ALTONA GROUP

PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROADS, PICKERING, ONTARIO

FINAL REPORT

May 17, 2019

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1.0 EXECUTIVE SUMMARY

Terrapex Environmental Ltd. was retained by Altona Group (the Client) to conduct a Phase Two Environmental Site Assessment (ESA) of the property located at 1294 Kingston Road, 1848 and 1852 Liverpool Road in the City of Pickering, Ontario (referenced variously as the Phase Two Property or the site). It is understood that the study documented herein is being undertaken by Altona Group for the purposes of filing a Record of Site Condition per Ontario Regulation 153/04, *Records of Site Condition - Part XV.1 of the Act* for the site on the basis of future mixed residential and commercial development.

The objective of the investigation was to assess Areas of Potential Environmental Concern (APECs) identified during a previous Phase One ESA work program at the site in order to identify the location and concentration of contaminants, and (if necessary) to remediate contaminants found in the land or water on, in, or under the Phase Two property.

The Site is comprised of a commercial plaza with one 2-storey commercial building located in the southern portion of the Site (1294 Kingston Road), one 1-storey commercial building located in the central portion of the Site (1848 Liverpool Road), and one 1-storey residential building used for commercial purpose, located in the northern portion of the Site (1852 Liverpool Road). The Site is partially marked by a brick and steel fence to the south and east and a wooden fence to the north and west. The access to the Site is obtained from two entrances leading west from Liverpool Road. The Site is generally flat and slopes to the southwest towards Frenchman's Bay.

The Phase Two ESA was undertaken to assess twelve APECs identified at the site during a previously completed Phase One ESA associated with the following Potentially Contaminating Activities (PCAs):

- Importation of Fill Material of Unknown Quality (PCA type 30);
- Gasoline and Associated Products Storage in Fixed Tanks (PCA type 28);
- Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications (PCA type 40);
- Transformer Manufacturing, Processing and Use (PCA type 55);
- Operation of Dry Cleaning Equipment (where chemicals are used; PCA type 37) ;
- Not specifically defined (spill); and,
- Not specifically defined (de-icing activities).

The fieldwork for the Phase Two ESA was conducted in conjunction with the geotechnical study and the hydrogeological investigation. The hydrogeological and geotechnical conditions at the site are reported under separate covers by Terrapex and Alston Associated (AA), the geotechnical division of Terrapex, respectively.

On January 2, 7, and 31, 2019 and February 1, 7, 8 and 13, 2019, Terrapex advanced nine exterior boreholes, and one interior borehole. One single monitoring well was installed at seven borehole locations, and one pair of deep-shallow cluster wells were installed at two locations. The deep wells were installed to determine the groundwater level at the site and for use of the hydrogeological assessment.

Selected soil samples were submitted for laboratory analyses for a variety of parameters including benzene, toluene, ethylbenzene, and total xylenes (collectively, BTEX); the “F1”, “F2”, “F3”, and “F4” general petroleum hydrocarbon parameters (PHCs); volatile organic compounds (VOCs); polycyclic aromatic hydrocarbons (PAHs); polychlorinated biphenyls (PCBs); and various metallic and inorganic parameters, including metals, hydride forming metals, hot water soluble boron (HWSB), hexavalent chromium, cyanide, mercury, pH, electrical conductivity (EC), and sodium adsorption ratio (SAR). Selected groundwater samples were submitted for laboratory analysis of BTEX; PHCs; VOCs; and various metallic and inorganic parameters, including metals, hydride forming metals, sodium, and chloride.

Generic Ontario Ministry of the Environment, Conservation and Forestry (MECP) Site Condition Standards listed in Table 2 of the April 15, 2011 *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act* document (MOE, 2011) that are applicable to residential/parkland/institutional land use, coarse-textured soil, in a potable groundwater condition (hereafter, the MECP Table 2 Site Condition Standards) were selected for evaluating laboratory analytical results.

Elevated levels of the HWSB, pH, EC and SAR parameters exceeding the generic MECP Table 2 Site Condition Standards were found to be present in soils. The exceedances are attributed to the poor quality of the fill material and the application of de-icing salt on-site, as well as from Liverpool Road and Kingston Road.

Elevated levels of the barium, chloride, and sodium parameters exceeding the generic MECP Table 2 Site Condition Standards were found to be present in groundwater. The exceedances are attributed to the poor quality of the fill material and the application of de-icing salt on-site, as well as from Liverpool Road and Kingston Road.

Sediment is not present at the site, and therefore contaminants of concern are not present within sediment.

The Phase Two ESA investigation of the site, as documented in this report, identified concentrations of the inorganic parameters HWSB, EC, pH, and SAR in soil, and barium, sodium, chloride in groundwater, in excess of the generic MECP Table 2 Site Condition Standards. Therefore, a Risk Assessment is required prior to filing a Record of Site Condition.

2.0 INTRODUCTION

Terrapex Environmental Ltd. (Terrapex) was retained by Altona Group (Client) to conduct a Phase Two Environmental Site Assessment (ESA) of the property located at 1294 Kingston Road, 1848 and 1852 Liverpool Road, Pickering, Ontario (referenced variously as the Phase Two Property or the Site). It is understood that the study documented herein is being undertaken by Altona Group for the purposes of filing a Record of Site Condition per Ontario Regulation 153/04, *Records of Site Condition - Part XV.1 of the Act* for the site on the basis of future residential development.

The objective of the investigation was to assess Areas of Potential Environmental Concern (APECs) identified during a previous Phase One ESA work program at the site in order to identify the location and concentration of contaminants, and (if necessary) to remediate contaminant found in the land or water on, in, or under the Phase Two property.

The findings of the Phase One ESA are documented in Terrapex's report entitled *Phase One Environmental Site Assessment, 1294 Kingston Road, 1848 and 1852 Liverpool Roads, Pickering, Ontario,* dated May 17, 2019.

2.1 SITE DESCRIPTION

The Site comprises an approximately 0.91 ha parcel of a commercial plaza with one 2-storey commercial building located in the southern portion of the Site (1294 Kingston Road), one 1-storey commercial building located in the central portion of the Site (1848 Liverpool Road), and one 1-storey residential building used for commercial purpose, located in the northern portion of the Site (1852 Liverpool road). The Site is bounded by Liverpool Road to the east, residential properties to the north, a commercial plaza and residential properties to the west, and Kingston Road to the south. The access to the Site is obtained from two entrances leading west from Liverpool Road.

According to the Parcel Register, the site is associated with following PINs and legal descriptions which are listed below:

PHASE ONE PROPERTY INFORMATION

Property Identification Number (PIN)	Municipal Address	Legal Description
26340-0122	1294 Kingston Road and 1848 Liverpool Road, Pickering	CONSOLIDATION OF VARIOUS PROPERTIES: 1STLY: PT LT 26 PL492, PTS 1, 2 & 3 ON PL 40R10390; 2NDLY: PT LT 23 CON 1 PICKERING, PTS 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 & 16 ON PL 40R10390; PICKERING, REGIONAL MUNICIPALITY OF DURHAM
26340-0107	1848 Liverpool Road, Pickering	PT LT 30, PL492, PT15 ON 40R22154; PICKERING, REGIONAL MUNICIPALITY OF DURHAM

26340-0112		PT LT 29, PL492, PT 14 ON 40R22154; PICKERING, REGIONAL MUNICIPALITY OF DURHAM
26340-0117		PT LT 28, PL492, PT 13 ON 40R22154; PICKERING, REGIONAL MUNICIPALITY OF DURHAM
26340-0097	1852 Liverpool Road, Pickering	PT LT 26, PL 492, AS IN D498857; PICKERING

Refer to Figure 1 for the location of the Site within the City of Pickering and Figure 2 for the general layout of the Site at the time of the site reconnaissance.

2.2 PROPERTY OWNERSHIP

Parcel Registers indicate that the registered owner of PINs 26340-0122, 26340-0107, 26340-0112, 26340-0117, 26340-0097, as of February 14, 2019 was 2591662 Ontario Inc.

Written authorization to proceed with the study was provided by Mr. Muky Rajadurai, Director/Project Manager of Altona Group, 11 Progress Avenue. Unit #5, Toronto, Ontario, M1P 4S7.

2.3 CURRENT AND PROPOSED FUTURE USES

The Site is currently developed with a 2-storey commercial building located in the southern portion of the Site, one 1-storey commercial building located in the central portion of the Site, and one 1-storey residential building used for commercial purpose, located in the northern portion of the Site. The site is considered to be commercial property use per the definitions of O. Reg. 153/04.

According to the latest building scheme shown in the zoning set drawings, dated May 16, 2019, prepared by the project architect, Kirkor Architects + Planners (Kirkor), the Old Liverpool House (1294 Kingston Road) will be moved approximately 10 m towards the southern property line and all other existing structures at the site will be demolished to make way for a new mixed-use commercial and residential complex that consists of a mixed use development that incorporates a 25-storey tower, a 12-storey midrise building, and a row of 3-storey townhouses. The proposed future use of the site is considered to be residential and commercial property use per the definitions of O. Reg. 153/04.

2.4 APPLICABLE SITE CONDITION STANDARDS

Generic Ontario Ministry of the Environment, Conservation and Parks (MECP) Site Condition Standards (SCS) for evaluating laboratory analytical results pertaining to the site were selected from the April 15, 2011 *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of* *the Environmental Protection Act* document (MOE, 2011) using the criteria specified in O. Reg. 153/04.

The site specific details which influenced the soil and groundwater standards selection are summarized below:

- more than 2 m of overburden was observed during the work program;
- the pH determined for samples submitted for analysis as part of this Phase Two ESA ranged between the prescribed values of 5 and 9 for surface soils and 5 and 11 for subsurface soils except for sample MW1-1 potentially due to the poor quality of fill material;
- the site does not include land within 30 m of an area of natural significance and is not otherwise considered "potentially sensitive" per the definitions of O. Reg. 153/04;
- stratified site conditions will not be used when evaluating laboratory analytical results;
- future use of the site is intended to comprise residential and commercial property use per the definitions of O. Reg. 153/04;
- the site and surrounding properties within 250 m of the site are serviced with a municipal drinking supply derived from a surface water source (Lake Ontario). Although the site and surrounding properties are serviced, the Region of Durham typically requires that a door-to-door well survey be completed before the Region permits the adoption of non-potable standards. As a result, the more conservative potable standards will be selected;
- soil at the site has been classified as coarse-textured per the definitions of O. Reg. 153/04 based on the stratigraphy observed during borehole advancements as part of the Phase Two ESA work program.

Based on the above, full depth generic MECP Site Condition Standards corresponding to residential/parkland/institutional land use, coarse-textured soil, in a potable groundwater situation that are listed in Table 2 of the April 15, 2011 *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act* document have been selected for evaluating soil and groundwater laboratory analytical results.

3.0 BACKGROUND INFORMATION

3.1 PHYSICAL SETTING

3.1.1 WATER BODIES & AREAS OF NATURAL SIGNIFICANCE

The nearest identified/mapped watercourse is a creek located approximately 230 m southwest of the site, which is shown flowing to the south.

According to information obtained from the Ministry of Natural Resources and Forestry, the site is not located in an environmentally significant area, a Natural Heritage area, or parkland area, and no such lands are located in the general vicinity of the site.

3.1.2 TOPOGRAPHY & SURFACE WATER DRAINAGE

Previous review of topographic information during the previous Phase One ESA determined the general elevation of the Site to be approximately 87 to 90 m above mean sea level (amsl). This is consistent with the surveying of ground elevations at the installed monitoring wells at the site during the Phase Two ESA, which identified elevations ranging between 89.02 m amsl and 90.63 m amsl.

A review of the Topographic Map and OBM Map (based on a 1982 air photo) shows that the site and surrounding areas are developed for commercial and residential uses. Based on Google Earth on-line information cross referenced with the VuMap mapping application, the site is relatively flat with no significant grade difference. The general topography of the area is sloped to the south/southwest towards Frenchman's Bay.

Given the intervening distances between potential surface water receptors, storm waters from the site (other than what infiltrate into the ground) are likely captured by the municipal storm water sewer system.

3.2 PAST INVESTIGATIONS

Terrapex was provided with the following previous environmental reports by Altona for review as part of the scope of the current Phase One ESA.

- Phase I Environmental Site Assessment, 1294 Kingston Road and 1848-1852 Liverpool Road, Pickering, Ontario.
  Prepared by Pinchin Environmental Limited (Pinchin), dated August 23, 2017.

- Bearing Assessment and Preloading Requirement, Proposed Townhouse Development, Glenanna Road and Liverpool Road, City of Pickering.
  Prepared by Soil Engineers Ltd. (SEL), dated July 14, 2011.

The findings of the Phase I Environmental Site Assessment report by Pinchin are summarized below;

- Beneath the topsoil veneer the area of the subject site is underlain by surficial layers of fine sand and silty fine sand extending to depths of 0.8 to 1.5 m, which in turn overlie a complex stratigraphy consisting of soft to stiff, generally firm silty clay and firm to hard, generally hard silty clay till.

- Localized deposits of loose to compact, generally loose silty sand till; loose sandy silt and compact to very dense gravelly sand were found at various depths and locations.

- Sketchley Cleaners, a former on-Site tenant was located within the multi-unit commercial building at 1848 Liverpool Road from approximately 1990 until 1991. Based on the aforementioned information, and the short duration of operation, it is Pinchin's opinion that this former dry cleaner is unlikely to result in potential subsurface impacts at the Site.

- There is a potential for friable and non-friable asbestos-containing materials (ACMs) to be present in the Site Building at 1294 Kingston Road and the Site Building at 1852 Liverpool Road, and non-friable ACMs to be present in Site Building at 1848 Liverpool Road.

- Dry cleaners were observed at 1294 and 1298 Kingston Road. It is Pinchin's opinion that these off-site dry cleaning facilities are unlikely to result in potential subsurface impacts at the Site.

- A retail fuel outlet (RFO) is located at 1299 Kingston Road. It is Pinchin's opinion that the RFO and the associated USTs on this property are unlikely to result in potential subsurface impacts at the Site.

4.0 SCOPE OF INVESTIGATION

4.1 OVERVIEW OF SITE INVESTIGATION

The scope of Terrapex's assessment comprised the following:

- preparing a sampling and analysis plan which identified target sampling locations and associated rationale, a proposed laboratory analytical program, sample containers and preservation methods, and the number and type of Quality Control (QC) samples;
- advancing nine exterior boreholes to depths ranging between approximately 3.9 m and 16.8 m below grade using a truck-mounted CME 75 drill rig equipped with split spoon samplers. One interior borehole was completed with Manual Slide Hammer;
- collecting soil samples during drilling, and logging of visual, olfactory and tactile soil characteristics, and evidence of petroleum hydrocarbon or volatile organic compound impact;
- measuring combustible vapour (CV) and organic vapour (OV) concentrations in soil samples and monitoring wells;
- submitting selected soil samples for laboratory analyses;
- installing a groundwater monitoring well at seven borehole locations and one pair of deep-shallow cluster wells at two borehole locations;
- surveying the elevation of each of the newly installed wells relative to a recoverable local benchmark;
- monitoring groundwater conditions within each well;
- submitting groundwater samples for laboratory analyses from the installed monitoring wells;
- evaluating laboratory analytical results with respect to the selected Site Condition Standards; and,
- refining the existing Conceptual Site Model (developed during the Terrapex Phase One ESA work program) in light of the information collected during the Phase Two ESA activities.

The sampling and analysis plans are attached in Appendix II. The sampling procedures are documented in detail in Section 5.0.

4.2 MEDIA INVESTIGATED

Based on the findings of the Phase One ESA, the Phase Two ESA work program documented herein included investigation of the environmental quality of both soil and groundwater at the site. The environmental quality of sediment was not investigated as sediment is not present at the site.

Soil and groundwater were investigated by drilling boreholes, installing monitoring wells and groundwater sampling, as described above, and in Section 4.0.

4.3 PHASE ONE CONCEPTUAL SITE MODEL

The Phase One ESA Conceptual Site Model (CSM) showing the PCAs is presented on Figure 4. A summary of the CSM is provided below. Refer to Sections 7.2 and 7.3 for detailed information about APECs and PCAs identified within the Phase One Study Area.

Site Features: The Site is irregular in shape and has an area of approximately 0.91 ha. The Site is bounded by Liverpool Road to the east, residential properties to the north, a commercial plaza and residential properties to the west, and Kingston Road to the South.

The Site is comprised of a commercial plaza with one 2-storey commercial building located in the southern portion of the Site (1294 Kingston Road), one 1-storey commercial building located in the central portion of the Site (1848 Liverpool Road), and one 1-storey commercial building converted from a residential house, located in the northern portion of the Site (1852 Liverpool road). The Site is partially marked by a brick and steel fence to the south and east and a wooden fence to the north and west. The access to the Site is obtained from two entrances leading west from Liverpool Road. The Site is generally flat and slopes to the southwest towards Frenchman's Bay.

Geology/Hydrogeology: The Site is located in a physiographic region known as clay plains. The surficial geological mapping indicates that the Site is located in an area of massive to well laminated silt and clay, minor sand and gravel fine-textured glaciolacustrine deposits. Quaternary geology mapping indicates the Site is in an area of Till, predominantly undifferentiated, predominantly sand matrix, extremely stony, boulder and high in total matrix carbonated, often high in total matrix carbonate content of the Pleistocene era.

Bedrock geology in the area of the site comprises shale, limestone, dolostone, and siltstone of the Georgian Bay Formation.

The Site is located within Frenchman's Bay Subwatershed, which discharges into Lake Ontario. A creek is located approximately 230 m southwest of the Site. The creek flows to the south and discharges to Frenchman's Bay. The inferred direction of groundwater flow at the Site is anticipated to be to the southwest towards the creek.

Potentially Contaminating Activities (PCAs) / Areas of Potential Environmental Concern (APECs): A total of sixteen (16) PCAs are listed in section 7.2 relating to activities or incidents within the Phase One Study Area that were evaluated for their potential to contribute to an Area of Potential Environmental Concern (APEC).

Based on a detailed review of the available information relating to the PCAs, twelve (12) APECs resulting from six (6) on-Site and six (6) off-Site PCAs were identified on the Site. The APECs and associated PCAs are provided in the table titled Identified Areas of Potential Environmental Concern presented in Section 6.10.

Contaminants of Concern: The Contaminants of Potential Concern (COPCs) associated with the APECs are listed above in the table titled Identified Areas of Potential Environmental Concern presented in Section 6.10.

Migration Pathways: In general, potential preferential migration pathways for sub-surface contaminants at a Site comprise buried utilities, naturally occurring sand seams, or other subsurface areas of increased permeability. Therefore, sand seams and old service lines within the Site (if any) could act as potential migration pathways.

Uncertainty: The main uncertainty in the CSM is the lack of information regarding the operation of the former dry cleaners (depot versus on-site equipment), former on-Site Structures and the interior of the on-Site bank unit at 1848 Liverpool Road (National Bank).

4.4 DEVIATIONS FROM THE SAMPLING AND ANALYSIS PLAN

During the work program, additional soil samples were submitted for analysis of metals, hot water soluble boron (HWSB), pH, EC and SAR to achieve vertical delineation of identified HWSB, EC, pH, and SAR impacts.

MW2, MW3, MW4, and MW6 were screened at a water-bearing sand horizon of soil below the apparent water table, for the shared purpose of a concurrent hydrogeological study.

MW4A, MW7, MW8 were screened at the apparent water table based on field observations made during the drilling program (colour change of soil from brown to grey, generally indicative of waterlogged soil and a lack of air, producing anaerobic soil conditions), however, artesian pressure resulted in the static water table being higher than the apparent water table within the monitoring well.

The deviations from the Sampling and Analysis Plan listed above are not considered to have affected the conclusion of the report.

There were no other deviations from the sampling and analysis plan.

Copies of the sampling and analysis plan are provided in Appendix II.

4.5 IMPEDIMENTS

Access to and throughout the site was not impeded at any time during the Phase Two ESA work program. Underground services, such as water lines, private hydro and former utilities are present in some areas of the site.

5.0 INVESTIGATION METHOD

5.1 GENERAL

The locations of the boreholes were selected to assess potential impacts within the subsurface conditions across the site from historical site activities, for lateral delineation of identified soil impacts, and for site coverage.

On January 2 and 7, 2019, Terrapex advanced three boreholes (MW4, BH5, and MW6) at the Site. One single monitoring well was installed at Borehole MW5 and one pair of deep-shallow cluster wells were installed at MW4. The deep wells were installed to determine the groundwater level at the site and for use of the hydrogeological assessment.

On January 31, February 1, 7, 8 and 13, 2019, Terrapex advanced six exterior boreholes (MW1, MW2, MW3, MW7, MW8, and MW10), and one interior borehole (MW9). One single monitoring well was installed at each of Borehole MW1, MW3, MW7 through MW10, and one pair of deep-shallow cluster wells were installed at MW2. The deep wells were installed to determine the groundwater level at the site and for use of the hydrogeological assessment.

The approximate locations of the boreholes and monitoring wells are shown on Figure 2.

Prior to drilling at the site, local utility companies were contacted in order to obtain stake-outs and clearance with respect to buried services. A private locating company (On-Site Locates Inc.) was also retained to provide clearance with respect to buried services in the drill areas.

All intrusive sampling locations were greater than the required distance from all located underground utilities, and were therefore given clearance.

A site-specific health and safety plan (HASP) and a Daily Safe Work Permit were also prepared by Terrapex prior to commencing field work. All team members, including sub-contractors, read and signed the HASP before completing intrusive work at the site.

All methods used during the investigation were completed as per the proposed associated standard operating procedures (SOPs), except where explicitly noted within this report.

5.2 DRILLING

For this work program, borehole drilling and monitoring well installation services were provided by Pontil Drilling Inc. (Pontil) of Mount Albert, Ontario. Pontil is a MECP-licensed well drilling contractor.

The exterior boreholes were advanced using CME 75 rig equipped with a split spoon sampler and hollow stem augers. The interior borehole was advanced using Manual Slide Hammer

During drilling, soil samples were collected at regular depth intervals using a 50 mm nominal diameter split spoon. Boreholes were advance to at least the maximum anticipated depth of potential impact.

Measures to minimize potential cross-contamination or other potential bias are described in Terrapex's Standard Operating Procedures (Appendix III). There were no deviations from the Standard Operating Procedures regarding borehole drilling during this investigation.

5.3 SOIL

5.3.1 SOIL SAMPLING

During drilling, soil samples were collected at regular depth intervals using 50 mm nominal diameter split spoon. Each recovered sample was divided into two portions, with one portion placed in a clear sampling bag for field screening/logging, and the second portion placed in laboratory-supplied sampling containers for possible laboratory analyses. Combustible soil vapour (CSV) and organic vapour (OV) concentrations were measured in the headspace of each sampling bag using a dual sensor RKI Eagle 2 portable gas detector (RKI Eagle), equipped with a photo-ionization detector (PID) with a 10.6 eV lamp. Prior to use, the gas monitor was calibrated to *n*-hexane and operated in “methane elimination” mode and the PID was calibrated to isobutylene. Soil descriptions were recorded based on the Unified Soil Classification System (USCS).

To mitigate cross-contamination, split spoons were washed with a mixture of water and Alconox and rinsed between each use. Fresh nitrile gloves were donned for the handling of each sample.

Samples for analyses were placed in a cooler with ice packs and shipped under signed chain of custody to Maxxam for analysis.

Borehole and monitoring well locations are shown on Figure 2. Graphical borehole logs illustrating the stratigraphy encountered, chemical analysis samples and measured CSV and OV concentrations are included in Appendix IV.

5.3.2 FIELD SCREENING MEASUREMENTS

Organic vapour (OV) and combustible soil vapour (CSV) concentrations were measured in each soil sample using a Eagle equipped with PID. The PID can measure organic compounds to a nominal detection level of 0.1 parts per million by volume (ppm), with an accuracy of ±10%. The Eagle can measure organic compounds to a nominal detection level of 1 ppm and combustible compounds to a nominal detection level of 5 ppm, with an accuracy of ±5%.

The Eagle was calibrated according to the manufacturer's instructions and Terrapex Standard Operating Procedures before the field investigation.

“Worst-case” soil samples from each were selected on the basis of vapour screening, visual and olfactory evidence of contamination, and sample location in relation to potential point sources of impact.

OV concentrations measured on recovered samples from each borehole ranged from 0.0 ppm to 1.0 ppm. CSV concentrations were less than 10 ppm.

5.4 GROUNDWATER

5.4.1 MONITORING WELL INSTALLATION

Monitoring well installation services for this work program were provided by Pontil of Mount Albert, Ontario. The exterior boreholes were advanced using CME 75 equipped with hollow stem augers. The interior borehole was advanced using Manual Slide Hammer. Pontil was under contract with Terrapex and is MECP-licensed well drilling contractor.

Single monitoring wells were installed in seven of the boreholes (MW1, MW3, MW6, MW7, MW8, MW9, and MW10). Pair of deep-shallow cluster wells were installed in two of the boreholes (MW2 and MW4). Each of the monitoring wells were equipped with a 51 mm inside diameter schedule 40, PVC well pipe and #10 slot screen. The annulus of each well was backfilled with washed silica sand to a depth of approximately 0.3 to 0.5 m above the screened interval. A hydrated bentonite seal was placed above the sand pack to prevent infiltration of surface water into the monitoring wells. A protective casing, cemented in place, was installed on each well, flush with the ground surface.

Measures to minimize potential cross-contamination or other potential bias are described in Terrapex's Standard Operating Procedures (Appendix III).

MW2, MW3, MW4, and MW6 were screened at a water-bearing sand horizon of soil below the apparent water table, for the shared purpose of a concurrent hydrogeological study. There were no other deviations from the Sampling and Analysis Plans in installation of the monitoring wells.

Well installation details are provided within the borehole logs in Appendix IV.

5.4.2 MONITORING WELL DEVELOPMENT METHOD

All of the installed monitoring wells were developed prior to monitoring or sampling. Monitoring well MW3, MW4S, MW6, MW7, and MW8 were developed on February 15, 2019, and monitoring well MW1, MW2, MW2A, MW4, MW9 and MW10 were developed on February 22, 2019.

Prior to development, the wells were monitored to determine the depth to water and depth to the bottom of the well. The volume of water in the well and its annulus were calculated based on the depth measurements, diameter of the well standpipe and annulus, and assumed annulus porosity of 30%.

The wells were developed in order to remove entrained particulate in the well standpipe, well screen and filter pack as well as surrounding formation materials.

Development of each monitoring well was conducted with a dedicated inertial sampler comprising low density polyethylene (LDPE) tubing and a LDPE foot valve, with water being purged from the well until no visible particulate was observed in the recovered waters. The use of this technique resulted in the removal of between 25 L and 90 L from the monitoring wells.

5.4.3 FIELD MEASUREMENTS OF WATER QUALITY PARAMETERS

The water quality parameters temperature, pH, specific conductivity, dissolved oxygen (DO), and oxidation reduction potential (ORP), were measured during sampling and samples were obtained after the parameters had stabilized.

5.4.4 GROUNDWATER SAMPLING

Groundwater samples were recovered from monitoring wells MW2A, MW4A, MW7, MW8, MW9 and MW10 on March 1, 2019.

Prior to sampling, the depth to water in the wells was measured using a Solinst interface probe. The presence, and apparent thickness (if applicable), of any light non-aqueous phase liquids (LNAPL) in the well was also assessed using the interface probe.

To mitigate cross-contamination, the interface probe was washed with a liquid solution of Alconox detergent and rinsed with distilled water between each monitoring well. A fresh pair of nitrile gloves was donned at each well location.

Sampling of the wells was conducted using a “low-flow” peristaltic pump. Care was taken to avoid disturbance of the sediment layer within the wells in order to obtain particulate-free samples. Groundwater samples were collected directly into pre-cleaned, laboratory-supplied sampling bottles, packed in a cooler with ice, and shipped under signed chain of custody to Maxxam for laboratory analysis. Field filters were used prior to sample collection for various inorganic parameters.

5.5 SEDIMENT

Sediment sampling was not completed as sediment is not present at the site.

5.6 ANALYTICAL TESTING

Laboratory analytical services for this work program involving soil and groundwater media were provided by Maxxam Analytics Inc. (Maxxam) in Mississauga, Ontario under contract with Terrapex. Maxxam is accredited by Standards Council of Canada (SCC) to International Standard ISO/IEC 17025:2005, *General Requirements for the Competence of Testing and Calibration Laboratories*.

Soil and groundwater samples were analysed as per the sampling and analysis plans (refer to Appendix II) to address the identified Areas of Potential Environmental Concern from the previous Phase One ESA.

5.7 RESIDUE MANAGEMENT PROCEDURES

All waste generated during the work program (soil cuttings, purged groundwater, and equipment wash) were containerized in steel drums stored temporarily on the site for future management by the owner.

5.8 ELEVATION SURVEYING

The elevations of the top of the pipe and ground surface for each installed monitoring well were surveyed using a GNSS (Topcon). The GNSS survey was conducted by Terrapex on March 1, 2019. [Note: the benchmark elevation used by Terrapex]

5.9 QUALITY ASSURANCE AND QUALITY CONTROL MEASURES

Quality Assurance/Quality Control (QA/QC) measures were implemented during the Phase Two ESA in accordance with Terrapex Standard Operating Procedures. A summary of these measures follows.

During drilling, to mitigate cross-contamination, the split-spoon sampler was washed with a liquid solution of Alconox detergent and rinsed with distilled water between samples. Fresh nitrile gloves were donned for the handling of each sample.

During groundwater sampling, dedicated sampling equipment was used at each monitoring well location. To mitigate cross-contamination, the interface (water level) probe was washed with a liquid solution of Alconox detergent and rinsed with distilled water between each monitoring well. A fresh pair of nitrile gloves was donned at each well location.

Pre-cleaned groundwater sample containers for the specific parameters of interest were provided by the contract laboratory (Maxxam Analytics Inc.) and used at each borehole and monitoring well location for the collection of soil and groundwater samples. Samples for analyses were placed in an enclosed cooler with loose ice and shipped under signed chain of custody and custody seals to Maxxam for analysis.

Five “blind” field duplicates were submitted to the laboratory for chemical analysis for QA/QC purposes during Terrapex's work program:

- a duplicate of soil sample MW10-5 (identified as MW10-95) was submitted for analyses of BTEX, PHCs, and VOCs parameters;
- a duplicate of soil sample MW8-3 (identified as MW8-93) was submitted for analyses of metals and inorganics parameters;
- a duplicate of soil sample MW10-1 (identified as MW10-91) was submitted for analyses of OC Pesticides parameters;
- a duplicate of groundwater sample MW7 (identified as MW77) was submitted for analysis of BTEX, PHCs, and VOCs parameters during the March 1, 2019 sampling event;
- a duplicate of groundwater sample MW4A (identified as MW44) was submitted for analysis of metals and inorganic parameters during the March 1, 2019 sampling event;

One trip blank (identified as MW1000) was submitted for analysis as a QA/QC measure during the soil sampling activities. One trip blank sample (identified as TRIP BLANK) and one trip spike samples (identified as TRIP SPIKE) were also submitted for analyses as QA/QC measures during groundwater sampling activities. The samples were prepared by the laboratory, and the sampling containers remained within the bottle order package from the time of the delivery, sampling, and submission to the laboratory.

With the exception of samples prepared by the laboratory, the laboratory was not informed of the nature or number of the field QA/QC samples outlined above. Though the laboratory was not informed of the nature of the trip blank soil samples (MW1000 and MW2000), the absence of soil material within these samples would have alerted the laboratory to the nature and purpose of the samples.

Sample containers including specific preservation for soil and groundwater collection are included in Appendix II.

6.0 REVIEW AND EVALUATION

6.1 GEOLOGY

Quaternary geology mapping confirms the geologic setting of the site as being classified as Till, predominantly undifferentiated, predominantly sand matrix, extremely stony, boulder and high in total matrix carbonated, often high in total matrix, extremely stony, boulder and high in total matrix carbonated, often high in total matrix carbonate content of the Pleistocene era. The site is located in a physiographic region known as the Clay Plains.

Based on the VuMap mapping application, the elevation at the site is considered to be between approximately 87 m above mean sea level (mamsl) and 89 mamsl.

Based on the findings of the Phase Two ESA work program, the subsurface stratigraphy comprises sand and gravel fill underlain by clayey silt and sandy silt fill to depths between 0.7 m and 1.5 m below grade (mbg). It is likely these materials were placed on-site in order to facilitate paving and grading.

Native soils comprising silt and clay material with various amount of sand is present. It extends to depths ranging from approximately 3.5 mbg at Borehole MW4 to 8.5 mbg at Borehole MW2 and to the termination depths of Borehole MW8 through MW10. The silt and clay deposit is varved, yellow-brown in color with oxidized lenses at shallow depths, becoming grey at approximate depths ranging from 3 to 4 mbg. Grey to dark grey silty sand till is present below the silt and clay material in Boreholes MW1 through MW4, BH5, MW6 and MW7. The depths to the top of the till layer ranges from 3.5 mbg at Borehole MW4 to 8.5 mbg at Boreholes MW2. The till layer extends to depths about 14.5 to 15.5 mbg at Boreholes MW1, MW3, BH5, and MW7, to the termination depths of abouth 14.3 mbg at Borehoels MW2 and MW6, and 17.1 mbg at Borehole MW4. Grey shale bedrock underlies the till in Boreholes MW1, MNW3, MW4, and BH5; positioned below an approximate depth of about 16.0 mbg, corresponding to approximate elevations of about 72.0 to 73.1 masl.

Grey shale bedrock of the Georgian Bay Formation underlies the till in Boreholes MW1, MW3, MW4, and BH5; positioned below an approximate depth of about 16.0 mbg, corresponding to approximate elevation 72.0 to 73.1 mamsl.

Copies of the borehole logs are included in Appendix IV.

6.2 GROUNDWATER ELEVATIONS AND FLOW DIRECTION

Monitoring wells at the site were screened between:

Monitoring wells screen interval

Monitoring well ID	Depth to top of Screen (mbgs)	Depth to bottom of Screen (mbgs)
MW1	10.7	12.2
MW2	11.3	12.8
MW2A	2.2	5.2
MW3	9.2	12.2
MW4	10.7	12.2
MW4A	3.1	4.6
MW6	10.7	12.2
MW7	2.2	5.2
MW8	3.1	6.1
MW9	0.9	3.9
MW10	2.2	5.2

The monitoring wells were monitored on three separate monitoring events between February and March, 2019. The depth to groundwater was identified between 0.42 m below grade (MW9 on March 1, 2019) and 4.11 m below grade (MW6 on February 22, 2019).

The March 1, 2019 monitoring event indicated that the groundwater flow is generally towards the southwest. Interpreted groundwater elevation contours for the site are shown on Figure 6A and 6B.

LNAPL was not encountered during monitoring, purging, or sampling of the monitoring wells during this work program.

6.3 GROUNDWATER HYDRAULIC GRADIENTS AND CONDUCTIVITY

Calculated relative water table elevations indicated an average horizontal gradient in groundwater at the site of approximately 0.011 m/m towards the southwest

The hydraulic conductivity for the silty sand to silty clay was estimated to be between $1x10^{-6}$ and $3x10^{-6}$ m/s based on single well response testing (“slug” tests) conducted in MW1, MW6 and MW8 (Terrapex Hydrogeological Review, April 2019 (Draft)).

6.4 FINE-MEDIUM SOIL TEXTURE

On-site soils were conservatively determined to be coarse-textured per the definitions of O. Reg. 153/04. Therefore, the Site Condition Standards for coarse-textured soil were used when evaluating laboratory analytical results.

6.5 SOIL FIELD SCREENING

No visual evidence of impacted soil (staining) and/or elevated CSV concentrations were identified in any of the boreholes at the site. In addition, no evidence of poor quality fill materials (e.g., containing debris, wood, brick, concrete, and similar materials) was observed at any of the sampling locations.

The OV concentrations of recovered soil samples ranged between 0.0 ppm to 1.0 ppm and the CSV concentrations were less than 10 ppm.

6.6 SOIL QUALITY

Laboratory results for the soil samples submitted for analyses of:

- BTEX and PHCs;
- VOCs;
- PAHs;
- OC Pesticides
- metallic and inorganic parameters
- PCBs.

Results are summarized in Tables 2 through 7, respectively.

Concentrations of the following parameters, in excess of 2011 Table 2 Site Condition Standards were found to be present in soils:

<u>Other Regulated Parameters:</u>

- electrical conductivity (EC)
- sodium adsorption ratio (SAR)
- hot water soluble boron (HWSB)
- pH

As HWSB, pH, EC and SAR concentrations in excess of the SCS have been identified at the site, and are attributed to the poor quality of on-site fill material and application of de-icing salt on-site, as well as from Liverpool Road and Kingston Road, a Risk Assessment (or soil remediation) is required to be completed prior to filing an RSC.

Copies of the Laboratory Certificates of Analyses are attached in Appendix V. Summaries of the soil sampling are presented on Figures 7A through 7N (plan view), Figures 10A through 10I (cross-section A-A'), Figures 11A through 11I (cross-section B-B') and Figures 12A through 12I (cross-section C-C').

6.7 GROUNDWATER QUALITY

Laboratory results for the groundwater samples submitted for analyses of:

- BTEX and PHCs;
- VOCs; and,
- metallic and inorganic parameters

Results are summarized in Tables 8 through 10, respectively.

Concentrations of the following parameters, in excess of 2011 Table 2 Site Condition Standards were found to be present in groundwater:

Metals:

- barium

Other Regulated Parameters:

- sodium
- chloride

The exceedance of barium is likely attributed to the poor quality of the fill material. The exceedances of sodium and chloride are likely attributed to the application of de-icing salt on-site, as well as from Liverpool Road and Kingston Road. A Risk Assessment is required to be completed prior to filing an RSC.

Copies of the Laboratory Certificates of Analyses are attached in Appendix V. The summaries of the groundwater sampling are presented on Figures 8A through 8I (plan view), Figures 13A through 13I (cross-section A-A'), Figures 14A through 14I (cross-section B-B') and Figures 15A through 15I (cross-section C-C').

6.8 SEDIMENT QUALITY

The environmental quality of sediment was not investigated as sediment is not present at the site.

6.9 QUALITY ASSURANCE AND QUALITY CONTROL RESULTS

Maxxam's Quality Assurance/Quality Control (QA/QC) program consisted of the analysis of laboratory replicates, method and spiked blanks, process percent recoveries, matrix spikes, and surrogate percent recoveries, as appropriate for the particular analysis protocol.

QA/QC Control Limits: A review of the quality assurance reports attached to the laboratory certificates of analyses indicate that the laboratory QA/QC samples were within the quality control limits.

Lab Duplicate Samples: Acceptable correlation was observed between the laboratory duplicate and its corresponding sampling pair for each of the tested parameters.

Matrix Spike Recoveries: No issues regarding matrix spike recoveries were outlined in any of the laboratory certificates of analysis.

Detection Limits: There were no instances in the laboratory reports wherein the detection limits were adjusted. All detection limits were below the applicable SCS.

General Comments: There were no instances in the laboratory reports wherein the laboratory analysis protocol deviated from standard protocol.

Field Duplicate Samples: Field duplicate sample results are presented in the soil and groundwater analytical results tables. Acceptable correlation was observed between the duplicate sample and its corresponding sampling pair for each of the tested parameters, with the exception of:

- the RPD for arsenic in soil sample MW8-3 and MW8-93 for Maxxam job # B936015 was outside the acceptable limit (33% compared to an acceptable limit of 30%); and,
- the RPD for conductivity in soil sample MW8-3 and MW8-93 for Maxxam job # B936015 was outside the acceptable limit (127% compared to an acceptable limit of 10%); and,

The RPD exceedance in these samples was attributed to sample heterogeneity.

Trip Blank Samples: Trip blank samples were submitted for analysis of VOCs as part of the February 7, 2019 soil sampling and for analysis of VOCs as part of the March 1, 2019 groundwater sampling event. Analytical results from the trip blank samples were all less than the detection limit.

Trip Spike Sample: A trip spike sample was submitted for analysis of BTEX and VOCs as part of the March 1, 2019 groundwater sampling event. Acceptable recoveries of the target compounds were reported by the laboratory for the trip spike sample.

On the basis of the analysis summarized above, no concerns regarding the adequacy or representativeness of the sampling and analytical program were identified.

6.10 PHASE TWO CONCEPTUAL SITE MODEL

A preliminary conceptual site model was developed as part of the Phase One ESA. Following the completion of the Phase Two ESA field program, the conceptual site model was updated to present the current site characteristics and identify actual or potential sources of contamination, pathways, release mechanisms, receptors, and exposure routes.

Additional inputs to the conceptual site model include:

- Stratigraphy observed during the Phase Two ESA work program;
- Results of chemical testing for the current soil and groundwater conditions at the site; and,
- Groundwater levels and interpreted groundwater flow direction.

Site Overview: The Site comprises an approximately 0.91 ha parcel of a commercial plaza with one 2-storey commercial building located in the southern portion of the Site (1294 Kingston Road), one 1-storey commercial building located in the central portion of the Site (1848 Liverpool Road), and one 1-storey residential building used for commercial purpose, located in the northern portion of the Site (1852 Liverpool road). The Site is bounded by Liverpool Road to the east, residential properties to the north, a commercial plaza and residential properties to the west, and Kingston Road to the south. The access to the Site is obtained from two entrances leading west from Liverpool Road.

Based on information obtained from the Phase One ESA, it was determined that the first developed land use at the site was for commercial use as an inn prior to 1878, and then re-developed around 1980s as a commercial plaza.

The general site layout is shown on Figure 2. The Phase One study area, illustrating the site and surrounding land use, is shown on Figure 3.

Assessment Criteria: The generic MECP Site Condition Standards which are applicable to the proposed use of the site are those for residential/parkland/institutional property use, coarse-textured soil, in a non-potable groundwater situation (MECP Table 2 Site Condition Standards). The site is not environmentally sensitive per the definition of O. Reg. 153/04.

Potentially Contaminating Activity: During the Phase One ESA, 16 Potentially Contaminating Activities (PCAs) were identified within the Phase One Study Area. The approximate locations of the PCAs are shown on Figure 4 and are summarized in the table, below.

POTENTIALLY CONTAMINATING ACTIVIES IDENTIFIED WITHIN THE PHASE ONE STUDY AREA

PCA	LOCATION	DESCRIPTION	POTENTIALLY CONTAMINATING ACTIVITY (as set out in Column A of Table 2 in Schedule D of O. Reg. 153/04)	SOURCE	UNCERTAINTY	LIKELIHOOD TO AFFECT THE SITE
PCA 1	- On-Site Northern section of the Site	- Backfill of former structures - Unknown quality of fill material	- 30 – Importation of Fill Material of unknown Quality	- Aerial Photographs	- Quality of the fill material	- Possible
PCA 2	- On-Site Southern section of the Site	- Unknown previous heating system for the heritage building on Site	- 28 – Gasoline and Associated Products Storage in Fixed Tanks	- Site Reconnaissance - Aerial Photographs	- Previous heating system for the heritage building	- Possible
PCA 3	- On-Site Northern section of the Site	- A former dry cleaner was located at 1848 Liverpool Road, Pickering (on Site). It was reportedly a depot, however, this could not be confirmed.	- 37 – Operation of Dry Cleaning Equipment (where chemicals are used)	- Previous report - City directories	- It is unknown whether dry cleaning equipment was operated on site.	- Possible
PCA 4	- On-Site Northern section of the Site	- Records of pesticide register were found at 1848 Liverpool Road Pickering (on Site)	- 40 – Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications	- ERIS report	- Historical housekeeping practices are unknown	- Possible
PCA 5	- On-Site Eastern section of the Site	- One transformer was located adjacent to the south entrance of the commercial plaza	- 55 – Transformer Manufacturing, Processing and Use	- Site Reconnaissance	-	- Possible
PCA 6	- Off-Site Approximately 75 m northeast of the Site	- A dry cleaner was located at 1298 Kingston Road, Pickering	- 37 – Operation of Dry Cleaning Equipment (where chemicals are used)	- Site Reconnaissance	- Historical housekeeping practices are unknown	- Possible
PCA 7	- Off-Site Approximately 240 m northeast of the Site	- A dry cleaner was located at 1360 Kingston Road, Pickering	- 37 – Operation of Dry Cleaning Equipment (where chemicals are used)	- City directories	- Historical housekeeping practices are unknown	- Possible
PCA 8	- Off-Site Approximately 15 m west of the Site	- A dry cleaner was located at 1284 Kingston Road, Pickering	- 37 – Operation of Dry Cleaning Equipment (where chemicals are used)	- Site Reconnaissance	- It is unknown whether dry cleaning equipment was operated on site.	- Possible

PCA	LOCATION	DESCRIPTION	POTENTIALLY CONTAMINATING ACTIVITY (as set out in Column A of Table 2 in Schedule D of O. Reg. 153/04)	SOURCE	UNCERTAINTY	LIKELIHOOD TO AFFECT THE SITE
PCA 9	- Off-Site Approximately 35 m southeast of the Site	- Records of spill were found at the intersection of Liverpool Road and Kingston Road	- Not specifically defined (spill)	- ERIS report	- Details about the spill incidents	- Possible
PCA 10	- Off-Site Approximately 60 m south of the Site	- Records of ASTs were found at a gas station located at 1299 Kingston Road	- 28 – Gasoline and Associated Products Storage in Fixed Tanks	- ERIS report - Site Reconnaissance	- Historical housekeeping practices are unknown	- Possible
PCA 11	- On-Site Parking area and driveway	- De-icing activities	- Not specifically defined (de-icing activities)	- Site Reconnaissance - Aerial photographs	- Historical housekeeping practices are unknown	- Possible
PCA 12	- Off-Site Approximately 230 m northeast of the Site	- A record of transformer oil spill was found at 1331 Glenanna Road	- 55 – Transformer Manufacturing, Processing and Use	- ERIS report	- Spill amount	- Unlikely, given the distance
PCA 13	- Off-Site Approximately 130 m south of the Site	- A dry cleaner was located at 1794 Liverpool Road, Pickering	- 37 – Operation of Dry Cleaning Equipment (where chemicals are used)	- Site Reconnaissance	- Historical housekeeping practices are unknown	- Unlikely, given the distance and down-gradient location.
PCA 14	- Off-Site Approximately 210 m northwest of the Site	- A record of hydraulic oil spill was found at the intersection of Glenanna Road and Glendale Drive	- 28 – Gasoline and Associated Products Storage in Fixed Tanks	- ERIS report	-	- Unlikely, given the distance
PCA 15	- Off-Site Approximately 205 m south of the Site	- Records of ASTs , gasoline spill and waste generators were found at a gas station located at 1799 Liverpool Road	- 28 – Gasoline and Associated Products Storage in Fixed Tanks	- Site Reconnaissance - Aerial photographs - ERIS report	- Historical housekeeping practices are unknown	- Unlikely, given the distance and trans-gradient location.
PCA 16	- Off-Site Adjacent to the southeast boundary of the Site	- Gas and oil was served at the Old Liverpool House (Liverpool Arms Inn) in 1930s	- 28 – Gasoline and Associated Products Storage in Fixed Tanks	- Historical poster	- Locations of the fuel storage tanks	- Possible

Areas of Potential Environmental Concern: Twelve APECs were determined to be associated with the identified PCAs. Details regarding the sources of the APECs, their locations on the site, the contaminants of potential concern and the media which may be affected are provided below. The locations of the APECs are shown on Figure 5.

IDENTIFIED AREAS OF POTENTIAL ENVIRONMENTAL CONCERN

APEC	LOCATION OF APEC ON PHASE ONE PROPERTY	POTENTIALLY CONTAMINATING ACTIVITY (as set out in Column A of Table 2 in Schedule D of O. Reg. 153/04)	LOCATION OF PCA (On-Site or Off-Site)	CONTAMINANTS OF POTENTIAL CONCERN	MEDIA POTENTIALLY IMPACTED (Groundwater, Soil, and/or Sediment)
APEC 1	- Entire Site	- 30 – Importation of Fill Material of unknown Quality	- PCA 1 (On-Site)	- Metals - Hydride-forming metals - ORPs	- Soil
APEC 2	- Southern section of the Site	- 28 – Gasoline and Associated Products Storage in Fixed Tanks	- PCA 2 (On-Site)	- PHCs - VOCs	- Soil - Groundwater
APEC 3	- Northern section of the Site	- 37 – Operation of Dry Cleaning Equipment (where chemicals are used)	- PCA 3 (On-Site)	- VOCs	- Soil - Groundwater
APEC 4	- Northern section of the Site	- 40 – Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications	- PCA 4 (On-Site)	- OC Pesticides	- Soil
APEC 5	- Eastern section of the Site	- 55 – Transformer Manufacturing, Processing and Use	- PCA 5 (On-Site)	- PCBs	- Soil
APEC 6	- Northeastern section of the Site	- 37 – Operation of Dry Cleaning Equipment (where chemicals are used)	- PCA 6 (Off-Site)	- VOCs	- Groundwater
APEC 7	- Northeastern section of the Site	- 37 – Operation of Dry Cleaning Equipment (where chemicals are used)	- PCA 7 (Off-Site)	- VOCs	- Groundwater
APEC 8	- Southwestern section of the Site	- 37 – Operation of Dry Cleaning Equipment (where chemicals are used)	- PCA 8 (Off-Site)	- VOCs	- Groundwater
APEC 9	- Southern section of the Site	- Not specifically defined (spill)	- PCA 9 (Off-Site)	- PHCs - VOCs	- Groundwater
APEC 10	- Southern section of the Site	- 28 – Gasoline and Associated Products Storage in Fixed Tanks	- PCA 10 (Off-Site)	- PHCs - VOCs	- Groundwater
APEC 11	- Entire site	- De-icing activities	- PCA 11 (On-Site)	- EC and SAR	- Soil

APEC	LOCATION OF APEC ON PHASE ONE PROPERTY	POTENTIALLY CONTAMINATING ACTIVITY (as set out in Column A of Table 2 in Schedule D of O. Reg. 153/04)	LOCATION OF PCA (On-Site or Off-Site)	CONTAMINANTS OF POTENTIAL CONCERN	MEDIA POTENTIALLY IMPACTED (Groundwater, Soil, and/or Sediment)
APEC 12	- Southern section of the Site	- 28 – Gasoline and Associated Products Storage in Fixed Tanks	- PCA 16 (Off-Site)	- PHCs - VOCs	- Soil - Groundwater

OC Pesticide: *organochlorine pesticide*
PAHs: *polycyclic aromatic hydrocarbons*
PHCs: *Petroleum hydrocarbons*
VOCs *Volatile organic compounds*
ORPs: *other regulated parameters*
Soil: (cyanide (free), chromium VI, mercury, boron (hot water soluble), electrical conductivity, sodium adsorption ratio, pH)
Groundwater: chromium VI, mercury, sodium, chloride

Subsurface Structures and Utilities Affecting Contaminant Distribution and Transport:

In general, potential preferential migration pathways for sub-surface contaminants at a site comprise buried utilities, naturally occurring sand seams, or other subsurface areas of increased permeability. Therefore, sand seams and thick lens of silty sand material in the subsurface, as well as the utilities traversing the site and old service lines within the site (if any) could act as potential migration pathways.

Based off the topographic survey, as well as the public and private locates conducted prior to the intrusive investigations, utilities at the site comprise gas service on the west and north sides of the multi-unit commercial building (1848 Liverpool Road) leading towards Liverpool Road, hydro, electrical, and water service on the east side of the multi-unit commercial building (1848 Liverpool Road) leading towards Liverpool Road, hydro lines on the east side of the Old Liverpool House (1294 Kingston Road) leading towards the transformer adjacent to the south entrance of the Site, water service on the east side of the Old Liverpool House leading towards Liverpool Road, gas service on the west side of the Old Liverpool House leading towards the neighbouring property to the west, and electrical lines along the east and south boundaries of the Site. Catch basins were also observed within the parking area of the Site, presumably connected to storm sewers.

The Phase Two ESA findings suggest that such features may have been influencing the distribution/migration of contaminants at the site.

Physical Setting of the Phase Two Property:

Stratigraphy

Quaternary geology mapping indicates the Site is in an area of Till, predominantly undifferentiated, predominantly sand matrix, extremely stony, boulder and high in total matrix carbonated, often high in total matrix carbonate content of the Pleistocene era.

Bedrock geology in the area of the site comprises shale, limestone, dolostone, and siltstone of the Georgian Bay Formation, Blue Mountain Formation, Billings Formation, Collingwood Member, and Eastview Member.

Based on VuMap OBM Contours, the surface elevation of the Site ranges between approximately 87 m above mean sea level (amsl) and 89 m amsl, sloping to the southwest. The surveyed ground elevations of the monitoring wells installed at the site range from 89.02 m to 90.63 m above sea level (masl).

Based on the findings of the Phase Two ESA work program, the subsurface stratigraphy comprises sand and gravel fill underlain by clayey silt and sandy silt fill to depths between 0.7 m and 1.5 m below grade (mbg). It is likely these materials were placed on-site in order to facilitate paving and grading.

Native soils comprising silt and clay material with various amount of sand is present. It extends to depths ranging from approximately 3.5 mbg at Borehole MW4 to 8.5 mbg at Borehole MW2 and to the termination depths of Borehole MW8 through MW10. The silt and clay deposit is varved, yellow-brown in color with oxidized lenses at shallow depths, becoming grey at approximate depths ranging from 3 to 4 mbg. Grey to dark grey silty sand till is present below the silt and clay material in Boreholes MW1 through MW4, BH5, MW6 and MW7. The depths to the top of the till layer ranges from 3.5 mbg at Borehole MW4 to 8.5 mbg at Boreholes MW2. The till layer extends to depths about 14.5 to 15.5 mbg at Boreholes MW1, MW3, BH5, and MW7, to the termination depths of abouth 14.3 mbg at Borehoels MW2 and MW6, and 17.1 mbg at Borehole MW4. Grey shale bedrock underlies the till in Boreholes MW1, MNW3, MW4, and BH5; positioned below an approximate depth of about 16.0 mbg, corresponding to approximate elevations of about 72.0 to 73.1 masl.

The cross sections of the site showing the site stratigraphy are shown on Figures 10A through 10I (cross-section A-A'), Figures 11A through 11I (cross-section B-B') and Figures 12A through 12I (cross-section C-C').

Hydrogeology

The nearest identified/mapped watercourse is a creek located approximately 230 m southwest of the site.

Monitoring wells screen interval

Monitoring well ID	Depth to top of Screen (mbgs)	Depth to top of Screen (mbgs)
MW1	9.3	12.4
MW2	10.0	13.0
MW2A	2.1	5.1

Monitoring well ID	Depth to top of Screen (mbgs)	Depth to top of Screen (mbgs)
MW3	7.8	10.9
MW4	8.2	11.2
MW4A	3.0	4.5
MW6	9.4	12.4
MW7	2.1	5.1
MW8	3.0	6.1
MW9	0.9	4.0
MW10	2.2	5.3

The monitoring wells were monitored on three separate monitoring events between February and March, 2019. The depth to groundwater was identified between 0.42 m below grade (MW9 on March 1, 2019) and 4.11 m below grade (MW6 on February 22, 2019).

The March 1, 2019 monitoring event indicated that the groundwater flow is generally towards the southwest. Interpreted groundwater elevation contours for the site are shown on Figure 6.

The elevations of the top of the pipe and ground surface for each installed monitoring well were surveyed, with reference to a local geodedic benchmark (Pickering Benchmark NO.1-059), located on the south side of Glenanna Road, approximately 60 m east of Storrington Street, having an elevation of 84.110 m above mean sea level. The survey was conducted by Terrapex on March 1, 2019.

LNAPL was not encountered during monitoring, purging, or sampling of the monitoring wells during this work program.

Calculated relative water table elevations indicated an average horizontal gradient in groundwater at the site of approximately 0.011 m/m towards the southwest

The hydraulic conductivity for the silty sand to silty clay was estimated to be between $1x10^{-6}$ and $3x10^{-6}$ m/s based on single well response testing (“slug” tests) conducted in MW1, MW6 and MW8 (Terrapex Hydrogeological Review, April 2019 (Draft)).

Applicability of Section 41 or 43.1 of O. Reg. 153/04

O. Reg. 153/04 describes conditions, which when present, can constitute an “environmentally sensitive site”. They include the presence of areas of natural significance (such as wetlands, provincial parks, nature reserves and valuable animal habitats) within 30 m of the site, and sites where soil pH lies outside the range of 5 to 9.

The Phase Two site does not contain any areas of natural significance, nor are there any within 30 m of site. The pH of the soil is between 5 to 9, with exception of soil sample MW1-1, potentially due to the poor quality of fill material at the sampling location. With the remediation of this area, the site would not display any conditions of an environmentally sensitive site.

O. Reg. 153/04 also specifies SCS for properties that have more than one-third of the area with less than 2 m of soil. Overburden depths at the site were greater than 2 m for the entire site.

O. Reg. 153/04 also specifies SCS for properties where there is a water body within 30 m of the site. There is no water body within 30 m of the site.

As a result of the above, Sections 41 and 43.1 of O. Reg. 153/04 are not considered to apply to this site and the applicable full-depth generic Site Condition Standards may be used in the submission of a Record of Site Condition for the site.

Fill Areas

Soil brought from another property to the site (fill materials) has been encountered over the entirety of the site, ranging in thickness between approximately 0.7 m to 1.5 m below ground surface. Fill materials are believed to have been imported to the site for general site grading purposes.

No soil was imported to the property as part of the Phase Two ESA, therefore testing of imported soil in accordance with Section 32 of the Regulation was not required.

Proposed Structures

The Site is currently developed with a 2-storey commercial building located in the southern portion of the Site (1294 Kingston Road), one 1-storey commercial building located in the central portion of the Site (1848 Liverpool Road), and one 1-storey residential building used for commercial purpose, located in the northern portion of the Site (1852 Liverpool road). The site is considered to be commercial property use per the definitions of O. Reg. 153/04.

According to the latest building scheme shown in the zoning set drawings, dated May16, 2019, prepared by the project architect, Kirkor Architects + Planners (Kirkor), the Old Liverpool House (1294 Kingston Road) will be moved approximately 10 m towards the southern property line and all other existing structures at the site will be demolished to make way for a new mixed-use commercial and residential complex that consists of a mixed use development that incorporates a 25-storey tower, a 12-storey midrise building, and a row of 3-storey townhouses. The proposed future use of the site is considered to be residential and commercial property use per the definitions of O. Reg. 153/04.

Contamination:

Areas of Contamination

The Phase Two investigative scope was designed to provide full site coverage using boreholes and groundwater monitoring wells. Phase Two ESA sampling locations in relation to the APECs are shown on Figure 5.

As summarized in the table below, the sampling programs described above have adequately investigated all contaminants of potential concern within each APEC at the site.

SUMMARY OF SAMPLING LOCATIONS

APEC	MEDIA POTENTIALLY IMPACTED	CONTAMINANTS OF POTENTIAL CONCERN	SAMPLING LOCATIONS
APEC 1	Soil	Metals	MW1, MW2, MW3, MW4, MW6, MW10
		Hydride-forming metals	MW1, MW2, MW3, MW4, MW6, MW10
		ORPs	MW1, MW2, MW3, MW4, MW6, MW10
APEC 2	Soil	VOCs	MW9
		PHCs	MW9
	Groundwater	VOCs	MW9
		PHCs	MW9
APEC 3	Soil	VOCs	MW10
	Groundwater	VOCs	MW10
APEC 4	Soil	OC Pesticides	MW10
APEC 5	Soil	PCBs	GS-1
APEC 6	Groundwater	VOCs	MW2, MW4
APEC 7	Groundwater	VOCs	MW2, MW4
APEC 8	Groundwater	VOCs	MW8
APEC 9	Groundwater	PHCs	MW7
		VOCs	MW7
APEC 10	Groundwater	PHCs	MW7
		VOCs	MW7
APEC 11	Soil	EC, SAR	MW1, MW2, MW3, MW4, BH5, MW6, MW7, MW8, MW10
APEC 12	Soil	VOCs	MW7
		PHCs	MW7
	Groundwater	VOCs	MW7
		PHCs	MW7

Identification of COCs in Soil

Concentrations of the following parameters, in excess of 2011 Table 2 Site Condition Standards were found to be present in soils:

Other Regulated Parameters:

- electrical conductivity (EC)
- sodium adsorption ratio (SAR)
- hot water soluble boron (HWSB)
- pH

As contaminant concentrations in excess of the SCS have been identified at the site, and are attributed to the poor quality of on-site fill material (HWSB and pH) and application of de-icing salt on-site, as well as from Liverpool Road and Kingston Road (EC, SAR), a Risk Assessment (or remediation) is required to be completed prior to filing an RSC.

Summaries of the soil sampling are presented on Figures 7A through 7I (plan view), Figures 10A through 10I (cross-section A-A'), Figures 11A through 11I (cross-section B-B') and Figures 12A through 12I (cross-section C-C').

Identification of COCs in Groundwater

Concentrations of analysed parameters in groundwater, in excess of the 2011 Table 2 Site Condition Standards were found to be present at the site:

Metals:

- barium

Other Regulated Parameters:

- sodium
- chloride

The exceedances are likely attributed to the poor quality of the fill material (barium) and the application of de-icing salt on-site, as well as from Liverpool Road and Kingston Road (sodium, chloride). A Risk Assessment is required to be completed prior to filing an RSC.

The summary of the groundwater sampling is presented on Figures 8A through 8I (plan view), Figures 13A through 13I (cross-section A-A'), Figures 14A through 14I (cross-section B-B') and Figures 15A through 15I (cross-section C-C').

Media of Concern

Based on the findings of the previous Phase One ESA by Terrapex, the Phase Two ESA work program documented herein included investigation of the environmental quality of soil and groundwater at the site. The environmental quality of sediment was not investigated as sediment is not present at the site.

Details of Contaminated Areas

Other than HWSB, EC, SAR, and pH in soil and barium, sodium, and chloride in groundwater, all analysed parameters in soil and groundwater were less than the 2011 Table 2 Site Condition Standards in all samples submitted for laboratory analysis.

Origin, Extent and Distribution of Contaminants

The identified elevated concentrations of EC and SAR in soil and sodium and chloride in groundwater are considered to be related to the application of de-icing salt on-site, and the adjacent municipal roads (Kingston Road and Liverpool Road). The identified elevated concentrations of HWSB and pH in soil and barium in groundwater are considered to be related to the poor quality of fill material on-site. Therefore, a Risk Assessment is required prior to filing an RSC.

Other than HWSB, pH, EC and SAR in soil and barium, sodium, and chloride in groundwater, all analysed parameters in soil and groundwater were less than the 2011 Table 2 Site Condition Standards in all samples submitted for laboratory analysis.

Migration of Contaminants

During periods of salt application to ground surfaces, melt waters (arising from the application of salt and resulting from springtime warming) would be expected to provide a transport mechanism for salt to move vertically in the subsurface, increasing the vertical extent of EC and SAR in soils and sodium and chloride in groundwater.

Climatic or Meteorological Impacts on Contaminant Migration

Slight fluctuations in water table elevation have undoubtedly occurred over time due to climatic or meteorological changes. As such, it is possible that these fluctuations may have impacted migration of HWSB, pH, EC, SAR, barium, sodium, and chloride, at the site.

Vapour Intrusion of Contaminants Into Buildings

As HWSB, pH, EC, SAR, barium, sodium and chloride are effectively non-volatile, no concerns with respect to soil vapour intrusion into current or future buildings are anticipated.

Risk Analysis:

Risk assessment, in the context of properties potentially impacted by contaminants, is the process of estimating the likelihood of undesirable effects on human and ecological health resulting from exposure to chemical contaminants. Three components must be present for risks to human or ecological health to exist at sites impacted by contaminants:

- the contaminant must be present at concentrations sufficient to cause a possible adverse effect;
- a receptor (human or ecological) must be present; and,
- there must be a complete exposure pathway by which the receptor can come into contact with the contaminant.

Human and ecological conceptual exposure models have been developed for the site by considering the potential receptors, contaminant release and transport mechanisms, and exposure pathways. The Phase Two human health conceptual exposure model is illustrated in Figure 16, and the Phase Two ecological conceptual exposure model is illustrated in Figure 17.

7.0 CONCLUSIONS

The Phase Two ESA investigation of the site, as documented in this report, identified concentrations of the other regulated parameters HWSB, pH, EC and SAR in soil, and the metal barium and other regulated parameters chloride, and sodium in groundwater, in excess of the generic MECP Table 2 Site Condition Standards. Therefore, a Risk Assessment is required prior to filing a Record of Site Condition.

Sediment is not present at the site, and therefore contaminants of concern are not present within sediment.

7.1 SIGNATURES

The environmental assessment described herein was conducted in accordance with the terms of reference for this project, agreed upon by Altona Group and Terrapex Environmental Ltd. The Phase Two Environmental Site Assessment of the property located at 1294 Kingston Road, 1848 and 1852 Liverpool Roads, Pickering, Ontario was conducted in accordance with O. Reg. 153/04 by, or under the supervision of, a Qualified Person as required by the regulation.

Terrapex Environmental Ltd. has exercised due care, diligence, and judgement in the performance of this Phase Two ESA; however, studies of this nature have inherent limitations. The reported information is believed to provide a reasonable representation of the general environmental conditions at the site at the time the assessment was conducted. However, the data were collected at discrete locations and conditions may vary at other locations or with the passage of time. The assessment was also limited to a study of those chemical parameters specifically addressed in this report. In addition, our comments, conclusions, and recommendations are based in part on the observations and data documented by third parties. By necessity, except where explicitly noted, we have relied upon the accuracy and completeness of information presented by said third parties, regardless of any disclaimers regarding reliance provided in the documentation subjected to peer review. Terrapex Environmental Ltd. does not assume any responsibility for errors, omissions, or other limitations pertaining to third party work programs.

This report has been prepared for the sole use Altona Group. Terrapex Environmental Ltd. accepts no liability for claims arising from the use of this report, or from actions taken or decisions made as a result of this report, by parties other than Altona Group.

Chaoran Li, P.Geo.
Project Manager

Steven Ruminsky, P.Eng.
QP_{ESA} as per O.Reg 153/04
Senior Reviewer

LICENCED PROFESSIONAL ENGINEER
17 May '19
S. T. RUMINSKY
PROVINCE OF ONTARIO

8.0 REFERENCES

City of Pickering, Official Plan, Zoning By-law 7553/17;

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Sharpe, D.R., 1980. *Quaternary Geology of Toronto and Surrounding Area; Ontario Geological Survey, Map P.2204, scale 1:100,000*.

Environmental Reports

Terrapex Environmental Ltd. (Terrapex), 2019. *Phase One Environmental Site Assessment, 1294 Kingston Road, 1848 and 1852 Liverpool Roads, Toronto, Ontario*. Report to Altona Group, March 28, 2019 (DRAFT).

FIGURES

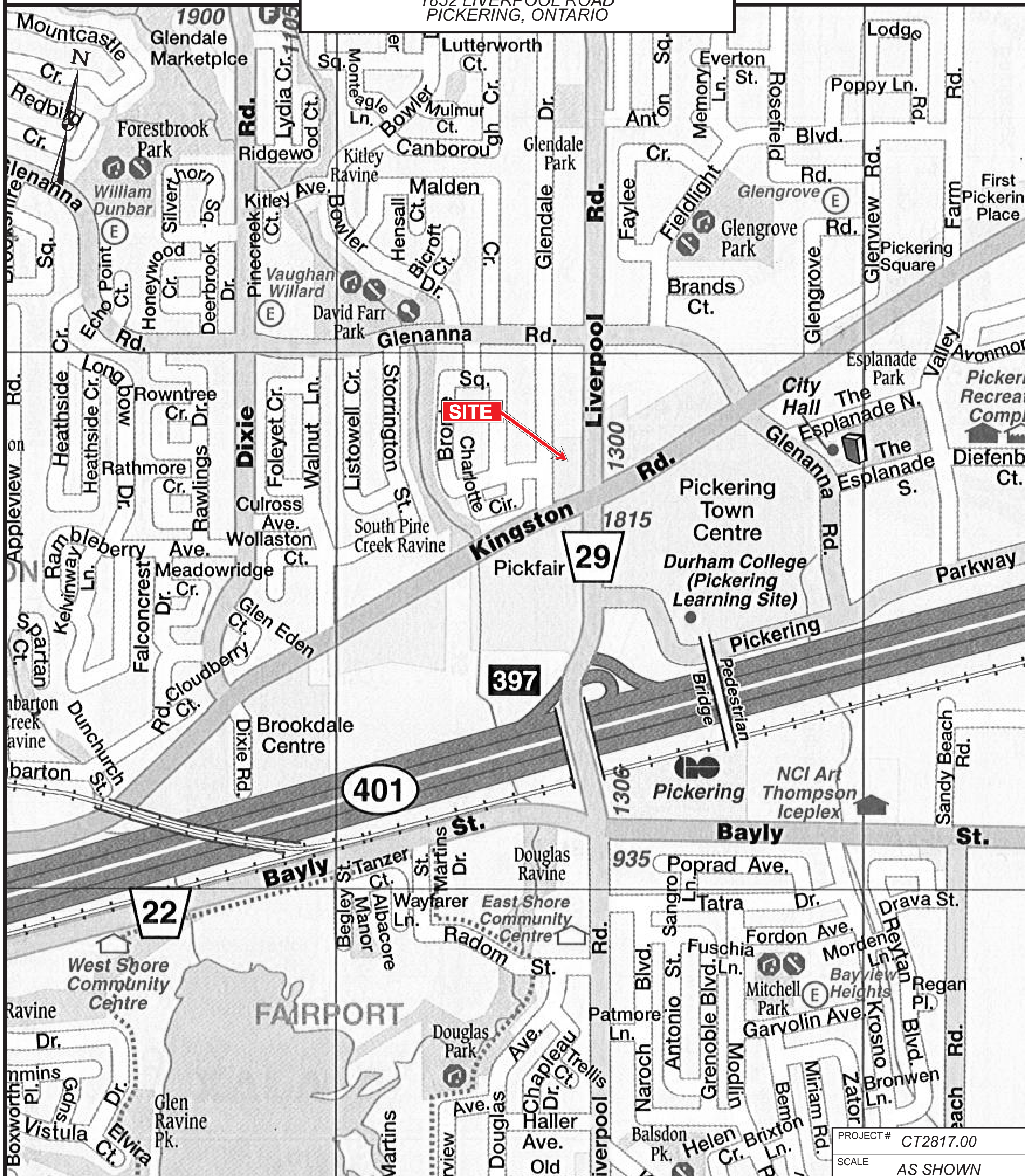
TERRAPEX

SITE LOCATION

1294 KINGSTON ROAD, 1848 AND
1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP



0 300m 600m
(APPROXIMATE)

SOURCE: CCCMAPS, THE GOLDEN HORSESHOE, 2015 EDITION, PAGES 111.

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	FEBRUARY 2019
DRAWN	SK
CHECKED	CL
DRAWING #	FIGURE 1

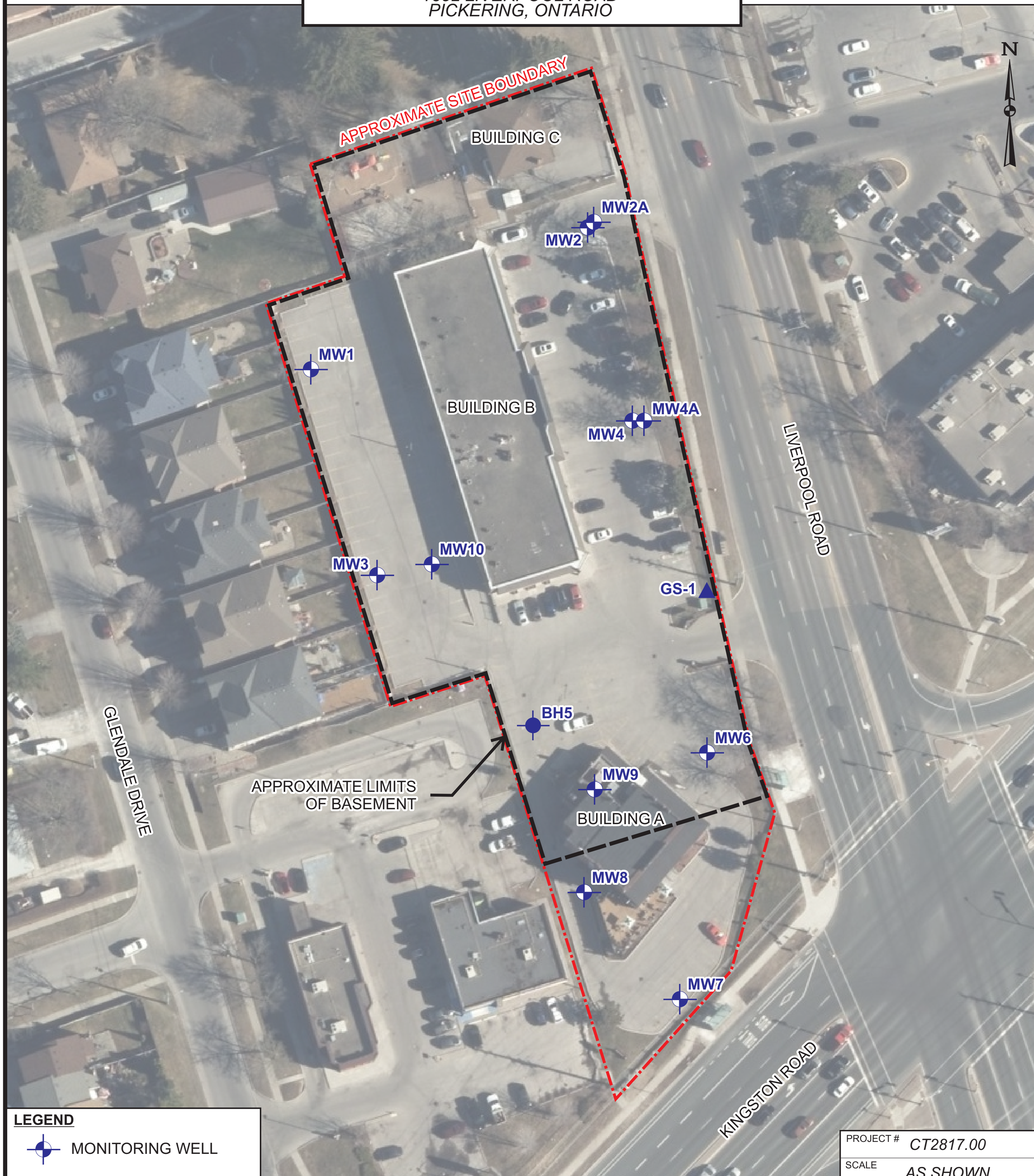
TERRAPEX

GENERAL SITE LAYOUT

1294 KINGSTON ROAD, 1848 AND
1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP



LEGEND

- MONITORING WELL
- BOREHOLE
- SOIL SAMPLE LOCATION
- APPROXIMATE LIMITS OF BASEMENT

0 25m 50m

(APPROXIMATE)

SOURCE: VUMAP, FIRST BASE SOLUTIONS, 2018 IMAGERY.

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	APRIL 2019
DRAWN SF	CHECKED STR
DRAWING #	FIGURE 2

TERRAPEX

PHASE ONE STUDY AREA

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP

0 100m 200m
(APPROXIMATE)

SOURCE: VUMAP FIRST BASE SOLUTIONS, 2018 IMAGERY.

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	FEBRUARY 2019
DRAWN SK	CHECKED CL
DRAWING #	FIGURE 3

TERRAPEX

CONCEPTUAL SITE MODEL - PCAs

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP

LEGEND

● POTENTIALLY CONTAMINATING ACTIVITIES (PCA)

NOTE: PCA LOCATIONS SHOWN ARE FOR ILLUSTRATION PURPOSES, THESE ARE APPROXIMATE LOCATIONS AND DO NOT REPRESENT AREA OF STORAGE / OPERATIONS.

0 100m 200m

(APPROXIMATE)

SOURCE: VUMAP FIRST BASE SOLUTIONS, 2018 IMAGERY.

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	FEBRUARY 2019
DRAWN SK	CHECKED CL
DRAWING #	FIGURE 4

PHASE ONE CONCEPTUAL SITE MODEL - APECs

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

TERRAPEX

CLIENT: ALTONA GROUP

LEGEND

AREA OF POTENTIAL ENVIRONMENTAL CONCERN (APEC)

0 30m 60m
(APPROXIMATE)

SOURCE: VUMAP FIRST BASE SOLUTIONS, 2018 IMAGERY.

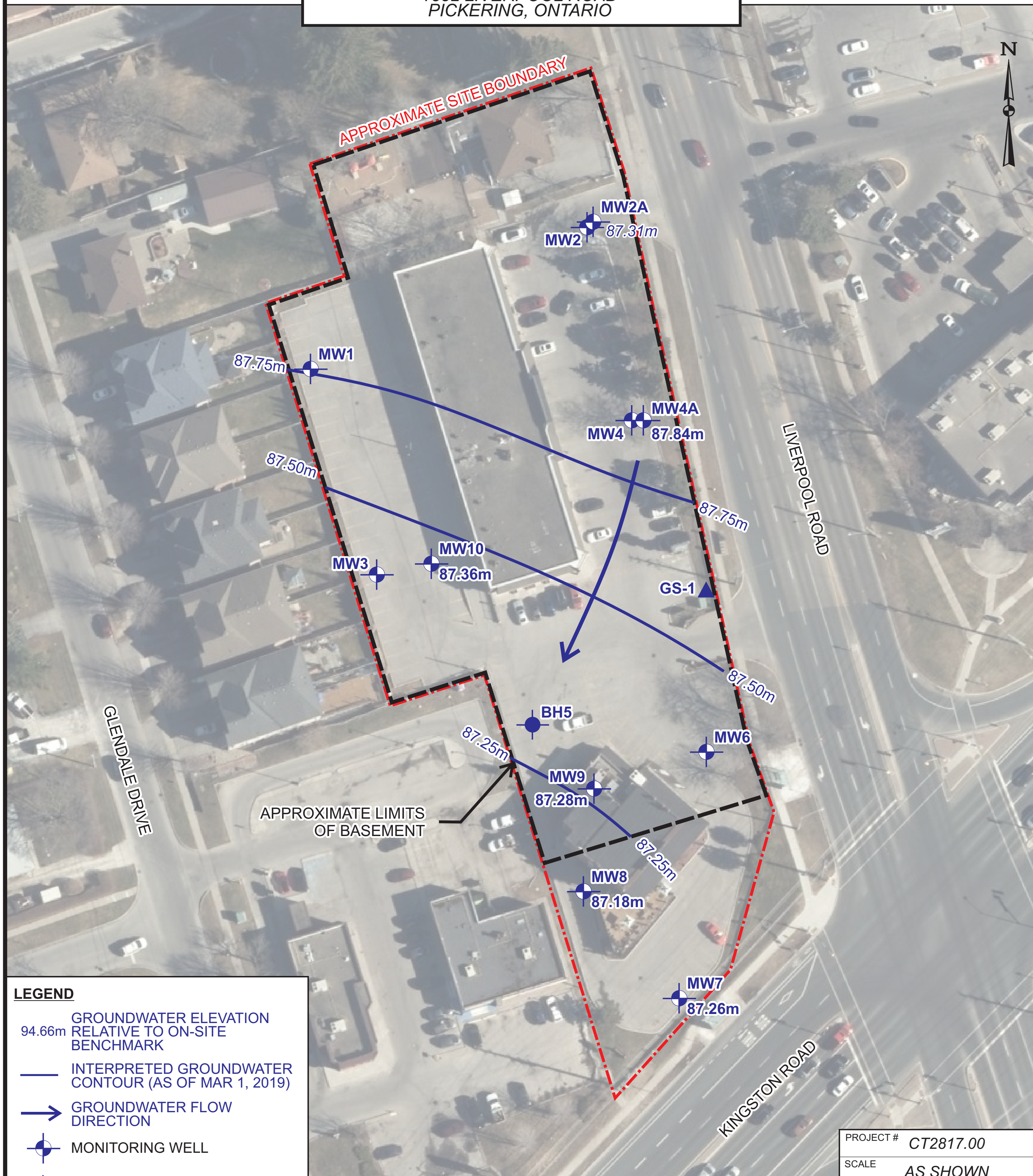
PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	FEBRUARY 2019
DRAWN	SK
CHECKED	CL
DRAWING #	FIGURE 5

TERRAPEX

INTERPRETED SHALLOW GROUNDWATER FLOW (AS OF MARCH 1, 2019)

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT
ALTONA GROUP



LEGEND

- 94.66m GROUNDWATER ELEVATION RELATIVE TO ON-SITE BENCHMARK
- INTERPRETED GROUNDWATER CONTOUR (AS OF MAR 1, 2019)
- GROUNDWATER FLOW DIRECTION
- MONITORING WELL
- BOREHOLE
- SOIL SAMPLE LOCATION
- APPROXIMATE LIMITS OF BASEMENT

0 25m 50m
(APPROXIMATE)

NOTE: MW2A WAS NOT USED IN THE INTERPRETATION.
SOURCE: VUMAP, FIRST BASE SOLUTIONS, 2018 IMAGERY.

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	APRIL 2019
DRAWN SF	CHECKED STR
DRAWING #	FIGURE 6A

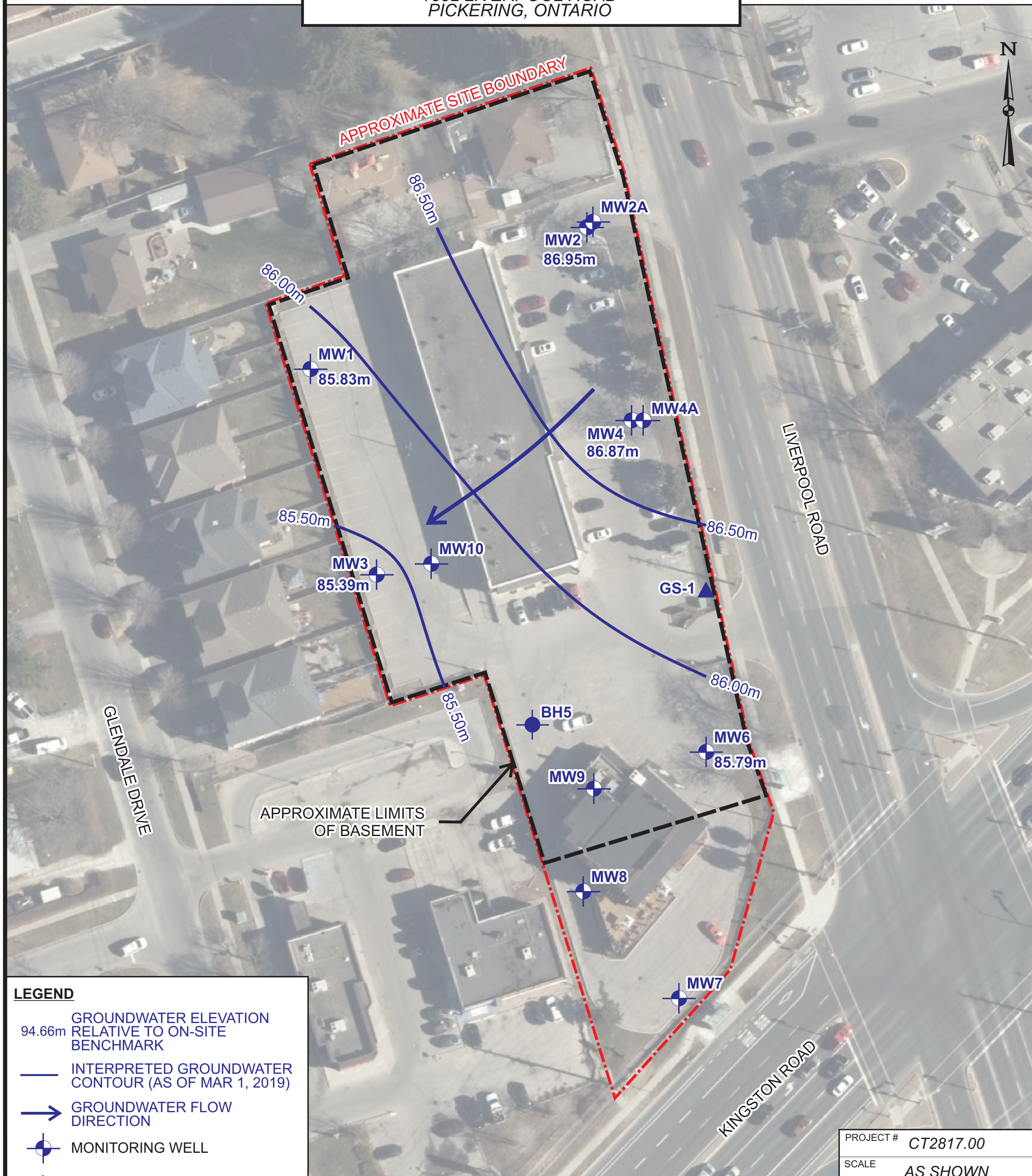
TERRAPEX

INTERPRETED DEEP GROUNDWATER FLOW (AS OF MARCH 1, 2019)

1294 KINGSTON ROAD, 1848 AND
1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP



LEGEND

94.66m GROUNDWATER ELEVATION RELATIVE TO ON-SITE BENCHMARK

INTERPRETED GROUNDWATER CONTOUR (AS OF MAR 1, 2019)

GROUNDWATER FLOW DIRECTION

MONITORING WELL

BOREHOLE

SOIL SAMPLE LOCATION

APPROXIMATE LIMITS OF BASEMENT

0 25m 50m
(APPROXIMATE)

SOURCE: VUMAP, FIRST BASE SOLUTIONS, 2018 IMAGERY.

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	APRIL 2019
DRAWN SF	CHECKED STR
DRAWING #	FIGURE 6B

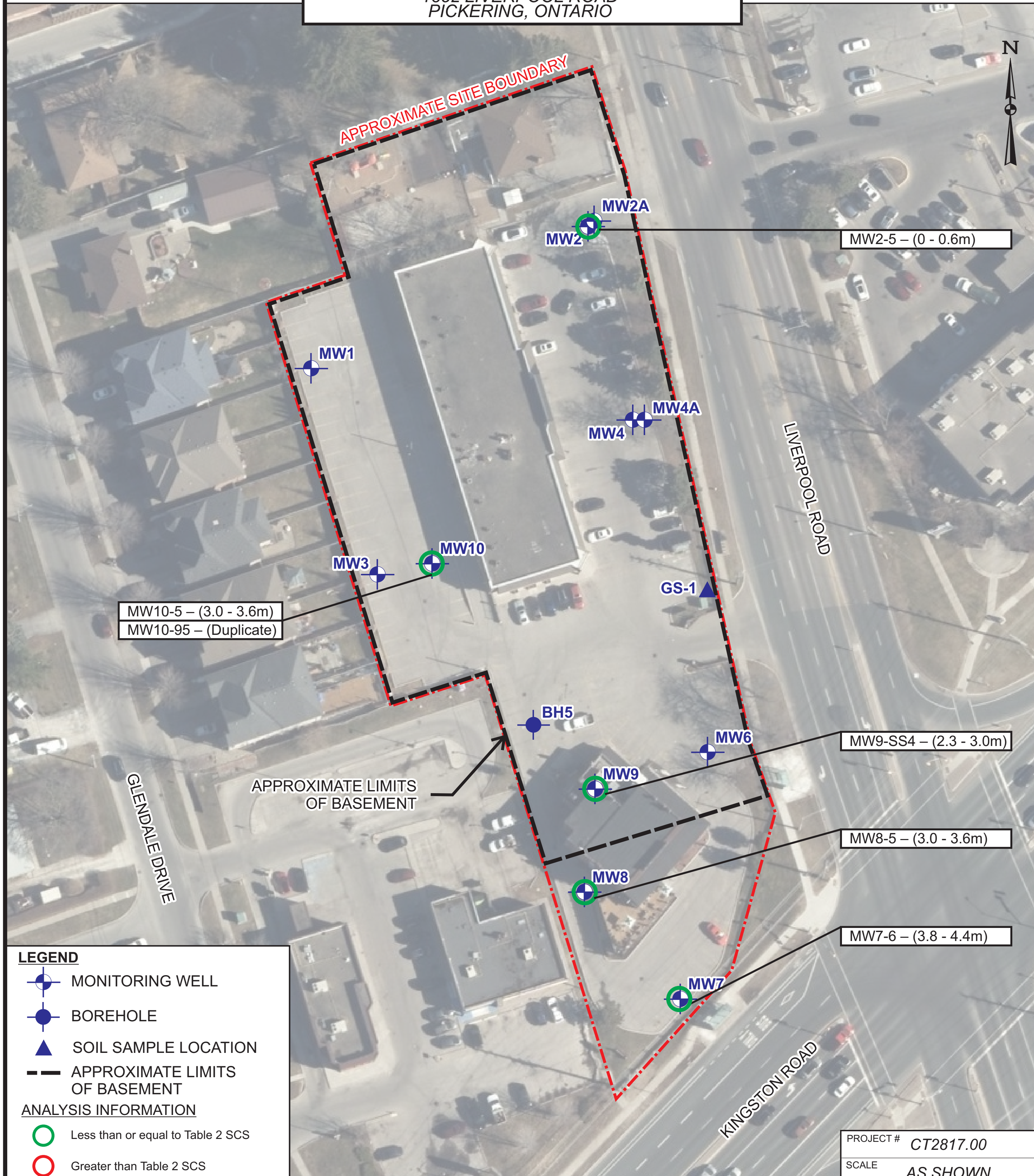
TERRAPEX

SOIL ANALYTICAL RESULTS - PHCs

1294 KINGSTON ROAD, 1848 AND
1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP



LEGEND

- MONITORING WELL
- BOREHOLE
- SOIL SAMPLE LOCATION
- APPROXIMATE LIMITS OF BASEMENT

ANALYSIS INFORMATION

- Less than or equal to Table 2 SCS
- Greater than Table 2 SCS

Sample I.D. — Sample depth

MW103-4 – (depth)

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; Residential / Parkland / Institutional land use, coarse textured soil

0 25m 50m

(APPROXIMATE)

SOURCE: VUMAP, FIRST BASE SOLUTIONS, 2018 IMAGERY.

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN SF	CHECKED STR
DRAWING #	FIGURE 7A

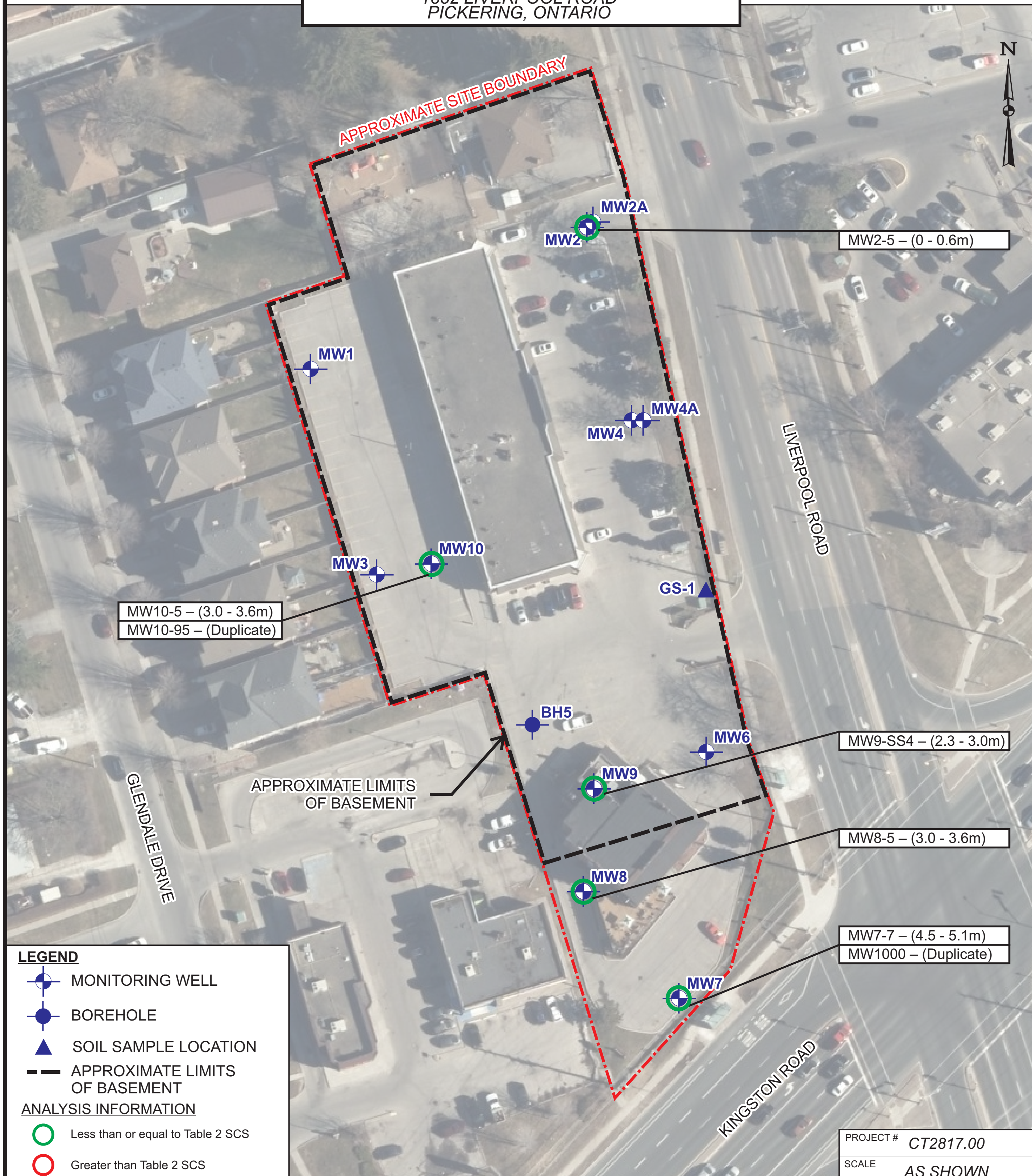
TERRAPEX

SOIL ANALYTICAL RESULTS - VOCs

1294 KINGSTON ROAD, 1848 AND
1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP



LEGEND

MONITORING WELL

BOREHOLE

SOIL SAMPLE LOCATION

APPROXIMATE LIMITS OF BASEMENT

ANALYSIS INFORMATION

Less than or equal to Table 2 SCS

Greater than Table 2 SCS

Sample I.D. — Sample depth

MW103-4 – (depth)

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; Residential / Parkland / Institutional land use, coarse textured soil

0 25m 50m

(APPROXIMATE)

SOURCE: VUMAP, FIRST BASE SOLUTIONS, 2018 IMAGERY.

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN SF	CHECKED STR
DRAWING #	FIGURE 7B

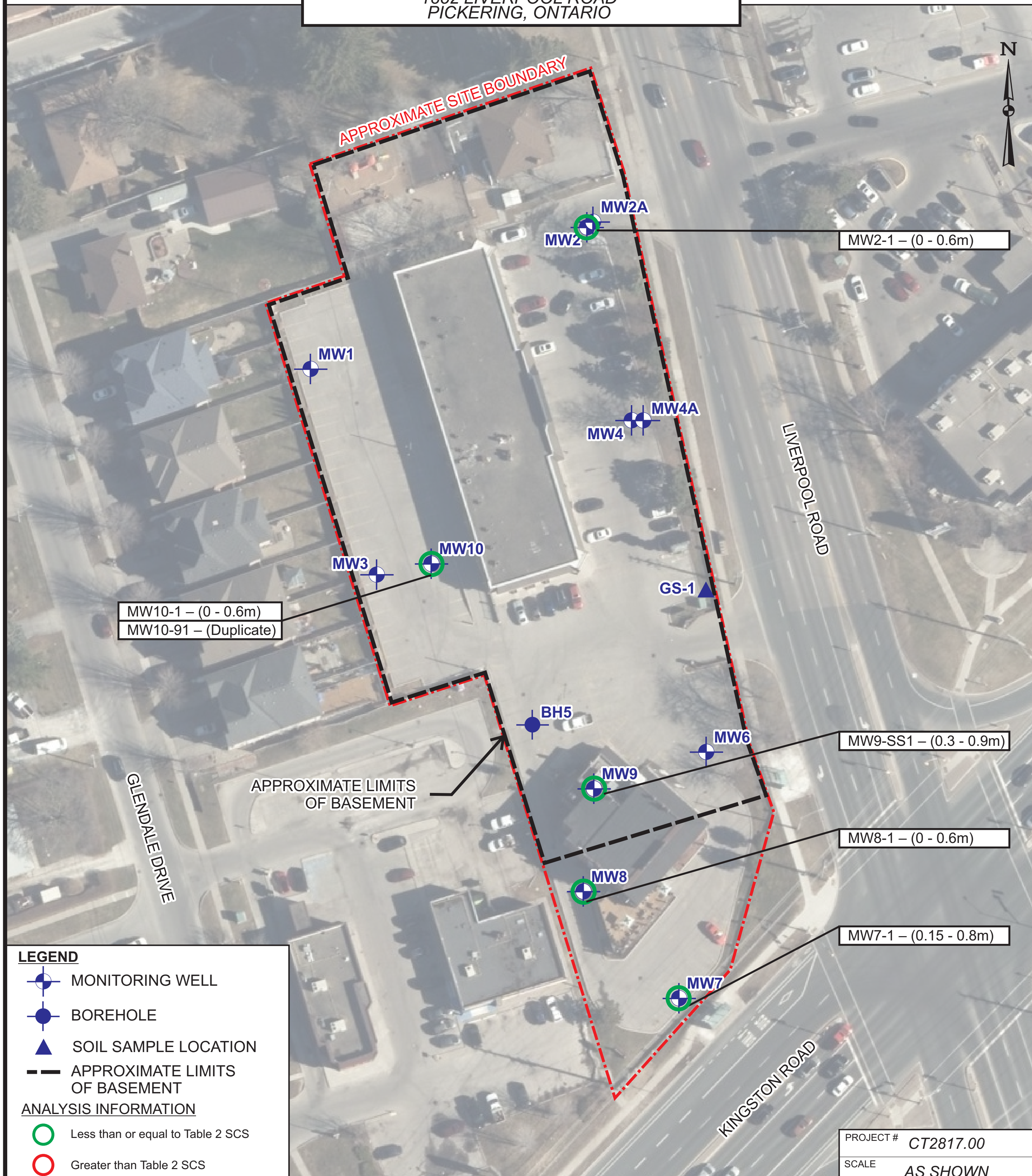
TERRAPEX

SOIL ANALYTICAL RESULTS - PAHs

1294 KINGSTON ROAD, 1848 AND
1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP



LEGEND

- MONITORING WELL
- BOREHOLE
- SOIL SAMPLE LOCATION
- APPROXIMATE LIMITS OF BASEMENT

ANALYSIS INFORMATION

- Less than or equal to Table 2 SCS
- Greater than Table 2 SCS

Sample I.D. — Sample depth

MW103-4 – (depth)

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; Residential / Parkland / Institutional land use, coarse textured soil

0 25m 50m

(APPROXIMATE)

SOURCE: VUMAP, FIRST BASE SOLUTIONS, 2018 IMAGERY.

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN SF	CHECKED STR
DRAWING #	FIGURE 7C

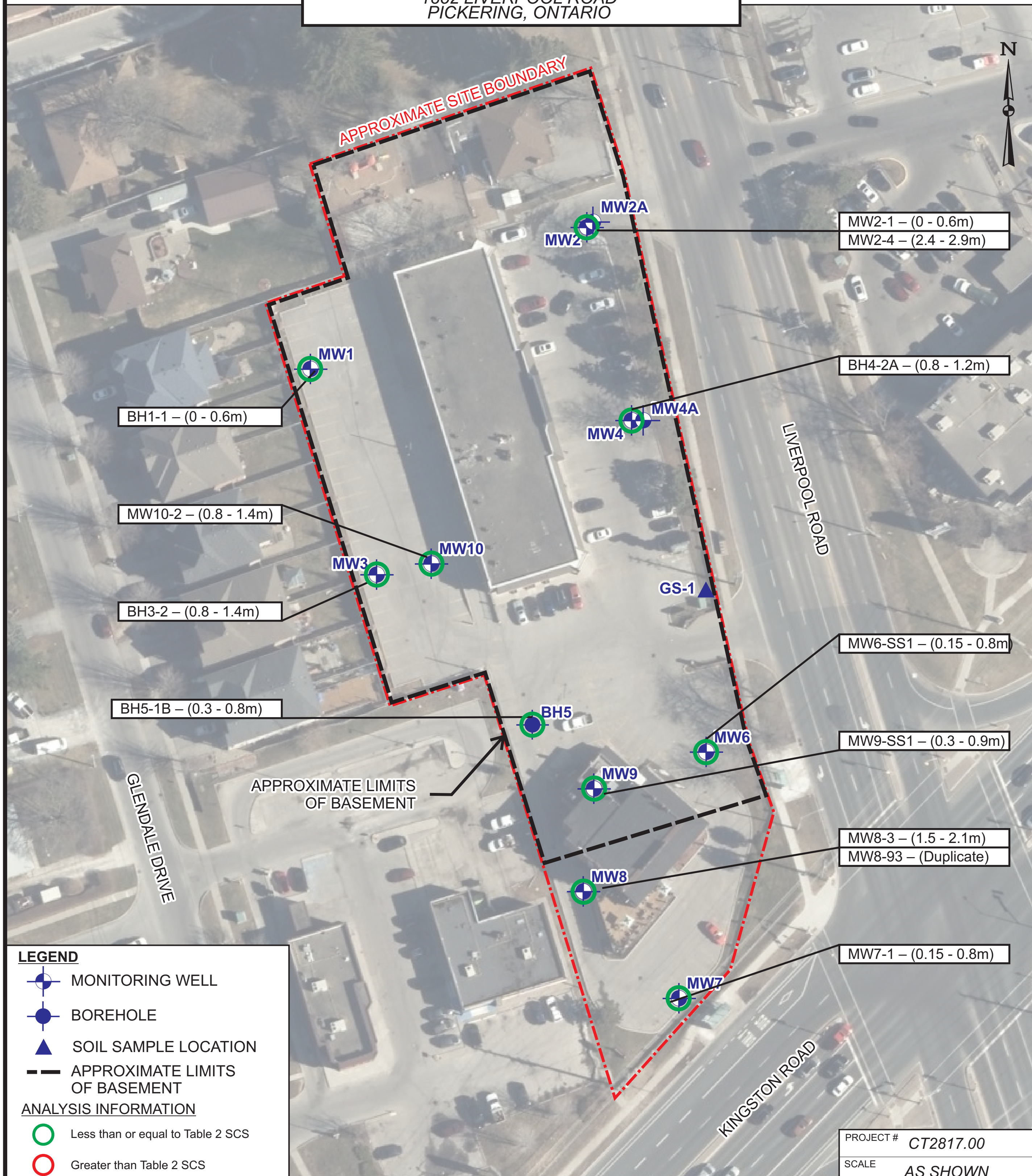
TERRAPEX

SOIL ANALYTICAL RESULTS - METALS

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP



LEGEND

- MONITORING WELL
- BOREHOLE
- SOIL SAMPLE LOCATION
- APPROXIMATE LIMITS OF BASEMENT

ANALYSIS INFORMATION

- Less than or equal to Table 2 SCS
- Greater than Table 2 SCS

Sample I.D. — Sample depth

MW103-4 – (depth)

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; Residential / Parkland / Institutional land use, coarse textured soil

0 25m 50m

(APPROXIMATE)

SOURCE: VUMAP, FIRST BASE SOLUTIONS, 2018 IMAGERY.

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN SF	CHECKED STR
DRAWING #	FIGURE 7D

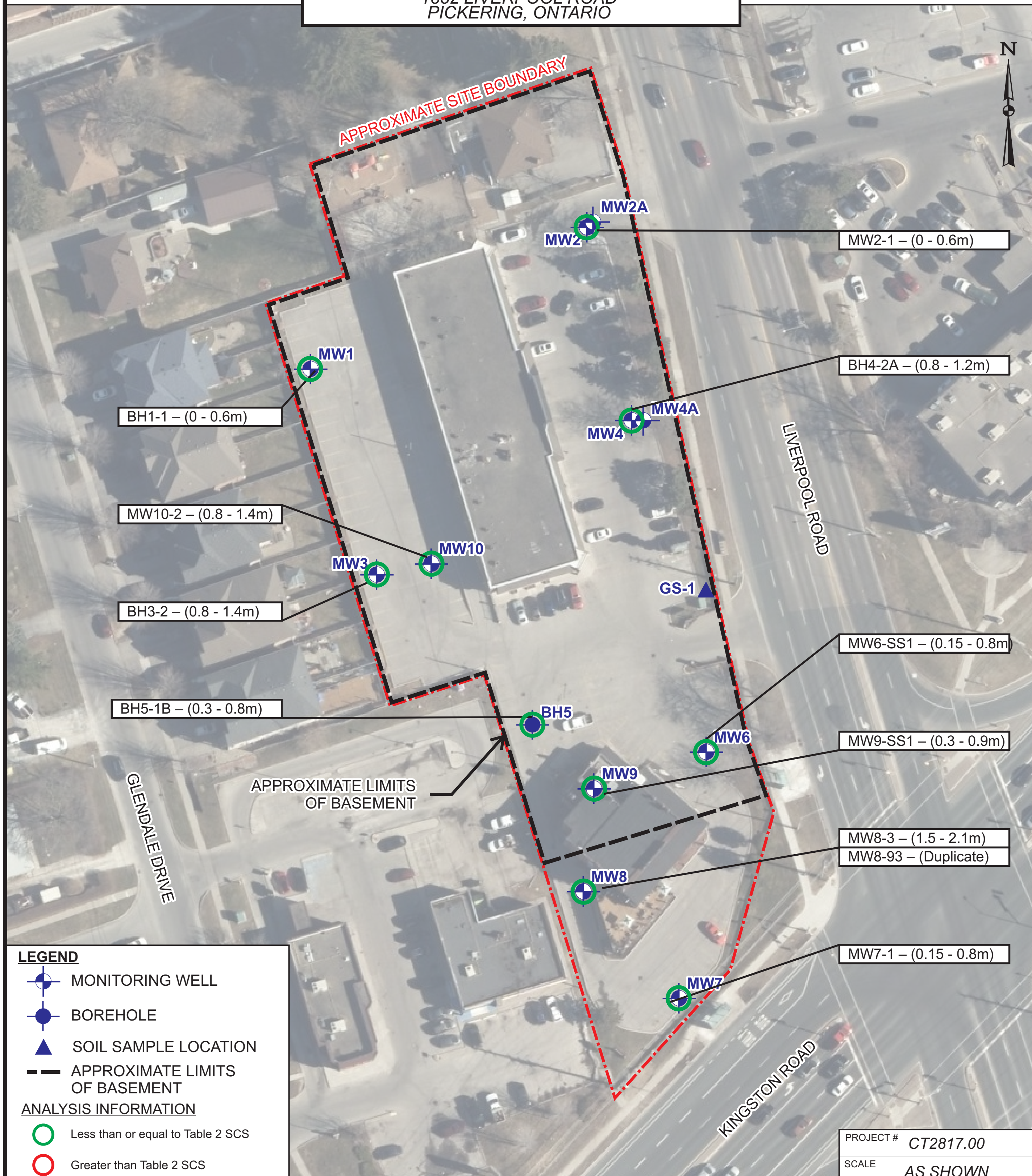
TERRAPEX

SOIL ANALYTICAL RESULTS - HYDRIDE-FORMING METALS

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP



LEGEND

- MONITORING WELL
- BOREHOLE
- SOIL SAMPLE LOCATION
- APPROXIMATE LIMITS OF BASEMENT

ANALYSIS INFORMATION

- Less than or equal to Table 2 SCS
- Greater than Table 2 SCS

Sample I.D. — Sample depth
MW103-4 – (depth)

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; Residential / Parkland / Institutional land use, coarse textured soil

0 25m 50m
(APPROXIMATE)

SOURCE: VUMAP, FIRST BASE SOLUTIONS, 2018 IMAGERY.

