engineered Shoring

Engineered Shoring system is required during excavation and construction to protect any adjacent utilities, and for the worker's safety. Engineered Shoring systems may vary from as simple as the trench boxes to soldier piles and lagging, and secant and/or tangent walls. The design of the Engineered Shoring system is the responsibility of the Contractor. The Contractor should hire an experienced professional Geotechnical engineer to provide a detailed design for the Engineered Shoring system. The Engineered Shoring designer must take into consideration any adjacent infrastructure being retained, lateral earth pressures, groundwater pressure, construction surcharge loads, and pre-stressing loads or post tensioning loads on tiebacks. Also, it should consider the freeze-thaw action on the face of excavations, expansion and contraction of shoring elements, construction vibrations and compatibility with the design of proposed waterproofing and drainage systems for the proposed structure.

Stockpiling of soil beside the excavations should be avoided. The weight of the stockpiled soil could lead to overstressing the shoring system.

The temporary excavation support systems should be designed and constructed in accordance with OPSS.PROV 539 (Temporary Protection Systems). The lateral movement of the temporary shoring system should meet Performance Level 2 as specified in OPSS.PROV 539, provided that any adjacent utilities can tolerate this magnitude of deformation.

It is recommended that the Client retain a Contractor and a Designer who have significant experience with excavations performed under similar soil conditions. Shop drawings should be submitted to the designers and reviewed by the geotechnical engineer well in advance of mobilization.

Fully mobilized (i.e., active lateral earth pressure coefficient) conditions shall be considered. The lateral earth pressure coefficients for existing native and granular fill are given in Table 7-1 Section 7.8 to assist Designer and Contractor with the design of the shoring system.

7.4 Temporary Construction Dewatering

Excavation for preventer valve will proceed through the native Silt and Clay to Sandy Clayey Silt Layer down into the bedrock. Although groundwater was not observed upon the completion of the borehole drilling, the contractor should be prepared for any perched groundwater and surface runoff water that may infiltrate and accumulate at the bottom of the excavations due to seasonal changes and rainfall events. Contractors should be prepared to handle any surface water or groundwater infiltration by ditching, pumping and/or other methods in order to maintain dry working conditions. Recommendations for appropriate dewatering measures beyond conventional sump pump techniques or other more intensive dewatering systems (e.g., well points or other specialized methods) to effectively lower the static groundwater level shall be provided by a specialized dewatering contractor.

The groundwater disposal should be performed in accordance with applicable regulations. Assessment of the dewatering requirements and the need for registration on the Environmental Activity and Sector Registry (EASR) or a Permit to take Water (PTTW) should be carried out by specialists experienced in this field.

7.5 Frost Depth and Frost Susceptibility

Based on OPSD 3090.101, the Frost Penetration Depth for the project area ranges between 1.4 to 1.6m. Therefore, all foundation elements that are sensitive to movements (i.e., heave and subsequent thaw settlements) located in unheated areas should be provided with a minimum of 1.5 metres (interpolated value) of non-frost susceptible earth cover or equivalent thermal insulation for frost protection services from the finished grades.

Based on Table 13.1 in the Canadian Foundation Engineering Manual, U.S. Corps of Engineers Frost Design Soil Classification, and since the grain size distribution for the soils intercepted within the frost depth has a percentage of grain sizes (in the 5 microns to 75 microns range) are generally higher than 55 %, and as such these soils are classified to be type F4 that has a high frost susceptibility.

7.6 Foundations (Slab on Grade Option)

It is important to emphasize that at the time of preparing this report, Egis has not been provided with the proposed service loads or foundation details for the proposed preventive valve enclosure. However, it was provided by the Client that the enclosure is to be supported by a slab on grade. Based on section 7.5, and since the existing soils within the frost depth are classified to be type F4 that has a high frost susceptibility, The proposed slab on grade cannot be supported on the existing native soils. Therefore, existing native silt deposits must be removed up to the bedrock surface and replaced with compacted granular material.

The preparation of the granular platform should be carried out as follows:

The subsurface of the exposed bedrock after removal of the overburden should be inspected and approved to be clear from any loose materials in the presence of a qualified geotechnical engineer.

Imported engineered fill OPSS 1010 Type II Granular 'B' or Granular A, placed in shallow lifts not exceeding 250 mm and compacted to 98% of the Standard Proctor Maximum Dry Density (SPMDD) of the material. This operation should be carried out under strict construction compliance.

The slab-on-grade should be founded on engineered OPSS 1010 Granular A or B with a minimum thickness of 200 mm, compacted to 100% of the SPMDD of the material, the final thickness of the slab to be decided by the structural engineer.

A moisture barrier consisting of at least a 200 mm thick layer of 19 mm clear crushed stone or 10 mm polyethylene vapor barrier is recommended to be placed directly under the floor slab. The stone bed would act as a barrier and prevent the capillary rise of moisture into the floor slab.

A modulus of Subgrade Reaction (k_s) of 20 MPa/m is recommended for slab-on-grade design.

7.7 Site Classification for Seismic Site Response

Seismic site classification is completed based on National Building Code (NBC) 2020 Section 4.1.8.4 and Table 4.1.8.4.-B. This classification system is based on the average soil properties in the upper 30 m. The site can be classified as a Site Class "C" based on the fact the footings will be founded on bedrock for the site-specific seismic response to.

7.8 Lateral Earth Pressures

The following preliminary lateral earth pressure parameters are provided to assist Contractors and Designers with the design of temporary Engineered Shoring systems.

Compaction of backfill behind retaining structures can induce loads greater than the active or at-rest earth pressures. Therefore, the induced lateral earth pressure due to compaction should be added to the calculated earth pressure in accordance with Section 24.8 of CFEM (2006).

The following static lateral earth pressure coefficients are recommended.

Table 7-1: Lateral Earth Pressure Coefficient for Static Conditions

Material	Bulk Unit Weight, γ (kN/m ³)	Friction Angle, ϕ' (°)	Static active pressure, K_a	Static at-rest pressure, K_o	Static passive pressure, K_p
Existing Silt and Clay to Sandy Clayey Silt in firm state	18	28	0.36	0.53	2.77
New compacted Granular B Type I	20	30	0.33	0.72	3.00
New compacted Granular A and Granular B Type II	22	32	0.31	0.47	3.25

Static lateral earth pressure can be calculated by using the following equation:

$$\sigma_h = K \times (\gamma h + q)$$

where K is the lateral earth pressure coefficient. For yielding retaining walls, the active earth pressure coefficients, K_a , is recommended to be used. For non-yielding temporary shoring walls, the at-rest, K_o , is recommended to be used for design. The resultant of the applicable static or at-rest force is assumed to act at $h = 1/3H$ above the base of the wall where H is the Height of the wall. The unit of the retained soil " γ " is given in Table 7-1, and " q " is the value of any applied surcharge.

The above noted lateral pressure coefficients are calculated assuming the wall back angel is vertical and the backslope of the retained soil is horizontal. The wall-soil interaction angle is assumed to equal to $0.5\phi'$ as per CFEM. If Engineered Shoring is used, then designers should refer to CFEM for design assistance and a geotechnical engineer should be retained to perform the shoring design review.

7.9 Waterproofing and Permanent Drainage

Since no groundwater was intercepted upon the borehole drilling completion, and provided that the water main backflow prevention assembly, metering and structure enclosure will be founded on a slab on grade supported on a granular backfill platform over the bedrock. Therefore, permanent under-floor drainage will not be required.

7.10 Backfill

Since the native soil is considered as a high susceptible for frost heave and has organic inclusions and its non-uniform density, the existing site materials are unsuitable for backfilling under the slab-on-grade and pavement in its present condition. Therefore, it is recommended to be sub-excavated, and replaced with OPSS Granular A or B Type II material placed in thin, loose lifts (maximum 0.2m thick) and each lift thoroughly compacted to a minimum of 98% of Standard Proctor Maximum Dry Density (SPMDD) as outlined below:

- Backfill should not be placed in frozen condition or placed on a frozen subgrade.
- In landscaped areas, the existing on-site materials can be used for the upper 0.3m of backfill below the surrounding landscape for its low permeability to reduce surface water infiltration.
- Exterior grades should be sloped away from the prevent valve enclosure walls, and roof drainage downspouts from adjacent buildings should be placed so that water flows away from the enclosure.

7.11 *Underground Utilities*

At the subject site, it is expected that the burial depth of water utility lines is typically 1.7 m (as a minimum depth) below the ground surface or as specified in the Technical Standards and Specifications, City of Kingston. Equivalent thermal insulation should be provided if this depth is not achievable.

The contractor should retain a professional engineer to provide detailed drawings for excavation and temporary support of the excavation walls during construction.

Excavations for the utility lines shall be performed in accordance with the Occupational Health and Safety Act (OHSA) of Ontario. Excavations shall be performed in accordance with Section 7.3 of this report.

The engineer designing utilities shall ensure the proposed utility pipes can tolerate compaction loads.

The recommendations within this section are intended to be a supplement to, and not a replacement of the most recent local municipal requirements.

7.11.1 *Bedding and Cover*

The following are recommendations for service trench bedding and cover materials:

- Bedding for buried utilities should consist of an OPSS.MUNI 1010 "Granular A" material and should be placed in accordance with municipal requirements, assuming the subgrade soils are not allowed to become disturbed. All utility pipes and high amps electrical conduits shall receive a minimum of 150 mm bedding.
- It is not recommended to bear utility line directly on bedrock subgrade. Utility lines on bedrock shall also receive 150 mm Granular A as a bedding to avoid differential behavior.
- The use of clear stone is not recommended for use as pipe bedding. The voids in the stone may result in a low gradient water flow and infiltration of fines from the surrounding soils and cover materials, causing settlement and loss of support to pipes and structures.
- The cover material should be a service sand material or an OPSS.MUNI 1010 "Granular A". The dimensions should comply with the pertinent specification section.
- The bedding, spring line, and cover should be compacted to at least 98% of its SPMDD.
- All covers are to be compacted to 100% SPMDD if they are intersecting structural elements.
- Compaction equipment should be used in such a way that the utility pipes are not damaged during construction.
- If the encountered subgrade below the utility line is clay or silt, it is recommended that the utility bedding be separated from the native soil by a non-woven geotextile.

7.11.2 *Trench Backfill*

- Backfill above the cover for buried utilities should be in accordance with the following recommendations:
- The backfill should be placed in a maximum of 200 mm thick layers at or near (+ 2%) their optimum moisture content, and each layer should be compacted to at least 95% SPMDD within the landscape areas. This value should be increased to at least 98% SPMDD within the roadway and the proposed enclosure structure subgrade backfilling.

- In general excavation backfill should attempt to match the texture of the existing adjacent soils. If imported materials are used, side slopes with frost tapers are recommended. Typically, frost tapers should be a back-slope of 10H:1V through the frost zone, (i.e., 1.5 m from finished grade).
- During backfilling, care should be taken to ensure the backfill proceeds in equal stages simultaneously on both sides of the utility pipes; and
- No frozen material should be used as backfill; neither should the trench base be allowed to freeze.
- The quality and workmanship in the construction are as important as the compaction standards themselves. It is imperative that the guidelines for the compaction be followed for the full depth of the trench to achieve satisfactory performance.

7.11.3 Clay Seals

In the event that a perched groundwater encountered during the excavation for the installation of the watermain backflow prevention assembly, clay seals are recommended as a seepage barrier for all utility trenches. In the absence of clay seals, there is a potential for the trench to act as a drain into the watermain trench. To avoid such an effect, clay seals are recommended at both ends of the open trench. The clay seal shall be constructed of low permeability material, such as silty clay, to a minimum thickness of 0.6 m, clay seal material shall be according to OPSS 1205 and OPSD 802.095. The clay seal (i.e., silty clay) material shall be compacted to a minimum of 95% SPMDD in loose lifts of no thicker than 300 mm. Acceptable imported clay material may be used for the construction of the clay seals.

8.0 CEMENT TYPE AND CORROSION POTENTIAL

One soil sample was submitted to Parcel laboratories for testing of chemical properties relevant to exposure of concrete elements to sulphate attacks as well as potential soil corrosivity effects on buried metallic structural elements. Test results are presented in Table 6-4 and the laboratory results for the chemical analysis are shown in appendix B.

Electrical resistivity, pH-value, and chloride concentration can provide an indication of the corrosion potential to buried steel elements in contact with subsurface environment. Using a corrosion nomograph proposed by King (1977) for buried metals and based on electrical resistivity results and pH-value, the corrosion potential for buried steel elements is within the non-aggressive range. The corrosive effects of road de-icing salts should also be considered.

The analytical results of the soil sample were compared with applicable Canadian Standards Association (CSA) A23.1-04 and are given in Table 8-1 below.

Table 8-1: Additional Requirement for Concrete Subjected to Sulphate Attack

Class of Exposure	Degree of Exposure	Water Soluble Sulphate in Soil Sample (%)	Cementing Material to be Used
S-1	Very Severe	> 2.0	HS or HSb
S-2	Severe	0.2 – 2.0	HS or HSb
S-3	Moderate	0.1 – 0.2	MS, MSb, LH, HS, or HSb

The chemical sulphate content analyses for selected soil sample tested indicate a sulphate concentration of maximum of a 0.015 % in soil, as shown in Table 6-4, indicating a “moderate to low” risk for sulphate attack on concrete material. The selection for class of concrete should include consideration of the effects of road de-icing salts.

9.0 PAVEMENT STRUCTURE

Since a new roadway will be required to reach the proposed enclosure, recommendation included in this section can be used for the pavement design. Investigation results indicated approximately 800 mm of Silt and Clay in BH24-1A, and such material is considered as a high susceptible for frost heave.

The production and placement of asphaltic concrete and granular materials shall conform to the requirements of OPSS MUNI 1003, 1151 for Superpave mixes and OPSS 1150 for Marshal mixes.

Prior to placing the pavement structure, any soft, loose, or unstable soil should be removed, and the subgrade prepared as noted below. Pavement subgrade can consist of the fill materials encountered at the site.

Pavement subgrade should be compacted to at least 98% of the SPMDD and proof rolled. Areas exhibiting more than 20 mm deflection should have the top 300mm removed and replaced with approved drier materials.

Sub-grade up-fill should also be compacted to at least 98% of the standard Proctor density of the material, at or below the optimum moisture content (OMC) in lifts not exceeding 200 mm in thickness.

The Granular Base and Subbase layers should be compacted to at least 100% of the SPMDD. In the extreme cases, such as during the wet season, the top 300mm of the sub-grade may have to be replaced by compacted granular material to compensate for the inadequate strength of the wet sub-grade.

Table 9-1 provides the minimum recommended thicknesses of both heavy and light duty pavements. If the use of the access road is limited to maintenance pickup trucks and snowplows, then it may be considered as a light duty pavement. However, the proposed access road should match with the existing connecting road structure to reduce the risk of differential behaviors between the existing and proposed surfaces and to extend the purpose that the original road was built to serve.

Table 9-1: Proposed Pavement Structure

Material		Heavy Duty Thickness (mm)	Light Duty Thickness (mm)
Surface	HL3 or Superpave 12.5 mm, Design Category B, PG 58-28*	50	50
Binder	HL8 or Superpave 19.0 mm, Design Category B, PG 58-28*	50	--
Base	OPSS Granular A	150	150
Sub-base	OPSS Granular B Type II	400	300

*-New hot mix or up to a maximum of 20% RAP

The existing asphalt should be cut back a minimum of 3 m from the edge of any excavation. Top 50 mm of the existing asphalt shall be also milled for 0.3 m to stagger the surface joint and the binder joint. Both base and sub-base should be compacted to 100% SPMD. Asphalt layers should be compacted to comply with OPSS.MUNI 310. Asphalt layers shall be compacted to minimum 92% and maximum 97% density, 4% air void is ideal.

10.0 ENVIRONMENTAL SOIL SAMPLING AND ANALYSIS

Egis carried out a scoped due diligence environmental subsurface investigation on January 26, 2024, following the geotechnical field investigation conducted at the Site. It is understood that the due diligence sampling program is intended to inform future tendering of work at the Site, and as such, Egis did not complete an Assessment of Past Uses (APU) or Sampling and Analysis Plan (SAP) for the Site prior to the investigation. Egis staff carried out the collection, screening, and laboratory analysis of soil samples. This included the completion of two (2) boreholes and the submission of one (1) soil sample per borehole (two total) for analysis of contaminants of potential concern, as well as Toxicity Characteristic Leaching Procedure (TCLP) leachate analysis. As agreed with the Client, the sampling did not strictly comply with the required sampling to meet Ontario Regulation (O. Reg.) 406/19 and was instead intended to provide an initial characterization of the soils that will become excess at the Site, with the understanding that additional sampling/testing will be conducted following the tendering of the work. This investigation was conducted in accordance with Egis' Standard Operating Procedures.

Soil results were compared to the following Site Condition Standards for the purposes of this report, from the document entitled "*Generic Excess Soil Quality Standards*" as defined within the MECP document "Rules for Soil Management and Excess Soil Quality Standards," dated December 23, 2022.

- Table 1: Full Depth Background Site Condition Standards for Agricultural and Other Property Uses;
- Table 1: Full Depth Background Site Condition Standards for Residential, Parkland, Institutional, Industrial, Commercial and Community Property Uses
- Table 2.1: Full-Depth Excess Soil Quality Standards for Agricultural and Other Uses in a Potable Groundwater Condition (Volume-independent);
- Table 2.1: Full-Depth Excess Soil Quality Standards for Residential, Parkland and Institutional Property Uses in a Potable Groundwater Condition (Volume-independent);
- Table 2.1: Full-Depth Excess Soil Quality Standards for Industrial, Commercial, Community Property Uses in a Potable Groundwater Condition (Volume-independent);
- Table 3.1: Full-Depth Excess Soil Quality Standards for Residential, Parkland, Institutional Property Uses in a Non-Potable Groundwater Condition (Volume-independent); and,
- Table 3.1: Full-Depth Excess Soil Quality Standards for Industrial, Commercial, Community Property Uses in a Non-Potable Groundwater Condition (Volume-independent).

The Toxicity Characteristic Leaching Procedure (TCLP) screening results were compared to:

- O. Reg 558/04 General – Waste Management, Schedule 4 Leachate Quality Criteria.

It is important to note that soil only becomes “excess soil” if it is not reused within the project limits. To minimize the generation of waste and environmental impact, every attempt should be made to reuse the soil within the project limits if a geotechnically suitable use can be found. It is recommended that for any soils found to have exceedances of all the above noted SCS and ESQS, an attempt should be made to reuse this soil within the Project Area, for landscaping berms or to improve drainage, if there will be no adverse impacts. If this cannot be accomplished any heavily contaminated soils should be disposed of at a licensed landfill.

It is recommended that reuse of contaminated soils within the Project Area, once fully characterized, shall only be located:

- a. A minimum of 30 metres (m) away from waterbodies;
- b. A minimum of 3 m away from the property line (boundary);
- c. A minimum of 2 m above the ground water table;
- d. A minimum of 100 m from water wells; and
- e. Covered with 0.3 m of clean soil and revegetated or capped.

10.1 Scope of Investigation

The due diligence environmental investigation at the Site consisted of the following components:

- Underground service locate clearance was provided by public utility services through Ontario One Call;
- The advancement of two (2) auger holes at the Site to a maximum depth of 4.1 m below ground surface (m bgs);
- Submission of select “worst case” soil samples from target depths, collected from each auger hole, as determined through field screening, general coverage, and the judgement of the field staff, for laboratory analyses of petroleum hydrocarbons (PHCs) in the F1 to F4 fraction ranges (F1-F4); benzene, toluene, ethylbenzene, and xylene (BTEX); polycyclic aromatic hydrocarbons (PAHs), metals and inorganic parameters, and volatile organic compounds (VOCs);
- Submission of “worst case” soil leachate samples for toxicity characteristic leaching procedure (TCLP) analyses; and
- Completion of a Due Diligence Soils Investigation discussion, presented within the geotechnical investigation report for the Site.

10.2 Investigation Methods

As agreed with the Client, this investigation was conducted for due diligence purposes for general characterization of the soil at the Site and does not fully comply with the requirements of O. Reg. 406/19, O. Reg. 153/04, nor the MECP “Rules for Soil Management and Excess Soil Quality Standards.” The Client requested testing of 1-2 soil samples from each Site and one (1) TCLP sample to provide general soil quality information. It is understood that additional sampling/testing would be completed once the work has been tendered.

A total of two (2) boreholes were advanced within the Project Area in areas where excess soil is expected to be generated.

Site Location is presented in Figure 1. Borehole locations along the Site are shown in Appendix A.

10.3 Soil Sampling

A total of six (6) soil samples, three (3) from BH24-1A and three (3) from BH24-1B, were collected at the Site using a Mobile B53 track-mounted drilling rig, outfitted with solid stem augers. The six (6) soil samples were collected to a maximum depth of 4.1 m bgs. All samples were collected directly into Ziploc® bags and screened. Two (2) of the six (6) soil samples were selected for laboratory analysis using a “worst-case” scenario and were then placed into laboratory supplied containers and placed into chilled coolers for transport to the laboratory, Eurofins Scientific (Eurofins), under strict Chain of Custody documentation protocols. Eurofins is accredited by the Standards Council of Canada and the Canadian Association for Laboratory Accreditation, in accordance with the international standard ISO/IEC 17025:2005 – *General Requirements for the Competence of Testing and Calibration Laboratories*. Eurofins is accredited for analysis of all parameters required under the O. Reg. 153/04 – Record of Site Condition, as outlined in the MECP Technical Update entitled ‘*Laboratory Accreditation Requirements Under the New Record of Site Condition Regulation (O. Reg. 153/04)*’.

One (1) representative composite sample was obtained for TCLP leachate analyses to determine disposal options for potentially contaminated soil. A modified Synthetic Precipitation Leaching Procedure (mSPLP) sample was not submitted.

All non-dedicated equipment used during soil sampling (i.e., hand auger) were cleaned between sampling with a mixture of Alconox® and water. Additionally, prior to use on-Site, the RKI Eagle 2 used as part of this Soil Characterization investigation was calibrated to manufacturer specifications by the equipment supplier (Maxim Environmental).

The following summarizes the soil samples submitted for laboratory analyses:

Table 10-1: Samples Submitted

BH ID	Sample ID	Coordinates (UTM Zone 18N)	Approx. Depth (mbgs)	Chemical Analysis	Rationale
BH24-1A	BH24-1A ¹	N: 4900031.987 E: 383438.672	0.00 – 0.84	PHC F1-F4, BTEX, PAHs, M&I, VOC	General soil characterization at the Site
BH24-1B	BH24-1B (24-1B-SS1)	N: 4899987.745 E: 383409.321	0.76 – 0.81	PHC F1-F4, BTEX, PAHs, M&I, VOC	General soil characterization at the Site
Composite	TCLP-24-1	-	-	TCLP Metals, TCLP PHCs, TCLP PAHs, TCLP VOCs	Off-site disposal options

¹Composite sample submitted (24-1A-GS1, 24-1A-SS1, 24-1A-SS2) due to low recovery.

10.4 Analytical Results

The COPCs at the Site are VOCs including BTEX, PHCs (F1-F4), PAHs, and metals and inorganics. The analytical results were compared to the following criteria:

- Table 1 AO SCS;

- Table 1 RPIICC SCS;
- Table 2.1 AO ESQS;
- Table 2.1 RPI ESQS;
- Table 2.1 ICC ESQS;
- Table 3.1 RPI ESQS; and
- Table 3.1 ICC ESQS.

The exceedances are summarized in Table 10-2 below with the analytical results summarized in Tables A1 through A3. Certificates of Analysis are presented in Appendix B.

Analytical results are only applicable to locations and excavation depths stated in this document. The Client will be responsible for characterization of the soil and ensuring the appropriate number of bulk and leachate samples are collected and analyzed in order to meet the testing requirements outlined in O.Reg. 406/19 and by the chosen reuse sites, as applicable.

Additionally, if olfactory evidence (i.e. staining, odours, etc.) is noted in the soils during construction, testing of soils should be completed by the Contractor to determine soil quality and appropriate reuse and/or disposal, if unknown.

A summary of soil results exceedances are presented in Table 10-2 below:

Table 10-2: Analytical Summary – Exceedances

BH ID	Sample ID:	Sample Depth Range (m bgs)	Table 1 AO SCS	Table 1 RPIICC SCS	Table 2.1 AO ESQS	Table 2.1 RPI ESQS	Table 2.1 ICC ESQS	Table 3.1 RPI ESQS	Table 3.1 ICC ESQS
24-1A	Composite of 24-1A-GS1, 24-1A-SS1, and 24-1A-SS2	0.00 – 0.84	Ba, Se	Ba, Se	-	-	-	-	-
24-1B	24-1B-SS1	0.76 – 0.81	Ba, Ni, Se	Ba	-	-	-	-	-

*Note: Barium (Ba), Nickel (Ni), Selenium (Se)

All other tested parameters were below the noted SCS/ESQS guidelines.

10.5 TCLP Leachate Results

One (1) soil sample was submitted to Eurofins on January 26, 2024, for TCLP analyses of metals and inorganics, PHC, VOC, and PAH leachate criteria.

The TCLP leachate analytical results are compared to Schedule 4: Leachate Quality Criteria in O. Reg 558/00 General – Waste Management made under the Environmental Protection Act, dated October 10, 2000.

A review of the analytical results indicates that the TCLP sample did not exceed the Leachate Quality Criteria for any of the analyzed parameters, and thus, should be classified as non-hazardous solid waste.

The analytical results for the TCLP sample are presented in Table A4. Laboratory Certificates of Analysis are appended.

10.6 Conclusions

Of the two (2) borehole locations sampled during the investigation, all of the samples submitted met the above-noted Site Condition Standards or Excess Soil Quality Standards with the exception of Table 1 SCS for select metals. Borehole 24-1A exceeded Table 1 R/P/I/I/C/C SCS for barium and selenium. Borehole 24-1B exceeded Table 1 AO SCS for nickel and selenium, and Table 1 R/P/I/I/C/C SCS for barium. It should be noted that barium and selenium concentrations were consistently detectable in boreholes across the Sites (Sites 1-4) and as such, it is considered possible that these exceedances in BH24-1A and BH24-1B may be of natural origin. Barium and selenium-impacted soils may be suitable for reuse at a site with similarly elevated levels of metals. All other analyzed parameters were found at concentrations below SCS/ESQS.

The Client will be responsible for full characterization of any excess soil and for ensuring the appropriate number of bulk samples, leachate samples, and reporting is completed to meet the testing requirements outlined by O.Reg. 406/19 and the chosen reuse sites, as applicable.

It is important to note that soil only becomes “excess soil” if it is not reused within the Project Area. To minimize the generation of waste and environmental impact, every attempt should be made to reuse the soil within the project limits if a geotechnically suitable use can be found. It is recommended that any soils found to exceed of all the above noted SCS and ESQS, that an attempt should be made to reuse this soil on site, such as in berms or to improve drainage, if there will be no adverse impacts. If this cannot be accomplished any heavily contaminated soils should be disposed of at a licensed landfill.

11.0 CONSTRUCTION CONSIDERATIONS

The recommendations presented in this report are based on the assumption that an adequate level of construction monitoring by qualified geotechnical personnel during construction will be provided. All bearing surfaces should be inspected and approved by experienced geotechnical personnel prior to placing the footings or lean mix concrete.

In addition, an adequate level of construction monitoring should include laboratory and field test during construction. This includes Full time compaction testing of Engineered Fill and part time compaction testing under the slab on grade platform backfill with laboratory testing for the proposed fill soils for this Site. Also, periodic testing of concrete is required.

The vibration should be kept at a minimal level to avoid soil disturbance and associated unexpected settlement to the nearby structures, roadway, load bearing elements, and utilities. Also, the noise level should be kept at a tolerance level of noise per the City of Kingston requirements. Vibration and deformation monitoring will be required throughout the construction.

A separate monitoring program should be developed by the shoring designer to monitor the inward movements of the excavation support system to ensure compliance with the design assumptions and avoidance of adverse impacts on nearby structures and buried services.

Also as noted earlier in this report, the existing native soil cannot be used as engineered fill, bedding, cover, or any part of the pavement structure. If the existing native soil is to be reused for backfilling, it has to be reviewed by a geotechnical engineer and approved through bulk sampling and Proctor testing. However, it still can be reused for landscaping.

12.0 IMPORTANT INFORMATION AND LIMITATIONS OF THIS REPORT

The geotechnical assessment presented in this report are intended for the sole guidance of the client named and their design consultants. It should not be relied upon for any other purpose.

In the event of change of the design further geotechnical investigation must be carried out.

The information on which these recommendations are based is subject to confirmation by engineering personnel at the time of construction.

The data we have collated and the opinions we have formed after reviewing this information should not be construed as a guarantee but only as a guide to probable expectations. Conditions that exist, but are not recorded herein, were not apparent given the level of study authorized.

Localized variations in the subsurface conditions may be present between and beyond the boreholes advanced, and that these conditions may be significantly different from the general description provided for design purposes.

It is strongly urged that Egis should be contacted to aid in the interpretation of the borehole records by anyone undertaking work on/or below the ground surface at this Site prior to this work being carried out.

The client expressly agrees that it has entered into this agreement with Egis, both on its own behalf and as an agent on behalf of its employees and principals.

The client expressly agrees that Egis employees and principals shall have no personal liability to the client in respect of a claim, whether in contract, tort, and/or any other cause of action in law. Accordingly, the client expressly agrees that it will bring no proceedings and take no action in any court of law against any Egis employees or principals in their personal capacity.

13.0 CLOSURE

We trust that the following information is sufficient for your needs. We will be pleased to discuss the salient findings of this report with you, should you wish. If you require our further services in this regard, please do not hesitate to contact our office.

Yours truly,

Egis Canada Limited.

Field work carried out by:



Jeffrey Forrester, C.E.T.
Foundations Coordinator

The Geotechnical Part of the Report prepared by:



Zeyad Buni, P.Eng.,
Practice Area Lead, Geotechnical Services

The Geotechnical Part of the Report reviewed by:



Esam Deif, P.Eng.,
Vice President, Geotechnical Services

The Environmental Soil Sampling and
Analysis Part of the Report



Jordan Bowman, P.Geo., P.Biol.
Manager, Geo-Environmental

Egis Group Canada

Appendix A – Borehole Location Plan and Borehole Logs

EXPLANATION OF TERMS USED IN REPORT

N-VALUE: THE STANDARD PENETRATION TEST (SPT) N-VALUE IS THE NUMBER OF BLOWS REQUIRED TO CAUSE A STANDARD 51mm O.D SPLIT BARREL SAMPLER TO PENETRATE 0.3m INTO UNDISTURBED GROUND IN A BOREHOLE WHEN DRIVEN BY A HAMMER WITH A MASS OF 63.5 kg, FALLING FREELY A DISTANCE OF 0.76m. FOR PENETRATIONS OF LESS THAN 0.3m N-VALUES ARE INDICATED AS THE NUMBER OF BLOWS FOR THE PENETRATION ACHIEVED. AVERAGE N-VALUE IS DENOTED THUS N.

DYNAMIC CONE PENETRATION TEST: CONTINUOUS PENETRATION OF A CONICAL STEEL POINT (51mm O.D. 60° CONE ANGLE) DRIVEN BY 475J IMPACT ENERGY ON 'A' SIZE DRILL RODS. THE RESISTANCE TO CONE PENETRATION IS MEASURED AS THE NUMBER OF BLOWS FOR EACH 0.3m ADVANCE OF THE CONICAL POINT INTO THE UNDISTURBED GROUND.

SOILS ARE DESCRIBED BY THEIR COMPOSITION AND CONSISTENCY OR DENSENESS.

CONSISTENCY: COHESIVE SOILS ARE DESCRIBED ON THE BASIS OF THEIR UNDRAINED SHEAR STRENGTH (c_u) AS FOLLOWS:

C_u (kPa)	0 – 12	12 – 25	25 – 50	50 – 100	100 – 200	>200
	VERY SOFT	SOFT	FIRM	STIFF	VERY STIFF	HARD

COMPACTION: COHESIONLESS SOILS ARE DESCRIBED ON THE BASIS OF DENSENESS AS INDICATED BY SPT N VALUES AS FOLLOWS:

N (BLOWS/0.3m)	0 – 5	5 – 10	10 – 30	30 – 50	>50
	VERY LOOSE	LOOSE	COMPACT	DENSE	VERY DENSE

ROCKS ARE DESCRIBED BY THEIR COMPOSITION AND STRUCTURAL FEATURES AND/OR STRENGTH.

RECOVERY: SUM OF ALL RECOVERED ROCK CORE PIECES FROM A CORING RUN EXPRESSED AS A PERCENT OF THE TOTAL LENGTH OF THE CORING RUN.

MODIFIED RECOVERY: SUM OF THOSE INTACT CORE PIECES, 100mm+ IN LENGTH EXPRESSED AS A PERCENT OF THE LENGTH OF THE CORING RUN. THE ROCK QUALITY DESIGNATION (RQD), FOR MODIFIED RECOVERY IS:

RQD (%)	0 – 25	25 – 50	50 – 75	75 – 90	90 – 100
	VERY POOR	POOR	FAIR	GOOD	EXCELLENT

JOINT AND BEDDING:

SPACING	50mm	50 – 300mm	0.3m – 1m	1m – 3m	>3m
JOINTING	VERY CLOSE	CLOSE	MOD. CLOSE	WIDE	VERY WIDE
BEDDING	VERY THIN	THIN	MEDIUM	THICK	VERY THICK

ABBREVIATIONS AND SYMBOLS

FIELD SAMPLING

SS	SPLIT SPOON	TP	THINWALL PISTON
AS	AUGER SAMPLE	OS	OSTERBERG SAMPLE
ST	SLOTTED TUBE SAMPLE	RC	ROCK CORE
BS	BLOCK SAMPLE	PH	TW ADVANCED HYDRAULICALLY
CS	CHUNK SAMPLE	PM	TW ADVANCED MANUALLY
SHELBY	SHELBY TUBE SAMPLE	FS	FOIL SAMPLE

STRESS AND STRAIN

u_w	kPa	PORE WATER PRESSURE
r_u	1	PORE PRESSURE RATIO
σ	kPa	TOTAL NORMAL STRESS
σ'	kPa	EFFECTIVE NORMAL STRESS
τ	kPa	SHEAR STRESS
$\sigma_1, \sigma_2, \sigma_3$	kPa	PRINCIPAL STRESSES
ε	%	LINEAR STRAIN
$\varepsilon_1, \varepsilon_2, \varepsilon_3$	%	PRINCIPAL STRAINS
E	kPa	MODULUS OF LINEAR DEFORMATION
G	kPa	MODULUS OF SHEAR DEFORMATION
μ	1	COEFFICIENT OF FRICTION

MECHANICAL PROPERTIES OF SOIL

m_v	kPa^{-1}	COEFFICIENT OF VOLUME CHANGE
C_c	1	COMPRESSION INDEX
C_s	1	SWELLING INDEX
C_a	1	RATE OF SECONDARY CONSOLIDATION
C_v	m^2/s	COEFFICIENT OF CONSOLIDATION
H	m	DRAINAGE PATH
T_v	1	TIME FACTOR
U	%	DEGREE OF CONSOLIDATION
σ'_{vo}	kPa	EFFECTIVE OVERBURDEN PRESSURE
σ'_p	kPa	PRECONSOLIDATION PRESSURE
τ_f	kPa	SHEAR STRENGTH
c'	kPa	EFFECTIVE COHESION INTERCEPT
Φ_i	-°	EFFECTIVE ANGLE OF INTERNAL FRICTION
c_u	kPa	APPARENT COHESION INTERCEPT
Φ_u	-°	APPARENT ANGLE OF INTERNAL FRICTION
τ_R	kPa	RESIDUAL SHEAR STRENGTH
τ_r	kPa	REMOULDED SHEAR STRENGTH
S_t	1	SENSITIVITY = c_u / τ_r

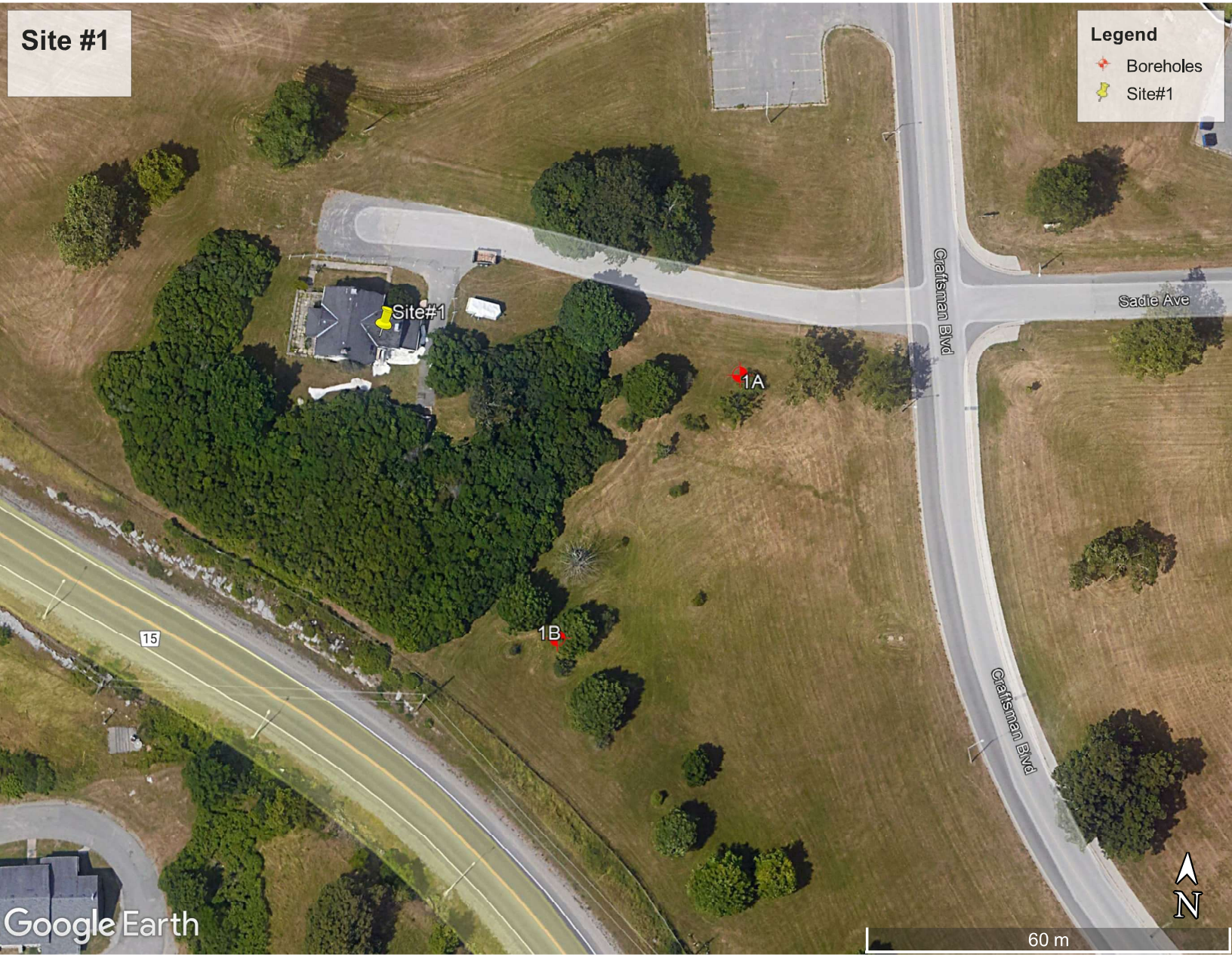
PHYSICAL PROPERTIES OF SOIL


P_s	kg/m^3	DENSITY OF SOLID PARTICLES	e	1, %	VOID RATIO	e_{min}	1, %	VOID RATIO IN DENSEST STATE
γ_s	kN/m^3	UNIT WEIGHT OF SOLID PARTICLES	n	1, %	POROSITY	I_D	1	DENSITY INDEX = $\frac{e_{max} - e}{e_{max} - e_{min}}$
P_w	kg/m^3	DENSITY OF WATER	w	1, %	WATER CONTENT	D	mm	GRAIN DIAMETER
γ_w	kN/m^3	UNIT WEIGHT OF WATER	S_r	%	DEGREE OF SATURATION	D_n	mm	N PERCENT – DIAMETER
P	kg/m^3	DENSITY OF SOIL	w_L	%	LIQUID LIMIT	C_u	1	UNIFORMITY COEFFICIENT
γ	kN/m^3	UNIT WEIGHT OF SOIL	w_p	%	PLASTIC LIMIT	h	m	HYDRAULIC HEAD OR POTENTIAL
P_d	kg/m^3	DENSITY OF DRY SOIL	w_s	%	SHRINKAGE LIMIT	q	m^3/s	RATE OF DISCHARGE
γ_d	kN/m^3	UNIT WEIGHT OF DRY SOIL	I_p	%	PLASTICITY INDEX = $(W_L - W_P)$	v	m/s	DISCHARGE VELOCITY
P_{sat}	kg/m^3	DENSITY OF SATURATED SOIL	I_L	1	LIQUIDITY INDEX = $(W - W_P) / I_p$	i	1	HYDRAULIC GRADIENT
γ_{sat}	kN/m^3	UNIT WEIGHT OF SATURATED SOIL	I_C	1	CONSISTENCY INDEX = $(W_L - W) / I_p$	k	m/s	HYDRAULIC CONDUCTIVITY
P'	kg/m^3	DENSITY OF SUBMERGED SOIL	e_{max}	1, %	VOID RATIO IN LOOSEST STATE	j	kN/m^3	SEEPAGE FORCE
γ'	kN/m^3	UNIT WEIGHT OF SUBMERGED SOIL						

Site #1

Legend

- Boreholes
- Site#1



PROJECT NO.: CCO-24-2687							Drilling Date: Jan/22/2024 - Jan/22/2024							BH No: 24-1A						
PROJECT: Geotech Investigation - Proposed Watermain Valves and Structures							BH Location: N 4900031.987; E 383438.672							Datum: Geodetic						
CLIENT: Eastpoint Engineering Ltd							Drilling Equipment: Mobile B53							Elevation: 99.5 m						
PROJECT LOCATION: CFB Kingston, ON							Drilling Method: Solid Stem Auger							Compiled by: JP						
							Remarks: Coordinate System - UTM Zone 18T							Checked by: ZB						
SOIL PROFILE			SAMPLES				GROUNDWATER CONDITIONS	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT				PLASTIC LIMIT	NATURAL MOISTURE CONTENT	LIQUID LIMIT	Remarks and Grain Size Distribution (%)			
ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS/0.3 m RQD (%)	RECOVERY (%)				SHEAR STRENGTH (kPa) Field, Shear Vane (x) & Sensitivity (s) Pocket Penetrometer								WATER CONTENT (%)		
99.5 0.0	SILT and CLAY some sand and organics brown to dark brown firm moist		1	SS	7	54%											2 13 46 39			
98.7 0.8			2	SS	50/ 75 mm	13%														
	Auger refusal @ 0.84 m on inferred bedrock Borehole dry upon completion																			

1MP SOIL LOG GINT CFB KINGSTON.GPJ MP_OTTAWA_FOUNDATIONS.GDT 3/15/24

PROJECT NO.: CCO-24-2687

PROJECT: Geotech Investigation - Proposed Watermain Valves and Structures

CLIENT: Eastpoint Engineering Ltd

PROJECT LOCATION: CFB Kingston, ON

Drilling Date: Jan/23/2024 - Jan/23/2024

BH Location: N 4899987.745; E 383409.321

Drilling Equipment: Mobile B53

Drilling Method: Solid Stem Auger

Remarks: Coordinate System - UTM Zone 18T

BH No: 24-1B

Datum: Geodetic

Elevation: 100.8 m

Compiled by: JP

Checked by: ZB

SOIL PROFILE			SAMPLES				GROUNDWATER CONDITIONS	DEPTH (m) ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT				PLASTIC LIMIT	NATURAL MOISTURE CONTENT	LIQUID LIMIT	Remarks and Grain Size Distribution (%) Unit Weight (kN/m ³) Pocket Penetro. (kPa)
ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS/0.3 m RQD (%)	RECOVERY (%)			SHEAR STRENGTH (kPa)							
									Field, Shear Vane (x) & Sensitivity (s) Pocket Penetrometer							
100.8 0.0	SANDY CLAYEY SILT some organics brown to dark brown firm moist 															

1MP SOIL LOG GINT CFB KINGSTON.GPJ MP_OTTAWA_FOUNDATIONS.GDT 3/15/24

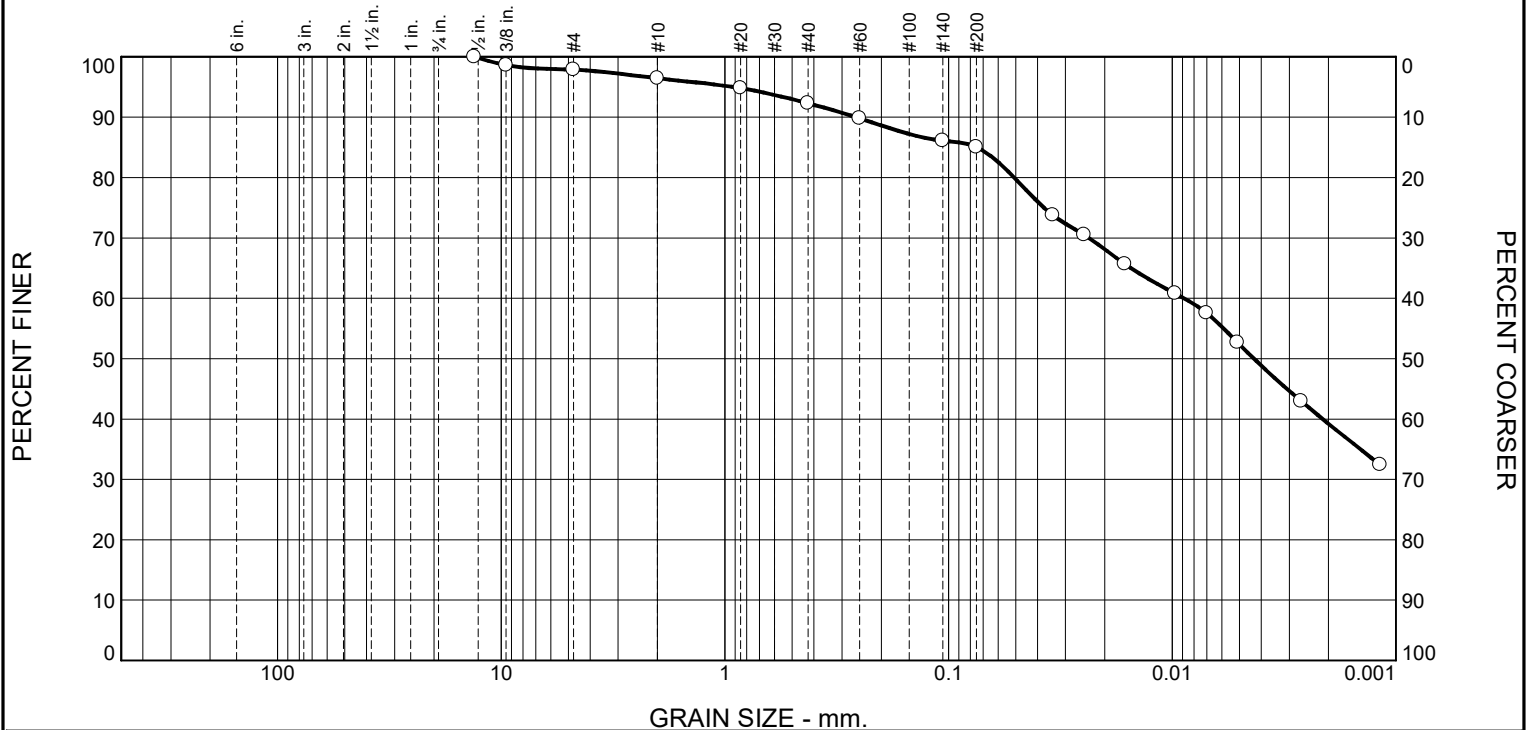
Egis Group Canada

Appendix B – Laboratory Test Results

WATER CONTENT DETERMINATION

[illegible]

Particle Size Distribution Report



GRAIN SIZE - mm.

% +75mm	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	2.1	1.4	4.2	7.3	45.8	39.2

TEST RESULTS			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
13.2mm	100.0		
9.5mm	98.6		
4.75mm	97.9		
2.00mm	96.5		
0.850mm	94.8		
0.425mm	92.3		
0.250mm	89.8		
0.106mm	86.1		
0.075mm	85.0		
0.0342 mm.	73.8		
0.0248 mm.	70.5		
0.0163 mm.	65.7		
0.0097 mm.	60.8		
0.0070 mm.	57.6		
0.0051 mm.	52.7		
0.0027 mm.	43.0		
0.0012 mm.	32.4		

* (no specification provided)

Location: BH24-1A SS-1
Sample Number: SS-1

Depth: 0'-2'

Date Sampled: Jan 22, 2024

Material Description

Silt and Clay some Sand trace fine Gravel

Atterberg Limits (ASTM D 4318)

PL= LL= PI=

Classification

USCS (D 2487)= AASHTO (M 145)=

Coefficients

D₉₀= 0.2587 D₈₅= 0.0745 D₆₀= 0.0089
D₅₀= 0.0043 D₃₀= C_u= D₁₅= C_c=

Remarks

Note: Specific Gravity of soils is assumed.

Organics present

F.M.=0.40

Date Received: Feb 9, 2024 Date Tested: Feb 13, 2024

Tested By: R.C

Checked By: J.Hopwood-Jones

Title: Lab Manager



Client: Eastpoint Engineering Ltd.

Project: CFB Kingston

Project No: CCO-24-2687

Figure

GRAIN SIZE DISTRIBUTION TEST DATA**2024-02-21****Client:** Eastpoint Engineering Ltd.**Project:** CFB Kingston**Project Number:** CCO-24-2687**Location:** BH24-1A SS-1**Depth:** 0'-2'**Sample Number:** SS-1**Material Description:** Silt and Clay some Sand trace fine Gravel**Sample Date:** Jan 22,2024**Date Received:** Feb 9,2024**Testing Remarks:** Note: Specific Gravity of soils is assumed.
Organics present**Tested By:** R.C**Test Date:** Feb 13,2024**Checked By:** J.Hopwood-Jones**Title:** Lab Manager**Sieve Test Data**

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
100.41	0.00	0.00	13.2mm	0.00	100.0	0.0
			9.5mm	1.37	98.6	1.4
			4.75mm	2.13	97.9	2.1
			2.00mm	3.56	96.5	3.5
57.91	0.00	0.00	0.850mm	0.99	94.8	5.2
			0.425mm	2.49	92.3	7.7
			0.250mm	3.98	89.8	10.2
			0.106mm	6.22	86.1	13.9
			0.075mm	6.85	85.0	15.0

Hydrometer Test Data**Hydrometer test uses material passing #10****Percent passing #10 based upon complete sample = 96.5****Weight of hydrometer sample = 57.91****Table of composite correction values:**

Temp., deg. C:	21.9	21.8	21.5
Comp. corr.:	-6.5	-6.5	-6.0

Meniscus correction only = -1.0**Specific gravity of solids = 2.775****Hydrometer type = 152H****Hydrometer effective depth equation: $L = 16.6007 - 0.187 \times R_m$**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
1.00	21.9	52.0	45.5	0.0129	51.0	7.1	0.0342	73.8	26.2
2.00	21.9	50.0	43.5	0.0129	49.0	7.4	0.0248	70.5	29.5
5.00	21.9	47.0	40.5	0.0129	46.0	8.0	0.0163	65.7	34.3
15.00	21.9	44.0	37.5	0.0129	43.0	8.6	0.0097	60.8	39.2
30.00	21.9	42.0	35.5	0.0129	41.0	8.9	0.0070	57.6	42.4
60.00	21.9	39.0	32.5	0.0129	38.0	9.5	0.0051	52.7	47.3

Hydrometer Test Data (continued)

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
250.00	21.8	33.0	26.5	0.0129	32.0	10.6	0.0027	43.0	57.0
1440.00	21.5	26.0	20.0	0.0129	25.0	11.9	0.0012	32.4	67.6

Fractional Components

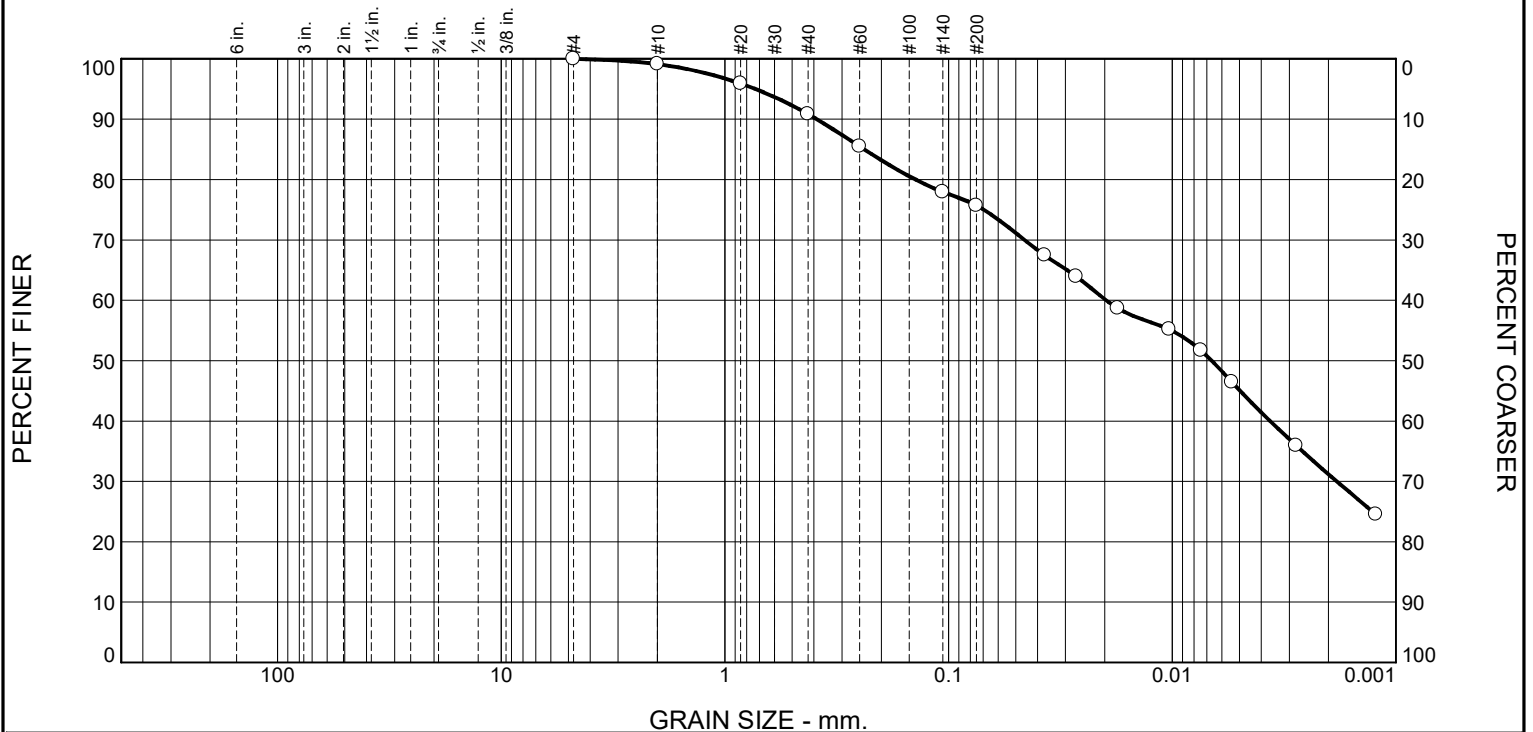
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	2.1	2.1	1.4	4.2	7.3	12.9	45.8	39.2	85.0

D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
					0.0021	0.0043	0.0089	0.0509	0.0745	0.2587	0.9167

Fineness Modulus

0.40

Particle Size Distribution Report



% +75mm	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.9	8.3	15.1	44.5	31.2

TEST RESULTS			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
4.75mm	100.0		
2.00mm	99.1		
0.850mm	95.9		
0.425mm	90.8		
0.250mm	85.5		
0.106mm	77.9		
0.075mm	75.7		
0.0372 mm.	67.5		
0.0269 mm.	64.0		
0.0175 mm.	58.7		
0.0103 mm.	55.2		
0.0074 mm.	51.7		
0.0054 mm.	46.4		
0.0028 mm.	35.9		
0.0012 mm.	24.5		

Material Description
Clayey Sandy Silt

Atterberg Limits (ASTM D 4318)
 PL= LL= PI=

Classification
 USCS (D 2487)= AASHTO (M 145)=

Coefficients
 D₉₀= 0.3884 D₈₅= 0.2382 D₆₀= 0.0197
 D₅₀= 0.0067 D₃₀= 0.0018 D₁₅=
 D₁₀= C_u= C_c=

Remarks
 Note: Specific gravity of soils is assumed.
 Organics present.
 F.M.=0.41

Date Received: Feb 8,2024 **Date Tested:** Feb 13,2024
Tested By: R.C
Checked By: J.Hopwood-Jones
Title: Lab Manager

* (no specification provided)

Location: BH24-1B SS-1 **Depth:** 0'-2' **Date Sampled:** Jan 22,2024

Sample Number: SS-1



Client: Eastpoint Engineering Ltd.
Project: CFB Kingston
Project No: CCO-24-2687

Figure

GRAIN SIZE DISTRIBUTION TEST DATA

2024-02-21

Client: Eastpoint Engineering Ltd.

Project: CFB Kingston

Project Number: CCO-24-2687

Location: BH24-1B SS-1

Depth: 0'-2'

Sample Number: SS-1

Material Description: Clayey Sandy Silt

Sample Date: Jan 22,2024

Date Received: Feb 8,2024

Testing Remarks: Note: Specific gravity of soils is assumed.
Organics present.

Tested By: R.C

Test Date: Feb 13,2024

Checked By: J.Hopwood-Jones

Title: Lab Manager

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
106.34	0.00	0.00	4.75mm	0.00	100.0	0.0
			2.00mm	0.93	99.1	0.9
55.07	0.00	0.00	0.850mm	1.79	95.9	4.1
			0.425mm	4.60	90.8	9.2
			0.250mm	7.57	85.5	14.5
			0.106mm	11.77	77.9	22.1
			0.075mm	13.01	75.7	24.3

Hydrometer Test Data

Hydrometer test uses material passing #10

Percent passing #10 based upon complete sample = 99.1

Weight of hydrometer sample =55.07

Table of composite correction values:

Temp., deg. C:	21.9	21.8	21.5
Comp. corr.:	-6.5	-6.5	-6.0

Meniscus correction only = -1.0

Specific gravity of solids = 2.775

Hydrometer type = 152H

Hydrometer effective depth equation: $L = 16.6007 - 0.187 \times R_m$

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
1.00	21.9	45.0	38.5	0.0129	44.0	8.4	0.0372	67.5	32.5
2.00	21.9	43.0	36.5	0.0129	42.0	8.7	0.0269	64.0	36.0
5.00	21.9	40.0	33.5	0.0129	39.0	9.3	0.0175	58.7	41.3
15.00	21.9	38.0	31.5	0.0129	37.0	9.7	0.0103	55.2	44.8
30.00	21.9	36.0	29.5	0.0129	35.0	10.1	0.0074	51.7	48.3
60.00	21.9	33.0	26.5	0.0129	32.0	10.6	0.0054	46.4	53.6
250.00	21.8	27.0	20.5	0.0129	26.0	11.7	0.0028	35.9	64.1
1440.00	21.5	20.0	14.0	0.0129	19.0	13.0	0.0012	24.5	75.5

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.9	8.3	15.1	24.3	44.5	31.2	75.7

D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
				0.0018	0.0037	0.0067	0.0197	0.1406	0.2382	0.3884	0.7299

Fineness Modulus
0.41



Unconfined Compressive Strength of Intact Rock Cores
ASTM D7012 Method C

Project No.:	CCO-24-2687	Date Issued:	February 13, 2024
Lab No.:	OL- 23077	Report No.:	1 of 1
Project Name:	Geo.Inv./Env.Soil Sampling-CFB Kingston		
Core No.:	1	Moisture Condition:	Dry as received
Borehole Location:	BH24-1B	Run:	1
Depth (ft):	4'10"-5'3.5"		
Date Sampled:	Jan 18, 2024	Received:	Jan 26, 2024
Tested:	Feb 12, 2024		
Core No.:	2	Moisture Condition:	Dry as received
Borehole Location:	BH24-2B	Run:	1
Depth (ft):	8'6"-8'11.5"		
Date Sampled:	Jan 18, 2024	Received:	Jan 26, 2024
Tested:	Feb 12, 2024		
Core No.:	3	Moisture Condition:	Dry as received
Borehole Location:	BH24-3B	Run:	2
Depth (ft):	7'2"-7'7.5"		
Date Sampled:	Jan 18, 2024	Received:	Jan 26, 2024
Tested:	Feb 12, 2024		
Core No. :	1	2	3
Diameter (mm)	63.2	63.0	62.9
Thickness/Height (mm)	129.2	128.8	128.1
Density (Kg/m³)	2672	2736	2730
Compressive Strength (Mpa)	166.3	174.9	228.2
Mass of Core (kg)	1.083	1.099	1.087
Description of Failure	2	2	3

Remarks: Core#3 Diagonal fracture with some columnar vertical cracking through top end. No well formed

Cones on ether end.

Core#1&2 Relatively well-formed cone on one end, vertical cracks running through end, no well

formed cone on other end.

Reviewed By:

Date:

Feb 13, 2024

Jason Hopwood-Jones
Laboratory Manager

Certificate of Analysis

Egis Canada Ltd. (Nepean)

215 Menten Place, Unit 104
Nepean, ON K2H 9C1

Attn: Jason Hopwood-Jones

Client PO: CFB Kingston

Project: CCO-24-2687

Custody: 140454

Report Date: 15-Feb-2024

Order Date: 9-Feb-2024

Order #: 2406540

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
2406540-01	BH24-1B SS2
2406540-02	BH24-2B SS3
2406540-03	BH24-3B SS1
2406540-04	BH24-4B SS2

Approved By:



Dale Robertson, BSc

Laboratory Director

Certificate of Analysis

Report Date: 15-Feb-2024

Client: Egis Canada Ltd. (Nepean)

Order Date: 9-Feb-2024

Client PO: CFB Kingston

Project Description: CCO-24-2687

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Anions	EPA 300.1 - IC, water extraction	12-Feb-24	12-Feb-24
pH, soil	EPA 150.1 - pH probe @ 25 °C, CaCl buffered ext.	13-Feb-24	13-Feb-24
Resistivity	EPA 120.1 - probe, water extraction	12-Feb-24	12-Feb-24
Solids, %	CWS Tier 1 - Gravimetric	14-Feb-24	15-Feb-24

Certificate of Analysis

Report Date: 15-Feb-2024

Client: Egis Canada Ltd. (Nepean)

Order Date: 9-Feb-2024

Client PO: CFB Kingston

Project Description: CCO-24-2687

Client ID:	BH24-1B SS2	BH24-2B SS3	BH24-3B SS1	BH24-4B SS2	-	-
Sample Date:	22-Jan-24 09:00	22-Jan-24 09:00	22-Jan-24 09:00	22-Jan-24 09:00	-	-
Sample ID:	2406540-01	2406540-02	2406540-03	2406540-04	-	-
Matrix:	Soil	Soil	Soil	Soil	-	-
MDL/Units						

Physical Characteristics

% Solids	0.1 % by Wt.	83.3	77.5	77.6	91.3	-	-
----------	--------------	------	------	------	------	---	---

General Inorganics

pH	0.05 pH Units	7.41	7.40	6.90	7.32	-	-
Resistivity	0.1 Ohm.m	58.9	58.3	62.3	72.3	-	-

Anions

Chloride	10 ug/g	<10	<10	<10	<10	-	-
Sulphate	10 ug/g	15	13	<10	<10	-	-

Certificate of Analysis

Report Date: 15-Feb-2024

Client: Egis Canada Ltd. (Nepean)

Order Date: 9-Feb-2024

Client PO: CFB Kingston

Project Description: CCO-24-2687

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions								
Chloride	ND	10	ug/g					
Sulphate	ND	10	ug/g					
General Inorganics								
Resistivity	ND	0.1	Ohm.m					

Certificate of Analysis

Report Date: 15-Feb-2024

Client: Egis Canada Ltd. (Nepean)

Order Date: 9-Feb-2024

Client PO: CFB Kingston

Project Description: CCO-24-2687

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	118	10	ug/g	110			7.0	35	
Sulphate	58.3	10	ug/g	57.8			0.8	35	
General Inorganics									
pH	7.12	0.05	pH Units	7.08			0.6	2.3	
Resistivity	12.9	0.1	Ohm.m	12.7			1.2	20	
Physical Characteristics									
% Solids	87.9	0.1	% by Wt.	88.0			0.1	25	

Certificate of Analysis

Report Date: 15-Feb-2024

Client: Egis Canada Ltd. (Nepean)

Order Date: 9-Feb-2024

Client PO: CFB Kingston

Project Description: CCO-24-2687

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	217	10	ug/g	110	107	82-118			
Sulphate	159	10	ug/g	57.8	101	80-120			

Certificate of Analysis

Report Date: 15-Feb-2024

Client: Egis Canada Ltd. (Nepean)

Order Date: 9-Feb-2024

Client PO: CFB Kingston

Project Description: CCO-24-2687

Qualifier Notes:

Sample Data Revisions:

None

Work Order Revisions / Comments:

Client confirmed all samples collected January 22, 2024.

Other Report Notes:

n/a: not applicable

ND: Not Detected

MDL: Method Detection Limit

Source Result: Data used as source for matrix and duplicate samples

%REC: Percent recovery.

RPD: Relative percent difference.

NC: Not Calculated

Soil results are reported on a dry weight basis unless otherwise noted.

Where %Solids is reported, moisture loss includes the loss of volatile hydrocarbons.

Any use of these results implies your agreement that our total liability in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.



Paracel ID: 2406540

Blvd.
4J835.com
7Paracel Order Number
(Lab Use Only)

2406540

Chain Of Custody
(Lab Use Only)

No 140454

Client Name: EGIS Canada LTD	Project Ref: CFB Kingston	Page 1 of 1
Contact Name: Jason Hopwood-Jones	Quote #: _____	Turnaround Time
Address: 215 Menten Pl Nepean ON	PO #: CCO-24-2687	<input type="checkbox"/> 1 day <input type="checkbox"/> 3 day
Telephone: 613 453-0751	E-mail: j.hopwood-jones@mcintoshperry.com	<input type="checkbox"/> 2 day <input checked="" type="checkbox"/> Regular
Date Required: _____		

<input type="checkbox"/> REG 153/04 <input type="checkbox"/> REG 406/10	Other Regulation	Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)	Required Analysis												
<input type="checkbox"/> Table 1 <input type="checkbox"/> Res/Park <input type="checkbox"/> Mod/Fine <input type="checkbox"/> REG 558 <input type="checkbox"/> PWQO	<input type="checkbox"/> Table 2 <input type="checkbox"/> Ind/Comm <input type="checkbox"/> Coarse <input type="checkbox"/> CCMC <input type="checkbox"/> MISA	<input type="checkbox"/> Table 3 <input type="checkbox"/> Agri/Other <input type="checkbox"/> sU - Sand <input type="checkbox"/> SU - Storm	<input type="checkbox"/> Table _____	Mun: _____	<input type="checkbox"/> Other: _____	Sample Taken	PHCs F1-F4+BTX	VOCs	PAHs	Metals by ICP	Hg	Cu-VI	B (HWS)	Chemical Package	
Sample ID/Location Name						Matrix	Air Volume	# of Containers	Date	Time					
1 BH 24-1B SS2						S		1							X
2 BH 24-2B SS3						S		1							X
3 BH 24-3B SS1						S		1							X
4 BH 24-4B SS2						S		1							X
5															
6															
7															
8															
9															
10															

Comments:		Method of Delivery: Walk	
Relinquished By (Sign): R. Collette	Received at: 3:35	Received at Lab: SO	Verified By: SO
Relinquished By (Print): R Collette	Date/Time: Feb 9, 2024 1:15	Date/Time: Feb 9, 2024 4:35pm	Date/Time: Feb 9, 2024 4:36pm
Date/Time: 02/09/24 @ 4:00pm	Temperature: 22.4 °C	Temperature: 17.4 °C	pH Verified: <input type="checkbox"/> By: _____

Chain of Custody (EHS) XIX

Revision 4.0

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
Invoice to: EGIS Canada Ltd.
PO#:

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844
Temperature (C): 7
Custody Seal:

Page 1 of 25

Dear Benjamin Edwards:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Report Comments:

Emma-Dawn Ferguson, Chemist

All analysis is completed at Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) unless otherwise stated

Eurofins Environment Testing Canada Inc. is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on the scope of accreditation. The scope is available at <https://directory.cala.ca/>

Please note: Field data, where presented on the report, has been provided by the client and is presented for informational purposes only. Guideline or regulatory limits listed on this report are provided for ease of use (informational purposes) only. Eurofins recommends consulting the official guideline or regulation as required. Unless otherwise stated, measurement uncertainty is not taken into account when determining guideline or regulatory exceedances.



Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0

Attention: Mr. Benjamin Edwards

PO#:

Invoice to: EGIS Canada Ltd.

Report Number: 3004774

Date Submitted: 2024-01-26

Date Reported: 2024-02-02

Project: CCO - 24 - 2687

COC #: 226844

Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

Exceedence Summary

Sample I.D.	Analyte	Result	Units	Criteria
Inorganics				
24-4A	Electrical Conductivity	0.61	mS/cm	STD 0.57
Metals				
24-1A	Barium	376	ug/g	STD 220
24-1A	Selenium	1.8	ug/g	STD 1.5
24-1B	Barium	377	ug/g	STD 220
24-2A	Barium	307	ug/g	STD 220
24-2B	Barium	442	ug/g	STD 220
24-2B	Selenium	1.6	ug/g	STD 1.5
24-3A	Barium	238	ug/g	STD 220
24-3A	Selenium	1.6	ug/g	STD 1.5
24-4A	Barium	317	ug/g	STD 220

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

Hydrocarbons

Lab I.D.
Sample Matrix
Sample Type
Sample Date
Sampling Time
Sample I.D.

1716832 Soil153	1716833 Soil153	1716834 Soil153	1716835 Soil153	1716836 Soil153
2024-01-26	2024-01-26	2024-01-26	2024-01-26	2024-01-26
24-1A	24-1B	24-2A	24-2B	24-3A

Analyte	Batch No	MRL	Units	Guideline
---------	----------	-----	-------	-----------

PHC's F1	455317	10	ug/g	STD 25	<10	<10	<10	<10	<10
PHC's F1-BTEX	455321	10	ug/g		<10	<10	<10	<10	<10
PHC's F2	455308	2	ug/g	STD 10		<2	<2		<2
	455313	2	ug/g	STD 10	<2			<2	
PHC's F2-Naph	455413	2	ug/g		<2	<2	<2	<2	<2
PHC's F3	455308	20	ug/g	STD 240		<20	<20		<20
	455313	20	ug/g	STD 240	<20			<20	
PHC's F3-PAH	455414	20	ug/g		<20	<20	<20	<20	<20
PHC's F4	455308	20	ug/g	STD 120		<20	<20		<20
	455313	20	ug/g	STD 120	<20			<20	

Hydrocarbons

Lab I.D.
Sample Matrix
Sample Type
Sample Date
Sampling Time
Sample I.D.

1716837 Soil153	1716838 Soil153	1716839 Soil153
2024-01-26	2024-01-26	2024-01-26
24-3B	24-4A	24-4B

Analyte	Batch No	MRL	Units	Guideline
---------	----------	-----	-------	-----------

PHC's F1	455317	10	ug/g	STD 25	<10	<10	<10
PHC's F1-BTEX	455321	10	ug/g		<10	<10	
	455322	10	ug/g				<10
PHC's F2	455308	2	ug/g	STD 10	<2		
	455313	2	ug/g	STD 10		<2	
	455411	2	ug/g	STD 10			<2
PHC's F2-Naph	455413	2	ug/g		<2	<2	<2
PHC's F3	455308	20	ug/g	STD 240	<20		
	455313	20	ug/g	STD 240		<20	

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

Hydrocarbons

Lab I.D.
Sample Matrix
Sample Type
Sample Date
Sampling Time
Sample I.D.

1716837 Soil153	1716838 Soil153	1716839 Soil153
2024-01-26	2024-01-26	2024-01-26
24-3B	24-4A	24-4B

Analyte	Batch No	MRL	Units	Guideline
---------	----------	-----	-------	-----------

PHC's F3	455411	20	ug/g	STD 240			<20
PHC's F3-PAH	455414	20	ug/g		<20	<20	<20
PHC's F4	455308	20	ug/g	STD 120	<20		
	455313	20	ug/g	STD 120		<20	
	455411	20	ug/g	STD 120			<20

Metals

Lab I.D.
Sample Matrix
Sample Type
Sample Date
Sampling Time
Sample I.D.

1716832 Soil153	1716833 Soil153	1716834 Soil153	1716835 Soil153	1716836 Soil153
2024-01-26	2024-01-26	2024-01-26	2024-01-26	2024-01-26
24-1A	24-1B	24-2A	24-2B	24-3A

Analyte	Batch No	MRL	Units	Guideline
---------	----------	-----	-------	-----------

Antimony	455434	1	ug/g	STD 1.3	<1	<1	<1	<1	<1
Arsenic	455434	1	ug/g	STD 18	5	6	4	4	3
Barium	455434	1	ug/g	STD 220	376*	377*	307*	442*	238*
Beryllium	455434	1	ug/g	STD 2.5	2	2	1	2	<1
Boron (total)	455434	5	ug/g	STD 36	13	10	10	10	11
Cadmium	455434	0.4	ug/g	STD 1.2	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium Total	455434	1	ug/g	STD 70		64	43	62	38
	455501	1	ug/g	STD 70	56				
Cobalt	455434	1	ug/g	STD 21		19	12	19	12
	455501	1	ug/g	STD 21	15				
Copper	455434	1	ug/g	STD 92		38	28	39	21
	455501	1	ug/g	STD 92	36				
Lead	455434	1	ug/g	STD 120		16	11	11	14
	455501	1	ug/g	STD 120	20				

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range



Certificate of Analysis

Environment Testing

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

Metals

Lab I.D. Sample Matrix Sample Type Sample Date Sampling Time Sample I.D.					1716832 Soil153	1716833 Soil153	1716834 Soil153	1716835 Soil153	1716836 Soil153
Guideline					24-1A	24-1B	24-2A	24-2B	24-3A
Analyte	Batch No	MRL	Units	Guideline					
Molybdenum	455434	1	ug/g	STD 2	<1	<1	<1	<1	<1
Nickel	455434	1	ug/g	STD 82		42	33	43	26
	455501	1	ug/g	STD 82	37				
Selenium	455434	0.5	ug/g	STD 1.5	1.8*	1.5	1.1	1.6*	1.6*
Silver	455434	0.2	ug/g	STD 0.5	<0.2	<0.2	<0.2	<0.2	<0.2
Thallium	455434	1	ug/g	STD 1	<1	<1	<1	<1	<1
Uranium	455434	0.5	ug/g	STD 2.5	1.0	0.7	<0.5	<0.5	<0.5
Vanadium	455434	2	ug/g	STD 86		77	56	82	43
	455501	2	ug/g	STD 86	66				
Zinc	455434	2	ug/g	STD 290		109	75	120	74
	455501	2	ug/g	STD 290	106				

Metals

Lab I.D. Sample Matrix Sample Type Sample Date Sampling Time Sample I.D.					1716837 Soil153	1716838 Soil153	1716839 Soil153
Guideline					24-3B	24-4A	24-4B
Analyte	Batch No	MRL	Units	Guideline			
Antimony	455434	1	ug/g	STD 1.3	<1	<1	<1
Arsenic	455434	1	ug/g	STD 18	4	3	2
Barium	455434	1	ug/g	STD 220	195	317*	39
Beryllium	455434	1	ug/g	STD 2.5	<1	<1	<1
Boron (total)	455434	5	ug/g	STD 36	12	8	8
Cadmium	455434	0.4	ug/g	STD 1.2	<0.4	<0.4	<0.4
Chromium Total	455434	1	ug/g	STD 70	27	46	15
Cobalt	455434	1	ug/g	STD 21	9	13	5

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

Metals

Lab I.D.
Sample Matrix
Sample Type
Sample Date
Sampling Time
Sample I.D.

1716837 Soil153	1716838 Soil153	1716839 Soil153
2024-01-26	2024-01-26	2024-01-26
24-3B	24-4A	24-4B

Analyte	Batch No	MRL	Units	Guideline			
Copper	455434	1	ug/g	STD 92	17	29	10
Lead	455434	1	ug/g	STD 120	22	10	4
Molybdenum	455434	1	ug/g	STD 2	<1	<1	<1
Nickel	455434	1	ug/g	STD 82	20	30	10
Selenium	455434	0.5	ug/g	STD 1.5	1.3	1.2	<0.5
Silver	455434	0.2	ug/g	STD 0.5	<0.2	<0.2	<0.2
Thallium	455434	1	ug/g	STD 1	<1	<1	<1
Uranium	455434	0.5	ug/g	STD 2.5	<0.5	<0.5	<0.5
Vanadium	455434	2	ug/g	STD 86	29	59	20
Zinc	455434	2	ug/g	STD 290	54	77	17

PAH

Lab I.D.
Sample Matrix
Sample Type
Sample Date
Sampling Time
Sample I.D.

1716832 Soil153	1716833 Soil153	1716834 Soil153	1716835 Soil153	1716836 Soil153
2024-01-26	2024-01-26	2024-01-26	2024-01-26	2024-01-26
24-1A	24-1B	24-2A	24-2B	24-3A

Analyte	Batch No	MRL	Units	Guideline					
1+2-methylnaphthalene	455358	0.05	ug/g	STD 0.59	<0.05	<0.05	<0.05	<0.05	<0.05
Acenaphthene	455318	0.05	ug/g	STD 0.072	<0.05	<0.05	<0.05	<0.05	<0.05
Acenaphthylene	455318	0.05	ug/g	STD 0.093	<0.05	<0.05	<0.05	<0.05	<0.05
Anthracene	455318	0.05	ug/g	STD 0.16	<0.05	<0.05	<0.05	<0.05	<0.05
Benz[a]anthracene	455318	0.05	ug/g	STD 0.36	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo[a]pyrene	455318	0.05	ug/g	STD 0.3	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo[b]fluoranthene	455318	0.05	ug/g	STD 0.47	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo[ghi]perylene	455318	0.05	ug/g	STD 0.68	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo[k]fluoranthene	455318	0.05	ug/g	STD 0.48	<0.05	<0.05	<0.05	<0.05	<0.05

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range



Certificate of Analysis

Environment Testing

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

PAH

Lab I.D. Sample Matrix Sample Type Sample Date Sampling Time Sample I.D.					1716832 Soil153	1716833 Soil153	1716834 Soil153	1716835 Soil153	1716836 Soil153
					2024-01-26	2024-01-26	2024-01-26	2024-01-26	2024-01-26
					24-1A	24-1B	24-2A	24-2B	24-3A
Analyte	Batch No	MRL	Units	Guideline					
Chrysene	455318	0.05	ug/g	STD 2.8	<0.05	<0.05	<0.05	<0.05	<0.05
Dibenz[a h]anthracene	455318	0.05	ug/g	STD 0.1	<0.05	<0.05	<0.05	<0.05	<0.05
Fluoranthene	455318	0.05	ug/g	STD 0.56	<0.05	<0.05	<0.05	<0.05	<0.05
Fluorene	455318	0.05	ug/g	STD 0.12	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno[1 2 3-cd]pyrene	455318	0.05	ug/g	STD 0.23	<0.05	<0.05	<0.05	<0.05	<0.05
Methlynaphthalene, 1-	455318	0.05	ug/g		<0.05	<0.05	<0.05	<0.05	<0.05
Methlynaphthalene, 2-	455318	0.05	ug/g		<0.05	<0.05	<0.05	<0.05	<0.05
Naphthalene	455318	0.013	ug/g	STD 0.09	<0.013	<0.013	<0.013	<0.013	<0.013
Phenanthrene	455318	0.05	ug/g	STD 0.69	<0.05	<0.05	<0.05	<0.05	<0.05
Pyrene	455318	0.05	ug/g	STD 1	<0.05	<0.05	<0.05	<0.05	<0.05

PAH

Lab I.D. Sample Matrix Sample Type Sample Date Sampling Time Sample I.D.					1716837 Soil153	1716838 Soil153	1716839 Soil153
					2024-01-26	2024-01-26	2024-01-26
					24-3B	24-4A	24-4B
Analyte	Batch No	MRL	Units	Guideline			
1+2-methylnaphthalene	455358	0.05	ug/g	STD 0.59	<0.05	<0.05	<0.05
Acenaphthene	455318	0.05	ug/g	STD 0.072	<0.05	<0.05	<0.05
Acenaphthylene	455318	0.05	ug/g	STD 0.093	<0.05	<0.05	<0.05
Anthracene	455318	0.05	ug/g	STD 0.16	<0.05	<0.05	<0.05
Benz[a]anthracene	455318	0.05	ug/g	STD 0.36	<0.05	<0.05	<0.05
Benzo[a]pyrene	455318	0.05	ug/g	STD 0.3	<0.05	<0.05	<0.05
Benzo[b]fluoranthene	455318	0.05	ug/g	STD 0.47	<0.05	<0.05	<0.05
Benzo[ghi]perylene	455318	0.05	ug/g	STD 0.68	<0.05	<0.05	<0.05
Benzo[k]fluoranthene	455318	0.05	ug/g	STD 0.48	<0.05	<0.05	<0.05

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational
Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim
Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial
Water Quality Guideline, IPWQO = Interim Provincial Water Quality
Objective, TDR = Typical Desired Range

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

PAH

Lab I.D.
Sample Matrix
Sample Type
Sample Date
Sampling Time
Sample I.D.

1716837 Soil153	1716838 Soil153	1716839 Soil153
2024-01-26	2024-01-26	2024-01-26
24-3B	24-4A	24-4B

Analyte	Batch No	MRL	Units	Guideline			
Chrysene	455318	0.05	ug/g	STD 2.8	<0.05	<0.05	<0.05
Dibenz[a h]anthracene	455318	0.05	ug/g	STD 0.1	<0.05	<0.05	<0.05
Fluoranthene	455318	0.05	ug/g	STD 0.56	<0.05	<0.05	<0.05
Fluorene	455318	0.05	ug/g	STD 0.12	<0.05	<0.05	<0.05
Indeno[1 2 3-cd]pyrene	455318	0.05	ug/g	STD 0.23	<0.05	<0.05	<0.05
Methlynaphthalene, 1-	455318	0.05	ug/g		<0.05	<0.05	<0.05
Methlynaphthalene, 2-	455318	0.05	ug/g		<0.05	<0.05	<0.05
Naphthalene	455318	0.013	ug/g	STD 0.09	<0.013	<0.013	<0.013
Phenanthrene	455318	0.05	ug/g	STD 0.69	<0.05	<0.05	<0.05
Pyrene	455318	0.05	ug/g	STD 1	<0.05	<0.05	<0.05

Volatiles

Lab I.D.
Sample Matrix
Sample Type
Sample Date
Sampling Time
Sample I.D.

1716832 Soil153	1716833 Soil153	1716834 Soil153	1716835 Soil153	1716836 Soil153
2024-01-26	2024-01-26	2024-01-26	2024-01-26	2024-01-26
24-1A	24-1B	24-2A	24-2B	24-3A

Analyte	Batch No	MRL	Units	Guideline					
Acetone	455316	0.50	ug/g	STD 0.5	<0.50	<0.50	<0.50	<0.50	<0.50
Benzene	455316	0.0068	ug/g	STD 0.02	<0.0068	<0.0068	<0.0068	<0.0068	<0.0068
Bromodichloromethane	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Bromoform	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Bromomethane	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Carbon Tetrachloride	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorobenzene	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chloroform	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dibromochloromethane	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational
Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim
Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial
Water Quality Guideline, IPWQO = Interim Provincial Water Quality
Objective, TDR = Typical Desired Range



Certificate of Analysis

Environment Testing

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

Volatiles

Lab I.D. Sample Matrix Sample Type Sample Date Sampling Time Sample I.D.					1716832 Soil153	1716833 Soil153	1716834 Soil153	1716835 Soil153	1716836 Soil153
Guideline					2024-01-26 24-1A	2024-01-26 24-1B	2024-01-26 24-2A	2024-01-26 24-2B	2024-01-26 24-3A
Analyte	Batch No	MRL	Units	Guideline					
Dichlorobenzene, 1,2-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichlorobenzene, 1,3-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichlorobenzene, 1,4-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichlorodifluoromethane	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichloroethane, 1,1-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichloroethane, 1,2-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichloroethylene, 1,1-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichloroethylene, 1,2-cis-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichloroethylene, 1,2-trans-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichloropropane, 1,2-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichloropropene, 1,3-	455320	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichloropropene, 1,3-cis-	455316	0.05	ug/g		<0.05	<0.05	<0.05	<0.05	<0.05
Dichloropropene, 1,3-trans-	455316	0.05	ug/g		<0.05	<0.05	<0.05	<0.05	<0.05
Ethylbenzene	455316	0.018	ug/g	STD 0.05	<0.018	<0.018	<0.018	<0.018	<0.018
Ethylene dibromide	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Hexane (n)	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Methyl Ethyl Ketone	455316	0.50	ug/g	STD 0.5	<0.50	<0.50	<0.50	<0.50	<0.50
Methyl Isobutyl Ketone	455316	0.50	ug/g	STD 0.5	<0.50	<0.50	<0.50	<0.50	<0.50
Methyl tert-Butyl Ether (MTBE)	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Methylene Chloride	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Styrene	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Tetrachloroethane, 1,1,1,2-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Tetrachloroethane, 1,1,2,2-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational
Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim
Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial
Water Quality Guideline, IPWQO = Interim Provincial Water Quality
Objective, TDR = Typical Desired Range



Certificate of Analysis

Environment Testing

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0

Attention: Mr. Benjamin Edwards

PO#:

Invoice to: EGIS Canada Ltd.

Report Number: 3004774

Date Submitted: 2024-01-26

Date Reported: 2024-02-02

Project: CCO - 24 - 2687

COC #: 226844

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

Volatiles

Lab I.D. Sample Matrix Sample Type Sample Date Sampling Time Sample I.D.					1716832 Soil153	1716833 Soil153	1716834 Soil153	1716835 Soil153	1716836 Soil153
					2024-01-26	2024-01-26	2024-01-26	2024-01-26	2024-01-26
					24-1A	24-1B	24-2A	24-2B	24-3A
Analyte	Batch No	MRL	Units	Guideline					
Tetrachloroethylene	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Toluene	455316	0.08	ug/g	STD 0.2	<0.08	<0.08	<0.08	<0.08	<0.08
Trichloroethane, 1,1,1-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Trichloroethane, 1,1,2-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Trichloroethylene	455316	0.01	ug/g	STD 0.05	<0.01	<0.01	<0.01	<0.01	<0.01
Trichlorofluoromethane	455316	0.05	ug/g	STD 0.25	<0.05	<0.05	<0.05	<0.05	<0.05
Vinyl Chloride	455316	0.02	ug/g	STD 0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Xylene Mixture	455319	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Xylene, m/p-	455316	0.05	ug/g		<0.05	<0.05	<0.05	<0.05	<0.05
Xylene, o-	455316	0.05	ug/g		<0.05	<0.05	<0.05	<0.05	<0.05

Volatiles

Lab I.D. Sample Matrix Sample Type Sample Date Sampling Time Sample I.D.					1716837 Soil153	1716838 Soil153	1716839 Soil153
					2024-01-26	2024-01-26	2024-01-26
					24-3B	24-4A	24-4B
Analyte	Batch No	MRL	Units	Guideline			
Acetone	455316	0.50	ug/g	STD 0.5	<0.50	<0.50	<0.50
Benzene	455316	0.0068	ug/g	STD 0.02	<0.0068	<0.0068	<0.0068
Bromodichloromethane	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Bromoform	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Bromomethane	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Carbon Tetrachloride	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Chlorobenzene	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Chloroform	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dibromochloromethane	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range



Certificate of Analysis

Environment Testing

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0

Attention: Mr. Benjamin Edwards

PO#:

Invoice to: EGIS Canada Ltd.

Report Number: 3004774

Date Submitted: 2024-01-26

Date Reported: 2024-02-02

Project: CCO - 24 - 2687

COC #: 226844

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

Volatiles

					1716837 Soil153	1716838 Soil153	1716839 Soil153
					2024-01-26	2024-01-26	2024-01-26
					24-3B	24-4A	24-4B
Analyte	Batch No	MRL	Units	Guideline			
Dichlorobenzene, 1,2-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichlorobenzene, 1,3-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichlorobenzene, 1,4-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichlorodifluoromethane	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichloroethane, 1,1-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichloroethane, 1,2-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichloroethylene, 1,1-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichloroethylene, 1,2-cis-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichloroethylene, 1,2-trans-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichloropropane, 1,2-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichloropropene, 1,3-	455320	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichloropropene, 1,3-cis-	455316	0.05	ug/g		<0.05	<0.05	<0.05
Dichloropropene, 1,3-trans-	455316	0.05	ug/g		<0.05	<0.05	<0.05
Ethylbenzene	455316	0.018	ug/g	STD 0.05	<0.018	<0.018	<0.018
Ethylene dibromide	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Hexane (n)	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Methyl Ethyl Ketone	455316	0.50	ug/g	STD 0.5	<0.50	<0.50	<0.50
Methyl Isobutyl Ketone	455316	0.50	ug/g	STD 0.5	<0.50	<0.50	<0.50
Methyl tert-Butyl Ether (MTBE)	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Methylene Chloride	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Styrene	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Tetrachloroethane, 1,1,1,2-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Tetrachloroethane, 1,1,2,2-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational
Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim
Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial
Water Quality Guideline, IPWQO = Interim Provincial Water Quality
Objective, TDR = Typical Desired Range



Certificate of Analysis

Environment Testing

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

Volatiles

Analyte	Batch No	MRL	Units	Guideline	Lab I.D.	Sample Matrix	Sample Type	Sample Date	Sampling Time	Sample I.D.
					1716837	Soil153	1716838	Soil153	1716839	Soil153
Tetrachloroethylene	455316	0.05	ug/g	STD 0.05	2024-01-26	24-3B	2024-01-26	24-4A	2024-01-26	24-4B
Toluene	455316	0.08	ug/g	STD 0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Trichloroethane, 1,1,1-	455316	0.05	ug/g	STD 0.05	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
Trichloroethane, 1,1,2-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Trichloroethylene	455316	0.01	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Trichlorofluoromethane	455316	0.05	ug/g	STD 0.25	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Vinyl Chloride	455316	0.02	ug/g	STD 0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Xylene Mixture	455319	0.05	ug/g	STD 0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Xylene, m/p-	455316	0.05	ug/g		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Xylene, o-	455316	0.05	ug/g		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

Inorganics

Analyte	Batch No	MRL	Units	Guideline	Lab I.D.	Sample Matrix	Sample Type	Sample Date	Sampling Time	Sample I.D.
					1716832	Soil153	1716833	Soil153	1716834	Soil153
Cyanide (CN-)	455419	0.005	ug/g	STD 0.051	2024-01-26	24-1A	2024-01-26	24-1B	2024-01-26	24-2A
Electrical Conductivity	455468	0.05	mS/cm	STD 0.57	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Sodium Adsorption Ratio	455477	0.01		STD 2.4	0.26	0.22	0.26	0.23	0.24	0.24
					0.13	0.35	0.18	0.25	0.31	0.31

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range



Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

Inorganics

Analyte	Batch No	MRL	Units	Guideline	Lab I.D.	Sample Matrix	Sample Type	Sample Date	Sampling Time	Sample I.D.
					1716837	Soil153	1716838	Soil153	1716839	Soil153
Cyanide (CN-)	455419	0.005	ug/g	STD 0.051	2024-01-26	24-3B	2024-01-26	24-4A	2024-01-26	24-4B
Electrical Conductivity	455468	0.05	mS/cm	STD 0.57	0.16		0.61*		0.15	
Sodium Adsorption Ratio	455477	0.01		STD 2.4	0.28		0.22		0.25	

Moisture

Analyte	Batch No	MRL	Units	Guideline	Lab I.D.	Sample Matrix	Sample Type	Sample Date	Sampling Time	Sample I.D.
					1716832	Soil153	1716833	Soil153	1716834	Soil153
Moisture-Humidite	455308	0.1	%		2024-01-26	24-1A	2024-01-26	24-1B	2024-01-26	24-2A
	455313	0.1	%		24.7		26.9		26.7	
									26.7	19.4

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range



Certificate of Analysis

Environment Testing

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

Moisture

Analyte	Batch No	MRL	Units	Guideline	Lab I.D.	Sample Matrix	Sample Type	Sample Date	Sampling Time	Sample I.D.
					1716837	Soil153	1716838	Soil153	1716839	Soil153
Moisture-Humidite	455308	0.1	%		2024-01-26		2024-01-26		2024-01-26	
	455313	0.1	%		24-3B		24-4A		24-4B	
	455411	0.1	%							10.5

PHC Surrogate

Analyte	Batch No	MRL	Units	Guideline	Lab I.D.	Sample Matrix	Sample Type	Sample Date	Sampling Time	Sample I.D.
					1716832	Soil153	1716833	Soil153	1716834	Soil153
Alpha-androstrane	455308	0	%		2024-01-26		2024-01-26		2024-01-26	
	455313	0	%		24-1A		24-1B		24-2A	
									24-2B	
									24-3A	
										66
					68				62	

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational
Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim
Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial
Water Quality Guideline, IPWQO = Interim Provincial Water Quality
Objective, TDR = Typical Desired Range



Environment Testing

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

PHC Surrogate

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co							
<u>PHC Surrogate</u>				Lab I.D.	1716837	1716838	1716839
				Sample Matrix	Soil153	Soil153	Soil153
				Sample Type			
				Sample Date	2024-01-26	2024-01-26	2024-01-26
				Sampling Time			
			Sample I.D.				
Analyte	Batch No	MRL	Units	Guideline	24-3B	24-4A	24-4B
Alpha-androstrane	455308	0	%		61		
	455313	0	%			77	
	455411	0	%				73

VOCs Surrogates

<u>VOCs Surrogates</u>					Lab I.D.	1716832	1716833	1716834	1716835	1716836
Analyte	Batch No	MRL	Units	Sample Matrix	Soil153	Soil153	Soil153	Soil153	Soil153	
				Sample Type						
				Sample Date	2024-01-26	2024-01-26	2024-01-26	2024-01-26	2024-01-26	
				Sampling Time						
Guideline										
				Sample I.D.	24-1A	24-1B	24-2A	24-2B	24-3A	
1,2-dichloroethane-d4	455316	0	%		123	125	126	129	127	
4-bromofluorobenzene	455316	0	%		71	70	72	74	70	
Toluene-d8	455316	0	%		124	122	109	112	114	

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range



Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

VOCs Surrogates

					Lab I.D. Sample Matrix Sample Type Sample Date Sampling Time Sample I.D.		
					Guideline		
Analyte	Batch No	MRL	Units				
1,2-dichloroethane-d4	455316	0	%			127	121
4-bromofluorobenzene	455316	0	%			79	73
Toluene-d8	455316	0	%			82	114

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational
Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim
Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial
Water Quality Guideline, IPWQO = Interim Provincial Water Quality
Objective, TDR = Typical Desired Range

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Quality Assurance Summary

Batch No	Analyte	Blank	QC % Rec	QC Limits	Spike % Rec	Spike Limits	Dup % RPD	Duplicate Limits
455308	PHC's F2	<2 ug/g	87	80-120	75	60-140	0	0-30
455308	PHC's F3	<20 ug/g	87	80-120	75	60-140	0	0-30
455308	PHC's F4	<20 ug/g	87	80-120	75	60-140	0	0-30
455308	Moisture-Humidite	<0.1 %	100	80-120			5	
455313	PHC's F2	<2 ug/g	91	80-120	66	60-140	0	0-30
455313	PHC's F3	<20 ug/g	91	80-120	66	60-140	0	0-30
455313	PHC's F4	<20 ug/g	91	80-120	66	60-140	0	0-30
455313	Moisture-Humidite	<0.1 %	100	80-120			23	
455316	Tetrachloroethane, 1,1,1,2-	<0.05 ug/g	122	60-130	107	50-140	0	0-50
455316	Trichloroethane, 1,1,1-	<0.05 ug/g	115	60-130	111	50-140	0	0-50
455316	Tetrachloroethane, 1,1,2,2-	<0.05 ug/g	119	60-130	91	50-140	0	0-30
455316	Trichloroethane, 1,1,2-	<0.05 ug/g	121	60-130	115	50-140	0	0-50
455316	Dichloroethane, 1,1-	<0.05 ug/g	117	60-130	112	50-140	0	0-50
455316	Dichloroethylene, 1,1-	<0.05 ug/g	108	60-130	87	50-140	0	0-50
455316	Dichlorobenzene, 1,2-	<0.05 ug/g	120	60-130	111	50-140	0	0-50
455316	Dichloroethane, 1,2-	<0.05 ug/g	121	60-130	114	50-140	0	0-50
455316	Dichloropropane, 1,2-	<0.05 ug/g	124	60-130	119	50-140	0	0-50
455316	Dichlorobenzene, 1,3-	<0.05 ug/g	120	60-130	112	50-140	0	0-50
455316	Dichlorobenzene, 1,4-	<0.05 ug/g	121	60-130	112	50-140	0	0-50
455316	Acetone	<0.50 ug/g	120	60-130	112	50-140	0	0-50
455316	Benzene	<0.0068	113	60-130	114	50-140	0	0-50
455316	Bromodichloromethane	<0.05 ug/g	120	60-130	110	50-140	0	0-50
455316	Bromoform	<0.05 ug/g	118	60-130	109	50-140	0	0-50
455316	Bromomethane	<0.05 ug/g	105	60-130	105	50-140	0	0-50
455316	Dichloroethylene, 1,2-cis-	<0.05 ug/g	121	60-130	115	50-140	0	0-50
455316	Dichloropropene, 1,3-cis-	<0.05 ug/g	118	60-130	115	50-140	0	0-50
455316	Carbon Tetrachloride	<0.05 ug/g	115	60-130	107	50-140	0	0-50
455316	Chloroform	<0.05 ug/g	121	60-130	115	50-140	0	0-50
455316	Dibromochloromethane	<0.05 ug/g	120	60-130	101	50-140	0	0-50
455316	Dichlorodifluoromethane	<0.05 ug/g	114	60-130	106	50-140	0	0-50
455316	Methylene Chloride	<0.05 ug/g	102	60-130	95	50-140	0	0-50
455316	Ethylbenzene	<0.018 ug/g	116	60-130	121	50-140	0	0-50

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Quality Assurance Summary

Batch No	Analyte	Blank	QC % Rec	QC Limits	Spike % Rec	Spike Limits	Dup % RPD	Duplicate Limits
455316	Ethylene dibromide	<0.05 ug/g	120	60-130	113	50-140	0	0-50
455316	Hexane (n)	<0.05 ug/g	113	60-130	112	50-140	0	0-50
455316	Xylene, m/p-	<0.05 ug/g	119	60-130	112	50-140	0	0-50
455316	Methyl Ethyl Ketone	<0.50 ug/g	118	60-130	116	50-140	0	0-50
455316	Methyl Isobutyl Ketone	<0.50 ug/g	121	60-130	114	50-140	0	0-50
455316	Methyl tert-Butyl Ether (MTBE)	<0.05 ug/g	120	60-130	114	50-140	0	0-50
455316	Chlorobenzene	<0.05 ug/g	115	60-130	115	50-140	0	0-50
455316	Xylene, o-	<0.05 ug/g	117	60-130	118	50-140	0	0-50
455316	Styrene	<0.05 ug/g	117	60-130	117	50-140	0	0-50
455316	Dichloroethylene, 1,2-trans-	<0.05 ug/g	120	60-130	110	50-140	0	0-50
455316	Dichloropropene, 1,3-trans-	<0.05 ug/g	119	60-130	115	50-140	0	0-50
455316	Tetrachloroethylene	<0.05 ug/g	119	60-130	119	50-140	0	0-50
455316	Toluene	<0.08 ug/g	115	60-130	114	50-140	0	0-50
455316	Trichloroethylene	<0.01 ug/g	115	60-130	115	50-140	0	0-50
455316	Trichlorofluoromethane	<0.05 ug/g	116	60-130	98	50-140	0	0-50
455316	Vinyl Chloride	<0.02 ug/g	106	60-130	92	50-140	0	0-50
455317	PHC's F1	<10 ug/g	97	80-120	90	60-140	0	0-30
455318	Methlynaphthalene, 1-	<0.05 ug/g	63	50-140	64	50-140	0	0-40
455318	Methlynaphthalene, 2-	<0.05 ug/g	59	50-140	61	50-140	0	0-40
455318	Acenaphthene	<0.05 ug/g	61	50-140	61	50-140	0	0-40
455318	Acenaphthylene	<0.05 ug/g	60	50-140	60	50-140	0	0-40
455318	Anthracene	<0.05 ug/g	63	50-140	61	50-140	0	0-40
455318	Benz[a]anthracene	<0.05 ug/g	59	50-140	61	50-140	0	0-40
455318	Benzo[a]pyrene	<0.05 ug/g	50	50-140	58	50-140	0	0-40
455318	Benzo[b]fluoranthene	<0.05 ug/g	62	50-140	54	50-140	0	0-40
455318	Benzo[ghi]perylene	<0.05 ug/g	66	50-140	54	50-140	0	0-40
455318	Benzo[k]fluoranthene	<0.05 ug/g	57	50-140	56		0	0-40
455318	Chrysene	<0.05 ug/g	65	50-140	63	50-140	0	0-40
455318	Dibenz[a h]anthracene	<0.05 ug/g	62	50-140	57	50-140	0	0-40
455318	Fluoranthene	<0.05 ug/g	62	50-140	61	50-140	0	0-40
455318	Fluorene	<0.05 ug/g	61	50-140	61	50-140	0	0-40
455318	Indeno[1 2 3-cd]pyrene	<0.05 ug/g	63	50-140	55	50-140	0	0-40
455318	Naphthalene	<0.013 ug/g	60	50-140	60	50-140	0	0-40

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Quality Assurance Summary

Batch No	Analyte	Blank	QC % Rec	QC Limits	Spike % Rec	Spike Limits	Dup % RPD	Duplicate Limits
455318	Phenanthrene	<0.05 ug/g	59	50-140	58	50-140	0	0-40
455318	Pyrene	<0.05 ug/g	61	50-140	61	50-140	0	0-40
455319	Xylene Mixture							
455320	Dichloropropene, 1,3-							
455321	PHC's F1-BTEX							
455322	PHC's F1-BTEX							
455358	1+2-methylnaphthalene							
455411	PHC's F2	<2 ug/g	84	80-120	64	60-140	0	0-30
455411	PHC's F3	<20 ug/g	84	80-120	64	60-140	0	0-30
455411	PHC's F4	<20 ug/g	84	80-120	64	60-140	0	0-30
455411	Moisture-Humidite	<0.1 %	100	80-120			16	
455413	PHC's F2-Napth							
455414	PHC's F3-PAH							
455419	Cyanide (CN-)	<0.005 ug/g	85	75-125	98	70-130	0	0-20
455434	Silver	<0.2 ug/g	110	70-130	103	70-130	0	0-20
455434	Arsenic	<1 ug/g	96	70-130	89	70-130	11	0-20
455434	Boron (total)	<5 ug/g	97	70-130	119	70-130	0	0-20
455434	Barium	<1 ug/g	96	70-130		70-130	11	0-20
455434	Beryllium	<1 ug/g	100	70-130	100	70-130	0	0-20
455434	Cadmium	<0.4 ug/g	98	70-130	101	70-130	0	0-20
455434	Cobalt	<1 ug/g	97	70-130	65	70-130	10	0-20
455434	Chromium Total	<1 ug/g	99	70-130	19	70-130	12	0-20
455434	Copper	<1 ug/g	105	70-130	36	70-130	14	0-20
455434	Molybdenum	<1 ug/g	102	70-130	93	70-130	0	0-20
455434	Nickel	<1 ug/g	102	70-130	29	70-130	11	0-20
455434	Lead	<1 ug/g	103	70-130	77	70-130	22	0-20
455434	Antimony	<1 ug/g	77	70-130	68	70-130	0	0-20
455434	Selenium	<0.5 ug/g	98	70-130	97	70-130	0	0-20
455434	Thallium	<1 ug/g	101	70-130	92	70-130	0	0-20
455434	Uranium	<0.5 ug/g	88	70-130	90	70-130	0	0-20
455434	Vanadium	<2 ug/g	97	70-130	6	70-130	12	0-20
455434	Zinc	<2 ug/g	104	70-130		70-130	13	0-20
455468	Electrical Conductivity	<0.05	100	90-110			0	0-10

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range



Certificate of Analysis

Environment Testing

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Quality Assurance Summary

Batch No	Analyte	Blank	QC % Rec	QC Limits	Spike % Rec	Spike Limits	Dup % RPD	Duplicate Limits
455477	Sodium Adsorption Ratio	<0.01					4	
455501	Cobalt	<1 ug/g	97	70-130	106	70-130	0	0-20
455501	Chromium Total	<1 ug/g	99	70-130	119	70-130	18	0-20
455501	Copper	<1 ug/g	106	70-130	102	70-130	21	0-20
455501	Nickel	<1 ug/g	103	70-130	107	70-130	0	0-20
455501	Lead	<1 ug/g	100	70-130	110	70-130	0	0-20
455501	Vanadium	<2 ug/g	96	70-130	133	70-130	33	0-20
455501	Zinc	<2 ug/g	105	70-130	100	70-130	17	0-20

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Test Summary

Batch No	Analyte	Instrument	Preparation Date	Analysis Date	Analyst	Method
455308	PHC's F2	GC/FID	2024-01-29	2024-01-30	PJ	CCME
455308	PHC's F3	GC/FID	2024-01-29	2024-01-30	PJ	CCME
455308	PHC's F4	GC/FID	2024-01-29	2024-01-30	PJ	CCME
455308	Moisture-Humidite	Oven	2024-01-29	2024-01-30	PJ	ASTM 2216
455313	PHC's F2	GC/FID	2024-01-29	2024-01-30	PJ	CCME
455313	PHC's F3	GC/FID	2024-01-29	2024-01-30	PJ	CCME
455313	PHC's F4	GC/FID	2024-01-29	2024-01-30	PJ	CCME
455313	Moisture-Humidite	Oven	2024-01-29	2024-01-30	PJ	ASTM 2216
455316	Tetrachloroethane, 1,1,1,2-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Trichloroethane, 1,1,1-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Tetrachloroethane, 1,1,2,2-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Trichloroethane, 1,1,2-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Dichloroethane, 1,1-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Dichloroethylene, 1,1-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Dichlorobenzene, 1,2-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Dichloroethane, 1,2-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Dichloropropane, 1,2-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Dichlorobenzene, 1,3-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Dichlorobenzene, 1,4-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Acetone	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Benzene	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Bromodichloromethane	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Bromoform	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Bromomethane	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Dichloroethylene, 1,2-cis-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Dichloropropene, 1,3-cis-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Carbon Tetrachloride	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Chloroform	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Dibromochloromethane	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Dichlorodifluoromethane	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Methylene Chloride	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Ethylbenzene	GC-MS	2024-01-26	2024-01-29	SS	V 8260B

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Test Summary

Batch No	Analyte	Instrument	Preparation Date	Analysis Date	Analyst	Method
455316	Ethylene dibromide	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Hexane (n)	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Xylene, m/p-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Methyl Ethyl Ketone	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Methyl Isobutyl Ketone	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Methyl tert-Butyl Ether (MTBE)	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Chlorobenzene	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Xylene, o-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Styrene	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Dichloroethylene, 1,2-trans-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Dichloropropene, 1,3-trans-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Tetrachloroethylene	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Toluene	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Trichloroethylene	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Trichlorofluoromethane	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Vinyl Chloride	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455317	PHC's F1	GC/FID	2024-01-26	2024-01-30	SS	CCME
455318	Methylnaphthalene, 1-	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455318	Methylnaphthalene, 2-	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455318	Acenaphthene	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455318	Acenaphthylene	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455318	Anthracene	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455318	Benz[a]anthracene	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455318	Benzo[a]pyrene	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455318	Benzo[b]fluoranthene	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455318	Benzo[ghi]perylene	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455318	Benzo[k]fluoranthene	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455318	Chrysene	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455318	Dibenz[a h]anthracene	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455318	Fluoranthene	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455318	Fluorene	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455318	Indeno[1 2 3-cd]pyrene	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455318	Naphthalene	GC-MS	2024-01-29	2024-01-30	C_M	P 8270

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Test Summary

Batch No	Analyte	Instrument	Preparation Date	Analysis Date	Analyst	Method
455318	Phenanthrene	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455318	Pyrene	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455319	Xylene Mixture	GC-MS	2024-01-30	2024-01-30	SS	V 8260B
455320	Dichloropropene, 1,3-	GC-MS	2024-01-30	2024-01-30	SS	V 8260B
455321	PHC's F1-BTEX	GC/FID	2024-01-30	2024-01-30	SS	CCME
455322	PHC's F1-BTEX	GC/FID	2024-01-30	2024-01-30	SS	CCME
455358	1+2-methylnaphthalene	GC-MS	2024-01-31	2024-01-31	C_M	P 8270
455411	PHC's F2	GC/FID	2024-01-30	2024-01-31	PJ	CCME
455411	PHC's F3	GC/FID	2024-01-30	2024-01-31	PJ	CCME
455411	PHC's F4	GC/FID	2024-01-30	2024-01-31	PJ	CCME
455411	Moisture-Humidity	Oven	2024-01-30	2024-01-31	PJ	ASTM 2216
455413	PHC's F2-Naph	GC/FID	2024-01-31	2024-01-31	PJ	CCME
455414	PHC's F3-PAH	GC/FID	2024-01-31	2024-01-31	PJ	CCME
455419	Cyanide (CN-)	Skalar CN Analyzer	2024-01-31	2024-01-31	Z_S	MOECC E3015
455434	Silver	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Arsenic	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Boron (total)	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Barium	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Beryllium	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Cadmium	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Cobalt	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Chromium Total	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Copper	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Molybdenum	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Nickel	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Lead	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Antimony	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Selenium	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Thallium	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Uranium	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Vanadium	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Zinc	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455468	Electrical Conductivity	Electrical Conductivity Meter	2024-02-01	2024-02-01	Z_S	Cond-Soil

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range



Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0

Attention: Mr. Benjamin Edwards

PO#:

Invoice to: EGIS Canada Ltd.

Report Number: 3004774

Date Submitted: 2024-01-26

Date Reported: 2024-02-02

Project: CCO - 24 - 2687

COC #: 226844

Test Summary

Batch No	Analyte	Instrument	Preparation Date	Analysis Date	Analyst	Method
455477	Sodium Adsorption Ratio	iCAP OES	2024-02-01	2024-02-01	Z_S	Ag Soil
455501	Cobalt	ICAPQ-MS	2024-02-02	2024-02-02	AaN	EPA 200.8/6020
455501	Chromium Total	ICAPQ-MS	2024-02-02	2024-02-02	AaN	EPA 200.8/6020
455501	Copper	ICAPQ-MS	2024-02-02	2024-02-02	AaN	EPA 200.8/6020
455501	Nickel	ICAPQ-MS	2024-02-02	2024-02-02	AaN	EPA 200.8/6020
455501	Lead	ICAPQ-MS	2024-02-02	2024-02-02	AaN	EPA 200.8/6020
455501	Vanadium	ICAPQ-MS	2024-02-02	2024-02-02	AaN	EPA 200.8/6020
455501	Zinc	ICAPQ-MS	2024-02-02	2024-02-02	AaN	EPA 200.8/6020

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

CWS for Petroleum Hydrocarbons in Soil - Tier 1**Notes:**

1. The laboratory method complies with CCME Tier 1 reference method for PHC in soil. It is validated for laboratory use.
2. Where the F1 fraction (C6 to C10) and BTEX are both measured, F1-BTEX is reported.
3. Where the F2 fraction (C10 to C16) and naphthalene are both measured, F2-naphthalene is reported.
4. Where the F3 fraction (C16 to C34) and PAHs* are both measured, F3-PAH is reported.
5. F4G is analyzed if the chromatogram does not descend to baseline before C50. Where F4 (C34 to C50) and F4G are both reported, the higher result is compared to the standard.
6. Unless otherwise stated in the sample comments, the following criteria have been met where applicable:
 - nC6 and nC10 response factors within 30% of response factor for toluene;
 - nC10, nC16, and nC34 response factors within 10% of each other;
 - C50 response factors within 70% of nC10 + nC16 + nC34 average; and,
 - Linearity is within 15%.
7. Unless otherwise stated in the sample comments, sampling requirements and analytical holding times have been met.
8. Gravimetric heavy hydrocarbons (F4G) cannot be added to the C6 and C50 hydrocarbons.
9. *PAHs = phenanthrene, benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, fluoranthene, dibenz(a,h)anthracene, indeno(1,2,3-c,d)pyrene and pyrene.



226844

STANDARD CHAIN-OF-CUSTODY

146 Colonnade Road, Unit #8, Ottawa, ON, K2E 7Y1 - Phone: 613-727-5692, Fax: 613-727-5222

Eurofins Workorder #: 3004774

CLIENT INFORMATION

Company: Egis Canada Ltd
Contact: Benjamin Edwards
Address: 115 Walsgreen Rd, Carp, ON K0A 1L1
Telephone: Cell: 613-315-3093
Email: #1: benjamin.edwards@egis-groupe.com
Email: #2:
Project: ELD-24-2657
Quote #:

INVOICE INFORMATION (SAME AS CLIENT INFORMATION: YES ☒ NO ☐

Company: Egis Canada Ltd
Contact: Accounts Payable
Address:
Telephone:
Fax:
Email: #1: ap@eminto.com
Email: #2:
PO #:

REGULATION/GUIDELINE REQUIRED

- ☐ Sanitary Sewer, City: _____
☐ Storm Sewer, City: _____
☐ ODWSOG (Use DW CoC if analyzing drinking water)
☐ PWQO
☐ O.Reg 347
☐ Other: _____

- ☐ O. Reg 153
The sample results from this submission will form part of a formal Record of Site Condition (RSC) under O.Reg. 153/04. Analysis of full parameter list only
Yes ☐ No ☐
Table # _____ Coarse / Fine, Surface / subsurface
Type: Com-Ind / Res-Park / Agri / GW / All Other / Sediment
☒ O. Reg 406 Excess Soils
Table # L-3 Full depth/Strat/Ceiling/mSPLP Leachate
Type: Com-Ind / Res-Park / Agri / All Other
Category: Surface / Subsurface

TURN-AROUND TIME (Business Days)

- ☐ 1 Day* (100%) ☐ 2 Day** (50%) ☐ 3-5 Days (25%) ☒ 5-7 Days (Standard)

Please contact Lab in advance to determine rush availability.

*For results reported after rush due date, surcharges will apply: before 12:00 - 100%, after 12:00 - 50%.

**For results reported after rush due date, surcharges will apply: before 12:00 - 50%, after 12:00 - 25%.

The optimal temperature conditions during transport should be less than 10°C. Sample(s) cannot be frozen, unless otherwise indicated or agreed upon with the Laboratory. Note that this CoC is not to be used for drinking water samples. The CoC must be complete upon submission of the samples, there will be a \$25 surcharge if required information is missing (required fields are shaded in grey).

Sample Details

Field Filtered -->

Sample Matrix

of Containers

O.Reg.153 parameters

PHC F1 - F4

BTEX

VOCs

PAHs

PCBs

Metals + Inorganic

Metals only

EL5AD

Cyanide

TCP-VOL

PAHs, BTEX

PHS, MHI

RN#
(Lab Use Only)

Sample ID	Date/Time Collected	Sample Matrix	# of Containers	PHC F1 - F4	BTEX	VOCs	PAHs	PCBs	Metals + Inorganic	Metals only	EL5AD	Cyanide	TCP-VOL	PAHs, BTEX	PHS, MHI	RN# (Lab Use Only)
24-1A	26-Jan-2024	soil	4	x	x	x	x			x	x	x				1716832
24-1B	26-Jan-2024	soil	4	x	x	x	x			x	x	x				33
TCLP-24-1	26-Jan-2024	soil	2										x			
24-2A	26-Jan-2024	soil	4	x	x	x	x			x	x	x				34
24-2B	26-Jan-2024	soil	4	x	x	x	x			x	x	x				35
TCLP-24-2	26-Jan-2024	soil	2										x			
24-3A	26-Jan-2024	soil	4	x	x	x	x			x	x	x				36
24-3B	26-Jan-2024	soil	4	x	x	x	x			x	x	x				37
TCLP-24-3	26-Jan-2024	soil	2										x			
24-4A	26-Jan-2024	soil	4	x	x	x	x			x	x	x				38

PRINT

SIGN

DATE/TIME

TEMP (°C)

COMMENTS:

Sampled By: Ben Edwards / Rebecca Leclerc
Relinquished By: Rebecca Leclerc
Received By: Sy 1/26/24 20
CUSTODY SEAL: ☐ YES ☐ NO ice packs submit ☐ Yes ☐ No

401 Magnetic Drive, Unit #1, North York, ON, M3J 3H9 - Telephone: 416-661-5287 • 380 Vansickle Road, Unit #630, St. Catharines, ON, L2S 0B5 - Telephone: 905-680-8887 • 608 Norris Court, Kingston, ON, K7P 2R9 - Telephone: 613-634-9307



Environment Testing

Certificate of Analysis

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004775
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Page 1 of 8

Dear Benjamin Edwards:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Report Comments:

APPROVAL:

Emma-Dawn Ferguson, Chemist

All analysis is completed at Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) unless otherwise indicated.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on the scope of accreditation. The scope is available at: <https://directory.cala.ca/>.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is licensed by the Ontario Ministry of the Environment, Conservation, and Parks (MECP) for specific tests in drinking water (license #2318). A copy of the license is available upon request.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is accredited by the Ontario Ministry of Agriculture, Food, and Rural Affairs for specific tests in agricultural soils.

Please note: Field data, where presented on the report, has been provided by the client and is presented for informational purposes only. Guideline values listed on this report are provided for ease of use (informational purposes) only. Eurofins recommends consulting the official provincial or federal guideline as required. Unless otherwise stated, measurement uncertainty is not taken into account when determining guideline or regulatory exceedances.



Environment Testing

Certificate of Analysis

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004775
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

					1716840 R347 2024-01-26 TCLP - 24-1	1716841 R347 2024-01-26 TCLP - 24-2	1716842 R347 2024-01-26 TCLP - 24-3	1716843 R347 2024-01-26 TCLP - 24-4
Group	Analyte	MRL	Units	Guideline				
Anions	F	0.10	mg/L	LQC 150.0	<0.10	0.12	<0.10	0.12
General Chemistry	Cyanide (free)	0.05	mg/L	LQC 20.0	<0.05	<0.05	<0.05	<0.05
Hydrocarbons	F1 (C6-C10)	20	ug/L		<20	<20	<20	<20
	F2 (C10-C16)	20	ug/L		<20	<20	<20	<20
	F3 (C16-C34)	50	ug/L		<50	<50	<50	<50
	F4 (C34-C50)	50	ug/L		<50	<50	<50	<50
Leachate	REG 558 Leach				y	y	y	y
	Zero Headspace Extraction				y	y	y	y
Mercury	Hg	0.001	mg/L	LQC 0.1	<0.001	<0.001	<0.001	<0.001
Metals	Ag	0.01	mg/L	LQC 5	<0.01	<0.01	<0.01	<0.01
	As	0.02	mg/L	LQC 2.5	<0.02	<0.02	<0.02	<0.02
	B	0.1	mg/L	LQC 500.0	<0.1	0.1	0.1	<0.1
	Ba	0.01	mg/L	LQC 100.0	1.45	1.13	1.17	1.10
	Cd	0.008	mg/L	LQC 0.5	<0.008	<0.008	<0.008	<0.008
	Cr	0.05	mg/L	LQC 5.0	<0.05	<0.05	<0.05	<0.05
	Pb	0.01	mg/L	LQC 5.0	0.05	<0.01	<0.01	<0.01
	Se	0.02	mg/L	LQC 1.0	<0.02	<0.02	<0.02	<0.02
	U	0.01	mg/L	LQC 10.0	<0.01	<0.01	<0.01	<0.01
Moisture	Moisture-Humidite	0.1	%		22.8	22.8	28.1	9.8
Others	NO2 + NO3 as N	1.0	mg/L	LQC 1000	<1.0	<1.0	<1.0	<1.0
PAH	1-methylnaphthalene	0.1	ug/L		<0.1	<0.1	<0.1	<0.1
	2-methylnaphthalene	0.1	ug/L		<0.1	<0.1	<0.1	<0.1
	Acenaphthene	0.1	ug/L		<0.1	<0.1	<0.1	<0.1
	Acenaphthylene	0.1	ug/L		<0.1	<0.1	<0.1	<0.1
	Anthracene	0.1	ug/L		<0.1	<0.1	<0.1	<0.1

Guideline = REG 558

* = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range



Environment Testing

Certificate of Analysis

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004775
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

					1716840 R347 2024-01-26 TCLP - 24-1	1716841 R347 2024-01-26 TCLP - 24-2	1716842 R347 2024-01-26 TCLP - 24-3	1716843 R347 2024-01-26 TCLP - 24-4
Group	Analyte	MRL	Units	Guideline				
PAH	Benzo(a)anthracene	0.1	ug/L		<0.1	<0.1	<0.1	<0.1
	Benzo(a)pyrene	0.01	ug/L	LQC 1.0	<0.01	<0.01	<0.01	<0.01
	Benzo(b)fluoranthene	0.05	ug/L		<0.05	<0.05	<0.05	<0.05
	Benzo(g,h,i)perylene	0.1	ug/L		<0.1	<0.1	<0.1	<0.1
	Benzo(k)fluoranthene	0.05	ug/L		<0.05	<0.05	<0.05	<0.05
	Chrysene	0.05	ug/L		<0.05	<0.05	<0.05	<0.05
	Dibenzo(a,h)anthracene	0.1	ug/L		<0.1	<0.1	<0.1	<0.1
	Fluoranthene	0.1	ug/L		<0.1	<0.1	<0.1	<0.1
	Fluorene	0.1	ug/L		<0.1	<0.1	<0.1	<0.1
	Indeno(1,2,3-c,d)pyrene	0.1	ug/L		<0.1	<0.1	<0.1	<0.1
	Naphthalene	0.1	ug/L		<0.1	<0.1	<0.1	<0.1
	Phenanthrene	0.1	ug/L		<0.1	<0.1	<0.1	<0.1
	Pyrene	0.1	ug/L		<0.1	<0.1	<0.1	<0.1
VOCs Surrogates	1,2-dichloroethane-d4	0	%		108	120	123	119
	4-bromofluorobenzene	0	%		89	84	130	75
	Toluene-d8	0	%		91	94	95	95
Volatiles	1,1-dichloroethylene	0.5	ug/L	LQC 1400	<0.5	<0.5	<0.5	<0.5
	1,2-dichlorobenzene	0.4	ug/L	LQC 20000	<0.4	<0.4	<0.4	<0.4
	1,2-dichloroethane	0.5	ug/L	LQC 500	<0.5	<0.5	<0.5	<0.5
	1,4-dichlorobenzene	0.4	ug/L	LQC 500	<0.4	<0.4	<0.4	<0.4
	Benzene	0.5	ug/L	LQC 500	<0.5	<0.5	<0.5	<0.5
	Carbon Tetrachloride	0.2	ug/L	LQC 500	<0.2	<0.2	<0.2	<0.2
	Chloroform	0.5	ug/L	LQC 10000	<0.5	<0.5	<0.5	<0.5
	Dichloromethane	4.0	ug/L	LQC 5000	<4.0	<4.0	<4.0	<4.0
	Methyl Ethyl Ketone (MEK)	2	ug/L	LQC 200000	<2	<2	<2	<2

Guideline = REG 558

* = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range



Environment Testing

Certificate of Analysis

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004775
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

					1716840 R347 2024-01-26 TCLP - 24-1	1716841 R347 2024-01-26 TCLP - 24-2	1716842 R347 2024-01-26 TCLP - 24-3	1716843 R347 2024-01-26 TCLP - 24-4
Group	Analyte	MRL	Units	Guideline				
Volatiles	Monochlorobenzene	0.5	ug/L	LQC 8000	<0.5	<0.5	<0.5	<0.5
	Tetrachloroethylene	0.3	ug/L	LQC 3000	<0.3	<0.3	<0.3	<0.3
	Trichloroethylene	0.3	ug/L	LQC 5000	<0.3	<0.3	<0.3	<0.3
	Vinyl Chloride	0.2	ug/L	LQC 200	<0.2	<0.2	<0.2	<0.2

Guideline = REG 558 * = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Certificate of Analysis

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0

Attention: Mr. Benjamin Edwards

PO#:

Invoice to: EGIS Canada Ltd.

Report Number: 3004775
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 454563 Method P 8270	Analysis/Extraction Date 2024-01-31 Analyst C_M		
Methlynaphthalene, 1-	<0.1 ug/L	72	50-140
Methlynaphthalene, 2-	<0.1 ug/L	62	50-140
Acenaphthene	<0.1 ug/L	75	50-140
Acenaphthylene	<0.1 ug/L	75	50-140
Anthracene	<0.1 ug/L	88	50-140
Benz[a]anthracene	<0.1 ug/L	74	50-140
Benzo[a]pyrene	<0.01 ug/L	83	50-140
Benzo[b]fluoranthene	<0.05 ug/L	67	50-140
Benzo[ghi]perylene	<0.1 ug/L	97	50-140
Benzo[k]fluoranthene	<0.05 ug/L	98	50-140
Chrysene	<0.05 ug/L	99	50-140
Dibenz[a h]anthracene	<0.1 ug/L	87	50-140
Fluoranthene	<0.1 ug/L	96	50-140
Fluorene	<0.1 ug/L	71	50-140
Indeno[1 2 3-cd]pyrene	<0.1 ug/L	91	50-140
Naphthalene	<0.1 ug/L	66	50-140

Guideline = REG 558

* = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range



Environment Testing

Certificate of Analysis

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004775
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Phenanthrene	<0.1 ug/L	74	50-140
Pyrene	<0.1 ug/L	99	50-140
Run No 455365 Analysis/Extraction Date 2024-01-31 Analyst AsA Method EPA 1311/O. Reg 347			
REG 558 Leach			
Zero Headspace Extraction			
Run No 455366 Analysis/Extraction Date 2024-01-30 Analyst AsA Method ASTM 2216			
Moisture-Humidite			80-120
Run No 455420 Analysis/Extraction Date 2024-01-31 Analyst AaN Method M SM3112B-3500B			
Mercury	<0.001 mg/L	118	76-123
Run No 455425 Analysis/Extraction Date 2024-01-31 Analyst AsA Method SM2320,2510,4500H/F			
F	<0.10 mg/L	105	90-110
Run No 455462 Analysis/Extraction Date 2024-02-01 Analyst PJ Method CCME O.Reg 153/04			
Petroleum Hydrocarbons F2	<20 ug/L	87	60-140
Petroleum Hydrocarbons F3	<50 ug/L	87	60-140

Guideline = REG 558

* = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range



Environment Testing

Certificate of Analysis

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004775
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Petroleum Hydrocarbons F4	<50 ug/L	87	60-140
Run No 455464 Analysis/Extraction Date 2024-02-01 Analyst AaN Method EPA 200.8			
Silver	<0.01 mg/L	100	70-130
Arsenic	<0.02 mg/L	101	70-130
Boron (total)	<0.1 mg/L	106	70-130
Barium	<0.01 mg/L	108	70-130
Cadmium	<0.008 mg/L	102	70-130
Chromium Total	<0.05 mg/L	108	70-130
Lead	<0.01 mg/L	109	70-130
Selenium	<0.02 mg/L	99	70-130
Uranium	<0.01 mg/L	94	70-130
Run No 455480 Analysis/Extraction Date 2024-02-01 Analyst Z_S Method SM4500-CNC/MOE E3015			
Cyanide (CN-)	<0.05 mg/L	93	75-125
Run No 455486 Analysis/Extraction Date 2024-02-02 Analyst SKH Method C SM4500-NO3-F			
NO2 + NO3 as N	<1.0 mg/L	100	80-120

Guideline = REG 558

* = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range



Environment Testing

Certificate of Analysis

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004775
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 455508 Analysis/Extraction Date 2024-02-01 Analyst SS Method EPA 8260			
Dichloroethylene, 1,1-	<0.5 ug/L	108	60-130
Dichlorobenzene, 1,2-	<0.4 ug/L	120	60-130
Dichloroethane, 1,2-	<0.5 ug/L	121	60-130
Dichlorobenzene, 1,4-	<0.4 ug/L	121	60-130
Benzene	<0.5 ug/L	113	60-130
Carbon Tetrachloride	<0.2 ug/L	115	60-130
Chloroform	<0.5 ug/L	121	60-130
Methylene Chloride	<4.0 ug/L	102	60-130
Methyl Ethyl Ketone	<2 ug/L	118	60-130
Chlorobenzene	<0.5 ug/L	115	60-130
Tetrachloroethylene	<0.3 ug/L	119	60-130
Trichloroethylene	<0.3 ug/L	115	60-130
Vinyl Chloride	<0.2 ug/L	106	60-130
Run No 455510 Analysis/Extraction Date 2024-02-02 Analyst SS Method CCME O.Reg 153/04			
Petroleum Hydrocarbons F1	<20 ug/L	94	60-140

Guideline = REG 558 * = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range



226844

STANDARD CHAIN-OF-CUSTODY

146 Colonnade Road, Unit #8, Ottawa, ON, K2E 7Y1 - Phone: 613-727-5692, Fax: 613-727-5222

Eurofins Workorder #: 3004774

CLIENT INFORMATION

Company: Egis Canada Ltd
Contact: Benjamin Edwards
Address: 115 Walsgreen Rd, Carp, ON K0A 1L1
Telephone: Cell: 613-315-3093
Email: #1: benjamin.edwards@egis-groupe.com
Email: #2:
Project: ELD-24-2657
Quote #:

INVOICE INFORMATION (SAME AS CLIENT INFORMATION: YES ☒ NO ☐

Company: Egis Canada Ltd
Contact: Accounts Payable
Address:
Telephone:
Fax:
Email: #1: ap@eurofins.com
Email: #2:
PO #:

REGULATION/GUIDELINE REQUIRED

- ☐ Sanitary Sewer, City: _____
☐ Storm Sewer, City: _____
☐ ODWSOG (Use DW CoC if analyzing drinking water)
☐ PWQO
☐ O.Reg 347
☐ Other: _____

- ☐ O. Reg 153
The sample results from this submission will form part of a formal Record of Site Condition (RSC) under O.Reg. 153/04. Analysis of full parameter list only
Yes ☐ No ☐
Table # _____ Coarse / Fine, Surface / subsurface
Type: Com-Ind / Res-Park / Agri / GW / All Other / Sediment
☒ O. Reg 406 Excess Soils
Table # L-3 Full depth/Strat/Ceiling/mSPLP Leachate
Type: Com-Ind / Res-Park / Agri / All Other
Category: Surface / Subsurface

TURN-AROUND TIME (Business Days)

- ☐ 1 Day* (100%) ☐ 2 Day** (50%) ☐ 3-5 Days (25%) ☒ 5-7 Days (Standard)

Please contact Lab in advance to determine rush availability.

*For results reported after rush due date, surcharges will apply: before 12:00 - 100%, after 12:00 - 50%.

**For results reported after rush due date, surcharges will apply: before 12:00 - 50%, after 12:00 - 25%.

The optimal temperature conditions during transport should be less than 10°C. Sample(s) cannot be frozen, unless otherwise indicated or agreed upon with the Laboratory. Note that this CoC is not to be used for drinking water samples. The CoC must be complete upon submission of the samples, there will be a \$25 surcharge if required information is missing (required fields are shaded in grey).

Sample Details

Field Filtered -->

Sample Matrix

of Containers

O.Reg.153 parameters

PHC F1 - F4

BTEX

VOCs

PAHs

PCBs

Metals + Inorganic

Metals only

EL5AD

Cyanide

TCP-VOL

PAHs, BTEX

PHS, NH

RN#
(Lab Use Only)

Sample ID	Date/Time Collected	Sample Matrix	# of Containers	PHC F1 - F4	BTEX	VOCs	PAHs	PCBs	Metals + Inorganic	Metals only	EL5AD	Cyanide	TCP-VOL	PAHs, BTEX	PHS, NH	RN# (Lab Use Only)
24-1A	26-Jan-2024	soil	4	x	x	x	x			x	x	x				1716832
24-1B	26-Jan-2024	soil	4	x	x	x	x			x	x	x				33
TCLP-24-1	26-Jan-2024	soil	2										x			
24-2A	26-Jan-2024	soil	4	x	x	x	x			x	x	x				34
24-2B	26-Jan-2024	soil	4	x	x	x	x			x	x	x				35
TCLP-24-2	26-Jan-2024	soil	2										x			
24-3A	26-Jan-2024	soil	4	x	x	x	x			x	x	x				36
24-3B	26-Jan-2024	soil	4	x	x	x	x			x	x	x				37
TCLP-24-3	26-Jan-2024	soil	2										x			
24-4A	26-Jan-2024	soil	4	x	x	x	x			x	x	x				38

PRINT

SIGN

DATE/TIME

TEMP (°C)

COMMENTS:

Sampled By: Ben Edwards (Rebecca Leclerc)
Relinquished By: Rebecca Leclerc
Received By: Sy 1/26/24 20
CUSTODY SEAL: ☐ YES ☐ NO ice packs submit ☐ Yes ☐ No

401 Magnetic Drive, Unit #1, North York, ON, M3J 3H9 - Telephone: 416-661-5287 • 380 Vansickle Road, Unit #630, St. Catharines, ON, L2S 0B5 - Telephone: 905-680-8887 • 608 Norris Court, Kingston, ON, K7P 2R9 - Telephone: 613-634-9307

Egis Group Canada

Appendix C – Bedrock Cores Photos



**PROJECT: Geotechnical Investigation
Proposed Watermain – CFB Kingston, ON**

PROJECT #: CCO-24-2687

BOREHOLE: BH24-1B

DRILLING DATE: January 23, 2024

ROCK CORES:

RC3: 2' 8" – 6' 3"

RC4: 6' 3" – 10' 7"

RC5: 10' 7" – 11' 7"

RC6: 11' 7" – 13' 4"

CCO-24-2687
BH-24-1B
4'10" → 4'10"-5'3.5" → 5'3.5"

0

100 mm

200 mm

300 mm

McINTOSH PERRY

000-24-2687
CFB Kingston
BH-24-1B
4'10"-5'3.5"

0

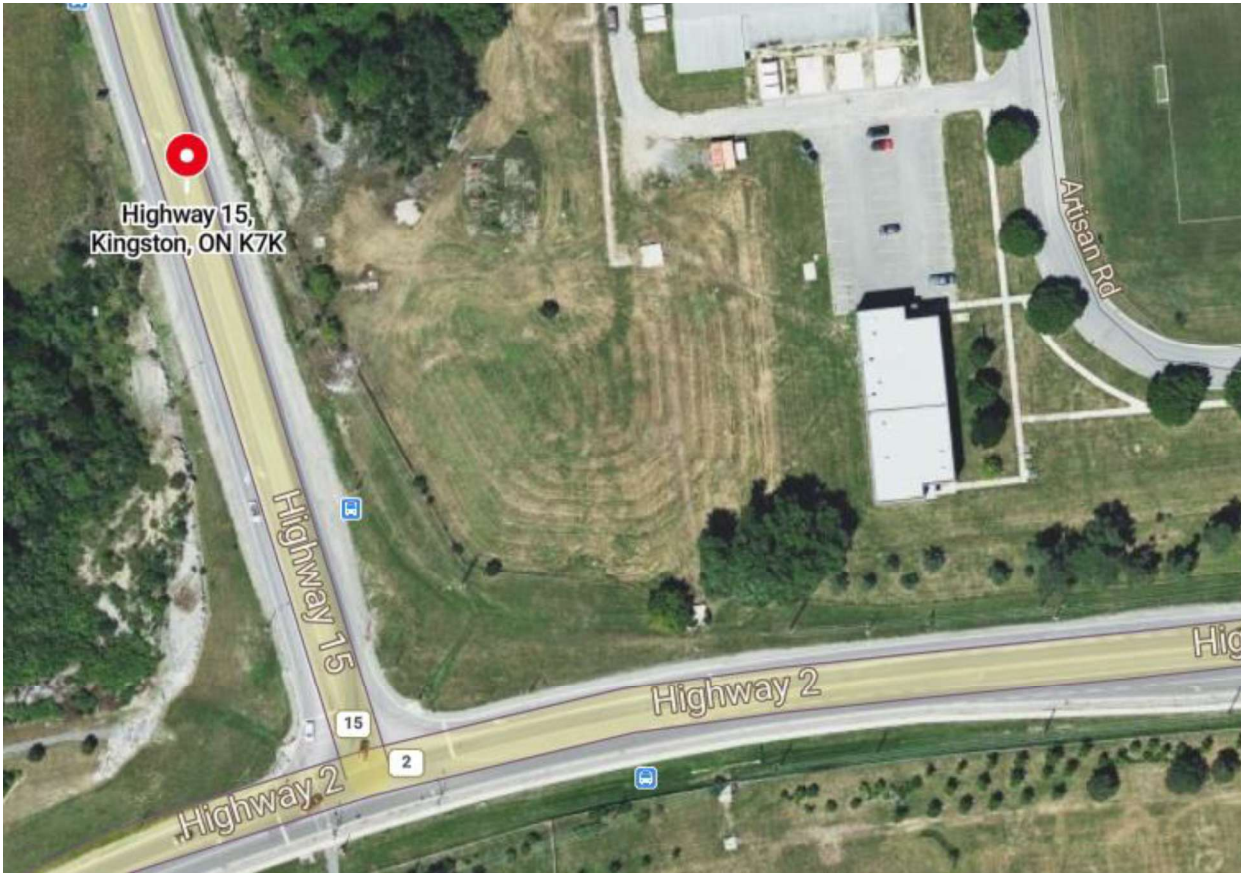
100 mm

200 mm

300 mm

McINTOSH PERRY

**ENGINEERING CONSULTING SERVICES
GEOTECHNICAL INVESTIGATION REPORT
CANADIAN FORCES BASE (CFB) - SITE-2, KINGSTON, ON.**



Project No.: CCO-242687-00

Prepared for:

EastPoint
1801 Hollis Street
Suite 1500
Halifax, Nova Scotia B3J 3N4

Prepared by:

Egis Canada Limited (formerly McIntosh Perry Consulting Engineers Ltd.)
6240 Highway 7, Suite 200, Woodbridge, ON
Egis Contact: Esam Deif, P. Eng.
esam.deif@egis-group.com
Direct Line: 289.319.3167 Mobile: 647.970.3291

Table of Content

1.0 INTRODUCTION	4
2.0 PROJECT UNDERSTANDING	4
3.0 SITE AND PROJECT DESCRIPTION	6
3.1 Existing Site Conditions.....	6
3.2 Site Geology	6
4.0 FIELD INVESTIGATION AND TESTING	7
5.0 LABORATORY TESTING	8
6.0 SUBSURFACE CONDITIONS	8
6.1 Overview	8
6.2 Fill Soil.....	9
6.3 Native Cohesive Deposit.....	9
6.4 Bedrock.....	10
6.5 Groundwater Level Observation.....	11
6.6 Chemical Test Results	11
7.0 GEOTECHNICAL DISCUSSION AND RECOMMENDATIONS.....	11
7.1 General.....	11
7.2 Site Preparation	13
7.3 Excavation	13
7.3.1 Overburden Excavation	13
7.3.2 Bedrock Excavation	14
7.3.3 Engineered Shoring.....	14
7.4 Temporary Construction Dewatering.....	15
7.5 Frost Depth and Frost Susceptibility.....	15
7.6 Foundations (Slab on Grade Option)	15
7.7 Site Classification for Seismic Site Response.....	16
7.8 Lateral Earth Pressures	16
7.9 Waterproofing and Permanent Drainage.....	17
7.10 Backfill.....	17
7.11 Underground Utilities	18
7.11.1 Bedding and Cover	18

7.11.2

Trench Backfill

19

7.11.3

Clay Seals

19

8.0

CEMENT TYPE AND CORROSION POTENTIAL

19

9.0

PAVEMENT STRUCTURE

20

10.0

ENVIRONMENTAL SOIL SAMPLING AND ANALYSIS

21

10.1

Scope of Investigation

22

10.2

Investigation Methods

23

10.3

Soil Sampling

23

10.4

Analytical Results

24

10.5

TCLP Leachate Results

26

10.6

Conclusions

26

11.0

CONSTRUCTION CONSIDERATIONS

26

12.0

IMPORTANT INFORMATION AND LIMITATIONS OF THIS REPORT

27

13.0

CLOSURE

28

APPENDIX A

Borehole Location Plan and Borehole Logs

APPENDIX B

Laboratory Test Results

APPENDIX C

Rock Cores Photos

March 15, 2024

EastPoint
1801 Hollis Street, Suite 1500
Halifax, Nova Scotia B3J 3N4

Attention: Andy Noble, P.Eng. and Ben Valiquette, P.Eng.

1.0 INTRODUCTION

Egis Canada Limited (Egis) *formerly McIntosh Perry Consulting Engineers Ltd. (MPCE)* was retained by EastPoint (the Client) to prepare a geotechnical investigation for the provide a geotechnical soil investigation, environmental soil sampling and analysis for the installation of back flow valves into the existing lines for the four sites in Kingston, Ontario.

The four sites are located along Hwy 2, starting with the intersection with Navy Way to the intersection with Craftsman Boulevard. In this report the second site will be addressed, the other three sites will be provided under separate reports. The second Site is located west of the civic address at 5 Artisan Road, Kingston, ON. (CFB Kingston (DND) property), at the northeast corner of the intersection between Hwy 2 and Hwy 15, Kingston Ontario as indicated in Figure -1.

The geotechnical investigation was completed in general accordance with proposal No. PCO-242687-00, dated November 2, 2023.

Authorization to proceed with the updating was given by Andy Noble, P.Eng. November 17, 2023.

The purpose of the of the geotechnical investigation was to determine the subsurface conditions of the property located west of the civic address at 5 Artisan Road, Kingston, Ontario to obtain the geotechnical and engineering parameters and provide recommendations for the design and construction of the proposed back flow valves into the existing lines by means of drilling two boreholes, carrying out field testing/observation and laboratory testing.

This report is prepared for the sole use of the Client. The use of this report, or any reliance on it by any third party, is the responsibility of such third party. It is understood that the Project will be designed and constructed in accordance with all applicable codes and standards present within its jurisdiction.

2.0 PROJECT UNDERSTANDING

Egis understanding of the Project is based on the correspondence and email from the Client on February 6, 2024. In accordance with Drawing number G-B35-BFP-SITE2 (Figure-3), It is understood that backflow preventer valve will be accommodated within a light weighted enclosure supported on a slab on grade similar to the one shown in Figure-2. An access road will be also constructed to reach to the proposed enclosure as indicated in Figure -3.



Figure -1 Site Location



Figure -2 Example of the Enclosure



Figure-3 Drawing G-B35-BFP-SITE1

3.0 SITE AND PROJECT DESCRIPTION

3.1 Existing Site Conditions

It is understood the site is currently an active military base known as CFB Kingston, back flow valves are proposed to be installed on the existing water main pipe crossing the property.

3.2 Site Geology

Based on published geological maps of the area (Ontario Geological Survey), the site is located within the Napanee Plain. Surficial geology maps of southern Ontario indicate that the site is located within Paleozoic bedrock-drift complex in Paleozoic terrain. The bedrock within the area is identified to comprise of Limestone, dolostone, shale, arkose, and sandstone of the Shadow Lake Formation.

4.0 FIELD INVESTIGATION AND TESTING

Egis cleared the Site before the commencement of any geotechnical drilling. Utility clearance requisitions were submitted to Ontario One Call (ON1Call) to obtain public utility locates. Private utility clearance was performed by a private locator on behalf of Egis, in conjunction with CFB private utility clearance. Public utility owners were informed, and all utility clearance documents were obtained before the commencement of drilling work.

The field work was completed on January 22, 2024. Two boreholes in total were marked for drilling. Upon completion of utility locate process, one borehole BH24-2B respectively within proximity of the proposed backflow preventer valve, and the other BH24-2A was at the proposed access road.

BH24-2A was drilled to 1.3 meter below grade surface (mbgs) (El. 101.1m) to auger refusal and BH24-2B was drilled to 6.0 mbgs (El. 96.3 m).

The boreholes were drilled using a Mobile B53 track-mounted drilling rig, outfitted with solid stem augers. The equipment used for drilling was owned and operated by Drilltech Drilling Ltd. Soil samples were obtained at 0.75 m intervals in boreholes using a 51 mm outside diameter split spoon sampler in accordance with the Standard Penetration Test (SPT) procedure. Upon auger refusal, the bedrock was cored and sampled in Borehole BH24-2B to approximately 3.4 m depth from the top of the encountered bedrock surface at El. 99.70 meter above the sea level (masl). In BH24-2B NQ size rock cores were obtained using diamond drilling and wireline tooling. Rock cores were retrieved in double-walled NQ coring methods.

The bedrock core holes were sealed with bentonite hole plug and the boreholes were backfilled with auger cuttings and hole plug and restored to the original ground surface. The boreholes were surveyed with a GPS unit to record their locations and elevations. Borehole locations are shown in Figure- 3, and included in Appendix B.

Table 4-1: Borehole Designations, Locations, and Depth

BH No.	Drilling Date	Coordinates Coordinate System: NAD 83		Coordinates Coordinate System: UTM Zone 18T			Borehole Termination	
		Longitude	Latitude	Northing	Easting	Surface El. (m)	Depth (mbgs)	Bottom El. (m)
BH24-2A	Jan. 22, 2024	-76.45808221	44.24087641	4899660.695	383573.187	102.4	1.3	101.1
BH24-2B	Jan. 22, 2024	-76.45816504	44.24052502	4899621.782	383565.880	102.3	6.0	96.3

Field investigation, including drilling and sampling, were supervised on a full-time basis by Egis. All boreholes were logged during the drilling process. All samples were labelled by waterproof paper one by one as they were retrieved. All soil samples were preserved in double plastic bags to mitigate the risk of moisture loss during transportation to the geotechnical laboratory. Rock cores were laid and labelled in specialty boxes made for rock core transferring. The Rock Quality Designation was measured for the first time in the field immediately after drilling to reduce the measurement errors caused by transportation induced damages to the rock cores.

5.0 LABORATORY TESTING

All soil samples and rock cores obtained during the investigation were transported to Egis's geotechnical laboratory in Nepean, Ontario.

Geotechnical laboratory testing was performed on representative soil samples to determine soil index properties including grain-size analysis tests. Uniaxial compressive strength test was performed on one (1) rock core. The laboratory tests were performed in accordance with the Ministry of Transportation Ontario (MTO) test procedures, which follow the American Society for Testing Materials (ASTM) test procedures.

Paracel Laboratories Ltd. in Ottawa carried out chemical test on one (1) representative soil samples and consisted of pH, chloride, sulphate, and resistivity. Laboratory test results are included in Appendix B.

The rest of the soil samples recovered will be stored in Egis storage facility for a period of three (3) months after submission of the final report. Samples will be disposed after this period unless otherwise requested in writing by the Client.

6.0 SUBSURFACE CONDITIONS

6.1 Overview

The subsurface conditions encountered in the boreholes are shown on the borehole records provided in Appendix A. The boreholes records include soil stratification at the borehole locations with detailed soil descriptions and selected physical properties for each stratum encountered.

In general, the site stratigraphy consists of fill soil layer overlaying a cohesive deposit of Silty Clay to Clayey Silt underlain by bedrock. Both Boreholes were drilled on the open and gras planted landscape. The bedrock was cored and sampled in Borehole BH24-2B for classification purposes. The subsurface at this site can be divided into three distinguishable zones.

- Fill Soil
- Native Cohesive Deposit
- Bedrock

The subsurface soils and bedrock description encountered during the course of the investigation, together with the field and laboratory test results are shown on the borehole records included in Appendix A. Laboratory test results are included in Appendix B. Unless otherwise mentioned, all SPT 'N' results quoted are for SPT spoon penetrations of 300mm as per the subject ASTM. Supplementary information supporting the above overall subsurface observations, where available and indicated below. However, it should be borne in mind the below descriptions are based on and limited to, some generalizations of the actually verified soil information intercepted in the boreholes and documented in the borehole logs. Description of the subsurface strata encountered are given below.

6.2 Fill Soil

Fill soil Layer soil was encountered at the surface of both boreholes. The Fill soil layer was generally consisting of Sand and gravel to Sand trace gravel with organics overlying the native cohesive deposits. The fill soil layer extends to a depth of 0.5 to 0.8 m below the existing grade at the location of BH24-2A and 2B respectively.

The fill soil Layer depth, thickness, composition is given in Table 6-1.

Table 6-1: Location, Thickness, and Compaction of the Fill Soil Layer

BH No.	Layer's Depth (mbgs)	Layer's Top Elevation (masl)	Layer's Bottom Elevation (masl)	Layer's Thickness (m)	Description
BH24-2A	0.0	102.4	101.9	0.5	Sand and Gravel, some fines
BH24-2B	0.0	102.3	101.5	0.8	Sand, trace gravel

Grain size analysis test results of one representative sample from the fill Soil are shown in Table 6-2, and the corresponding graphical plot is shown in, Appendix B.

Table 6-2: Grain Size Distribution Summary – Fill Soil Layer

BH No./ SS No.	Size Fraction (%)					Moisture Content (%)
	Gravel	Sand	Silt	Clay	Fines	
BH24-2A / SS1	37	40	--	--	23	11

The Standard Penetration Test (SPT) 'N' values widely ranged between 12 to 28 blows per 300 mm penetration, with an average value of 20 blows per 300 mm based on two readings indicating compact compactness.

6.3 Native Cohesive Deposit

Native cohesive deposit was encountered below the fill soil layer in both boreholes. The soil was generally consisting of Silty Clay to Clayey Silt. The native cohesive deposit extends to a depth ranging between 1.3 to 2.6 m below the existing grade and overlaying the bedrock.

The cohesive deposit, thickness, composition is given in Table 6-3.

Table 6-3: Location, Thickness, and Compaction of the Native Cohesive Deposit Layer

BH No.	Layer's Depth (mbgs)	Layer's Top Elevation (masl)	Layer's Bottom Elevation (masl)	Layer's Thickness (m)	Description
BH24-2A	0.5	101.9	101.1	0.8	Silty Clay to Clayey Silt, some sand trace gravel
BH24-2B	0.8	101.5	99.7	1.8	Silty Clay to Clayey Silt, some sand trace gravel

Grain size analysis test result of one representative sample from the native cohesive deposit is shown in Table 6-4, and the corresponding graphical plot is shown in, Appendix B.