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN SF	CHECKED STR
DRAWING #	FIGURE 7E

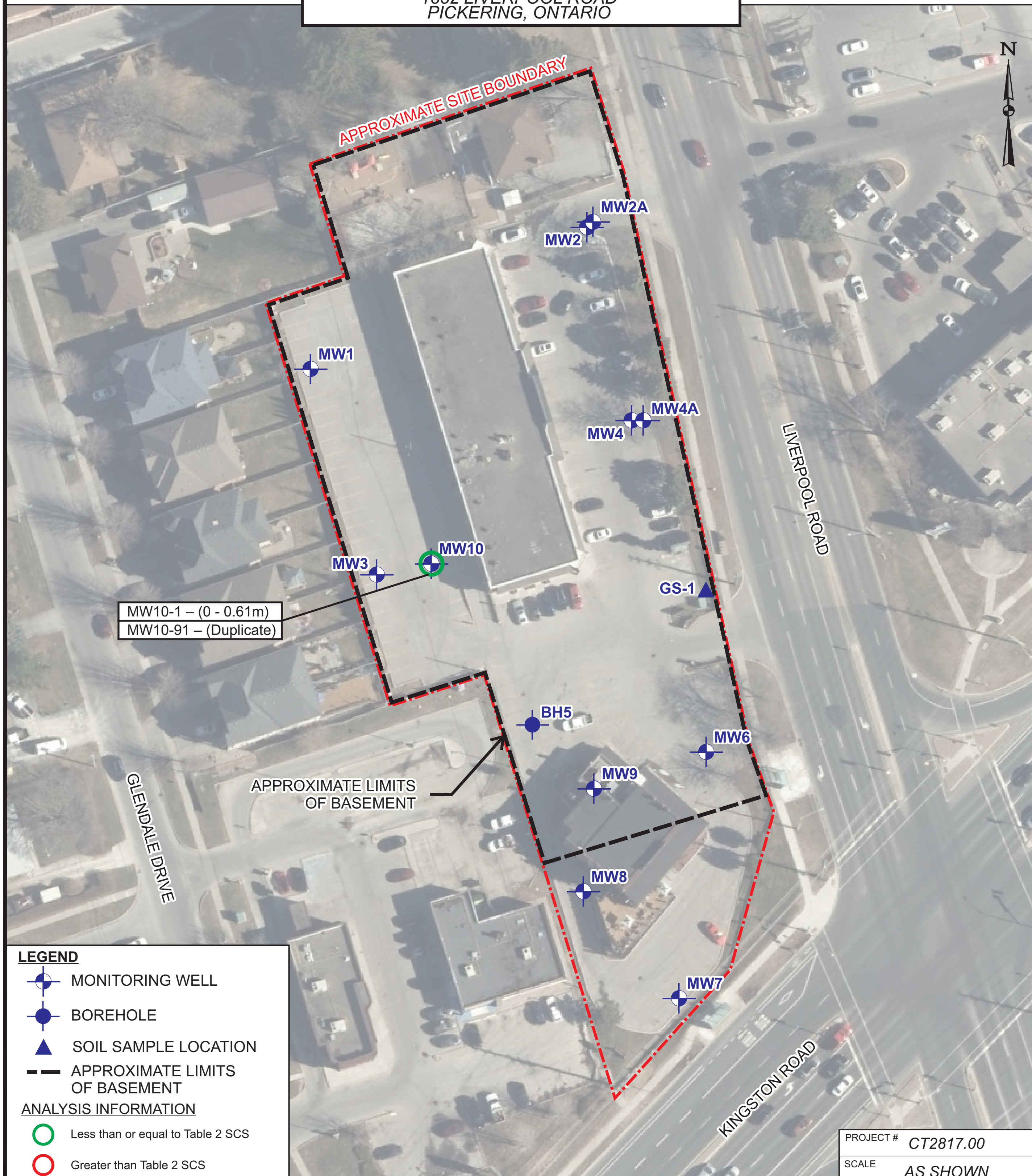
TERRAPEX

SOIL ANALYTICAL RESULTS - OC PESTICIDES

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP



LEGEND

- MONITORING WELL
- BOREHOLE
- SOIL SAMPLE LOCATION
- APPROXIMATE LIMITS OF BASEMENT

ANALYSIS INFORMATION

- Less than or equal to Table 2 SCS
- Greater than Table 2 SCS

Sample I.D. — Sample depth

MW103-4 – (depth)

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; Residential / Parkland / Institutional land use, coarse textured soil

0 25m 50m

(APPROXIMATE)

SOURCE: VUMAP, FIRST BASE SOLUTIONS, 2018 IMAGERY.

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN SF	CHECKED STR
DRAWING #	FIGURE 7F

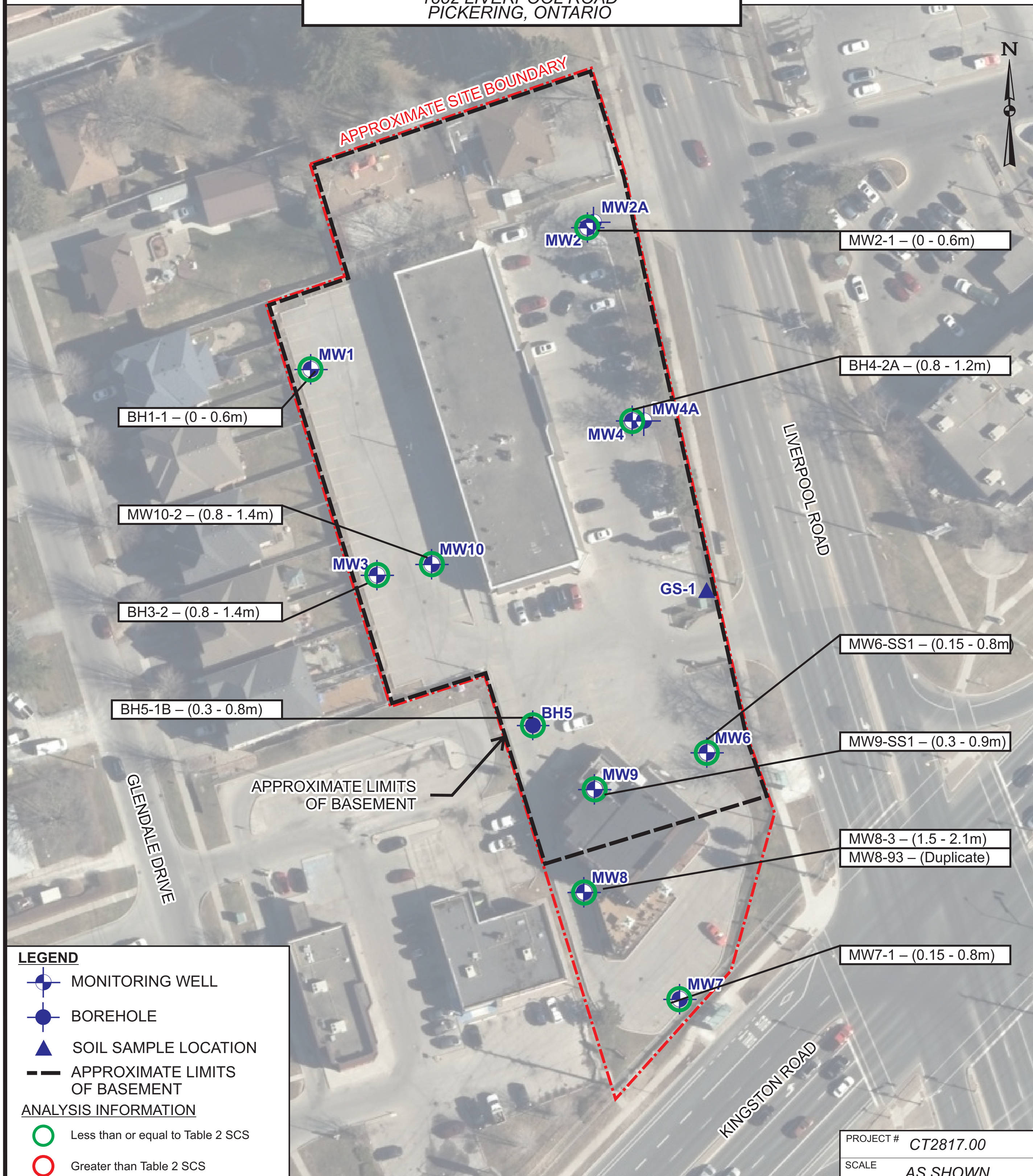
SOIL ANALYTICAL RESULTS - CYANIDE (CN-)

1294 KINGSTON ROAD, 1848 AND
1852 LIVERPOOL ROAD
PICKERING, ONTARIO

TERRAPEX

CLIENT

ALTONA GROUP



LEGEND

- MONITORING WELL
- BOREHOLE
- SOIL SAMPLE LOCATION
- APPROXIMATE LIMITS OF BASEMENT

ANALYSIS INFORMATION

- Less than or equal to Table 2 SCS
- Greater than Table 2 SCS

Sample I.D. — Sample depth

MW103-4 – (depth)

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; Residential / Parkland / Institutional land use, coarse textured soil

0 25m 50m

(APPROXIMATE)

SOURCE: VUMAP, FIRST BASE SOLUTIONS, 2018 IMAGERY.

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN	SF
CHECKED	STR
DRAWING #	FIGURE 7G

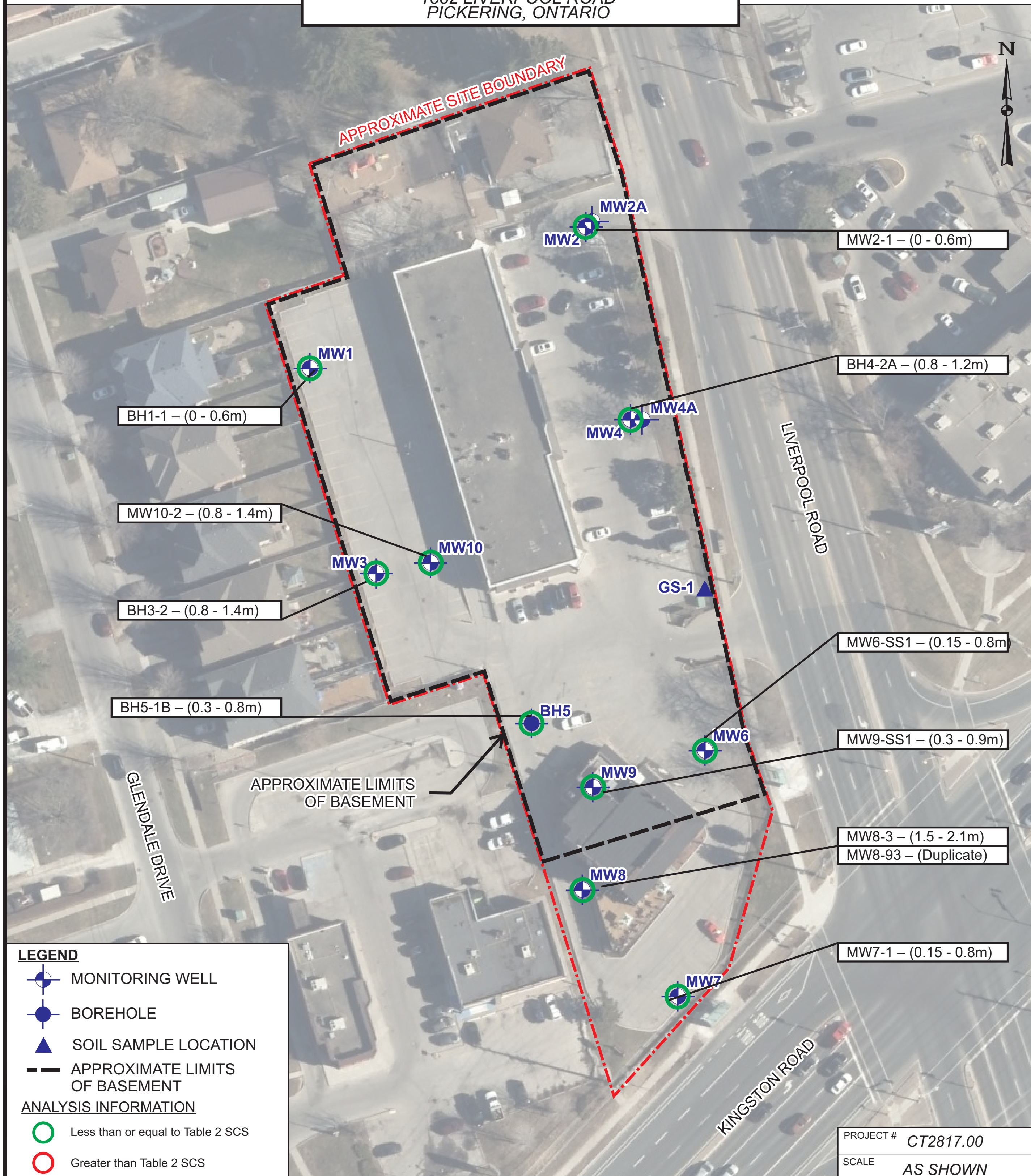
TERRAPEX

SOIL ANALYTICAL RESULTS - HEXAVALENT CHROMIUM

1294 KINGSTON ROAD, 1848 AND
1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP



LEGEND

- MONITORING WELL
- BOREHOLE
- SOIL SAMPLE LOCATION
- APPROXIMATE LIMITS OF BASEMENT

ANALYSIS INFORMATION

- Less than or equal to Table 2 SCS
- Greater than Table 2 SCS

Sample I.D. — Sample depth
MW103-4 – (depth)

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; Residential / Parkland / Institutional land use, coarse textured soil

0 25m 50m
(APPROXIMATE)

SOURCE: VUMAP, FIRST BASE SOLUTIONS, 2018 IMAGERY.

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN SF	CHECKED STR
DRAWING #	FIGURE 7H

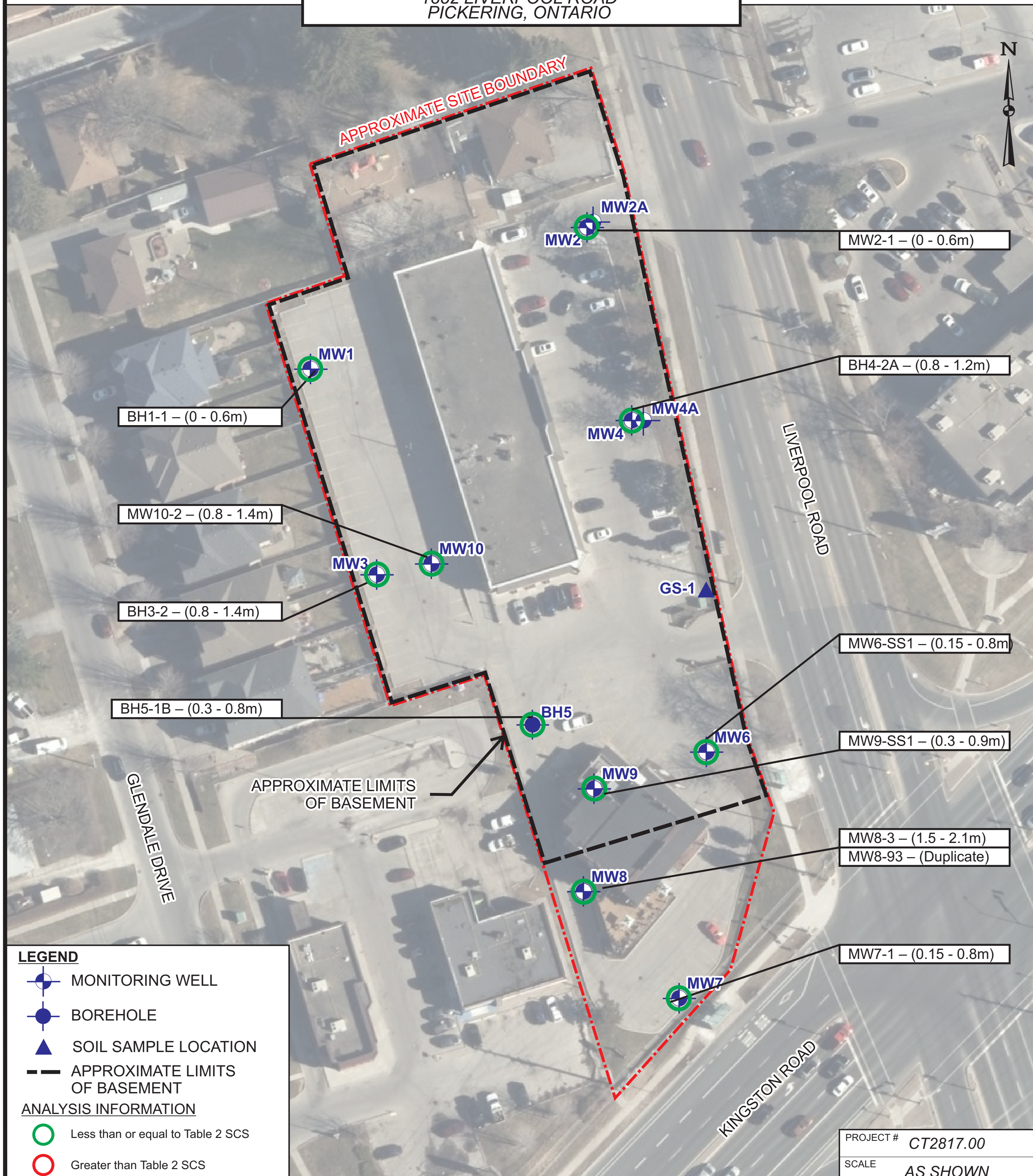
TERRAPEX

SOIL ANALYTICAL RESULTS - MERCURY

1294 KINGSTON ROAD, 1848 AND
1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP



LEGEND

MONITORING WELL

BOREHOLE

SOIL SAMPLE LOCATION

APPROXIMATE LIMITS OF BASEMENT

ANALYSIS INFORMATION

Less than or equal to Table 2 SCS

Greater than Table 2 SCS

Sample I.D. — Sample depth

MW103-4 – (depth)

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; Residential / Parkland / Institutional land use, coarse textured soil

0 25m 50m

(APPROXIMATE)

SOURCE: VUMAP, FIRST BASE SOLUTIONS, 2018 IMAGERY.

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN: SF	CHECKED: STR
DRAWING #	FIGURE 7I

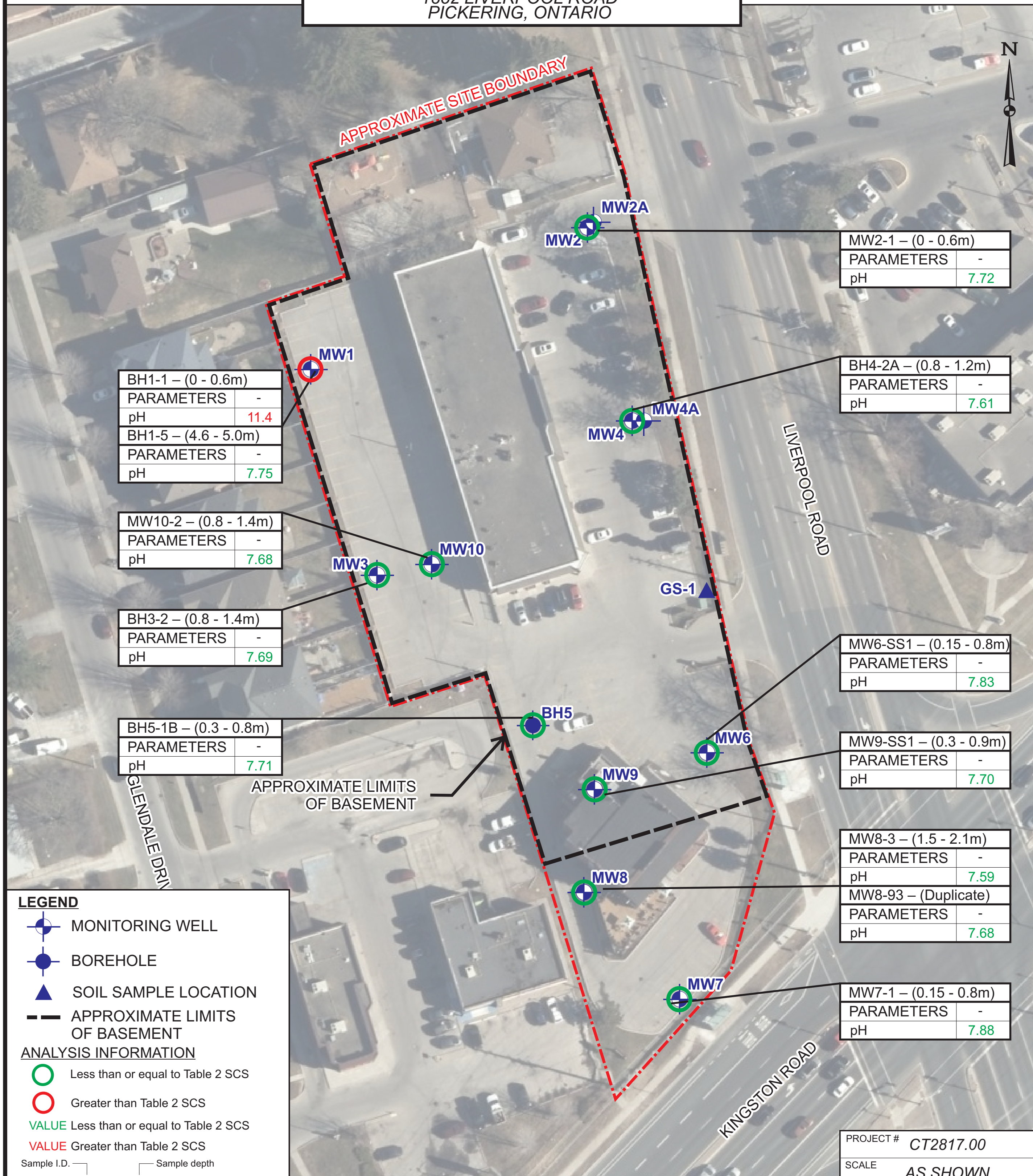
TERRAPEX

SOIL ANALYTICAL RESULTS - pH

1294 KINGSTON ROAD, 1848 AND
1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP



LEGEND

MONITORING WELL

BOREHOLE

SOIL SAMPLE LOCATION

APPROXIMATE LIMITS OF BASEMENT

ANALYSIS INFORMATION

Less than or equal to Table 2 SCS

Greater than Table 2 SCS

VALUE Less than or equal to Table 2 SCS

VALUE Greater than Table 2 SCS

Sample I.D. — Sample depth

BH103-4 – (depth)	
PARAMETERS	-
pH	7.0

TABLE 2 SCS
-

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; Residential / Parkland / Institutional land use, coarse textured soil

0 25m 50m

(APPROXIMATE)

SOURCE: VUMAP, FIRST BASE SOLUTIONS, 2018 IMAGERY.

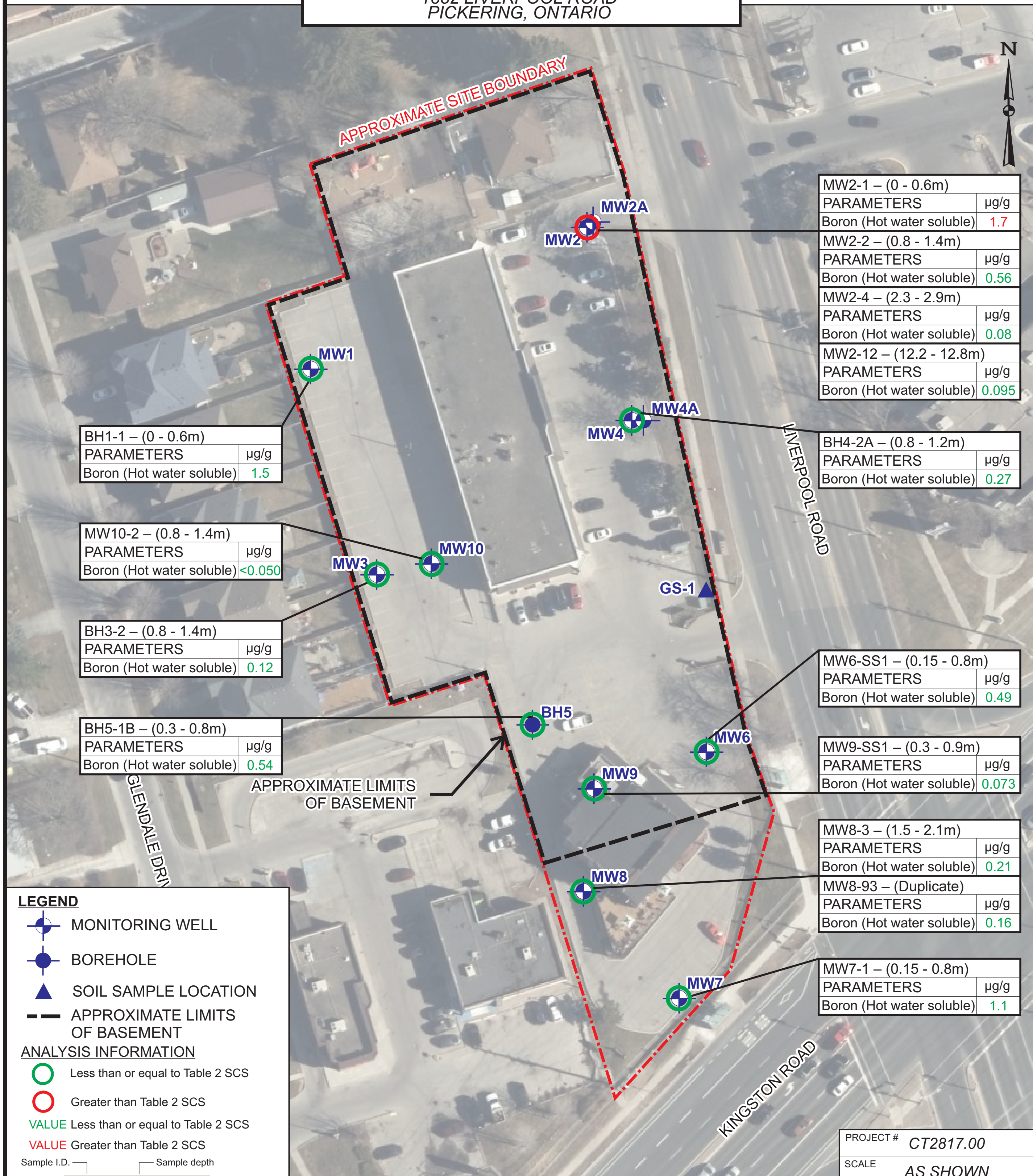
PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN SF	CHECKED STR
DRAWING #	FIGURE 7J

SOIL ANALYTICAL RESULTS - BORON (HOT WATER SOLUBLE)

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

TERRAPEX

CLIENT
ALTONA GROUP



LEGEND

- MONITORING WELL
- BOREHOLE
- SOIL SAMPLE LOCATION
- APPROXIMATE LIMITS OF BASEMENT

ANALYSIS INFORMATION

- Less than or equal to Table 2 SCS
- Greater than Table 2 SCS
- VALUE Less than or equal to Table 2 SCS
- VALUE Greater than Table 2 SCS

Sample I.D. — Sample depth

BH103-4 – (depth)	
PARAMETERS	µg/g
Boron (Hot water soluble)	0.05

TABLE 2 SCS
1.5

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; Residential / Parkland / Institutional land use, coarse textured soil

0 25m 50m
(APPROXIMATE)

SOURCE: VUMAP, FIRST BASE SOLUTIONS, 2018 IMAGERY.

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN	SF
CHECKED	STR
DRAWING #	FIGURE 7K

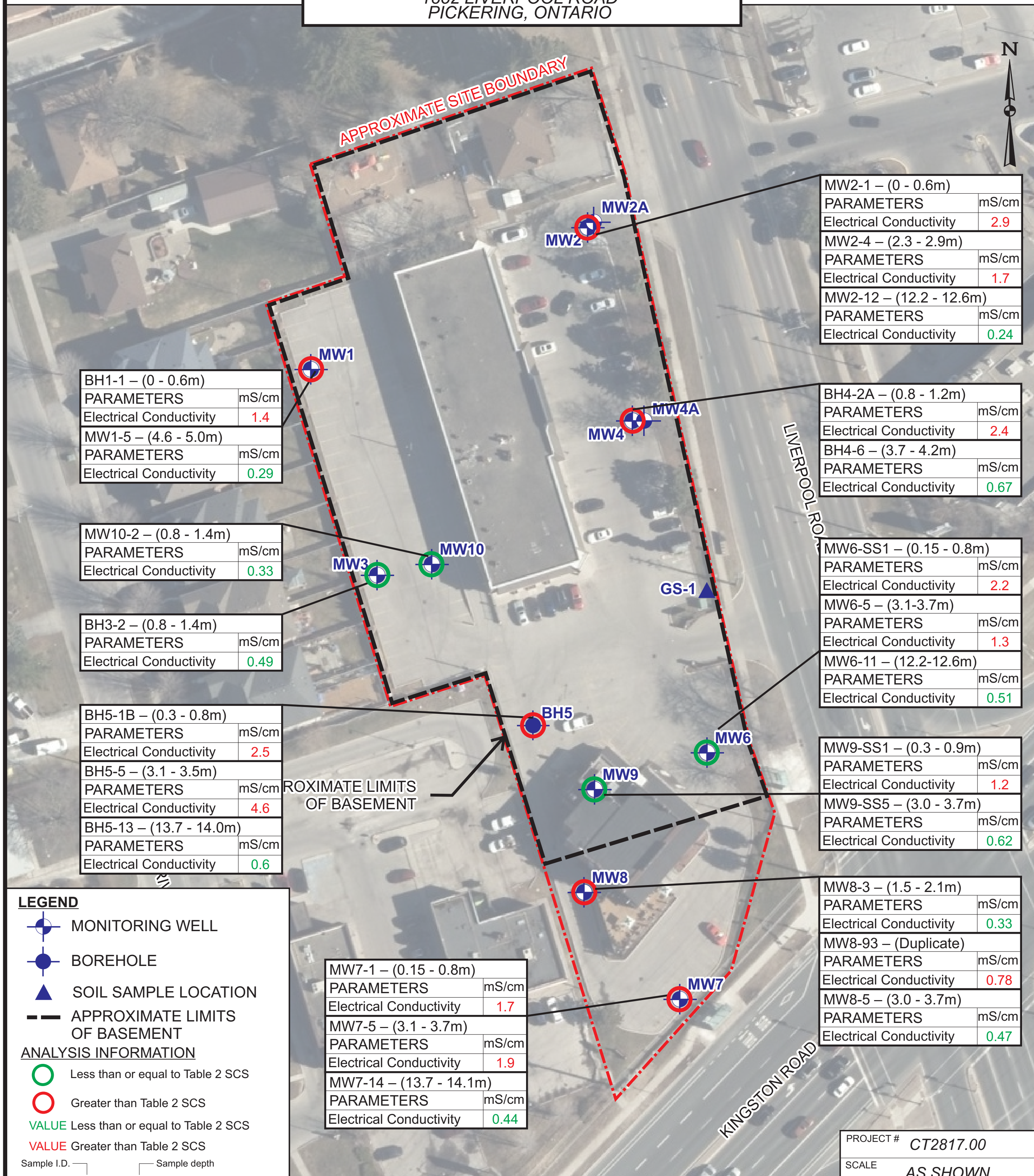
TERRAPEX

SOIL ANALYTICAL RESULTS - ELECTRICAL CONDUCTIVITY

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP



MW2-1 – (0 - 0.6m)	
PARAMETERS	mS/cm
Electrical Conductivity	2.9
MW2-4 – (2.3 - 2.9m)	
PARAMETERS	mS/cm
Electrical Conductivity	1.7
MW2-12 – (12.2 - 12.6m)	
PARAMETERS	mS/cm
Electrical Conductivity	0.24

BH1-1 – (0 - 0.6m)	
PARAMETERS	mS/cm
Electrical Conductivity	1.4
MW1-5 – (4.6 - 5.0m)	
PARAMETERS	mS/cm
Electrical Conductivity	0.29

BH4-2A – (0.8 - 1.2m)	
PARAMETERS	mS/cm
Electrical Conductivity	2.4
BH4-6 – (3.7 - 4.2m)	
PARAMETERS	mS/cm
Electrical Conductivity	0.67

MW10-2 – (0.8 - 1.4m)	
PARAMETERS	mS/cm
Electrical Conductivity	0.33

MW6-SS1 – (0.15 - 0.8m)	
PARAMETERS	mS/cm
Electrical Conductivity	2.2
MW6-5 – (3.1-3.7m)	
PARAMETERS	mS/cm
Electrical Conductivity	1.3
MW6-11 – (12.2-12.6m)	
PARAMETERS	mS/cm
Electrical Conductivity	0.51

BH3-2 – (0.8 - 1.4m)	
PARAMETERS	mS/cm
Electrical Conductivity	0.49

BH5-1B – (0.3 - 0.8m)	
PARAMETERS	mS/cm
Electrical Conductivity	2.5
BH5-5 – (3.1 - 3.5m)	
PARAMETERS	mS/cm
Electrical Conductivity	4.6
BH5-13 – (13.7 - 14.0m)	
PARAMETERS	mS/cm
Electrical Conductivity	0.6

MW9-SS1 – (0.3 - 0.9m)	
PARAMETERS	mS/cm
Electrical Conductivity	1.2
MW9-SS5 – (3.0 - 3.7m)	
PARAMETERS	mS/cm
Electrical Conductivity	0.62

MW8-3 – (1.5 - 2.1m)	
PARAMETERS	mS/cm
Electrical Conductivity	0.33
MW8-93 – (Duplicate)	
PARAMETERS	mS/cm
Electrical Conductivity	0.78
MW8-5 – (3.0 - 3.7m)	
PARAMETERS	mS/cm
Electrical Conductivity	0.47

MW7-1 – (0.15 - 0.8m)	
PARAMETERS	mS/cm
Electrical Conductivity	1.7
MW7-5 – (3.1 - 3.7m)	
PARAMETERS	mS/cm
Electrical Conductivity	1.9
MW7-14 – (13.7 - 14.1m)	
PARAMETERS	mS/cm
Electrical Conductivity	0.44

LEGEND

- MONITORING WELL
- BOREHOLE
- SOIL SAMPLE LOCATION
- APPROXIMATE LIMITS OF BASEMENT

ANALYSIS INFORMATION

- Less than or equal to Table 2 SCS
- Greater than Table 2 SCS
- VALUE Less than or equal to Table 2 SCS
- VALUE Greater than Table 2 SCS

Sample I.D. — Sample depth

BH103-4 – (depth)		TABLE 2 SCS
PARAMETERS	mS/cm	
Electrical Conductivity	0.002	0.7

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; Residential / Parkland / Institutional land use, coarse textured soil

0 25m 50m
(APPROXIMATE)

SOURCE: VUMAP, FIRST BASE SOLUTIONS, 2018 IMAGERY.

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN	SF
CHECKED	STR
DRAWING #	FIGURE 7L

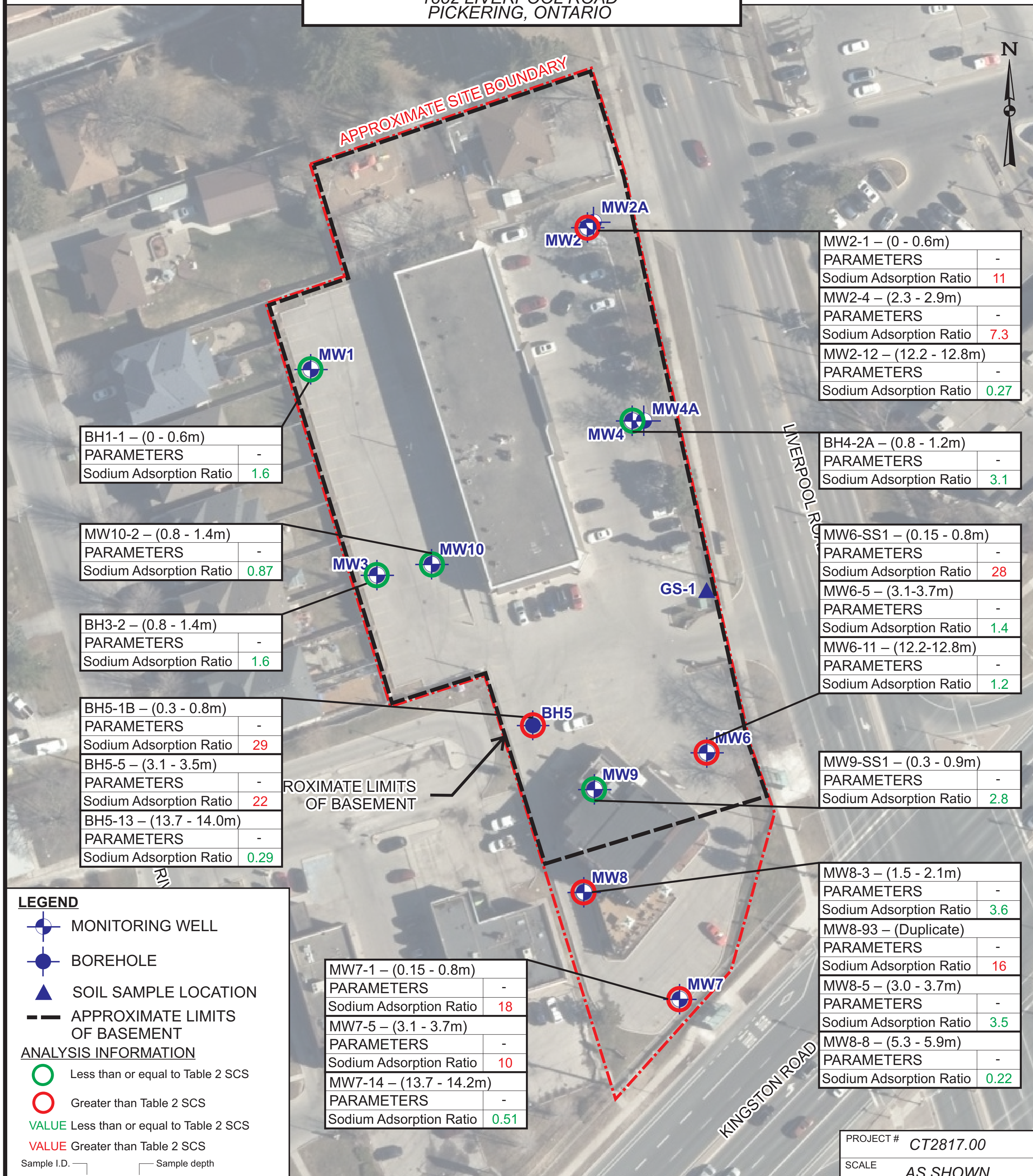
TERRAPEX

SOIL ANALYTICAL RESULTS - SODIUM ADSORPTION RATIO

1294 KINGSTON ROAD, 1848 AND
1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP



MW2-1 – (0 - 0.6m)	
PARAMETERS	-
Sodium Adsorption Ratio	11
MW2-4 – (2.3 - 2.9m)	
PARAMETERS	-
Sodium Adsorption Ratio	7.3
MW2-12 – (12.2 - 12.8m)	
PARAMETERS	-
Sodium Adsorption Ratio	0.27

BH1-1 – (0 - 0.6m)	
PARAMETERS	-
Sodium Adsorption Ratio	1.6

BH4-2A – (0.8 - 1.2m)	
PARAMETERS	-
Sodium Adsorption Ratio	3.1

MW10-2 – (0.8 - 1.4m)	
PARAMETERS	-
Sodium Adsorption Ratio	0.87

MW6-SS1 – (0.15 - 0.8m)	
PARAMETERS	-
Sodium Adsorption Ratio	28
MW6-5 – (3.1-3.7m)	
PARAMETERS	-
Sodium Adsorption Ratio	1.4
MW6-11 – (12.2-12.8m)	
PARAMETERS	-
Sodium Adsorption Ratio	1.2

BH3-2 – (0.8 - 1.4m)	
PARAMETERS	-
Sodium Adsorption Ratio	1.6

BH5-1B – (0.3 - 0.8m)	
PARAMETERS	-
Sodium Adsorption Ratio	29
BH5-5 – (3.1 - 3.5m)	
PARAMETERS	-
Sodium Adsorption Ratio	22
BH5-13 – (13.7 - 14.0m)	
PARAMETERS	-
Sodium Adsorption Ratio	0.29

MW9-SS1 – (0.3 - 0.9m)	
PARAMETERS	-
Sodium Adsorption Ratio	2.8

MW8-3 – (1.5 - 2.1m)	
PARAMETERS	-
Sodium Adsorption Ratio	3.6
MW8-93 – (Duplicate)	
PARAMETERS	-
Sodium Adsorption Ratio	16
MW8-5 – (3.0 - 3.7m)	
PARAMETERS	-
Sodium Adsorption Ratio	3.5
MW8-8 – (5.3 - 5.9m)	
PARAMETERS	-
Sodium Adsorption Ratio	0.22

MW7-1 – (0.15 - 0.8m)	
PARAMETERS	-
Sodium Adsorption Ratio	18
MW7-5 – (3.1 - 3.7m)	
PARAMETERS	-
Sodium Adsorption Ratio	10
MW7-14 – (13.7 - 14.2m)	
PARAMETERS	-
Sodium Adsorption Ratio	0.51

LEGEND

MONITORING WELL

BOREHOLE

SOIL SAMPLE LOCATION

APPROXIMATE LIMITS OF BASEMENT

ANALYSIS INFORMATION

Less than or equal to Table 2 SCS

Greater than Table 2 SCS

VALUE Less than or equal to Table 2 SCS

VALUE Greater than Table 2 SCS

Sample I.D. — Sample depth

BH103-4 – (depth)	
PARAMETERS	-
Sodium Adsorption Ratio	-

TABLE 2 SCS
5

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; Residential / Parkland / Institutional land use, coarse textured soil

0 25m 50m

(APPROXIMATE)

SOURCE: VUMAP, FIRST BASE SOLUTIONS, 2018 IMAGERY.

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN SF	CHECKED STR
DRAWING #	FIGURE 7M

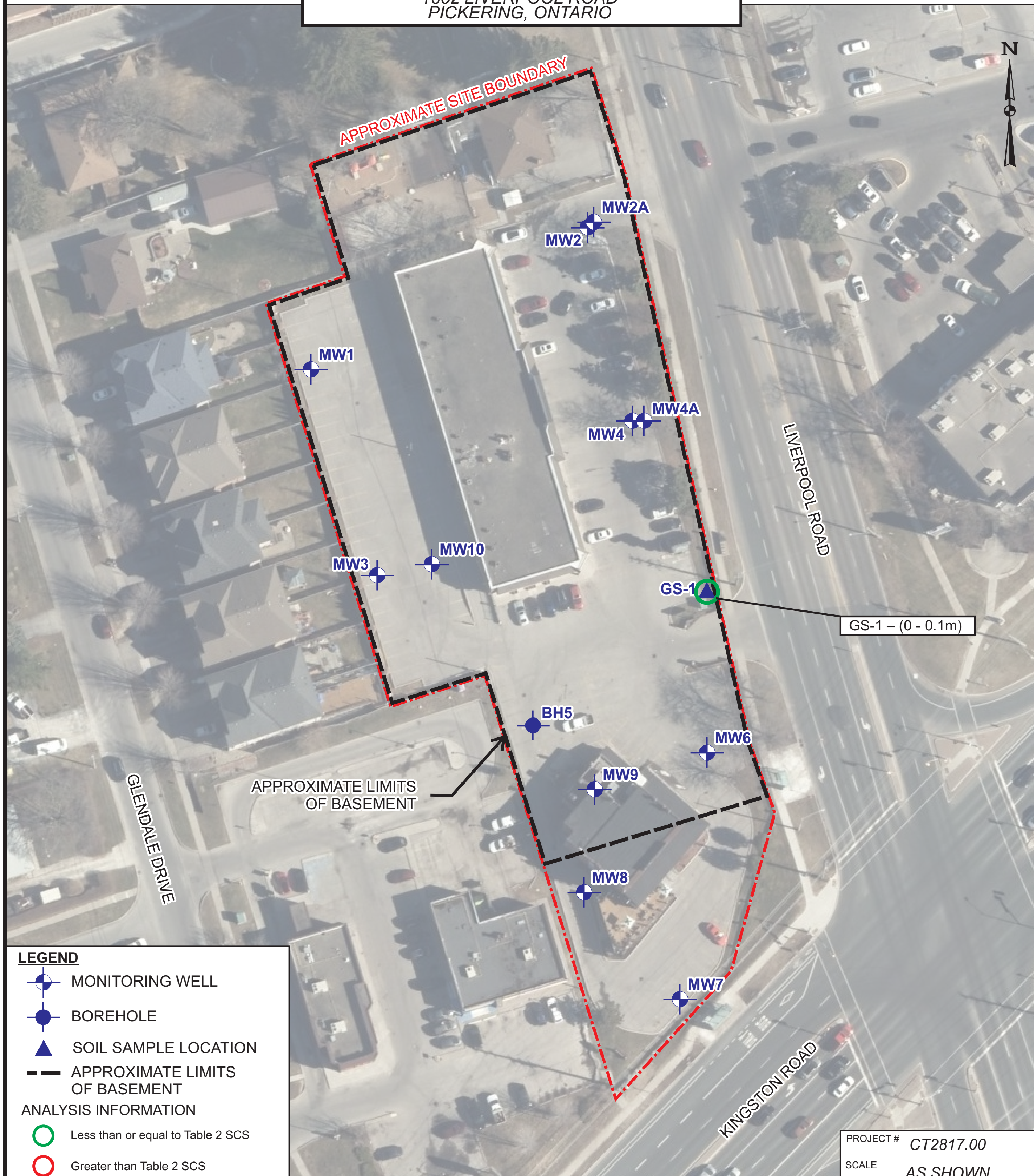
TERRAPEX

SOIL ANALYTICAL RESULTS - PCBs

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP



LEGEND

- MONITORING WELL
- BOREHOLE
- SOIL SAMPLE LOCATION
- APPROXIMATE LIMITS OF BASEMENT

ANALYSIS INFORMATION

- Less than or equal to Table 2 SCS
- Greater than Table 2 SCS

Sample I.D. — Sample depth
MW103-4 – (depth)

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; Residential / Parkland / Institutional land use, coarse textured soil

0 25m 50m
(APPROXIMATE)

SOURCE: VUMAP, FIRST BASE SOLUTIONS, 2018 IMAGERY.

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN	SF
CHECKED	STR
DRAWING #	FIGURE 7N

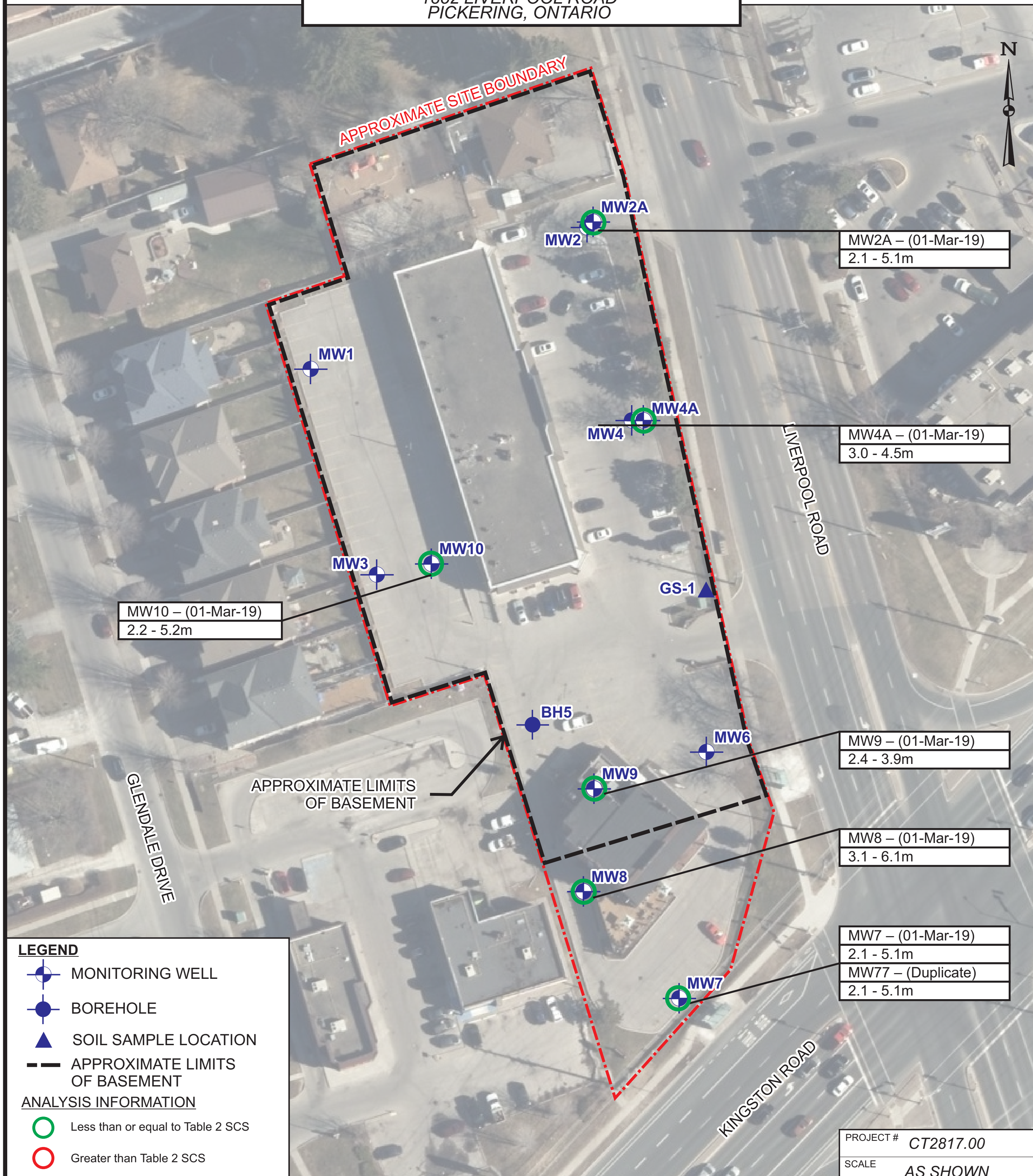
TERRAPEX

GROUNDWATER ANALYTICAL RESULTS - PHCs

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP



LEGEND

- MONITORING WELL
- BOREHOLE
- SOIL SAMPLE LOCATION
- APPROXIMATE LIMITS OF BASEMENT

ANALYSIS INFORMATION

- Less than or equal to Table 2 SCS
- Greater than Table 2 SCS

Sample I.D. — Sample date

MW103 – (date)
Screen Interval

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; coarse textured soil

0 25m 50m
(APPROXIMATE)

SOURCE: VUMAP, FIRST BASE SOLUTIONS, 2018 IMAGERY.

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN SF	CHECKED STR
DRAWING #	FIGURE 8A

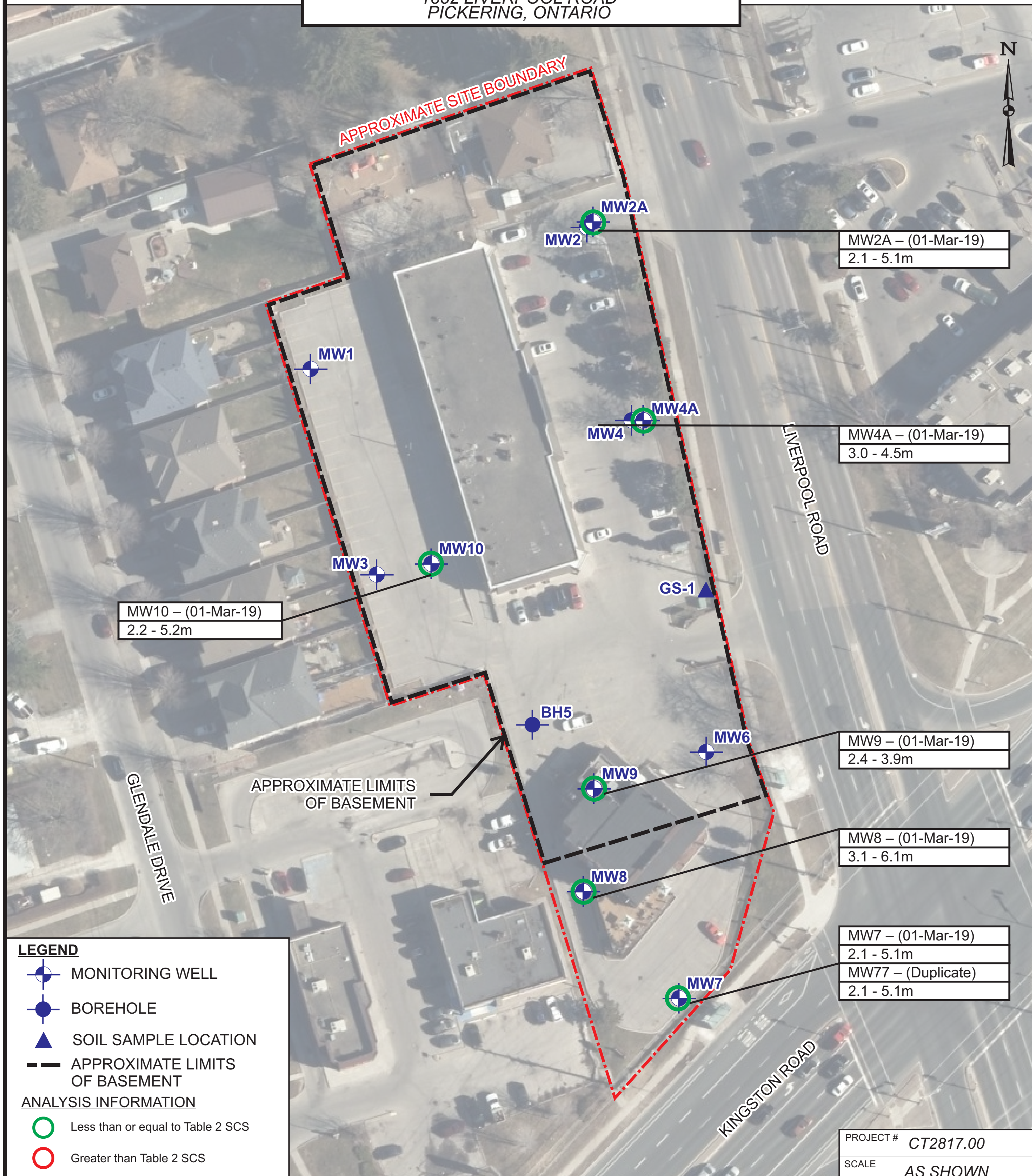
TERRAPEX

GROUNDWATER ANALYTICAL RESULTS - VOCs

1294 KINGSTON ROAD, 1848 AND
1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP



LEGEND

MONITORING WELL

BOREHOLE

SOIL SAMPLE LOCATION

APPROXIMATE LIMITS OF BASEMENT

ANALYSIS INFORMATION

Less than or equal to Table 2 SCS

Greater than Table 2 SCS

Sample I.D. — Sample date

MW103 – (date)
Screen Interval

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; coarse textured soil

0 25m 50m

(APPROXIMATE)

SOURCE: VUMAP, FIRST BASE SOLUTIONS, 2018 IMAGERY.

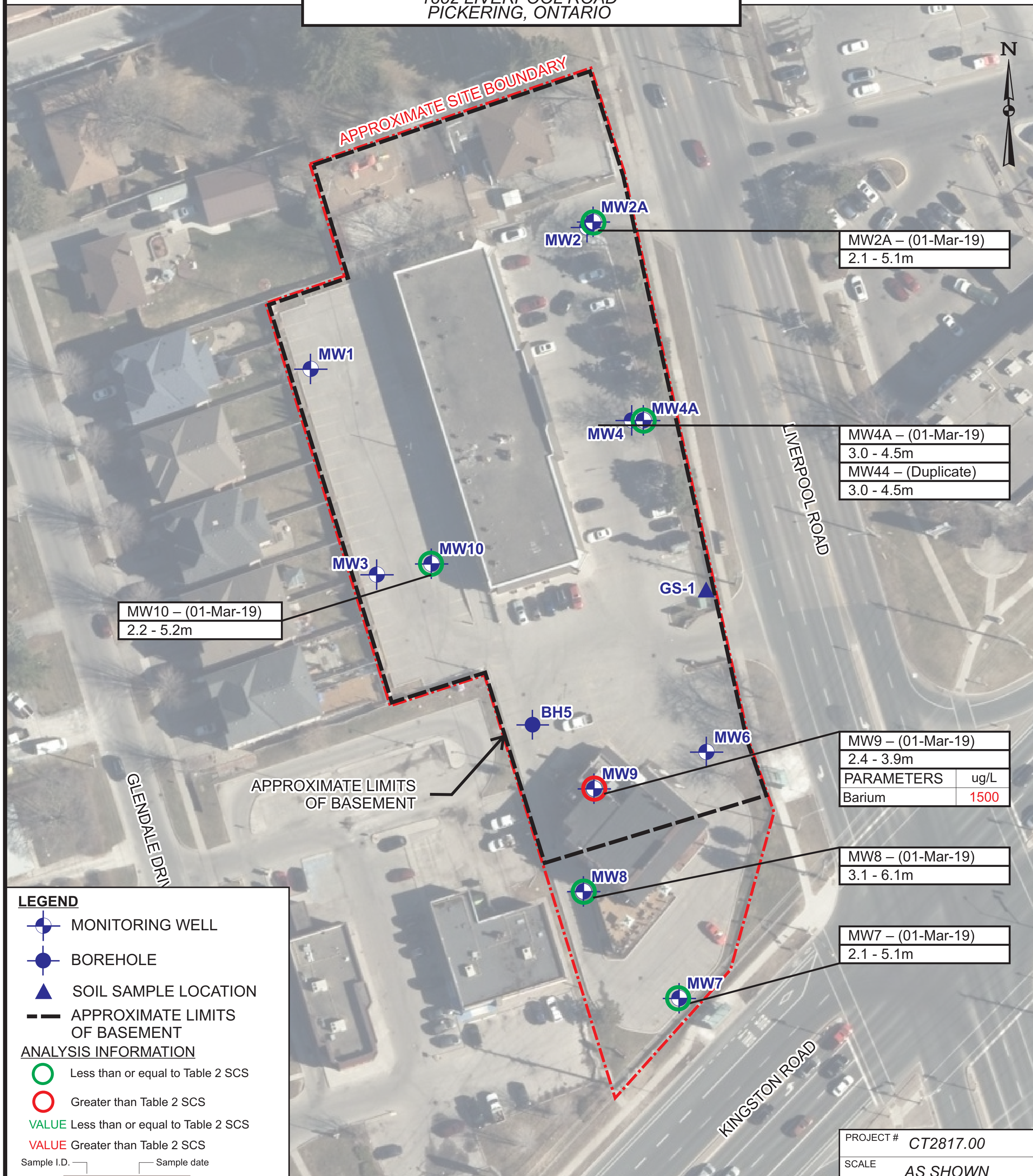
PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN SF	CHECKED STR
DRAWING #	FIGURE 8B

GROUNDWATER ANALYTICAL RESULTS - METALS

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP



LEGEND

- MONITORING WELL
- BOREHOLE
- SOIL SAMPLE LOCATION
- APPROXIMATE LIMITS OF BASEMENT

ANALYSIS INFORMATION

- Less than or equal to Table 2 SCS
- Greater than Table 2 SCS
- VALUE Less than or equal to Table 2 SCS
- VALUE Greater than Table 2 SCS

Sample I.D. — Sample date

BH103 – (date)	
Screen Interval	
PARAMETERS	ug/L
Barium	2

TABLE 2 SCS
1000

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; coarse textured soil

0 25m 50m
(APPROXIMATE)

SOURCE: VUMAP, FIRST BASE SOLUTIONS, 2018 IMAGERY.

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN	SF
CHECKED	STR
DRAWING #	FIGURE 8C

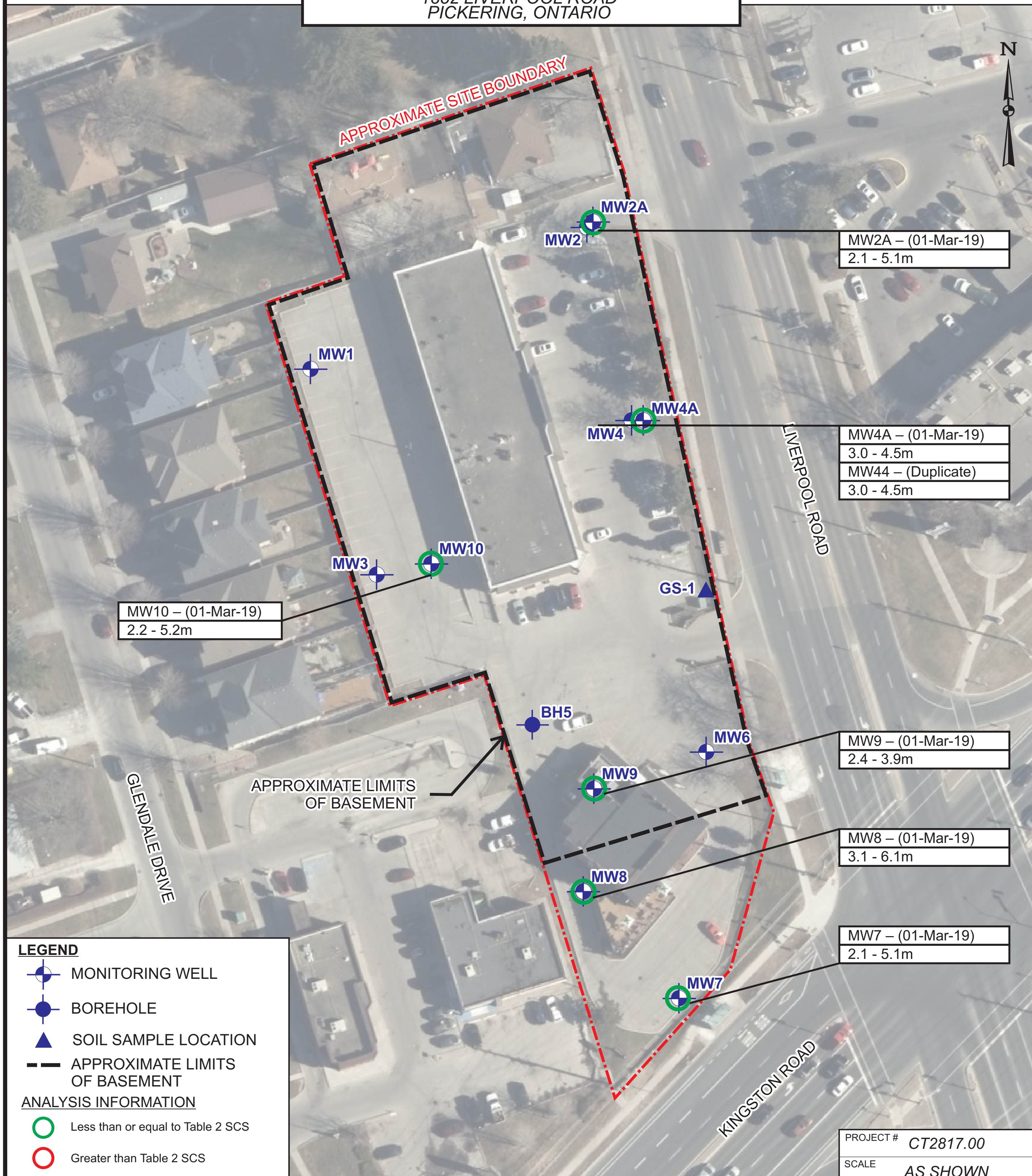
TERRAPEX

GROUNDWATER ANALYTICAL RESULTS - HYDRIDE-FORMING METALS

1294 KINGSTON ROAD, 1848 AND
1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP



LEGEND

MONITORING WELL

BOREHOLE

SOIL SAMPLE LOCATION

APPROXIMATE LIMITS OF BASEMENT

ANALYSIS INFORMATION

Less than or equal to Table 2 SCS

Greater than Table 2 SCS

Sample I.D. — Sample date

MW103 – (date)
Screen Interval

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; coarse textured soil

0 25m 50m

(APPROXIMATE)

SOURCE: VUMAP, FIRST BASE SOLUTIONS, 2018 IMAGERY.

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN	SF
CHECKED	STR
DRAWING #	FIGURE 8D

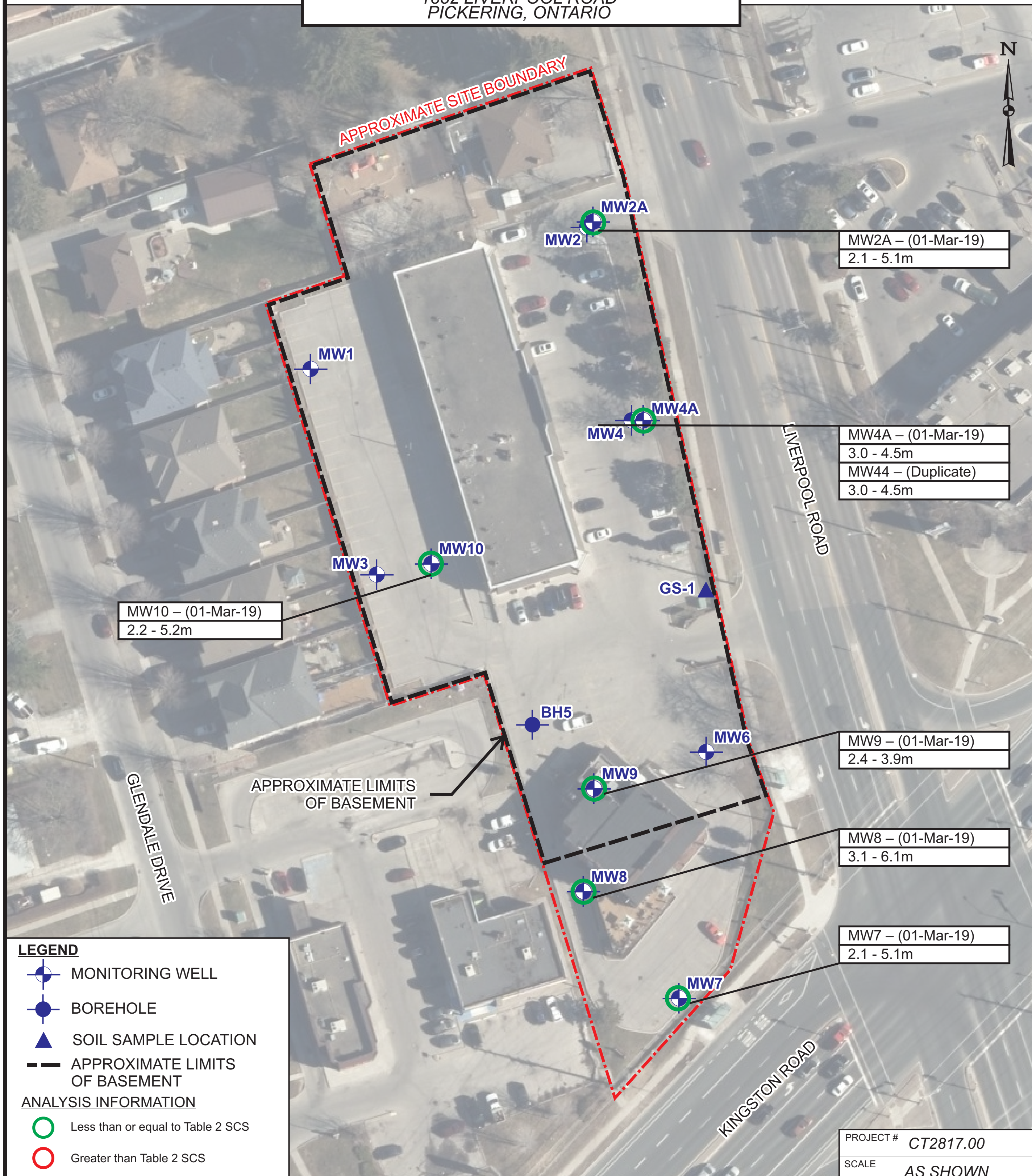
TERRAPEX

GROUNDWATER ANALYTICAL RESULTS - HEXAVALENT CHROMIUM

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD PICKERING, ONTARIO

CLIENT

ALTONA GROUP



LEGEND

- MONITORING WELL
- BOREHOLE
- SOIL SAMPLE LOCATION
- APPROXIMATE LIMITS OF BASEMENT

ANALYSIS INFORMATION

- Less than or equal to Table 2 SCS
- Greater than Table 2 SCS

Sample I.D. — Sample date

MW103 – (date)
Screen Interval

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; coarse textured soil

0 25m 50m

(APPROXIMATE)

SOURCE: VUMAP, FIRST BASE SOLUTIONS, 2018 IMAGERY.

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN SF	CHECKED STR
DRAWING #	FIGURE 8E

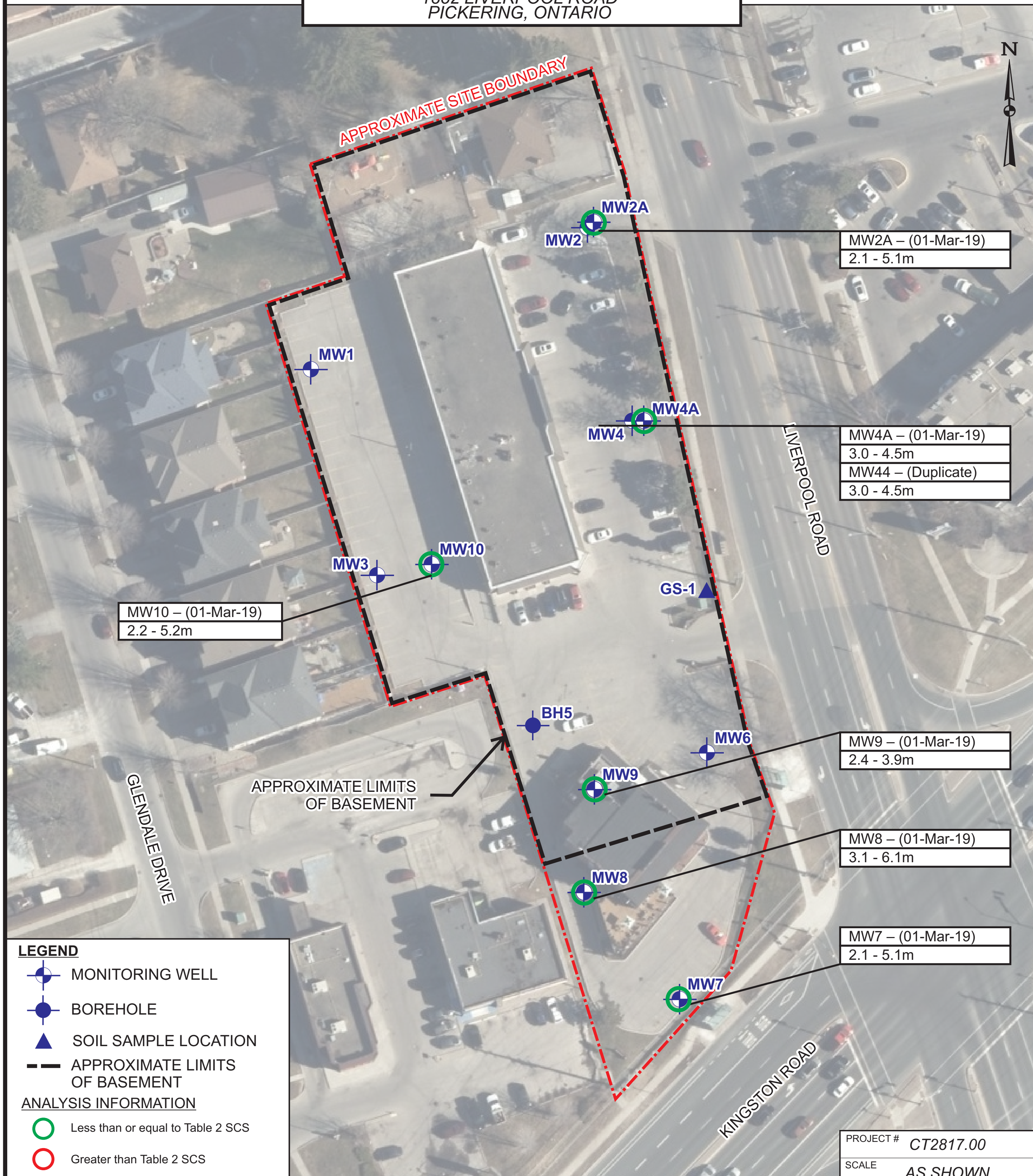
TERRAPEX

GROUNDWATER ANALYTICAL RESULTS - MERCURY

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP



LEGEND

- MONITORING WELL
- BOREHOLE
- SOIL SAMPLE LOCATION
- APPROXIMATE LIMITS OF BASEMENT

ANALYSIS INFORMATION

- Less than or equal to Table 2 SCS
- Greater than Table 2 SCS

Sample I.D. — Sample date

MW103 – (date)
Screen Interval

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; coarse textured soil

0 25m 50m
(APPROXIMATE)

SOURCE: VUMAP, FIRST BASE SOLUTIONS, 2018 IMAGERY.

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN	SF
CHECKED	STR
DRAWING #	FIGURE 8F

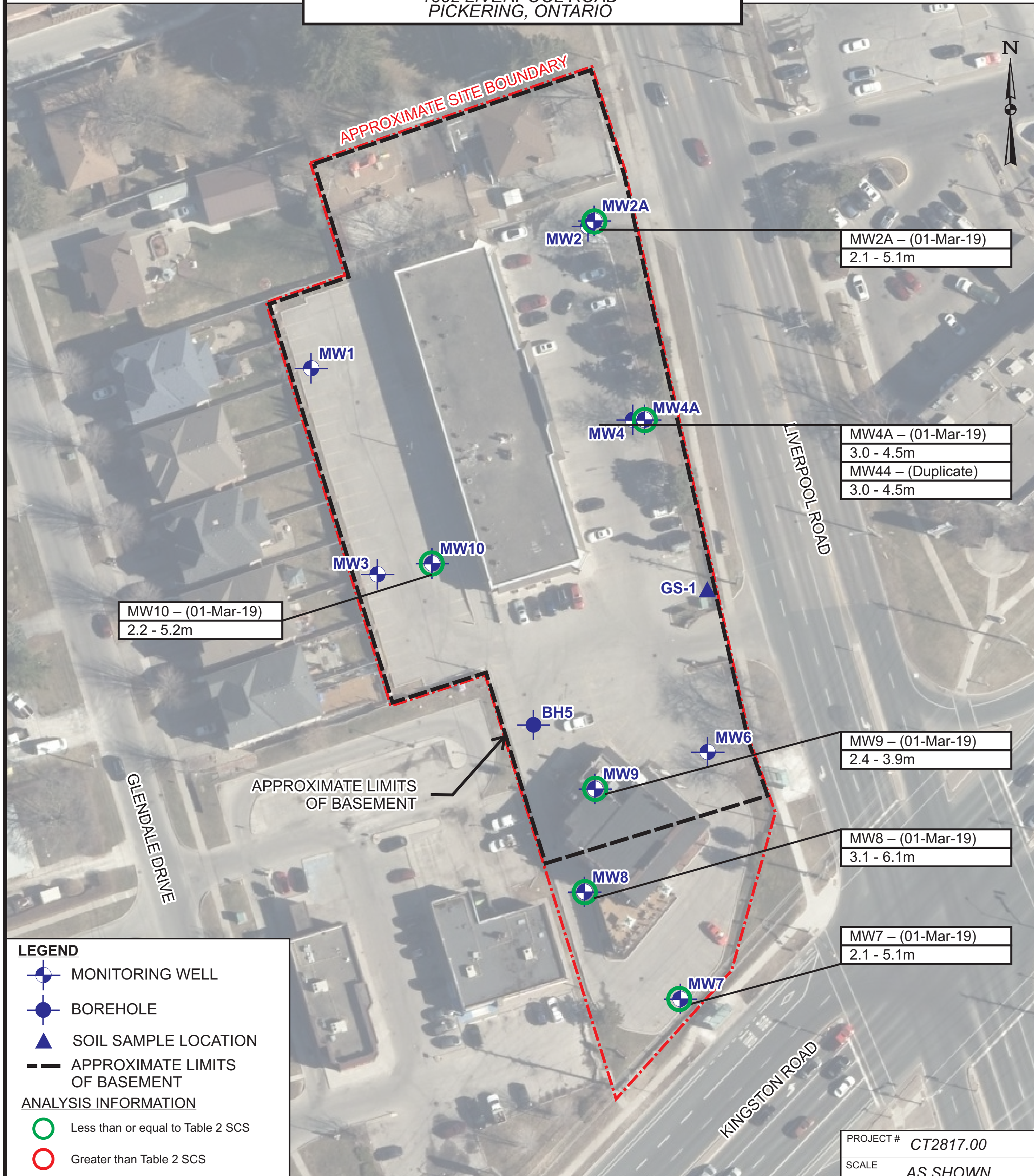
GROUNDWATER ANALYTICAL RESULTS - CYANIDE (CN-)

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

TERRAPEX

CLIENT

ALTONA GROUP



LEGEND

MONITORING WELL

BOREHOLE

SOIL SAMPLE LOCATION

APPROXIMATE LIMITS OF BASEMENT

ANALYSIS INFORMATION

Less than or equal to Table 2 SCS

Greater than Table 2 SCS

Sample I.D. — Sample date

MW103 – (date)
Screen Interval

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; coarse textured soil

0 25m 50m

(APPROXIMATE)

SOURCE: VUMAP, FIRST BASE SOLUTIONS, 2018 IMAGERY.

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN SF	CHECKED STR
DRAWING #	FIGURE 8G

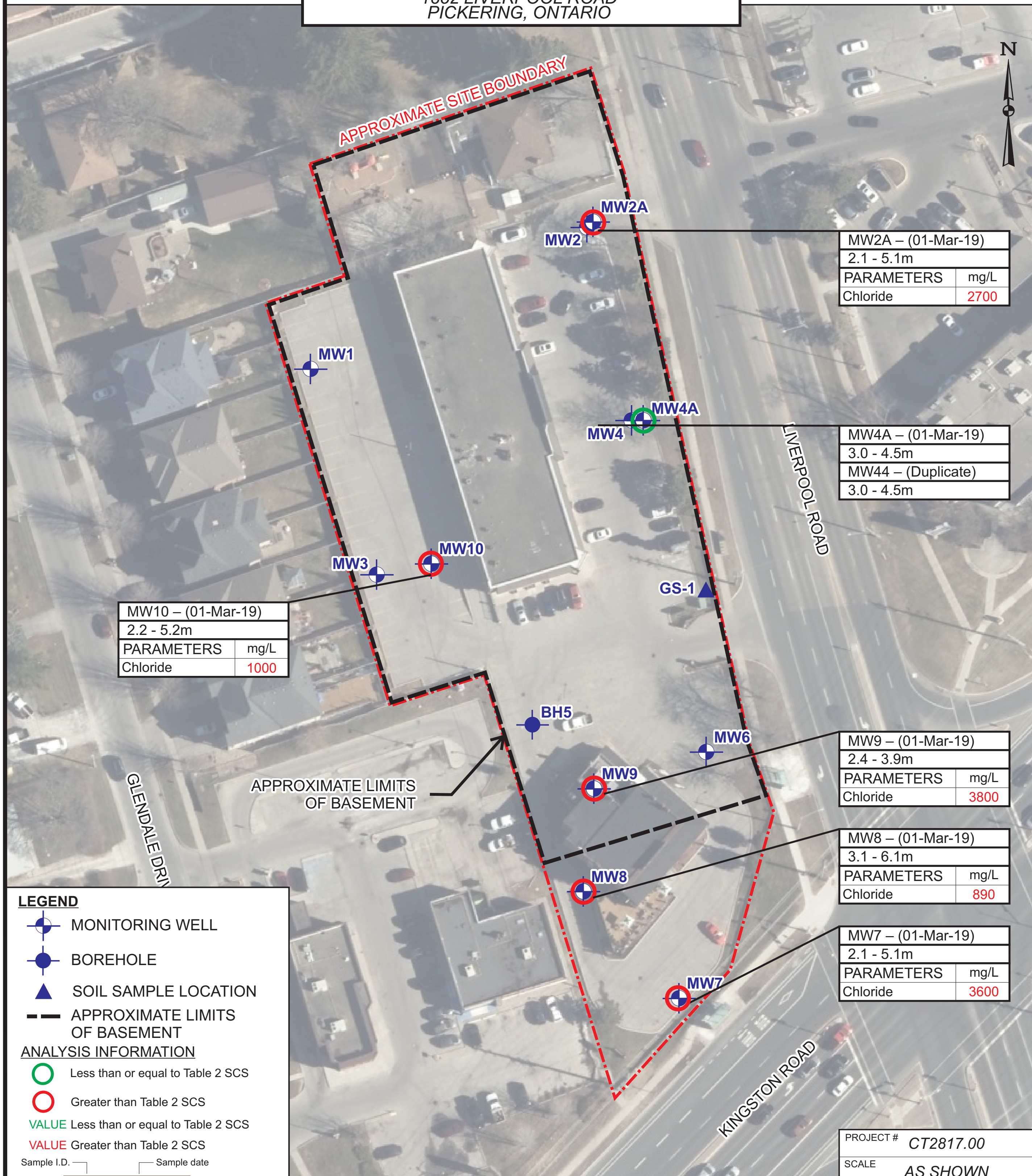
TERRAPEX

GROUNDWATER ANALYTICAL RESULTS - CHLORIDE

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP



LEGEND

- MONITORING WELL
- BOREHOLE
- SOIL SAMPLE LOCATION
- APPROXIMATE LIMITS OF BASEMENT

ANALYSIS INFORMATION

- Less than or equal to Table 2 SCS
- Greater than Table 2 SCS
- VALUE Less than or equal to Table 2 SCS
- VALUE Greater than Table 2 SCS

Sample I.D. — Sample date

BH103 – (date)	
Screen Interval	
PARAMETERS	mg/L
Chloride	10

TABLE 2 SCS
790

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; coarse textured soil

0 25m 50m
(APPROXIMATE)

SOURCE: VUMAP, FIRST BASE SOLUTIONS, 2018 IMAGERY.

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN SF	CHECKED STR
DRAWING #	FIGURE 8H

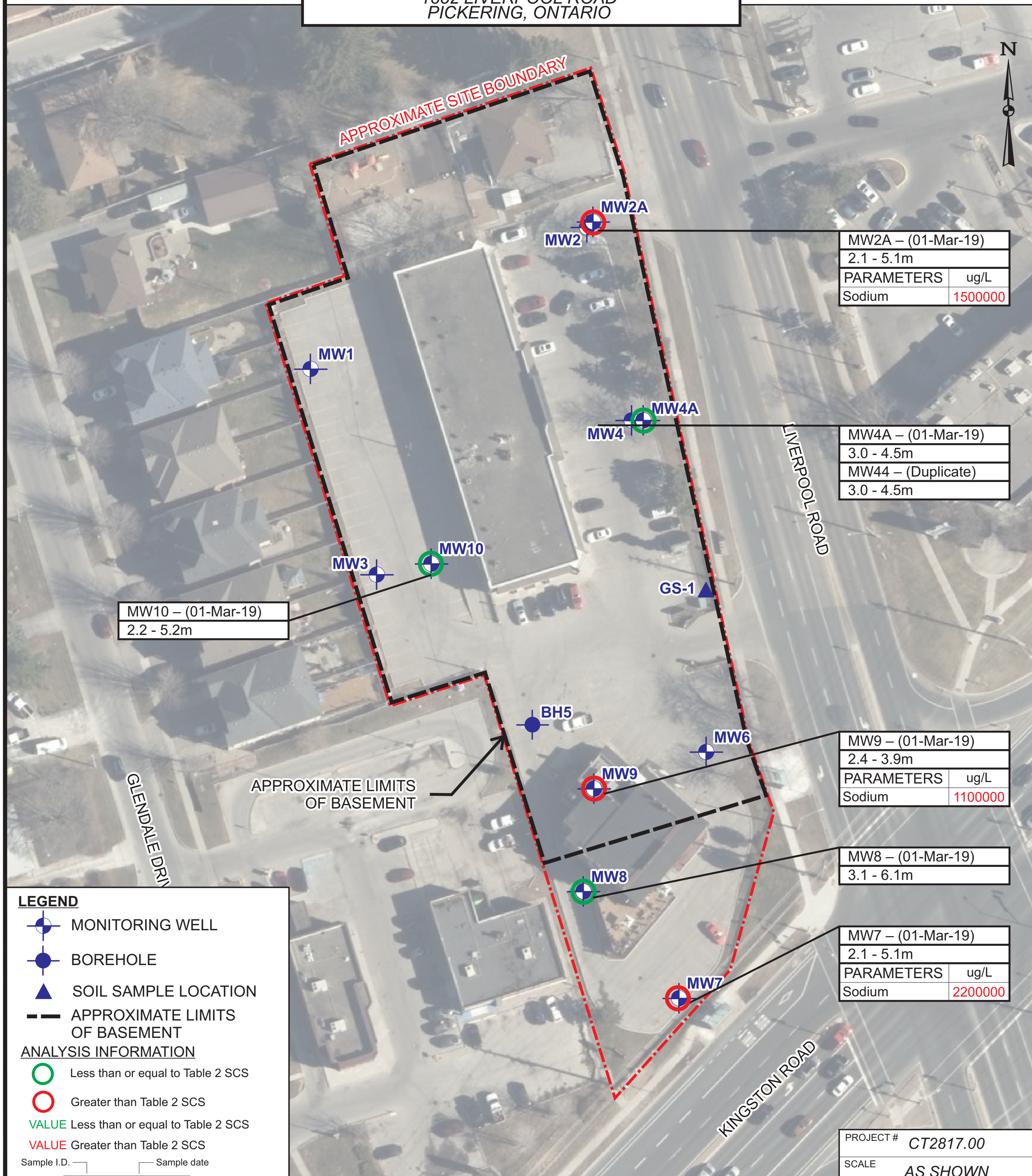
TERRAPEX

GROUNDWATER ANALYTICAL RESULTS - SODIUM

1294 KINGSTON ROAD, 1848 AND
1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP



LEGEND

MONITORING WELL

BOREHOLE

SOIL SAMPLE LOCATION

APPROXIMATE LIMITS OF BASEMENT

ANALYSIS INFORMATION

Less than or equal to Table 2 SCS

Greater than Table 2 SCS

VALUE Less than or equal to Table 2 SCS

VALUE Greater than Table 2 SCS

Sample I.D. — Sample date

BH103 – (date)	
Screen Interval	
PARAMETERS	ug/L
Sodium	100

TABLE 2 SCS
490000

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; coarse textured soil

0 25m 50m

(APPROXIMATE)

SOURCE: VUMAP, FIRST BASE SOLUTIONS, 2018 IMAGERY.

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN SF	CHECKED STR
DRAWING #	FIGURE 8I

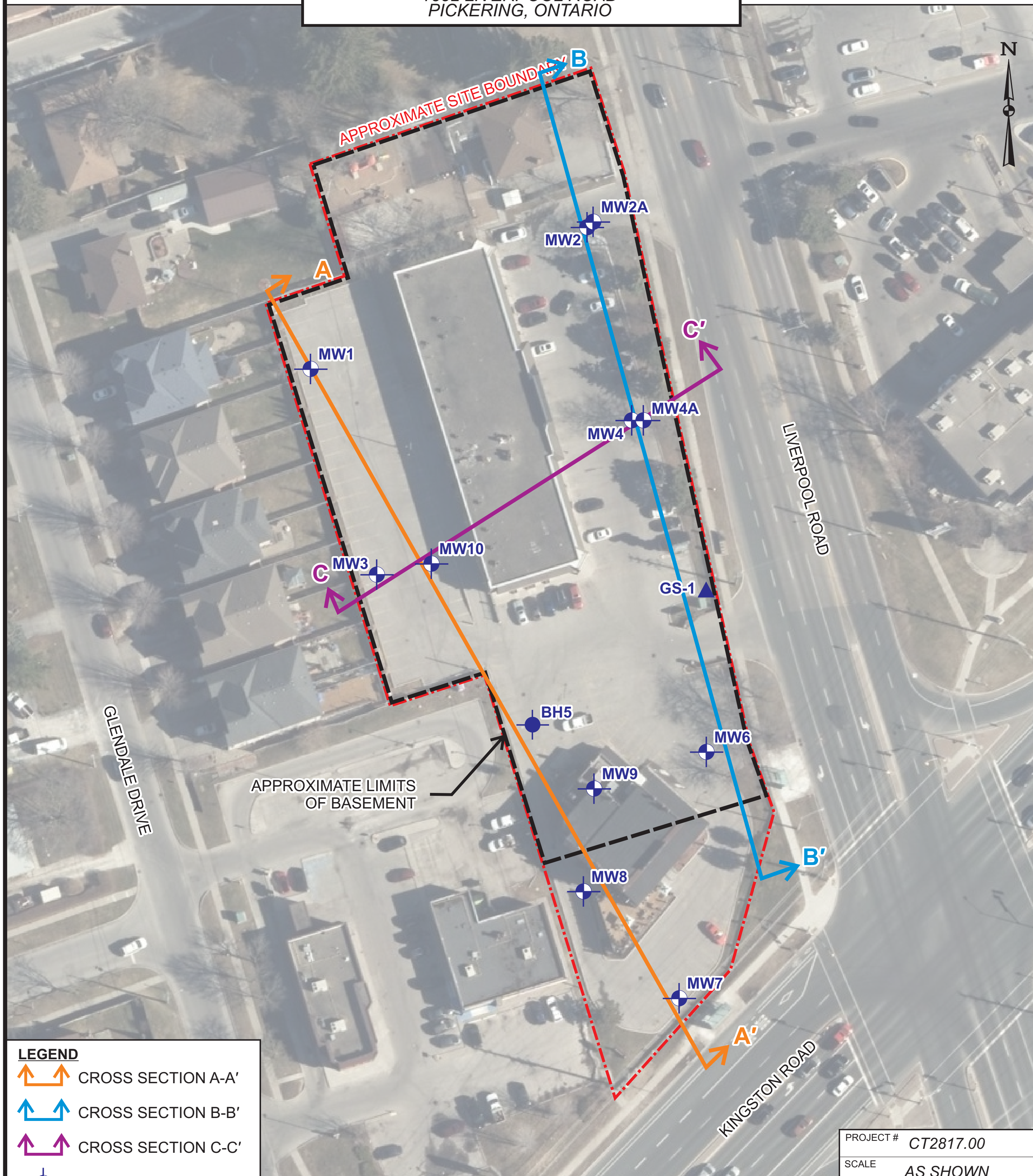
TERRAPEX

CROSS SECTION PLAN

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP



LEGEND

- CROSS SECTION A-A′
- CROSS SECTION B-B′
- CROSS SECTION C-C′
- MONITORING WELL
- BOREHOLE
- APPROXIMATE LIMITS OF BASEMENT

0 25m 50m
(APPROXIMATE)

SOURCE: VUMAP, FIRST BASE SOLUTIONS, 2018 IMAGERY.

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN SF	CHECKED STR
DRAWING #	FIGURE 9

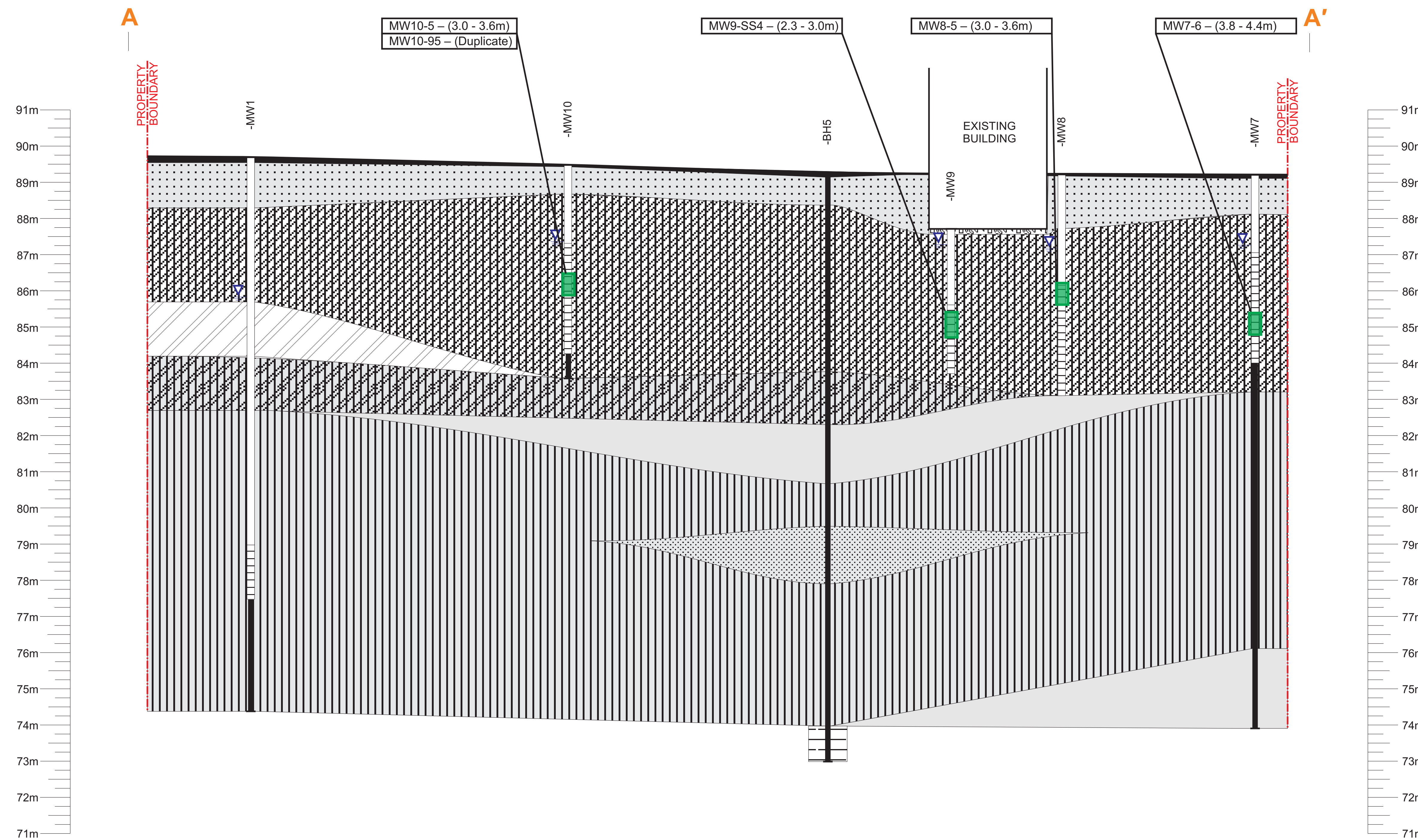
TERRAPEX

SOIL ANALYTICAL RESULTS - PHCs
CROSS SECTION A - A'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP



LEGEND

- ASPHALT
- CONCRETE
- FILL
- CLAY
- SILT
- SILTY SAND TILL
- SILTY CLAY/ CLAYEY SILT
- SANDY SILTY CLAY
- SAND
- GRAVELLY SAND (TILL)
- SHALE
- GROUNDWATER LEVEL (AS OF MARCH 1, 2019)
- MONITORING WELL
- SCREENED LEVEL
- BOREHOLE

ANALYSIS INFORMATION

- Less than or equal to Table 3 SCS
- Greater than Table 3 SCS

Sample I.D. / Sample depth: MW103-4 – (depth)

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; Residential / Parkland / Institutional land use, coarse textured soil

VERTICAL SCALE: 0 — 2.5m — 5m (APPROXIMATE)

HORIZONTAL SCALE: 0 — 10m — 20m (APPROXIMATE)

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN	SF
CHECKED	STR
DRAWING #	FIGURE 10A

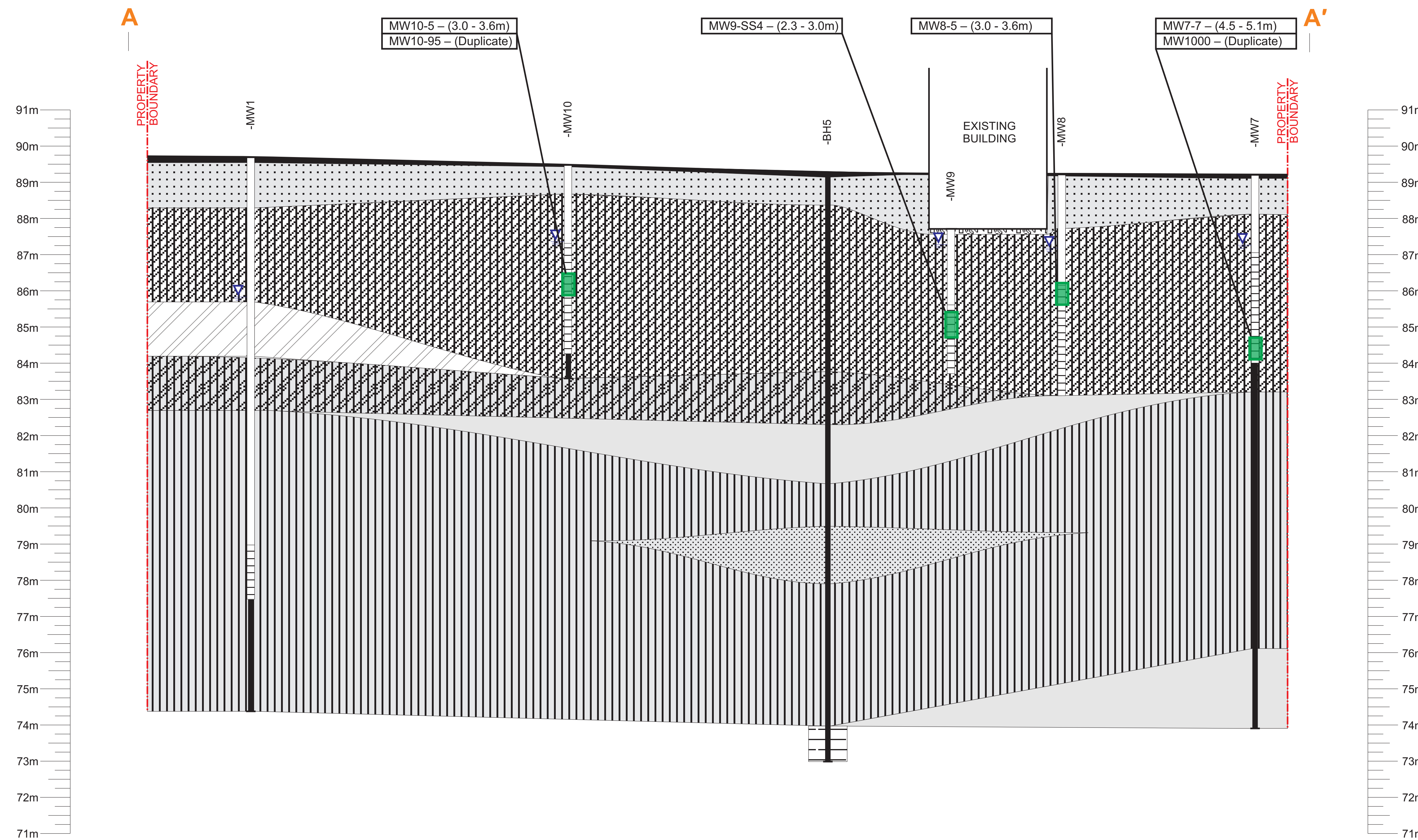
TERRAPEX

SOIL ANALYTICAL RESULTS - VOCs
CROSS SECTION A - A'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP



LEGEND

- ASPHALT
- CONCRETE
- FILL
- CLAY
- SILT
- SILTY SAND TILL
- SILTY CLAY/ CLAYEY SILT
- SANDY SILTY CLAY
- SAND
- GRAVELLY SAND (TILL)
- SHALE
- GROUNDWATER LEVEL (AS OF MARCH 1, 2019)
- MONITORING WELL
- SCREENED LEVEL
- BOREHOLE

ANALYSIS INFORMATION

- Less than or equal to Table 3 SCS
- Greater than Table 3 SCS

Sample I.D. / Sample depth: MW103-4 – (depth)

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; Residential / Parkland / Institutional land use, coarse textured soil

VERTICAL SCALE: 0 – 2.5m – 5m (APPROXIMATE)

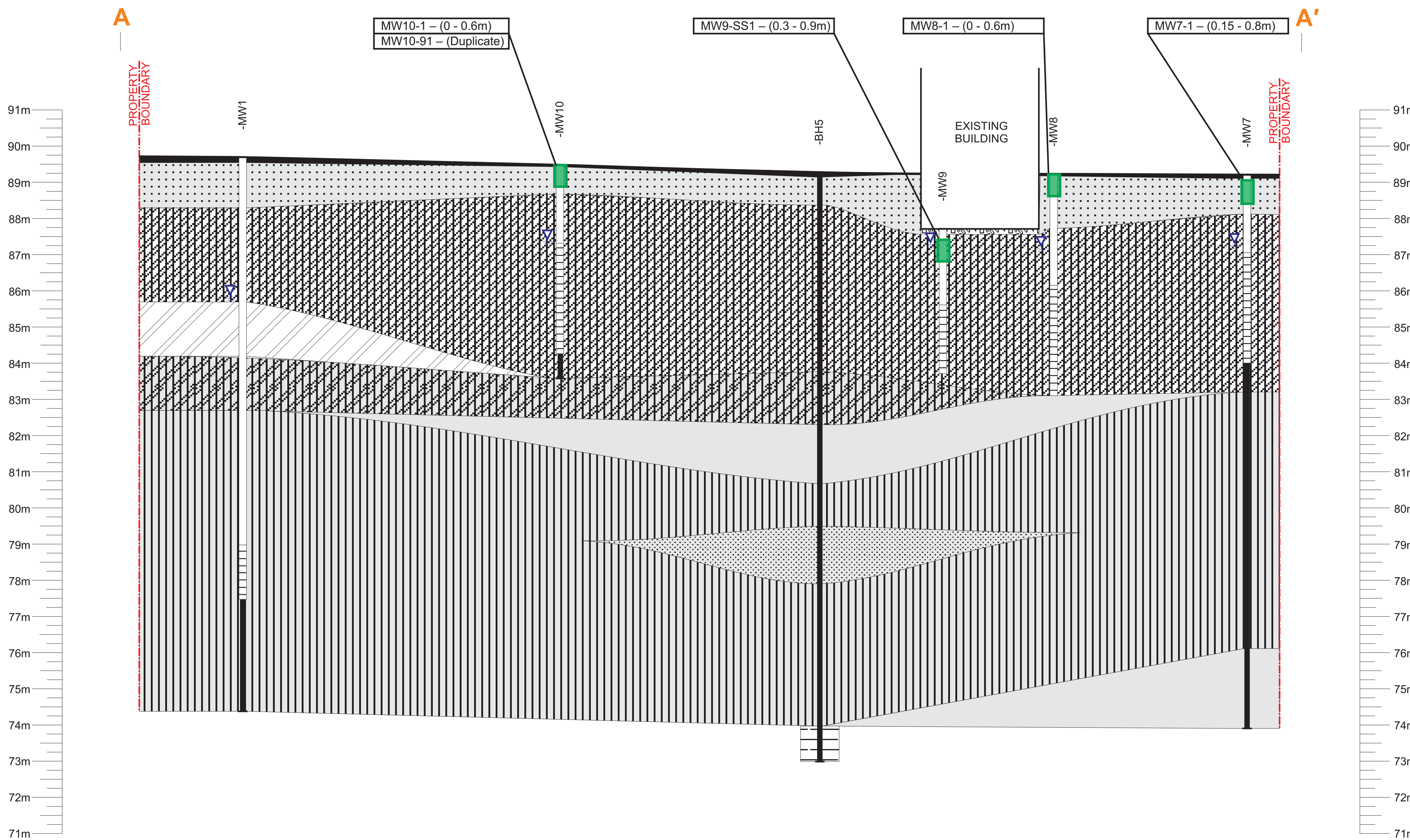
HORIZONTAL SCALE: 0 – 10m – 20m (APPROXIMATE)

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN	SF
CHECKED	STR
DRAWING #	FIGURE 10B

SOIL ANALYTICAL RESULTS - PAHs
CROSS SECTION A - A'
1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

TERRAPEX

CLIENT: ALTONA GROUP



LEGEND

- ASPHALT
- CONCRETE
- FILL
- CLAY
- SILT
- SILTY SAND TILL
- SILTY CLAY/ CLAYEY SILT
- SANDY SILTY CLAY
- SAND
- GRAVELLY SAND (TILL)
- SHALE
- GROUNDWATER LEVEL (AS OF MARCH 1, 2019)
- MONITORING WELL
- SCREENED LEVEL
- BOREHOLE

ANALYSIS INFORMATION

- Less than or equal to Table 3 SCS
- Greater than Table 3 SCS

Sample I.D. / Sample depth: MW103-4 – (depth)

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; Residential / Parkland / Institutional land use, coarse textured soil

VERTICAL SCALE: 0 — 2.5m — 5m (APPROXIMATE)

HORIZONTAL SCALE: 0 — 10m — 20m (APPROXIMATE)

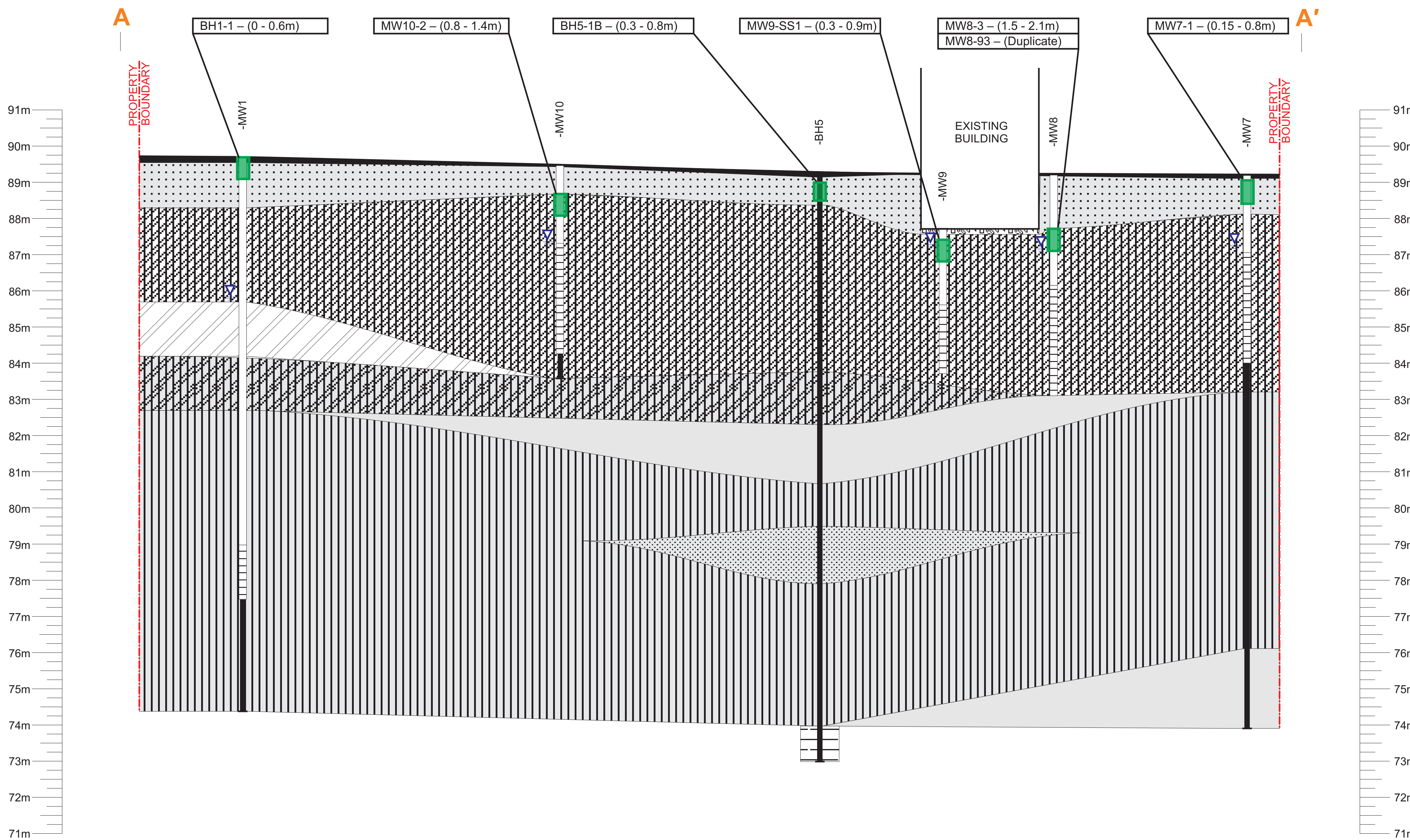
PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN	SF
CHECKED	STR
DRAWING #	FIGURE 10C

TERRAPEX

SOIL ANALYTICAL RESULTS - METALS
CROSS SECTION A - A'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT
ALTONA GROUP



LEGEND

- ASPHALT
- CONCRETE
- FILL
- CLAY
- SILT
- SILTY SAND TILL
- SILTY CLAY/ CLAYEY SILT
- SANDY SILTY CLAY
- SAND
- GRAVELLY SAND (TILL)
- SHALE
- GROUNDWATER LEVEL (AS OF MARCH 1, 2019)
- - MONITORING WELL
- - SCREENED LEVEL
- - BOREHOLE

ANALYSIS INFORMATION

- Less than or equal to Table 3 SCS
- Greater than Table 3 SCS

Sample I.D. — Sample depth
MW103-4 – (depth)

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; Residential / Parkland / Institutional land use, coarse textured soil

VERTICAL SCALE:
0 — 2.5m — 5m
(APPROXIMATE)

HORIZONTAL SCALE:
0 — 10m — 20m
(APPROXIMATE)