Table 6-4: Grain Size Distribution Summary – Native Cohesive Deposit Layer

BH No./ SS No.	Size Fraction (%)					Moisture Content (%)
	Gravel	Sand	Silt	Clay	Fines	
BH24-2B /SS1	4	16	34	46	--	31

The Standard Penetration Test (SPT) 'N' values widely ranged between 11 to 26 blows per 300 mm penetration, with an average value of 19 blows per 300 mm based on two readings indicating very stiff consistency. The high SPT 'N' values encountered at both boreholes on the lower part of the layer are due to the underlying bedrock.

6.4 Bedrock

Bedrock was encountered in both boreholes and cored in borehole BH24-2B as described in Table 6-5. The bedrock was observed below the native cohesive deposit at El. 101.1 m in BH24-2A and El. 99.7 in BH24-2B. The bedrock was cored and sampled to the bottom of BH24-2B.

During the core drilling, measurements including Total Core Recovery (TCR) and Rock Quality Designation (RQD) were carried out as part of the rock quality classification. TCR is defined as the sum of all recovered rock core pieces from a core run expressed as a percent of the total length of the core run. The RQD is defined as a percentage of the sum of the intact core pieces over 100 mm divided by the total length of core run. The TCR and RQD for the rock cores are presented in the borehole log records in Appendix A.

Based on the retrieved rock cores from borehole within the proposed backflow preventer valve enclosure footprint, the bedrock was identified as limestone with frequent shale parting. The bedrock was closely spaced with horizontal joint discontinuities. The limestone was observed to be strong, grey, thinly bedded, and has fair to excellent quality based on RQD values (59% to 100%). The rock cores are shown in Appendix C.

A summary of bedrock observations is provided in Table 6-5.

Table 6-5: Summary of Bedrock Observations

BH #	Ground Surface El. (m)	Bedrock Surface El. (m)	Weathered Bedrock El. (m)	Sound Bedrock El. (m)	RC #	El. (m)	Rec. (%)	RQD (%)	UCS (MPa)	ISRM classification corresponding to the UCS
BH24-2B	102.3	99.7	--	99.7 – 96.3	RC5	99.7 – 98.6	72	59		
					RC6	98.6 – 97.1	92	82	174.9	Very strong
					RC7	97.1 – 96.3	100	100		

6.5 Groundwater Level Observation

No groundwater was observed on both boreholes upon the completion of the auguring up to the elevation of the bedrock. No monitoring wells were installed in the advanced boreholes.

6.6 Chemical Test Results

Chemical analysis was conducted by Paracel Laboratories in Ottawa, ON, to determine the resistivity, pH, sulphate and chloride content of one (1) representative soil samples collected from the boreholes. The laboratory results for the chemical analysis are shown in Table 6-6 and included in Appendix B.

Table 6-6: Soil Chemical Analysis Results

Borehole	Sample	Depth (mbgs)	pH	Sulphate (10 µg/g)	Chloride (10 µg/g)	Resistivity (0.1 Ohm.m)
BH24-2B	SS-3	1.5	7.40	13	<10	58.3

7.0 GEOTECHNICAL DISCUSSION AND RECOMMENDATIONS

7.1 General

Based on the results of the geotechnical field and laboratory investigation performed, the following discussion is provided to assist the Client and the Designer with the proposed backflow preventer valve will be accommodated within a light weighted enclosure supported on a slab on grade.

The recommendations provided within this report are based on our understanding of the proposed project which is summarized above in “Section 2” and through the interpretation of factual information obtained from the boreholes advanced during this subsurface investigation. If any of these understandings change, Egis should be contacted to assess the implications of those changes on the recommendations provided herein.

Based on the soil conditions observed in the boreholes, and assuming they are representative of soil condition across the site, the most important geotechnical considerations for the design and construction of the water main backflow prevention assembly, metering and structure enclosure are expected to be the following:

Foundation on slab on grade supported on Adequately Prepared Granular Pad:

The water main backflow prevention assembly, metering and structure enclosure will be supported on slab on grade foundation supported on a granular backfill pad and overlies the native cohesive deposit at approximately 1.6 m mbgs depth (El. 100.50 ± 0.5 m).

The native cohesive deposit subgrade surface should be compacted, cleaned of any soft or unsuitable soil from the foundation influence zone before the construction of the granular pad. The granular backfill pad must extend a minimum of 1.6 m beyond the edge of the footing and then downward at a 1H:1V. The slab on grade thickness must consider and accommodate any uplift pressure that piping assembly may apply on the slab on grade foundation.

Temporary protection System:

Open excavation within proximity of any utility lines may not be possible without a temporary protection system (TPS). The design of the TPS system is the responsibility of the Contractor and shall be performed by an experienced professional Geostructural engineer. To reduce the lateral deflections, the Designer of the TPS may consider including anchoring and/or internal bracing system.

Temporary Construction Dewatering:

Excavation for preventer valve will proceed through the native cohesive deposit and may extend down into the bedrock. Although groundwater was not observed upon the completion of the borehole drilling, the contractor should be prepared for any perched groundwater and surface runoff water that may infiltrate and accumulate at the bottom of the excavations due to seasonal changes and rainfall events. Dewatering may be achievable with traditional sump and pump dewatering method. The groundwater disposal should be performed in accordance with applicable regulations. Assessment of the dewatering requirements and the need for registration on the Environmental Activity and Sector Registry (EASR) or a Permit to take Water (PTTW) should be carried out by specialists experienced in this field.

Permanent Drainage and Waterproofing:

Since no groundwater was intercepted upon the borehole drilling completion, and provided that the water main backflow prevention assembly, metering and structure enclosure will be founded on a slab on grade supported on a granular backfill platform over the bedrock. Therefore, permanent under-floor drainage will not be required.

The comments made regarding the construction of the proposed preventive valve are intended to highlight those aspects which could impact or affect the detail design of the proposed preventive valve and its enclosure, for which special provisions may be required in the Contract Documents. Comments related to construction aspects are not intended to

dictate construction equipment or methods. Relevant parties should make their own interpretation of the factual data presented in the report. Interpretation of the data presented may affect equipment selection, proposed construction methods, and scheduling of construction activities.

7.2 Site Preparation

The site should be graded in the early stages of construction to provide for positive control of surface water and directing it away from excavations and subgrades. The Contractor should take appropriate measurements for collection and disposal of surface and groundwater and runoff including an adequate pumping system. Prior to the site preparation.

Public and private utility owners should be notified prior to the commencement of any construction activities. Existing underground utilities in the vicinity of the proposed excavation should be reviewed before commencing any excavation works to identify potential damage hazards due to the proposed excavation.

Existing utilities that are excavated or exposed as part of the construction will need to be supported and rerouted during the construction. Even with a shoring system, some inward movement of shoring is inevitable. This may cause slight ground settlement which may have an adverse effect on the existing buried utilities. The contractor shall inform owners of all existing utilities before proceeding with excavation. The utility owners may provide the permissible deformation that a particular utility may tolerate. Shoring shop drawings should be stamped by a professional engineer.

7.3 Excavation

Excavations will proceed through the overburden and bedrock. The excavations for the prevent valve installation will extend to the depth of the existing water main. As per the Technical Standards and Specifications, City of Kingston, the depth of the watermain must not be less than 1.7m therefore the existing watermain may be installed within the overburden or within the upper layer of the bedrock. Based on the required excavation depth, it is anticipated that excavations for the proposed backflow preventive valves will need to be performed with the confinement of engineered shoring or trench boxes to avoid undermining the adjacent utilities and to ensure the safety of the working crew.

The excavated materials and any corresponding excess soils and rock should be disposed of in accordance with all applicable environmental legislation. Excess soils management and evaluation of the environmental quality of subsoils will be provided in another section of this report.

7.3.1 Overburden Excavation

All excavations must be undertaken in accordance with the requirements of the Occupational Health and Safety Act of Ontario (OHSA), Regulations for Construction O.Reg. 213/91, with specific reference to acceptable size slopes and stabilization requirements. The general stratigraphy outlined herein can be considered an OHSA Soil Type 3 for the native cohesive soil and Type 4 for the fill soil. The excavation for proposed preventive valve should be conducted through a minimum 1H:1V or a flatter slope for Type 3 Soil and 3H:1V for Type 4 Soil (i.e., the fill soil).

For excavations through multiple soil types, the side slope geometry is governed by the soil with the highest number designation as per OHSA. If the minimum slope requirement cannot be achieved, temporary protection system (TPS) or Engineered Shoring should be used.

Since the proposed excavations will be conducted below 1.2m, it is recommended that the excavations be undertaken within the confines of an Engineered Shoring designed and installed in accordance with OHSA. The shoring will need to support the excavation sidewalls and act as a barrier against any perched groundwater flow into the excavation. However, the removal of water within the shored excavation may still be required. Further discussion on the Engineered Shoring is provided in Section 7.3.3.

The stability of the excavation side slopes is highly dependent on the Contractor's methodology and layout. The excavations of the overburden soils are expected to be performed using conventional hydraulic excavation equipment. Cobbles, and boulders may be encountered during the excavations. Boulders larger than 0.3 meters in diameter should be removed from the excavation side slopes for workers' safety. No surface surcharges should be placed closer to the edge of the excavation than a distance equal to twice the depth of the excavation, unless a TPS has been designed to accommodate such a surcharge.

7.3.2 Bedrock Excavation

It is understood that the proposed installation of the preventive valve may require bedrock excavation. Therefore, moderate bedrock excavation will be required to achieve the desired elevations which is expected to generate a manageable amount of excavated rock materials.

For planning purposes, a weathered bedrock is recommended to be treated as a Type 2 Soil. Sound rock would generally be self-supporting. All rock excavations should be scaled, to remove loose rock fragments to ensure safe working conditions. All rock faces should be reviewed by the geotechnical engineer to look for loose pieces and wedge failures. Rock bolting for worker safety may be necessary depending on the layout and field condition at that time.

Bedrock excavation will require pneumatic or hydraulic breakers such as hoe-rams or heavy rock excavation equipment capable of breaking and ripping sound limestone bedrock.

7.3.3 Engineered Shoring

Engineered Shoring system is required during excavation and construction to protect any adjacent utilities, and for the worker's safety. Engineered Shoring systems may vary from as simple as the trench boxes to soldier piles and lagging, and secant and/or tangent walls. The design of the Engineered Shoring system is the responsibility of the Contractor. The Contractor should hire an experienced professional Geotechnical engineer to provide a detailed design for the Engineered Shoring system. The Engineered Shoring designer must take into consideration any adjacent infrastructure being retained, lateral earth pressures, groundwater pressure, construction surcharge loads, and pre-stressing loads or post tensioning loads on tiebacks. Also, it should consider the freeze-thaw action on the face of excavations, expansion and contraction of shoring elements, construction vibrations and compatibility with the design of proposed waterproofing and drainage systems for the proposed structure.

Stockpiling of soil beside the excavations should be avoided. The weight of the stockpiled soil could lead to overstressing the shoring system.

The temporary excavation support systems should be designed and constructed in accordance with OPSS.PROV 539 (Temporary Protection Systems). The lateral movement of the temporary shoring system should meet Performance Level 2 as specified in OPSS.PROV 539, provided that any adjacent utilities can tolerate this magnitude of deformation.

It is recommended that the Client retain a Contractor and a Designer who have significant experience with excavations performed under similar soil conditions. Shop drawings should be submitted to the designers and reviewed by the geotechnical engineer well in advance of mobilization.

Fully mobilized (i.e., active lateral earth pressure coefficient) conditions shall be considered. The lateral earth pressure coefficients for existing native and granular fill are given in Table 7-1 Section 7.8 to assist Designer and Contractor with the design of the shoring system.

7.4 Temporary Construction Dewatering

Excavation for preventive valve will proceed through the fill and native cohesive deposit layers and may reach the bedrock. Although groundwater was not observed upon the completion of the borehole drilling, the contractor should be prepared for any perched groundwater and surface runoff water that may infiltrate and accumulate at the bottom of the excavations due to seasonal changes and rainfall events. Contractors should be prepared to handle any surface water or groundwater infiltration by ditching, pumping and/or other methods in order to maintain dry working conditions.

Recommendations for appropriate dewatering measures beyond conventional sump pump techniques or other more intensive dewatering systems (e.g., well points or other specialized methods) to effectively lower the static groundwater level shall be provided by a specialized dewatering contractor.

The groundwater disposal should be performed in accordance with applicable regulations. Assessment of the dewatering requirements and the need for registration on the Environmental Activity and Sector Registry (EASR) or a Permit to take Water (PTTW) should be carried out by specialists experienced in this field.

7.5 Frost Depth and Frost Susceptibility

Based on OPSD 3090.101, the Frost Penetration Depth for the project area ranges between 1.4 to 1.6m. Therefore, all foundation elements that are sensitive to movements (i.e., heave and subsequent thaw settlements) located in unheated areas should be provided with a minimum of 1.5 metres (interpolated value) of non-frost susceptible earth cover or equivalent thermal insulation for frost protection services from the finished grades.

Based on Table 13.1 in the Canadian Foundation Engineering Manual, U.S. Corps of Engineers Frost Design Soil Classification, and since the grain size distribution for the soils intercepted within the frost depth has a percentage of grain sizes (in the 5 microns to 75 microns range) are generally higher than 55 %, and as such these soils are classified to be type F4 that has a high frost susceptibility.

7.6 Foundations (Slab on Grade Option)

It is important to emphasize that at the time of preparing this report, Egis has not been provided with the proposed service loads or foundation details for the proposed preventive valve enclosure. However, it was provided by the Client that the enclosure is to be supported by a slab on grade.

Based on section 7.5, and since the existing soils within the frost depth are classified to be type F4 that has a high frost susceptibility, The proposed slab on grade cannot be supported on the existing native soils that are subject to the frost

heave. Therefore, existing native cohesive deposits must be removed up to the frost depth and replaced with compacted granular material.

The preparation of the granular platform should be carried out as follows:

The subsurface of the exposed subgrade after the removal of the 1.6m thick of the soil should be compacted, proof rolled and inspected and approved to be clear from any soft soil in the presence of a qualified geotechnical engineer.

Imported engineered fill OPSS 1010 Type II Granular 'B' or Granular A, placed in shallow lifts not exceeding 250 mm and compacted to 98% of the Standard Proctor Maximum Dry Density (SPMDD) of the material. This operation should be carried out under strict construction compliance.

A moisture barrier consisting of at least a 200 mm thick layer of 19 mm clear crushed stone or 10 mm polyethylene vapor barrier is recommended to be placed directly under the floor slab. The stone bed would act as a barrier and prevent the capillary rise of moisture into the floor slab.

The slab-on-grade should be founded over the moisture barrier with a minimum thickness of 200 mm, the final thickness of the slab to be decided by the structural engineer.

A modulus of Subgrade Reaction (k_s) of 18 MPa/m is recommended for slab-on-grade design.

7.7 Site Classification for Seismic Site Response

Seismic site classification is completed based on National Building Code (NBC) 2020 Section 4.1.8.4 and Table 4.1.8.4.-B. This classification system is based on the average soil properties in the upper 30 m. The site can be classified as a Site Class "C" based on the fact the footings will be founded very close to the bedrock layer.

7.8 Lateral Earth Pressures

The following preliminary lateral earth pressure parameters are provided to assist Contractors and Designers with the design of temporary Engineered Shoring systems.

Compaction of backfill behind retaining structures can induce loads greater than the active or at-rest earth pressures. Therefore, the induced lateral earth pressure due to compaction should be added to the calculated earth pressure in accordance with Section 24.8 of CFEM (2006).

The following static lateral earth pressure coefficients are recommended.

Table 7-1: Lateral Earth Pressure Coefficient for Static Conditions

Material	Bulk Unit Weight, γ (kN/m ³)	Friction Angle, ϕ' (°)	Static active pressure, K_a	Static at-rest pressure, K_0	Static passive pressure, K_p
Native cohesive deposit layer in a stiff state	19	28	0.36	0.53	2.77
New compacted Granular B Type I	20	30	0.33	0.50	3.00
New compacted Granular A and Granular B Type II	22	32	0.31	0.47	3.25

Static lateral earth pressure can be calculated by using the following equation:

$$\sigma_h = K \times (\gamma h + q)$$

where K is the lateral earth pressure coefficient. For yielding retaining walls, the active earth pressure coefficients, K_a , is recommended to be used. For non-yielding temporary shoring walls, the at-rest, K_0 , is recommended to be used for design. The resultant of the applicable static or at-rest force is assumed to act at $h = 1/3H$ above the base of the wall where H is the Height of the wall. The unit of the retained soil " γ " is given in Table 7-1, and " q " is the value of any applied surcharge.

The above noted lateral pressure coefficients are calculated assuming the wall back angel is vertical and the backslope of the retained soil is horizontal. The wall-soil interaction angle is assumed to equal to $0.5\phi'$ as per CFEM. If Engineered Shoring is used, then designers should refer to CFEM for design assistance and a geotechnical engineer should be retained to perform the shoring design review.

7.9 Waterproofing and Permanent Drainage

Since no groundwater was intercepted upon the borehole drilling completion, and provided that the water main backflow prevention assembly, metering and structure enclosure will be founded on a slab on grade supported on a granular backfill platform over the native cohesive deposit. Therefore, permanent under-floor drainage will not be required.

7.10 Backfill

Although the sandy fill soil can be reused for backfilling, the native cohesive deposit is considered as a high susceptible for frost heave and its non-uniform density, the existing native soils are unsuitable for backfilling under the slab-on-grade and pavement in its present condition. Therefore, it is recommended to be sub-excavated, and replaced with OPSS Granular A or B Type II material placed in thin, loose lifts (maximum 0.2m thick) and each lift thoroughly compacted to a minimum of 98% of Standard Proctor Maximum Dry Density (SPMDD) as outlined below:

- Backfill should not be placed in frozen condition or placed on a frozen subgrade.
- In landscaped areas, the existing on-site native soil can be used for the upper 0.3m of backfill below the surrounding landscape for its low permeability to reduce surface water infiltration.

- Exterior grades should be sloped away from the prevent valve enclosure walls, and roof drainage downspouts from adjacent buildings should be placed so that water flows away from the enclosure.

7.11 *Underground Utilities*

At the subject site, it is expected that the burial depth of water utility lines is typically 1.7 m below the ground surface or as per the Technical Standards and Specifications, City of Kingston. Equivalent thermal insulation should be provided if this depth is not achievable.

The contractor should retain a professional engineer to provide detailed drawings for excavation and temporary support of the excavation walls during construction.

Excavations for the utility lines shall be performed in accordance with the Occupational Health and Safety Act (OHSA) of Ontario. Excavations shall be performed in accordance with Section 7.3 of this report.

The engineer designing utilities shall ensure the proposed utility pipes can tolerate compaction loads.

The recommendations within this section are intended to be a supplement to, and not a replacement of the most recent local municipal requirements.

7.11.1 *Bedding and Cover*

The following are recommendations for service trench bedding and cover materials:

- Bedding for buried utilities should consist of an OPSS.MUNI 1010 "Granular A" material and should be placed in accordance with municipal requirements, assuming the subgrade soils are not allowed to become disturbed. All utility pipes and high amps electrical conduits shall receive a minimum of 150 mm bedding.
- It is not recommended to bear utility line directly on bedrock subgrade. Utility lines on bedrock shall also receive 150 mm Granular A as a bedding to avoid differential behavior.
- The use of clear stone is not recommended for use as pipe bedding. The voids in the stone may result in a low gradient water flow and infiltration of fines from the surrounding soils and cover materials, causing settlement and loss of support to pipes and structures.
- The cover material should be a service sand material or an OPSS.MUNI 1010 "Granular A". The dimensions should comply with the pertinent specification section.
- The bedding, spring line, and cover should be compacted to at least 98% of its SPMDD.
- All covers are to be compacted to 100% SPMDD if they are intersecting structural elements.
- Compaction equipment should be used in such a way that the utility pipes are not damaged during construction.
- If the encountered subgrade below the utility line is clay or silt, it is recommended that the utility bedding be separated from the native soil by a non-woven geotextile.

7.11.2 Trench Backfill

- Backfill above the cover for buried utilities should be in accordance with the following recommendations:
- The backfill should be placed in a maximum of 200 mm thick layers at or near (+ 2%) their optimum moisture content, and each layer should be compacted to at least 95% SPMDD within the landscape areas. This value should be increased to at least 98% SPMDD within the roadway and the proposed enclosure structure subgrade backfilling.
- In general excavation backfill should attempt to match the texture of the existing adjacent soils. If imported materials are used, side slopes with frost tapers are recommended. Typically, frost tapers should be a back-slope of 10H:1V through the frost zone, (i.e., 1.5 m from finished grade).
- During backfilling, care should be taken to ensure the backfill proceeds in equal stages simultaneously on both sides of the utility pipes; and
- No frozen material should be used as backfill; neither should the trench base be allowed to freeze.
- The quality and workmanship in the construction are as important as the compaction standards themselves. It is imperative that the guidelines for the compaction be followed for the full depth of the trench to achieve satisfactory performance.

7.11.3 Clay Seals

In the event that a perched groundwater encountered during the excavation for the installation of the watermain backflow prevention assembly, clay seals are recommended as a seepage barrier for all utility trenches. In the absence of clay seals, there is a potential for the trench to act as a drain into the watermain trench. To avoid such an effect, clay seals are recommended at both ends of the open trench. The clay seal shall be constructed of low permeability material, such as silty clay, to a minimum thickness of 0.6 m, clay seal material shall be according to OPSS 1205 and OPSD 802.095. The clay seal (i.e., silty clay) material shall be compacted to a minimum of 95% SPMDD in loose lifts of no thicker than 300 mm. Acceptable imported clay material may be used for the construction of the clay seals.

8.0 CEMENT TYPE AND CORROSION POTENTIAL

One soil sample was submitted to Parcel laboratories for testing of chemical properties relevant to exposure of concrete elements to sulphate attacks as well as potential soil corrosivity effects on buried metallic structural elements. Test results are presented in Table 6-6 and the laboratory results for the chemical analysis are shown in appendix B.

Electrical resistivity, pH-value, and chloride concentration can provide an indication of the corrosion potential to buried steel elements in contact with subsurface environment. Using a corrosion nomograph proposed by King (1977) for buried metals and based on electrical resistivity results and pH-value, the corrosion potential for buried steel elements is within the non-aggressive range. The corrosive effects of road de-icing salts should also be considered.

The analytical results of the soil sample were compared with applicable Canadian Standards Association (CSA) A23.1-04 and are given in Table 8-1 below.

Table 8-1: Additional Requirement for Concrete Subjected to Sulphate Attack

Class of Exposure	Degree of Exposure	Water Soluble Sulphate in Soil Sample (%)	Cementing Material to be Used
S-1	Very Severe	> 2.0	HS or HSb
S-2	Severe	0.2 – 2.0	HS or HSb
S-3	Moderate	0.1 – 0.2	MS, MSb, LH, HS, or HSb

The chemical sulphate content analyses for selected soil sample tested indicate a sulphate concentration of maximum of a 0.013 % in soil, as shown in Table 6-6, indicating a “moderate to low” risk for sulphate attack on concrete material. The selection for class of concrete should include consideration of the effects of road de-icing salts.

9.0 PAVEMENT STRUCTURE

Since a new roadway will be required to reach the proposed enclosure, recommendation included in this section can be used for the pavement design. Investigation results indicated approximately 500 mm of sand and gravel fill in BH24-2A, and such material can be stock piled and reused to replace the soft and unsuitable soil when proof rolling the exposed subgrade. The native cohesive deposit is considered as a high susceptible for frost heave and therefore it cannot be reused in backfilling.

The production and placement of asphaltic concrete and granular materials shall conform to the requirements of OPSS MUNI 1003, 1151 for Superpave mixes and OPSS 1150 for Marshal mixes.

Prior to placing the pavement structure, any soft, loose, or unstable soil should be removed, and the subgrade prepared as noted below. Pavement subgrade can consist of the fill materials encountered at the site.

Pavement subgrade should be compacted to at least 98% of the SPMDD and proof rolled. Areas exhibiting more than 20 mm deflection should have the top 300mm removed and replaced with approved drier materials.

Sub-grade up-fill should also be compacted to at least 98% of the standard Proctor density of the material, at or below the optimum moisture content (OMC) in lifts not exceeding 200 mm in thickness.

The Granular Base and Subbase layers should be compacted to at least 100% of the SPMDD. In the extreme cases, such as during the wet season, the top 300mm of the sub-grade may have to be replaced by compacted granular material to compensate for the inadequate strength of the wet sub-grade.

Table 9-1 provides the minimum recommended thicknesses of both heavy and light duty pavements. If the use of the access road is limited to maintenance pickup trucks and snowplows, then it may be considered as a light duty pavement. However, the proposed access road should match with the existing connecting road structure to reduce the risk of differential behaviors between the existing and proposed surfaces and to extend the purpose that the original road was built to serve.

Table 9-1: Proposed Pavement Structure

Material		Heavy Duty Thickness (mm)	Light Duty Thickness (mm)
Surface	HL3 or Superpave 12.5 mm, Design Category B, PG 58-28*	50	50
Binder	HL8 or Superpave 19.0 mm, Design Category B, PG 58-28*	50	--
Base	OPSS Granular A	150	150
Sub-base	OPSS Granular B Type II	400	300

*-New hot mix or up to a maximum of 20% RAP

The existing asphalt should be cut back a minimum of 3 m from the edge of any excavation. Top 50 mm of the existing asphalt shall be also milled for 0.3 m to stagger the surface joint and the binder joint. Both base and sub-base should be compacted to 100% SPMD. Asphalt layers should be compacted to comply with OPSS.MUNI 310. Asphalt layers shall be compacted to minimum 92% and maximum 97% density, 4% air void is ideal.

10.0 ENVIRONMENTAL SOIL SAMPLING AND ANALYSIS

Egis carried out a scoped due diligence environmental subsurface investigation on January 26, 2024, following the geotechnical field investigation conducted at the Site. It is understood that the due diligence sampling program is intended to inform future tendering of work at the Site, and as such, Egis did not complete an Assessment of Past Uses (APU) or Sampling and Analysis Plan (SAP) for the Site prior to the investigation. Egis staff carried out the collection, screening, and laboratory analysis of soil samples. This included the completion of two (2) boreholes and the submission of one (1) soil sample per borehole (two total) for analysis of contaminants of potential concern, as well as Toxicity Characteristic Leaching Procedure (TCLP) leachate analysis. As agreed with the Client, the sampling did not strictly comply with the required sampling to meet Ontario Regulation (O. Reg.) 406/19 and was instead intended to provide general soil quality information of the soils that will become excess at the Site, with the understanding that additional sampling/testing will be conducted following the tendering of the work. This investigation was conducted in accordance with Egis' Standard Operating Procedures.

Soil results were compared to the following Site Condition Standards for the purposes of this report, from the document entitled "*Generic Excess Soil Quality Standards*" as defined within the MECP document "Rules for Soil Management and Excess Soil Quality Standards," dated December 23, 2022.

- Table 1: Full Depth Background Site Condition Standards for Agricultural and Other Property Uses;
- Table 1: Full Depth Background Site Condition Standards for Residential, Parkland, Institutional, Industrial, Commercial and Community Property Uses
- Table 2.1: Full-Depth Excess Soil Quality Standards for Agricultural and Other Uses in a Potable Groundwater Condition (Volume-independent);

- Table 2.1: Full-Depth Excess Soil Quality Standards for Residential, Parkland and Institutional Property Uses in a Potable Groundwater Condition (Volume-independent);
- Table 2.1: Full-Depth Excess Soil Quality Standards for Industrial, Commercial, Community Property Uses in a Potable Groundwater Condition (Volume-independent);
- Table 3.1: Full-Depth Excess Soil Quality Standards for Residential, Parkland, Institutional Property Uses in a Non-Potable Groundwater Condition (Volume-independent); and,
- Table 3.1: Full-Depth Excess Soil Quality Standards for Industrial, Commercial, Community Property Uses in a Non-Potable Groundwater Condition (Volume-independent).

The Toxicity Characteristic Leaching Procedure (TCLP) screening results were compared to:

- O. Reg 558/04 General – Waste Management, Schedule 4 Leachate Quality Criteria.

It is important to note that soil only becomes “excess soil” if it is not reused within the project limits. To minimize the generation of waste and environmental impact, every attempt should be made to reuse the soil within the project limits if a geotechnically suitable use can be found. It is recommended that for any soils found to have exceedances of all the above noted SCS and ESQS, an attempt should be made to reuse this soil within the Project Area, for landscaping berms or to improve drainage, if there will be no adverse impacts. If this cannot be accomplished any heavily contaminated soils should be disposed of at a licensed landfill.

It is recommended that reuse of contaminated soils within the Project Area, once fully characterized, shall only be located:

- a. A minimum of 30 metres (m) away from waterbodies;
- b. A minimum of 3 m away from the property line (boundary);
- c. A minimum of 2 m above the ground water table;
- d. A minimum of 100 m from water wells; and
- e. Covered with 0.3 m of clean soil and revegetated or capped.

10.1 Scope of Investigation

The due diligence environmental investigation at the Site consisted of the following components:

- Underground service locate clearance was provided by public utility services through Ontario One Call;
- The advancement of two (2) auger holes at the Site to a maximum depth of 6 m below ground surface (m bgs);
- Submission of select “worst case” soil samples from target depths, collected from each auger hole, as determined through field screening, general coverage, and the judgement of the field staff, for laboratory analyses of petroleum hydrocarbons (PHCs) in the F1 to F4 fraction ranges (F1-F4); benzene, toluene, ethylbenzene, and xylene (BTEX); polycyclic aromatic hydrocarbons (PAHs), metals and inorganic parameters, and volatile organic compounds (VOCs);
- Submission of “worst case” soil leachate samples for toxicity characteristic leaching procedure (TCLP) analyses; and

- Completion of a Due Diligence Soils Investigation discussion, presented within the geotechnical investigation report for the Site.

10.2 Investigation Methods

As agreed with the Client, this investigation was conducted for due diligence purposes for general characterization of the soil at the Site and does not fully comply with the requirements of O. Reg. 406/19, O. Reg. 153/04, nor the MECP “Rules for Soil Management and Excess Soil Quality Standards.” The Client requested testing of 1-2 soil samples from each Site and one (1) TCLP sample to provide general soil quality information. It is understood that additional sampling/testing would be completed once the work has been tendered.

A total of two (2) boreholes were advanced within the Project Area in areas where excess soil is expected to be generated.

Site Location is presented in Figure 1. Borehole locations along the Site are shown in Appendix A.

10.3 Soil Sampling

A total of eight (8) soil samples, three (3) from BH24-2A and five (5) from BH24-2B, were collected at the Site using a Mobile B53 track-mounted drilling rig, outfitted with solid stem augers. The eight (8) soil samples were collected to a maximum depth of 6 m bgs. All samples were collected directly into Ziploc® bags and screened. Two (2) of the eight (8) soil samples were submitted for laboratory analysis using a “worst-case” scenario and were then placed into laboratory supplied containers and placed into chilled coolers for transport to the laboratory, Eurofins Scientific (Eurofins), under strict Chain of Custody documentation protocols. Eurofins is accredited by the Standards Council of Canada and the Canadian Association for Laboratory Accreditation, in accordance with the international standard ISO/IEC 17025:2005 – General Requirements for the Competence of Testing and Calibration Laboratories. Eurofins is accredited for analysis of all parameters required under the O. Reg. 153/04 – Record of Site Condition, as outlined in the MECP Technical Update entitled ‘Laboratory Accreditation Requirements Under the New Record of Site Condition Regulation (O. Reg. 153/04)’.

One (1) representative composite sample was obtained for TCLP leachate analyses to determine disposal options for potentially contaminated soil. A modified Synthetic Precipitation Leaching Procedure (mSPLP) sample was not submitted.

All non-dedicated equipment used during soil sampling (i.e., hand auger) were cleaned between sampling with a mixture of Alconox® and water. Additionally, prior to use on-Site, the RKL Eagle 2 used as part of this Soil Characterization investigation was calibrated to manufacturer specifications by the equipment supplier (Maxim Environmental).

The following summarizes the soil samples submitted for laboratory analyses:

Table 10-1: Samples Submitted

BH ID	Sample ID	Coordinates (UTM Zone 18N)	Approx. Depth (mbgs)	Chemical Analysis	Rationale
BH24-2A	BH24-2A (24-2A-SS2)	N: 4899660.695 E: 383573.187	0.76 – 1.27	PHC F1-F4, BTEX, PAHs, M&I, VOC	General soil information at the Site
BH24-2B	BH24-2B (24-1B-SS1)	N: 4899621.782 E: 383565.880	0.76 – 1.37	PHC F1-F4, BTEX, PAHs, M&I, VOC	General soil information at the Site
Composite	TCLP-24-2	-	-	TCLP Metals, TCLP PHCs, TCLP PAHs, TCLP VOCs	Off-site disposal options

10.4 Analytical Results

The COPCs at the Site are VOCs including BTEX, PHCs (F1-F4), PAHs, and metals and inorganics.

The analytical results were compared to the following criteria:

- Table 1 AO SCS;
- Table 1 RPIICC SCS;
- Table 2.1 AO ESQS;
- Table 2.1 RPI ESQS;
- Table 2.1 ICC ESQS;
- Table 3.1 RPI ESQS; and
- Table 3.1 ICC ESQS.

The exceedances are summarized in Table 10-2 below. Laboratory Certificates of Analysis are presented in Appendix B.

Analytical results are only applicable to locations and excavation depths stated in this document. The Client will be responsible for characterization of the soil and ensuring the appropriate number of bulk and leachate samples are collected and analyzed in order to meet the testing requirements outlined in O.Reg. 406/19 and by the chosen reuse sites, as applicable.

Additionally, if olfactory evidence (i.e. staining, odours, etc.) is noted in the soils during construction, testing of soils should be completed by the Contractor to determine soil quality and appropriate reuse and/or disposal, if unknown.

A summary of soil results exceedances are presented in Table 10-2 below:

Table 10-2: Analytical Summary – Exceedances

BH ID	Sample ID:	Sample Depth Range (m bgs)	Table 1 AO SCS	Table 1 RPI/ICC SCS	Table 2.1 AO ESQS	Table 2.1 RPI ESQS	Table 2.1 ICC ESQS	Table 3.1 RPI ESQS	Table 3.1 ICC ESQS
BH24-2A	BH24-2A (24-2A-SS2)	0.76 – 1.27	Ba	Ba	-	-	-	-	-
BH24-2B	BH24-2B (24-1B-SS1)	0.76 – 1.37	Ba, Ni, Se	Ba, Se	Ba	Ba	-	-	-

*Note: Barium (Ba), Nickel (Ni), Selenium (Se)

All other tested parameters were below the noted SCS/ESQS guidelines.

10.5 TCLP Leachate Results

One (1) soil sample was submitted to Eurofins on January 26, 2024, for TCLP analyses of metals and inorganics, PHC, VOC, and PAH leachate criteria.

The TCLP leachate analytical results are compared to Schedule 4: Leachate Quality Criteria in O. Reg 558/00 General – Waste Management made under the Environmental Protection Act, dated October 10, 2000.

A review of the analytical results indicates that the TCLP sample did not exceed the Leachate Quality Criteria for any of the analyzed parameters, and thus, should be classified as non-hazardous solid waste.

The Laboratory Certificates of Analysis and results for the TCLP sample are appended.

10.6 Conclusions

Of the two (2) borehole locations sampled during the investigation, all of the samples submitted met the above-noted Site Condition Standards or Excess Soil Quality Standards, with the exception of Table 1 SCS and Table 2.1 ESQS for select metals. Borehole 24-2A exceeded Table 1 R/P/I/I/C/C SCS for barium. Borehole 24-2B exceeded Table 1 AO SCS for nickel, Table 1 R/P/I/I/C/C SCS for selenium, and Table 2.1 R/P/I ESQS for barium. It should be noted that barium and selenium concentrations were consistently detectable in boreholes across the Sites (Sites 1-4) and as such, it is considered possible that these exceedances in BH24-2A and BH24-2B may be of natural origin. Barium and selenium-impacted soils may be suitable for reuse at a site with similarly elevated levels of metals. All other analyzed parameters were found at concentrations below SCS/ESQS.

The Client will be responsible for full characterization of any excess soil and for ensuring the appropriate number of bulk samples, leachate samples, and reporting is completed to meet the testing requirements outlined by O.Reg. 406/19 and the chosen reuse sites, as applicable.

It is important to note that soil only becomes “excess soil” if it is not reused within the Project Area. To minimize the generation of waste and environmental impact, every attempt should be made to reuse the soil within the project limits if a geotechnically suitable use can be found. It is recommended that any soils found to exceed of all the above noted SCS and ESQS, that an attempt should be made to reuse this soil on site, such as in berms or to improve drainage, if there will be no adverse impacts. If this cannot be accomplished any heavily contaminated soils should be disposed of at a licensed landfill.

11.0 CONSTRUCTION CONSIDERATIONS

The recommendations presented in this report are based on the assumption that an adequate level of construction monitoring by qualified geotechnical personnel during construction will be provided. All bearing surfaces should be inspected and approved by experienced geotechnical personnel prior to placing the footings or lean mix concrete.

In addition, an adequate level of construction monitoring should include laboratory and field test during construction. This includes Full time compaction testing of Engineered Fill and part time compaction testing under the slab on grade platform backfill with laboratory testing for the proposed fill soils for this Site. Also, periodic testing of concrete is required.

The vibration should be kept at a minimal level to avoid soil disturbance and associated unexpected settlement to the nearby structures, roadway, load bearing elements, and utilities. Also, the noise level should be kept at a tolerance level of noise per the City of Kingston requirements. Vibration and deformation monitoring will be required throughout the construction.

A separate monitoring program should be developed by the shoring designer to monitor the inward movements of the excavation support system to ensure compliance with the design assumptions and avoidance of adverse impacts on nearby structures and buried services.

Also as noted earlier in this report, the existing native soil cannot be used as engineered fill, bedding, cover, or any part of the pavement structure. If the existing native soil is to be reused for backfilling, it has to be reviewed by a geotechnical engineer and approved through bulk sampling and Proctor testing. However, it still can be reused for landscaping.

12.0 IMPORTANT INFORMATION AND LIMITATIONS OF THIS REPORT

The geotechnical assessment presented in this report are intended for the sole guidance of the client named and their design consultants. It should not be relied upon for any other purpose.

In the event of change of the design/reducing, further geotechnical investigation must be carried out to further investigate.

The information on which these recommendations are based is subject to confirmation by engineering personnel at the time of construction.

The data we have collated and the opinions we have formed after reviewing this information should not be construed as a guarantee but only as a guide to probable expectations. Conditions that exist, but are not recorded herein, were not apparent given the level of study authorized.

Localized variations in the subsurface conditions may be present between and beyond the boreholes advanced, and that these conditions may be significantly different from the general description provided for design purposes.

It is strongly urged that Egis should be contacted to aid in the interpretation of the borehole records by anyone undertaking work on/or below the ground surface at this Site prior to this work being carried out.

The client expressly agrees that it has entered into this agreement with Egis, both on its own behalf and as an agent on behalf of its employees and principals.

The client expressly agrees that Egis employees and principals shall have no personal liability to the client in respect of a claim, whether in contract, tort, and/or any other cause of action in law. Accordingly, the client expressly agrees that it will bring no proceedings and take no action in any court of law against any Egis employees or principals in their personal capacity.

13.0 CLOSURE

We trust that the following information is sufficient for your needs. We will be pleased to discuss the salient findings of this report with you, should you wish. If you require our further services in this regard, please do not hesitate to contact our office.

Yours truly,

Egis Canada Limited.

Field work carried out by:



Jeffrey Forrester, C.E.T.
Foundations Coordinator

The Geotechnical Part of the Report prepared by:



Zeyad Buni, P.Eng.,
Practice Area Lead, Geotechnical Services

The Geotechnical Part of the Report reviewed by:



Esam Deif, P.Eng.,
Vice President, Geotechnical Services

The Environmental Soil Sampling and
Analysis Part of the Report



Jordan Bowman, P.Geo., P.Biol.
Manager, Geo-Environmental

Egis Group Canada

Appendix A – Borehole Location Plan and Borehole Logs

Site#2

Legend

-  Borehole
-  Site 2
-  Site#2



Google Earth

© 2023 Google
Image © 2024 Airbus



70 m

EXPLANATION OF TERMS USED IN REPORT

N-VALUE: THE STANDARD PENETRATION TEST (SPT) N-VALUE IS THE NUMBER OF BLOWS REQUIRED TO CAUSE A STANDARD 51mm O.D SPLIT BARREL SAMPLER TO PENETRATE 0.3m INTO UNDISTURBED GROUND IN A BOREHOLE WHEN DRIVEN BY A HAMMER WITH A MASS OF 63.5 kg, FALLING FREELY A DISTANCE OF 0.76m. FOR PENETRATIONS OF LESS THAN 0.3m N-VALUES ARE INDICATED AS THE NUMBER OF BLOWS FOR THE PENETRATION ACHIEVED. AVERAGE N-VALUE IS DENOTED THUS N.

DYNAMIC CONE PENETRATION TEST: CONTINUOUS PENETRATION OF A CONICAL STEEL POINT (51mm O.D. 60° CONE ANGLE) DRIVEN BY 475J IMPACT ENERGY ON 'A' SIZE DRILL RODS. THE RESISTANCE TO CONE PENETRATION IS MEASURED AS THE NUMBER OF BLOWS FOR EACH 0.3m ADVANCE OF THE CONICAL POINT INTO THE UNDISTURBED GROUND.

SOILS ARE DESCRIBED BY THEIR COMPOSITION AND CONSISTENCY OR DENSENESS.

CONSISTENCY: COHESIVE SOILS ARE DESCRIBED ON THE BASIS OF THEIR UNDRAINED SHEAR STRENGTH (c_u) AS FOLLOWS:

C_u (kPa)	0 – 12	12 – 25	25 – 50	50 – 100	100 – 200	>200
	VERY SOFT	SOFT	FIRM	STIFF	VERY STIFF	HARD

COMPACTION: COHESIONLESS SOILS ARE DESCRIBED ON THE BASIS OF DENSENESS AS INDICATED BY SPT N VALUES AS FOLLOWS:

N (BLOWS/0.3m)	0 – 5	5 – 10	10 – 30	30 – 50	>50
	VERY LOOSE	LOOSE	COMPACT	DENSE	VERY DENSE

ROCKS ARE DESCRIBED BY THEIR COMPOSITION AND STRUCTURAL FEATURES AND/OR STRENGTH.

RECOVERY: SUM OF ALL RECOVERED ROCK CORE PIECES FROM A CORING RUN EXPRESSED AS A PERCENT OF THE TOTAL LENGTH OF THE CORING RUN.

MODIFIED RECOVERY: SUM OF THOSE INTACT CORE PIECES, 100mm+ IN LENGTH EXPRESSED AS A PERCENT OF THE LENGTH OF THE CORING RUN. THE ROCK QUALITY DESIGNATION (RQD), FOR MODIFIED RECOVERY IS:

RQD (%)	0 – 25	25 – 50	50 – 75	75 – 90	90 – 100
	VERY POOR	POOR	FAIR	GOOD	EXCELLENT

JOINT AND BEDDING:

SPACING	50mm	50 – 300mm	0.3m – 1m	1m – 3m	>3m
JOINTING	VERY CLOSE	CLOSE	MOD. CLOSE	WIDE	VERY WIDE
BEDDING	VERY THIN	THIN	MEDIUM	THICK	VERY THICK

ABBREVIATIONS AND SYMBOLS

FIELD SAMPLING

SS	SPLIT SPOON	TP	THINWALL PISTON
AS	AUGER SAMPLE	OS	OSTERBERG SAMPLE
ST	SLOTTED TUBE SAMPLE	RC	ROCK CORE
BS	BLOCK SAMPLE	PH	TW ADVANCED HYDRAULICALLY
CS	CHUNK SAMPLE	PM	TW ADVANCED MANUALLY
SHELBY	SHELBY TUBE SAMPLE	FS	FOIL SAMPLE

STRESS AND STRAIN



u_w	kPa	PORE WATER PRESSURE
r_u	1	PORE PRESSURE RATIO
σ	kPa	TOTAL NORMAL STRESS
σ'	kPa	EFFECTIVE NORMAL STRESS
τ	kPa	SHEAR STRESS
$\sigma_1, \sigma_2, \sigma_3$	kPa	PRINCIPAL STRESSES
ϵ	%	LINEAR STRAIN
$\epsilon_1, \epsilon_2, \epsilon_3$	%	PRINCIPAL STRAINS
E	kPa	MODULUS OF LINEAR DEFORMATION
G	kPa	MODULUS OF SHEAR DEFORMATION
μ	1	COEFFICIENT OF FRICTION

MECHANICAL PROPERTIES OF SOIL

m_v	kPa^{-1}	COEFFICIENT OF VOLUME CHANGE
c_c	1	COMPRESSION INDEX
c_s	1	SWELLING INDEX
c_a	1	RATE OF SECONDARY CONSOLIDATION
c_v	m^2/s	COEFFICIENT OF CONSOLIDATION
H	m	DRAINAGE PATH
T_v	1	TIME FACTOR
U	%	DEGREE OF CONSOLIDATION
σ'_{v0}	kPa	EFFECTIVE OVERBURDEN PRESSURE
σ'_p	kPa	PRECONSOLIDATION PRESSURE
τ_t	kPa	SHEAR STRENGTH
c'	kPa	EFFECTIVE COHESION INTERCEPT
Φ_i	$^\circ$	EFFECTIVE ANGLE OF INTERNAL FRICTION
c_u	kPa	APPARENT COHESION INTERCEPT
Φ_u	$^\circ$	APPARENT ANGLE OF INTERNAL FRICTION
τ_R	kPa	RESIDUAL SHEAR STRENGTH
τ_r	kPa	REMOULDED SHEAR STRENGTH
S_t	1	SENSITIVITY = c_u / τ_r

PHYSICAL PROPERTIES OF SOIL

P_s	kg/m^3	DENSITY OF SOLID PARTICLES	e	1, %	VOID RATIO	e_{\min}	1, %	VOID RATIO IN DENSEST STATE
γ_s	kN/m^3	UNIT WEIGHT OF SOLID PARTICLES	n	1, %	POROSITY	I_D	1	DENSITY INDEX = $\frac{e_{\max} - e}{e_{\max} - e_{\min}}$
P_w	kg/m^3	DENSITY OF WATER	w	1, %	WATER CONTENT	D	mm	GRAIN DIAMETER
γ_w	kN/m^3	UNIT WEIGHT OF WATER	S_r	%	DEGREE OF SATURATION	D_n	mm	N PERCENT – DIAMETER
P	kg/m^3	DENSITY OF SOIL	w_L	%	LIQUID LIMIT	C_u	1	UNIFORMITY COEFFICIENT
γ	kN/m^3	UNIT WEIGHT OF SOIL	w_p	%	PLASTIC LIMIT	h	m	HYDRAULIC HEAD OR POTENTIAL
P_d	kg/m^3	DENSITY OF DRY SOIL	w_s	%	SHRINKAGE LIMIT	q	m^3/s	RATE OF DISCHARGE
γ_d	kN/m^3	UNIT WEIGHT OF DRY SOIL	I_p	%	PLASTICITY INDEX = $(W_L - W_P)$	v	m/s	DISCHARGE VELOCITY
P_{sat}	kg/m^3	DENSITY OF SATURATED SOIL	I_L	1	LIQUIDITY INDEX = $(W - W_P) / I_p$	i	1	HYDRAULIC GRADIENT
γ_{sat}	kN/m^3	UNIT WEIGHT OF SATURATED SOIL	I_C	1	CONSISTENCY INDEX = $(W_L - W) / I_p$	k	m/s	HYDRAULIC CONDUCTIVITY
P'	kg/m^3	DENSITY OF SUBMERGED SOIL	e_{\max}	1, %	VOID RATIO IN LOOSEST STATE	j	kN/m^3	SEEPAGE FORCE
γ'	kN/m^3	UNIT WEIGHT OF SUBMERGED SOIL						

PROJECT NO.: CCO-24-2687							Drilling Date: Jan/22/2024 - Jan/22/2024							BH No: 24-2A						
PROJECT: Geotech Investigation - Proposed Watermain Valves and Structures							BH Location: N 4899660.695; E 383573.187							Datum: Geodetic						
CLIENT: Eastpoint Engineering Ltd							Drilling Equipment: Mobile B53							Elevation: 102.4 m						
PROJECT LOCATION: CFB Kingston, ON							Drilling Method: Solid Stem Auger							Compiled by: JP						
							Remarks: Coordinate System - UTM Zone 18T							Checked by: ZB						
SOIL PROFILE			SAMPLES				GROUNDWATER CONDITIONS	DEPTH (m) ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT				PLASTIC LIMIT	NATURAL MOISTURE CONTENT	LIQUID LIMIT	Remarks and Grain Size Distribution (%) Unit Weight (kN/m³) Pocket Penetro. (kPa) GR SA SI CL				
ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS/0.3 m RQD (%)	RECOVERY (%)			SHEAR STRENGTH (kPa) Field, Shear Vane (x) & Sensitivity (s) Pocket Penetrometer								WATER CONTENT (%)			
									● Quick Triaxial	○ Unconfined										
102.4 0.0	FILL, sand and gravel, some fines dark brown to grey compact moist		1	SS	28	54%										37 40 (23)				
101.9 0.5	SILTY CLAY - CLAYEY SILT some sand, trace gravel stiff to hard brown moist		2	SS	50/ 125 mm	100%														
101.1 1.3	Auger refusal @ 1.25 m on inferred bedrock Borehole dry upon completion																			

PROJECT NO.: CCO-24-2687							Drilling Date: Jan/22/2024 - Jan/22/2024							BH No: 24-2B								
PROJECT: Geotech Investigation - Proposed Watermain Valves and Structures							BH Location: N 4899621.782; E 383565.88							Datum: Geodetic								
CLIENT: Eastpoint Engineering Ltd							Drilling Equipment: Mobile B53							Elevation: 102.3 m								
PROJECT LOCATION: CFB Kingston, ON							Drilling Method: Solid Stem Auger							Compiled by: JP								
							Remarks: Coordinate System - UTM Zone 18T							Checked by: ZB								
SOIL PROFILE			SAMPLES				GROUNDWATER CONDITIONS	DEPTH (m) ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT				PLASTIC LIMIT			NATURAL MOISTURE CONTENT			LIQUID LIMIT			Remarks and Grain Size Distribution (%) Unit Weight (kN/m³) Pocket Penetro. (kPa)
ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS/0.3 m	RQD (%)			RECOVERY (%)	SHEAR STRENGTH (kPa)				W _P	W	W _L						
										Field, Shear Vane (x) & Sensitivity (s) Pocket Penetrometer												
								● Quick Triaxial	○ Unconfined	✕												
102.3 0.0	FILL, sand, trace gravel brown compact moist		1	SS	12	54%																
101.5 0.8			SILTY CLAY - CLAYEY SILT some sand, trace gravel stiff to hard brown moist	2	SS	11	88%															
	3	SS		26	100%																	
	4	SS		50/ 100 mm	67%																	
99.7 2.6	Limestone bedrock, fair to excellent quality, frequent shale partings		5	RC	RQD = 59%	72%																
			6	RC	RQD = 82%	92%																
			7	RC	RQD = 100%	100%																
96.3 6.0	End of Borehole																					

1MP SOIL LOG GINT CFB KINGSTON.GPJ MP_OTTAWA_FOUNDATIONS.GDT 3/19/24

Egis Group Canada

Appendix B – Laboratory Test Results

WATER CONTENT DETERMINATION

[illegible]

Particle Size Distribution Report



% +75mm	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	7.8	29.5	15.3	15.5	8.6	23.3	

TEST RESULTS			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
37.5mm	100.0		
26.5mm	92.2		
19.0mm	92.2		
16.0mm	90.4		
13.2mm	87.5		
9.5mm	80.4		
4.75mm	62.7		
2.36mm	49.9		
1.18mm	40.3		
0.600mm	34.2		
0.300mm	30.1		
0.150mm	27.1		
0.075mm	23.3		

* (no specification provided)

Material Description		
Silty/Clayey Sand and Gravel		
Atterberg Limits (ASTM D 4318)		
PL=	LL=	PI=
Classification		
USCS (D 2487)=	AASHTO (M 145)=	
Coefficients		
D ₉₀ = 15.5834	D ₈₅ = 11.5951	D ₆₀ = 4.2000
D ₅₀ = 2.3783	D ₃₀ = 0.2942	D ₁₅ =
D ₁₀ =	C _u =	C _c =
Remarks		
Organics present F.M.=3.83		
Date Received: Feb 8,2024 Date Tested: Feb 14,2024		
Tested By: R.C		
Checked By: J.Hopwood-Jones		
Title: Lab Manager		

Location: BH24-2A SS-1

Sample Number: SS-1

Depth: 0'-2'

Date Sampled: Jan 22,2024



Client: Eastpoint Engineering Ltd.

Project: CFB Kingston

Project No: CCO-24-2687

Figure

GRAIN SIZE DISTRIBUTION TEST DATA

2024-02-21

Client: Eastpoint Engineering Ltd.

Project: CFB Kingston

Project Number: CCO-24-2687

Location: BH24-2A SS-1

Depth: 0'-2'

Material Description: Silty/Clayey Sand and Gravel

Sample Date: Jan 22,2024

Date Received: Feb 8,2024

Testing Remarks: Organics present

Tested By: R.C

Checked By: J.Hopwood-Jones

Sample Number: SS-1

Test Date: Feb 14,2024

Title: Lab Manager

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
450.70	0.00	0.00	37.5mm	0.00	100.0	0.0
			26.5mm	35.05	92.2	7.8
			19.0mm	35.05	92.2	7.8
			16.0mm	43.42	90.4	9.6
			13.2mm	56.40	87.5	12.5
			9.5mm	88.36	80.4	19.6
			4.75mm	168.19	62.7	37.3
			2.36mm	225.89	49.9	50.1
			1.18mm	268.90	40.3	59.7
			0.600mm	296.68	34.2	65.8
			0.300mm	315.08	30.1	69.9
			0.150mm	328.71	27.1	72.9
			0.075mm	345.85	23.3	76.7

Fractional Components

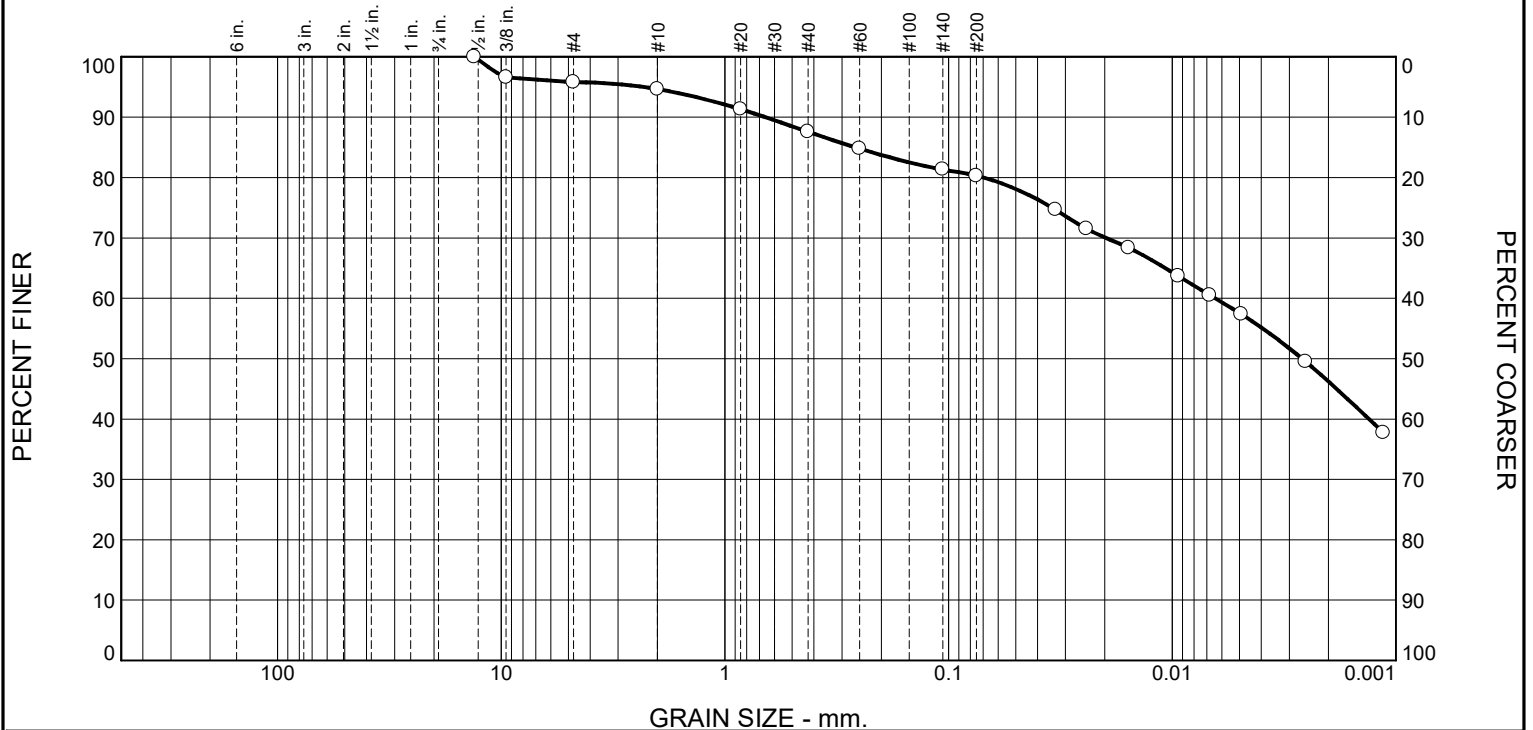
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	7.8	29.5	37.3	15.3	15.5	8.6	39.4			23.3

D5	D10	D15	D20	D30	D40	D50	D60	D80	D85	D90	D95
				0.2942	1.1454	2.3783	4.2000	9.3503	11.5951	15.5834	31.2971

Fineness Modulus

3.83

Particle Size Distribution Report



GRAIN SIZE - mm.

% +75mm	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	4.2	1.1	7.1	7.3	34.1	46.2

TEST RESULTS			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
13.2mm	100.0		
9.5mm	96.6		
4.75mm	95.8		
2.00mm	94.7		
0.850mm	91.3		
0.425mm	87.6		
0.250mm	84.8		
0.106mm	81.3		
0.075mm	80.3		
0.0332 mm.	74.7		
0.0242 mm.	71.5		
0.0157 mm.	68.4		
0.0094 mm.	63.7		
0.0068 mm.	60.5		
0.0049 mm.	57.4		
0.0025 mm.	49.5		
0.0011 mm.	37.7		

* (no specification provided)

Material Description		
Silty Clay some Sand trace fine Gravel		
Atterberg Limits (ASTM D 4318)		
PL=	LL=	PI=
Classification		
USCS (D 2487)=	AASHTO (M 145)=	
Coefficients		
D ₉₀ = 0.6581	D ₈₅ = 0.2601	D ₆₀ = 0.0064
D ₅₀ = 0.0026	D ₃₀ =	D ₁₅ =
D ₁₀ =	C _u =	C _c =
Remarks		
Note: Specific gravity of soils is assumed. F.M.=0.62		
Date Received: Feb 8, 2024	Date Tested: Feb 13, 2024	
Tested By: R.C		
Checked By: J.Hopwood-Jones		
Title: Lab Manager		

Location: BH24-2B SS-2
Sample Number: SS-2

Depth: 2.6'-4.6'

Date Sampled: Jan 22, 2024



Client: Eastpoint Engineering Ltd.
Project: CFB Kingston

Project No: CCO-24-2687

Figure

GRAIN SIZE DISTRIBUTION TEST DATA

2024-02-21

Client: Eastpoint Engineering Ltd.

Project: CFB Kingston

Project Number: CCO-24-2687

Location: BH24-2B SS-2

Depth: 2.6'-4.6'

Sample Number: SS-2

Material Description: Silty Clay some Sand trace fine Gravel

Sample Date: Jan 22,2024

Date Received: Feb 8,2024

Testing Remarks: Note: Specific gravity of soils is assumed.

Tested By: R.C

Test Date: Feb 13,2024

Checked By: J.Hopwood-Jones

Title: Lab Manager

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
129.27	0.00	0.00	13.2mm	0.00	100.0	0.0
			9.5mm	4.43	96.6	3.4
			4.75mm	5.43	95.8	4.2
			2.00mm	6.91	94.7	5.3
58.62	0.00	0.00	0.850mm	2.06	91.3	8.7
			0.425mm	4.38	87.6	12.4
			0.250mm	6.10	84.8	15.2
			0.106mm	8.25	81.3	18.7
			0.075mm	8.89	80.3	19.7

Hydrometer Test Data

Hydrometer test uses material passing #10

Percent passing #10 based upon complete sample = 94.7

Weight of hydrometer sample = 58.62

Table of composite correction values:

Temp., deg. C:	21.9	21.8	21.5
Comp. corr.:	-6.5	-6.5	-6.0

Meniscus correction only = -1.0

Specific gravity of solids = 2.775

Hydrometer type = 152H

Hydrometer effective depth equation: $L = 16.6007 - 0.187 \times R_m$

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
1.00	21.9	54.0	47.5	0.0129	53.0	6.7	0.0332	74.7	25.3
2.00	21.9	52.0	45.5	0.0129	51.0	7.1	0.0242	71.5	28.5
5.00	21.9	50.0	43.5	0.0129	49.0	7.4	0.0157	68.4	31.6
15.00	21.9	47.0	40.5	0.0129	46.0	8.0	0.0094	63.7	36.3
30.00	21.9	45.0	38.5	0.0129	44.0	8.4	0.0068	60.5	39.5
60.00	21.9	43.0	36.5	0.0129	42.0	8.7	0.0049	57.4	42.6
250.00	21.8	38.0	31.5	0.0129	37.0	9.7	0.0025	49.5	50.5

Hydrometer Test Data (continued)

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
1440.00	21.5	30.0	24.0	0.0129	29.0	11.2	0.0011	37.7	62.3

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	4.2	4.2	1.1	7.1	7.3	15.5	34.1	46.2	80.3

D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
					0.0013	0.0026	0.0064	0.0697	0.2601	0.6581	2.3099

Fineness Modulus
0.62



Unconfined Compressive Strength of Intact Rock Cores
ASTM D7012 Method C

Project No.:	CCO-24-2687	Date Issued:	February 13,2024
Lab No.:	OL- 23077	Report No.:	1 of 1
Project Name:	Geo.Inv./Env.Soil Sampling-CFB Kingston		
Core No.:	1	Moisture Condition:	Dry as received
Borehole Location:	BH24-1B	Run:	1
Depth (ft):	4'10"-5'3.5"		
Date Sampled:	Jan 18,2024	Received:	Jan 26,2024
Tested:	Feb 12,2024		
Core No.:	2	Moisture Condition:	Dry as received
Borehole Location:	BH24-2B	Run:	1
Depth (ft):	8'6"-8'11.5"		
Date Sampled:	Jan 18,2024	Received:	Jan 26,2024
Tested:	Feb 12,2024		
Core No.:	3	Moisture Condition:	Dry as received
Borehole Location:	BH24-3B	Run:	2
Depth (ft):	7'2"-7'7.5"		
Date Sampled:	Jan 18,2024	Received:	Jan 26,2024
Tested:	Feb 12,2024		
Core No. :	1	2	3
Diameter (mm)	63.2	63.0	62.9
Thickness/Height (mm)	129.2	128.8	128.1
Density (Kg/m³)	2672	2736	2730
Compressive Strength (Mpa)	166.3	174.9	228.2
Mass of Core (kg)	1.083	1.099	1.087
Description of Failure	2	2	3

Remarks: Core#3 Diagonal fracture with some columnar vertical cracking through top end. No well formed
Cones on ether end.

Core#1&2 Relatively well-formed cone on one end, vertical cracks running through end, no well
formed cone on other end.

Reviewed By:

Jason Hopwood-Jones
Laboratory Manager

Date:

Feb 13,2024



TRUSTED.
RESPONSIVE.
RELIABLE.

300 - 2319 St. Laurent Blvd
Ottawa, ON, K1G 4J8
1-800-749-1947
www.paracellabs.com

Certificate of Analysis

Egis Canada Ltd. (Nepean)

215 Menten Place, Unit 104
Nepean, ON K2H 9C1

Attn: Jason Hopwood-Jones

Client PO: CFB Kingston
Project: CCO-24-2687

Custody: 140454

Report Date: 15-Feb-2024
Order Date: 9-Feb-2024

Order #: 2406540

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
2406540-01	BH24-1B SS2
2406540-02	BH24-2B SS3
2406540-03	BH24-3B SS1
2406540-04	BH24-4B SS2

Approved By:

A handwritten signature in blue ink, appearing to read 'D. Robertson', is shown within a light blue rectangular box.

Dale Robertson, BSc
Laboratory Director

Certificate of Analysis

Report Date: 15-Feb-2024

Client: Egis Canada Ltd. (Nepean)

Order Date: 9-Feb-2024

Client PO: CFB Kingston

Project Description: CCO-24-2687

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Anions	EPA 300.1 - IC, water extraction	12-Feb-24	12-Feb-24
pH, soil	EPA 150.1 - pH probe @ 25 °C, CaCl buffered ext.	13-Feb-24	13-Feb-24
Resistivity	EPA 120.1 - probe, water extraction	12-Feb-24	12-Feb-24
Solids, %	CWS Tier 1 - Gravimetric	14-Feb-24	15-Feb-24

Certificate of Analysis

Report Date: 15-Feb-2024

Client: Egis Canada Ltd. (Nepean)

Order Date: 9-Feb-2024

Client PO: CFB Kingston

Project Description: CCO-24-2687

	Client ID:	BH24-1B SS2	BH24-2B SS3	BH24-3B SS1	BH24-4B SS2	-	-
	Sample Date:	22-Jan-24 09:00	22-Jan-24 09:00	22-Jan-24 09:00	22-Jan-24 09:00	-	-
	Sample ID:	2406540-01	2406540-02	2406540-03	2406540-04	-	-
	Matrix:	Soil	Soil	Soil	Soil	-	-
	MDL/Units					-	-
Physical Characteristics							
% Solids	0.1 % by Wt.	83.3	77.5	77.6	91.3	-	-
General Inorganics							
pH	0.05 pH Units	7.41	7.40	6.90	7.32	-	-
Resistivity	0.1 Ohm.m	58.9	58.3	62.3	72.3	-	-
Anions							
Chloride	10 ug/g	<10	<10	<10	<10	-	-
Sulphate	10 ug/g	15	13	<10	<10	-	-

Certificate of Analysis

Report Date: 15-Feb-2024

Client: Egis Canada Ltd. (Nepean)

Order Date: 9-Feb-2024

Client PO: CFB Kingston

Project Description: CCO-24-2687

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions								
Chloride	ND	10	ug/g					
Sulphate	ND	10	ug/g					
General Inorganics								
Resistivity	ND	0.1	Ohm.m					

Certificate of Analysis

Report Date: 15-Feb-2024

Client: Egis Canada Ltd. (Nepean)

Order Date: 9-Feb-2024

Client PO: CFB Kingston

Project Description: CCO-24-2687

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	118	10	ug/g	110			7.0	35	
Sulphate	58.3	10	ug/g	57.8			0.8	35	
General Inorganics									
pH	7.12	0.05	pH Units	7.08			0.6	2.3	
Resistivity	12.9	0.1	Ohm.m	12.7			1.2	20	
Physical Characteristics									
% Solids	87.9	0.1	% by Wt.	88.0			0.1	25	

Certificate of Analysis

Report Date: 15-Feb-2024

Client: Egis Canada Ltd. (Nepean)

Order Date: 9-Feb-2024

Client PO: CFB Kingston

Project Description: CCO-24-2687

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	217	10	ug/g	110	107	82-118			
Sulphate	159	10	ug/g	57.8	101	80-120			

Certificate of Analysis

Report Date: 15-Feb-2024

Client: Egis Canada Ltd. (Nepean)

Order Date: 9-Feb-2024

Client PO: CFB Kingston

Project Description: CCO-24-2687

Qualifier Notes:

Sample Data Revisions:

None

Work Order Revisions / Comments:

Client confirmed all samples collected January 22, 2024.

Other Report Notes:

n/a: not applicable

ND: Not Detected

MDL: Method Detection Limit

Source Result: Data used as source for matrix and duplicate samples

%REC: Percent recovery.

RPD: Relative percent difference.

NC: Not Calculated

Soil results are reported on a dry weight basis unless otherwise noted.

Where %Solids is reported, moisture loss includes the loss of volatile hydrocarbons.

Any use of these results implies your agreement that our total liability in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.



Paracel ID: 2406540

Blvd.
4J835.com
7Paracel Order Number
(Lab Use Only)

2406540

Chain Of Custody
(Lab Use Only)

No 140454

Client Name: EGIS Canada LTD	Project Ref: CFB Kingston	Page 1 of 1
Contact Name: Jason Hopwood-Jones	Quote #: _____	Turnaround Time
Address: 215 Menten Pl Nepean ON	PO #: CCO-24-2687	<input type="checkbox"/> 1 day <input type="checkbox"/> 3 day
Telephone: 613 453-0751	E-mail: j.hopwood-jones@mcintoshperry.com	<input type="checkbox"/> 2 day <input checked="" type="checkbox"/> Regular
Date Required: _____		

<input type="checkbox"/> REG 153/04 <input type="checkbox"/> REG 406/10	Other Regulation	Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)	Required Analysis												
<input type="checkbox"/> Table 1 <input type="checkbox"/> Res/Park <input type="checkbox"/> Mod/Fine <input type="checkbox"/> REG 558 <input type="checkbox"/> PWQO	<input type="checkbox"/> Table 2 <input type="checkbox"/> Ind/Comm <input type="checkbox"/> Coarse <input type="checkbox"/> CME <input type="checkbox"/> MISA	<input type="checkbox"/> Table 3 <input type="checkbox"/> Agri/Other <input type="checkbox"/> sU - Sand <input type="checkbox"/> SU - Storm	<input type="checkbox"/> Table _____	Mun: _____	<input type="checkbox"/> Other: _____	Sample Taken	PHCs F1-F4+BTX	VOCs	PAHs	Metals by ICP	Hg	Cu-VI	B (HWS)	Chemical Package	
Sample ID/Location Name						Matrix	Air Volume	# of Containers	Date	Time					
1 BH 24-1B SS2						S		1							X
2 BH 24-2B SS3						S		1							X
3 BH 24-3B SS1						S		1							X
4 BH 24-4B SS2						S		1							X
5															
6															
7															
8															
9															
10															

Comments:		Method of Delivery: Walk	
Relinquished By (Sign): R. Collette	Received at: 3:35	Received at Lab: SO	Verified By: SO
Relinquished By (Print): R. Collette	Date/Time: Feb 9, 2024 1:15	Date/Time: Feb 9, 2024 4:35pm	Date/Time: Feb 9, 2024 4:36pm
Date/Time: 02/09/24 @ 4:00pm	Temperature: 22.4 °C	Temperature: 17.4 °C	pH Verified: <input type="checkbox"/> By: _____

Chain of Custody (EHS) XIX

Revision 4.0

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
Invoice to: EGIS Canada Ltd.
PO#:

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844
Temperature (C): 7
Custody Seal:

Page 1 of 25

Dear Benjamin Edwards:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Report Comments:

Emma-Dawn Ferguson, Chemist

All analysis is completed at Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) unless otherwise stated

Eurofins Environment Testing Canada Inc. is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on the scope of accreditation. The scope is available at <https://directory.cala.ca/>

Please note: Field data, where presented on the report, has been provided by the client and is presented for informational purposes only. Guideline or regulatory limits listed on this report are provided for ease of use (informational purposes) only. Eurofins recommends consulting the official guideline or regulation as required. Unless otherwise stated, measurement uncertainty is not taken into account when determining guideline or regulatory exceedances.



Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0

Attention: Mr. Benjamin Edwards

PO#:

Invoice to: EGIS Canada Ltd.

Report Number: 3004774

Date Submitted: 2024-01-26

Date Reported: 2024-02-02

Project: CCO - 24 - 2687

COC #: 226844

Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

Exceedence Summary

Sample I.D.	Analyte	Result	Units	Criteria
Inorganics				
24-4A	Electrical Conductivity	0.61	mS/cm	STD 0.57
Metals				
24-1A	Barium	376	ug/g	STD 220
24-1A	Selenium	1.8	ug/g	STD 1.5
24-1B	Barium	377	ug/g	STD 220
24-2A	Barium	307	ug/g	STD 220
24-2B	Barium	442	ug/g	STD 220
24-2B	Selenium	1.6	ug/g	STD 1.5
24-3A	Barium	238	ug/g	STD 220
24-3A	Selenium	1.6	ug/g	STD 1.5
24-4A	Barium	317	ug/g	STD 220

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

Hydrocarbons

Lab I.D.
Sample Matrix
Sample Type
Sample Date
Sampling Time
Sample I.D.

1716832 Soil153	1716833 Soil153	1716834 Soil153	1716835 Soil153	1716836 Soil153
2024-01-26	2024-01-26	2024-01-26	2024-01-26	2024-01-26
24-1A	24-1B	24-2A	24-2B	24-3A

Analyte	Batch No	MRL	Units	Guideline
---------	----------	-----	-------	-----------

PHC's F1	455317	10	ug/g	STD 25	<10	<10	<10	<10	<10
PHC's F1-BTEX	455321	10	ug/g		<10	<10	<10	<10	<10
PHC's F2	455308	2	ug/g	STD 10		<2	<2		<2
	455313	2	ug/g	STD 10	<2			<2	
PHC's F2-Naph	455413	2	ug/g		<2	<2	<2	<2	<2
PHC's F3	455308	20	ug/g	STD 240		<20	<20		<20
	455313	20	ug/g	STD 240	<20			<20	
PHC's F3-PAH	455414	20	ug/g		<20	<20	<20	<20	<20
PHC's F4	455308	20	ug/g	STD 120		<20	<20		<20
	455313	20	ug/g	STD 120	<20			<20	

Hydrocarbons

Lab I.D.
Sample Matrix
Sample Type
Sample Date
Sampling Time
Sample I.D.

1716837 Soil153	1716838 Soil153	1716839 Soil153
2024-01-26	2024-01-26	2024-01-26
24-3B	24-4A	24-4B

Analyte	Batch No	MRL	Units	Guideline
---------	----------	-----	-------	-----------

PHC's F1	455317	10	ug/g	STD 25	<10	<10	<10
PHC's F1-BTEX	455321	10	ug/g		<10	<10	
	455322	10	ug/g				<10
PHC's F2	455308	2	ug/g	STD 10	<2		
	455313	2	ug/g	STD 10		<2	
	455411	2	ug/g	STD 10			<2
PHC's F2-Naph	455413	2	ug/g		<2	<2	<2
PHC's F3	455308	20	ug/g	STD 240	<20		
	455313	20	ug/g	STD 240		<20	

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

Hydrocarbons

Lab I.D.
Sample Matrix
Sample Type
Sample Date
Sampling Time
Sample I.D.

1716837 Soil153	1716838 Soil153	1716839 Soil153
2024-01-26	2024-01-26	2024-01-26
24-3B	24-4A	24-4B

Analyte	Batch No	MRL	Units	Guideline
---------	----------	-----	-------	-----------

PHC's F3	455411	20	ug/g	STD 240			<20
PHC's F3-PAH	455414	20	ug/g		<20	<20	<20
PHC's F4	455308	20	ug/g	STD 120	<20		
	455313	20	ug/g	STD 120		<20	
	455411	20	ug/g	STD 120			<20

Metals

Lab I.D.
Sample Matrix
Sample Type
Sample Date
Sampling Time
Sample I.D.