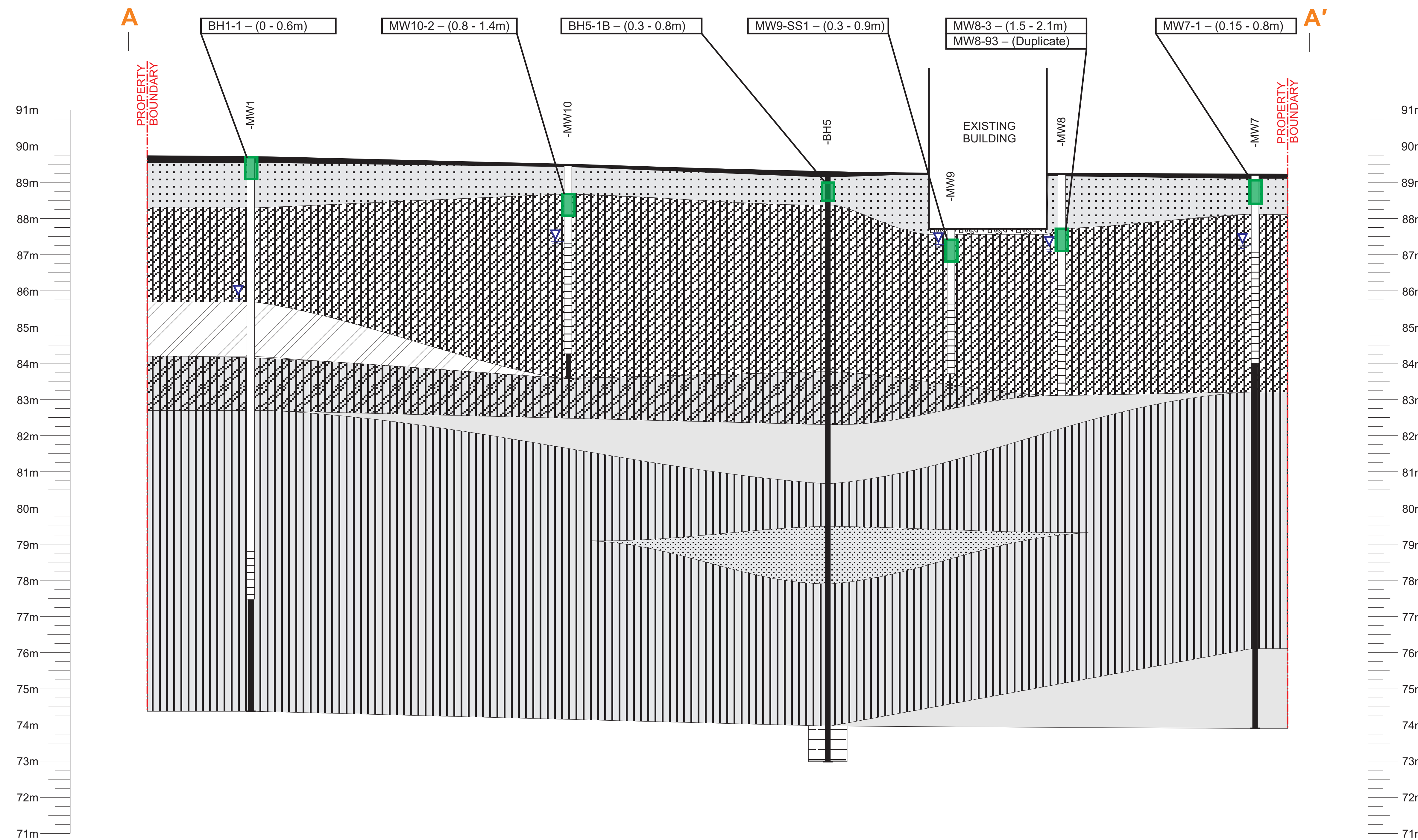
PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN SF	CHECKED STR
DRAWING #	FIGURE 10D

TERRAPEX

SOIL ANALYTICAL RESULTS - HYDRIDE-FORMING METALS - CROSS SECTION A - A'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT: ALTONA GROUP



LEGEND

- ASPHALT
- CONCRETE
- FILL
- CLAY
- SILT
- SILTY SAND TILL
- SILTY CLAY/ CLAYEY SILT
- SANDY SILTY CLAY
- SAND
- GRAVELLY SAND (TILL)
- SHALE
- GROUNDWATER LEVEL (AS OF MARCH 1, 2019)
- MONITORING WELL
- SCREENED LEVEL
- BOREHOLE

ANALYSIS INFORMATION

- Less than or equal to Table 3 SCS
- Greater than Table 3 SCS

Sample I.D. — Sample depth: MW103-4 – (depth)

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; Residential / Parkland / Institutional land use, coarse textured soil

VERTICAL SCALE: 0 — 2.5m — 5m (APPROXIMATE)

HORIZONTAL SCALE: 0 — 10m — 20m (APPROXIMATE)

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN	SF
CHECKED	STR
DRAWING #	FIGURE 10E

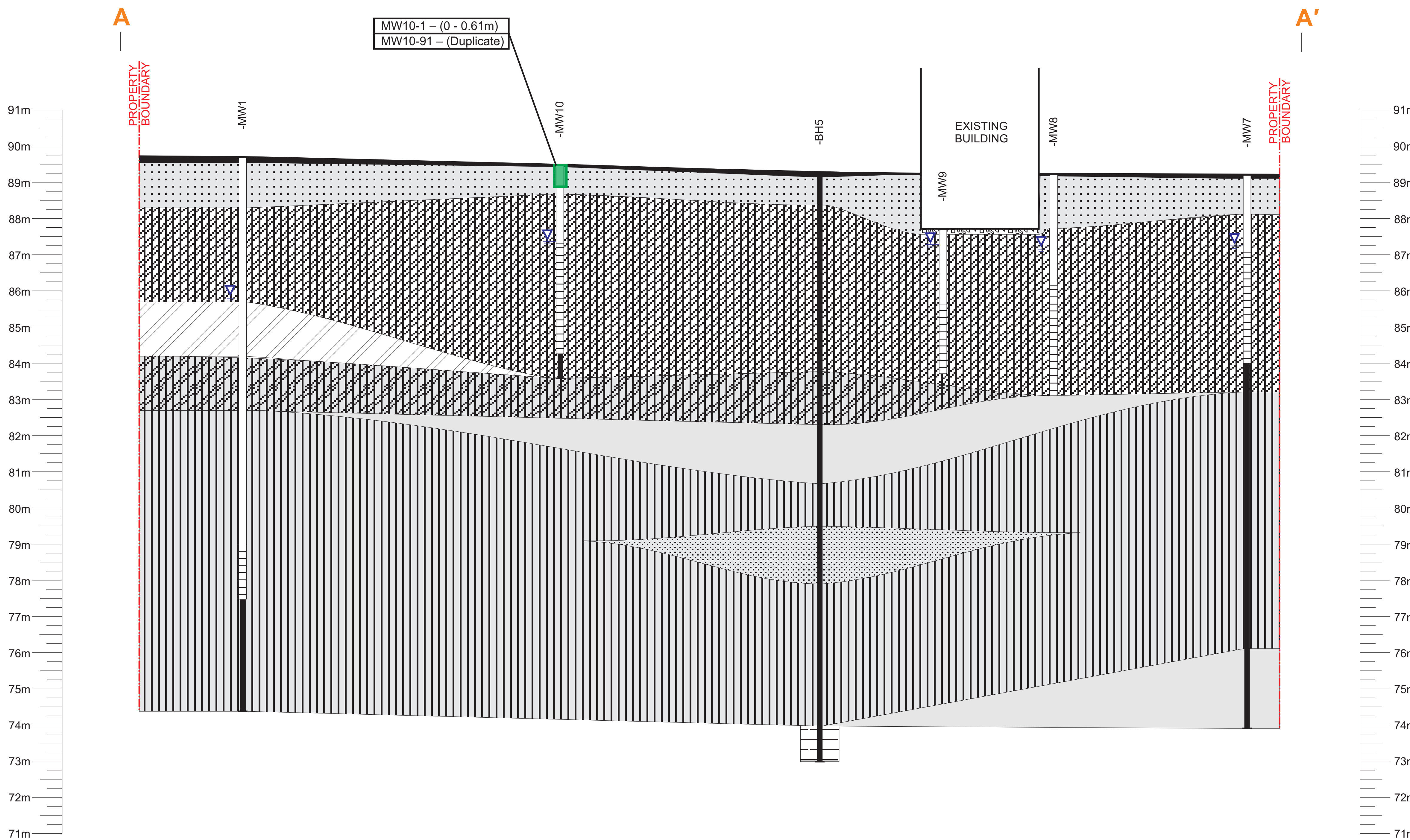
TERRAPEX

SOIL ANALYTICAL RESULTS - OC PESTICIDES CROSS SECTION A - A'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP



LEGEND

- ASPHALT
- CONCRETE
- FILL
- CLAY
- SILT
- SILTY SAND TILL
- SILTY CLAY/ CLAYEY SILT
- SANDY SILTY CLAY
- SAND
- GRAVELLY SAND (TILL)
- SHALE
- GROUNDWATER LEVEL (AS OF MARCH 1, 2019)
- MONITORING WELL
- SCREENED LEVEL
- BOREHOLE

ANALYSIS INFORMATION

- Less than or equal to Table 3 SCS
- Greater than Table 3 SCS

Sample I.D. — Sample depth
MW103-4 – (depth)

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; Residential / Parkland / Institutional land use, coarse textured soil

VERTICAL SCALE:
0 2.5m 5m
(APPROXIMATE)

HORIZONTAL SCALE:
0 10m 20m
(APPROXIMATE)

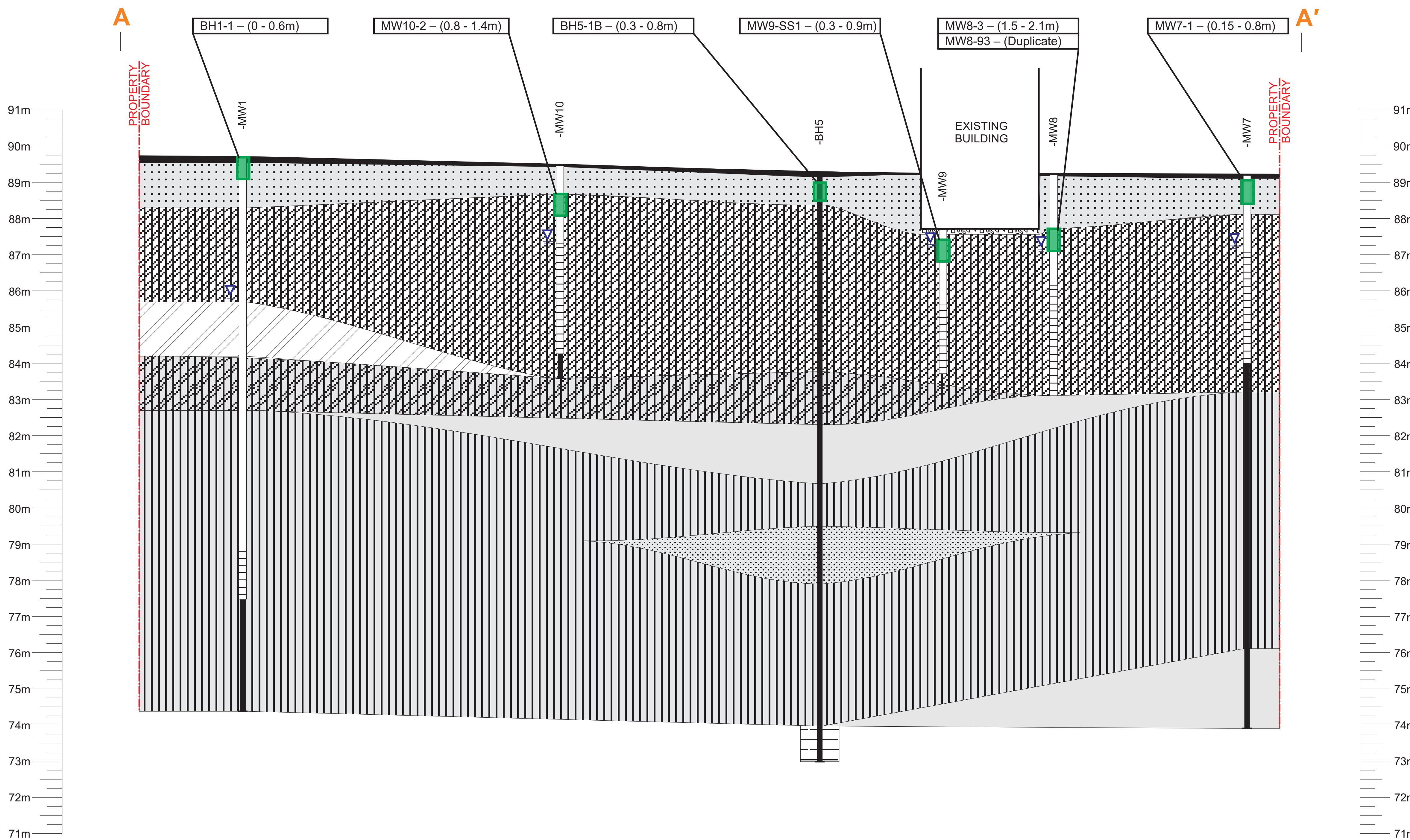
PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN	SF
CHECKED	STR
DRAWING #	FIGURE 10F

TERRAPEX

SOIL ANALYTICAL RESULTS - CYANIDE (CN-)
CROSS SECTION A - A'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT
ALTONA GROUP



LEGEND

- ASPHALT
- CONCRETE
- FILL
- CLAY
- SILT
- SILTY SAND TILL
- SILTY CLAY/ CLAYEY SILT
- SANDY SILTY CLAY
- SAND
- GRAVELLY SAND (TILL)
- SHALE
- GROUNDWATER LEVEL (AS OF MARCH 1, 2019)
- MONITORING WELL
- SCREENED LEVEL
- BOREHOLE

ANALYSIS INFORMATION

- Less than or equal to Table 3 SCS
- Greater than Table 3 SCS

Sample I.D. — Sample depth
MW103-4 – (depth)

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; Residential / Parkland / Institutional land use, coarse textured soil

VERTICAL SCALE:
0 — 2.5m — 5m
(APPROXIMATE)

HORIZONTAL SCALE:
0 — 10m — 20m
(APPROXIMATE)

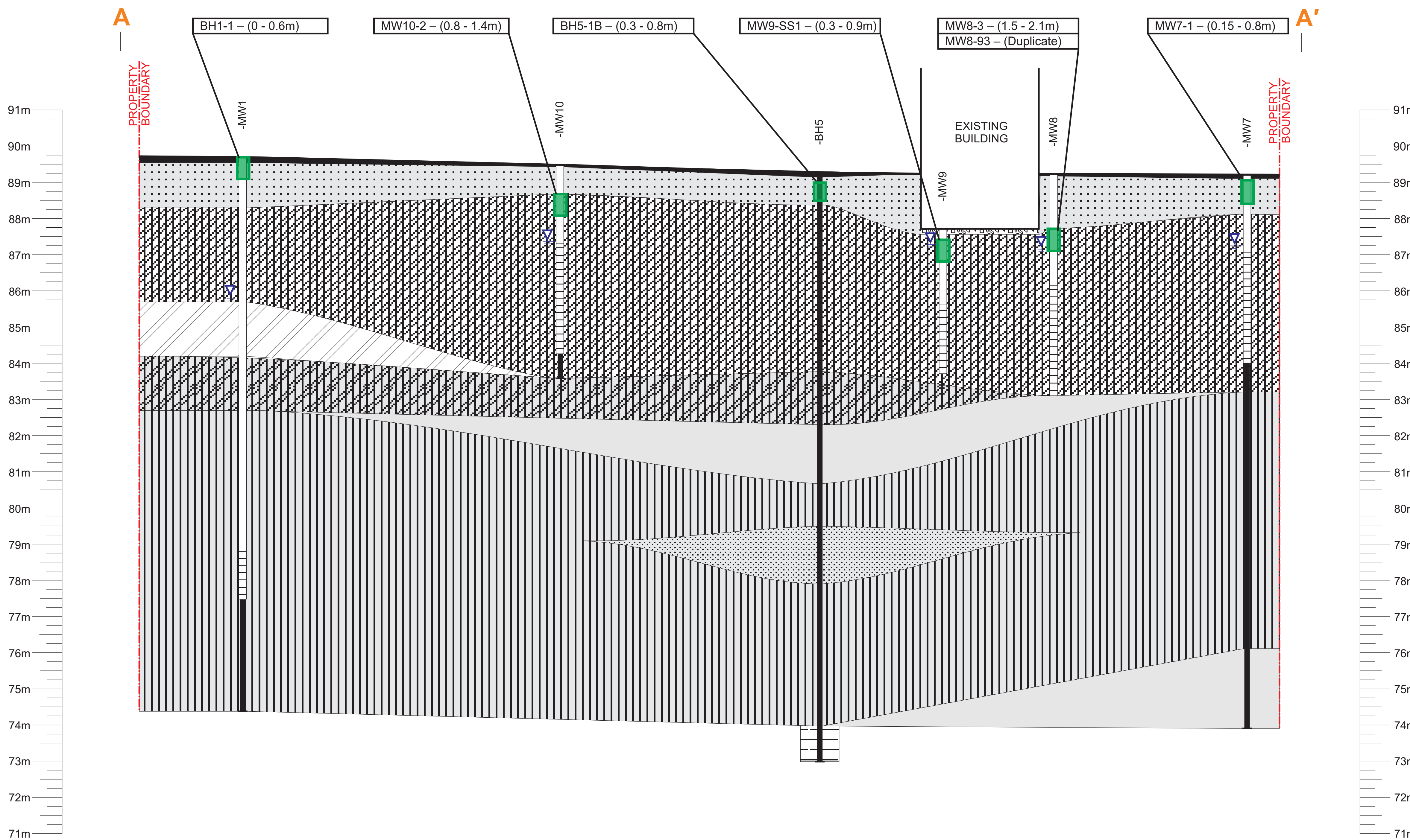
PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN	SF
CHECKED	STR
DRAWING #	FIGURE 10G

SOIL ANALYTICAL RESULTS - CYANIDE (CN-)
CROSS SECTION A - A'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

TERRAPEX

CLIENT: ALTONA GROUP



LEGEND

- ASPHALT
- CONCRETE
- FILL
- CLAY
- SILT
- SILTY SAND TILL
- SILTY CLAY/ CLAYEY SILT
- SANDY SILTY CLAY
- SAND
- GRAVELLY SAND (TILL)
- SHALE
- GROUNDWATER LEVEL (AS OF MARCH 1, 2019)
- MONITORING WELL
- SCREENED LEVEL
- BOREHOLE

ANALYSIS INFORMATION

- Less than or equal to Table 3 SCS
- Greater than Table 3 SCS

Sample I.D. Sample depth
MW103-4 – (depth)

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; Residential / Parkland / Institutional land use, coarse textured soil

VERTICAL SCALE: 0 2.5m 5m (APPROXIMATE)

HORIZONTAL SCALE: 0 10m 20m (APPROXIMATE)

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN	SF
CHECKED	STR
DRAWING #	FIGURE 10H

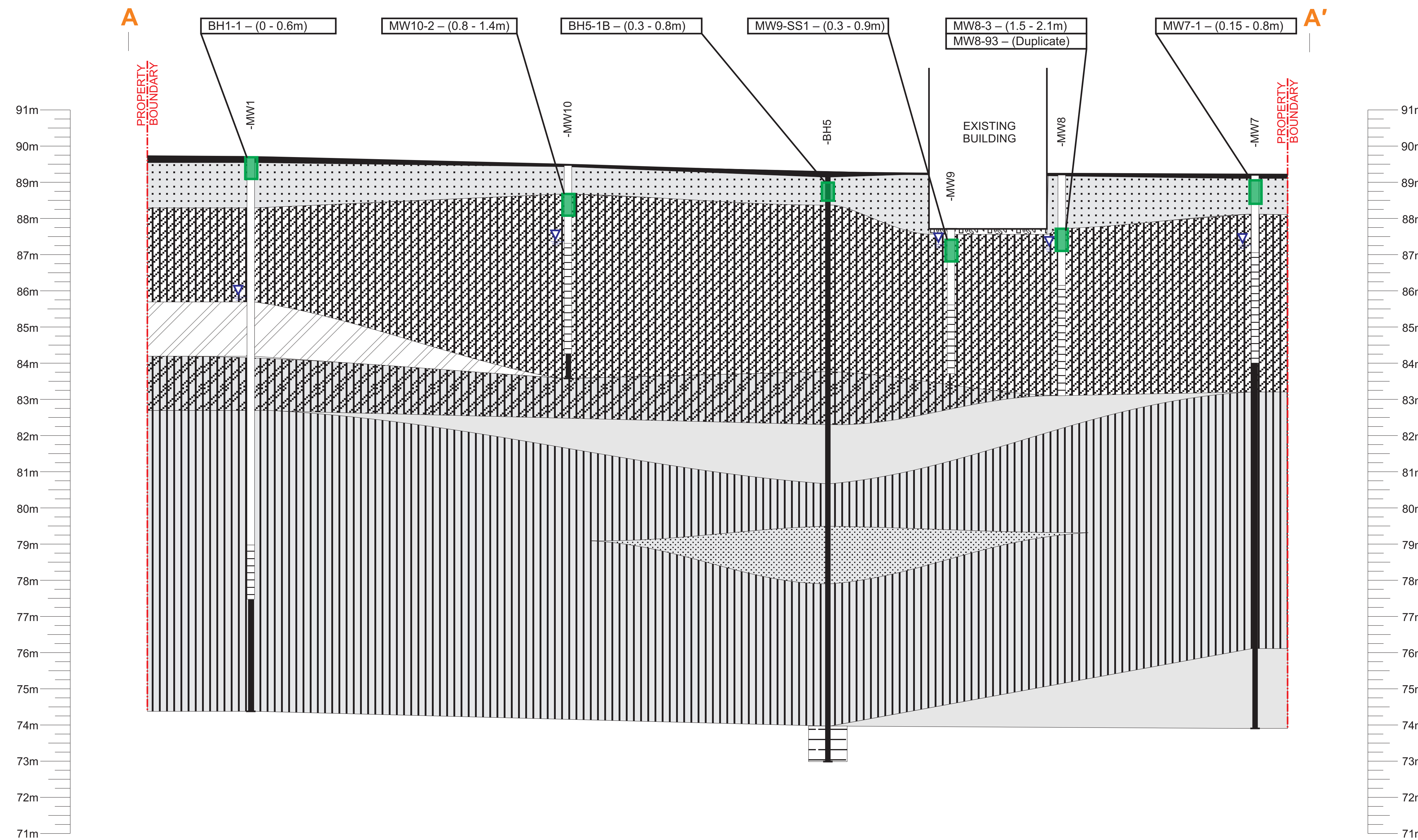
TERRAPEX

SOIL ANALYTICAL RESULTS - MERCURY
CROSS SECTION A - A'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP



LEGEND

- ASPHALT
- CONCRETE
- FILL
- CLAY
- SILT
- SILTY SAND TILL
- SILTY CLAY/ CLAYEY SILT
- SANDY SILTY CLAY
- SAND
- GRAVELLY SAND (TILL)
- SHALE
- GROUNDWATER LEVEL (AS OF MARCH 1, 2019)
- MONITORING WELL
- SCREENED LEVEL
- BOREHOLE

ANALYSIS INFORMATION

- Less than or equal to Table 3 SCS
- Greater than Table 3 SCS

Sample I.D. — Sample depth
MW103-4 – (depth)

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; Residential / Parkland / Institutional land use, coarse textured soil

VERTICAL SCALE: 0 — 2.5m — 5m (APPROXIMATE)

HORIZONTAL SCALE: 0 — 10m — 20m (APPROXIMATE)

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN	SF
CHECKED	STR
DRAWING #	FIGURE 10I

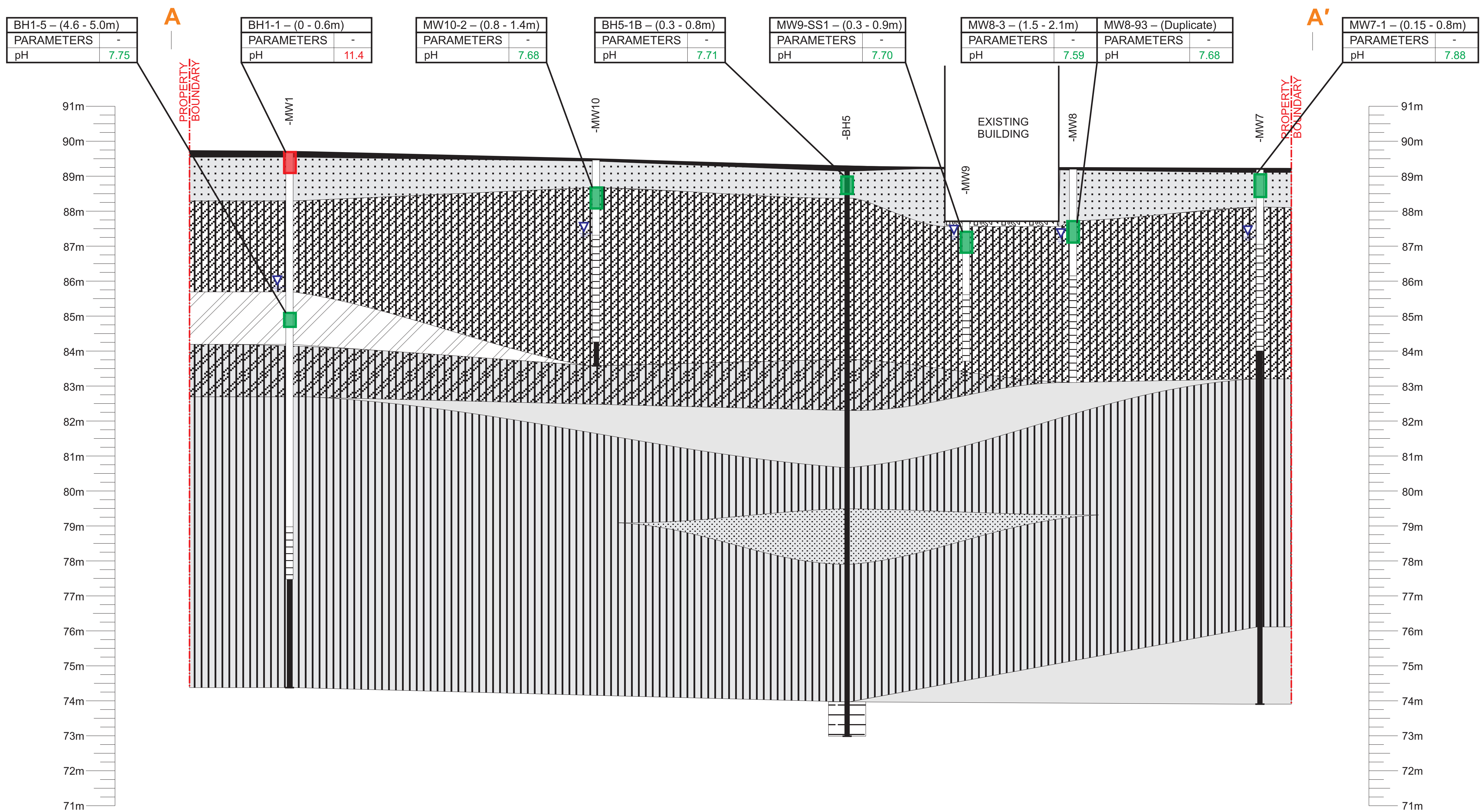
TERRAPEX

SOIL ANALYTICAL RESULTS - pH
CROSS SECTION A - A'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP



LEGEND

- ASPHALT
- CONCRETE
- FILL
- CLAY
- SILT
- SILTY SAND TILL
- SILTY CLAY/ CLAYEY SILT
- SANDY SILTY CLAY
- SAND
- GRAVELLY SAND (TILL)
- SHALE
- GROUNDWATER LEVEL (AS OF MARCH 1, 2019)
- MONITORING WELL
- SCREENED LEVEL
- BOREHOLE

ANALYSIS INFORMATION

- Less than or equal to Table 3 SCS
- Greater than Table 3 SCS

Sample I.D. — Sample depth

BH103-4 – (depth)	
PARAMETERS	-
pH	7.0

TABLE 2 SCS
-

VALUE Less than or equal to Table 2 SCS
VALUE Greater than Table 2 SCS

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; Residential / Parkland / Institutional land use, coarse textured soil

VERTICAL SCALE:
0 2.5m 5m
(APPROXIMATE)

HORIZONTAL SCALE:
0 10m 20m
(APPROXIMATE)

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN SF	CHECKED STR
DRAWING #	FIGURE 10J

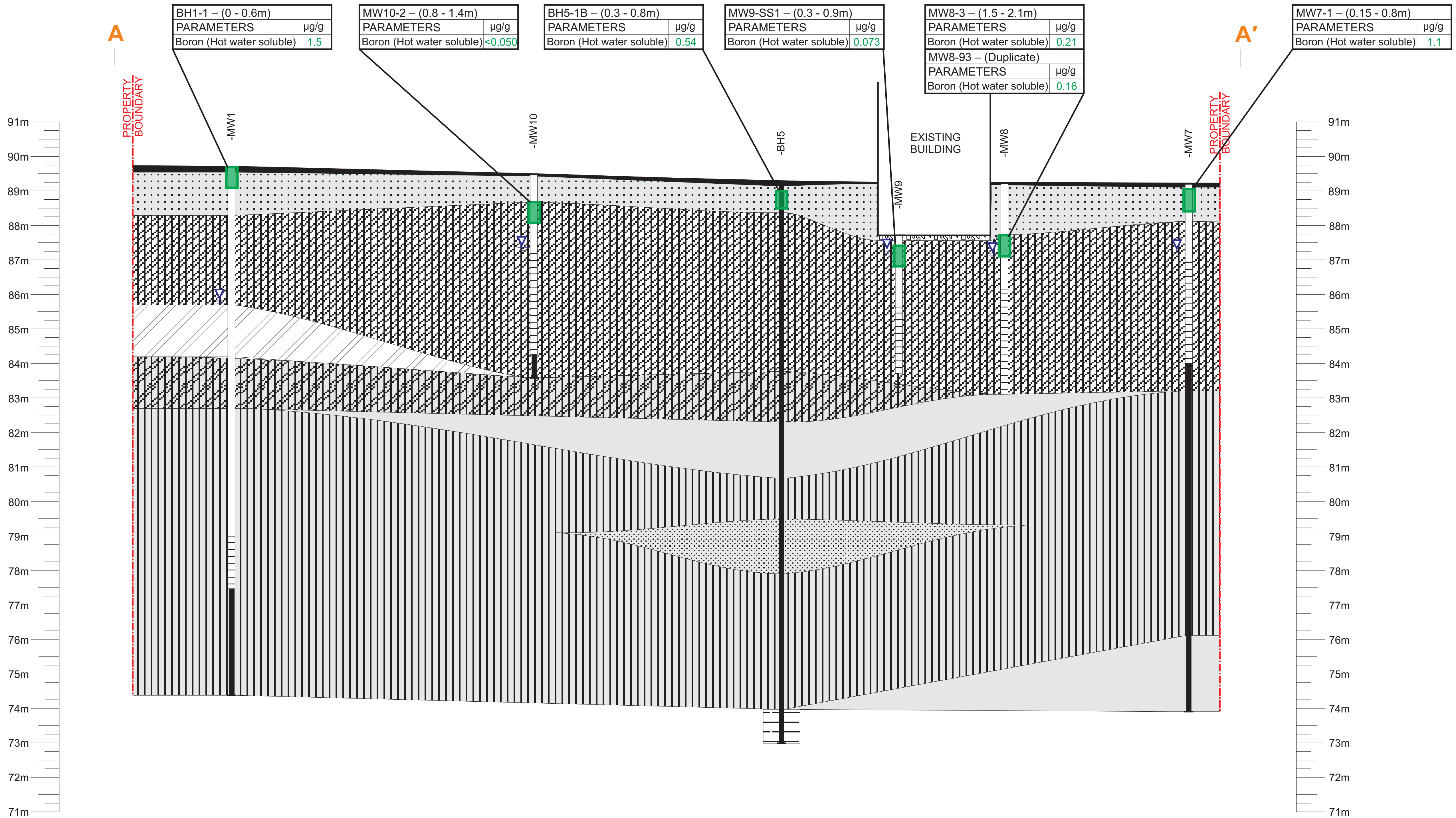
TERRAPEX

SOIL ANALYTICAL RESULTS - BORON (HOT WATER SOLUBLE) - CROSS SECTION A - A'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP



LEGEND

ASPHALT
CONCRETE
FILL
CLAY
SILT
SILTY SAND TILL
SILTY CLAY/ CLAYEY SILT
SANDY SILTY CLAY
SAND
GRAVELLY SAND (TILL)
SHALE
GROUNDWATER LEVEL (AS OF MARCH 1, 2019)

- MONITORING WELL
- SCREENED LEVEL
- BOREHOLE

ANALYSIS INFORMATION

Less than or equal to Table 3 SCS
Greater than Table 3 SCS
VALUE Less than or equal to Table 2 SCS
VALUE Greater than Table 2 SCS

Sample I.D. — Sample depth

BH103-4 – (depth)	
PARAMETERS	µg/g
Boron (Hot water soluble)	0.05

TABLE 2 SCS
1.5

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; Residential / Parkland / Institutional land use, coarse textured soil

VERTICAL SCALE:
0 2.5m 5m
(APPROXIMATE)

HORIZONTAL SCALE:
0 10m 20m
(APPROXIMATE)

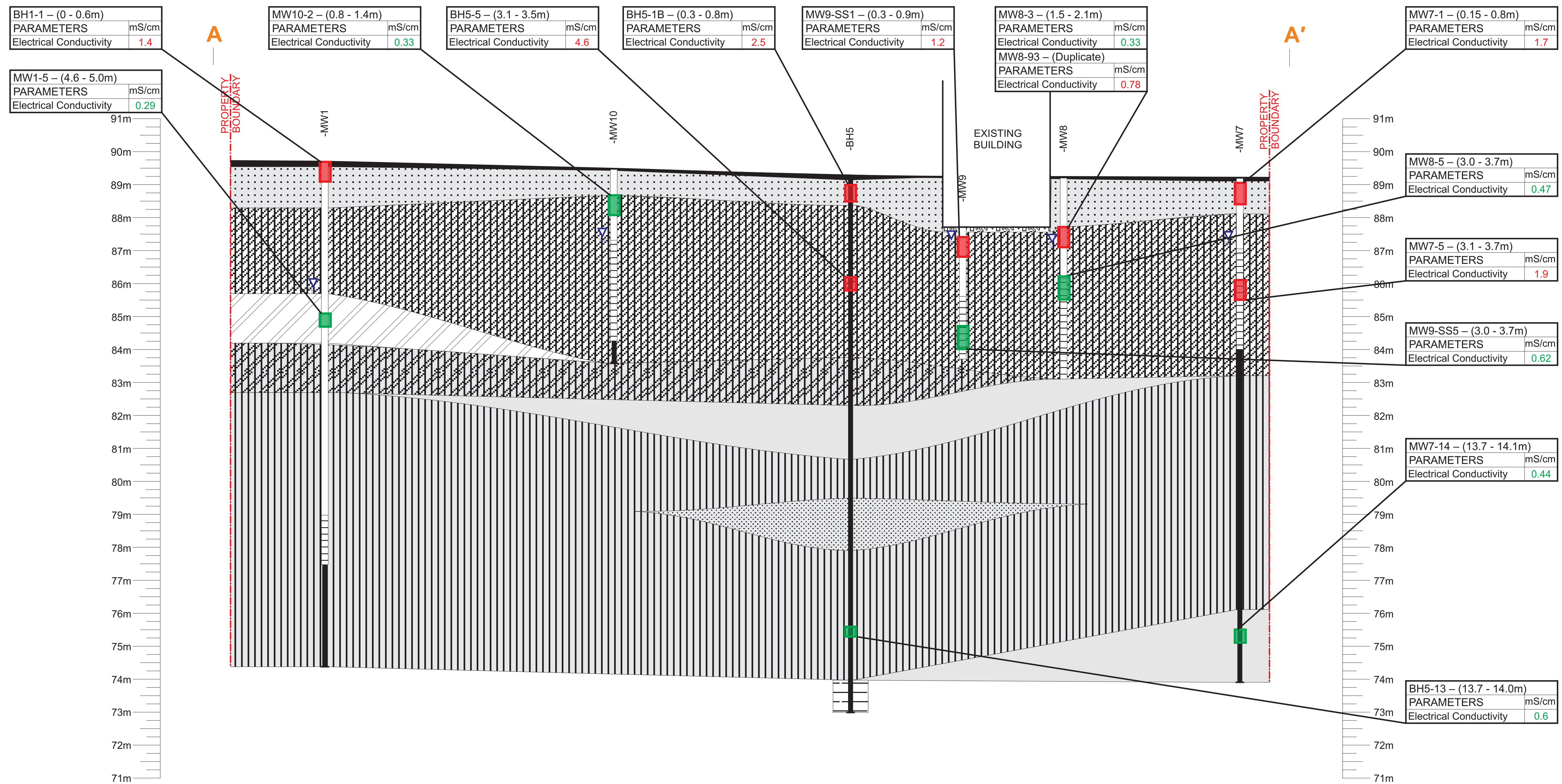
PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN SF	CHECKED STR
DRAWING #	FIGURE 10K

SOIL ANALYTICAL RESULTS - ELECTRICAL CONDUCTIVITY - CROSS SECTION A - A'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

TERRAPEX

CLIENT: ALTONA GROUP



LEGEND

- ASPHALT
- CONCRETE
- FILL
- CLAY
- SILT
- SILTY SAND TILL
- SILTY CLAY/ CLAYEY SILT
- SANDY SILTY CLAY
- SAND
- GRAVELLY SAND (TILL)
- SHALE
- GROUNDWATER LEVEL (AS OF MARCH 1, 2019)
- MONITORING WELL
- SCREENED LEVEL
- BOREHOLE

ANALYSIS INFORMATION

- Less than or equal to Table 3 SCS
- Greater than Table 3 SCS

VALUE Less than or equal to Table 2 SCS
VALUE Greater than Table 2 SCS

Sample I.D. — Sample depth

BH103-4 – (depth)	
PARAMETERS	mS/cm
Electrical Conductivity	0.002

TABLE 2 SCS
0.7

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; Residential / Parkland / Institutional land use, coarse textured soil

VERTICAL SCALE: 0 2.5m 5m (APPROXIMATE)

HORIZONTAL SCALE: 0 10m 20m (APPROXIMATE)

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN	SF
CHECKED	STR
DRAWING #	FIGURE 10L

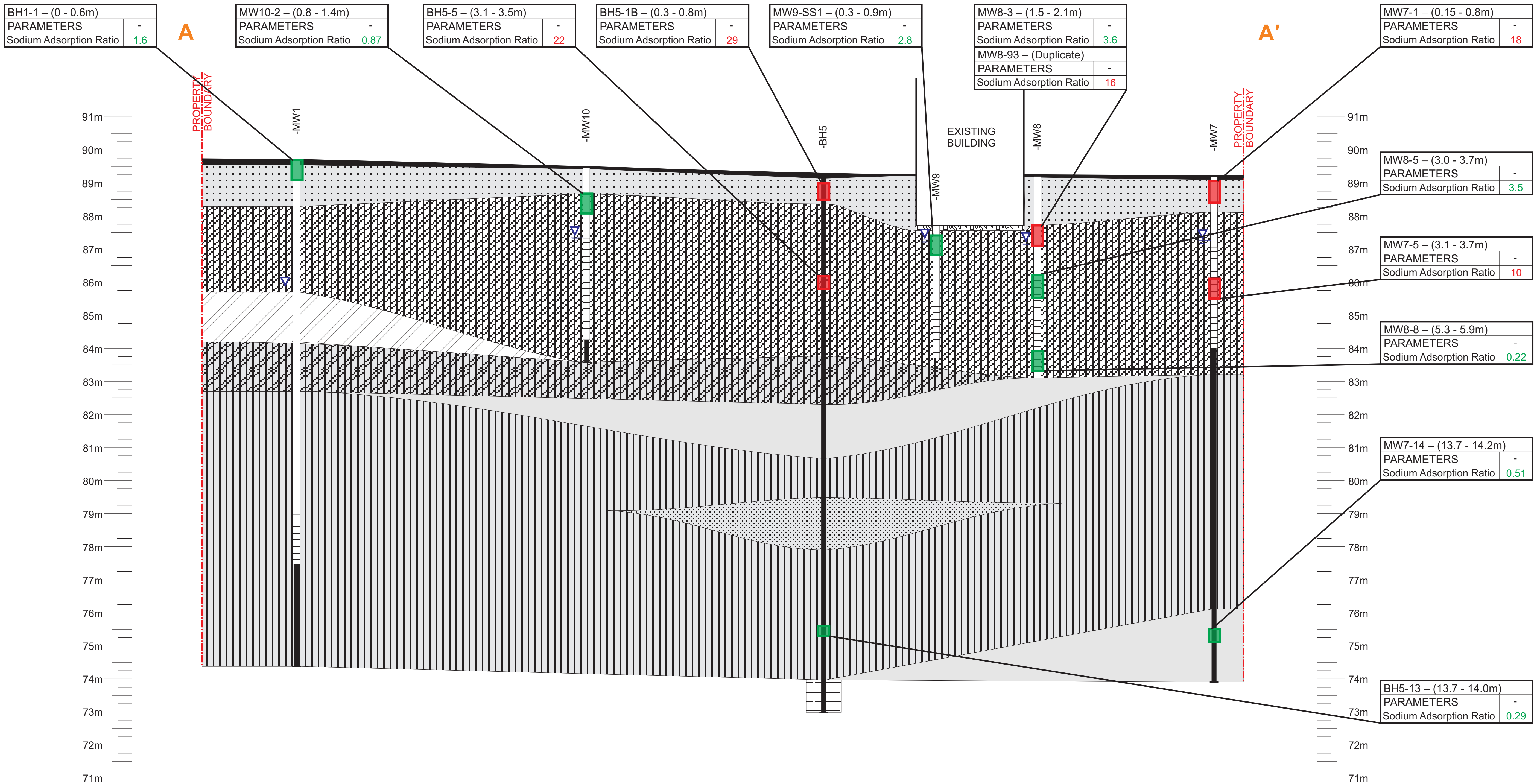
TERRAPEX

SOIL ANALYTICAL RESULTS - SODIUM ADSORPTION RATIO - CROSS SECTION A - A'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP



LEGEND

- ASPHALT
- CONCRETE
- FILL
- CLAY
- SILT
- SILTY SAND TILL
- SILTY CLAY/ CLAYEY SILT
- SANDY SILTY CLAY
- SAND
- GRAVELLY SAND (TILL)
- SHALE
- GROUNDWATER LEVEL (AS OF MARCH 1, 2019)
- MONITORING WELL
- SCREENED LEVEL
- BOREHOLE

ANALYSIS INFORMATION

- Less than or equal to Table 3 SCS
- Greater than Table 3 SCS

VALUE Less than or equal to Table 2 SCS
VALUE Greater than Table 2 SCS

Sample I.D. — Sample depth

BH103-4 – (depth)	
PARAMETERS	-
Sodium Adsorption Ratio	-

TABLE 2 SCS
5

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; Residential / Parkland / Institutional land use, coarse textured soil

VERTICAL SCALE:
0 2.5m 5m
(APPROXIMATE)

HORIZONTAL SCALE:
0 10m 20m
(APPROXIMATE)

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN SF	CHECKED STR
DRAWING #	FIGURE 10M

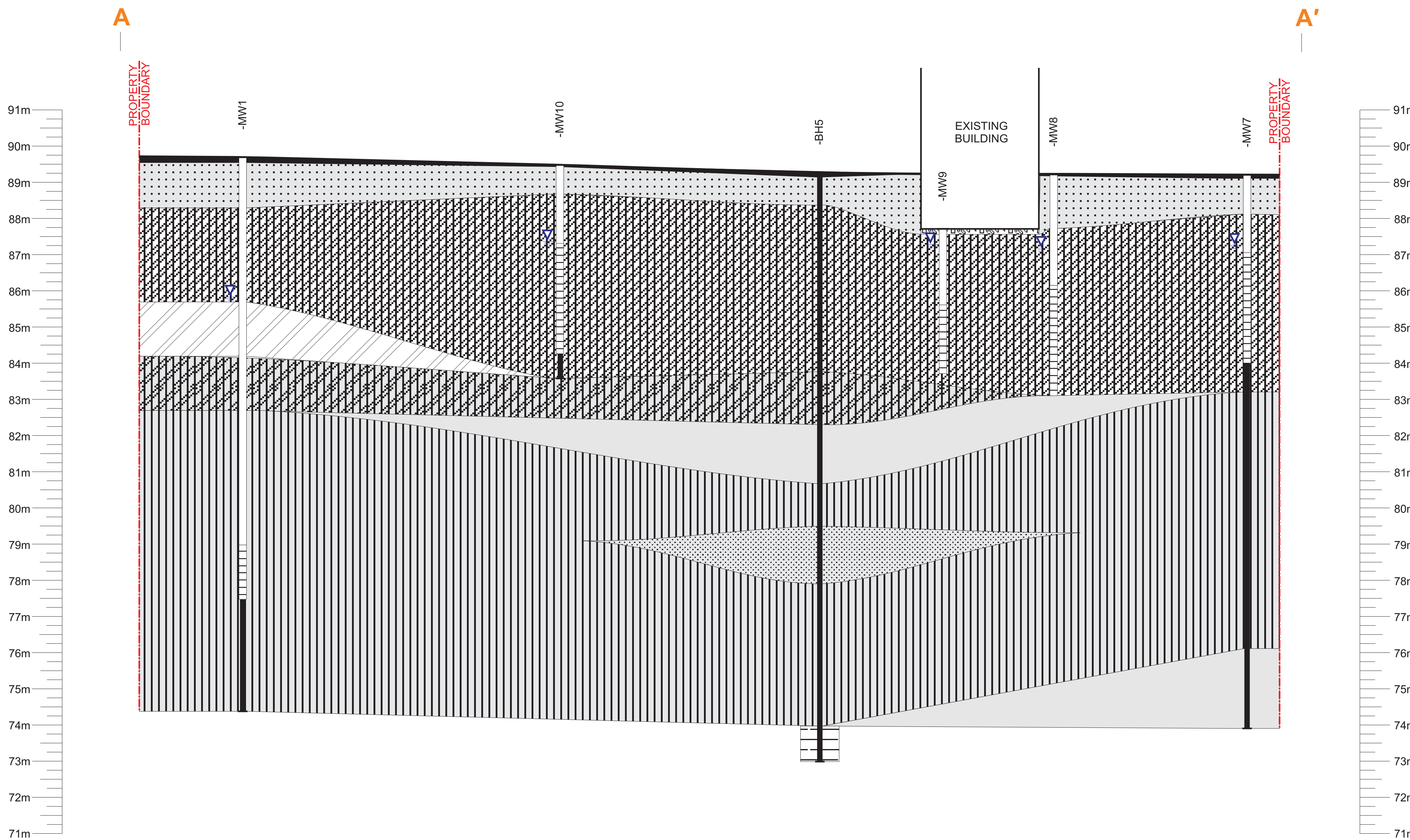
TERRAPEX

SOIL ANALYTICAL RESULTS - PCBs
CROSS SECTION A - A'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP



LEGEND

- ASPHALT
- CONCRETE
- FILL
- CLAY
- SILT
- SILTY SAND TILL
- SILTY CLAY/ CLAYEY SILT
- SANDY SILTY CLAY
- SAND
- GRAVELLY SAND (TILL)
- SHALE
- GROUNDWATER LEVEL (AS OF MARCH 1, 2019)
- MONITORING WELL
- SCREENED LEVEL
- BOREHOLE

ANALYSIS INFORMATION

- Less than or equal to Table 3 SCS
- Greater than Table 3 SCS

Sample I.D. Sample depth
MW103-4 – (depth)

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; Residential / Parkland / Institutional land use, coarse textured soil

VERTICAL SCALE: 0 2.5m 5m (APPROXIMATE)

HORIZONTAL SCALE: 0 10m 20m (APPROXIMATE)

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN	SF
CHECKED	STR
DRAWING #	FIGURE 10N

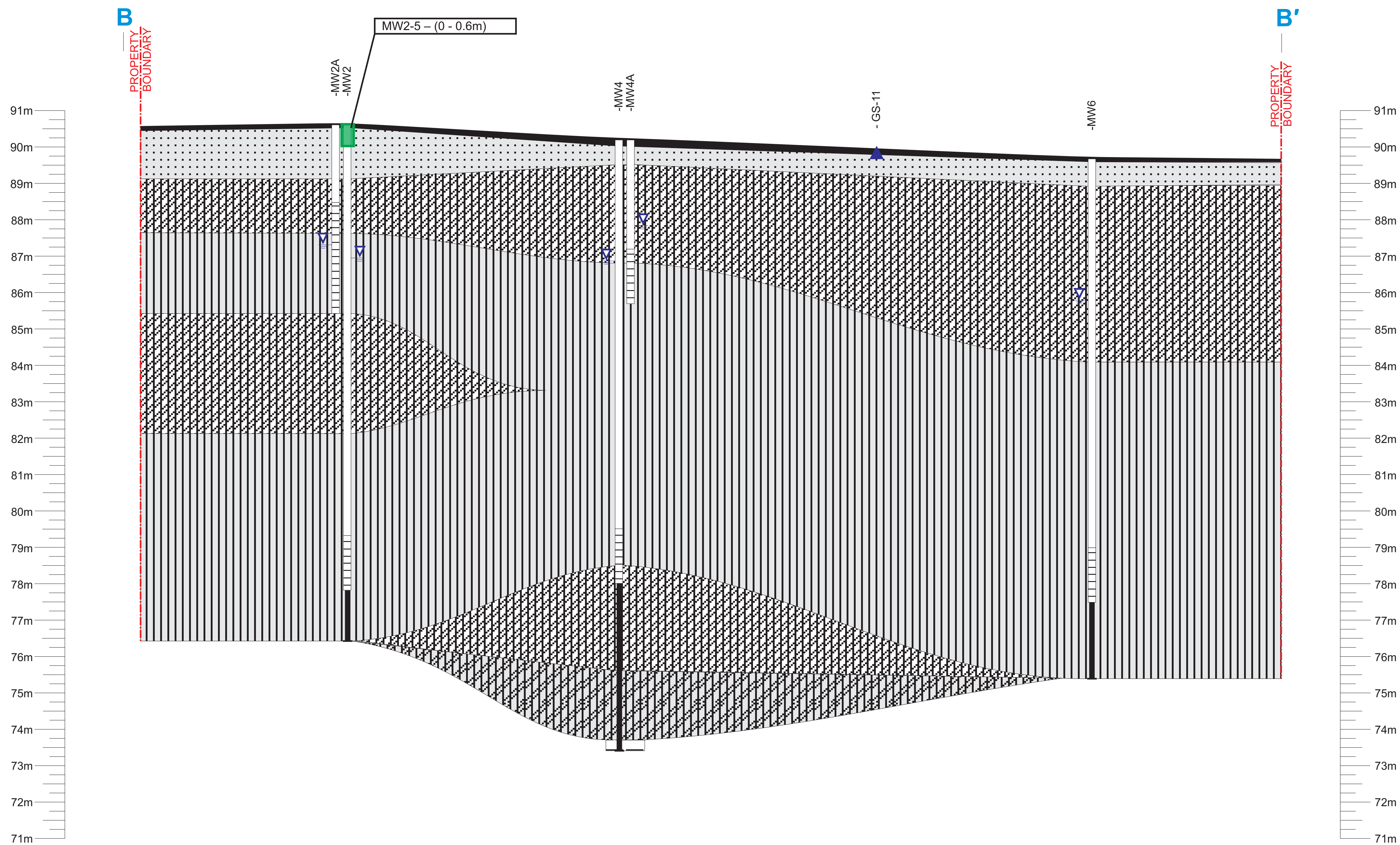
TERRAPEX

SOIL ANALYTICAL RESULTS - PHCs CROSS SECTION B - B'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP



LEGEND

- ASPHALT
- CONCRETE
- FILL
- CLAY
- SILT
- SILTY SAND TILL
- SILTY CLAY/ CLAYEY SILT
- SANDY SILTY CLAY
- SAND
- SHALE
- GROUNDWATER LEVEL (AS OF MARCH 1, 2019)
- SOIL SAMPLE
- MONITORING WELL
- SCREENED LEVEL
- BOREHOLE

ANALYSIS INFORMATION

- Less than or equal to Table 3 SCS
- Greater than Table 3 SCS

Sample I.D. — Sample depth
MW103-4 – (depth)

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; Residential / Parkland / Institutional land use, coarse textured soil

VERTICAL SCALE: 0 — 2.5m — 5m (APPROXIMATE)

HORIZONTAL SCALE: 0 — 10m — 20m (APPROXIMATE)

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN	SF
CHECKED	STR
DRAWING #	FIGURE 11A

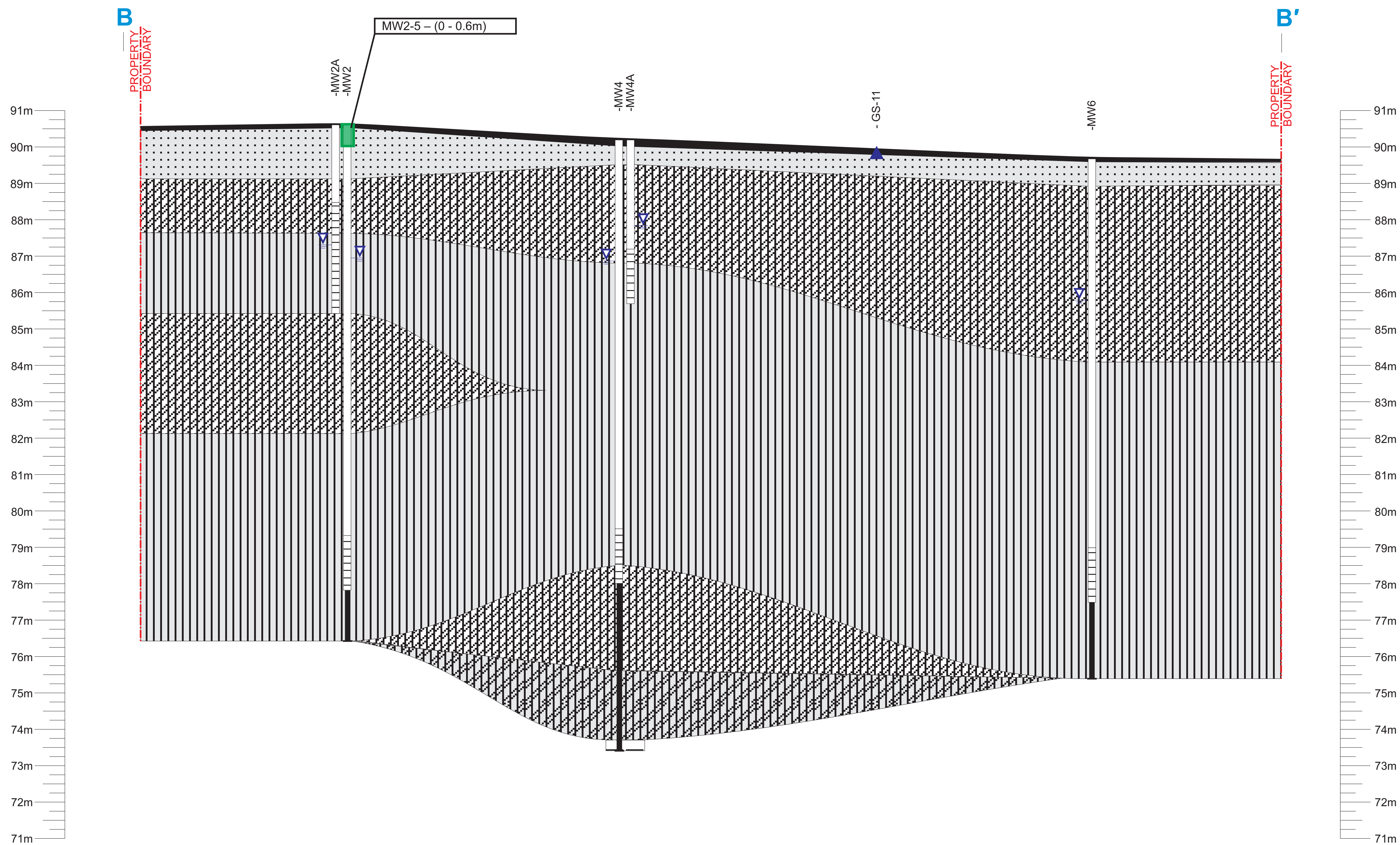
TERRAPEX

SOIL ANALYTICAL RESULTS - VOCs
CROSS SECTION B - B'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD PICKERING, ONTARIO

CLIENT

ALTONA GROUP



LEGEND

- ASPHALT
- CONCRETE
- FILL
- CLAY
- SILT
- SILTY SAND TILL
- SILTY CLAY/ CLAYEY SILT
- SANDY SILTY CLAY
- SAND
- SHALE
- GROUNDWATER LEVEL (AS OF MARCH 1, 2019)
- SOIL SAMPLE
- MONITORING WELL
- SCREENED LEVEL
- BOREHOLE

ANALYSIS INFORMATION

- Less than or equal to Table 3 SCS
- Greater than Table 3 SCS

Sample I.D. Sample depth
MW103-4 – (depth)

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; Residential / Parkland / Institutional land use, coarse textured soil

VERTICAL SCALE: 0 2.5m 5m (APPROXIMATE)

HORIZONTAL SCALE: 0 10m 20m (APPROXIMATE)

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN SF	CHECKED STR
DRAWING #	FIGURE 11B

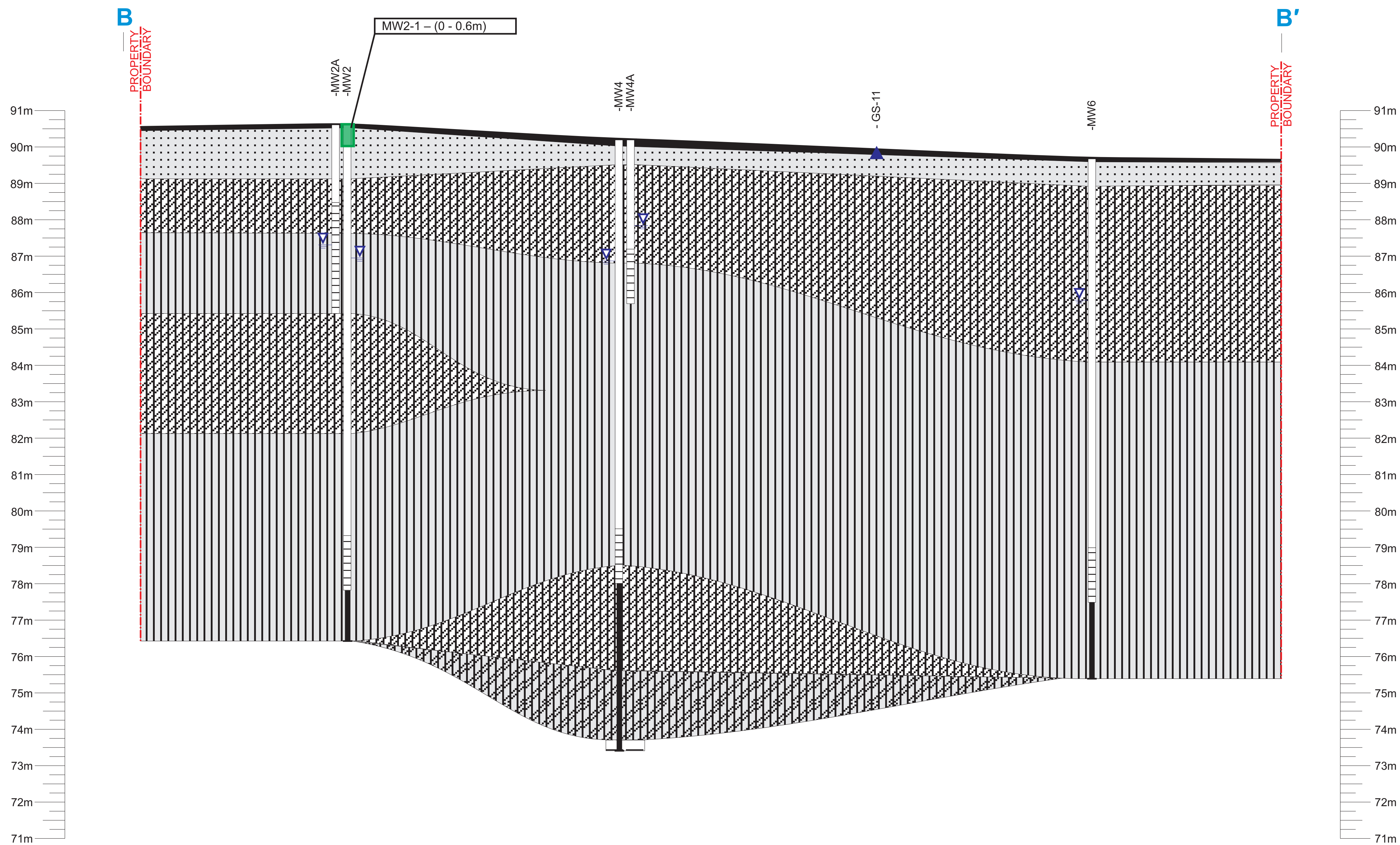
TERRAPEX

SOIL ANALYTICAL RESULTS - PAHs
CROSS SECTION B - B'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP



LEGEND

- ASPHALT
- CONCRETE
- FILL
- CLAY
- SILT
- SILTY SAND TILL
- SILTY CLAY/ CLAYEY SILT
- SANDY SILTY CLAY
- SAND
- SHALE
- GROUNDWATER LEVEL (AS OF MARCH 1, 2019)
- - SOIL SAMPLE
- - MONITORING WELL
- - SCREENED LEVEL
- - BOREHOLE

ANALYSIS INFORMATION

- Less than or equal to Table 3 SCS
- Greater than Table 3 SCS

Sample I.D. / Sample depth: MW103-4 – (depth)

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; Residential / Parkland / Institutional land use, coarse textured soil

VERTICAL SCALE: 0 — 2.5m — 5m (APPROXIMATE)

HORIZONTAL SCALE: 0 — 10m — 20m (APPROXIMATE)

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN	SF
CHECKED	STR
DRAWING #	FIGURE 11C

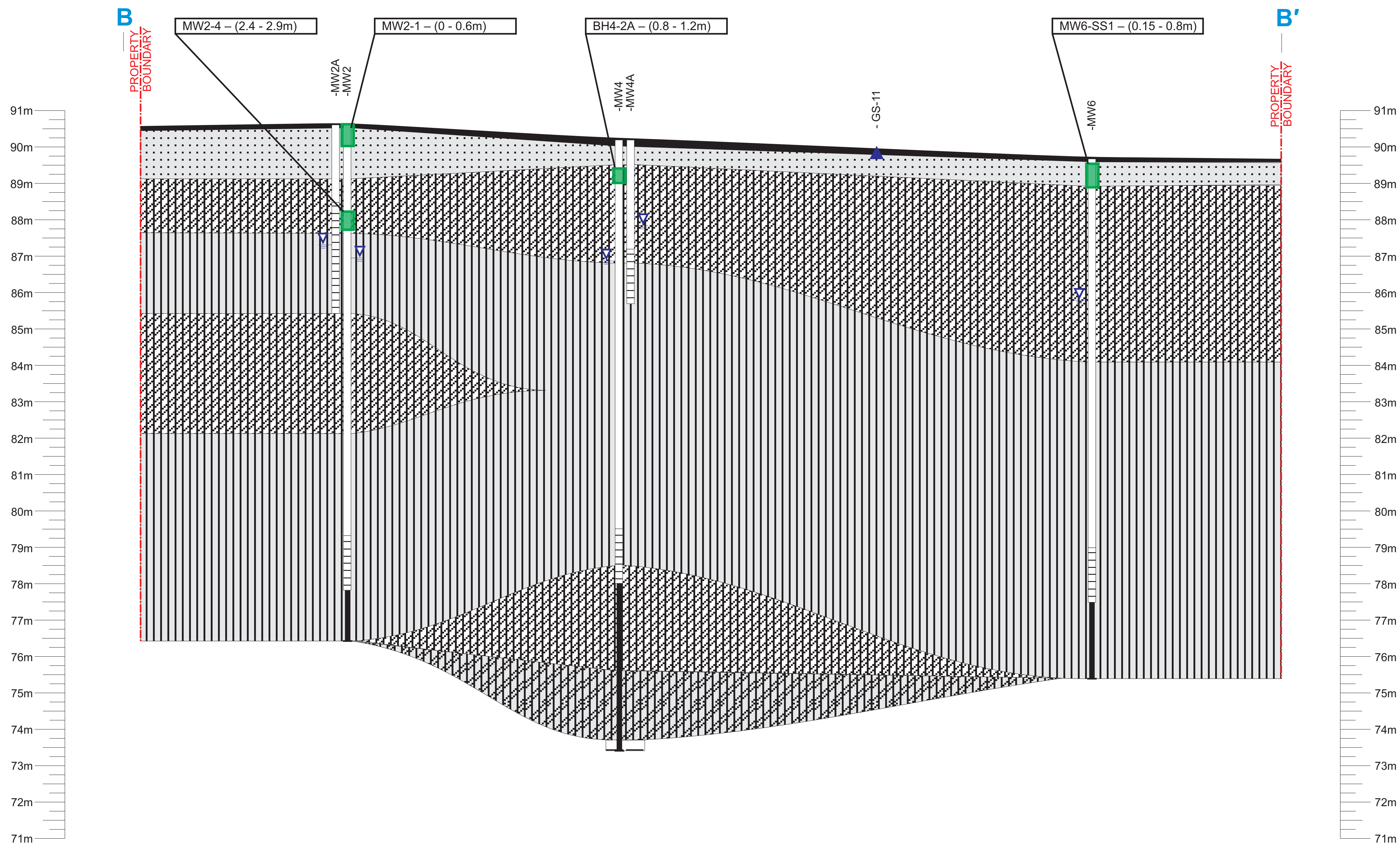
TERRAPEX

SOIL ANALYTICAL RESULTS - METALS CROSS SECTION B - B'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD PICKERING, ONTARIO

CLIENT

ALTONA GROUP



LEGEND

- ASPHALT
- CONCRETE
- FILL
- CLAY
- SILT
- SILTY SAND TILL
- SILTY CLAY/ CLAYEY SILT
- SANDY SILTY CLAY
- SAND
- SHALE
- GROUNDWATER LEVEL (AS OF MARCH 1, 2019)
- SOIL SAMPLE
- MONITORING WELL
- SCREENED LEVEL
- BOREHOLE

ANALYSIS INFORMATION

- Less than or equal to Table 3 SCS
- Greater than Table 3 SCS

Sample I.D. Sample depth
MW103-4 – (depth)

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; Residential / Parkland / Institutional land use, coarse textured soil

VERTICAL SCALE: 0 2.5m 5m (APPROXIMATE)

HORIZONTAL SCALE: 0 10m 20m (APPROXIMATE)

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN	SF
CHECKED	STR
DRAWING #	FIGURE 11D

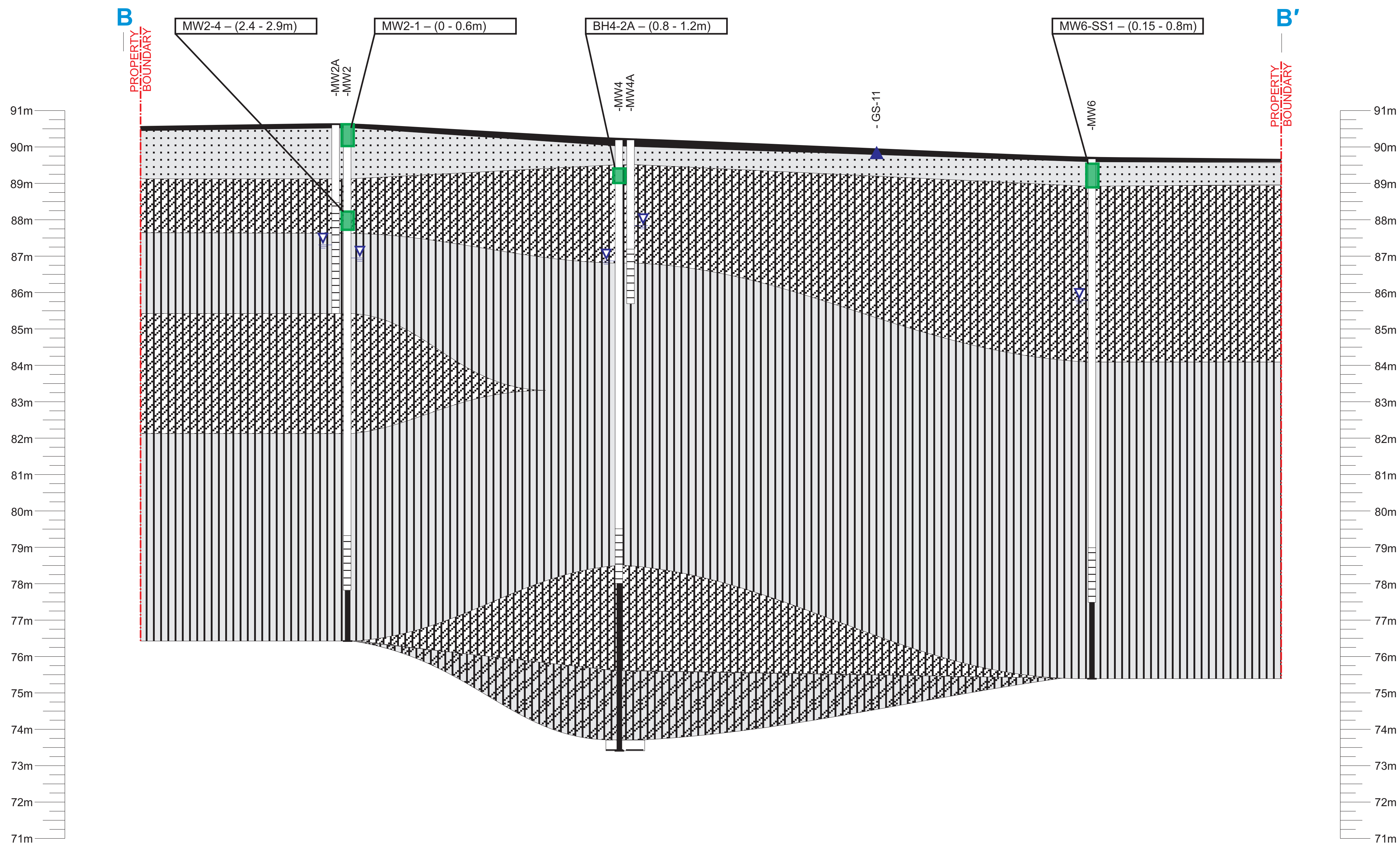
TERRAPEX

SOIL ANALYTICAL RESULTS - HYDRIDE-FORMING METALS - CROSS SECTION B - B'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP



LEGEND

- ASPHALT
- CONCRETE
- FILL
- CLAY
- SILT
- SILTY SAND TILL
- SILTY CLAY/ CLAYEY SILT
- SANDY SILTY CLAY
- SAND
- SHALE
- GROUNDWATER LEVEL (AS OF MARCH 1, 2019)
- SOIL SAMPLE
- MONITORING WELL
- SCREENED LEVEL
- BOREHOLE

ANALYSIS INFORMATION

- Less than or equal to Table 3 SCS
- Greater than Table 3 SCS

Sample I.D. — Sample depth: MW103-4 – (depth)

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; Residential / Parkland / Institutional land use, coarse textured soil

VERTICAL SCALE: 0 — 2.5m — 5m (APPROXIMATE)

HORIZONTAL SCALE: 0 — 10m — 20m (APPROXIMATE)

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN	SF
CHECKED	STR
DRAWING #	FIGURE 11E

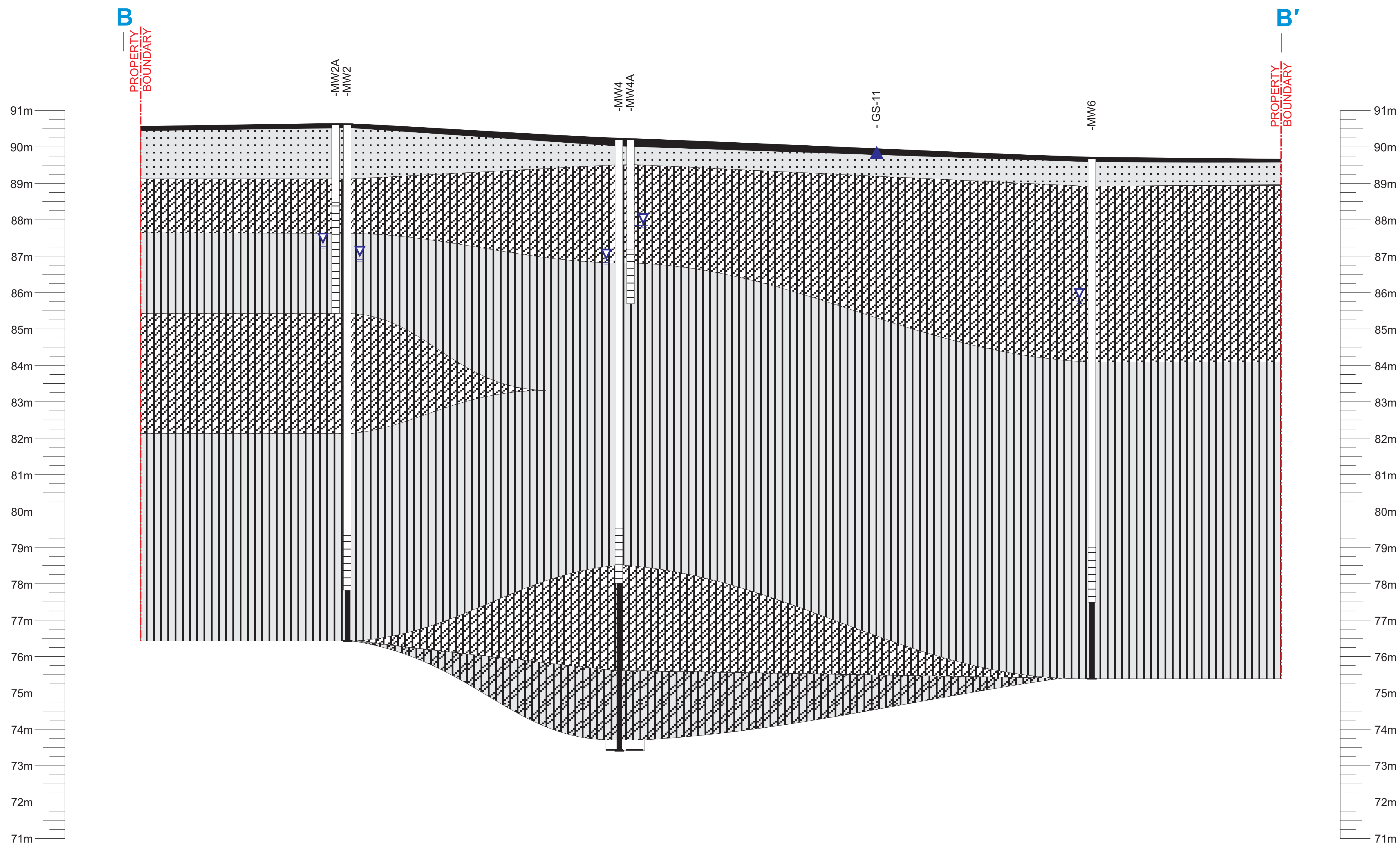
TERRAPEX

SOIL ANALYTICAL RESULTS - OC PESTICIDES
CROSS SECTION B - B'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP



LEGEND

- ASPHALT
- CONCRETE
- FILL
- CLAY
- SILT
- SILTY SAND TILL
- SILTY CLAY/ CLAYEY SILT
- SANDY SILTY CLAY
- SAND
- SHALE
- GROUNDWATER LEVEL (AS OF MARCH 1, 2019)
- SOIL SAMPLE
- MONITORING WELL
- SCREENED LEVEL
- BOREHOLE

ANALYSIS INFORMATION

- Less than or equal to Table 3 SCS
- Greater than Table 3 SCS

Sample I.D. — Sample depth
MW103-4 – (depth)

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; Residential / Parkland / Institutional land use, coarse textured soil

VERTICAL SCALE:
0 2.5m 5m
(APPROXIMATE)

HORIZONTAL SCALE:
0 10m 20m
(APPROXIMATE)

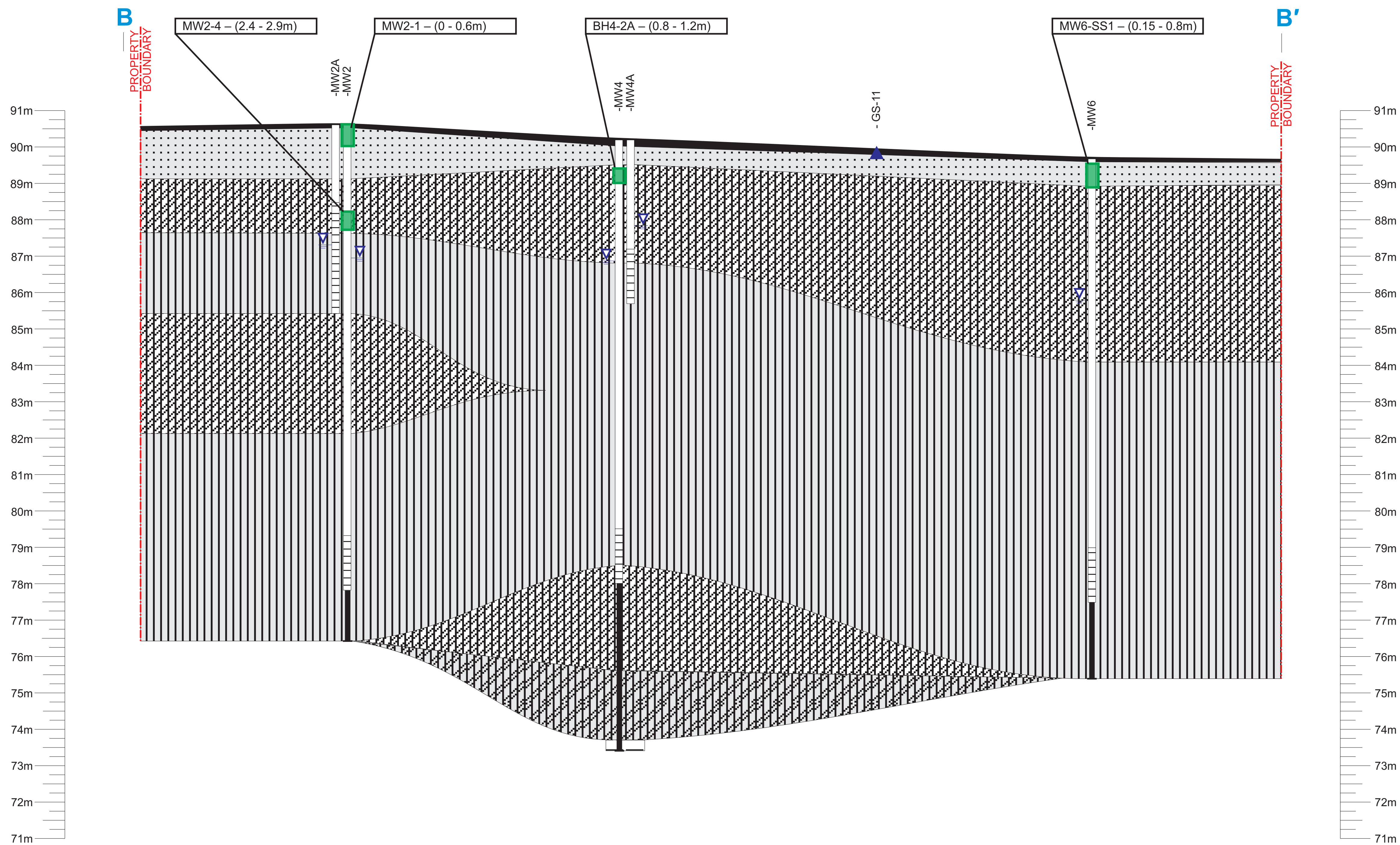
PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN	SF
CHECKED	STR
DRAWING #	FIGURE 11F

TERRAPEX

SOIL ANALYTICAL RESULTS - CYANIDE (CN-)
CROSS SECTION B - B'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT
ALTONA GROUP



LEGEND

- ASPHALT
- CONCRETE
- FILL
- CLAY
- SILT
- SILTY SAND TILL
- SILTY CLAY/ CLAYEY SILT
- SANDY SILTY CLAY
- SAND
- SHALE
- GROUNDWATER LEVEL (AS OF MARCH 1, 2019)
- SOIL SAMPLE
- MONITORING WELL
- SCREENED LEVEL
- BOREHOLE

ANALYSIS INFORMATION

- Less than or equal to Table 3 SCS
- Greater than Table 3 SCS

Sample I.D. Sample depth
MW103-4 – (depth)

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; Residential / Parkland / Institutional land use, coarse textured soil

VERTICAL SCALE: 0 2.5m 5m (APPROXIMATE)

HORIZONTAL SCALE: 0 10m 20m (APPROXIMATE)

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN	SF
CHECKED	STR
DRAWING #	FIGURE 11G

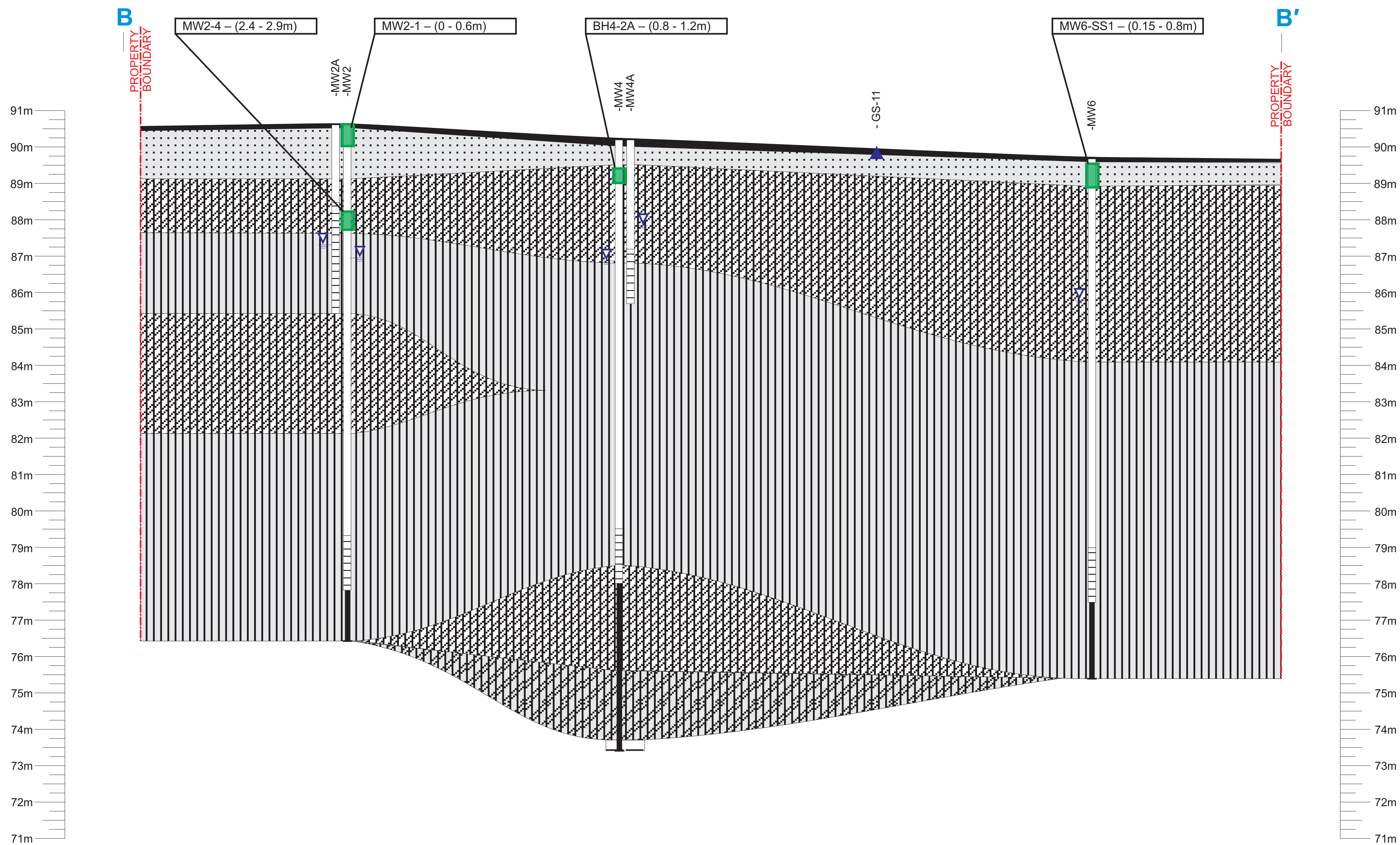
TERRAPEX

SOIL ANALYTICAL RESULTS - CYANIDE (CN-)
CROSS SECTION B - B'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP



LEGEND

ASPHALT	SANDY SILTY CLAY
CONCRETE	SAND
FILL	SHALE
CLAY	GROUNDWATER LEVEL (AS OF MARCH 1, 2019)
SILT	- SOIL SAMPLE
SILTY SAND TILL	- MONITORING WELL
SILTY CLAY/ CLAYEY SILT	- SCREENED LEVEL
	- BOREHOLE

ANALYSIS INFORMATION

- Less than or equal to Table 3 SCS
- Greater than Table 3 SCS

Sample I.D. — Sample depth

MW103-4 – (depth)

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; Residential / Parkland / Institutional land use, coarse textured soil

VERTICAL SCALE: *0 2.5m 5m (APPROXIMATE)*

HORIZONTAL SCALE: *0 10m 20m (APPROXIMATE)*

PROJECT #	*CT2817.00*
SCALE	*AS SHOWN*
DATE	*MARCH 2019*
DRAWN *SF*	CHECKED *STR*
DRAWING #	*FIGURE 11H*

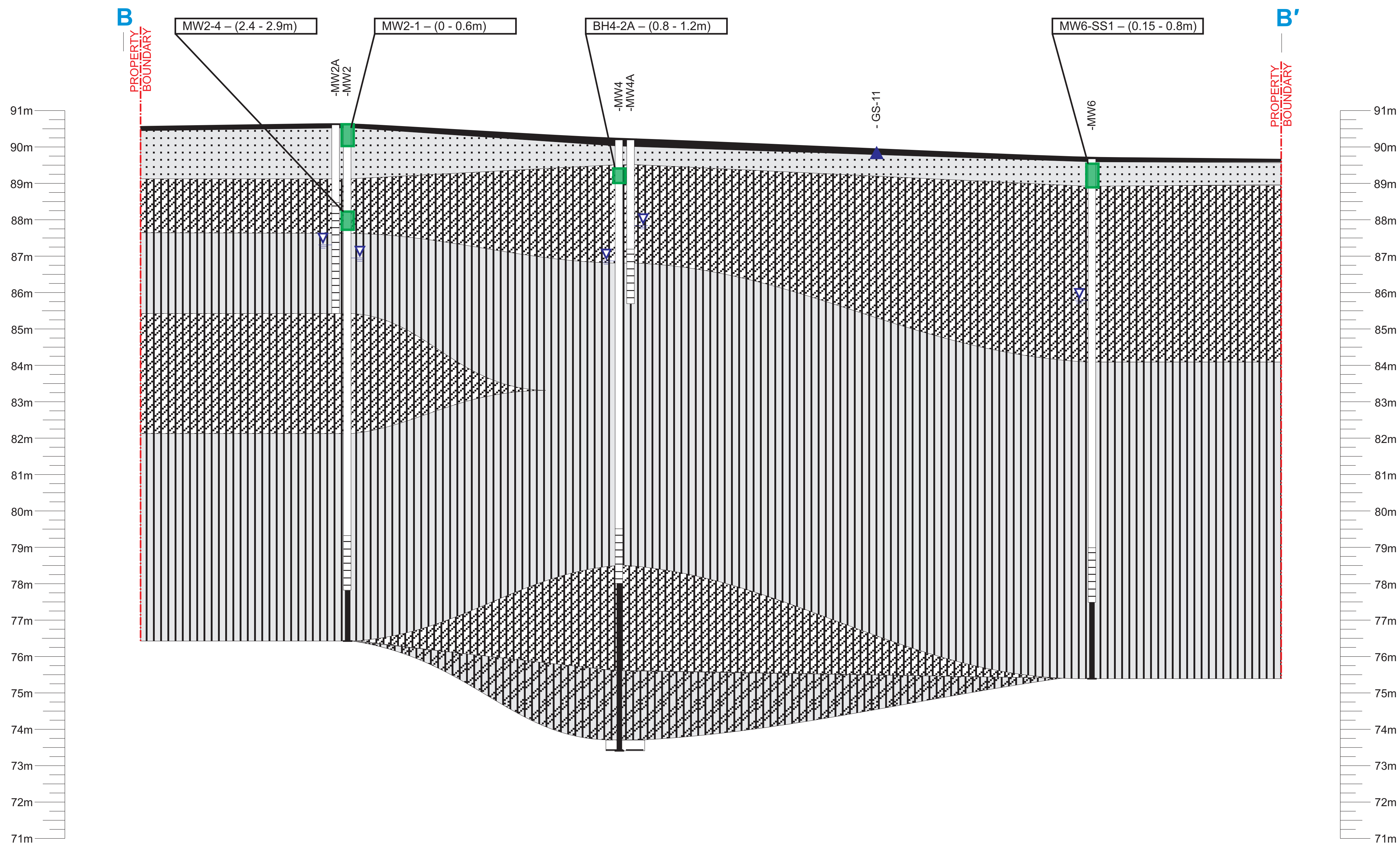
TERRAPEX

SOIL ANALYTICAL RESULTS - MERCURY
CROSS SECTION B - B'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP



LEGEND

- ASPHALT
- CONCRETE
- FILL
- CLAY
- SILT
- SILTY SAND TILL
- SILTY CLAY/ CLAYEY SILT
- SANDY SILTY CLAY
- SAND
- SHALE
- GROUNDWATER LEVEL (AS OF MARCH 1, 2019)
- SOIL SAMPLE
- MONITORING WELL
- SCREENED LEVEL
- BOREHOLE

ANALYSIS INFORMATION

- Less than or equal to Table 3 SCS
- Greater than Table 3 SCS

Sample I.D. — Sample depth
MW103-4 – (depth)

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; Residential / Parkland / Institutional land use, coarse textured soil

VERTICAL SCALE:
0 2.5m 5m
(APPROXIMATE)

HORIZONTAL SCALE:
0 10m 20m
(APPROXIMATE)

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN SF	CHECKED STR
DRAWING #	FIGURE 11I

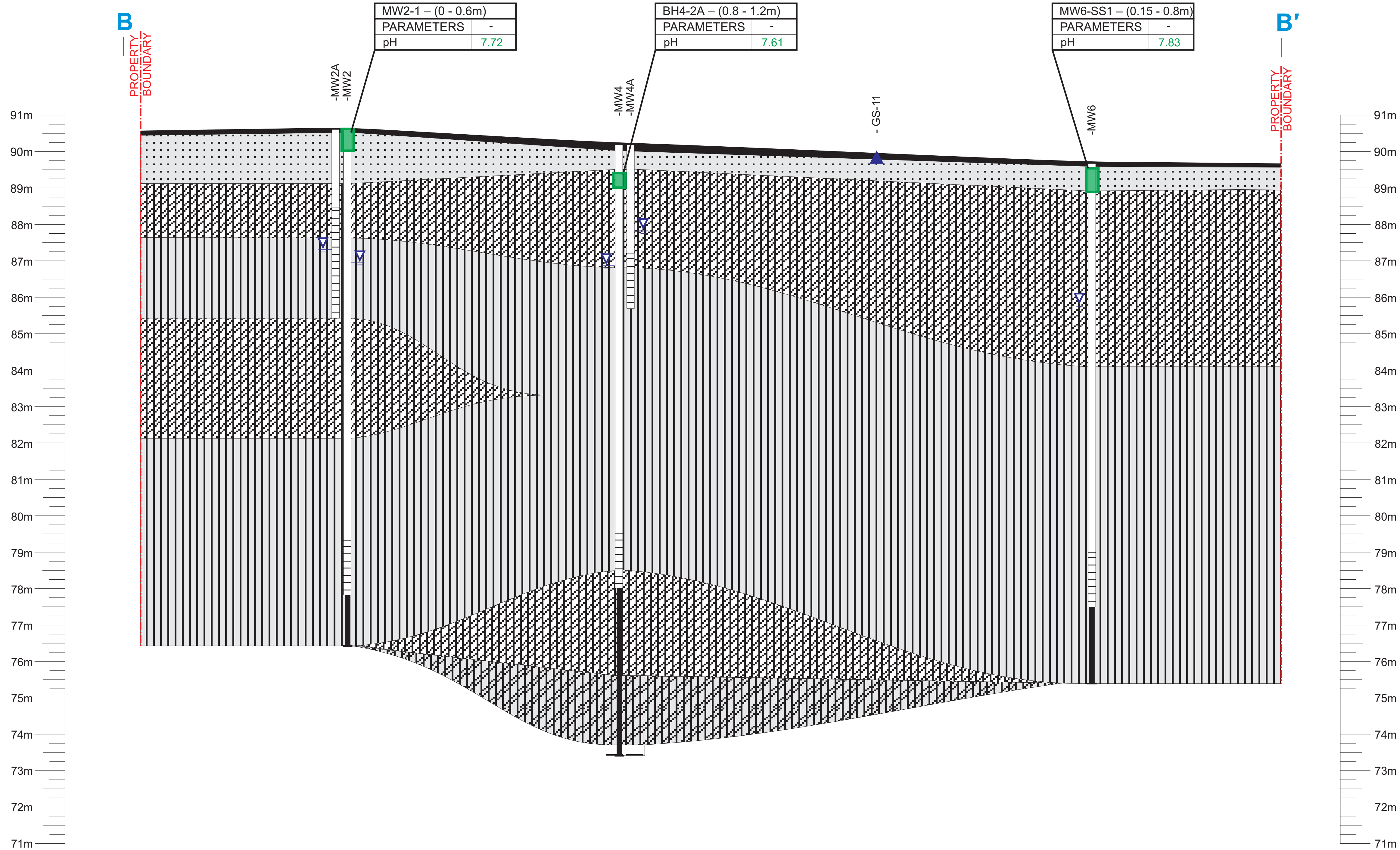
TERRAPEX

SOIL ANALYTICAL RESULTS - pH
CROSS SECTION B - B'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP



LEGEND

ASPHALT
CONCRETE
FILL
CLAY
SILT
SILTY SAND TILL
SILTY CLAY/ CLAYEY SILT
SANDY SILTY CLAY
SAND
SHALE
GROUNDWATER LEVEL (AS OF MARCH 1, 2019)
- SOIL SAMPLE
- MONITORING WELL
- SCREENED LEVEL
- BOREHOLE

ANALYSIS INFORMATION

Less than or equal to Table 3 SCS
Greater than Table 3 SCS
VALUE Less than or equal to Table 2 SCS
VALUE Greater than Table 2 SCS

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; Residential / Parkland / Institutional land use, coarse textured soil

Sample I.D.
Sample depth

BH103-4 – (depth)	
PARAMETERS	-
pH	7.0

TABLE 2 SCS
-

VERTICAL SCALE:
0 2.5m 5m
(APPROXIMATE)

HORIZONTAL SCALE:
0 10m 20m
(APPROXIMATE)

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN	SF
CHECKED	STR
DRAWING #	FIGURE 11J

TERRAPEX

SOIL ANALYTICAL RESULTS - BORON (HOT WATER SOLUBLE) - CROSS SECTION B - B'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP

MW2-12 – (12.2 - 12.8m)	
PARAMETERS	µg/g
Boron (Hot water soluble)	0.095

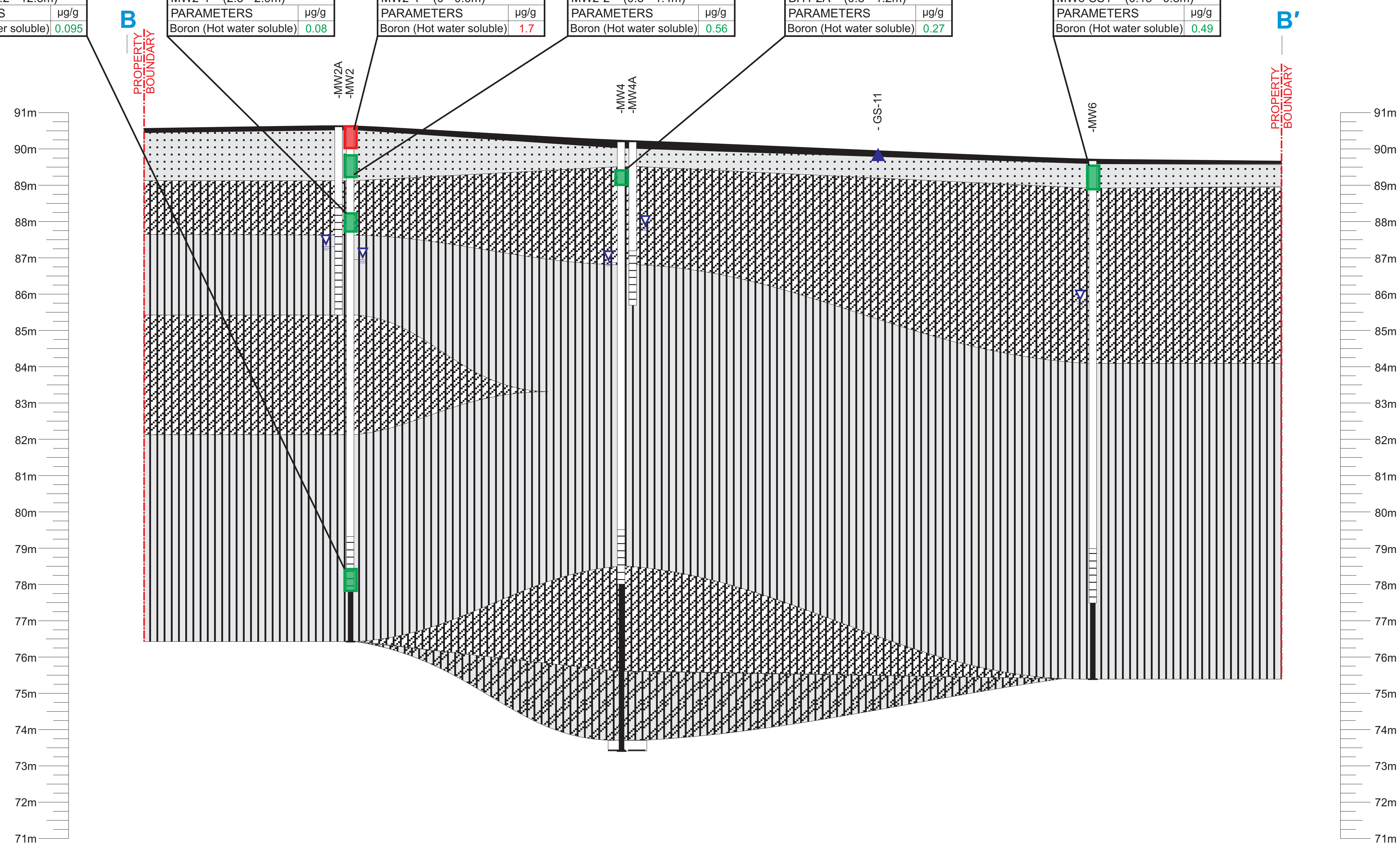
MW2-4 – (2.3 - 2.9m)	
PARAMETERS	µg/g
Boron (Hot water soluble)	0.08

MW2-1 – (0 - 0.6m)	
PARAMETERS	µg/g
Boron (Hot water soluble)	1.7

MW2-2 – (0.8 - 1.4m)	
PARAMETERS	µg/g
Boron (Hot water soluble)	0.56

BH4-2A – (0.8 - 1.2m)	
PARAMETERS	µg/g
Boron (Hot water soluble)	0.27

MW6-SS1 – (0.15 - 0.8m)	
PARAMETERS	µg/g
Boron (Hot water soluble)	0.49



LEGEND

- ASPHALT
- CONCRETE
- FILL
- CLAY
- SILT
- SILTY SAND TILL
- SILTY CLAY/ CLAYEY SILT
- SANDY SILTY CLAY
- SAND
- SHALE
- GROUNDWATER LEVEL (AS OF MARCH 1, 2019)
- SOIL SAMPLE
- MONITORING WELL
- SCREENED LEVEL
- BOREHOLE

ANALYSIS INFORMATION

- Less than or equal to Table 3 SCS
- Greater than Table 3 SCS

VALUE Less than or equal to Table 2 SCS
VALUE Greater than Table 2 SCS

Sample I.D. / Sample depth

BH103-4 – (depth)	
PARAMETERS	µg/g
Boron (Hot water soluble)	0.05

TABLE 2 SCS
1.5

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; Residential / Parkland / Institutional land use, coarse textured soil

VERTICAL SCALE: 0 2.5m 5m (APPROXIMATE)

HORIZONTAL SCALE: 0 10m 20m (APPROXIMATE)

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN	SF
CHECKED	STR
DRAWING #	FIGURE 11K

TERRAPEX

SOIL ANALYTICAL RESULTS - ELECTRICAL CONDUCTIVITY - CROSS SECTION B - B'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP

MW2-12 – (12.2 - 12.6m)	
PARAMETERS	mS/cm
Electrical Conductivity	0.24

MW2-4 – (2.3 - 2.9m)	
PARAMETERS	mS/cm
Electrical Conductivity	1.7

MW2-1 – (0 - 0.6m)	
PARAMETERS	mS/cm
Electrical Conductivity	2.9

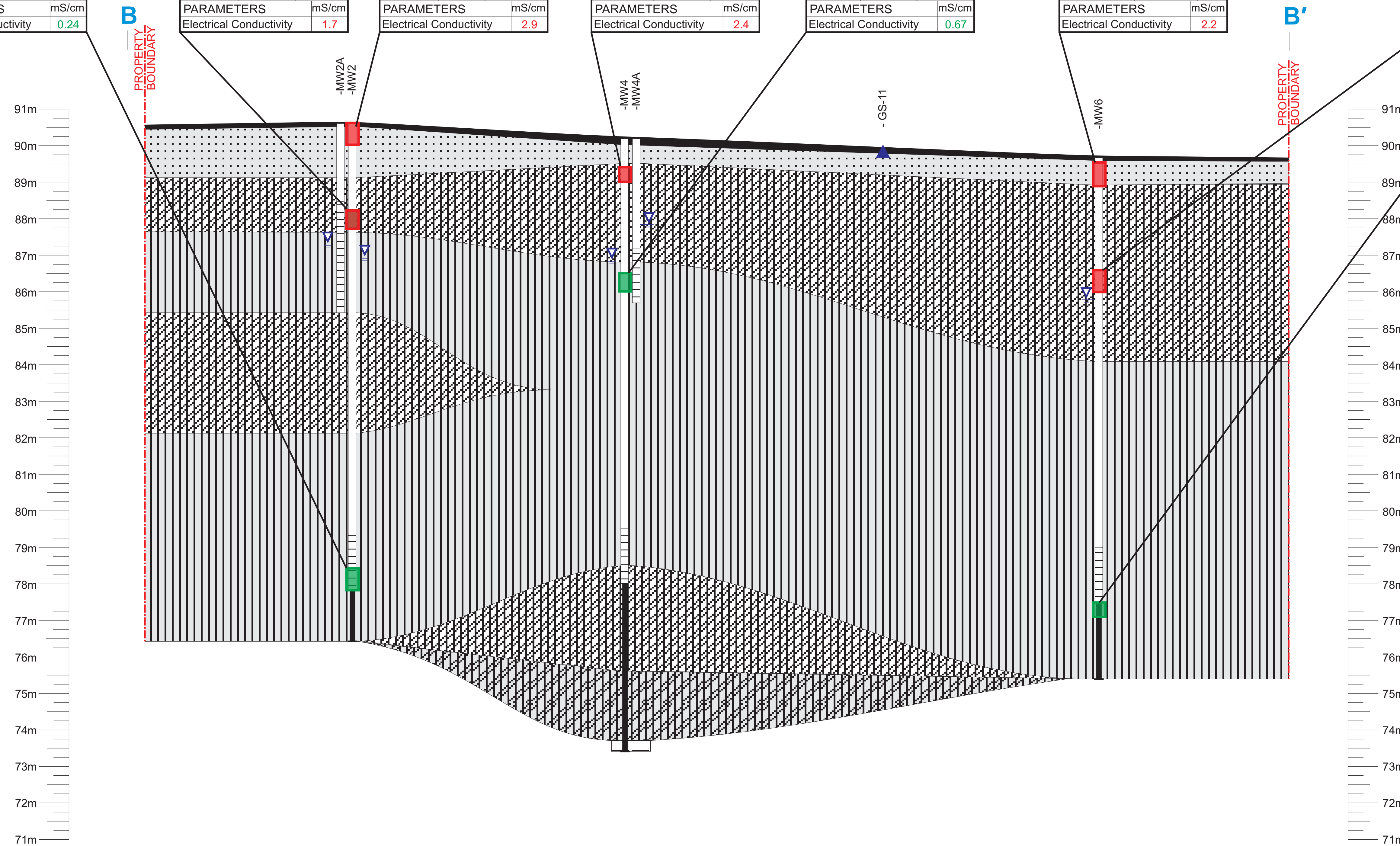
BH4-2A – (0.8 - 1.2m)	
PARAMETERS	mS/cm
Electrical Conductivity	2.4

BH4-6 – (3.7 - 4.2m)	
PARAMETERS	mS/cm
Electrical Conductivity	0.67

MW6-SS1 – (0.15 - 0.8m)	
PARAMETERS	mS/cm
Electrical Conductivity	2.2

MW6-5 – (3.1-3.7m)	
PARAMETERS	mS/cm
Electrical Conductivity	1.3

MW6-11 – (12.2-12.6m)	
PARAMETERS	mS/cm
Electrical Conductivity	0.51



LEGEND

- ASPHALT
- CONCRETE
- FILL
- CLAY
- SILT
- SILTY SAND TILL
- SILTY CLAY/ CLAYEY SILT
- SANDY SILTY CLAY
- SAND
- SHALE
- GROUNDWATER LEVEL (AS OF MARCH 1, 2019)
- SOIL SAMPLE
- MONITORING WELL
- SCREENED LEVEL
- BOREHOLE

ANALYSIS INFORMATION

- Less than or equal to Table 3 SCS
- Greater than Table 3 SCS

VALUE Less than or equal to Table 2 SCS
VALUE Greater than Table 2 SCS

Sample I.D. — Sample depth

BH103-4 – (depth)	
PARAMETERS	mS/cm
Electrical Conductivity	0.002

TABLE 2 SCS
0.7

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; Residential / Parkland / Institutional land use, coarse textured soil

VERTICAL SCALE:
0 2.5m 5m
(APPROXIMATE)

HORIZONTAL SCALE:
0 10m 20m
(APPROXIMATE)

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN SF	CHECKED STR
DRAWING #	FIGURE 11L