1716832 Soil153	1716833 Soil153	1716834 Soil153	1716835 Soil153	1716836 Soil153
2024-01-26	2024-01-26	2024-01-26	2024-01-26	2024-01-26
24-1A	24-1B	24-2A	24-2B	24-3A

Analyte	Batch No	MRL	Units	Guideline
---------	----------	-----	-------	-----------

Antimony	455434	1	ug/g	STD 1.3	<1	<1	<1	<1	<1
Arsenic	455434	1	ug/g	STD 18	5	6	4	4	3
Barium	455434	1	ug/g	STD 220	376*	377*	307*	442*	238*
Beryllium	455434	1	ug/g	STD 2.5	2	2	1	2	<1
Boron (total)	455434	5	ug/g	STD 36	13	10	10	10	11
Cadmium	455434	0.4	ug/g	STD 1.2	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium Total	455434	1	ug/g	STD 70		64	43	62	38
	455501	1	ug/g	STD 70	56				
Cobalt	455434	1	ug/g	STD 21		19	12	19	12
	455501	1	ug/g	STD 21	15				
Copper	455434	1	ug/g	STD 92		38	28	39	21
	455501	1	ug/g	STD 92	36				
Lead	455434	1	ug/g	STD 120		16	11	11	14
	455501	1	ug/g	STD 120	20				

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range



Certificate of Analysis

Environment Testing

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

Metals

Lab I.D. Sample Matrix Sample Type Sample Date Sampling Time Sample I.D.					1716832 Soil153	1716833 Soil153	1716834 Soil153	1716835 Soil153	1716836 Soil153
Guideline					24-1A	24-1B	24-2A	24-2B	24-3A
Analyte	Batch No	MRL	Units	Guideline					
Molybdenum	455434	1	ug/g	STD 2	<1	<1	<1	<1	<1
Nickel	455434	1	ug/g	STD 82		42	33	43	26
	455501	1	ug/g	STD 82	37				
Selenium	455434	0.5	ug/g	STD 1.5	1.8*	1.5	1.1	1.6*	1.6*
Silver	455434	0.2	ug/g	STD 0.5	<0.2	<0.2	<0.2	<0.2	<0.2
Thallium	455434	1	ug/g	STD 1	<1	<1	<1	<1	<1
Uranium	455434	0.5	ug/g	STD 2.5	1.0	0.7	<0.5	<0.5	<0.5
Vanadium	455434	2	ug/g	STD 86		77	56	82	43
	455501	2	ug/g	STD 86	66				
Zinc	455434	2	ug/g	STD 290		109	75	120	74
	455501	2	ug/g	STD 290	106				

Metals

Lab I.D. Sample Matrix Sample Type Sample Date Sampling Time Sample I.D.					1716837 Soil153	1716838 Soil153	1716839 Soil153
Guideline					24-3B	24-4A	24-4B
Analyte	Batch No	MRL	Units	Guideline			
Antimony	455434	1	ug/g	STD 1.3	<1	<1	<1
Arsenic	455434	1	ug/g	STD 18	4	3	2
Barium	455434	1	ug/g	STD 220	195	317*	39
Beryllium	455434	1	ug/g	STD 2.5	<1	<1	<1
Boron (total)	455434	5	ug/g	STD 36	12	8	8
Cadmium	455434	0.4	ug/g	STD 1.2	<0.4	<0.4	<0.4
Chromium Total	455434	1	ug/g	STD 70	27	46	15
Cobalt	455434	1	ug/g	STD 21	9	13	5

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational
Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim
Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial
Water Quality Guideline, IPWQO = Interim Provincial Water Quality
Objective, TDR = Typical Desired Range

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

Metals

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co					1716837 Soil153 2024-01-26 24-3B	1716838 Soil153 2024-01-26 24-4A	1716839 Soil153 2024-01-26 24-4B
<u>Metals</u>							
Analyte	Batch No	MRL	Units	Guideline			
Copper	455434	1	ug/g	STD 92	17	29	10
Lead	455434	1	ug/g	STD 120	22	10	4
Molybdenum	455434	1	ug/g	STD 2	<1	<1	<1
Nickel	455434	1	ug/g	STD 82	20	30	10
Selenium	455434	0.5	ug/g	STD 1.5	1.3	1.2	<0.5
Silver	455434	0.2	ug/g	STD 0.5	<0.2	<0.2	<0.2
Thallium	455434	1	ug/g	STD 1	<1	<1	<1
Uranium	455434	0.5	ug/g	STD 2.5	<0.5	<0.5	<0.5
Vanadium	455434	2	ug/g	STD 86	29	59	20
Zinc	455434	2	ug/g	STD 290	54	77	17

PAH

<div><div>PAH</div></div>					Lab I.D. Sample Matrix Sample Type Sample Date Sampling Time Sample I.D.	1716832 Soil153 2024-01-26 24-1A	1716833 Soil153 2024-01-26 24-1B	1716834 Soil153 2024-01-26 24-2A	1716835 Soil153 2024-01-26 24-2B	1716836 Soil153 2024-01-26 24-3A
Analyte	Batch No	MRL	Units	Guideline						
1+2-methylnaphthalene	455358	0.05	ug/g	STD 0.59	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Acenaphthene	455318	0.05	ug/g	STD 0.072	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Acenaphthylene	455318	0.05	ug/g	STD 0.093	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Anthracene	455318	0.05	ug/g	STD 0.16	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benz[a]anthracene	455318	0.05	ug/g	STD 0.36	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo[a]pyrene	455318	0.05	ug/g	STD 0.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo[b]fluoranthene	455318	0.05	ug/g	STD 0.47	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo[ghi]perylene	455318	0.05	ug/g	STD 0.68	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo[k]fluoranthene	455318	0.05	ug/g	STD 0.48	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range



Certificate of Analysis

Environment Testing

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

PAH

Lab I.D. Sample Matrix Sample Type Sample Date Sampling Time Sample I.D.					1716832 Soil153	1716833 Soil153	1716834 Soil153	1716835 Soil153	1716836 Soil153
					2024-01-26	2024-01-26	2024-01-26	2024-01-26	2024-01-26
					24-1A	24-1B	24-2A	24-2B	24-3A
Analyte	Batch No	MRL	Units	Guideline					
Chrysene	455318	0.05	ug/g	STD 2.8	<0.05	<0.05	<0.05	<0.05	<0.05
Dibenz[a h]anthracene	455318	0.05	ug/g	STD 0.1	<0.05	<0.05	<0.05	<0.05	<0.05
Fluoranthene	455318	0.05	ug/g	STD 0.56	<0.05	<0.05	<0.05	<0.05	<0.05
Fluorene	455318	0.05	ug/g	STD 0.12	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno[1 2 3-cd]pyrene	455318	0.05	ug/g	STD 0.23	<0.05	<0.05	<0.05	<0.05	<0.05
Methlynaphthalene, 1-	455318	0.05	ug/g		<0.05	<0.05	<0.05	<0.05	<0.05
Methlynaphthalene, 2-	455318	0.05	ug/g		<0.05	<0.05	<0.05	<0.05	<0.05
Naphthalene	455318	0.013	ug/g	STD 0.09	<0.013	<0.013	<0.013	<0.013	<0.013
Phenanthrene	455318	0.05	ug/g	STD 0.69	<0.05	<0.05	<0.05	<0.05	<0.05
Pyrene	455318	0.05	ug/g	STD 1	<0.05	<0.05	<0.05	<0.05	<0.05

PAH

Lab I.D. Sample Matrix Sample Type Sample Date Sampling Time Sample I.D.					1716837 Soil153	1716838 Soil153	1716839 Soil153
					2024-01-26	2024-01-26	2024-01-26
					24-3B	24-4A	24-4B
Analyte	Batch No	MRL	Units	Guideline			
1+2-methylnaphthalene	455358	0.05	ug/g	STD 0.59	<0.05	<0.05	<0.05
Acenaphthene	455318	0.05	ug/g	STD 0.072	<0.05	<0.05	<0.05
Acenaphthylene	455318	0.05	ug/g	STD 0.093	<0.05	<0.05	<0.05
Anthracene	455318	0.05	ug/g	STD 0.16	<0.05	<0.05	<0.05
Benz[a]anthracene	455318	0.05	ug/g	STD 0.36	<0.05	<0.05	<0.05
Benzo[a]pyrene	455318	0.05	ug/g	STD 0.3	<0.05	<0.05	<0.05
Benzo[b]fluoranthene	455318	0.05	ug/g	STD 0.47	<0.05	<0.05	<0.05
Benzo[ghi]perylene	455318	0.05	ug/g	STD 0.68	<0.05	<0.05	<0.05
Benzo[k]fluoranthene	455318	0.05	ug/g	STD 0.48	<0.05	<0.05	<0.05

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational
Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim
Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial
Water Quality Guideline, IPWQO = Interim Provincial Water Quality
Objective, TDR = Typical Desired Range

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

PAH

Lab I.D.
Sample Matrix
Sample Type
Sample Date
Sampling Time
Sample I.D.

1716837 Soil153	1716838 Soil153	1716839 Soil153
2024-01-26	2024-01-26	2024-01-26
24-3B	24-4A	24-4B

Analyte	Batch No	MRL	Units	Guideline
---------	----------	-----	-------	-----------

Chrysene	455318	0.05	ug/g	STD 2.8	<0.05	<0.05	<0.05
Dibenz[a h]anthracene	455318	0.05	ug/g	STD 0.1	<0.05	<0.05	<0.05
Fluoranthene	455318	0.05	ug/g	STD 0.56	<0.05	<0.05	<0.05
Fluorene	455318	0.05	ug/g	STD 0.12	<0.05	<0.05	<0.05
Indeno[1 2 3-cd]pyrene	455318	0.05	ug/g	STD 0.23	<0.05	<0.05	<0.05
Methlynaphthalene, 1-	455318	0.05	ug/g		<0.05	<0.05	<0.05
Methlynaphthalene, 2-	455318	0.05	ug/g		<0.05	<0.05	<0.05
Naphthalene	455318	0.013	ug/g	STD 0.09	<0.013	<0.013	<0.013
Phenanthrene	455318	0.05	ug/g	STD 0.69	<0.05	<0.05	<0.05
Pyrene	455318	0.05	ug/g	STD 1	<0.05	<0.05	<0.05

Volatiles

Lab I.D.
Sample Matrix
Sample Type
Sample Date
Sampling Time
Sample I.D.

1716832 Soil153	1716833 Soil153	1716834 Soil153	1716835 Soil153	1716836 Soil153
2024-01-26	2024-01-26	2024-01-26	2024-01-26	2024-01-26
24-1A	24-1B	24-2A	24-2B	24-3A

Analyte	Batch No	MRL	Units	Guideline
---------	----------	-----	-------	-----------

Acetone	455316	0.50	ug/g	STD 0.5	<0.50	<0.50	<0.50	<0.50	<0.50
Benzene	455316	0.0068	ug/g	STD 0.02	<0.0068	<0.0068	<0.0068	<0.0068	<0.0068
Bromodichloromethane	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Bromoform	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Bromomethane	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Carbon Tetrachloride	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorobenzene	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chloroform	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dibromochloromethane	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range



Certificate of Analysis

Environment Testing

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

Volatiles

Lab I.D. Sample Matrix Sample Type Sample Date Sampling Time Sample I.D.					1716832 Soil153	1716833 Soil153	1716834 Soil153	1716835 Soil153	1716836 Soil153
Guideline					2024-01-26	2024-01-26	2024-01-26	2024-01-26	2024-01-26
Analyte	Batch No	MRL	Units	Guideline	24-1A	24-1B	24-2A	24-2B	24-3A
Dichlorobenzene, 1,2-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichlorobenzene, 1,3-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichlorobenzene, 1,4-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichlorodifluoromethane	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichloroethane, 1,1-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichloroethane, 1,2-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichloroethylene, 1,1-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichloroethylene, 1,2-cis-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichloroethylene, 1,2-trans-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichloropropane, 1,2-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichloropropene, 1,3-	455320	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichloropropene, 1,3-cis-	455316	0.05	ug/g		<0.05	<0.05	<0.05	<0.05	<0.05
Dichloropropene, 1,3-trans-	455316	0.05	ug/g		<0.05	<0.05	<0.05	<0.05	<0.05
Ethylbenzene	455316	0.018	ug/g	STD 0.05	<0.018	<0.018	<0.018	<0.018	<0.018
Ethylene dibromide	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Hexane (n)	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Methyl Ethyl Ketone	455316	0.50	ug/g	STD 0.5	<0.50	<0.50	<0.50	<0.50	<0.50
Methyl Isobutyl Ketone	455316	0.50	ug/g	STD 0.5	<0.50	<0.50	<0.50	<0.50	<0.50
Methyl tert-Butyl Ether (MTBE)	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Methylene Chloride	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Styrene	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Tetrachloroethane, 1,1,1,2-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Tetrachloroethane, 1,1,2,2-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational
Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim
Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial
Water Quality Guideline, IPWQO = Interim Provincial Water Quality
Objective, TDR = Typical Desired Range



Certificate of Analysis

Environment Testing

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

Volatiles

Lab I.D. Sample Matrix Sample Type Sample Date Sampling Time Sample I.D.					1716832 Soil153	1716833 Soil153	1716834 Soil153	1716835 Soil153	1716836 Soil153
					2024-01-26	2024-01-26	2024-01-26	2024-01-26	2024-01-26
					24-1A	24-1B	24-2A	24-2B	24-3A
Analyte	Batch No	MRL	Units	Guideline					
Tetrachloroethylene	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Toluene	455316	0.08	ug/g	STD 0.2	<0.08	<0.08	<0.08	<0.08	<0.08
Trichloroethane, 1,1,1-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Trichloroethane, 1,1,2-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Trichloroethylene	455316	0.01	ug/g	STD 0.05	<0.01	<0.01	<0.01	<0.01	<0.01
Trichlorofluoromethane	455316	0.05	ug/g	STD 0.25	<0.05	<0.05	<0.05	<0.05	<0.05
Vinyl Chloride	455316	0.02	ug/g	STD 0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Xylene Mixture	455319	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Xylene, m/p-	455316	0.05	ug/g		<0.05	<0.05	<0.05	<0.05	<0.05
Xylene, o-	455316	0.05	ug/g		<0.05	<0.05	<0.05	<0.05	<0.05

Volatiles

Lab I.D. Sample Matrix Sample Type Sample Date Sampling Time Sample I.D.					1716837 Soil153	1716838 Soil153	1716839 Soil153
					2024-01-26	2024-01-26	2024-01-26
					24-3B	24-4A	24-4B
Analyte	Batch No	MRL	Units	Guideline			
Acetone	455316	0.50	ug/g	STD 0.5	<0.50	<0.50	<0.50
Benzene	455316	0.0068	ug/g	STD 0.02	<0.0068	<0.0068	<0.0068
Bromodichloromethane	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Bromoform	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Bromomethane	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Carbon Tetrachloride	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Chlorobenzene	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Chloroform	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dibromochloromethane	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range



Certificate of Analysis

Environment Testing

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

Volatiles

Lab I.D.
Sample Matrix
Sample Type
Sample Date
Sampling Time
Sample I.D.

1716837 Soil153	1716838 Soil153	1716839 Soil153
2024-01-26	2024-01-26	2024-01-26
24-3B	24-4A	24-4B

Analyte	Batch No	MRL	Units	Guideline
Dichlorobenzene, 1,2-	455316	0.05	ug/g	STD 0.05
Dichlorobenzene, 1,3-	455316	0.05	ug/g	STD 0.05
Dichlorobenzene, 1,4-	455316	0.05	ug/g	STD 0.05
Dichlorodifluoromethane	455316	0.05	ug/g	STD 0.05
Dichloroethane, 1,1-	455316	0.05	ug/g	STD 0.05
Dichloroethane, 1,2-	455316	0.05	ug/g	STD 0.05
Dichloroethylene, 1,1-	455316	0.05	ug/g	STD 0.05
Dichloroethylene, 1,2-cis-	455316	0.05	ug/g	STD 0.05
Dichloroethylene, 1,2-trans-	455316	0.05	ug/g	STD 0.05
Dichloropropane, 1,2-	455316	0.05	ug/g	STD 0.05
Dichloropropene, 1,3-	455320	0.05	ug/g	STD 0.05
Dichloropropene, 1,3-cis-	455316	0.05	ug/g	
Dichloropropene, 1,3-trans-	455316	0.05	ug/g	
Ethylbenzene	455316	0.018	ug/g	STD 0.05
Ethylene dibromide	455316	0.05	ug/g	STD 0.05
Hexane (n)	455316	0.05	ug/g	STD 0.05
Methyl Ethyl Ketone	455316	0.50	ug/g	STD 0.5
Methyl Isobutyl Ketone	455316	0.50	ug/g	STD 0.5
Methyl tert-Butyl Ether (MTBE)	455316	0.05	ug/g	STD 0.05
Methylene Chloride	455316	0.05	ug/g	STD 0.05
Styrene	455316	0.05	ug/g	STD 0.05
Tetrachloroethane, 1,1,1,2-	455316	0.05	ug/g	STD 0.05
Tetrachloroethane, 1,1,2,2-	455316	0.05	ug/g	STD 0.05

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational
Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim
Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial
Water Quality Guideline, IPWQO = Interim Provincial Water Quality
Objective, TDR = Typical Desired Range



Certificate of Analysis

Environment Testing

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

Volatiles

Analyte	Batch No	MRL	Units	Guideline	Lab I.D.	Sample Matrix	Sample Type	Sample Date	Sampling Time	Sample I.D.
					1716837	Soil153	1716838	Soil153	1716839	Soil153
Tetrachloroethylene	455316	0.05	ug/g	STD 0.05	2024-01-26	24-3B	2024-01-26	24-4A	2024-01-26	24-4B
Toluene	455316	0.08	ug/g	STD 0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Trichloroethane, 1,1,1-	455316	0.05	ug/g	STD 0.05	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
Trichloroethane, 1,1,2-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Trichloroethylene	455316	0.01	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Trichlorofluoromethane	455316	0.05	ug/g	STD 0.25	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Vinyl Chloride	455316	0.02	ug/g	STD 0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Xylene Mixture	455319	0.05	ug/g	STD 0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Xylene, m/p-	455316	0.05	ug/g		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Xylene, o-	455316	0.05	ug/g		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

Inorganics

Analyte	Batch No	MRL	Units	Guideline	Lab I.D.	Sample Matrix	Sample Type	Sample Date	Sampling Time	Sample I.D.
					1716832	Soil153	1716833	Soil153	1716834	Soil153
Cyanide (CN-)	455419	0.005	ug/g	STD 0.051	2024-01-26	24-1A	2024-01-26	24-1B	2024-01-26	24-2A
Electrical Conductivity	455468	0.05	mS/cm	STD 0.57	2024-01-26	24-1A	2024-01-26	24-1B	2024-01-26	24-2A
Sodium Adsorption Ratio	455477	0.01		STD 2.4	0.13	0.35	0.18	0.25	0.31	0.31

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range



Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

Inorganics

					Lab I.D. Sample Matrix Sample Type Sample Date Sampling Time Sample I.D.			
Analyte	Batch No	MRL	Units	Guideline				
Cyanide (CN-)	455419	0.005	ug/g	STD 0.051	1716837 Soil153 2024-01-26 24-3B	1716838 Soil153 2024-01-26 24-4A	1716839 Soil153 2024-01-26 24-4B	
Electrical Conductivity	455468	0.05	mS/cm	STD 0.57	<0.005	<0.005	<0.005	
Sodium Adsorption Ratio	455477	0.01		STD 2.4	0.16	0.61*	0.15	
					0.28	0.22	0.25	

Moisture

					Lab I.D. Sample Matrix Sample Type Sample Date Sampling Time Sample I.D.					
Analyte	Batch No	MRL	Units	Guideline						
Moisture-Humidite	455308	0.1	%		1716832 Soil153 2024-01-26 24-1A	1716833 Soil153 2024-01-26 24-1B	1716834 Soil153 2024-01-26 24-2A	1716835 Soil153 2024-01-26 24-2B	1716836 Soil153 2024-01-26 24-3A	
	455313	0.1	%			26.9	26.7		19.4	
					24.7			26.7		

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational
Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim
Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial
Water Quality Guideline, IPWQO = Interim Provincial Water Quality
Objective, TDR = Typical Desired Range

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0

Attention: Mr. Benjamin Edwards

PO#:

Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

Moisture

<u>Moisture</u>					Lab I.D.	1716837	1716838	1716839
					Sample Matrix	Soil153	Soil153	Soil153
					Sample Type	2024-01-26	2024-01-26	2024-01-26
					Sample Date			
					Sampling Time			
					Sample I.D.	24-3B	24-4A	24-4B
Analyte	Batch No	MRL	Units	Guideline				
Moisture-Humidite	455308	0.1	%		20.8			
	455313	0.1	%			27.7		
	455411	0.1	%					10.5

PHC Surrogate

<u>PHC Surrogate</u>					Lab I.D.	1716832	1716833	1716834	1716835	1716836
					Sample Matrix	Soil153	Soil153	Soil153	Soil153	Soil153
					Sample Type	2024-01-26	2024-01-26	2024-01-26	2024-01-26	2024-01-26
					Sample Date					
					Sampling Time					
					Sample I.D.					
Analyte	Batch No	MRL	Units	Guideline		24-1A	24-1B	24-2A	24-2B	24-3A
Alpha-androstrane	455308	0	%				70	61		66
	455313	0	%			68			62	

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range



Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

PHC Surrogate

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co							
<u>PHC Surrogate</u>				Lab I.D.	1716837	1716838	1716839
				Sample Matrix	Soil153	Soil153	Soil153
				Sample Type			
				Sample Date	2024-01-26	2024-01-26	2024-01-26
				Sampling Time			
			Sample I.D.	24-3B	24-4A	24-4B	
Analyte	Batch No	MRL	Units	Guideline			
Alpha-androstrane	455308	0	%		61		
	455313	0	%			77	
	455411	0	%				73

VOCs Surrogates

<u>VOCs Surrogates</u>					Lab I.D.	1716832	1716833	1716834	1716835	1716836
Analyte	Batch No	MRL	Units	Sample Matrix	Soil153	Soil153	Soil153	Soil153	Soil153	
				Sample Type						
				Sample Date	2024-01-26	2024-01-26	2024-01-26	2024-01-26	2024-01-26	
				Sampling Time						
Guideline										
				Sample I.D.	24-1A	24-1B	24-2A	24-2B	24-3A	
1,2-dichloroethane-d4	455316	0	%		123	125	126	129	127	
4-bromofluorobenzene	455316	0	%		71	70	72	74	70	
Toluene-d8	455316	0	%		124	122	109	112	114	

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range



Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

VOCs Surrogates

					Lab I.D. Sample Matrix Sample Type Sample Date Sampling Time Sample I.D.		
					Guideline		
Analyte	Batch No	MRL	Units				
1,2-dichloroethane-d4	455316	0	%			127	121
4-bromofluorobenzene	455316	0	%			79	73
Toluene-d8	455316	0	%			82	114

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational
Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim
Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial
Water Quality Guideline, IPWQO = Interim Provincial Water Quality
Objective, TDR = Typical Desired Range

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Quality Assurance Summary

Batch No	Analyte	Blank	QC % Rec	QC Limits	Spike % Rec	Spike Limits	Dup % RPD	Duplicate Limits
455308	PHC's F2	<2 ug/g	87	80-120	75	60-140	0	0-30
455308	PHC's F3	<20 ug/g	87	80-120	75	60-140	0	0-30
455308	PHC's F4	<20 ug/g	87	80-120	75	60-140	0	0-30
455308	Moisture-Humidite	<0.1 %	100	80-120			5	
455313	PHC's F2	<2 ug/g	91	80-120	66	60-140	0	0-30
455313	PHC's F3	<20 ug/g	91	80-120	66	60-140	0	0-30
455313	PHC's F4	<20 ug/g	91	80-120	66	60-140	0	0-30
455313	Moisture-Humidite	<0.1 %	100	80-120			23	
455316	Tetrachloroethane, 1,1,1,2-	<0.05 ug/g	122	60-130	107	50-140	0	0-50
455316	Trichloroethane, 1,1,1-	<0.05 ug/g	115	60-130	111	50-140	0	0-50
455316	Tetrachloroethane, 1,1,2,2-	<0.05 ug/g	119	60-130	91	50-140	0	0-30
455316	Trichloroethane, 1,1,2-	<0.05 ug/g	121	60-130	115	50-140	0	0-50
455316	Dichloroethane, 1,1-	<0.05 ug/g	117	60-130	112	50-140	0	0-50
455316	Dichloroethylene, 1,1-	<0.05 ug/g	108	60-130	87	50-140	0	0-50
455316	Dichlorobenzene, 1,2-	<0.05 ug/g	120	60-130	111	50-140	0	0-50
455316	Dichloroethane, 1,2-	<0.05 ug/g	121	60-130	114	50-140	0	0-50
455316	Dichloropropane, 1,2-	<0.05 ug/g	124	60-130	119	50-140	0	0-50
455316	Dichlorobenzene, 1,3-	<0.05 ug/g	120	60-130	112	50-140	0	0-50
455316	Dichlorobenzene, 1,4-	<0.05 ug/g	121	60-130	112	50-140	0	0-50
455316	Acetone	<0.50 ug/g	120	60-130	112	50-140	0	0-50
455316	Benzene	<0.0068	113	60-130	114	50-140	0	0-50
455316	Bromodichloromethane	<0.05 ug/g	120	60-130	110	50-140	0	0-50
455316	Bromoform	<0.05 ug/g	118	60-130	109	50-140	0	0-50
455316	Bromomethane	<0.05 ug/g	105	60-130	105	50-140	0	0-50
455316	Dichloroethylene, 1,2-cis-	<0.05 ug/g	121	60-130	115	50-140	0	0-50
455316	Dichloropropene, 1,3-cis-	<0.05 ug/g	118	60-130	115	50-140	0	0-50
455316	Carbon Tetrachloride	<0.05 ug/g	115	60-130	107	50-140	0	0-50
455316	Chloroform	<0.05 ug/g	121	60-130	115	50-140	0	0-50
455316	Dibromochloromethane	<0.05 ug/g	120	60-130	101	50-140	0	0-50
455316	Dichlorodifluoromethane	<0.05 ug/g	114	60-130	106	50-140	0	0-50
455316	Methylene Chloride	<0.05 ug/g	102	60-130	95	50-140	0	0-50
455316	Ethylbenzene	<0.018 ug/g	116	60-130	121	50-140	0	0-50

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Quality Assurance Summary

Batch No	Analyte	Blank	QC % Rec	QC Limits	Spike % Rec	Spike Limits	Dup % RPD	Duplicate Limits
455316	Ethylene dibromide	<0.05 ug/g	120	60-130	113	50-140	0	0-50
455316	Hexane (n)	<0.05 ug/g	113	60-130	112	50-140	0	0-50
455316	Xylene, m/p-	<0.05 ug/g	119	60-130	112	50-140	0	0-50
455316	Methyl Ethyl Ketone	<0.50 ug/g	118	60-130	116	50-140	0	0-50
455316	Methyl Isobutyl Ketone	<0.50 ug/g	121	60-130	114	50-140	0	0-50
455316	Methyl tert-Butyl Ether (MTBE)	<0.05 ug/g	120	60-130	114	50-140	0	0-50
455316	Chlorobenzene	<0.05 ug/g	115	60-130	115	50-140	0	0-50
455316	Xylene, o-	<0.05 ug/g	117	60-130	118	50-140	0	0-50
455316	Styrene	<0.05 ug/g	117	60-130	117	50-140	0	0-50
455316	Dichloroethylene, 1,2-trans-	<0.05 ug/g	120	60-130	110	50-140	0	0-50
455316	Dichloropropene, 1,3-trans-	<0.05 ug/g	119	60-130	115	50-140	0	0-50
455316	Tetrachloroethylene	<0.05 ug/g	119	60-130	119	50-140	0	0-50
455316	Toluene	<0.08 ug/g	115	60-130	114	50-140	0	0-50
455316	Trichloroethylene	<0.01 ug/g	115	60-130	115	50-140	0	0-50
455316	Trichlorofluoromethane	<0.05 ug/g	116	60-130	98	50-140	0	0-50
455316	Vinyl Chloride	<0.02 ug/g	106	60-130	92	50-140	0	0-50
455317	PHC's F1	<10 ug/g	97	80-120	90	60-140	0	0-30
455318	Methlynaphthalene, 1-	<0.05 ug/g	63	50-140	64	50-140	0	0-40
455318	Methlynaphthalene, 2-	<0.05 ug/g	59	50-140	61	50-140	0	0-40
455318	Acenaphthene	<0.05 ug/g	61	50-140	61	50-140	0	0-40
455318	Acenaphthylene	<0.05 ug/g	60	50-140	60	50-140	0	0-40
455318	Anthracene	<0.05 ug/g	63	50-140	61	50-140	0	0-40
455318	Benz[a]anthracene	<0.05 ug/g	59	50-140	61	50-140	0	0-40
455318	Benzo[a]pyrene	<0.05 ug/g	50	50-140	58	50-140	0	0-40
455318	Benzo[b]fluoranthene	<0.05 ug/g	62	50-140	54	50-140	0	0-40
455318	Benzo[ghi]perylene	<0.05 ug/g	66	50-140	54	50-140	0	0-40
455318	Benzo[k]fluoranthene	<0.05 ug/g	57	50-140	56		0	0-40
455318	Chrysene	<0.05 ug/g	65	50-140	63	50-140	0	0-40
455318	Dibenz[a h]anthracene	<0.05 ug/g	62	50-140	57	50-140	0	0-40
455318	Fluoranthene	<0.05 ug/g	62	50-140	61	50-140	0	0-40
455318	Fluorene	<0.05 ug/g	61	50-140	61	50-140	0	0-40
455318	Indeno[1 2 3-cd]pyrene	<0.05 ug/g	63	50-140	55	50-140	0	0-40
455318	Naphthalene	<0.013 ug/g	60	50-140	60	50-140	0	0-40

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Quality Assurance Summary

Batch No	Analyte	Blank	QC % Rec	QC Limits	Spike % Rec	Spike Limits	Dup % RPD	Duplicate Limits
455318	Phenanthrene	<0.05 ug/g	59	50-140	58	50-140	0	0-40
455318	Pyrene	<0.05 ug/g	61	50-140	61	50-140	0	0-40
455319	Xylene Mixture							
455320	Dichloropropene, 1,3-							
455321	PHC's F1-BTEX							
455322	PHC's F1-BTEX							
455358	1+2-methylnaphthalene							
455411	PHC's F2	<2 ug/g	84	80-120	64	60-140	0	0-30
455411	PHC's F3	<20 ug/g	84	80-120	64	60-140	0	0-30
455411	PHC's F4	<20 ug/g	84	80-120	64	60-140	0	0-30
455411	Moisture-Humidite	<0.1 %	100	80-120			16	
455413	PHC's F2-Napth							
455414	PHC's F3-PAH							
455419	Cyanide (CN-)	<0.005 ug/g	85	75-125	98	70-130	0	0-20
455434	Silver	<0.2 ug/g	110	70-130	103	70-130	0	0-20
455434	Arsenic	<1 ug/g	96	70-130	89	70-130	11	0-20
455434	Boron (total)	<5 ug/g	97	70-130	119	70-130	0	0-20
455434	Barium	<1 ug/g	96	70-130		70-130	11	0-20
455434	Beryllium	<1 ug/g	100	70-130	100	70-130	0	0-20
455434	Cadmium	<0.4 ug/g	98	70-130	101	70-130	0	0-20
455434	Cobalt	<1 ug/g	97	70-130	65	70-130	10	0-20
455434	Chromium Total	<1 ug/g	99	70-130	19	70-130	12	0-20
455434	Copper	<1 ug/g	105	70-130	36	70-130	14	0-20
455434	Molybdenum	<1 ug/g	102	70-130	93	70-130	0	0-20
455434	Nickel	<1 ug/g	102	70-130	29	70-130	11	0-20
455434	Lead	<1 ug/g	103	70-130	77	70-130	22	0-20
455434	Antimony	<1 ug/g	77	70-130	68	70-130	0	0-20
455434	Selenium	<0.5 ug/g	98	70-130	97	70-130	0	0-20
455434	Thallium	<1 ug/g	101	70-130	92	70-130	0	0-20
455434	Uranium	<0.5 ug/g	88	70-130	90	70-130	0	0-20
455434	Vanadium	<2 ug/g	97	70-130	6	70-130	12	0-20
455434	Zinc	<2 ug/g	104	70-130		70-130	13	0-20
455468	Electrical Conductivity	<0.05	100	90-110			0	0-10

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range



Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Quality Assurance Summary

Batch No	Analyte	Blank	QC % Rec	QC Limits	Spike % Rec	Spike Limits	Dup % RPD	Duplicate Limits
455477	Sodium Adsorption Ratio	<0.01					4	
455501	Cobalt	<1 ug/g	97	70-130	106	70-130	0	0-20
455501	Chromium Total	<1 ug/g	99	70-130	119	70-130	18	0-20
455501	Copper	<1 ug/g	106	70-130	102	70-130	21	0-20
455501	Nickel	<1 ug/g	103	70-130	107	70-130	0	0-20
455501	Lead	<1 ug/g	100	70-130	110	70-130	0	0-20
455501	Vanadium	<2 ug/g	96	70-130	133	70-130	33	0-20
455501	Zinc	<2 ug/g	105	70-130	100	70-130	17	0-20

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Test Summary

Batch No	Analyte	Instrument	Preparation Date	Analysis Date	Analyst	Method
455308	PHC's F2	GC/FID	2024-01-29	2024-01-30	PJ	CCME
455308	PHC's F3	GC/FID	2024-01-29	2024-01-30	PJ	CCME
455308	PHC's F4	GC/FID	2024-01-29	2024-01-30	PJ	CCME
455308	Moisture-Humidite	Oven	2024-01-29	2024-01-30	PJ	ASTM 2216
455313	PHC's F2	GC/FID	2024-01-29	2024-01-30	PJ	CCME
455313	PHC's F3	GC/FID	2024-01-29	2024-01-30	PJ	CCME
455313	PHC's F4	GC/FID	2024-01-29	2024-01-30	PJ	CCME
455313	Moisture-Humidite	Oven	2024-01-29	2024-01-30	PJ	ASTM 2216
455316	Tetrachloroethane, 1,1,1,2-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Trichloroethane, 1,1,1-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Tetrachloroethane, 1,1,2,2-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Trichloroethane, 1,1,2-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Dichloroethane, 1,1-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Dichloroethylene, 1,1-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Dichlorobenzene, 1,2-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Dichloroethane, 1,2-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Dichloropropane, 1,2-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Dichlorobenzene, 1,3-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Dichlorobenzene, 1,4-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Acetone	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Benzene	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Bromodichloromethane	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Bromoform	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Bromomethane	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Dichloroethylene, 1,2-cis-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Dichloropropene, 1,3-cis-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Carbon Tetrachloride	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Chloroform	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Dibromochloromethane	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Dichlorodifluoromethane	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Methylene Chloride	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Ethylbenzene	GC-MS	2024-01-26	2024-01-29	SS	V 8260B

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Test Summary

Batch No	Analyte	Instrument	Preparation Date	Analysis Date	Analyst	Method
455316	Ethylene dibromide	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Hexane (n)	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Xylene, m/p-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Methyl Ethyl Ketone	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Methyl Isobutyl Ketone	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Methyl tert-Butyl Ether (MTBE)	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Chlorobenzene	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Xylene, o-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Styrene	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Dichloroethylene, 1,2-trans-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Dichloropropene, 1,3-trans-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Tetrachloroethylene	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Toluene	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Trichloroethylene	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Trichlorofluoromethane	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Vinyl Chloride	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455317	PHC's F1	GC/FID	2024-01-26	2024-01-30	SS	CCME
455318	Methylnaphthalene, 1-	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455318	Methylnaphthalene, 2-	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455318	Acenaphthene	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455318	Acenaphthylene	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455318	Anthracene	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455318	Benz[a]anthracene	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455318	Benzo[a]pyrene	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455318	Benzo[b]fluoranthene	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455318	Benzo[ghi]perylene	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455318	Benzo[k]fluoranthene	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455318	Chrysene	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455318	Dibenz[a h]anthracene	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455318	Fluoranthene	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455318	Fluorene	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455318	Indeno[1 2 3-cd]pyrene	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455318	Naphthalene	GC-MS	2024-01-29	2024-01-30	C_M	P 8270

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Test Summary

Batch No	Analyte	Instrument	Preparation Date	Analysis Date	Analyst	Method
455318	Phenanthrene	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455318	Pyrene	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455319	Xylene Mixture	GC-MS	2024-01-30	2024-01-30	SS	V 8260B
455320	Dichloropropene, 1,3-	GC-MS	2024-01-30	2024-01-30	SS	V 8260B
455321	PHC's F1-BTEX	GC/FID	2024-01-30	2024-01-30	SS	CCME
455322	PHC's F1-BTEX	GC/FID	2024-01-30	2024-01-30	SS	CCME
455358	1+2-methylnaphthalene	GC-MS	2024-01-31	2024-01-31	C_M	P 8270
455411	PHC's F2	GC/FID	2024-01-30	2024-01-31	PJ	CCME
455411	PHC's F3	GC/FID	2024-01-30	2024-01-31	PJ	CCME
455411	PHC's F4	GC/FID	2024-01-30	2024-01-31	PJ	CCME
455411	Moisture-Humidity	Oven	2024-01-30	2024-01-31	PJ	ASTM 2216
455413	PHC's F2-Naph	GC/FID	2024-01-31	2024-01-31	PJ	CCME
455414	PHC's F3-PAH	GC/FID	2024-01-31	2024-01-31	PJ	CCME
455419	Cyanide (CN-)	Skalar CN Analyzer	2024-01-31	2024-01-31	Z_S	MOECC E3015
455434	Silver	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Arsenic	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Boron (total)	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Barium	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Beryllium	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Cadmium	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Cobalt	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Chromium Total	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Copper	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Molybdenum	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Nickel	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Lead	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Antimony	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Selenium	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Thallium	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Uranium	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Vanadium	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Zinc	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455468	Electrical Conductivity	Electrical Conductivity Meter	2024-02-01	2024-02-01	Z_S	Cond-Soil

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range



Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Test Summary

Batch No	Analyte	Instrument	Preparation Date	Analysis Date	Analyst	Method
455477	Sodium Adsorption Ratio	iCAP OES	2024-02-01	2024-02-01	Z_S	Ag Soil
455501	Cobalt	ICAPQ-MS	2024-02-02	2024-02-02	AaN	EPA 200.8/6020
455501	Chromium Total	ICAPQ-MS	2024-02-02	2024-02-02	AaN	EPA 200.8/6020
455501	Copper	ICAPQ-MS	2024-02-02	2024-02-02	AaN	EPA 200.8/6020
455501	Nickel	ICAPQ-MS	2024-02-02	2024-02-02	AaN	EPA 200.8/6020
455501	Lead	ICAPQ-MS	2024-02-02	2024-02-02	AaN	EPA 200.8/6020
455501	Vanadium	ICAPQ-MS	2024-02-02	2024-02-02	AaN	EPA 200.8/6020
455501	Zinc	ICAPQ-MS	2024-02-02	2024-02-02	AaN	EPA 200.8/6020

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

CWS for Petroleum Hydrocarbons in Soil - Tier 1**Notes:**

1. The laboratory method complies with CCME Tier 1 reference method for PHC in soil. It is validated for laboratory use.
2. Where the F1 fraction (C6 to C10) and BTEX are both measured, F1-BTEX is reported.
3. Where the F2 fraction (C10 to C16) and naphthalene are both measured, F2-naphthalene is reported.
4. Where the F3 fraction (C16 to C34) and PAHs* are both measured, F3-PAH is reported.
5. F4G is analyzed if the chromatogram does not descend to baseline before C50. Where F4 (C34 to C50) and F4G are both reported, the higher result is compared to the standard.
6. Unless otherwise stated in the sample comments, the following criteria have been met where applicable:
 - nC6 and nC10 response factors within 30% of response factor for toluene;
 - nC10, nC16, and nC34 response factors within 10% of each other;
 - C50 response factors within 70% of nC10 + nC16 + nC34 average; and,
 - Linearity is within 15%.
7. Unless otherwise stated in the sample comments, sampling requirements and analytical holding times have been met.
8. Gravimetric heavy hydrocarbons (F4G) cannot be added to the C6 and C50 hydrocarbons.
9. *PAHs = phenanthrene, benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, fluoranthene, dibenz(a,h)anthracene, indeno(1,2,3-c,d)pyrene and pyrene.



226844

STANDARD CHAIN-OF-CUSTODY

146 Colonnade Road, Unit #8, Ottawa, ON, K2E 7Y1 - Phone: 613-727-5692, Fax: 613-727-5222

Eurofins Workorder #: 3004774

CLIENT INFORMATION

Company: Egis Canada Ltd
Contact: Benjamin Edwards
Address: 115 Walgreen Rd, Carp, ON K0A 1L1
Telephone: Cell: 613-315-3093
Email: #1: benjamin.edwards@egis-groupe.com
Email: #2:
Project: ELD-24-2657
Quote #:

INVOICE INFORMATION (SAME AS CLIENT INFORMATION: YES ☒ NO ☐

Company: Egis Canada Ltd
Contact: Accounts Payable
Address:
Telephone:
Fax:
Email: #1: ap@emintostrp.com
Email: #2:
PO #:

REGULATION/GUIDELINE REQUIRED

- ☐ Sanitary Sewer, City: _____
☐ Storm Sewer, City: _____
☐ ODWSOG (Use DW CoC if analyzing drinking water)
☐ PWQO
☐ O.Reg 347
☐ Other: _____

- ☐ O. Reg 153
The sample results from this submission will form part of a formal Record of Site Condition (RSC) under O.Reg. 153/04. Analysis of full parameter list only
Yes ☐ No ☐
Table # _____ Coarse / Fine, Surface / subsurface
Type: Com-Ind / Res-Park / Agri / GW / All Other / Sediment
☒ O. Reg 406 Excess Soils
Table # L-3 Full depth/Strat/Ceiling/mSPLP Leachate
Type: Com-Ind / Res-Park / Agri / All Other
Category: Surface / Subsurface

TURN-AROUND TIME (Business Days)

- ☐ 1 Day* (100%) ☐ 2 Day** (50%) ☐ 3-5 Days (25%) ☒ 5-7 Days (Standard)

Please contact Lab in advance to determine rush availability.

*For results reported after rush due date, surcharges will apply: before 12:00 - 100%, after 12:00 - 50%.

**For results reported after rush due date, surcharges will apply: before 12:00 - 50%, after 12:00 - 25%.

The optimal temperature conditions during transport should be less than 10°C. Sample(s) cannot be frozen, unless otherwise indicated or agreed upon with the Laboratory. Note that this CoC is not to be used for drinking water samples. The CoC must be complete upon submission of the samples, there will be a \$25 surcharge if required information is missing (required fields are shaded in grey).

Sample Details

Field Filtered -->

Sample Matrix

of Containers

O.Reg.153 parameters

PHC F1 - F4

BTEX

VOCs

PAHs

PCBs

Metals + Inorganic

Metals only

EL5AD

Cyanide

TCP-VOL

PAHs, BTEX

PHS, NH

RN#
(Lab Use Only)

Sample ID	Date/Time Collected	Sample Matrix	# of Containers	PHC F1 - F4	BTEX	VOCs	PAHs	PCBs	Metals + Inorganic	Metals only	EL5AD	Cyanide	TCP-VOL	PAHs, BTEX	PHS, NH	RN# (Lab Use Only)
24-1A	26-Jan-2024	soil	4	x	x	x	x			x	x	x				1716832
24-1B	26-Jan-2024	soil	4	x	x	x	x			x	x	x				33
TCLP-24-1	26-Jan-2024	soil	2										x			
24-2A	26-Jan-2024	soil	4	x	x	x	x			x	x	x				34
24-2B	26-Jan-2024	soil	4	x	x	x	x			x	x	x				35
TCLP-24-2	26-Jan-2024	soil	2										x			
24-3A	26-Jan-2024	soil	4	x	x	x	x			x	x	x				36
24-3B	26-Jan-2024	soil	4	x	x	x	x			x	x	x				37
TCLP-24-3	26-Jan-2024	soil	2										x			
24-4A	26-Jan-2024	soil	4	x	x	x	x			x	x	x				38

PRINT

SIGN

DATE/TIME

TEMP (°C)

COMMENTS:

Sampled By: Ben Edwards / Rebecca Leclerc
Relinquished By: Rebecca Leclerc
Received By: Sy 1/26/24 20
CUSTODY SEAL: ☐ YES ☐ NO ice packs submit ☐ Yes ☐ No

401 Magnetic Drive, Unit #1, North York, ON, M3J 3H9 - Telephone: 416-661-5287 • 380 Vansickle Road, Unit #630, St. Catharines, ON, L2S 0B5 - Telephone: 905-680-8887 • 608 Norris Court, Kingston, ON, K7P 2R9 - Telephone: 613-634-9307



Environment Testing

Certificate of Analysis

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004775
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Page 1 of 8

Dear Benjamin Edwards:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Report Comments:

APPROVAL:

Emma-Dawn Ferguson, Chemist

All analysis is completed at Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) unless otherwise indicated.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on the scope of accreditation. The scope is available at: <https://directory.cala.ca/>.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is licensed by the Ontario Ministry of the Environment, Conservation, and Parks (MECP) for specific tests in drinking water (license #2318). A copy of the license is available upon request.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is accredited by the Ontario Ministry of Agriculture, Food, and Rural Affairs for specific tests in agricultural soils.

Please note: Field data, where presented on the report, has been provided by the client and is presented for informational purposes only. Guideline values listed on this report are provided for ease of use (informational purposes) only. Eurofins recommends consulting the official provincial or federal guideline as required. Unless otherwise stated, measurement uncertainty is not taken into account when determining guideline or regulatory exceedances.



Environment Testing

Certificate of Analysis

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004775
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

					1716840 R347 2024-01-26 TCLP - 24-1	1716841 R347 2024-01-26 TCLP - 24-2	1716842 R347 2024-01-26 TCLP - 24-3	1716843 R347 2024-01-26 TCLP - 24-4
Group	Analyte	MRL	Units	Guideline				
Anions	F	0.10	mg/L	LQC 150.0	<0.10	0.12	<0.10	0.12
General Chemistry	Cyanide (free)	0.05	mg/L	LQC 20.0	<0.05	<0.05	<0.05	<0.05
Hydrocarbons	F1 (C6-C10)	20	ug/L		<20	<20	<20	<20
	F2 (C10-C16)	20	ug/L		<20	<20	<20	<20
	F3 (C16-C34)	50	ug/L		<50	<50	<50	<50
	F4 (C34-C50)	50	ug/L		<50	<50	<50	<50
Leachate	REG 558 Leach				y	y	y	y
	Zero Headspace Extraction				y	y	y	y
Mercury	Hg	0.001	mg/L	LQC 0.1	<0.001	<0.001	<0.001	<0.001
Metals	Ag	0.01	mg/L	LQC 5	<0.01	<0.01	<0.01	<0.01
	As	0.02	mg/L	LQC 2.5	<0.02	<0.02	<0.02	<0.02
	B	0.1	mg/L	LQC 500.0	<0.1	0.1	0.1	<0.1
	Ba	0.01	mg/L	LQC 100.0	1.45	1.13	1.17	1.10
	Cd	0.008	mg/L	LQC 0.5	<0.008	<0.008	<0.008	<0.008
	Cr	0.05	mg/L	LQC 5.0	<0.05	<0.05	<0.05	<0.05
	Pb	0.01	mg/L	LQC 5.0	0.05	<0.01	<0.01	<0.01
	Se	0.02	mg/L	LQC 1.0	<0.02	<0.02	<0.02	<0.02
	U	0.01	mg/L	LQC 10.0	<0.01	<0.01	<0.01	<0.01
Moisture	Moisture-Humidite	0.1	%		22.8	22.8	28.1	9.8
Others	NO2 + NO3 as N	1.0	mg/L	LQC 1000	<1.0	<1.0	<1.0	<1.0
PAH	1-methylnaphthalene	0.1	ug/L		<0.1	<0.1	<0.1	<0.1
	2-methylnaphthalene	0.1	ug/L		<0.1	<0.1	<0.1	<0.1
	Acenaphthene	0.1	ug/L		<0.1	<0.1	<0.1	<0.1
	Acenaphthylene	0.1	ug/L		<0.1	<0.1	<0.1	<0.1
	Anthracene	0.1	ug/L		<0.1	<0.1	<0.1	<0.1

Guideline = REG 558

* = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range



Environment Testing

Certificate of Analysis

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004775
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

					1716840 R347 2024-01-26 TCLP - 24-1	1716841 R347 2024-01-26 TCLP - 24-2	1716842 R347 2024-01-26 TCLP - 24-3	1716843 R347 2024-01-26 TCLP - 24-4
Group	Analyte	MRL	Units	Guideline				
PAH	Benzo(a)anthracene	0.1	ug/L		<0.1	<0.1	<0.1	<0.1
	Benzo(a)pyrene	0.01	ug/L	LQC 1.0	<0.01	<0.01	<0.01	<0.01
	Benzo(b)fluoranthene	0.05	ug/L		<0.05	<0.05	<0.05	<0.05
	Benzo(g,h,i)perylene	0.1	ug/L		<0.1	<0.1	<0.1	<0.1
	Benzo(k)fluoranthene	0.05	ug/L		<0.05	<0.05	<0.05	<0.05
	Chrysene	0.05	ug/L		<0.05	<0.05	<0.05	<0.05
	Dibenzo(a,h)anthracene	0.1	ug/L		<0.1	<0.1	<0.1	<0.1
	Fluoranthene	0.1	ug/L		<0.1	<0.1	<0.1	<0.1
	Fluorene	0.1	ug/L		<0.1	<0.1	<0.1	<0.1
	Indeno(1,2,3-c,d)pyrene	0.1	ug/L		<0.1	<0.1	<0.1	<0.1
	Naphthalene	0.1	ug/L		<0.1	<0.1	<0.1	<0.1
	Phenanthrene	0.1	ug/L		<0.1	<0.1	<0.1	<0.1
	Pyrene	0.1	ug/L		<0.1	<0.1	<0.1	<0.1
VOCs Surrogates	1,2-dichloroethane-d4	0	%		108	120	123	119
	4-bromofluorobenzene	0	%		89	84	130	75
	Toluene-d8	0	%		91	94	95	95
Volatiles	1,1-dichloroethylene	0.5	ug/L	LQC 1400	<0.5	<0.5	<0.5	<0.5
	1,2-dichlorobenzene	0.4	ug/L	LQC 20000	<0.4	<0.4	<0.4	<0.4
	1,2-dichloroethane	0.5	ug/L	LQC 500	<0.5	<0.5	<0.5	<0.5
	1,4-dichlorobenzene	0.4	ug/L	LQC 500	<0.4	<0.4	<0.4	<0.4
	Benzene	0.5	ug/L	LQC 500	<0.5	<0.5	<0.5	<0.5
	Carbon Tetrachloride	0.2	ug/L	LQC 500	<0.2	<0.2	<0.2	<0.2
	Chloroform	0.5	ug/L	LQC 10000	<0.5	<0.5	<0.5	<0.5
	Dichloromethane	4.0	ug/L	LQC 5000	<4.0	<4.0	<4.0	<4.0
	Methyl Ethyl Ketone (MEK)	2	ug/L	LQC 200000	<2	<2	<2	<2

Guideline = REG 558

* = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range



Environment Testing

Certificate of Analysis

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004775
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

					1716840 R347 2024-01-26 TCLP - 24-1	1716841 R347 2024-01-26 TCLP - 24-2	1716842 R347 2024-01-26 TCLP - 24-3	1716843 R347 2024-01-26 TCLP - 24-4
Group	Analyte	MRL	Units	Guideline				
Volatiles	Monochlorobenzene	0.5	ug/L	LQC 8000	<0.5	<0.5	<0.5	<0.5
	Tetrachloroethylene	0.3	ug/L	LQC 3000	<0.3	<0.3	<0.3	<0.3
	Trichloroethylene	0.3	ug/L	LQC 5000	<0.3	<0.3	<0.3	<0.3
	Vinyl Chloride	0.2	ug/L	LQC 200	<0.2	<0.2	<0.2	<0.2

Guideline = REG 558 * = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range



Environment Testing

Certificate of Analysis

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004775
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 454563 Analysis/Extraction Date 2024-01-31 Analyst C_M			
Method P 8270			
Methlynaphthalene, 1-	<0.1 ug/L	72	50-140
Methlynaphthalene, 2-	<0.1 ug/L	62	50-140
Acenaphthene	<0.1 ug/L	75	50-140
Acenaphthylene	<0.1 ug/L	75	50-140
Anthracene	<0.1 ug/L	88	50-140
Benz[a]anthracene	<0.1 ug/L	74	50-140
Benzo[a]pyrene	<0.01 ug/L	83	50-140
Benzo[b]fluoranthene	<0.05 ug/L	67	50-140
Benzo[ghi]perylene	<0.1 ug/L	97	50-140
Benzo[k]fluoranthene	<0.05 ug/L	98	50-140
Chrysene	<0.05 ug/L	99	50-140
Dibenz[a h]anthracene	<0.1 ug/L	87	50-140
Fluoranthene	<0.1 ug/L	96	50-140
Fluorene	<0.1 ug/L	71	50-140
Indeno[1 2 3-cd]pyrene	<0.1 ug/L	91	50-140
Naphthalene	<0.1 ug/L	66	50-140

Guideline = REG 558

* = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range



Environment Testing

Certificate of Analysis

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004775
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Phenanthrene	<0.1 ug/L	74	50-140
Pyrene	<0.1 ug/L	99	50-140
Run No 455365 Analysis/Extraction Date 2024-01-31 Analyst AsA Method EPA 1311/O. Reg 347			
REG 558 Leach			
Zero Headspace Extraction			
Run No 455366 Analysis/Extraction Date 2024-01-30 Analyst AsA Method ASTM 2216			
Moisture-Humidite			80-120
Run No 455420 Analysis/Extraction Date 2024-01-31 Analyst AaN Method M SM3112B-3500B			
Mercury	<0.001 mg/L	118	76-123
Run No 455425 Analysis/Extraction Date 2024-01-31 Analyst AsA Method SM2320,2510,4500H/F			
F	<0.10 mg/L	105	90-110
Run No 455462 Analysis/Extraction Date 2024-02-01 Analyst PJ Method CCME O.Reg 153/04			
Petroleum Hydrocarbons F2	<20 ug/L	87	60-140
Petroleum Hydrocarbons F3	<50 ug/L	87	60-140

Guideline = REG 558

* = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range



Environment Testing

Certificate of Analysis

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004775
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Petroleum Hydrocarbons F4	<50 ug/L	87	60-140
Run No 455464 Analysis/Extraction Date 2024-02-01 Analyst AaN Method EPA 200.8			
Silver	<0.01 mg/L	100	70-130
Arsenic	<0.02 mg/L	101	70-130
Boron (total)	<0.1 mg/L	106	70-130
Barium	<0.01 mg/L	108	70-130
Cadmium	<0.008 mg/L	102	70-130
Chromium Total	<0.05 mg/L	108	70-130
Lead	<0.01 mg/L	109	70-130
Selenium	<0.02 mg/L	99	70-130
Uranium	<0.01 mg/L	94	70-130
Run No 455480 Analysis/Extraction Date 2024-02-01 Analyst Z_S Method SM4500-CNC/MOE E3015			
Cyanide (CN-)	<0.05 mg/L	93	75-125
Run No 455486 Analysis/Extraction Date 2024-02-02 Analyst SKH Method C SM4500-NO3-F			
NO2 + NO3 as N	<1.0 mg/L	100	80-120

Guideline = REG 558

* = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Certificate of Analysis

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0

Attention: Mr. Benjamin Edwards

PO#:

Invoice to: EGIS Canada Ltd.

Report Number: 3004775
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 455508	Analysis/Extraction Date 2024-02-01	Analyst SS	
Method EPA 8260			
Dichloroethylene, 1,1-	<0.5 ug/L	108	60-130
Dichlorobenzene, 1,2-	<0.4 ug/L	120	60-130
Dichloroethane, 1,2-	<0.5 ug/L	121	60-130
Dichlorobenzene, 1,4-	<0.4 ug/L	121	60-130
Benzene	<0.5 ug/L	113	60-130
Carbon Tetrachloride	<0.2 ug/L	115	60-130
Chloroform	<0.5 ug/L	121	60-130
Methylene Chloride	<4.0 ug/L	102	60-130
Methyl Ethyl Ketone	<2 ug/L	118	60-130
Chlorobenzene	<0.5 ug/L	115	60-130
Tetrachloroethylene	<0.3 ug/L	119	60-130
Trichloroethylene	<0.3 ug/L	115	60-130
Vinyl Chloride	<0.2 ug/L	106	60-130
Run No 455510	Analysis/Extraction Date 2024-02-02	Analyst SS	
Method CCME O.Reg 153/04			
Petroleum Hydrocarbons F1	<20 ug/L	94	60-140

Guideline = REG 558

* = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Euroflins Workorder #: 3004774

146 Colonnade Road, Unit #8, Ottawa, ON, K2E 7Y1 - Phone: 613-727-5692, Fax: 613-727-5222

CLIENT INFORMATION										INVOICE INFORMATION (SAME AS CLIENT INFORMATION: YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>									
Company: Egis Canada Ltd					Company: Egis Canada Ltd					Fax:									
Contact: Benjamin Edwards					Contact: Accounts Payable					Email: #1: ap@mcintoshperry.com									
Address: 115 Walgreen Rd, Lang, ON K0A 1K1					Address:					Email: #2:									
Telephone:					Cell: 613-315-3093					Telephone:									
Email: #1: benjamin.edwards@egis-group.com					REGULATION/GUIDELINE REQUIRED <input type="checkbox"/> Sanitary Sewer, City: _____ <input type="checkbox"/> Storm Sewer, City: _____ <input type="checkbox"/> ODWSOG (Use DW CoC if analyzing drinking water) <input type="checkbox"/> PWQO <input type="checkbox"/> O.Reg 347 <input type="checkbox"/> Other: _____														
Email: #2:																			
Project: 610-24-2687					Quote #:					<input type="checkbox"/> O. Reg 153 The sample results from this submission will form part of a formal Record of Site Condition (RSC) under O.Reg. 153/04. Analysis of full parameter list only Yes <input type="checkbox"/> No <input type="checkbox"/>									
TURN-AROUND TIME (Business Days) <input type="checkbox"/> 1 Day* (100%) <input type="checkbox"/> 2 Day** (50%) <input type="checkbox"/> 3-5 Days (25%) <input checked="" type="checkbox"/> 5-7 Days (Standard)										<input checked="" type="checkbox"/> O. Reg 406 Excess Soils Table # 63 Full depth/Strat/Celling/mSPLP Leachate Type: Com-Ind / Res-Park / Agri / All Other Category: Surface / Subsurface									
Please contact Lab in advance to determine rush availability. *For results reported after rush due date, surcharges will apply: before 12:00 - 100%, after 12:00 - 50%. **For results reported after rush due date, surcharges will apply: before 12:00 - 50%, after 12:00 - 25%.																			
The optimal temperature conditions during transport should be less than 10°C. Sample(s) cannot be frozen, unless otherwise indicated or agreed upon with the Laboratory. Note that this COC is not to be used for drinking water samples. The COC must be complete upon submission of the samples, there will be a \$25 surcharge if required information is missing (required fields are shaded in grey).										Sample Details									
Field Filtered ->										Field Filtered ->									
Sample Matrix										Sample Matrix									
# of Containers										# of Containers									
PHC F1 - F4										PHC F1 - F4									
BTEX										BTEX									
VOCs										VOCs									
PAHs										PAHs									
PCBs										PCBs									
Metals - Inorganic										Metals - Inorganic									
Metals only										Metals only									
EC50/50										EC50/50									
Cyanide										Cyanide									
TCP-VOCs										TCP-VOCs									
PAHs, PCBs										PAHs, PCBs									
PHS, MFI										PHS, MFI									
Sample ID										Sample ID									
Date/Time Collected										Date/Time Collected									
24-1A										26-Jan-2024									
24-1B										26-Jan-2024									
TCP-24-1										26-Jan-2024									
24-2A										26-Jan-2024									
24-2B										26-Jan-2024									
TCP-24-2										26-Jan-2024									
24-3A										26-Jan-2024									
24-3B										26-Jan-2024									
TCP-24-3										26-Jan-2024									
24-4A										26-Jan-2024									
PRINT										SIGN									
Sampled By: Ben Edwards (Rebecca Ledue)										DATE/TIME: 26-Jan-24									
Relinquished By: Rebecca Ledue										TEMP (°C): 20									
Received By:										CUSTODY SEAL: <input type="checkbox"/> YES <input type="checkbox"/> NO Ice packs submit <input type="checkbox"/> Yes <input type="checkbox"/> No									

Egis Group Canada

Appendix C – Bedrock Cores Photos



**PROJECT: Geotechnical Investigation
Proposed Watermain – CFB Kingston, ON
PROJECT #: CCO-24-2687
BOREHOLE: BH24-2B**

DRILLING DATE: January 22, 2024

ROCK CORES:

RC5: 8' 5" – 12' 2"

RC6: 12' 2" – 17' 2"

RC7: 17' 2" – 19' 8"

CO-24-2687
BH-24-2B
8'6" - 8'11.5"

0 100 mm 200 mm 300 mm



McINTOSH PERRY

CCO-24-2687
CFB Kingston
BH-24-2B
8'6"-8'11.5"



0 100 mm

200

0 mm

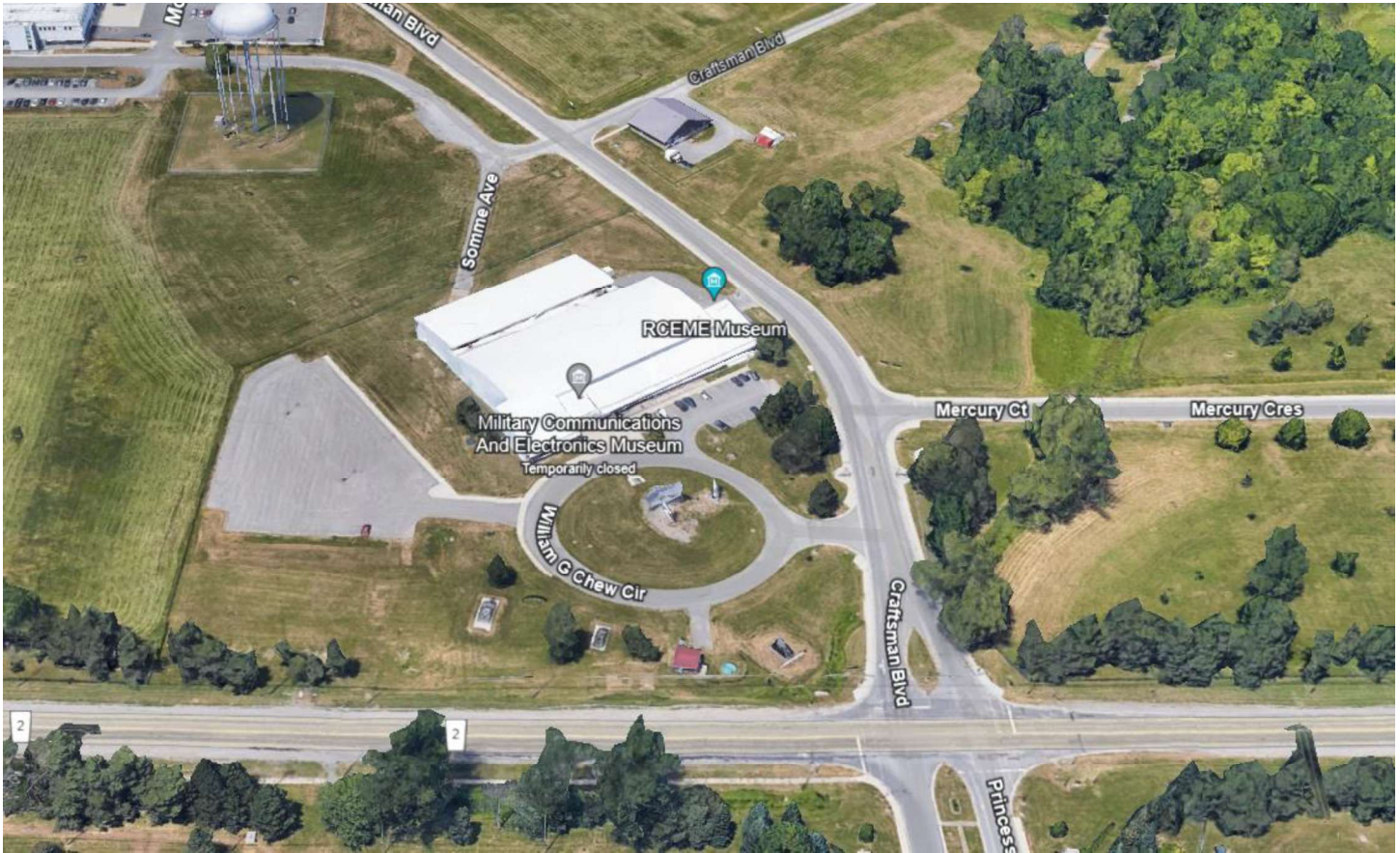


McINTOSH PERRY

ENGINEERING CONSULTING SERVICES

GEOTECHNICAL INVESTIGATION REPORT

CANADIAN FORCES BASE (CFB) - SITE-3, KINGSTON, ON.



Project No.: CCO-242687-00

Prepared for:

EastPoint

1801 Hollis Street

Suite 1500

Halifax, Nova Scotia B3J 3N4

Prepared by:

Egis Canada Limited (formerly McIntosh Perry Consulting Engineers Ltd.)

6240 Highway 7, Suite 200, Woodbridge, ON

Egis Contact: Esam Deif, P. Eng.

esam.deif@egis-group.com

Direct Line: 289.319.3167 Mobile: 647.970.3291

Table of Content

1.0 INTRODUCTION	4
2.0 PROJECT UNDERSTANDING	4
3.0 SITE AND PROJECT DESCRIPTION	6
3.1 Existing Site Conditions.....	6
3.2 Site Geology	6
4.0 FIELD INVESTIGATION AND TESTING	7
5.0 LABORATORY TESTING	8
6.0 SUBSURFACE CONDITIONS	8
6.1 Overview	8
6.2 Topsoil / Fill Soil.....	9
6.3 Native Sandy Silt.....	9
6.4 Bedrock.....	10
6.5 Ground Water Level Observation	11
6.6 Chemical Test Results	11
7.0 GEOTECHNICAL DISCUSSION AND RECOMMENDATIONS.....	11
7.1 General.....	11
7.2 Site Preparation	13
7.3 Excavation	13
7.3.1 Overburden Excavation	13
7.3.2 Bedrock Excavation	14
7.3.3 Engineered Shoring.....	14
7.4 Temporary Construction Dewatering.....	15
7.5 Frost Depth and Frost Susceptibility.....	15
7.6 Foundations (Slab on Grade Option)	15
7.7 Site Classification for Seismic Site Response.....	16
7.8 Lateral Earth Pressures	16
7.9 Waterproofing and Permanent Drainage.....	17
7.10 Backfill.....	17
7.11 Underground Utilities	18
7.11.1 Bedding and Cover	18

7.11.2

Trench Backfill

18

7.11.3

Clay Seals.....

19

8.0

CEMENT TYPE AND CORROSION POTENTIAL.....

19

9.0

PAVEMENT STRUCTURE.....

20

10.0

ENVIRONMENTAL SOIL SAMPLING AND ANALYSIS

21

10.1

Scope of Investigation.....

22

10.2

Investigation Methods

23

10.3

Soil Sampling

23

10.4

Analytical Results

24

10.5

TCLP Leachate Results.....

26

10.6

Conclusions

26

11.0

CONSTRUCTION CONSIDERATIONS

26

12.0

IMPORTANT INFORMATION AND LIMITATIONS OF THIS REPORT

27

13.0

CLOSURE.....

28

APPENDIX A

Borehole Location Plan and Borehole Logs

APPENDIX B

Laboratory Test Results

APPENDIX C

Rock Cores Photos

March 21, 2024

EastPoint
1801 Hollis Street, Suite 1500
Halifax, Nova Scotia B3J 3N4

Attention: Andy Noble, P.Eng. and Ben Valiquette, P.Eng.

1.0 INTRODUCTION

Egis Canada Limited (Egis) *formerly McIntosh Perry Consulting Engineers Ltd. (MPCE)* was retained by EastPoint (the Client) to prepare a geotechnical investigation for the provide a geotechnical soil investigation, environmental soil sampling and analysis for the installation of back flow valves into the existing lines for the four sites in Kingston, Ontario.

The four sites are located along Hwy 2, starting with the intersection with Navy Way to the intersection with Craftsman Boulevard. In this report the third site will be addressed, the other three sites will be provided under separate reports. The third Site is located at the west of civic address 3 William G Chew Circle, Kingston, ON. (CFB Kingston (DND) property), at the northwest corner of the intersection between Hwy 2 and Craftsman Boulevard, Kingston Ontario as indicated in Figure -1.

The geotechnical investigation was completed in general accordance with proposal No. PCO-242687-00, dated November 2, 2023.

Authorization to proceed with the updating was given by Andy Noble, P.Eng. November 17, 2023.

The purpose of the of the geotechnical investigation was to determine the subsurface conditions of the property at the west of civic address 3 William G Chew Circle, Kingston, Ontario to obtain the geotechnical and engineering parameters and provide recommendations for the design and construction of the proposed back flow valves into the existing lines by means of drilling two boreholes, carrying out field testing/observation and laboratory testing.

This report is prepared for the sole use of the Client. The use of this report, or any reliance on it by any third party, is the responsibility of such third party. It is understood that the Project will be designed and constructed in accordance with all applicable codes and standards present within its jurisdiction.

2.0 PROJECT UNDERSTANDING

Egis understanding of the Project is based on the correspondence and email from the Client on February 6, 2024. In accordance with Drawing number G-B35-BFP-SITE3 (Figure-3), It is understood that backflow preventer valve will be accommodated within a light weighted enclosure supported on a slab on grade similar to the one shown in Figure-2. An access road will be also constructed to reach to the proposed enclosure as indicated in Figure -3.

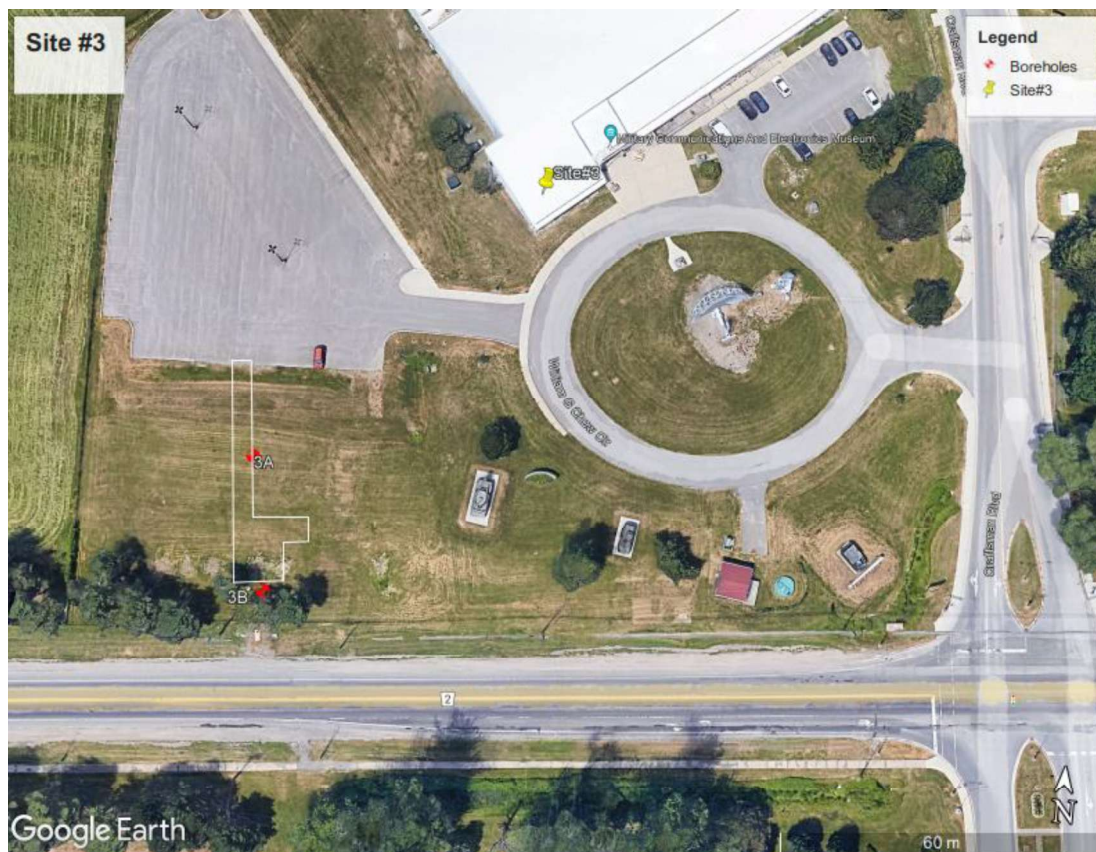


Figure -1 Site Location



Figure -2 Example of the Enclosure

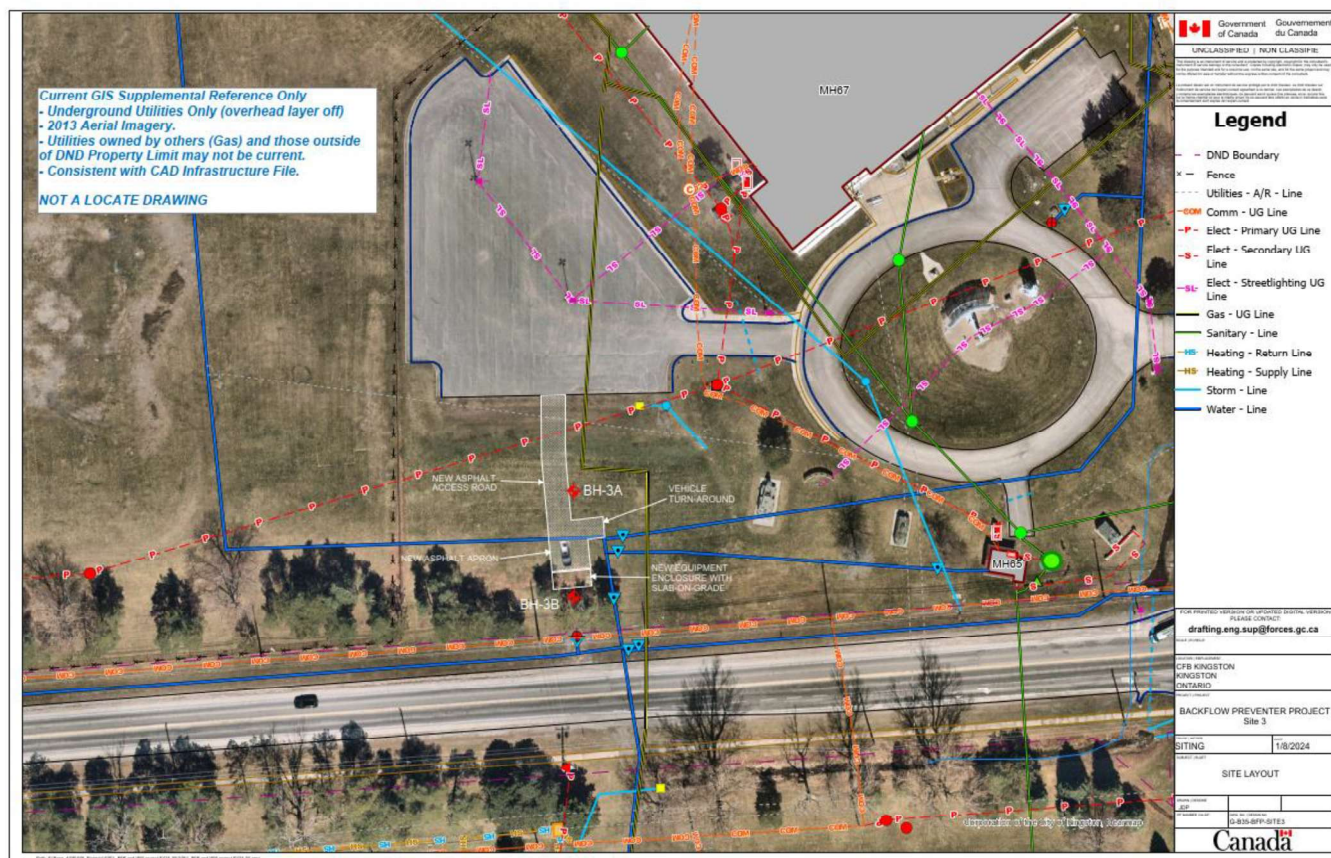


Figure-3 Drawing G-B35-BFP-SITE3

3.0 SITE AND PROJECT DESCRIPTION

3.1 Existing Site Conditions

It is understood the site is currently an active military base known as CFB Kingston, back flow valves are proposed to be installed on the existing water main pipe crossing the property.