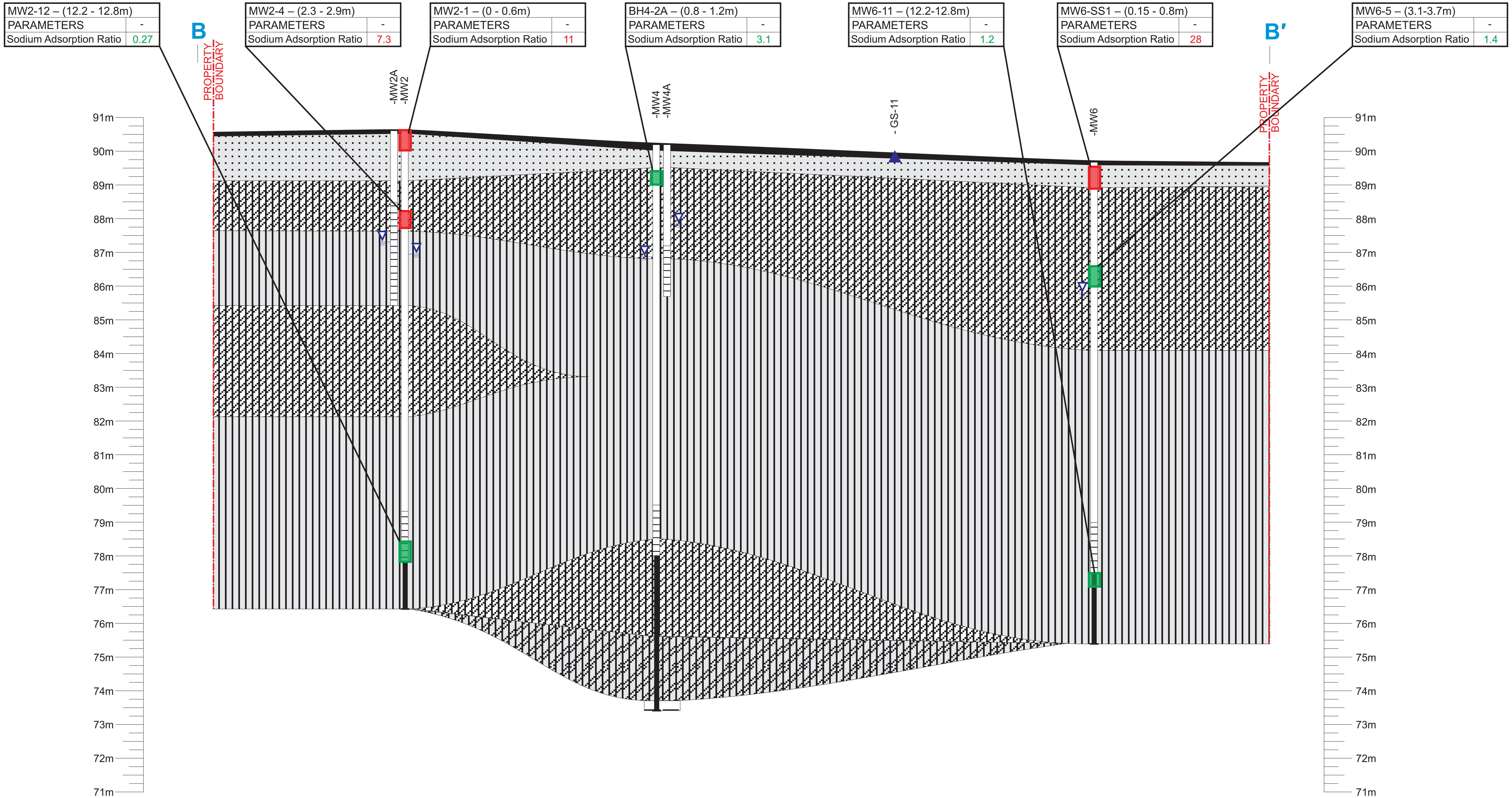
SOIL ANALYTICAL RESULTS - SODIUM ADSORPTION RATIO - CROSS SECTION B - B'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

TERRAPEX

CLIENT

ALTONA GROUP



LEGEND

- ASPHALT
- CONCRETE
- FILL
- CLAY
- SILT
- SILTY SAND TILL
- SILTY CLAY/ CLAYEY SILT
- SANDY SILTY CLAY
- SAND
- SHALE
- GROUNDWATER LEVEL (AS OF MARCH 1, 2019)
- SOIL SAMPLE
- MONITORING WELL
- SCREENED LEVEL
- BOREHOLE

ANALYSIS INFORMATION

- Less than or equal to Table 3 SCS
- Greater than Table 3 SCS

VALUE Less than or equal to Table 2 SCS
VALUE Greater than Table 2 SCS

Sample I.D. — Sample depth

BH103-4 – (depth)	
PARAMETERS	-
Sodium Adsorption Ratio	-

TABLE 2 SCS
5

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; Residential / Parkland / Institutional land use, coarse textured soil

VERTICAL SCALE:
0 2.5m 5m
(APPROXIMATE)

HORIZONTAL SCALE:
0 10m 20m
(APPROXIMATE)

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN SF	CHECKED STR
DRAWING #	FIGURE 11M

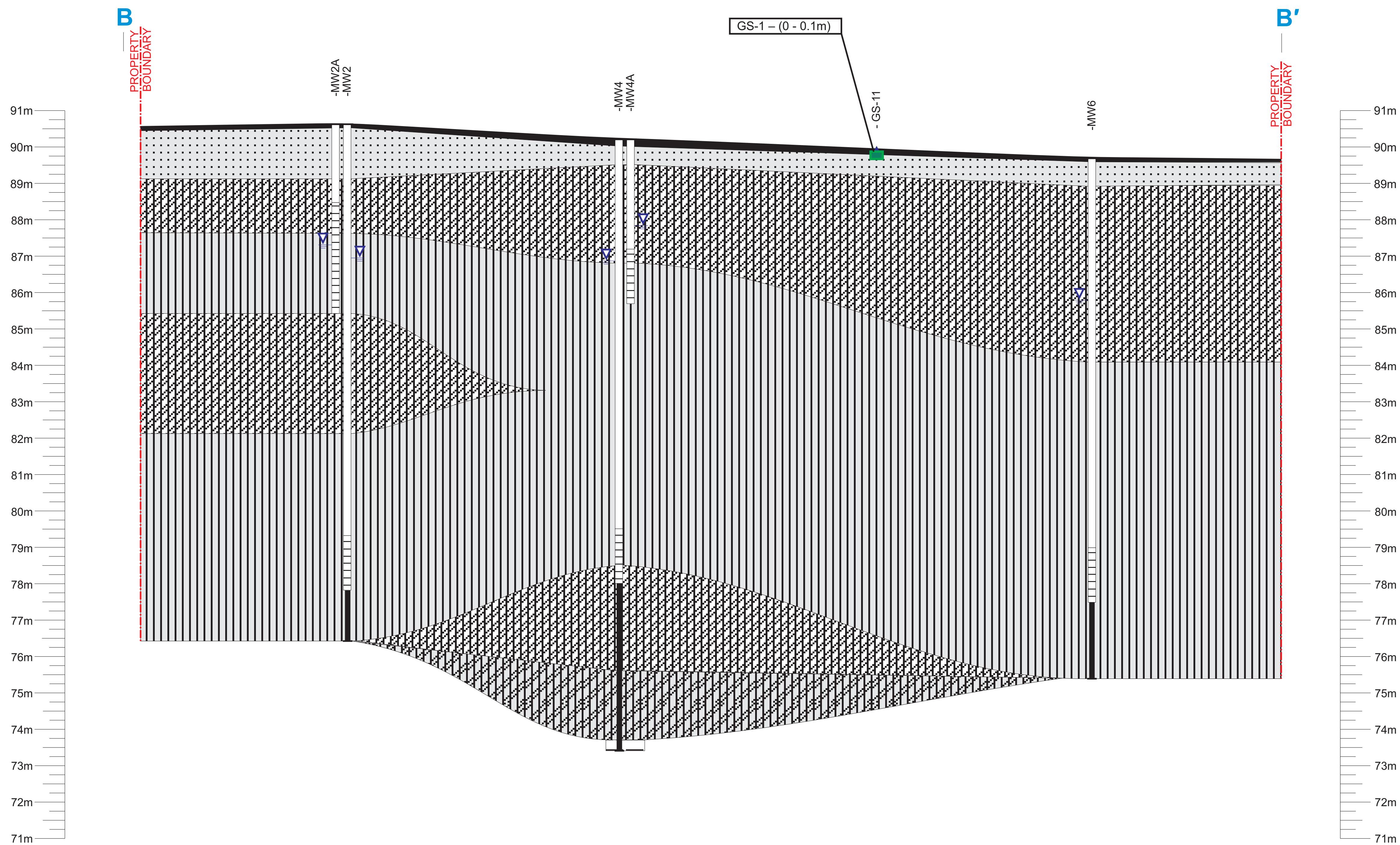
TERRAPEX

SOIL ANALYTICAL RESULTS - PCBs
CROSS SECTION B - B'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP



LEGEND

- ASPHALT
- CONCRETE
- FILL
- CLAY
- SILT
- SILTY SAND TILL
- SILTY CLAY/ CLAYEY SILT
- SANDY SILTY CLAY
- SAND
- SHALE
- GROUNDWATER LEVEL (AS OF MARCH 1, 2019)
- SOIL SAMPLE
- MONITORING WELL
- SCREENED LEVEL
- BOREHOLE

ANALYSIS INFORMATION

- Less than or equal to Table 3 SCS
- Greater than Table 3 SCS

Sample I.D. Sample depth
MW103-4 – (depth)

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; Residential / Parkland / Institutional land use, coarse textured soil

VERTICAL SCALE: 0 2.5m 5m (APPROXIMATE)

HORIZONTAL SCALE: 0 10m 20m (APPROXIMATE)

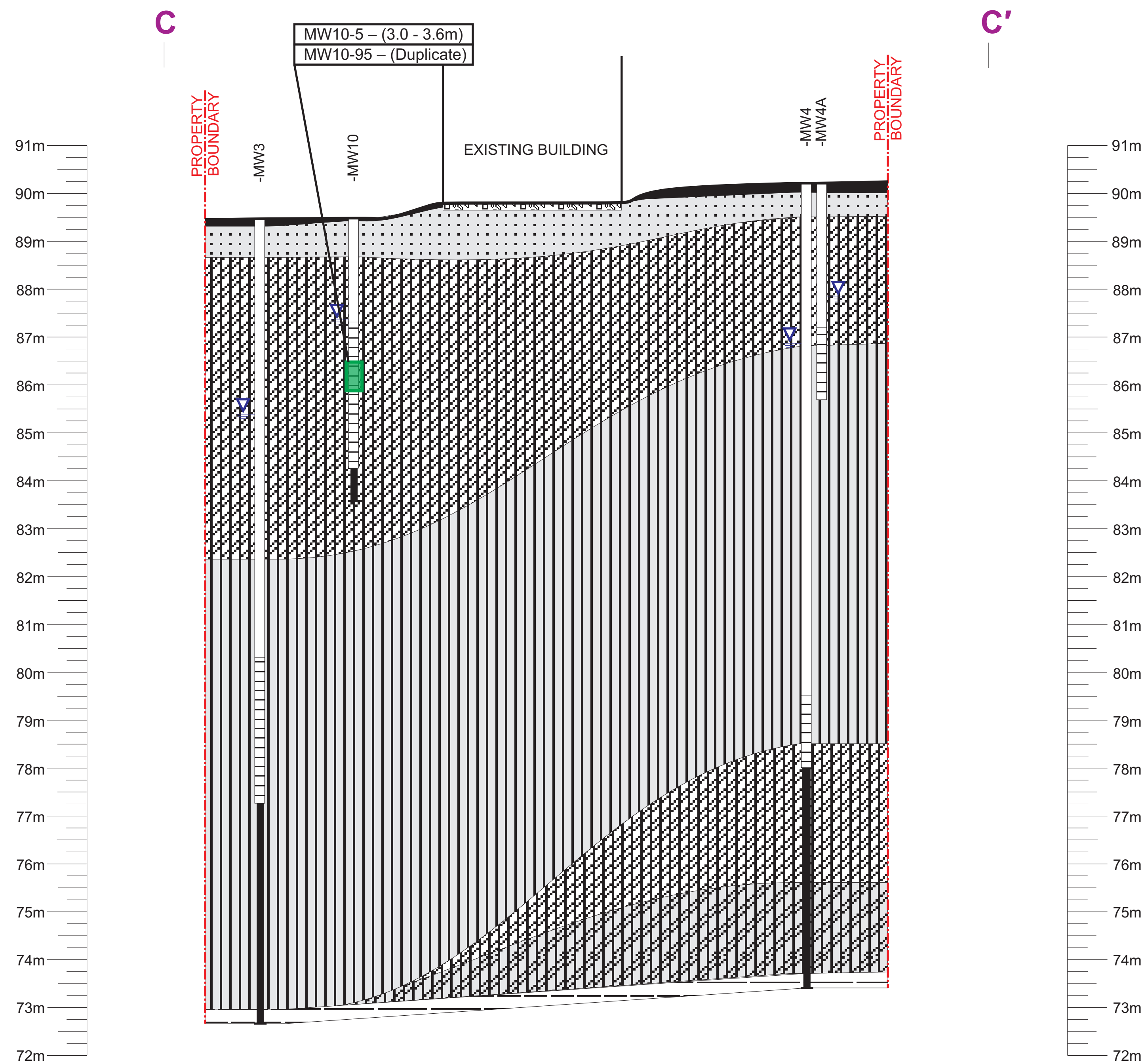
PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN	SF
CHECKED	STR
DRAWING #	FIGURE 11N

TERRAPEX

SOIL ANALYTICAL RESULTS - PHCs
CROSS SECTION C - C'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT
ALTONA GROUP



LEGEND

- ASPHALT
- CONCRETE
- FILL
- CLAY
- SILT
- SILTY SAND TILL
- SILTY CLAY/ CLAYEY SILT
- SANDY SILTY CLAY
- SAND
- SHALE
- GROUNDWATER LEVEL (AS OF MARCH 1, 2019)
- MONITORING WELL
- SCREENED LEVEL
- BOREHOLE

ANALYSIS INFORMATION

- Less than or equal to Table 3 SCS
- Greater than Table 3 SCS

Sample I.D. Sample depth
MW103-4 – (depth)

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; Residential / Parkland / Institutional land use, coarse textured soil

VERTICAL SCALE: 0 2.5m 5m (APPROXIMATE)

HORIZONTAL SCALE: 0 10m 20m (APPROXIMATE)

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN	SF
CHECKED	STR
DRAWING #	FIGURE 12A

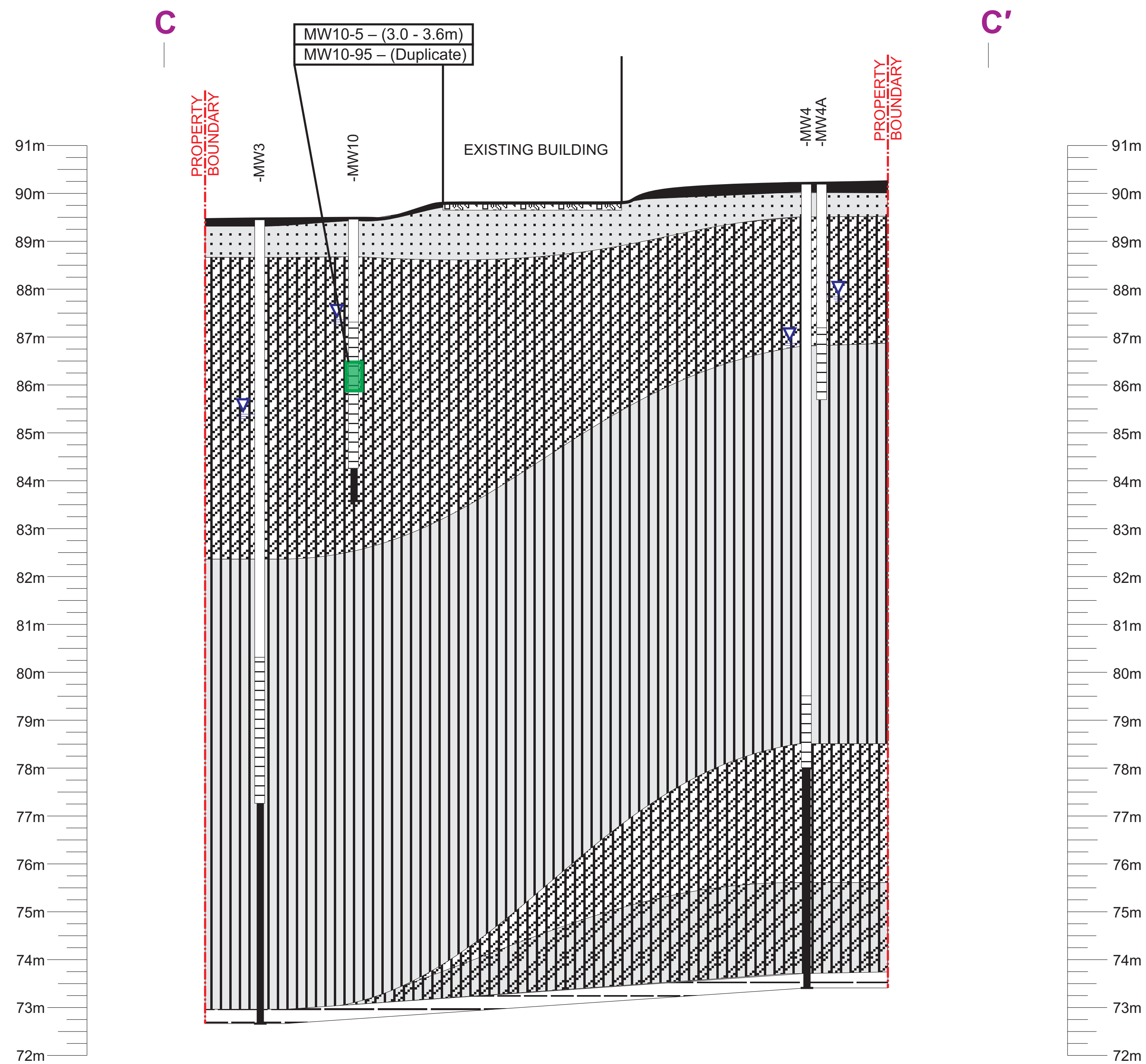
TERRAPEX

SOIL ANALYTICAL RESULTS - VOCs
CROSS SECTION C - C'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP



LEGEND

- ASPHALT
- CONCRETE
- FILL
- CLAY
- SILT
- SILTY SAND TILL
- SILTY CLAY/ CLAYEY SILT
- SANDY SILTY CLAY
- SAND
- SHALE
- GROUNDWATER LEVEL (AS OF MARCH 1, 2019)
- MONITORING WELL
- SCREENED LEVEL
- BOREHOLE

ANALYSIS INFORMATION

- Less than or equal to Table 3 SCS
- Greater than Table 3 SCS

Sample I.D. — Sample depth

MW103-4 – (depth)

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; Residential / Parkland / Institutional land use, coarse textured soil

VERTICAL SCALE:

0 — 2.5m — 5m

(APPROXIMATE)

HORIZONTAL SCALE:

0 — 10m — 20m

(APPROXIMATE)

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN	SF
CHECKED	STR
DRAWING #	FIGURE 12B

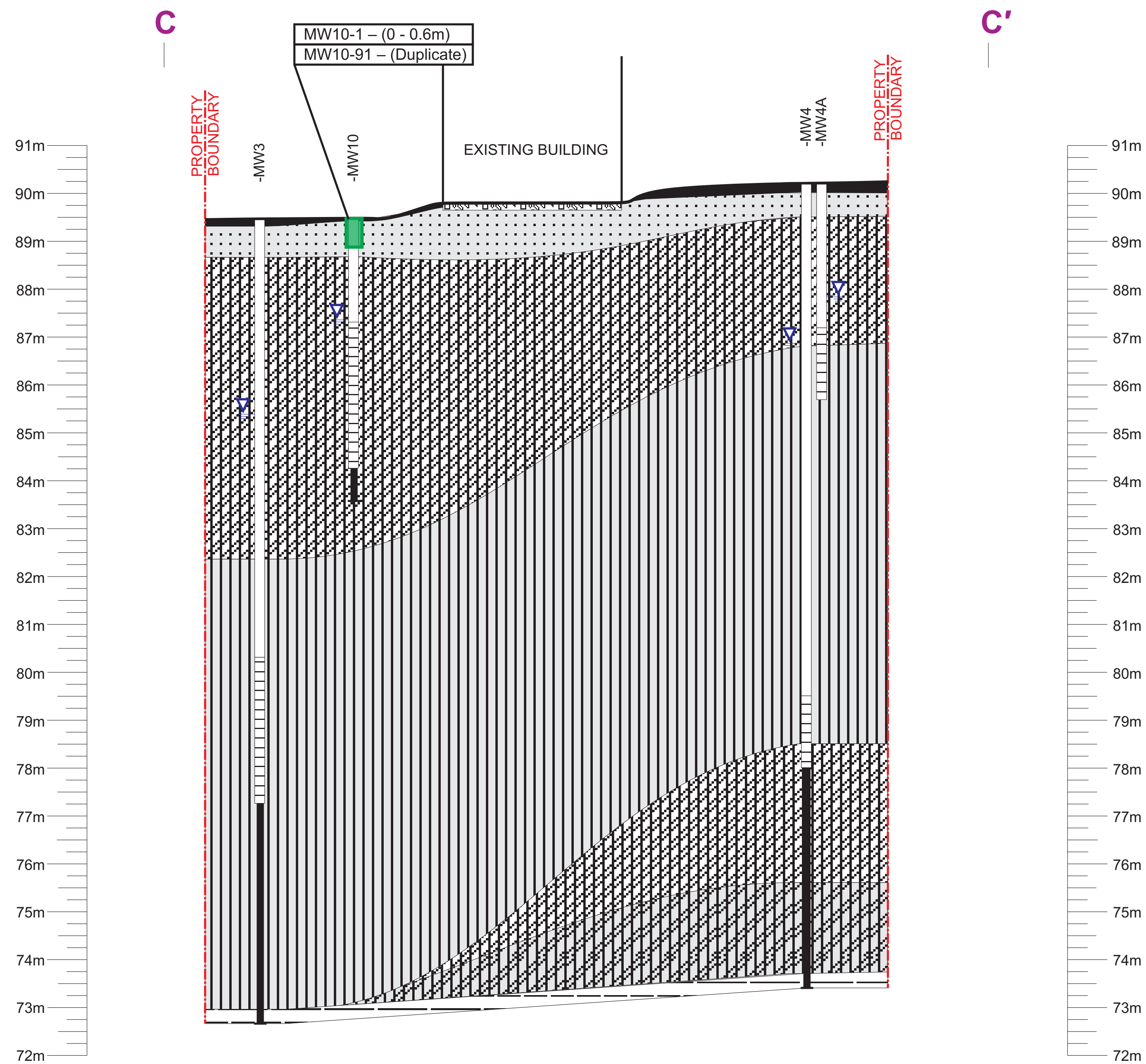
TERRAPEX

SOIL ANALYTICAL RESULTS - PAHs
CROSS SECTION C - C'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP



LEGEND

- ASPHALT
- CONCRETE
- FILL
- CLAY
- SILT
- SILTY SAND TILL
- SILTY CLAY/ CLAYEY SILT
- SANDY SILTY CLAY
- SAND
- SHALE
- GROUNDWATER LEVEL (AS OF MARCH 1, 2019)
- MONITORING WELL
- SCREENED LEVEL
- BOREHOLE

ANALYSIS INFORMATION

- Less than or equal to Table 3 SCS
- Greater than Table 3 SCS

Sample I.D. / Sample depth: MW103-4 – (depth)

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; Residential / Parkland / Institutional land use, coarse textured soil

VERTICAL SCALE: 0 — 2.5m — 5m (APPROXIMATE)

HORIZONTAL SCALE: 0 — 10m — 20m (APPROXIMATE)

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN	SF
CHECKED	STR
DRAWING #	FIGURE 12C

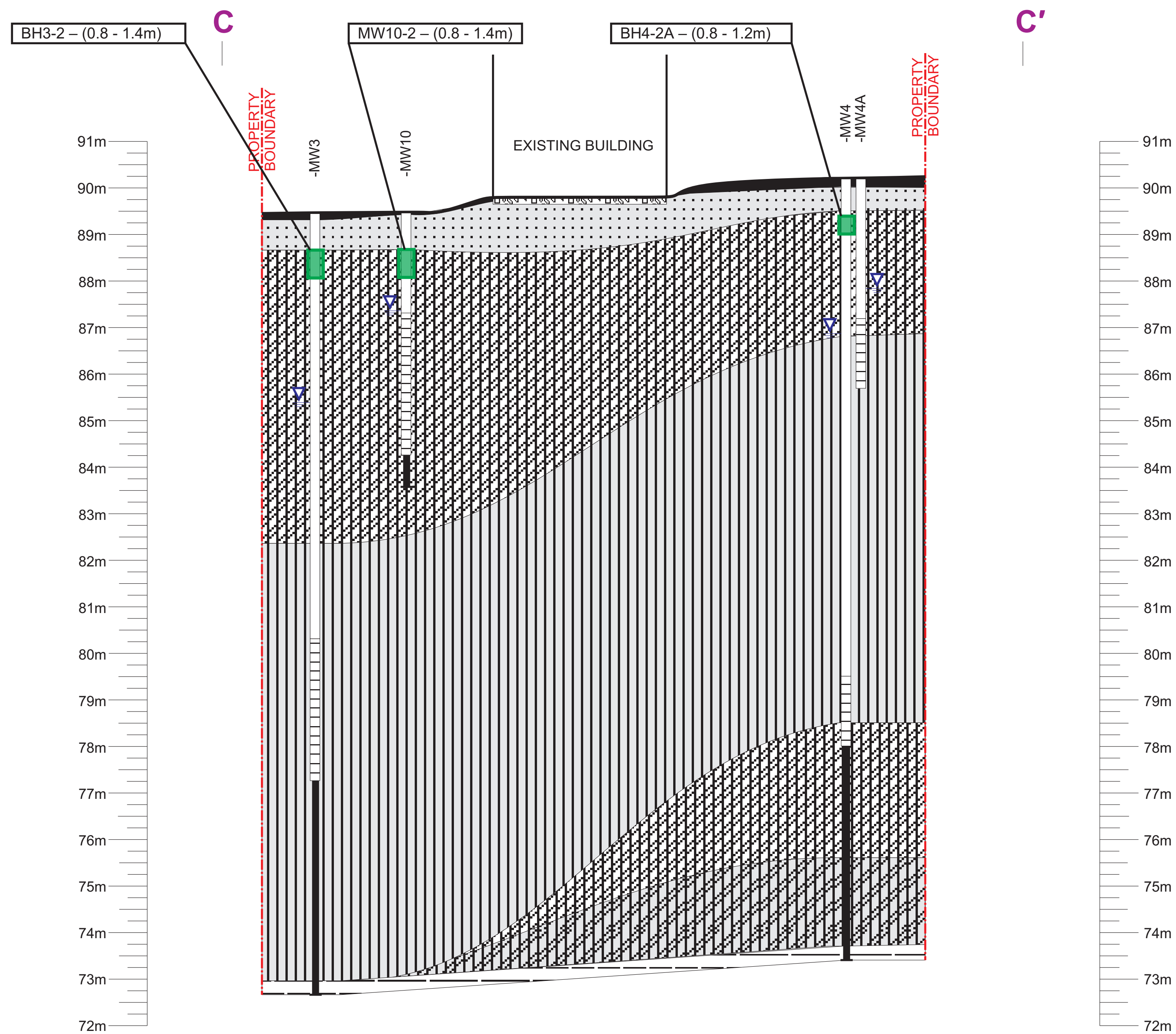
SOIL ANALYTICAL RESULTS - METALS
CROSS SECTION C - C'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

TERRAPEX

CLIENT

ALTONA GROUP



LEGEND

- ASPHALT
- CONCRETE
- FILL
- CLAY
- SILT
- SILTY SAND TILL
- SILTY CLAY/ CLAYEY SILT
- SANDY SILTY CLAY
- SAND
- SHALE
- GROUNDWATER LEVEL (AS OF MARCH 1, 2019)
- MONITORING WELL
- SCREENED LEVEL
- BOREHOLE

ANALYSIS INFORMATION

- Less than or equal to Table 3 SCS
- Greater than Table 3 SCS

Sample I.D. Sample depth
MW103-4 – (depth)

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; Residential / Parkland / Institutional land use, coarse textured soil

VERTICAL SCALE:

0 2.5m 5m
(APPROXIMATE)

HORIZONTAL SCALE:

0 10m 20m
(APPROXIMATE)

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN SF	CHECKED STR
DRAWING #	FIGURE 12D

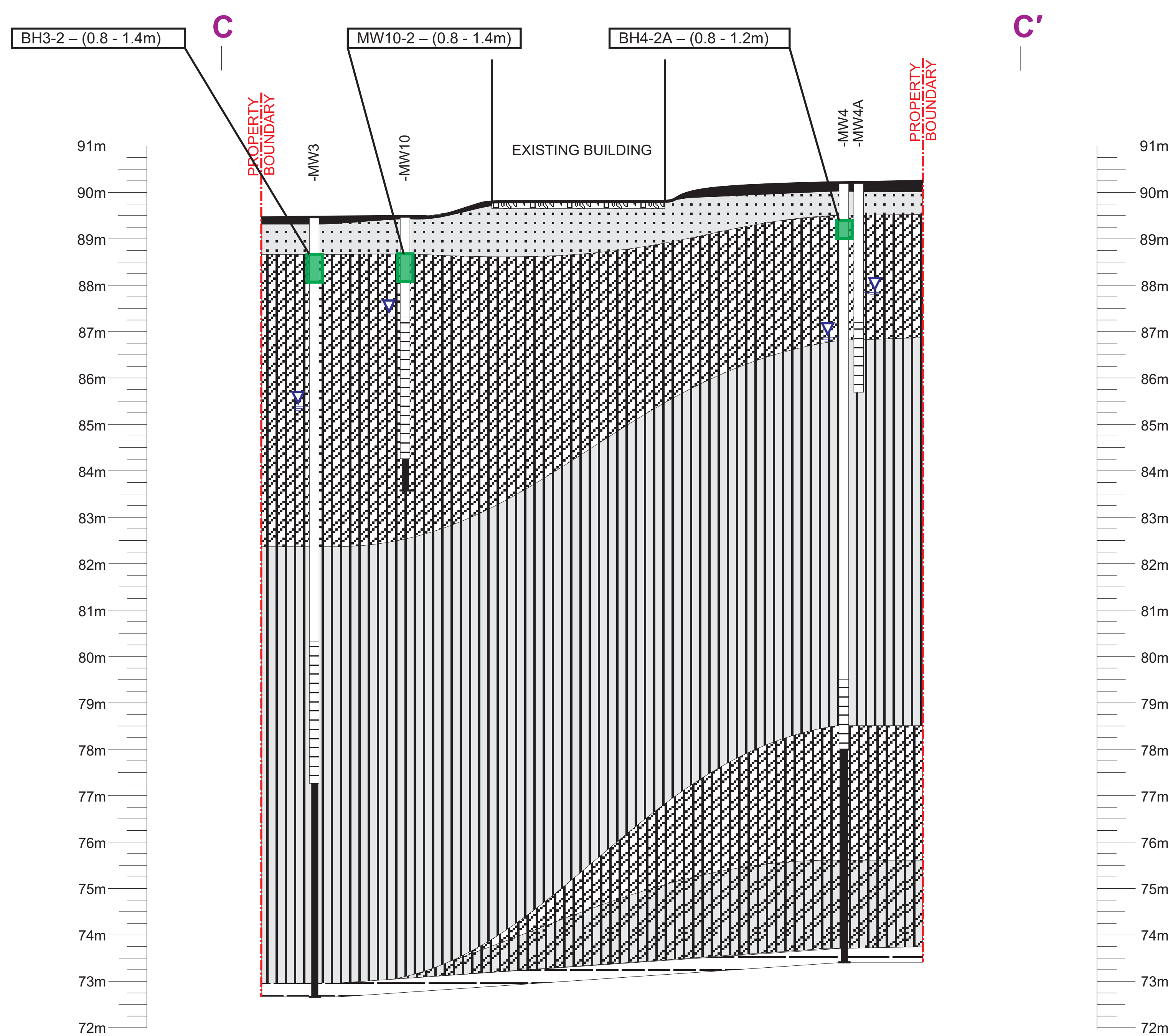
TERRAPEX

SOIL ANALYTICAL RESULTS - HYDRIDE-FORMING METALS - CROSS SECTION C - C'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP



LEGEND

- ASPHALT
- CONCRETE
- FILL
- CLAY
- SILT
- SILTY SAND TILL
- SILTY CLAY/ CLAYEY SILT
- SANDY SILTY CLAY
- SAND
- SHALE
- GROUNDWATER LEVEL (AS OF MARCH 1, 2019)
- MONITORING WELL
- SCREENED LEVEL
- BOREHOLE

ANALYSIS INFORMATION

- Less than or equal to Table 3 SCS
- Greater than Table 3 SCS

Sample I.D. Sample depth
MW103-4 – (depth)

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; Residential / Parkland / Institutional land use, coarse textured soil

VERTICAL SCALE: 0 2.5m 5m (APPROXIMATE)

HORIZONTAL SCALE: 0 10m 20m (APPROXIMATE)

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN SF	CHECKED STR
DRAWING #	FIGURE 12E

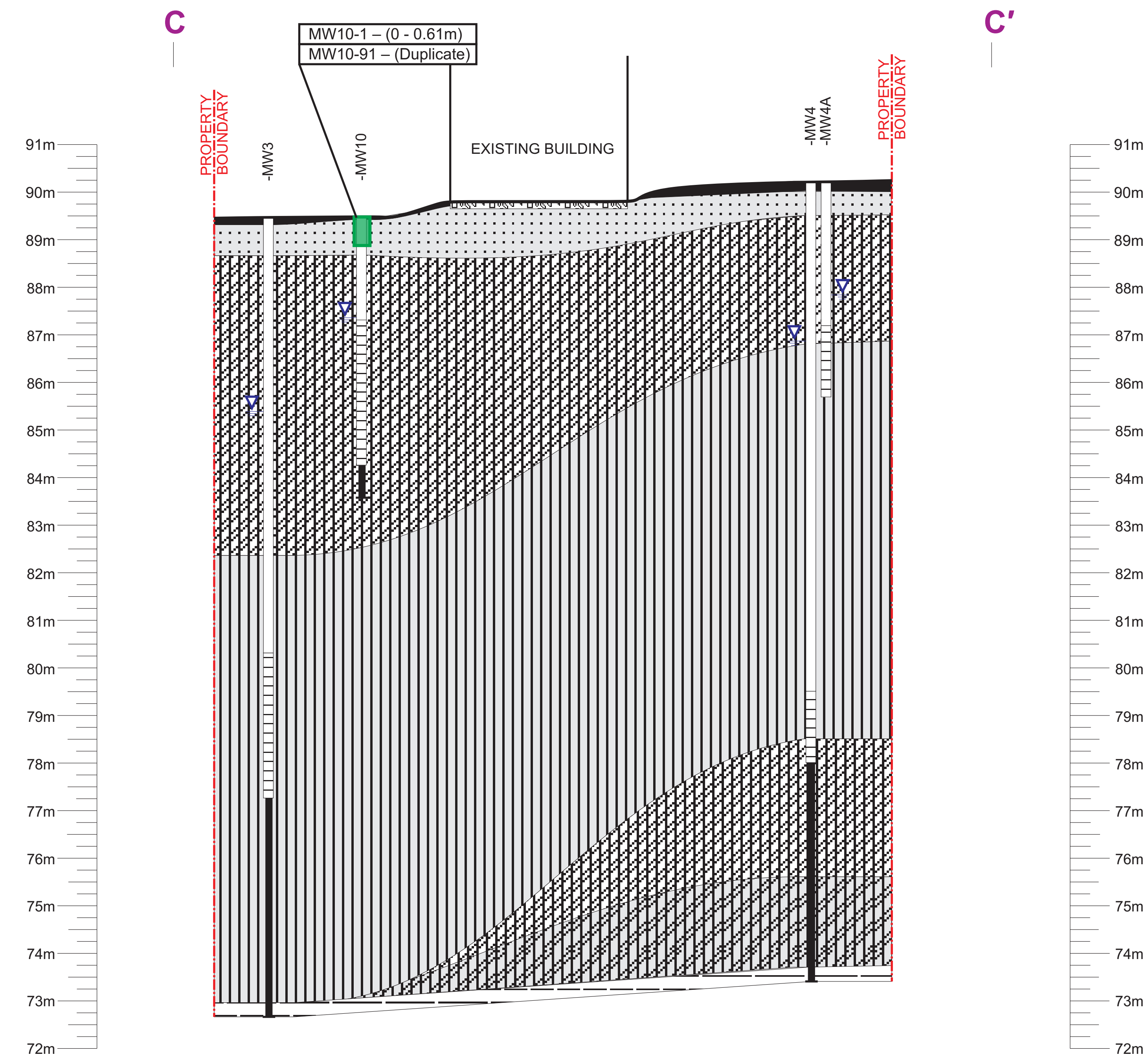
TERRAPEX

SOIL ANALYTICAL RESULTS - OC PESTICIDES CROSS SECTION C - C'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP



LEGEND

- ASPHALT
- CONCRETE
- FILL
- CLAY
- SILT
- SILTY SAND TILL
- SILTY CLAY/ CLAYEY SILT
- SANDY SILTY CLAY
- SAND
- SHALE
- GROUNDWATER LEVEL (AS OF MARCH 1, 2019)
- MONITORING WELL
- SCREENED LEVEL
- BOREHOLE

ANALYSIS INFORMATION

- Less than or equal to Table 3 SCS
- Greater than Table 3 SCS

Sample I.D. — Sample depth
MW103-4 – (depth)

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; Residential / Parkland / Institutional land use, coarse textured soil

VERTICAL SCALE:
0 2.5m 5m
(APPROXIMATE)

HORIZONTAL SCALE:
0 10m 20m
(APPROXIMATE)

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN	SF
CHECKED	STR
DRAWING #	FIGURE 12F

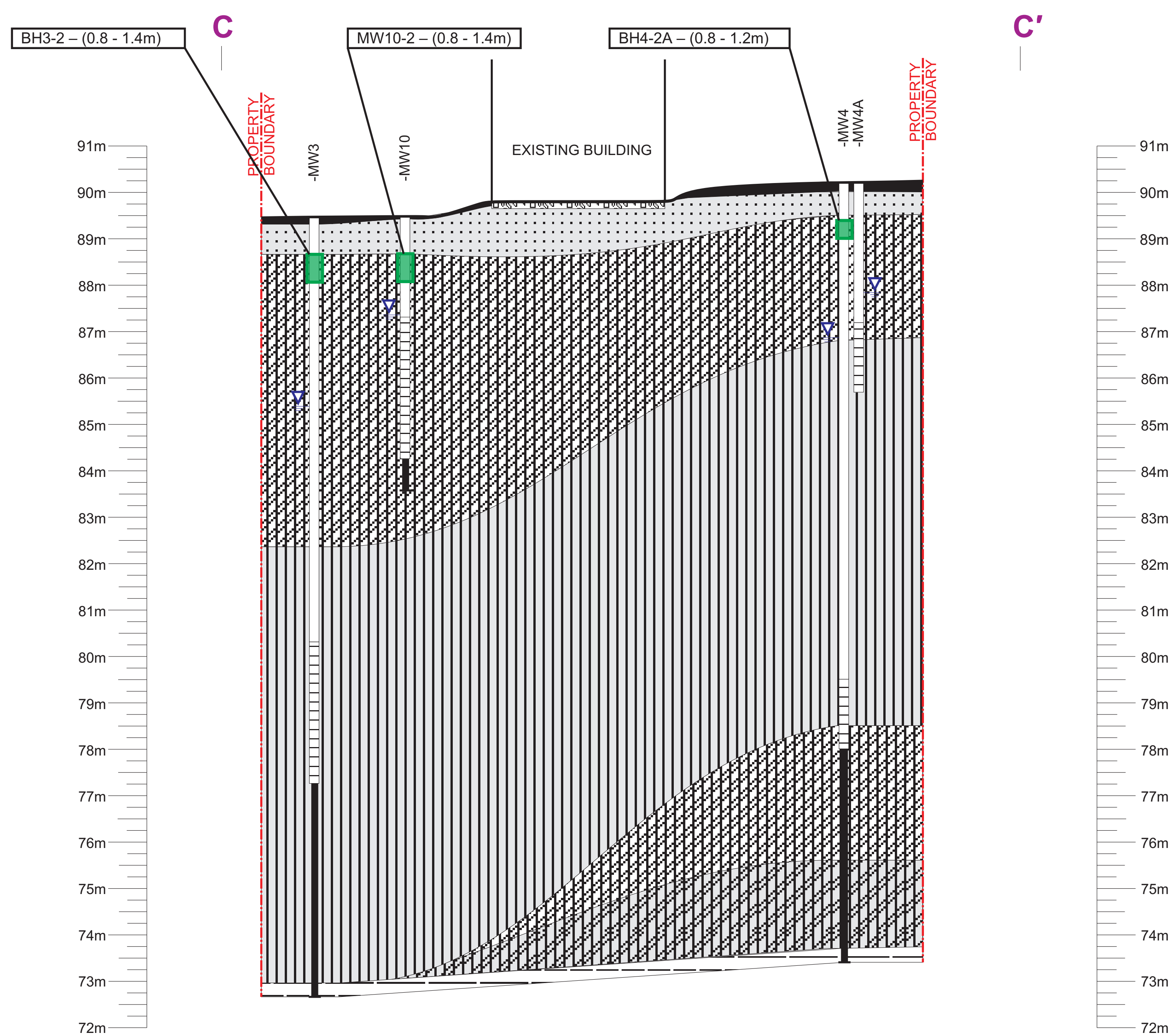
TERRAPEX

SOIL ANALYTICAL RESULTS - CYANIDE (CN-)
CROSS SECTION C - C'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP



LEGEND

- ASPHALT
- CONCRETE
- FILL
- CLAY
- SILT
- SILTY SAND TILL
- SILTY CLAY/ CLAYEY SILT
- SANDY SILTY CLAY
- SAND
- SHALE
- GROUNDWATER LEVEL (AS OF MARCH 1, 2019)
- MONITORING WELL
- SCREENED LEVEL
- BOREHOLE

ANALYSIS INFORMATION

- Less than or equal to Table 3 SCS
- Greater than Table 3 SCS

Sample I.D. — Sample depth: MW103-4 – (depth)

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; Residential / Parkland / Institutional land use, coarse textured soil

VERTICAL SCALE: 0 — 2.5m — 5m (APPROXIMATE)

HORIZONTAL SCALE: 0 — 10m — 20m (APPROXIMATE)

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN	SF
CHECKED	STR
DRAWING #	FIGURE 12G

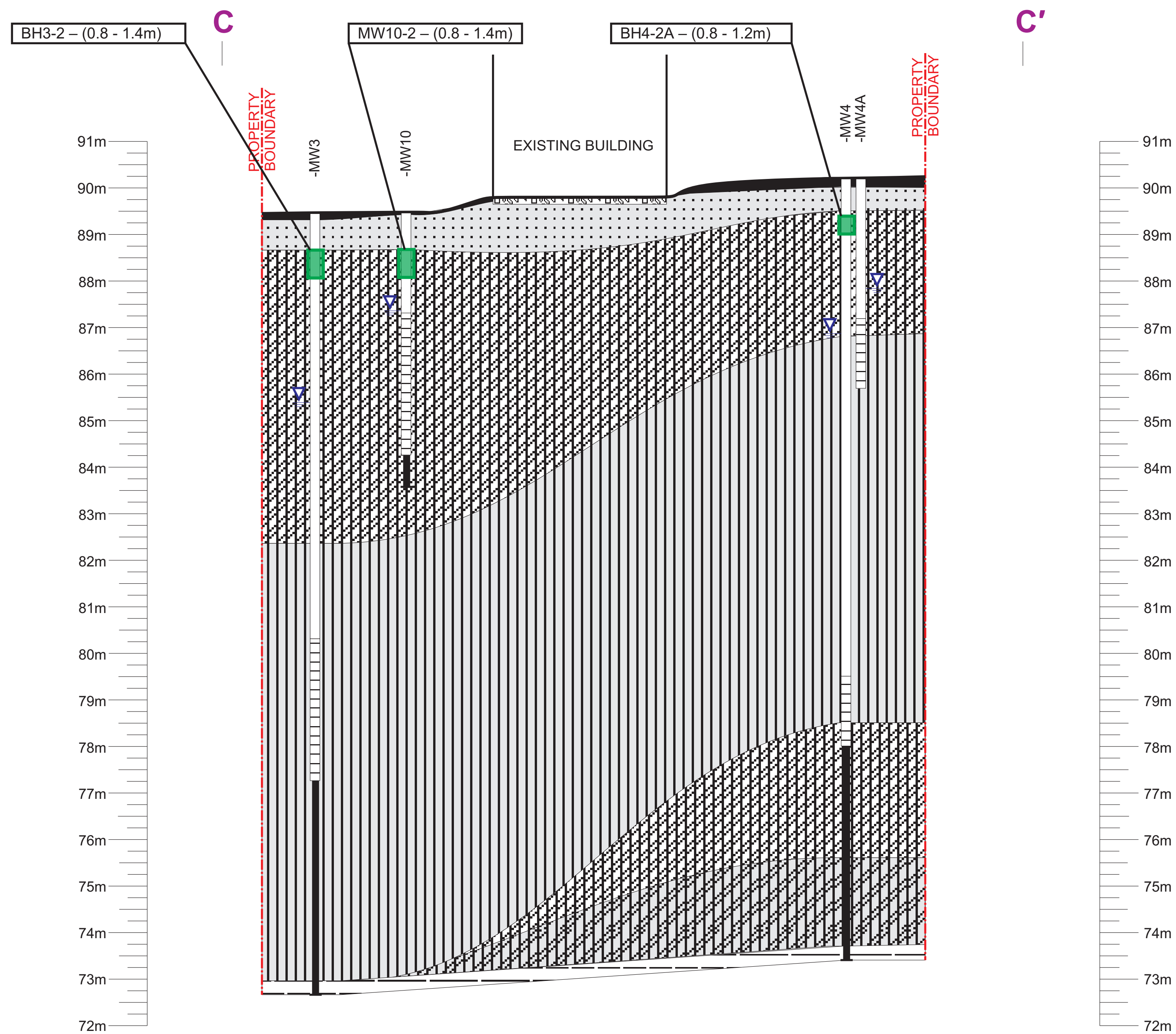
TERRAPEX

SOIL ANALYTICAL RESULTS - CYANIDE (CN-)
CROSS SECTION C - C'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP



LEGEND

- ASPHALT
- CONCRETE
- FILL
- CLAY
- SILT
- SILTY SAND TILL
- SILTY CLAY/ CLAYEY SILT
- SANDY SILTY CLAY
- SAND
- SHALE
- GROUNDWATER LEVEL (AS OF MARCH 1, 2019)
- MONITORING WELL
- SCREENED LEVEL
- BOREHOLE

ANALYSIS INFORMATION

- Less than or equal to Table 3 SCS
- Greater than Table 3 SCS

Sample I.D. Sample depth
MW103-4 – (depth)

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; Residential / Parkland / Institutional land use, coarse textured soil

VERTICAL SCALE:
0 2.5m 5m
(APPROXIMATE)

HORIZONTAL SCALE:
0 10m 20m
(APPROXIMATE)

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN SF	CHECKED STR
DRAWING #	FIGURE 12H

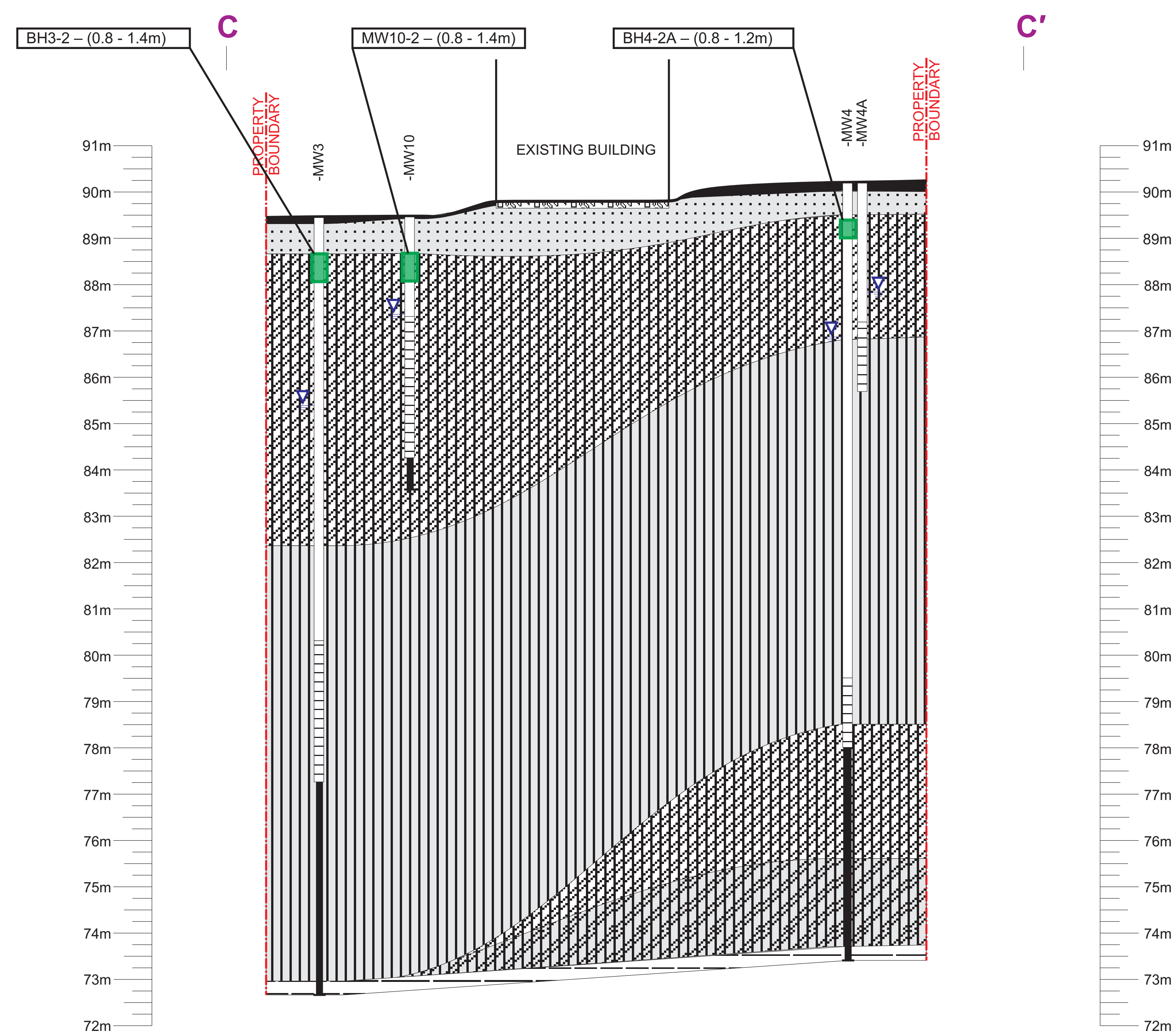
TERRAPEX

SOIL ANALYTICAL RESULTS - MERCURY
CROSS SECTION C - C'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP



LEGEND

- ASPHALT
- CONCRETE
- FILL
- CLAY
- SILT
- SILTY SAND TILL
- SILTY CLAY/ CLAYEY SILT
- SANDY SILTY CLAY
- SAND
- SHALE
- GROUNDWATER LEVEL (AS OF MARCH 1, 2019)
- MONITORING WELL
- SCREENED LEVEL
- BOREHOLE

ANALYSIS INFORMATION

- Less than or equal to Table 3 SCS
- Greater than Table 3 SCS

Sample I.D. Sample depth
MW103-4 – (depth)

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; Residential / Parkland / Institutional land use, coarse textured soil

VERTICAL SCALE:
0 2.5m 5m
(APPROXIMATE)

HORIZONTAL SCALE:
0 10m 20m
(APPROXIMATE)

PROJECT #	*CT2817.00*
SCALE	*AS SHOWN*
DATE	*MARCH 2019*
DRAWN *SF*	CHECKED *STR*
DRAWING #	*FIGURE 12I*

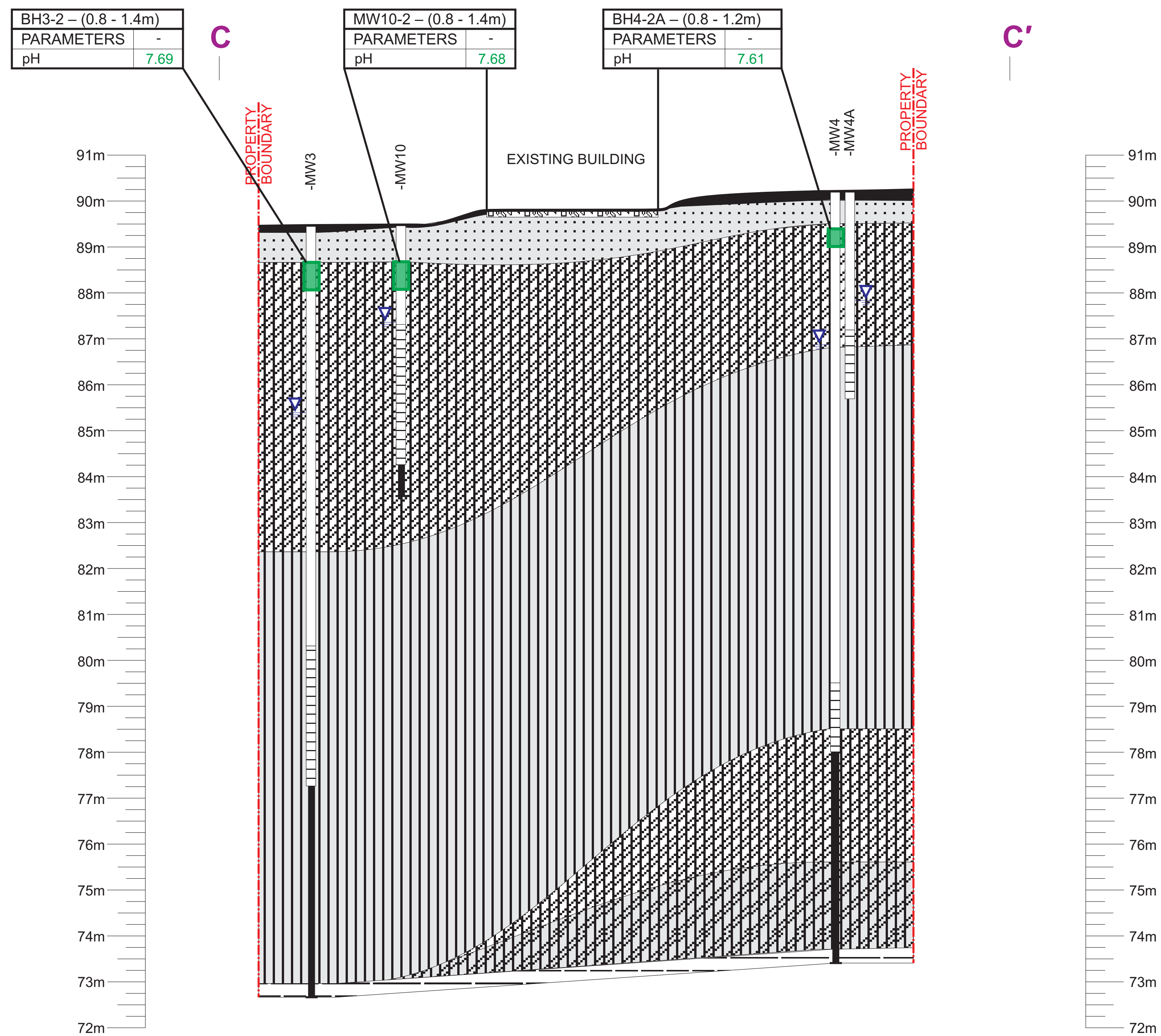
TERRAPEX

SOIL ANALYTICAL RESULTS - pH
CROSS SECTION C - C'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP



LEGEND

- ASPHALT
- CONCRETE
- FILL
- CLAY
- SILT
- SILTY SAND TILL
- SILTY CLAY/ CLAYEY SILT
- SANDY SILTY CLAY
- SAND
- SHALE
- GROUNDWATER LEVEL (AS OF MARCH 1, 2019)
- MONITORING WELL
- SCREENED LEVEL
- BOREHOLE

ANALYSIS INFORMATION

- Less than or equal to Table 3 SCS
- Greater than Table 3 SCS

VALUE Less than or equal to Table 2 SCS
VALUE Greater than Table 2 SCS

Sample I.D. — Sample depth

BH103-4 – (depth)	
PARAMETERS	-
pH	7.0

TABLE 2 SCS
-

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; Residential / Parkland / Institutional land use, coarse textured soil

VERTICAL SCALE:
0 2.5m 5m
(APPROXIMATE)

HORIZONTAL SCALE:
0 10m 20m
(APPROXIMATE)

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN SF	CHECKED STR
DRAWING #	FIGURE 12J

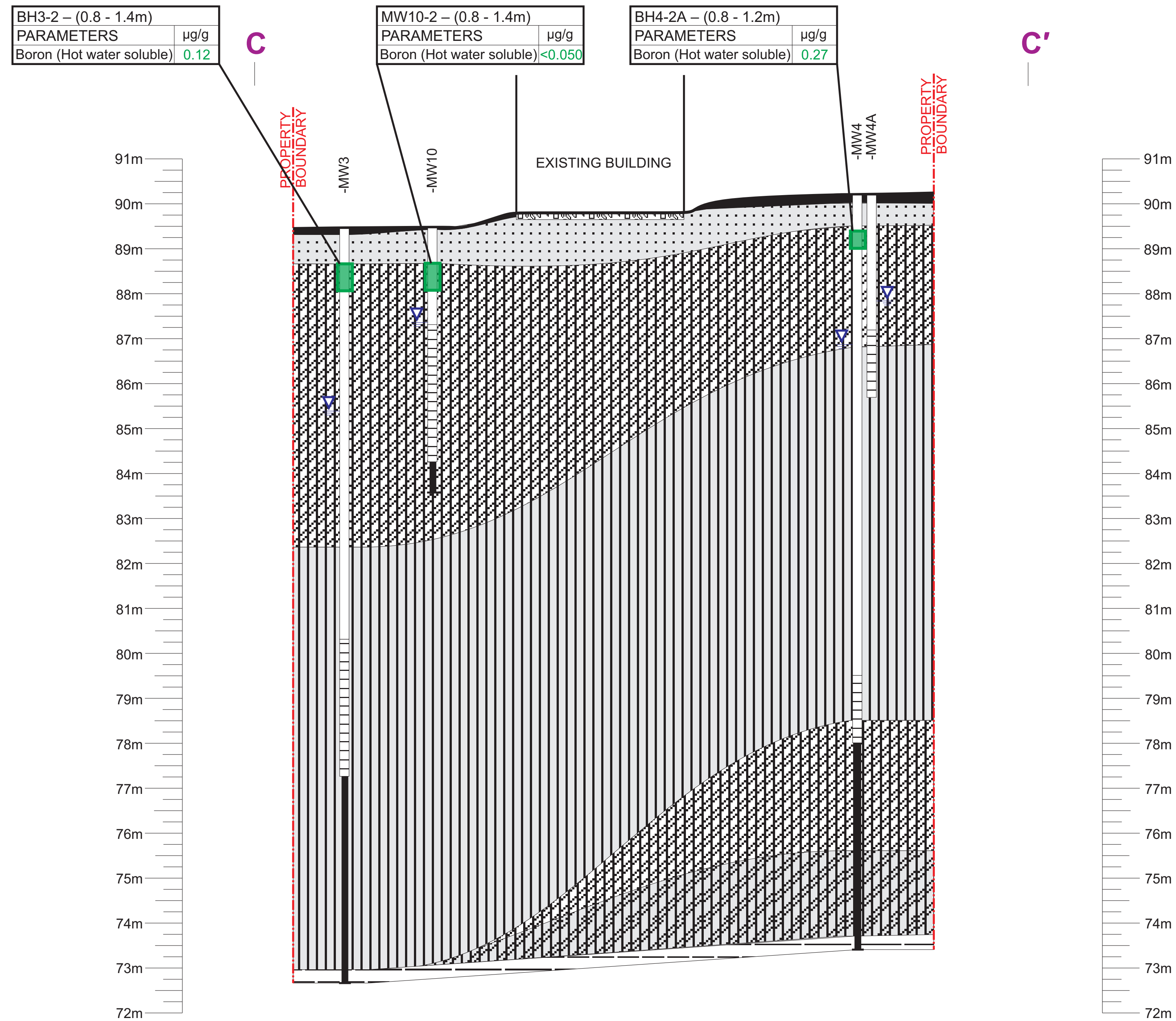
TERRAPEX

SOIL ANALYTICAL RESULTS - BOREN (HOT WATER SOLUBLE) - CROSS SECTION C - C'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP



LEGEND

- ASPHALT
- CONCRETE
- FILL
- CLAY
- SILT
- SILTY SAND TILL
- SILTY CLAY/ CLAYEY SILT
- SANDY SILTY CLAY
- SAND
- SHALE
- GROUNDWATER LEVEL (AS OF MARCH 1, 2019)
- MONITORING WELL
- SCREENED LEVEL
- BOREHOLE

ANALYSIS INFORMATION

- Less than or equal to Table 3 SCS
- Greater than Table 3 SCS
- VALUE Less than or equal to Table 2 SCS
- VALUE Greater than Table 2 SCS

Sample I.D. — Sample depth

BH103-4 – (depth)	
PARAMETERS	µg/g
Boron (Hot water soluble)	0.05

TABLE 2 SCS
1.5

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; Residential / Parkland / Institutional land use, coarse textured soil

VERTICAL SCALE:

0 2.5m 5m (APPROXIMATE)

HORIZONTAL SCALE:

0 10m 20m (APPROXIMATE)

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN SF	CHECKED STR
DRAWING #	FIGURE 12K

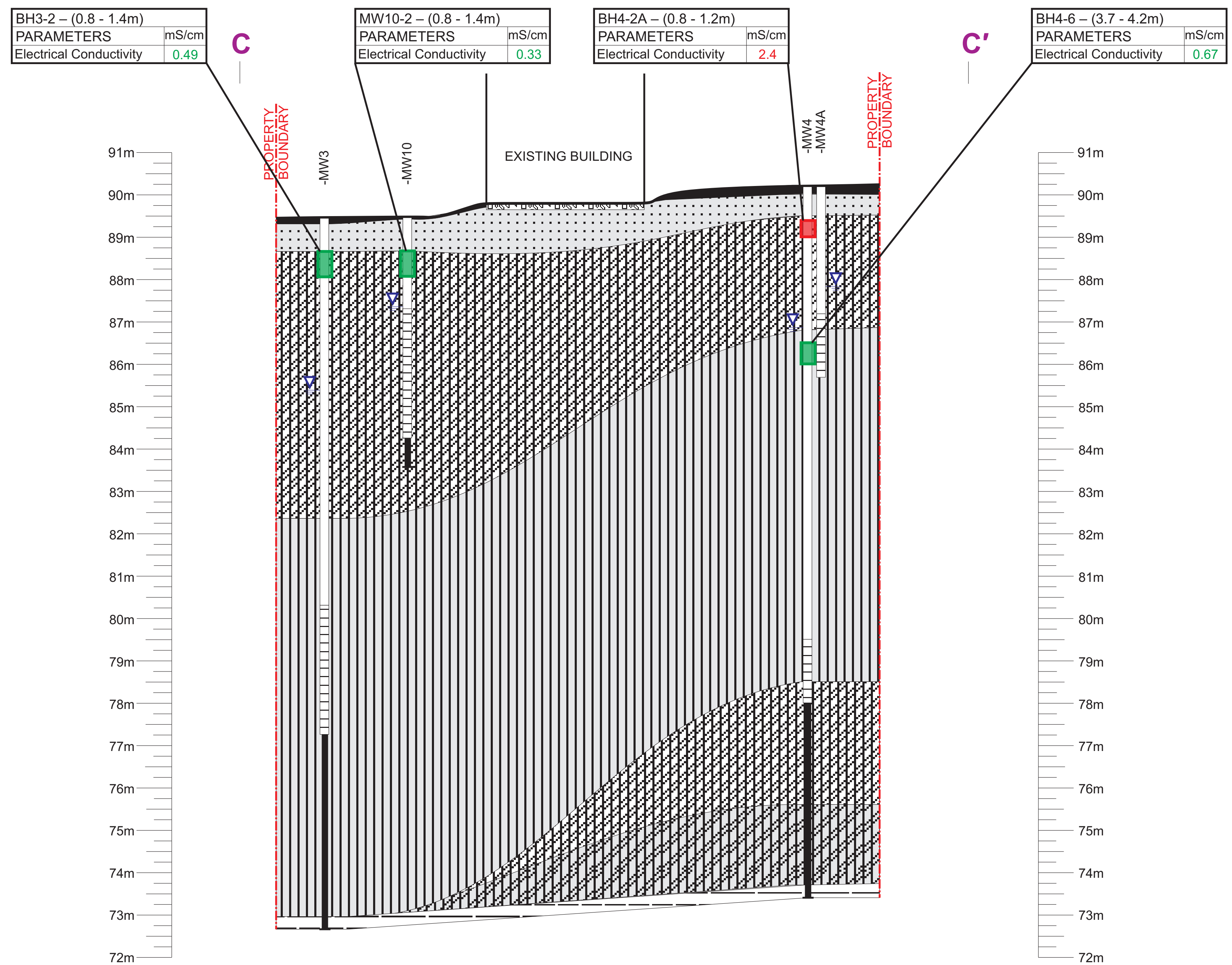
TERRAPEX

SOIL ANALYTICAL RESULTS - ELECTRICAL CONDUCTIVITY - CROSS SECTION C - C'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP



LEGEND

- ASPHALT
- CONCRETE
- FILL
- CLAY
- SILT
- SILTY SAND TILL
- SILTY CLAY/ CLAYEY SILT
- SANDY SILTY CLAY
- SAND
- SHALE
- GROUNDWATER LEVEL (AS OF MARCH 1, 2019)
- MONITORING WELL
- SCREENED LEVEL
- BOREHOLE

ANALYSIS INFORMATION

- Less than or equal to Table 3 SCS
- Greater than Table 3 SCS

VALUE Less than or equal to Table 2 SCS
VALUE Greater than Table 2 SCS

Sample I.D. — Sample depth

BH103-4 – (depth)	
PARAMETERS	mS/cm
Electrical Conductivity	0.002

TABLE 2 SCS
0.7

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; Residential / Parkland / Institutional land use, coarse textured soil

VERTICAL SCALE: 0 2.5m 5m (APPROXIMATE)

HORIZONTAL SCALE: 0 10m 20m (APPROXIMATE)

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN	SF
CHECKED	STR
DRAWING #	FIGURE 12L

TERRAPEX

SOIL ANALYTICAL RESULTS - SODIUM ADSORPTION RATIO - CROSS SECTION C - C'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

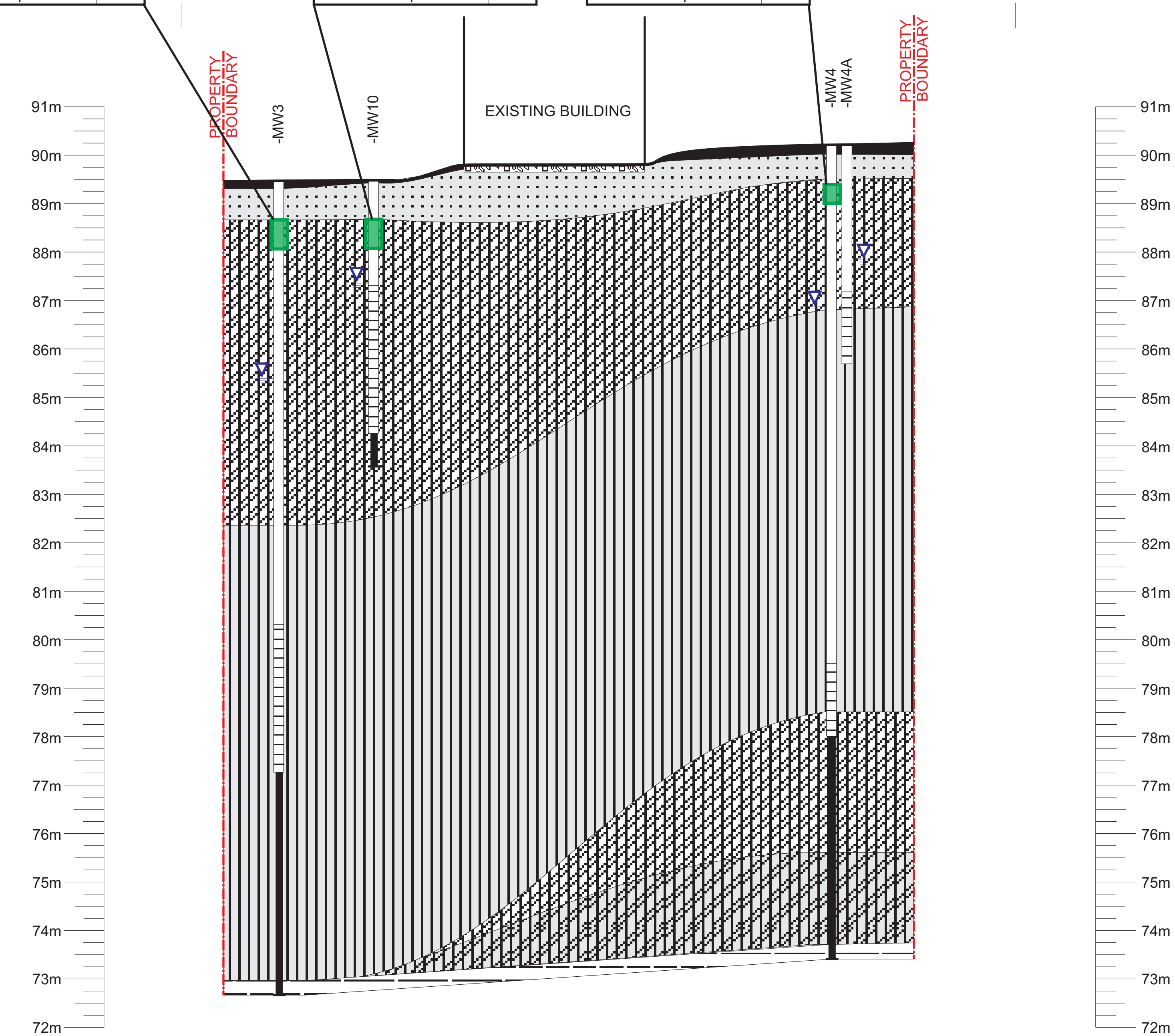
CLIENT

ALTONA GROUP

BH3-2 – (0.8 - 1.4m)	
PARAMETERS	-
Sodium Adsorption Ratio	1.6

MW10-2 – (0.8 - 1.4m)	
PARAMETERS	-
Sodium Adsorption Ratio	0.87

BH4-2A – (0.8 - 1.2m)	
PARAMETERS	-
Sodium Adsorption Ratio	3.1



LEGEND

- ASPHALT
- CONCRETE
- FILL
- CLAY
- SILT
- SILTY SAND TILL
- SILTY CLAY/ CLAYEY SILT
- SANDY SILTY CLAY
- SAND
- SHALE
- GROUNDWATER LEVEL (AS OF MARCH 1, 2019)
- MONITORING WELL
- SCREENED LEVEL
- BOREHOLE

ANALYSIS INFORMATION

- Less than or equal to Table 3 SCS
- Greater than Table 3 SCS
- VALUE Less than or equal to Table 2 SCS
- VALUE Greater than Table 2 SCS

Sample I.D. — Sample depth

BH103-4 – (depth)	
PARAMETERS	-
Sodium Adsorption Ratio	-

TABLE 2 SCS
5

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; Residential / Parkland / Institutional land use, coarse textured soil

VERTICAL SCALE: 0 2.5m 5m (APPROXIMATE)

HORIZONTAL SCALE: 0 10m 20m (APPROXIMATE)

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN	SF
CHECKED	STR
DRAWING #	FIGURE 12M

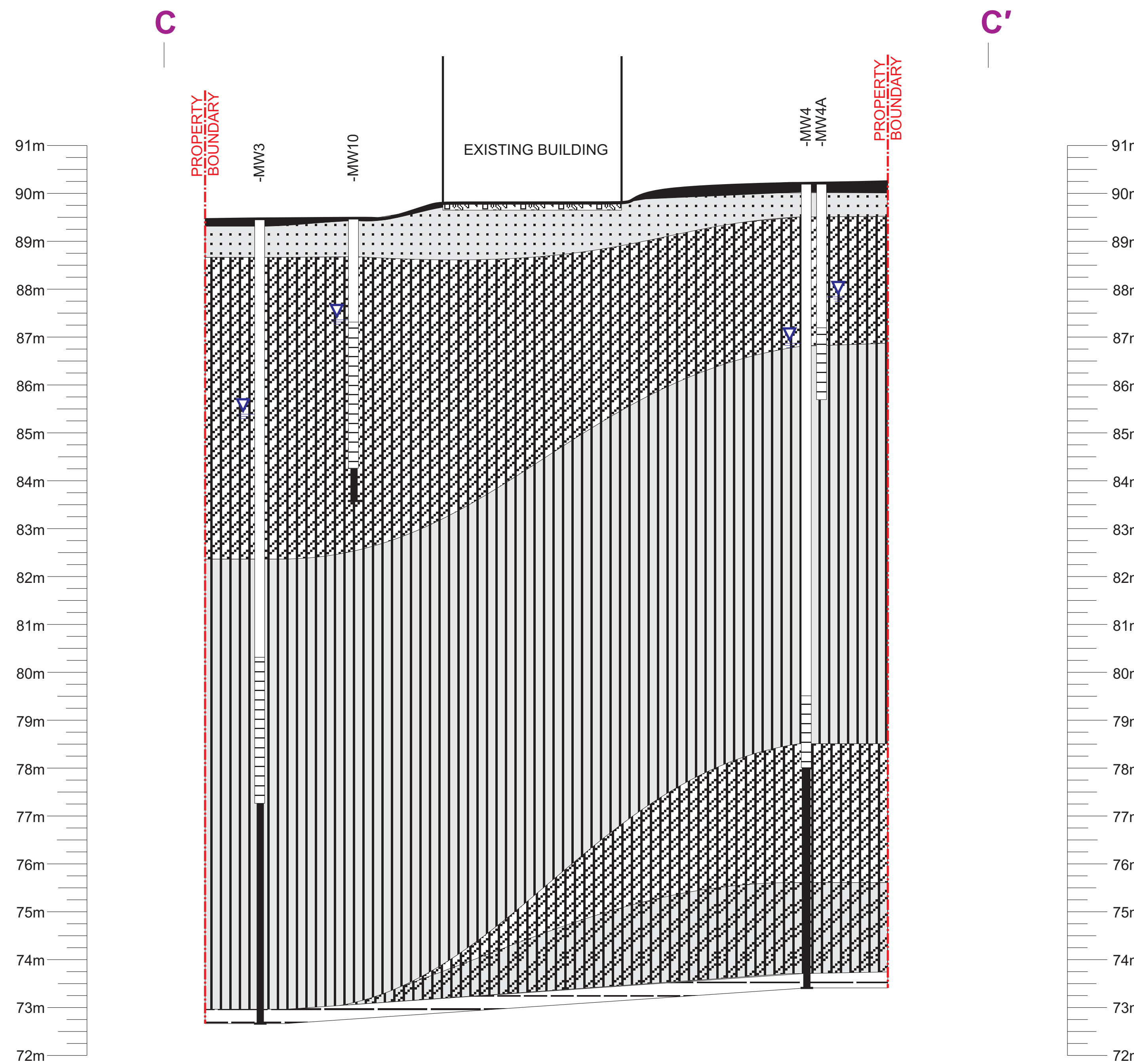
TERRAPEX

SOIL ANALYTICAL RESULTS - PCBs
CROSS SECTION C - C'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP



LEGEND

- ASPHALT
- CONCRETE
- FILL
- CLAY
- SILT
- SILTY SAND TILL
- SILTY CLAY/ CLAYEY SILT
- SANDY SILTY CLAY
- SAND
- SHALE
- GROUNDWATER LEVEL (AS OF MARCH 1, 2019)
- MONITORING WELL
- SCREENED LEVEL
- BOREHOLE

ANALYSIS INFORMATION

- Less than or equal to Table 3 SCS
- Greater than Table 3 SCS

Sample I.D. — Sample depth

MW103-4 – (depth)

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; Residential / Parkland / Institutional land use, coarse textured soil

VERTICAL SCALE: 0 2.5m 5m (APPROXIMATE)

HORIZONTAL SCALE: 0 10m 20m (APPROXIMATE)

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN	SF
CHECKED	STR
DRAWING #	FIGURE 12N

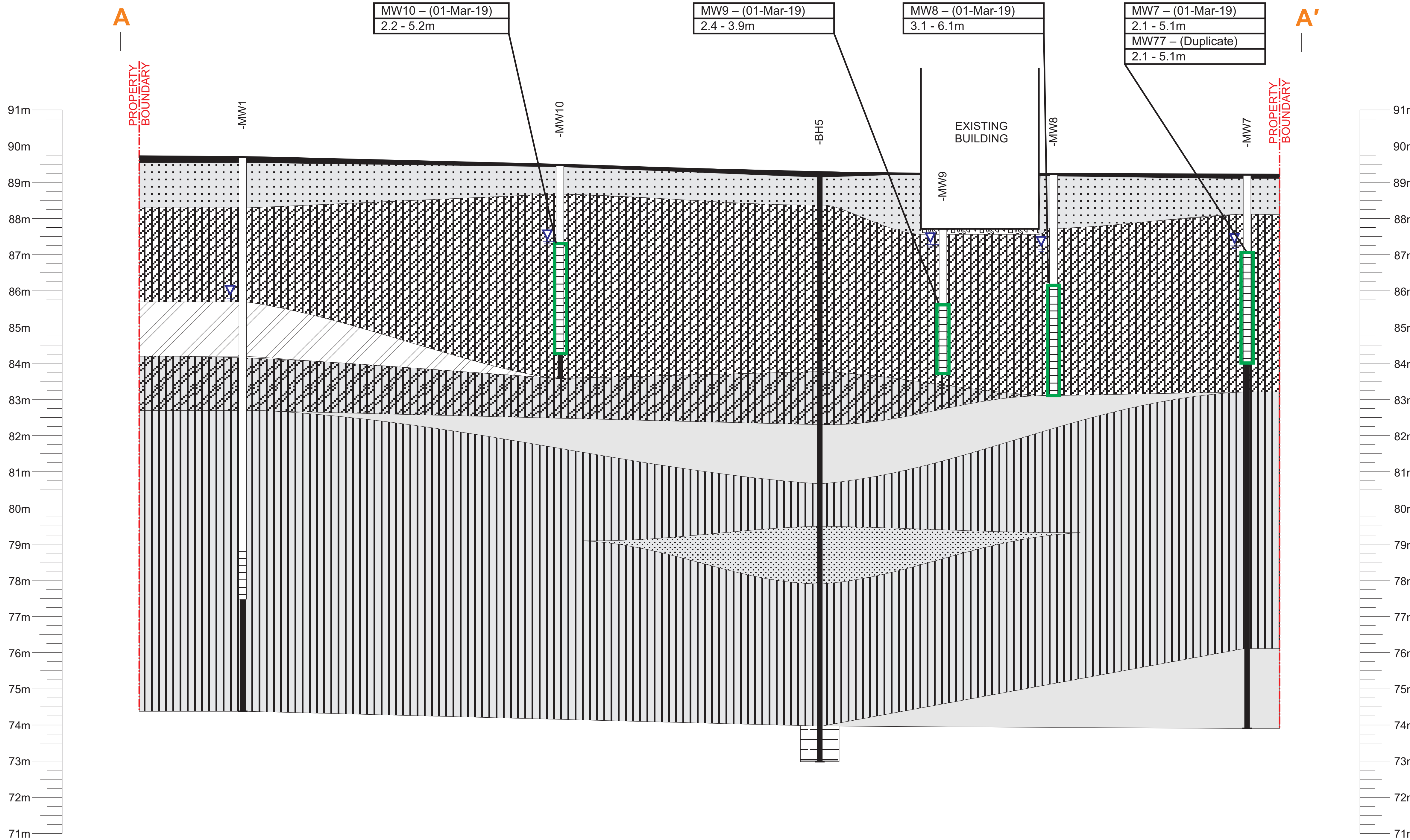
TERRAPEX

GROUNDWATER ANALYTICAL RESULTS - PHCs
CROSS SECTION A - A'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP



LEGEND

- ASPHALT
- CONCRETE
- FILL
- CLAY
- SILT
- SILTY SAND TILL
- SILTY CLAY/ CLAYEY SILT
- SANDY SILTY CLAY
- SAND
- GRAVELLY SAND (TILL)
- SHALE
- GROUNDWATER LEVEL (AS OF MARCH 1, 2019)
- MONITORING WELL
- SCREENED LEVEL
- BOREHOLE

ANALYSIS INFORMATION

- Less than or equal to Table 3 SCS
- Greater than Table 3 SCS

Sample I.D. — Sample date
MW103 – (date)
Screen Interval

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; coarse textured soil

VERTICAL SCALE: 0 2.5m 5m (APPROXIMATE)

HORIZONTAL SCALE: 0 10m 20m (APPROXIMATE)

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN	SF
CHECKED	STR
DRAWING #	FIGURE 13A

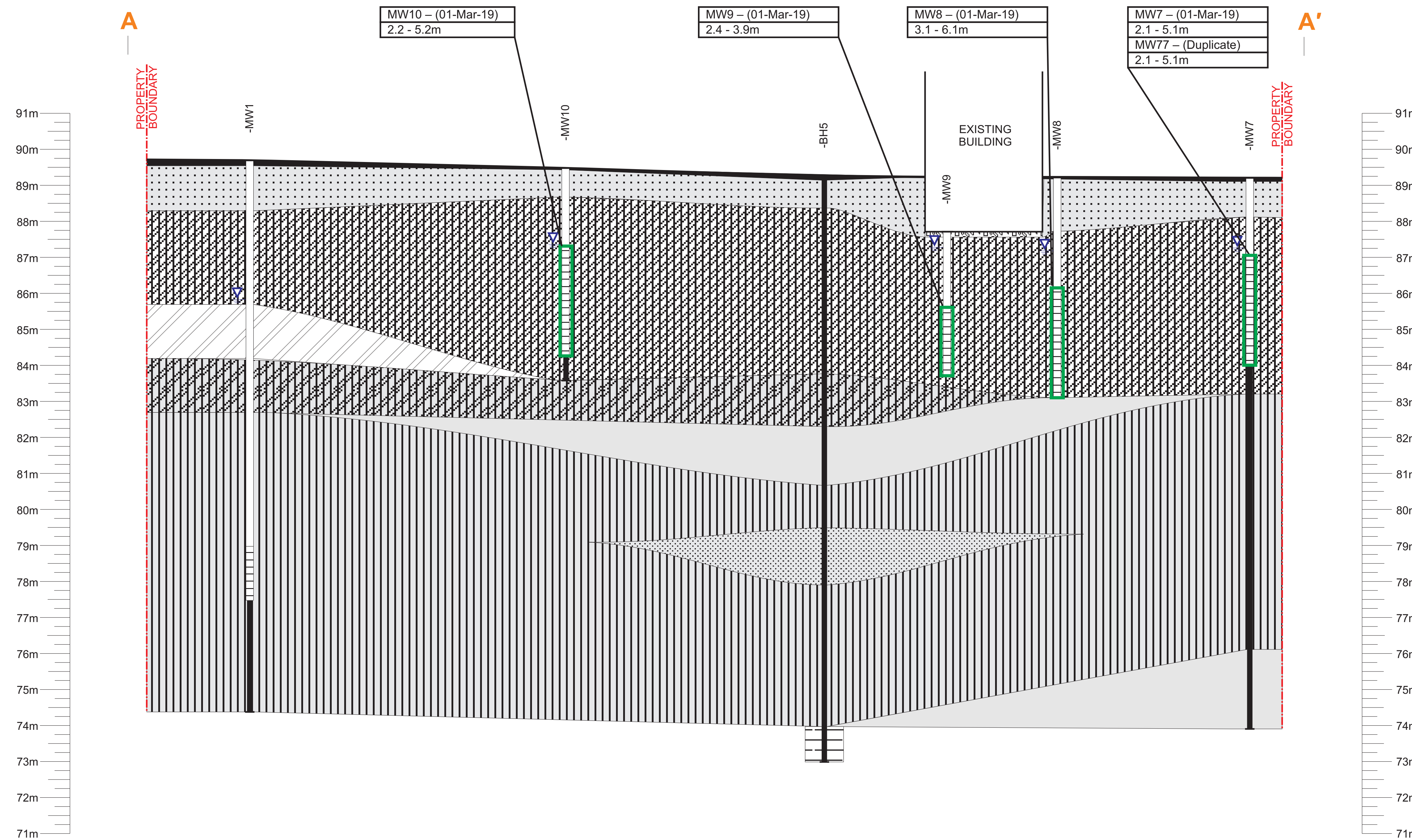
TERRAPEX

GROUNDWATER ANALYTICAL RESULTS - VOCs
CROSS SECTION A - A'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP



LEGEND

- ASPHALT
- CONCRETE
- FILL
- CLAY
- SILT
- SILTY SAND TILL
- SILTY CLAY/ CLAYEY SILT
- SANDY SILTY CLAY
- SAND
- GRAVELLY SAND (TILL)
- SHALE
- GROUNDWATER LEVEL (AS OF MARCH 1, 2019)
- MONITORING WELL
- SCREENED LEVEL
- BOREHOLE

ANALYSIS INFORMATION

- Less than or equal to Table 3 SCS
- Greater than Table 3 SCS

Sample I.D. — Sample date
MW103 – (date)
Screen Interval

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; coarse textured soil

VERTICAL SCALE:
0 2.5m 5m
(APPROXIMATE)

HORIZONTAL SCALE:
0 10m 20m
(APPROXIMATE)

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN SF	CHECKED STR
DRAWING #	FIGURE 13B

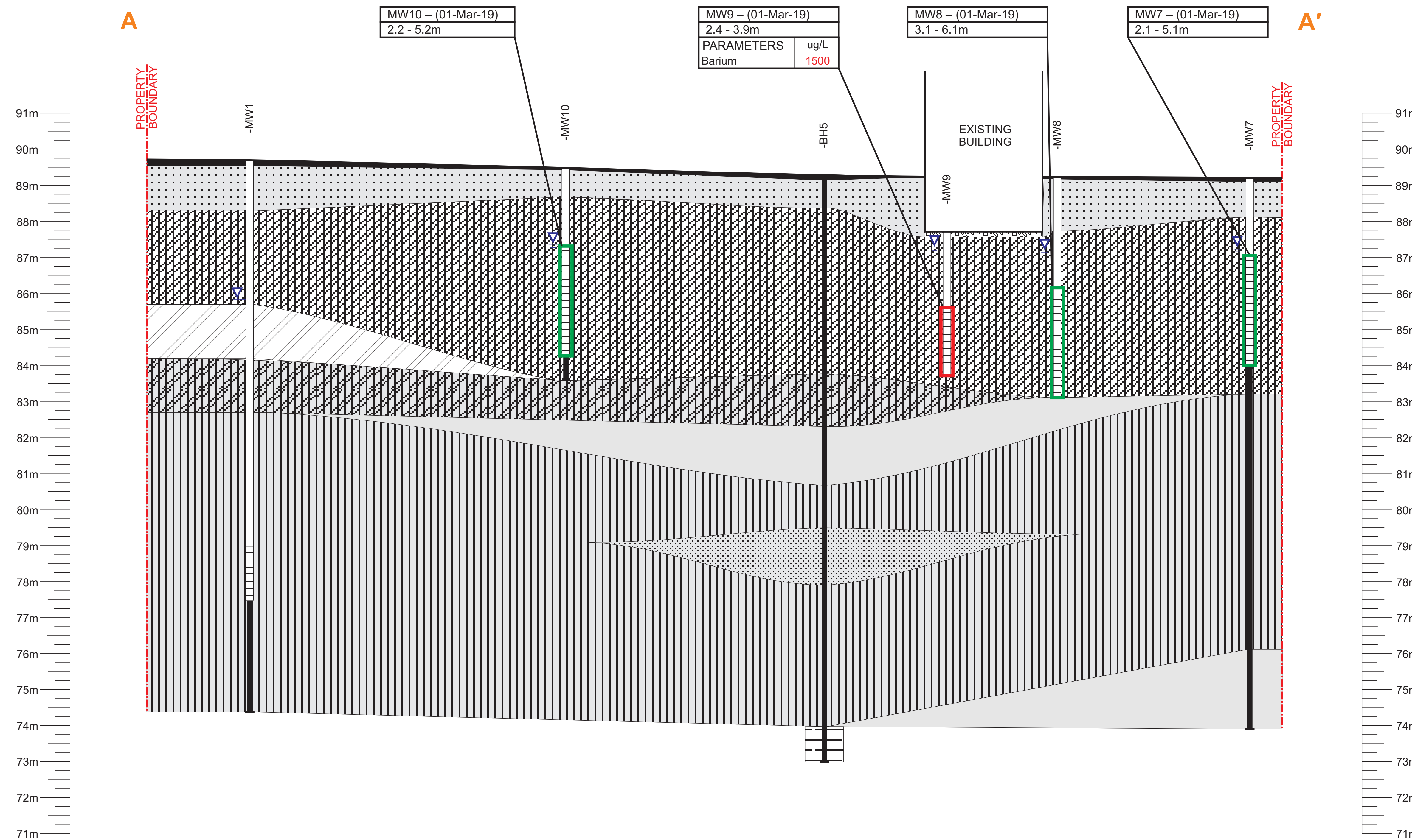
TERRAPEX

GROUNDWATER ANALYTICAL RESULTS - METALS - CROSS SECTION A - A'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP



LEGEND

ASPHALT
CONCRETE
FILL
CLAY
SILT
SILTY SAND TILL
SILTY CLAY/ CLAYEY SILT
SANDY SILTY CLAY
SAND
GRAVELLY SAND (TILL)
SHALE
GROUNDWATER LEVEL (AS OF MARCH 1, 2019)

- MONITORING WELL
- SCREENED LEVEL
- BOREHOLE

ANALYSIS INFORMATION

Less than or equal to Table 3 SCS
Greater than Table 3 SCS
VALUE Less than or equal to Table 2 SCS
VALUE Greater than Table 2 SCS

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; coarse textured soil

Sample I.D. — Sample date

BH103 – (date)	
Screen Interval	
PARAMETERS	ug/L
Barium	2

TABLE 2 SCS
1000

VERTICAL SCALE:
0 2.5m 5m
(APPROXIMATE)

HORIZONTAL SCALE:
0 10m 20m
(APPROXIMATE)

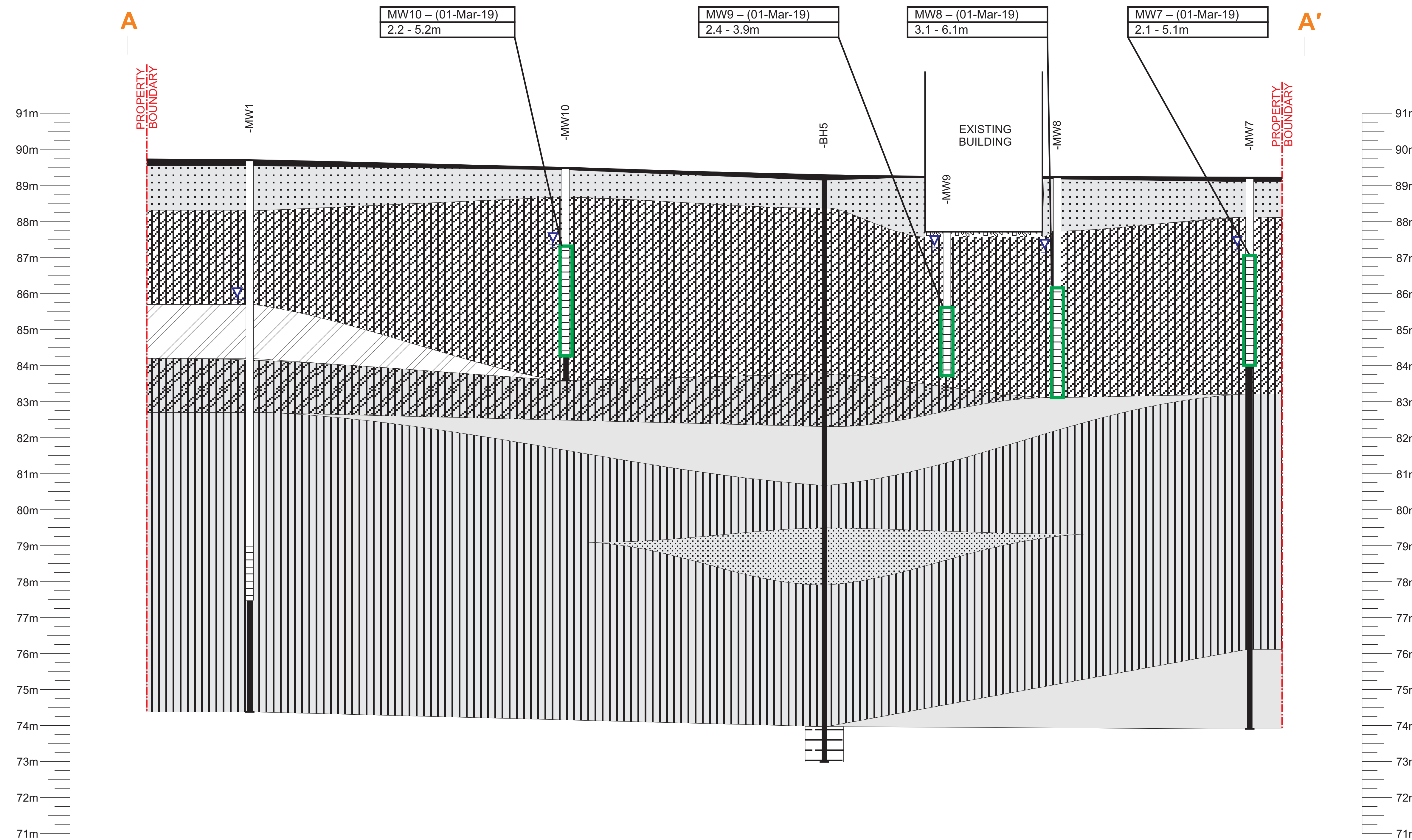
PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN SF	CHECKED STR
DRAWING #	FIGURE 13C

GROUNDWATER ANALYTICAL RESULTS - HYDRIDE-FORMING METALS - CROSS SECTION A - A'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

TERRAPEX

CLIENT: ALTONA GROUP



LEGEND

- ASPHALT
- CONCRETE
- FILL
- CLAY
- SILT
- SILTY SAND TILL
- SILTY CLAY/ CLAYEY SILT
- SANDY SILTY CLAY
- SAND
- GRAVELLY SAND (TILL)
- SHALE
- GROUNDWATER LEVEL (AS OF MARCH 1, 2019)
- MONITORING WELL
- SCREENED LEVEL
- BOREHOLE

ANALYSIS INFORMATION

- Less than or equal to Table 3 SCS
- Greater than Table 3 SCS

Sample I.D. — Sample date
MW103 – (date)
Screen Interval

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; coarse textured soil

VERTICAL SCALE: 0 — 2.5m — 5m (APPROXIMATE)

HORIZONTAL SCALE: 0 — 10m — 20m (APPROXIMATE)

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN	SF
CHECKED	STR
DRAWING #	FIGURE 13D

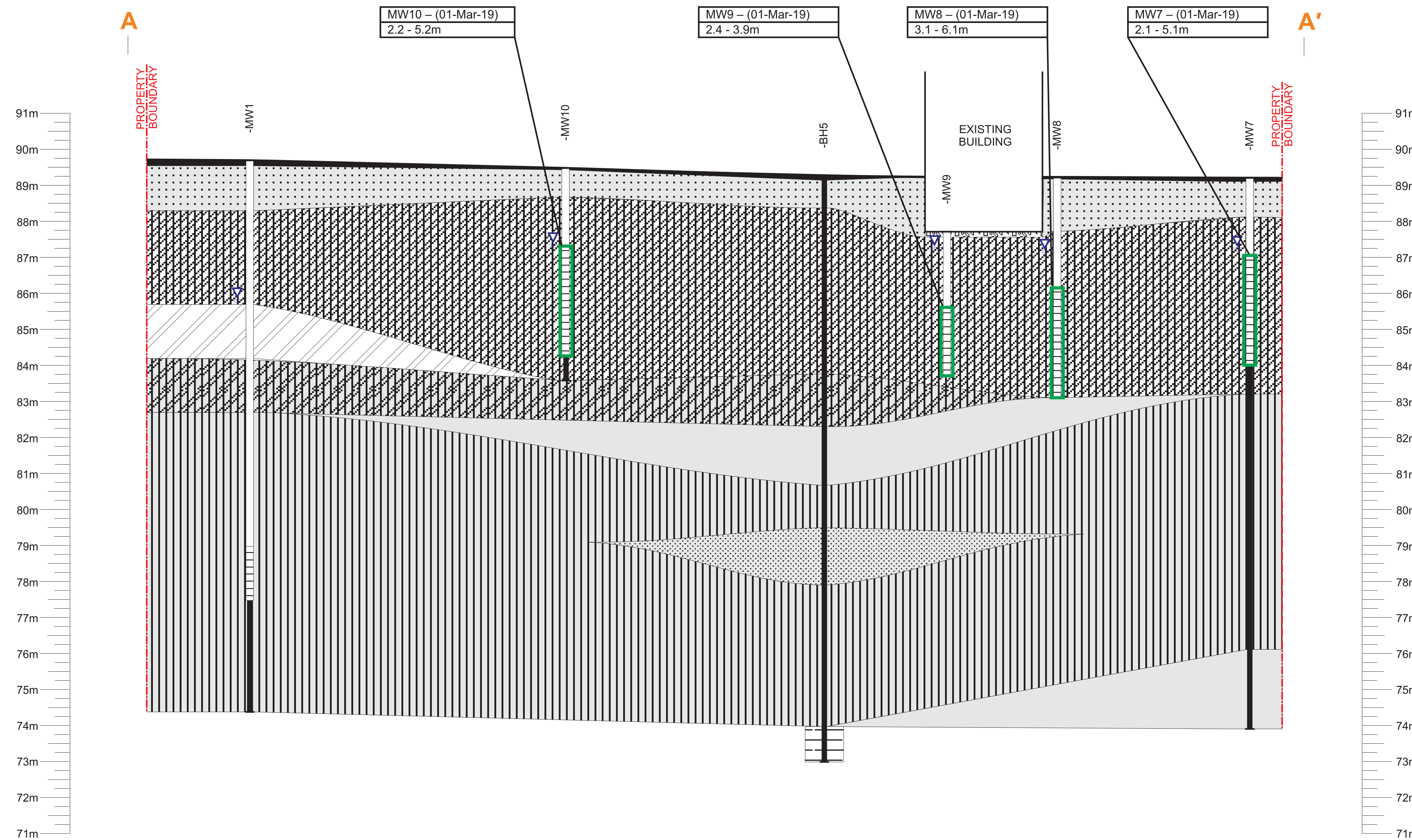
TERRAPEX

GROUNDWATER ANALYTICAL RESULTS - CYANIDE (CN-) - CROSS SECTION A - A'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP



LEGEND

- ASPHALT
- CONCRETE
- FILL
- CLAY
- SILT
- SILTY SAND TILL
- SILTY CLAY/ CLAYEY SILT
- SANDY SILTY CLAY
- SAND
- GRAVELLY SAND (TILL)
- SHALE
- GROUNDWATER LEVEL (AS OF MARCH 1, 2019)
- MONITORING WELL
- SCREENED LEVEL
- BOREHOLE

ANALYSIS INFORMATION

- Less than or equal to Table 3 SCS
- Greater than Table 3 SCS

Sample I.D. — Sample date
MW103 – (date)
Screen Interval

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; coarse textured soil

VERTICAL SCALE:
0 2.5m 5m
(APPROXIMATE)

HORIZONTAL SCALE:
0 10m 20m
(APPROXIMATE)

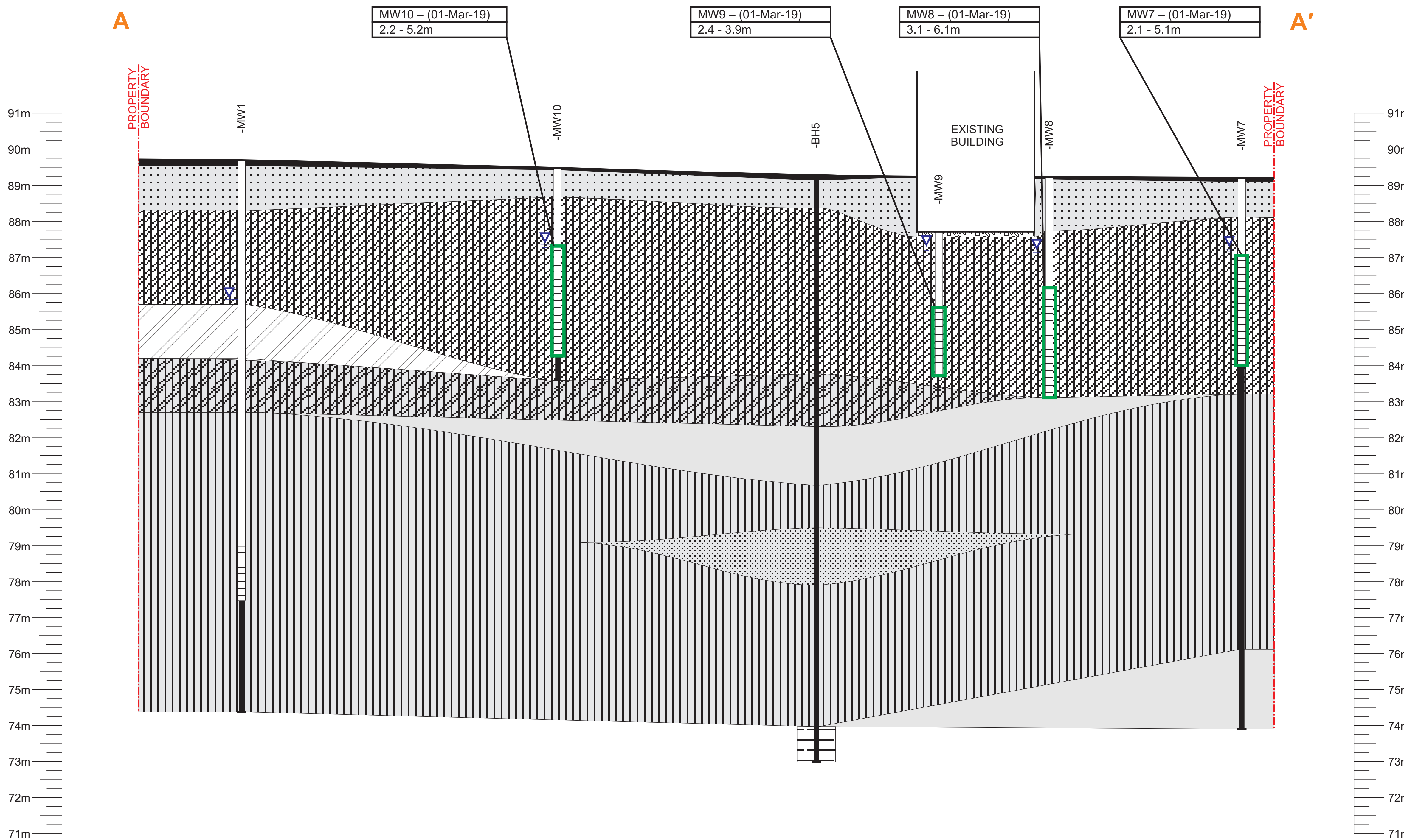
PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN SF	CHECKED STR
DRAWING #	FIGURE 13E

TERRAPEX

GROUNDWATER ANALYTICAL RESULTS - MERCURY - CROSS SECTION A - A'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT
ALTONA GROUP



LEGEND

- ASPHALT
- CONCRETE
- FILL
- CLAY
- SILT
- SILTY SAND TILL
- SILTY CLAY/ CLAYEY SILT
- SANDY SILTY CLAY
- SAND
- GRAVELLY SAND (TILL)
- SHALE
- GROUNDWATER LEVEL (AS OF MARCH 1, 2019)
- MONITORING WELL
- SCREENED LEVEL
- BOREHOLE

ANALYSIS INFORMATION

- Less than or equal to Table 3 SCS
- Greater than Table 3 SCS

Sample I.D. — Sample date
MW103 – (date)
Screen Interval

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; coarse textured soil

VERTICAL SCALE: 0 — 2.5m — 5m (APPROXIMATE)

HORIZONTAL SCALE: 0 — 10m — 20m (APPROXIMATE)

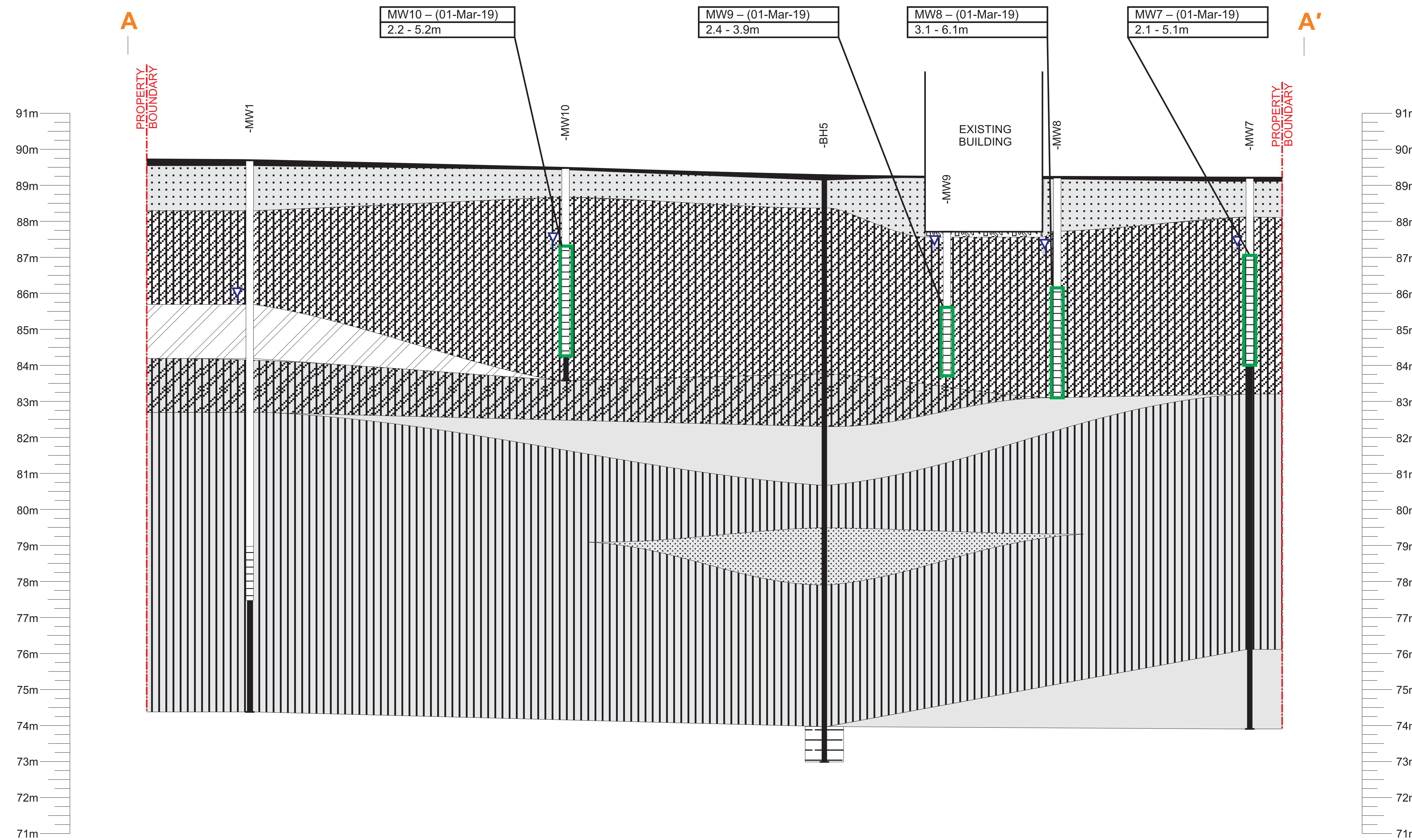
PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN SF	CHECKED STR
DRAWING #	FIGURE 13F

TERRAPEX

GROUNDWATER ANALYTICAL RESULTS - CYANIDE (CN-) - CROSS SECTION A - A'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT
ALTONA GROUP



LEGEND

- ASPHALT
- CONCRETE
- FILL
- CLAY
- SILT
- SILTY SAND TILL
- SILTY CLAY/ CLAYEY SILT
- SANDY SILTY CLAY
- SAND
- GRAVELLY SAND (TILL)
- SHALE
- GROUNDWATER LEVEL (AS OF MARCH 1, 2019)
- MONITORING WELL
- SCREENED LEVEL
- BOREHOLE

ANALYSIS INFORMATION

- Less than or equal to Table 3 SCS
- Greater than Table 3 SCS

Sample I.D. — Sample date
MW103 – (date)
Screen Interval

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; coarse textured soil

VERTICAL SCALE: 0 — 2.5m — 5m (APPROXIMATE)

HORIZONTAL SCALE: 0 — 10m — 20m (APPROXIMATE)