3.2 Site Geology

Based on published geological maps of the area (Ontario Geological Survey), the site is located within the Napanee Plain. Surficial geology maps of southern Ontario indicate that the site is located within Paleozoic bedrock-drift complex in Paleozoic terrain. The bedrock within the area is identified to comprise of Limestone, dolostone, shale, arkose, and sandstone of the Shadow Lake Formation.

4.0 FIELD INVESTIGATION AND TESTING

Egis cleared the Site before the commencement of any geotechnical drilling. Utility clearance requisitions were submitted to Ontario One Call (ON1Call) to obtain public utility locates. Private utility clearance was performed by a private locator on behalf of Egis, in conjunction with CFB private utility clearance. Public utility owners were informed, and all utility clearance documents were obtained before the commencement of drilling work.

The field work was completed on January 23, 2024. Two boreholes in total were marked for drilling. Upon completion of utility locate process, one borehole BH24-3B respectively within proximity of the proposed backflow preventer valve, and the other BH24-3A was at the proposed access road.

BH24-3A was drilled to 1.6 meter below grade surface (mbgs) (El. 101.6m) to auger refusal and BH24-3B was drilled to 4.4 mbgs (El. 98.0 m).

The boreholes were drilled using a Mobile B53 track-mounted drilling rig, outfitted with solid stem augers. The equipment used for drilling was owned and operated by Drilltech Drilling Ltd. Soil samples were obtained at 0.75 m intervals in boreholes using a 51 mm outside diameter split spoon sampler in accordance with the Standard Penetration Test (SPT) procedure. Upon auger refusal, the bedrock was cored and sampled in Borehole BH24-3B to approximately 3.6 m depth from the top of the encountered bedrock surface at El. 101.6 meter above the sea level (masl). In BH24-3B NQ size rock cores were obtained using diamond drilling and wireline tooling. Rock cores were retrieved in double-walled NQ coring methods.

The bedrock core holes were sealed with bentonite hole plug and the boreholes were backfilled with auger cuttings and hole plug and restored to the original ground surface. The boreholes were surveyed with a GPS unit to record their locations and elevations. Borehole locations are shown in Figure- 3, and included in Appendix B.

Table 4-1: Borehole Designations, Locations, and Depth

BH No.	Drilling Date	Coordinates Coordinate System: NAD 83		Coordinates Coordinate System: UTM Zone 18T			Borehole Termination	
		Longitude	Latitude	Northing	Easting	Surface El. (m)	Depth (mbgs)	Bottom El. (m)
BH24-3A	Jan. 23, 2024	-76.4406433	44.24143164	4899697.785	384966.762	103.2	1.6	101.6
BH24-3B	Jan. 23, 2024	-76.44059859	44.24120228	4899672.247	384969.885	102.4	4.4	98.0

Field investigation, including drilling and sampling, were supervised on a full-time basis by Egis. All boreholes were logged during the drilling process. All samples were labelled by waterproof paper one by one as they were retrieved. All soil samples were preserved in double plastic bags to mitigate the risk of moisture loss during transportation to the geotechnical laboratory. Rock cores were laid and labelled in specialty boxes made for rock core transferring. The Rock Quality Designation was measured for the first time in the field immediately after drilling to reduce the measurement errors caused by transportation induced damages to the rock cores.

5.0 LABORATORY TESTING

All soil samples and rock cores obtained during the investigation were transported to Egis's geotechnical laboratory in Nepean, Ontario.

Geotechnical laboratory testing was performed on representative soil samples to determine soil index properties including grain-size analysis tests. Uniaxial compressive strength test was performed on one (1) rock core. The laboratory tests were performed in accordance with the Ministry of Transportation Ontario (MTO) test procedures, which follow the American Society for Testing Materials (ASTM) test procedures.

Paracel Laboratories Ltd. in Ottawa carried out chemical test on one (1) representative soil samples and consisted of pH, chloride, sulphate, and resistivity. Laboratory test results are included in Appendix B.

The rest of the soil samples recovered will be stored in Egis storage facility for a period of three (3) months after submission of the final report. Samples will be disposed after this period unless otherwise requested in writing by the Client.

6.0 SUBSURFACE CONDITIONS

6.1 Overview

The subsurface conditions encountered in the boreholes are shown on the borehole records provided in Appendix A. The boreholes records include soil stratification at the borehole locations with detailed soil descriptions and selected physical properties for each stratum encountered.

In general, the site stratigraphy consists of topsoil/fill soil layer overlaying a native Sandy Silt underlain by bedrock. Both Boreholes were drilled on the open and gras planted landscape. The bedrock was cored and sampled in Borehole BH24-3B for classification purposes. The subsurface at this site can be divided into three distinguishable zones.

- Topsoil / Fill Soil
- Sandy Silt
- Bedrock

The subsurface soils and bedrock description encountered during the course of the investigation, together with the field and laboratory test results are shown on the borehole records included in Appendix A. Laboratory test results are included in Appendix B. Unless otherwise mentioned, all SPT 'N' results quoted are for SPT spoon penetrations of 300mm as per the subject ASTM. Supplementary information supporting the above overall subsurface observations, where available and indicated below. However, it should be borne in mind the below descriptions are based on and limited to, some generalizations of the actually verified soil information intercepted in the boreholes and documented in the borehole logs. Description of the subsurface strata encountered are given below.

6.2 Topsoil / Fill Soil

Topsoil / Fill soil Layer soil was encountered at the surface of borehole BH24-3A. The Fill soil layer was generally consisting of Sand and Gravel with fines overlying the native Sandy Silt layer. The topsoil / fill soil layer extends to a depth of 0.3 m below the existing grade at the location of BH24-3A.

The fill soil Layer depth, thickness, composition is given in Table 6-1.

Table 6-1: Location, Thickness, and Compaction of the Fill Soil Layer

BH No.	Layer's Depth (mbgs)	Layer's Top Elevation (masl)	Layer's Bottom Elevation (masl)	Layer's Thickness (m)	Description
BH24-3A	0.2	103.1	102.9	0.2	Sand and Gravel, some fines

Grain size analysis test result of one representative sample from the fill Soil is shown in Table 6-2, and the corresponding graphical plot is shown in, Appendix B.

Table 6-2: Grain Size Distribution Summary – Fill Soil Layer

BH No./ SS No.	Size Fraction (%)					Moisture Content (%)
	Gravel	Sand	Silt	Clay	Fines	
BH24-3A / SS1	33	39	--	--	28	20

The Standard Penetration Test (SPT) within the fill layer indicated loose compactness.

6.3 Native Sandy Silt

Native Sandy Silt layer was encountered below the fill soil layer in borehole BH24-3A and at the surface of borehole BH24-3B. The native Sandy Silt extends to a depth ranging between 0.8 to 1.6 m below the existing grade and overlying the bedrock.

The Sandy Silt, thickness, composition is given in Table 6-3.

Table 6-3: Location, Thickness, and Compaction of the Native Sandy silt Layer

BH No.	Layer's Depth (mbgs)	Layer's Top Elevation (masl)	Layer's Bottom Elevation (masl)	Layer's Thickness (m)	Description
BH24-3A	0.3	102.9	101.6	1.3	Sandy Silt, some gravel
BH24-3B	0.0	102.4	101.6	0.8	Sandy Silt, trace gravel

Grain size analysis test result of one representative sample from the Sandy Silt Layer is shown in Table 6-4, and the corresponding graphical plot is shown in, Appendix B.

Table 6-4: Grain Size Distribution Summary – Native Sandy Silt Layer

BH No./ SS No.	Size Fraction (%)					Moisture Content (%)
	Gravel	Sand	Silt	Clay	Fines	
BH24-3B /SS1	5	32	--	--	63	

The Standard Penetration Test (SPT) 'N' values ranged between 5 to 15 blows per 300 mm penetration, with an average value of 10 blows per 300 mm based on two readings indicating loose to compact compactness. The high SPT 'N' values encountered at both boreholes on the lower part of the layer are due to the underlying bedrock.

6.4 Bedrock

Bedrock was encountered in both boreholes and cored in borehole BH24-3B as described in Table 6-5. The bedrock was observed below the native Sandy Silt at El. 101.6 m in both boreholes. The bedrock was cored and sampled to the bottom of BH24-3B.

During the core drilling, measurements including Total Core Recovery (TCR) and Rock Quality Designation (RQD) were carried out as part of the rock quality classification. TCR is defined as the sum of all recovered rock core pieces from a core run expressed as a percent of the total length of the core run. The RQD is defined as a percentage of the sum of the intact core pieces over 100 mm divided by the total length of core run. The TCR and RQD for the rock cores are presented in the borehole log records in Appendix A.

Based on the retrieved rock cores from borehole within the proposed backflow preventer valve enclosure footprint, the bedrock was identified as limestone with frequent shale parting. The bedrock was closely spaced with horizontal joint

discontinuities. The limestone was observed to be strong, grey, thinly bedded, and has poor to excellent quality based on RQD values (21% to 93%). The rock cores are shown in Appendix C.

A summary of bedrock observations is provided in Table 6-5.

Table 6-5: Summary of Bedrock Observations

BH #	Ground Surface El. (m)	Bedrock Surface El. (m)	Weathered Bedrock El. (m)	Sound Bedrock El. (m)	RC #	El. (m)	Rec. (%)	RQD (%)	UCS (MPa)	ISRM classification corresponding to the UCS
BH24-3B	102.4	101.6	--	101.6 – 98.0	RC3	101.6 – 100.5	66	21		
					RC4	100.5 – 99.0	98	74	228	Very strong
					RC5	99.0 – 98.0	100	93		

6.5 Ground Water Level Observation

No ground water was observed on both boreholes upon the completion of the auguring up to the elevation of the bedrock. No monitoring wells were installed in the advanced boreholes.

6.6 Chemical Test Results

Chemical analysis was conducted by Paracel Laboratories in Ottawa, ON, to determine the resistivity, pH, sulphate and chloride content of one (1) representative soil samples collected from the boreholes. The laboratory results for the chemical analysis are shown in Table 6-6 and included in Appendix B.

Table 6-6: Soil Chemical Analysis Results

Borehole	Sample	Depth (mbgs)	pH	Sulphate (10 µg/g)	Chloride (10 µg/g)	Resistivity (0.1 Ohm.m)
BH24-3B	SS-1	0.5	6.90	<10	<10	62.3

7.0 GEOTECHNICAL DISCUSSION AND RECOMMENDATIONS

7.1 General

Based on the results of the geotechnical field and laboratory investigation performed, the following discussion is provided to assist the Client and the Designer with the proposed backflow preventer valve will be accommodated within a light weighted enclosure supported on a slab on grade.

The recommendations provided within this report are based on our understanding of the proposed project which is summarized above in “Section 2” and through the interpretation of factual information obtained from the boreholes advanced during this subsurface investigation. If any of these understandings change, Egis should be contacted to assess the implications of those changes on the recommendations provided herein.

Based on the soil conditions observed in the boreholes, and assuming they are representative of soil condition across the site, the most important geotechnical considerations for the design and construction of the water main backflow prevention assembly, metering and structure enclosure are expected to be the following:

Foundation on slab on grade supported on Adequately Prepared Granular Pad:

The water main backflow prevention assembly, metering and structure enclosure will be supported on slab on grade foundation supported on a granular backfill pad and overlies the bedrock at approximately 0.8 m mbgs depth (El. 101.6 ± 0.5 m).

The bedrock surface should be cleaned of any soft or unsuitable soil from the foundation influence zone before the construction of the granular pad. The granular backfill pad must extend a minimum of 0.8 m beyond the edge of the footing and then downward at a 1H:1V. The slab on grade thickness must consider and accommodate any uplift pressure that piping assembly may apply on the slab on grade foundation.

Temporary protection System:

Open excavation within proximity of any utility lines may not be possible without a temporary protection system (TPS). The design of the TPS system is the responsibility of the Contractor and shall be performed by an experienced professional Geostructural engineer. To reduce the lateral deflections, the Designer of the TPS may consider including anchoring and/or internal bracing system.

Temporary Construction Dewatering:

Excavation for preventer valve will proceed through the native Sandy Silt and may extend down into the bedrock. Although ground water was not observed upon the completion of the borehole drilling, the contractor should be prepared for any perched ground water and surface runoff water that may infiltrate and accumulate at the bottom of the excavations due to seasonal changes and rainfall events. Dewatering may be achievable with traditional sump and pump dewatering method. The ground water disposal should be performed in accordance with applicable regulations. Assessment of the dewatering requirements and the need for registration on the Environmental Activity and Sector Registry (EASR) or a Permit to take Water (PTTW) should be carried out by specialists experienced in this field.

Permanent Drainage and Waterproofing:

Since no ground water was intercepted upon the borehole drilling completion, and provided that the water main backflow prevention assembly, metering and structure enclosure will be founded on a slab on grade supported on a granular backfill platform over the bedrock. Therefore, permanent under-floor drainage will not be required.

The comments made regarding the construction of the proposed preventive valve are intended to highlight those aspects which could impact or affect the detail design of the proposed preventive valve and its enclosure, for which special provisions may be required in the Contract Documents. Comments related to construction aspects are not intended to dictate construction equipment or methods. Relevant parties should make their own interpretation of the factual data

presented in the report. Interpretation of the data presented may affect equipment selection, proposed construction methods, and scheduling of construction activities.

7.2 Site Preparation

The site should be graded in the early stages of construction to provide for positive control of surface water and directing it away from excavations and subgrades. The Contractor should take appropriate measurements for collection and disposal of surface and ground water and runoff including an adequate pumping system. Prior to the site preparation.

Public and private utility owners should be notified prior to the commencement of any construction activities. Existing underground utilities in the vicinity of the proposed excavation should be reviewed before commencing any excavation works to identify potential damage hazards due to the proposed excavation.

Existing utilities that are excavated or exposed as part of the construction will need to be supported and rerouted during the construction. Even with a shoring system, some inward movement of shoring is inevitable. This may cause slight ground settlement which may have an adverse effect on the existing buried utilities. The contractor shall inform owners of all existing utilities before proceeding with excavation. The utility owners may provide the permissible deformation that a particular utility may tolerate. Shoring shop drawings should be stamped by a professional engineer.

7.3 Excavation

Excavations will proceed through the overburden and bedrock. The excavations for the prevent valve installation will extend to the depth of the existing water main. As per the Technical Standards and Specifications, City of Kingston, the depth of the watermain must not be less than 1.7m therefore the existing watermain will be installed within the upper layer of the bedrock. Based on the required excavation depth, it is anticipated that excavations for the proposed backflow preventive valves will need to be performed with the confinement of engineered shoring or trench boxes to avoid undermining the adjacent utilities and to ensure the safety of the working crew.

The excavated materials and any corresponding excess soils and rock should be disposed of in accordance with all applicable environmental legislation. Excess soils management and evaluation of the environmental quality of subsoils will be provided in another section of this report.

7.3.1 Overburden Excavation

All excavations must be undertaken in accordance with the requirements of the Occupational Health and Safety Act of Ontario (OHSA), Regulations for Construction O.Reg. 213/91, with specific reference to acceptable size slopes and stabilization requirements. The general stratigraphy outlined herein can be considered an OHSA Soil Type 3 for the native Sandy Silt soil. The excavation for proposed preventive valve should be conducted through a minimum 1H:1V or a flatter slope for Type 3 Soil.

For excavations through multiple soil types, the side slope geometry is governed by the soil with the highest number designation as per OHSA. If the minimum slope requirement cannot be achieved, temporary protection system (TPS) or Engineered Shoring should be used.

Since the proposed excavations will be conducted below 1.2m, it is recommended that the excavations be undertaken within the confines of an Engineered Shoring designed and installed in accordance with OHSA. The shoring will need to support the excavation sidewalls and act as a barrier against any perched ground water flow into the excavation. However, the removal of water within the shored excavation may still be required. Further discussion on the Engineered Shoring is provided in Section 7.3.3.

The stability of the excavation side slopes is highly dependent on the Contractor's methodology and layout. The excavations of the overburden soils are expected to be performed using conventional hydraulic excavation equipment. Cobbles, and boulders may be encountered during the excavations. Boulders larger than 0.3 meters in diameter should be removed from the excavation side slopes for workers' safety. No surface surcharges should be placed closer to the edge of the excavation than a distance equal to twice the depth of the excavation, unless a TPS has been designed to accommodate such a surcharge.

7.3.2 Bedrock Excavation

It is understood that the proposed installation of the preventive valve may require bedrock excavation. Therefore, moderate bedrock excavation will be required to achieve the desired elevations which is expected to generate a manageable amount of excavated rock materials.

For planning purposes, a weathered bedrock is recommended to be treated as a Type 2 Soil. Sound rock would generally be self-supporting. All rock excavations should be scaled, to remove loose rock fragments to ensure safe working conditions. All rock faces should be reviewed by the geotechnical engineer to look for loose pieces and wedge failures. Rock bolting for worker safety may be necessary depending on the layout and field condition at that time.

Bedrock excavation will require pneumatic or hydraulic breakers such as hoe-rams or heavy rock excavation equipment capable of breaking and ripping sound limestone bedrock.

7.3.3 Engineered Shoring

Engineered Shoring system is required during excavation and construction to protect any adjacent utilities, and for the worker's safety. Engineered Shoring systems may vary from as simple as the trench boxes to soldier piles and lagging, and secant and/or tangent walls. The design of the Engineered Shoring system is the responsibility of the Contractor. The Contractor should hire an experienced professional Geotechnical engineer to provide a detailed design for the Engineered Shoring system. The Engineered Shoring designer must take into consideration any adjacent infrastructure being retained, lateral earth pressures, construction surcharge loads, and pre-stressing loads or post tensioning loads on tiebacks. Also, it should consider the freeze-thaw action on the face of excavations, expansion and contraction of shoring elements, construction vibrations and compatibility with the design of proposed waterproofing and drainage systems for the proposed structure.

Stockpiling of soil beside the excavations should be avoided. The weight of the stockpiled soil could lead to overstressing the shoring system.

The temporary excavation support systems should be designed and constructed in accordance with OPSS.PROV 539 (Temporary Protection Systems). The lateral movement of the temporary shoring system should meet Performance Level 2 as specified in OPSS.PROV 539, provided that any adjacent utilities can tolerate this magnitude of deformation.

It is recommended that the Client retain a Contractor and a Designer who have significant experience with excavations performed under similar soil conditions. Shop drawings should be submitted to the designers and reviewed by the geotechnical engineer well in advance of mobilization.

Fully mobilized (i.e., active lateral earth pressure coefficient) conditions shall be considered. The lateral earth pressure coefficients for existing native and granular fill are given in Table 7-1 Section 7.8 to assist Designer and Contractor with the design of the shoring system.

7.4 Temporary Construction Dewatering

Excavation for preventer valve will proceed through the fill and native Sandy Silt Layers and will reach the bedrock. Although ground water was not observed upon the completion of the borehole drilling, the contractor should be prepared for any perched ground water and surface runoff water that may infiltrate and accumulate at the bottom of the excavations due to seasonal changes and rainfall events. Contractors should be prepared to handle any surface water or ground water infiltration by ditching, pumping and/or other methods in order to maintain dry working conditions.

Recommendations for appropriate dewatering measures beyond conventional sump pump techniques or other more intensive dewatering systems (e.g., well points or other specialized methods) to effectively lower the static ground water level shall be provided by a specialized dewatering contractor.

The ground water disposal should be performed in accordance with applicable regulations. Assessment of the dewatering requirements and the need for registration on the Environmental Activity and Sector Registry (EASR) or a Permit to take Water (PTTW) should be carried out by specialists experienced in this field.

7.5 Frost Depth and Frost Susceptibility

Based on OPSD 3090.101, the Frost Penetration Depth for the project area ranges between 1.4 to 1.6m. Therefore, all foundation elements that are sensitive to movements (i.e., heave and subsequent thaw settlements) located in unheated areas should be provided with a minimum of 1.5 metres (interpolated value) of non-frost susceptible earth cover or equivalent thermal insulation for frost protection services from the finished grades.

Based on Table 13.1 in the Canadian Foundation Engineering Manual, U.S. Corps of Engineers Frost Design Soil Classification, and since the grain size distribution for the soils intercepted within the frost depth are generally Silt soils, and as such these soils are classified to be type F4 that has a high frost susceptibility.

7.6 Foundations (Slab on Grade Option)

It is important to emphasize that at the time of preparing this report, Egis has not been provided with the proposed service loads or foundation details for the proposed preventive valve enclosure. However, it was provided by the Client that the enclosure is to be supported by a slab on grade.

Based on section 7.5, and since the existing soils within the frost depth are classified to be type F4 that has a high frost susceptibility, The proposed slab on grade cannot be supported on the existing native soils that are subject to the frost heave. Therefore, existing native Sandy Silt must be removed up to the frost depth or bedrock surface whichever comes first and replaced with compacted granular material.

The preparation of the granular platform should be carried out as follows:

The subsurface of the exposed bedrock after the removal of the soil should be inspected and approved to be clear from any soft soil in the presence of a qualified geotechnical engineer.

Imported engineered fill OPSS 1010 Type II Granular 'B' or Granular A, placed in shallow lifts not exceeding 250 mm and compacted to 98% of the Standard Proctor Maximum Dry Density (SPMDD) of the material. This operation should be carried out under strict construction compliance.

A moisture barrier consisting of at least a 200 mm thick layer of 19 mm clear crushed stone or 10 mm polyethylene vapor barrier is recommended to be placed directly under the floor slab. The stone bed would act as a barrier and prevent the capillary rise of moisture into the floor slab.

The slab-on-grade should be founded over the moisture barrier with a minimum thickness of 200 mm, the final thickness of the slab to be decided by the structural engineer.

A modulus of Subgrade Reaction (k_s) of 20 MPa/m is recommended for slab-on-grade design.

7.7 Site Classification for Seismic Site Response

Seismic site classification is completed based on National Building Code (NBC) 2020 Section 4.1.8.4 and Table 4.1.8.4. -B. This classification system is based on the average soil properties in the upper 30 m. The site can be classified as a Site Class "C" based on the fact the footings will be founded very close to the bedrock layer.

7.8 Lateral Earth Pressures

The following preliminary lateral earth pressure parameters are provided to assist Contractors and Designers with the design of temporary Engineered Shoring systems.

Compaction of backfill behind retaining structures can induce loads greater than the active or at-rest earth pressures. Therefore, the induced lateral earth pressure due to compaction should be added to the calculated earth pressure in accordance with Section 24.8 of CFEM (2006).

The following static lateral earth pressure coefficients are recommended.

Table 7-1: Lateral Earth Pressure Coefficient for Static Conditions

Material	Bulk Unit Weight, γ (kN/m ³)	Friction Angle, ϕ' (°)	Static active pressure, K_a	Static at-rest pressure, K_o	Static passive pressure, K_p
Native Sandy Silt layer in a loose to compact state	18	28	0.36	0.53	2.77
New compacted Granular B Type I	20	30	0.33	0.50	3.00
New compacted Granular A and Granular B Type II	22	32	0.31	0.47	3.25

Static lateral earth pressure can be calculated by using the following equation:

$$\sigma_h = K \times (\gamma h + q)$$

where K is the lateral earth pressure coefficient. For yielding retaining walls, the active earth pressure coefficients, K_a , is recommended to be used. For non-yielding temporary shoring walls, the at-rest, K_o , is recommended to be used for design. The resultant of the applicable static or at-rest force is assumed to act at $h = 1/3H$ above the base of the wall where H is the Height of the wall. The unit of the retained soil " γ " is given in Table 7-1, and "q" is the value of any applied surcharge.

The above noted lateral pressure coefficients are calculated assuming the wall back angel is vertical and the backslope of the retained soil is horizontal. The wall-soil interaction angle is assumed to equal to $0.5\phi'$ as per CFEM. If Engineered Shoring is used, then designers should refer to CFEM for design assistance and a geotechnical engineer should be retained to perform the shoring design review.

7.9 Waterproofing and Permanent Drainage

Since no ground water was intercepted upon the borehole drilling completion, and provided that the water main backflow prevention assembly, metering and structure enclosure will be founded on a slab on grade supported on a granular backfill platform over the native Sandy Silt. Therefore, permanent under-floor drainage will not be required.

7.10 Backfill

Although the sand and gravel fill soil can be reused for backfilling, the native Sandy Silt is considered as a high susceptible for frost heave and its non-uniform density, the existing native soils are unsuitable for backfilling under the slab-on-grade and pavement in its present condition. Therefore, it is recommended to be sub-excavated, and replaced with OPSS Granular A or B Type II material placed in thin, loose lifts (maximum 0.2m thick) and each lift thoroughly compacted to a minimum of 98% of Standard Proctor Maximum Dry Density (SPMDD) as outlined below:

- Backfill should not be placed in frozen condition or placed on a frozen subgrade.
- In landscaped areas, the existing on-site native soil can be used for the upper 0.3m of backfill below the surrounding landscape for its low permeability to reduce surface water infiltration.

- Exterior grades should be sloped away from the prevent valve enclosure walls, and roof drainage downspouts from adjacent buildings should be placed so that water flows away from the enclosure.

7.11 *Underground Utilities*

At the subject site, it is expected that the burial depth of water utility lines is typically 1.7 m below the ground surface or as per the Technical Standards and Specifications, City of Kingston. Equivalent thermal insulation should be provided if this depth is not achievable.

The contractor should retain a professional engineer to provide detailed drawings for excavation and temporary support of the excavation walls during construction.

Excavations for the utility lines shall be performed in accordance with the Occupational Health and Safety Act (OHSA) of Ontario. Excavations shall be performed in accordance with Section 7.3 of this report.

The engineer designing utilities shall ensure the proposed utility pipes can tolerate compaction loads.

The recommendations within this section are intended to be a supplement to, and not a replacement of the most recent local municipal requirements.

7.11.1 *Bedding and Cover*

The following are recommendations for service trench bedding and cover materials:

- Bedding for buried utilities should consist of an OPSS.MUNI 1010 "Granular A" material and should be placed in accordance with municipal requirements. All utility pipes and high amps electrical conduits shall receive a minimum of 150 mm bedding.
- It is not recommended to bear utility line directly on bedrock subgrade. Utility lines on bedrock shall also receive 150 mm Granular A as a bedding to avoid differential behavior.
- The use of clear stone is not recommended for use as pipe bedding. The voids in the stone may result in a low gradient water flow and infiltration of fines from the surrounding soils and cover materials, causing settlement and loss of support to pipes and structures.
- The cover material should be a service sand material or an OPSS.MUNI 1010 "Granular A". The dimensions should comply with the pertinent specification section.
- The bedding, spring line, and cover should be compacted to at least 98% of its SPMDD.
- All covers are to be compacted to 100% SPMDD if they are intersecting structural elements.
- Compaction equipment should be used in such a way that the utility pipes are not damaged during construction.
- If the encountered subgrade below the utility line is clay or silt, it is recommended that the utility bedding be separated from the native soil by a non-woven geotextile.

7.11.2 *Trench Backfill*

- Backfill above the cover for buried utilities should be in accordance with the following recommendations:

- The backfill should be placed in a maximum of 200 mm thick layers at or near (+ 2%) their optimum moisture content, and each layer should be compacted to at least 95% SPMDD within the landscape areas. This value should be increased to at least 98% SPMDD within the roadway and the proposed enclosure structure subgrade backfilling.
- In general excavation backfill should attempt to match the texture of the existing adjacent soils. If imported materials are used, side slopes with frost tapers are recommended. Typically, frost tapers should be a back-slope of 10H:1V through the frost zone, (i.e., 1.5 m from finished grade).
- During backfilling, care should be taken to ensure the backfill proceeds in equal stages simultaneously on both sides of the utility pipes; and
- No frozen material should be used as backfill; neither should the trench base be allowed to freeze.
- The quality and workmanship in the construction are as important as the compaction standards themselves. It is imperative that the guidelines for the compaction be followed for the full depth of the trench to achieve satisfactory performance.

7.11.3 Clay Seals

In the event that a perched groundwater encountered during the excavation for the installation of the watermain backflow prevention assembly, clay seals are recommended as a seepage barrier for all utility trenches. In the absence of clay seals, there is a potential for the trench to act as a drain into the watermain trench. To avoid such an effect, clay seals are recommended at both ends of the open trench. The clay seal shall be constructed of low permeability material, such as silty clay, to a minimum thickness of 0.6 m, clay seal material shall be according to OPSS 1205 and OPSD 802.095. The clay seal (i.e., silty clay) material shall be compacted to a minimum of 95% SPMDD in loose lifts of no thicker than 300 mm. Acceptable imported clay material may be used for the construction of the clay seals.

8.0 CEMENT TYPE AND CORROSION POTENTIAL

One soil sample was submitted to Parcel laboratories for testing of chemical properties relevant to exposure of concrete elements to sulphate attacks as well as potential soil corrosivity effects on buried metallic structural elements. Test results are presented in Table 6-6 and the laboratory results for the chemical analysis are shown in appendix B.

Electrical resistivity, pH-value, and chloride concentration can provide an indication of the corrosion potential to buried steel elements in contact with subsurface environment. Using a corrosion nomograph proposed by King (1977) for buried metals and based on electrical resistivity results and pH-value, the corrosion potential for buried steel elements is within the non-aggressive range. The corrosive effects of road de-icing salts should also be considered.

The analytical results of the soil sample were compared with applicable Canadian Standards Association (CSA) A23.1-04 and are given in Table 8-1 below.

Table 8-1: Additional Requirement for Concrete Subjected to Sulphate Attack

Class of Exposure	Degree of Exposure	Water Soluble Sulphate in Soil Sample (%)	Cementing Material to be Used
S-1	Very Severe	> 2.0	HS or HSb
S-2	Severe	0.2 – 2.0	HS or HSb
S-3	Moderate	0.1 – 0.2	MS, MSb, LH, HS, or HSb

The chemical sulphate content analyses for selected soil sample tested indicate a sulphate concentration of maximum of a 0.013 % in soil, as shown in Table 6-6, indicating a “moderate to low” risk for sulphate attack on concrete material. The selection for class of concrete should include consideration of the effects of road de-icing salts.

9.0 PAVEMENT STRUCTURE

Since a new roadway will be required to reach the proposed enclosure, recommendation included in this section can be used for the pavement design. Investigation results indicated approximately 200 mm of sand and gravel fill in BH24-3A, and such material can be stock piled and reused to replace the soft and unsuitable soil when proof rolling the exposed subgrade. The native Sandy Silt is considered as a high susceptible for frost heave and therefore it cannot be reused in backfilling.

The production and placement of asphaltic concrete and granular materials shall conform to the requirements of OPSS MUNI 1003, 1151 for Superpave mixes and OPSS 1150 for Marshal mixes.

Prior to placing the pavement structure, any loose, or unstable soil should be removed, and the subgrade prepared as noted below. Pavement subgrade can consist of the native Sandy Silt.

Pavement subgrade should be compacted to at least 98% of the SPMD and proof rolled. Areas exhibiting more than 20 mm deflection should have the top 300mm removed and replaced with approved drier materials.

Sub-grade up-fill should also be compacted to at least 98% of the standard Proctor density of the material, at or below the optimum moisture content (OMC) in lifts not exceeding 200 mm in thickness.

The Granular Base and Subbase layers should be compacted to at least 100% of the SPMD. In the extreme cases, such as during the wet season, the top 300mm of the sub-grade may have to be replaced by compacted granular material to compensate for the inadequate strength of the wet sub-grade.

Table 9-1 provides the minimum recommended thicknesses of both heavy and light duty pavements. If the use of the access road is limited to maintenance pickup trucks and snowplows, then it may be considered as a light duty pavement. However, the proposed access road should match with the existing connecting road structure to reduce the risk of differential behaviors between the existing and proposed surfaces and to extend the purpose that the original road was built to serve.

Table 9-1: Proposed Pavement Structure

Material		Heavy Duty Thickness (mm)	Light Duty Thickness (mm)
Surface	HL3 or Superpave 12.5 mm, Design Category B, PG 58-28*	50	50
Binder	HL8 or Superpave 19.0 mm, Design Category B, PG 58-28*	50	--
Base	OPSS Granular A	150	150
Sub-base	OPSS Granular B Type II	400	300

*-New hot mix or up to a maximum of 20% RAP

The existing asphalt should be cut back a minimum of 3 m from the edge of any excavation. Top 50 mm of the existing asphalt shall be also milled for 0.3 m to stagger the surface joint and the binder joint. Both base and sub-base should be compacted to 100% SPMD. Asphalt layers should be compacted to comply with OPSS.MUNI 310. Asphalt layers shall be compacted to minimum 92% and maximum 97% density, 4% air void is ideal.

10.0 ENVIRONMENTAL SOIL SAMPLING AND ANALYSIS

Egis carried out a scoped due diligence environmental subsurface investigation on January 26, 2024, following the geotechnical field investigation conducted at the Site. It is understood that the due diligence sampling program is intended to inform future tendering of work at the Site, and as such, Egis did not complete an Assessment of Past Uses (APU) or Sampling and Analysis Plan (SAP) for the Site prior to the investigation. Egis staff carried out the collection, screening, and laboratory analysis of soil samples. This included the completion of two (2) boreholes and the submission of one (1) soil sample per borehole (two total) for analysis of contaminants of potential concern, as well as Toxicity Characteristic Leaching Procedure (TCLP) leachate analysis. As agreed with the Client, the sampling did not strictly comply with the required sampling to meet Ontario Regulation (O. Reg.) 406/19 and was instead intended to provide general soil quality information of the soils that will become excess at the Site, with the understanding that additional sampling/testing will be conducted following the tendering of the work. This investigation was conducted in accordance with Egis' Standard Operating Procedures.

Soil results were compared to the following Site Condition Standards for the purposes of this report, from the document entitled "*Generic Excess Soil Quality Standards*" as defined within the MECP document "Rules for Soil Management and Excess Soil Quality Standards," dated December 23, 2022.

- Table 1: Full Depth Background Site Condition Standards for Agricultural and Other Property Uses;
- Table 1: Full Depth Background Site Condition Standards for Residential, Parkland, Institutional, Industrial, Commercial and Community Property Uses;
- Table 2.1: Full-Depth Excess Soil Quality Standards for Agricultural and Other Uses in a Potable Groundwater Condition (Volume-independent);

- Table 2.1: Full-Depth Excess Soil Quality Standards for Residential, Parkland and Institutional Property Uses in a Potable Groundwater Condition (Volume-independent);
- Table 2.1: Full-Depth Excess Soil Quality Standards for Industrial, Commercial, Community Property Uses in a Potable Groundwater Condition (Volume-independent);
- Table 3.1: Full-Depth Excess Soil Quality Standards for Residential, Parkland, Institutional Property Uses in a Non-Potable Groundwater Condition (Volume-independent); and,
- Table 3.1: Full-Depth Excess Soil Quality Standards for Industrial, Commercial, Community Property Uses in a Non-Potable Groundwater Condition (Volume-independent).

The Toxicity Characteristic Leaching Procedure (TCLP) screening results were compared to:

- O. Reg 558/04 General – Waste Management, Schedule 4 Leachate Quality Criteria.

It is important to note that soil only becomes “excess soil” if it is not reused within the project limits. To minimize the generation of waste and environmental impact, every attempt should be made to reuse the soil within the project limits if a geotechnically suitable use can be found. It is recommended that for any soils found to have exceedances of all the above noted SCS and ESQS, an attempt should be made to reuse this soil within the Project Area, for landscaping berms or to improve drainage, if there will be no adverse impacts. If this cannot be accomplished any heavily contaminated soils should be disposed of at a licensed landfill.

It is recommended that reuse of contaminated soils within the Project Area, once fully characterized, shall only be located:

- a. A minimum of 30 metres (m) away from waterbodies;
- b. A minimum of 3 m away from the property line (boundary);
- c. A minimum of 2 m above the ground water table;
- d. A minimum of 100 m from water wells; and
- e. Covered with 0.3 m of clean soil and revegetated or capped.

10.1 Scope of Investigation

The due diligence environmental investigation at the Site consisted of the following components:

- Underground service locate clearance was provided by public utility services through Ontario One Call;
- The advancement of two (2) auger holes at the Site to a maximum depth of 4.4 m below ground surface (m bgs);
- Submission of select “worst case” soil samples from target depths, collected from each auger hole, as determined through field screening, general coverage, and the judgement of the field staff, for laboratory analyses of petroleum hydrocarbons (PHCs) in the F1 to F4 fraction ranges (F1-F4); benzene, toluene, ethylbenzene, and xylene (BTEX); polycyclic aromatic hydrocarbons (PAHs), metals and inorganic parameters, and volatile organic compounds (VOCs);
- Submission of “worst case” soil leachate samples for toxicity characteristic leaching procedure (TCLP) analyses; and

- Completion of a Due Diligence Soils Investigation discussion, presented within the geotechnical investigation report for the Site.

10.2 Investigation Methods

As agreed with the Client, this investigation was conducted for due diligence purposes for general characterization of the soil at the Site and does not fully comply with the requirements of O. Reg. 406/19, O. Reg. 153/04, nor the MECP “Rules for Soil Management and Excess Soil Quality Standards.” The Client requested testing of 1-2 soil samples from each Site and one (1) TCLP sample to provide general soil quality information. It is understood that additional sampling/testing would be completed once the work has been tendered.

A total of two (2) boreholes were advanced within the Project Area in areas where excess soil is expected to be generated.

Site Location is presented in Figure 1. Borehole locations along the Site are shown in Appendix A.

10.3 Soil Sampling

A total of seven (7) soil samples, three (3) from BH24-3A and four (4) from BH24-3B, were collected at the Site using a Mobile B53 track-mounted drilling rig, outfitted with solid stem augers. The seven (7) soil samples were collected to a maximum depth of 4.4 m bgs. All samples were collected directly into Ziploc® bags and screened. Two (2) of the seven (7) soil samples were submitted for laboratory analysis using a “worst-case” scenario and were then placed into laboratory supplied containers and placed into chilled coolers for transport to the laboratory, Eurofins Scientific (Eurofins), under strict Chain of Custody documentation protocols. Eurofins is accredited by the Standards Council of Canada and the Canadian Association for Laboratory Accreditation, in accordance with the international standard ISO/IEC 17025:2005 – *General Requirements for the Competence of Testing and Calibration Laboratories*. Eurofins is accredited for analysis of all parameters required under the O. Reg. 153/04 – Record of Site Condition, as outlined in the MECP Technical Update entitled ‘*Laboratory Accreditation Requirements Under the New Record of Site Condition Regulation (O. Reg. 153/04)*’.

One (1) representative composite sample was obtained for TCLP leachate analyses to determine disposal options for potentially contaminated soil. A modified Synthetic Precipitation Leaching Procedure (mSPLP) sample was not submitted.

All non-dedicated equipment used during soil sampling (i.e., hand auger) were cleaned between sampling with a mixture of Alconox® and water. Additionally, prior to use on-Site, the RKI Eagle 2 used as part of this Soil Characterization investigation was calibrated to manufacturer specifications by the equipment supplier (Maxim Environmental).

The following summarizes the soil samples submitted for laboratory analyses:

Table 10-1: Samples Submitted

BH ID	Sample ID	Coordinates (UTM Zone 18N)	Approx. Depth (mbgs)	Chemical Analysis	Rationale
BH24-3A	BH24-3A ¹	N: 4899697.785 E: 384966.762	0.00 – 1.37	PHC F1-F4, BTEX, PAHs, M&I, VOC	General soil information at the Site
BH24-3B	BH24-3B (24-3B-SS1)	N: 4899672.247 E: 384969.885	0.00 – 0.60	PHC F1-F4, BTEX, PAHs, M&I, VOC	General soil information at the Site
Composite	TCLP-24-3	-	-	TCLP Metals, TCLP PHCs, TCLP PAHs, TCLP VOCs	Off-site disposal options

¹Composite sample submitted (24-3A-SS1 and 24-3A-SS2) due to low recovery.

10.4 Analytical Results

The COPCs at the Site are VOCs including BTEX, PHCs (F1-F4), PAHs, and metals and inorganics.

The analytical results were compared to the following criteria:

- Table 1 AO SCS;
- Table 1 RPIICC SCS;
- Table 2.1 AO ESQS;
- Table 2.1 RPI ESQS;
- Table 2.1 ICC ESQS;
- Table 3.1 RPI ESQS; and
- Table 3.1 ICC ESQS.

The exceedances are summarized in Table 10-2 below. Laboratory Certificates of Analysis are presented in Appendix B.

Analytical results are only applicable to locations and excavation depths stated in this document. The Client will be responsible for characterization of the soil and ensuring the appropriate number of bulk and leachate samples are collected and analyzed in order to meet the testing requirements outlined in O.Reg. 406/19 and by the chosen reuse sites, as applicable

Additionally, if olfactory evidence (i.e. staining, odours, etc.) is noted in the soils during construction, testing of soils should be completed by the Contractor to determine soil quality and appropriate reuse and/or disposal, if unknown.

A summary of soil results exceedances are presented in Table 10-2 below:

Table 10-2: Analytical Summary – Exceedances

BH ID	Sample ID:	Sample Depth Range (m bgs)	Table 1 AO SCS	Table 1 RPI/ICC SCS	Table 2.1 AO ESQS	Table 2.1 RPI ESQS	Table 2.1 ICC ESQS	Table 3.1 RPI ESQS	Table 3.1 ICC ESQS
24-3A	24-3A (Composite of 24-3A-SS1, and 24-3A-SS2)	0.00 – 1.37	Ba, Se	Ba, Se	-	-	-	-	-
24-3B	24-3B (24-3B-SS1)	0.00 – 0.60	Se	-	-	-	-	-	-

*Note: Barium (Ba), Selenium (Se)

All other tested parameters were below the noted SCS/ESQS guidelines.

10.5 TCLP Leachate Results

One (1) soil sample was submitted to Eurofins on January 26, 2024, for TCLP analyses of metals and inorganics, PHC, VOC, and PAH leachate criteria.

The TCLP leachate analytical results are compared to Schedule 4: Leachate Quality Criteria in O. Reg 558/00 General – Waste Management made under the Environmental Protection Act, dated October 10, 2000.

A review of the analytical results indicates that the TCLP sample did not exceed the Leachate Quality Criteria for any of the analyzed parameters, and thus, should be classified as non-hazardous solid waste.

The analytical results for the TCLP sample and Laboratory Certificates of Analysis are appended.

10.6 Conclusions

Of the two (2) borehole locations sampled during the investigation, all of the samples submitted met the above-noted Site Condition Standards or Excess Soil Quality Standards with the exception of Table 1 SCS for select metals. Borehole 24-3A exceeded Table 1 R/P/I/I/C/C SCS for barium and selenium. Borehole 24-3B exceeded Table 1 AO SCS for selenium. It should be noted that barium and selenium concentrations were consistently detectable in boreholes across the Sites (Sites 1-4) and as such, it is considered possible that these exceedances in BH24-3A and BH24-3B may be of natural origin. Barium and selenium-impacted soils may be suitable for reuse at a site with similarly elevated levels of metals. All other analyzed parameters were found at concentrations below SCS/ESQS.

The Client will be responsible for full characterization of any excess soil and for ensuring the appropriate number of bulk samples, leachate samples, and reporting is completed to meet the testing requirements outlined by O.Reg. 406/19 and the chosen reuse sites, as applicable.

It is important to note that soil only becomes "excess soil" if it is not reused within the Project Area. To minimize the generation of waste and environmental impact, every attempt should be made to reuse the soil within the project limits if a geotechnically suitable use can be found. It is recommended that any soils found to exceed of all the above noted SCS and ESQS, that an attempt should be made to reuse this soil on site, such as in berms or to improve drainage, if there will be no adverse impacts. If this cannot be accomplished any heavily contaminated soils should be disposed of at a licensed landfill.

11.0 CONSTRUCTION CONSIDERATIONS

The recommendations presented in this report are based on the assumption that an adequate level of construction monitoring by qualified geotechnical personnel during construction will be provided. All bearing surfaces should be inspected and approved by experienced geotechnical personnel prior to placing the footings or lean mix concrete.

In addition, an adequate level of construction monitoring should include laboratory and field test during construction. This includes Full time compaction testing of Engineered Fill and part time compaction testing under the slab on grade platform backfill with laboratory testing for the proposed fill soils for this Site. Also, periodic testing of concrete is required.

The vibration should be kept at a minimal level to avoid soil disturbance and associated unexpected settlement to the nearby structures, roadway, load bearing elements, and utilities. Also, the noise level should be kept at a tolerance level of noise per the City of Kingston requirements. Vibration and deformation monitoring will be required throughout the construction.

A separate monitoring program should be developed by the shoring designer to monitor the inward movements of the excavation support system to ensure compliance with the design assumptions and avoidance of adverse impacts on nearby structures and buried services.

Also as noted earlier in this report, the existing native soil cannot be used as engineered fill, bedding, cover, or any part of the pavement structure. If the existing native soil is to be reused for backfilling, it has to be reviewed by a geotechnical engineer and approved through bulk sampling and Proctor testing. However, it still can be reused for landscaping.

12.0 IMPORTANT INFORMATION AND LIMITATIONS OF THIS REPORT

The geotechnical assessment presented in this report are intended for the sole guidance of the client named and their design consultants. It should not be relied upon for any other purpose.

In the event of change of the design, further geotechnical investigation must be carried out.

The information on which these recommendations are based is subject to confirmation by engineering personnel at the time of construction.

The data we have collated and the opinions we have formed after reviewing this information should not be construed as a guarantee but only as a guide to probable expectations. Conditions that exist, but are not recorded herein, were not apparent given the level of study authorized.

Localized variations in the subsurface conditions may be present between and beyond the boreholes advanced, and that these conditions may be significantly different from the general description provided for design purposes.

It is strongly urged that Egis should be contacted to aid in the interpretation of the borehole records by anyone undertaking work on/or below the ground surface at this Site prior to this work being carried out.

The client expressly agrees that it has entered into this agreement with Egis, both on its own behalf and as an agent on behalf of its employees and principals.

The client expressly agrees that Egis employees and principals shall have no personal liability to the client in respect of a claim, whether in contract, tort, and/or any other cause of action in law. Accordingly, the client expressly agrees that it will bring no proceedings and take no action in any court of law against any Egis employees or principals in their personal capacity.

13.0 CLOSURE

We trust that the following information is sufficient for your needs. We will be pleased to discuss the salient findings of this report with you, should you wish. If you require our further services in this regard, please do not hesitate to contact our office.

Yours truly,

Egis Canada Limited.

Field work carried out by:



Jeffrey Forrester, C.E.T.
Foundations Coordinator

The Geotechnical Part of the Report prepared by:



Zeyad Buni, P.Eng.,
Practice Area Lead, Geotechnical Services

The Geotechnical Part of the Report reviewed by:



Esam Deif, P.Eng.,
Vice President, Geotechnical Services

The Environmental Soil Sampling and
Analysis Part of the Report



Jordan Bowman, P.Geo., P.Biol.
Manager, Geo-Environmental

Egis Group Canada

Appendix A – Borehole Location Plan and Borehole Logs

EXPLANATION OF TERMS USED IN REPORT

N-VALUE: THE STANDARD PENETRATION TEST (SPT) N-VALUE IS THE NUMBER OF BLOWS REQUIRED TO CAUSE A STANDARD 51mm O.D SPLIT BARREL SAMPLER TO PENETRATE 0.3m INTO UNDISTURBED GROUND IN A BOREHOLE WHEN DRIVEN BY A HAMMER WITH A MASS OF 63.5 kg, FALLING FREELY A DISTANCE OF 0.76m. FOR PENETRATIONS OF LESS THAN 0.3m N-VALUES ARE INDICATED AS THE NUMBER OF BLOWS FOR THE PENETRATION ACHIEVED. AVERAGE N-VALUE IS DENOTED THUS N.

DYNAMIC CONE PENETRATION TEST: CONTINUOUS PENETRATION OF A CONICAL STEEL POINT (51mm O.D. 60° CONE ANGLE) DRIVEN BY 475J IMPACT ENERGY ON 'A' SIZE DRILL RODS. THE RESISTANCE TO CONE PENETRATION IS MEASURED AS THE NUMBER OF BLOWS FOR EACH 0.3m ADVANCE OF THE CONICAL POINT INTO THE UNDISTURBED GROUND.

SOILS ARE DESCRIBED BY THEIR COMPOSITION AND CONSISTENCY OR DENSENESS.

CONSISTENCY: COHESIVE SOILS ARE DESCRIBED ON THE BASIS OF THEIR UNDRAINED SHEAR STRENGTH (c_u) AS FOLLOWS:

C_u (kPa)	0 – 12	12 – 25	25 – 50	50 – 100	100 – 200	>200
	VERY SOFT	SOFT	FIRM	STIFF	VERY STIFF	HARD

COMPACTION: COHESIONLESS SOILS ARE DESCRIBED ON THE BASIS OF DENSENESS AS INDICATED BY SPT N VALUES AS FOLLOWS:

N (BLOWS/0.3m)	0 – 5	5 – 10	10 – 30	30 – 50	>50
	VERY LOOSE	LOOSE	COMPACT	DENSE	VERY DENSE

ROCKS ARE DESCRIBED BY THEIR COMPOSITION AND STRUCTURAL FEATURES AND/OR STRENGTH.

RECOVERY: SUM OF ALL RECOVERED ROCK CORE PIECES FROM A CORING RUN EXPRESSED AS A PERCENT OF THE TOTAL LENGTH OF THE CORING RUN.

MODIFIED RECOVERY: SUM OF THOSE INTACT CORE PIECES, 100mm+ IN LENGTH EXPRESSED AS A PERCENT OF THE LENGTH OF THE CORING RUN. THE ROCK QUALITY DESIGNATION (RQD), FOR MODIFIED RECOVERY IS:

RQD (%)	0 – 25	25 – 50	50 – 75	75 – 90	90 – 100
	VERY POOR	POOR	FAIR	GOOD	EXCELLENT

JOINT AND BEDDING:

SPACING	50mm	50 – 300mm	0.3m – 1m	1m – 3m	>3m
JOINTING	VERY CLOSE	CLOSE	MOD. CLOSE	WIDE	VERY WIDE
BEDDING	VERY THIN	THIN	MEDIUM	THICK	VERY THICK

ABBREVIATIONS AND SYMBOLS

FIELD SAMPLING

SS	SPLIT SPOON	TP	THINWALL PISTON
AS	AUGER SAMPLE	OS	OSTERBERG SAMPLE
ST	SLOTTED TUBE SAMPLE	RC	ROCK CORE
BS	BLOCK SAMPLE	PH	TW ADVANCED HYDRAULICALLY
CS	CHUNK SAMPLE	PM	TW ADVANCED MANUALLY
SHELBY	SHELBY TUBE SAMPLE	FS	FOIL SAMPLE

STRESS AND STRAIN

u_w	kPa	PORE WATER PRESSURE
r_u	1	PORE PRESSURE RATIO
σ	kPa	TOTAL NORMAL STRESS
σ'	kPa	EFFECTIVE NORMAL STRESS
τ	kPa	SHEAR STRESS
$\sigma_1, \sigma_2, \sigma_3$	kPa	PRINCIPAL STRESSES
ε	%	LINEAR STRAIN
$\varepsilon_1, \varepsilon_2, \varepsilon_3$	%	PRINCIPAL STRAINS
E	kPa	MODULUS OF LINEAR DEFORMATION
G	kPa	MODULUS OF SHEAR DEFORMATION
μ	1	COEFFICIENT OF FRICTION

MECHANICAL PROPERTIES OF SOIL

m_v	kPa^{-1}	COEFFICIENT OF VOLUME CHANGE
c_c	1	COMPRESSION INDEX
c_s	1	SWELLING INDEX
c_a	1	RATE OF SECONDARY CONSOLIDATION
c_v	m^2/s	COEFFICIENT OF CONSOLIDATION
H	m	DRAINAGE PATH
T_v	1	TIME FACTOR
U	%	DEGREE OF CONSOLIDATION
σ'_{v0}	kPa	EFFECTIVE OVERBURDEN PRESSURE
σ'_p	kPa	PRECONSOLIDATION PRESSURE
τ_t	kPa	SHEAR STRENGTH
c'	kPa	EFFECTIVE COHESION INTERCEPT
Φ_i	$^\circ$	EFFECTIVE ANGLE OF INTERNAL FRICTION
c_u	kPa	APPARENT COHESION INTERCEPT
Φ_u	$^\circ$	APPARENT ANGLE OF INTERNAL FRICTION
τ_R	kPa	RESIDUAL SHEAR STRENGTH
τ_r	kPa	REMOULDED SHEAR STRENGTH
S_t	1	SENSITIVITY = c_u / τ_r

PHYSICAL PROPERTIES OF SOIL

P_s	kg/m^3	DENSITY OF SOLID PARTICLES	e	1, %	VOID RATIO	e_{\min}	1, %	VOID RATIO IN DENSEST STATE
γ_s	kN/m^3	UNIT WEIGHT OF SOLID PARTICLES	n	1, %	POROSITY	I_D	1	DENSITY INDEX = $\frac{e_{\max} - e}{e_{\max} - e_{\min}}$
P_w	kg/m^3	DENSITY OF WATER	w	1, %	WATER CONTENT	D	mm	GRAIN DIAMETER
γ_w	kN/m^3	UNIT WEIGHT OF WATER	S_r	%	DEGREE OF SATURATION	D_n	mm	N PERCENT – DIAMETER
P	kg/m^3	DENSITY OF SOIL	w_L	%	LIQUID LIMIT	C_u	1	UNIFORMITY COEFFICIENT
γ	kN/m^3	UNIT WEIGHT OF SOIL	w_p	%	PLASTIC LIMIT	h	m	HYDRAULIC HEAD OR POTENTIAL
P_d	kg/m^3	DENSITY OF DRY SOIL	w_s	%	SHRINKAGE LIMIT	q	m^3/s	RATE OF DISCHARGE
γ_d	kN/m^3	UNIT WEIGHT OF DRY SOIL	I_p	%	PLASTICITY INDEX = $(W_L - W_P)$	v	m/s	DISCHARGE VELOCITY
P_{sat}	kg/m^3	DENSITY OF SATURATED SOIL	I_L	1	LIQUIDITY INDEX = $(W - W_P) / I_p$	i	1	HYDRAULIC GRADIENT
γ_{sat}	kN/m^3	UNIT WEIGHT OF SATURATED SOIL	I_C	1	CONSISTENCY INDEX = $(W_L - W) / I_p$	k	m/s	HYDRAULIC CONDUCTIVITY
P'	kg/m^3	DENSITY OF SUBMERGED SOIL	e_{\max}	1, %	VOID RATIO IN LOOSEST STATE	j	kN/m^3	SEEPAGE FORCE
γ'	kN/m^3	UNIT WEIGHT OF SUBMERGED SOIL						

Site #3





Legend

-  Boreholes
-  Site#3



Google Earth

60 m

PROJECT NO.: CCO-24-2687					Drilling Date: Jan/23/2024 - Jan/23/2024					BH No: 24-3A							
PROJECT: Geotech Investigation - Proposed Watermain Valves and Structures					BH Location: N 4899697.785; E 384966.762					Datum: Geodetic							
CLIENT: Eastpoint Engineering Ltd					Drilling Equipment: Mobile B53					Elevation: 103.2 m							
PROJECT LOCATION: CFB Kingston, ON					Drilling Method: Solid Stem Auger					Compiled by: JP							
					Remarks: Coordinate System - UTM Zone 18T					Checked by: ZB							
SOIL PROFILE			SAMPLES				GROUNDWATER CONDITIONS	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT				PLASTIC LIMIT	NATURAL MOISTURE CONTENT	LIQUID LIMIT	Remarks and Grain Size Distribution (%)
ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS/0.3 m	RQD (%)				RECOVERY (%)	SHEAR STRENGTH (kPa)						
103.2																	
0.0	Topsoil																
103.1																	
0.2	FILL																
102.9	sand and gravel, some fines, loose, brown to dark brown, moist		1	SS	7	50%											33 39 (28)
0.3	SANDY SILT some gravel, compact light brown moist to wet																
101.6			3	SS	50/ 75 mm	29%											
1.6	Auger Refusal @ 1.66 m on inferred bedrock Borehole dry upon completion																

PROJECT NO.: CCO-24-2687

PROJECT: Geotech Investigation - Proposed Watermain Valves and Structures

CLIENT: Eastpoint Engineering Ltd

PROJECT LOCATION: CFB Kingston, ON

Drilling Date: Jan/23/2024 - Jan/23/2024

BH Location: N 4899672.247; E 384969.885

Drilling Equipment: Mobile B53

Drilling Method: Solid Stem Auger

Remarks: Coordinate System - UTM Zone 18T

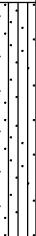
BH No: 24-3B

Datum: Geodetic

Elevation: 102.4 m

Compiled by: JP

Checked by: ZB

SOIL PROFILE			SAMPLES				GROUNDWATER CONDITIONS	DEPTH (m)	ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT					NATURAL MOISTURE CONTENT					LIQUID LIMIT					Remarks and Grain Size Distribution (%) Unit Weight (kN/m ³) Pocket Penetro. (kPa)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS/0.3 m RQD (%)	RECOVERY (%)				SHEAR STRENGTH (kPa)					WATER CONTENT (%)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
										Field: Shear Vane (x) & Sensitivity (s) Pocket Penetrometer x Unconfined ● Quick Triaxial ○																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
102.4 0.0	SANDY SILT some gravel loose light brown moist		1	SS	5	83%																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			

1MP SOIL LOG GINT CFB KINGSTON.GPJ_MP_OTTAWA_FOUNDATIONS.GDT 3/21/24

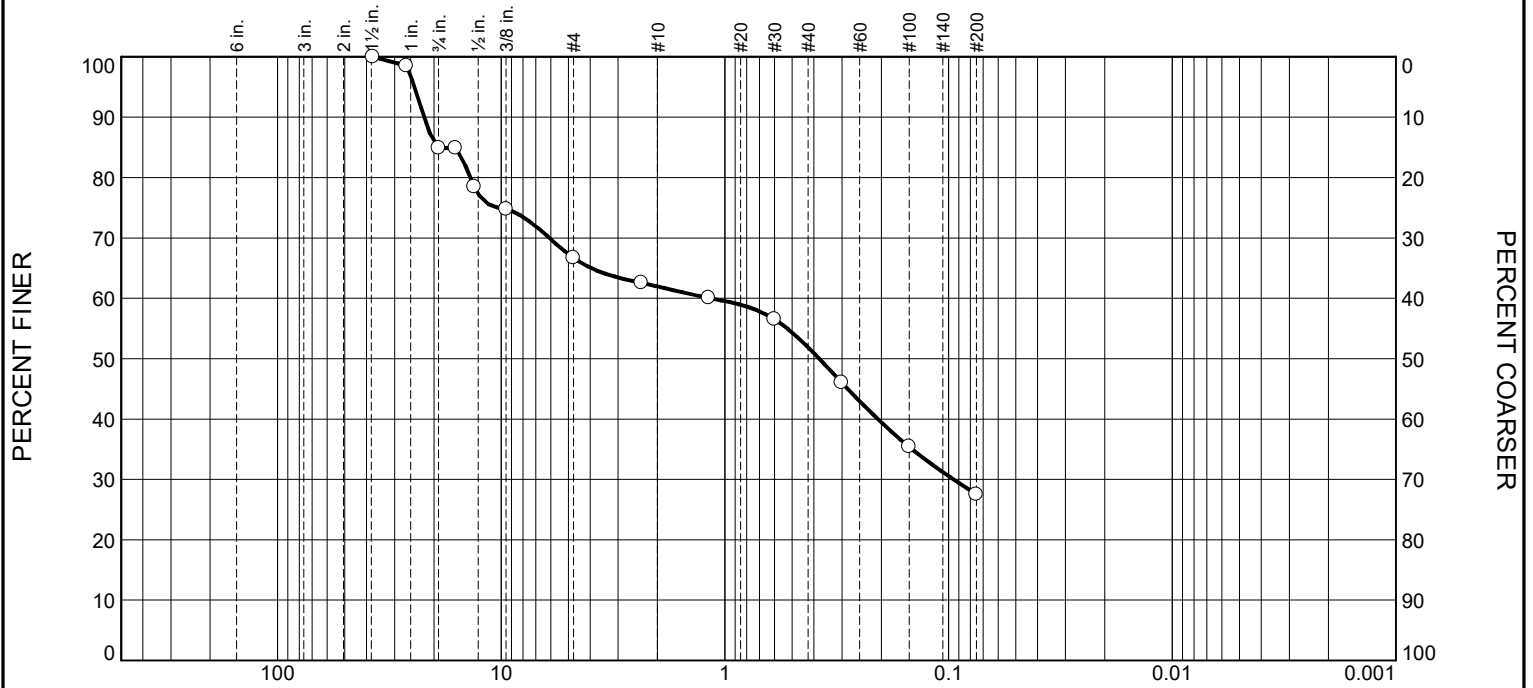
Egis Group Canada

Appendix B – Laboratory Test Results

WATER CONTENT DETERMINATION

Test Method Utilized <input checked="" type="checkbox"/> MTO LS-701 <input type="checkbox"/> ASTM D 2216 <input type="checkbox"/> AASHTO T-265							
Project No.: CCO-24-2687-01-02						Date Received: Feb 9,2024	
Project Name/Location: Geotech Invest. - CFB Kingston						Date Tested: Feb 10,2024	
Material Type: Soils						Lab Sample No.: OL-24002	
Borehole No.	Depth Sample Taken (ft ')	Sample Container I.D.	Wet Sample + Tare (A)	Dry Sample + Tare (B)	Tare (C)	Mass of Sample (D) (B-C)	% Moisture (A-B)/Dx100
BH24-1A SS-1	0'-2'	P.69	318.16	282.54	182.13	100.41	35.5
BH24-1B SS-1	0'-2'	P.6	285.79	258.39	152.05	106.34	25.8
BH24-2A SS-1	0'-2'	P.22	666.87	617.29	166.59	450.70	11.0
BH24-2B SS-2	2.6'-4.6'	P.66	304.70	264.11	134.84	129.27	31.4
BH24-3A SS-1	0'-2'	P.51	359.54	322.24	139.54	182.70	20.4
BH24-4A SS-2	2.6'-4.6'	P.21	816.95	751.00	177.55	573.45	11.5
BH24-4B SS-3	5'-7'	P.73	728.20	682.34	180.64	501.70	9.1
BH24-4B SS-4	7.6'-9.6'	P.36	575.25	555.70	130.00	425.70	4.6
Non-Conformance's from Test Procedure: N/A							
Comments:							
Checked by: J.H-J				Signature:			

Particle Size Distribution Report



GRAIN SIZE - mm

% +75mm	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	15.1	18.2	4.7	10.1	24.4	27.5	

TEST RESULTS			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
37.5mm	100.0		
26.5mm	98.5		
19.0mm	84.9		
16.0mm	84.9		
13.2mm	78.5		
9.5mm	74.8		
4.75mm	66.7		
2.36mm	62.6		
1.18mm	60.1		
0.600mm	56.5		
0.300mm	46.0		
0.150mm	35.4		
0.075mm	27.5		

* (no specification provided)

Material Description		
Gravelly Silty/Clayey Sand		
Atterberg Limits (ASTM D 4318)		
PL=	LL=	PI=
Classification		
USCS (D 2487)=	AASHTO (M 145)=	
Coefficients		
D ₉₀ = 22.1158	D ₈₅ = 19.1563	D ₆₀ = 1.1598
D ₅₀ = 0.3787	D ₃₀ = 0.0950	D ₁₅ =
D ₁₀ =	C _u =	C _c =
Remarks		
Note: Specific gravity of soils is assumed.		
Organics present.		
F.M.=3.13		
Date Received: Feb 8,2024	Date Tested: Feb 13,2024	
Tested By: R.C		
Checked By: J.Hopwood-Jones		
Title: Lab Manager		

Location: BH24-3A SS-1
Sample Number: SS-1

Depth: 0'-2'

Date Sampled: Jan 22,2024



Client: Eastpoint Engineering Ltd.
Project: CFB Kingston

Project No: CCO-24-2687

Figure

GRAIN SIZE DISTRIBUTION TEST DATA

2024-02-21

Client: Eastpoint Engineering Ltd.
Project: CFB Kingston
Project Number: CCO-24-2687
Location: BH24-3A SS-1
Depth: 0'-2' Sample Number: SS-1
Material Description: Gravelly Silty/Clayey Sand
Sample Date: Jan 22,2024
Date Received: Feb 8,2024
Testing Remarks: Note: Specific gravity of soils is assumed.
Organics present.
Tested By: R.C Test Date: Feb 13,2024
Checked By: J.Hopwood-Jones Title: Lab Manager

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
182.70	0.00	0.00	37.5mm	0.00	100.0	0.0
			26.5mm	2.74	98.5	1.5
			19.0mm	27.59	84.9	15.1
			16.0mm	27.59	84.9	15.1
			13.2mm	39.33	78.5	21.5
			9.5mm	46.09	74.8	25.2
			4.75mm	60.84	66.7	33.3
			2.36mm	68.39	62.6	37.4
			1.18mm	72.98	60.1	39.9
			0.600mm	79.42	56.5	43.5
			0.300mm	98.63	46.0	54.0
			0.150mm	118.04	35.4	64.6
			0.075mm	132.47	27.5	72.5

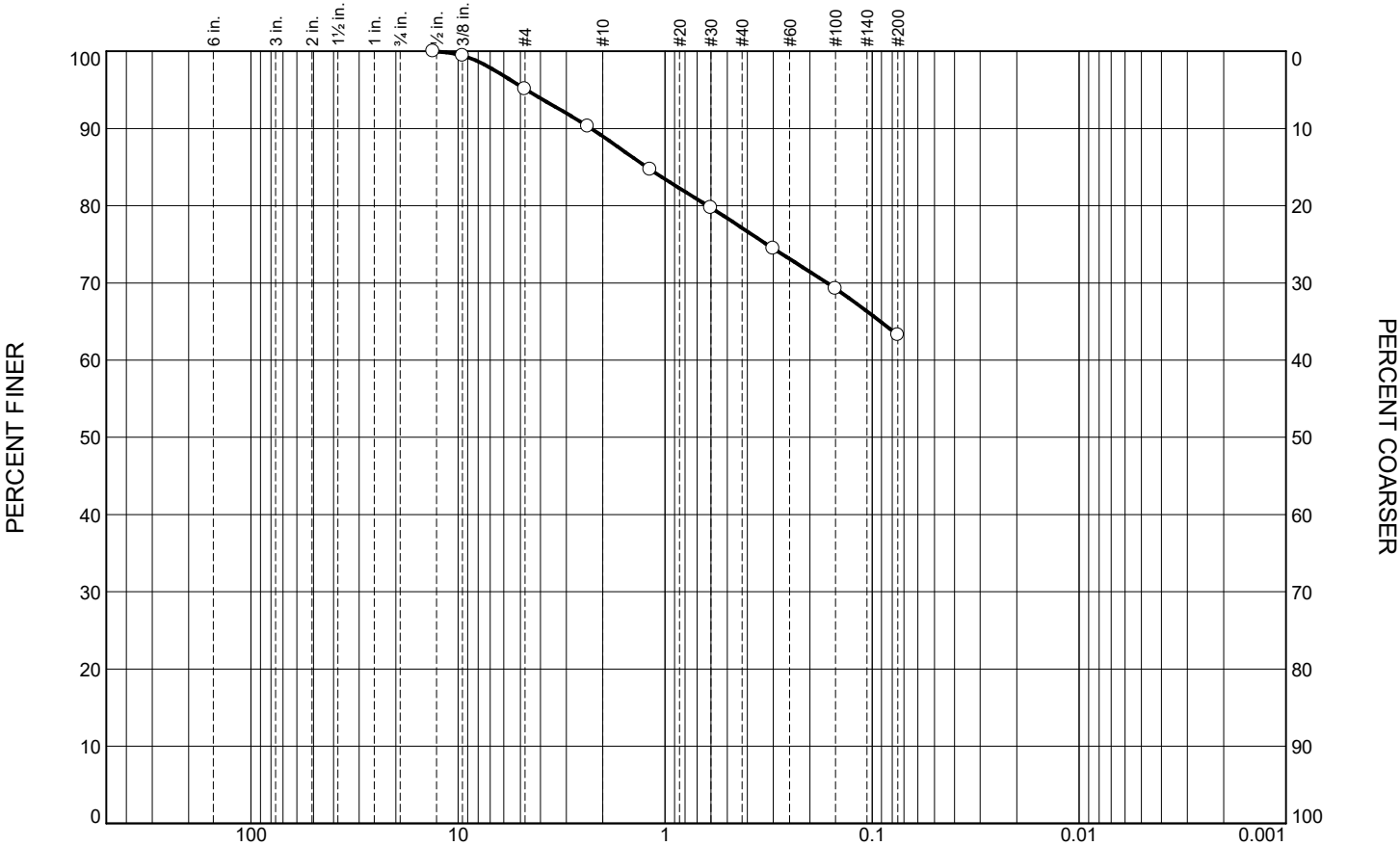
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	15.1	18.2	33.3	4.7	10.1	24.4	39.2			27.5

D5	D10	D15	D20	D30	D40	D50	D60	D80	D85	D90	D95
				0.0950	0.2071	0.3787	1.1598	13.7623	19.1563	22.1158	24.4174

Fineness Modulus
3.13

Particle Size Distribution Report



GRAIN SIZE - mm.

	% +75mm	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	4.9	6.1	11.9	13.8	63.3	

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	Added	GS-1	0'-2'	Sandy Silt/Clay trace fine Gravel	



Client: Eastpoint Engineering Ltd.

Project: CFB Kingston

Project No.: CCO-24-2687

Figure

Tested By: R.C Checked By: J.Hopwood-Jones

GRAIN SIZE DISTRIBUTION TEST DATA

2024-03-22

Client: Eastpoint Engineering Ltd.

Project: CFB Kingston

Project Number: CCO-24-2687

Location: BH24-3B GS-1

Depth: 0'-2'

Sample Number: GS-1

Material Description: Sandy Silt/Clay trace fine Gravel

Tested by: R.C

Checked by: J.Hopwood-Jones

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
493.17	0.00	0.00	13.2mm	0.00	100.0	0.0
			9.5mm	2.86	99.4	0.6
			4.75mm	24.18	95.1	4.9
			2.36mm	47.93	90.3	9.7
			1.18mm	75.50	84.7	15.3
			0.600mm	100.04	79.7	20.3
			0.300mm	126.02	74.4	25.6
			0.150mm	151.74	69.2	30.8
			0.075mm	181.18	63.3	36.7

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	4.9	4.9	6.1	11.9	13.8	31.8			63.3

D5	D10	D15	D20	D30	D40	D50	D60	D80	D85	D90	D95
								0.6237	1.2271	2.2736	4.6858

Fineness Modulus
1.07



Unconfined Compressive Strength of Intact Rock Cores
ASTM D7012 Method C

Project No.:	CCO-24-2687	Date Issued:	February 13, 2024
Lab No.:	OL- 23077	Report No.:	1 of 1
Project Name:	Geo.Inv./Env.Soil Sampling-CFB Kingston		
Core No.:	1	Moisture Condition:	Dry as received
Borehole Location:	BH24-1B	Run:	1
Depth (ft):	4'10"-5'3.5"		
Date Sampled:	Jan 18, 2024	Received:	Jan 26, 2024
Tested:	Feb 12, 2024		
Core No.:	2	Moisture Condition:	Dry as received
Borehole Location:	BH24-2B	Run:	1
Depth (ft):	8'6"-8'11.5"		
Date Sampled:	Jan 18, 2024	Received:	Jan 26, 2024
Tested:	Feb 12, 2024		
Core No.:	3	Moisture Condition:	Dry as received
Borehole Location:	BH24-3B	Run:	2
Depth (ft):	7'2"-7'7.5"		
Date Sampled:	Jan 18, 2024	Received:	Jan 26, 2024
Tested:	Feb 12, 2024		
Core No. :	1	2	3
Diameter (mm)	63.2	63.0	62.9
Thickness/Height (mm)	129.2	128.8	128.1
Density (Kg/m³)	2672	2736	2730
Compressive Strength (Mpa)	166.3	174.9	228.2
Mass of Core (kg)	1.083	1.099	1.087
Description of Failure	2	2	3

Remarks: Core#3 Diagonal fracture with some columnar vertical cracking through top end. No well formed
Cones on ether end.

Core#1&2 Relatively well-formed cone on one end, vertical cracks running through end, no well
formed cone on other end.

Reviewed By:

Jason Hopwood-Jones
Laboratory Manager

Date:

Feb 13, 2024



TRUSTED.
RESPONSIVE.
RELIABLE.

300 - 2319 St. Laurent Blvd
Ottawa, ON, K1G 4J8
1-800-749-1947
www.paracellabs.com

Certificate of Analysis

Egis Canada Ltd. (Nepean)

215 Menten Place, Unit 104
Nepean, ON K2H 9C1

Attn: Jason Hopwood-Jones

Client PO: CFB Kingston

Project: CCO-24-2687

Custody: 140454

Report Date: 15-Feb-2024

Order Date: 9-Feb-2024

Order #: 2406540

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
2406540-01	BH24-1B SS2
2406540-02	BH24-2B SS3
2406540-03	BH24-3B SS1
2406540-04	BH24-4B SS2

Approved By:

A handwritten signature in blue ink, appearing to read 'D. Robertson', on a light blue background.

Dale Robertson, BSc

Laboratory Director

Certificate of Analysis

Report Date: 15-Feb-2024

Client: Egis Canada Ltd. (Nepean)

Order Date: 9-Feb-2024

Client PO: CFB Kingston

Project Description: CCO-24-2687

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Anions	EPA 300.1 - IC, water extraction	12-Feb-24	12-Feb-24
pH, soil	EPA 150.1 - pH probe @ 25 °C, CaCl buffered ext.	13-Feb-24	13-Feb-24
Resistivity	EPA 120.1 - probe, water extraction	12-Feb-24	12-Feb-24
Solids, %	CWS Tier 1 - Gravimetric	14-Feb-24	15-Feb-24

Certificate of Analysis

Report Date: 15-Feb-2024

Client: Egis Canada Ltd. (Nepean)

Order Date: 9-Feb-2024

Client PO: CFB Kingston

Project Description: CCO-24-2687

	Client ID:	BH24-1B SS2	BH24-2B SS3	BH24-3B SS1	BH24-4B SS2		
	Sample Date:	22-Jan-24 09:00	22-Jan-24 09:00	22-Jan-24 09:00	22-Jan-24 09:00	-	-
	Sample ID:	2406540-01	2406540-02	2406540-03	2406540-04		
	Matrix:	Soil	Soil	Soil	Soil		
	MDL/Units						
Physical Characteristics							
% Solids	0.1 % by Wt.	83.3	77.5	77.6	91.3	-	-
General Inorganics							
pH	0.05 pH Units	7.41	7.40	6.90	7.32	-	-
Resistivity	0.1 Ohm.m	58.9	58.3	62.3	72.3	-	-
Anions							
Chloride	10 ug/g	<10	<10	<10	<10	-	-
Sulphate	10 ug/g	15	13	<10	<10	-	-

Certificate of Analysis

Report Date: 15-Feb-2024

Client: Egis Canada Ltd. (Nepean)

Order Date: 9-Feb-2024

Client PO: CFB Kingston

Project Description: CCO-24-2687

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions								
Chloride	ND	10	ug/g					
Sulphate	ND	10	ug/g					
General Inorganics								
Resistivity	ND	0.1	Ohm.m					

Certificate of Analysis

Report Date: 15-Feb-2024

Client: Egis Canada Ltd. (Nepean)

Order Date: 9-Feb-2024

Client PO: CFB Kingston

Project Description: CCO-24-2687

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	118	10	ug/g	110			7.0	35	
Sulphate	58.3	10	ug/g	57.8			0.8	35	
General Inorganics									
pH	7.12	0.05	pH Units	7.08			0.6	2.3	
Resistivity	12.9	0.1	Ohm.m	12.7			1.2	20	
Physical Characteristics									
% Solids	87.9	0.1	% by Wt.	88.0			0.1	25	

Certificate of Analysis

Report Date: 15-Feb-2024

Client: Egis Canada Ltd. (Nepean)

Order Date: 9-Feb-2024

Client PO: CFB Kingston

Project Description: CCO-24-2687

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	217	10	ug/g	110	107	82-118			
Sulphate	159	10	ug/g	57.8	101	80-120			

Certificate of Analysis

Report Date: 15-Feb-2024

Client: Egis Canada Ltd. (Nepean)

Order Date: 9-Feb-2024

Client PO: CFB Kingston

Project Description: CCO-24-2687

Qualifier Notes:

Sample Data Revisions:

None

Work Order Revisions / Comments:

Client confirmed all samples collected January 22, 2024.

Other Report Notes:

n/a: not applicable

ND: Not Detected

MDL: Method Detection Limit

Source Result: Data used as source for matrix and duplicate samples

%REC: Percent recovery.

RPD: Relative percent difference.

NC: Not Calculated

Soil results are reported on a dry weight basis unless otherwise noted.

Where %Solids is reported, moisture loss includes the loss of volatile hydrocarbons.

Any use of these results implies your agreement that our total liability in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.



Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
Invoice to: EGIS Canada Ltd.
PO#:

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844
Temperature (C): 7
Custody Seal:

Page 1 of 25

Dear Benjamin Edwards:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Report Comments:

Emma-Dawn Ferguson, Chemist

All analysis is completed at Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) unless otherwise stated

Eurofins Environment Testing Canada Inc. is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on the scope of accreditation. The scope is available at <https://directory.cala.ca/>

Please note: Field data, where presented on the report, has been provided by the client and is presented for informational purposes only. Guideline or regulatory limits listed on this report are provided for ease of use (informational purposes) only. Eurofins recommends consulting the official guideline or regulation as required. Unless otherwise stated, measurement uncertainty is not taken into account when determining guideline or regulatory exceedances.



Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0

Attention: Mr. Benjamin Edwards

PO#:

Invoice to: EGIS Canada Ltd.

Report Number: 3004774

Date Submitted: 2024-01-26

Date Reported: 2024-02-02

Project: CCO - 24 - 2687

COC #: 226844

Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

Exceedence Summary

Sample I.D.	Analyte	Result	Units	Criteria
Inorganics				
24-4A	Electrical Conductivity	0.61	mS/cm	STD 0.57
Metals				
24-1A	Barium	376	ug/g	STD 220
24-1A	Selenium	1.8	ug/g	STD 1.5
24-1B	Barium	377	ug/g	STD 220
24-2A	Barium	307	ug/g	STD 220
24-2B	Barium	442	ug/g	STD 220
24-2B	Selenium	1.6	ug/g	STD 1.5
24-3A	Barium	238	ug/g	STD 220
24-3A	Selenium	1.6	ug/g	STD 1.5
24-4A	Barium	317	ug/g	STD 220

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

Hydrocarbons

Lab I.D.
Sample Matrix
Sample Type
Sample Date
Sampling Time
Sample I.D.

1716832 Soil153	1716833 Soil153	1716834 Soil153	1716835 Soil153	1716836 Soil153
2024-01-26	2024-01-26	2024-01-26	2024-01-26	2024-01-26
24-1A	24-1B	24-2A	24-2B	24-3A

Analyte	Batch No	MRL	Units	Guideline
---------	----------	-----	-------	-----------

PHC's F1	455317	10	ug/g	STD 25	<10	<10	<10	<10	<10
PHC's F1-BTEX	455321	10	ug/g		<10	<10	<10	<10	<10
PHC's F2	455308	2	ug/g	STD 10		<2	<2		<2
	455313	2	ug/g	STD 10	<2			<2	
PHC's F2-Naph	455413	2	ug/g		<2	<2	<2	<2	<2
PHC's F3	455308	20	ug/g	STD 240		<20	<20		<20
	455313	20	ug/g	STD 240	<20			<20	
PHC's F3-PAH	455414	20	ug/g		<20	<20	<20	<20	<20
PHC's F4	455308	20	ug/g	STD 120		<20	<20		<20
	455313	20	ug/g	STD 120	<20			<20	

Hydrocarbons

Lab I.D.
Sample Matrix
Sample Type
Sample Date
Sampling Time
Sample I.D.

1716837 Soil153	1716838 Soil153	1716839 Soil153
2024-01-26	2024-01-26	2024-01-26
24-3B	24-4A	24-4B

Analyte	Batch No	MRL	Units	Guideline
---------	----------	-----	-------	-----------

PHC's F1	455317	10	ug/g	STD 25	<10	<10	<10
PHC's F1-BTEX	455321	10	ug/g		<10	<10	
	455322	10	ug/g				<10
PHC's F2	455308	2	ug/g	STD 10	<2		
	455313	2	ug/g	STD 10		<2	
	455411	2	ug/g	STD 10			<2
PHC's F2-Naph	455413	2	ug/g		<2	<2	<2
PHC's F3	455308	20	ug/g	STD 240	<20		
	455313	20	ug/g	STD 240		<20	

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

Hydrocarbons

Lab I.D.
Sample Matrix
Sample Type
Sample Date
Sampling Time
Sample I.D.

1716837 Soil153	1716838 Soil153	1716839 Soil153
2024-01-26	2024-01-26	2024-01-26
24-3B	24-4A	24-4B

Analyte	Batch No	MRL	Units	Guideline			
PHC's F3	455411	20	ug/g	STD 240			<20
PHC's F3-PAH	455414	20	ug/g		<20	<20	<20
PHC's F4	455308	20	ug/g	STD 120	<20		
	455313	20	ug/g	STD 120		<20	
	455411	20	ug/g	STD 120			<20

Metals

Lab I.D.
Sample Matrix
Sample Type
Sample Date
Sampling Time
Sample I.D.

1716832 Soil153	1716833 Soil153	1716834 Soil153	1716835 Soil153	1716836 Soil153
2024-01-26	2024-01-26	2024-01-26	2024-01-26	2024-01-26
24-1A	24-1B	24-2A	24-2B	24-3A

Analyte	Batch No	MRL	Units	Guideline					
Antimony	455434	1	ug/g	STD 1.3	<1	<1	<1	<1	<1
Arsenic	455434	1	ug/g	STD 18	5	6	4	4	3
Barium	455434	1	ug/g	STD 220	376*	377*	307*	442*	238*
Beryllium	455434	1	ug/g	STD 2.5	2	2	1	2	<1
Boron (total)	455434	5	ug/g	STD 36	13	10	10	10	11
Cadmium	455434	0.4	ug/g	STD 1.2	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium Total	455434	1	ug/g	STD 70		64	43	62	38
	455501	1	ug/g	STD 70	56				
Cobalt	455434	1	ug/g	STD 21		19	12	19	12
	455501	1	ug/g	STD 21	15				
Copper	455434	1	ug/g	STD 92		38	28	39	21
	455501	1	ug/g	STD 92	36				
Lead	455434	1	ug/g	STD 120		16	11	11	14
	455501	1	ug/g	STD 120	20				

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range



Certificate of Analysis

Environment Testing

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

Metals

Lab I.D. Sample Matrix Sample Type Sample Date Sampling Time Sample I.D.					1716832 Soil153	1716833 Soil153	1716834 Soil153	1716835 Soil153	1716836 Soil153
Guideline					24-1A	24-1B	24-2A	24-2B	24-3A
Analyte	Batch No	MRL	Units	Guideline					
Molybdenum	455434	1	ug/g	STD 2	<1	<1	<1	<1	<1
Nickel	455434	1	ug/g	STD 82		42	33	43	26
	455501	1	ug/g	STD 82	37				
Selenium	455434	0.5	ug/g	STD 1.5	1.8*	1.5	1.1	1.6*	1.6*
Silver	455434	0.2	ug/g	STD 0.5	<0.2	<0.2	<0.2	<0.2	<0.2
Thallium	455434	1	ug/g	STD 1	<1	<1	<1	<1	<1
Uranium	455434	0.5	ug/g	STD 2.5	1.0	0.7	<0.5	<0.5	<0.5
Vanadium	455434	2	ug/g	STD 86		77	56	82	43
	455501	2	ug/g	STD 86	66				
Zinc	455434	2	ug/g	STD 290		109	75	120	74
	455501	2	ug/g	STD 290	106				

Metals

Lab I.D. Sample Matrix Sample Type Sample Date Sampling Time Sample I.D.					1716837 Soil153	1716838 Soil153	1716839 Soil153
Guideline					24-3B	24-4A	24-4B
Analyte	Batch No	MRL	Units	Guideline			
Antimony	455434	1	ug/g	STD 1.3	<1	<1	<1
Arsenic	455434	1	ug/g	STD 18	4	3	2
Barium	455434	1	ug/g	STD 220	195	317*	39
Beryllium	455434	1	ug/g	STD 2.5	<1	<1	<1
Boron (total)	455434	5	ug/g	STD 36	12	8	8
Cadmium	455434	0.4	ug/g	STD 1.2	<0.4	<0.4	<0.4
Chromium Total	455434	1	ug/g	STD 70	27	46	15
Cobalt	455434	1	ug/g	STD 21	9	13	5

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range



Certificate of Analysis

Environment Testing

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

Metals

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co					1716837 Soil153 2024-01-26 24-3B	1716838 Soil153 2024-01-26 24-4A	1716839 Soil153 2024-01-26 24-4B
<u>Metals</u>							
Analyte	Batch No	MRL	Units	Guideline			
Copper	455434	1	ug/g	STD 92	17	29	10
Lead	455434	1	ug/g	STD 120	22	10	4
Molybdenum	455434	1	ug/g	STD 2	<1	<1	<1
Nickel	455434	1	ug/g	STD 82	20	30	10
Selenium	455434	0.5	ug/g	STD 1.5	1.3	1.2	<0.5
Silver	455434	0.2	ug/g	STD 0.5	<0.2	<0.2	<0.2
Thallium	455434	1	ug/g	STD 1	<1	<1	<1
Uranium	455434	0.5	ug/g	STD 2.5	<0.5	<0.5	<0.5
Vanadium	455434	2	ug/g	STD 86	29	59	20
Zinc	455434	2	ug/g	STD 290	54	77	17

PAH

<div>PAH</div>					Lab I.D. Sample Matrix Sample Type Sample Date Sampling Time Sample I.D.	1716832 Soil153 2024-01-26 24-1A	1716833 Soil153 2024-01-26 24-1B	1716834 Soil153 2024-01-26 24-2A	1716835 Soil153 2024-01-26 24-2B	1716836 Soil153 2024-01-26 24-3A
Analyte	Batch No	MRL	Units	Guideline						
1+2-methylnaphthalene	455358	0.05	ug/g	STD 0.59	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Acenaphthene	455318	0.05	ug/g	STD 0.072	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Acenaphthylene	455318	0.05	ug/g	STD 0.093	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Anthracene	455318	0.05	ug/g	STD 0.16	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benz[a]anthracene	455318	0.05	ug/g	STD 0.36	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo[a]pyrene	455318	0.05	ug/g	STD 0.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo[b]fluoranthene	455318	0.05	ug/g	STD 0.47	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo[ghi]perylene	455318	0.05	ug/g	STD 0.68	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo[k]fluoranthene	455318	0.05	ug/g	STD 0.48	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational
Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim
Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial
Water Quality Guideline, IPWQO = Interim Provincial Water Quality
Objective, TDR = Typical Desired Range

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

PAH

Lab I.D. Sample Matrix Sample Type Sample Date Sampling Time Sample I.D.					1716832 Soil153	1716833 Soil153	1716834 Soil153	1716835 Soil153	1716836 Soil153
					2024-01-26	2024-01-26	2024-01-26	2024-01-26	2024-01-26
					24-1A	24-1B	24-2A	24-2B	24-3A
Analyte	Batch No	MRL	Units	Guideline					
Chrysene	455318	0.05	ug/g	STD 2.8	<0.05	<0.05	<0.05	<0.05	<0.05
Dibenz[a h]anthracene	455318	0.05	ug/g	STD 0.1	<0.05	<0.05	<0.05	<0.05	<0.05
Fluoranthene	455318	0.05	ug/g	STD 0.56	<0.05	<0.05	<0.05	<0.05	<0.05
Fluorene	455318	0.05	ug/g	STD 0.12	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno[1 2 3-cd]pyrene	455318	0.05	ug/g	STD 0.23	<0.05	<0.05	<0.05	<0.05	<0.05
Methlynaphthalene, 1-	455318	0.05	ug/g		<0.05	<0.05	<0.05	<0.05	<0.05
Methlynaphthalene, 2-	455318	0.05	ug/g		<0.05	<0.05	<0.05	<0.05	<0.05
Naphthalene	455318	0.013	ug/g	STD 0.09	<0.013	<0.013	<0.013	<0.013	<0.013
Phenanthrene	455318	0.05	ug/g	STD 0.69	<0.05	<0.05	<0.05	<0.05	<0.05
Pyrene	455318	0.05	ug/g	STD 1	<0.05	<0.05	<0.05	<0.05	<0.05

PAH

Lab I.D. Sample Matrix Sample Type Sample Date Sampling Time Sample I.D.					1716837 Soil153	1716838 Soil153	1716839 Soil153
					2024-01-26	2024-01-26	2024-01-26
					24-3B	24-4A	24-4B
Analyte	Batch No	MRL	Units	Guideline			
1+2-methylnaphthalene	455358	0.05	ug/g	STD 0.59	<0.05	<0.05	<0.05
Acenaphthene	455318	0.05	ug/g	STD 0.072	<0.05	<0.05	<0.05
Acenaphthylene	455318	0.05	ug/g	STD 0.093	<0.05	<0.05	<0.05
Anthracene	455318	0.05	ug/g	STD 0.16	<0.05	<0.05	<0.05
Benz[a]anthracene	455318	0.05	ug/g	STD 0.36	<0.05	<0.05	<0.05
Benzo[a]pyrene	455318	0.05	ug/g	STD 0.3	<0.05	<0.05	<0.05
Benzo[b]fluoranthene	455318	0.05	ug/g	STD 0.47	<0.05	<0.05	<0.05
Benzo[ghi]perylene	455318	0.05	ug/g	STD 0.68	<0.05	<0.05	<0.05
Benzo[k]fluoranthene	455318	0.05	ug/g	STD 0.48	<0.05	<0.05	<0.05

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational
Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim
Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial
Water Quality Guideline, IPWQO = Interim Provincial Water Quality
Objective, TDR = Typical Desired Range

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

PAH

Lab I.D.
Sample Matrix
Sample Type
Sample Date
Sampling Time
Sample I.D.

1716837 Soil153	1716838 Soil153	1716839 Soil153
2024-01-26	2024-01-26	2024-01-26
24-3B	24-4A	24-4B

Analyte	Batch No	MRL	Units	Guideline			
Chrysene	455318	0.05	ug/g	STD 2.8	<0.05	<0.05	<0.05
Dibenz[a h]anthracene	455318	0.05	ug/g	STD 0.1	<0.05	<0.05	<0.05
Fluoranthene	455318	0.05	ug/g	STD 0.56	<0.05	<0.05	<0.05
Fluorene	455318	0.05	ug/g	STD 0.12	<0.05	<0.05	<0.05
Indeno[1 2 3-cd]pyrene	455318	0.05	ug/g	STD 0.23	<0.05	<0.05	<0.05
Methlynaphthalene, 1-	455318	0.05	ug/g		<0.05	<0.05	<0.05
Methlynaphthalene, 2-	455318	0.05	ug/g		<0.05	<0.05	<0.05
Naphthalene	455318	0.013	ug/g	STD 0.09	<0.013	<0.013	<0.013
Phenanthrene	455318	0.05	ug/g	STD 0.69	<0.05	<0.05	<0.05
Pyrene	455318	0.05	ug/g	STD 1	<0.05	<0.05	<0.05

Volatiles

Lab I.D.
Sample Matrix
Sample Type
Sample Date
Sampling Time
Sample I.D.

1716832 Soil153	1716833 Soil153	1716834 Soil153	1716835 Soil153	1716836 Soil153
2024-01-26	2024-01-26	2024-01-26	2024-01-26	2024-01-26
24-1A	24-1B	24-2A	24-2B	24-3A

Analyte	Batch No	MRL	Units	Guideline					
Acetone	455316	0.50	ug/g	STD 0.5	<0.50	<0.50	<0.50	<0.50	<0.50
Benzene	455316	0.0068	ug/g	STD 0.02	<0.0068	<0.0068	<0.0068	<0.0068	<0.0068
Bromodichloromethane	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Bromoform	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Bromomethane	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Carbon Tetrachloride	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorobenzene	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chloroform	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dibromochloromethane	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range



Certificate of Analysis

Environment Testing

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

Volatiles

Lab I.D.
Sample Matrix
Sample Type
Sample Date
Sampling Time
Sample I.D.

1716832 Soil153	1716833 Soil153	1716834 Soil153	1716835 Soil153	1716836 Soil153
2024-01-26	2024-01-26	2024-01-26	2024-01-26	2024-01-26
24-1A	24-1B	24-2A	24-2B	24-3A

Analyte	Batch No	MRL	Units	Guideline					
Dichlorobenzene, 1,2-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichlorobenzene, 1,3-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichlorobenzene, 1,4-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichlorodifluoromethane	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichloroethane, 1,1-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichloroethane, 1,2-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichloroethylene, 1,1-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichloroethylene, 1,2-cis-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichloroethylene, 1,2-trans-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichloropropane, 1,2-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichloropropene, 1,3-	455320	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichloropropene, 1,3-cis-	455316	0.05	ug/g		<0.05	<0.05	<0.05	<0.05	<0.05
Dichloropropene, 1,3-trans-	455316	0.05	ug/g		<0.05	<0.05	<0.05	<0.05	<0.05
Ethylbenzene	455316	0.018	ug/g	STD 0.05	<0.018	<0.018	<0.018	<0.018	<0.018
Ethylene dibromide	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Hexane (n)	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Methyl Ethyl Ketone	455316	0.50	ug/g	STD 0.5	<0.50	<0.50	<0.50	<0.50	<0.50
Methyl Isobutyl Ketone	455316	0.50	ug/g	STD 0.5	<0.50	<0.50	<0.50	<0.50	<0.50
Methyl tert-Butyl Ether (MTBE)	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Methylene Chloride	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Styrene	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Tetrachloroethane, 1,1,1,2-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Tetrachloroethane, 1,1,2,2-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational
Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim
Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial
Water Quality Guideline, IPWQO = Interim Provincial Water Quality
Objective, TDR = Typical Desired Range



Certificate of Analysis

Environment Testing

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

Volatiles

Lab I.D. Sample Matrix Sample Type Sample Date Sampling Time Sample I.D.					1716832 Soil153	1716833 Soil153	1716834 Soil153	1716835 Soil153	1716836 Soil153
					2024-01-26	2024-01-26	2024-01-26	2024-01-26	2024-01-26
					24-1A	24-1B	24-2A	24-2B	24-3A
Analyte	Batch No	MRL	Units	Guideline					
Tetrachloroethylene	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Toluene	455316	0.08	ug/g	STD 0.2	<0.08	<0.08	<0.08	<0.08	<0.08
Trichloroethane, 1,1,1-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Trichloroethane, 1,1,2-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Trichloroethylene	455316	0.01	ug/g	STD 0.05	<0.01	<0.01	<0.01	<0.01	<0.01
Trichlorofluoromethane	455316	0.05	ug/g	STD 0.25	<0.05	<0.05	<0.05	<0.05	<0.05
Vinyl Chloride	455316	0.02	ug/g	STD 0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Xylene Mixture	455319	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Xylene, m/p-	455316	0.05	ug/g		<0.05	<0.05	<0.05	<0.05	<0.05
Xylene, o-	455316	0.05	ug/g		<0.05	<0.05	<0.05	<0.05	<0.05

Volatiles

Lab I.D. Sample Matrix Sample Type Sample Date Sampling Time Sample I.D.					1716837 Soil153	1716838 Soil153	1716839 Soil153
					2024-01-26	2024-01-26	2024-01-26
					24-3B	24-4A	24-4B
Analyte	Batch No	MRL	Units	Guideline			
Acetone	455316	0.50	ug/g	STD 0.5	<0.50	<0.50	<0.50
Benzene	455316	0.0068	ug/g	STD 0.02	<0.0068	<0.0068	<0.0068
Bromodichloromethane	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Bromoform	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Bromomethane	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Carbon Tetrachloride	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Chlorobenzene	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Chloroform	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dibromochloromethane	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational
Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim
Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial
Water Quality Guideline, IPWQO = Interim Provincial Water Quality
Objective, TDR = Typical Desired Range

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

Volatiles

					1716837 Soil153	1716838 Soil153	1716839 Soil153
					2024-01-26	2024-01-26	2024-01-26
					24-3B	24-4A	24-4B
Analyte	Batch No	MRL	Units	Guideline			
Dichlorobenzene, 1,2-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichlorobenzene, 1,3-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichlorobenzene, 1,4-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichlorodifluoromethane	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichloroethane, 1,1-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichloroethane, 1,2-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichloroethylene, 1,1-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichloroethylene, 1,2-cis-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichloroethylene, 1,2-trans-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichloropropane, 1,2-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichloropropene, 1,3-	455320	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichloropropene, 1,3-cis-	455316	0.05	ug/g		<0.05	<0.05	<0.05
Dichloropropene, 1,3-trans-	455316	0.05	ug/g		<0.05	<0.05	<0.05
Ethylbenzene	455316	0.018	ug/g	STD 0.05	<0.018	<0.018	<0.018
Ethylene dibromide	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Hexane (n)	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Methyl Ethyl Ketone	455316	0.50	ug/g	STD 0.5	<0.50	<0.50	<0.50
Methyl Isobutyl Ketone	455316	0.50	ug/g	STD 0.5	<0.50	<0.50	<0.50
Methyl tert-Butyl Ether (MTBE)	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Methylene Chloride	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Styrene	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Tetrachloroethane, 1,1,1,2-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Tetrachloroethane, 1,1,2,2-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range



Certificate of Analysis

Environment Testing

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

Volatiles

					Lab I.D. Sample Matrix Sample Type Sample Date Sampling Time Sample I.D.		
Analyte	Batch No	MRL	Units	Guideline	1716837 Soil153 2024-01-26 24-3B	1716838 Soil153 2024-01-26 24-4A	1716839 Soil153 2024-01-26 24-4B
Tetrachloroethylene	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Toluene	455316	0.08	ug/g	STD 0.2	<0.08	<0.08	<0.08
Trichloroethane, 1,1,1-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Trichloroethane, 1,1,2-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Trichloroethylene	455316	0.01	ug/g	STD 0.05	<0.01	<0.01	<0.01
Trichlorofluoromethane	455316	0.05	ug/g	STD 0.25	<0.05	<0.05	<0.05
Vinyl Chloride	455316	0.02	ug/g	STD 0.02	<0.02	<0.02	<0.02
Xylene Mixture	455319	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Xylene, m/p-	455316	0.05	ug/g		<0.05	<0.05	<0.05
Xylene, o-	455316	0.05	ug/g		<0.05	<0.05	<0.05

Inorganics

					Lab I.D. Sample Matrix Sample Type Sample Date Sampling Time Sample I.D.				
Analyte	Batch No	MRL	Units	Guideline	1716832 Soil153 2024-01-26 24-1A	1716833 Soil153 2024-01-26 24-1B	1716834 Soil153 2024-01-26 24-2A	1716835 Soil153 2024-01-26 24-2B	1716836 Soil153 2024-01-26 24-3A
Cyanide (CN-)	455419	0.005	ug/g	STD 0.051	<0.005	<0.005	<0.005	<0.005	<0.005
Electrical Conductivity	455468	0.05	mS/cm	STD 0.57	0.26	0.22	0.26	0.23	0.24
Sodium Adsorption Ratio	455477	0.01		STD 2.4	0.13	0.35	0.18	0.25	0.31

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational
Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim
Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial
Water Quality Guideline, IPWQO = Interim Provincial Water Quality
Objective, TDR = Typical Desired Range



Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

Inorganics

Analyte	Batch No	MRL	Units	Guideline	Lab I.D.	Sample Matrix	Sample Type	Sample Date	Sampling Time	Sample I.D.
					1716837	Soil153	1716838	Soil153	1716839	Soil153
Cyanide (CN-)	455419	0.005	ug/g	STD 0.051	2024-01-26	24-3B	2024-01-26	24-4A	2024-01-26	24-4B
Electrical Conductivity	455468	0.05	mS/cm	STD 0.57	0.16		0.61*		0.15	
Sodium Adsorption Ratio	455477	0.01		STD 2.4	0.28		0.22		0.25	

Moisture

Analyte	Batch No	MRL	Units	Guideline	Lab I.D.	Sample Matrix	Sample Type	Sample Date	Sampling Time	Sample I.D.
					1716832	Soil153	1716833	Soil153	1716834	Soil153
Moisture-Humidite	455308	0.1	%		2024-01-26	24-1A	2024-01-26	24-1B	2024-01-26	24-2A
	455313	0.1	%		24.7		26.9		26.7	
									26.7	19.4

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range



Certificate of Analysis

Environment Testing

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

Moisture

Analyte	Batch No	MRL	Units	Guideline	Lab I.D.	Sample Matrix	Sample Type	Sample Date	Sampling Time	Sample I.D.
					1716837	Soil153	1716838	Soil153	1716839	Soil153
Moisture-Humidite	455308	0.1	%		2024-01-26		2024-01-26		2024-01-26	
	455313	0.1	%		24-3B		24-4A		24-4B	
	455411	0.1	%							10.5

PHC Surrogate

Analyte	Batch No	MRL	Units	Guideline	Lab I.D.	Sample Matrix	Sample Type	Sample Date	Sampling Time	Sample I.D.
					1716832	Soil153	1716833	Soil153	1716834	Soil153
Alpha-androstrane	455308	0	%		2024-01-26		2024-01-26		2024-01-26	
	455313	0	%		24-1A		24-1B		24-2A	
									24-2B	
									24-3A	
										66
					68				62	

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range



Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

PHC Surrogate

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co								
<u>PHC Surrogate</u>					Lab I.D.	1716837	1716838	1716839
					Sample Matrix	Soil153	Soil153	Soil153
					Sample Type			
					Sample Date	2024-01-26	2024-01-26	2024-01-26
					Sampling Time			
				Sample I.D.	24-3B	24-4A	24-4B	
Analyte	Batch No	MRL	Units	Guideline				
Alpha-androstrane	455308	0	%		61			
	455313	0	%			77		
	455411	0	%					73

VOCs Surrogates

<u>VOCs Surrogates</u>					Lab I.D.	1716832	1716833	1716834	1716835	1716836
Analyte	Batch No	MRL	Units	Sample Matrix	Soil153	Soil153	Soil153	Soil153	Soil153	
				Sample Type						
				Sample Date	2024-01-26	2024-01-26	2024-01-26	2024-01-26	2024-01-26	
				Sampling Time						
Guideline										
				Sample I.D.	24-1A	24-1B	24-2A	24-2B	24-3A	
1,2-dichloroethane-d4	455316	0	%		123	125	126	129	127	
4-bromofluorobenzene	455316	0	%		71	70	72	74	70	
Toluene-d8	455316	0	%		124	122	109	112	114	

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range



Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

VOCs Surrogates

					Lab I.D. Sample Matrix Sample Type Sample Date Sampling Time Sample I.D.		
					Guideline		
Analyte	Batch No	MRL	Units				
1,2-dichloroethane-d4	455316	0	%			127	121
4-bromofluorobenzene	455316	0	%			79	73
Toluene-d8	455316	0	%			82	114

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational
Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim
Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial
Water Quality Guideline, IPWQO = Interim Provincial Water Quality
Objective, TDR = Typical Desired Range

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Quality Assurance Summary

Batch No	Analyte	Blank	QC % Rec	QC Limits	Spike % Rec	Spike Limits	Dup % RPD	Duplicate Limits
455308	PHC's F2	<2 ug/g	87	80-120	75	60-140	0	0-30
455308	PHC's F3	<20 ug/g	87	80-120	75	60-140	0	0-30
455308	PHC's F4	<20 ug/g	87	80-120	75	60-140	0	0-30
455308	Moisture-Humidite	<0.1 %	100	80-120			5	
455313	PHC's F2	<2 ug/g	91	80-120	66	60-140	0	0-30
455313	PHC's F3	<20 ug/g	91	80-120	66	60-140	0	0-30
455313	PHC's F4	<20 ug/g	91	80-120	66	60-140	0	0-30
455313	Moisture-Humidite	<0.1 %	100	80-120			23	
455316	Tetrachloroethane, 1,1,1,2-	<0.05 ug/g	122	60-130	107	50-140	0	0-50
455316	Trichloroethane, 1,1,1-	<0.05 ug/g	115	60-130	111	50-140	0	0-50
455316	Tetrachloroethane, 1,1,2,2-	<0.05 ug/g	119	60-130	91	50-140	0	0-30
455316	Trichloroethane, 1,1,2-	<0.05 ug/g	121	60-130	115	50-140	0	0-50
455316	Dichloroethane, 1,1-	<0.05 ug/g	117	60-130	112	50-140	0	0-50
455316	Dichloroethylene, 1,1-	<0.05 ug/g	108	60-130	87	50-140	0	0-50
455316	Dichlorobenzene, 1,2-	<0.05 ug/g	120	60-130	111	50-140	0	0-50
455316	Dichloroethane, 1,2-	<0.05 ug/g	121	60-130	114	50-140	0	0-50
455316	Dichloropropane, 1,2-	<0.05 ug/g	124	60-130	119	50-140	0	0-50
455316	Dichlorobenzene, 1,3-	<0.05 ug/g	120	60-130	112	50-140	0	0-50
455316	Dichlorobenzene, 1,4-	<0.05 ug/g	121	60-130	112	50-140	0	0-50
455316	Acetone	<0.50 ug/g	120	60-130	112	50-140	0	0-50
455316	Benzene	<0.0068	113	60-130	114	50-140	0	0-50
455316	Bromodichloromethane	<0.05 ug/g	120	60-130	110	50-140	0	0-50
455316	Bromoform	<0.05 ug/g	118	60-130	109	50-140	0	0-50
455316	Bromomethane	<0.05 ug/g	105	60-130	105	50-140	0	0-50
455316	Dichloroethylene, 1,2-cis-	<0.05 ug/g	121	60-130	115	50-140	0	0-50
455316	Dichloropropene, 1,3-cis-	<0.05 ug/g	118	60-130	115	50-140	0	0-50
455316	Carbon Tetrachloride	<0.05 ug/g	115	60-130	107	50-140	0	0-50
455316	Chloroform	<0.05 ug/g	121	60-130	115	50-140	0	0-50
455316	Dibromochloromethane	<0.05 ug/g	120	60-130	101	50-140	0	0-50
455316	Dichlorodifluoromethane	<0.05 ug/g	114	60-130	106	50-140	0	0-50
455316	Methylene Chloride	<0.05 ug/g	102	60-130	95	50-140	0	0-50
455316	Ethylbenzene	<0.018 ug/g	116	60-130	121	50-140	0	0-50

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Quality Assurance Summary

Batch No	Analyte	Blank	QC % Rec	QC Limits	Spike % Rec	Spike Limits	Dup % RPD	Duplicate Limits
455316	Ethylene dibromide	<0.05 ug/g	120	60-130	113	50-140	0	0-50
455316	Hexane (n)	<0.05 ug/g	113	60-130	112	50-140	0	0-50
455316	Xylene, m/p-	<0.05 ug/g	119	60-130	112	50-140	0	0-50
455316	Methyl Ethyl Ketone	<0.50 ug/g	118	60-130	116	50-140	0	0-50
455316	Methyl Isobutyl Ketone	<0.50 ug/g	121	60-130	114	50-140	0	0-50
455316	Methyl tert-Butyl Ether (MTBE)	<0.05 ug/g	120	60-130	114	50-140	0	0-50
455316	Chlorobenzene	<0.05 ug/g	115	60-130	115	50-140	0	0-50
455316	Xylene, o-	<0.05 ug/g	117	60-130	118	50-140	0	0-50
455316	Styrene	<0.05 ug/g	117	60-130	117	50-140	0	0-50
455316	Dichloroethylene, 1,2-trans-	<0.05 ug/g	120	60-130	110	50-140	0	0-50
455316	Dichloropropene, 1,3-trans-	<0.05 ug/g	119	60-130	115	50-140	0	0-50
455316	Tetrachloroethylene	<0.05 ug/g	119	60-130	119	50-140	0	0-50
455316	Toluene	<0.08 ug/g	115	60-130	114	50-140	0	0-50
455316	Trichloroethylene	<0.01 ug/g	115	60-130	115	50-140	0	0-50
455316	Trichlorofluoromethane	<0.05 ug/g	116	60-130	98	50-140	0	0-50
455316	Vinyl Chloride	<0.02 ug/g	106	60-130	92	50-140	0	0-50
455317	PHC's F1	<10 ug/g	97	80-120	90	60-140	0	0-30
455318	Methlynaphthalene, 1-	<0.05 ug/g	63	50-140	64	50-140	0	0-40
455318	Methlynaphthalene, 2-	<0.05 ug/g	59	50-140	61	50-140	0	0-40
455318	Acenaphthene	<0.05 ug/g	61	50-140	61	50-140	0	0-40
455318	Acenaphthylene	<0.05 ug/g	60	50-140	60	50-140	0	0-40
455318	Anthracene	<0.05 ug/g	63	50-140	61	50-140	0	0-40
455318	Benz[a]anthracene	<0.05 ug/g	59	50-140	61	50-140	0	0-40
455318	Benzo[a]pyrene	<0.05 ug/g	50	50-140	58	50-140	0	0-40
455318	Benzo[b]fluoranthene	<0.05 ug/g	62	50-140	54	50-140	0	0-40
455318	Benzo[ghi]perylene	<0.05 ug/g	66	50-140	54	50-140	0	0-40
455318	Benzo[k]fluoranthene	<0.05 ug/g	57	50-140	56		0	0-40
455318	Chrysene	<0.05 ug/g	65	50-140	63	50-140	0	0-40
455318	Dibenz[a h]anthracene	<0.05 ug/g	62	50-140	57	50-140	0	0-40
455318	Fluoranthene	<0.05 ug/g	62	50-140	61	50-140	0	0-40
455318	Fluorene	<0.05 ug/g	61	50-140	61	50-140	0	0-40
455318	Indeno[1 2 3-cd]pyrene	<0.05 ug/g	63	50-140	55	50-140	0	0-40
455318	Naphthalene	<0.013 ug/g	60	50-140	60	50-140	0	0-40

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Quality Assurance Summary

Batch No	Analyte	Blank	QC % Rec	QC Limits	Spike % Rec	Spike Limits	Dup % RPD	Duplicate Limits
455318	Phenanthrene	<0.05 ug/g	59	50-140	58	50-140	0	0-40
455318	Pyrene	<0.05 ug/g	61	50-140	61	50-140	0	0-40
455319	Xylene Mixture							
455320	Dichloropropene, 1,3-							
455321	PHC's F1-BTEX							
455322	PHC's F1-BTEX							
455358	1+2-methylnaphthalene							
455411	PHC's F2	<2 ug/g	84	80-120	64	60-140	0	0-30
455411	PHC's F3	<20 ug/g	84	80-120	64	60-140	0	0-30
455411	PHC's F4	<20 ug/g	84	80-120	64	60-140	0	0-30
455411	Moisture-Humidite	<0.1 %	100	80-120			16	
455413	PHC's F2-Napth							
455414	PHC's F3-PAH							
455419	Cyanide (CN-)	<0.005 ug/g	85	75-125	98	70-130	0	0-20
455434	Silver	<0.2 ug/g	110	70-130	103	70-130	0	0-20
455434	Arsenic	<1 ug/g	96	70-130	89	70-130	11	0-20
455434	Boron (total)	<5 ug/g	97	70-130	119	70-130	0	0-20
455434	Barium	<1 ug/g	96	70-130		70-130	11	0-20
455434	Beryllium	<1 ug/g	100	70-130	100	70-130	0	0-20
455434	Cadmium	<0.4 ug/g	98	70-130	101	70-130	0	0-20
455434	Cobalt	<1 ug/g	97	70-130	65	70-130	10	0-20
455434	Chromium Total	<1 ug/g	99	70-130	19	70-130	12	0-20
455434	Copper	<1 ug/g	105	70-130	36	70-130	14	0-20
455434	Molybdenum	<1 ug/g	102	70-130	93	70-130	0	0-20
455434	Nickel	<1 ug/g	102	70-130	29	70-130	11	0-20
455434	Lead	<1 ug/g	103	70-130	77	70-130	22	0-20
455434	Antimony	<1 ug/g	77	70-130	68	70-130	0	0-20
455434	Selenium	<0.5 ug/g	98	70-130	97	70-130	0	0-20
455434	Thallium	<1 ug/g	101	70-130	92	70-130	0	0-20
455434	Uranium	<0.5 ug/g	88	70-130	90	70-130	0	0-20
455434	Vanadium	<2 ug/g	97	70-130	6	70-130	12	0-20
455434	Zinc	<2 ug/g	104	70-130		70-130	13	0-20
455468	Electrical Conductivity	<0.05	100	90-110			0	0-10

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range



Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Quality Assurance Summary

Batch No	Analyte	Blank	QC % Rec	QC Limits	Spike % Rec	Spike Limits	Dup % RPD	Duplicate Limits
455477	Sodium Adsorption Ratio	<0.01					4	
455501	Cobalt	<1 ug/g	97	70-130	106	70-130	0	0-20
455501	Chromium Total	<1 ug/g	99	70-130	119	70-130	18	0-20
455501	Copper	<1 ug/g	106	70-130	102	70-130	21	0-20
455501	Nickel	<1 ug/g	103	70-130	107	70-130	0	0-20
455501	Lead	<1 ug/g	100	70-130	110	70-130	0	0-20
455501	Vanadium	<2 ug/g	96	70-130	133	70-130	33	0-20
455501	Zinc	<2 ug/g	105	70-130	100	70-130	17	0-20

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Test Summary

Batch No	Analyte	Instrument	Preparation Date	Analysis Date	Analyst	Method
455308	PHC's F2	GC/FID	2024-01-29	2024-01-30	PJ	CCME
455308	PHC's F3	GC/FID	2024-01-29	2024-01-30	PJ	CCME
455308	PHC's F4	GC/FID	2024-01-29	2024-01-30	PJ	CCME
455308	Moisture-Humidite	Oven	2024-01-29	2024-01-30	PJ	ASTM 2216
455313	PHC's F2	GC/FID	2024-01-29	2024-01-30	PJ	CCME
455313	PHC's F3	GC/FID	2024-01-29	2024-01-30	PJ	CCME
455313	PHC's F4	GC/FID	2024-01-29	2024-01-30	PJ	CCME
455313	Moisture-Humidite	Oven	2024-01-29	2024-01-30	PJ	ASTM 2216
455316	Tetrachloroethane, 1,1,1,2-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Trichloroethane, 1,1,1-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Tetrachloroethane, 1,1,2,2-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Trichloroethane, 1,1,2-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Dichloroethane, 1,1-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Dichloroethylene, 1,1-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Dichlorobenzene, 1,2-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Dichloroethane, 1,2-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Dichloropropane, 1,2-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Dichlorobenzene, 1,3-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Dichlorobenzene, 1,4-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Acetone	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Benzene	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Bromodichloromethane	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Bromoform	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Bromomethane	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Dichloroethylene, 1,2-cis-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Dichloropropene, 1,3-cis-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Carbon Tetrachloride	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Chloroform	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Dibromochloromethane	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Dichlorodifluoromethane	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Methylene Chloride	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Ethylbenzene	GC-MS	2024-01-26	2024-01-29	SS	V 8260B

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Test Summary

Batch No	Analyte	Instrument	Preparation Date	Analysis Date	Analyst	Method
455316	Ethylene dibromide	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Hexane (n)	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Xylene, m/p-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Methyl Ethyl Ketone	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Methyl Isobutyl Ketone	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Methyl tert-Butyl Ether (MTBE)	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Chlorobenzene	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Xylene, o-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Styrene	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Dichloroethylene, 1,2-trans-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Dichloropropene, 1,3-trans-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Tetrachloroethylene	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Toluene	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Trichloroethylene	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Trichlorofluoromethane	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Vinyl Chloride	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455317	PHC's F1	GC/FID	2024-01-26	2024-01-30	SS	CCME
455318	Methylnaphthalene, 1-	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455318	Methylnaphthalene, 2-	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455318	Acenaphthene	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455318	Acenaphthylene	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455318	Anthracene	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455318	Benz[a]anthracene	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455318	Benzo[a]pyrene	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455318	Benzo[b]fluoranthene	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455318	Benzo[ghi]perylene	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455318	Benzo[k]fluoranthene	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455318	Chrysene	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455318	Dibenz[a h]anthracene	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455318	Fluoranthene	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455318	Fluorene	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455318	Indeno[1 2 3-cd]pyrene	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455318	Naphthalene	GC-MS	2024-01-29	2024-01-30	C_M	P 8270

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Test Summary

Batch No	Analyte	Instrument	Preparation Date	Analysis Date	Analyst	Method
455318	Phenanthrene	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455318	Pyrene	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455319	Xylene Mixture	GC-MS	2024-01-30	2024-01-30	SS	V 8260B
455320	Dichloropropene, 1,3-	GC-MS	2024-01-30	2024-01-30	SS	V 8260B
455321	PHC's F1-BTEX	GC/FID	2024-01-30	2024-01-30	SS	CCME
455322	PHC's F1-BTEX	GC/FID	2024-01-30	2024-01-30	SS	CCME
455358	1+2-methylnaphthalene	GC-MS	2024-01-31	2024-01-31	C_M	P 8270
455411	PHC's F2	GC/FID	2024-01-30	2024-01-31	PJ	CCME
455411	PHC's F3	GC/FID	2024-01-30	2024-01-31	PJ	CCME
455411	PHC's F4	GC/FID	2024-01-30	2024-01-31	PJ	CCME
455411	Moisture-Humidity	Oven	2024-01-30	2024-01-31	PJ	ASTM 2216
455413	PHC's F2-Naph	GC/FID	2024-01-31	2024-01-31	PJ	CCME
455414	PHC's F3-PAH	GC/FID	2024-01-31	2024-01-31	PJ	CCME
455419	Cyanide (CN-)	Skalar CN Analyzer	2024-01-31	2024-01-31	Z_S	MOECC E3015
455434	Silver	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Arsenic	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Boron (total)	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Barium	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Beryllium	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Cadmium	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Cobalt	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Chromium Total	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Copper	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Molybdenum	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Nickel	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Lead	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Antimony	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Selenium	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Thallium	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Uranium	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Vanadium	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Zinc	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455468	Electrical Conductivity	Electrical Conductivity Meter	2024-02-01	2024-02-01	Z_S	Cond-Soil

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range



Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0

Attention: Mr. Benjamin Edwards

PO#:

Invoice to: EGIS Canada Ltd.

Report Number: 3004774

Date Submitted: 2024-01-26

Date Reported: 2024-02-02

Project: CCO - 24 - 2687

COC #: 226844

Test Summary

Batch No	Analyte	Instrument	Preparation Date	Analysis Date	Analyst	Method
455477	Sodium Adsorption Ratio	iCAP OES	2024-02-01	2024-02-01	Z_S	Ag Soil
455501	Cobalt	ICAPQ-MS	2024-02-02	2024-02-02	AaN	EPA 200.8/6020
455501	Chromium Total	ICAPQ-MS	2024-02-02	2024-02-02	AaN	EPA 200.8/6020
455501	Copper	ICAPQ-MS	2024-02-02	2024-02-02	AaN	EPA 200.8/6020
455501	Nickel	ICAPQ-MS	2024-02-02	2024-02-02	AaN	EPA 200.8/6020
455501	Lead	ICAPQ-MS	2024-02-02	2024-02-02	AaN	EPA 200.8/6020
455501	Vanadium	ICAPQ-MS	2024-02-02	2024-02-02	AaN	EPA 200.8/6020
455501	Zinc	ICAPQ-MS	2024-02-02	2024-02-02	AaN	EPA 200.8/6020

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

CWS for Petroleum Hydrocarbons in Soil - Tier 1**Notes:**

1. The laboratory method complies with CCME Tier 1 reference method for PHC in soil. It is validated for laboratory use.
2. Where the F1 fraction (C6 to C10) and BTEX are both measured, F1-BTEX is reported.
3. Where the F2 fraction (C10 to C16) and naphthalene are both measured, F2-naphthalene is reported.
4. Where the F3 fraction (C16 to C34) and PAHs* are both measured, F3-PAH is reported.
5. F4G is analyzed if the chromatogram does not descend to baseline before C50. Where F4 (C34 to C50) and F4G are both reported, the higher result is compared to the standard.
6. Unless otherwise stated in the sample comments, the following criteria have been met where applicable:
 - nC6 and nC10 response factors within 30% of response factor for toluene;
 - nC10, nC16, and nC34 response factors within 10% of each other;
 - C50 response factors within 70% of nC10 + nC16 + nC34 average; and,
 - Linearity is within 15%.
7. Unless otherwise stated in the sample comments, sampling requirements and analytical holding times have been met.
8. Gravimetric heavy hydrocarbons (F4G) cannot be added to the C6 and C50 hydrocarbons.
9. *PAHs = phenanthrene, benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, fluoranthene, dibenz(a,h)anthracene, indeno(1,2,3-c,d)pyrene and pyrene.



Environment Testing

Certificate of Analysis

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004775
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Page 1 of 8

Dear Benjamin Edwards:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Report Comments:

APPROVAL:

Emma-Dawn Ferguson, Chemist

All analysis is completed at Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) unless otherwise indicated.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on the scope of accreditation. The scope is available at: <https://directory.cala.ca/>.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is licensed by the Ontario Ministry of the Environment, Conservation, and Parks (MECP) for specific tests in drinking water (license #2318). A copy of the license is available upon request.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is accredited by the Ontario Ministry of Agriculture, Food, and Rural Affairs for specific tests in agricultural soils.

Please note: Field data, where presented on the report, has been provided by the client and is presented for informational purposes only. Guideline values listed on this report are provided for ease of use (informational purposes) only. Eurofins recommends consulting the official provincial or federal guideline as required. Unless otherwise stated, measurement uncertainty is not taken into account when determining guideline or regulatory exceedances.



Environment Testing

Certificate of Analysis

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004775
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

					1716840 R347 2024-01-26 TCLP - 24-1	1716841 R347 2024-01-26 TCLP - 24-2	1716842 R347 2024-01-26 TCLP - 24-3	1716843 R347 2024-01-26 TCLP - 24-4
Group	Analyte	MRL	Units	Guideline				
Anions	F	0.10	mg/L	LQC 150.0	<0.10	0.12	<0.10	0.12
General Chemistry	Cyanide (free)	0.05	mg/L	LQC 20.0	<0.05	<0.05	<0.05	<0.05
Hydrocarbons	F1 (C6-C10)	20	ug/L		<20	<20	<20	<20
	F2 (C10-C16)	20	ug/L		<20	<20	<20	<20
	F3 (C16-C34)	50	ug/L		<50	<50	<50	<50
	F4 (C34-C50)	50	ug/L		<50	<50	<50	<50
Leachate	REG 558 Leach				y	y	y	y
	Zero Headspace Extraction				y	y	y	y
Mercury	Hg	0.001	mg/L	LQC 0.1	<0.001	<0.001	<0.001	<0.001
Metals	Ag	0.01	mg/L	LQC 5	<0.01	<0.01	<0.01	<0.01
	As	0.02	mg/L	LQC 2.5	<0.02	<0.02	<0.02	<0.02
	B	0.1	mg/L	LQC 500.0	<0.1	0.1	0.1	<0.1
	Ba	0.01	mg/L	LQC 100.0	1.45	1.13	1.17	1.10
	Cd	0.008	mg/L	LQC 0.5	<0.008	<0.008	<0.008	<0.008
	Cr	0.05	mg/L	LQC 5.0	<0.05	<0.05	<0.05	<0.05
	Pb	0.01	mg/L	LQC 5.0	0.05	<0.01	<0.01	<0.01
	Se	0.02	mg/L	LQC 1.0	<0.02	<0.02	<0.02	<0.02
	U	0.01	mg/L	LQC 10.0	<0.01	<0.01	<0.01	<0.01
Moisture	Moisture-Humidite	0.1	%		22.8	22.8	28.1	9.8
Others	NO2 + NO3 as N	1.0	mg/L	LQC 1000	<1.0	<1.0	<1.0	<1.0
PAH	1-methylnaphthalene	0.1	ug/L		<0.1	<0.1	<0.1	<0.1
	2-methylnaphthalene	0.1	ug/L		<0.1	<0.1	<0.1	<0.1
	Acenaphthene	0.1	ug/L		<0.1	<0.1	<0.1	<0.1
	Acenaphthylene	0.1	ug/L		<0.1	<0.1	<0.1	<0.1
	Anthracene	0.1	ug/L		<0.1	<0.1	<0.1	<0.1

Guideline = REG 558

* = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range



Environment Testing

Certificate of Analysis

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004775
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

					1716840 R347 2024-01-26 TCLP - 24-1	1716841 R347 2024-01-26 TCLP - 24-2	1716842 R347 2024-01-26 TCLP - 24-3	1716843 R347 2024-01-26 TCLP - 24-4
Group	Analyte	MRL	Units	Guideline				
PAH	Benzo(a)anthracene	0.1	ug/L		<0.1	<0.1	<0.1	<0.1
	Benzo(a)pyrene	0.01	ug/L	LQC 1.0	<0.01	<0.01	<0.01	<0.01
	Benzo(b)fluoranthene	0.05	ug/L		<0.05	<0.05	<0.05	<0.05
	Benzo(g,h,i)perylene	0.1	ug/L		<0.1	<0.1	<0.1	<0.1
	Benzo(k)fluoranthene	0.05	ug/L		<0.05	<0.05	<0.05	<0.05
	Chrysene	0.05	ug/L		<0.05	<0.05	<0.05	<0.05
	Dibenzo(a,h)anthracene	0.1	ug/L		<0.1	<0.1	<0.1	<0.1
	Fluoranthene	0.1	ug/L		<0.1	<0.1	<0.1	<0.1
	Fluorene	0.1	ug/L		<0.1	<0.1	<0.1	<0.1
	Indeno(1,2,3-c,d)pyrene	0.1	ug/L		<0.1	<0.1	<0.1	<0.1
	Naphthalene	0.1	ug/L		<0.1	<0.1	<0.1	<0.1
	Phenanthrene	0.1	ug/L		<0.1	<0.1	<0.1	<0.1
	Pyrene	0.1	ug/L		<0.1	<0.1	<0.1	<0.1
VOCs Surrogates	1,2-dichloroethane-d4	0	%		108	120	123	119
	4-bromofluorobenzene	0	%		89	84	130	75
	Toluene-d8	0	%		91	94	95	95
Volatiles	1,1-dichloroethylene	0.5	ug/L	LQC 1400	<0.5	<0.5	<0.5	<0.5
	1,2-dichlorobenzene	0.4	ug/L	LQC 20000	<0.4	<0.4	<0.4	<0.4
	1,2-dichloroethane	0.5	ug/L	LQC 500	<0.5	<0.5	<0.5	<0.5
	1,4-dichlorobenzene	0.4	ug/L	LQC 500	<0.4	<0.4	<0.4	<0.4
	Benzene	0.5	ug/L	LQC 500	<0.5	<0.5	<0.5	<0.5
	Carbon Tetrachloride	0.2	ug/L	LQC 500	<0.2	<0.2	<0.2	<0.2
	Chloroform	0.5	ug/L	LQC 10000	<0.5	<0.5	<0.5	<0.5
	Dichloromethane	4.0	ug/L	LQC 5000	<4.0	<4.0	<4.0	<4.0
	Methyl Ethyl Ketone (MEK)	2	ug/L	LQC 200000	<2	<2	<2	<2

Guideline = REG 558

* = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range



Environment Testing

Certificate of Analysis

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004775
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

					1716840 R347 2024-01-26 TCLP - 24-1	1716841 R347 2024-01-26 TCLP - 24-2	1716842 R347 2024-01-26 TCLP - 24-3	1716843 R347 2024-01-26 TCLP - 24-4
Group	Analyte	MRL	Units	Guideline				
Volatiles	Monochlorobenzene	0.5	ug/L	LQC 8000	<0.5	<0.5	<0.5	<0.5
	Tetrachloroethylene	0.3	ug/L	LQC 3000	<0.3	<0.3	<0.3	<0.3
	Trichloroethylene	0.3	ug/L	LQC 5000	<0.3	<0.3	<0.3	<0.3
	Vinyl Chloride	0.2	ug/L	LQC 200	<0.2	<0.2	<0.2	<0.2

Guideline = REG 558 * = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Certificate of Analysis

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0

Attention: Mr. Benjamin Edwards

PO#:

Invoice to: EGIS Canada Ltd.

Report Number: 3004775
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 454563 Analysis/Extraction Date 2024-01-31 Analyst C_M			
Method P 8270			
Methlynaphthalene, 1-	<0.1 ug/L	72	50-140
Methlynaphthalene, 2-	<0.1 ug/L	62	50-140
Acenaphthene	<0.1 ug/L	75	50-140
Acenaphthylene	<0.1 ug/L	75	50-140
Anthracene	<0.1 ug/L	88	50-140
Benz[a]anthracene	<0.1 ug/L	74	50-140
Benzo[a]pyrene	<0.01 ug/L	83	50-140
Benzo[b]fluoranthene	<0.05 ug/L	67	50-140
Benzo[ghi]perylene	<0.1 ug/L	97	50-140
Benzo[k]fluoranthene	<0.05 ug/L	98	50-140
Chrysene	<0.05 ug/L	99	50-140
Dibenz[a h]anthracene	<0.1 ug/L	87	50-140
Fluoranthene	<0.1 ug/L	96	50-140
Fluorene	<0.1 ug/L	71	50-140
Indeno[1 2 3-cd]pyrene	<0.1 ug/L	91	50-140
Naphthalene	<0.1 ug/L	66	50-140

Guideline = REG 558

* = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range



Environment Testing

Certificate of Analysis

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004775
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Phenanthrene	<0.1 ug/L	74	50-140
Pyrene	<0.1 ug/L	99	50-140
Run No 455365 Analysis/Extraction Date 2024-01-31 Analyst AsA Method EPA 1311/O. Reg 347			
REG 558 Leach			
Zero Headspace Extraction			
Run No 455366 Analysis/Extraction Date 2024-01-30 Analyst AsA Method ASTM 2216			
Moisture-Humidite			80-120
Run No 455420 Analysis/Extraction Date 2024-01-31 Analyst AaN Method M SM3112B-3500B			
Mercury	<0.001 mg/L	118	76-123
Run No 455425 Analysis/Extraction Date 2024-01-31 Analyst AsA Method SM2320,2510,4500H/F			
F	<0.10 mg/L	105	90-110
Run No 455462 Analysis/Extraction Date 2024-02-01 Analyst PJ Method CCME O.Reg 153/04			
Petroleum Hydrocarbons F2	<20 ug/L	87	60-140
Petroleum Hydrocarbons F3	<50 ug/L	87	60-140

Guideline = REG 558

* = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range



Environment Testing

Certificate of Analysis

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004775
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Petroleum Hydrocarbons F4	<50 ug/L	87	60-140
Run No 455464 Analysis/Extraction Date 2024-02-01 Analyst AaN Method EPA 200.8			
Silver	<0.01 mg/L	100	70-130
Arsenic	<0.02 mg/L	101	70-130
Boron (total)	<0.1 mg/L	106	70-130
Barium	<0.01 mg/L	108	70-130
Cadmium	<0.008 mg/L	102	70-130
Chromium Total	<0.05 mg/L	108	70-130
Lead	<0.01 mg/L	109	70-130
Selenium	<0.02 mg/L	99	70-130
Uranium	<0.01 mg/L	94	70-130
Run No 455480 Analysis/Extraction Date 2024-02-01 Analyst Z_S Method SM4500-CNC/MOE E3015			
Cyanide (CN-)	<0.05 mg/L	93	75-125
Run No 455486 Analysis/Extraction Date 2024-02-02 Analyst SKH Method C SM4500-NO3-F			
NO2 + NO3 as N	<1.0 mg/L	100	80-120

Guideline = REG 558

* = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range



Environment Testing

Certificate of Analysis

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004775
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 455508 Analysis/Extraction Date 2024-02-01 Analyst SS Method EPA 8260			
Dichloroethylene, 1,1-	<0.5 ug/L	108	60-130
Dichlorobenzene, 1,2-	<0.4 ug/L	120	60-130
Dichloroethane, 1,2-	<0.5 ug/L	121	60-130
Dichlorobenzene, 1,4-	<0.4 ug/L	121	60-130
Benzene	<0.5 ug/L	113	60-130
Carbon Tetrachloride	<0.2 ug/L	115	60-130
Chloroform	<0.5 ug/L	121	60-130
Methylene Chloride	<4.0 ug/L	102	60-130
Methyl Ethyl Ketone	<2 ug/L	118	60-130
Chlorobenzene	<0.5 ug/L	115	60-130
Tetrachloroethylene	<0.3 ug/L	119	60-130
Trichloroethylene	<0.3 ug/L	115	60-130
Vinyl Chloride	<0.2 ug/L	106	60-130
Run No 455510 Analysis/Extraction Date 2024-02-02 Analyst SS Method CCME O.Reg 153/04			
Petroleum Hydrocarbons F1	<20 ug/L	94	60-140

Guideline = REG 558 * = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range



226844

STANDARD CHAIN-OF-CUSTODY

146 Colonnade Road, Unit #8, Ottawa, ON, K2E 7Y1 - Phone: 613-727-5692, Fax: 613-727-5222

Eurofins Workorder #: 3004774

CLIENT INFORMATION

Company: Egis Canada Ltd
Contact: Benjamin Edwards
Address: 115 Walsgreen Rd, Carp, ON K0A 1L1
Telephone: Cell: 613-315-3093
Email: #1: benjamin.edwards@egis-groupe.com
Email: #2:
Project: ELD-24-2657
Quote #:

INVOICE INFORMATION (SAME AS CLIENT INFORMATION: YES ☒ NO ☐

Company: Egis Canada Ltd
Contact: Accounts Payable
Address:
Telephone:
Fax:
Email: #1: ap@egiscanada.com
Email: #2:
PO #:

REGULATION/GUIDELINE REQUIRED

- ☐ Sanitary Sewer, City: _____
☐ Storm Sewer, City: _____
☐ ODWSOG (Use DW CoC if analyzing drinking water)
☐ PWQO
☐ O.Reg 347
☐ Other: _____

- ☐ O. Reg 153
The sample results from this submission will form part of a formal Record of Site Condition (RSC) under O.Reg. 153/04. Analysis of full parameter list only
Yes ☐ No ☐
Table # _____ Coarse / Fine, Surface / subsurface
Type: Com-Ind / Res-Park / Agri / GW / All Other / Sediment
☒ O. Reg 406 Excess Soils
Table # L-3 Full depth/Strat/Ceiling/mSPLP Leachate
Type: Com-Ind / Res-Park / Agri / All Other
Category: Surface / Subsurface

TURN-AROUND TIME (Business Days)

- ☐ 1 Day* (100%) ☐ 2 Day** (50%) ☐ 3-5 Days (25%) ☒ 5-7 Days (Standard)

Please contact Lab in advance to determine rush availability.

*For results reported after rush due date, surcharges will apply: before 12:00 - 100%, after 12:00 - 50%.

**For results reported after rush due date, surcharges will apply: before 12:00 - 50%, after 12:00 - 25%.

The optimal temperature conditions during transport should be less than 10°C. Sample(s) cannot be frozen, unless otherwise indicated or agreed upon with the Laboratory. Note that this CoC is not to be used for drinking water samples. The CoC must be complete upon submission of the samples, there will be a \$25 surcharge if required information is missing (required fields are shaded in grey).

Sample Details

Field Filtered -->

Sample Matrix

of Containers

O.Reg.153 parameters

PHC F1 - F4

BTEX

VOCs

PAHs

PCBs

Metals + Inorganic

Metals only

EL5AD

Cyanide

TCP-VOCs

PAHs, PCBs, PHCs, MHL

RN#
(Lab Use Only)

Sample ID	Date/Time Collected	Sample Matrix	# of Containers	PHC F1 - F4	BTEX	VOCs	PAHs	PCBs	Metals + Inorganic	Metals only	EL5AD	Cyanide	TCP-VOCs	PAHs, PCBs, PHCs, MHL	RN# (Lab Use Only)
24-1A	26-Jan-2024	soil	4	x	x	x	x			x	x	x			1716832
24-1B	26-Jan-2024	soil	4	x	x	x	x			x	x	x			33
TCLP-24-1	26-Jan-2024	soil	2										x		
24-2A	26-Jan-2024	soil	4	x	x	x	x			x	x	x			34
24-2B	26-Jan-2024	soil	4	x	x	x	x			x	x	x			35
TCLP-24-2	26-Jan-2024	soil	2										x		
24-3A	26-Jan-2024	soil	4	x	x	x	x			x	x	x			36
24-3B	26-Jan-2024	soil	4	x	x	x	x			x	x	x			37
TCLP-24-3	26-Jan-2024	soil	2										x		
24-4A	26-Jan-2024	soil	4	x	x	x	x			x	x	x			38

PRINT

SIGN

DATE/TIME

TEMP (°C)

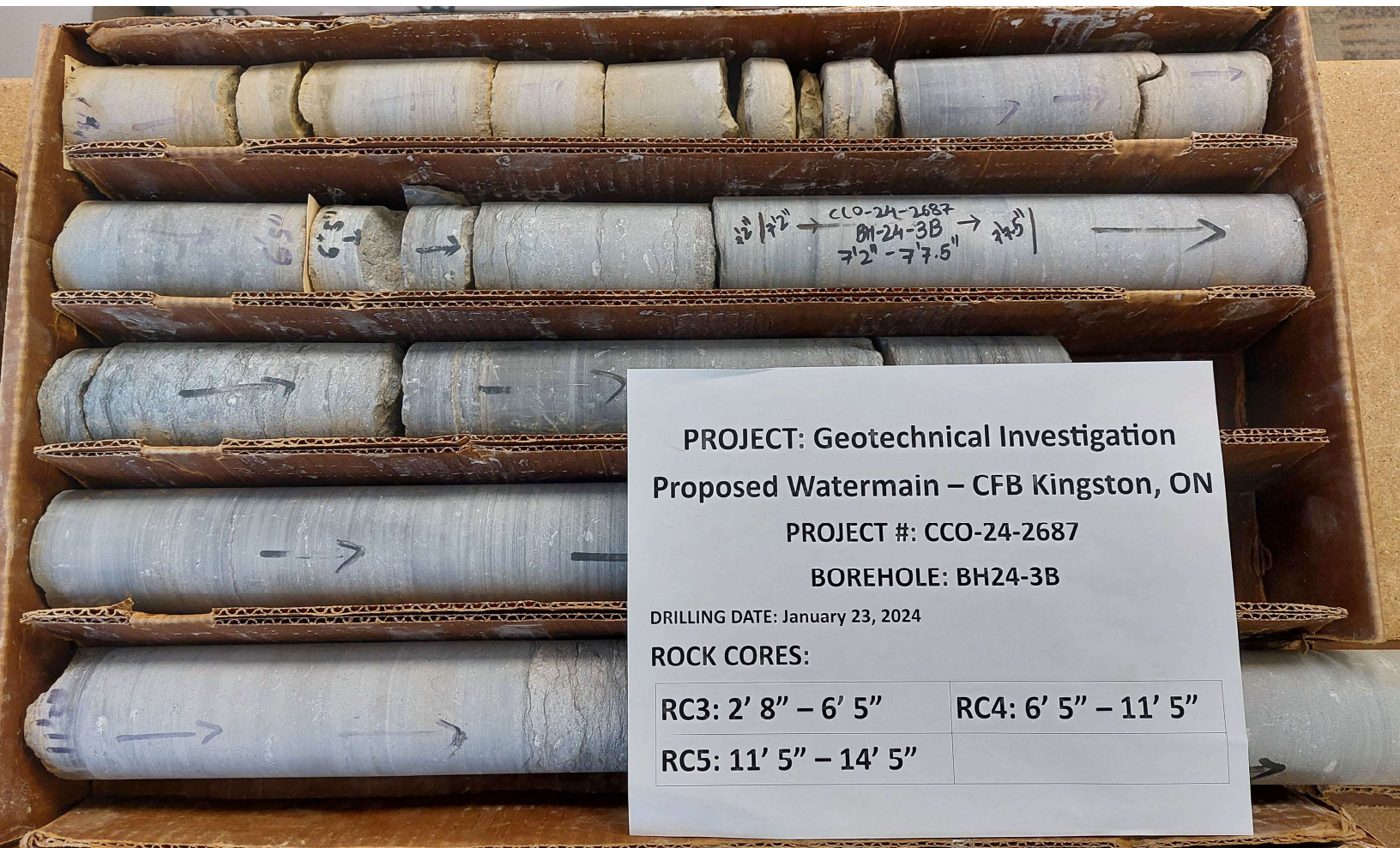
COMMENTS:

Sampled By: Ben Edwards (Rebecca Leclerc)
Relinquished By: Rebecca Leclerc
Received By: Sy
DATE/TIME: 26-Jan-24
TEMP (°C): 20
CUSTODY SEAL: ☐ YES ☐ NO ice packs submit ☐ Yes ☐ No

401 Magnetic Drive, Unit #1, North York, ON, M3J 3H9 - Telephone: 416-661-5287 • 380 Vansickle Road, Unit #630, St. Catharines, ON, L2S 0B5 - Telephone: 905-680-8887 • 608 Norris Court, Kingston, ON, K7P 2R9 - Telephone: 613-634-9307

Egis Group Canada

Appendix C – Bedrock Cores Photos



**PROJECT: Geotechnical Investigation
Proposed Watermain – CFB Kingston, ON**

PROJECT #: CCO-24-2687

BOREHOLE: BH24-3B

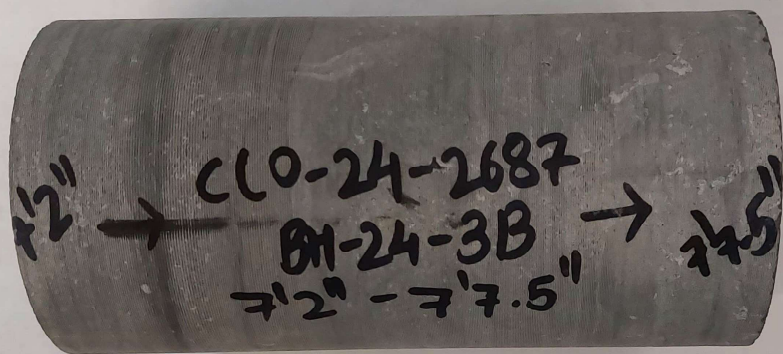
DRILLING DATE: January 23, 2024

ROCK CORES:

RC3: 2' 8" – 6' 5"

RC4: 6' 5" – 11' 5"

RC5: 11' 5" – 14' 5"

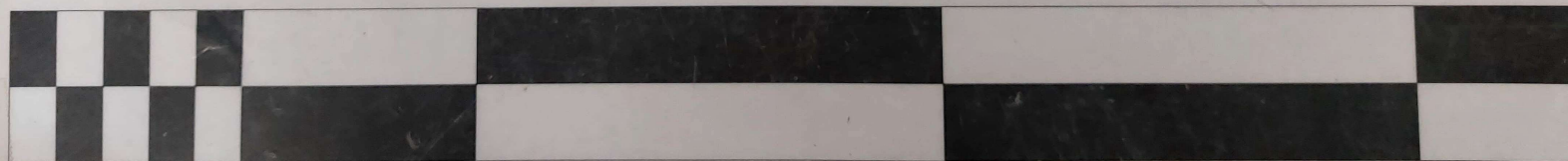


0

100 mm

200 mm

300 mm



McINTOSH PERRY

CO-24-2687
(FB Kingston)
BH-24-8B
7'2"-7'7.5"



0

100 mm

200 mm

300 mm

McINTOSH PERRY

ENGINEERING CONSULTING SERVICES GEOTECHNICAL INVESTIGATION REPORT CANADIAN FORCES BASE (CFB) - SITE-4, KINGSTON, ON.



Project No.: CCO-242687-00

Prepared for:

EastPoint
1801 Hollis Street
Suite 1500
Halifax, Nova Scotia B3J 3N4

Prepared by:

Egis Canada Limited (formerly McIntosh Perry Consulting Engineers Ltd.)
6240 Highway 7, Suite 200, Woodbridge, ON
Egis Contact: Esam Deif, P. Eng.
esam.deif@egis-group.com
Direct Line: 289.319.3167 Mobile: 647.970.3291

Table of Content

1.0 INTRODUCTION	4
2.0 PROJECT UNDERSTANDING	4
3.0 SITE AND PROJECT DESCRIPTION	6
3.1 Existing Site Conditions.....	6
3.2 Site Geology	6
4.0 FIELD INVESTIGATION AND TESTING	7
5.0 LABORATORY TESTING	8
6.0 SUBSURFACE CONDITIONS	8
6.1 Overview	8
6.2 Asphaltic Concrete Layer	8
6.3 Fill Soil.....	9
6.3 Native Clay and Silt.....	10
6.4 Ground water Level Observation.....	10
6.5 Chemical Test Results	10
7.0 GEOTECHNICAL DISCUSSION AND RECOMMENDATIONS.....	11
7.1 General.....	11
7.2 Site Preparation	12
7.3 Excavation	12
7.3.1 Overburden Excavation	13
7.3.2 Engineered Shoring	13
7.4 Temporary Construction Dewatering.....	14
7.5 Frost Depth and Frost Susceptibility.....	14
7.6 Foundations (Slab on Grade Option)	15
7.7 Site Classification for Seismic Site Response.....	15
7.8 Lateral Earth Pressures	15
7.9 Waterproofing and Permanent Drainage.....	16
7.10 Backfill.....	16
7.11 Underground Utilities	17
7.11.1 Bedding and Cover.....	17

7.11.2

Trench Backfill

18

7.11.3

Clay Seals

18

8.0

CEMENT TYPE AND CORROSION POTENTIAL

18

9.0

PAVEMENT STRUCTURE

19

10.0

ENVIRONMENTAL SOIL SAMPLING AND ANALYSIS

20

10.1

Scope of Investigation

21

10.2

Investigation Methods

22

10.3

Soil Sampling

22

10.4

Analytical Results

23

10.5

TCLP Leachate Results

25

10.6

Conclusions

25

11.0

CONSTRUCTION CONSIDERATIONS

25

12.0

IMPORTANT INFORMATION AND LIMITATIONS OF THIS REPORT

26

13.0

CLOSURE

27

APPENDIX A Borehole Location Plan and Borehole Logs

APPENDIX B Laboratory Test Results

March 22, 2024

EastPoint
1801 Hollis Street, Suite 1500
Halifax, Nova Scotia B3J 3N4

Attention: Andy Noble, P.Eng. and Ben Valiquette, P.Eng.

1.0 INTRODUCTION

Egis Canada Limited (Egis) *formerly McIntosh Perry Consulting Engineers Ltd. (MPCE)* was retained by EastPoint (the Client) to prepare a geotechnical investigation for the provide a geotechnical soil investigation, environmental soil sampling and analysis for the installation of back flow valves into the existing lines for the four sites in Kingston, Ontario.

The four sites are located along Hwy 2, starting with the intersection with Navy Way to the intersection with Craftsman Boulevard. In this report the forth site will be addressed, the other three sites will be provided under separate reports. The fourth Site is located at the east of the civic address at 2 Navy Way, Kingston, ON. (CFB Kingston (DND) property), approximately 120m west of the intersection between Main Street and James Street, Kingston Ontario as indicated in Figure -1.

The geotechnical investigation was completed in general accordance with proposal No. PCO-242687-00, dated November 2, 2023.

Authorization to proceed with the updating was given by Andy Noble, P.Eng. November 17, 2023.

The purpose of the of the geotechnical investigation was to determine the subsurface conditions of the property at the east of the civic address at 2 Navy Way, Kingston, Ontario to obtain the geotechnical and engineering parameters and provide recommendations for the design and construction of the proposed back flow valves into the existing lines by means of drilling two boreholes, carrying out field testing/observation and laboratory testing.

This report is prepared for the sole use of the Client. The use of this report, or any reliance on it by any third party, is the responsibility of such third party. It is understood that the Project will be designed and constructed in accordance with all applicable codes and standards present within its jurisdiction.

2.0 PROJECT UNDERSTANDING

Egis understanding of the Project is based on the correspondence and email from the Client on February 6, 2024. In accordance with Drawing number G-B35-BFP-SITE4 (Figure-3), It is understood that backflow preventer valve will be accommodated within a light weighted enclosure supported on a slab on grade similar to the one shown in Figure-2. An access road will be also constructed to reach to the proposed enclosure as indicated in Figure -3.

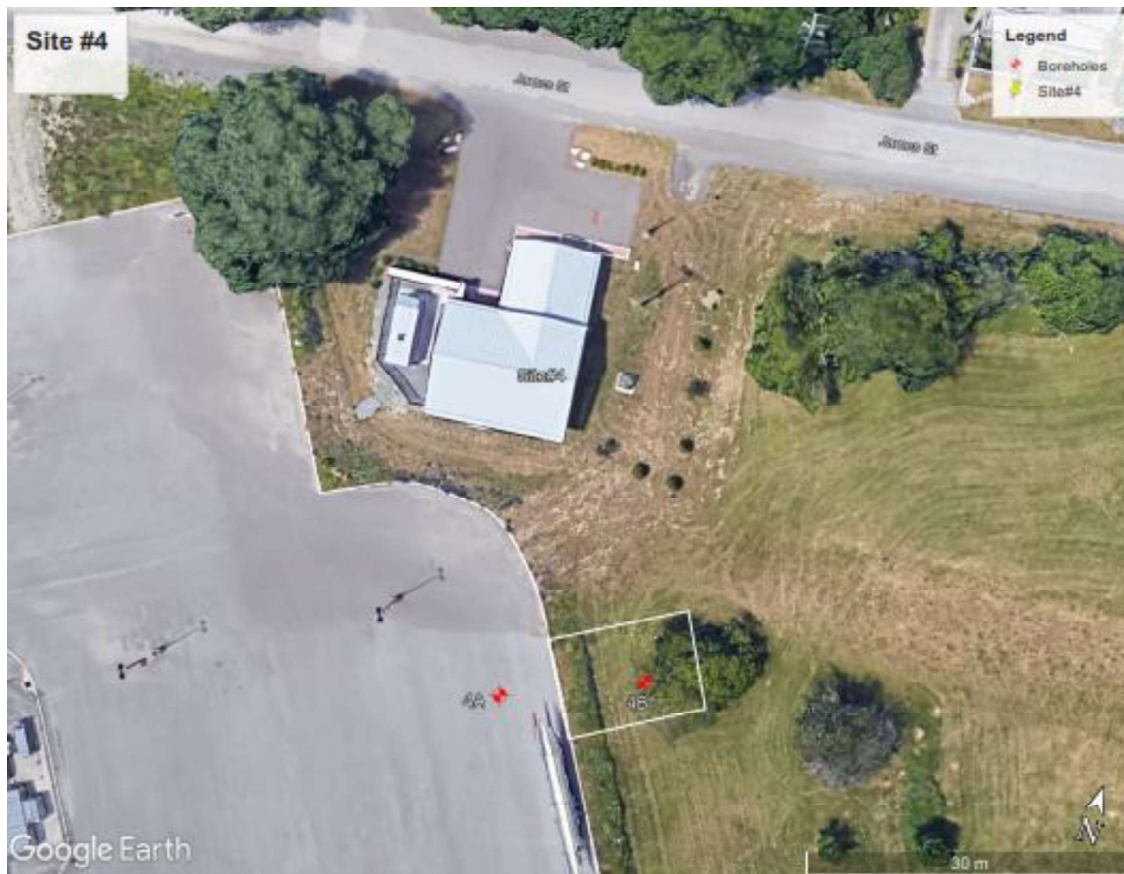


Figure -1 Site Location



Figure -2 Example of the Enclosure



Figure-3 Drawing G-B35-BFP-SITE4

3.0 SITE AND PROJECT DESCRIPTION

3.1 Existing Site Conditions

It is understood the site is currently an active military base known as CFB Kingston, back flow valves are proposed to be installed on the existing water main pipe crossing the property.