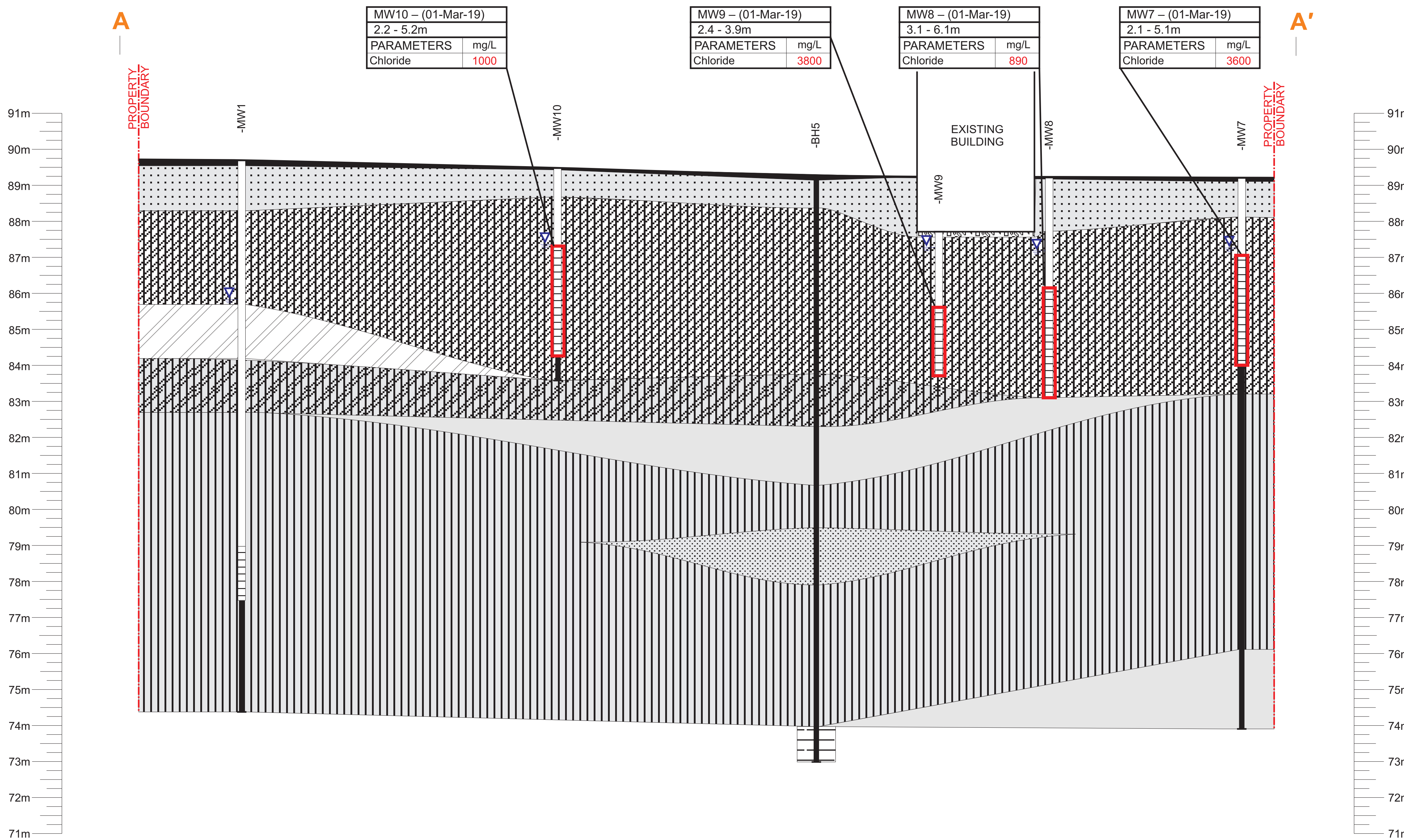
PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN	SF
CHECKED	STR
DRAWING #	FIGURE 13G

TERRAPEX

GROUNDWATER ANALYTICAL RESULTS - CHLORIDE - CROSS SECTION A - A'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT: ALTONA GROUP



LEGEND

- ASPHALT
- CONCRETE
- FILL
- CLAY
- SILT
- SILTY SAND TILL
- SILTY CLAY/ CLAYEY SILT
- SANDY SILTY CLAY
- SAND
- GRAVELLY SAND (TILL)
- SHALE
- GROUNDWATER LEVEL (AS OF MARCH 1, 2019)
- MONITORING WELL
- SCREENED LEVEL
- BOREHOLE

ANALYSIS INFORMATION

- Less than or equal to Table 3 SCS
- Greater than Table 3 SCS

VALUE Less than or equal to Table 2 SCS
VALUE Greater than Table 2 SCS

Sample I.D. — Sample date

BH103 – (date)	
Screen Interval	
PARAMETERS	mg/L
Chloride	10

TABLE 2 SCS
790

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; coarse textured soil

VERTICAL SCALE: 0 2.5m 5m (APPROXIMATE)

HORIZONTAL SCALE: 0 10m 20m (APPROXIMATE)

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN	SF
CHECKED	STR
DRAWING #	FIGURE 13H

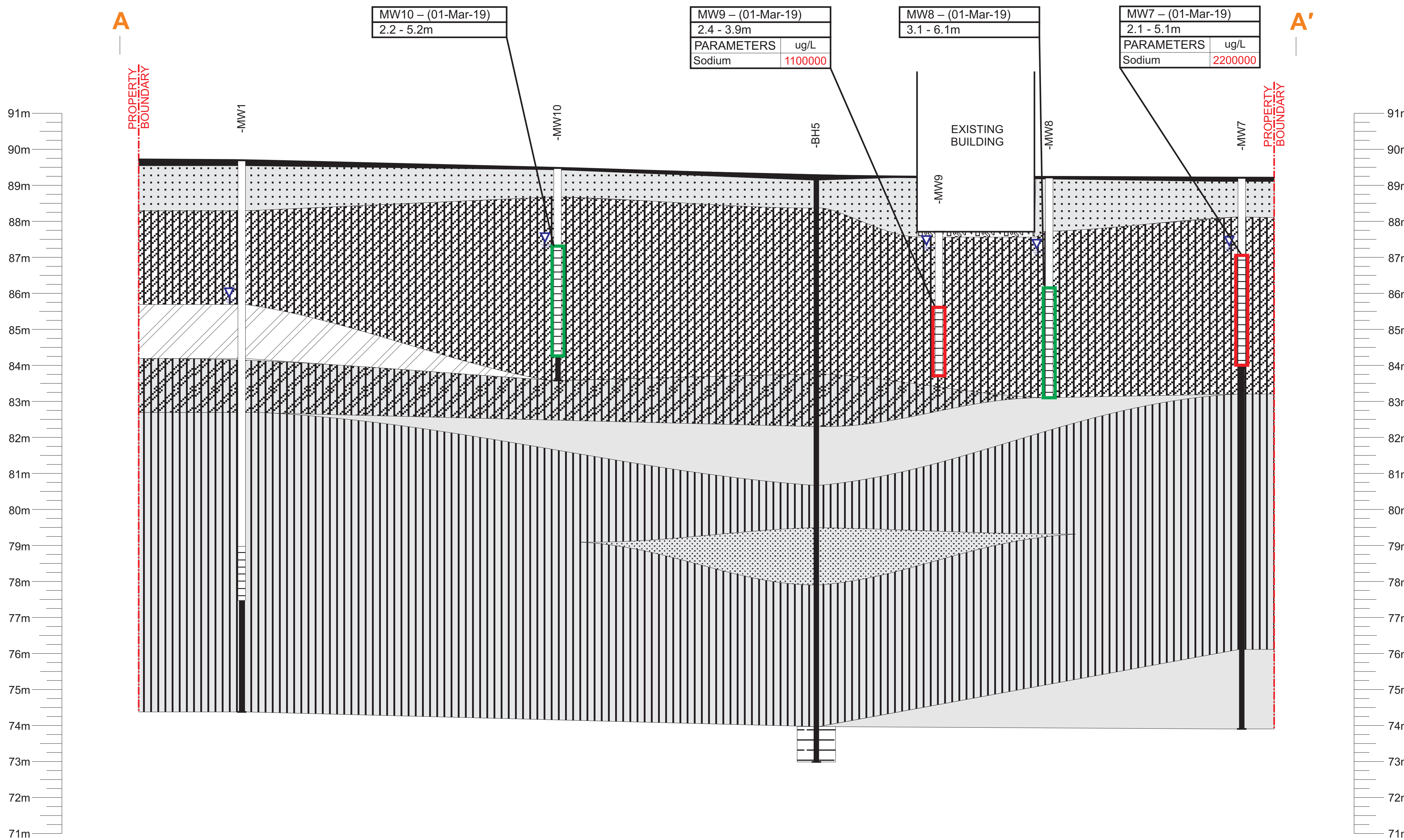
TERRAPEX

GROUNDWATER ANALYTICAL RESULTS - SODIUM - CROSS SECTION A - A'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP



LEGEND

- ASPHALT
- CONCRETE
- FILL
- CLAY
- SILT
- SILTY SAND TILL
- SILTY CLAY/ CLAYEY SILT
- SANDY SILTY CLAY
- SAND
- GRAVELLY SAND (TILL)
- SHALE
- GROUNDWATER LEVEL (AS OF MARCH 1, 2019)
- MONITORING WELL
- SCREENED LEVEL
- BOREHOLE

ANALYSIS INFORMATION

- Less than or equal to Table 3 SCS
- Greater than Table 3 SCS
- VALUE Less than or equal to Table 2 SCS
- VALUE Greater than Table 2 SCS

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; coarse textured soil

Sample I.D. / Sample date

BH103 – (date)	
Screen Interval	
PARAMETERS	ug/L
Sodium	100

TABLE 2 SCS
490000

VERTICAL SCALE: 0 2.5m 5m (APPROXIMATE)

HORIZONTAL SCALE: 0 10m 20m (APPROXIMATE)

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN SF	CHECKED STR
DRAWING #	FIGURE 13I

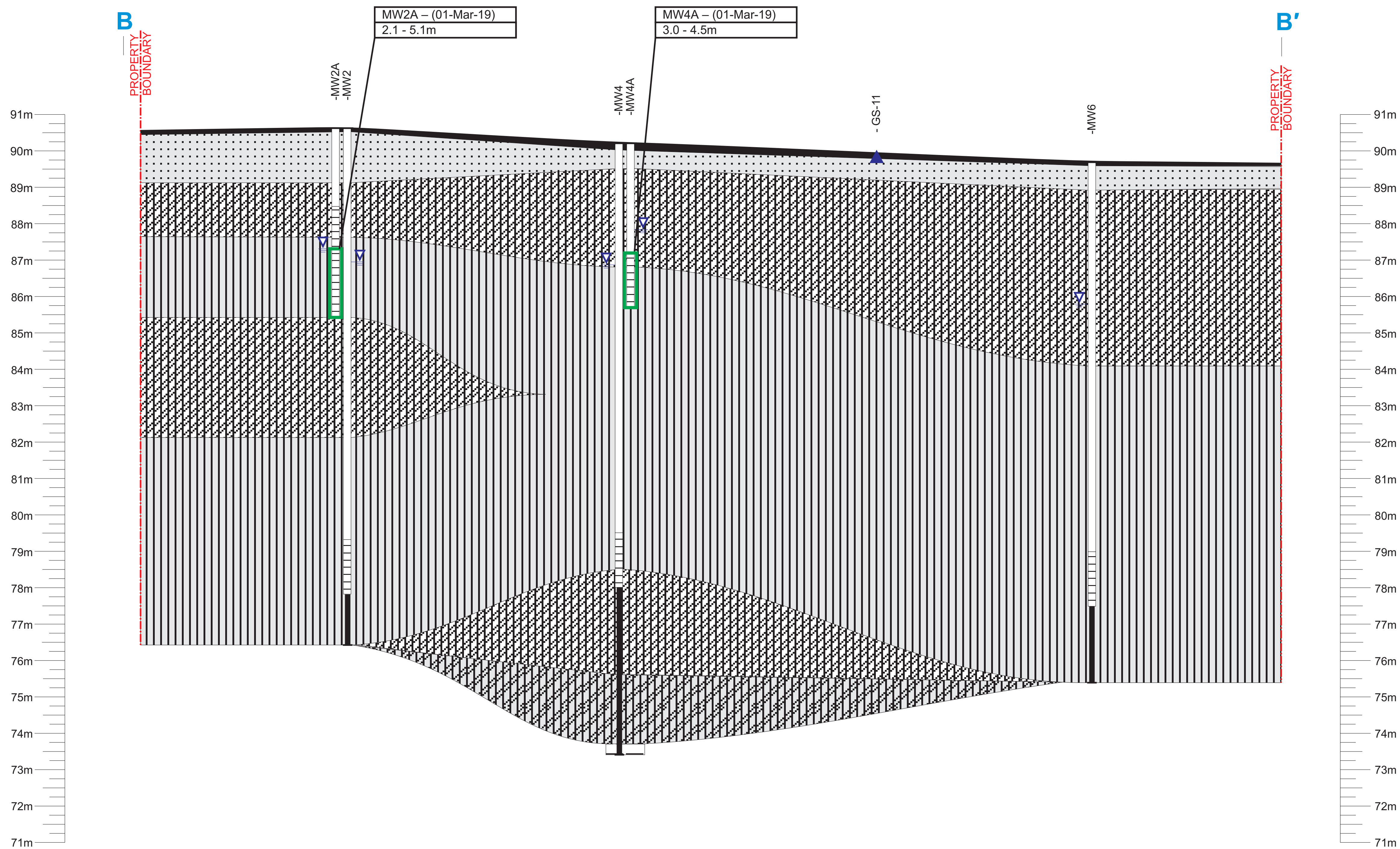
GROUNDWATER ANALYTICAL RESULTS - PHCs
CROSS SECTION B - B'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

TERRAPEX

CLIENT

ALTONA GROUP



LEGEND

- ASPHALT
- CONCRETE
- FILL
- CLAY
- SILT
- SILTY SAND TILL
- SILTY CLAY/ CLAYEY SILT
- SANDY SILTY CLAY
- SAND
- SHALE
- GROUNDWATER LEVEL (AS OF MARCH 1, 2019)
- SOIL SAMPLE
- MONITORING WELL
- SCREENED LEVEL
- BOREHOLE

ANALYSIS INFORMATION

- Less than or equal to Table 3 SCS
- Greater than Table 3 SCS

Sample I.D. — Sample date
MW103 – (date)
Screen Interval

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; coarse textured soil

VERTICAL SCALE: 0 — 2.5m — 5m (APPROXIMATE)

HORIZONTAL SCALE: 0 — 10m — 20m (APPROXIMATE)

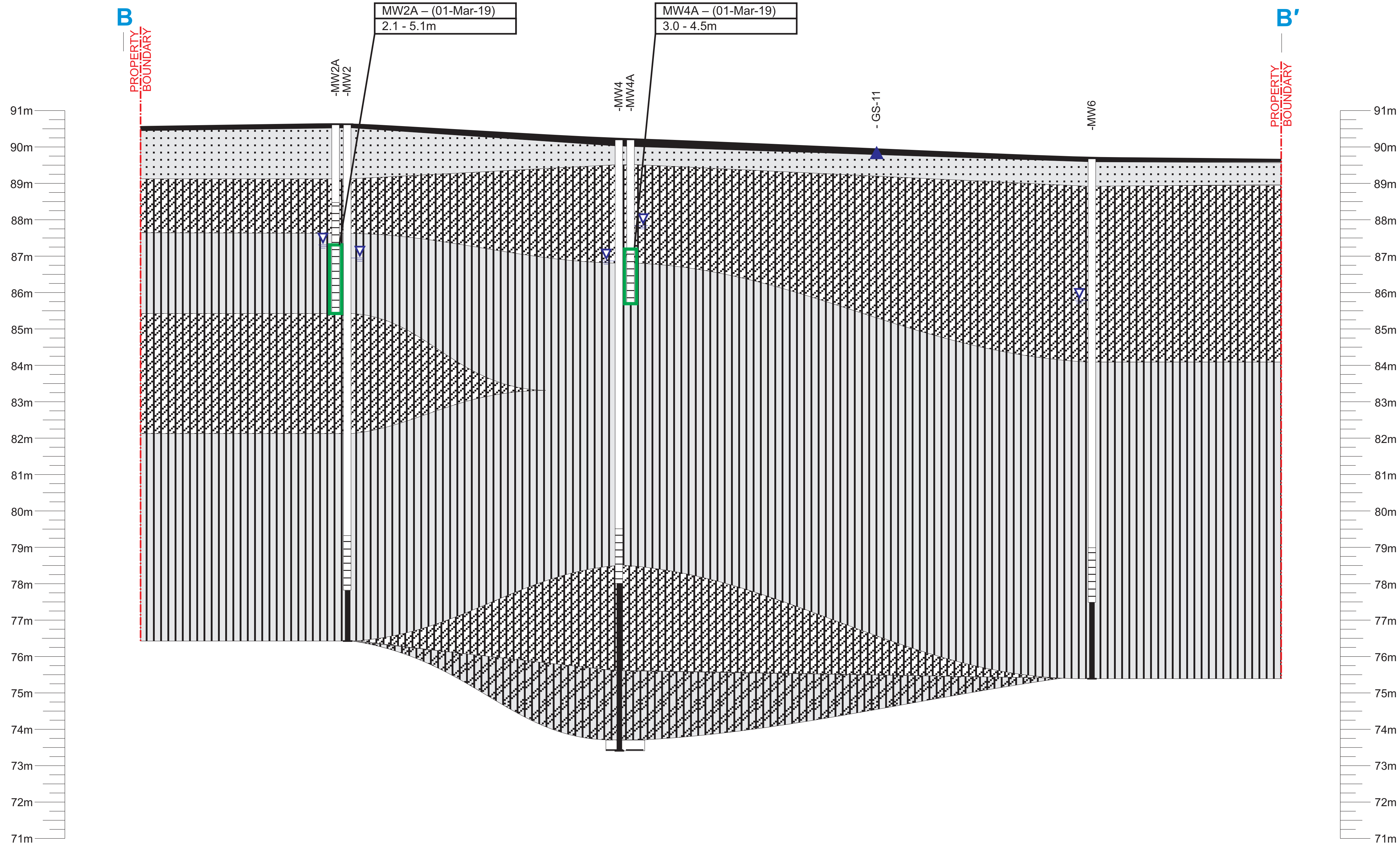
PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN SF	CHECKED STR
DRAWING #	FIGURE 14A

TERRAPEX

GROUNDWATER ANALYTICAL RESULTS - VOCs
CROSS SECTION B - B'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT: ALTONA GROUP



LEGEND

- ASPHALT
- CONCRETE
- FILL
- CLAY
- SILT
- SILTY SAND TILL
- SILTY CLAY/ CLAYEY SILT
- SANDY SILTY CLAY
- SAND
- SHALE
- GROUNDWATER LEVEL (AS OF MARCH 1, 2019)
- SOIL SAMPLE
- MONITORING WELL
- SCREENED LEVEL
- BOREHOLE

ANALYSIS INFORMATION

- Less than or equal to Table 3 SCS
- Greater than Table 3 SCS

Sample I.D. / Sample date
MW103 – (date)
Screen Interval

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; coarse textured soil

VERTICAL SCALE: 0 — 2.5m — 5m (APPROXIMATE)

HORIZONTAL SCALE: 0 — 10m — 20m (APPROXIMATE)

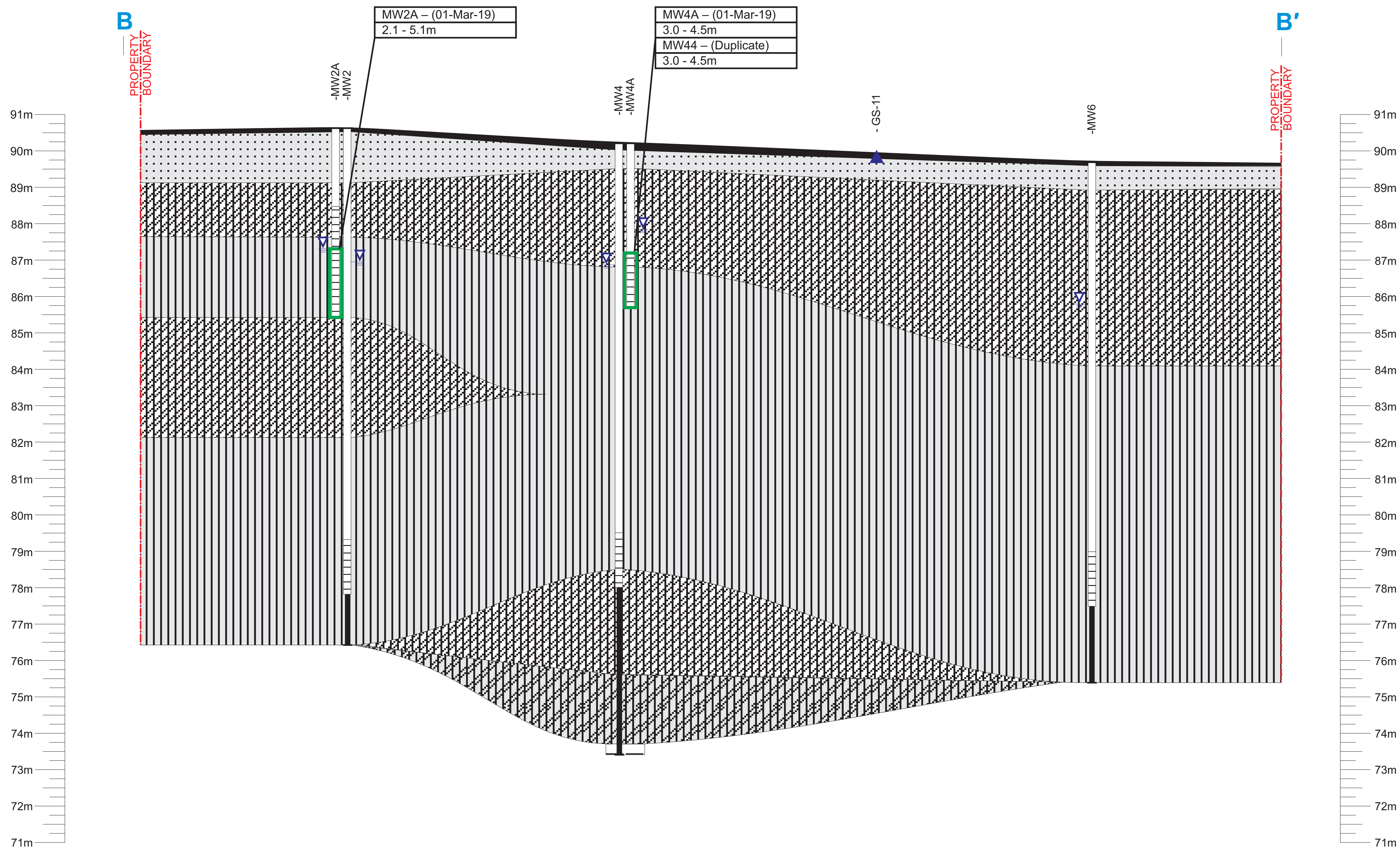
PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN	SF
CHECKED	STR
DRAWING #	FIGURE 14B

TERRAPEX

GROUNDWATER ANALYTICAL RESULTS - METALS - CROSS SECTION B - B'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT
ALTONA GROUP



LEGEND

- ASPHALT
- CONCRETE
- FILL
- CLAY
- SILT
- SILTY SAND TILL
- SILTY CLAY/ CLAYEY SILT
- SANDY SILTY CLAY
- SAND
- SHALE
- GROUNDWATER LEVEL (AS OF MARCH 1, 2019)
- SOIL SAMPLE
- MONITORING WELL
- SCREENED LEVEL
- BOREHOLE

ANALYSIS INFORMATION

- Less than or equal to Table 3 SCS
- Greater than Table 3 SCS

Sample I.D. — Sample date
MW103 – (date)
Screen Interval

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; coarse textured soil

VERTICAL SCALE:
0 2.5m 5m
(APPROXIMATE)

HORIZONTAL SCALE:
0 10m 20m
(APPROXIMATE)

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN SF	CHECKED STR
DRAWING #	FIGURE 14C

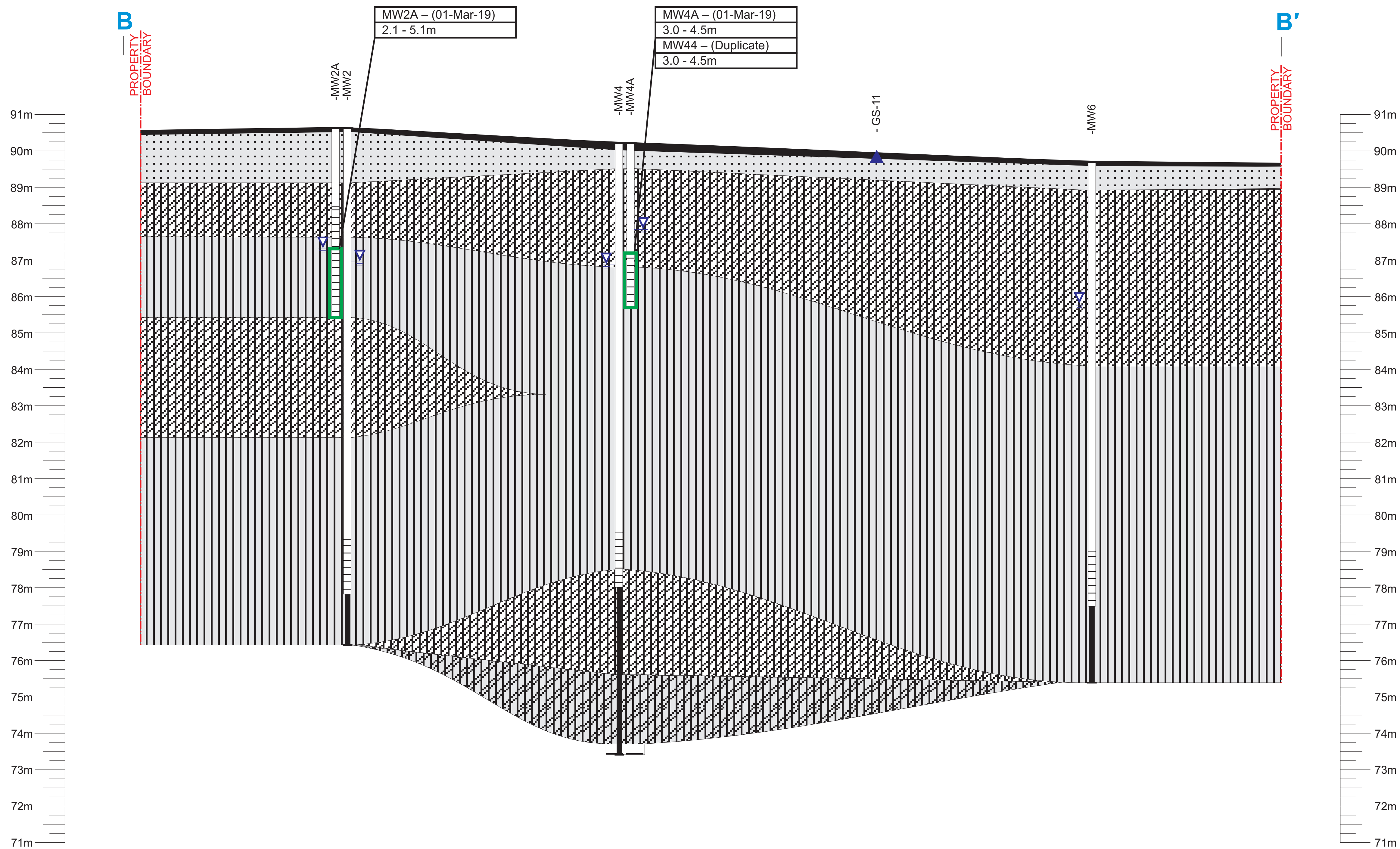
TERRAPEX

GROUNDWATER ANALYTICAL RESULTS - HYDRIDE-FORMING METALS - CROSS SECTION B - B'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP



LEGEND

- ASPHALT
- CONCRETE
- FILL
- CLAY
- SILT
- SILTY SAND TILL
- SILTY CLAY/ CLAYEY SILT
- SANDY SILTY CLAY
- SAND
- SHALE
- GROUNDWATER LEVEL (AS OF MARCH 1, 2019)
- SOIL SAMPLE
- MONITORING WELL
- SCREENED LEVEL
- BOREHOLE

ANALYSIS INFORMATION

- Less than or equal to Table 3 SCS
- Greater than Table 3 SCS

Sample I.D. — Sample date
MW103 – (date)
Screen Interval

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; coarse textured soil

VERTICAL SCALE: 0 — 2.5m — 5m (APPROXIMATE)

HORIZONTAL SCALE: 0 — 10m — 20m (APPROXIMATE)

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN	SF
CHECKED	STR
DRAWING #	FIGURE 14D

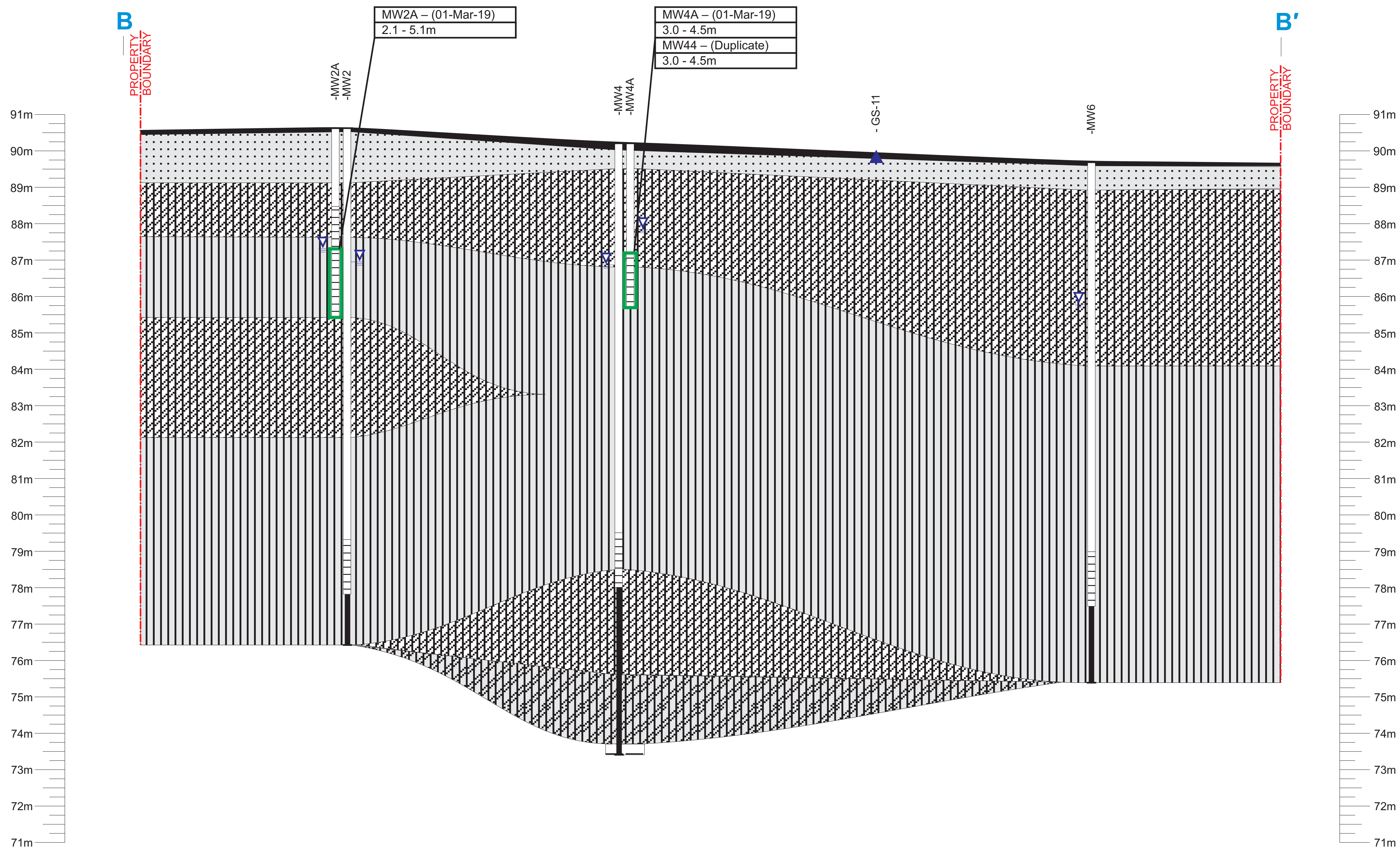
TERRAPEX

GROUNDWATER ANALYTICAL RESULTS - CYANIDE (CN-) - CROSS SECTION B - B'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP



LEGEND

- ASPHALT
- CONCRETE
- FILL
- CLAY
- SILT
- SILTY SAND TILL
- SILTY CLAY/ CLAYEY SILT
- SANDY SILTY CLAY
- SAND
- SHALE
- GROUNDWATER LEVEL (AS OF MARCH 1, 2019)
- SOIL SAMPLE
- MONITORING WELL
- SCREENED LEVEL
- BOREHOLE

ANALYSIS INFORMATION

- Less than or equal to Table 3 SCS
- Greater than Table 3 SCS

Sample I.D. — Sample date
MW103 – (date)
Screen Interval

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; coarse textured soil

VERTICAL SCALE: 0 — 2.5m — 5m (APPROXIMATE)

HORIZONTAL SCALE: 0 — 10m — 20m (APPROXIMATE)

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN	SF
CHECKED	STR
DRAWING #	FIGURE 14E

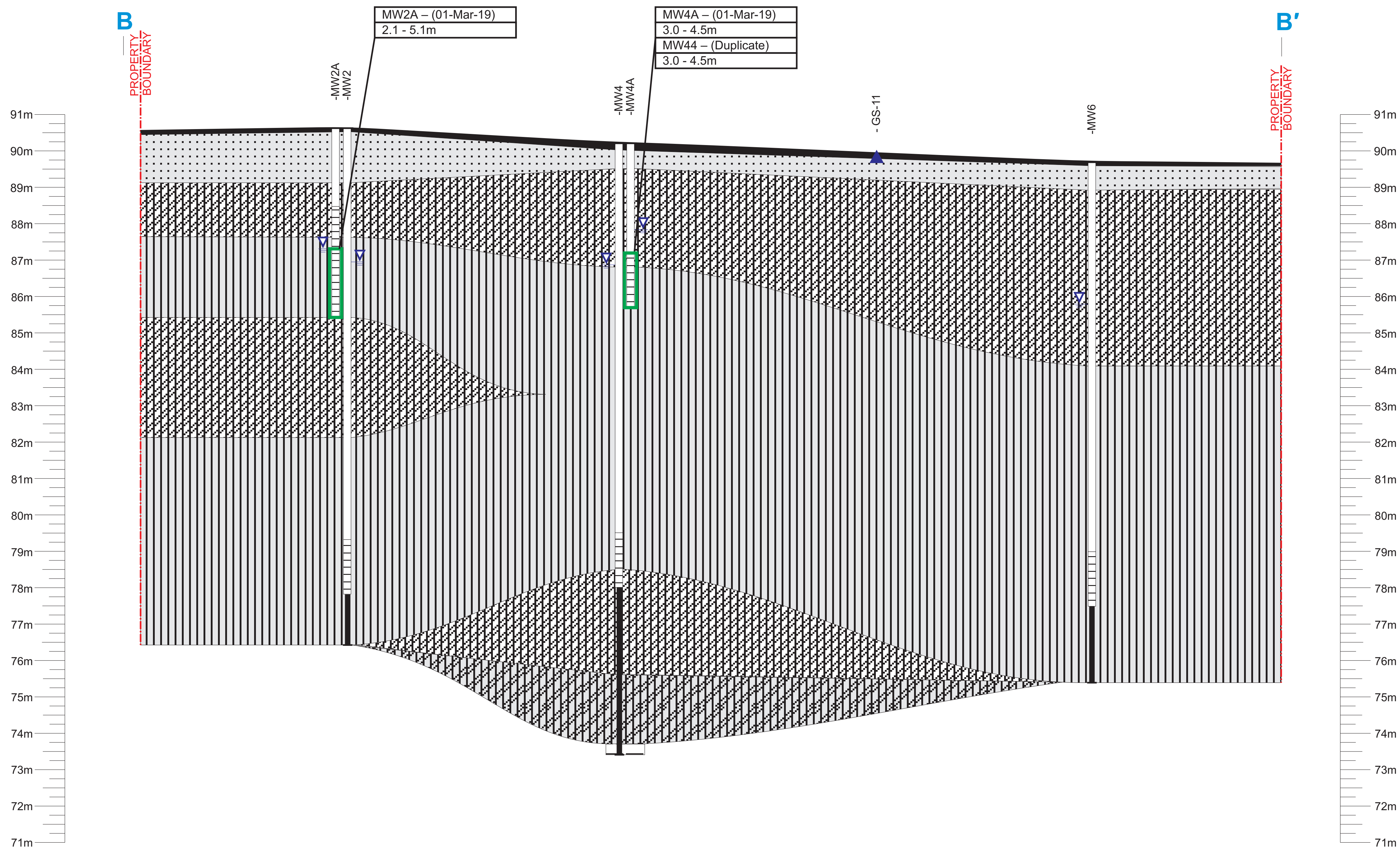
TERRAPEX

GROUNDWATER ANALYTICAL RESULTS - MERCURY - CROSS SECTION B - B'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP



LEGEND

- ASPHALT
- CONCRETE
- FILL
- CLAY
- SILT
- SILTY SAND TILL
- SILTY CLAY/ CLAYEY SILT
- SANDY SILTY CLAY
- SAND
- SHALE
- GROUNDWATER LEVEL (AS OF MARCH 1, 2019)
- SOIL SAMPLE
- MONITORING WELL
- SCREENED LEVEL
- BOREHOLE

ANALYSIS INFORMATION

- Less than or equal to Table 3 SCS
- Greater than Table 3 SCS

Sample I.D. — Sample date

MW103 – (date)
Screen Interval

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; coarse textured soil

VERTICAL SCALE:
0 2.5m 5m
(APPROXIMATE)

HORIZONTAL SCALE:
0 10m 20m
(APPROXIMATE)

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN SF	CHECKED STR
DRAWING #	FIGURE 14F

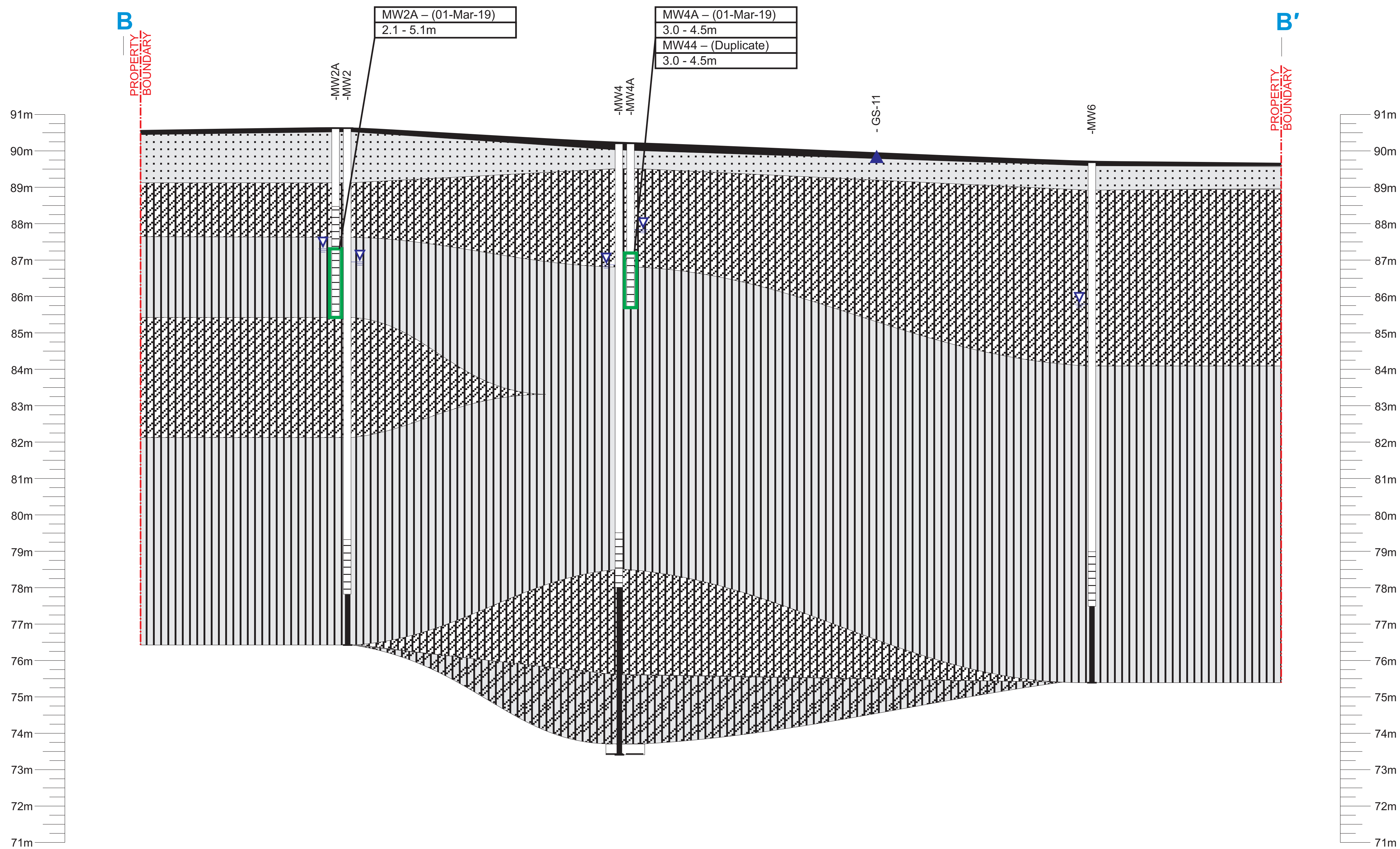
TERRAPEX

GROUNDWATER ANALYTICAL RESULTS - CYANIDE (CN-) - CROSS SECTION B - B'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP



LEGEND

- ASPHALT
- CONCRETE
- FILL
- CLAY
- SILT
- SILTY SAND TILL
- SILTY CLAY/ CLAYEY SILT
- SANDY SILTY CLAY
- SAND
- SHALE
- GROUNDWATER LEVEL (AS OF MARCH 1, 2019)
- - SOIL SAMPLE
- - MONITORING WELL
- - SCREENED LEVEL
- - BOREHOLE

ANALYSIS INFORMATION

- Less than or equal to Table 3 SCS
- Greater than Table 3 SCS

Sample I.D. — Sample date
MW103 – (date)
Screen Interval

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; coarse textured soil

VERTICAL SCALE:
0 2.5m 5m
(APPROXIMATE)

HORIZONTAL SCALE:
0 10m 20m
(APPROXIMATE)

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN SF	CHECKED STR
DRAWING #	FIGURE 14G

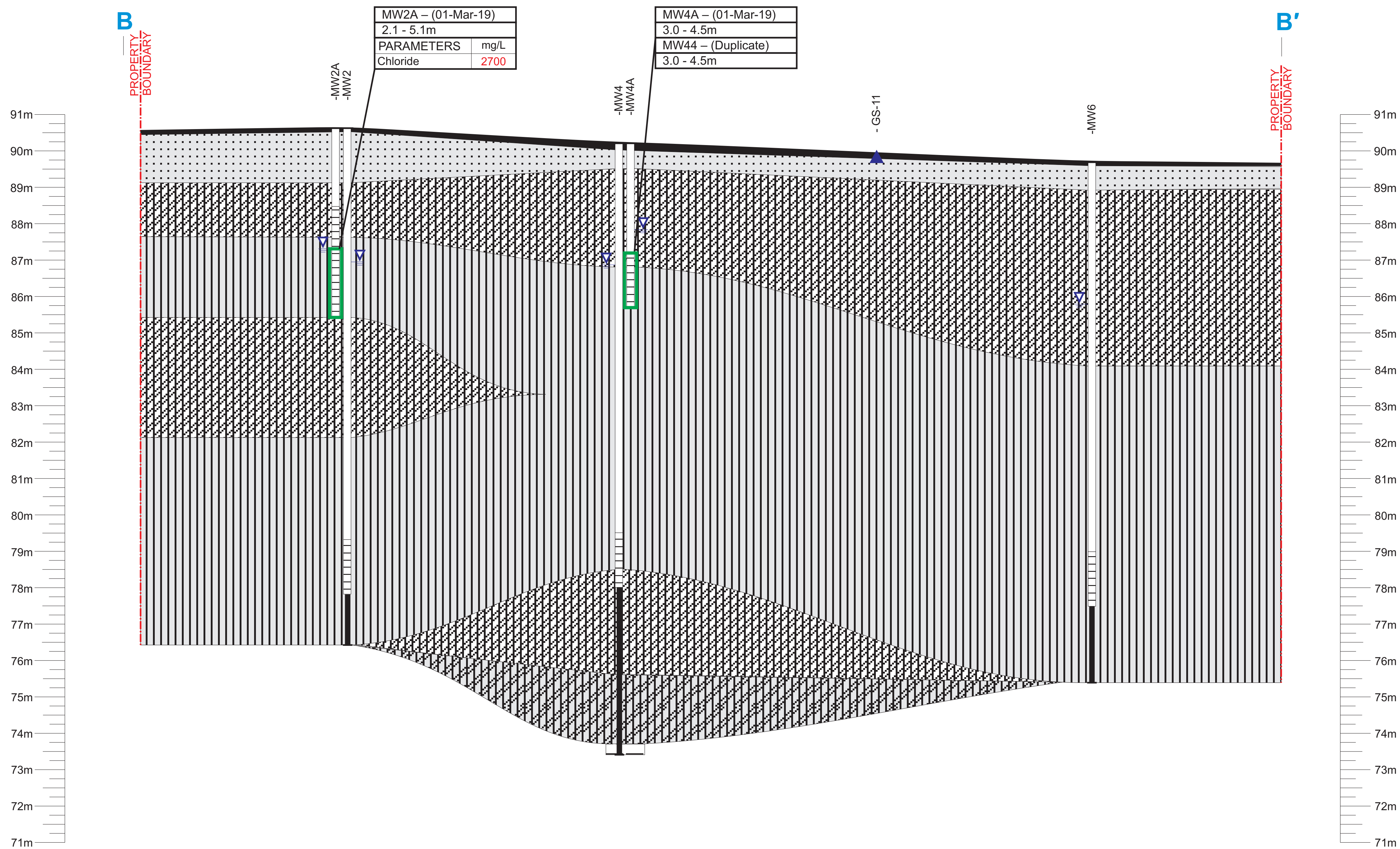
TERRAPEX

GROUNDWATER ANALYTICAL RESULTS - CHLORIDE - CROSS SECTION B - B'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP



LEGEND

- ASPHALT
- CONCRETE
- FILL
- CLAY
- SILT
- SILTY SAND TILL
- SILTY CLAY/ CLAYEY SILT
- SANDY SILTY CLAY
- SAND
- SHALE
- GROUNDWATER LEVEL (AS OF MARCH 1, 2019)
- SOIL SAMPLE
- MONITORING WELL
- SCREENED LEVEL
- BOREHOLE

ANALYSIS INFORMATION

Less than or equal to Table 3 SCS

Greater than Table 3 SCS

VALUE Less than or equal to Table 2 SCS

VALUE Greater than Table 2 SCS

Sample I.D. — Sample date

BH103 – (date)		TABLE 2 SCS
Screen Interval		
PARAMETERS	mg/L	
Chloride	10	790

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; coarse textured soil

VERTICAL SCALE:

0 2.5m 5m

(APPROXIMATE)

HORIZONTAL SCALE:

0 10m 20m

(APPROXIMATE)

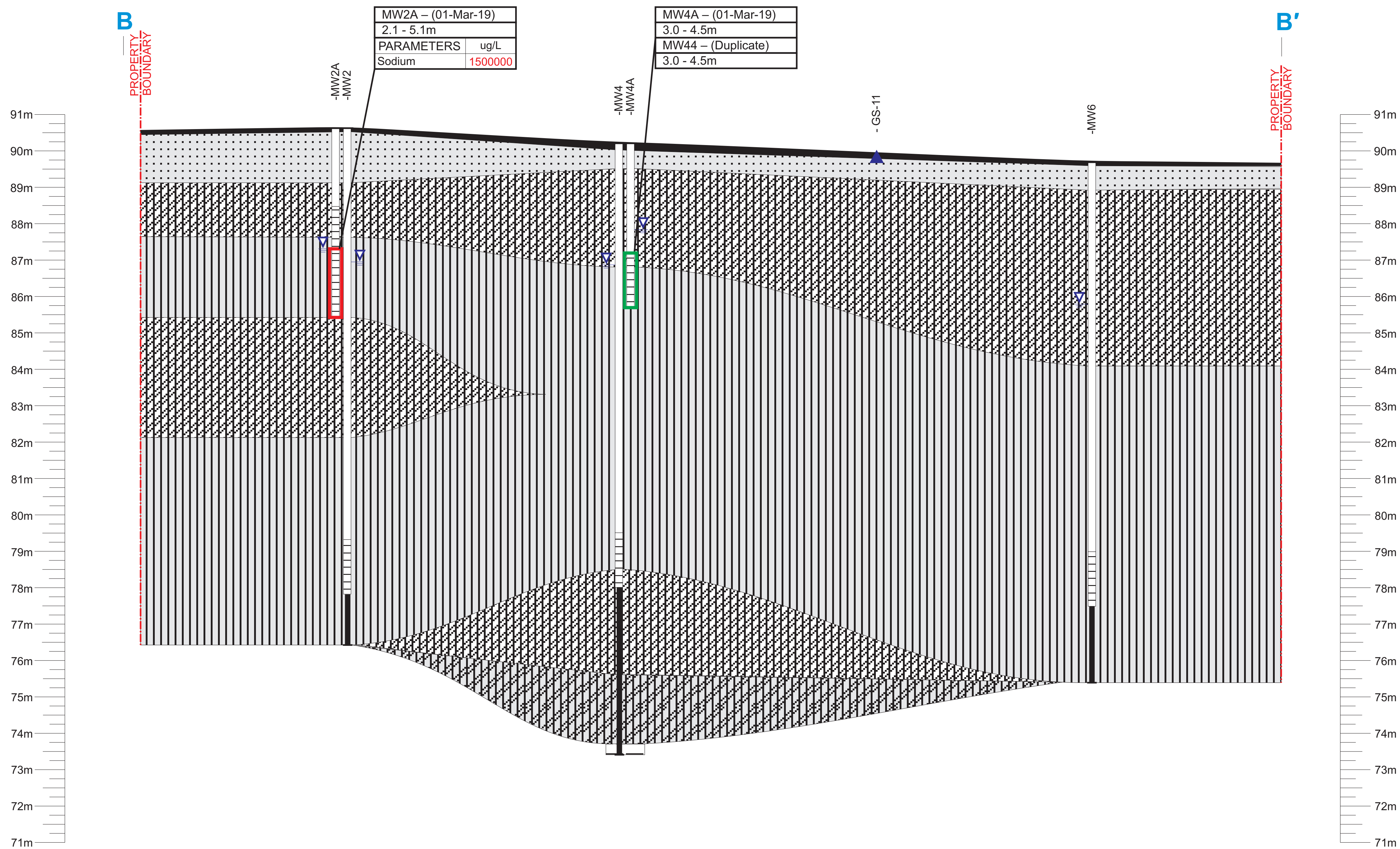
PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN SF	CHECKED STR
DRAWING #	FIGURE 14H

TERRAPEX

GROUNDWATER ANALYTICAL RESULTS - SODIUM - CROSS SECTION B - B'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT
ALTONA GROUP



LEGEND

- ASPHALT
- CONCRETE
- FILL
- CLAY
- SILT
- SILTY SAND TILL
- SILTY CLAY/ CLAYEY SILT
- SANDY SILTY CLAY
- SAND
- SHALE
- GROUNDWATER LEVEL (AS OF MARCH 1, 2019)
- SOIL SAMPLE
- MONITORING WELL
- SCREENED LEVEL
- BOREHOLE

ANALYSIS INFORMATION

Less than or equal to Table 3 SCS
Greater than Table 3 SCS
VALUE Less than or equal to Table 2 SCS
VALUE Greater than Table 2 SCS

Sample I.D. — Sample date

BH103 – (date)	
Screen Interval	
PARAMETERS	ug/L
Sodium	100

TABLE 2 SCS
490000

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; coarse textured soil

VERTICAL SCALE:
0 2.5m 5m
(APPROXIMATE)

HORIZONTAL SCALE:
0 10m 20m
(APPROXIMATE)

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN	SF
CHECKED	STR
DRAWING #	FIGURE 14I

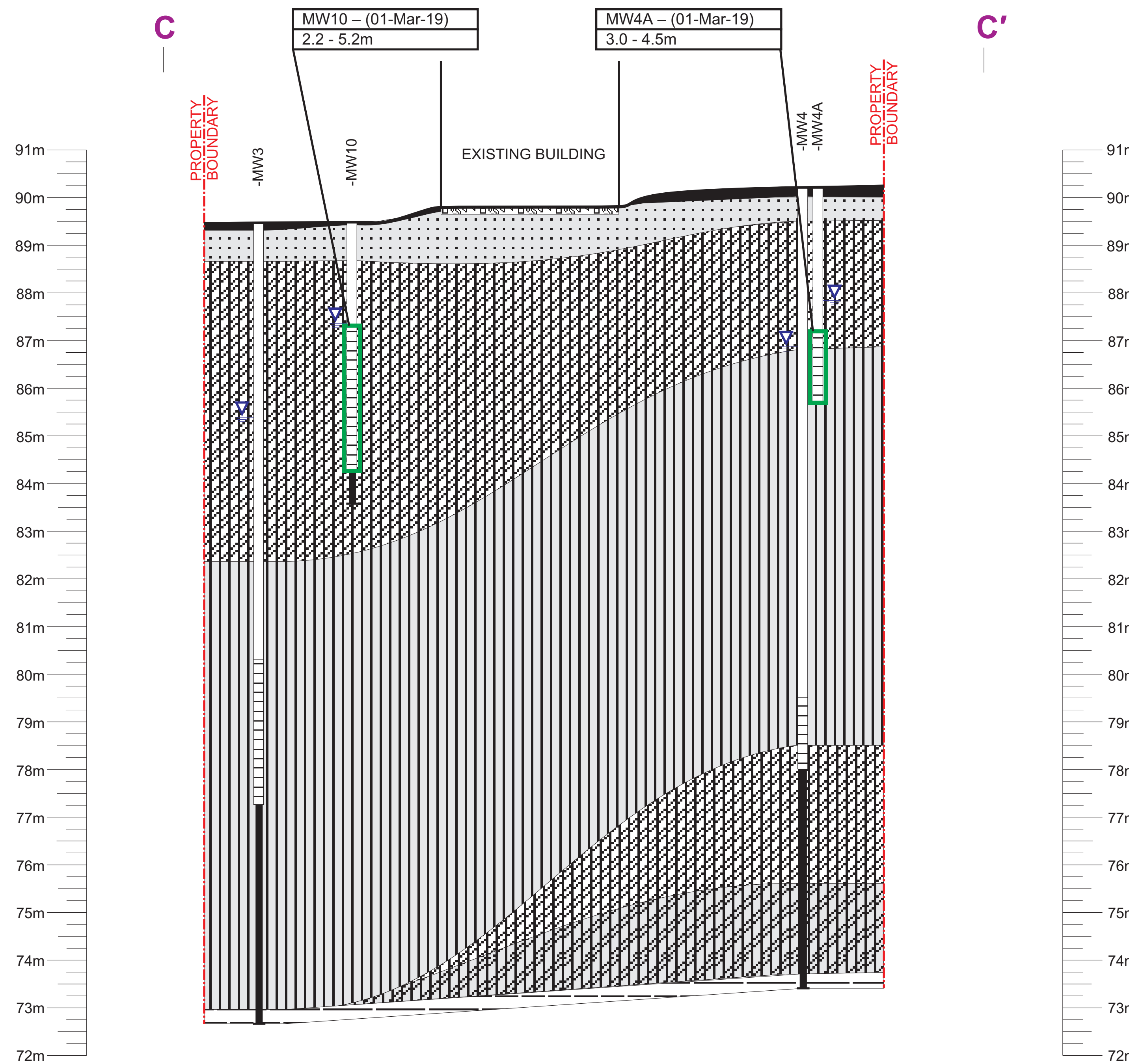
TERRAPEX

GROUNDWATER ANALYTICAL RESULTS - PHCs
CROSS SECTION C - C'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP



LEGEND

- ASPHALT
- CONCRETE
- FILL
- CLAY
- SILT
- SILTY SAND TILL
- SILTY CLAY/ CLAYEY SILT
- SANDY SILTY CLAY
- SAND
- SHALE
- GROUNDWATER LEVEL (AS OF MARCH 1, 2019)
- MONITORING WELL
- SCREENED LEVEL
- BOREHOLE

ANALYSIS INFORMATION

- Less than or equal to Table 3 SCS
- Greater than Table 3 SCS

Sample I.D. — Sample date

MW103 – (date)
Screen Interval

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; coarse textured soil

VERTICAL SCALE:
0 — 2.5m — 5m
(APPROXIMATE)

HORIZONTAL SCALE:
0 — 10m — 20m
(APPROXIMATE)

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN	SF
CHECKED	STR
DRAWING #	FIGURE 15A

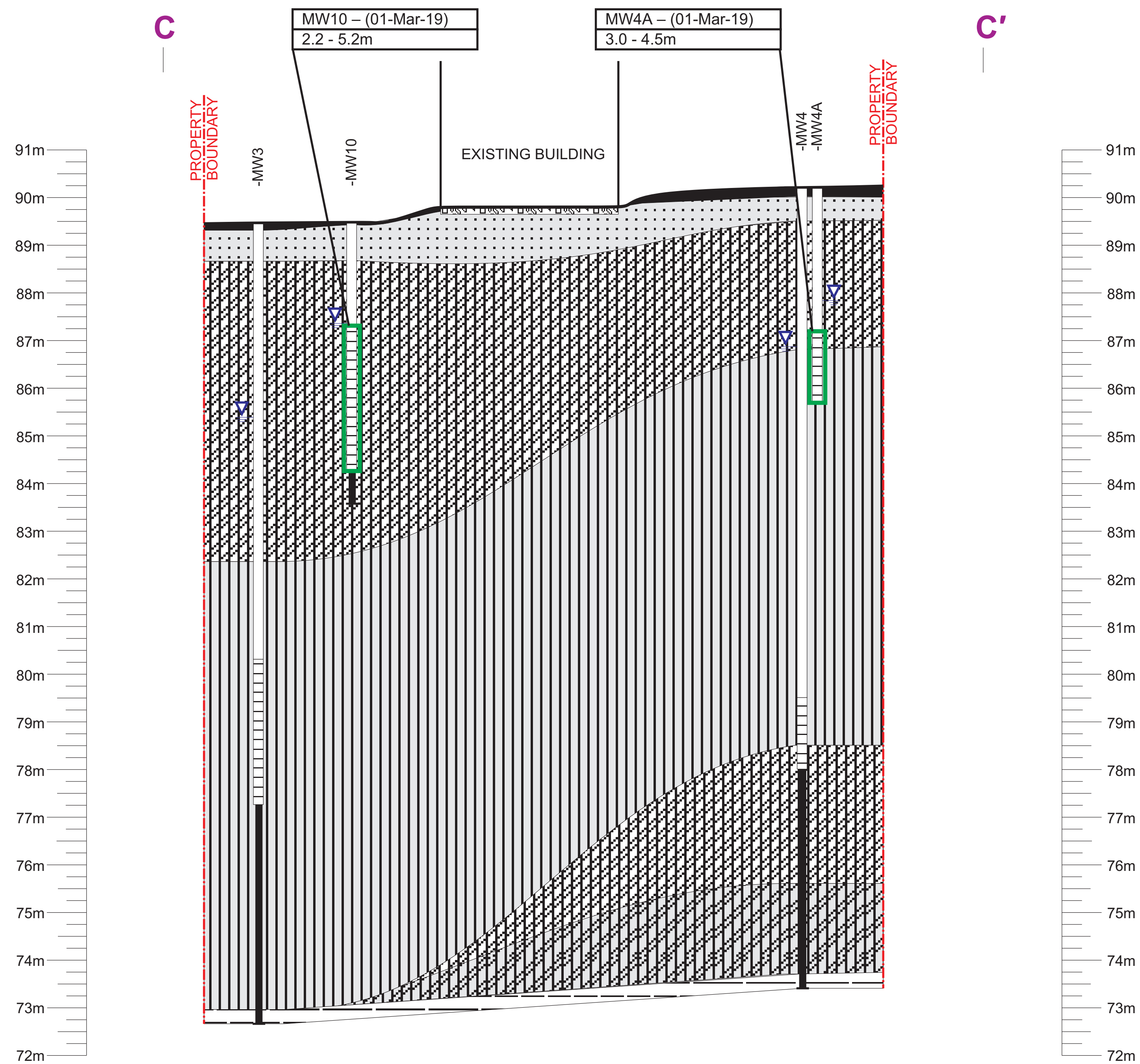
TERRAPEX

GROUNDWATER ANALYTICAL RESULTS - VOCs
CROSS SECTION C - C'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP



LEGEND

- ASPHALT
- CONCRETE
- FILL
- CLAY
- SILT
- SILTY SAND TILL
- SILTY CLAY/ CLAYEY SILT
- SANDY SILTY CLAY
- SAND
- SHALE
- GROUNDWATER LEVEL (AS OF MARCH 1, 2019)
- MONITORING WELL
- SCREENED LEVEL
- BOREHOLE

ANALYSIS INFORMATION

- Less than or equal to Table 3 SCS
- Greater than Table 3 SCS

Sample I.D. — Sample date

MW103 – (date)
Screen Interval

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; coarse textured soil

VERTICAL SCALE: 0 — 2.5m — 5m (APPROXIMATE)

HORIZONTAL SCALE: 0 — 10m — 20m (APPROXIMATE)

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN	SF
CHECKED	STR
DRAWING #	FIGURE 15B

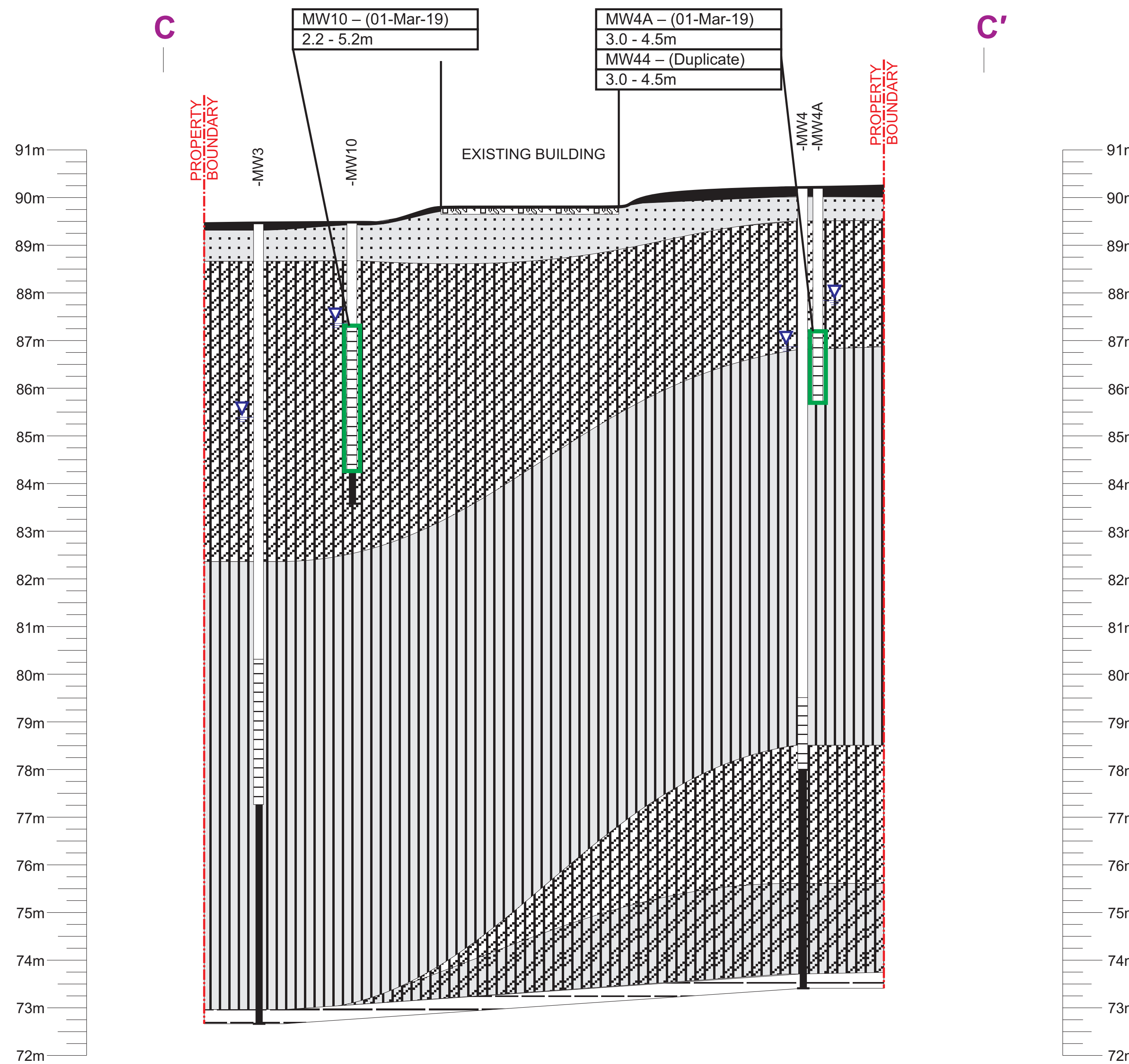
TERRAPEX

GROUNDWATER ANALYTICAL RESULTS - METALS - CROSS SECTION C - C'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP



LEGEND

- ASPHALT
- CONCRETE
- FILL
- CLAY
- SILT
- SILTY SAND TILL
- SILTY CLAY/ CLAYEY SILT
- SANDY SILTY CLAY
- SAND
- SHALE
- GROUNDWATER LEVEL (AS OF MARCH 1, 2019)
- MONITORING WELL
- SCREENED LEVEL
- BOREHOLE

ANALYSIS INFORMATION

- Less than or equal to Table 3 SCS
- Greater than Table 3 SCS

Sample I.D. — Sample date
MW103 – (date)
Screen Interval

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; coarse textured soil

VERTICAL SCALE:
0 2.5m 5m
(APPROXIMATE)

HORIZONTAL SCALE:
0 10m 20m
(APPROXIMATE)

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN SF	CHECKED STR
DRAWING #	FIGURE 15C

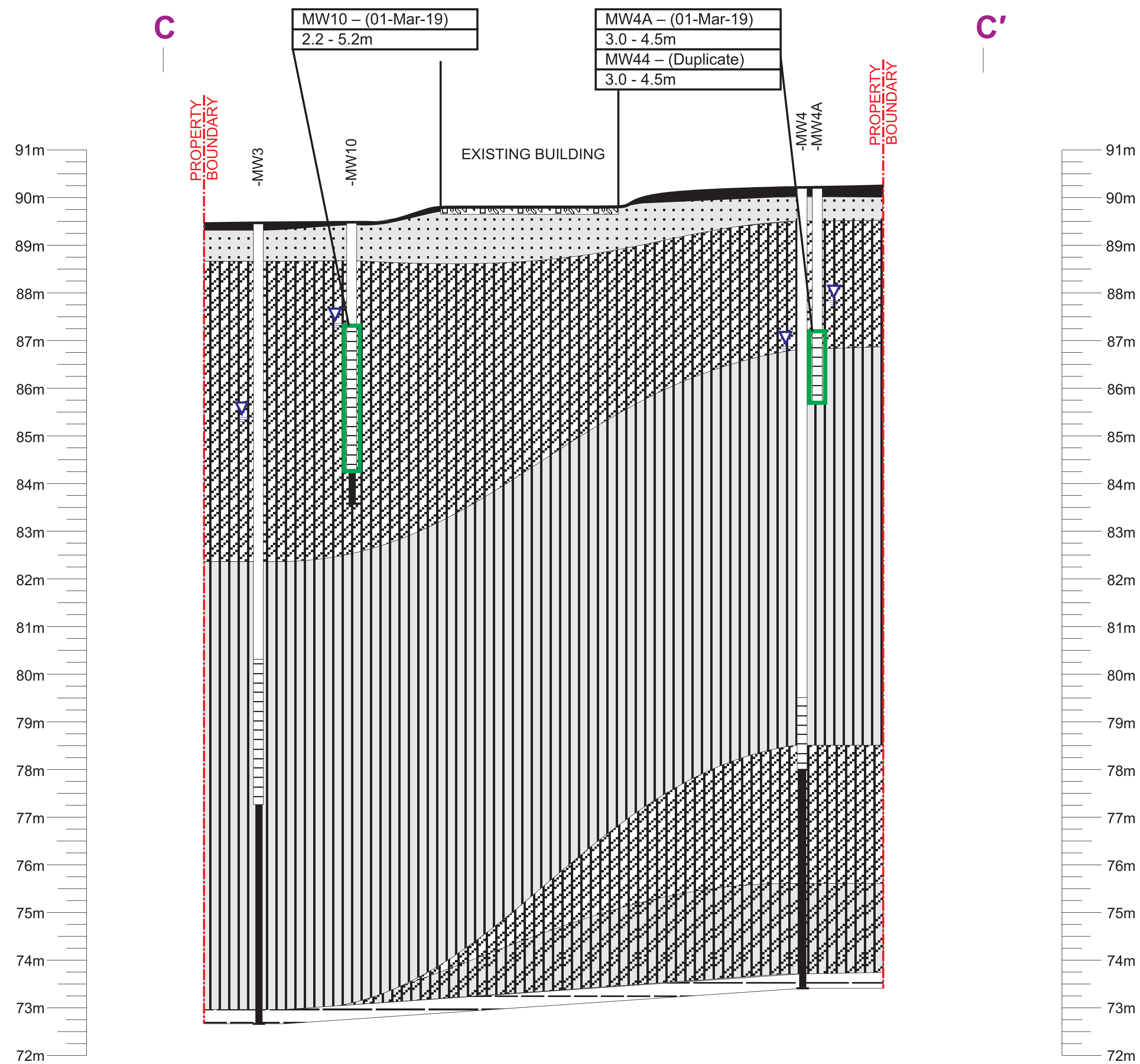
TERRAPEX

GROUNDWATER ANALYTICAL RESULTS - HYDRIDE-FORMING METALS - CROSS SECTION C - C'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP



LEGEND

- ASPHALT
- CONCRETE
- FILL
- CLAY
- SILT
- SILTY SAND TILL
- SILTY CLAY/ CLAYEY SILT
- SANDY SILTY CLAY
- SAND
- SHALE
- GROUNDWATER LEVEL (AS OF MARCH 1, 2019)
- MONITORING WELL
- SCREENED LEVEL
- BOREHOLE

ANALYSIS INFORMATION

- Less than or equal to Table 3 SCS
- Greater than Table 3 SCS

Sample I.D. — Sample date
MW103 – (date)
Screen Interval

SCS (Site Conditions Standards) refer to Standards from Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act; coarse textured soil

VERTICAL SCALE:
0 2.5m 5m
(APPROXIMATE)

HORIZONTAL SCALE:
0 10m 20m
(APPROXIMATE)

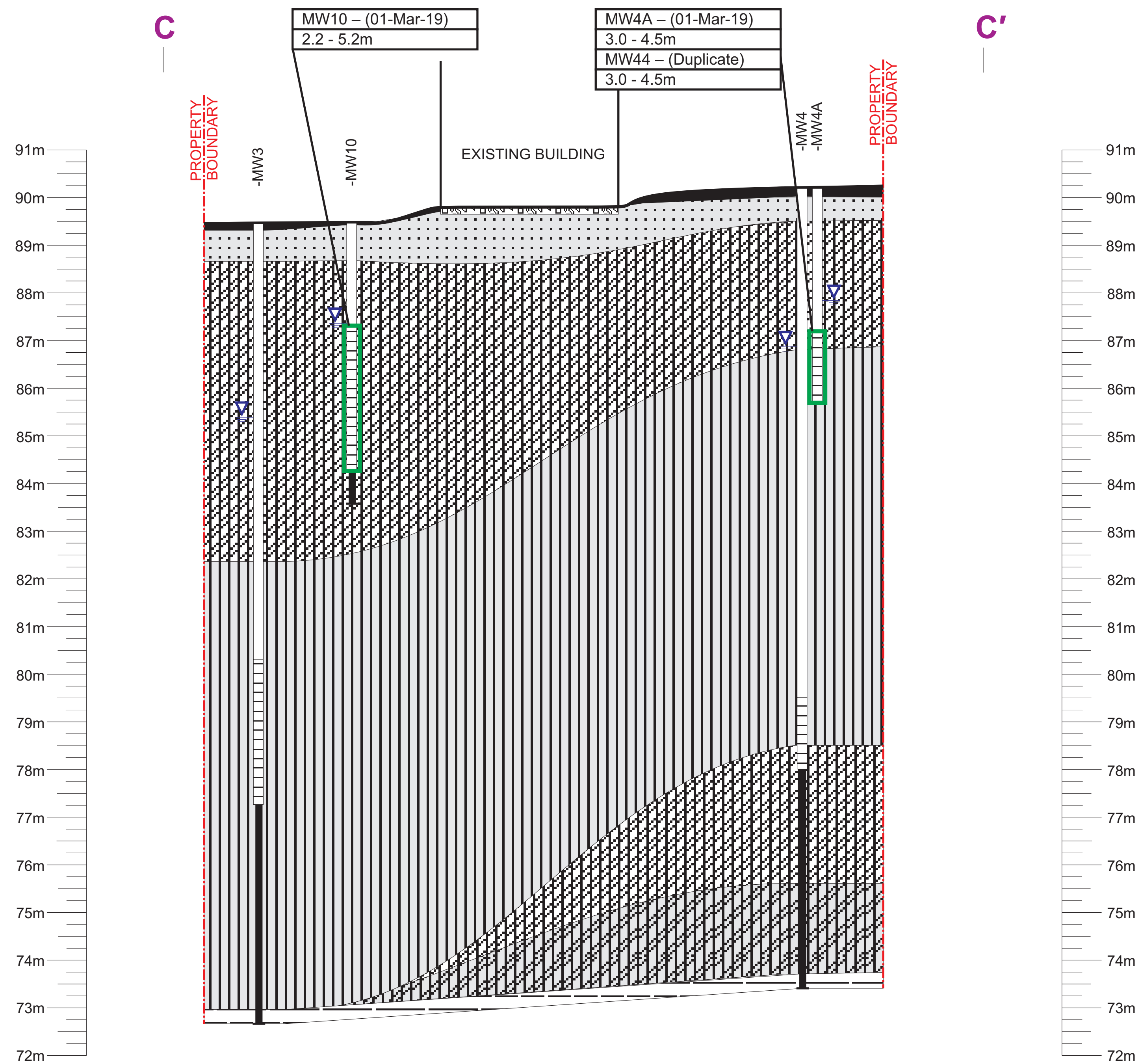
PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN	SF
CHECKED	STR
DRAWING #	FIGURE 15D

TERRAPEX

GROUNDWATER ANALYTICAL RESULTS - CYANIDE (CN-) - CROSS SECTION C - C'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT: ALTONA GROUP



LEGEND

- ASPHALT
- CONCRETE
- FILL
- CLAY
- SILT
- SILTY SAND TILL
- SILTY CLAY/ CLAYEY SILT
- SANDY SILTY CLAY
- SAND
- SHALE
- GROUNDWATER LEVEL (AS OF MARCH 1, 2019)
- MONITORING WELL
- SCREENED LEVEL
- BOREHOLE

ANALYSIS INFORMATION

- Less than or equal to Table 3 SCS
- Greater than Table 3 SCS

Sample I.D. — Sample date
MW103 – (date)
Screen Interval

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; coarse textured soil

VERTICAL SCALE: 0 — 2.5m — 5m (APPROXIMATE)

HORIZONTAL SCALE: 0 — 10m — 20m (APPROXIMATE)

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN	SF
CHECKED	STR
DRAWING #	FIGURE 15E

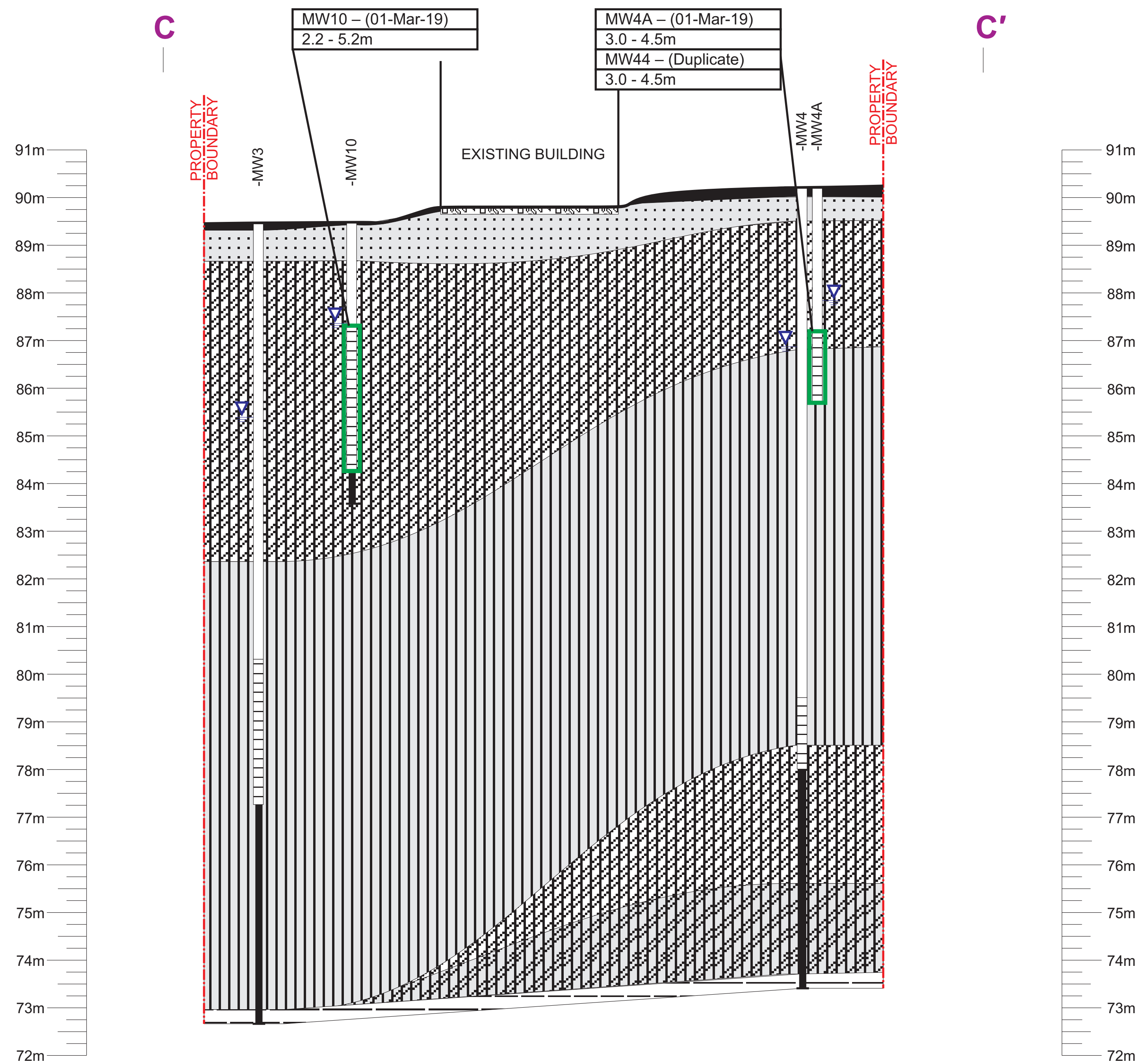
TERRAPEX

GROUNDWATER ANALYTICAL RESULTS - MERCURY - CROSS SECTION C - C'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD PICKERING, ONTARIO

CLIENT

ALTONA GROUP



LEGEND

- ASPHALT
- CONCRETE
- FILL
- CLAY
- SILT
- SILTY SAND TILL
- SILTY CLAY/ CLAYEY SILT
- SANDY SILTY CLAY
- SAND
- SHALE
- GROUNDWATER LEVEL (AS OF MARCH 1, 2019)
- MONITORING WELL
- SCREENED LEVEL
- BOREHOLE

ANALYSIS INFORMATION

- Less than or equal to Table 3 SCS
- Greater than Table 3 SCS

Sample I.D. — Sample date
MW103 – (date)
Screen Interval

SCS (Site Conditions Standards) refer to Standards from Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act; coarse textured soil

VERTICAL SCALE:
0 2.5m 5m
(APPROXIMATE)

HORIZONTAL SCALE:
0 10m 20m
(APPROXIMATE)

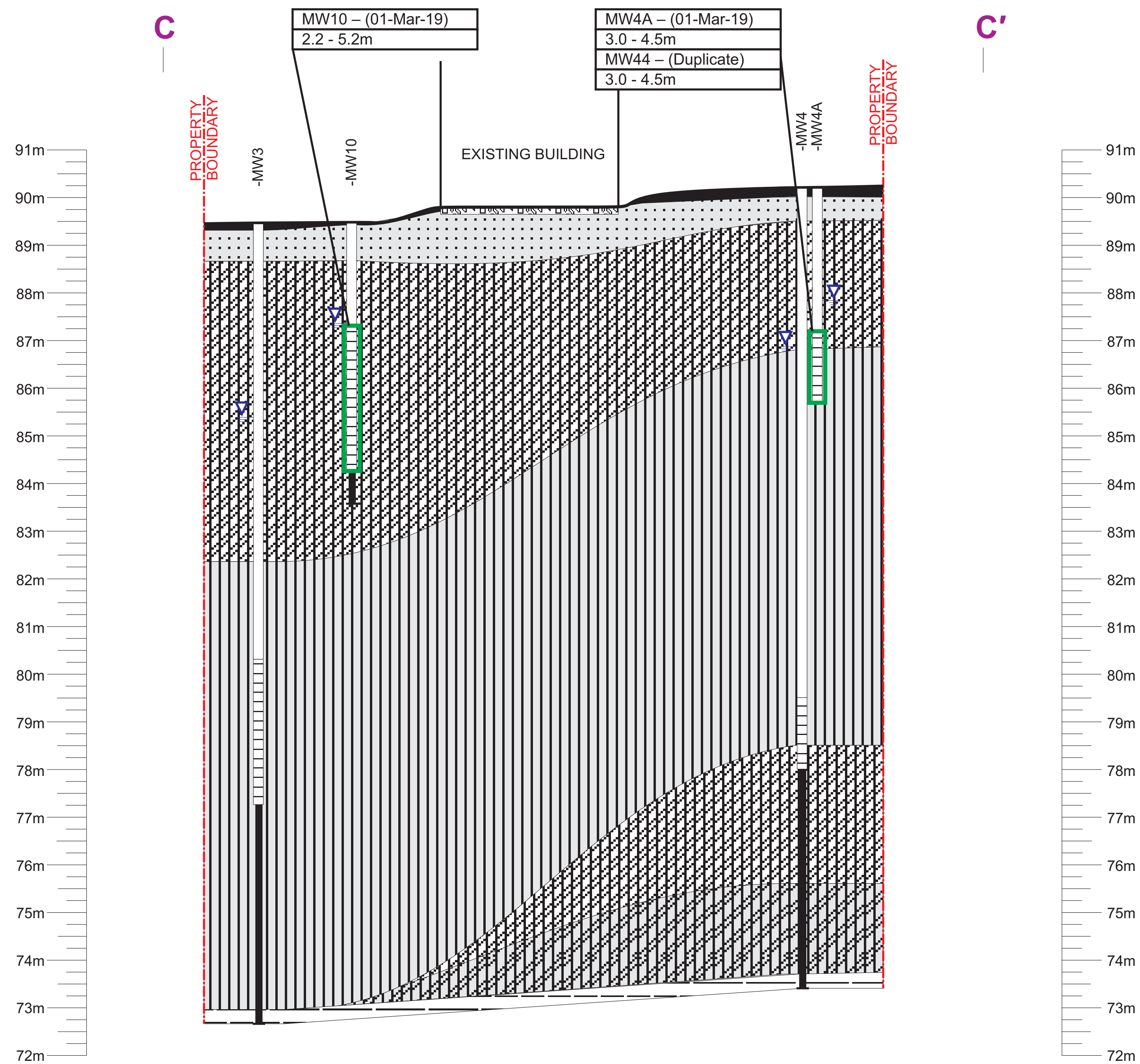
PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN	SF
CHECKED	STR
DRAWING #	FIGURE 15F

TERRAPEX

GROUNDWATER ANALYTICAL RESULTS - CYANIDE (CN-) - CROSS SECTION C - C'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT: ALTONA GROUP



LEGEND

- ASPHALT
- CONCRETE
- FILL
- CLAY
- SILT
- SILTY SAND TILL
- SILTY CLAY/ CLAYEY SILT
- SANDY SILTY CLAY
- SAND
- SHALE
- GROUNDWATER LEVEL (AS OF MARCH 1, 2019)
- MONITORING WELL
- SCREENED LEVEL
- BOREHOLE

ANALYSIS INFORMATION

- Less than or equal to Table 3 SCS
- Greater than Table 3 SCS

Sample I.D. — Sample date
MW103 – (date)
Screen Interval

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; coarse textured soil

VERTICAL SCALE: 0 — 2.5m — 5m (APPROXIMATE)

HORIZONTAL SCALE: 0 — 10m — 20m (APPROXIMATE)

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN	SF
CHECKED	STR
DRAWING #	FIGURE 15G

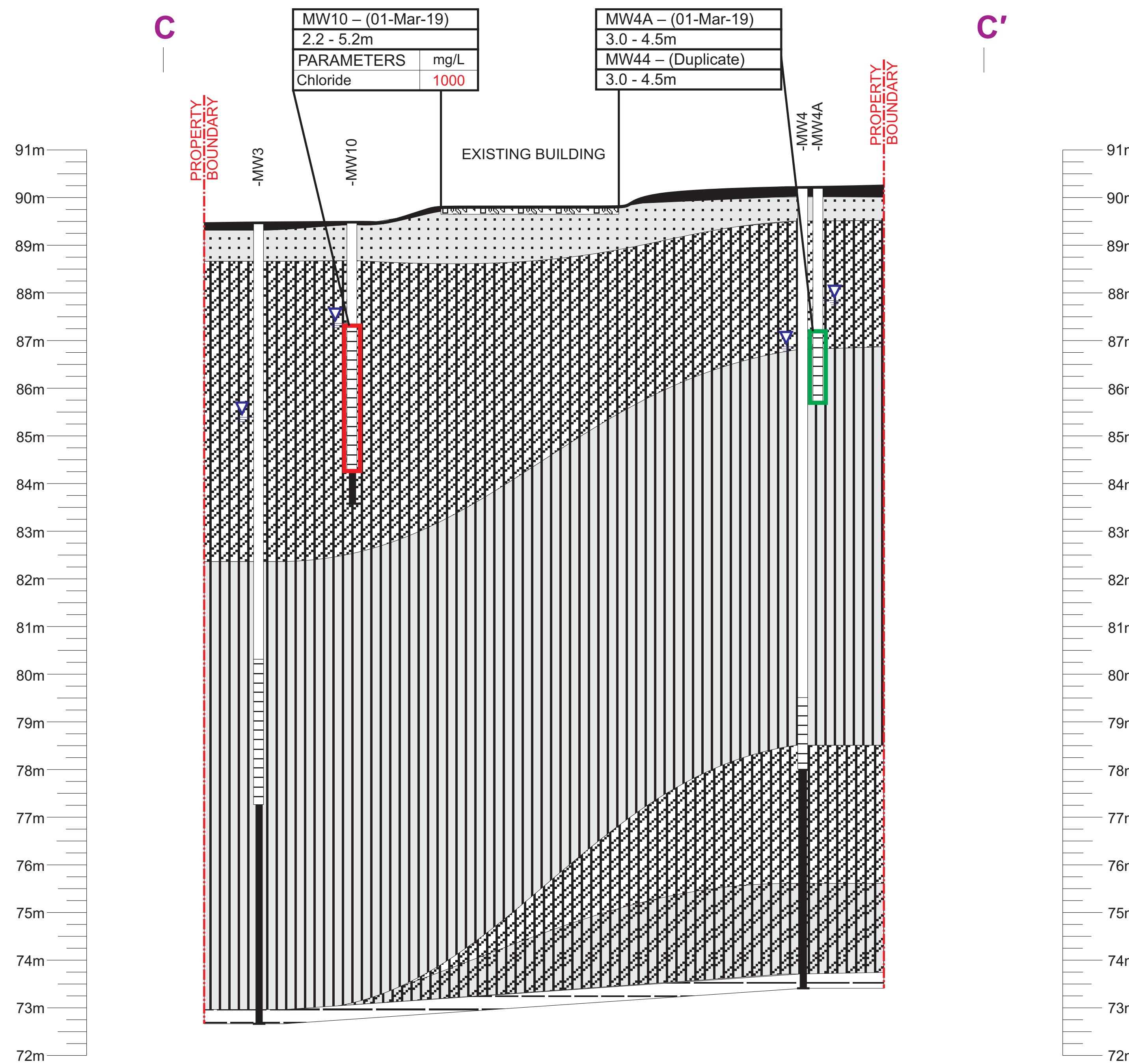
TERRAPEX

GROUNDWATER ANALYTICAL RESULTS - CHLORIDE - CROSS SECTION C - C'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT

ALTONA GROUP



LEGEND

- ASPHALT
- CONCRETE
- FILL
- CLAY
- SILT
- SILTY SAND TILL
- SILTY CLAY/ CLAYEY SILT
- SANDY SILTY CLAY
- SAND
- SHALE
- GROUNDWATER LEVEL (AS OF MARCH 1, 2019)
- MONITORING WELL
- SCREENED LEVEL
- BOREHOLE

ANALYSIS INFORMATION

- Less than or equal to Table 3 SCS
- Greater than Table 3 SCS
- VALUE Less than or equal to Table 2 SCS
- VALUE Greater than Table 2 SCS

Sample I.D. / Sample date

BH103 – (date)	
Screen Interval	
PARAMETERS	mg/L
Chloride	10

TABLE 2 SCS
790

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; coarse textured soil

VERTICAL SCALE: 0 2.5m 5m (APPROXIMATE)

HORIZONTAL SCALE: 0 10m 20m (APPROXIMATE)

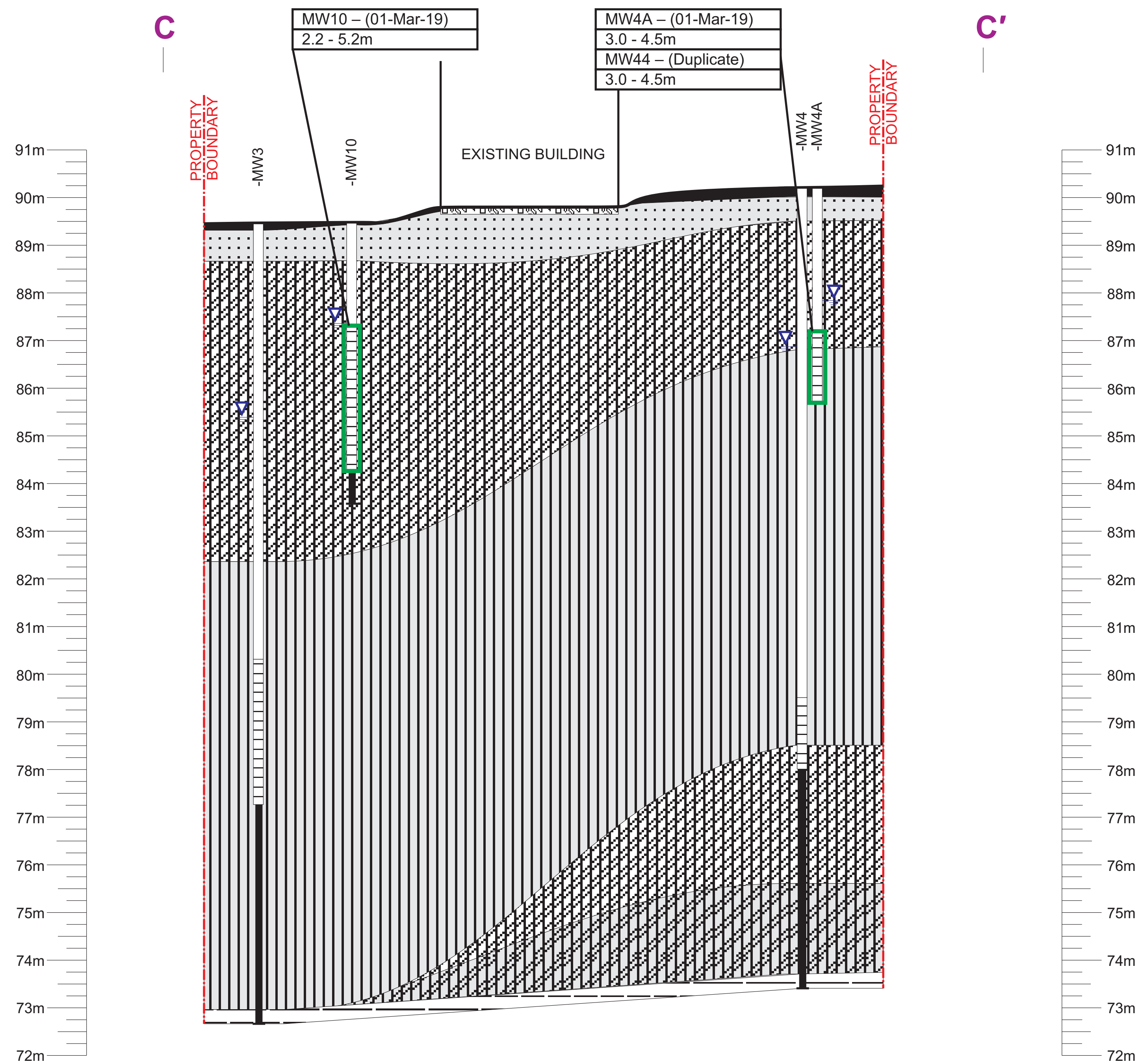
PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN SF	CHECKED STR
DRAWING #	FIGURE 15H

TERRAPEX

GROUNDWATER ANALYTICAL RESULTS - SODIUM - CROSS SECTION C - C'

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT: *ALTONA GROUP*



LEGEND

- ASPHALT
- CONCRETE
- FILL
- CLAY
- SILT
- SILTY SAND TILL
- SILTY CLAY/ CLAYEY SILT
- SANDY SILTY CLAY
- SAND
- SHALE
- GROUNDWATER LEVEL (AS OF MARCH 1, 2019)
- MONITORING WELL
- SCREENED LEVEL
- BOREHOLE

ANALYSIS INFORMATION

- Less than or equal to Table 3 SCS (green box)
- Greater than Table 3 SCS (red box)

VALUE Less than or equal to Table 2 SCS (green)
VALUE Greater than Table 2 SCS (red)

SCS (Site Conditions Standards) refer to Standards from *Table 2 of April 15, 2011 Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; coarse textured soil

Sample I.D. — Sample date

BH103 – (date)	
Screen Interval	
PARAMETERS	ug/L
Sodium	100

TABLE 2 SCS
490000

VERTICAL SCALE: 0 — 2.5m — 5m (APPROXIMATE)

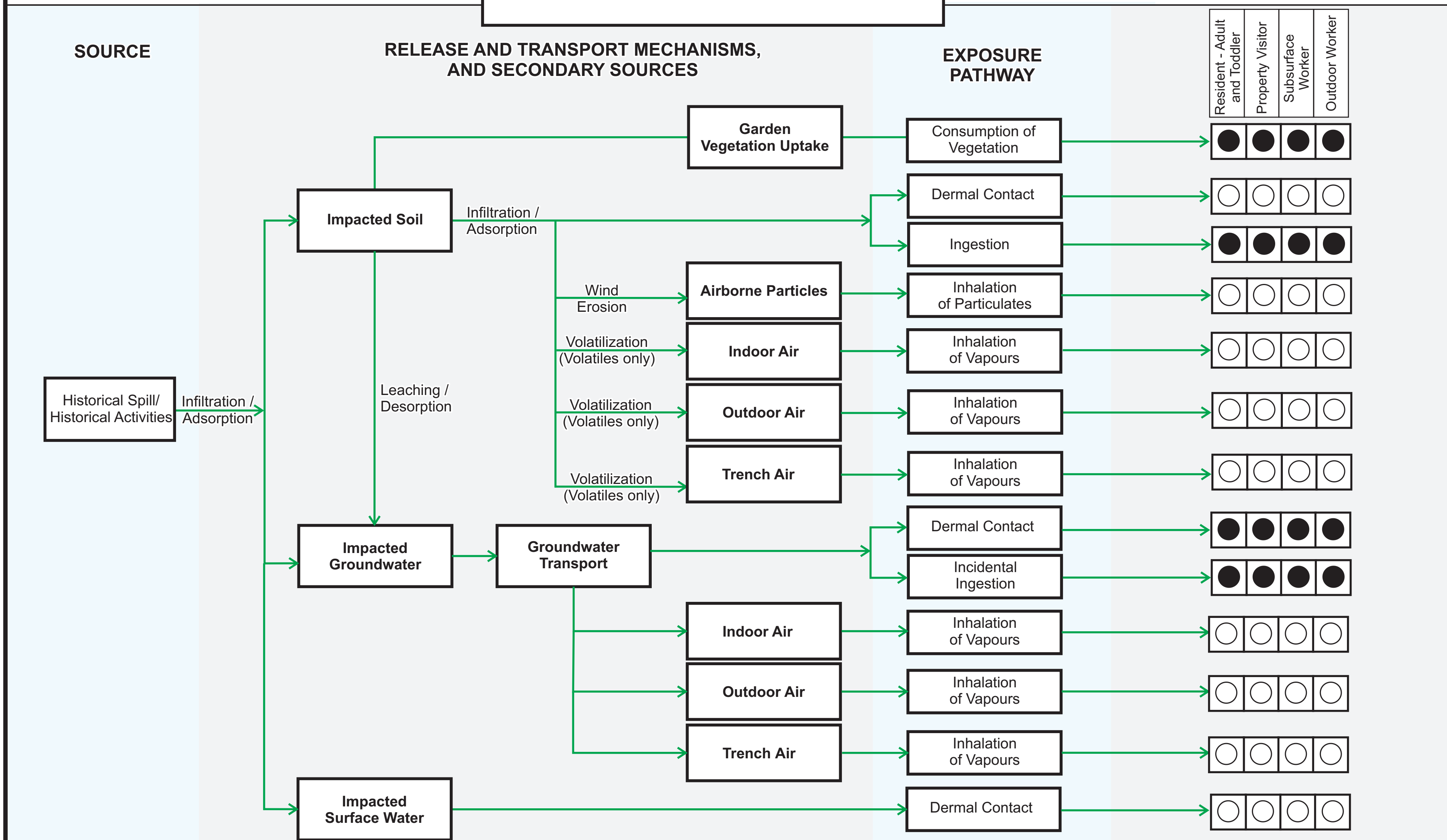
HORIZONTAL SCALE: 0 — 10m — 20m (APPROXIMATE)

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN SF	CHECKED STR
DRAWING #	FIGURE 15I

TERRAPEX

CONCEPTUAL MODEL FOR HUMAN HEALTH EXPOSURE

ALTONA GROUP

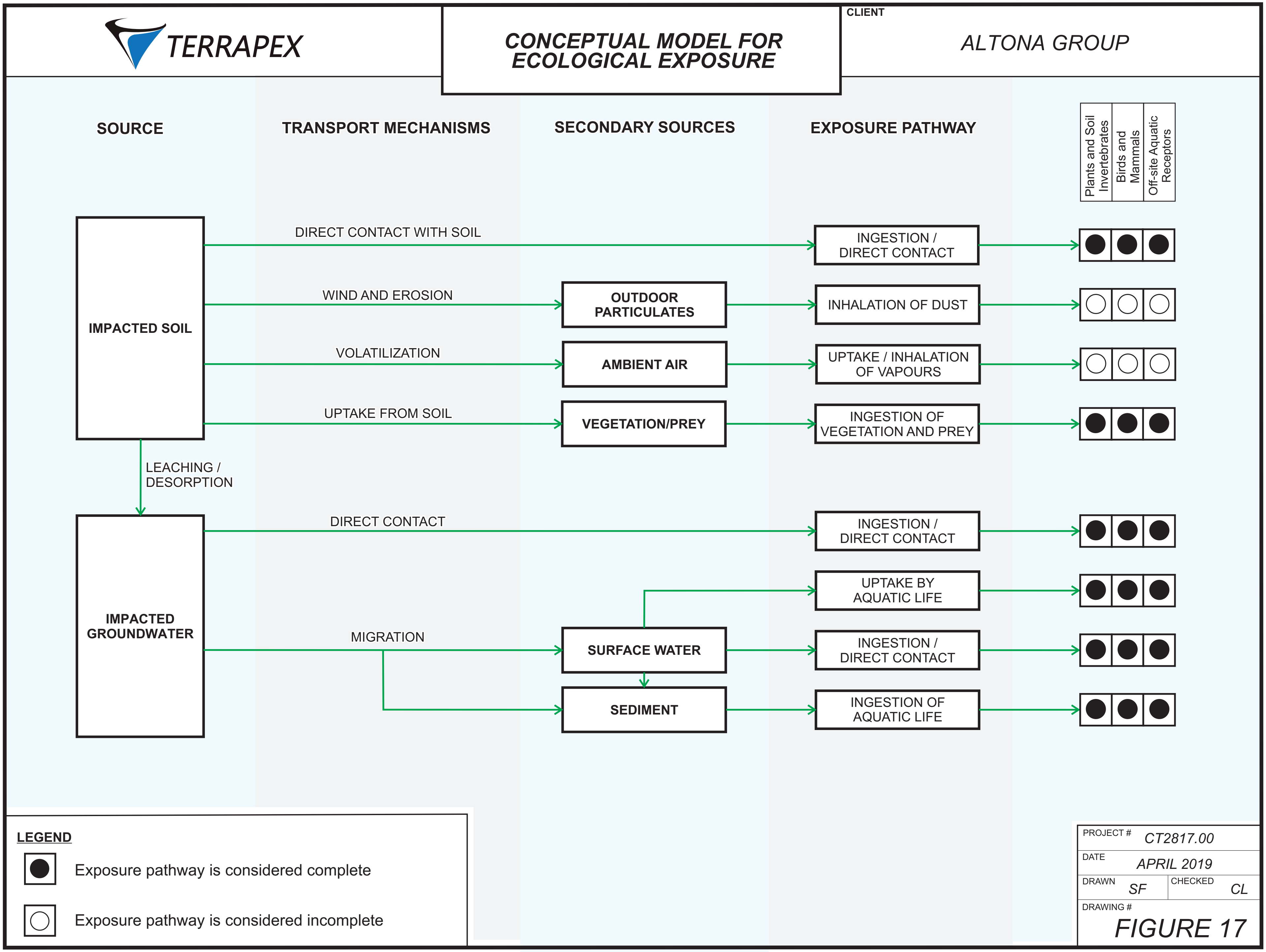


LEGEND

● Receptor present or anticipated, and exposure pathway is considered complete

○ No receptor present or anticipated, and exposure pathway is considered incomplete

PROJECT #	CT2817.00
DATE	APRIL 2019
DRAWN SF	CHECKED CL
DRAWING #	FIGURE 16


TERRAPEX
CONCEPTUAL MODEL FOR ECOLOGICAL EXPOSURE
CLIENT
ALTONA GROUP
SOURCE
TRANSPORT MECHANISMS
SECONDARY SOURCES
EXPOSURE PATHWAY
Plants and Soil Invertebrates
Birds and Mammals
Off-site Aquatic Receptors
IMPACTED SOIL
DIRECT CONTACT WITH SOIL
INGESTION / DIRECT CONTACT
WIND AND EROSION
OUTDOOR PARTICULATES
INHALATION OF DUST
VOLATILIZATION
AMBIENT AIR
UPTAKE / INHALATION OF VAPOURS
UPTAKE FROM SOIL
VEGETATION/PREY
INGESTION OF VEGETATION AND PREY
LEACHING / DESORPTION
IMPACTED GROUNDWATER
DIRECT CONTACT
INGESTION / DIRECT CONTACT
UPTAKE BY AQUATIC LIFE
MIGRATION
SURFACE WATER
INGESTION / DIRECT CONTACT
SEDIMENT
INGESTION OF AQUATIC LIFE
LEGEND
Exposure pathway is considered complete
Exposure pathway is considered incomplete
PROJECT # CT2817.00
DATE APRIL 2019
DRAWN SF
CHECKED CL
DRAWING #
FIGURE 17

TABLES

TABLE 1 GROUNDWATER MONITORING DATA

1294 Kingston Road, 1848 and 1852 Liverpool Road, Pickering, Ontario

WELL NUMBER	DATE	GROUND ELEVATION[1] (m)	T.O.P. ELEVATION[2] (m)	SCREEN LENGTH (m)	BOTTOM OF SCREEN[3] (m)	CV[4]	TOV[5]	DEPTH TO WATER FROM T.O.P. (m)	DEPTH TO WATER FROM GROUND (m)	GROUNDWATER ELEVATION[6] (m)	LNAPL RELATIVE DENSITY[7]	LNAPL THICKNESS[8] (m)
MW1	15-Feb-19	89.69	89.60	1.52	77.49	8% LEL	0 ppm	3.20	3.29	86.40	0.80	None
	22-Feb-19					60% LEL	0 ppm	3.37	3.46	86.23	0.80	None
	01-Mar-19					89% LEL	1 ppm	3.77	3.86	85.83	0.80	None
MW2	15-Feb-19	90.63	90.50	1.52	77.83	5% LEL	0 ppm	3.49	3.62	87.01	0.80	None
	22-Feb-19					5 ppm	1 ppm	3.37	3.50	87.14	0.80	None
	01-Mar-19					8% LEL	0 ppm	3.55	3.68	86.95	0.80	None
MW2A	15-Feb-19	90.62	90.53	3.05	85.42	5% LEL	1 ppm	3.21	3.30	87.32	0.80	None
	22-Feb-19					8% LEL	1 ppm	3.67	3.76	86.86	0.80	None
	01-Mar-19					<10 ppm	1 ppm	3.22	3.31	87.31	0.80	None
MW3	15-Feb-19	89.45	89.37	3.05	77.25	24% LEL	4 ppm	3.68	3.76	85.69	0.80	None
	22-Feb-19					7% LEL	0 ppm	4.11	4.19	85.26	0.80	None
	01-Mar-19					150 ppm	2 ppm	3.98	4.06	85.39	0.80	None
MW4	15-Feb-19	90.20	89.98	1.52	78.00	<10 ppm	3 ppm	3.26	3.47	86.73	0.80	None
	22-Feb-19					200 ppm	5 ppm	3.23	3.44	86.75	0.80	None
	01-Mar-19					<10 ppm	4 ppm	3.12	3.33	86.87	0.80	None
MW4A	15-Feb-19	90.23	90.23	1.52	85.63	30 ppm	0 ppm	2.28	2.28	87.95	0.80	None
	22-Feb-19					720 ppm	1 ppm	2.47	2.47	87.76	0.80	None
	01-Mar-19					5% LEL	2 ppm	2.39	2.39	87.84	0.80	None
MW6	15-Feb-19	89.68	89.56	1.52	77.48	17% LEL	0 ppm	3.58	3.70	85.98	0.80	None
	22-Feb-19					20% LEL	2 ppm	3.88	3.99	85.68	0.80	None
	01-Mar-19					22% LEL	2 ppm	3.77	3.89	85.79	0.80	None
MW7	15-Feb-19	89.02	88.87	3.05	83.82	5% LEL	0 ppm	1.70	1.85	87.17	0.80	None
	22-Feb-19					15% LEL	0 ppm	1.73	1.88	87.14	0.80	None
	01-Mar-19					19% LEL	2 ppm	1.61	1.76	87.26	0.80	None
MW8	15-Feb-19	89.22	89.11	3.05	83.12	<10 ppm	0 ppm	2.01	2.12	87.10	0.80	None
	22-Feb-19					145 ppm	1 ppm	2.10	2.21	87.01	0.80	None
	01-Mar-19					100 ppm	2 ppm	1.93	2.04	87.18	0.80	None
MW9	15-Feb-19	87.70	87.60	3.05	83.80	-	-	-	-	-	0.80	None
	22-Feb-19					6% LEL	1 ppm	0.50	0.60	87.10	0.80	None
	01-Mar-19					50 ppm	2 ppm	0.41	0.51	87.19	0.80	None
MW10	15-Feb-19	89.48	89.37	3.05	84.28	90% LEL	0 ppm	2.04	2.15	87.33	0.80	None
	22-Feb-19					20% LEL	0 ppm	2.09	2.19	87.29	0.80	None
	01-Mar-19					15 ppm	1 ppm	2.01	2.12	87.36	0.80	None