3.2 Site Geology

Based on published geological maps of the area (Ontario Geological Survey), the site is located within the Napanee Plain. Surficial geology maps of southern Ontario indicate that the site is located within Paleozoic bedrock-drift complex in Paleozoic terrain. The bedrock within the area is identified to comprise of Limestone, dolostone, shale, arkose, and sandstone of the Shadow Lake Formation.

4.0 FIELD INVESTIGATION AND TESTING

Egis cleared the Site before the commencement of any geotechnical drilling. Utility clearance requisitions were submitted to Ontario One Call (ON1Call) to obtain public utility locates. Private utility clearance was performed by a private locator on behalf of Egis, in conjunction with CFB private utility clearance. Public utility owners were informed, and all utility clearance documents were obtained before the commencement of drilling work.

The field work was completed on January 24, 2024. Two boreholes in total were marked for drilling. Upon completion of utility locate process, one borehole BH24-4B respectively within proximity of the proposed backflow preventer valve, and the other BH24-4A was at the proposed access road.

BH24-4A was drilled to 3.7 meter below grade surface (mbgs) (El. 75.7m) and BH24-4B was drilled to 3.7 mbgs (El. 76.3 m).

The boreholes were drilled using a Mobile B53 track-mounted drilling rig, outfitted with solid stem augers. The equipment used for drilling was owned and operated by Drilltech Drilling Ltd. Soil samples were obtained at 0.75 m intervals in boreholes using a 51 mm outside diameter split spoon sampler in accordance with the Standard Penetration Test (SPT) procedure.

The boreholes were backfilled with bentonite and auger cuttings and restored to the original ground surface. The boreholes were surveyed with a GPS unit to record their locations and elevations. Borehole locations are shown in Figure- 3, and included in Appendix B.

Table 4-1: Borehole Designations, Locations, and Depth

BH No.	Drilling Date	Coordinates Coordinate System: NAD 83		Coordinates Coordinate System: UTM Zone 18T			Borehole Termination	
		Longitude	Latitude	Northing	Easting	Surface El. (m)	Depth (mbgs)	Bottom El. (m)
BH24-4A	Jan. 24, 2024	-76.46459031	44.2387119	4899429.524	383049.229	79.4	3.7	75.7
BH24-4B	Jan. 24, 2024	-76.46443192	44.23876086	4899434.737	383061.973	80.0	3.7	76.3

Field investigation, including drilling and sampling, were supervised on a full-time basis by Egis. All boreholes were logged during the drilling process. All samples were labelled by waterproof paper one by one as they were retrieved. All soil samples were preserved in double plastic bags to mitigate the risk of moisture loss during transportation to the geotechnical laboratory.

5.0 LABORATORY TESTING

All soil samples obtained during the investigation were transported to Egis's geotechnical laboratory in Nepean, Ontario.

Geotechnical laboratory testing was performed on representative soil samples to determine soil index properties including grain-size analysis tests. The laboratory tests were performed in accordance with the Ministry of Transportation Ontario (MTO) test procedures, which follow the American Society for Testing Materials (ASTM) test procedures.

Paracel Laboratories Ltd. in Ottawa carried out chemical test on one (1) representative soil samples and consisted of pH, chloride, sulphate, and resistivity. Laboratory test results are included in Appendix B.

The rest of the soil samples recovered will be stored in Egis storage facility for a period of three (3) months after submission of the final report. Samples will be disposed after this period unless otherwise requested in writing by the Client.

6.0 SUBSURFACE CONDITIONS

6.1 Overview

The subsurface conditions encountered in the boreholes are shown on the borehole records provided in Appendix A. The boreholes records include soil stratification at the borehole locations with detailed soil descriptions and selected physical properties for each stratum encountered.

In general, the site stratigraphy consists of asphaltic concrete layer at BH-24-4A, fill soils at both boreholes and a native Clay and Silt encountered at BH24-4A. Borehole BH24-4A was drilled on the parking lot whereas BH24-4B was drilled on the open and gras planted landscape. The subsurface at this site can be divided into three distinguishable zones.

- Asphaltic Concrete Layer
- Fill Soil
- Clay and Silt

The subsurface soils description encountered during the course of the investigation, together with the field and laboratory test results are shown on the borehole records included in Appendix A. Laboratory test results are included in Appendix B. Unless otherwise mentioned, all SPT 'N' results quoted are for SPT spoon penetrations of 300mm as per the subject ASTM. Supplementary information supporting the above overall subsurface observations, where available and indicated below. However, it should be borne in mind the below descriptions are based on and limited to, some generalizations of the actually verified soil information intercepted in the boreholes and documented in the borehole logs. Description of the subsurface strata encountered are given below.

6.2 Asphaltic Concrete Layer

An asphaltic concrete layer was covering borehole BH24-4A, the layer was 40mm thick.

6.3 Fill Soil

Fill soil layer soil was encountered below the asphaltic concrete layer and overlaying the native Clay and Silt Layer at BH24-4A whereas the fill soil layer at borehole BH24-4B encountered at the surface of the borehole and extended until the termination depth. The Fill soil layer was generally consisting of silty gravelly sand to gravelly sand to sand and gravel. The fill soil layer extends to a depth of 1.8 m below the existing grade at the location of BH24-4A and to the termination depth of 3.7m at the location of BH24-4B.

The fill soil Layer depth, thickness, composition is given in Table 6-1.

Table 6-1: Location, Thickness, and Compaction of the Fill Soil Layer

BH No.	Layer's Depth (mbgs)	Layer's Top Elevation (masl)	Layer's Bottom Elevation (masl)	Layer's Thickness (m)	Description
BH24-4A	0.04	79.4	77.6	1.8	silty gravelly sand, some clay
BH24-4B	0.0	80.0	76.3*	N/A	gravelly sand, some silt, trace clay to sand and gravel, trace silt and clay below 2.3m

*-Denotes Termination Depth

Grain size analysis test result of three representative samples from the fill Soil are shown in Table 6-2, and the corresponding graphical plot is shown in, Appendix B.

Table 6-2: Grain Size Distribution Summary – Fill Soil Layer

BH No./ SS No.	Size Fraction (%)					Moisture Content (%)
	Gravel	Sand	Silt	Clay	Fines	
BH24-4A / SS2	26	35	28	11	--	12
BH24-4B / SS3	34	37	23	7	--	9
BH24-4B / SS4	42	45	10	3	--	5

The Standard Penetration Test (SPT) 'N' values ranged between 5 to 23 blows per 300 mm penetration, with an average value of 13 blows per 300 mm based on six readings indicating loose to compact compactness. The high SPT 'N' value encountered at borehole BH24-4A may be due to the presence of gravel within the fill layer.

6.3 Native Clay and Silt

Native Clay and Silt layer was encountered below the fill soil layer in borehole BH24-4A. The native Clay and Silt extends to the termination depth at 3.7 m below the existing grade.

The Clay and Silt, thickness, composition is given in Table 6-3.

Table 6-3: Location, Thickness, and Compaction of the Native Clay and Silt Layer

BH No.	Layer's Depth (mbgs)	Layer's Top Elevation (masl)	Layer's Bottom Elevation (masl)	Layer's Thickness (m)	Description
BH24-4A	1.8	77.6	75.7	N/A	Clay and Silt, trace sand

Grain size analysis test result of one representative sample from the Clay and Silt Layer is shown in Table 6-4, and the corresponding graphical plot is shown in, Appendix B.

Table 6-4: Grain Size Distribution Summary – Native Clay and Silt Layer

BH No./ SS No.	Size Fraction (%)					Moisture Content (%)
	Gravel	Sand	Silt	Clay	Fines	
BH24-4A /SS4	0	4	45	51	--	31

The Standard Penetration Test (SPT) 'N' values ranged between 9 to 25 blows per 300 mm penetration, with an average value of 16 blows per 300 mm based on three readings indicating Stiff consistency in general.

6.4 Ground water Level Observation

No ground water was observed on both boreholes upon the completion of the boreholes, however and based on our previous experience with a nearby site (approximately 450 m) to the west of the site the ground water elevation was recorded at El. 75.3 which matches the water level of Lake Ontario. No monitoring wells were installed in the advanced boreholes.

6.5 Chemical Test Results

Chemical analysis was conducted by Paracel Laboratories in Ottawa, ON, to determine the resistivity, pH, sulphate and chloride content of one (1) representative soil samples collected from the boreholes. The laboratory results for the chemical analysis are shown in Table 6-6 and included in Appendix B.

Table 6-6: Soil Chemical Analysis Results

Borehole	Sample	Depth (mbgs)	pH	Sulphate (10 µg/g)	Chloride (10 µg/g)	Resistivity (0.1 Ohm.m)
BH24-4B	SS-2	1.0	7.32	<10	<10	72.3

7.0 GEOTECHNICAL DISCUSSION AND RECOMMENDATIONS

7.1 General

Based on the results of the geotechnical field and laboratory investigation performed, the following discussion is provided to assist the Client and the Designer with the proposed backflow preventer valve will be accommodated within a light weighted enclosure supported on a slab on grade.

The recommendations provided within this report are based on our understanding of the proposed project which is summarized above in "Section 2" and through the interpretation of factual information obtained from the boreholes advanced during this subsurface investigation. If any of these understandings change, Egis should be contacted to assess the implications of those changes on the recommendations provided herein.

Based on the soil conditions observed in the boreholes, and assuming they are representative of soil condition across the site, the most important geotechnical considerations for the design and construction of the water main backflow prevention assembly, metering and structure enclosure are expected to be the following:

Foundation on slab on grade supported on Adequately Prepared Granular Pad:

The water main backflow prevention assembly, metering and structure enclosure will be supported on slab on grade foundation supported on a granular backfill pad and overlies the engineered fill.

Loose/Uncompacted fill should be removed and re-engineered, the depth of the excavation in the existing fill to be verified and confirmed on-site by Egis geotechnical engineers. The granular backfill pad must extend a minimum of 0.8 m beyond the edge of the footing and then downward at a 1H:1V. The slab on grade thickness must consider and accommodate any uplift pressure that piping assembly may apply on the slab on grade foundation.

Temporary protection System:

Open excavation within proximity of any utility lines may not be possible without a temporary protection system (TPS). The design of the TPS system is the responsibility of the Contractor and shall be performed by an experienced professional Geotechnical engineer. To reduce the lateral deflections, the Designer of the TPS may consider including anchoring and/or internal bracing system.

Temporary Construction Dewatering:

Excavation for preventer valve will proceed through the fill and possibly the native Clay and Silt. Although ground water was not observed upon the completion of the borehole drilling, the contractor should be prepared for ground water

dewatering if the excavation was decided to reach El. 75.3 or less as per Section 6.4. for shallower excavations the contractor should also be prepared to dewater any perched ground water and surface runoff water that may infiltrate and accumulate at the bottom of the excavations due to seasonal changes and rainfall events. Dewatering may be achievable with traditional sump and pump dewatering method. The ground water disposal should be performed in accordance with applicable regulations. Assessment of the dewatering requirements and the need for registration on the Environmental Activity and Sector Registry (EASR) or a Permit to take Water (PTTW) should be carried out by specialists experienced in this field.

Permanent Drainage and Waterproofing:

Since no ground water was intercepted upon the borehole drilling completion, and provided that the water main backflow prevention assembly, metering and structure enclosure will be founded on a slab on grade supported on a granular backfill platform approximately 4.5m above the ground water elevation. Therefore, permanent under-floor drainage will not be required.

The comments made regarding the construction of the proposed preventive valve are intended to highlight those aspects which could impact or affect the detail design of the proposed preventive valve and its enclosure, for which special provisions may be required in the Contract Documents. Comments related to construction aspects are not intended to dictate construction equipment or methods. Relevant parties should make their own interpretation of the factual data presented in the report. Interpretation of the data presented may affect equipment selection, proposed construction methods, and scheduling of construction activities.

7.2 Site Preparation

The site should be graded in the early stages of construction to provide for positive control of surface water and directing it away from excavations and subgrades. The Contractor should take appropriate measurements for collection and disposal of surface and ground water and runoff including an adequate pumping system. Prior to the site preparation.

Public and private utility owners should be notified prior to the commencement of any construction activities. Existing underground utilities in the vicinity of the proposed excavation should be reviewed before commencing any excavation works to identify potential damage hazards due to the proposed excavation.

Existing utilities that are excavated or exposed as part of the construction will need to be supported and rerouted during the construction. Even with a shoring system, some inward movement of shoring is inevitable. This may cause slight ground settlement which may have an adverse effect on the existing buried utilities. The contractor shall inform owners of all existing utilities before proceeding with excavation. The utility owners may provide the permissible deformation that a particular utility may tolerate. Shoring shop drawings should be stamped by a professional engineer.

7.3 Excavation

Excavations will proceed through the overburden. The excavations for the prevent valve installation will extend to the depth of the existing water main. As per the Technical Standards and Specifications, City of Kingston, the depth of the watermain must not be less than 1.7m therefore the existing watermain will be installed within the existing fill or native Clay and Silt layer. Based on the required excavation depth, it is anticipated that excavations for the proposed backflow preventive valves

will need to be performed with the confinement of engineered shoring or trench boxes to avoid undermining the adjacent utilities and to ensure the safety of the working crew.

The excavated materials and any corresponding excess unsuitable soils should be disposed off-site in accordance with all applicable environmental legislation. Excess soils management and evaluation of the environmental quality of subsoils will be provided in another section of this report.

7.3.1 Overburden Excavation

All excavations must be undertaken in accordance with the requirements of the Occupational Health and Safety Act of Ontario (OHSA), Regulations for Construction O.Reg. 213/91, with specific reference to acceptable size slopes and stabilization requirements. The general stratigraphy outlined herein can be considered an OHSA Soil Type 4 for the fill soil. The excavation for proposed preventive valve should be conducted through a minimum 3H:1V or a flatter slope for Type 4 Soil.

For excavations through multiple soil types, the side slope geometry is governed by the soil with the highest number designation as per OHSA. If the minimum slope requirement cannot be achieved, temporary protection system (TPS) or Engineered Shoring should be used.

Since the proposed excavations will be conducted below 1.2m, it is recommended that the excavations be undertaken within the confines of an Engineered Shoring designed and installed in accordance with OHSA. The shoring will need to support the excavation sidewalls and act as a barrier against any perched ground water flow into the excavation. However, the removal of water within the shored excavation may still be required. Further discussion on the Engineered Shoring is provided in Section 7.3.2.

The stability of the excavation side slopes is highly dependent on the Contractor's methodology and layout. The excavations of the overburden soils are expected to be performed using conventional hydraulic excavation equipment. Cobbles, and boulders may be encountered during the excavations. Boulders larger than 0.3 meters in diameter should be removed from the excavation side slopes for workers' safety. No surface surcharges should be placed closer to the edge of the excavation than a distance equal to twice the depth of the excavation, unless a TPS has been designed to accommodate such a surcharge.

7.3.2 Engineered Shoring

Engineered Shoring system is required during excavation and construction to protect any adjacent utilities, and for the worker's safety. Engineered Shoring systems may vary from as simple as the trench boxes to soldier piles and lagging, and secant and/or tangent walls. The design of the Engineered Shoring system is the responsibility of the Contractor. The Contractor should hire an experienced professional Geotechnical engineer to provide a detailed design for the Engineered Shoring system. The Engineered Shoring designer must take into consideration any adjacent infrastructure being retained, lateral earth pressures, construction surcharge loads, and pre-stressing loads or post tensioning loads on tiebacks. Also, it should consider the freeze-thaw action on the face of excavations, expansion and contraction of shoring elements, construction vibrations and compatibility with the design of proposed waterproofing and drainage systems for the proposed structure.

Stockpiling of soil beside the excavations should be avoided. The weight of the stockpiled soil could lead to overstressing the shoring system.

The temporary excavation support systems should be designed and constructed in accordance with OPSS.PROV 539 (Temporary Protection Systems). The lateral movement of the temporary shoring system should meet Performance Level 2 as specified in OPSS.PROV 539, provided that any adjacent utilities can tolerate this magnitude of deformation.

It is recommended that the Client retain a Contractor and a Designer who have significant experience with excavations performed under similar soil conditions. Shop drawings should be submitted to the designers and reviewed by the geotechnical engineer well in advance of mobilization.

Fully mobilized (i.e., active lateral earth pressure coefficient) conditions shall be considered. The lateral earth pressure coefficients for existing native and granular fill are given in Table 7-1 Section 7.8 to assist Designer and Contractor with the design of the shoring system.

7.4 Temporary Construction Dewatering

Excavation for preventer valve will proceed through the fill and native Clay and Silt Layers. Although ground water was not observed upon the completion of the borehole drilling, the contractor should be prepared for ground water dewatering if the excavation was decided to reach El. 75.3 or less as per Section 6.4. for shallower excavations the contractor should also be prepared to dewater any perched ground water and surface runoff water that may infiltrate and accumulate at the bottom of the excavations due to seasonal changes and rainfall events. Contractors should be prepared to handle any surface water or ground water infiltration by ditching, pumping and/or other methods in order to maintain dry working conditions.

Recommendations for appropriate dewatering measures beyond conventional sump pump techniques or other more intensive dewatering systems (e.g., well points or other specialized methods) to effectively lower the static ground water level shall be provided by a specialized dewatering contractor.

The ground water disposal should be performed in accordance with applicable regulations. Assessment of the dewatering requirements and the need for registration on the Environmental Activity and Sector Registry (EASR) or a Permit to take Water (PTTW) should be carried out by specialists experienced in this field.

7.5 Frost Depth and Frost Susceptibility

Based on OPSD 3090.101, the Frost Penetration Depth for the project area ranges between 1.4 to 1.6m. Therefore, all foundation elements that are sensitive to movements (i.e., heave and subsequent thaw settlements) located in unheated areas should be provided with a minimum of 1.5 metres (interpolated value) of non-frost susceptible earth cover or equivalent thermal insulation for frost protection services from the finished grades.

Based on Table 13.1 in the Canadian Foundation Engineering Manual, U.S. Corps of Engineers Frost Design Soil Classification, and since the grain size distribution for the fill soils intercepted within the frost depth are generally have a percent of finer than 0.02 mm by weight ranging between 22 to 9 as such these soils are classified to be type F3. For a frost group F3 subgrade, differential heave can generally be controlled to 25mm in 5m by providing a thickness of granular material equal to 60 percent of the frost depth, that is 1.0 m.

7.6 Foundations (Slab on Grade Option)

It is important to emphasize that at the time of preparing this report, Egis has not been provided with the proposed service loads or foundation details for the proposed preventive valve enclosure. However, it was provided by the Client that the enclosure is to be supported by a slab on grade.

Based on section 7.5, and since the existing soils within the frost depth are classified to be type F3, the proposed slab on grade cannot be supported on the existing engineered fill soils that are subject to the frost heave. Therefore, existing fill within 1.0 m in depths to be removed and replaced with proper compacted granular material.

The preparation of the granular platform should be carried out as follows:

The subsurface of the exposed subgrade after the removal of the upper 1.0 m thick layer of the existing soil should be inspected and any loose/uncompacted fill should be removed and re-engineered, the final depth of the excavation in the existing fill to be verified and confirmed on-site by Egis geotechnical engineers. The surface of the exposed fill should be compacted, proof rolled and inspected and approved to be clear from any soft soil in the presence of an Egis geotechnical engineer.

Imported engineered fill OPSS 1010 Type II Granular 'B' or Granular A, placed in shallow lifts not exceeding 250 mm and compacted to 98% of the Standard Proctor Maximum Dry Density (SPMDD) of the material. This operation should be carried out under strict construction compliance.

A moisture barrier consisting of at least a 200 mm thick layer of 19 mm clear crushed stone or 10 mm polyethylene vapor barrier is recommended to be placed directly under the floor slab. The stone bed would act as a barrier and prevent the capillary rise of moisture into the floor slab.

The slab-on-grade should be founded over the moisture barrier with a minimum thickness of 200 mm, the final thickness of the slab to be decided by the structural engineer.

A modulus of Subgrade Reaction (k_s) of 15 MPa/m is recommended for slab-on-grade design.

7.7 Site Classification for Seismic Site Response

Seismic site classification is completed based on National Building Code (NBC) 2020 Section 4.1.8.4 and Table 4.1.8.4.-B. This classification system is based on the average soil properties in the upper 30 m. Since the proposed foundations will be above the fill soil, therefore the site can be classified as a Site Class "E". For the possibility of obtaining higher Site Class, e.g., Site Class D or C, Shear wave tests should be considered.

7.8 Lateral Earth Pressures

The following preliminary lateral earth pressure parameters are provided to assist Contractors and Designers with the design of temporary Engineered Shoring systems.

Compaction of backfill behind retaining structures can induce loads greater than the active or at-rest earth pressures. Therefore, the induced lateral earth pressure due to compaction should be added to the calculated earth pressure in accordance with Section 24.8 of CFEM (2006).

The following static lateral earth pressure coefficients are recommended.

Table 7-1: Lateral Earth Pressure Coefficient for Static Conditions

Material	Bulk Unit Weight, γ (kN/m ³)	Friction Angle, ϕ' (°)	Static active pressure, K_a	Static at-rest pressure, K_0	Static passive pressure, K_p
Fill soil layer in a loose to compact state	18	25	0.41	0.58	2.46
New compacted Granular B Type I	20	30	0.33	0.50	3.00
New compacted Granular A and Granular B Type II	22	32	0.31	0.47	3.25

Static lateral earth pressure can be calculated by using the following equation:

$$\sigma_h = K \times (\gamma h + q)$$

where K is the lateral earth pressure coefficient. For yielding retaining walls, the active earth pressure coefficients, K_a , is recommended to be used. For non-yielding temporary shoring walls, the at-rest, K_0 , is recommended to be used for design. The resultant of the applicable static or at-rest force is assumed to act at $h = 1/3H$ above the base of the wall where H is the Height of the wall. The unit of the retained soil " γ " is given in Table 7-1, and "q" is the value of any applied surcharge.

The above noted lateral pressure coefficients are calculated assuming the wall back angel is vertical and the backslope of the retained soil is horizontal. The wall-soil interaction angle is assumed to equal to $0.5\phi'$ as per CFEM. If Engineered Shoring is used, then designers should refer to CFEM for design assistance and a geotechnical engineer should be retained to perform the shoring design review.

7.9 Waterproofing and Permanent Drainage

Since no ground water was intercepted upon the borehole drilling completion, and provided that the water main backflow prevention assembly, metering and structure enclosure will be founded on a slab on grade supported on a granular backfill platform is approximately 4.5 m above the groundwater elevation (refer to Section 6.4 the groundwater elevation was measured at El. 75.3 in a nearby site). Therefore, permanent under-floor drainage will not be required.

7.10 Backfill

The existing fill material is considered as a F3 material with moderate frost heave susceptibility and due to its non-uniform density, the existing fill soils are unsuitable for backfilling under the slab-on-grade, however it can be used to raise the

grade under the proposed pavement in its present condition. Therefore, it is recommended to be sub-excavated at the slab on grade location and replaced with OPSS Granular A or B Type II material placed in thin, loose lifts (maximum 0.2m thick) and each lift thoroughly compacted to a minimum of 98% of Standard Proctor Maximum Dry Density (SPMDD) as outlined below:

- Backfill should not be placed in frozen condition or placed on a frozen subgrade.
- In landscaped areas, the existing on-site native Clay and Silt soil can be used for the upper 0.3m of backfill below the surrounding landscape for its low permeability to reduce surface water infiltration.
- Exterior grades should be sloped away from the prevent valve enclosure walls, and roof drainage downspouts from adjacent buildings should be placed so that water flows away from the enclosure.

7.11 *Underground Utilities*

At the subject site, it is expected that the burial depth of water utility lines is typically 1.7 m below the ground surface or as per the Technical Standards and Specifications, City of Kingston. Equivalent thermal insulation should be provided if this depth is not achievable.

The contractor should retain a professional engineer to provide detailed drawings for excavation and temporary support of the excavation walls during construction.

Excavations for the utility lines shall be performed in accordance with the Occupational Health and Safety Act (OHSA) of Ontario. Excavations shall be performed in accordance with Section 7.3 of this report.

The engineer designing utilities shall ensure the proposed utility pipes can tolerate compaction loads.

The recommendations within this section are intended to be a supplement to, and not a replacement of the most recent local municipal requirements.

7.11.1 *Bedding and Cover*

The following are recommendations for service trench bedding and cover materials:

- Bedding for buried utilities should consist of an OPSS.MUNI 1010 "Granular A" material and should be placed in accordance with municipal requirements. All utility pipes and high amps electrical conduits shall receive a minimum of 150 mm bedding.
- The use of clear stone is not recommended for use as pipe bedding. The voids in the stone may result in a low gradient water flow and infiltration of fines from the surrounding soils and cover materials, causing settlement and loss of support to pipes and structures.
- The cover material should be a service sand material or an OPSS.MUNI 1010 "Granular A". The dimensions should comply with the pertinent specification section.
- The bedding, spring line, and cover should be compacted to at least 98% of its SPMDD.
- All covers are to be compacted to 100% SPMDD if they are intersecting structural elements.
- Compaction equipment should be used in such a way that the utility pipes are not damaged during construction.

- If the encountered subgrade below the utility line is clay or silt, it is recommended that the utility bedding be separated from the native soil by a non-woven geotextile.

7.11.2 Trench Backfill

- Backfill above the cover for buried utilities should be in accordance with the following recommendations:
- The backfill should be placed in a maximum of 200 mm thick layers at or near (+ 2%) their optimum moisture content, and each layer should be compacted to at least 95% SPMDD within the landscape areas. This value should be increased to at least 98% SPMDD within the roadway and the proposed enclosure structure subgrade backfilling.
- In general excavation backfill should attempt to match the texture of the existing adjacent soils. If imported materials are used, side slopes with frost tapers are recommended. Typically, frost tapers should be a back-slope of 10H:1V through the frost zone, (i.e., 1.5 m from finished grade).
- During backfilling, care should be taken to ensure the backfill proceeds in equal stages simultaneously on both sides of the utility pipes; and
- No frozen material should be used as backfill; neither should the trench base be allowed to freeze.
- The quality and workmanship in the construction are as important as the compaction standards themselves. It is imperative that the guidelines for the compaction be followed for the full depth of the trench to achieve satisfactory performance.

7.11.3 Clay Seals

In the event that a perched groundwater encountered during the excavation for the installation of the watermain backflow prevention assembly, clay seals are recommended as a seepage barrier for all utility trenches. In the absence of clay seals, there is a potential for the trench to act as a drain into the watermain trench. To avoid such an effect, clay seals are recommended at both ends of the open trench. The clay seal shall be constructed of low permeability material, such as silty clay, to a minimum thickness of 0.6 m, clay seal material shall be according to OPSS 1205 and OPSD 802.095. The clay seal (i.e., silty clay) material shall be compacted to a minimum of 95% SPMDD in loose lifts of no thicker than 300 mm. Acceptable imported clay material may be used for the construction of the clay seals.

8.0 CEMENT TYPE AND CORROSION POTENTIAL

One soil sample was submitted to Parcel laboratories for testing of chemical properties relevant to exposure of concrete elements to sulphate attacks as well as potential soil corrosivity effects on buried metallic structural elements. Test results are presented in Table 6-6 and the laboratory results for the chemical analysis are shown in appendix B.

Electrical resistivity, pH-value, and chloride concentration can provide an indication of the corrosion potential to buried steel elements in contact with subsurface environment. Using a corrosion nomograph proposed by King (1977) for buried metals and based on electrical resistivity results and pH-value, the corrosion potential for buried steel elements is within the non-aggressive range. The corrosive effects of road de-icing salts should also be considered.

The analytical results of the soil sample were compared with applicable Canadian Standards Association (CSA) A23.1-04 and are given in Table 8-1 below.

Table 8-1: Additional Requirement for Concrete Subjected to Sulphate Attack

Class of Exposure	Degree of Exposure	Water Soluble Sulphate in Soil Sample (%)	Cementing Material to be Used
S-1	Very Severe	> 2.0	HS or HSb
S-2	Severe	0.2 – 2.0	HS or HSb
S-3	Moderate	0.1 – 0.2	MS, MSb, LH, HS, or HSb

The chemical sulphate content analyses for selected soil sample tested indicate a sulphate concentration of maximum of a 0.010 % in soil, as shown in Table 6-6, indicating a “moderate to low” risk for sulphate attack on concrete material. The selection for class of concrete should include consideration of the effects of road de-icing salts.

9.0 PAVEMENT STRUCTURE

Since a new roadway will be required to reach the proposed enclosure, recommendation included in this section can be used for the pavement design.

The production and placement of asphaltic concrete and granular materials shall conform to the requirements of OPSS MUNI 1003, 1151 for Superpave mixes and OPSS 1150 for Marshal mixes.

Prior to placing the pavement structure, any loose, or unstable soil should be removed, and the subgrade prepared as noted below. Pavement subgrade can consist of the fill material.

Pavement subgrade should be compacted to at least 98% of the SPMDD and proof rolled. Areas exhibiting more than 20 mm deflection should have the top 300mm removed and replaced with approved drier materials.

Sub-grade up-fill should also be compacted to at least 98% of the standard Proctor density of the material, at or below the optimum moisture content (OMC) in lifts not exceeding 200 mm in thickness.

The Granular Base and Subbase layers should be compacted to at least 100% of the SPMDD. In the extreme cases, such as during the wet season, the top 300mm of the sub-grade may have to be replaced by compacted granular material to compensate for the inadequate strength of the wet sub-grade.

Table 9-1 provides the minimum recommended thicknesses of both heavy and light duty pavements. If the use of the access road is limited to maintenance pickup trucks and snowplows, then it may be considered as a light duty pavement. However, the proposed access road should match with the existing connecting road structure to reduce the risk of differential behaviors between the existing and proposed surfaces and to extend the purpose that the original road was built to serve.

Table 9-1: Proposed Pavement Structure

Material		Heavy Duty Thickness (mm)	Light Duty Thickness (mm)
Surface	HL3 or Superpave 12.5 mm, Design Category B, PG 58-28*	50	50
Binder	HL8 or Superpave 19.0 mm, Design Category B, PG 58-28*	50	--
Base	OPSS Granular A	150	150
Sub-base	OPSS Granular B Type II	400	300

*-New hot mix or up to a maximum of 20% RAP

The existing asphalt should be cut back a minimum of 3.0 m from the edge of any excavation. Top 50 mm of the existing asphalt shall be also milled for 0.3 m to stagger the surface joint and the binder joint. Both base and sub-base should be compacted to 100% SPMD. Asphalt layers should be compacted to comply with OPSS.MUNI 310. Asphalt layers shall be compacted to minimum 92% and maximum 97% density, 4% air void is ideal.

10.0 ENVIRONMENTAL SOIL SAMPLING AND ANALYSIS

Egis carried out a scoped due diligence environmental subsurface investigation on January 26, 2024, following the geotechnical field investigation conducted at the Site. It is understood that the due diligence sampling program is intended to inform future tendering of work at the Site, and as such, Egis did not complete an Assessment of Past Uses (APU) or Sampling and Analysis Plan (SAP) for the Site prior to the investigation. Egis staff carried out the collection, screening, and laboratory analysis of soil samples. This included the completion of two (2) boreholes and the submission of one (1) soil sample per borehole (two total) for analysis of contaminants of potential concern, as well as Toxicity Characteristic Leaching Procedure (TCLP) leachate analysis. As agreed with the Client, the sampling did not strictly comply with the required sampling to meet Ontario Regulation (O. Reg.) 406/19 and was instead intended to provide general soil quality information of the soils that will become excess at the Site, with the understanding that additional sampling/testing will be conducted following the tendering of the work. This investigation was conducted in accordance with Egis' Standard Operating Procedures.

Soil results were compared to the following Site Condition Standards for the purposes of this report, from the document entitled "*Generic Excess Soil Quality Standards*" as defined within the MECP document "Rules for Soil Management and Excess Soil Quality Standards," dated December 23, 2022.

- Table 1: Full Depth Background Site Condition Standards for Agricultural and Other Property Uses;
- Table 1: Full Depth Background Site Condition Standards for Residential, Parkland, Institutional, Industrial, Commercial and Community Property Uses
- Table 2.1: Full-Depth Excess Soil Quality Standards for Agricultural and Other Uses in a Potable Groundwater Condition (Volume-independent);

- Table 2.1: Full-Depth Excess Soil Quality Standards for Residential, Parkland and Institutional Property Uses in a Potable Groundwater Condition (Volume-independent);
- Table 2.1: Full-Depth Excess Soil Quality Standards for Industrial, Commercial, Community Property Uses in a Potable Groundwater Condition (Volume-independent);
- Table 3.1: Full-Depth Excess Soil Quality Standards for Residential, Parkland, Institutional Property Uses in a Non-Potable Groundwater Condition (Volume-independent); and,
- Table 3.1: Full-Depth Excess Soil Quality Standards for Industrial, Commercial, Community Property Uses in a Non-Potable Groundwater Condition (Volume-independent).

The Toxicity Characteristic Leaching Procedure (TCLP) screening results were compared to:

- O. Reg 558/04 General – Waste Management, Schedule 4 Leachate Quality Criteria.

It is important to note that soil only becomes “excess soil” if it is not reused within the project limits. To minimize the generation of waste and environmental impact, every attempt should be made to reuse the soil within the project limits if a geotechnically suitable use can be found. It is recommended that for any soils found to have exceedances of all the above noted SCS and ESQS, an attempt should be made to reuse this soil within the Project Area, for landscaping berms or to improve drainage, if there will be no adverse impacts. If this cannot be accomplished any heavily contaminated soils should be disposed of at a licensed landfill.

It is recommended that reuse of contaminated soils within the Project Area, once fully characterized, shall only be located:

- a. A minimum of 30 metres (m) away from waterbodies;
- b. A minimum of 3 m away from the property line (boundary);
- c. A minimum of 2 m above the ground water table;
- d. A minimum of 100 m from water wells; and
- e. Covered with 0.3 m of clean soil and revegetated or capped.

10.1 Scope of Investigation

The due diligence environmental investigation at the Site consisted of the following components:

- Underground service locate clearance was provided by public utility services through Ontario One Call;
- The advancement of two (2) auger holes at the Site to a maximum depth of 3.7 m below ground surface (m bgs);
- Submission of select “worst case” soil samples from target depths, collected from each auger hole, as determined through field screening, general coverage, and the judgement of the field staff, for laboratory analyses of petroleum hydrocarbons (PHCs) in the F1 to F4 fraction ranges (F1-F4); benzene, toluene, ethylbenzene, and xylene (BTEX); polycyclic aromatic hydrocarbons (PAHs), metals and inorganic parameters, and volatile organic compounds (VOCs);
- Submission of “worst case” soil leachate samples for toxicity characteristic leaching procedure (TCLP) analyses; and

- Completion of a Due Diligence Soils Investigation discussion, presented within the geotechnical investigation report for the Site.

10.2 Investigation Methods

As agreed with the Client, this investigation was conducted for due diligence purposes for general characterization of the soil at the Site and does not fully comply with the requirements of O. Reg. 406/19, O. Reg. 153/04, nor the MECP "Rules for Soil Management and Excess Soil Quality Standards." The Client requested testing of 1-2 soil samples from each Site and one (1) TCLP sample to provide general soil quality information. It is understood that additional sampling/testing would be completed once the work has been tendered.

A total of two (2) boreholes were advanced within the Project Area in areas where excess soil is expected to be generated.

Site Location is presented in Figure 1. Borehole locations along the Site are shown in Appendix A.

10.3 Soil Sampling

A total of twelve (12) soil samples, six (6) from BH24-4A and six (6) from BH24-4B, were collected at the Site using a Mobile B53 track-mounted drilling rig, outfitted with solid stem augers. The twelve (12) soil samples were collected to a maximum depth of 3.7 m bgs. All samples were collected directly into Ziploc® bags and screened. Two (2) of the twelve (12) soil samples were submitted for laboratory analysis using a "worst-case" scenario and were then placed into laboratory supplied containers and placed into chilled coolers for transport to the laboratory, Eurofins Scientific (Eurofins), under strict Chain of Custody documentation protocols. Eurofins is accredited by the Standards Council of Canada and the Canadian Association for Laboratory Accreditation, in accordance with the international standard ISO/IEC 17025:2005 – *General Requirements for the Competence of Testing and Calibration Laboratories*. Eurofins is accredited for analysis of all parameters required under the O. Reg. 153/04 – Record of Site Condition, as outlined in the MECP Technical Update entitled '*Laboratory Accreditation Requirements Under the New Record of Site Condition Regulation (O. Reg. 153/04)*'.

One (1) representative composite sample was obtained for TCLP leachate analyses to determine disposal options for potentially contaminated soil. A modified Synthetic Precipitation Leaching Procedure (mSPLP) sample was not submitted.

All non-dedicated equipment used during soil sampling (i.e., hand auger) were cleaned between sampling with a mixture of Alconox® and water. Additionally, prior to use on-Site, the RKI Eagle 2 used as part of this Soil Characterization investigation was calibrated to manufacturer specifications by the equipment supplier (Maxim Environmental).

The following summarizes the soil samples submitted for laboratory analyses:

Table 10-1: Samples Submitted

BH ID	Sample ID	Coordinates (UTM Zone 18N)	Approx. Depth (mbgs)	Chemical Analysis	Rationale
BH24-4A	BH24-4A (24-4A-SS3)	N: 4899429.524 E: 383049.229	1.52 – 2.13	PHC F1-F4, BTEX, PAHs, M&I, VOC	General soil information at the Site

BH ID	Sample ID	Coordinates (UTM Zone 18N)	Approx. Depth (mbgs)	Chemical Analysis	Rationale
BH24-4B	BH24-4B ¹	N: 4899434.737 E: 383061.973	1.52 – 2.90	PHC F1-F4, BTEX, PAHs, M&I, VOC	General soil information at the Site
Composite	TCLP-24-4	-	-	TCLP Metals, TCLP PHCs, TCLP PAHs, TCLP VOCs	Off-site disposal options

¹Composite sample submitted (24-4B-SS3 and 24-4B-SS4) due to low recovery.

10.4 Analytical Results

The COPCs at the Site are VOCs including BTEX, PHCs (F1-F4), PAHs, and metals and inorganics.

The analytical results were compared to the following criteria:

- Table 1 AO SCS;
- Table 1 RPIICC SCS;
- Table 2.1 AO ESQS;
- Table 2.1 RPI ESQS;
- Table 2.1 ICC ESQS;
- Table 3.1 RPI ESQS; and
- Table 3.1 ICC ESQS.

The exceedances are summarized in Table 10-2 below. Laboratory Certificates of Analysis are presented in Appendix B.

Analytical results are only applicable to locations and excavation depths stated in this document. The Client will be responsible for characterization of the soil and ensuring the appropriate number of bulk and leachate samples are collected and analyzed in order to meet the testing requirements outlined in O.Reg. 406/19 and by the chosen reuse sites, as applicable.

Additionally, if olfactory evidence (i.e. staining, odours, etc.) is noted in the soils during construction, testing of soils should be completed by the Contractor to determine soil quality and appropriate reuse and/or disposal, if unknown.

A summary of soil results exceedances are presented in Table 10-2 below:

Table 10-2: Analytical Summary – Exceedances

BH ID	Sample ID:	Sample Depth Range (m bgs)	Table 1 AO SCS	Table 1 RPIICC SCS	Table 2.1 AO ESQS	Table 2.1 RPI ESQS	Table 2.1 ICC ESQS	Table 3.1 RPI ESQS	Table 3.1 ICC ESQS
24-4A	24-4A (Composite of 24-4B-SS3, and 24-4B-SS4)	1.52 – 2.13	Ba, EC	Ba, EC	-	-	-	-	-

BH ID	Sample ID:	Sample Depth Range (m bgs)	Table 1 AO SCS	Table 1 RPI/ICC SCS	Table 2.1 AO ESQS	Table 2.1 RPI ESQS	Table 2.1 ICC ESQS	Table 3.1 RPI ESQS	Table 3.1 ICC ESQS
24-4B	24-3B (24-3B-SS1)	1.52 – 2.90	-	-	-	-	-	-	-

*Note: Barium (Ba), Electrical Conductivity (EC)

All other tested parameters were below the noted SCS/ESQS guidelines.

10.5 TCLP Leachate Results

One (1) soil sample was submitted to Eurofins on January 26, 2024, for TCLP analyses of metals and inorganics, PHC, VOC, and PAH leachate criteria.

The TCLP leachate analytical results are compared to Schedule 4: Leachate Quality Criteria in O. Reg 558/00 General – Waste Management made under the Environmental Protection Act, dated October 10, 2000.

A review of the analytical results indicates that the TCLP sample did not exceed the Leachate Quality Criteria for any of the analyzed parameters, and thus, should be classified as non-hazardous solid waste.

The analytical results for the TCLP sample and Laboratory Certificates of Analysis are appended.

10.6 Conclusions

Of the two (2) borehole locations sampled during the investigation, all of the samples submitted met the above-noted Site Condition Standards or Excess Soil Quality Standards with the exception of Table 1 SCS for select metals and electrical conductivity. Borehole 24-4A exceeded Table 1 R/P/I/I/C/C SCS for barium and electrical conductivity. Borehole 24-3B did not exceed any of the above-noted standards. It should be noted that barium and selenium concentrations were consistently detectable in boreholes across the Sites (Sites 1-4) and as such, it is considered possible that these exceedances in BH24-4A may be of natural origin. Barium-impacted soils may be suitable for reuse at a site with similarly elevated levels of metals. Notwithstanding other impacts or characterizations, soil impacted with exceeding values of electrical conductivity is likely suitable for reuse at properties where a landscape architect has confirmed that salt-related impacts will not affect vegetation. All other analyzed parameters were found at concentrations below SCS/ESQS.

The Client will be responsible for full characterization of any excess soil and for ensuring the appropriate number of bulk samples, leachate samples, and reporting is completed to meet the testing requirements outlined by O.Reg. 406/19 and the chosen reuse sites, as applicable.

It is important to note that soil only becomes “excess soil” if it is not reused within the Project Area. To minimize the generation of waste and environmental impact, every attempt should be made to reuse the soil within the project limits if a geotechnically suitable use can be found. It is recommended that any soils found to exceed of all the above noted SCS and ESQS, that an attempt should be made to reuse this soil on site, such as in berms or to improve drainage, if there will be no adverse impacts. If this cannot be accomplished any heavily contaminated soils should be disposed of at a licensed landfill.

11.0 CONSTRUCTION CONSIDERATIONS

The recommendations presented in this report are based on the assumption that an adequate level of construction monitoring by qualified geotechnical personnel during construction will be provided. All bearing surfaces should be inspected and approved by experienced geotechnical personnel prior to placing the footings or lean mix concrete.

In addition, an adequate level of construction monitoring should include laboratory and field test during construction. This includes Full time compaction testing of Engineered Fill and part time compaction testing under the slab on grade platform backfill with laboratory testing for the proposed fill soils for this Site. Also, periodic testing of concrete is required.

The vibration should be kept at a minimal level to avoid soil disturbance and associated unexpected settlement to the nearby structures, roadway, load bearing elements, and utilities. Also, the noise level should be kept at a tolerance level of noise per the City of Kingston requirements. Vibration and deformation monitoring will be required throughout the construction.

A separate monitoring program should be developed by the shoring designer to monitor the inward movements of the excavation support system to ensure compliance with the design assumptions and avoidance of adverse impacts on nearby structures and buried services.

Also as noted earlier in this report, the existing native soil cannot be used as engineered fill, bedding, cover, or any part of the pavement structure. If the existing native soil is to be reused for backfilling, it has to be reviewed by a geotechnical engineer and approved through bulk sampling and Proctor testing. However, it still can be reused for landscaping.

12.0 IMPORTANT INFORMATION AND LIMITATIONS OF THIS REPORT

The geotechnical assessment presented in this report are intended for the sole guidance of the client named and their design consultants. It should not be relied upon for any other purpose.

In the event of change of the design, further geotechnical investigation must be carried out.

The information on which these recommendations are based is subject to confirmation by engineering personnel at the time of construction.

The data we have collated and the opinions we have formed after reviewing this information should not be construed as a guarantee but only as a guide to probable expectations. Conditions that exist, but are not recorded herein, were not apparent given the level of study authorized.

Localized variations in the subsurface conditions may be present between and beyond the boreholes advanced, and that these conditions may be significantly different from the general description provided for design purposes.

It is strongly urged that Egis should be contacted to aid in the interpretation of the borehole records by anyone undertaking work on/or below the ground surface at this Site prior to this work being carried out.

The client expressly agrees that it has entered into this agreement with Egis, both on its own behalf and as an agent on behalf of its employees and principals.

The client expressly agrees that Egis employees and principals shall have no personal liability to the client in respect of a claim, whether in contract, tort, and/or any other cause of action in law. Accordingly, the client expressly agrees that it will bring no proceedings and take no action in any court of law against any Egis employees or principals in their personal capacity.

13.0 CLOSURE

We trust that the following information is sufficient for your needs. We will be pleased to discuss the salient findings of this report with you, should you wish. If you require our further services in this regard, please do not hesitate to contact our office.

Yours truly,

Egis Canada Limited.

Field work carried out by:



Jeffrey Forrester, C.E.T.
Foundations Coordinator

The Geotechnical Part of the Report prepared by:



Zeyad Buni, P.Eng.,
Practice Area Lead, Geotechnical Services

The Geotechnical Part of the Report reviewed by:



Esam Deif, P.Eng.,
Vice President, Geotechnical Services

The Environmental Soil Sampling and
Analysis Part of the Report



Jordan Bowman, P.Geo., P.Biol.
Manager, Geo-Environmental

Egis Group Canada

Appendix A – Borehole Location Plan and Borehole Logs

Site #4

Legend

- Boreholes
- Site#4

James St

James St

Site#4

4A

4B

Google Earth



30 m



PROJECT NO.: CCO-24-2687					Drilling Date: Jan/24/2024 - Jan/24/2024					BH No: 24-4A						
PROJECT: Geotech Investigation - Proposed Watermain Valves and Structures					BH Location: N 4899429.524; E 383049.229					Datum: Geodetic						
CLIENT: Eastpoint Engineering Ltd					Drilling Equipment: Mobile B53					Elevation: 79.4 m						
PROJECT LOCATION: CFB Kingston, ON					Drilling Method: Solid Stem Auger					Compiled by: JP						
					Remarks: Coordinate System - UTM Zone 18T					Checked by: ZB						
SOIL PROFILE			SAMPLES				GROUNDWATER CONDITIONS	DEPTH (m) ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT				PLASTIC LIMIT	NATURAL MOISTURE CONTENT	LIQUID LIMIT	Remarks and Grain Size Distribution (%) Unit Weight (kN/m³) Pocket Penetro. (kPa)
ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS/0.3 m RQD (%)	RECOVERY (%)			SHEAR STRENGTH (kPa) Field, Shear Vane (x) & Sensitivity (s) Pocket Penetrometer ● Quick Triaxial ○ Unconfined							
79.4 0.0	ASPHALT- 40 mm FILL silty gravelly sand, some clay compact grey to brown dry to moist		1	SS	50/ 75 mm	12%		0.0								26 35 28 11
			2	SS	23	63%		79								
																0 4 45 51
77.6 1.8	CLAY AND SILT trace sand stiff greyish brown moist		3	SS	9	88%		2.0								
			4	SS	13	100%		77								
			5	SS	25	71%		76								
75.7 3.7	End of Borehole Borehole dry upon completion															

1MP SOIL LOG GINT CFB KINGSTON MARCH 26.GPJ MP_OTTAWA_FOUNDATIONS.GDT 3/27/24

PROJECT NO.: CCO-24-2687

PROJECT: Geotech Investigation - Proposed Watermain Valves and Structures

CLIENT: Eastpoint Engineering Ltd

PROJECT LOCATION: CFB Kingston, ON

Drilling Date: Jan/24/2024 - Jan/24/2024

BH Location: N 4899434.737; E 383061.973

Drilling Equipment: Mobile B53

Drilling Method: Solid Stem Auger

Remarks: Coordinate System - UTM Zone 18T


BH No: 24-4B

Datum: Geodetic

Elevation: 80.0 m

Compiled by: JP

Checked by: ZB

SOIL PROFILE			SAMPLES				GROUNDWATER CONDITIONS	DEPTH (m) ELEVATION (m)	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT			LIQUID LIMIT		Remarks and Grain Size Distribution (%) Unit Weight (kN/m ³) Pocket Penetro. (kPa)	
ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS/0.3 m RQD (%)	RECOVERY (%)			SHEAR STRENGTH (kPa)					W _P	W	W _L				
									Field: Shear Vane (x) & Sensitivity (s) Pocket Penetrometer x Quick Triaxial o Unconfined											
80.0 0.0	FILL gravelly sand, some silt, trace clay light brown loose to compact moist ----- sand and gravel, trace silt and clay, loose to compact, brown, moist to dry below 2.3m		1	SS	5	50%														
					2	SS	14	63%												
					3	SS	13	100%												
			4	SS	9	58%														
			5	SS	16	67%														
76.3 3.7	End of Borehole Borehole dry upon completion																			

1MP SOIL LOG GINT CFB KINGSTON MARCH 26.GPJ MP_OTTAWA_FOUNDATIONS.GDT 3/27/24

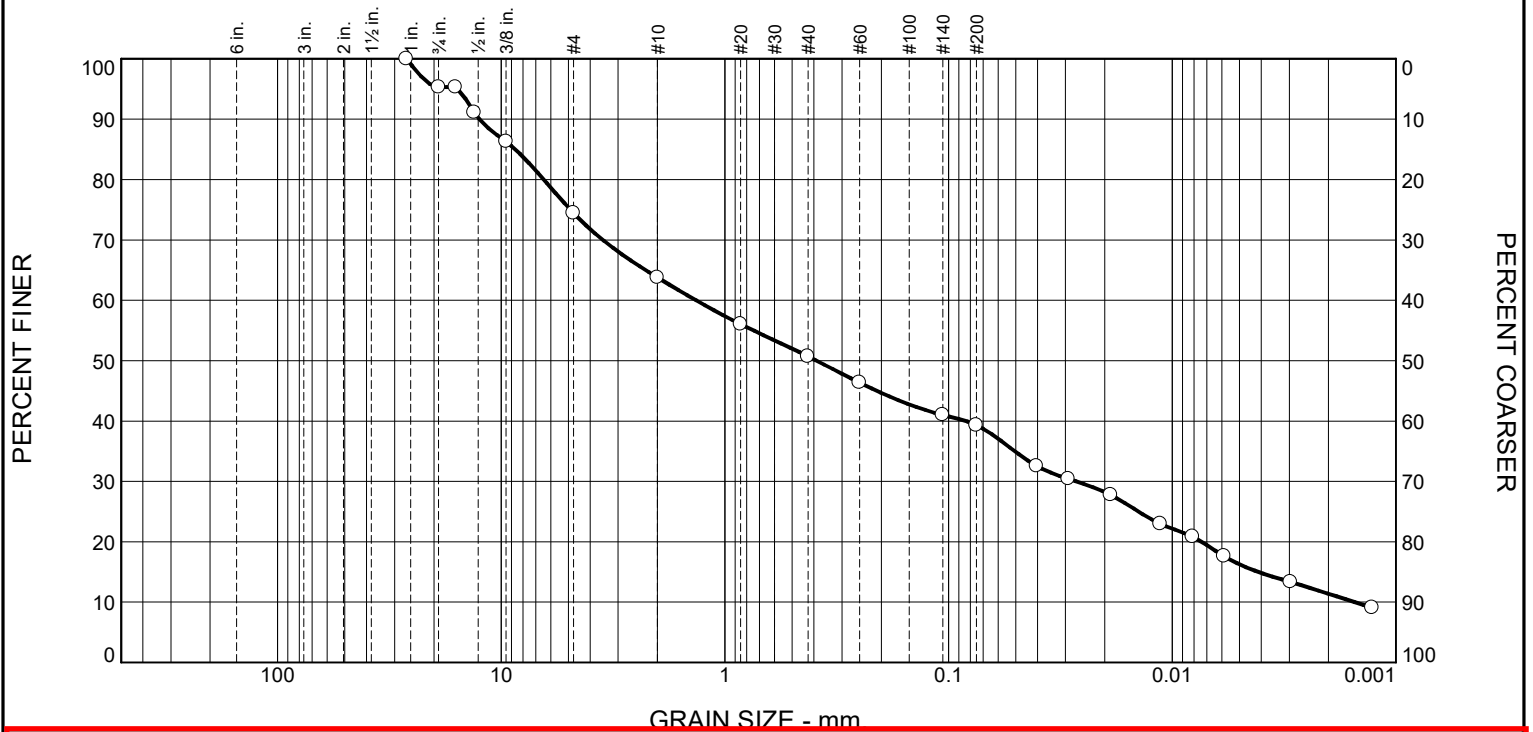
Egis Group Canada

Appendix B – Laboratory Test Results

WATER CONTENT DETERMINATION

[illegible]

Particle Size Distribution Report



GRAIN SIZE - mm

% +75mm	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	4.7	20.8	10.7	13.1	11.4	27.9	11.4

TEST RESULTS			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
26.5mm	100.0		
19.0mm	95.3		
16.0mm	95.3		
13.2mm	91.1		
9.5mm	86.3		
4.75mm	74.5		
2.00mm	63.8		
0.850mm	56.0		
0.425mm	50.7		
0.250mm	46.3		
0.106mm	41.0		
0.075mm	39.3		
0.0404 mm.	32.5		
0.0291 mm.	30.4		
0.0188 mm.	27.7		
0.0113 mm.	22.9		
0.0081 mm.	20.8		
0.0059 mm.	17.6		
0.0030 mm.	13.3		
0.0013 mm.	9.1		

* (no specification provided)

Material Description

Silty Gravelly Sand some Clay

Atterberg Limits (ASTM D 4318)

PL= LL= PI=

Classification

USCS (D 2487)= AASHTO (M 145)=

Coefficients

D₉₀= 12.5233 D₈₅= 8.6529 D₆₀= 1.3453
D₅₀= 0.3896 D₃₀= 0.0268 D₁₅= 0.0041
D₁₀= 0.0015 C_u= 881.90 C_c= 0.35

Remarks

Note: Specific gravity of soils is assumed.
F.M.=2.76

Date Received: Feb 8,2024 Date Tested: Feb 13,2024

Tested By: R.C

Checked By: J.Hopwood-Jones

Title: Lab Manager

Location: BH24-4A SS-2
Sample Number: SS-2

Depth: 2.6'-4.6'

Date Sampled: Jan 22,2024



Client: Eastpoint Engineering Ltd.

Project: CFB Kingston

Project No: CCO-24-2687

Figure

GRAIN SIZE DISTRIBUTION TEST DATA

2024-02-21

Client: Eastpoint Engineering Ltd.
Project: CFB Kingston
Project Number: CCO-24-2687
Location: BH24-4A SS-2
Depth: 2.6'-4.6' Sample Number: SS-2
Material Description: Silty Gravelly Sand some Clay
Sample Date: Jan 22,2024
Date Received: Feb 8,2024
Testing Remarks: Note: Specific gravity of soils is assumed.
Tested By: R.C Test Date: Feb 13,2024
Checked By: J.Hopwood-Jones Title: Lab Manager

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
573.45	0.00	0.00	26.5mm	0.00	100.0	0.0
			19.0mm	26.86	95.3	4.7
			16.0mm	26.86	95.3	4.7
			13.2mm	50.97	91.1	8.9
			9.5mm	78.68	86.3	13.7
			4.75mm	146.40	74.5	25.5
			2.00mm	207.74	63.8	36.2
58.17	0.00	0.00	0.850mm	7.05	56.0	44.0
			0.425mm	11.92	50.7	49.3
			0.250mm	15.90	46.3	53.7
			0.106mm	20.77	41.0	59.0
			0.075mm	22.32	39.3	60.7

Hydrometer Test Data

Hydrometer test uses material passing #10

Percent passing #10 based upon complete sample = 63.8

Weight of hydrometer sample = 58.17

Table of composite correction values:

Temp., deg. C:	21.9	21.8	21.5
Comp. corr.:	-6.5	-6.5	-6.0

Meniscus correction only = -1.0

Specific gravity of solids = 2.775

Hydrometer type = 152H

Hydrometer effective depth equation: $L = 16.6007 - 0.187 \times R_m$

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
1.00	21.9	37.0	30.5	0.0129	36.0	9.9	0.0404	32.5	67.5
2.00	21.9	35.0	28.5	0.0129	34.0	10.2	0.0291	30.4	69.6
5.00	21.9	32.5	26.0	0.0129	31.5	10.7	0.0188	27.7	72.3
15.00	21.9	28.0	21.5	0.0129	27.0	11.6	0.0113	22.9	77.1
30.00	21.9	26.0	19.5	0.0129	25.0	11.9	0.0081	20.8	79.2
60.00	21.9	23.0	16.5	0.0129	22.0	12.5	0.0059	17.6	82.4
250.00	21.8	19.0	12.5	0.0129	18.0	13.2	0.0030	13.3	86.7
1440.00	21.5	14.5	8.5	0.0129	13.5	14.1	0.0013	9.1	90.9

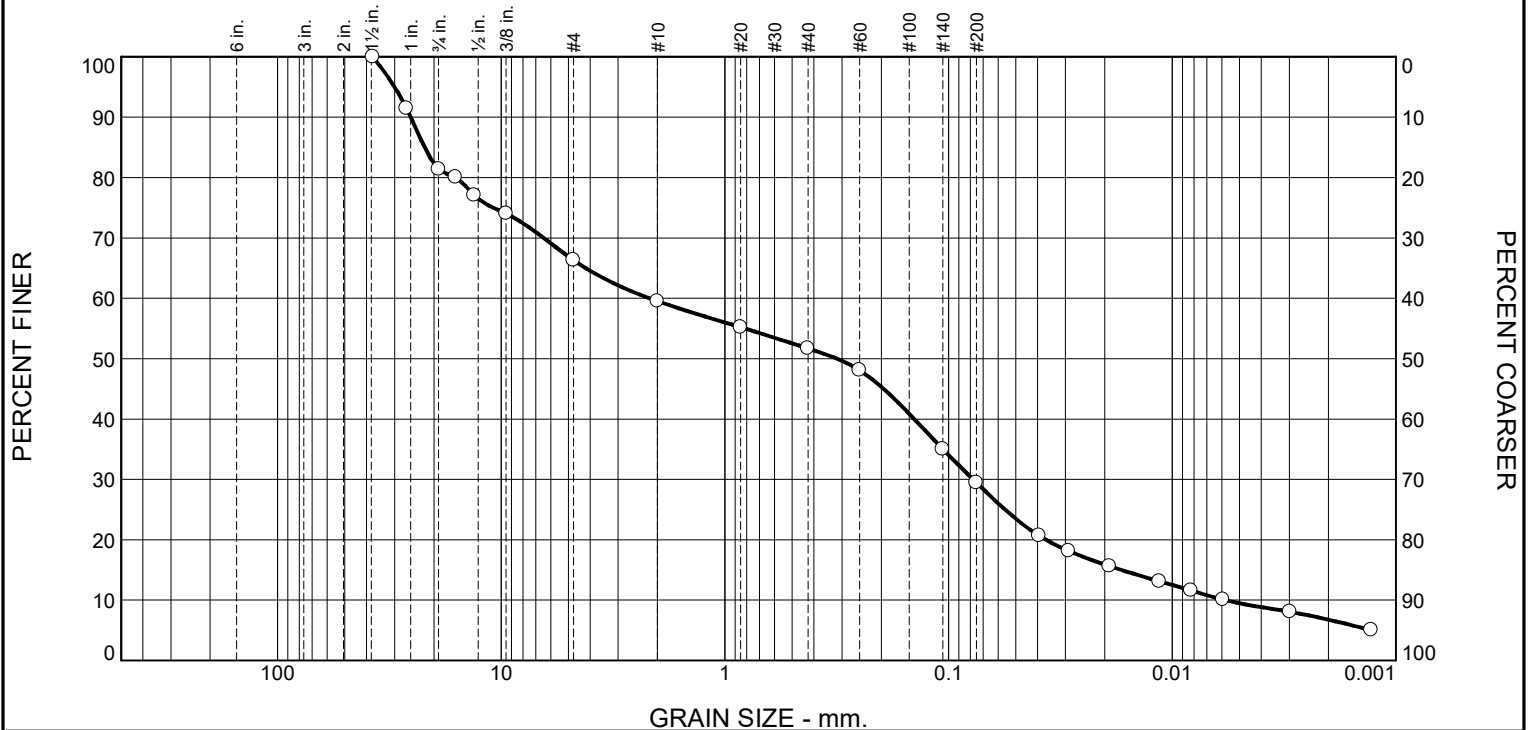
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	4.7	20.8	25.5	10.7	13.1	11.4	35.2	27.9	11.4	39.3

D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
	0.0015	0.0041	0.0074	0.0268	0.0836	0.3896	1.3453	6.4513	8.6529	12.5233	15.6036

Fineness Modulus	C _u	C _c
2.76	881.90	0.35

Particle Size Distribution Report



GRAIN SIZE - mm.

% +75mm	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	18.6	15.1	6.8	7.8	22.3	22.6	6.8

TEST RESULTS			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
37.5mm	100.0		
26.5mm	91.5		
19.0mm	81.4		
16.0mm	80.1		
13.2mm	77.1		
9.5mm	74.0		
4.75mm	66.3		
2.00mm	59.5		
0.850mm	55.2		
0.425mm	51.7		
0.250mm	48.1		
0.106mm	35.0		
0.075mm	29.4		
0.0394 mm.	20.7		
0.0290 mm.	18.2		
0.0191 mm.	15.6		
0.0114 mm.	13.1		
0.0082 mm.	11.6		
0.0059 mm.	10.1		
0.0030 mm.	8.1		
0.0013 mm.	5.0		

* (no specification provided)

Material Description

Gravelly Silty Sand trace Clay

Atterberg Limits (ASTM D 4318)

PL= LL= PI=

Classification

USCS (D 2487)= AASHTO (M 145)=

Coefficients

D₉₀= 25.3767 D₈₅= 21.9989 D₆₀= 2.1712
D₅₀= 0.3151 D₃₀= 0.0777 D₁₅= 0.0169
D₁₀= 0.0058 C_u= 374.09 C_c= 0.48

Remarks

Note: Specific gravity of soils is assumed.
F.M.=3.17

Date Received: Feb 8,2024 Date Tested: Feb 14,2024

Tested By: R.C

Checked By: J.Hopwood-Jones

Title: Lab Manager

Location: BH24-4B SS-3
Sample Number: SS-3

Depth: 5'-7'

Date Sampled: Jan 22,2024



Client: Eastpoint Engineering Ltd.

Project: CFB Kingston

Project No: CCO-24-2687

Figure

GRAIN SIZE DISTRIBUTION TEST DATA

2024-02-21

Client: Eastpoint Engineering Ltd.
Project: CFB Kingston
Project Number: CCO-24-2687
Location: BH24-4B SS-3
Depth: 5'-7'
Sample Number: SS-3
Material Description: Gravelly Silty Sand trace Clay
Sample Date: Jan 22,2024
Date Received: Feb 8,2024
Testing Remarks: Note: Specific gravity of soils is assumed.
Tested By: R.C
Test Date: Feb 14,2024
Checked By: J.Hopwood-Jones
Title: Lab Manager

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
501.70	0.00	0.00	37.5mm	0.00	100.0	0.0
			26.5mm	42.81	91.5	8.5
			19.0mm	93.47	81.4	18.6
			16.0mm	100.04	80.1	19.9
			13.2mm	115.06	77.1	22.9
			9.5mm	130.27	74.0	26.0
			4.75mm	168.91	66.3	33.7
			2.00mm	203.07	59.5	40.5
114.90	0.00	0.00	0.850mm	8.32	55.2	44.8
			0.425mm	15.12	51.7	48.3
			0.250mm	22.11	48.1	51.9
			0.106mm	47.34	35.0	65.0
			0.075mm	58.06	29.4	70.6

Hydrometer Test Data

Hydrometer test uses material passing #10

Percent passing #10 based upon complete sample = 59.5

Weight of hydrometer sample = 114.90

Table of composite correction values:

Temp., deg. C:	21.8	21.3
Comp. corr.:	-2.0	-2.5

Meniscus correction only = -1.0

Specific gravity of solids = 2.775

Hydrometer type = 152H

Hydrometer effective depth equation: $L = 16.1047 - 0.160 \times R_m$

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
1.00	21.8	43.0	41.0	0.0129	42.0	9.4	0.0394	20.7	79.3
2.00	21.8	38.0	36.0	0.0129	37.0	10.2	0.0290	18.2	81.8
5.00	21.8	33.0	31.0	0.0129	32.0	11.0	0.0191	15.6	84.4
15.00	21.8	28.0	26.0	0.0129	27.0	11.8	0.0114	13.1	86.9
30.00	21.8	25.0	23.0	0.0129	24.0	12.3	0.0082	11.6	88.4
60.00	21.8	22.0	20.0	0.0129	21.0	12.7	0.0059	10.1	89.9
250.00	21.8	18.0	16.0	0.0129	17.0	13.4	0.0030	8.1	91.9
1440.00	21.3	12.5	10.0	0.0129	11.5	14.3	0.0013	5.0	95.0

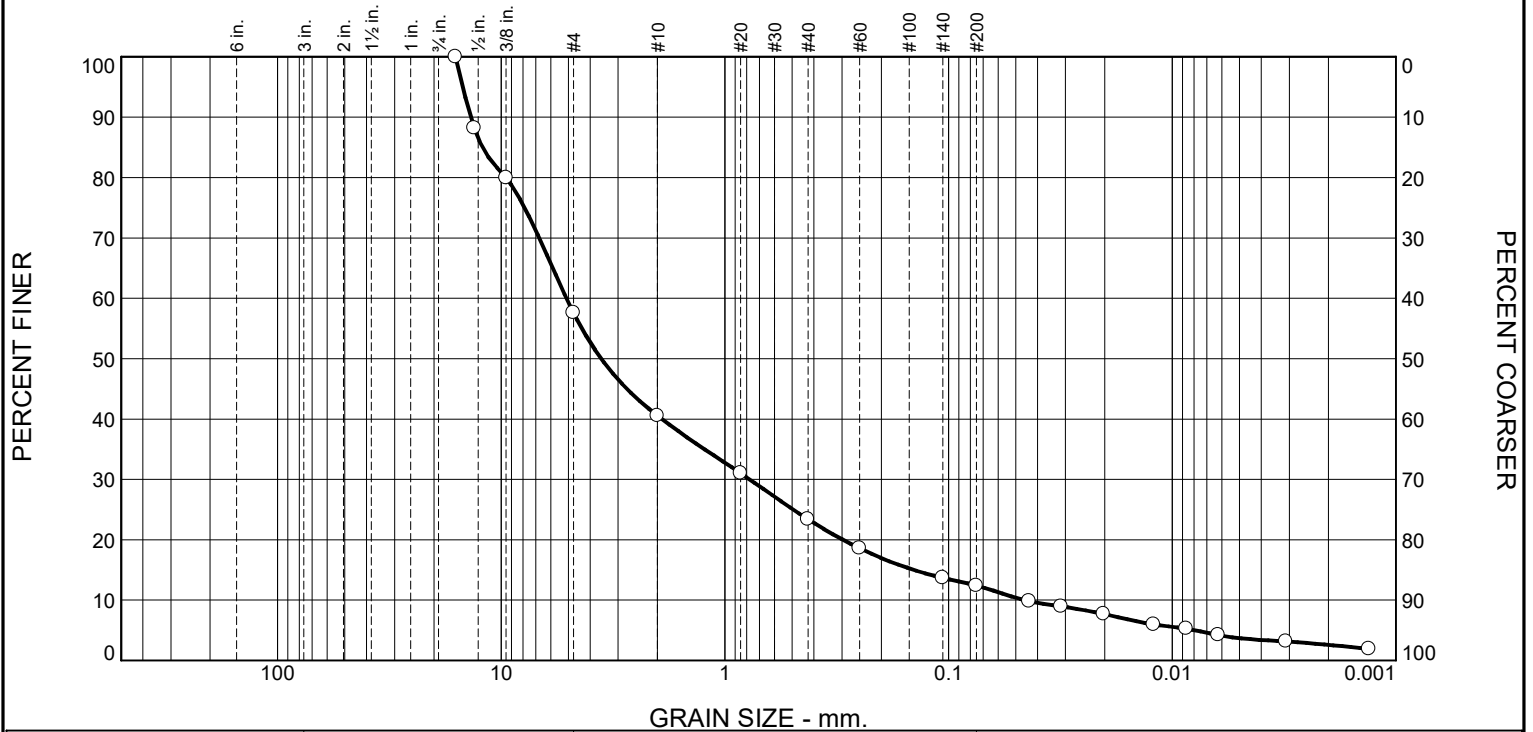
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	18.6	15.1	33.7	6.8	7.8	22.3	36.9	22.6	6.8	29.4

D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
	0.0058	0.0169	0.0367	0.0777	0.1423	0.3151	2.1712	15.9048	21.9989	25.3767	29.9515

Fineness Modulus	C _u	C _c
3.17	374.09	0.48

Particle Size Distribution Report



% +75mm	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	42.4	17.1	17.1	11.0	9.8	2.6

TEST RESULTS			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
16.0mm	100.0		
13.2mm	88.2		
9.5mm	79.9		
4.75mm	57.6		
2.00mm	40.5		
0.850mm	31.0		
0.425mm	23.4		
0.250mm	18.6		
0.106mm	13.7		
0.075mm	12.4		
0.0436 mm.	9.8		
0.0313 mm.	8.9		
0.0203 mm.	7.7		
0.0121 mm.	6.0		
0.0086 mm.	5.3		
0.0062 mm.	4.2		
0.0031 mm.	3.2		
0.0013 mm.	1.9		

* (no specification provided)

Material Description Sand and Gravel trace Silt trace Clay		
Atterberg Limits (ASTM D 4318) PL= LL= PI=		
Classification USCS (D 2487)= AASHTO (M 145)=		
Coefficients D ₉₀ = 13.6835 D ₈₅ = 12.1372 D ₆₀ = 5.1097 D ₅₀ = 3.5712 D ₃₀ = 0.7750 D ₁₅ = 0.1428 D ₁₀ = 0.0456 C _u = 112.10 C _c = 2.58		
Remarks Note: Specific gravity of soils is assumed. F.M.=4.23		
Date Received: Feb 8,2024		Date Tested: Feb 14,2024
Tested By: R.C		
Checked By: J.Hopwood-Jones		
Title: Lab Manager		

Location: BH24-4B SS-4
 Sample Number: SS-4 Depth: 7.6'-9.6'

Date Sampled: Jan 22,2024



Client: Eastpoint Engineering Ltd.
 Project: CFB Kingston

Project No: CCO-24-2687

Figure

GRAIN SIZE DISTRIBUTION TEST DATA

2024-02-21

Client: Eastpoint Engineering Ltd.
Project: CFB Kingston
Project Number: CCO-24-2687
Location: BH24-4B SS-4
Depth: 7.6'-9.6'
Sample Number: SS-4
Material Description: Sand and Gravel trace Silt trace Clay
Sample Date: Jan 22,2024
Date Received: Feb 8,2024
Testing Remarks: Note: Specific gravity of soils is assumed.
Tested By: R.C
Test Date: Feb 14,2024
Checked By: J.Hopwood-Jones
Title: Lab Manager

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
425.70	0.00	0.00	16.0mm	0.00	100.0	0.0
			13.2mm	50.30	88.2	11.8
			9.5mm	85.42	79.9	20.1
			4.75mm	180.49	57.6	42.4
			2.00mm	253.08	40.5	59.5
112.47	0.00	0.00	0.850mm	26.43	31.0	69.0
			0.425mm	47.57	23.4	76.6
			0.250mm	60.88	18.6	81.4
			0.106mm	74.54	13.7	86.3
			0.075mm	78.09	12.4	87.6

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 40.5
Weight of hydrometer sample =112.47
Table of composite correction values:
Temp., deg. C: 21.8 21.3
Comp. corr.: -2.0 -2.5
Meniscus correction only = -1.0
Specific gravity of solids = 2.775
Hydrometer type = 152H
Hydrometer effective depth equation: $L = 16.1047 - 0.160 \times R_m$

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
1.00	21.8	30.0	28.0	0.0129	29.0	11.5	0.0436	9.8	90.2
2.00	21.8	27.5	25.5	0.0129	26.5	11.9	0.0313	8.9	91.1
5.00	21.8	24.0	22.0	0.0129	23.0	12.4	0.0203	7.7	92.3
15.00	21.8	19.0	17.0	0.0129	18.0	13.2	0.0121	6.0	94.0
30.00	21.8	17.0	15.0	0.0129	16.0	13.5	0.0086	5.3	94.7
60.00	21.8	14.0	12.0	0.0129	13.0	14.0	0.0062	4.2	95.8

Hydrometer Test Data (continued)

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
250.00	21.8	11.0	9.0	0.0129	10.0	14.5	0.0031	3.2	96.8
1440.00	21.3	8.0	5.5	0.0129	7.0	15.0	0.0013	1.9	98.1

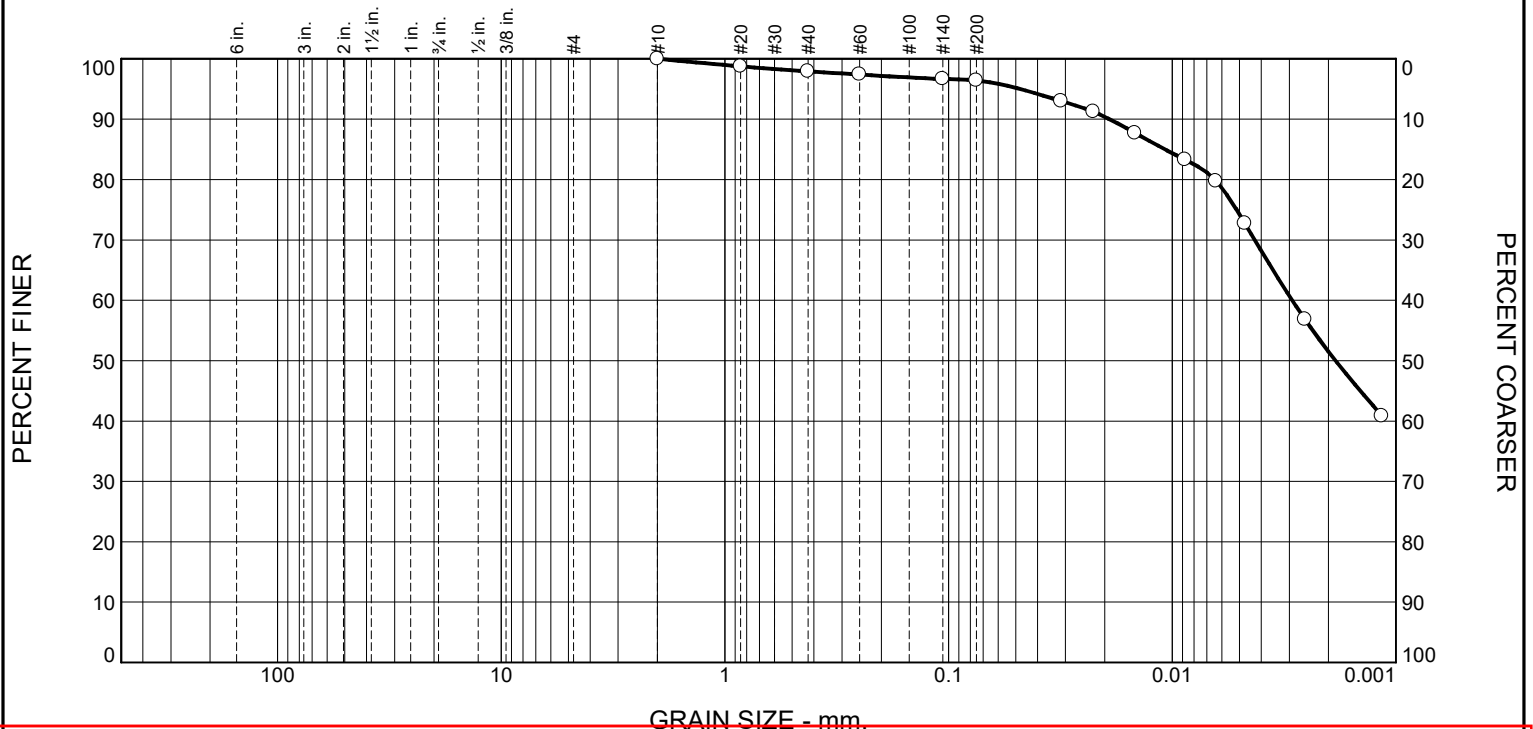
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	42.4	42.4	17.1	17.1	11.0	45.2	9.8	2.6	12.4

D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
0.0079	0.0456	0.1428	0.2965	0.7750	1.9130	3.5712	5.1097	9.5312	12.1372	13.6835	14.8618

Fineness Modulus	C _u	C _c
4.23	112.10	2.58

Particle Size Distribution Report



% +75mm	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	2.1	1.5	44.9	51.5

TEST RESULTS			
Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
2.00mm	100.0		
0.850mm	98.8		
0.425mm	97.9		
0.250mm	97.4		
0.106mm	96.7		
0.075mm	96.4		
0.0313 mm.	93.0		
0.0225 mm.	91.2		
0.0147 mm.	87.7		
0.0088 mm.	83.3		
0.0064 mm.	79.8		
0.0047 mm.	72.7		
0.0026 mm.	56.8		
0.0012 mm.	40.8		

* (no specification provided)

Material Description
 Clay and Silt trace Sand

Atterberg Limits (ASTM D 4318)
 PL= LL= PI=

Classification
 USCS (D 2487)= AASHTO (M 145)=

Coefficients
 D₉₀= 0.0191 D₈₅= 0.0108 D₆₀= 0.0029
 D₅₀= 0.0019 D₃₀= D₁₅=
 D₁₀= C_u= C_c=

Remarks
 Note: Specific gravity is assumed.
 F.M.=0.08

Date Received: Mar 20,2024 Date Tested: Mar 26,2024
 Tested By: R.C.
 Checked By: J.Hopwood-Jones
 Title: Lab Manager

Location: BH24-4A SS-4 Depth: 7.6'-9.6'

Date Sampled: Jan 23,2024



Client: Eastpoint Engineering Ltd.
 Project: CFB Kingston

Project No: CCO-24-2687

Figure

GRAIN SIZE DISTRIBUTION TEST DATA

2024-03-26

Client: Eastpoint Engineering Ltd.