[1] Elevation of ground surface at well location, relative to site benchmark
[2] Elevation of highest point of well pipe ("top of pipe"), relative to site benchmark
[3] Elevation of bottom of well screened interval, relative to site benchmark
[4] Combustible vapour concentration in well headspace in parts per million by volume (ppm) or percent of lower explosive limit (%LEL)
[5] Total organic vapour concentration in well headspace in parts per million by volume (ppm)
[6] Adjusted static water level elevation, relative to site benchmark, using indicated relative density of LNAPL to groundwater
[7] Measured/Assumed relative density of LNAPL to groundwater
[8] Measured thickness of light, non-aqueous phase liquid, if any

TABLE 2 SOIL ANALYTICAL RESULTS - VOCs
1294 Kingston Road, 1848 and 1852 Liverpool Roads, Pickering

Terrapex Sample Name	Units	RDL	STANDARDS[1] 2011 Table 2 R / P / I coarse	MW2-5	MW7-7
Sample Depth	m bg	-	-	0 - 0.6	4.5 - 5.1
SV Reading	-	-	-	<10 ppm	<10 ppm
Sampling Date	-	-	-	7-Feb-19	7-Feb-19
Analysis Date	-	-	-	12-Feb-19	12-Feb-19
Certificate of Analysis No.	-	-	-	B936015	B936015
Acetone	µg/g	0.50	16	<0.50	<0.50
Benzene	µg/g	0.020	0.21	<0.020	<0.020
Bromodichloromethane	µg/g	0.050	1.5	<0.050	<0.050
Bromoform	µg/g	0.050	0.27	<0.050	<0.050
Bromomethane	µg/g	0.050	0.05	<0.050	<0.050
Carbon tetrachloride	µg/g	0.050	0.05	<0.050	<0.050
Chlorobenzene	µg/g	0.050	2.4	<0.050	<0.050
Chloroform	µg/g	0.050	0.05	<0.050	<0.050
Dibromochloromethane	µg/g	0.050	2.3	<0.050	<0.050
Dichlorobenzene 1,2-	µg/g	0.050	1.2	<0.050	<0.050
Dichlorobenzene, 1,3-	µg/g	0.050	4.8	<0.050	<0.050
Dichlorobenzene,1,4-	µg/g	0.050	0.083	<0.050	<0.050
Dichlorodifluoromethane	µg/g	0.050	16	<0.050	<0.050
Dichloroethane, 1,1-	µg/g	0.050	0.47	<0.050	<0.050
Dichloroethane, 1,2-	µg/g	0.050	0.05	<0.050	<0.050
Dichloroethylene, 1,1-	µg/g	0.050	0.05	<0.050	<0.050
Dichloroethylene, cis-1,2-	µg/g	0.050	1.9	<0.050	<0.050
Dichloroethylene, trans-1,2-	µg/g	0.050	0.084	<0.050	<0.050
Dichloropropane, 1,2-	µg/g	0.050	0.05	<0.050	<0.050
Dichloropropene, cis-1,3-	µg/g	0.030	-	<0.030	<0.030
Dichloropropene, trans-1,3-	µg/g	0.040	-	<0.040	<0.040
Dichloropropene, 1,3-	µg/g	0.05	0.05	<0.050	<0.050
Ethylbenzene	µg/g	0.020	1.1	<0.020	<0.020
Ethylene dibromide	µg/g	0.050	0.05	<0.050	<0.050
Hexane	µg/g	0.050	2.8	<0.050	<0.050
Methyl ethyl ketone	µg/g	0.50	16	<0.50	<0.50
Methyl isobutyl ketone	µg/g	0.50	1.7	<0.50	<0.50
Methyl tert butyl ether	µg/g	0.050	0.75	<0.050	<0.050
Methylene Chloride	µg/g	0.050	0.1	<0.050	<0.050
Styrene	µg/g	0.050	0.7	<0.050	<0.050
Tetrachloroethane, 1,1,1,2-	µg/g	0.050	0.058	<0.050	<0.050
Tetrachloroethane, 1,1,2,2-	µg/g	0.050	0.05	<0.050	<0.050
Tetrachloroethylene	µg/g	0.050	0.28	<0.050	<0.050
Toluene	µg/g	0.020	2.3	<0.020	<0.020
Trichloroethane, 1,1,1-	µg/g	0.050	0.38	<0.050	<0.050
Trichloroethane, 1,1,2-	µg/g	0.050	0.05	<0.050	<0.050
Trichloroethylene	µg/g	0.050	0.061	<0.050	<0.050
Trichlorofluoromethane	µg/g	0.050	4	<0.050	<0.050
Vinyl chloride	µg/g	0.020	0.02	<0.020	<0.020
m,p-Xylenes	µg/g	0.020	-	<0.020	<0.020
o-Xylene	µg/g	0.020	-	<0.020	<0.020
Xylenes (total)	µg/g	0.020	3.1	<0.020	<0.020

1	Standards from Table 2 of April 15, 2011 *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; Residential / Parkland / Institutional land use, coarse textured soil
ns	No standard
m bg	Meters below grade
SV Reading	Soil vapour reading (ppm or % LEL)
ppm	Parts per million (by volume)
% LEL	Percent of the lower explosive limit
BOLD	Exceeds standard

TABLE 2 **SOIL ANALYTICAL RESULTS - VOCs**
1294 Kingston Road, 1848 and 1852 Liverpool Roads, Pickering **CONTINUED**

Terrapex Sample Name	Units	RDL	STANDARDS[1] 2011 Table 2 R / P / I coarse	MW1000 Tripblank	MW8-5
Sample Depth	m bg	-	-	4.5 - 5.1	3.0 - 3.6
SV Reading	-	-	-	-	<10 ppm
Sampling Date	-	-	-	7-Feb-19	7-Feb-19
Analysis Date	-	-	-	12-Feb-19	12-Feb-19
Certificate of Analysis No.	-	-	-	B936015	B936015
Acetone	µg/g	0.50	16	<0.50	<0.50
Benzene	µg/g	0.020	0.21	<0.020	<0.020
Bromodichloromethane	µg/g	0.050	1.5	<0.050	<0.050
Bromoform	µg/g	0.050	0.27	<0.050	<0.050
Bromomethane	µg/g	0.050	0.05	<0.050	<0.050
Carbon tetrachloride	µg/g	0.050	0.05	<0.050	<0.050
Chlorobenzene	µg/g	0.050	2.4	<0.050	<0.050
Chloroform	µg/g	0.050	0.05	<0.050	<0.050
Dibromochloromethane	µg/g	0.050	2.3	<0.050	<0.050
Dichlorobenzene 1,2-	µg/g	0.050	1.2	<0.050	<0.050
Dichlorobenzene, 1,3-	µg/g	0.050	4.8	<0.050	<0.050
Dichlorobenzene,1,4-	µg/g	0.050	0.083	<0.050	<0.050
Dichlorodifluoromethane	µg/g	0.050	16	<0.050	<0.050
Dichloroethane, 1,1-	µg/g	0.050	0.47	<0.050	<0.050
Dichloroethane, 1,2-	µg/g	0.050	0.05	<0.050	<0.050
Dichloroethylene, 1,1-	µg/g	0.050	0.05	<0.050	<0.050
Dichloroethylene, cis-1,2-	µg/g	0.050	1.9	<0.050	<0.050
Dichloroethylene, trans-1,2-	µg/g	0.050	0.084	<0.050	<0.050
Dichloropropane, 1,2-	µg/g	0.050	0.05	<0.050	<0.050
Dichloropropene, cis-1,3-	µg/g	0.030	-	<0.030	<0.030
Dichloropropene, trans-1,3-	µg/g	0.040	-	<0.040	<0.040
Dichloropropene, 1,3-	µg/g	0.05	0.05	<0.050	<0.050
Ethylbenzene	µg/g	0.020	1.1	<0.020	<0.020
Ethylene dibromide	µg/g	0.050	0.05	<0.050	<0.050
Hexane	µg/g	0.050	2.8	<0.050	<0.050
Methyl ethyl ketone	µg/g	0.50	16	<0.50	<0.50
Methyl isobutyl ketone	µg/g	0.50	1.7	<0.50	<0.50
Methyl tert butyl ether	µg/g	0.050	0.75	<0.050	<0.050
Methylene Chloride	µg/g	0.050	0.1	<0.050	<0.050
Styrene	µg/g	0.050	0.7	<0.050	<0.050
Tetrachloroethane, 1,1,1,2-	µg/g	0.050	0.058	<0.050	<0.050
Tetrachloroethane, 1,1,2,2-	µg/g	0.050	0.05	<0.050	<0.050
Tetrachloroethylene	µg/g	0.050	0.28	<0.050	<0.050
Toluene	µg/g	0.020	2.3	<0.020	<0.020
Trichloroethane, 1,1,1-	µg/g	0.050	0.38	<0.050	<0.050
Trichloroethane, 1,1,2-	µg/g	0.050	0.05	<0.050	<0.050
Trichloroethylene	µg/g	0.050	0.061	<0.050	<0.050
Trichlorofluoromethane	µg/g	0.050	4	<0.050	<0.050
Vinyl chloride	µg/g	0.020	0.02	<0.020	<0.020
m,p-Xylenes	µg/g	0.020	-	<0.020	<0.020
o-Xylene	µg/g	0.020	-	<0.020	<0.020
Xylenes (total)	µg/g	0.020	3.1	<0.020	<0.020

1 Standards from Table 2 of April 15, 2011 *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; Residential / Parkland / Institutional land use, coarse textured soil
ns No standard
m bg Meters below grade
SV Reading Soil vapour reading (ppm or % LEL)
ppm Parts per million (by volume)
% LEL Percent of the lower explosive limit
BOLD Exceeds standard

TABLE 2 SOIL ANALYTICAL RESULTS - VOCs

1294 Kingston Road, 1848 and 1852 Liverpool Roads, Pickering **CONTINUED**

Terrapex Sample Name	Units	RDL	STANDARDS[1] 2011 Table 2 R / P / I coarse	MW9-SS4	MW10-5
Sample Depth	m bg	-	-	2.3 - 3.0	3.0 - 3.6
SV Reading	-	-	-	<10 ppm	<10 ppm
Sampling Date	-	-	-	31-Jan-19	7-Feb-19
Analysis Date	-	-	-	04-Feb-19	12-Feb-19
Certificate of Analysis No.	-	-	-	B929073	B936015
Acetone	µg/g	0.50	16	<0.50	<0.50
Benzene	µg/g	0.020	0.21	<0.020	<0.020
Bromodichloromethane	µg/g	0.050	1.5	<0.050	<0.050
Bromoform	µg/g	0.050	0.27	<0.050	<0.050
Bromomethane	µg/g	0.050	0.05	<0.050	<0.050
Carbon tetrachloride	µg/g	0.050	0.05	<0.050	<0.050
Chlorobenzene	µg/g	0.050	2.4	<0.050	<0.050
Chloroform	µg/g	0.050	0.05	<0.050	<0.050
Dibromochloromethane	µg/g	0.050	2.3	<0.050	<0.050
Dichlorobenzene 1,2-	µg/g	0.050	1.2	<0.050	<0.050
Dichlorobenzene, 1,3-	µg/g	0.050	4.8	<0.050	<0.050
Dichlorobenzene,1,4-	µg/g	0.050	0.083	<0.050	<0.050
Dichlorodifluoromethane	µg/g	0.050	16	<0.050	<0.050
Dichloroethane, 1,1-	µg/g	0.050	0.47	<0.050	<0.050
Dichloroethane, 1,2-	µg/g	0.050	0.05	<0.050	<0.050
Dichloroethylene, 1,1-	µg/g	0.050	0.05	<0.050	<0.050
Dichloroethylene, cis-1,2-	µg/g	0.050	1.9	<0.050	<0.050
Dichloroethylene, trans-1,2-	µg/g	0.050	0.084	<0.050	<0.050
Dichloropropane, 1,2-	µg/g	0.050	0.05	<0.050	<0.050
Dichloropropene, cis-1,3-	µg/g	0.030	-	<0.030	<0.030
Dichloropropene, trans-1,3-	µg/g	0.040	-	<0.040	<0.040
Dichloropropene, 1,3-	µg/g	0.05	0.05	<0.050	<0.050
Ethylbenzene	µg/g	0.020	1.1	<0.020	<0.020
Ethylene dibromide	µg/g	0.050	0.05	<0.050	<0.050
Hexane	µg/g	0.050	2.8	<0.050	<0.050
Methyl ethyl ketone	µg/g	0.50	16	<0.50	<0.50
Methyl isobutyl ketone	µg/g	0.50	1.7	<0.50	<0.50
Methyl tert butyl ether	µg/g	0.050	0.75	<0.050	<0.050
Methylene Chloride	µg/g	0.050	0.1	<0.050	<0.050
Styrene	µg/g	0.050	0.7	<0.050	<0.050
Tetrachloroethane, 1,1,1,2-	µg/g	0.050	0.058	<0.050	<0.050
Tetrachloroethane, 1,1,2,2-	µg/g	0.050	0.05	<0.050	<0.050
Tetrachloroethylene	µg/g	0.050	0.28	<0.050	<0.050
Toluene	µg/g	0.020	2.3	<0.020	<0.020
Trichloroethane, 1,1,1-	µg/g	0.050	0.38	<0.050	<0.050
Trichloroethane, 1,1,2-	µg/g	0.050	0.05	<0.050	<0.050
Trichloroethylene	µg/g	0.050	0.061	<0.050	<0.050
Trichlorofluoromethane	µg/g	0.050	4	<0.050	<0.050
Vinyl chloride	µg/g	0.020	0.02	<0.020	<0.020
m,p-Xylenes	µg/g	0.020	-	<0.020	<0.020
o-Xylene	µg/g	0.020	-	<0.020	<0.020
Xylenes (total)	µg/g	0.020	3.1	<0.020	<0.020

1	Standards from Table 2 of April 15, 2011 *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; Residential / Parkland / Institutional land use, coarse textured soil
ns	No standard
m bg	Meters below grade
SV Reading	Soil vapour reading (ppm or % LEL)
ppm	Parts per million (by volume)
% LEL	Percent of the lower explosive limit
BOLD	Exceeds standard

TABLE 2 **SOIL ANALYTICAL RESULTS - VOCs**
1294 Kingston Road, 1848 and 1852 Liverpool Roads, Pickering **CONTINUED**

Terrapex Sample Name	Units	RDL	STANDARDS[1] 2011 Table 2 R / P / I coarse	MW10-95 Field Duplicate of MW10-5
Sample Depth	m bg	-	-	3.0 - 3.6
SV Reading	-	-	-	<10 ppm
Sampling Date	-	-	-	7-Feb-19
Analysis Date	-	-	-	12-Feb-19
Certificate of Analysis No.	-	-	-	B936015
Acetone	µg/g	0.50	16	<0.50
Benzene	µg/g	0.020	0.21	<0.020
Bromodichloromethane	µg/g	0.050	1.5	<0.050
Bromoform	µg/g	0.050	0.27	<0.050
Bromomethane	µg/g	0.050	0.05	<0.050
Carbon tetrachloride	µg/g	0.050	0.05	<0.050
Chlorobenzene	µg/g	0.050	2.4	<0.050
Chloroform	µg/g	0.050	0.05	<0.050
Dibromochloromethane	µg/g	0.050	2.3	<0.050
Dichlorobenzene 1,2-	µg/g	0.050	1.2	<0.050
Dichlorobenzene, 1,3-	µg/g	0.050	4.8	<0.050
Dichlorobenzene,1,4-	µg/g	0.050	0.083	<0.050
Dichlorodifluoromethane	µg/g	0.050	16	<0.050
Dichloroethane, 1,1-	µg/g	0.050	0.47	<0.050
Dichloroethane, 1,2-	µg/g	0.050	0.05	<0.050
Dichloroethylene, 1,1-	µg/g	0.050	0.05	<0.050
Dichloroethylene, cis-1,2-	µg/g	0.050	1.9	<0.050
Dichloroethylene, trans-1,2-	µg/g	0.050	0.084	<0.050
Dichloropropane, 1,2-	µg/g	0.050	0.05	<0.050
Dichloropropene, cis-1,3-	µg/g	0.030	-	<0.030
Dichloropropene, trans-1,3-	µg/g	0.040	-	<0.040
Dichloropropene, 1,3-	µg/g	0.05	0.05	<0.050
Ethylbenzene	µg/g	0.020	1.1	<0.020
Ethylene dibromide	µg/g	0.050	0.05	<0.050
Hexane	µg/g	0.050	2.8	<0.050
Methyl ethyl ketone	µg/g	0.50	16	<0.50
Methyl isobutyl ketone	µg/g	0.50	1.7	<0.50
Methyl tert butyl ether	µg/g	0.050	0.75	<0.050
Methylene Chloride	µg/g	0.050	0.1	<0.050
Styrene	µg/g	0.050	0.7	<0.050
Tetrachloroethane, 1,1,1,2-	µg/g	0.050	0.058	<0.050
Tetrachloroethane, 1,1,2,2-	µg/g	0.050	0.05	<0.050
Tetrachloroethylene	µg/g	0.050	0.28	<0.050
Toluene	µg/g	0.020	2.3	<0.020
Trichloroethane, 1,1,1-	µg/g	0.050	0.38	<0.050
Trichloroethane, 1,1,2-	µg/g	0.050	0.05	<0.050
Trichloroethylene	µg/g	0.050	0.061	<0.050
Trichlorofluoromethane	µg/g	0.050	4	<0.050
Vinyl chloride	µg/g	0.020	0.02	<0.020
m,p-Xylenes	µg/g	0.020	-	<0.020
o-Xylene	µg/g	0.020	-	<0.020
Xylenes (total)	µg/g	0.020	3.1	<0.020

1 Standards from Table 2 of April 15, 2011 *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act* ; Residential / Parkland / Institutional land use, coarse textured soil

ns No standard
m bg Meters below grade
SV Reading Soil vapour reading (ppm or % LEL)
ppm Parts per million (by volume)
% LEL Percent of the lower explosive limit
BOLD Exceeds standard

TABLE 3 SOIL ANALYTICAL RESULTS - PHCs
1294 Kingston Road, 1848 and 1852 Liverpool Road, Pickering, Ontario

Terrapex Sample Name	Units	RDL	STANDARDS[1] 2011 Table 2 R / P / I coarse	MW2-5	MW7-6	MW8-5	MW9-SS4	MW10-5	MW10-95 Field of Duplicate MW10-5
Sample Depth	m bg	-	-	0 - 0.6	3.8 - 4.4	3.0 - 3.6	2.3 - 3.0	3.0 - 3.6	3.0 - 3.6
SV Reading	-	-	-	<10 ppm	<10 ppm	<10 ppm	<10 ppm	<10 ppm	<10 ppm
Sampling Date	-	-	-	7-Feb-19	7-Feb-19	7-Feb-19	31-Jan-19	7-Feb-19	7-Feb-19
Analysis Date	-	-	-	12-Feb-19	12-Feb-19	12-Feb-19	4-Feb-19	12-Feb-19	12-Feb-19
Certificate of Analysis No.	-	-	-	B936015	B936015	B936015	B929073	B936015	B936015
Benzene	µg/g	0.020	0.21	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Toluene	µg/g	0.020	2.3	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Ethylbenzene	µg/g	0.020	1.1	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Xylenes (total)	µg/g	0.020	3.1	<0.020	<0.040 (0.040)	<0.020	<0.020	<0.020	<0.020
Petroleum Hydrocarbons, F1	µg/g	10	55	<10	<10	<10	<10	<10	<10
Petroleum Hydrocarbons, F2	µg/g	10	98	<10	<10	<10	<10	<10	<10
Petroleum Hydrocarbons, F3	µg/g	50	300	<50	<50	<50	<50	<50	<50
Petroleum Hydrocarbons, F4	µg/g	50	2,800	<50	<50	<50	<50	<50	<50

[1] Standards from Table 2 of April 15, 2011 *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act* ; Residential / Parkland / Institutional land use, coarse textured soil

ns No standard
m bg Meters below grade
SV Reading Soil vapour reading (ppm or % LEL)
ppm Parts per million (by volume)
% LEL Percent of the lower explosive limit
BOLD Exceeds standard

TABLE 4 SOIL ANALYTICAL RESULTS - PAHs
1294 Kingston Road, 1848 and 1852 Liverpool Road, Pickering, Ontario

Terrapex Sample Name	Units	RDL	STANDARDS[2] 2011 Table 2 R / P / I coarse	MW2-1	MW7-1
Sample Depth	m bg	-	-	0 - 0.6	0.15 - 0.8
SV Reading	-	-	-	<10 ppm	<10 ppm
Sampling Date	-	-	-	7-Feb-19	7-Feb-19
Analysis Date	-	-	-	15-Feb-19	15-Feb-19
Certificate of Analysis No.	-	-	-	B936015	B936015
Acenaphthene	µg/g	0.0060	7.9	<0.0060	<0.0050
Acenaphthylene	µg/g	0.0050	0.15	<0.0050	<0.0050
Anthracene	µg/g	0.0050	0.67	<0.0050	0.0082
Benz(a)anthracene	µg/g	0.0050	0.5	<0.0050	0.034
Benzo(a)pyrene	µg/g	0.0050	0.3	<0.0050	0.034
Benzo(b)fluoranthene	µg/g	0.0050	0.78	0.0074	0.042
Benzo(g,h,i)perylene	µg/g	0.0050	6.6	<0.0050	0.026
Benzo(k)fluoranthene	µg/g	0.0050	0.78	<0.0050	0.016
Chrysene	µg/g	0.0050	7	<0.0050	0.032
Dibenz(a,h)anthracene	µg/g	0.0050	0.1	<0.0050	<0.0050
Fluoranthene	µg/g	0.0050	0.69	<0.0050	0.088
Fluorene	µg/g	0.0050	62	<0.0050	<0.0050
Indeno(1,2,3-cd)pyrene	µg/g	0.0050	0.38	<0.0050	0.024
Methylnaphthalene, 1- [1]	µg/g	0.0050	0.99	0.038	<0.0050
Methylnaphthalene, 2- [1]	µg/g	0.0050	0.99	0.039	<0.0050
Methylnaphthalene, 1- & 2- [1]	µg/g	0.0071	0.99	0.076	<0.0071
Naphthalene	µg/g	0.0050	0.6	0.0071	<0.0050
Phenanthrene	µg/g	0.0050	6.2	0.034	0.047
Pyrene	µg/g	0.0050	78	0.0053	0.082

[2] Standards from Table 2 of April 15, 2011 *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act* ; Residential / Parkland / Institutional land use, coarse textured soil

[1] 2-methylnaphthalene standard applicable to 1-methylnaphthalene with the provision that if both are detected, the sum of the two concentrations cannot exceed the standard

ns No standard
m bg Meters below grade
SV Reading Soil vapour reading (ppm or % LEL)
ppm Parts per million (by volume)
% LEL Percent of the lower explosive limit
BOLD Exceeds standard

TABLE 4 SOIL ANALYTICAL RESULTS - PAHs

1294 Kingston Road, 1848 and 1852 Liverpool Road, Pickering, Ontario **CONTINUED**

Terrapex Sample Name	Units	RDL	STANDARDS[2] 2011 Table 2 R / P / I coarse	MW8-1	MW9-SS1
Sample Depth	m bg	-	-	0 - 0.6	0.3 - 0.9
SV Reading	-	-	-	<10 ppm	<10 ppm
Sampling Date	-	-	-	7-Feb-19	31-Jan-19
Analysis Date	-	-	-	15-Feb-19	6-Feb-19
Certificate of Analysis No.	-	-	-	B936015	B929073
Acenaphthene	µg/g	0.0060	7.9	<0.0050	<0.0050
Acenaphthylene	µg/g	0.0050	0.15	0.0053	<0.0050
Anthracene	µg/g	0.0050	0.67	<0.0050	<0.0050
Benz(a)anthracene	µg/g	0.0050	0.5	0.019	<0.0050
Benzo(a)pyrene	µg/g	0.0050	0.3	0.027	<0.0050
Benzo(b)fluoranthene	µg/g	0.0050	0.78	0.033	<0.0050
Benzo(g,h,i)perylene	µg/g	0.0050	6.6	0.026	<0.0050
Benzo(k)fluoranthene	µg/g	0.0050	0.78	0.010	<0.0050
Chrysene	µg/g	0.0050	7	0.022	<0.0050
Dibenz(a,h)anthracene	µg/g	0.0050	0.1	<0.0050	<0.0050
Fluoranthene	µg/g	0.0050	0.69	0.069	<0.0050
Fluorene	µg/g	0.0050	62	<0.0050	<0.0050
Indeno(1,2,3-cd)pyrene	µg/g	0.0050	0.38	0.021	<0.0050
Methylnaphthalene, 1- [1]	µg/g	0.0050	0.99	<0.0050	<0.0050
Methylnaphthalene, 2- [1]	µg/g	0.0050	0.99	<0.0050	<0.0050
Methylnaphthalene, 1- & 2- [1]	µg/g	0.0071	0.99	<0.0071	<0.0071
Naphthalene	µg/g	0.0050	0.6	<0.0050	<0.0050
Phenanthrene	µg/g	0.0050	6.2	0.033	<0.0050
Pyrene	µg/g	0.0050	78	0.077	<0.0050

[2] Standards from Table 2 of April 15, 2011 *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act* ; Residential / Parkland / Institutional land use, coarse textured soil

[1] 2-methylnaphthalene standard applicable to 1-methylnaphthalene with the provision that if both are detected, the sum of the two concentrations cannot exceed the standard

ns No standard
m bg Meters below grade
SV Reading Soil vapour reading (ppm or % LEL)
ppm Parts per million (by volume)
% LEL Percent of the lower explosive limit
BOLD Exceeds standard

TABLE 4 SOIL ANALYTICAL RESULTS - PAHs
1294 Kingston Road, 1848 and 1852 Liverpool Road, Pickering, Ontario **CONTINUED**

Terrapex Sample Name	Units	RDL	STANDARDS[2] 2011 Table 2 R / P / I coarse	MW10-1	MW10-91 Field Duplicate of MW10-1
Sample Depth	m bg	-	-	0 - 0.6	0 - 0.6
SV Reading	-	-	-	<10 ppm	<10 ppm
Sampling Date	-	-	-	7-Feb-19	7-Feb-19
Analysis Date	-	-	-	15-Feb-19	15-Feb-19
Certificate of Analysis No.	-	-	-	B936015	B936015
Acenaphthene	µg/g	0.0060	7.9	<0.050	<0.050
Acenaphthylene	µg/g	0.0050	0.15	<0.050	<0.050
Anthracene	µg/g	0.0050	0.67	<0.050	<0.050
Benz(a)anthracene	µg/g	0.0050	0.5	0.095	0.13
Benzo(a)pyrene	µg/g	0.0050	0.3	0.091	0.12
Benzo(b)fluoranthene	µg/g	0.0050	0.78	0.12	0.14
Benzo(g,h,i)perylene	µg/g	0.0050	6.6	0.064	0.079
Benzo(k)fluoranthene	µg/g	0.0050	0.78	<0.050	0.055
Chrysene	µg/g	0.0050	7	0.075	0.11
Dibenz(a,h)anthracene	µg/g	0.0050	0.1	<0.050	<0.050
Fluoranthene	µg/g	0.0050	0.69	0.27	0.33
Fluorene	µg/g	0.0050	62	<0.050	<0.050
Indeno(1,2,3-cd)pyrene	µg/g	0.0050	0.38	0.058	0.075
Methylnaphthalene, 1- [1]	µg/g	0.0050	0.99	<0.050	<0.050
Methylnaphthalene, 2- [1]	µg/g	0.0050	0.99	<0.050	<0.050
Methylnaphthalene, 1- & 2- [1]	µg/g	0.0071	0.99	<0.071 (0.071)	<0.071 (0.071)
Naphthalene	µg/g	0.0050	0.6	<0.050	<0.050
Phenanthrene	µg/g	0.0050	6.2	0.14	0.17
Pyrene	µg/g	0.0050	78	0.25	0.29

2 Standards from Table 2 of April 15, 2011 *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act* ; Residential / Parkland / Institutional land use, coarse textured soil
1 2-methylnaphthalene standard applicable to 1-methylnaphthalene with the provision that if both are detected, the sum of the two concentrations cannot exceed the standard
ns No standard
m bg Meters below grade
SV Reading Soil vapour reading (ppm or % LEL)
ppm Parts per million (by volume)
% LEL Percent of the lower explosive limit
BOLD Exceeds standard

TABLE 5 **SOIL ANALYTICAL RESULTS - INORGANICS**
1294 Kingston Road, 1848 and 1852 Liverpool Road, Pickering, Ontario

Terrapex Sample Name	Units	RDL	STANDARDS[2] 2011 Table 2 R / P / I coarse	BH1-1	MW1-5
Sample Depth	m bg	-	-	0 - 0.6	4.6-5.0
SV Reading	-	-	-	-	-
Sampling Date	-	-	-	13-Feb-19	13-Feb-19
Analysis Date	-	-	-	27-Feb-19	04-Mar-19
Certificate of Analysis No.	-	-	-	B944876	B953411
Antimony	µg/g	0.20	7.5	0.31	-
Arsenic	µg/g	1.0	18	2.2	-
Barium	µg/g	0.50	390	61	-
Beryllium	µg/g	0.20	4	0.42	-
Boron (Hot Water Soluble) [1]	µg/g	0.050	1.5	0.51	-
Boron (Total) [1]	µg/g	5.0	120	10	-
Cadmium	µg/g	0.10	1.2	0.14	-
Chromium	µg/g	1.0	160	17	-
Hexavalent Chromium	µg/g	0.2	8	0.4	-
Cobalt	µg/g	0.10	22	5.4	-
Copper	µg/g	0.50	140	16	-
Cyanide (CN-)	µg/g	0.01	0.051	<0.01	-
Lead	µg/g	1.0	120	15	-
Mercury	µg/g	0.050	0.27	0.056	-
Molybdenum	µg/g	0.50	6.9	1	-
Nickel	µg/g	0.50	100	9.7	-
Selenium	µg/g	0.50	2.4	<0.50	-
Silver	µg/g	0.20	20	<0.20	-
Thallium	µg/g	0.050	1	0.06	-
Uranium	µg/g	0.050	23	0.82	-
Vanadium	µg/g	5.0	86	21	-
Zinc	µg/g	5.0	340	59	-
pH	-	-	-	11.4	7.75
Electrical Conductivity	mS/cm	0.002	0.7	**1.4**	0.29
Sodium Adsorption Ratio	-	-	5	1.6	-

3	Samples analyzed past the recommeded hold time for Conductivity
2	Standards from Table 2 of April 15, 2011 *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; Residential / Parkland / Institutional land use, coarse textured soil
1	Hot Water Soluble Boron standard applies to surface soils; for subsurface soils, the Total Boron standard applies
ns	No standard
m bg	Meters below grade
SV Reading	Soil vapour reading (ppm or % LEL)
ppm	Parts per million (by volume)
% LEL	Percent of the lower explosive limit
BOLD	Exceeds standard

TABLE 5 SOIL ANALYTICAL RESULTS - INORGANICS

1294 Kingston Road, 1848 and 1852 Liverpool Road, Pickering, Ontario **CONTINUED**

Terrapex Sample Name	Units	RDL	STANDARDS[2] 2011 Table 2 R / P / I coarse	MW2-1	MW2-2
Sample Depth	m bg	-	-	0 - 0.6	0 - 0.6
SV Reading	-	-	-	<10 ppm	<10 ppm
Sampling Date	-	-	-	07-Feb-19	07-Feb-19
Analysis Date	-	-	-	13-Feb-19	04-Mar-19
Certificate of Analysis No.	-	-	-	B936015	B954499
Antimony	µg/g	0.20	7.5	<0.20	-
Arsenic	µg/g	1.0	18	2.6	-
Barium	µg/g	0.50	390	75	-
Beryllium	µg/g	0.20	4	0.43	-
Boron (Hot Water Soluble) [1]	µg/g	0.050	1.5	**1.7**	0.56
Boron (Total) [1]	µg/g	5.0	120	8.0	-
Cadmium	µg/g	0.10	1.2	0.30	-
Chromium	µg/g	1.0	160	15	-
Hexavalent Chromium	µg/g	0.2	8	<0.2	-
Cobalt	µg/g	0.10	22	5.8	-
Copper	µg/g	0.50	140	9.2	-
Cyanide (CN-)	µg/g	0.01	0.051	0.01	-
Lead	µg/g	1.0	120	16	-
Mercury	µg/g	0.050	0.27	<0.050	-
Molybdenum	µg/g	0.50	6.9	<0.50	-
Nickel	µg/g	0.50	100	11	-
Selenium	µg/g	0.50	2.4	<0.50	-
Silver	µg/g	0.20	20	<0.20	-
Thallium	µg/g	0.050	1	0.12	-
Uranium	µg/g	0.050	23	0.40	-
Vanadium	µg/g	5.0	86	27	-
Zinc	µg/g	5.0	340	46	-
pH	-	-	-	7.72	-
Electrical Conductivity	mS/cm	0.002	0.7	**2.9**	-
Sodium Adsorption Ratio	-	-	5	**11**	-

3 Samples analyzed past the recommeded hold time for Conductivity

2 Standards from Table 2 of April 15, 2011 *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; Residential / Parkland / Institutional land use, coarse textured soil

1 Hot Water Soluble Boron standard applies to surface soils; for subsurface soils, the Total Boron standard applies

ns No standard

m bg Meters below grade

SV Reading Soil vapour reading (ppm or % LEL)

ppm Parts per million (by volume)

% LEL Percent of the lower explosive limit

BOLD Exceeds standard

TABLE 5 SOIL ANALYTICAL RESULTS - INORGANICS

1294 Kingston Road, 1848 and 1852 Liverpool Road, Pickering, Ontario **CONTINUED**

Terrapex Sample Name	Units	RDL	STANDARDS[2] 2011 Table 2 R / P / I coarse	MW2-4	MW2-12
Sample Depth	m bg	-	-	2.3-2.9	12.2-12.8
SV Reading	-	-	-	<10 ppm	<10 ppm
Sampling Date	-	-	-	07-Feb-19	07-Feb-19
Analysis Date	-	-	-	27-Feb-19	27-Feb-19
Certificate of Analysis No.	-	-	-	B946830	B946830
Antimony	µg/g	0.20	7.5	<0.20	-
Arsenic	µg/g	1.0	18	1.3	-
Barium	µg/g	0.50	390	70	-
Beryllium	µg/g	0.20	4	0.38	-
Boron (Hot Water Soluble) [1]	µg/g	0.050	1.5	0.080	0.095
Boron (Total) [1]	µg/g	5.0	120	7.7	-
Cadmium	µg/g	0.10	1.2	0.11	-
Chromium	µg/g	1.0	160	15	-
Hexavalent Chromium	µg/g	0.2	8	<0.2	-
Cobalt	µg/g	0.10	22	5.5	-
Copper	µg/g	0.50	140	9.7	-
Cyanide (CN-)	µg/g	0.01	0.051	-	-
Lead	µg/g	1.0	120	5.5	-
Mercury	µg/g	0.050	0.27	<0.050	-
Molybdenum	µg/g	0.50	6.9	<0.50	-
Nickel	µg/g	0.50	100	11	-
Selenium	µg/g	0.50	2.4	<0.50	-
Silver	µg/g	0.20	20	<0.20	-
Thallium	µg/g	0.050	1	0.089	-
Uranium	µg/g	0.050	23	0.50	-
Vanadium	µg/g	5.0	86	22	-
Zinc	µg/g	5.0	340	31	-
pH	-	-	-	-	-
Electrical Conductivity	mS/cm	0.002	0.7	**1.7**	0.24
Sodium Adsorption Ratio	-	-	5	**7.3**	0.27

3 Samples analyzed past the recommeded hold time for Conductivity

2 Standards from Table 2 of April 15, 2011 *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; Residential / Parkland / Institutional land use, coarse textured soil

1 Hot Water Soluble Boron standard applies to surface soils; for subsurface soils, the Total Boron standard applies

ns No standard

m bg Meters below grade

SV Reading Soil vapour reading (ppm or % LEL)

ppm Parts per million (by volume)

% LEL Percent of the lower explosive limit

BOLD Exceeds standard

TABLE 5 **SOIL ANALYTICAL RESULTS - INORGANICS**

1294 Kingston Road, 1848 and 1852 Liverpool Road, Pickering, Ontario **CONTINUED**

Terrapex Sample Name	Units	RDL	STANDARDS[2] 2011 Table 2 R / P / I coarse	BH3-2	BH4-2A
Sample Depth	m bg	-	-	0.8 - 1.4	0.8 - 1.2
SV Reading	-	-	-	<10 ppm	-
Sampling Date	-	-	-	07-Jan-19	07-Jan-19
Analysis Date	-	-	-	25-Jan-19	25-Jan-19
Certificate of Analysis No.	-	-	-	B918849	B918849
Antimony	µg/g	0.20	7.5	<0.20	<0.20
Arsenic	µg/g	1.0	18	2.1	2.4
Barium	µg/g	0.50	390	80	100
Beryllium	µg/g	0.20	4	0.48	0.49
Boron (Hot Water Soluble) [1]	µg/g	0.050	1.5	0.12	0.27
Boron (Total) [1]	µg/g	5.0	120	5.8	6.2
Cadmium	µg/g	0.10	1.2	<0.10	0.13
Chromium	µg/g	1.0	160	18	18
Hexavalent Chromium	µg/g	0.2	8	<0.2	<0.2
Cobalt	µg/g	0.10	22	7.0	7.2
Copper	µg/g	0.50	140	15	15
Cyanide (CN-)	µg/g	0.01	0.051	-	-
Lead	µg/g	1.0	120	7.2	10
Mercury	µg/g	0.050	0.27	<0.050	<0.050
Molybdenum	µg/g	0.50	6.9	<0.50	<0.50
Nickel	µg/g	0.50	100	14	15
Selenium	µg/g	0.50	2.4	<0.50	<0.50
Silver	µg/g	0.20	20	<0.20	<0.20
Thallium	µg/g	0.050	1	0.14	0.14
Uranium	µg/g	0.050	23	0.54	0.51
Vanadium	µg/g	5.0	86	32	29
Zinc	µg/g	5.0	340	37	41
pH	-	-	-	7.69	7.61
Electrical Conductivity	mS/cm	0.002	0.7	0.49	**2.4**
Sodium Adsorption Ratio	-	-	5	1.6	3.1

3 Samples analyzed past the recommeded hold time for Conductivity

2 Standards from Table 2 of April 15, 2011 *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act* ; Residential / Parkland / Institutional land use, coarse textured soil

1 Hot Water Soluble Boron standard applies to surface soils; for subsurface soils, the Total Boron standard applies

ns No standard

m bg Meters below grade

SV Reading Soil vapour reading (ppm or % LEL)

ppm Parts per million (by volume)

% LEL Percent of the lower explosive limit

BOLD Exceeds standard

TABLE 5 **SOIL ANALYTICAL RESULTS - INORGANICS**
1294 Kingston Road, 1848 and 1852 Liverpool Road, Pickering, Ontario **CONTINUED**

Terrapex Sample Name	Units	RDL	STANDARDS[2] 2011 Table 2 R / P / I coarse	BH4-6	BH5-1B
Sample Depth	m bg	-	-	3.7 - 4.2	0.3 - 0.8
SV Reading	-	-	-	-	-
Sampling Date	-	-	-	07-Jan-19	07-Jan-19
Analysis Date	-	-	-	06-Mar-19	25-Jan-19
Certificate of Analysis No.	-	-	-	B954489	B918849
Antimony	µg/g	0.20	7.5	-	<0.20
Arsenic	µg/g	1.0	18	-	2.8
Barium	µg/g	0.50	390	-	120
Beryllium	µg/g	0.20	4	-	0.78
Boron (Hot Water Soluble) [1]	µg/g	0.050	1.5	-	0.54
Boron (Total) [1]	µg/g	5.0	120	-	7.4
Cadmium	µg/g	0.10	1.2	-	0.27
Chromium	µg/g	1.0	160	-	26
Hexavalent Chromium	µg/g	0.2	8	-	<0.2
Cobalt	µg/g	0.10	22	-	9.3
Copper	µg/g	0.50	140	-	16
Cyanide (CN-)	µg/g	0.01	0.051	-	-
Lead	µg/g	1.0	120	-	17
Mercury	µg/g	0.050	0.27	-	0.063
Molybdenum	µg/g	0.50	6.9	-	<0.50
Nickel	µg/g	0.50	100	-	18
Selenium	µg/g	0.50	2.4	-	<0.50
Silver	µg/g	0.20	20	-	<0.20
Thallium	µg/g	0.050	1	-	0.16
Uranium	µg/g	0.050	23	-	0.63
Vanadium	µg/g	5.0	86	-	41
Zinc	µg/g	5.0	340	-	66
pH	-	-	-	-	7.71
Electrical Conductivity	mS/cm	0.002	0.7	0.67[3]	**2.5**
Sodium Adsorption Ratio	-	-	5	-	**29**

3 Samples analyzed past the recommeded hold time for Conductivity
2 Standards from Table 2 of April 15, 2011 *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act* ; Residential / Parkland / Institutional land use, coarse textured soil
1 Hot Water Soluble Boron standard applies to surface soils; for subsurface soils, the Total Boron standard applies

ns	No standard
m bg	Meters below grade
SV Reading	Soil vapour reading (ppm or % LEL)
ppm	Parts per million (by volume)
% LEL	Percent of the lower explosive limit
BOLD	Exceeds standard

TABLE 5 SOIL ANALYTICAL RESULTS - INORGANICS

1294 Kingston Road, 1848 and 1852 Liverpool Road, Pickering, Ontario CONTINUED

Terrapex Sample Name	Units	RDL	STANDARDS[2] 2011 Table 2 R / P / I coarse	BH5-5	BH5-13
Sample Depth	m bg	-	-	3.1 - 3.5	13.7-14.0
SV Reading	-	-	-	-	-
Sampling Date	-	-	-	07-Jan-19	07-Jan-19
Analysis Date	-	-	-	06-Mar-19	13-Mar-19
Certificate of Analysis No.	-	-	-	B954489	B961302
Antimony	µg/g	0.20	7.5	-	-
Arsenic	µg/g	1.0	18	-	-
Barium	µg/g	0.50	390	-	-
Beryllium	µg/g	0.20	4	-	-
Boron (Hot Water Soluble) [1]	µg/g	0.050	1.5	-	-
Boron (Total) [1]	µg/g	5.0	120	-	-
Cadmium	µg/g	0.10	1.2	-	-
Chromium	µg/g	1.0	160	-	-
Hexavalent Chromium	µg/g	0.2	8	-	-
Cobalt	µg/g	0.10	22	-	-
Copper	µg/g	0.50	140	-	-
Cyanide (CN-)	µg/g	0.01	0.051	-	-
Lead	µg/g	1.0	120	-	-
Mercury	µg/g	0.050	0.27	-	-
Molybdenum	µg/g	0.50	6.9	-	-
Nickel	µg/g	0.50	100	-	-
Selenium	µg/g	0.50	2.4	-	-
Silver	µg/g	0.20	20	-	-
Thallium	µg/g	0.050	1	-	-
Uranium	µg/g	0.050	23	-	-
Vanadium	µg/g	5.0	86	-	-
Zinc	µg/g	5.0	340	-	-
pH	-	-	-	-	-
Electrical Conductivity	mS/cm	0.002	0.7	**4.6**[3]	0.6[3]
Sodium Adsorption Ratio	-	-	5	**22**	0.29

3 Samples analyzed past the recommeded hold time for Conductivity

2 Standards from Table 2 of April 15, 2011 *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act* ; Residential / Parkland / Institutional land use, coarse textured soil

1 Hot Water Soluble Boron standard applies to surface soils; for subsurface soils, the Total Boron standard applies

ns No standard

m bg Meters below grade

SV Reading Soil vapour reading (ppm or % LEL)

ppm Parts per million (by volume)

% LEL Percent of the lower explosive limit

BOLD Exceeds standard

TABLE 5 SOIL ANALYTICAL RESULTS - INORGANICS

1294 Kingston Road, 1848 and 1852 Liverpool Road, Pickering, Ontario **CONTINUED**

Terrapex Sample Name	Units	RDL	STANDARDS[2] 2011 Table 2 R / P / I coarse	MW6-SS1	MW6-5
Sample Depth	m bg	-	-	0.15 - 0.8	3.1-3.7
SV Reading	-	-	-	-	-
Sampling Date	-	-	-	01-Feb-19	01-Feb-19
Analysis Date	-	-	-	13-Feb-19	27-Feb-19
Certificate of Analysis No.	-	-	-	B934256	B946830
Antimony	µg/g	0.20	7.5	0.21	-
Arsenic	µg/g	1.0	18	4.8	-
Barium	µg/g	0.50	390	97	-
Beryllium	µg/g	0.20	4	0.50	-
Boron (Hot Water Soluble) [1]	µg/g	0.050	1.5	0.49	-
Boron (Total) [1]	µg/g	5.0	120	5.4	-
Cadmium	µg/g	0.10	1.2	0.17	-
Chromium	µg/g	1.0	160	19	-
Hexavalent Chromium	µg/g	0.2	8	<0.2	-
Cobalt	µg/g	0.10	22	7.3	-
Copper	µg/g	0.50	140	16	-
Cyanide (CN-)	µg/g	0.01	0.051	0.01	-
Lead	µg/g	1.0	120	19	-
Mercury	µg/g	0.050	0.27	0.074	-
Molybdenum	µg/g	0.50	6.9	<0.50	-
Nickel	µg/g	0.50	100	14	-
Selenium	µg/g	0.50	2.4	<0.50	-
Silver	µg/g	0.20	20	<0.20	-
Thallium	µg/g	0.050	1	0.13	-
Uranium	µg/g	0.050	23	0.47	-
Vanadium	µg/g	5.0	86	32	-
Zinc	µg/g	5.0	340	51	-
pH	-	-	-	7.83	-
Electrical Conductivity	mS/cm	0.002	0.7	**2.2**	**1.3**
Sodium Adsorption Ratio	-	-	5	**28**	1.4

3 Samples analyzed past the recommeded hold time for Conductivity

2 Standards from Table 2 of April 15, 2011 *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; Residential / Parkland / Institutional land use, coarse textured soil

1 Hot Water Soluble Boron standard applies to surface soils; for subsurface soils, the Total Boron standard applies

ns No standard

m bg Meters below grade

SV Reading Soil vapour reading (ppm or % LEL)

ppm Parts per million (by volume)

% LEL Percent of the lower explosive limit

BOLD Exceeds standard

TABLE 5 SOIL ANALYTICAL RESULTS - INORGANICS

1294 Kingston Road, 1848 and 1852 Liverpool Road, Pickering, Ontario **CONTINUED**

Terrapex Sample Name	Units	RDL	STANDARDS[2] 2011 Table 2 R / P / I coarse	MW6-11	MW7-1
Sample Depth	m bg	-	-	12.2-12.8	0.15 - 0.8
SV Reading	-	-	-	-	<10 ppm
Sampling Date	-	-	-	01-Feb-19	07-Feb-19
Analysis Date	-	-	-	27-Feb-19	13-Feb-19
Certificate of Analysis No.	-	-	-	B946830	B936015
Antimony	µg/g	0.20	7.5	-	0.40
Arsenic	µg/g	1.0	18	-	3.1
Barium	µg/g	0.50	390	-	97
Beryllium	µg/g	0.20	4	-	0.43
Boron (Hot Water Soluble) [1]	µg/g	0.050	1.5	-	1.1
Boron (Total) [1]	µg/g	5.0	120	-	6.1
Cadmium	µg/g	0.10	1.2	-	0.30
Chromium	µg/g	1.0	160	-	17
Hexavalent Chromium	µg/g	0.2	8	-	<0.2
Cobalt	µg/g	0.10	22	-	5.0
Copper	µg/g	0.50	140	-	16
Cyanide (CN-)	µg/g	0.01	0.051	-	0.01
Lead	µg/g	1.0	120	-	100
Mercury	µg/g	0.050	0.27	-	0.16
Molybdenum	µg/g	0.50	6.9	-	<0.50
Nickel	µg/g	0.50	100	-	11
Selenium	µg/g	0.50	2.4	-	<0.50
Silver	µg/g	0.20	20	-	<0.20
Thallium	µg/g	0.050	1	-	0.12
Uranium	µg/g	0.050	23	-	0.45
Vanadium	µg/g	5.0	86	-	28
Zinc	µg/g	5.0	340	-	92
pH	-	-	-	-	7.88
Electrical Conductivity	mS/cm	0.002	0.7	0.51	**1.7**
Sodium Adsorption Ratio	-	-	5	1.2	**18**

[3] Samples analyzed past the recommeded hold time for Conductivity

[2] Standards from Table 2 of April 15, 2011 *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; Residential / Parkland / Institutional land use, coarse textured soil

[1] Hot Water Soluble Boron standard applies to surface soils; for subsurface soils, the Total Boron standard applies

ns No standard

m bg Meters below grade

SV Reading Soil vapour reading (ppm or % LEL)

ppm Parts per million (by volume)

% LEL Percent of the lower explosive limit

BOLD Exceeds standard

TABLE 5 SOIL ANALYTICAL RESULTS - INORGANICS

1294 Kingston Road, 1848 and 1852 Liverpool Road, Pickering, Ontario **CONTINUED**

Terrapex Sample Name	Units	RDL	STANDARDS[2] 2011 Table 2 R / P / I coarse	MW7-5	MW7-14
Sample Depth	m bg	-	-	3.1-3.7	13.7-14.2
SV Reading	-	-	-	<10 ppm	<10 ppm
Sampling Date	-	-	-	07-Feb-19	07-Feb-19
Analysis Date	-	-	-	27-Feb-19	27-Feb-19
Certificate of Analysis No.	-	-	-	B946830	B946830
Antimony	µg/g	0.20	7.5	-	-
Arsenic	µg/g	1.0	18	-	-
Barium	µg/g	0.50	390	-	-
Beryllium	µg/g	0.20	4	-	-
Boron (Hot Water Soluble) [1]	µg/g	0.050	1.5	-	-
Boron (Total) [1]	µg/g	5.0	120	-	-
Cadmium	µg/g	0.10	1.2	-	-
Chromium	µg/g	1.0	160	-	-
Hexavalent Chromium	µg/g	0.2	8	-	-
Cobalt	µg/g	0.10	22	-	-
Copper	µg/g	0.50	140	-	-
Cyanide (CN-)	µg/g	0.01	0.051	-	-
Lead	µg/g	1.0	120	-	-
Mercury	µg/g	0.050	0.27	-	-
Molybdenum	µg/g	0.50	6.9	-	-
Nickel	µg/g	0.50	100	-	-
Selenium	µg/g	0.50	2.4	-	-
Silver	µg/g	0.20	20	-	-
Thallium	µg/g	0.050	1	-	-
Uranium	µg/g	0.050	23	-	-
Vanadium	µg/g	5.0	86	-	-
Zinc	µg/g	5.0	340	-	-
pH	-	-	-	-	-
Electrical Conductivity	mS/cm	0.002	0.7	**1.9**	0.44
Sodium Adsorption Ratio	-	-	5	**10**	0.51

3 Samples analyzed past the recommeded hold time for Conductivity

2 Standards from Table 2 of April 15, 2011 *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act* ; Residential / Parkland / Institutional land use, coarse textured soil

1 Hot Water Soluble Boron standard applies to surface soils; for subsurface soils, the Total Boron standard applies

ns No standard

m bg Meters below grade

SV Reading Soil vapour reading (ppm or % LEL)

ppm Parts per million (by volume)

% LEL Percent of the lower explosive limit

BOLD Exceeds standard

TABLE 5 **SOIL ANALYTICAL RESULTS - INORGANICS**

1294 Kingston Road, 1848 and 1852 Liverpool Road, Pickering, Ontario **CONTINUED**

Terrapex Sample Name	Units	RDL	STANDARDS[2] 2011 Table 2 R / P / I coarse	MW8-3	MW8-93 Field Duplicate of MW8-3
Sample Depth	m bg	-	-	1.5 - 2.1	1.5 - 2.1
SV Reading	-	-	-	<10 ppm	<10 ppm
Sampling Date	-	-	-	07-Feb-19	07-Feb-19
Analysis Date	-	-	-	13-Feb-19	13-Feb-19
Certificate of Analysis No.	-	-	-	B936015	B936015
Antimony	µg/g	0.20	7.5	<0.20	<0.20
Arsenic	µg/g	1.0	18	2.5	1.8
Barium	µg/g	0.50	390	95	87
Beryllium	µg/g	0.20	4	0.47	0.45
Boron (Hot Water Soluble) [1]	µg/g	0.050	1.5	0.21	0.16
Boron (Total) [1]	µg/g	5.0	120	6.2	6.7
Cadmium	µg/g	0.10	1.2	<0.10	<0.10
Chromium	µg/g	1.0	160	24	20
Hexavalent Chromium	µg/g	0.2	8	<0.2	<0.2
Cobalt	µg/g	0.10	22	6.8	6.6
Copper	µg/g	0.50	140	14	12
Cyanide (CN-)	µg/g	0.01	0.051	<0.01	<0.01
Lead	µg/g	1.0	120	6.9	5.5
Mercury	µg/g	0.050	0.27	<0.050	<0.050
Molybdenum	µg/g	0.50	6.9	<0.50	<0.50
Nickel	µg/g	0.50	100	15	14
Selenium	µg/g	0.50	2.4	<0.50	<0.50
Silver	µg/g	0.20	20	<0.20	<0.20
Thallium	µg/g	0.050	1	0.17	0.13
Uranium	µg/g	0.050	23	0.46	0.47
Vanadium	µg/g	5.0	86	32	30
Zinc	µg/g	5.0	340	38	35
pH	-	-	-	7.59	7.68
Electrical Conductivity	mS/cm	0.002	0.7	0.33	**<u>0.78</u>**
Sodium Adsorption Ratio	-	-	5	3.6	**<u>16</u>**

3 Samples analyzed past the recommeded hold time for Conductivity

2 Standards from Table 2 of April 15, 2011 *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act* ; Residential / Parkland / Institutional land use, coarse textured soil

1 Hot Water Soluble Boron standard applies to surface soils; for subsurface soils, the Total Boron standard applies

ns No standard

m bg Meters below grade

SV Reading Soil vapour reading (ppm or % LEL)

ppm Parts per million (by volume)

% LEL Percent of the lower explosive limit

<u>BOLD</u> Exceeds standard

TABLE 5 **SOIL ANALYTICAL RESULTS - INORGANICS**

1294 Kingston Road, 1848 and 1852 Liverpool Road, Pickering, Ontario **CONTINUED**

Terrapex Sample Name	Units	RDL	STANDARDS[2] 2011 Table 2 R / P / I coarse	MW8-5	MW8-8
Sample Depth	m bg	-	-	3.0-3.7	5.3-5.9
SV Reading	-	-	-	<10 ppm	<10 ppm
Sampling Date	-	-	-	07-Feb-19	07-Feb-19
Analysis Date	-	-	-	27-Feb-19	27-Feb-19
Certificate of Analysis No.	-	-	-	B946830	B946830
Antimony	µg/g	0.20	7.5	-	-
Arsenic	µg/g	1.0	18	-	-
Barium	µg/g	0.50	390	-	-
Beryllium	µg/g	0.20	4	-	-
Boron (Hot Water Soluble) [1]	µg/g	0.050	1.5	-	-
Boron (Total) [1]	µg/g	5.0	120	-	-
Cadmium	µg/g	0.10	1.2	-	-
Chromium	µg/g	1.0	160	-	-
Hexavalent Chromium	µg/g	0.2	8	-	-
Cobalt	µg/g	0.10	22	-	-
Copper	µg/g	0.50	140	-	-
Cyanide (CN-)	µg/g	0.01	0.051	-	-
Lead	µg/g	1.0	120	-	-
Mercury	µg/g	0.050	0.27	-	-
Molybdenum	µg/g	0.50	6.9	-	-
Nickel	µg/g	0.50	100	-	-
Selenium	µg/g	0.50	2.4	-	-
Silver	µg/g	0.20	20	-	-
Thallium	µg/g	0.050	1	-	-
Uranium	µg/g	0.050	23	-	-
Vanadium	µg/g	5.0	86	-	-
Zinc	µg/g	5.0	340	-	-
pH	-	-	-	-	-
Electrical Conductivity	mS/cm	0.002	0.7	0.47	-
Sodium Adsorption Ratio	-	-	5	3.5	0.22

3 Samples analyzed past the recommeded hold time for Conductivity

2 Standards from Table 2 of April 15, 2011 *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; Residential / Parkland / Institutional land use, coarse textured soil

1 Hot Water Soluble Boron standard applies to surface soils; for subsurface soils, the Total Boron standard applies

ns No standard

m bg Meters below grade

SV Reading Soil vapour reading (ppm or % LEL)

ppm Parts per million (by volume)

% LEL Percent of the lower explosive limit

BOLD Exceeds standard

TABLE 5 **SOIL ANALYTICAL RESULTS - INORGANICS**

1294 Kingston Road, 1848 and 1852 Liverpool Road, Pickering, Ontario **CONTINUED**

Terrapex Sample Name	Units	RDL	STANDARDS[2] 2011 Table 2 R / P / I coarse	MW9-SS1	MW9-SS5
Sample Depth	m bg	-	-	0.3 - 1.0	3.0-3.7
SV Reading	-	-	-	<10 ppm	<10 ppm
Sampling Date	-	-	-	31-Jan-19	31-Jan-19
Analysis Date	-	-	-	04-Feb-19	27-Feb-19
Certificate of Analysis No.	-	-	-	B929073	B946830
Antimony	µg/g	0.20	7.5	<0.20	-
Arsenic	µg/g	1.0	18	2.5	-
Barium	µg/g	0.50	390	86	-
Beryllium	µg/g	0.20	4	0.52	-
Boron (Hot Water Soluble) [1]	µg/g	0.050	1.5	0.073	-
Boron (Total) [1]	µg/g	5.0	120	7.6	-
Cadmium	µg/g	0.10	1.2	<0.10	-
Chromium	µg/g	1.0	160	19	-
Hexavalent Chromium	µg/g	0.2	8	<0.2	-
Cobalt	µg/g	0.10	22	6.8	-
Copper	µg/g	0.50	140	17	-
Cyanide (CN-)	µg/g	0.01	0.051	<0.02	-
Lead	µg/g	1.0	120	7.1	-
Mercury	µg/g	0.050	0.27	<0.050	-
Molybdenum	µg/g	0.50	6.9	<0.50	-
Nickel	µg/g	0.50	100	16	-
Selenium	µg/g	0.50	2.4	<0.50	-
Silver	µg/g	0.20	20	<0.20	-
Thallium	µg/g	0.050	1	0.15	-
Uranium	µg/g	0.050	23	0.53	-
Vanadium	µg/g	5.0	86	30	-
Zinc	µg/g	5.0	340	38	-
pH	-	-	-	7.70	-
Electrical Conductivity	mS/cm	0.002	0.7	**1.2**	0.62
Sodium Adsorption Ratio	-	-	5	2.8	-

3	Samples analyzed past the recommeded hold time for Conductivity
2	Standards from Table 2 of April 15, 2011 *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; Residential / Parkland / Institutional land use, coarse textured soil
1	Hot Water Soluble Boron standard applies to surface soils; for subsurface soils, the Total Boron standard applies
ns	No standard
m bg	Meters below grade
SV Reading	Soil vapour reading (ppm or % LEL)
ppm	Parts per million (by volume)
% LEL	Percent of the lower explosive limit
BOLD	Exceeds standard

TABLE 5 **SOIL ANALYTICAL RESULTS - INORGANICS**

1294 Kingston Road, 1848 and 1852 Liverpool Road, Pickering, Ontario **CONTINUED**

Terrapex Sample Name	Units	RDL	STANDARDS[2] 2011 Table 2 R / P / I coarse	MW10-2
Sample Depth	m bg	-	-	0.8 - 1.4
SV Reading	-	-	-	<10 ppm
Sampling Date	-	-	-	07-Feb-19
Analysis Date	-	-	-	13-Feb-19
Certificate of Analysis No.	-	-	-	B936015
Antimony	µg/g	0.20	7.5	<0.20
Arsenic	µg/g	1.0	18	2.1
Barium	µg/g	0.50	390	60
Beryllium	µg/g	0.20	4	0.35
Boron (Hot Water Soluble) [1]	µg/g	0.050	1.5	<0.050
Boron (Total) [1]	µg/g	5.0	120	6.1
Cadmium	µg/g	0.10	1.2	<0.10
Chromium	µg/g	1.0	160	13
Hexavalent Chromium	µg/g	0.2	8	<0.2
Cobalt	µg/g	0.10	22	5.8
Copper	µg/g	0.50	140	12
Cyanide (CN-)	µg/g	0.01	0.051	<0.01
Lead	µg/g	1.0	120	5.4
Mercury	µg/g	0.050	0.27	<0.050
Molybdenum	µg/g	0.50	6.9	<0.50
Nickel	µg/g	0.50	100	12
Selenium	µg/g	0.50	2.4	<0.50
Silver	µg/g	0.20	20	<0.20
Thallium	µg/g	0.050	1	0.090
Uranium	µg/g	0.050	23	0.46
Vanadium	µg/g	5.0	86	24
Zinc	µg/g	5.0	340	27
pH	-	-	-	7.68
Electrical Conductivity	mS/cm	0.002	0.7	0.33
Sodium Adsorption Ratio	-	-	5	0.87

3 Samples analyzed past the recommeded hold time for Conductivity

2 Standards from Table 2 of April 15, 2011 *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*; Residential / Parkland / Institutional land use, coarse textured soil

1 Hot Water Soluble Boron standard applies to surface soils; for subsurface soils, the Total Boron standard applies

ns No standard

m bg Meters below grade

SV Reading Soil vapour reading (ppm or % LEL)

ppm Parts per million (by volume)

% LEL Percent of the lower explosive limit

BOLD Exceeds standard

TABLE 6 **SOIL ANALYTICAL RESULTS - OC Pesticides**
1294 Kingston Road, 1848 and 1852 Liverpool Road, Pickering, Ontario

Terrapex Sample Name	Units	STANDARDS 2009 Table 2 R / P / I fine / medium	BH10-1	BH10-91 Field Duplicate of BH10-1
Sample Depth	m bg	-	0-0.61 m	0-0.61 m
CSV Reading	-	-	<10 ppm	<10 ppm
Sampling Date	-	-	07-Feb-19	07-Feb-19
Analysis Date	-	-	16,23-Feb-19	16,23-Feb-19
Certificate of Analysis No.	-	-	B940713	B940713
Aldrin	µg/g	29	<0.0020	<0.0020
Chlordane (total)	µg/g	0.63	<0.0020	<0.0020
DDD (total)	µg/g	3.3	<0.0020	<0.0020
DDE (total)	µg/g	0.33	0.0028	0.0033
op-DDT	µg/g	-	<0.0020	<0.0020
pp-DDT	µg/g	-	<0.0020	<0.0020
DDT (total)	µg/g	0.78	<0.0020	<0.0020
Dieldrin	µg/g	7.8	<0.0020	<0.0020
Endosulphan I	µg/g	0.78	<0.0020	<0.0020
Endosulphan II	µg/g	7.8	<0.0020	<0.0020
Total Endosulphan	µg/g	0.1	<0.0020	<0.0020
Endrin	µg/g	0.69	<0.0020	<0.0020
Heptachlor	µg/g	69	<0.0020	<0.0020
Heptachlor Epoxide	µg/g	0.48	<0.0020	<0.0020
Lindane	µg/g	3.4	<0.0020	<0.0020
Methoxychlor	µg/g	3.4	<0.0050	<0.0050
Total PCB	µg/g	3.4	<0.020	<0.020
Hexachlorobenzene	µg/g	0.75	<0.0020	<0.0020
Hexachlorobutadiene	-	7.8	<0.0020	<0.0020
Hexachloroethane	mS/cm	78	<0.0020	<0.0020

Standards from Table 2 of April 15, 2011 *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act* ; Residential / Parkland / Institutional land use, coarse textured soil

[1] 2-methylnaphthalene standard applicable to 1-methylnaphthalene with the provision that if both are detected, the sum of the two concentrations cannot exceed the standard

ns No standard
m bg Meters below grade
CSV Reading Combustible soil vapour reading (ppm or % LEL)
ppm Parts per million (by volume)
% LEL Percent of the lower explosive limit
BOLD Exceeds standard

TABLE 7 **SOIL ANALYTICAL RESULTS - PCB**
1294 Kingston Road, 1848 and 1852 Liverpool Road, Pickering, Ontario

Terrapex Sample Name	Units	STANDARDS 2011 Table 3 R / P / I coarse	GS-1
Sample Depth	m bg	-	0-0.1 m
CSV Reading	-	-	<10 ppm
Sampling Date	-	-	15-Feb-19
Analysis Date	-	-	23-Feb-19
Certificate of Analysis No.	-	-	B943887
Aldrin	µg/g	0.05	-
Chlordane (total)	µg/g	0.05	-
DDD (total)	µg/g	3.3	-
DDE (total)	µg/g	0.26	-
op-DDT	µg/g	NV	-
pp-DDT	µg/g	NV	-
DDT (total)	µg/g	1.4	-
Dieldrin	µg/g	0.05	-
Endosulphan I	µg/g	NV	-
Endosulphan II	µg/g	NV	-
Total Endosulphan	µg/g	0.04	-
Endrin	µg/g	0.04	-
Heptachlor	µg/g	0.15	-
Heptachlor Epoxide	µg/g	0.05	-
Lindane	µg/g	0.056	-
Methoxychlor	µg/g	0.13	-
Total PCB	µg/g	0.35	<0.020
Hexachlorobenzene	µg/g	0.52	-
Hexachlorobutadiene	-	0.012	-
Hexachloroethane	mS/cm	0.089	-

Standards from Table 2 of April 15, 2011 *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act* ; Residential / Parkland / Institutional land use, coarse textured soil

[1] 2-methylnaphthalene standard applicable to 1-methylnaphthalene with the provision that if both are detected, the sum of the two concentrations cannot exceed the standard

ns No standard
m bg Meters below grade
CSV Reading Combustible soil vapour reading (ppm or % LEL)
ppm Parts per million (by volume)
% LEL Percent of the lower explosive limit
BOLD Exceeds standard

TABLE 8 GROUNDWATER ANALYTICAL RESULTS - VOCs

1294 Kingston Road, 1848 and 1852 Liverpool Road, Pickering, Ontario

Terrapex Sample Name	Units	STANDARDS 2011 Table 2 coarse	MW2A	MW4A	MW7
CV Reading	-	-	<10 ppm	5% LEL	19% LEL
TOV Reading	-	-	1 ppm	4 ppm	2 ppm
Sampling Date	-	-	1-Mar-19	1-Mar-19	1-Mar-19
Analysis Date	-	-	07-Mar-19	07-Mar-19	07-Mar-19
Certificate of Analysis No.	-	-	B956082	B956082	B956082
Acetone	µg/L	2,700	<10	<10	<10
Benzene	µg/L	5	<0.20	<0.20	<0.20
Bromodichloromethane	µg/L	16	<0.50	<0.50	<0.50
Bromoform	µg/L	25	<1.0	<1.0	<1.0
Bromomethane	µg/L	0.89	<0.50	<0.50	<0.50
Carbon tetrachloride	µg/L	0.79	<0.20	<0.20	<0.20
Chlorobenzene	µg/L	30	<0.20	<0.20	<0.20
Chloroform	µg/L	2.4	<0.20	<0.20	<0.20
Dibromochloromethane	µg/L	25	<0.50	<0.50	<0.50
Dichlorobenzene 1,2-	µg/L	3	<0.50	<0.50	<0.50
Dichlorobenzene, 1,3-	µg/L	59	<0.50	<0.50	<0.50
Dichlorobenzene,1,4-	µg/L	1	<0.50	<0.50	<0.50
Dichlorodifluoromethane	µg/L	590	<1.0	<1.0	<1.0
Dichloroethane, 1,1-	µg/L	5	<0.20	<0.20	<0.20
Dichloroethane, 1,2-	µg/L	1.6	<0.50	<0.50	<0.50
Dichloroethylene, 1,1-	µg/L	1.6	<0.20	<0.20	<0.20
Dichloroethylene, cis-1,2-	µg/L	1.6	<0.50	<0.50	<0.50
Dichloroethylene, trans-1,2-	µg/L	1.6	<0.50	<0.50	<0.50
Dichloropropane, 1,2-	µg/L	5	<0.20	<0.20	<0.20
Dichloropropene, cis-1,3-	µg/L	-	<0.30	<0.30	<0.30
Dichloropropene, trans-1,3-	µg/L	-	<0.40	<0.40	<0.40
Dichloropropene, 1,3-	µg/L	0.5	< 0.5	< 0.5	< 0.5
Ethylbenzene	µg/L	2.4	<0.20	<0.20	<0.20
Ethylene dibromide	µg/L	0.2	<0.20	<0.20	<0.20
Hexane	µg/L	51	<1.0	<1.0	<1.0
Methyl ethyl ketone	µg/L	1,800	<10	<10	<10
Methyl isobutyl ketone	µg/L	640	<5.0	<5.0	<5.0
Methyl tert butyl ether	µg/L	15	<0.50	<0.50	<0.50
Methylene Chloride	µg/L	50	<2.0	<2.0	<2.0
Styrene	µg/L	5.4	<0.50	<0.50	<0.50
Tetrachloroethane, 1,1,1,2-	µg/L	1.1	<0.50	<0.50	<0.50
Tetrachloroethane, 1,1,2,2-	µg/L	1	<0.50	<0.50	<0.50
Tetrachloroethylene	µg/L	1.6	<0.20	<0.20	<0.20
Toluene	µg/L	24	0.29	0.34	0.22
Trichloroethane, 1,1,1-	µg/L	200	<0.20	<0.20	<0.20
Trichloroethane, 1,1,2-	µg/L	4.7	<0.50	<0.50	<0.50
Trichloroethylene	µg/L	1.6	<0.20	<0.20	<0.20
Trichlorofluoromethane	µg/L	150	<0.50	<0.50	<0.50
Vinyl chloride	µg/L	0.5	<0.20	<0.20	<0.20
m,p-Xylenes	µg/L	-	0.81	0.82	<0.20
o-Xylene	µg/L	-	0.39	0.39	<0.20
Xylenes (total)	µg/L	300	1.2	1.2	<0.20

Standards from Table 2 of April 15, 2011 *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act* ; coarse textured soil

ns No standard
CV Reading Combustible vapour reading (ppm or % LEL)
ppm Parts per million (by volume)
% LEL Percent of the lower explosive limit
BOLD Exceeds standard

TABLE 8 GROUNDWATER ANALYTICAL RESULTS - VOCs

1294 Kingston Road, 1848 and 1852 Liverpool Road, Pickering, Ontario

Terrapex Sample Name	Units	STANDARDS 2011 Table 2 coarse	MW77 Field Duplicate of MW7	MW8
CV Reading	-	-	-	100 ppm
TOV Reading	-	-	-	2 ppm
Sampling Date	-	-	1-Mar-19	1-Mar-19
Analysis Date	-	-	07-Mar-19	07-Mar-19
Certificate of Analysis No.	-	-	B956082	B956082
Acetone	µg/L	2,700	<10	<10
Benzene	µg/L	5	<0.20	<0.20
Bromodichloromethane	µg/L	16	<0.50	<0.50
Bromoform	µg/L	25	<1.0	<1.0
Bromomethane	µg/L	0.89	<0.50	<0.50
Carbon tetrachloride	µg/L	0.79	<0.20	<0.20
Chlorobenzene	µg/L	30	<0.20	<0.20
Chloroform	µg/L	2.4	<0.20	<0.20
Dibromochloromethane	µg/L	25	<0.50	<0.50
Dichlorobenzene 1,2-	µg/L	3	<0.50	<0.50
Dichlorobenzene, 1,3-	µg/L	59	<0.50	<0.50
Dichlorobenzene,1,4-	µg/L	1	<0.50	<0.50
Dichlorodifluoromethane	µg/L	590	<1.0	<1.0
Dichloroethane, 1,1-	µg/L	5	<0.20	<0.20
Dichloroethane, 1,2-	µg/L	1.6	<0.50	<0.50
Dichloroethylene, 1,1-	µg/L	1.6	<0.20	<0.20
Dichloroethylene, cis-1,2-	µg/L	1.6	<0.50	<0.50
Dichloroethylene, trans-1,2-	µg/L	1.6	<0.50	<0.50
Dichloropropane, 1,2-	µg/L	5	<0.20	<0.20
Dichloropropene, cis-1,3-	µg/L	-	<0.30	<0.30
Dichloropropene, trans-1,3-	µg/L	-	<0.40	<0.40
Dichloropropene, 1,3-	µg/L	0.5	< 0.5	< 0.5
Ethylbenzene	µg/L	2.4	<0.20	0.23
Ethylene dibromide	µg/L	0.2	<0.20	<0.20
Hexane	µg/L	51	<1.0	<1.0
Methyl ethyl ketone	µg/L	1,800	<10	<10
Methyl isobutyl ketone	µg/L	640	<5.0	<5.0
Methyl tert butyl ether	µg/L	15	<0.50	<0.50
Methylene Chloride	µg/L	50	<2.0	<2.0
Styrene	µg/L	5.4	<0.50	<0.50
Tetrachloroethane, 1,1,1,2-	µg/L	1.1	<0.50	<0.50
Tetrachloroethane, 1,1,2,2-	µg/L	1	<0.50	<0.50
Tetrachloroethylene	µg/L	1.6	<0.20	<0.20
Toluene	µg/L	24	0.22	0.54
Trichloroethane, 1,1,1-	µg/L	200	<0.20	<0.20
Trichloroethane, 1,1,2-	µg/L	4.7	<0.50	<0.50
Trichloroethylene	µg/L	1.6	<0.20	<0.20
Trichlorofluoromethane	µg/L	150	<0.50	<0.50
Vinyl chloride	µg/L	0.5	<0.20	<0.20
m,p-Xylenes	µg/L	-	<0.20	1.2
o-Xylene	µg/L	-	<0.20	0.53
Xylenes (total)	µg/L	300	<0.20	1.8

Standards from Table 2 of April 15, 2011 *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act* ; coarse textured soil

ns	No standard
CV Reading	Combustible vapour reading (ppm or % LEL)
ppm	Parts per million (by volume)
% LEL	Percent of the lower explosive limit
<u>**BOLD**</u>	Exceeds standard

TABLE 8 GROUNDWATER ANALYTICAL RESULTS - VOCs
1294 Kingston Road, 1848 and 1852 Liverpool Road, Pickering, Ontario

Terrapex Sample Name	Units	STANDARDS 2011 Table 2 coarse	MW9	MW10	TRIP BLANK
CV Reading	-	-	50 ppm	15 ppm	50 ppm
TOV Reading	-	-	2 ppm	1 ppm	2 ppm
Sampling Date	-	-	1-Mar-19	1-Mar-19	1-Mar-19
Analysis Date	-	-	07-Mar-19	07-Mar-19	6/7-Mar-19
Certificate of Analysis No.	-	-	B956082	B956082	B956082
Acetone	µg/L	2,700	<10	<10	<10
Benzene	µg/L	5	<0.20	<0.20	<0.20
Bromodichloromethane	µg/L	16	<0.50	<0.50	<0.50
Bromoform	µg/L	25	<1.0	<1.0	<1.0
Bromomethane	µg/L	0.89	<0.50	<0.50	<0.50
Carbon tetrachloride	µg/L	0.79	<0.20	<0.20	<0.20
Chlorobenzene	µg/L	30	<0.20	<0.20	<0.20
Chloroform	µg/L	2.4	<0.20	<0.20	<0.20
Dibromochloromethane	µg/L	25	<0.50	<0.50	<0.50
Dichlorobenzene 1,2-	µg/L	3	<0.50	<0.50	<0.50
Dichlorobenzene, 1,3-	µg/L	59	<0.50	<0.50	<0.50
Dichlorobenzene,1,4-	µg/L	1	<0.50	<0.50	<0.50
Dichlorodifluoromethane	µg/L	590	<1.0	<1.0	<1.0
Dichloroethane, 1,1-	µg/L	5	<0.20	<0.20	<0.20
Dichloroethane, 1,2-	µg/L	1.6	<0.50	<0.50	<0.50
Dichloroethylene, 1,1-	µg/L	1.6	<0.20	<0.20	<0.20
Dichloroethylene, cis-1,2-	µg/L	1.6	<0.50	<0.50	<0.50
Dichloroethylene, trans-1,2-	µg/L	1.6	<0.50	<0.50	<0.50
Dichloropropane, 1,2-	µg/L	5	<0.20	<0.20	<0.20
Dichloropropene, cis-1,3-	µg/L	-	<0.30	<0.30	<0.30
Dichloropropene, trans-1,3-	µg/L	-	<0.40	<0.40	<0.40
Dichloropropene, 1,3-	µg/L	0.5	< 0.5	< 0.5	< 0.5
Ethylbenzene	µg/L	2.4	<0.20	<0.20	<0.20
Ethylene dibromide	µg/L	0.2	<0.20	<0.20	<0.20
Hexane	µg/L	51	<1.0	<1.0	<1.0
Methyl ethyl ketone	µg/L	1,800	<10	<10	<10
Methyl isobutyl ketone	µg/L	640	<5.0	<5.0	<5.0
Methyl tert butyl ether	µg/L	15	<0.50	<0.50	<0.50
Methylene Chloride	µg/L	50	<2.0	<2.0	<2.0
Styrene	µg/L	5.4	<0.50	<0.50	<0.50
Tetrachloroethane, 1,1,1,2-	µg/L	1.1	<0.50	<0.50	<0.50
Tetrachloroethane, 1,1,2,2-	µg/L	1	<0.50	<0.50	<0.50
Tetrachloroethylene	µg/L	1.6	<0.20	<0.20	<0.20
Toluene	µg/L	24	<0.20	<0.20	<0.20
Trichloroethane, 1,1,1-	µg/L	200	<0.20	<0.20	<0.20
Trichloroethane, 1,1,2-	µg/L	4.7	<0.50	<0.50	<0.50
Trichloroethylene	µg/L	1.6	<0.20	<0.20	<0.20
Trichlorofluoromethane	µg/L	150	<0.50	<0.50	<0.50
Vinyl chloride	µg/L	0.5	<0.20	<0.20	<0.20
m,p-Xylenes	µg/L	-	<0.20	<0.20	<0.20
o-Xylene	µg/L	-	<0.20	<0.20	<0.20
Xylenes (total)	µg/L	300	<0.20	<0.20	<0.20

Standards from Table 2 of April 15, 2011 *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act* ; coarse textured soil

ns No standard
CV Reading Combustible vapour reading (ppm or % LEL)
ppm Parts per million (by volume)
% LEL Percent of the lower explosive limit
BOLD Exceeds standard

TABLE 8 **GROUNDWATER ANALYTICAL RESULTS - VOCs**
1294 Kingston Road, 1848 and 1852 Liverpool Road, Pickering, Ontario

Terrapex Sample Name	Units	STANDARDS 2011 Table 2 coarse	TRIP SPIKE
CV Reading	-	-	15 ppm
TOV Reading	-	-	1 ppm
Sampling Date	-	-	25-Feb-19
Analysis Date	-	-	06-Mar-19
Certificate of Analysis No.	-	-	B956082
Acetone	µg/L	2,700	95
Benzene	µg/L	5	85
Bromodichloromethane	µg/L	16	90
Bromoform	µg/L	25	90
Bromomethane	µg/L	0.89	85
Carbon tetrachloride	µg/L	0.79	85
Chlorobenzene	µg/L	30	90
Chloroform	µg/L	2.4	90
Dibromochloromethane	µg/L	25	90
Dichlorobenzene 1,2-	µg/L	3	90
Dichlorobenzene, 1,3-	µg/L	59	85
Dichlorobenzene,1,4-	µg/L	1	85
Dichlorodifluoromethane	µg/L	590	70
Dichloroethane, 1,1-	µg/L	5	90
Dichloroethane, 1,2-	µg/L	1.6	90
Dichloroethylene, 1,1-	µg/L	1.6	85
Dichloroethylene, cis-1,2-	µg/L	1.6	85
Dichloroethylene, trans-1,2-	µg/L	1.6	85
Dichloropropane, 1,2-	µg/L	5	90
Dichloropropene, cis-1,3-	µg/L	-	80
Dichloropropene, trans-1,3-	µg/L	-	80
Dichloropropene, 1,3-	µg/L	0.5	< 0.5
Ethylbenzene	µg/L	2.4	85
Ethylene dibromide	µg/L	0.2	90
Hexane	µg/L	51	45
Methyl ethyl ketone	µg/L	1,800	95
Methyl isobutyl ketone	µg/L	640	90
Methyl tert butyl ether	µg/L	15	85
Methylene Chloride	µg/L	50	85
Styrene	µg/L	5.4	75
Tetrachloroethane, 1,1,1,2-	µg/L	1.1	90
Tetrachloroethane, 1,1,2,2-	µg/L	1	95
Tetrachloroethylene	µg/L	1.6	80
Toluene	µg/L	24	85
Trichloroethane, 1,1,1-	µg/L	200	85
Trichloroethane, 1,1,2-	µg/L	4.7	95
Trichloroethylene	µg/L	1.6	85
Trichlorofluoromethane	µg/L	150	80
Vinyl chloride	µg/L	0.5	80
m,p-Xylenes	µg/L	-	80
o-Xylene	µg/L	-	80
Xylenes (total)	µg/L	300	-

Standards from Table 2 of April 15, 2011 *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act* ; coarse textured soil

ns No standard
CV Reading Combustible vapour reading (ppm or % LEL)
ppm Parts per million (by volume)
% LEL Percent of the lower explosive limit
BOLD Exceeds standard

TABLE 9 GROUNDWATER ANALYTICAL RESULTS - INORGANICS

1294 Kingaton Road, 1848 and 1852 Liverpool Road, Pickering, Ontario

Terrapex Sample Name	Units	STANDARDS 2011 Table 2 coarse	MW2A	MW4A
CS Reading			<10 ppm	5% LEL
TOV Reading	-	-	1 ppm	2 ppm
Sampling Date	-	-	1-Mar-19	1-Mar-19
Analysis Date	-	-	5/6-Mar-19	5/6-Mar-19
Certificate of Analysis No.	-	-	B956082	B956082
Antimony	µg/L	6	<0.50	0.50
Arsenic	µg/L	25	<1.0	<1.0
Barium	µg/L	1,000	110	260
Beryllium	µg/L	4	<0.50	<0.50
Boron	µg/L	5,000	50	27
Cadmium	µg/L	2.7	<0.10	<0.10
Chromium	µg/L	50	<5.0	<5.0
Hexavalent Chromium	µg/L	25	<0.50	<0.50
Cobalt	µg/L	3.8	2.8	1.9
Copper	µg/L	87	1.5	<1.0
Cyanide (CN-)	µg/L	66	<1	<1
Lead	µg/L	10	<0.50	<0.50
Mercury	µg/L	0.29	<0.1	<0.1
Molybdenum	µg/L	70	1.5	12
Nickel	µg/L	100	9.1	5.3
Selenium	µg/L	10	<2.0	<2.0
Silver	µg/L	1.5	<0.10	<0.10
Sodium	µg/L	490,000	**1,500,000**	63,000
Thallium	µg/L	2	0.054	<0.050
Uranium	µg/L	20	7.6	12
Vanadium	µg/L	6.2	1.2	0.95
Zinc	µg/L	1,100	<5.0	23
Chloride	µg/L	790,000	**2,700,000**	410,000

Standards from Table 2 of April 15, 2011 *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act* ; coarse textured soil

ns No standard
CV Reading Combustible vapour reading (ppm or % LEL)
ppm Parts per million (by volume)
% LEL Percent of the lower explosive limit
BOLD Exceeds standard

TABLE 9 **GROUNDWATER ANALYTICAL RESULTS - INORGANICS**

1294 Kingaton Road, 1848 and 1852 Liverpool Road, Pickering, Ontario

Terrapex Sample Name	Units	STANDARDS 2011 Table 2 coarse	MW44 Field Duplicate of MW4A	MW7
CS Reading			-	19% LEL
TOV Reading	-	-	-	2 ppm
Sampling Date	-	-	1-Mar-19	1-Mar-19
Analysis Date	-	-	5/6-Mar-19	5/6-Mar-19
Certificate of Analysis No.	-	-	B956082	B956082
Antimony	µg/L	6	0.53	<0.50
Arsenic	µg/L	25	<1.0	1.2
Barium	µg/L	1,000	250	880
Beryllium	µg/L	4	<0.50	<0.50
Boron	µg/L	5,000	28	140
Cadmium	µg/L	2.7	<0.10	<0.10
Chromium	µg/L	50	<5.0	<5.0
Hexavalent Chromium	µg/L	25	<0.50	<0.50
Cobalt	µg/L	3.8	2.0	1.5
Copper	µg/L	87	2.7	1.1
Cyanide (CN-)	µg/L	66	<1	2
Lead	µg/L	10	<0.50	<0.50
Mercury	µg/L	0.29	<0.1	<0.1
Molybdenum	µg/L	70	12	26
Nickel	µg/L	100	6.2	4.6
Selenium	µg/L	10	<2.0	<2.0
Silver	µg/L	1.5	<0.10	<0.10
Sodium	µg/L	490,000	63,000	**2,200,000**
Thallium	µg/L	2	<0.050	<0.050
Uranium	µg/L	20	11	2.1
Vanadium	µg/L	6.2	1.0	0.88
Zinc	µg/L	1,100	20	23
Chloride	µg/L	790,000	400,000	**3,600,000**

Standards from Table 2 of April 15, 2011 *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act* ; coarse textured soil

ns	No standard
CV Reading	Combustible vapour reading (ppm or % LEL)
ppm	Parts per million (by volume)
% LEL	Percent of the lower explosive limit
BOLD	Exceeds standard

TABLE 9 GROUNDWATER ANALYTICAL RESULTS - INORGANICS
1294 Kingaton Road, 1848 and 1852 Liverpool Road, Pickering, Ontario

Terrapex Sample Name	Units	STANDARDS 2011 Table 2 coarse	MW8	MW9
CS Reading			100 ppm	50 ppm
TOV Reading	-	-	2 ppm	2 ppm
Sampling Date	-	-	1-Mar-19	1-Mar-19
Analysis Date	-	-	5/6-Mar-19	5/6-Mar-19
Certificate of Analysis No.	-	-	B956082	B956082
Antimony	µg/L	6	<0.50	<0.50
Arsenic	µg/L	25	<1.0	<1.0
Barium	µg/L	1,000	360	**1,500**
Beryllium	µg/L	4	<0.50	<0.50
Boron	µg/L	5,000	73	28
Cadmium	µg/L	2.7	<0.10	<0.10
Chromium	µg/L	50	<5.0	<5.0
Hexavalent Chromium	µg/L	25	<0.50	<0.50
Cobalt	µg/L	3.8	0.66	1.1
Copper	µg/L	87	<1.0	<1.0
Cyanide (CN-)	µg/L	66	<1	<1
Lead	µg/L	10	<0.50	<0.50
Mercury	µg/L	0.29	<0.1	<0.1
Molybdenum	µg/L	70	<0.50	<0.50
Nickel	µg/L	100	2.3	6.0
Selenium	µg/L	10	<2.0	<2.0
Silver	µg/L	1.5	<0.10	<0.10
Sodium	µg/L	490,000	380,000	**1,100,000**
Thallium	µg/L	2	<0.050	<0.050
Uranium	µg/L	20	1.1	1.0
Vanadium	µg/L	6.2	0.82	<0.50
Zinc	µg/L	1,100	<5.0	<5.0
Chloride	µg/L	790,000	**890,000**	**3,800,000**

Standards from Table 2 of April 15, 2011 *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act* ; coarse textured soil

ns	No standard
CV Reading	Combustible vapour reading (ppm or % LEL)
ppm	Parts per million (by volume)
% LEL	Percent of the lower explosive limit
BOLD	Exceeds standard

TABLE 9 GROUNDWATER ANALYTICAL RESULTS - INORGANICS

1294 Kingaton Road, 1848 and 1852 Liverpool Road, Pickering, Ontario

Terrapex Sample Name	Units	STANDARDS 2011 Table 2 coarse	MW10
CS Reading			15 ppm
TOV Reading	-	-	1 ppm
Sampling Date	-	-	1-Mar-19
Analysis Date	-	-	5/6-Mar-19
Certificate of Analysis No.	-	-	B956082
Antimony	µg/L	6	<0.50
Arsenic	µg/L	25	<1.0
Barium	µg/L	1,000	350
Beryllium	µg/L	4	<0.50
Boron	µg/L	5,000	22
Cadmium	µg/L	2.7	<0.10
Chromium	µg/L	50	<5.0
Hexavalent Chromium	µg/L	25	<0.50
Cobalt	µg/L	3.8	<0.50
Copper	µg/L	87	<1.0
Cyanide (CN-)	µg/L	66	<1
Lead	µg/L	10	<0.50
Mercury	µg/L	0.29	<0.1
Molybdenum	µg/L	70	2.8
Nickel	µg/L	100	2.0
Selenium	µg/L	10	<2.0
Silver	µg/L	1.5	<0.10
Sodium	µg/L	490,000	260,000
Thallium	µg/L	2	<0.050
Uranium	µg/L	20	1.2
Vanadium	µg/L	6.2	1.2
Zinc	µg/L	1,100	<5.0
Chloride	µg/L	790,000	**1,000,000**

Standards from Table 2 of April 15, 2011 *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act* ; coarse textured soil

ns No standard
CV Reading Combustible vapour reading (ppm or % LEL)
ppm Parts per million (by volume)
% LEL Percent of the lower explosive limit
BOLD Exceeds standard

TABLE 10 GROUNDWATER ANALYTICAL RESULTS - PHCs

1294 Kingston Road, 1848 and 1852 Liverpool Road, Pickering, Ontario

Terrapex Sample Name	Units	STANDARDS 2011 Table 2 coarse	MW2A	MW4A	MW7	MW77 Field Duplicate of MW7	MW8
Sample Location	-	-	<10ppm	5% LEL	19% LEL	-	100 ppm
CV Reading	-	-	1 ppm	2 ppm	2 ppm	-	2 ppm
Sampling Date	-	-	1-Mar-19	1-Mar-19	1-Mar-19	1-Mar-19	1-Mar-19
Analysis Date	-	-	07-Mar-19	07-Mar-19	07-Mar-19	07-Mar-19	07-Mar-19
Certificate of Analysis No.	-	-	B956082	B956082	B956082	B956082	B956082
Benzene	µg/L	5	<0.20	<0.20	<0.20	<0.20	<0.20
Toluene	µg/L	24	0.29	0.34	0.22	0.22	0.54
Ethylbenzene	µg/L	2.4	<0.20	<0.20	<0.20	<0.20	0.23
Xylenes (total)	µg/L	300	1.2	1.2	<0.20	<0.20	1.8
Petroleum Hydrocarbons, F1	µg/L	750	<25	<25	<25	<25	<25
Petroleum Hydrocarbons, F2	µg/L	150	<100	<100	<100	<100	<100
Petroleum Hydrocarbons, F3	µg/L	500	<200	<200	<200	<200	<200
Petroleum Hydrocarbons, F4	µg/L	500	<200	<200	<200	<200	<200

Standards from Table 2 of April 15, 2011 *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act* ; coarse textured soil

ns No standard
CV Reading Combustible vapour reading (ppm or % LEL)
ppm Parts per million (by volume)
% LEL Percent of the lower explosive limit
BOLD Exceeds standard

TABLE 10 GROUNDWATER ANALYTICAL RESULTS - PHCs

1294 Kingston Road, 1848 and 1852 Liverpool Road, Pickering, Ontario

Terrapex Sample Name	Units	STANDARDS 2011 Table 2 coarse	MW9	MW10	TRIP BLANK	TRIP SPIKE
Sample Location	-	-	50 ppm	15 ppm	-	-
CV Reading	-	-	2 ppm	1 ppm	-	-
Sampling Date	-	-	1-Mar-19	1-Mar-19	1-Mar-19	25-Feb-19
Analysis Date	-	-	07-Mar-19	07-Mar-19	6/7-Mar-19	06-Mar-19
Certificate of Analysis No.	-	-	B956082	B956082	B956082	B956082
Benzene	µg/L	5	<0.20	<0.20	<0.20	85
Toluene	µg/L	24	<0.20	<0.20	<0.20	85
Ethylbenzene	µg/L	2.4	<0.20	<0.20	<0.20	85
Xylenes (total)	µg/L	300	<0.20	<0.20	<0.20	-
Petroleum Hydrocarbons, F1	µg/L	750	<25	<25	-	-
Petroleum Hydrocarbons, F2	µg/L	150	<100	<100	-	-
Petroleum Hydrocarbons, F3	µg/L	500	<200	<200	-	-
Petroleum Hydrocarbons, F4	µg/L	500	<200	<200	-	-

Standards from Table 2 of April 15, 2011 *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act* ; coarse textured soil

ns	No standard
CV Reading	Combustible vapour reading (ppm or % LEL)
ppm	Parts per million (by volume)
% LEL	Percent of the lower explosive limit
BOLD	Exceeds standard

APPENDIX I

TOPOGRAPHIC SURVEY

TOPOGRAPHIC SURVEY OF
PART OF LOTS 26, 28, 29 AND 30 REGISTERED PLAN 492 AND PART OF LOT 23 CONCESSION 1

CITY OF PICKERING
REGIONAL MUNICIPALITY OF DURHAM

SCALE 1:250

10m 5 0 15 METRES

MANDARIN SURVEYORS LIMITED, O.L.S. ©

METRIC

DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

LEGEND

PIN	DENOTES PROPERTY IDENTIFIER NUMBER
D.S.	DENOTES FINISHED SILL ELEVATION AT ENTRY
N,S,E,W	DENOTES NORTH, SOUTH, EAST, WEST
B.F.	DENOTES BOARD FENCE
C.L.F.	DENOTES CHAIN LINK FENCE
P.W.F.	DENOTES POST AND WIRE FENCE
OHW	DENOTES OVERHEAD WIRES
G.W.	DENOTES GUY WIRES
CRW	DENOTES CONCRETE RETAINING WALL
◎U.P.	DENOTES UTILITY POLE
◎L.S.	DENOTES LIGHT STANDARD
◎H.W.	DENOTES HAND WELL
⋈W.V.	DENOTES WATER VALVE
○M.H.	DENOTES MAN HOLE
○T.S.	DENOTES TRAFFIC SIGN
▤C.B.	DENOTES CATCH BASIN
0.2 Dia.	DENOTES CONIFEROUS TREE
0.1 Dia.	DENOTES DECIDUOUS TREE

BENCHMARK NOTE

ELEVATIONS SHOWN HEREON ARE GEODETIC AND ARE REFERRED TO THE TOWN OF PICKERING BENCHMARK No.1-059, HAVING AN ELEVATION OF 84.110 METRES. BRASS TABLE SET HORIZONTALLY IN SOUTH FACE OF CONCRETE HEADWALL ON SOUTH SIDE OF GLENANNA ROAD. LOCATED 60m ± EAST OF STORRINGTON STREET. TABLET IS LOCATED 0.30m EAST OF THE WEST EDGE OF HEADWALL AND IS 0.40m BLOW TOP OF WALL.

CERTIFICATE

THE FIELD OBSERVATIONS REPRESENTED ON THIS PLAN WERE COMPLETED ON THE 30th DAY OF NOVEMBER , 2017

JANUARY 20 , 2017
DATE

Z. ZENG
ONTARIO LAND SURVEYOR

CAUTION

THIS IS NOT A PLAN OF SURVEY AND SHALL NOT BE USED FOR MORTGAGE OR TRANSACTION PURPOSES.

MANDARIN SURVEYORS LIMITED
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SURVEY BY: S.Z.	CAD No: 17-424TP	JOB No: 2017-424

APPENDIX II

SAMPLING AND ANALYSIS PLAN

SAMPLING AND ANALYSIS PLAN
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

Site: 1294 Kingston Road, 1848 and 1852 Liverpool Roads, Pickering, Ontario
Project No: CT2817.00
Date: January 28, 2019

OBJECTIVES

On behalf of Altona Group (Altona), Terrapex Environmental Ltd. (Terrapex) has prepared this sampling and analysis plan for a Phase Two Environmental Site Assessment (ESA) at 1294 Kingston Road, 1848 and 1852 Liverpool Roads, Pickering, Ontario, the "Phase Two Property". The Phase Two ESA is to be conducted for the purposes of filing a Record of Site Condition per Ontario Regulation (O. Reg.) 153/04, *Records of Site Condition - Part XV.1 of the Act* on the basis of future development for residential use. The objective of this ESA is to determine the location and concentration of contaminants in the land or water on, in or under the Phase Two Property.

The Phase Two ESA will investigate all Areas of Potential Environmental Concern (APECs) which were identified in a Phase One ESA of the property conducted by Terrapex, dated March 29, 2019 (draft report). The APECs are shown on Figure 1 and listed in Table 1.

SAMPLING PROGRAM

The media to be investigated and the contaminants of concern have been determined based on findings from previous investigations and potential environmental concerns identified from on-site and off-site activities. The media, contaminants, investigation and sampling methods are summarized on Table 2. The rationale for each sampling location, and the proposed laboratory analytical program for each location, is shown on Table 3. Modifications may be made to the program during the course of implementation, based on field observations, and will be documented in the Phase Two ESA report.

STANDARD OPERATING PROCEDURES

The following Terrapex Standard Operating Procedures (SOPs) will be used:

SOP E01.00 – Field Meter Calibration
SOP E03.00 – Borehole Advancement Using Rotary Auger
SOP E04.00 – Monitoring Well Installation
SOP E05.00 – Monitoring Well Development
SOP E06.00 – Groundwater Monitoring
SOP E07.01 – Groundwater Sampling, Low Volume Purge, Using Peristaltic Pump
SOP E09.00 – Soil Sample Handling
SOP E10.00 – Soil Classification
SOP E12.00 – Field Program Quality Assurance & Quality Control

DATA QUALITY OBJECTIVES

The investigation will be completed following Terrapex SOP *E12.00 - Field Program Quality Assurance & Quality Control*, which specifies requirements for minimizing cross-contamination, record-keeping, sample storage, sample submission, field QA/QC samples and data quality objectives. If the data quality objectives are not met, the Qualified Person for the project will review the results and determine whether the deviation affects decision-making or the overall objectives of the investigation.

LABORATORY PROGRAM

Project Laboratory: Maxxam Analytics Inc.

Accreditation: Standards Council of Canada (SCC) in accordance with the International Standard ISO/IEC 17025:2005 – *General Requirements for the Competence of Testing and Calibration Laboratories*

Proposed Analytical Program: See Table 3, attached.

Analytical Methods: The laboratory will use the methods specified in the MOE *Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act* (March 9, 2005, amended as of July 1, 2011). The laboratory will adopt a quality assurance / quality control program consisting of method blanks, laboratory control samples, matrix spikes, duplicates, and surrogates consistent with the requirements of the *Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act* document.

Sample Containers and Preservatives: See Table 4, attached.

SUB-CONTRACTORS

All sub-contractors used in the Phase Two ESA will be approved suppliers according to Terrapex's ISO 9001:2008 system. The following sub-contractors will be retained for this project:

Private utility locates: OnSite Locates Inc.
Borehole drilling and well installation: Pontil Drilling Inc.
Laboratory analyses: Maxxam Analytics Inc.
Waste disposal: a MECP – licenced contractor

ATTACHMENTS

Figure 1 – Areas of Potential Environmental Concern and Proposed Sampling Locations
Table 1 – Areas of Potential Environmental Concern
Table 2 – Media to be Investigated and Chemicals of Concern
Table 3 – Sampling Plan and Rationale
Table 4 – Sample Containers and Preservation Plan
Applicable Standard Operating Procedures

TERRAPEX

PHASE ONE CONCEPTUAL SITE MODEL - APECs

1294 KINGSTON ROAD, 1848 AND 1852 LIVERPOOL ROAD
PICKERING, ONTARIO

CLIENT
ALTONA GROUP

LEGEND

AREA OF POTENTIAL ENVIRONMENTAL CONCERN (APEC)

0 30m 60m
(APPROXIMATE)

SOURCE: VUMAP FIRST BASE SOLUTIONS, 2018 IMAGERY.

PROJECT #	CT2817.00
SCALE	AS SHOWN
DATE	MARCH 2019
DRAWN SK	CHECKED CL
DRAWING #	FIGURE 1

TABLE 1: AREAS OF POTENTIAL ENVIRONMENTAL CONCERN

APEC	LOCATION OF APEC ON PHASE ONE PROPERTY	POTENTIALLY CONTAMINATING ACTIVITY (as set out in Column A of Table 2 in Schedule D of O. Reg. 153/04)	LOCATION OF PCA (On-Site or Off-Site)	CONTAMINANTS OF POTENTIAL CONCERN	MEDIA POTENTIALLY IMPACTED (Groundwater, Soil, and/or Sediment)
APEC 1	- Entire Site	- 30 – Importation of Fill Material of unknown Quality	- PCA 1 (On-Site)	- Metals - Hydride-forming metals - ORPs	- Soil
APEC 2	- Southern section of the Site	- 28 – Gasoline and Associated Products Storage in Fixed Tanks	- PCA 2 (On-Site)	- PHCs - VOCs	- Soil - Groundwater
APEC 3	- Northern section of the Site	- 37 – Operation of Dry Cleaning Equipment (where chemicals are used)	- PCA 3 (On-Site)	- VOCs	- Soil - Groundwater
APEC 4	- Northern section of the Site	- 40 – Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications	- PCA 4 (On-Site)	- OC Pesticides	- Soil
APEC 5	- Eastern section of the Site	- 55 – Transformer Manufacturing, Processing and Use	- PCA 5 (On-Site)	- PCBs	- Soil
APEC 6	- Northeastern section of the Site	- 37 – Operation of Dry Cleaning Equipment (where chemicals are used)	- PCA 6 (Off-Site)	- VOCs	- Groundwater
APEC 7	- Northeastern section of the Site	- 37 – Operation of Dry Cleaning Equipment (where chemicals are used)	- PCA 7 (Off-Site)	- VOCs	- Groundwater
APEC 8	- Southwestern section of the Site	- 37 – Operation of Dry Cleaning Equipment (where chemicals are used)	- PCA 8 (Off-Site)	- VOCs	- Groundwater
APEC 9	- Southern section of the Site	- Not specifically defined (spill)	- PCA 9 (Off-Site)	- PHCs - VOCs	- Groundwater
APEC 10	- Southern section of the Site	- 28 – Gasoline and Associated Products Storage in Fixed Tanks	- PCA 10 (Off-Site)	- PHCs - VOCs	- Groundwater
APEC 11	- Entire site	- De-icing activities	- PCA 11 (On-Site)	- EC and SAR	- Soil
APEC 12	- Southern section of the Site	- 28 – Gasoline and Associated Products Storage in Fixed Tanks	- PCA 16 (Off-Site)	- PHCs - VOCs	- Soil - Groundwater

OC Pesticide: *organochlorine pesticide*
PAHs: *polycyclic aromatic hydrocarbons*
PHCs: *Petroleum hydrocarbons*
VOCs *Volatile organic compounds*
ORPs: *other regulated parameters*
Soil: (cyanide (free), chromium VI, mercury, boron (hot water soluble), electrical conductivity, sodium adsorption ratio, pH)
Groundwater: chromium VI, mercury, sodium, chloride

TABLE 2 - MEDIA INVESTIGATED, CONTAMINANTS OF CONCERN AND METHODS

Media	Contaminants of Concern	Investigation Method	Equipment	Sample Collection Method
Soil	Petroleum hydrocarbons Polycyclic aromatic hydrocarbons Volatile organic compounds Benzene, toluene, ethylbenzene, xylenes Metals, metal hydrides Mercury Cyanide Chromium VI Hot water soluble boron Electrical conductivity Sodium absorption ratio (SAR) Polychlorinated biphenyl	Boreholes	CME 75 rotary auger rig	Split spoon sampler, sample every 0.75 m
Groundwater	Petroleum hydrocarbons Volatile organic compounds Benzene, toluene, ethylbenzene, xylenes Metals, metal hydrides Mercury Cyanide Chromium VI Sodium, chloride	Monitoring wells	CME 75 rotary auger rig	Low-flow sampling using peristaltic pump, target top 0.5 m of water column

TABLE 3 SAMPLING PLAN AND RATIONALE
1294 Kingston Road, 1848 and 1852 Liverpool Roads, Pickering, Ontario

Borehole ID	Location	APEC	Depth (m)	Screened Interval (m)	Soil Sampling Interval	Rationale	Lab Analyses										
							Soil							Groundwater			
							VOCs	BTEX	PHCs	PCB	OCPs	M&I	PAHs	VOCs	BTEX	PHCs	M&I
BH1	Northwestern corner of the Site	1,11	18	9-12	Fill	Borehole and monitoring well were advanced for geotechnical and hydrogeological purposes. Soil sample collected from fill material						1					
BH2	Northeastern corner of the Site	1,6,7,11	18	3-6, 9-12	Fill Native Worst Case	Assess soil and groundwater conditions related to the off-site dry cleaner, as well as soil conditions of the fill material.	1	1	1			1	1	1	1	1	1
BH3	Western portion of the Site	1,11	18	9-12	Fill	Borehole and monitoring well were advanced for geotechnical and hydrogeological purposes. Soil sample collected from fill material						1					
BH4	Eastern portion of the Site	1,6,7,11	18	2-5, 9-12	Fill Native Worst Case	Assess soil and groundwater conditions related to the off-site dry cleaner, as well as soil conditions of the fill material.						1		1	1	1	1
BH5	West-centreal portion of the Site	11	18	-	Fill	Borehole and monitoring well were advanced for geotechnical and hydrogeological purposes. Soil sample collected from fill material						1					
BH6	East-centreal portion of the Site	1,11	18	9-12	Fill	Borehole and monitoring well were advanced for geotechnical and hydrogeological purposes. Soil sample collected from fill material						1					
BH7	Southern portion of the Site	9,10,11,12	18	3-6	Fill Native Worst Case	Assess soil and groundwater conditions related to the off-site spill records and gas stations, as well as soil conditions of the fill material.	1	1	1			1	1	1	1	1	1
BH8	Southeastern portion of the Site	8,11	6	3-6	Fill Native Worst Case	Assess soil and groundwater conditions related to the off-site dry cleaner, as well as soil conditions of the fill material.	1	1	1			1	1	1	1	1	1
BH9	Heritage building	2	5	2-5	Fill Native Worst Case	Assess soil and groundwater conditions related to unknown former heating system of the heritage building, as well as soil conditions of the fill material.	1	1	1			1	1	1	1	1	1
BH10	Southwestern corner of the commericla complex	1,3,4,11	6	3-6	Fill Native Worst Case	Assess soil and groundwater conditions related to the former on-site dry cleaner, as well as soil conditions of the fill material.	1	1	1		1	1	1	1	1	1	1
TP1	Near the south entrance of the commercial plaza	5	0.2	-	Fill	Assess soil and groundwater conditions related to the transformer				1							
Total Before QA/QC Samples							**5**	**5**	**5**	**1**	**1**	**10**	**5**	**6**	**6**	**6**	**6**
QA/QC field duplicate						One duplicate per 10 samples	1	1	1		1	1	1	1	1	1	1
QA/QC field blank (methanol blank for soil, deionized water blank for water)						One per sampling round (volatiles only)	1										
QA/QC trip blank						One per sampling round (volatiles in groundwater only)								1			
QA/QC trip spike						One per sampling round (volatiles in groundwater only)								1			
Total Laboratory Analyses							**7**	**6**	**6**	**1**	**2**	**11**	**6**	**9**	**7**	**7**	**7**

Notes: VOCs = volatile organic compounds (O. Reg. 153/04)
BTEX = benzene, toluene, ethylbenzene, and xylenes
PCB = polychlorinated biphenyl
OCPs = organochlorine pesticides
PHCs = petroleum hydrocarbons in the F1 to F4 fractions
M&I = metals and general inorganic parameters (O. Reg. 153/04)
PAHs = polycyclic aromatic hydrocarbons (O. Reg. 153/04)

TABLE 4 - SAMPLE CONTAINERS AND PRESERVATION

Media	Analytical Parameter	Field Filtered	Sample Container	Preservation	Holding Time (preserved)
Soil	Metals, metal hydrides, hot water soluble boron, chromium VI, SAR, EC, pH	Not applicable	250 mL glass jar	5 ± 3 °C	180 days
	Cyanide	Not applicable	250 mL glass jar, teflon lined lid	5 ± 3 °C	14 days
	BTEX, PHC F1	Not applicable	40 mL glass vial and 60 mL glass jar, no headspace	10 mL methanol, 5 ± 3 °C	14 days
	PHCs F2-F4	Not applicable	120 mL glass jar, teflon lined lid	5 ± 3 °C	14 days
	VOCs	Not applicable	40 mL glass vial and 60 mL glass jar, no headspace	10 mL methanol, 5 ± 3 °C	14 days
	PAHs	Not applicable	120 mL glass jar, teflon lined lid	5 ± 3 °C	60 days
	Reg. 558 TCLP - non-volatiles	Not applicable	250 mL glass jar	5 ± 3 °C	
	Reg. 558 TCLP - volatiles	Not applicable	120 mL glass jar, teflon lined lid	5 ± 3 °C	
Groundwater	Metals, metal hydrides, sodium	Yes	250 mL HDPE bottle	HNO_3 to pH < 2 5 ± 3 oC	60 days
	Mercury	Yes	125 mL clear glass bottle	HCl to pH < 2 5 ± 3 oC	28 days
	Chromium VI	Yes	250 mL HDPE bottle	$(NH_4)_2SO_4/HN_4OH$ 5 ± 3 oC	28 days
	Cyanide	No	250 mL HDPE bottle	NaOH to pH > 12 5 ± 3 °C	14 days
	BTEX, PHC F1	No	3 x 40 mL clear glass septum vial, no headspace	$NaHSO_4$ to pH < 2 5 ± 3 $_o$C	14 days
	PHCs F2-F4	No	1 x 500 mL amber glass bottle or 2 x 250 mL amber bottles	$NaHSO_4$ to pH < 2 5 ± 3 $_o$C	40 days
	VOCs	No	3 x 40 mL clear glass septum vial, no headspace	$NaHSO_4$ to pH < 2 5 ± 3 $_o$C	14 days
	PAHs	No	1 L amber glass bottle or 2 x 500 mL amber bottles	5 ± 3 °C	14 days

SAR = sodium absorption ratio
EC = electrical conductivity
BTEX = benzene, toluene, ethylbenzene, xylenes
PHC F1 - F4 = petroleum hydrocarbons F1 to F4 fractions
VOCs = volatile organic compounds
PAHs = polycyclic aromatic hydrocarbons (O. Reg. 153/04)
TCLP = toxicity characterization leachate procedure
HDPE = high density polyethylene

APPENDIX III
STANDARD OPERATING PROCEDURES

TERRAPEX STANDARD OPERATING PROCEDURE
FIELD VAPOUR METER CALIBRATION

GENERAL NOTES

Standard Operating Procedures (SOPs) have been developed by Terrapex Environmental Ltd. to standardize protocols used during environmental assessment work programs. However, certain work programs may warrant deviations from SOPs and some clients may have specific requirements which differ from those outlined in this SOP. Any significant deviations should be discussed with and approved by the project manager. Each deviation, along with the rationale for the deviation, should be documented in the field notes, project scope and/or notes to file.

Where SOPs are appended to reports, all deviations from this SOP, along with the rationale for the deviation, must be documented in the report.

APPLICATION

This SOP describes calibration procedures and requirements for portable meters used to measure combustible vapours, volatile organic compounds, and/or other gases within an atmosphere. The procedures described herein are applicable to calibration both in the office and in the field (using a portable calibration kit).

GENERAL CALIBRATION PROCEDURES

1. Turn on the instrument and allow 5-10 minutes for it to warm up. When calibrating in the field, complete instrument warm up in a sheltered environment, or allow an additional 5-10 minutes for warm up.
2. Attach hoses, water traps, probe ends and other pieces that will be utilized during actual measurement, and set instrument to the intended measurement mode (e.g., on a Gastech Model 1238 ME, turn “methane elimination” on or off, as appropriate).
3. Check instrument flow rate to confirm suitable vapour intake.
4. In a baseline environment (e.g., ambient air), “zero” the instrument. Record any adjustments made on the instrument calibration log, including initial and final (calibrated) readings.
5. Fill an empty Tedlar bag with calibration gas, and connect it to the instrument. If the instrument being calibrated has multiple sensors for different ranges of target vapours (e.g., GasTech model 1238ME), calibrate the coarse range (higher concentrations) first.

6. Allow the instrument to equilibrate with the environment in the Tedlar bag and adjust the instrument span settings as appropriate. Record any adjustments made on the instrument calibration log, including initial and final (calibrated) readings.
7. Remove the Tedlar bag and confirm that the instrument returns to a baseline reading (e.g., zero reading on a combustible vapour meter).
8. Repeat steps 4 through 7, as necessary, for additional sensors and/or target vapours.

CALIBRATION REQUIREMENTS

Portable meters are to be calibrated prior to the start of a site visit, and prior to the start of each successive site visit if the project requires more than a single day onsite.

More frequent calibration may be required on projects where elevated vapour readings are frequently encountered, as such scenarios can results in calibration “drift” (erroneous readings on the instrument). Calibration drift is often characterized by one or more of the following conditions:

- Failure of the instrument to return to a baseline reading in ambient conditions;
- No response or apparently “sluggish” response of the instrument upon exposure to an environment containing target vapours; or,
- Inconsistent instrument readings despite exposure to apparently identical target environments.

Where calibration drift is suspected, the instrument should be recalibrated as soon as practicable. Readings potentially affected by calibration drift should be appropriately annotated on field notes/log sheets.

TERRAPEX STANDARD OPERATING PROCEDURE
BOREHOLE ADVANCEMENT USING ROTARY AUGER

GENERAL NOTES

Standard Operating Procedures (SOPs) have been developed by Terrapex Environmental Ltd. to standardize protocols used during environmental assessment work programs. However, certain work programs may warrant deviations from SOPs and some clients may have specific requirements which differ from those outlined in this SOP. Any significant deviations should be discussed with and approved by the project manager. Each deviation, along with the rationale for the deviation, should be documented in the field notes, project scope and/or notes to file.

Where SOPs are appended to reports, all deviations from this SOP, along with the rationale for the deviation, must be documented in the report.

APPLICATION

This SOP is applicable to intrusive environmental investigations involving the advancement of borings using rotary auger drilling rigs employing 5 ft (approximately 1.5 m) long continuous flight hollow stem augers or solid stem augers. The SOP is applicable whether such activity constitutes the whole of a work program, or part of a larger work program.

EQUIPMENT

The following list details the standard equipment necessary for borehole advancement. Specific sites may require additional or specialized equipment.

- ☐ Portable vapour meter (e.g., Gastech™ 1238ME), calibrated and charged
- ☐ Vapour meter field calibration kit, if applicable
- ☐ tape measure with weighted end
- ☐ sampling equipment (gloves, bags, permanent marker)
- ☐ bucket for washing split spoon samplers
- ☐ detergent solution in spray bottle
- ☐ distilled/clean water in spray bottle
- ☐ laboratory-supplied sampling jars appropriate for contaminants of concern
- ☐ cooler with ice

- ☐ laboratory chain of custody forms
- ☐ field notebook
- ☐ field borehole logs (F025)
- ☐ site plan
- ☐ scope of work/field work instructions
- ☐ site-specific health and safety plan, including Job Safety Analysis and other POST^{TM} documentation
- ☐ Personal Protective Equipment (e.g., hard hat, vest, safety glasses, respirator, steel toe boots, gloves, hearing protection)
- ☐ Camera
- ☐ Measuring wheel or similar device

PREPARATION

- review scope, proposed borehole locations, and utility locates with project manager
- ensure utility locates are complete, contractor is confirmed, and site access is confirmed
- ensure equipment booked is suitable for site (e.g., tracked drill rig vs. truck-mounted rig)
- calibrate and sign-out field equipment

SPECIAL PLANNING AND PREPARATION REQUIREMENTS

Above ground and underground utilities and other services within the assessment area are to be located and identified in the field prior to drilling. Where appropriate, a private locating contractor should also be retained to identify secondary services such as yard lights, internal computer/communication lines, etc., and clear proposed borehole locations. All exclusions or conditions attached to utility service locates (e.g., notification requirements, "hand dig only" areas) are to be strictly adhered to.

NOMENCLATURE

Boreholes should be uniquely numbered on a sequential basis, and prefaced by "BH".

The initial round of borehole advancement should begin with borehole "BH101", with subsequent boreholes advanced during this round identified as "BH102", "BH103", etc. Additional rounds of borehole advancement would begin by advancing the borehole count to the next 100 (e.g., the first borehole from the second and third investigation program would be “BH201” and “BH301”, respectively). Borehole numbering is to be maintained irrespective of the manner in which the borehole is advanced (e.g., if the second round of borehole advancement is completed using a method other than rotary auger drilling, it would still commence with borehole “BH201”).

If a monitoring well is installed in a borehole (refer to *Monitoring Well Installation*, SOP E04.00), the prefix “MW” is to be substituted for “BH”, however, the borehole numbering sequence is to be maintained (e.g., if the second borehole of the first round of investigation is instrumented as a monitoring well, it would be identified as “MW102”, <u>not</u> “MW101”).

Soil samples collected during borehole advancement should be numbered sequentially using the borehole number followed by a dash as a prefix, (e.g., sample “BH101-4", indicating the fourth sample from borehole BH101). Subdivided samples should be labelled with alphabetical suffixes from the top of the sample (e.g., “BH101-4A” and “BH101-4B”, with the later sample located at the greater depth).

All alphabetical prefixes and suffixes should be written in capital letters.

FIELD PROCEDURES

Sampling

Split spoons are to be advanced, where possible, 2 ft. (approx. 61 cm) below the end of the augers at regular 2.5 ft. intervals (e.g. 0 ft., 2.5 ft., 5 ft., etc.), beginning at ground surface, and at regular 2.5 ft. intervals thereafter (i.e. 2.5 ft., 5 ft., 7.5 ft., etc.). Standard penetration tests should be conducted to advance the spoon, and the number of blows required to drive the spoon each 6 in. (approx. 150 mm) interval recorded.

For boreholes advanced in areas of asphalt, concrete, or crushed stone surfacing, the initial spoon should be advanced starting at the base of the surfacing, and to a depth no greater than 2.5 ft. to permit subsequent spoons to be advanced at regular intervals beginning at 2.5 ft. (e.g. 2.5 ft., 5 ft., 7.5 ft., etc.). The thickness and type of the “unsampled” surfacing material is to be measured and recorded on the borehole log.

Split spoon advancement should be abandoned at “refusal”. “Refusal” includes greater than 50 blows to drive a spoon 6 in. (150 mm) or less.

Where significant “caving” or “slough” occurs, or may occur, between sample intervals, hollow stem augers should be used to advance the borehole and to facilitate the installation of a monitoring well (if applicable) in the completed boring. Sand traps may be used to improve sample recovery, where necessary, when advancing split spoons into wet, non-cohesive soils (e.g. sands and gravels).

Split spoon samples are to be cleaned prior to use using soapy water and a fresh water rinse.

Recovered soil samples should be handled and screened in the field as specified in *Soil Sample Handling* (SOP E09.00). Where appropriate, samples should be divided into two or more sub-samples to facilitate logging of observed changes in geological conditions (stratigraphy, etc.) or evidence of possible impact (staining, odours, etc.). Subdivided samples should be identified as described in the Nomenclature section above; i.e., assigning the suffix "A" to the sub-sample at the top of the spoon (the sample first collected), then "B", "C", etc.

Boreholes are to be advanced to <u>at least</u> the maximum anticipated depth of potential impact (e.g., <u>at least</u> the water table for investigations of possible petroleum hydrocarbon impacts). Whenever possible, the final depth of the borehole should approximately delineate the vertical extent of contamination in the vicinity of the borehole (e.g., one "clean" sample should be obtained from the base of the borehole).

Note Taking

Use the Terrapex field borehole form (Form F025). Always fill in every field of the top portion of the form completely - logs can easily get separated from each other. Note the outer diameter of augers.

Avoid using non-established short forms on all descriptions. Do not scribble anything out or erase, just place a line through the word.

The type and thickness of surfacing materials (asphalt, concrete and/or crushed stone) should also be recorded.

Record the sampling interval graphically as the interval over which the split spoon was driven, not the length of the spoon (i.e., record the actual sampling interval, accounting for refusal, not the planned sampling interval).

Label each sample collected as 1, 2, 3, etc. as specified in the Nomenclature section. Do <u>not</u> start a new set of numbers if you change collection methods. Do <u>not</u> use depth intervals for the sample name (e.g. 10'-12').

Record percent recovery based on how far you drove the spoon (actual sampling interval), not one length of the spoon or the intended sampling interval, rounded to the nearest 5%.

% recovery = (Quantity of soil recovered)/(distance spoon was driven) x 100%

For example, if the spoon was driven 60 cm (2 ft), and 20 cm (8") of soil was recovered, % recovery = (20 cm / 60 cm) x 100% = 33.33%, rounded to 35%.

Record blow counts based on Standard Penetration Test (blows to drive the split spoon 6 inches). If it takes more than 50 blows to drive the spoon less than 6 inches, record as 50/x”, where x is the number of inches the spoon was actually driven, and terminate the test.

When screening soil headspace vapours, record vapour readings AND units. Note the instrument number used to collect vapour readings. If you are using an instrument other than the default GasTech 1238 combustible meter or equivalent, note the type of instrument.

If there is no deflection on the combustible gas meter (or other field headspace screening instrument) record the reading as less than the effective detection limit (<10 ppm for combustible gas meters), <u>not</u> 0 ppm.

For odours, use NONE, SLIGHT, MODERATE and STRONG. The default is assumed to be hydrocarbon odour; other types of odours require a description entered onto the log. Do not leave this blank unless you did not check for odours.

Refer to the *Soil Classification* (SOP E10.00) for standard terminology for recording sample descriptions. In addition:

- always record the relative grain size of sand particles (fine/medium/coarse), not just “sand”;
- note any structural observations (bedding, etc.)
- record presence of rootlets/roots, organic matter, debris, and anything else that might help determine whether the soil is fill or native;
- note fractures and location, width, weathered, staining, open, closed, tight.
- for sand seams, record the depth and thickness as well as a description (coarse, wet, etc.).

Clearly and fully document the stratigraphy encountered during drilling and soil sampling, including the depths of stratigraphic contacts observed <u>within</u> split spoons (e.g., located within sampling intervals). If there are distinct layers within a split spoon, the samples should be divided into sub-samples and identified with suffixes A, B, C, etc. as described above.

The depth and reasons for abandoning further borehole advancement (e.g., refusal at bedrock, depth of desired investigation obtained) is to be recorded on the log.

Backfilling

This section applies to boreholes in which monitoring wells are not installed. Refer to Monitoring *Well Installation* (SOP E04.00) for instrumenting boreholes as monitoring wells.

To ensure that the boring does not represent a potential conduit for groundwater flow or contaminant migration, boreholes are to be backfilled using bentonite chips and subsequently hydrated by the addition of a sufficient volume of potable-grade water. Where boreholes have been advanced through a hole cut through asphalt, concrete or similar hard surfacing, a concrete patch is to be applied to mitigate further cracking/degradation of surface treatments.

Prior to Leaving Site

- Check the scope of work to ensure you have completed project objectives
- Measure the final location of all boreholes from permanent site features and show on site plan (refer to *Measuring and Surveying using Rod and Level*, SOP E11.00)
- Ensure boreholes are properly backfilled and the site is sufficiently restored
- Clean up any garbage or debris and leave the site the way you found it (or better)
- Call the project manager to ensure there is nothing else required, to summarize findings and results, and select final lab samples
- Pack and submit samples to lab with chain of custody

UPON RETURN TO OFFICE

- Clean and sign in all equipment used
- Log in soil samples in soil bins
- Complete equipment and supply form
- Complete field package (place logs and photocopies of relevant field log book pages in project file folder)
- Submit site drawing depicting borehole locations to drafting.

TERRAPEX STANDARD OPERATING PROCEDURE
MONITORING WELL INSTALLATION

GENERAL NOTES

Standard Operating Procedures (SOPs) have been developed by Terrapex Environmental Ltd. to standardize protocols used during environmental assessment work programs. However, certain work programs may warrant deviations from SOPs and some clients may have specific requirements which differ from those outlined in this SOP. Any significant deviations should be discussed with and approved by the project manager. Each deviation, along with the rationale for the deviation, should be documented in the field notes, project scope and/or notes to file.

Where SOPs are appended to reports, all deviations from this SOP, along with the rationale for the deviation, must be documented in the report.

APPLICATION

This SOP is applicable to the installation of monitoring wells following the vertical advancement of a borehole in overburden or bedrock. Borehole drilling procedures are not covered by this SOP.

EQUIPMENT

The following list details the standard equipment necessary for monitoring well installation over and beyond that required for borehole advancement. Specific sites may require additional or specialized equipment.

- ☐ Well screen and riser pipe
- ☐ “well gravel” (silica sand)
- ☐ Bentonite chips
- ☐ Cement mix
- ☐ End caps
- ☐ Expandable gripper caps (“J-plugs”)
- ☐ Protective casings
- ☐ locks
- ☐ clean, disposable vinyl or nitrile gloves

SPECIAL PLANNING AND PREPARATION REQUIREMENTS

A well record (per R.R.O. 1990, Reg. 903) must be completed by the drilling contractor for all monitoring wells greater than 3 m in depth, or for any well (regardless of depth) installed with a contaminated or potentially contaminated area. All necessary information to complete the well record (e.g., well owner, their address and telephone number, etc.) is to be on hand during installation or provided to the well contractor prior to the start of the work program.

Wells shall not be installed in a manner that would facilitate the migration of liquids between differing water-bearing units, or between overburden and bedrock. The subsurface stratigraphy at the borehole location should be thoroughly assessed prior to well installation.

Monitoring wells to be used for the collection of groundwater samples for laboratory analyses shall be installed such that the saturated portion of the well screen has a length less than or equal to 3.1 m.

NOMENCLATURE

Monitoring wells will be assigned numbers corresponding to the borehole numbering (refer to the appropriate borehole advancement SOP), identified by a “MW” prefix in place of “BH” (e.g., borehole “BH101” becomes “MW101”).

Multi-level well installations, whether installed within a common boring or as a series of separate borings in immediate proximity of each other, will be identified through the use of alphabetical suffixes from the deepest to the shallowest installation (e.g., “MW101A” is deeper than “MW101B”); this convention is based on the principle that numbering begins with the initial installation, and proceeds sequentially thereafter.

All alphabetical prefixes and suffixes should be written in capital letters.

The assigned well name is to be recorded on the well casing, outside of the well standpipe, and/or the top (outside) of the well standpipe cap/plug.

FIELD PROCEDURES

Well Construction

Monitoring wells must be constructed of new, clean materials. Every individual (including drilling contractor staff) involved in the installation of a monitoring well shall be provided, and must wear, a new, clean pair of disposable gloves. Gloves should be changed between installations, and whenever contact with a potential contaminant occurs.

The base of the completed boring should be measured using a weighted tape and recorded prior to well installation. It is <u>not</u> acceptable to rely on estimates of the completed boring depth based on the number of auger sections used to advance the borehole, etc.

The well should be constructed such that the screened portion of the well intersects the depth range of interest (e.g., the top of the unconfined water table for a typical investigation of potential petroleum hydrocarbon impacts).

Well screens shall intersect a single water-bearing unit only. If the depth range of interest comprises multiple water-bearing units, multi-level well installations should be used. Well screens shall not traverse the bedrock-overburden interface. If the depth range of interest includes both bedrock and overburden, multi-level well installations should be used.

The length of the screened interval, as well as the depth of installation (base of the screened interval) are to be measured and recorded, along with the well slot size, standpipe thickness (e.g., schedule 40, schedule 80, etc.), and standpipe diameter. The length of the screened interval should not exceed 3.1 m (10 ft), and the screened interval of the well should extend no higher than a depth of 1.2 m (4 ft) below ground surface to ensure adequate sealing of the boring annulus.

“Well gravel” (filter pack) should be placed in the annulus of the borehole either by manually filling the annual space, or by using a tremie pipe. The grading classification (e.g., No. 1, No.2, etc.) of well gravel used should be recorded. The top of the filter pack should ideally be located between 15 and 30 cm (6 and 12 in) above the top of the screened interval of the well. The depth of the top of the filter pack should be measured using a weighted tape and recorded. It is <u>not</u> acceptable to rely on estimates of the depth of the top of the filter pack.

The remaining annulus of the well should be backfilled using bentonite chips to a depth of approximately 45 cm (18 in) below ground surface and subsequently hydrated by the addition of a sufficient volume of potable-grade water. The depth of the top of the sealant should be measured and recorded.

A flush-mount or monument (“stick-up”) protective casing shall be set in concrete overtop the well. If a monument casing is installed, the height of the above grade portion of the well standpipe (not the casing) is to be measured and recorded.

Surveying, Establishment of Measuring Points

A consistent measuring point for future groundwater monitoring events is to be indicated on each well by placing a shallow notch on the <u>outside of the well standpipe</u> at its highest point. The elevation of the “ground surface” and “top of pipe” are to be surveyed relative to an appropriate temporary or geodetic benchmark. All “top of pipe” elevations are to be surveyed by placing the rod on the shallow notch (measuring point) on the outside of the well standpipe. Refer to Measuring and Surveying using Rod and Level SOP E11.00 for additional surveying details.

MULTI-LEVEL INSTALLATIONS

The preferred method for completing multi-levelled well installations is to complete a separate boring for each screened interval in the immediate vicinity of each other (“nested installation”). Nested installations should not be separated from the adjoining installation by distances greater than 1 m (3 ft).

Within nested installations, it is typically only necessary to collect soil samples and log stratigraphy within the deepest boring. However, each well installation is to be logged and recorded on a separate field form/report log with each log illustrating a single standpipe in a unique boring.

If multiple well standpipes are placed within the same boring, an appropriate sealant with a thickness of at least 2 m must be used to mitigate migration of liquids between the screened intervals. Such installations are to be logged and recorded on a single field form/report log that illustrates the multiple standpipes within a common boring.

FIELD DOCUMENTATION

Monitoring well installations should be recorded on field form F025 (field borehole log). Refer to the appropriate borehole advancement SOP for general borehole logging procedures.

TERRAPEX STANDARD OPERATING PROCEDURE
MONITORING WELL DEVELOPMENT

GENERAL NOTE

Standard Operating Procedures (SOPs) have been developed by Terrapex Environmental Ltd. to standardize protocols used during environmental assessment work programs. However, certain work programs may warrant deviations from SOPs and some clients may have specific requirements which differ from those outlined in this SOP. Any significant deviations should be discussed with and approved by the project manager. Each deviation, along with the rationale for the deviation, should be documented in the field notes, project scope and/or notes to file.

Where SOPs are appended to reports, all deviations from this SOP, along with the rationale for the deviation, <u>must</u> be documented in the report.

APPLICATION

These procedures are applicable to developing monitoring wells or piezometers installed for the purposes of monitoring groundwater conditions, hydraulic conductivity or similar in-situ testing, and/or recovering samples for physical inspection/laboratory analytical testing. The procedures are applicable whether such activity constitutes the whole of a work program, or part of a larger work program.

EQUIPMENT

The following list details the standard equipment necessary for groundwater monitoring. Specific sites may require additional or specialized equipment.

☐ Well opening tools (e.g., hex wrench , $^{9}/_{16}$" socket wrench, pry bar, well keys)

☐ bucket for washing down-hole field equipment

☐ detergent solution in spray bottle

☐ distilled/clean water in spray bottle

☐ Surge-block

☐ File for well notching

☐ field notebook

☐ well development field form (F054)

☐ site plan

☐ scope of work/field work instructions

☐ site-specific health and safety plan, including Job Safety Analysis and other POST^{TM} documentation

☐ Personal Protective Equipment (e.g., hard hat, vest, safety glasses, respirator, steel toe boots, gloves, hearing protection)

☐ Camera

PREPARATION

- review scope of work with project manager
- ensure site access is confirmed
- calibrate and sign-out field equipment

SPECIAL PLANNING AND PREPARATION REQUIREMENTS

Traffic spotters should be employed when development activities include wells located in the travelled portion of a roadway or in high-traffic areas. A traffic control plan in accordance with Ontario Ministry of Transportation (MTO) guidelines must be implemented for all work in road allowance.

Accumulated headspace vapours, the depth to water, the depth to the bottom of the well, and the depths to any water/non-aqueous phase liquid (NAPL) interfaces within the well should be measured (refer to SOP E06.00, *Groundwater Monitoring*) prior to development so as to establish baseline conditions.

Waters removed from wells in which there is evidence of significant contamination (e.g., NAPL) should be containerized for future disposal off-site.

Well development is <u>NOT</u> synonymous with purging completed prior to groundwater sampling, and wells must be permitted to return to equilibrium conditions prior to subsequent monitoring, in-situ testing, and/or sampling efforts. The period of recovery will vary depending on well construction and subsurface conditions, but will be no less than twenty-four hours regardless.

FIELD PROCEDURES

Objectives

Monitoring wells are developed in order to remove "drilling debris" - entrained particulate in the well standpipe, well screen and filter pack, and surrounding formation materials - thereby mitigating potential bias that may occur during groundwater monitoring, in-situ hydraulic testing, or laboratory analyses of recovered groundwater samples. A secondary objective of development is to remove waters that may have been introduced during drilling (e.g., water used as coolant during diamond coring), or that may have been impacted by drilling fluids used during drilling (e.g., mud-rotary augering).

Development Requirements

Non-dedicated down hole equipment employed during development must be cleaned using soapy water and a fresh water rinse prior to use within a well.

Development is conducted until the well yields water free of visible particulate. At a minimum, at least one borehole volume of water (defined as the initial volume of water in the well standpipe plus the volume of water in the filter pack surrounding the well) should be removed from the well during surge/purge cycles.

Where water or drilling fluids have been introduced during borehole drilling and/or monitoring well installation, development efforts should not commence until a minimum of seven calendar days have passed since the completion of borehole drilling and monitoring well installation. Alternatively, the minimum volume of water to be removed from the well during the surge/purge cycles should be calculated as the greater of:

i. three times the volume of the water/fluids introduced (or "lost") to the subsurface during drilling; and,

ii. one borehole volume of water (defined as the initial volume of water in the well standpipe plus the volume of water in the filter pack surrounding the well).

Under certain circumstances, development may be halted prior to achieving visibly particulate-free discharges waters and removing the required volume of water:

- If the well has been purged to a “dry” condition on three consecutive surge/purge cycles, and where the water column within the well standpipe has been permitted to recover to at least 90% of its initial height between each surge/purge cycle; or,
- If the well has been purged to a “dry” condition during surging/purging, where at least three times the volume of water/fluids introduced ("lost") to the subsurface have been removed, and where the water column within the well standpipe has not returned to at least 90% of its initial height following a recovery period of 24 hours or more; or,
- Following the removal of an “excessive” volume of water from a well that has yielded water continuously during surge/purge cycles, where “excessive” is defined as **the greater of**:

    i. a volume exceeding three times the initial borehole volume of water (where a borehole volume is calculated as the volume of water in the well standpipe plus the volume of water in the filter pack surrounding the well);

ii. ten times the initial volume of water in the well standpipe; and,

iii. three times the volume of the water/fluids introduced (or "lost") to the subsurface during drilling.

The start and stop time of development, equipment used (e.g., surge block, bailer), the volume of water removed, and the rationale for ceasing development efforts (e.g., particulate-free water obtained, excessive volume of water removed) are to be recorded for each well.

Bailers and Inertial Samplers

Inertial samplers generally exert a weak “surging” action, and as a result typically require significantly more water to be purged from a well to achieve a particulate-free state.

A relatively strong surging action can be achieved using a bailer if:

- the bailer is rapidly removed from the well; and,
- the removal results in a significant instantaneous drop in the water level within the well standpipe.

This generally requires the use of an elongated bailer (e.g., a 36" nominal length rather than a 12" nominal length bailer) with an outside diameter only marginally less than the inside diameter of a well standpipe (e.g., a 1.66" nominal diameter bailer within a 2" nominal diameter monitoring well), as well as a sufficient volume of water in the well to fill or nearly fill the bailer. The well must yield a sufficient volume of water to permit particulate mobilized during the removal of the bailer to be subsequently captured as the bailer is reintroduced into the well. (Otherwise, the particulate will simply settle at the bottom of the well standpipe.)

Because of their relatively weak surging action, the use of bailers and inertial samplers may result in poor development of wells that do not yield water continuously.

Surge Blocks

Surge blocks generates significant surging action and are therefore quite effective for wells that do not yield water continuously and/or that contain a significant amount of particulate (e.g., wells installed in borings advanced through bedrock).

However, surge blocks do not contribute any purging action, and must therefore be combined with a sampling or pumping device (e.g., a bailer or an inertial sampler) to remove mobilized particulate. Moreover, surge blocks generally cannot be employed within a well that has down-hole equipment installed within, necessitating the successive installation and removal of the paired sampling/pumping device. Care must be taking to ensure that neither the surge block nor the sampling/pumping device come into direct contact with the ground while they are being installed, removed, used, or otherwise manipulated.

As surge blocks are not dedicated sampling equipment, they must be cleaned using soapy water and a fresh water rinse prior to use in a well.

PRIOR TO LEAVING SITE

- Check the scope of work to ensure you have completed project objectives
- Verify the site plan accurately reflects site features and infrastructure (e.g., plan does not indicate buildings that have since been demolished, wells that have been decommissioned, etc.)
- Clean up any garbage or debris and leave the site the way you found it (or better)
- Call the project manager to ensure there is nothing else required, to summarize findings and results

UPON RETURN TO OFFICE

- Clean and sign in all equipment used
- Complete equipment and supply form
- Complete field package (place logs and photocopies of relevant field log book pages in project file folder)
- Submit any necessary revisions to site plan to drafting.

TERRAPEX STANDARD OPERATING PROCEDURE
GROUNDWATER MONITORING

GENERAL NOTE

Standard Operating Procedures (SOPs) have been developed by Terrapex Environmental Ltd. to standardize protocols used during environmental assessment work programs. However, certain work programs may warrant deviations from SOPs and some clients may have specific requirements which differ from those outlined in this SOP. Any significant deviations should be discussed with and approved by the project manager. Each deviation, along with the rationale for the deviation, should be documented in the field notes, project scope and/or notes to file.

Where SOPs are appended to reports, all deviations from this SOP, along with the rationale for the deviation, <u>must</u> be documented in the report.

APPLICATION

These procedures are applicable to monitoring headspace vapours, depth to water, and non-aqueous phase liquid (NAPL) thicknesses within existing groundwater monitoring wells. The procedures are applicable whether such activity constitutes the whole of a work program, or part of a larger work program.

EQUIPMENT

The following list details the standard equipment necessary for groundwater monitoring. Specific sites may require additional or specialized equipment.

- ☐ Portable vapour meter (e.g., Gastech™ 1238ME), calibrated and charged
- ☐ Vapour meter field calibration kit, if applicable
- ☐ “oil/water” interface probe
- ☐ Well opening tools (e.g., hex wrench , $^{9}/_{16}$” socket wrench, pry bar, well keys)
- ☐ File for well notching
- ☐ bucket for washing down-hole field equipment
- ☐ detergent solution in spray bottle
- ☐ distilled/clean water in spray bottle
- ☐ field notebook
- ☐ field groundwater monitoring form (F018)

- ☐ site plan
- ☐ scope of work/field work instructions
- ☐ site-specific health and safety plan, including Job Safety Analysis and other POST™ documentation
- ☐ Personal Protective Equipment (e.g., hard hat, vest, safety glasses, respirator, steel toe boots, gloves, hearing protection)
- ☐ Camera

PREPARATION

- review scope of work with project manager
- ensure site access is confirmed
- calibrate and sign-out field equipment

SPECIAL PLANNING AND PREPARATION REQUIREMENTS

Traffic spotters should be employed when monitoring activities include wells located in the travelled portion of a roadway or in high-traffic areas. A traffic control plan in accordance with Ontario Ministry of Transportation (MTO) guidelines must be implemented for all work in road allowance.

Groundwater monitoring should not be conducted on wells that have not been developed (refer to SOP E05.00, *Monitoring Well Development*), and should only be conducted if at least 24 hours has elapsed since well development efforts were completed.

FIELD PROCEDURES

General Instructions

Groundwater monitoring activities comprise the measurement of accumulated headspace vapours, the depth to water, the depth to the bottom of the well, and the depths to any water/NAPL interfaces detected within a well. Vapour measurements should be collected immediately upon removal of the well plug/cap to minimize venting of accumulated vapours.

To minimize contamination of the interface probe and tape, well depths should not be measured if floating (“light”) NAPL is encountered.

As part of the groundwater monitoring activities, each monitored well should be inspected to assess whether the well casing is intact, MOE well record tags (if present) remain attached to the well, and that the well standpipe is equipped with an appropriate plug/cap. Damage to the well or surrounding ground surfacing should be recorded, and broken/missing plugs or caps replaced.

If the well name recorded on the well casing, outside of the well standpipe, or top of the well standpipe cap/plug has faded or smudged, a replacement identifier is to be placed. However; it is imperative that appropriate steps be taken to confirm the well identification before doing so to avoid mislabelling.

Headspace Vapour Measurements

A water trap must be used for the field vapour meter if it is available. The probe tip is to be inserted approximately 15 cm into the well or other headspace being measured, unless this would result in immersing the probe tip in water. Cover the opening as best as possible to mitigate venting of vapours and record the highest vapour level indicated on the meter within the 30 seconds of inserting the probe tip.

When utilizing Gastech 1238 ME combustible (or “hydrocarbon”) vapour meters or equivalent devices, switch to the % LEL (percentage of lower explosive limit) scale when measured vapours in excess of 500 parts per million by volume (ppm). Recognize that Gastech 1238 ME and equivalent devices are considered to have an effective detection limit of 10 ppm; readings of zero or readings less than 10 ppm are to be recorded as “< 10 ppm”.

Depth to Water and Water/NAPL Interface Measurements

Prior to use in a well, the interface probe is to be cleaned using soapy water and a fresh water rinse. The grounding clip is to be attached to the well casing or an equivalent grounding point before inserting the probe into the well.

Depths to water and any water/NAPL interfaces are to be measured relative to established measuring points (a notch on the outside of the well standpipe). Should a well lack an established measuring point, a file should be used to create a notch on the outside of the well standpoint <u>at its highest point</u>, and this point should be used to measure depths.

Depths are to be recorded to the gradations provided on the probe tape (typically 5 mm), or at least the nearest 0.5 cm if the tape lacks more detailed gradational markings.

If the presence of NAPL is indicated by the interface probe, depths to the interface of water and floating NAPL (LNAPL) in the well are to be determined by lowering the probe past the apparent interface and slowly raising the probe until the presence of NAPL is indicated. For sinking NAPL (DNAPL), depths to the water/NAPL are to be determined by raising the probe above the apparent interface and slowly lowering the probe until the presence of NAPL is indicated. This approach will limit potential measurement bias associated with adherence of non-polar NAPL to the probe surface as it is raised/lowered in the well water column.

If the interface probe does not indicate the presence of floating NAPL (LNAPL), but other factors suggest LNAPL may be present (e.g., high headspace vapour readings, “sheen” on the probe, historical LNAPL findings), a clean disposable bailer should be used to recover a water sample and visually assess the possible presence of LNAPL. Such verification efforts and their findings should be documented in the field notes.

Prior to Leaving Site

- Check the scope of work to ensure you have completed project objectives
- Verify the site plan accurately reflects site features and infrastructure (e.g., plan does not indicate buildings that have since been demolished, wells that have been decommissioned, etc.)
- Clean up any garbage or debris and leave the site the way you found it (or better)
- Call the project manager to ensure there is nothing else required, to summarize findings and results, and select final lab samples

UPON RETURN TO OFFICE

- Clean and sign in all equipment used
- Complete equipment and supply form
- Complete field package (place logs and photocopies of relevant field log book pages in project file folder)
- Submit any necessary revisions to site plan to drafting.

TERRAPEX STANDARD OPERATING PROCEDURE
GROUNDWATER SAMPLING, LOW VOLUME PURGE, USING PERISTALTIC PUMP

GENERAL NOTES

Standard Operating Procedures (SOPs) have been developed by Terrapex Environmental Ltd. to standardize protocols used during environmental assessment work programs. However, certain work programs may warrant deviations from SOPs and some clients may have specific requirements which differ from those outlined in this SOP. Any significant deviations should be discussed with and approved by the project manager. Each deviation, along with the rationale for the deviation, should be documented in the field notes, project scope and/or notes to file.

Where SOPs are appended to reports, all deviations from this SOP, along with the rationale for the deviation, must be documented in the report.

APPLICATION

This SOP is applicable to the collection of groundwater samples from developed monitoring wells using a positive displacement peristaltic pump, or “roller” pump. Procedures for well development are defined in SOP E05.00, *Monitoring Well Development*, while procedures for pre-screening (“monitoring”) of groundwater conditions are described in SOP E06.00, *Groundwater Monitoring*.

EQUIPMENT

The following list details the standard equipment necessary for groundwater sampling. Specific sites may require additional or specialized equipment.

- ☐ Portable combustible vapour meter (e.g., Gastech™ 1238ME), calibrated and charged
- ☐ Combustible vapour meter field calibration kit, if applicable
- ☐ Water level indicator or equivalent (e.g., interface probe)
- ☐ Multi-meter capable of measuring pH, conductivity, ORP/redox potential, and dissolved oxygen
- ☐ Flow-through cell
- ☐ Variable-speed Peristaltic Pump
- ☐ Equipment cleaning/decontamination supplies (spray bottle with detergent solution, spray bottle with distilled/potable-grade water, paper towels)

- ☐ Well opening tools (hex keys, brass key, socket wrench, screwdriver, pry bar, well key)
- ☐ Turkey baster or other equipment to purge or bail accumulated water within protective casings
- ☐ File for well “notching”
- ☐ bucket with volume markings
- ☐ laboratory-supplied sampling containers appropriate for contaminants of concern
- ☐ cooler with ice
- ☐ laboratory chain of custody forms
- ☐ field notebook
- ☐ well sampling form (F028)
- ☐ site plan
- ☐ scope of work/field work instructions
- ☐ site-specific health and safety plan, including Job Safety Analysis and other POST™ documentation
- ☐ Personal Protective Equipment (hard hat, vest, safety glasses, respirator, steel toe boots, gloves, hearing protection)
- ☐ Camera
- ☐ Measuring wheel or similar device

PLANNING

- review scope of work and well locations with project manager
- ensure site access is confirmed
- calibrate and sign-out field equipment

SPECIAL PLANNING AND PREPARATION REQUIREMENTS

Traffic control and, flag persons, and/or spotters should be employed when groundwater sampling activities include wells within a road allowance, or in high-traffic areas of a site (e.g., an operating retail fuel outlet). Traffic control plans must correspond to Ontario Ministry of Transportation guidelines/requirements.

Groundwater samples should not be collected from wells that have not been developed (refer to SOP E05.00, *Monitoring Well Development*).

Care should be taken when handling sampling containers pre-charged with sample preservative for safety reasons (they are generally acids), and so that preservative is not inadvertently lost.

NOMENCLATURE

Groundwater samples are assigned names that correspond to the well from which the sample was collected (e.g., sample name “MW110A” is assigned to the sample recovered from monitoring well MW110A).

FIELD PROCEDURES

Prior to use, the peristaltic pump is to be outfitted with new silicone tubing for the sampling mechanism, and any non-dedicated equipment is to be cleaned using soapy water and a fresh water rinse. New and/or dedicated tubing is to be employed to draw water into and out from the pump.

To mitigate potential cross-contamination:

- always don fresh latex/nitrile gloves for each sample collection;
- do not allow the sampling equipment to touch sample bottles (preservatives from one bottle may be a “contaminant” for another bottle)
- use dedicated sampling equipment to the maximum extent possible;
- decontaminate non-dedicated monitoring equipment between samples; and,
- Wells should be sampled beginning with “least” impacted and progressing to the “most” impacted wells to minimize cross-contamination potential. The determination of relative impact should be made using information obtained during pre-sampling monitoring, previous monitoring/sampling events, site assessment results, or similar data.

Discharge waters are to be inspected to assess for the possibility of contamination of the samplers (e.g., the presence of odours in discharged waters where none had been observed during previous samplings).

Purging

For a well that is screened across the water table, set the pump intake approximately 0.5 m below the initial static water surface level. Otherwise, set the pump intake at the approximate midpoint of the screened interval.

Water is to be purged from the well at a rate between 0.1 to 0.5 L/min. (0.1 L/min = 500 mL in 5 minutes and 0.5 L/min = 2.5 L in 5 minutes). If the pump does not have a flow meter, check the flow rate by pumping into a container of known volume and record the time to fill it. Do not use the flow-through cell to check flow rate.

Water levels should be monitored to ensure that excessive drawdown does not occur within the well (the height of the water column in the well does not drop by more than 25% during purging). To the extent possible, the pump flow rate should be adjusted to maintain a constant water level within the well during purging.

Geochemical parameters should be measured using the multi-meter and flow-through cell assembly approximately every 3 to 5 minutes.

Purging is considered complete once the monitored parameters have "stabilized" for a minimum of <u>three</u> consecutive readings (parameters are within the ranges shown below of the previous reading). Note that dissolved oxygen may not stabilize in all situations; if all parameters other than dissolved oxygen have stabilized for a minimum of <u>five</u> consecutive readings, purging may be considered complete.

Geochemical stabilization Requirements

pH units	+/-0.2
Conductivity	+/-3%
ORP/redox	+/-20 mV
Dissolved Oxygen	+/-0.2 mg/L

(Source: ASTM Standard D6771)

It is not necessary to wait for groundwater levels in the well to recover before recovering samples for laboratory analysis.

Alternative Purging Criteria

Purging may cease once three times the initial volume of water in the well has been removed, regardless of whether the monitored parameters have stabilized, and groundwater samples may be collected. It is not necessary to wait for groundwater levels in the well to recover before recovering samples for laboratory analysis. The reason for ceasing purging should be recorded.

(Well volumes are calculated on the basis of the well standpipe; the volume of any water in the sand pack surrounding the well screen is not included in the calculation of the initial volume of water. For a 2 inch (50 mm) nominal diameter well, one well volume is approximately equal to 2 L per metre of standing water.)

If excessive drawdown cannot be avoided during purging (i.e., the water column height in the well drops more than 25%, even at a purge rate of 0.1 L/min), the well should be purged until a minimum of three times the initial volume of water in the wells has been removed. The well should then be permitted to recover; purging will be considered complete once the well has recovered such that the volume of water in the well is at least 50% of its initial volume.

If the well does not yield three volumes of water (e.g., the well is purged “dry”), the well should be allowed to recover so that the volume of water in the well is at least 50% of its initial volume, and then purged “dry” once more. The well should then be permitted to recover again; purging will be considered complete once the well has recovered such that the volume of water in the well is at least 50% of its initial volume.

Volumes purged, points at which the well went “dry” (if applicable), and well recovery (water height) are to be recorded.

Sampling

Wells are to be sampled immediately following purging (and recovery, if applicable). Sampling is to be completed by disconnecting the flow-through cell and adjusting the pump flow rate to collect groundwater samples into standard laboratory supplied containers for analysis at a steady rate, and under laminar (not turbulent) flow conditions.

Where more than one sampling container is required, filling should be conducted concurrently, alternating filling so that the containers contain the same “mix” of water (e.g., avoid filling bottles sequentially). Turbulent flow conditions should be avoided to minimize loss of volatile or semi-volatile parameters. Vials and bottles should be filled until a convex water surface occurs at the top of the vial or bottle, and the cap carefully placed on the sampling container.

Vials filed for testing of volatile compounds should be inverted (turned upside down) to examine for the presence of air bubbles. If significant bubbles are present, the cap should be removed and additional water added. When using sampling vials pre-charged with sample preservative, no more than two additional attempts to remove excessive bubbles through the addition of extra water are to be made; if after the second attempt significant bubble remain in the sample, the vial should be discarded and another vial filled to mitigate unacceptable preservative loss/dilution in the sample.

Always be aware of the preservatives in the bottles, for safety reasons (they are generally acids) and so that you do not inadvertently wash them out.

To mitigate potential cross-contamination:

- always don fresh latex/nitrile gloves for each sample collection;

- do not allow the sampling equipment to touch sample bottles (preservatives from one bottle may be a "contaminant" for another bottle)
- use dedicated sampling equipment to the maximum extent possible;
- decontaminate non-dedicated monitoring equipment between samples; and,
- Wells should be sampled beginning with "least" impacted and progressing to the "most" impacted wells to minimize cross-contamination potential. The determination of relative impact should be made using information obtained during pre-sampling monitoring, previous monitoring/sampling events, site assessment results, or similar data.

Recovered samples are to be placed in a closed cooler with ice immediately after collection, and maintained in a secure environment to prevent accidental or deliberate tampering.

Field Filtering

Groundwater samples collected for analyses of metallic parameters (including hydride metals, hexavalent chromium, and mercury, but excluding methyl mercury) are to be field filtered during sample collection using dedicated 0.45 µm in-line filters. Groundwater samples for other analyses, including inorganic analyses, are not to be field filtered.

The purpose of filtering groundwater samples for metals analysis is to remove particulate before acidifying the water, so that the acid does not extract metals contained within the particulate.

Each filter is to be fitted to the discharge point of the inertial foot-valve during purging such that a minimum volume of water equal to three times the volume of the filter passes through the filter before sampling containers are filled. In-line filters cannot be re-used. A new filter is required for each well, and each sampling event.

Submission to contract laboratory

All samples are to be packed in coolers with loose ice and appropriate packing materials to mitigate potential breakage during shipment to the contact laboratory. All shipments must be accompanied by completed and signed Chain of Custody form placed inside the cooler. The date and time for each sample recovery is to be recorded on the Chain of Custody.

Each cooler is to be secured with Custody Seals affixed in such a fashion that the cooler may not be opened without breaking one or more of the Custody Seals.

QUALITY ASSURANCE / QUALITY CONTROL SAMPLES

QA/QC sample requirements are specified in SOP E12.00, *Field Program Quality Assurance & Quality Control*.

FIELD DOCUMENTATION

Groundwater sampling should be recorded on the Low Flow Purging and Sampling field form. The form must be filled out completely, and dates should be recorded such that the month, day, and year of the sampling event is unambiguous (e.g., use Feb. 3, 2011, rather than 03/02/11).

Any irregularities or conditions suggestive of possible bias observed during sampling (e.g., sediment within recovered groundwater samples) should be recorded on the form.

TERRAPEX STANDARD OPERATING PROCEDURE
SOIL SAMPLE HANDLING

GENERAL NOTE

Standard Operating Procedures (SOPs) have been developed by Terrapex Environmental Ltd. to standardize protocols used during environmental assessment work programs. However, certain work programs may warrant deviations from SOPs and some clients may have specific requirements which differ from those outlined in this SOP. Any significant deviations should be discussed with and approved by the project manager. Each deviation, along with the rationale for the deviation, should be documented in the field notes, project scope and/or notes to file.

Where SOPs are appended to reports, all deviations from this SOP, along with the rationale for the deviation, <u>must</u> be documented in the report.

APPLICATION

These procedures are applicable to intrusive investigations involving the collection of soil samples for the purposes of environmental assessment. The SOP is also applicable to work programs that involve the collection of samples of materials that are not technically soil, but which are soil-like, including sediments, regolith, and engineered granular materials.

It should be noted that this SOP addresses general requirements related to soil sample handling (e.g., once a sample has been recovered). Specific requirements related to sample collection methodology, including sample nomenclature and documentation, are provided in SOPs related to these sampling approaches. Additional information relating to sample description and quality assurance and quality control requirements for soil sampling programs are provided in SOPs E10.00 (*Soil Classification*) and E12.00 (*Field Program Quality Assurance & Quality Control*), respectively.

EQUIPMENT

The following list details standard equipment used in the sampling of soil or soil-like materials. Specific sites may require additional or specialized equipment.

- ☐ Gastech™ 1238ME, calibrated and charged
- ☐ Gastech™ field calibration kit, if applicable
- ☐ tape measure (preferably weighted flexible tape)
- ☐ trowel or knife for sampling from bucket

☐ sampling equipment (gloves, bags, permanent marker)

☐ laboratory-supplied sampling jars appropriate for contaminants of concern

☐ laboratory chain of custody forms

☐ field notebook

☐ site plan

☐ Sampling Plan (scope of work/field work instructions)

☐ site-specific health and safety plan

☐ Personal Protective Equipment (hard hat, vest, safety glasses, respirator, steel toe boots)

☐ camera

SPECIAL PLANNING AND PREPARATION REQUIREMENTS

Above ground and underground utilities and other services within the assessment area are to be located and identified in the field prior to intrusive sampling. Where appropriate, a private locating contractor should also be retained to identify secondary services such as yard lights, internal computer/communication lines, etc. and clear proposed sampling locations. All exclusions or conditions attached to utility service locates (e.g. notification requirements, "hand dig only" areas) are to be strictly adhered to.

Requirements outlined in the SOP specific to the sampling methodology are to be adopted during sample collection. To mitigate potential cross contamination, new disposable gloves are to be donned for the collection / handling of each sample, and any non-dedicated sampling equipment washed and rinsed prior to use.

Recovered samples should be identified using the nomenclature requirements outlined in the SOP specific to the sampling methodology. Available information relating to previous intrusive sampling programs at the site (including those by parties other than Terrapex) should be reviewed to ensure that sample identifications employed during the work program are unique; in some instances this may require advancing standard Terrapex sampling counts to address sampling identifications used by third parties during earlier investigations (e.g., if another consultant has already advanced boreholes identified as BH1 through BH10, the first round of Terrapex boreholes should begin at BH101, even though this is normally the count for the second round of Terrapex boreholes).

DISCRETE SAMPLES

Recovered samples are to be split into two portions; one portion is to be placed in a clear sealable sampling bag for field logging and screening, while the second portion is to be retained for possible laboratory analyses.

Portions for (Possible) Laboratory Analyses

If contaminants of concern / potential contaminants of concern for the sampling program include volatile constituents (see below for a detailed list of these parameters), the portion of the sample for possible volatile laboratory analyses is to be collected using a hermetically sealed sampling device (e.g., En Core Samplers) or placed directly into laboratory-supplied sampling containers pre-charged with sample preservative.

Samples (or portions of samples) for other analyses should either be placed directly into laboratory-supplied sampling containers appropriate for the intended/potential analyses, or should be placed in a second sealable sampling bag (i.e., a sampling bag other than the bag in which the portion for field screening and logging was placed) without headspace for subsequent transfer to laboratory-supplied sampling containers once samples for laboratory analyses have been selected).

If it is possible to accurately return to the sampling location, it is also acceptable for initial sampling to be completed for field screening and logging purposes only, with the portion of the sample for laboratory analyses recovered at a later time. In such an instance, samples for laboratory analyses are to be collected directly into laboratory-supplied sampling containers. This approach is generally only applicable during the collection of samples from open excavations (remedial excavation work programs, tank removals, etc.).

From a purely technical perspective, the preference for sample collection methodologies (from most preferred to least preferred) is:

1. Collection directly into laboratory-supplied sampling containers concurrently with collection of the portion of the sample for field screening and logging.
2. Initial sampling for field screening and logging only, and returning to the sampling location at a later time to sample for the purposes of laboratory analyses.
3. Collection into sealable sampling bags concurrently with separate bags collected for the portion of the sample for field screening and logging and the portion of the sample for laboratory analyses.

To the extent practicable during the work program, the technical preference outlined above should be adhered to. The sampling methodology employed for each sample should be recorded in the field notes, and included as part of the report documenting the work program.

If the third approach is selected the sampling bags should be managed while in temporary storage as would any other sample (refer to SOP E12.00, *Field Program Quality Assurance & Quality Control*), and should not be manipulated or otherwise disturbed until the bag contents are to be transferred to laboratory-supplied sampling containers for submission to the contract laboratory. When transferring the sample from the sampling bag to the laboratory-supplied sampling containers, efforts should be made to select portions of the sample from the interior of the bag (i.e., not in contact with the sides of the bag) and avoid undue manipulation of the sample.

Sample submissions to the contract laboratory should NOT be prepared using material placed in the sampling bag for field logging and screening (see below), as this activity involves significant manipulation of the recovered sample.

Field Screening and Logging

Logging is the process by which individual samples are recorded (documented). Logging also includes classifying / describing the sample for the purposes of determining overall site stratigraphy.

Samples are to be logged using the appropriate field form (refer to the SOP specific to the sampling methodology), and classified / described as per SOP E10.00, *Soil Classification*.

Detailed examination and logging of samples requires some time, and is often completed at the conclusion of sampling activities. This practice is acceptable, but any information relating to structural or similar details (e.g., bedding, orientation of clasts within soil matrix) likely to be lost during movement of the bag and/or manipulation of the sample during field screening will need to be logged immediately at the time of sample collection.

Field screening is the process by which samples are qualitatively assessed for evidence of chemical impact, often to assist in the selection of samples for quantitative chemical testing by a contract laboratory. As field screening information is often gathered concurrently with field logging of recovered samples and is recorded on field logs, the distinction between field logging and field screening is subtle.

The components of field screening include:

- Measurements of vapours within the headspace of the sealable sampling bag containing the portion of the soil sample for field screening and logging (sometimes referred to combustible soil vapour measurements or CSV measurement);
- Examination of the sample for visual evidence of possible chemical impact (e.g., staining, presence of debris or other inclusions); and,
- Examination of the sample for olfactory evidence of possible chemical impact; and,
- Evaluation of the sampling location (both horizontally and vertically) with respect to the conceptual site model (e.g., proximity to underground storage tanks or other areas of potential environmental concern, relative positioning to the groundwater table or other contaminant fate and transport factors).

Typically, the selection of soil samples for laboratory analyses will be based on the results of the field screening process. On occasion, samples may also be selected to address specific work program objectives (e.g., duplication of previous results, re-evaluation of specific sampling locations), regardless of field screening results, however, field screening of recovered samples is still to be completed in such instances.

Procedures for measuring headspace vapours within the sealable sampling bag are described below.

Observations regarding visual and/or olfactory evidence of possible chemical impact are to be recorded in the sampling log. Where staining is present, describe both the apparent colour and the distribution of the staining (e.g., throughout the soil matrix, or within fractures). Odours are described using NONE, SLIGHT, MODERATE or STRONG, along with a description of the type of odour (e.g., hydrocarbon, organic, etc.).

DUPLICATE SAMPLES

A field duplicate is a second sample concurrently collected from the same location as another sample and submitted for duplicate analyses to provide quality assurance information during sampling programs (refer to SOP E12.00, *Field Program Quality Assurance & Quality Control*).

Field duplicate samples should be recorded in the field notes using their assigned sample nomenclature, along with their corresponding sampling pair. When possible, sample duplicates should be subjected to field screening and logging procedures, although limited sample volume may occasionally preclude such efforts.

COMPOSITE SAMPLES

Composite samples are ‘prepared’ samples; that is they are created by Terrapex out of two or more discrete samples. Composite samples may only be prepared using samples collected from the same depth, and that are located within a single 2 m horizontal radius.

Composite samples should be prepared by placing approximately equal volumes of each contributing discrete sample in a stainless steel bowl and blending the samples together such that the individual samples can no longer be visually distinguished from one another. It should be noted that compositing cohesive soils or very dense cohesionless soils may be impracticable at some sites.

The composite sample should be recorded in the field notes (e.g., on the sampling log), noting each of the contributing discrete samples incorporated within, with the time and date of the composite "sampling" being that when the sample was created. Composite soil samples are NOT to be classified per SOP E10.00, *Soil Classification*, nor are they subject to the field screening procedures applicable to discrete soil samples.

Composite soil samples should not be submitted for laboratory analyses other than metallic (with the exception of mercury and methyl mercury, which are volatile parameters) or general chemistry (inorganic) parameters.

SPECIAL CONSIDERATIONS, SAMPLES FOR ANALYSES OF VOLATILE CONSTITUENTS

To minimize potential losses through off-gassing, soil samples for analyses or potential analyses of volatile constituents are subject to special handling requirements as outlined in Table 1, below.

Table 1 Soil Sampling Requirements, Analyses for Volatile Constituents

Parameter(s)	Notes
Mercury, Methyl Mercury	Samples to be packaged in glass, high density polyethylene (HDPE), or polyethylene terephthalate (PET) container without headspace. Note that it is not necessary to prepare additional sampling containers for mercury and/or methyl mercury analyses if analyses of other metallic compounds are also being completed for the sample.
Volatile Organic Compounds (VOCs)	Samples are to be collected using hermetically sealed sampling device (e.g., En Core Samplers) and submitted to the laboratory for receipt within 36 hours of sample collection. The sampling devices may need to be accompanied by a portion of the sample placed in a glass jar to permit moisture content determination; **OR**, Each sample is to be placed into sampling containers pre-charged with methanol preservative (note that a second container may be required by the laboratory to facilitate laboratory QA/QC; verify requirements with the contract laboratory). The methanol-preserved samples must be accompanied by a portion of the sample placed in a glass jar to permit moisture content determination.
Bromomethane (also known as methyl bromide)	Where the collection of soil samples employ methanol preservative and where bromomethane is a contaminant of concern, a separate sample (collected either using a hermetically sealed sampling device, or collected into a container pre-charged with sodium bisulphate solution preservative) may be required to achieve appropriate detection limits.

Parameter(s)	Notes
Trihalomethanes (THMs)	THMs are technically VOCs, but since they are primarily related to chlorination of drinking water they may also be considered separately. Requirements for general VOCs apply to THMs. Note that it is not necessary to prepare additional sampling containers for THMs if general VOC analyses are also being completed for the sample.
1,4-Dioxane	1,4-Dioxane is typically an additional analysis to a general VOC analyses, or an additional analysis to an analyses of acid/base/neutral compounds. It is not necessary to collect additional sampling containers when 1,4-Dioxane analyses is to be completed as an addition to either VOC or acid/base/neutral compound analyses. When collected as an addition to acid/base/neutral compound analyses, the sampling requirements of that analysis apply. When completed as an addition to general VOCs analyses, the sampling requirements for general VOCs apply. When a soil sample is collected specifically for analysis or potential analysis of 1,4-Dioxane (e.g., and not also for analyses of VOCs or acid/base/neutral compounds), the requirements for general VOCs apply (see above).
Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX)	BTEX can be determined as part of a general VOC analyses, or as a targeted analyses only for these parameters (typically in combination with the F1 parameter and accompanied by samples for analyses of the F2 to F4 parameters). When soil samples are being collected specifically for analyses or potential analyses of BTEX, the requirements for general VOCs apply (see above).
F1 Petroleum Hydrocarbon (PHC) parameter	Requirements for general VOCs apply to the F1 parameter. Note that it is not necessary to prepare additional sampling containers analysis of F1 if BTEX or general VOC analyses are also being completed for the sample.
F2 to F4 PHC parameters (includes gravimetric determination of F4 parameter)	Samples to be packaged in glass jar without headspace and sealed using polytetrafluoroethylene (PTFE, or “Teflon”) lined cap.

HEADSPACE VAPOUR SCREENING

Headspace vapour screening is completed using portable gas monitoring devices (or meters), with the most common devices being catalytic bead combustible gas meters (e.g., Gastech 1238 ME, RKI Eagle, RKI NP-204) and photo ionization detectors (PIDs).

The selection of the specific gas monitoring device is determined during development of the Sampling Plan. Generally, PIDs are employed at locations where volatile compounds are considered to be contaminants of concern. However, if volatile contaminants of concern are restricted to petroleum hydrocarbons (PHCs), a combustible gas meter calibrated to n-hexane will typically be selected over a PID, due to their relatively greater 'sensitivity' to PHC compounds. Combustible gas meters calibrated to methane may also be used at locations where elevated natural gas levels are a concern or potential concern.

Some combustible gas meters are equipped with a "methane elimination" toggle that, when activated, reduces the response of the instrument to methane gas. However, it should be noted that the switch does not truly eliminate contributions of methane gas to the overall combustible gas reading; where significant methane is present, the gas meter may still report significant overall combustible gas levels, even in the absence of any other gases.

Methodology

1. Field screening is to be completed using portable gas monitoring meters that have been appropriately calibrated (refer to SOP E01.00, *Field Meter Calibration*).
2. The sampling bag containing the portion of the sample for field screening is to be tightly sealed with a nominal headspace, and any clumps within the sampling bag are to be gently broken by manually manipulating the sealed sampling bag.
3. The sampling bag should is not be opened or pierced until headspace vapour screening has been completed.
4. Once the sample has reached a temperature approximately between 5ºC and 15ºC and within two hours of sample collection, the tip of the portable gas monitoring meter is to be inserted into the nominal headspace of the sampling bag to record headspace vapour levels. The tip is to be inserted in a manner that does not permit vapours within the sampling bag to vent to ambient air during measurement.
5. The sample should be gently manipulated, and the peak reading registered by the meter during the first 15 seconds of measurement should be recorded as the sample headspace vapour reading.

TERRAPEX STANDARD OPERATING PROCEDURE
SOIL CLASSIFICATION

GENERAL NOTE

Standard Operating Procedures (SOPs) have been developed by Terrapex Environmental Ltd. to standardize protocols used during environmental assessment work programs. However, certain work programs may warrant deviations from SOPs and some clients may have specific requirements which differ from those outlined in this SOP. Any significant deviations should be discussed with and approved by the project manager. Each deviation, along with the rationale for the deviation, should be documented in the field notes, project scope and/or notes to file.

Where SOPs are appended to reports, all deviations from this SOP, along with the rationale for the deviation, must be documented in the report.

APPLICATION

These procedures are applicable to intrusive investigations involving the completion of localized excavations for the purposes of collecting soil samples and/or documenting subsurface conditions. The procedures are applicable whether such activity constitutes the whole of a work program, or part of a larger work program.

PRESENTATION OF DESCRIPTION

Soils descriptions will be presented in the order specified below:

- Texture Descriptive (applicable for sands and gravels only)
- Major Constituent (principal grain size)
- Minor constituents (major to minor, largest to smallest if same %).
  - include organics after minor constituents
- Colour
- Moisture Descriptive
- Consistency Descriptive (only where appropriate field tests are conducted)
- Plasticity (if applicable)
- Other Modifiers, e.g. laminated, uniform, fissured, etc. (If applicable)
- Odours, where applicable, i.e., slight, moderate, strong with odour type (e.g., earthy, hydrocarbon, etc.)

CLASSIFICATION BY PARTICLE DIAMETER

Description	Range	Notes
BOULDERS	> 300 mm	
COBBLES	75 to 300 mm	
GRAVEL		
Coarse	19 to 75 mm	
Fine	4.75 to 19 mm	
SAND		
Coarse	2.0 to 4.75 mm	individual grains are visible to naked eye; refer to examples for texture descriptive
Medium	0.425 to 2.0 mm	
Fine	0.075 to 0.425 mm	
SILT	0.002 to 0.075 mm	individual grains not visible to naked eye; other methods necessary to mores specifically identify distribution/type of fines
CLAY	< 0.002	

DESCRIPTION OF CONSTITUENT PARTS OF A SOIL

Soils will be principally described on the basis of the largest particle size classification by percentage of particles (e.g. sand, silt), with the dominant texture descriptive, where applicable (e.g. coarse sand). Where two or more classifications are present in approximately equal amounts, the sample will be principally described using the constituents presented from largest to smallest and joined by “and” (e.g. “sand and silt”).

Where two or more texture descriptives are present in approximately equal amounts, the sample will be described using the descriptives presented from largest to smallest and joined by “and” (e.g. “coarse and medium sand”).

Minor constituents are described using the terms defined below

Descriptive Term	Range of Proportion
Trace	1-10%
Some	11-20%
Adjective (i.e. sandy, silty)	21-35%
And	36-50%

COLOUR

Generally soil is described using BROWN, GREY, OLIVE.

Use qualifiers such as LIGHT, DARK, or combination terms like REDDISH-BROWN, BROWN/BLACK

Where more specific colour references are required, scientific colour descriptors from the Munsell Colour Chart should be used.

MOISTURE DESCRIPTIVE

- DRY - absence of moisture
- MOIST - damp, but no visible water
- WET - damp, contains visible water
- SATURATED - soil is completely wetted to excess and may be dripping

CONSISTENCY OF COHESIONLESS SOILS

The standard terminology to describe cohesionless soils (i.e., gravel, sand, or silt) includes the compactness as determined by laboratory test or by the Standard Penetration Test ‘N’ value.

Descriptive Term	Density Index	Standard Penetration Test (blows per 300 mm)
Very Loose	0-20%	0 - 4
Loose	20-40%	5 - 10
Compact	40-70%	11 - 30
Dense	70-90%	31 - 50
Very Dense	90-100%	over 50

CONSISTENCY OF COHESIVE SOILS

The standard terminology to describe cohesive soils (i.e., clay, or soil containing significant clay content) includes the consistency, which is based on undrained shear strength as measured by in-situ vane tests, penetrometer tests, unconfined compression tests, or occasionally by Standard Penetration Tests.

Descriptive Term	Standard Penetration Test (blows per 300 mm)	
Very Soft	Less than 2	penetrate w/fist
Soft	2-4	indent w/fist
Firm	5-8	penetrate w/thumb
Stiff	9-15	indent w/thumb
Very Stiff	16-30	indent w/thumbnail
Hard	over 30	can't indent

Consistency Limits of Cohesive Soil

Applicable if geotechnical laboratory tests are completed.

Descriptive Term	Plasticity Index
Non-plastic	0 - 3
Low plastic	4 - 9
Medium plastic	10 - 30
Highly plastic	over 30

FIELD TESTS FOR COHESIVE SOIL

For determining relative clay content.

Dilatancy – “none”, “slow”, or “rapid”

Pat of wet soil is shaken in the palm of the hand and alternately squeezed and released. Predominantly silty materials will show a dull, dry surface when squeezed and a glassy wet surface when released/shaken (dilatent). This characteristic becomes less pronounced with increasing clay content, as clays are not dilatant.

Plasticity from thread test – “none”, “low”, “medium”, or “high”

Attempt to roll a 3 mm thread of soil on a flat surface with the palm of your hand, adding as much water as necessary. Fold the thread and roll until it crumbles. (Note: silts can be plastic as well as clays so this is not a definitive test of particle size.)

- NON-PLASTIC - thread cannot be rolled
- LOW PLASTICITY - thread can barely be rolled
- MEDIUM PLASTICITY - thread can be rolled, but not re-rolled
- HIGH PLASTICITY - can be easily rolled and re-rolled

OTHER MODIFIERS

Sorting

Sorting is a geological term that describes the relative range of particles sizes.

- POORLY SORTED - a wide range of particle sizes is present
- WELL SORTED - a narrow range of particle sizes is present

Sorting is analogous to the geotechnical concept of “grading”, except that opposite descriptors are used (e.g. a poorly sorted soil, geologically, is considered a well graded soil, geotechnically). Geological descriptors are to be used for environmental descriptions of the relative range of particle sizes.

Angularity of Particles

- ANGULAR — Many corners/pointed parts, not smooth
- SUB-ANGULAR — Between angular and rounded
- ROUNDED — Rounded and generally smooth, no corners or pointed parts
- WELL-ROUNDED — Very round and smooth

DESCRIPTIVE SOIL TERMINOLOGY

These terms may be used, where applicable, to further describe soils.

TILL	An unstratified, unsorted glacial deposit of clay, silt, sand, gravel, cobbles and boulders in any combination. Typically dense and heterogeneous.
FILL	Any materials below the surface identified as placed by humans. “FILL (PRESUMED)” may be used when a stratigraphy is suspected as being fill, but the author also wishes to convey uncertainty regarding the accuracy of this determination.
TOPSOIL	Weathered surface materials which are capable of supporting plant life.
INCLUSION	An anomalous substance or fragment incorporated in a soil or rock mass.

STRATIFIED	Containing layers of different soil types (more than 3 mm thick).
LAMINATED	Composed of thin layers (less than 3 mm thick) of varying color and texture.
DESICCATED	Dried by moisture evaporation - desiccated clays are sometimes described as fissured or having nugget structure.
FISSURED	Containing shrinkage cracks, frequently filled with fine sand or silt; usually more or less vertical.
SENSITIVE	Exhibiting loss of strength on remolding.
FRIABLE	A soil consistency term pertaining to the ease of crumbling of soils. Easily crumbled between the fingers.
CALCAREOUS	Containing appreciable quantities of calcium-carbonate.
LAYER	> 75 mm in thickness
SEAM	2 mm to 75 mm in thickness
PARTING	< 2 mm in thickness
VARVED	Composed of regular alternating layers of silt and clay, often manifesting as alternating light and dark colouring, each usually between 25 and 75 mm in thickness, typically resulting from alternating seasonal deposition in a lacustrine environment.

TERRAPEX STANDARD OPERATING PROCEDURE
FIELD PROGRAM QUALITY ASSURANCE & QUALITY CONTROL

GENERAL NOTES

Standard Operating Procedures (SOPs) have been developed by Terrapex Environmental Ltd. to standardize protocols used during environmental assessment work programs. However, certain work programs may warrant deviations from SOPs and some clients may have specific requirements which differ from those outlined in this SOP. Any significant deviations should be discussed with and approved by the project manager. Each deviation, along with the rationale for the deviation, should be documented in the field notes, project scope and/or notes to file.

Where SOPs are appended to reports, all deviations from this SOP, along with the rationale for the deviation, must be documented in the report.

APPLICATION

This SOP is applicable to intrusive investigations involving the collection of soil, water, and air samples for possible laboratory chemical analyses, including sediment, groundwater, surface water, indoor air, outdoor air, and soil vapour. The SOP addresses only measures required for quality assurance and quality control purposes. Sample collection, nomenclature, documentation, and other requirements associated with specific sampling approaches (e.g., borehole drilling using rotary auger equipment) are described in other SOPs.

SPECIAL PLANNING AND PREPARATION REQUIREMENTS

Liaison with the contract laboratory in advance of field programs will be required as the laboratory will normally be responsible for providing appropriate sampling containers, prepared trip blank and trip spike quality assurance samples, and appropriate analyte-free water for the preparation of field blanks and equipment blanks by Terrapex.

FIELD PROGRAM QUALITY CONTROL REQUIREMENTS

Sample Collection

Quality control measures during sample collection are primarily intended to mitigate the accidental introduction of a contaminant or the loss of a volatile constituent of the sample.

Specific requirements associated with sampling methods are defined in the SOP(s) applicable to those methods. General requirements for all work programs are described below:

- Sampling containers and field preservative (if applicable) will be obtained from the contract laboratory.
- Available information relating to environmental conditions at the site should be reviewed and, to the extent practicable, sampling should commence in the apparent least-impacted area and progress to areas of apparently greater impact, finishing in the apparent "worst-case" area.
- New disposable gloves are to be donned for the collection / handling of each sample.
- To the extent practicable, dedicated sampling equipment is to be employed during sampling collection; any non-dedicated sampling equipment which comes into contact with the sample must be thoroughly washed and rinsed prior to use.
- For water samples, sampling equipment (regardless of whether it is dedicated or non-dedicated) should be purged prior to sample collection by passing a minimum of three times the volume of the sampling equipment of either sample water or analyte-free water supplied by the contract laboratory through the equipment.

  For groundwater samples, purging of sampling equipment is typically completed concurrently with well purging (e.g., by employing the inertial sampler to be used during sample collection during the initial purging of the well).

  It should be noted that "sampling equipment" in this context does not include laboratory-supplied sampling containers.
- Water samples (including groundwater) are to be collected directly into laboratory-supplied containers appropriate for intended/potential analytical requirements; passing the sample through an in-line field filtration device prior to collection into the sampling container is an acceptable practice for samples that require field filtration.
- Soil and sediment samples are often split into two portions – one for field screening/logging, and one for (potential) laboratory analyses; to the extent practical, the sample portion for (potential) laboratory analyses should be immediately placed into laboratory-supplied containers appropriate for the intended/potential analytical requirements. Regardless, samples of soil potentially impacted by volatile or organic contaminants should be containerized immediately to minimize potential volatile loss.
- Where multiple sampling containers are required, to the extent practical the containers should be filled concurrently – for instance, by alternating the filling of the sampling bottles during sample recover to ensure that each container is filled at approximately the same rate and over the same period as the other sample containers.
- Samples collected for (potential) analyses of organic contaminants should not be subjected to extended contact with plastics.

Quality control measures are also required to ensure that a record of recovered samples, and the location from which they were obtained, is maintained. Specific requirements associated with sampling methods are defined in the SOP(s) applicable to those methods. General requirements for all work programs are described below:

- All recovered samples during a work program are to be assigned a sample identification that is unique during the work program, and sampling details – INCLUDING the time and date of sample collection – are to be recorded on field forms and/or in the field notes.
- In the case of soil or sediment samples, sample identifications are expected to be unique even over several work programs, including work programs that are completed by other parties. In some instances this may require advancing standard Terrapex sampling counts to address sampling identifications used or potentially used by third parties (e.g., if another consultant has already advanced boreholes identified as BH101 through BH110, the first round of Terrapex boreholes should begin at BH201, even though this is normally the count for the second round of Terrapex boreholes).
- In the case of water or groundwater samples, sample identifications are typically tied to a sampling location (e.g., a monitoring well identification), and it is quite common for several water samples (collected on different dates) to have been assigned a common identification. This is acceptable, provided that the date of sample collection is recorded in the field notes and included in work program documentation so as to create unique sample identification information.

Temporary Sample Storage

Temporary sample storage is required between the time of sample collection and the time of sample submission or when the sample is discarded. Quality control measures during temporary sample storage are primarily intended to mitigate the accidental introduction of a contaminant or the loss of a volatile constituent of the sample. Quality control measures are also required to maintain appropriate Chain of Custody of recovered samples.

- Samples must be labelled prior to being placed in temporary storage.
- Generally, samples are to be maintained in a cool environment, ideally 3 to 5ºC, and protected from direct exposure to sunlight (e.g., within a cooler with loose ice).
- Samples are not to be left unattended in a public space during storage. A public space includes any work site where access is not restricted by a fence or similar physical barrier to prevent unauthorized entry, even if the site is owned by a private corporation or individual.

  Terrapex offices, locked vehicles, or work site trailers are not considered public spaces.

- Unpreserved samples submitted for laboratory analyses of VOCs / F1 PHCs and/or volatile gases should be received by the contract laboratory within 36 hours of sample collection (so as to permit the laboratory sufficient time to prepare sample extractions within regulated hold times). Samples submitted for all other analyses should be received by the contract laboratory within 72 hours of sample collection.

  Note that a sample collected using a hermetic sampling device (e.g., En Core sampler) is NOT considered to be preserved.

Sample Submission

Sample submission is the point at which Terrapex ceases to have custody of samples intended for laboratory analyses. This point may occur when the samples are released directly into the custody of the contract laboratory (i.e., hand delivered by Terrapex), or when the samples are released into the custody of a courier for delivery to the laboratory.

Quality control measures associated with sample submission are required to maintain sample integrity and appropriate Chain of Custody:

- Samples for submission are to be placed in an insulated packing container (e.g., a cooler) along with appropriate packing materials to mitigate breakage during transport to the contract laboratory.
- Loose ice is also to be placed in the cooler to assist in maintaining a cool internal temperature (ideally 3 to 5ºC).
- Sample submissions are to be accompanied by a completed Chain of Custody form. The Chain of Custody form is to be signed immediately before sealing the cooler, and placed inside the cooler within a sealed bag.
- Both the date and time of sample collection is to be recorded for each sample on the Chain of Custody form.
- If coolers are to be released into the custody of a party other than the contract laboratory (e.g., a courier), signed and dated custody seals must be placed on the cooler and secured in a manner that it is not possible to open the cooler without breaking one or more seals.

FIELD PROGRAM QUALITY ASSURANCE SAMPLES

Field Quality Assurance sample requirements for work programs are outlined below. These requirements are related to both the frequency of sample submissions (the number of samples submitted) as well as the duration of the field program.

The following terminology is used in defining sample requirements for this SOP:

- ***Field day*****:** a work program to which this SOP applies that is completed in the space of a single calendar day.
- ***Sampling round:*** a work program to which this SOP applies that is completed over a period of one or more days, and which are associated with a single submission of samples to the contract laboratory. (Note that a single submission may constitute several coolers; "submission" refers to a batch of samples which are delivered to the laboratory at the same time.)
- ***Number of samples:*** for the purposes of this SOP, the number of samples for the work program comprises the sum of uniquely identified samples, excluding field program quality assurance samples, within each of the Analytical Program Groupings (refer to Table 1, below).

  For example, a work program involving the submission of three samples for VOC analyses with two of these three samples also submitted for analyses of metallic parameters would comprise a total of five samples, even though only three sample names might be listed on a chain of custody.

  The number of samples can be determined on both a field day and sampling round basis.

Table 1 Analytical Program Groupings, Quality Assurance Sampling and Analyses

Grouping	Notes
Metals	-
VOCs / F1 PHCs	Includes "BTEX" parameters; includes 1,4-dioxane when processed as a VOC sample
Volatile Gases	-
General Chemistry	Includes inorganic parameters
Base, Neutral and Acid Extractables (BNAs)	Includes PAHs, phenols and TCLP extractions; includes 1,4-dioxane when processed as an BNA sample
Other organics	Includes the F2, F3, and F4 PHC parameters

Source: adapted from Tables A and B, MOECC Analytical Protocol (April 15, 2011)

Field Duplicates

A field duplicate is a second sample concurrently collected from the same location as another sample and submitted for duplicated analyses. Field duplicates provide information relating to:

- The ability of the contract laboratory to provide reproducible (i.e., similar or the same results) analytical results;

- The ability of Terrapex to consistently collect representative samples (as both the duplicate and its sampling pair are purportedly representative of the sampling location, similar results should be obtained); and,
- Homogeneity of the sampled media.

It is generally preferable to obtain field duplicate samples from sampling locations likely to generate quantified concentrations of the target parameters, as comparisons of quantified results is more informative than comparisons of non-detectable concentrations.

To mitigate potential bias in methodology, etc. at the contract laboratory, field duplicate samples should not be identified as field program quality assurance samples at the time of submission.

Field duplicate sampling requirements are provided in Table 2.

Field Blanks

Field blanks, whether they are accompanying soil, sediment, or groundwater samples, comprise a sample of analyte-free water prepared in the field and submitted for laboratory analyses as a measure of:

- The ability of the laboratory to avoid introducing concentrations of target parameters into analysed samples (i.e., potential analytical bias);
- The ability of Terrapex to avoid introducing concentrations of target parameters into recovered samples (e.g., cross contamination);
- Potential cross-contamination between samples during temporary storage and/or transportation to the contract laboratory; and,
- Potential cross-contamination between samples during temporary storage at the contract laboratory.

Analyte-free water for preparing field blanks should be obtained from the contract laboratory in bulk and transferred to appropriate sampling containers in the field. Ideally, a field blank sample should be prepared (or opened) adjacent to the "worst-case" sampling location. If this is impracticable, field blank samples should be prepared at another location in the field. Field blank samples should not be prepared at the office or at the laboratory. The location at which a field blank sample was prepared should be recorded in the field notes.

To mitigate potential bias in methodology, etc., at the contract laboratory, field blank samples should not be identified as field program quality assurance samples at the time of submission. Consequently, because a field blank is by definition a water sample, field blanks are not normally part of soil sampling programs.

The exception to these general rules involves the use of methanol-preserved or sodium bisulphate solution-preserved soil samples for analyses of volatile organic constituents. Unused sampling containers precharged with preservative should be used as field blanks. The container(s) for the blank sample(s) should be opened, exposed to ambient atmosphere for approximately 30 seconds (the approximate time required to collect a soil sample into the sampling container), and re-sealed. It is not necessary, and not advisable, to attempt to transfer the preservative to another sampling container.

The “preparation” of the soil sample field blanks should be completed adjacent to the “worst-case” sampling location or condition; if this is impracticable, the activity should be completed at another location in the field at which bias of sampling results could have resulted. The location at which the soil sample field blank was prepared should be recorded in the field notes.

Field blank sampling requirements are provided in Table 2.

Trip Blanks

A trip blank is a sample prepared by the contract laboratory using analyte-free water and obtained by Terrapex immediately prior to the site visit. Trip blanks may also be prepared by the laboratory using methanol or sodium bisulphate solution for sampling programs involving soil samples for analyses of volatile organic constituents.

The trip blank sample accompanies Terrapex during the execution of the sampling activities and is not opened during this time. While in the possession of Terrapex, trip blanks are to be managed as if they were any other sample (e.g., maintained in a cool, dark environment as described above). At the conclusion of the sampling activities, the sample is submitted to the contract laboratory for analyses as a measure of:

- The ability of the laboratory to avoid introducing concentrations of target parameters into analysed samples;
- Potential cross-contamination between samples during temporary storage and/or transportation to the contract laboratory; and,
- Potential cross-contamination between samples during temporary storage at the contract laboratory.

As it is prepared by the contract laboratory, trip blanks will be received bearing a sampling label and associated sample identification. Reasonable efforts are to be made to limit the amount of time a trip blank sample is in possession of Terrapex (e.g., obtaining the sample is close to practicable to the start of sampling activities whilst ensuring it is in Terrapex’s possession at the start). Regardless, the trip blank sample is to be received by the laboratory within seven days of the date/time of preparation listed on the sampling label.

Trip blank sampling requirements are provided in Table 2.

Equipment Blanks

An equipment blank is a sample prepared by exposing analyte-free water (supplied by the contract laboratory) to sampling equipment employed during the sampling activities (e.g., passing water through a bailer). Because the objectives of the equipment blank includes assessment of potential cross-contamination associated with the use of non-dedicated sampling equipment, non-dedicated equipment is to be washed in accordance with normal field procedures prior to preparing equipment blank samples.

Notwithstanding the objective of equipment blank samples, it should be noted that equipment blank laboratory results may also be affected by analytical bias or cross-contamination.

Equipment blanks should be prepared at the conclusion of the field day (as representative of “worst-case” cross-contamination potential when non-dedicated sampling equipment is used), as sampling is to commence in the apparent least impacted area and progress to areas of apparent increasing impact), and ideally in the field itself. The time and location of preparing each equipment blank sample is to be recorded in the field notes.

Equipment blank sampling requirements are provided in Table 2.

Trip Spikes

A trip spike is a sample prepared by the contract laboratory using water containing known concentrations of target parameters. The sample is obtained by Terrapex immediately prior to the site visit and accompanies Terrapex during the execution of the sampling activities, but is not opened. While in the possession of Terrapex, trip spikes are to be managed as if it were any other sample. At the conclusion of the sampling round, the sample is submitted to the contract laboratory for analyses.

Trip Spikes are primarily intended as measures of potential loss (low bias) in samples collected for volatile analysis, although results can also be affected by issues associated with laboratory analytical precision (e.g., laboratory equipment calibration) as well as potential cross-contamination between samples during temporary storage and/or transportation.

As it is prepared by the contract laboratory, trip spikes will be received bearing a sampling label and associated sample identification. Reasonable efforts are to be made to limit the amount of time a trip spike sample is in possession of Terrapex (e.g., obtaining the sample as close to practicable to the start of sampling activities whilst ensuring it is in Terrapex’s possession at the start of the work program). Regardless, the trip spike sample is to be received by the laboratory within seven days of the date/time of preparation listed on the sampling label.

Trip spike sampling requirements are provided in Table 2.

Table 2 Field Program Quality Assurance Sampling Requirements

Sample Type	Media	Minimum Frequency	Comments
Field Duplicate [1]	Soil / Sediment	1 per 10 samples	Duplicates not required for TCLP extraction analyses
	Water / Groundwater	1 per 10 samples	
	Air / Soil Vapour	1 per 10 samples	
Field Blank [1]	Soil / Sediment	Generally not required [2]	A field blank is not required if a trip blank is being submitted (e.g., analyses of VOCs / F1 PHCs and/or volatile gases)
	Water / Groundwater	1 per sampling round	
	Air / Soil Vapour	1 per sampling round	
Trip Blank	Soil / Sediment	Generally not required [2]	Applicable only for analyses of VOCs / F1 PHCs and/or volatile gases
	Water / Groundwater	1 per sampling round (see comments)	
	Air / Soil Vapour	1 per sampling round (see comments)	
Equipment Blank [1]	Soil / Sediment	Generally not required [3]	Not required if only dedicated sampling equipment employed
	Water / Groundwater	1 per field day	
	Air / Soil Vapour	Not required	It is generally impracticable to attempt collection of equipment blanks during air or soil vapour sampling
Trip Spike	Soil / Sediment	Generally not required [4]	Applicable only for analyses of VOCs / F1 PHCs and/or volatile gases
	Water / Groundwater	Not required but 1 per sampling round recommended [5]	
	Air / Soil Vapour	Not required	Commercial laboratories are generally unable to provide reliable trip spike samples for air or soil vapour sampling

Notes:

1 *To the extent practicable, at least one of each type of field program quality assurance sample should be submitted for the various analytical groupings that comprises the sampling program*

2 *A trip blank sample OR a field blank sample is required for each sampling round that includes methanol-preserved or sodium bisulphate solution-preserved soil samples for analyses of volatile constituents*

3 *Equipment blanks are not required if reasonable efforts are made to clean non-dedicated soil or sediment samplers between use (e.g., if split spoon samplers are washed between use, an equipment blank would not be required by this SOP). Otherwise, an equipment blank sample should be prepared by running laboratory-supplied analyte-free water over/through the equipment and collecting these waters for laboratory analyses of the target parameters.*

4 *Trip Spike samples are not required for soil or sediment analyses, as the laboratory-provided spikes are generally not provided in an equivalent media to the recovered samples (e.g., trip spike samples are generally water, and losses in a water sample may not be representative of the presence, absence, or magnitude of losses in hermetic samplers, methanol preserved samples, etc.)*

5 *Trip Spike samples are not required field program Quality Assurance elements per O. Reg. 153/04 and consequently are not mandatory per this SOP. However, as loss of volatile constituents during sample storage / transport to the analytical laboratory can significantly affect the reliability of analytical results, analyses of one trip per sampling round is recommended.*

Nomenclature for Field Quality Assurance Samples

As a general practice, the contract laboratory should not be informed of the number or nature of field program quality assurance samples submitted as part of a sampling program unless the laboratory's assistance is required in investigating a potential data quality issue (e.g., in the event of a result triggering an alert criteria specified in Data Quality Analysis, below).

Notwithstanding this general principal, both trip blank and trip spike samples are typically prepared and provided by the contract laboratory. Accordingly, these samples will be assigned sample identifications by the laboratory, and the date/time of preparation will typically be recorded on the sampling label. Such samples should be recorded on the Chain of Custody form using the sample identification and date/time of preparation provided by the laboratory.

The remaining field program quality assurance samples (field duplicates, field blanks, and equipment blanks) should be submitted on a "blind" basis so that the laboratory ought to be reasonably unaware of the nature of the sample submission. That is, these samples should be assigned a plausible sampling identification that does not correspond to another actual or potential sampling location at the site, and the true nature of the sample identification recorded in the field notes. Selected sample identifications should not, for example, be identified as or include "DUP", "BLANK", or any other nomenclature suggesting that the sample represents a field program quality assurance measure.

This principal extends to field blanks prepared for methanol-preserved or sodium bisulphate solution-preserved soil samples for analyses of volatile constituents. Although field blanks may be readily identified as such at sample reception (through the lack of any soil within the sample container), the nature of such samples would not be readily apparent to other laboratory staff following laboratory extraction procedures. Accordingly, these samples should be assigned a plausible sampling identification that does not correspond to another actual or potential sampling location at the site, and the true nature of the sample identification recorded in the field notes.

LABORATORY QUALITY ASSURANCE

Commercial contract laboratories will have their own internal quality assurance and quality control programs. These programs typically include quality assurance samples in analytical runs, the results of which are provided (in summary form) in the Certificate of Analysis documenting analytical results for a sample submission.

Maintaining overall field program quality assurance and quality control and completing data quality analysis requires a review of the laboratory Certificate of Approval.

For the purposes of this SOP, laboratory quality assurance samples are defined as outlined below. Note that while this nomenclature had been adopted to reflect language typical in the commercial contract laboratory industry, it may not necessarily correlate exactly with that used in the laboratory Certificate of Analysis.

Method Blank: an aliquot prepared using analyte-free water and processed through the entire analytical method, including extracting, digestion, and other preparation procedures.

Blank Spike: an aliquot prepared using water containing known concentrations of target parameters and processed through the entire analytical method, including extracting, digestion, and other preparation procedures.

Matrix Spike: a second aliquot from an analytical sample that is fortified with known concentrations of the target parameters and processed through the entire analytical method, including extracting, digestion, and other preparation procedures. As quality assurance results are assessed on the basis of comparison of the determined concentration versus the known concentrations, high concentrations of the target parameters in the fortified sample can obscure (mask) matrix spike recovery.

Laboratory Duplicate: a second aliquot from an analytical sample that is included in the analytical run for comparison to results from the corresponding sampling pair.

Certificate Reference Material (CRM): an aliquot that has been certified by a recognized agency to contain specific concentrations of target parameters and which is included in the analytical run. A CRM differs from a blank spike in that it is not prepared internally by the contract laboratory.

Surrogate Recovery: Surrogates are parameters not normally found in nature but that behave chemically and physically similar to the analytical run target parameters, and that are introduced into the aliquot of an analytical sample. Surrogate recovery is the evaluation of the determined concentration of the surrogate versus the known concentration introduced into the sample aliquot.

DATA QUALITY OBJECTIVES

Alert criteria for quality assurance and quality control metrics are summarized in Table 3. Any result triggering the specified alert criteria must be identified in the work program report, and specific commentary regarding the implication of this result on the work program findings (if any) offered.

Note that triggering an alert criteria does not mean that the corresponding laboratory results are invalid; it only indicates a situation where specific commentary regarding the validity of the laboratory results is required in the work program report.

Quality assurance samples involving comparisons of actual results to expected results are evaluated on the basis of ***Recovery***, or recovery percentage. Note that Recovery does not necessarily relate to the ability to provide consistent (similar) quantitations between successive analyses.

Recovery is calculated as follows:

$$Recovery = \frac{reported\ concentration}{actual\ (expected) concentration}\ x\ 100\%$$

Quality assurance samples involving comparisons of 'duplicate' analysis are evaluated on the basis of ***Relative Percent Difference (RPD)***. RPD provides a measure of the ability to provide consistent results on successive analyses, but does not necessarily relate to the ability to provide results that are representative of the actual concentration of the target parameter (e.g., the expected result when comparing against a known standard).

RPD is calculated as follows:

$$RPD\ =\ \left| \frac{result_1 - result_2}{\frac{1}{2}\ x\ (result_1 +\ result_2)} \right|\ x\ 100\%$$

RPD values should not be calculated where one or both of the results do not yield quantifiable results (i.e., non-detect findings), or where one or both of the results are less than five times the reported detection limits. RPD values should not be calculated for parameters which are based on calculations using raw data (e.g., sodium adsorption ratio, total xylenes); instead, where applicable, RPD values should be calculated for the 'raw' data (e.g., the m&p-xylenes, o-xylenes parameters).

Note that the mere absence of a calculated RPD is not considered a quality assurance failure, but simply a situation where alert criteria cannot be quantifiably evaluated. Similarly, the absence of a RPD value is not necessarily considered to be an acceptable field quality assurance result (e.g., a non-detect result in a duplicate sample but an elevated concentrations reported for the corresponding sampling pair is suggestive of a potentially significant variance is sampling results, and may warrant commentary in the work program report).

Table 3 Field Program Data Quality Objectives

Field QC Metric	**Alert Criteria**		
Sample integrity	Deviation from this SOP recorded within field notes Significant variance in field screening results (if applicable) recorded within field notes between duplicate samples Laboratory reports average sample temperature at time of receipt greater than 10ºC Incorrect sampling container employed Broken or leaking sampling container reported by laboratory Excessive particulate within received water sample reported by laboratory		
Sample identification integrity	Laboratory reports discrepancy between samples reported on Chain of Custody and those actually received (as per sampling container labels) Laboratory reports unlabelled sample received (no sample identification apparent)		
Chain of Custody integrity	Laboratory reports missing/damaged custody seal Laboratory reports missing Chain of Custody form Date/time of sample recovery not recorded on Chain of Custody form		
Sample storage (hold time) integrity	Sample for analysis of VOC / F1 PHCs and/or volatile gases received by laboratory more than 36 hours after recorded sample collection Sample for analysis other than VOC / F1 PHCs and volatile gases received by laboratory more than 72 hours after recorded sample collection		
Laboratory QA Metric	**Alert Criteria**		
	Analytical Grouping	**Soil / Sediment**	**Air / Soil Vapour / Water / Groundwater**
Method Blank	ALL	Any concentration in excess of laboratory detection limits	

Table 3 Field Program Data Quality Objectives

Blank Spike, Matrix Spike		*results outside:*	*results outside:*
	BNAs, PAHs	50% - 140% Recovery [1]	50% - 140% Recovery [1]
	1,4-Dioxane	50% - 140% Recovery	50% - 140% Recovery
	Dioxins/Furans	50% - 150% Recovery	50% - 150% Recovery
	OC Pesticides	50% - 140% Recovery	50% - 140% Recovery
	PCBs	60% - 140% Recovery	60% - 140% Recovery
	PHCs	60% - 140% Recovery	60% - 140% Recovery
	VOCs	50% - 140% Recovery	50% - 140% Recovery
	Hg, Cr^{6+}, CN^-	70% - 130% Recovery	70% - 130% Recovery
	EC	n/a	n/a
	FOC, Chloride	70% - 130% Recovery	70% - 130% Recovery
	Methyl mercury	60% - 140% Recovery	60% - 140% Recovery
	Metals *(incl. B, HWS B, Ca, Mg, Na)*	70% - 130% Recovery [2]	70% - 130% Recovery [2]
Laboratory Duplicate	BNAs, PAHs	> 40% RPD	> 30% RPD
	1,4-Dioxane	> 50% RPD	> 30% RPD
	Dioxins/Furans	> 40% RPD	> 30% RPD
	OC Pesticides	> 40% RPD	> 30% RPD
	PCBs	> 40% RPD	> 30% RPD
	PHCs	> 30% RPD	> 30% RPD
	VOCs	> 50% RPD	> 30% RPD
	Hg, Cr^{6+}, CN^-	> 35% RPD	> 20% RPD
	EC	> 10% RPD	n/a
	FOC, Chloride	> 35% RPD	> 20% RPD
	Methyl mercury	> 30% RPD	> 20% RPD
	Metals *(incl. B, HWS B, Ca, Mg, Na)*	> 30% RPD [4,5]	> 20% RPD
	pH	[3]	[3]
Certified Reference Material, Laboratory Control Sample		*results outside:*	*results outside:*
	BNAs, PAHs	50% - 140% Recovery [1]	50% - 140% Recovery [1]
	1,4-Dioxane	50% - 140% Recovery	50% - 140% Recovery
	Dioxins/Furans	50% - 150% Recovery	50% - 150% Recovery
	OC Pesticides	50% - 140% Recovery	50% - 140% Recovery
	PCBs	60% - 140% Recovery	60% - 140% Recovery
	PHCs	80% - 120% Recovery	60% - 140% Recovery
	VOCs	60% - 140% Recovery	60% - 140% Recovery
	Hg, Cr^{6+}, CN^-	80% - 120% Recovery	80% - 120% Recovery
	EC	90% - 110% Recovery	90% - 110% Recovery
	FOC, Chloride	70% - 130% Recovery	70% - 130% Recovery
	Methyl mercury	70% - 130% Recovery	70% - 130% Recovery
	Metals *(incl. B, HWS B, Ca, Mg, Na)*	80% - 120% Recovery [6]	80% - 120% Recovery [6]

Table 3 Field Program Data Quality Objectives

Field Program QA Metric	Alert Criteria		
	Analytical Grouping	**Soil / Sediment**	**Air / Soil Vapour / Water / Groundwater**
Surrogate Recovery		*results outside:*	*results outside:*
	BNAs, PAHs	50% - 140% Recovery	50% - 140% Recovery
	1,4-Dioxane	50% - 140% Recovery	50% - 140% Recovery
	Dioxins/Furans	40% - 140% Recovery	40% - 140% Recovery
	OC Pesticides	50% - 140% Recovery	50% - 140% Recovery
	PCBs	60% - 140% Recovery	60% - 140% Recovery
	PHCs	60% - 140% Recovery	60% - 140% Recovery
	VOCs	50% - 140% Recovery	50% - 140% Recovery
Field Duplicate	pH	[3]	[3]
	BNAs, PAHs	> 40% RPD [1,4]	>30% RPD [1]
	1,4-Dioxane	> 50% RPD	> 30% RPD
	Dioxins/Furans	> 40% RPD	> 30% RPD
	OC Pesticides	> 40% RPD	> 30% RPD
	PCBs	> 40% RPD	> 30% RPD
	PHCs	> 30% RPD	> 30% RPD
	VOCs	> 50% RPD	> 30% RPD
	Hg, Cr^{6+}, CN^-	> 35% RPD	> 20% RPD
	EC	> 10% RPD	n/a
	FOC, Chloride	> 35% RPD	> 20% RPD
	Methyl mercury	> 30% RPD	> 20% RPD
	Metals *(incl. B, HWS B, Ca, Mg, Na)*	> 30% RPD [4,5]	> 20% RPD
Field Blank	ALL	Any concentration in excess of laboratory detection limits	
Trip Blank	VOCs / F1 PHCs Volatile Gases	Any concentration in excess of laboratory detection limits	
Equipment Blank	ALL	Any concentration in excess of laboratory detection limits	
Trip Spike		*results outside:*	
	F1 PHC	60% -140% Recovery	
	Ketones and Gaseous Compounds at 20°C [7]	60% - 140% Recovery	
	Other VOCs	70% - 130% Recovery	

Source: adapted from Tables 5-1 through 5-14, MOE Analytical Protocol (April 15, 2011)

Notes:

[1] *Alert Criteria for p-chloroaniline, 3,3-dichlorobenzidene, phenol, 2,4-dimethylphenol, and 2,4-dinitrophenol is 30% - 130%*

[2] *Alert Criteria for Hot Water Soluble Boron is 60% - 140% Recovery*

[3] *RPD values are not calculated for pH analyses; however, results should be within 0.3 pH units*

[4] *Increased RPD values may be encountered whenever duplicate analyses are completed on samples representing heterogeneous fill materials. Specific commentary regarding the validity of analytical results should be offered whenever the specified alert criteria is exceeded; however, significant concerns regarding the validity of analytical results would generally not be suspected if calculated RPD do not exceed the specified alert criteria more than a factor of 2.*

[5] *Alert Criteria for Hot Water Soluble Boron is >40% RPD*

[6] *Alert Criteria for Hot Water Soluble Boron is 70% - 130% Recovery*

[7] *In a standard VOC list, this includes acetone, dichlorodifluoromethane, 1,4-dioxane, methyl ethyl ketone, methyl isobutyl ketone, 1,1,1,2-tetrachloroethane, and vinyl chloride*

APPENDIX IV

BOREHOLE LOGS

LOG LEGEND

SOIL TYPES

SAND	SILTY SAND	SANDY SILT	CLAYEY SAND
SAND AND GRAVEL	GRAVEL	SILT	CLAYEY SILT
CLAY	SILTY CLAY	SANDY SILTY CLAY	CONCRETE
SILTY GRAVEL	SILTY CLAY AND GRAVEL	MIXED FILL	TOP SOIL and/or PEAT
ASPHALT	BEDROCK		

WELL CONSTRUCTION DESCRIPTIONS

Pipe and Screen

PIPE SCREEN

Packing and Backfill

SEALANT CONCRETE SAND

TERMINOLOGY

SPT (n): Standard Penetration Test with (n) representing the number of blows required by a 140 pound hammer, falling from 30 inches, to drive a 2 inch O.D. split spoon sampler 1 foot into the soil.

CSV: Combustable Soil Vapour measurement using Gastechtor Model 1238ME Hydrocarbon surveyor, or equivalent calibrated to hexane and set for methane elimination.

PID: Soil Vapour measured with Photoionization Detector calibrated to isobutylene

ppm: Parts Per Million

%LEL: Percentage of the Lower Explosive Limit

T.O.P: Top of Pipe Elevation

Water/Product Levels

-Water level measured from ground surface, and the date.

-LNAPL level measured from ground surface and the date.

SAMPLE METHOD

SPLIT SPOON: **SS**
GRAB SAMPLE: **GS**
AUGER SAMPLE: **AU**
ROCK CORE: **RC**
DIRECT PUSH: **DP**

LABORATORY ANALYSIS

BTEX: Benzene, Toluene, Ethylbenzene, Xylenes

PHC (F1-F4): Petroleum Hydrocarbons, F1 to F4 fractions

VOCs: Volatile Organic Compounds

PAHs: Polycyclic Aromatic Hydrocarbons

METALS: Metallic and Inorganic Parameters

PCBs: Polychlorinated Biphenyls

OCPs: Organochlorined Pesticides

CLIENT: Altona Group	METHOD: Hollow Stem Auger and Split Spoon	**BH No.: MW1**
PROJECT: Liverpool House Condos	PROJECT ENGINEER: VN / ELEV. (m) 88.65	
LOCATION: 1294 Kingston Road, Pickering	NORTHING: / EASTING:	PROJECT NO.: 18-204

SAMPLE TYPE: AUGER, DRIVEN, CORING, DYNAMIC CONE, SHELBY, SPLIT SPOON

GWL (m) | SOIL SYMBOL | SOIL DESCRIPTION | DEPTH (m) | ELEVATION (m) | Pocket Penetrometer (kPa) 100 200 300 400 / N-Value (Blows/300mm) 20 40 60 80 | Water Content (%) PL W.C. LL 20 40 60 80 | SAMPLE NO. | SAMPLE TYPE | SPT(N) | CSV (ppm) | PID (ppm) | Well Construction | REMARKS

SOIL DESCRIPTION	Depth (m)
150 mm Asphaltic Concrete	0 – 0.15
(FILL) brown to dark brown coarse to fine sand some gravel, trace brick fragments	0.15 – 0.6
(FILL) dark brown silty clay	0.6 – 1.35
varved SILTY CLAY slightly moist; yellow -brown grey ------ yellow -brown oxidized lenses	1.35 – 4.0
grey CLAY some gravel wet	4.0 – 5.5
grey SANDY SILTY CLAY some gravel	5.5 – 7.0
grey SILTY SAND some gravel some clay (TILL)	7.0 –

SAMPLE NO.	SPT(N)
1	50/125
2	9
3	14
4	6
5	4
6	0
7	54
8	91/225

REMARKS:

Groundwater measured at 3.27 m below ground surface on February 15, 2019

Sample 1 - Inorganics

Bentonite

Hollow Stem augers used to start drilling at MW1

Sample 4 - pH, EC

Mud rotary drilling started at 3.5 m depth

Weight of hammer/450 mm

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CLIENT: Altona Group	METHOD: Hollow Stem Auger and Split Spoon		BH No.: MW1
PROJECT: Liverpool House Condos	PROJECT ENGINEER: VN	ELEV. (m) 88.65	
LOCATION: 1294 Kingston Road, Pickering	NORTHING:	EASTING:	PROJECT NO.: 18-204

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	Pocket Penetrometer (kPa) 100 200 300 400 / N-Value (Blows/300mm) 20 40 60 80	Water Content (%) PL W.C. LL 20 40 60 80	SAMPLE NO.	SAMPLE TYPE	SPT(N)	CSV (ppm)	PID (ppm)	Well Construction	REMARKS
		grey SILTY SAND some gravel some clay (TILL)	10 – 15	78.5 – 73.5									Bentnonite
													Sand
					50/100		9		50/100				Sand and Screen
					50/100		10		50/100				
					50/125		11		50/125				
					50/100		12		50/100				
		END OF BOREHOLE											

TERRAPEX

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CLIENT: Altona Group	METHOD: Hollow Stem Auger and Split Spoon		BH No.: MW2
PROJECT: Liverpool House Condos	PROJECT ENGINEER: VN	ELEV. (m) 89.66	
LOCATION: 1294 Kingston Road, Pickering	NORTHING:	EASTING:	PROJECT NO.: 18-204

SAMPLE TYPE: AUGER, DRIVEN, CORING, DYNAMIC CONE, SHELBY, SPLIT SPOON

Depth (m)	SOIL DESCRIPTION	Sample No.	SPT(N)	CSV (ppm)	PID (ppm)	REMARKS
0–0.1	100 mm Asphaltic Concrete					
0.1–1.5	(Fill) silty and gravelly sad, moist	1A	28	<10	0	Groundwater measured at 3.56 m below ground surface on February 15, 2019.
		1B				Sample 1 - Inorganics, PAH Boron, HWS
		2	6	<10	0	Bentonite Hollow stem augering used st start drilling at MW2
1.5–3.0	brown varved SILTY CLAY moist	3	3	<10	0	
		4	7	<10	0	Sample 4 - Inorganics
3.0–5.2	SAND and SILT trace gravel trace clay; brown-grey, moist to wet / grey, wet	5	19	<10	0	Sample 5 - VOC, PHCs
		6	7	<10	0	
		7	10	<10	0	
5.2–8.5	grey SILTY CLAY some gravel	8	5	<10	0	
		9	16			Mud rotary drilling started at 8.0 m depth.
8.5–	grey SILTY SAND some gravel some clay (TILL)	10	29			

GWL (m): groundwater level symbol at approx. 3.56 m.

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CLIENT: Altona Group	METHOD: Hollow Stem Auger and Split Spoon	**BH No.: MW2**
PROJECT: Liverpool House Condos	PROJECT ENGINEER: VN / ELEV. (m) 89.66	
LOCATION: 1294 Kingston Road, Pickering	NORTHING: / EASTING:	PROJECT NO.: 18-204

SAMPLE TYPE: AUGER, DRIVEN, CORING, DYNAMIC CONE, SHELBY, SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	Pocket Penetrometer (kPa) 100 200 300 400 / N-Value (Blows/300mm) 20 40 60 80	Water Content (%) PL W.C. LL 20 40 60 80	SAMPLE NO.	SAMPLE TYPE	SPT(N)	CSV (ppm)	PID (ppm)	Well Construction	REMARKS
		grey SILTY SAND some clay some gravel (TILL)	10	79.5									Bentonite
			10.5	79									Sand
			11	78.5	38		11		38				
			11.5	78									Sand and Screen
			12	77.5									
			12.5	77	44		12		44				Sample 12 - EC, SAR, Boron HWS
			13	76.5									
			13.5	76									
			14	75.5	38		13		38				
		END OF BOREHOLE											

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CLIENT: Altona Group	METHOD: Hollow Stem Auger and Split Spoon		BH No.: MW2A
PROJECT: Liverpool House Condos	PROJECT ENGINEER: VN	ELEV. (m) 89.66	
LOCATION: 1294 Kingston Road, Pickering	NORTHING:	EASTING:	PROJECT NO.: 18-204

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	Pocket Penetrometer (kPa) 100 200 300 400 / N-Value (Blows/300mm) 20 40 60 80	Water Content (%) PL W.C. LL 20 40 60 80	SAMPLE NO.	SAMPLE TYPE	SPT(N)	CSV (ppm)	PID (ppm)	Well Construction	REMARKS
		For soil stratigraphy refer to MW2	0 – 5	89.5 – 84.5								Bentonite / Sand / Sand and Screen	Groundwater measured at 3.28 m below ground surface on February 15, 2019. Bentonite Sand Sand and Screen
		END OF BOREHOLE											

Depth scale: 0, 0.5, 1, 1.5, 2, 2.5, 3, 3.5, 4, 4.5, 5
Elevation scale: 89.5, 89, 88.5, 88, 87.5, 87, 86.5, 86, 85.5, 85, 84.5

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CLIENT: Altona Group	METHOD: Hollow Stem Auger and Split Spoon	**BH No.: MW3**
PROJECT: Liverpool House Condos	PROJECT ENGINEER: VN / ELEV. (m) 88.52	
LOCATION: 1294 Kingston Road, Pickering	NORTHING: / EASTING:	PROJECT NO.: 18-204

SAMPLE TYPE: AUGER, DRIVEN, CORING, DYNAMIC CONE, SHELBY, SPLIT SPOON

SOIL DESCRIPTION

Depth (m)	Description
0 – 0.15	150 mm Asphaltic Concrete
0.15 – 0.6	450 mm Granular Base
0.6 – 0.9	(FILL) dark brown to brown sandy silty clay
0.9 – 7.0	SILTY CLAY trace sand trace gravel; varved, brown-grey, moist; ------ (approx. 3 m) brown-grey, wet ------ (approx. 3.65 m); grey, wet (approx. 4.8 m)
7.0 – 9.8	grey SILTY SAND some gravel some clay (TILL)

GWL: groundwater symbol at approx. 3.75 m.

Sample No.	Depth (approx. m)	SPT(N)	Water Content (%)
1A	0.45	76	9
1B	0.65		19
2	1.0	5	21
3	1.75	7	
4	2.5	5	26
5	3.25	6	27
6	4.0	3	31
7	4.75	1	18
8	6.25	2	14
9	7.75	69	6
10	9.25	57	7

Columns: GWL (m), SOIL SYMBOL, DEPTH (m), ELEVATION (m), Pocket Penetrometer (kPa) 100 200 300 400 / N-Value (Blows/300mm) 20 40 60 80, Water Content (%) PL W.C. LL 20 40 60 80, SAMPLE NO., SAMPLE TYPE, SPT(N), CSV (ppm), PID (ppm), Well Construction, REMARKS

Depth / Elevation scale: 0 / 88.5; 0.5 / 88; 1 / 87.5; 1.5 / 87; 2 / 86.5; 2.5 / 86; 3 / 85.5; 3.5 / 85; 4 / 84.5; 4.5 / 84; 5 / 83.5; 5.5 / 83; 6 / 82.5; 6.5 / 82; 7 / 81.5; 7.5 / 81; 8 / 80.5; 8.5 / 80; 9 / 79.5; 9.5 / 79

REMARKS

Groundwater measured at 3.75 m below ground surface on February 15, 2019.