Project: CFB Kingston

Project Number: CCO-24-2687

Location: BH24-4A SS-4

Depth: 7.6'-9.6'

Sample Number: SS-4

Material Description: Clay and Silt trace Sand

Sample Date: Jan 23,2024

Date Received: Mar 20,2024

Testing Remarks: Note: Specific gravity is assumed.

Tested By: R.C

Test Date: Mar 26,2024

Checked By: J.Hopwood-Jones

Title: Lab Manager

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
447.77	0.00	0.00	2.00mm	0.00	100.0	0.0
55.18	0.00	0.00	0.850mm	0.68	98.8	1.2
			0.425mm	1.14	97.9	2.1
			0.250mm	1.43	97.4	2.6
			0.106mm	1.83	96.7	3.3
			0.075mm	1.97	96.4	3.6

Hydrometer Test Data

Hydrometer test uses material passing #10

Percent passing #10 based upon complete sample = 100.0

Weight of hydrometer sample =55.18

Automatic temperature correction

Composite correction (fluid density and meniscus height) at 20 deg. C = -6.0

Meniscus correction only = -1.0

Specific gravity of solids = 2.775

Hydrometer type = 152H

Hydrometer effective depth equation: $L = 16.6007 - 0.187 \times R_m$

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
1.00	21.2	58.5	52.7	0.0130	57.5	5.8	0.0313	93.0	7.0
2.00	21.2	57.5	51.7	0.0130	56.5	6.0	0.0225	91.2	8.8
5.00	21.2	55.5	49.7	0.0130	54.5	6.4	0.0147	87.7	12.3
15.00	21.2	53.0	47.2	0.0130	52.0	6.9	0.0088	83.3	16.7
30.00	21.2	51.0	45.2	0.0130	50.0	7.3	0.0064	79.8	20.2
60.00	21.2	47.0	41.2	0.0130	46.0	8.0	0.0047	72.7	27.3
250.00	21.2	38.0	32.2	0.0130	37.0	9.7	0.0026	56.8	43.2
1440.00	20.9	29.0	23.2	0.0130	28.0	11.4	0.0012	40.8	59.2

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	2.1	1.5	3.6	44.9	51.5	96.4

D ₅	D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₄₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
						0.0019	0.0029	0.0065	0.0108	0.0191	0.0478

Fineness Modulus
0.08



TRUSTED.
RESPONSIVE.
RELIABLE.

300 - 2319 St. Laurent Blvd
Ottawa, ON, K1G 4J8
1-800-749-1947
www.paracellabs.com

Certificate of Analysis

Egis Canada Ltd. (Nepean)

215 Menten Place, Unit 104
Nepean, ON K2H 9C1

Attn: Jason Hopwood-Jones

Client PO: CFB Kingston

Project: CCO-24-2687

Custody: 140454

Report Date: 15-Feb-2024

Order Date: 9-Feb-2024

Order #: 2406540

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
2406540-01	BH24-1B SS2
2406540-02	BH24-2B SS3
2406540-03	BH24-3B SS1
2406540-04	BH24-4B SS2

Approved By:

A handwritten signature in blue ink, appearing to read 'D. Robertson', on a light blue background.

Dale Robertson, BSc

Laboratory Director

Certificate of Analysis

Report Date: 15-Feb-2024

Client: Egis Canada Ltd. (Nepean)

Order Date: 9-Feb-2024

Client PO: CFB Kingston

Project Description: CCO-24-2687

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Anions	EPA 300.1 - IC, water extraction	12-Feb-24	12-Feb-24
pH, soil	EPA 150.1 - pH probe @ 25 °C, CaCl buffered ext.	13-Feb-24	13-Feb-24
Resistivity	EPA 120.1 - probe, water extraction	12-Feb-24	12-Feb-24
Solids, %	CWS Tier 1 - Gravimetric	14-Feb-24	15-Feb-24

Certificate of Analysis

Report Date: 15-Feb-2024

Client: Egis Canada Ltd. (Nepean)

Order Date: 9-Feb-2024

Client PO: CFB Kingston

Project Description: CCO-24-2687

	Client ID:	BH24-1B SS2	BH24-2B SS3	BH24-3B SS1	BH24-4B SS2		
	Sample Date:	22-Jan-24 09:00	22-Jan-24 09:00	22-Jan-24 09:00	22-Jan-24 09:00	-	-
	Sample ID:	2406540-01	2406540-02	2406540-03	2406540-04		
	Matrix:	Soil	Soil	Soil	Soil		
	MDL/Units						
Physical Characteristics							
% Solids	0.1 % by Wt.	83.3	77.5	77.6	91.3	-	-
General Inorganics							
pH	0.05 pH Units	7.41	7.40	6.90	7.32	-	-
Resistivity	0.1 Ohm.m	58.9	58.3	62.3	72.3	-	-
Anions							
Chloride	10 ug/g	<10	<10	<10	<10	-	-
Sulphate	10 ug/g	15	13	<10	<10	-	-

Certificate of Analysis

Report Date: 15-Feb-2024

Client: Egis Canada Ltd. (Nepean)

Order Date: 9-Feb-2024

Client PO: CFB Kingston

Project Description: CCO-24-2687

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions								
Chloride	ND	10	ug/g					
Sulphate	ND	10	ug/g					
General Inorganics								
Resistivity	ND	0.1	Ohm.m					

Certificate of Analysis

Report Date: 15-Feb-2024

Client: Egis Canada Ltd. (Nepean)

Order Date: 9-Feb-2024

Client PO: CFB Kingston

Project Description: CCO-24-2687

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	118	10	ug/g	110			7.0	35	
Sulphate	58.3	10	ug/g	57.8			0.8	35	
General Inorganics									
pH	7.12	0.05	pH Units	7.08			0.6	2.3	
Resistivity	12.9	0.1	Ohm.m	12.7			1.2	20	
Physical Characteristics									
% Solids	87.9	0.1	% by Wt.	88.0			0.1	25	

Certificate of Analysis

Report Date: 15-Feb-2024

Client: Egis Canada Ltd. (Nepean)

Order Date: 9-Feb-2024

Client PO: CFB Kingston

Project Description: CCO-24-2687

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	217	10	ug/g	110	107	82-118			
Sulphate	159	10	ug/g	57.8	101	80-120			

Certificate of Analysis

Report Date: 15-Feb-2024

Client: Egis Canada Ltd. (Nepean)

Order Date: 9-Feb-2024

Client PO: CFB Kingston

Project Description: CCO-24-2687

Qualifier Notes:

Sample Data Revisions:

None

Work Order Revisions / Comments:

Client confirmed all samples collected January 22, 2024.

Other Report Notes:

n/a: not applicable

ND: Not Detected

MDL: Method Detection Limit

Source Result: Data used as source for matrix and duplicate samples

%REC: Percent recovery.

RPD: Relative percent difference.

NC: Not Calculated

Soil results are reported on a dry weight basis unless otherwise noted.

Where %Solids is reported, moisture loss includes the loss of volatile hydrocarbons.

Any use of these results implies your agreement that our total liability in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.



Paracel ID: 2406540

Blvd.
4J835.com
7Paracel Order Number
(Lab Use Only)

2406540

Chain Of Custody
(Lab Use Only)

No 140454

Client Name: EGIS Canada LTD	Project Ref: CFB Kingston	Page 1 of 1
Contact Name: Jason Hopwood-Jones	Quote #: _____	Turnaround Time
Address: 215 Menten Pl Nepean ON	PO #: CCO-24-2687	<input type="checkbox"/> 1 day <input type="checkbox"/> 3 day
Telephone: 613 453-0751	E-mail: j.hopwood-jones@mcintoshperry.com	<input type="checkbox"/> 2 day <input checked="" type="checkbox"/> Regular
Date Required: _____		

<input type="checkbox"/> REG 153/04 <input type="checkbox"/> REG 406/10	Other Regulation	Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)	Required Analysis												
<input type="checkbox"/> Table 1 <input type="checkbox"/> Res/Park <input type="checkbox"/> Mod/Fine <input type="checkbox"/> REG 558 <input type="checkbox"/> PWQO	<input type="checkbox"/> Table 2 <input type="checkbox"/> Ind/Comm <input type="checkbox"/> Coarse <input type="checkbox"/> CME <input type="checkbox"/> MISA	<input type="checkbox"/> Table 3 <input type="checkbox"/> Agri/Other <input type="checkbox"/> sU - Sand <input type="checkbox"/> SU - Storm	<input type="checkbox"/> Table _____	Mun: _____	<input type="checkbox"/> Other: _____	Sample Taken	PHCs F1-F4+BTX	VOCs	PAHs	Metals by ICP	Hg	Cu-VI	B (HWS)	Chemical Package	
Sample ID/Location Name						Matrix	Air Volume	# of Containers	Date	Time					
1 BH 24-1B SS2						S		1							X
2 BH 24-2B SS3						S		1							X
3 BH 24-3B SS1						S		1							X
4 BH 24-4B SS2						S		1							X
5															
6															
7															
8															
9															
10															

Comments:		Method of Delivery: Walk	
Relinquished By (Sign): R. Collette	Received at: 3:35	Received at Lab: SO	Verified By: SO
Relinquished By (Print): R. Collette	Date/Time: Feb 9, 2024 1:15	Date/Time: Feb 9, 2024 4:35p	Date/Time: Feb 9, 2024 4:36pm
Date/Time: 02/09/24 @ 4:00pm	Temperature: 22.4 °C	Temperature: 17.4 °C	pH Verified: <input type="checkbox"/> By: _____

Chain of Custody (EHS) X15X

Revision 4.0

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
Invoice to: EGIS Canada Ltd.
PO#:

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844
Temperature (C): 7
Custody Seal:

Page 1 of 25

Dear Benjamin Edwards:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Report Comments:

Emma-Dawn Ferguson, Chemist

All analysis is completed at Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) unless otherwise stated

Eurofins Environment Testing Canada Inc. is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on the scope of accreditation. The scope is available at <https://directory.cala.ca/>

Please note: Field data, where presented on the report, has been provided by the client and is presented for informational purposes only. Guideline or regulatory limits listed on this report are provided for ease of use (informational purposes) only. Eurofins recommends consulting the official guideline or regulation as required. Unless otherwise stated, measurement uncertainty is not taken into account when determining guideline or regulatory exceedances.



Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0

Attention: Mr. Benjamin Edwards

PO#:

Invoice to: EGIS Canada Ltd.

Report Number: 3004774

Date Submitted: 2024-01-26

Date Reported: 2024-02-02

Project: CCO - 24 - 2687

COC #: 226844

Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

Exceedence Summary

Sample I.D.	Analyte	Result	Units	Criteria
Inorganics				
24-4A	Electrical Conductivity	0.61	mS/cm	STD 0.57
Metals				
24-1A	Barium	376	ug/g	STD 220
24-1A	Selenium	1.8	ug/g	STD 1.5
24-1B	Barium	377	ug/g	STD 220
24-2A	Barium	307	ug/g	STD 220
24-2B	Barium	442	ug/g	STD 220
24-2B	Selenium	1.6	ug/g	STD 1.5
24-3A	Barium	238	ug/g	STD 220
24-3A	Selenium	1.6	ug/g	STD 1.5
24-4A	Barium	317	ug/g	STD 220

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

Hydrocarbons

Lab I.D.
Sample Matrix
Sample Type
Sample Date
Sampling Time
Sample I.D.

1716832 Soil153	1716833 Soil153	1716834 Soil153	1716835 Soil153	1716836 Soil153
2024-01-26	2024-01-26	2024-01-26	2024-01-26	2024-01-26
24-1A	24-1B	24-2A	24-2B	24-3A

Analyte	Batch No	MRL	Units	Guideline
---------	----------	-----	-------	-----------

PHC's F1	455317	10	ug/g	STD 25	<10	<10	<10	<10	<10
PHC's F1-BTEX	455321	10	ug/g		<10	<10	<10	<10	<10
PHC's F2	455308	2	ug/g	STD 10		<2	<2		<2
	455313	2	ug/g	STD 10	<2			<2	
PHC's F2-Naph	455413	2	ug/g		<2	<2	<2	<2	<2
PHC's F3	455308	20	ug/g	STD 240		<20	<20		<20
	455313	20	ug/g	STD 240	<20			<20	
PHC's F3-PAH	455414	20	ug/g		<20	<20	<20	<20	<20
PHC's F4	455308	20	ug/g	STD 120		<20	<20		<20
	455313	20	ug/g	STD 120	<20			<20	

Hydrocarbons

Lab I.D.
Sample Matrix
Sample Type
Sample Date
Sampling Time
Sample I.D.

1716837 Soil153	1716838 Soil153	1716839 Soil153
2024-01-26	2024-01-26	2024-01-26
24-3B	24-4A	24-4B

Analyte	Batch No	MRL	Units	Guideline
---------	----------	-----	-------	-----------

PHC's F1	455317	10	ug/g	STD 25	<10	<10	<10
PHC's F1-BTEX	455321	10	ug/g		<10	<10	
	455322	10	ug/g				<10
PHC's F2	455308	2	ug/g	STD 10	<2		
	455313	2	ug/g	STD 10		<2	
	455411	2	ug/g	STD 10			<2
PHC's F2-Naph	455413	2	ug/g		<2	<2	<2
PHC's F3	455308	20	ug/g	STD 240	<20		
	455313	20	ug/g	STD 240		<20	

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

Hydrocarbons

Lab I.D.
Sample Matrix
Sample Type
Sample Date
Sampling Time
Sample I.D.

1716837 Soil153	1716838 Soil153	1716839 Soil153
2024-01-26	2024-01-26	2024-01-26
24-3B	24-4A	24-4B

Analyte	Batch No	MRL	Units	Guideline
---------	----------	-----	-------	-----------

PHC's F3	455411	20	ug/g	STD 240			<20
PHC's F3-PAH	455414	20	ug/g		<20	<20	<20
PHC's F4	455308	20	ug/g	STD 120	<20		
	455313	20	ug/g	STD 120		<20	
	455411	20	ug/g	STD 120			<20

Metals

Lab I.D.
Sample Matrix
Sample Type
Sample Date
Sampling Time
Sample I.D.

1716832 Soil153	1716833 Soil153	1716834 Soil153	1716835 Soil153	1716836 Soil153
2024-01-26	2024-01-26	2024-01-26	2024-01-26	2024-01-26
24-1A	24-1B	24-2A	24-2B	24-3A

Analyte	Batch No	MRL	Units	Guideline
---------	----------	-----	-------	-----------

Antimony	455434	1	ug/g	STD 1.3	<1	<1	<1	<1	<1
Arsenic	455434	1	ug/g	STD 18	5	6	4	4	3
Barium	455434	1	ug/g	STD 220	376*	377*	307*	442*	238*
Beryllium	455434	1	ug/g	STD 2.5	2	2	1	2	<1
Boron (total)	455434	5	ug/g	STD 36	13	10	10	10	11
Cadmium	455434	0.4	ug/g	STD 1.2	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium Total	455434	1	ug/g	STD 70		64	43	62	38
	455501	1	ug/g	STD 70	56				
Cobalt	455434	1	ug/g	STD 21		19	12	19	12
	455501	1	ug/g	STD 21	15				
Copper	455434	1	ug/g	STD 92		38	28	39	21
	455501	1	ug/g	STD 92	36				
Lead	455434	1	ug/g	STD 120		16	11	11	14
	455501	1	ug/g	STD 120	20				

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range



Certificate of Analysis

Environment Testing

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

Metals

Lab I.D. Sample Matrix Sample Type Sample Date Sampling Time Sample I.D.					1716832 Soil153	1716833 Soil153	1716834 Soil153	1716835 Soil153	1716836 Soil153
Guideline					24-1A	24-1B	24-2A	24-2B	24-3A
Analyte	Batch No	MRL	Units	Guideline					
Molybdenum	455434	1	ug/g	STD 2	<1	<1	<1	<1	<1
Nickel	455434	1	ug/g	STD 82		42	33	43	26
	455501	1	ug/g	STD 82	37				
Selenium	455434	0.5	ug/g	STD 1.5	1.8*	1.5	1.1	1.6*	1.6*
Silver	455434	0.2	ug/g	STD 0.5	<0.2	<0.2	<0.2	<0.2	<0.2
Thallium	455434	1	ug/g	STD 1	<1	<1	<1	<1	<1
Uranium	455434	0.5	ug/g	STD 2.5	1.0	0.7	<0.5	<0.5	<0.5
Vanadium	455434	2	ug/g	STD 86		77	56	82	43
	455501	2	ug/g	STD 86	66				
Zinc	455434	2	ug/g	STD 290		109	75	120	74
	455501	2	ug/g	STD 290	106				

Metals

Lab I.D. Sample Matrix Sample Type Sample Date Sampling Time Sample I.D.					1716837 Soil153	1716838 Soil153	1716839 Soil153
Guideline					24-3B	24-4A	24-4B
Analyte	Batch No	MRL	Units	Guideline			
Antimony	455434	1	ug/g	STD 1.3	<1	<1	<1
Arsenic	455434	1	ug/g	STD 18	4	3	2
Barium	455434	1	ug/g	STD 220	195	317*	39
Beryllium	455434	1	ug/g	STD 2.5	<1	<1	<1
Boron (total)	455434	5	ug/g	STD 36	12	8	8
Cadmium	455434	0.4	ug/g	STD 1.2	<0.4	<0.4	<0.4
Chromium Total	455434	1	ug/g	STD 70	27	46	15
Cobalt	455434	1	ug/g	STD 21	9	13	5

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational
Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim
Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial
Water Quality Guideline, IPWQO = Interim Provincial Water Quality
Objective, TDR = Typical Desired Range



Certificate of Analysis

Environment Testing

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

Metals

Analyte	Batch No	MRL	Units	Guideline	Lab I.D.	Sample Matrix	Sample Type	Sample Date	Sampling Time	Sample I.D.
					1716837	Soil153	1716838	Soil153	1716839	Soil153
					2024-01-26		2024-01-26		2024-01-26	
					24-3B		24-4A		24-4B	
Copper	455434	1	ug/g	STD 92	17		29		10	
Lead	455434	1	ug/g	STD 120	22		10		4	
Molybdenum	455434	1	ug/g	STD 2	<1		<1		<1	
Nickel	455434	1	ug/g	STD 82	20		30		10	
Selenium	455434	0.5	ug/g	STD 1.5	1.3		1.2		<0.5	
Silver	455434	0.2	ug/g	STD 0.5	<0.2		<0.2		<0.2	
Thallium	455434	1	ug/g	STD 1	<1		<1		<1	
Uranium	455434	0.5	ug/g	STD 2.5	<0.5		<0.5		<0.5	
Vanadium	455434	2	ug/g	STD 86	29		59		20	
Zinc	455434	2	ug/g	STD 290	54		77		17	

PAH

Analyte	Batch No	MRL	Units	Guideline	Lab I.D.	Sample Matrix	Sample Type	Sample Date	Sampling Time	Sample I.D.
					1716832	Soil153	1716833	Soil153	1716834	Soil153
					2024-01-26		2024-01-26		2024-01-26	2024-01-26
					24-1A		24-1B		24-2A	24-2B
1+2-methylnaphthalene	455358	0.05	ug/g	STD 0.59	<0.05		<0.05		<0.05	<0.05
Acenaphthene	455318	0.05	ug/g	STD 0.072	<0.05		<0.05		<0.05	<0.05
Acenaphthylene	455318	0.05	ug/g	STD 0.093	<0.05		<0.05		<0.05	<0.05
Anthracene	455318	0.05	ug/g	STD 0.16	<0.05		<0.05		<0.05	<0.05
Benz[a]anthracene	455318	0.05	ug/g	STD 0.36	<0.05		<0.05		<0.05	<0.05
Benzo[a]pyrene	455318	0.05	ug/g	STD 0.3	<0.05		<0.05		<0.05	<0.05
Benzo[b]fluoranthene	455318	0.05	ug/g	STD 0.47	<0.05		<0.05		<0.05	<0.05
Benzo[ghi]perylene	455318	0.05	ug/g	STD 0.68	<0.05		<0.05		<0.05	<0.05
Benzo[k]fluoranthene	455318	0.05	ug/g	STD 0.48	<0.05		<0.05		<0.05	<0.05

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational
Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim
Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial
Water Quality Guideline, IPWQO = Interim Provincial Water Quality
Objective, TDR = Typical Desired Range



Certificate of Analysis

Environment Testing

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

PAH

Lab I.D. Sample Matrix Sample Type Sample Date Sampling Time Sample I.D.					1716832 Soil153	1716833 Soil153	1716834 Soil153	1716835 Soil153	1716836 Soil153
					2024-01-26	2024-01-26	2024-01-26	2024-01-26	2024-01-26
					24-1A	24-1B	24-2A	24-2B	24-3A
Analyte	Batch No	MRL	Units	Guideline					
Chrysene	455318	0.05	ug/g	STD 2.8	<0.05	<0.05	<0.05	<0.05	<0.05
Dibenz[a h]anthracene	455318	0.05	ug/g	STD 0.1	<0.05	<0.05	<0.05	<0.05	<0.05
Fluoranthene	455318	0.05	ug/g	STD 0.56	<0.05	<0.05	<0.05	<0.05	<0.05
Fluorene	455318	0.05	ug/g	STD 0.12	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno[1 2 3-cd]pyrene	455318	0.05	ug/g	STD 0.23	<0.05	<0.05	<0.05	<0.05	<0.05
Methlynaphthalene, 1-	455318	0.05	ug/g		<0.05	<0.05	<0.05	<0.05	<0.05
Methlynaphthalene, 2-	455318	0.05	ug/g		<0.05	<0.05	<0.05	<0.05	<0.05
Naphthalene	455318	0.013	ug/g	STD 0.09	<0.013	<0.013	<0.013	<0.013	<0.013
Phenanthrene	455318	0.05	ug/g	STD 0.69	<0.05	<0.05	<0.05	<0.05	<0.05
Pyrene	455318	0.05	ug/g	STD 1	<0.05	<0.05	<0.05	<0.05	<0.05

PAH

Lab I.D. Sample Matrix Sample Type Sample Date Sampling Time Sample I.D.					1716837 Soil153	1716838 Soil153	1716839 Soil153
					2024-01-26	2024-01-26	2024-01-26
					24-3B	24-4A	24-4B
Analyte	Batch No	MRL	Units	Guideline			
1+2-methylnaphthalene	455358	0.05	ug/g	STD 0.59	<0.05	<0.05	<0.05
Acenaphthene	455318	0.05	ug/g	STD 0.072	<0.05	<0.05	<0.05
Acenaphthylene	455318	0.05	ug/g	STD 0.093	<0.05	<0.05	<0.05
Anthracene	455318	0.05	ug/g	STD 0.16	<0.05	<0.05	<0.05
Benz[a]anthracene	455318	0.05	ug/g	STD 0.36	<0.05	<0.05	<0.05
Benzo[a]pyrene	455318	0.05	ug/g	STD 0.3	<0.05	<0.05	<0.05
Benzo[b]fluoranthene	455318	0.05	ug/g	STD 0.47	<0.05	<0.05	<0.05
Benzo[ghi]perylene	455318	0.05	ug/g	STD 0.68	<0.05	<0.05	<0.05
Benzo[k]fluoranthene	455318	0.05	ug/g	STD 0.48	<0.05	<0.05	<0.05

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational
Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim
Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial
Water Quality Guideline, IPWQO = Interim Provincial Water Quality
Objective, TDR = Typical Desired Range

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

PAH

Lab I.D.
Sample Matrix
Sample Type
Sample Date
Sampling Time
Sample I.D.

1716837 Soil153	1716838 Soil153	1716839 Soil153
2024-01-26	2024-01-26	2024-01-26
24-3B	24-4A	24-4B

Analyte	Batch No	MRL	Units	Guideline			
Chrysene	455318	0.05	ug/g	STD 2.8	<0.05	<0.05	<0.05
Dibenz[a h]anthracene	455318	0.05	ug/g	STD 0.1	<0.05	<0.05	<0.05
Fluoranthene	455318	0.05	ug/g	STD 0.56	<0.05	<0.05	<0.05
Fluorene	455318	0.05	ug/g	STD 0.12	<0.05	<0.05	<0.05
Indeno[1 2 3-cd]pyrene	455318	0.05	ug/g	STD 0.23	<0.05	<0.05	<0.05
Methlynaphthalene, 1-	455318	0.05	ug/g		<0.05	<0.05	<0.05
Methlynaphthalene, 2-	455318	0.05	ug/g		<0.05	<0.05	<0.05
Naphthalene	455318	0.013	ug/g	STD 0.09	<0.013	<0.013	<0.013
Phenanthrene	455318	0.05	ug/g	STD 0.69	<0.05	<0.05	<0.05
Pyrene	455318	0.05	ug/g	STD 1	<0.05	<0.05	<0.05

Volatiles

Lab I.D.
Sample Matrix
Sample Type
Sample Date
Sampling Time
Sample I.D.

1716832 Soil153	1716833 Soil153	1716834 Soil153	1716835 Soil153	1716836 Soil153
2024-01-26	2024-01-26	2024-01-26	2024-01-26	2024-01-26
24-1A	24-1B	24-2A	24-2B	24-3A

Analyte	Batch No	MRL	Units	Guideline					
Acetone	455316	0.50	ug/g	STD 0.5	<0.50	<0.50	<0.50	<0.50	<0.50
Benzene	455316	0.0068	ug/g	STD 0.02	<0.0068	<0.0068	<0.0068	<0.0068	<0.0068
Bromodichloromethane	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Bromoform	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Bromomethane	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Carbon Tetrachloride	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorobenzene	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chloroform	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dibromochloromethane	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational
Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim
Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial
Water Quality Guideline, IPWQO = Interim Provincial Water Quality
Objective, TDR = Typical Desired Range

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

Volatiles

Lab I.D. Sample Matrix Sample Type Sample Date Sampling Time Sample I.D.					1716832 Soil153	1716833 Soil153	1716834 Soil153	1716835 Soil153	1716836 Soil153
Guideline					2024-01-26	2024-01-26	2024-01-26	2024-01-26	2024-01-26
Analyte	Batch No	MRL	Units	Guideline	24-1A	24-1B	24-2A	24-2B	24-3A
Dichlorobenzene, 1,2-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichlorobenzene, 1,3-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichlorobenzene, 1,4-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichlorodifluoromethane	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichloroethane, 1,1-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichloroethane, 1,2-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichloroethylene, 1,1-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichloroethylene, 1,2-cis-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichloroethylene, 1,2-trans-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichloropropane, 1,2-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichloropropene, 1,3-	455320	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichloropropene, 1,3-cis-	455316	0.05	ug/g		<0.05	<0.05	<0.05	<0.05	<0.05
Dichloropropene, 1,3-trans-	455316	0.05	ug/g		<0.05	<0.05	<0.05	<0.05	<0.05
Ethylbenzene	455316	0.018	ug/g	STD 0.05	<0.018	<0.018	<0.018	<0.018	<0.018
Ethylene dibromide	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Hexane (n)	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Methyl Ethyl Ketone	455316	0.50	ug/g	STD 0.5	<0.50	<0.50	<0.50	<0.50	<0.50
Methyl Isobutyl Ketone	455316	0.50	ug/g	STD 0.5	<0.50	<0.50	<0.50	<0.50	<0.50
Methyl tert-Butyl Ether (MTBE)	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Methylene Chloride	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Styrene	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Tetrachloroethane, 1,1,1,2-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Tetrachloroethane, 1,1,2,2-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational
Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim
Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial
Water Quality Guideline, IPWQO = Interim Provincial Water Quality
Objective, TDR = Typical Desired Range



Certificate of Analysis

Environment Testing

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

Volatiles

Lab I.D. Sample Matrix Sample Type Sample Date Sampling Time Sample I.D.					1716832 Soil153	1716833 Soil153	1716834 Soil153	1716835 Soil153	1716836 Soil153
					2024-01-26	2024-01-26	2024-01-26	2024-01-26	2024-01-26
					24-1A	24-1B	24-2A	24-2B	24-3A
Analyte	Batch No	MRL	Units	Guideline					
Tetrachloroethylene	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Toluene	455316	0.08	ug/g	STD 0.2	<0.08	<0.08	<0.08	<0.08	<0.08
Trichloroethane, 1,1,1-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Trichloroethane, 1,1,2-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Trichloroethylene	455316	0.01	ug/g	STD 0.05	<0.01	<0.01	<0.01	<0.01	<0.01
Trichlorofluoromethane	455316	0.05	ug/g	STD 0.25	<0.05	<0.05	<0.05	<0.05	<0.05
Vinyl Chloride	455316	0.02	ug/g	STD 0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Xylene Mixture	455319	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Xylene, m/p-	455316	0.05	ug/g		<0.05	<0.05	<0.05	<0.05	<0.05
Xylene, o-	455316	0.05	ug/g		<0.05	<0.05	<0.05	<0.05	<0.05

Volatiles

Lab I.D. Sample Matrix Sample Type Sample Date Sampling Time Sample I.D.					1716837 Soil153	1716838 Soil153	1716839 Soil153
					2024-01-26	2024-01-26	2024-01-26
					24-3B	24-4A	24-4B
Analyte	Batch No	MRL	Units	Guideline			
Acetone	455316	0.50	ug/g	STD 0.5	<0.50	<0.50	<0.50
Benzene	455316	0.0068	ug/g	STD 0.02	<0.0068	<0.0068	<0.0068
Bromodichloromethane	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Bromoform	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Bromomethane	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Carbon Tetrachloride	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Chlorobenzene	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Chloroform	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dibromochloromethane	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational
Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim
Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial
Water Quality Guideline, IPWQO = Interim Provincial Water Quality
Objective, TDR = Typical Desired Range

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

Volatiles

					1716837 Soil153	1716838 Soil153	1716839 Soil153
					2024-01-26	2024-01-26	2024-01-26
					24-3B	24-4A	24-4B
Analyte	Batch No	MRL	Units	Guideline			
Dichlorobenzene, 1,2-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichlorobenzene, 1,3-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichlorobenzene, 1,4-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichlorodifluoromethane	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichloroethane, 1,1-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichloroethane, 1,2-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichloroethylene, 1,1-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichloroethylene, 1,2-cis-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichloroethylene, 1,2-trans-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichloropropane, 1,2-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichloropropene, 1,3-	455320	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Dichloropropene, 1,3-cis-	455316	0.05	ug/g		<0.05	<0.05	<0.05
Dichloropropene, 1,3-trans-	455316	0.05	ug/g		<0.05	<0.05	<0.05
Ethylbenzene	455316	0.018	ug/g	STD 0.05	<0.018	<0.018	<0.018
Ethylene dibromide	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Hexane (n)	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Methyl Ethyl Ketone	455316	0.50	ug/g	STD 0.5	<0.50	<0.50	<0.50
Methyl Isobutyl Ketone	455316	0.50	ug/g	STD 0.5	<0.50	<0.50	<0.50
Methyl tert-Butyl Ether (MTBE)	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Methylene Chloride	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Styrene	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Tetrachloroethane, 1,1,1,2-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05
Tetrachloroethane, 1,1,2,2-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational
Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim
Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial
Water Quality Guideline, IPWQO = Interim Provincial Water Quality
Objective, TDR = Typical Desired Range



Certificate of Analysis

Environment Testing

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0

Attention: Mr. Benjamin Edwards

PO#:

Invoice to: EGIS Canada Ltd.

Report Number: 3004774

Date Submitted: 2024-01-26

Date Reported: 2024-02-02

Project: CCO - 24 - 2687

COC #: 226844

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

Volatiles

Analyte	Batch No	MRL	Units	Guideline	Lab I.D.	Sample Matrix	Sample Type	Sample Date	Sampling Time	Sample I.D.
					1716837	Soil153	1716838	Soil153	1716839	Soil153
Tetrachloroethylene	455316	0.05	ug/g	STD 0.05	2024-01-26	24-3B	2024-01-26	24-4A	2024-01-26	24-4B
Toluene	455316	0.08	ug/g	STD 0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Trichloroethane, 1,1,1-	455316	0.05	ug/g	STD 0.05	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
Trichloroethane, 1,1,2-	455316	0.05	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Trichloroethylene	455316	0.01	ug/g	STD 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Trichlorofluoromethane	455316	0.05	ug/g	STD 0.25	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Vinyl Chloride	455316	0.02	ug/g	STD 0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Xylene Mixture	455319	0.05	ug/g	STD 0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Xylene, m/p-	455316	0.05	ug/g		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Xylene, o-	455316	0.05	ug/g		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

Inorganics

Analyte	Batch No	MRL	Units	Guideline	Lab I.D.	Sample Matrix	Sample Type	Sample Date	Sampling Time	Sample I.D.
					1716832	Soil153	1716833	Soil153	1716834	Soil153
Cyanide (CN-)	455419	0.005	ug/g	STD 0.051	2024-01-26	24-1A	2024-01-26	24-1B	2024-01-26	24-2A
Electrical Conductivity	455468	0.05	mS/cm	STD 0.57	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Sodium Adsorption Ratio	455477	0.01		STD 2.4	0.26	0.22	0.26	0.23	0.24	0.24
					0.13	0.35	0.18	0.25	0.31	0.31

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range



Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

Inorganics

Analyte	Batch No	MRL	Units	Guideline	Lab I.D.	Sample Matrix	Sample Type	Sample Date	Sampling Time	Sample I.D.
					1716837	Soil153	1716838	Soil153	1716839	Soil153
Cyanide (CN-)	455419	0.005	ug/g	STD 0.051	2024-01-26	24-3B	2024-01-26	24-4A	2024-01-26	24-4B
Electrical Conductivity	455468	0.05	mS/cm	STD 0.57	0.16		0.61*		0.15	
Sodium Adsorption Ratio	455477	0.01		STD 2.4	0.28		0.22		0.25	

Moisture

Analyte	Batch No	MRL	Units	Guideline	Lab I.D.	Sample Matrix	Sample Type	Sample Date	Sampling Time	Sample I.D.
					1716832	Soil153	1716833	Soil153	1716834	Soil153
Moisture-Humidite	455308	0.1	%		2024-01-26	24-1A	2024-01-26	24-1B	2024-01-26	24-2A
	455313	0.1	%		24.7		26.9		26.7	
									26.7	19.4

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range



Certificate of Analysis

Environment Testing

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

Moisture

Analyte	Batch No	MRL	Units	Guideline	Lab I.D.	Sample Matrix	Sample Type	Sample Date	Sampling Time	Sample I.D.
					1716837	Soil153	1716838	Soil153	1716839	Soil153
Moisture-Humidite	455308	0.1	%		2024-01-26		2024-01-26		2024-01-26	
	455313	0.1	%		24-3B		24-4A		24-4B	
	455411	0.1	%							10.5

PHC Surrogate

Analyte	Batch No	MRL	Units	Guideline	Lab I.D.	Sample Matrix	Sample Type	Sample Date	Sampling Time	Sample I.D.
					1716832	Soil153	1716833	Soil153	1716834	Soil153
Alpha-androstrane	455308	0	%		2024-01-26		2024-01-26		2024-01-26	
	455313	0	%		24-1A		24-1B		24-2A	
									24-2B	
									24-3A	
										66
					68				62	

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational
Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim
Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial
Water Quality Guideline, IPWQO = Interim Provincial Water Quality
Objective, TDR = Typical Desired Range



Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

PHC Surrogate

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co							
<u>PHC Surrogate</u>				Lab I.D.	1716837	1716838	1716839
				Sample Matrix	Soil153	Soil153	Soil153
				Sample Type			
				Sample Date	2024-01-26	2024-01-26	2024-01-26
				Sampling Time			
			Sample I.D.	24-3B	24-4A	24-4B	
Analyte	Batch No	MRL	Units	Guideline			
Alpha-androstrane	455308	0	%		61		
	455313	0	%			77	
	455411	0	%				73

VOCs Surrogates

<u>VOCs Surrogates</u>					Lab I.D.	1716832	1716833	1716834	1716835	1716836
Analyte	Batch No	MRL	Units	Sample Matrix	Soil153	Soil153	Soil153	Soil153	Soil153	
				Sample Type						
				Sample Date	2024-01-26	2024-01-26	2024-01-26	2024-01-26	2024-01-26	
				Sampling Time						
Guideline										
				Sample I.D.	24-1A	24-1B	24-2A	24-2B	24-3A	
1,2-dichloroethane-d4	455316	0	%		123	125	126	129	127	
4-bromofluorobenzene	455316	0	%		71	70	72	74	70	
Toluene-d8	455316	0	%		124	122	109	112	114	

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational
Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim
Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial
Water Quality Guideline, IPWQO = Interim Provincial Water Quality
Objective, TDR = Typical Desired Range



Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Guideline = Excess Soil-T1-Res/Park/Inst/Ind/Cml/Co

VOCs Surrogates

					Lab I.D. Sample Matrix Sample Type Sample Date Sampling Time Sample I.D.		
					Guideline		
Analyte	Batch No	MRL	Units				
1,2-dichloroethane-d4	455316	0	%			127	121
4-bromofluorobenzene	455316	0	%			79	73
Toluene-d8	455316	0	%			82	114

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational
Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim
Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial
Water Quality Guideline, IPWQO = Interim Provincial Water Quality
Objective, TDR = Typical Desired Range

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Quality Assurance Summary

Batch No	Analyte	Blank	QC % Rec	QC Limits	Spike % Rec	Spike Limits	Dup % RPD	Duplicate Limits
455308	PHC's F2	<2 ug/g	87	80-120	75	60-140	0	0-30
455308	PHC's F3	<20 ug/g	87	80-120	75	60-140	0	0-30
455308	PHC's F4	<20 ug/g	87	80-120	75	60-140	0	0-30
455308	Moisture-Humidite	<0.1 %	100	80-120			5	
455313	PHC's F2	<2 ug/g	91	80-120	66	60-140	0	0-30
455313	PHC's F3	<20 ug/g	91	80-120	66	60-140	0	0-30
455313	PHC's F4	<20 ug/g	91	80-120	66	60-140	0	0-30
455313	Moisture-Humidite	<0.1 %	100	80-120			23	
455316	Tetrachloroethane, 1,1,1,2-	<0.05 ug/g	122	60-130	107	50-140	0	0-50
455316	Trichloroethane, 1,1,1-	<0.05 ug/g	115	60-130	111	50-140	0	0-50
455316	Tetrachloroethane, 1,1,2,2-	<0.05 ug/g	119	60-130	91	50-140	0	0-30
455316	Trichloroethane, 1,1,2-	<0.05 ug/g	121	60-130	115	50-140	0	0-50
455316	Dichloroethane, 1,1-	<0.05 ug/g	117	60-130	112	50-140	0	0-50
455316	Dichloroethylene, 1,1-	<0.05 ug/g	108	60-130	87	50-140	0	0-50
455316	Dichlorobenzene, 1,2-	<0.05 ug/g	120	60-130	111	50-140	0	0-50
455316	Dichloroethane, 1,2-	<0.05 ug/g	121	60-130	114	50-140	0	0-50
455316	Dichloropropane, 1,2-	<0.05 ug/g	124	60-130	119	50-140	0	0-50
455316	Dichlorobenzene, 1,3-	<0.05 ug/g	120	60-130	112	50-140	0	0-50
455316	Dichlorobenzene, 1,4-	<0.05 ug/g	121	60-130	112	50-140	0	0-50
455316	Acetone	<0.50 ug/g	120	60-130	112	50-140	0	0-50
455316	Benzene	<0.0068	113	60-130	114	50-140	0	0-50
455316	Bromodichloromethane	<0.05 ug/g	120	60-130	110	50-140	0	0-50
455316	Bromoform	<0.05 ug/g	118	60-130	109	50-140	0	0-50
455316	Bromomethane	<0.05 ug/g	105	60-130	105	50-140	0	0-50
455316	Dichloroethylene, 1,2-cis-	<0.05 ug/g	121	60-130	115	50-140	0	0-50
455316	Dichloropropene, 1,3-cis-	<0.05 ug/g	118	60-130	115	50-140	0	0-50
455316	Carbon Tetrachloride	<0.05 ug/g	115	60-130	107	50-140	0	0-50
455316	Chloroform	<0.05 ug/g	121	60-130	115	50-140	0	0-50
455316	Dibromochloromethane	<0.05 ug/g	120	60-130	101	50-140	0	0-50
455316	Dichlorodifluoromethane	<0.05 ug/g	114	60-130	106	50-140	0	0-50
455316	Methylene Chloride	<0.05 ug/g	102	60-130	95	50-140	0	0-50
455316	Ethylbenzene	<0.018 ug/g	116	60-130	121	50-140	0	0-50

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Quality Assurance Summary

Batch No	Analyte	Blank	QC % Rec	QC Limits	Spike % Rec	Spike Limits	Dup % RPD	Duplicate Limits
455316	Ethylene dibromide	<0.05 ug/g	120	60-130	113	50-140	0	0-50
455316	Hexane (n)	<0.05 ug/g	113	60-130	112	50-140	0	0-50
455316	Xylene, m/p-	<0.05 ug/g	119	60-130	112	50-140	0	0-50
455316	Methyl Ethyl Ketone	<0.50 ug/g	118	60-130	116	50-140	0	0-50
455316	Methyl Isobutyl Ketone	<0.50 ug/g	121	60-130	114	50-140	0	0-50
455316	Methyl tert-Butyl Ether (MTBE)	<0.05 ug/g	120	60-130	114	50-140	0	0-50
455316	Chlorobenzene	<0.05 ug/g	115	60-130	115	50-140	0	0-50
455316	Xylene, o-	<0.05 ug/g	117	60-130	118	50-140	0	0-50
455316	Styrene	<0.05 ug/g	117	60-130	117	50-140	0	0-50
455316	Dichloroethylene, 1,2-trans-	<0.05 ug/g	120	60-130	110	50-140	0	0-50
455316	Dichloropropene, 1,3-trans-	<0.05 ug/g	119	60-130	115	50-140	0	0-50
455316	Tetrachloroethylene	<0.05 ug/g	119	60-130	119	50-140	0	0-50
455316	Toluene	<0.08 ug/g	115	60-130	114	50-140	0	0-50
455316	Trichloroethylene	<0.01 ug/g	115	60-130	115	50-140	0	0-50
455316	Trichlorofluoromethane	<0.05 ug/g	116	60-130	98	50-140	0	0-50
455316	Vinyl Chloride	<0.02 ug/g	106	60-130	92	50-140	0	0-50
455317	PHC's F1	<10 ug/g	97	80-120	90	60-140	0	0-30
455318	Methlynaphthalene, 1-	<0.05 ug/g	63	50-140	64	50-140	0	0-40
455318	Methlynaphthalene, 2-	<0.05 ug/g	59	50-140	61	50-140	0	0-40
455318	Acenaphthene	<0.05 ug/g	61	50-140	61	50-140	0	0-40
455318	Acenaphthylene	<0.05 ug/g	60	50-140	60	50-140	0	0-40
455318	Anthracene	<0.05 ug/g	63	50-140	61	50-140	0	0-40
455318	Benz[a]anthracene	<0.05 ug/g	59	50-140	61	50-140	0	0-40
455318	Benzo[a]pyrene	<0.05 ug/g	50	50-140	58	50-140	0	0-40
455318	Benzo[b]fluoranthene	<0.05 ug/g	62	50-140	54	50-140	0	0-40
455318	Benzo[ghi]perylene	<0.05 ug/g	66	50-140	54	50-140	0	0-40
455318	Benzo[k]fluoranthene	<0.05 ug/g	57	50-140	56		0	0-40
455318	Chrysene	<0.05 ug/g	65	50-140	63	50-140	0	0-40
455318	Dibenz[a h]anthracene	<0.05 ug/g	62	50-140	57	50-140	0	0-40
455318	Fluoranthene	<0.05 ug/g	62	50-140	61	50-140	0	0-40
455318	Fluorene	<0.05 ug/g	61	50-140	61	50-140	0	0-40
455318	Indeno[1 2 3-cd]pyrene	<0.05 ug/g	63	50-140	55	50-140	0	0-40
455318	Naphthalene	<0.013 ug/g	60	50-140	60	50-140	0	0-40

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Quality Assurance Summary

Batch No	Analyte	Blank	QC % Rec	QC Limits	Spike % Rec	Spike Limits	Dup % RPD	Duplicate Limits
455318	Phenanthrene	<0.05 ug/g	59	50-140	58	50-140	0	0-40
455318	Pyrene	<0.05 ug/g	61	50-140	61	50-140	0	0-40
455319	Xylene Mixture							
455320	Dichloropropene, 1,3-							
455321	PHC's F1-BTEX							
455322	PHC's F1-BTEX							
455358	1+2-methylnaphthalene							
455411	PHC's F2	<2 ug/g	84	80-120	64	60-140	0	0-30
455411	PHC's F3	<20 ug/g	84	80-120	64	60-140	0	0-30
455411	PHC's F4	<20 ug/g	84	80-120	64	60-140	0	0-30
455411	Moisture-Humidite	<0.1 %	100	80-120			16	
455413	PHC's F2-Napth							
455414	PHC's F3-PAH							
455419	Cyanide (CN-)	<0.005 ug/g	85	75-125	98	70-130	0	0-20
455434	Silver	<0.2 ug/g	110	70-130	103	70-130	0	0-20
455434	Arsenic	<1 ug/g	96	70-130	89	70-130	11	0-20
455434	Boron (total)	<5 ug/g	97	70-130	119	70-130	0	0-20
455434	Barium	<1 ug/g	96	70-130		70-130	11	0-20
455434	Beryllium	<1 ug/g	100	70-130	100	70-130	0	0-20
455434	Cadmium	<0.4 ug/g	98	70-130	101	70-130	0	0-20
455434	Cobalt	<1 ug/g	97	70-130	65	70-130	10	0-20
455434	Chromium Total	<1 ug/g	99	70-130	19	70-130	12	0-20
455434	Copper	<1 ug/g	105	70-130	36	70-130	14	0-20
455434	Molybdenum	<1 ug/g	102	70-130	93	70-130	0	0-20
455434	Nickel	<1 ug/g	102	70-130	29	70-130	11	0-20
455434	Lead	<1 ug/g	103	70-130	77	70-130	22	0-20
455434	Antimony	<1 ug/g	77	70-130	68	70-130	0	0-20
455434	Selenium	<0.5 ug/g	98	70-130	97	70-130	0	0-20
455434	Thallium	<1 ug/g	101	70-130	92	70-130	0	0-20
455434	Uranium	<0.5 ug/g	88	70-130	90	70-130	0	0-20
455434	Vanadium	<2 ug/g	97	70-130	6	70-130	12	0-20
455434	Zinc	<2 ug/g	104	70-130		70-130	13	0-20
455468	Electrical Conductivity	<0.05	100	90-110			0	0-10

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range



Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Quality Assurance Summary

Batch No	Analyte	Blank	QC % Rec	QC Limits	Spike % Rec	Spike Limits	Dup % RPD	Duplicate Limits
455477	Sodium Adsorption Ratio	<0.01					4	
455501	Cobalt	<1 ug/g	97	70-130	106	70-130	0	0-20
455501	Chromium Total	<1 ug/g	99	70-130	119	70-130	18	0-20
455501	Copper	<1 ug/g	106	70-130	102	70-130	21	0-20
455501	Nickel	<1 ug/g	103	70-130	107	70-130	0	0-20
455501	Lead	<1 ug/g	100	70-130	110	70-130	0	0-20
455501	Vanadium	<2 ug/g	96	70-130	133	70-130	33	0-20
455501	Zinc	<2 ug/g	105	70-130	100	70-130	17	0-20

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Test Summary

Batch No	Analyte	Instrument	Preparation Date	Analysis Date	Analyst	Method
455308	PHC's F2	GC/FID	2024-01-29	2024-01-30	PJ	CCME
455308	PHC's F3	GC/FID	2024-01-29	2024-01-30	PJ	CCME
455308	PHC's F4	GC/FID	2024-01-29	2024-01-30	PJ	CCME
455308	Moisture-Humidite	Oven	2024-01-29	2024-01-30	PJ	ASTM 2216
455313	PHC's F2	GC/FID	2024-01-29	2024-01-30	PJ	CCME
455313	PHC's F3	GC/FID	2024-01-29	2024-01-30	PJ	CCME
455313	PHC's F4	GC/FID	2024-01-29	2024-01-30	PJ	CCME
455313	Moisture-Humidite	Oven	2024-01-29	2024-01-30	PJ	ASTM 2216
455316	Tetrachloroethane, 1,1,1,2-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Trichloroethane, 1,1,1-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Tetrachloroethane, 1,1,2,2-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Trichloroethane, 1,1,2-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Dichloroethane, 1,1-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Dichloroethylene, 1,1-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Dichlorobenzene, 1,2-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Dichloroethane, 1,2-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Dichloropropane, 1,2-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Dichlorobenzene, 1,3-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Dichlorobenzene, 1,4-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Acetone	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Benzene	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Bromodichloromethane	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Bromoform	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Bromomethane	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Dichloroethylene, 1,2-cis-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Dichloropropene, 1,3-cis-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Carbon Tetrachloride	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Chloroform	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Dibromochloromethane	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Dichlorodifluoromethane	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Methylene Chloride	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Ethylbenzene	GC-MS	2024-01-26	2024-01-29	SS	V 8260B

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Test Summary

Batch No	Analyte	Instrument	Preparation Date	Analysis Date	Analyst	Method
455316	Ethylene dibromide	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Hexane (n)	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Xylene, m/p-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Methyl Ethyl Ketone	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Methyl Isobutyl Ketone	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Methyl tert-Butyl Ether (MTBE)	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Chlorobenzene	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Xylene, o-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Styrene	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Dichloroethylene, 1,2-trans-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Dichloropropene, 1,3-trans-	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Tetrachloroethylene	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Toluene	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Trichloroethylene	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Trichlorofluoromethane	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455316	Vinyl Chloride	GC-MS	2024-01-26	2024-01-29	SS	V 8260B
455317	PHC's F1	GC/FID	2024-01-26	2024-01-30	SS	CCME
455318	Methylnaphthalene, 1-	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455318	Methylnaphthalene, 2-	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455318	Acenaphthene	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455318	Acenaphthylene	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455318	Anthracene	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455318	Benz[a]anthracene	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455318	Benzo[a]pyrene	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455318	Benzo[b]fluoranthene	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455318	Benzo[ghi]perylene	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455318	Benzo[k]fluoranthene	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455318	Chrysene	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455318	Dibenz[a h]anthracene	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455318	Fluoranthene	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455318	Fluorene	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455318	Indeno[1 2 3-cd]pyrene	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455318	Naphthalene	GC-MS	2024-01-29	2024-01-30	C_M	P 8270

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Test Summary

Batch No	Analyte	Instrument	Preparation Date	Analysis Date	Analyst	Method
455318	Phenanthrene	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455318	Pyrene	GC-MS	2024-01-29	2024-01-30	C_M	P 8270
455319	Xylene Mixture	GC-MS	2024-01-30	2024-01-30	SS	V 8260B
455320	Dichloropropene, 1,3-	GC-MS	2024-01-30	2024-01-30	SS	V 8260B
455321	PHC's F1-BTEX	GC/FID	2024-01-30	2024-01-30	SS	CCME
455322	PHC's F1-BTEX	GC/FID	2024-01-30	2024-01-30	SS	CCME
455358	1+2-methylnaphthalene	GC-MS	2024-01-31	2024-01-31	C_M	P 8270
455411	PHC's F2	GC/FID	2024-01-30	2024-01-31	PJ	CCME
455411	PHC's F3	GC/FID	2024-01-30	2024-01-31	PJ	CCME
455411	PHC's F4	GC/FID	2024-01-30	2024-01-31	PJ	CCME
455411	Moisture-Humidite	Oven	2024-01-30	2024-01-31	PJ	ASTM 2216
455413	PHC's F2-Naph	GC/FID	2024-01-31	2024-01-31	PJ	CCME
455414	PHC's F3-PAH	GC/FID	2024-01-31	2024-01-31	PJ	CCME
455419	Cyanide (CN-)	Skalar CN Analyzer	2024-01-31	2024-01-31	Z_S	MOECC E3015
455434	Silver	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Arsenic	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Boron (total)	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Barium	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Beryllium	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Cadmium	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Cobalt	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Chromium Total	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Copper	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Molybdenum	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Nickel	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Lead	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Antimony	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Selenium	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Thallium	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Uranium	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Vanadium	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455434	Zinc	ICAPQ-MS	2024-02-01	2024-02-01	AaN	EPA 200.8/6020
455468	Electrical Conductivity	Electrical Conductivity Mete	2024-02-01	2024-02-01	Z_S	Cond-Soil

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range



Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Test Summary

Batch No	Analyte	Instrument	Preparation Date	Analysis Date	Analyst	Method
455477	Sodium Adsorption Ratio	iCAP OES	2024-02-01	2024-02-01	Z_S	Ag Soil
455501	Cobalt	ICAPQ-MS	2024-02-02	2024-02-02	AaN	EPA 200.8/6020
455501	Chromium Total	ICAPQ-MS	2024-02-02	2024-02-02	AaN	EPA 200.8/6020
455501	Copper	ICAPQ-MS	2024-02-02	2024-02-02	AaN	EPA 200.8/6020
455501	Nickel	ICAPQ-MS	2024-02-02	2024-02-02	AaN	EPA 200.8/6020
455501	Lead	ICAPQ-MS	2024-02-02	2024-02-02	AaN	EPA 200.8/6020
455501	Vanadium	ICAPQ-MS	2024-02-02	2024-02-02	AaN	EPA 200.8/6020
455501	Zinc	ICAPQ-MS	2024-02-02	2024-02-02	AaN	EPA 200.8/6020

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004774
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

CWS for Petroleum Hydrocarbons in Soil - Tier 1

Notes:

1. The laboratory method complies with CCME Tier 1 reference method for PHC in soil. It is validated for laboratory use.
2. Where the F1 fraction (C6 to C10) and BTEX are both measured, F1-BTEX is reported.
3. Where the F2 fraction (C10 to C16) and naphthalene are both measured, F2-naphthalene is reported.
4. Where the F3 fraction (C16 to C34) and PAHs* are both measured, F3-PAH is reported.
5. F4G is analyzed if the chromatogram does not descend to baseline before C50. Where F4 (C34 to C50) and F4G are both reported, the higher result is compared to the standard.
6. Unless otherwise stated in the sample comments, the following criteria have been met where applicable:
 - nC6 and nC10 response factors within 30% of response factor for toluene;
 - nC10, nC16, and nC34 response factors within 10% of each other;
 - C50 response factors within 70% of nC10 + nC16 + nC34 average; and,
 - Linearity is within 15%.
7. Unless otherwise stated in the sample comments, sampling requirements and analytical holding times have been met.
8. Gravimetric heavy hydrocarbons (F4G) cannot be added to the C6 and C50 hydrocarbons.
9. *PAHs = phenanthrene, benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, fluoranthene, dibenz(a,h)anthracene, indeno(1,2,3-c,d)pyrene and pyrene.



226844

STANDARD CHAIN-OF-CUSTODY

146 Colonnade Road, Unit #8, Ottawa, ON, K2E 7Y1 - Phone: 613-727-5692, Fax: 613-727-5222

Eurofins Workorder #: 3004774

CLIENT INFORMATION

Company: Egis Canada Ltd
Contact: Benjamin Edwards
Address: 115 Walsgreen Rd, Carp, ON K0A 1L1
Telephone: Cell: 613-315-3093
Email: #1: benjamin.edwards@egis-groupe.com
Email: #2:
Project: ELD-24-2657 Quote #:

INVOICE INFORMATION (SAME AS CLIENT INFORMATION: YES ☒ NO ☐

Company: Egis Canada Ltd
Contact: Accounts Payable
Address:
Telephone:
Fax:
Email: #1: ap@eminto.com
Email: #2:
PO #:

REGULATION/GUIDELINE REQUIRED

- ☐ Sanitary Sewer, City: _____
☐ Storm Sewer, City: _____
☐ ODWSOG (Use DW CoC if analyzing drinking water)
☐ PWQO
☐ O.Reg 347
☐ Other: _____

- ☐ O. Reg 153
The sample results from this submission will form part of a formal Record of Site Condition (RSC) under O.Reg. 153/04. Analysis of full parameter list only
Yes ☐ No ☐
Table # _____ Coarse / Fine, Surface / subsurface
Type: Com-Ind / Res-Park / Agri / GW / All Other / Sediment
☒ O. Reg 406 Excess Soils
Table # L-3 Full depth/Strat/Ceiling/mSPLP Leachate
Type: Com-Ind / Res-Park / Agri / All Other
Category: Surface / Subsurface

TURN-AROUND TIME (Business Days)

- ☐ 1 Day* (100%) ☐ 2 Day** (50%) ☐ 3-5 Days (25%) ☒ 5-7 Days (Standard)

Please contact Lab in advance to determine rush availability.

*For results reported after rush due date, surcharges will apply: before 12:00 - 100%, after 12:00 - 50%.

**For results reported after rush due date, surcharges will apply: before 12:00 - 50%, after 12:00 - 25%.

The optimal temperature conditions during transport should be less than 10°C. Sample(s) cannot be frozen, unless otherwise indicated or agreed upon with the Laboratory. Note that this CoC is not to be used for drinking water samples. The CoC must be complete upon submission of the samples, there will be a \$25 surcharge if required information is missing (required fields are shaded in grey).

Sample Details

Field Filtered -->

Sample Matrix

of Containers

O.Reg.153 parameters

PHC F1 - F4

BTEX

VOCs

PAHs

PCBs

Metals + Inorganic

Metals only

EL5AD

Cyanide

TCP-VOL

PAHs, BTEX

PHS, NH

RN#
(Lab Use Only)

Sample ID	Date/Time Collected	Sample Matrix	# of Containers	PHC F1 - F4	BTEX	VOCs	PAHs	PCBs	Metals + Inorganic	Metals only	EL5AD	Cyanide	TCP-VOL	PAHs, BTEX	PHS, NH	RN# (Lab Use Only)
24-1A	26-Jan-2024	soil	4	x	x	x	x			x	x	x				1716832
24-1B	26-Jan-2024	soil	4	x	x	x	x			x	x	x				33
TCLP-24-1	26-Jan-2024	soil	2										x			
24-2A	26-Jan-2024	soil	4	x	x	x	x			x	x	x				34
24-2B	26-Jan-2024	soil	4	x	x	x	x			x	x	x				35
TCLP-24-2	26-Jan-2024	soil	2										x			
24-3A	26-Jan-2024	soil	4	x	x	x	x			x	x	x				36
24-3B	26-Jan-2024	soil	4	x	x	x	x			x	x	x				37
TCLP-24-3	26-Jan-2024	soil	2										x			
24-4A	26-Jan-2024	soil	4	x	x	x	x			x	x	x				38

PRINT

SIGN

DATE/TIME

TEMP (°C)

COMMENTS:

Sampled By: Ben Edwards / Rebecca Leclerc
Relinquished By: Rebecca Leclerc
Received By: Sy 1/26/24 20
CUSTODY SEAL: ☐ YES ☐ NO ice packs submit ☐ Yes ☐ No

401 Magnetic Drive, Unit #1, North York, ON, M3J 3H9 - Telephone: 416-661-5287 • 380 Vansickle Road, Unit #630, St. Catharines, ON, L2S 0B5 - Telephone: 905-680-8887 • 608 Norris Court, Kingston, ON, K7P 2R9 - Telephone: 613-634-9307



Environment Testing

Certificate of Analysis

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004775
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

Page 1 of 8

Dear Benjamin Edwards:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Report Comments:

APPROVAL:

Emma-Dawn Ferguson, Chemist

All analysis is completed at Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) unless otherwise indicated.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on the scope of accreditation. The scope is available at: <https://directory.cala.ca/>.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is licensed by the Ontario Ministry of the Environment, Conservation, and Parks (MECP) for specific tests in drinking water (license #2318). A copy of the license is available upon request.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is accredited by the Ontario Ministry of Agriculture, Food, and Rural Affairs for specific tests in agricultural soils.

Please note: Field data, where presented on the report, has been provided by the client and is presented for informational purposes only. Guideline values listed on this report are provided for ease of use (informational purposes) only. Eurofins recommends consulting the official provincial or federal guideline as required. Unless otherwise stated, measurement uncertainty is not taken into account when determining guideline or regulatory exceedances.



Environment Testing

Certificate of Analysis

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004775
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

					1716840 R347 2024-01-26 TCLP - 24-1	1716841 R347 2024-01-26 TCLP - 24-2	1716842 R347 2024-01-26 TCLP - 24-3	1716843 R347 2024-01-26 TCLP - 24-4
Group	Analyte	MRL	Units	Guideline				
Anions	F	0.10	mg/L	LQC 150.0	<0.10	0.12	<0.10	0.12
General Chemistry	Cyanide (free)	0.05	mg/L	LQC 20.0	<0.05	<0.05	<0.05	<0.05
Hydrocarbons	F1 (C6-C10)	20	ug/L		<20	<20	<20	<20
	F2 (C10-C16)	20	ug/L		<20	<20	<20	<20
	F3 (C16-C34)	50	ug/L		<50	<50	<50	<50
	F4 (C34-C50)	50	ug/L		<50	<50	<50	<50
Leachate	REG 558 Leach				y	y	y	y
	Zero Headspace Extraction				y	y	y	y
Mercury	Hg	0.001	mg/L	LQC 0.1	<0.001	<0.001	<0.001	<0.001
Metals	Ag	0.01	mg/L	LQC 5	<0.01	<0.01	<0.01	<0.01
	As	0.02	mg/L	LQC 2.5	<0.02	<0.02	<0.02	<0.02
	B	0.1	mg/L	LQC 500.0	<0.1	0.1	0.1	<0.1
	Ba	0.01	mg/L	LQC 100.0	1.45	1.13	1.17	1.10
	Cd	0.008	mg/L	LQC 0.5	<0.008	<0.008	<0.008	<0.008
	Cr	0.05	mg/L	LQC 5.0	<0.05	<0.05	<0.05	<0.05
	Pb	0.01	mg/L	LQC 5.0	0.05	<0.01	<0.01	<0.01
	Se	0.02	mg/L	LQC 1.0	<0.02	<0.02	<0.02	<0.02
	U	0.01	mg/L	LQC 10.0	<0.01	<0.01	<0.01	<0.01
Moisture	Moisture-Humidite	0.1	%		22.8	22.8	28.1	9.8
Others	NO2 + NO3 as N	1.0	mg/L	LQC 1000	<1.0	<1.0	<1.0	<1.0
PAH	1-methylnaphthalene	0.1	ug/L		<0.1	<0.1	<0.1	<0.1
	2-methylnaphthalene	0.1	ug/L		<0.1	<0.1	<0.1	<0.1
	Acenaphthene	0.1	ug/L		<0.1	<0.1	<0.1	<0.1
	Acenaphthylene	0.1	ug/L		<0.1	<0.1	<0.1	<0.1
	Anthracene	0.1	ug/L		<0.1	<0.1	<0.1	<0.1

Guideline = REG 558

* = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range



Environment Testing

Certificate of Analysis

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004775
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

					1716840 R347 2024-01-26 TCLP - 24-1	1716841 R347 2024-01-26 TCLP - 24-2	1716842 R347 2024-01-26 TCLP - 24-3	1716843 R347 2024-01-26 TCLP - 24-4
Group	Analyte	MRL	Units	Guideline				
PAH	Benzo(a)anthracene	0.1	ug/L		<0.1	<0.1	<0.1	<0.1
	Benzo(a)pyrene	0.01	ug/L	LQC 1.0	<0.01	<0.01	<0.01	<0.01
	Benzo(b)fluoranthene	0.05	ug/L		<0.05	<0.05	<0.05	<0.05
	Benzo(g,h,i)perylene	0.1	ug/L		<0.1	<0.1	<0.1	<0.1
	Benzo(k)fluoranthene	0.05	ug/L		<0.05	<0.05	<0.05	<0.05
	Chrysene	0.05	ug/L		<0.05	<0.05	<0.05	<0.05
	Dibenzo(a,h)anthracene	0.1	ug/L		<0.1	<0.1	<0.1	<0.1
	Fluoranthene	0.1	ug/L		<0.1	<0.1	<0.1	<0.1
	Fluorene	0.1	ug/L		<0.1	<0.1	<0.1	<0.1
	Indeno(1,2,3-c,d)pyrene	0.1	ug/L		<0.1	<0.1	<0.1	<0.1
	Naphthalene	0.1	ug/L		<0.1	<0.1	<0.1	<0.1
	Phenanthrene	0.1	ug/L		<0.1	<0.1	<0.1	<0.1
	Pyrene	0.1	ug/L		<0.1	<0.1	<0.1	<0.1
VOCs Surrogates	1,2-dichloroethane-d4	0	%		108	120	123	119
	4-bromofluorobenzene	0	%		89	84	130	75
	Toluene-d8	0	%		91	94	95	95
Volatiles	1,1-dichloroethylene	0.5	ug/L	LQC 1400	<0.5	<0.5	<0.5	<0.5
	1,2-dichlorobenzene	0.4	ug/L	LQC 20000	<0.4	<0.4	<0.4	<0.4
	1,2-dichloroethane	0.5	ug/L	LQC 500	<0.5	<0.5	<0.5	<0.5
	1,4-dichlorobenzene	0.4	ug/L	LQC 500	<0.4	<0.4	<0.4	<0.4
	Benzene	0.5	ug/L	LQC 500	<0.5	<0.5	<0.5	<0.5
	Carbon Tetrachloride	0.2	ug/L	LQC 500	<0.2	<0.2	<0.2	<0.2
	Chloroform	0.5	ug/L	LQC 10000	<0.5	<0.5	<0.5	<0.5
	Dichloromethane	4.0	ug/L	LQC 5000	<4.0	<4.0	<4.0	<4.0
	Methyl Ethyl Ketone (MEK)	2	ug/L	LQC 200000	<2	<2	<2	<2

Guideline = REG 558

* = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range



Environment Testing

Certificate of Analysis

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004775
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

					1716840 R347 2024-01-26 TCLP - 24-1	1716841 R347 2024-01-26 TCLP - 24-2	1716842 R347 2024-01-26 TCLP - 24-3	1716843 R347 2024-01-26 TCLP - 24-4
Group	Analyte	MRL	Units	Guideline				
Volatiles	Monochlorobenzene	0.5	ug/L	LQC 8000	<0.5	<0.5	<0.5	<0.5
	Tetrachloroethylene	0.3	ug/L	LQC 3000	<0.3	<0.3	<0.3	<0.3
	Trichloroethylene	0.3	ug/L	LQC 5000	<0.3	<0.3	<0.3	<0.3
	Vinyl Chloride	0.2	ug/L	LQC 200	<0.2	<0.2	<0.2	<0.2

Guideline = REG 558 * = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range



Environment Testing

Certificate of Analysis

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004775
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 454563 Analysis/Extraction Date 2024-01-31 Analyst C_M			
Method P 8270			
Methlynaphthalene, 1-	<0.1 ug/L	72	50-140
Methlynaphthalene, 2-	<0.1 ug/L	62	50-140
Acenaphthene	<0.1 ug/L	75	50-140
Acenaphthylene	<0.1 ug/L	75	50-140
Anthracene	<0.1 ug/L	88	50-140
Benz[a]anthracene	<0.1 ug/L	74	50-140
Benzo[a]pyrene	<0.01 ug/L	83	50-140
Benzo[b]fluoranthene	<0.05 ug/L	67	50-140
Benzo[ghi]perylene	<0.1 ug/L	97	50-140
Benzo[k]fluoranthene	<0.05 ug/L	98	50-140
Chrysene	<0.05 ug/L	99	50-140
Dibenz[a h]anthracene	<0.1 ug/L	87	50-140
Fluoranthene	<0.1 ug/L	96	50-140
Fluorene	<0.1 ug/L	71	50-140
Indeno[1 2 3-cd]pyrene	<0.1 ug/L	91	50-140
Naphthalene	<0.1 ug/L	66	50-140

Guideline = REG 558 * = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range



Environment Testing

Certificate of Analysis

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004775
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Phenanthrene	<0.1 ug/L	74	50-140
Pyrene	<0.1 ug/L	99	50-140
Run No 455365 Analysis/Extraction Date 2024-01-31 Analyst AsA Method EPA 1311/O. Reg 347			
REG 558 Leach			
Zero Headspace Extraction			
Run No 455366 Analysis/Extraction Date 2024-01-30 Analyst AsA Method ASTM 2216			
Moisture-Humidite			80-120
Run No 455420 Analysis/Extraction Date 2024-01-31 Analyst AaN Method M SM3112B-3500B			
Mercury	<0.001 mg/L	118	76-123
Run No 455425 Analysis/Extraction Date 2024-01-31 Analyst AsA Method SM2320,2510,4500H/F			
F	<0.10 mg/L	105	90-110
Run No 455462 Analysis/Extraction Date 2024-02-01 Analyst PJ Method CCME O.Reg 153/04			
Petroleum Hydrocarbons F2	<20 ug/L	87	60-140
Petroleum Hydrocarbons F3	<50 ug/L	87	60-140

Guideline = REG 558

* = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range



Environment Testing

Certificate of Analysis

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004775
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Petroleum Hydrocarbons F4	<50 ug/L	87	60-140
Run No 455464 Analysis/Extraction Date 2024-02-01 Analyst AaN Method EPA 200.8			
Silver	<0.01 mg/L	100	70-130
Arsenic	<0.02 mg/L	101	70-130
Boron (total)	<0.1 mg/L	106	70-130
Barium	<0.01 mg/L	108	70-130
Cadmium	<0.008 mg/L	102	70-130
Chromium Total	<0.05 mg/L	108	70-130
Lead	<0.01 mg/L	109	70-130
Selenium	<0.02 mg/L	99	70-130
Uranium	<0.01 mg/L	94	70-130
Run No 455480 Analysis/Extraction Date 2024-02-01 Analyst Z_S Method SM4500-CNC/MOE E3015			
Cyanide (CN-)	<0.05 mg/L	93	75-125
Run No 455486 Analysis/Extraction Date 2024-02-02 Analyst SKH Method C SM4500-NO3-F			
NO2 + NO3 as N	<1.0 mg/L	100	80-120

Guideline = REG 558

* = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range



Environment Testing

Certificate of Analysis

Client: Egis Canada Ltd.
115 Walgreen Rd., R.R. #3
Carp, ON
K0A 1L0
Attention: Mr. Benjamin Edwards
PO#:
Invoice to: EGIS Canada Ltd.

Report Number: 3004775
Date Submitted: 2024-01-26
Date Reported: 2024-02-02
Project: CCO - 24 - 2687
COC #: 226844

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 455508 Analysis/Extraction Date 2024-02-01 Analyst SS Method EPA 8260			
Dichloroethylene, 1,1-	<0.5 ug/L	108	60-130
Dichlorobenzene, 1,2-	<0.4 ug/L	120	60-130
Dichloroethane, 1,2-	<0.5 ug/L	121	60-130
Dichlorobenzene, 1,4-	<0.4 ug/L	121	60-130
Benzene	<0.5 ug/L	113	60-130
Carbon Tetrachloride	<0.2 ug/L	115	60-130
Chloroform	<0.5 ug/L	121	60-130
Methylene Chloride	<4.0 ug/L	102	60-130
Methyl Ethyl Ketone	<2 ug/L	118	60-130
Chlorobenzene	<0.5 ug/L	115	60-130
Tetrachloroethylene	<0.3 ug/L	119	60-130
Trichloroethylene	<0.3 ug/L	115	60-130
Vinyl Chloride	<0.2 ug/L	106	60-130
Run No 455510 Analysis/Extraction Date 2024-02-02 Analyst SS Method CCME O.Reg 153/04			
Petroleum Hydrocarbons F1	<20 ug/L	94	60-140

Guideline = REG 558 * = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range



STANDARD CHAIN-OF-CUSTODY

146 Colonnade Road, Unit #8, Ottawa, ON, K2E 7Y1 - Phone: 613-727-5692, Fax: 613-727-5222

Eurofins Workorder #: 3004774

401 Magnetic Drive, Unit #1, North York, ON, M3J 3H9 - Telephone: 416-661-5287 • 380 Vansickle Road, Unit #630, St. Catharines, ON, L2S 0B5 - Telephone: 905-680-8887 • 608 Norris Court, Kingston, ON, K7P 2R9 - Telephone: 613-634-9307