Sample 2 - Inorganics

Well construction: Sand (from approx. 8.5 m); Sand and Screen (from approx. 9.2 m)

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CLIENT: Altona Group	METHOD: Hollow Stem Auger and Split Spoon		BH No.: MW3
PROJECT: Liverpool House Condos	PROJECT ENGINEER: VN	ELEV. (m) 88.52	
LOCATION: 1294 Kingston Road, Pickering	NORTHING:	EASTING:	PROJECT NO.: 18-204

SAMPLE TYPE: AUGER, DRIVEN, CORING, DYNAMIC CONE, SHELBY, SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	Pocket Penetrometer (kPa) 100 200 300 400 / N-Value (Blows/300mm) 20 40 60 80	Water Content (%) PL W.C. LL 20 40 60 80	SAMPLE NO.	SAMPLE TYPE	SPT(N)	CSV (ppm)	PID (ppm)	Well Construction	REMARKS
		grey SILTY SAND some gravel some clay (TILL)	10	78.5									Sand and Screen
			10.5	78									
					50/150	8	11	SPLIT SPOON	50/ 150				
			11	77.5									
			11.5	77									
		grey to dark grey SANDY SILT wet to moist	12	76.5		8							
					50/125	13	12	SPLIT SPOON	50/ 125				
			12.5	76									
		grey SILTY SAND some gravel some clay (TILL)	13	75.5									
			13.5	75									
					50/150	7	13	SPLIT SPOON	50/ 150				
			14	74.5									
			14.5	74									
			15	73.5									
					50/150	7	14	SPLIT SPOON	50/ 150				
			15.5	73									
			16	72.5									
		grey weathered SHALE	16.5	72									
					50/75	10	15	SPLIT SPOON	50/ 75				

END OF BOREHOLE

TERRAPEX	LOGGED BY: DM	DRILLING DATE: 7 January, 2019
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CLIENT: Altona Group	METHOD: Hollow Stem Auger and Split Spoon	**BH No.: MW4**
PROJECT: Liverpool House Condos	PROJECT ENGINEER: VN / ELEV. (m) 89.15	
LOCATION: 1294 Kingston Road, Pickering	NORTHING: / EASTING:	PROJECT NO.: 18-204

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

Depth (m)	SOIL DESCRIPTION	SAMPLE NO.	SPT(N)	Water Content (%)	REMARKS
0	200 mm Asphaltic Concrete				
	(FILL) brown gravelly sand base, brown clayey silt	1A		1	Groundwater at 3.32 m below ground surface on February 15, 2019.
		1B	12	17	
	SILTY CLAY: varved, brown, moist	2A	6	22	Sample 2A - Inorganics
		2B		23	
	varved, brown, wet	3	14	20	Bentonite
		4	9	21	
	grey, wet	5A	10	15	
		5B		9	
	grey SILTY SAND some gravel some clay (TILL): moist	6	25	7	Sample 6 - EC
		7	40	8	
	wet	8	56	10	
		9	25	18	
		10	37	15	

Columns: GWL (m) | SOIL SYMBOL | SOIL DESCRIPTION | DEPTH (m) | ELEVATION (m) | Pocket Penetrometer (kPa) 100 200 300 400 / N-Value (Blows/300mm) 20 40 60 80 | Water Content (%) PL W.C. LL 20 40 60 80 | SAMPLE NO. | SAMPLE TYPE | SPT(N) | CSV (ppm) | PID (ppm) | Well Construction | REMARKS

TERRAPEX

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REVIEWED BY: VN	Page 1 of 2

CLIENT: Altona Group	METHOD: Hollow Stem Auger and Split Spoon	**BH No.: MW4**
PROJECT: Liverpool House Condos	PROJECT ENGINEER: VN / ELEV. (m) 89.15	
LOCATION: 1294 Kingston Road, Pickering	NORTHING: / EASTING:	PROJECT NO.: 18-204

SAMPLE TYPE: AUGER, DRIVEN, CORING, DYNAMIC CONE, SHELBY, SPLIT SPOON

SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	N-Value (Blows/300mm)	Water Content (%)	SAMPLE NO.	SPT(N)
grey SILTY SAND some gravel some clay (TILL) wet	10.0 – 11.7		43	14	11	43
grey CLAYEY SILT trace sand trace gravel moist (TILL)	11.7 – 14.6		48	14	12	48
			50/125	7	13	50/125
dark brown SANDY SILTY CLAY some gravel	14.6 – 16.5		62	9	14	62
grey weathered SHALE	16.5 – 16.8		50/25	15	15	50/25

END OF BOREHOLE

Column headings: GWL (m), SOIL SYMBOL, SOIL DESCRIPTION, DEPTH (m), ELEVATION (m), Pocket Penetrometer (kPa) 100 200 300 400, N-Value (Blows/300mm) 20 40 60 80, Water Content (%) PL W.C. LL 20 40 60 80, SAMPLE NO., SAMPLE TYPE, SPT(N), CSV (ppm), PID (ppm), Well Construction, REMARKS

Depth scale: 10, 10.5, 11, 11.5, 12, 12.5, 13, 13.5, 14, 14.5, 15, 15.5, 16, 16.5

Elevation scale: 79, 78.5, 78, 77.5, 77, 76.5, 76, 75.5, 75, 74.5, 74, 73.5, 73, 72.5

REMARKS (Well Construction):
- Sand
- Sand and Screen
- Bentonite

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CLIENT: Altona Group	METHOD: Hollow Stem Auger and Split Spoon		BH No.: MW4A
PROJECT: Liverpool House Condos	PROJECT ENGINEER: VN	ELEV. (m) 89.15	
LOCATION: 1294 Kingston Road, Pickering	NORTHING:	EASTING:	PROJECT NO.: 18-204

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	Pocket Penetrometer (kPa) 100 200 300 400 / N-Value (Blows/300mm) 20 40 60 80	Water Content (%) PL W.C. LL 20 40 60 80	SAMPLE NO.	SAMPLE TYPE	SPT(N)	CSV (ppm)	PID (ppm)	Well Construction	REMARKS
			0	89									Concrete Groundwater at 2.34 m below ground surface on February 15, 2019.
			0.5	88.5									
			1	88									Bentonite
			1.5	87.5									
			2	87									
▼		For stratigraphy please refer to MW4	2.5	86.5									Sand
			3	86									Sand and Screen
			3.5	85.5									
			4	85									
			4.5										
		END OF BOREHOLE											

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CLIENT: Altona Group	METHOD: Hollow Stem Auger and Split Spoon		**BH No.: 5**
PROJECT: Liverpool House Condos	PROJECT ENGINEER: VN	ELEV. (m) 88.42	
LOCATION: 1294 Kingston Road, Pickering	NORTHING:	EASTING:	PROJECT NO.: 18-204

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

Column headings: GWL (m) | SOIL SYMBOL | SOIL DESCRIPTION | DEPTH (m) | ELEVATION (m) | Pocket Penetrometer (kPa) 100 200 300 400; N-Value (Blows/300mm) 20 40 60 80 | Water Content (%) PL W.C. LL 20 40 60 80 | SAMPLE NO. | SAMPLE TYPE | SPT(N) | CSV (ppm) | PID (ppm) | Well Construction | REMARKS

Depth (m)	SOIL DESCRIPTION
0 – 0.15	150 mm Asphaltic Concrete
0.15 – 0.6	450 mm Granular Base
0.6 – 0.9	(FILL) dark brown silty clay some organics
0.9 – 5.5	SILTY CLAY trace to some sand trace gravel; varved, brown; moist to wet; ------ (approx. 2.9 m); grey
5.5 – 7.0	dark grey SANDY SILTY CLAY trace gravel (TILL)
7.0 – 8.6	dark grey GRAVELLY SAND some silt some clay (TILL) moist to wet
8.6 – 9.8	dark grey SILTY SAND trace to some clay trace to some gravel (TILL), moist

SAMPLE NO.	SPT(N)	REMARKS
1A		
1B	15	Sample 1B - Inorganics
2	7	
3	6	
4A	10	
4B		
5	4	Sample 5 - EC, SAR
6A	4	
6B		
7	1	
8	36	
9	56	
10	50/100	

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LOGGED BY: DM	DRILLING DATE: 3/4 January, 2019
REVIEWED BY: VN	Page 1 of 2

CLIENT: Altona Group	METHOD: Hollow Stem Auger and Split Spoon	**BH No.: 5**
PROJECT: Liverpool House Condos	PROJECT ENGINEER: VN / ELEV. (m) 88.42	
LOCATION: 1294 Kingston Road, Pickering	NORTHING: / EASTING:	PROJECT NO.: 18-204

SAMPLE TYPE: AUGER, DRIVEN, CORING, DYNAMIC CONE, SHELBY, SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	Pocket Penetrometer (kPa) 100 200 300 400 / N-Value (Blows/300mm) 20 40 60 80	Water Content (%) PL W.C. LL 20 40 60 80	SAMPLE NO.	SAMPLE TYPE	SPT(N)	CSV (ppm)	PID (ppm)	Well Construction	REMARKS
		grey medium to coarse SAND and gravel trace silt wet	10 – 11.5	78.5 – 77	50/75		11	Split spoon	50/75				
		grey SILTY SAND some gravel some clay (TILL)	11.5 – 15.4	77 – 73	50/100		12	Split spoon	50/100				
					50/150		13	Split spoon	50/150				Sample 13 - EC, SAR
		grey weathered SHALE	15.4 – 16.3	73 – 72.2	50/25		14A 14B	Split spoon	50/25				
					50/25		15	Split spoon	50/25				

END OF BOREHOLE

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REVIEWED BY: VN	Page 2 of 2

CLIENT: Altona Group	METHOD: Hollow Stem Auger and Split Spoon		**BH No.: MW6**
PROJECT: Liverpool House Condos	PROJECT ENGINEER: VN	ELEV. (m) 88.66	
LOCATION: 1294 Kingston Road, Pickering	NORTHING:	EASTING:	PROJECT NO.: 18-204

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	Pocket Penetrometer (kPa) 100 200 300 400 / N-Value (Blows/300mm) 20 40 60 80	Water Content (%) PL W.C. LL 20 40 60 80	SAMPLE NO.	SAMPLE TYPE	SPT(N)	CSV (ppm)	PID (ppm)	Well Construction	REMARKS
	100 mm Asphaltic Concrete	0	88.66									Groundwater at 3.65 m below ground surface on February 15, 2019.
	(FILL) brown sandy silt some gravel, damp			53		1	Split Spoon	53				Sample 1 - Inorganics
	SILT and CLAY trace to some sand moist; varved, yellow-brown			3		2	Split Spoon	3				Bentonite
				5	10	3	Split Spoon	5				
				6		4	Split Spoon	6				
	------	3		6		5	Split Spoon	6				Sample 5 - EC, SAR
▼ 3.65	brown-grey											
				2		6	Split Spoon	2				
	grey SILTY SAND some clay some gravel (TILL) slightly moist	5.6	83.1	31		7	Split Spoon	31				
				32		8	Split Spoon	32				
				98/250		9	Split Spoon	98/250				

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CLIENT: Altona Group	METHOD: Hollow Stem Auger and Split Spoon		BH No.: MW6
PROJECT: Liverpool House Condos	PROJECT ENGINEER: VN	ELEV. (m) 88.66	
LOCATION: 1294 Kingston Road, Pickering	NORTHING:	EASTING:	PROJECT NO.: 18-204

SAMPLE TYPE: AUGER, DRIVEN, CORING, DYNAMIC CONE, SHELBY, SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	Pocket Penetrometer (kPa) 100 200 300 400 / N-Value (Blows/300mm) 20 40 60 80	Water Content (%) PL W.C. LL 20 40 60 80	SAMPLE NO.	SAMPLE TYPE	SPT(N)	CSV (ppm)	PID (ppm)	Well Construction	REMARKS
		grey SILTY SAND some clay some gravel (TILL)	10	78.5								Bentonite	Bentonite
												Sand	Sand
		------ occasional sand seams, wet	10.5	78	84/275		10	Split spoon	84/275			Sand and Screen	Sand and Screen
		------	11 – 12	77.5 – 76.5									
		wet	12.5	76	88		11	Split spoon	88			Bentonite	Sample 11 - EC, SAR
		------ shale fragments	13 – 14	75.5 – 74.5	50/140		12	Split spoon	50/140				

END OF BOREHOLE

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CLIENT: Altona Group	METHOD: Hollow Stem Auger and Split Spoon		**BH No.: MW7**
PROJECT: Liverpool House Condos	PROJECT ENGINEER: VN	ELEV. (m) 88.02	
LOCATION: 1294 Kingston Road, Pickering	NORTHING:	EASTING:	PROJECT NO.: 18-204

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

Depth (m)	Elevation (m)	SOIL DESCRIPTION	Sample No.	SPT (N)	CSV (ppm)	PID (ppm)	Well Construction	Remarks
0	88	100 mm Asphaltic Concrete						Groundwater at 1.77 m below ground surface on completion.
0.5	87.5	(FILL) dark brown to brown clayey silt some sand, trace gravel trace brick fragments	1	30	<10	0	Bentonite	Sample 1 - Inorganics +Dup, PAH
1	87		2	9	<10	0	Bentonite	Bentonite
1.5	86.5	varved SILTY CLAY; yellow -brown, oxidized lenses, moist					Sand	Sand
2	86		3	5	<10	1	Sand	
2.5	85.5		4	3	<10	0	Sand and Screen	Sand and Screen
3	85	------ wet					Sand and Screen	Sample 5 - EC, SAR
3.5	84.5		5	4	<10	0	Sand and Screen	
4	84	brown-grey CLAYEY SILT wet	6	4	<10	0	Sand and Screen	Sample 6 - PHCs
4.5	83.5	grey SILTY CLAY some gravel wet	7	0	<10	0	Sand and Screen	Weight of hammer/450
5	83							
5.5	82.5		8	0				Weight of hammer/450 Sample 7 - VOCs
6	82	grey SILTY SAND some clay some gravel (TILL) wet						
6.5	81.5		9	5				
7	81							
7.5	80.5							
8	80		10	42				
8.5	79.5							
9	79							
9.5	78.5		11	58				

Pocket Penetrometer (kPa) 100 200 300 400 — N-Value (Blows/300mm) 20 40 60 80

Water Content (%) PL W.C. LL 20 40 60 80

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CLIENT: Altona Group	METHOD: Hollow Stem Auger and Split Spoon		BH No.: MW7
PROJECT: Liverpool House Condos	PROJECT ENGINEER: VN	ELEV. (m) 88.02	
LOCATION: 1294 Kingston Road, Pickering	NORTHING:	EASTING:	PROJECT NO.: 18-204

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL SYMBOL	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	Pocket Penetrometer (kPa) 100 200 300 400 / N-Value (Blows/300mm) 20 40 60 80	Water Content (%) PL W.C. LL 20 40 60 80	SAMPLE NO.	SAMPLE TYPE	SPT(N)	CSV (ppm)	PID (ppm)	Well Construction	REMARKS
		grey SILTY SAND some clay some gravel (TILL) wet	10 – 13	78 – 75	74		12	Split spoon	74				
					58		13	Split spoon	58				
		grey GRAVELLY coarse to fine SAND some silt (TILL)	13 – 15.3	75 – 72.7	54		14	Split spoon	54				Sample 14 - EC, SAR
					50/75		15	Split spoon	50/75				
		END OF BOREHOLE											

Depth scale (m): 10, 10.5, 11, 11.5, 12, 12.5, 13, 13.5, 14, 14.5, 15

Elevation scale (m): 78, 77.5, 77, 76.5, 76, 75.5, 75, 74.5, 74, 73.5, 73

TERRAPEX	LOGGED BY: JA	DRILLING DATE: 7 February 2019
	REVIEWED BY: VN	

CLIENT: Altona Group	METHOD: Hollow Stem Auger and Split Spoon	**BH No.: MW8**
PROJECT: Liverpool House Condos	PROJECT ENGINEER: VN / ELEV. (m) 88.15	
LOCATION: 1294 Kingston Road, Pickering	NORTHING: / EASTING:	PROJECT NO.: 18-204

SAMPLE TYPE: AUGER | DRIVEN | CORING | DYNAMIC CONE | SHELBY | SPLIT SPOON

GWL (m)	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	Pocket Penetrometer (kPa) 100 200 300 400 / N-Value (Blows/300mm) 20 40 60 80	Water Content (%) PL W.C. LL 20 40 60 80	SAMPLE NO.	SAMPLE TYPE	SPT(N)	CSV (ppm)	PID (ppm)	Well Construction	REMARKS
	50 mm Asphaltic Concrete / (FILL) 100 mm brown sand and gravel base / (FILL) brown clayey silt, moist	0 – 0.5	88 – 87.5	8		1		8	<10	0		Groundwater at 2.08 m below ground surface on February 15, 2019. Sample 1 - PAH
	(FILL) brown silty sand trace clay, moist	1	87	8		2		8	<10	0		Bentonite
	SILTY CLAY: varved, brown, oxidized lenses	1.5 – 2	86.5 – 86	7		3		7	<10	0		Sample 3 - Inorganics + Dup
▼		2.5	85.5	5		4		5	<10	0		Sand
	grey-brown, moist	3 – 3.5	85 – 84.5	4		5		4	<10	0		Sample 5 - VOCs, PHCs, EC, SAR Sand and Screen
	grey-brown, wet	4	84	3		6		3	<10	0		
		4.5	83.5	2		7		2	<10	0		
	grey, wet	5 – 5.5	83 – 82.5	2		8		2	<10	0		Sample 8 - SAR
	END OF BOREHOLE	6										

TERRAPEX	LOGGED BY: ALPK	DRILLING DATE: 7 February 2019
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CLIENT: Altona Group	METHOD: Manual Split Spoon Sampling		**BH No.: MW9**
PROJECT: Liverpool House Condos	PROJECT ENGINEER: VN	ELEV. (m) 86.7	
LOCATION: 1294 Kingston Road, Pickering	NORTHING:	EASTING:	PROJECT NO.: 18-204

SAMPLE TYPE: AUGER, DRIVEN, CORING, DYNAMIC CONE, SHELBY, SPLIT SPOON

GWL (m)	SOIL DESCRIPTION	DEPTH (m)	ELEVATION (m)	SAMPLE NO.	SPT(N)	CSV (ppm)	PID (ppm)	REMARKS
	150 mm Concrete	0	86.5					Interior borehole advanced in basement of Liverpool John's Pub. Samples were collected using direct push technology. No SPT's were performed. Groundwater measured at 0.55 m below basement floor slab on February 22, 2019.
▼	SILTY CLAY; varved, brown, oxidized lenses	0.5	86	1	-	<10	0	
		1	85.5	2	-	<10	0	Sample 1 - Inorganics, PAH
	brown	1.5–2	85	3	-	<10	0	Sand
		2	84.5					Sand and Screen Sample 4 - VOC, PHCs
		2.5	84	4	-	<10	0	
	grey	3	83.5					Sample 5 - EC
		3.5	83	5	-	<10	0	

END OF BOREHOLE

Pocket Penetrometer (kPa) 100 200 300 400; N-Value (Blows/300mm) 20 40 60 80; Water Content (%) PL W.C. LL 20 40 60 80; SAMPLE TYPE; Well Construction

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LOGGED BY: ALPK	DRILLING DATE: 31 January 2019
REVIEWED BY: VN	Page 1 of 1

CLIENT: Altona Group	METHOD: Hollow Stem Auger and Split Spoon	**BH No.: MW10**
PROJECT: Liverpool House Condos	PROJECT ENGINEER: VN / ELEV. (m) 88.50	
LOCATION: 1294 Kingston Road, Pickering	NORTHING: / EASTING:	PROJECT NO.: 18-204

SAMPLE TYPE: AUGER, DRIVEN, CORING, DYNAMIC CONE, SHELBY, SPLIT SPOON

Column headings: GWL (m) | SOIL SYMBOL | SOIL DESCRIPTION | DEPTH (m) | ELEVATION (m) | Pocket Penetrometer (kPa) 100 200 300 400; N-Value (Blows/300mm) 20 40 60 80 | Water Content (%) PL W.C. LL 20 40 60 80 | SAMPLE NO. | SAMPLE TYPE | SPT(N) | CSV (ppm) | PID (ppm) | Well Construction | REMARKS

Depth (m)	Elevation (m)	Soil Description
0	88.5	50 mm Asphaltic CONCRETE
		(FILL) brown sand and gravel trace silt, trace brick fragments
0.5	88	
		(FILL) brown clayey silt trace organics, moist
1	87.5	SILTY CLAY
1.5	87	varved, brown, moist
2	86.5	------
2.5	86	grey -brown, wet
3	85.5	
3.5	85	------
4	84.5	grey, wet
4.5	84	
5	83.5	
5.5	83	
		END OF BOREHOLE

SAMPLE NO.	SPT(N)	CSV (ppm)	PID (ppm)	Remarks
1	55	<10	0	Groundwater at 2.11 m below ground surface on February 15, 2019. Sample 1 - PAH + Dup, OC Pesticides + Dup
2	7	<10	0	Sample 2 - Inorganics; Bentonite
3	3	<10	0	Sand
4	4	<10	0	Sand and Screen
5	4	<10	0	Sample 5 - VOCs + Dup, F1- F4
6	1	<10	0	
7	1	<10	0	
8	1	<10	0	

TERRAPEX

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REVIEWED BY: VN	Page 1 of 1

APPENDIX V

LABORATORY CERTIFICATES OF ANALYSIS

Maxxam
A Bureau Veritas Group Company

Your Project #: CT2817.00
Your C.O.C. #: 701400-02-01

Attention: Chaoran Li

Terrapex Environmental Ltd
90 Scarsdale Rd
Toronto, ON
CANADA M3B 2R7

Report Date: 2019/02/26
Report #: R5608239
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B944876
Received: 2019/02/20, 14:40

Sample Matrix: Soil
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Hot Water Extractable Boron	1	2019/02/25	2019/02/25	CAM SOP-00408	R153 Ana. Prot. 2011
Free (WAD) Cyanide	1	2019/02/22	2019/02/25	CAM SOP-00457	OMOE E3015 m
Conductivity	1	2019/02/25	2019/02/25	CAM SOP-00414	OMOE E3530 v1 m
Hexavalent Chromium in Soil by IC (1)	1	2019/02/22	2019/02/25	CAM SOP-00436	EPA 3060/7199 m
Strong Acid Leachable Metals by ICPMS	1	2019/02/23	2019/02/26	CAM SOP-00447	EPA 6020B m
Moisture	1	N/A	2019/02/23	CAM SOP-00445	Carter 2nd ed 51.2 m
pH CaCl2 EXTRACT	1	2019/02/25	2019/02/25	CAM SOP-00413	EPA 9045 D m
Sodium Adsorption Ratio (SAR)	1	N/A	2019/02/26	CAM SOP-00102	EPA 6010C

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

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

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing. Maxxam is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Maxxam, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Soils are reported on a dry weight basis unless otherwise specified.

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Your Project #: CT2817.00
Your C.O.C. #: 701400-02-01

Attention: Chaoran Li

Terrapex Environmental Ltd
90 Scarsdale Rd
Toronto, ON
CANADA M3B 2R7

Report Date: 2019/02/26
Report #: R5608239
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B944876
Received: 2019/02/20, 14:40

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Ema Gitej, Senior Project Manager
Email: EGitej@maxxam.ca
Phone# (905)817-5829
==
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B944876
Report Date: 2019/02/26

Terrapex Environmental Ltd
Client Project #: CT2817.00
Sampler Initials: CL

O.REG 153 METALS & INORGANICS PKG (SOIL)

Maxxam ID		JAG765		
Sampling Date		2019/02/13 08:30		
COC Number		701400-02-01		
	UNITS	**MW1-1**	**RDL**	**QC Batch**
Calculated Parameters				
Sodium Adsorption Ratio	N/A	1.6		5982184
Inorganics				
Conductivity	mS/cm	1.4	0.002	5989388
Moisture	%	11	1.0	5988452
Available (CaCl2) pH	pH	11.4		5989415
WAD Cyanide (Free)	ug/g	<0.01	0.01	5987501
Chromium (VI)	ug/g	0.4	0.2	5987313
Metals				
Hot Water Ext. Boron (B)	ug/g	0.51	0.050	5989024
Acid Extractable Antimony (Sb)	ug/g	0.31	0.20	5988579
Acid Extractable Arsenic (As)	ug/g	2.2	1.0	5988579
Acid Extractable Barium (Ba)	ug/g	61	0.50	5988579
Acid Extractable Beryllium (Be)	ug/g	0.42	0.20	5988579
Acid Extractable Boron (B)	ug/g	10	5.0	5988579
Acid Extractable Cadmium (Cd)	ug/g	0.14	0.10	5988579
Acid Extractable Chromium (Cr)	ug/g	17	1.0	5988579
Acid Extractable Cobalt (Co)	ug/g	5.4	0.10	5988579
Acid Extractable Copper (Cu)	ug/g	16	0.50	5988579
Acid Extractable Lead (Pb)	ug/g	15	1.0	5988579
Acid Extractable Molybdenum (Mo)	ug/g	1.0	0.50	5988579
Acid Extractable Nickel (Ni)	ug/g	9.7	0.50	5988579
Acid Extractable Selenium (Se)	ug/g	<0.50	0.50	5988579
Acid Extractable Silver (Ag)	ug/g	<0.20	0.20	5988579
Acid Extractable Thallium (Tl)	ug/g	0.060	0.050	5988579
Acid Extractable Uranium (U)	ug/g	0.82	0.050	5988579
Acid Extractable Vanadium (V)	ug/g	21	5.0	5988579
Acid Extractable Zinc (Zn)	ug/g	59	5.0	5988579
Acid Extractable Mercury (Hg)	ug/g	0.056	0.050	5988579

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam
A Bureau Veritas Group Company

Maxxam Job #: B944876
Report Date: 2019/02/26

Terrapex Environmental Ltd
Client Project #: CT2817.00
Sampler Initials: CL

TEST SUMMARY

Maxxam ID: JAG765
Sample ID: MW1-1
Matrix: Soil

Collected: 2019/02/13
Shipped:
Received: 2019/02/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hot Water Extractable Boron	ICP	5989024	2019/02/25	2019/02/25	Suban Kanapathippllai
Free (WAD) Cyanide	TECH	5987501	2019/02/22	2019/02/25	Barbara Kalbasi Esfahani
Conductivity	AT	5989388	2019/02/25	2019/02/25	Kazzandra Adeva
Hexavalent Chromium in Soil by IC	IC/SPEC	5987313	2019/02/22	2019/02/25	Rupinder Sihota
Strong Acid Leachable Metals by ICPMS	ICP/MS	5988579	2019/02/23	2019/02/26	Daniel Teclu
Moisture	BAL	5988452	N/A	2019/02/23	Min Yang
pH CaCl2 EXTRACT	AT	5989415	2019/02/25	2019/02/25	Gnana Thomas
Sodium Adsorption Ratio (SAR)	CALC/MET	5982184	N/A	2019/02/26	Automated Statchk

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GENERAL COMMENTS

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

Package 1	2.0°C

cooler custody seal was present and intact.

Results relate only to the items tested.

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Maxxam
A Bureau Veritas Group Company

Maxxam Job #: B944876
Report Date: 2019/02/26

QUALITY ASSURANCE REPORT

Terrapex Environmental Ltd
Client Project #: CT2817.00
Sampler Initials: CL

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	**Parameter**	**Date**	**% Recovery**	**QC Limits**	**% Recovery**	**QC Limits**	**Value**	**UNITS**	**Value (%)**	**QC Limits**
5987313	Chromium (VI)	2019/02/25	71	70 - 130	92	80 - 120	<0.2	ug/g	NC	35
5987501	WAD Cyanide (Free)	2019/02/25	103	75 - 125	102	80 - 120	<0.01	ug/g	NC	35
5988452	Moisture	2019/02/23							4.5	20
5988579	Acid Extractable Antimony (Sb)	2019/02/26	87	75 - 125	103	80 - 120	<0.20	ug/g		
5988579	Acid Extractable Arsenic (As)	2019/02/26	91	75 - 125	102	80 - 120	<1.0	ug/g		
5988579	Acid Extractable Barium (Ba)	2019/02/26	NC	75 - 125	107	80 - 120	<0.50	ug/g		
5988579	Acid Extractable Beryllium (Be)	2019/02/26	96	75 - 125	104	80 - 120	<0.20	ug/g		
5988579	Acid Extractable Boron (B)	2019/02/26	93	75 - 125	104	80 - 120	<5.0	ug/g		
5988579	Acid Extractable Cadmium (Cd)	2019/02/26	92	75 - 125	100	80 - 120	<0.10	ug/g		
5988579	Acid Extractable Chromium (Cr)	2019/02/26	97	75 - 125	104	80 - 120	<1.0	ug/g		
5988579	Acid Extractable Cobalt (Co)	2019/02/26	89	75 - 125	103	80 - 120	<0.10	ug/g		
5988579	Acid Extractable Copper (Cu)	2019/02/26	97	75 - 125	101	80 - 120	<0.50	ug/g		
5988579	Acid Extractable Lead (Pb)	2019/02/26	89	75 - 125	99	80 - 120	<1.0	ug/g	1.4	30
5988579	Acid Extractable Mercury (Hg)	2019/02/26	83	75 - 125	94	80 - 120	<0.050	ug/g		
5988579	Acid Extractable Molybdenum (Mo)	2019/02/26	94	75 - 125	101	80 - 120	<0.50	ug/g		
5988579	Acid Extractable Nickel (Ni)	2019/02/26	93	75 - 125	98	80 - 120	<0.50	ug/g		
5988579	Acid Extractable Selenium (Se)	2019/02/26	95	75 - 125	101	80 - 120	<0.50	ug/g		
5988579	Acid Extractable Silver (Ag)	2019/02/26	92	75 - 125	103	80 - 120	<0.20	ug/g		
5988579	Acid Extractable Thallium (Tl)	2019/02/26	89	75 - 125	99	80 - 120	<0.050	ug/g		
5988579	Acid Extractable Uranium (U)	2019/02/26	89	75 - 125	96	80 - 120	<0.050	ug/g		
5988579	Acid Extractable Vanadium (V)	2019/02/26	NC	75 - 125	104	80 - 120	<5.0	ug/g		
5988579	Acid Extractable Zinc (Zn)	2019/02/26	NC	75 - 125	92	80 - 120	<5.0	ug/g		
5989024	Hot Water Ext. Boron (B)	2019/02/25	104	75 - 125	103	75 - 125	<0.050	ug/g	0.61	40
5989388	Conductivity	2019/02/25			102	90 - 110	<0.002	mS/cm	1.9	10

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QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
5989415	Available (CaCl2) pH	2019/02/25			100	97 - 103			0.28	N/A

N/A = Not Applicable

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

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

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

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

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

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

VALIDATION SIGNATURE PAGE

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

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

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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CHAIN OF CUSTODY RECORD

Page 1 of 1

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:	
Company Name:	#4398 Terrapex Environmental Ltd	Company Name:		Quotation #:	B80428
Attention:	Accounts Payable	Attention:	Chaoran Li	P.O. #:	
Address:	90 Scarsdale Rd	Address:		Project:	CT2817.00
	Toronto ON M3B 2R7			Project Name:	
Tel:	(416) 245-0011 Fax: (416) 245-0012	Tel:	(416) 245-0011 Ext: 232 Fax:	Site #:	
Email:	accounts.payable@terrapex.com	Email:	c.li@terrapex.com	Sampled By:	

Laboratory Use Only:

Maxxam Job #:	Bottle Order #:
	701400
COC #:	Project Manager:
C#701400-02-01	Ema Gitej

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)
- [x] Table 1 [x] Res/Park [ ] Medium/Fine
- [ ] Table 2 [ ] Ind/Comm [ ] Coarse
- [ ] Table 3 [ ] Agri/Other [x] For RSC
- [ ] Table ___

Other Regulations
- [ ] CCME [ ] Sanitary Sewer Bylaw
- [ ] Reg 558 [ ] Storm Sewer Bylaw
- [ ] MISA Municipality ______
- [ ] PWQO
- [ ] Other ______

Special Instructions

Include Criteria on Certificate of Analysis (Y/N)? N

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT: [x]
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ______ Time Required: ______
Rush Confirmation Number: ______ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	O.Reg 153 VOCs by HS & F1-F4	O.Reg 153 Metals & Inorganics Pkg	O.Reg 153 PAHs								# of Bottles	Comments
1		MW1-1	Feb13,19	8:30	S			X									1	
2																		
3																		
4																		
5																		
6																		
7																		20-Feb-19 14:40
8																		Ema Gitej
9																		B944876
10																		GID ENV-989

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
李超然 / Chaoran Li	19/02/20	10:45	[signature]	2019/02/20	1440	

Laboratory Use Only

Time Sensitive	Temperature (°C) on Recei	Custody Seal	Yes	No
	2 / 2 / 2	Present	✓	
		Intact	✓	

White: Maxxa Yellow: Client

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO MAXXAM'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.MAXXAM.CA/TERMS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT HTTP://MAXXAM.CA/WP-CONTENT/UPLOADS/ONTARIO-COC.PDF.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

10164

Maxxam Analytics International Corporation o/a Maxxam Analytics

Maxxam
A Bureau Veritas Group Company

Your Project #: CT2817.00
Your C.O.C. #: 108381

Attention: Chaoran Li

Terrapex Environmental Ltd
90 Scarsdale Rd
Toronto, ON
CANADA M3B 2R7

Report Date: 2019/02/19
Report #: R5599427
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B936015
Received: 2019/02/08, 15:20

Sample Matrix: Soil
Samples Received: 15

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Methylnaphthalene Sum	5	N/A	2019/02/16	CAM SOP-00301	EPA 8270D m
Hot Water Extractable Boron	3	2019/02/11	2019/02/11	CAM SOP-00408	R153 Ana. Prot. 2011
Hot Water Extractable Boron	2	2019/02/12	2019/02/12	CAM SOP-00408	R153 Ana. Prot. 2011
1,3-Dichloropropene Sum	1	N/A	2019/02/13		EPA 8260C m
1,3-Dichloropropene Sum	5	N/A	2019/02/14		EPA 8260C m
Free (WAD) Cyanide	5	2019/02/13	2019/02/14	CAM SOP-00457	OMOE E3015 m
Conductivity	5	2019/02/14	2019/02/14	CAM SOP-00414	OMOE E3530 v1 m
Hexavalent Chromium in Soil by IC (1)	5	2019/02/12	2019/02/13	CAM SOP-00436	EPA 3060/7199 m
Petroleum Hydro. CCME F1 & BTEX in Soil (2)	1	N/A	2019/02/15	CAM SOP-00315	CCME PHC-CWS m
Petroleum Hydrocarbons F2-F4 in Soil (3)	5	2019/02/14	2019/02/15	CAM SOP-00316	CCME CWS m
Strong Acid Leachable Metals by ICPMS	3	2019/02/11	2019/02/11	CAM SOP-00447	EPA 6020B m
Strong Acid Leachable Metals by ICPMS	2	2019/02/13	2019/02/13	CAM SOP-00447	EPA 6020B m
Moisture	1	N/A	2019/02/09	CAM SOP-00445	Carter 2nd ed 51.2 m
Moisture	13	N/A	2019/02/11	CAM SOP-00445	Carter 2nd ed 51.2 m
PAH Compounds in Soil by GC/MS (SIM)	5	2019/02/15	2019/02/15	CAM SOP-00318	EPA 8270D m
pH CaCl2 EXTRACT	5	2019/02/13	2019/02/13	CAM SOP-00413	EPA 9045 D m
Sodium Adsorption Ratio (SAR)	5	N/A	2019/02/15	CAM SOP-00102	EPA 6010C
Volatile Organic Compounds and F1 PHCs	4	N/A	2019/02/14	CAM SOP-00230	EPA 8260C m
Volatile Organic Compounds in Soil	2	N/A	2019/02/12	CAM SOP-00228	EPA 8260C m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

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

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise

Your Project #: CT2817.00
Your C.O.C. #: 108381

Attention: Chaoran Li

Terrapex Environmental Ltd
90 Scarsdale Rd
Toronto, ON
CANADA M3B 2R7

Report Date: 2019/02/19
Report #: R5599427
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B936015
Received: 2019/02/08, 15:20

agreed in writing. Maxxam is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Maxxam, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Soils are reported on a dry weight basis unless otherwise specified.
(2) No lab extraction date is given for F1BTEX & VOC samples that are field preserved with methanol. Extraction date is the date sampled unless otherwise stated.
(3) All CCME PHC results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Maxxam conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following “Alberta Environment’s Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Validation of Performance-Based Alternative Methods September 2003”. Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Ema Gitej, Senior Project Manager
Email: EGitej@maxxam.ca
Phone# (905)817-5829
==
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Job #: B936015
Report Date: 2019/02/19

Terrapex Environmental Ltd
Client Project #: CT2817.00
Sampler Initials: A

O.REG 153 METALS & INORGANICS PKG (SOIL)

Maxxam ID		IYK273		IYK277	IYK281		IYK284		
Sampling Date		2019/02/07 14:15		2019/02/07 08:45	2019/02/07 10:15		2019/02/07 11:15		
COC Number		108381		108381	108381		108381		
	UNITS	MW2-1	QC Batch	MW8-3	MW10-2	QC Batch	MW7-1	RDL	QC Batch
Calculated Parameters									
Sodium Adsorption Ratio	N/A	11	5968301	3.6	0.87	5968301	18		5968301
Inorganics									
Conductivity	mS/cm	2.9	5974600	0.33	0.33	5974600	1.7	0.002	5974600
Moisture	%	17	5970364	21	19	5970364	18	1.0	5969871
Available (CaCl2) pH	pH	7.72	5972891	7.59	7.68	5972891	7.88		5972891
WAD Cyanide (Free)	ug/g	0.01	5972827	<0.01	<0.01	5972827	0.01	0.01	5972827
Chromium (VI)	ug/g	<0.2	5971002	<0.2	<0.2	5971002	<0.2	0.2	5971002
Metals									
Hot Water Ext. Boron (B)	ug/g	1.7	5970972	0.21	<0.050	5969597	1.1	0.050	5969597
Acid Extractable Antimony (Sb)	ug/g	<0.20	5972604	<0.20	<0.20	5970022	0.40	0.20	5970022
Acid Extractable Arsenic (As)	ug/g	2.6	5972604	2.5	2.1	5970022	3.1	1.0	5970022
Acid Extractable Barium (Ba)	ug/g	75	5972604	95	60	5970022	97	0.50	5970022
Acid Extractable Beryllium (Be)	ug/g	0.43	5972604	0.47	0.35	5970022	0.43	0.20	5970022
Acid Extractable Boron (B)	ug/g	8.0	5972604	6.2	6.1	5970022	6.1	5.0	5970022
Acid Extractable Cadmium (Cd)	ug/g	0.30	5972604	<0.10	<0.10	5970022	0.30	0.10	5970022
Acid Extractable Chromium (Cr)	ug/g	15	5972604	24	13	5970022	17	1.0	5970022
Acid Extractable Cobalt (Co)	ug/g	5.8	5972604	6.8	5.8	5970022	5.0	0.10	5970022
Acid Extractable Copper (Cu)	ug/g	9.2	5972604	14	12	5970022	16	0.50	5970022
Acid Extractable Lead (Pb)	ug/g	16	5972604	6.9	5.4	5970022	100	1.0	5970022
Acid Extractable Molybdenum (Mo)	ug/g	<0.50	5972604	<0.50	<0.50	5970022	<0.50	0.50	5970022
Acid Extractable Nickel (Ni)	ug/g	11	5972604	15	12	5970022	11	0.50	5970022
Acid Extractable Selenium (Se)	ug/g	<0.50	5972604	<0.50	<0.50	5970022	<0.50	0.50	5970022
Acid Extractable Silver (Ag)	ug/g	<0.20	5972604	<0.20	<0.20	5970022	<0.20	0.20	5970022
Acid Extractable Thallium (Tl)	ug/g	0.12	5972604	0.17	0.090	5970022	0.12	0.050	5970022
Acid Extractable Uranium (U)	ug/g	0.40	5972604	0.46	0.46	5970022	0.45	0.050	5970022
Acid Extractable Vanadium (V)	ug/g	27	5972604	32	24	5970022	28	5.0	5970022
Acid Extractable Zinc (Zn)	ug/g	46	5972604	38	27	5970022	92	5.0	5970022
Acid Extractable Mercury (Hg)	ug/g	<0.050	5972604	<0.050	<0.050	5970022	0.16	0.050	5970022

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B936015
Report Date: 2019/02/19

Terrapex Environmental Ltd
Client Project #: CT2817.00
Sampler Initials: A

O.REG 153 METALS & INORGANICS PKG (SOIL)

Maxxam ID		IYK284			IYK288			IYK288		
Sampling Date		2019/02/07 11:15			2019/02/07 08:45			2019/02/07 08:45		
COC Number		108381			108381			108381		
	UNITS	**MW7-1 Lab-Dup**	**RDL**	**QC Batch**	**MW8-93**	**RDL**	**QC Batch**	**MW8-93 Lab-Dup**	**RDL**	**QC Batch**
Calculated Parameters										
Sodium Adsorption Ratio	N/A				16		5968301			
Inorganics										
Conductivity	mS/cm	1.7	0.002	5974600	0.78	0.002	5974600			
Moisture	%				18	1.0	5970364			
Available (CaCl2) pH	pH				7.68		5972891	7.75		5972891
WAD Cyanide (Free)	ug/g				<0.01	0.01	5972827	<0.01	0.01	5972827
Chromium (VI)	ug/g				<0.2	0.2	5971002	<0.2	0.2	5971002
Metals										
Hot Water Ext. Boron (B)	ug/g				0.16	0.050	5970972			
Acid Extractable Antimony (Sb)	ug/g				<0.20	0.20	5972604			
Acid Extractable Arsenic (As)	ug/g				1.8	1.0	5972604			
Acid Extractable Barium (Ba)	ug/g				87	0.50	5972604			
Acid Extractable Beryllium (Be)	ug/g				0.45	0.20	5972604			
Acid Extractable Boron (B)	ug/g				6.7	5.0	5972604			
Acid Extractable Cadmium (Cd)	ug/g				<0.10	0.10	5972604			
Acid Extractable Chromium (Cr)	ug/g				20	1.0	5972604			
Acid Extractable Cobalt (Co)	ug/g				6.6	0.10	5972604			
Acid Extractable Copper (Cu)	ug/g				12	0.50	5972604			
Acid Extractable Lead (Pb)	ug/g				5.5	1.0	5972604			
Acid Extractable Molybdenum (Mo)	ug/g				<0.50	0.50	5972604			
Acid Extractable Nickel (Ni)	ug/g				14	0.50	5972604			
Acid Extractable Selenium (Se)	ug/g				<0.50	0.50	5972604			
Acid Extractable Silver (Ag)	ug/g				<0.20	0.20	5972604			
Acid Extractable Thallium (Tl)	ug/g				0.13	0.050	5972604			
Acid Extractable Uranium (U)	ug/g				0.47	0.050	5972604			
Acid Extractable Vanadium (V)	ug/g				30	5.0	5972604			
Acid Extractable Zinc (Zn)	ug/g				35	5.0	5972604			
Acid Extractable Mercury (Hg)	ug/g				<0.050	0.050	5972604			

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

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Maxxam Job #: B936015
Report Date: 2019/02/19

Terrapex Environmental Ltd
Client Project #: CT2817.00
Sampler Initials: A

O.REG 153 PAHS (SOIL)

Maxxam ID		IYK273			IYK276		IYK280		
Sampling Date		2019/02/07 14:15			2019/02/07 08:45		2019/02/07 10:15		
COC Number		108381			108381		108381		
	UNITS	MW2-1	RDL	QC Batch	MW8-1	RDL	MW10-1	RDL	QC Batch
Inorganics									
Moisture	%				17	1.0	13	1.0	5969871
Calculated Parameters									
Methylnaphthalene, 2-(1-)	ug/g	0.076	0.0071	5968299	<0.0071	0.0071	<0.071	0.071	5968299
Polyaromatic Hydrocarbons									
Acenaphthene	ug/g	<0.0060 (1)	0.0060	5976852	<0.0050	0.0050	<0.050	0.050	5976852
Acenaphthylene	ug/g	<0.0050	0.0050	5976852	0.0053	0.0050	<0.050	0.050	5976852
Anthracene	ug/g	<0.0050	0.0050	5976852	<0.0050	0.0050	<0.050	0.050	5976852
Benzo(a)anthracene	ug/g	<0.0050	0.0050	5976852	0.019	0.0050	0.095	0.050	5976852
Benzo(a)pyrene	ug/g	<0.0050	0.0050	5976852	0.027	0.0050	0.091	0.050	5976852
Benzo(b/j)fluoranthene	ug/g	0.0074	0.0050	5976852	0.033	0.0050	0.12	0.050	5976852
Benzo(g,h,i)perylene	ug/g	<0.0050	0.0050	5976852	0.026	0.0050	0.064	0.050	5976852
Benzo(k)fluoranthene	ug/g	<0.0050	0.0050	5976852	0.010	0.0050	<0.050	0.050	5976852
Chrysene	ug/g	<0.0050	0.0050	5976852	0.022	0.0050	0.075	0.050	5976852
Dibenz(a,h)anthracene	ug/g	<0.0050	0.0050	5976852	<0.0050	0.0050	<0.050	0.050	5976852
Fluoranthene	ug/g	<0.0050	0.0050	5976852	0.069	0.0050	0.27	0.050	5976852
Fluorene	ug/g	<0.0050	0.0050	5976852	<0.0050	0.0050	<0.050	0.050	5976852
Indeno(1,2,3-cd)pyrene	ug/g	<0.0050	0.0050	5976852	0.021	0.0050	0.058	0.050	5976852
1-Methylnaphthalene	ug/g	0.038	0.0050	5976852	<0.0050	0.0050	<0.050	0.050	5976852
2-Methylnaphthalene	ug/g	0.039	0.0050	5976852	<0.0050	0.0050	<0.050	0.050	5976852
Naphthalene	ug/g	0.0071	0.0050	5976852	<0.0050	0.0050	<0.050	0.050	5976852
Phenanthrene	ug/g	0.034	0.0050	5976852	0.033	0.0050	0.14	0.050	5976852
Pyrene	ug/g	0.0053	0.0050	5976852	0.077	0.0050	0.25	0.050	5976852
Surrogate Recovery (%)									
D10-Anthracene	%	100		5976852	107		102		5976852
D14-Terphenyl (FS)	%	104		5976852	109		99		5976852
D8-Acenaphthylene	%	98		5976852	102		92		5976852

RDL = Reportable Detection Limit
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(1) DL was raised due to matrix interference.

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Maxxam Job #: B936015
Report Date: 2019/02/19

Terrapex Environmental Ltd
Client Project #: CT2817.00
Sampler Initials: A

O.REG 153 PAHS (SOIL)

Maxxam ID		IYK284			IYK289		
Sampling Date		2019/02/07 11:15			2019/02/07 10:15		
COC Number		108381			108381		
	UNITS	MW7-1	RDL	QC Batch	MW10-91	RDL	QC Batch
Inorganics							
Moisture	%				14	1.0	5969871
Calculated Parameters							
Methylnaphthalene, 2-(1-)	ug/g	<0.0071	0.0071	5968299	<0.071	0.071	5968299
Polyaromatic Hydrocarbons							
Acenaphthene	ug/g	<0.0050	0.0050	5976852	<0.050	0.050	5976852
Acenaphthylene	ug/g	<0.0050	0.0050	5976852	<0.050	0.050	5976852
Anthracene	ug/g	0.0082	0.0050	5976852	<0.050	0.050	5976852
Benzo(a)anthracene	ug/g	0.034	0.0050	5976852	0.13	0.050	5976852
Benzo(a)pyrene	ug/g	0.034	0.0050	5976852	0.12	0.050	5976852
Benzo(b/j)fluoranthene	ug/g	0.042	0.0050	5976852	0.14	0.050	5976852
Benzo(g,h,i)perylene	ug/g	0.026	0.0050	5976852	0.079	0.050	5976852
Benzo(k)fluoranthene	ug/g	0.016	0.0050	5976852	0.055	0.050	5976852
Chrysene	ug/g	0.032	0.0050	5976852	0.11	0.050	5976852
Dibenz(a,h)anthracene	ug/g	<0.0050	0.0050	5976852	<0.050	0.050	5976852
Fluoranthene	ug/g	0.088	0.0050	5976852	0.33	0.050	5976852
Fluorene	ug/g	<0.0050	0.0050	5976852	<0.050	0.050	5976852
Indeno(1,2,3-cd)pyrene	ug/g	0.024	0.0050	5976852	0.075	0.050	5976852
1-Methylnaphthalene	ug/g	<0.0050	0.0050	5976852	<0.050	0.050	5976852
2-Methylnaphthalene	ug/g	<0.0050	0.0050	5976852	<0.050	0.050	5976852
Naphthalene	ug/g	<0.0050	0.0050	5976852	<0.050	0.050	5976852
Phenanthrene	ug/g	0.047	0.0050	5976852	0.17	0.050	5976852
Pyrene	ug/g	0.082	0.0050	5976852	0.29	0.050	5976852
Surrogate Recovery (%)							
D10-Anthracene	%	90		5976852	105		5976852
D14-Terphenyl (FS)	%	96		5976852	106		5976852
D8-Acenaphthylene	%	88		5976852	99		5976852

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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O.REG 153 PETROLEUM HYDROCARBONS (SOIL)

Maxxam ID		IYK285		
Sampling Date		2019/02/07 11:50		
COC Number		108381		
	UNITS	**MW7-6**	**RDL**	**QC Batch**
Inorganics				
Moisture	%	21	1.0	5969871
BTEX & F1 Hydrocarbons				
Benzene	ug/g	<0.020	0.020	5976046
Toluene	ug/g	<0.020	0.020	5976046
Ethylbenzene	ug/g	<0.020	0.020	5976046
o-Xylene	ug/g	<0.020	0.020	5976046
p+m-Xylene	ug/g	<0.040	0.040	5976046
Total Xylenes	ug/g	<0.040	0.040	5976046
F1 (C6-C10)	ug/g	<10	10	5976046
F1 (C6-C10) - BTEX	ug/g	<10	10	5976046
F2-F4 Hydrocarbons				
F2 (C10-C16 Hydrocarbons)	ug/g	<10	10	5975846
F3 (C16-C34 Hydrocarbons)	ug/g	<50	50	5975846
F4 (C34-C50 Hydrocarbons)	ug/g	<50	50	5975846
Reached Baseline at C50	ug/g	Yes		5975846
Surrogate Recovery (%)				
1,4-Difluorobenzene	%	98		5976046
4-Bromofluorobenzene	%	98		5976046
D10-Ethylbenzene	%	96		5976046
D4-1,2-Dichloroethane	%	99		5976046
o-Terphenyl	%	109		5975846

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B936015
Report Date: 2019/02/19

Terrapex Environmental Ltd
Client Project #: CT2817.00
Sampler Initials: A

O.REG 153 VOCS BY HS & F1-F4 (SOIL)

Maxxam ID		IYK274	IYK278			IYK278			IYK282		
Sampling Date		2019/02/07 14:15	2019/02/07 08:45			2019/02/07 08:45			2019/02/07 10:15		
COC Number		108381	108381			108381			108381		
	UNITS	**MW2-5**	**MW8-5**	**RDL**	**QC Batch**	**MW8-5 Lab-Dup**	**RDL**	**QC Batch**	**MW10-5**	**RDL**	**QC Batch**
Inorganics											
Moisture	%	11	19	1.0	5969871				20	1.0	5969871
Calculated Parameters											
1,3-Dichloropropene (cis+trans)	ug/g	<0.050	<0.050	0.050	5968329				<0.050	0.050	5968329
Volatile Organics											
Acetone (2-Propanone)	ug/g	<0.50	<0.50	0.50	5970813				<0.50	0.50	5970813
Benzene	ug/g	<0.020	<0.020	0.020	5970813				<0.020	0.020	5970813
Bromodichloromethane	ug/g	<0.050	<0.050	0.050	5970813				<0.050	0.050	5970813
Bromoform	ug/g	<0.050	<0.050	0.050	5970813				<0.050	0.050	5970813
Bromomethane	ug/g	<0.050	<0.050	0.050	5970813				<0.050	0.050	5970813
Carbon Tetrachloride	ug/g	<0.050	<0.050	0.050	5970813				<0.050	0.050	5970813
Chlorobenzene	ug/g	<0.050	<0.050	0.050	5970813				<0.050	0.050	5970813
Chloroform	ug/g	<0.050	<0.050	0.050	5970813				<0.050	0.050	5970813
Dibromochloromethane	ug/g	<0.050	<0.050	0.050	5970813				<0.050	0.050	5970813
1,2-Dichlorobenzene	ug/g	<0.050	<0.050	0.050	5970813				<0.050	0.050	5970813
1,3-Dichlorobenzene	ug/g	<0.050	<0.050	0.050	5970813				<0.050	0.050	5970813
1,4-Dichlorobenzene	ug/g	<0.050	<0.050	0.050	5970813				<0.050	0.050	5970813
Dichlorodifluoromethane (FREON 12)	ug/g	<0.050	<0.050	0.050	5970813				<0.050	0.050	5970813
1,1-Dichloroethane	ug/g	<0.050	<0.050	0.050	5970813				<0.050	0.050	5970813
1,2-Dichloroethane	ug/g	<0.050	<0.050	0.050	5970813				<0.050	0.050	5970813
1,1-Dichloroethylene	ug/g	<0.050	<0.050	0.050	5970813				<0.050	0.050	5970813
cis-1,2-Dichloroethylene	ug/g	<0.050	<0.050	0.050	5970813				<0.050	0.050	5970813
trans-1,2-Dichloroethylene	ug/g	<0.050	<0.050	0.050	5970813				<0.050	0.050	5970813
1,2-Dichloropropane	ug/g	<0.050	<0.050	0.050	5970813				<0.050	0.050	5970813
cis-1,3-Dichloropropene	ug/g	<0.030	<0.030	0.030	5970813				<0.030	0.030	5970813
trans-1,3-Dichloropropene	ug/g	<0.040	<0.040	0.040	5970813				<0.040	0.040	5970813
Ethylbenzene	ug/g	<0.020	<0.020	0.020	5970813				<0.020	0.020	5970813
Ethylene Dibromide	ug/g	<0.050	<0.050	0.050	5970813				<0.050	0.050	5970813
Hexane	ug/g	<0.050	<0.050	0.050	5970813				<0.050	0.050	5970813
Methylene Chloride(Dichloromethane)	ug/g	<0.050	<0.050	0.050	5970813				<0.050	0.050	5970813
Methyl Ethyl Ketone (2-Butanone)	ug/g	<0.50	<0.50	0.50	5970813				<0.50	0.50	5970813
Methyl Isobutyl Ketone	ug/g	<0.50	<0.50	0.50	5970813				<0.50	0.50	5970813
Methyl t-butyl ether (MTBE)	ug/g	<0.050	<0.050	0.050	5970813				<0.050	0.050	5970813
Styrene	ug/g	<0.050	<0.050	0.050	5970813				<0.050	0.050	5970813
1,1,1,2-Tetrachloroethane	ug/g	<0.050	<0.050	0.050	5970813				<0.050	0.050	5970813

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

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Maxxam Job #: B936015
Report Date: 2019/02/19

Terrapex Environmental Ltd
Client Project #: CT2817.00
Sampler Initials: A

O.REG 153 VOCS BY HS & F1-F4 (SOIL)

Maxxam ID		IYK274	IYK278			IYK278			IYK282		
Sampling Date		2019/02/07 14:15	2019/02/07 08:45			2019/02/07 08:45			2019/02/07 10:15		
COC Number		108381	108381			108381			108381		
	UNITS	**MW2-5**	**MW8-5**	**RDL**	**QC Batch**	**MW8-5 Lab-Dup**	**RDL**	**QC Batch**	**MW10-5**	**RDL**	**QC Batch**
1,1,2,2-Tetrachloroethane	ug/g	<0.050	<0.050	0.050	5970813				<0.050	0.050	5970813
Tetrachloroethylene	ug/g	<0.050	<0.050	0.050	5970813				<0.050	0.050	5970813
Toluene	ug/g	<0.020	<0.020	0.020	5970813				<0.020	0.020	5970813
1,1,1-Trichloroethane	ug/g	<0.050	<0.050	0.050	5970813				<0.050	0.050	5970813
1,1,2-Trichloroethane	ug/g	<0.050	<0.050	0.050	5970813				<0.050	0.050	5970813
Trichloroethylene	ug/g	<0.050	<0.050	0.050	5970813				<0.050	0.050	5970813
Trichlorofluoromethane (FREON 11)	ug/g	<0.050	<0.050	0.050	5970813				<0.050	0.050	5970813
Vinyl Chloride	ug/g	<0.020	<0.020	0.020	5970813				<0.020	0.020	5970813
p+m-Xylene	ug/g	<0.020	<0.020	0.020	5970813				<0.020	0.020	5970813
o-Xylene	ug/g	<0.020	<0.020	0.020	5970813				<0.020	0.020	5970813
Total Xylenes	ug/g	<0.020	<0.020	0.020	5970813				<0.020	0.020	5970813
F1 (C6-C10)	ug/g	<10	<10	10	5970813				<10	10	5970813
F1 (C6-C10) - BTEX	ug/g	<10	<10	10	5970813				<10	10	5970813
F2-F4 Hydrocarbons											
F2 (C10-C16 Hydrocarbons)	ug/g	<10	<10	10	5975846	<10	10	5975846	<10	10	5975846
F3 (C16-C34 Hydrocarbons)	ug/g	<50	<50	50	5975846	<50	50	5975846	<50	50	5975846
F4 (C34-C50 Hydrocarbons)	ug/g	<50	<50	50	5975846	<50	50	5975846	<50	50	5975846
Reached Baseline at C50	ug/g	Yes	Yes		5975846	Yes		5975846	Yes		5975846
Surrogate Recovery (%)											
o-Terphenyl	%	106	109		5975846	108		5975846	110		5975846
4-Bromofluorobenzene	%	92	93		5970813				92		5970813
D10-o-Xylene	%	95	95		5970813				100		5970813
D4-1,2-Dichloroethane	%	108	108		5970813				109		5970813
D8-Toluene	%	100	100		5970813				100		5970813

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

Maxxam Job #: B936015
Report Date: 2019/02/19

Terrapex Environmental Ltd
Client Project #: CT2817.00
Sampler Initials: A

O.REG 153 VOCS BY HS & F1-F4 (SOIL)

Maxxam ID		IYK282			IYK290		
Sampling Date		2019/02/07 10:15			2019/02/07 10:15		
COC Number		108381			108381		
	UNITS	MW10-5 Lab-Dup	RDL	QC Batch	MW10-95	RDL	QC Batch
Inorganics							
Moisture	%				21	1.0	5969871
Calculated Parameters							
1,3-Dichloropropene (cis+trans)	ug/g				<0.050	0.050	5968329
Volatile Organics							
Acetone (2-Propanone)	ug/g	<0.50	0.50	5970813	<0.50	0.50	5970813
Benzene	ug/g	<0.020	0.020	5970813	<0.020	0.020	5970813
Bromodichloromethane	ug/g	<0.050	0.050	5970813	<0.050	0.050	5970813
Bromoform	ug/g	<0.050	0.050	5970813	<0.050	0.050	5970813
Bromomethane	ug/g	<0.050	0.050	5970813	<0.050	0.050	5970813
Carbon Tetrachloride	ug/g	<0.050	0.050	5970813	<0.050	0.050	5970813
Chlorobenzene	ug/g	<0.050	0.050	5970813	<0.050	0.050	5970813
Chloroform	ug/g	<0.050	0.050	5970813	<0.050	0.050	5970813
Dibromochloromethane	ug/g	<0.050	0.050	5970813	<0.050	0.050	5970813
1,2-Dichlorobenzene	ug/g	<0.050	0.050	5970813	<0.050	0.050	5970813
1,3-Dichlorobenzene	ug/g	<0.050	0.050	5970813	<0.050	0.050	5970813
1,4-Dichlorobenzene	ug/g	<0.050	0.050	5970813	<0.050	0.050	5970813
Dichlorodifluoromethane (FREON 12)	ug/g	<0.050	0.050	5970813	<0.050	0.050	5970813
1,1-Dichloroethane	ug/g	<0.050	0.050	5970813	<0.050	0.050	5970813
1,2-Dichloroethane	ug/g	<0.050	0.050	5970813	<0.050	0.050	5970813
1,1-Dichloroethylene	ug/g	<0.050	0.050	5970813	<0.050	0.050	5970813
cis-1,2-Dichloroethylene	ug/g	<0.050	0.050	5970813	<0.050	0.050	5970813
trans-1,2-Dichloroethylene	ug/g	<0.050	0.050	5970813	<0.050	0.050	5970813
1,2-Dichloropropane	ug/g	<0.050	0.050	5970813	<0.050	0.050	5970813
cis-1,3-Dichloropropene	ug/g	<0.030	0.030	5970813	<0.030	0.030	5970813
trans-1,3-Dichloropropene	ug/g	<0.040	0.040	5970813	<0.040	0.040	5970813
Ethylbenzene	ug/g	<0.020	0.020	5970813	<0.020	0.020	5970813
Ethylene Dibromide	ug/g	<0.050	0.050	5970813	<0.050	0.050	5970813
Hexane	ug/g	<0.050	0.050	5970813	<0.050	0.050	5970813
Methylene Chloride(Dichloromethane)	ug/g	<0.050	0.050	5970813	<0.050	0.050	5970813
Methyl Ethyl Ketone (2-Butanone)	ug/g	<0.50	0.50	5970813	<0.50	0.50	5970813
Methyl Isobutyl Ketone	ug/g	<0.50	0.50	5970813	<0.50	0.50	5970813
Methyl t-butyl ether (MTBE)	ug/g	<0.050	0.050	5970813	<0.050	0.050	5970813
Styrene	ug/g	<0.050	0.050	5970813	<0.050	0.050	5970813
1,1,1,2-Tetrachloroethane	ug/g	<0.050	0.050	5970813	<0.050	0.050	5970813

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

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A Bureau Veritas Group Company

Maxxam Job #: B936015
Report Date: 2019/02/19

Terrapex Environmental Ltd
Client Project #: CT2817.00
Sampler Initials: A

O.REG 153 VOCS BY HS & F1-F4 (SOIL)

Maxxam ID		IYK282			IYK290		
Sampling Date		2019/02/07 10:15			2019/02/07 10:15		
COC Number		108381			108381		
	UNITS	MW10-5 Lab-Dup	RDL	QC Batch	MW10-95	RDL	QC Batch
1,1,2,2-Tetrachloroethane	ug/g	<0.050	0.050	5970813	<0.050	0.050	5970813
Tetrachloroethylene	ug/g	<0.050	0.050	5970813	<0.050	0.050	5970813
Toluene	ug/g	<0.020	0.020	5970813	<0.020	0.020	5970813
1,1,1-Trichloroethane	ug/g	<0.050	0.050	5970813	<0.050	0.050	5970813
1,1,2-Trichloroethane	ug/g	<0.050	0.050	5970813	<0.050	0.050	5970813
Trichloroethylene	ug/g	<0.050	0.050	5970813	<0.050	0.050	5970813
Trichlorofluoromethane (FREON 11)	ug/g	<0.050	0.050	5970813	<0.050	0.050	5970813
Vinyl Chloride	ug/g	<0.020	0.020	5970813	<0.020	0.020	5970813
p+m-Xylene	ug/g	<0.020	0.020	5970813	<0.020	0.020	5970813
o-Xylene	ug/g	<0.020	0.020	5970813	<0.020	0.020	5970813
Total Xylenes	ug/g	<0.020	0.020	5970813	<0.020	0.020	5970813
F1 (C6-C10)	ug/g	<10	10	5970813	<10	10	5970813
F1 (C6-C10) - BTEX	ug/g	<10	10	5970813	<10	10	5970813
F2-F4 Hydrocarbons							
F2 (C10-C16 Hydrocarbons)	ug/g				<10	10	5975846
F3 (C16-C34 Hydrocarbons)	ug/g				<50	50	5975846
F4 (C34-C50 Hydrocarbons)	ug/g				<50	50	5975846
Reached Baseline at C50	ug/g				Yes		5975846
Surrogate Recovery (%)							
o-Terphenyl	%				107		5975846
4-Bromofluorobenzene	%	94		5970813	94		5970813
D10-o-Xylene	%	99		5970813	97		5970813
D4-1,2-Dichloroethane	%	108		5970813	109		5970813
D8-Toluene	%	99		5970813	98		5970813

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

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Maxxam Job #: B936015
Report Date: 2019/02/19

Terrapex Environmental Ltd
Client Project #: CT2817.00
Sampler Initials: A

O.REG 153 VOCS BY HS (SOIL)

Maxxam ID		IYK286			IYK291		
Sampling Date		2019/02/07 11:57			2019/02/07		
COC Number		108381			108381		
	UNITS	MW7-7	RDL	QC Batch	MW1000	RDL	QC Batch
Inorganics							
Moisture	%	24	1.0	5968561			
Calculated Parameters							
1,3-Dichloropropene (cis+trans)	ug/g	<0.050	0.050	5968329	<0.050	0.050	5969212
Volatile Organics							
Acetone (2-Propanone)	ug/g	<0.50	0.50	5970884	<0.50	0.50	5970884
Benzene	ug/g	<0.020	0.020	5970884	<0.020	0.020	5970884
Bromodichloromethane	ug/g	<0.050	0.050	5970884	<0.050	0.050	5970884
Bromoform	ug/g	<0.050	0.050	5970884	<0.050	0.050	5970884
Bromomethane	ug/g	<0.050	0.050	5970884	<0.050	0.050	5970884
Carbon Tetrachloride	ug/g	<0.050	0.050	5970884	<0.050	0.050	5970884
Chlorobenzene	ug/g	<0.050	0.050	5970884	<0.050	0.050	5970884
Chloroform	ug/g	<0.050	0.050	5970884	<0.050	0.050	5970884
Dibromochloromethane	ug/g	<0.050	0.050	5970884	<0.050	0.050	5970884
1,2-Dichlorobenzene	ug/g	<0.050	0.050	5970884	<0.050	0.050	5970884
1,3-Dichlorobenzene	ug/g	<0.050	0.050	5970884	<0.050	0.050	5970884
1,4-Dichlorobenzene	ug/g	<0.050	0.050	5970884	<0.050	0.050	5970884
Dichlorodifluoromethane (FREON 12)	ug/g	<0.050	0.050	5970884	<0.050	0.050	5970884
1,1-Dichloroethane	ug/g	<0.050	0.050	5970884	<0.050	0.050	5970884
1,2-Dichloroethane	ug/g	<0.050	0.050	5970884	<0.050	0.050	5970884
1,1-Dichloroethylene	ug/g	<0.050	0.050	5970884	<0.050	0.050	5970884
cis-1,2-Dichloroethylene	ug/g	<0.050	0.050	5970884	<0.050	0.050	5970884
trans-1,2-Dichloroethylene	ug/g	<0.050	0.050	5970884	<0.050	0.050	5970884
1,2-Dichloropropane	ug/g	<0.050	0.050	5970884	<0.050	0.050	5970884
cis-1,3-Dichloropropene	ug/g	<0.030	0.030	5970884	<0.030	0.030	5970884
trans-1,3-Dichloropropene	ug/g	<0.040	0.040	5970884	<0.040	0.040	5970884
Ethylbenzene	ug/g	<0.020	0.020	5970884	<0.020	0.020	5970884
Ethylene Dibromide	ug/g	<0.050	0.050	5970884	<0.050	0.050	5970884
Hexane	ug/g	<0.050	0.050	5970884	<0.050	0.050	5970884
Methylene Chloride(Dichloromethane)	ug/g	<0.050	0.050	5970884	<0.050	0.050	5970884
Methyl Ethyl Ketone (2-Butanone)	ug/g	<0.50	0.50	5970884	<0.50	0.50	5970884
Methyl Isobutyl Ketone	ug/g	<0.50	0.50	5970884	<0.50	0.50	5970884
Methyl t-butyl ether (MTBE)	ug/g	<0.050	0.050	5970884	<0.050	0.050	5970884
Styrene	ug/g	<0.050	0.050	5970884	<0.050	0.050	5970884
1,1,1,2-Tetrachloroethane	ug/g	<0.050	0.050	5970884	<0.050	0.050	5970884
1,1,2,2-Tetrachloroethane	ug/g	<0.050	0.050	5970884	<0.050	0.050	5970884

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B936015
Report Date: 2019/02/19

Terrapex Environmental Ltd
Client Project #: CT2817.00
Sampler Initials: A

O.REG 153 VOCS BY HS (SOIL)

Maxxam ID		IYK286			IYK291		
Sampling Date		2019/02/07 11:57			2019/02/07		
COC Number		108381			108381		
	UNITS	**MW7-7**	**RDL**	**QC Batch**	**MW1000**	**RDL**	**QC Batch**
Tetrachloroethylene	ug/g	<0.050	0.050	5970884	<0.050	0.050	5970884
Toluene	ug/g	<0.020	0.020	5970884	<0.020	0.020	5970884
1,1,1-Trichloroethane	ug/g	<0.050	0.050	5970884	<0.050	0.050	5970884
1,1,2-Trichloroethane	ug/g	<0.050	0.050	5970884	<0.050	0.050	5970884
Trichloroethylene	ug/g	<0.050	0.050	5970884	<0.050	0.050	5970884
Trichlorofluoromethane (FREON 11)	ug/g	<0.050	0.050	5970884	<0.050	0.050	5970884
Vinyl Chloride	ug/g	<0.020	0.020	5970884	<0.020	0.020	5970884
p+m-Xylene	ug/g	<0.020	0.020	5970884	<0.020	0.020	5970884
o-Xylene	ug/g	<0.020	0.020	5970884	<0.020	0.020	5970884
Total Xylenes	ug/g	<0.020	0.020	5970884	<0.020	0.020	5970884
Surrogate Recovery (%)							
4-Bromofluorobenzene	%	98		5970884	99		5970884
D10-o-Xylene	%	110		5970884	101		5970884
D4-1,2-Dichloroethane	%	93		5970884	92		5970884
D8-Toluene	%	97		5970884	98		5970884

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B936015
Report Date: 2019/02/19

Terrapex Environmental Ltd
Client Project #: CT2817.00
Sampler Initials: A

TEST SUMMARY

Maxxam ID: IYK273
Sample ID: MW2-1
Matrix: Soil

Collected: 2019/02/07
Shipped:
Received: 2019/02/08

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	5968299	N/A	2019/02/16	Automated Statchk
Hot Water Extractable Boron	ICP	5970972	2019/02/12	2019/02/12	Jolly John
Free (WAD) Cyanide	TECH	5972827	2019/02/13	2019/02/14	Barbara Kalbasi Esfahani
Conductivity	AT	5974600	2019/02/14	2019/02/14	Kazzandra Adeva
Hexavalent Chromium in Soil by IC	IC/SPEC	5971002	2019/02/12	2019/02/13	Sally Norouz
Strong Acid Leachable Metals by ICPMS	ICP/MS	5972604	2019/02/13	2019/02/13	Daniel Teclu
Moisture	BAL	5970364	N/A	2019/02/11	Mithunaa Sasitheepan
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	5976852	2019/02/15	2019/02/15	Lingyun Feng
pH CaCl2 EXTRACT	AT	5972891	2019/02/13	2019/02/13	Gnana Thomas
Sodium Adsorption Ratio (SAR)	CALC/MET	5968301	N/A	2019/02/15	Automated Statchk

Maxxam ID: IYK274
Sample ID: MW2-5
Matrix: Soil

Collected: 2019/02/07
Shipped:
Received: 2019/02/08

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
1,3-Dichloropropene Sum	CALC	5968329	N/A	2019/02/14	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5975846	2019/02/14	2019/02/15	Prabhjot Gulati
Moisture	BAL	5969871	N/A	2019/02/11	Mithunaa Sasitheepan
Volatile Organic Compounds and F1 PHCs	GC/MSFD	5970813	N/A	2019/02/14	Manpreet Sarao

Maxxam ID: IYK276
Sample ID: MW8-1
Matrix: Soil

Collected: 2019/02/07
Shipped:
Received: 2019/02/08

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	5968299	N/A	2019/02/16	Automated Statchk
Moisture	BAL	5969871	N/A	2019/02/11	Mithunaa Sasitheepan
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	5976852	2019/02/15	2019/02/15	Lingyun Feng

Maxxam ID: IYK277
Sample ID: MW8-3
Matrix: Soil

Collected: 2019/02/07
Shipped:
Received: 2019/02/08

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hot Water Extractable Boron	ICP	5969597	2019/02/11	2019/02/11	Suban Kanapathippllai
Free (WAD) Cyanide	TECH	5972827	2019/02/13	2019/02/14	Barbara Kalbasi Esfahani
Conductivity	AT	5974600	2019/02/14	2019/02/14	Kazzandra Adeva
Hexavalent Chromium in Soil by IC	IC/SPEC	5971002	2019/02/12	2019/02/13	Sally Norouz
Strong Acid Leachable Metals by ICPMS	ICP/MS	5970022	2019/02/11	2019/02/11	Daniel Teclu
Moisture	BAL	5970364	N/A	2019/02/11	Mithunaa Sasitheepan
pH CaCl2 EXTRACT	AT	5972891	2019/02/13	2019/02/13	Gnana Thomas
Sodium Adsorption Ratio (SAR)	CALC/MET	5968301	N/A	2019/02/15	Automated Statchk

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Maxxam Job #: B936015
Report Date: 2019/02/19

Terrapex Environmental Ltd
Client Project #: CT2817.00
Sampler Initials: A

TEST SUMMARY

Maxxam ID: IYK278 **Collected:** 2019/02/07
Sample ID: MW8-5 **Shipped:**
Matrix: Soil **Received:** 2019/02/08

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
1,3-Dichloropropene Sum	CALC	5968329	N/A	2019/02/14	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5975846	2019/02/14	2019/02/15	Prabhjot Gulati
Moisture	BAL	5969871	N/A	2019/02/11	Mithunaa Sasitheepan
Volatile Organic Compounds and F1 PHCs	GC/MSFD	5970813	N/A	2019/02/14	Manpreet Sarao

Maxxam ID: IYK278 Dup **Collected:** 2019/02/07
Sample ID: MW8-5 **Shipped:**
Matrix: Soil **Received:** 2019/02/08

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5975846	2019/02/14	2019/02/15	Prabhjot Gulati

Maxxam ID: IYK280 **Collected:** 2019/02/07
Sample ID: MW10-1 **Shipped:**
Matrix: Soil **Received:** 2019/02/08

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	5968299	N/A	2019/02/16	Automated Statchk
Moisture	BAL	5969871	N/A	2019/02/11	Mithunaa Sasitheepan
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	5976852	2019/02/15	2019/02/15	Lingyun Feng

Maxxam ID: IYK281 **Collected:** 2019/02/07
Sample ID: MW10-2 **Shipped:**
Matrix: Soil **Received:** 2019/02/08

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hot Water Extractable Boron	ICP	5969597	2019/02/11	2019/02/11	Suban Kanapathippllai
Free (WAD) Cyanide	TECH	5972827	2019/02/13	2019/02/14	Barbara Kalbasi Esfahani
Conductivity	AT	5974600	2019/02/14	2019/02/14	Kazzandra Adeva
Hexavalent Chromium in Soil by IC	IC/SPEC	5971002	2019/02/12	2019/02/13	Sally Norouz
Strong Acid Leachable Metals by ICPMS	ICP/MS	5970022	2019/02/11	2019/02/11	Daniel Teclu
Moisture	BAL	5970364	N/A	2019/02/11	Mithunaa Sasitheepan
pH CaCl2 EXTRACT	AT	5972891	2019/02/13	2019/02/13	Gnana Thomas
Sodium Adsorption Ratio (SAR)	CALC/MET	5968301	N/A	2019/02/15	Automated Statchk

Maxxam ID: IYK282 **Collected:** 2019/02/07
Sample ID: MW10-5 **Shipped:**
Matrix: Soil **Received:** 2019/02/08

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
1,3-Dichloropropene Sum	CALC	5968329	N/A	2019/02/14	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5975846	2019/02/14	2019/02/15	Prabhjot Gulati
Moisture	BAL	5969871	N/A	2019/02/11	Mithunaa Sasitheepan
Volatile Organic Compounds and F1 PHCs	GC/MSFD	5970813	N/A	2019/02/14	Manpreet Sarao

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Maxxam Job #: B936015
Report Date: 2019/02/19

Terrapex Environmental Ltd
Client Project #: CT2817.00
Sampler Initials: A

TEST SUMMARY

Maxxam ID: IYK282 Dup
Sample ID: MW10-5
Matrix: Soil

Collected: 2019/02/07
Shipped:
Received: 2019/02/08

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Volatile Organic Compounds and F1 PHCs	GC/MSFD	5970813	N/A	2019/02/14	Manpreet Sarao

Maxxam ID: IYK284
Sample ID: MW7-1
Matrix: Soil

Collected: 2019/02/07
Shipped:
Received: 2019/02/08

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	5968299	N/A	2019/02/16	Automated Statchk
Hot Water Extractable Boron	ICP	5969597	2019/02/11	2019/02/11	Suban Kanapathippllai
Free (WAD) Cyanide	TECH	5972827	2019/02/13	2019/02/14	Barbara Kalbasi Esfahani
Conductivity	AT	5974600	2019/02/14	2019/02/14	Kazzandra Adeva
Hexavalent Chromium in Soil by IC	IC/SPEC	5971002	2019/02/12	2019/02/13	Sally Norouz
Strong Acid Leachable Metals by ICPMS	ICP/MS	5970022	2019/02/11	2019/02/11	Daniel Teclu
Moisture	BAL	5969871	N/A	2019/02/11	Mithunaa Sasitheepan
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	5976852	2019/02/15	2019/02/15	Lingyun Feng
pH CaCl2 EXTRACT	AT	5972891	2019/02/13	2019/02/13	Gnana Thomas
Sodium Adsorption Ratio (SAR)	CALC/MET	5968301	N/A	2019/02/15	Automated Statchk

Maxxam ID: IYK284 Dup
Sample ID: MW7-1
Matrix: Soil

Collected: 2019/02/07
Shipped:
Received: 2019/02/08

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Conductivity	AT	5974600	2019/02/14	2019/02/14	Kazzandra Adeva

Maxxam ID: IYK285
Sample ID: MW7-6
Matrix: Soil

Collected: 2019/02/07
Shipped:
Received: 2019/02/08

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydro. CCME F1 & BTEX in Soil	HSGC/MSFD	5976046	N/A	2019/02/15	Georgeta Rusu
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5975846	2019/02/14	2019/02/15	Prabhjot Gulati
Moisture	BAL	5969871	N/A	2019/02/11	Mithunaa Sasitheepan

Maxxam ID: IYK286
Sample ID: MW7-7
Matrix: Soil

Collected: 2019/02/07
Shipped:
Received: 2019/02/08

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
1,3-Dichloropropene Sum	CALC	5968329	N/A	2019/02/13	Automated Statchk
Moisture	BAL	5968561	N/A	2019/02/09	Mithunaa Sasitheepan
Volatile Organic Compounds in Soil	GC/MS	5970884	N/A	2019/02/12	Juan Pangilinan

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TEST SUMMARY

Maxxam ID: IYK288
Sample ID: MW8-93
Matrix: Soil

Collected: 2019/02/07
Shipped:
Received: 2019/02/08

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hot Water Extractable Boron	ICP	5970972	2019/02/12	2019/02/12	Jolly John
Free (WAD) Cyanide	TECH	5972827	2019/02/13	2019/02/14	Barbara Kalbasi Esfahani
Conductivity	AT	5974600	2019/02/14	2019/02/14	Kazzandra Adeva
Hexavalent Chromium in Soil by IC	IC/SPEC	5971002	2019/02/12	2019/02/13	Sally Norouz
Strong Acid Leachable Metals by ICPMS	ICP/MS	5972604	2019/02/13	2019/02/13	Daniel Teclu
Moisture	BAL	5970364	N/A	2019/02/11	Mithunaa Sasitheepan
pH CaCl2 EXTRACT	AT	5972891	2019/02/13	2019/02/13	Gnana Thomas
Sodium Adsorption Ratio (SAR)	CALC/MET	5968301	N/A	2019/02/15	Automated Statchk

Maxxam ID: IYK288 Dup
Sample ID: MW8-93
Matrix: Soil

Collected: 2019/02/07
Shipped:
Received: 2019/02/08

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Free (WAD) Cyanide	TECH	5972827	2019/02/13	2019/02/14	Barbara Kalbasi Esfahani
Hexavalent Chromium in Soil by IC	IC/SPEC	5971002	2019/02/12	2019/02/13	Sally Norouz
pH CaCl2 EXTRACT	AT	5972891	2019/02/13	2019/02/13	Gnana Thomas

Maxxam ID: IYK289
Sample ID: MW10-91
Matrix: Soil

Collected: 2019/02/07
Shipped:
Received: 2019/02/08

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	5968299	N/A	2019/02/16	Automated Statchk
Moisture	BAL	5969871	N/A	2019/02/11	Mithunaa Sasitheepan
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	5976852	2019/02/15	2019/02/15	Lingyun Feng

Maxxam ID: IYK290
Sample ID: MW10-95
Matrix: Soil

Collected: 2019/02/07
Shipped:
Received: 2019/02/08

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
1,3-Dichloropropene Sum	CALC	5968329	N/A	2019/02/14	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5975846	2019/02/14	2019/02/15	Prabhjot Gulati
Moisture	BAL	5969871	N/A	2019/02/11	Mithunaa Sasitheepan
Volatile Organic Compounds and F1 PHCs	GC/MSFD	5970813	N/A	2019/02/14	Manpreet Sarao

Maxxam ID: IYK291
Sample ID: MW1000
Matrix: Soil

Collected: 2019/02/07
Shipped:
Received: 2019/02/08

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
1,3-Dichloropropene Sum	CALC	5969212	N/A	2019/02/14	Automated Statchk
Volatile Organic Compounds in Soil	GC/MS	5970884	N/A	2019/02/12	Juan Pangilinan

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Maxxam Job #: B936015
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Client Project #: CT2817.00
Sampler Initials: A

GENERAL COMMENTS

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

Package 1	2.0°C

Cooler custody seal was present and intact.

Sample IYK280 [MW10-1] : PAH Analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.

Sample IYK289 [MW10-91] : PAH Analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
5970813	4-Bromofluorobenzene	2019/02/13	98	60 - 140	98	60 - 140	94	%		
5970813	D10-o-Xylene	2019/02/13	102	60 - 130	93	60 - 130	91	%		
5970813	D4-1,2-Dichloroethane	2019/02/13	105	60 - 140	107	60 - 140	108	%		
5970813	D8-Toluene	2019/02/13	102	60 - 140	101	60 - 140	99	%		
5970884	4-Bromofluorobenzene	2019/02/12	101	60 - 140	101	60 - 140	99	%		
5970884	D10-o-Xylene	2019/02/12	115	60 - 130	89	60 - 130	91	%		
5970884	D4-1,2-Dichloroethane	2019/02/12	91	60 - 140	93	60 - 140	94	%		
5970884	D8-Toluene	2019/02/12	101	60 - 140	99	60 - 140	96	%		
5975846	o-Terphenyl	2019/02/15	100	60 - 130	97	60 - 130	96	%		
5976046	1,4-Difluorobenzene	2019/02/15	101	60 - 140	99	60 - 140	98	%		
5976046	4-Bromofluorobenzene	2019/02/15	100	60 - 140	99	60 - 140	95	%		
5976046	D10-Ethylbenzene	2019/02/15	103	60 - 140	98	60 - 140	92	%		
5976046	D4-1,2-Dichloroethane	2019/02/15	101	60 - 140	100	60 - 140	101	%		
5976852	D10-Anthracene	2019/02/15	94	50 - 130	88	50 - 130	88	%		
5976852	D14-Terphenyl (FS)	2019/02/15	98	50 - 130	97	50 - 130	91	%		
5976852	D8-Acenaphthylene	2019/02/15	90	50 - 130	88	50 - 130	86	%		
5968561	Moisture	2019/02/09							1.7	20
5969597	Hot Water Ext. Boron (B)	2019/02/11	101	75 - 125	102	75 - 125	<0.050	ug/g	5.5	40
5969871	Moisture	2019/02/11							1.7	20
5970022	Acid Extractable Antimony (Sb)	2019/02/11	94	75 - 125	98	80 - 120	<0.20	ug/g		
5970022	Acid Extractable Arsenic (As)	2019/02/11	98	75 - 125	93	80 - 120	<1.0	ug/g	15	30
5970022	Acid Extractable Barium (Ba)	2019/02/11	NC	75 - 125	96	80 - 120	<0.50	ug/g		
5970022	Acid Extractable Beryllium (Be)	2019/02/11	98	75 - 125	96	80 - 120	<0.20	ug/g		
5970022	Acid Extractable Boron (B)	2019/02/11	95	75 - 125	94	80 - 120	<5.0	ug/g		
5970022	Acid Extractable Cadmium (Cd)	2019/02/11	92	75 - 125	97	80 - 120	<0.10	ug/g		
5970022	Acid Extractable Chromium (Cr)	2019/02/11	96	75 - 125	97	80 - 120	<1.0	ug/g		
5970022	Acid Extractable Cobalt (Co)	2019/02/11	97	75 - 125	97	80 - 120	<0.10	ug/g		
5970022	Acid Extractable Copper (Cu)	2019/02/11	97	75 - 125	99	80 - 120	<0.50	ug/g		
5970022	Acid Extractable Lead (Pb)	2019/02/11	86	75 - 125	94	80 - 120	<1.0	ug/g		
5970022	Acid Extractable Mercury (Hg)	2019/02/11	83	75 - 125	89	80 - 120	<0.050	ug/g		
5970022	Acid Extractable Molybdenum (Mo)	2019/02/11	100	75 - 125	97	80 - 120	<0.50	ug/g		
5970022	Acid Extractable Nickel (Ni)	2019/02/11	97	75 - 125	98	80 - 120	<0.50	ug/g		

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
5970022	Acid Extractable Selenium (Se)	2019/02/11	97	75 - 125	101	80 - 120	<0.50	ug/g		
5970022	Acid Extractable Silver (Ag)	2019/02/11	92	75 - 125	96	80 - 120	<0.20	ug/g		
5970022	Acid Extractable Thallium (Tl)	2019/02/11	90	75 - 125	94	80 - 120	<0.050	ug/g		
5970022	Acid Extractable Uranium (U)	2019/02/11	92	75 - 125	93	80 - 120	<0.050	ug/g		
5970022	Acid Extractable Vanadium (V)	2019/02/11	93	75 - 125	96	80 - 120	<5.0	ug/g		
5970022	Acid Extractable Zinc (Zn)	2019/02/11	NC	75 - 125	98	80 - 120	<5.0	ug/g		
5970813	1,1,1,2-Tetrachloroethane	2019/02/14	101	60 - 140	97	60 - 130	<0.050	ug/g	NC	50
5970813	1,1,1-Trichloroethane	2019/02/14	103	60 - 140	99	60 - 130	<0.050	ug/g	NC	50
5970813	1,1,2,2-Tetrachloroethane	2019/02/14	101	60 - 140	99	60 - 130	<0.050	ug/g	NC	50
5970813	1,1,2-Trichloroethane	2019/02/14	109	60 - 140	106	60 - 130	<0.050	ug/g	NC	50
5970813	1,1-Dichloroethane	2019/02/14	102	60 - 140	99	60 - 130	<0.050	ug/g	NC	50
5970813	1,1-Dichloroethylene	2019/02/14	104	60 - 140	100	60 - 130	<0.050	ug/g	NC	50
5970813	1,2-Dichlorobenzene	2019/02/14	103	60 - 140	100	60 - 130	<0.050	ug/g	NC	50
5970813	1,2-Dichloroethane	2019/02/14	107	60 - 140	104	60 - 130	<0.050	ug/g	NC	50
5970813	1,2-Dichloropropane	2019/02/14	100	60 - 140	97	60 - 130	<0.050	ug/g	NC	50
5970813	1,3-Dichlorobenzene	2019/02/14	105	60 - 140	104	60 - 130	<0.050	ug/g	NC	50
5970813	1,4-Dichlorobenzene	2019/02/14	109	60 - 140	107	60 - 130	<0.050	ug/g	NC	50
5970813	Acetone (2-Propanone)	2019/02/14	111	60 - 140	109	60 - 140	<0.50	ug/g	NC	50
5970813	Benzene	2019/02/14	103	60 - 140	99	60 - 130	<0.020	ug/g	NC	50
5970813	Bromodichloromethane	2019/02/14	99	60 - 140	96	60 - 130	<0.050	ug/g	NC	50
5970813	Bromoform	2019/02/14	94	60 - 140	91	60 - 130	<0.050	ug/g	NC	50
5970813	Bromomethane	2019/02/14	103	60 - 140	99	60 - 140	<0.050	ug/g	NC	50
5970813	Carbon Tetrachloride	2019/02/14	101	60 - 140	98	60 - 130	<0.050	ug/g	NC	50
5970813	Chlorobenzene	2019/02/14	99	60 - 140	96	60 - 130	<0.050	ug/g	NC	50
5970813	Chloroform	2019/02/14	103	60 - 140	100	60 - 130	<0.050	ug/g	NC	50
5970813	cis-1,2-Dichloroethylene	2019/02/14	104	60 - 140	101	60 - 130	<0.050	ug/g	NC	50
5970813	cis-1,3-Dichloropropene	2019/02/14	85	60 - 140	82	60 - 130	<0.030	ug/g	NC	50
5970813	Dibromochloromethane	2019/02/14	105	60 - 140	103	60 - 130	<0.050	ug/g	NC	50
5970813	Dichlorodifluoromethane (FREON 12)	2019/02/14	107	60 - 140	102	60 - 140	<0.050	ug/g	NC	50
5970813	Ethylbenzene	2019/02/14	100	60 - 140	96	60 - 130	<0.020	ug/g	NC	50
5970813	Ethylene Dibromide	2019/02/14	103	60 - 140	101	60 - 130	<0.050	ug/g	NC	50
5970813	F1 (C6-C10) - BTEX	2019/02/14					<10	ug/g	NC	30

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
5970813	F1 (C6-C10)	2019/02/14	103	60 - 140	94	80 - 120	<10	ug/g	NC	30
5970813	Hexane	2019/02/14	102	60 - 140	97	60 - 130	<0.050	ug/g	NC	50
5970813	Methyl Ethyl Ketone (2-Butanone)	2019/02/14	107	60 - 140	105	60 - 140	<0.50	ug/g	NC	50
5970813	Methyl Isobutyl Ketone	2019/02/14	98	60 - 140	95	60 - 130	<0.50	ug/g	NC	50
5970813	Methyl t-butyl ether (MTBE)	2019/02/14	100	60 - 140	97	60 - 130	<0.050	ug/g	NC	50
5970813	Methylene Chloride(Dichloromethane)	2019/02/14	99	60 - 140	96	60 - 130	<0.050	ug/g	NC	50
5970813	o-Xylene	2019/02/14	101	60 - 140	96	60 - 130	<0.020	ug/g	NC	50
5970813	p+m-Xylene	2019/02/14	100	60 - 140	95	60 - 130	<0.020	ug/g	NC	50
5970813	Styrene	2019/02/14	98	60 - 140	95	60 - 130	<0.050	ug/g	NC	50
5970813	Tetrachloroethylene	2019/02/14	105	60 - 140	101	60 - 130	<0.050	ug/g	NC	50
5970813	Toluene	2019/02/14	100	60 - 140	96	60 - 130	<0.020	ug/g	NC	50
5970813	Total Xylenes	2019/02/14					<0.020	ug/g	NC	50
5970813	trans-1,2-Dichloroethylene	2019/02/14	103	60 - 140	100	60 - 130	<0.050	ug/g	NC	50
5970813	trans-1,3-Dichloropropene	2019/02/14	89	60 - 140	86	60 - 130	<0.040	ug/g	NC	50
5970813	Trichloroethylene	2019/02/14	102	60 - 140	98	60 - 130	<0.050	ug/g	NC	50
5970813	Trichlorofluoromethane (FREON 11)	2019/02/14	108	60 - 140	104	60 - 130	<0.050	ug/g	NC	50
5970813	Vinyl Chloride	2019/02/14	99	60 - 140	96	60 - 130	<0.020	ug/g	NC	50
5970884	1,1,1,2-Tetrachloroethane	2019/02/12	100	60 - 140	96	60 - 130	<0.050	ug/g		
5970884	1,1,1-Trichloroethane	2019/02/12	101	60 - 140	96	60 - 130	<0.050	ug/g		
5970884	1,1,2,2-Tetrachloroethane	2019/02/12	93	60 - 140	93	60 - 130	<0.050	ug/g	NC	50
5970884	1,1,2-Trichloroethane	2019/02/12	91	60 - 140	88	60 - 130	<0.050	ug/g	NC	50
5970884	1,1-Dichloroethane	2019/02/12	100	60 - 140	96	60 - 130	<0.050	ug/g		
5970884	1,1-Dichloroethylene	2019/02/12	102	60 - 140	97	60 - 130	<0.050	ug/g		
5970884	1,2-Dichlorobenzene	2019/02/12	100	60 - 140	97	60 - 130	<0.050	ug/g		
5970884	1,2-Dichloroethane	2019/02/12	92	60 - 140	90	60 - 130	<0.050	ug/g		
5970884	1,2-Dichloropropane	2019/02/12	98	60 - 140	95	60 - 130	<0.050	ug/g		
5970884	1,3-Dichlorobenzene	2019/02/12	106	60 - 140	100	60 - 130	<0.050	ug/g		
5970884	1,4-Dichlorobenzene	2019/02/12	105	60 - 140	99	60 - 130	<0.050	ug/g		
5970884	Acetone (2-Propanone)	2019/02/12	96	60 - 140	88	60 - 140	<0.50	ug/g		
5970884	Benzene	2019/02/12	100	60 - 140	96	60 - 130	<0.020	ug/g		
5970884	Bromodichloromethane	2019/02/12	96	60 - 140	94	60 - 130	<0.050	ug/g		
5970884	Bromoform	2019/02/12	94	60 - 140	93	60 - 130	<0.050	ug/g		

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
5970884	Bromomethane	2019/02/12	108	60 - 140	103	60 - 140	<0.050	ug/g		
5970884	Carbon Tetrachloride	2019/02/12	103	60 - 140	98	60 - 130	<0.050	ug/g		
5970884	Chlorobenzene	2019/02/12	100	60 - 140	95	60 - 130	<0.050	ug/g		
5970884	Chloroform	2019/02/12	99	60 - 140	96	60 - 130	<0.050	ug/g		
5970884	cis-1,2-Dichloroethylene	2019/02/12	99	60 - 140	95	60 - 130	<0.050	ug/g	NC	50
5970884	cis-1,3-Dichloropropene	2019/02/12	103	60 - 140	99	60 - 130	<0.030	ug/g		
5970884	Dibromochloromethane	2019/02/12	97	60 - 140	95	60 - 130	<0.050	ug/g		
5970884	Dichlorodifluoromethane (FREON 12)	2019/02/12	114	60 - 140	107	60 - 140	<0.050	ug/g		
5970884	Ethylbenzene	2019/02/12	102	60 - 140	97	60 - 130	<0.020	ug/g		
5970884	Ethylene Dibromide	2019/02/12	97	60 - 140	94	60 - 130	<0.050	ug/g		
5970884	Hexane	2019/02/12	105	60 - 140	98	60 - 130	<0.050	ug/g	NC	50
5970884	Methyl Ethyl Ketone (2-Butanone)	2019/02/12	95	60 - 140	92	60 - 140	<0.50	ug/g		
5970884	Methyl Isobutyl Ketone	2019/02/12	93	60 - 140	94	60 - 130	<0.50	ug/g		
5970884	Methyl t-butyl ether (MTBE)	2019/02/12	97	60 - 140	93	60 - 130	<0.050	ug/g		
5970884	Methylene Chloride(Dichloromethane)	2019/02/12	94	60 - 140	91	60 - 130	<0.050	ug/g		
5970884	o-Xylene	2019/02/12	100	60 - 140	95	60 - 130	<0.020	ug/g		
5970884	p+m-Xylene	2019/02/12	103	60 - 140	97	60 - 130	<0.020	ug/g		
5970884	Styrene	2019/02/12	103	60 - 140	98	60 - 130	<0.050	ug/g		
5970884	Tetrachloroethylene	2019/02/12	107	60 - 140	101	60 - 130	<0.050	ug/g		
5970884	Toluene	2019/02/12	100	60 - 140	94	60 - 130	<0.020	ug/g		
5970884	Total Xylenes	2019/02/12					<0.020	ug/g		
5970884	trans-1,2-Dichloroethylene	2019/02/12	101	60 - 140	96	60 - 130	<0.050	ug/g	NC	50
5970884	trans-1,3-Dichloropropene	2019/02/12	100	60 - 140	94	60 - 130	<0.040	ug/g		
5970884	Trichloroethylene	2019/02/12	105	60 - 140	101	60 - 130	<0.050	ug/g	NC	50
5970884	Trichlorofluoromethane (FREON 11)	2019/02/12	104	60 - 140	99	60 - 130	<0.050	ug/g		
5970884	Vinyl Chloride	2019/02/12	109	60 - 140	103	60 - 130	<0.020	ug/g		
5970972	Hot Water Ext. Boron (B)	2019/02/12	103	75 - 125	95	75 - 125	<0.050	ug/g	4.4	40
5971002	Chromium (VI)	2019/02/13	89	70 - 130	89	80 - 120	<0.2	ug/g	NC	35
5972604	Acid Extractable Antimony (Sb)	2019/02/13	81	75 - 125	102	80 - 120	<0.20	ug/g	0.89	30
5972604	Acid Extractable Arsenic (As)	2019/02/13	92	75 - 125	108	80 - 120	<1.0	ug/g	19	30
5972604	Acid Extractable Barium (Ba)	2019/02/13	NC	75 - 125	94	80 - 120	<0.50	ug/g	1.8	30
5972604	Acid Extractable Beryllium (Be)	2019/02/13	97	75 - 125	104	80 - 120	<0.20	ug/g	4.2	30

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
5972604	Acid Extractable Boron (B)	2019/02/13	97	75 - 125	103	80 - 120	<5.0	ug/g	2.2	30
5972604	Acid Extractable Cadmium (Cd)	2019/02/13	92	75 - 125	97	80 - 120	<0.10	ug/g	4.6	30
5972604	Acid Extractable Chromium (Cr)	2019/02/13	101	75 - 125	104	80 - 120	<1.0	ug/g	4.1	30
5972604	Acid Extractable Cobalt (Co)	2019/02/13	94	75 - 125	102	80 - 120	<0.10	ug/g	2.6	30
5972604	Acid Extractable Copper (Cu)	2019/02/13	NC	75 - 125	103	80 - 120	<0.50	ug/g	2.0	30
5972604	Acid Extractable Lead (Pb)	2019/02/13	NC	75 - 125	100	80 - 120	<1.0	ug/g	0.80	30
5972604	Acid Extractable Mercury (Hg)	2019/02/13	86	75 - 125	93	80 - 120	<0.050	ug/g	1.9	30
5972604	Acid Extractable Molybdenum (Mo)	2019/02/13	98	75 - 125	101	80 - 120	<0.50	ug/g	18	30
5972604	Acid Extractable Nickel (Ni)	2019/02/13	94	75 - 125	102	80 - 120	<0.50	ug/g	1.4	30
5972604	Acid Extractable Selenium (Se)	2019/02/13	91	75 - 125	102	80 - 120	<0.50	ug/g	NC	30
5972604	Acid Extractable Silver (Ag)	2019/02/13	91	75 - 125	103	80 - 120	<0.20	ug/g	15	30
5972604	Acid Extractable Thallium (Tl)	2019/02/13	89	75 - 125	100	80 - 120	<0.050	ug/g	13	30
5972604	Acid Extractable Uranium (U)	2019/02/13	86	75 - 125	94	80 - 120	<0.050	ug/g	19	30
5972604	Acid Extractable Vanadium (V)	2019/02/13	101	75 - 125	100	80 - 120	<5.0	ug/g	3.3	30
5972604	Acid Extractable Zinc (Zn)	2019/02/13	NC	75 - 125	96	80 - 120	<5.0	ug/g	3.8	30
5972827	WAD Cyanide (Free)	2019/02/14	99	75 - 125	98	80 - 120	<0.01	ug/g	NC	35
5972891	Available (CaCl2) pH	2019/02/13			100	97 - 103			0.94	N/A
5974600	Conductivity	2019/02/14			103	90 - 110	<0.002	mS/cm	0.77	10
5975846	F2 (C10-C16 Hydrocarbons)	2019/02/15	105	50 - 130	102	80 - 120	<10	ug/g	NC	30
5975846	F3 (C16-C34 Hydrocarbons)	2019/02/15	100	50 - 130	97	80 - 120	<50	ug/g	NC	30
5975846	F4 (C34-C50 Hydrocarbons)	2019/02/15	102	50 - 130	99	80 - 120	<50	ug/g	NC	30
5976046	Benzene	2019/02/15	91	60 - 140	94	60 - 140	<0.020	ug/g	NC	50
5976046	Ethylbenzene	2019/02/15	97	60 - 140	100	60 - 140	<0.020	ug/g	NC	50
5976046	F1 (C6-C10) - BTEX	2019/02/15					<10	ug/g	NC	30
5976046	F1 (C6-C10)	2019/02/15	99	60 - 140	104	80 - 120	<10	ug/g	NC	30
5976046	o-Xylene	2019/02/15	95	60 - 140	97	60 - 140	<0.020	ug/g	NC	50
5976046	p+m-Xylene	2019/02/15	97	60 - 140	100	60 - 140	<0.040	ug/g	NC	50
5976046	Toluene	2019/02/15	99	60 - 140	101	60 - 140	<0.020	ug/g	NC	50
5976046	Total Xylenes	2019/02/15					<0.040	ug/g	NC	50
5976852	1-Methylnaphthalene	2019/02/15	88	50 - 130	90	50 - 130	<0.0050	ug/g	NC	40
5976852	2-Methylnaphthalene	2019/02/15	79	50 - 130	79	50 - 130	<0.0050	ug/g	NC	40
5976852	Acenaphthene	2019/02/15	83	50 - 130	86	50 - 130	<0.0050	ug/g	NC	40

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
5976852	Acenaphthylene	2019/02/15	87	50 - 130	86	50 - 130	<0.0050	ug/g	NC	40
5976852	Anthracene	2019/02/15	82	50 - 130	80	50 - 130	<0.0050	ug/g	NC	40
5976852	Benzo(a)anthracene	2019/02/15	90	50 - 130	88	50 - 130	<0.0050	ug/g	NC	40
5976852	Benzo(a)pyrene	2019/02/15	88	50 - 130	85	50 - 130	<0.0050	ug/g	NC	40
5976852	Benzo(b/j)fluoranthene	2019/02/15	80	50 - 130	84	50 - 130	<0.0050	ug/g	NC	40
5976852	Benzo(g,h,i)perylene	2019/02/15	83	50 - 130	83	50 - 130	<0.0050	ug/g	NC	40
5976852	Benzo(k)fluoranthene	2019/02/15	82	50 - 130	80	50 - 130	<0.0050	ug/g	NC	40
5976852	Chrysene	2019/02/15	87	50 - 130	85	50 - 130	<0.0050	ug/g	NC	40
5976852	Dibenz(a,h)anthracene	2019/02/15	84	50 - 130	81	50 - 130	<0.0050	ug/g	NC	40
5976852	Fluoranthene	2019/02/15	89	50 - 130	88	50 - 130	<0.0050	ug/g	NC	40
5976852	Fluorene	2019/02/15	83	50 - 130	83	50 - 130	<0.0050	ug/g	NC	40
5976852	Indeno(1,2,3-cd)pyrene	2019/02/15	85	50 - 130	85	50 - 130	<0.0050	ug/g	NC	40
5976852	Naphthalene	2019/02/15	81	50 - 130	80	50 - 130	<0.0050	ug/g	NC	40
5976852	Phenanthrene	2019/02/15	82	50 - 130	82	50 - 130	<0.0050	ug/g	NC	40
5976852	Pyrene	2019/02/15	90	50 - 130	90	50 - 130	<0.0050	ug/g	NC	40

N/A = Not Applicable

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

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

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

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

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

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

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

VALIDATION SIGNATURE PAGE

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

Anastassia Hamanov, Scientific Specialist

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

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Phone: 905-817-5700 Fax: 905-817-5779 Toll Free: 800-563-6266
CAM FCD-01191/3

CHAIN OF CUSTODY RECORD

108381 Page 1 of 2

Invoice Information		Report Information (if differs from invoice)		Project Information (where applicable)		Turnaround Time (TAT) Required
Company Name:	Terrapex Environmental Ltd	Company Name:		Quotation #:	TPEX	[X] Regular TAT (5-7 days) Most analyses
Contact Name:	Chaoran Li	Contact Name:		P.O. #/ AFE#:		PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS
Address:	90 Scarsdale Rd, Toronto.	Address:		Project #:	CT2817.00	Rush TAT (Surcharges will be applied)
				Site Location:		[ ] 1 Day [ ] 2 Days [ ] 3-4 Days
Phone:	416-245-0011 Fax: 416-245-0012	Phone: Fax:		Site #:		
Email:	c.li@terrapex.com	Email:		Sampled By:	Allan	Date Required:

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Rush Confirmation #:

Regulation 153			Other Regulations	
[X] Table 1	[X] Res/Park	[ ] Med/ Fine	[ ] CCME	[ ] Sanitary Sewer Bylaw
[ ] Table 2	[ ] Ind/Comm	[ ] Coarse	[ ] MISA	[ ] Storm Sewer Bylaw
[ ] Table 3	[ ] Agri/ Other		[ ] PWQO	Region
[ ] Table ___			[ ] Other (Specify)	
FOR RSC (PLEASE CIRCLE) Y / N			[ ] REG 558 (MIN. 3 DAY TAT REQUIRED)	

Include Criteria on Certificate of Analysis: Y / N

SAMPLES MUST BE KEPT COOL (< 10 °C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

Analysis Requested

	SAMPLE IDENTIFICATION	DATE SAMPLED (YYYY/MM/DD)	TIME SAMPLED (HH:MM)	MATRIX	# OF CONTAINERS SUBMITTED	FIELD FILTERED (CIRCLE) Metals / Hg / CrVI	BTEX/ PHC F1	PHCs F2 - F4	VOCs	REG 153 METALS & INORGANICS	REG 153 ICPMS METALS	REG 153 METALS (Hg, Cr VI, ICPMS Metals, HWS - B)	PAHS	HOLD- DO NOT ANALYZE	COMMENTS
1	MW2-1	2019/02/07	14:15	S	2					X			X		Limited Recovery
2	MW2-5		14:15	S	3		X	X	X						
3	MW2-8		14.15	S	3		X	X	X					X	
4	MW8-1		8:45	S	1								X		
5	MW8-3		8:45	S	2					X					
6	MW8-5		8.45	S	3		X	X	X						
7	MW8-8		8:45	S	3		X	X	X					X	
8	MW10-1		10:15	S	1								X		
9	MW10-2		10:15	S	2					X					
10	MW10-5		10:15	S	3		X	X	X						

LABORATORY USE ONLY

CUSTODY SEAL Y / N		COOLER TEMPERATURES
Present	Intact	
Y	Y	4/1/1

COOLING MEDIA PRESENT: Y / N

RELINQUISHED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)	RECEIVED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)
Chaoran Li	2019/02/08	2:15		2019/02/08	15:20

08-Feb-19 15:20
Erna Gitej
B936015
KVG ENV-1355

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COC-1004 (03/17)

White: Maxxam - Yellow: Client

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6740 Campobello Road, Mississauga, Ontario L5N 2L8
Phone: 905-817-5700 Fax: 905-817-5779 Toll Free: 800-563-6266
CAM FCD-01191/3

CHAIN OF CUSTODY RECORD

108384 Page 2 of 2

Invoice Information		Report Information (if differs from invoice)		Project Information (where applicable)	
Company Name:	Terrapex Environmental Ltd	Company Name:		Quotation #:	TPEX
Contact Name:	Chearan L.	Contact Name:		P.O. #/ AFE#:	
Address:	90 Scarsdale Rd, Toronto	Address:		Project #:	CT2817.00
Phone:	416-245-0011 Fax: 416-245-2012	Phone:	Fax:	Site Location:	
Email:	C.Li@terrapex.com	Email:		Site #:	
				Sampled By:	Allan.

Turnaround Time (TAT) Required
- [X] Regular TAT (5-7 days) Most analyses

PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS

Rush TAT (Surcharges will be applied)
- [ ] 1 Day
- [ ] 2 Days
- [ ] 3-4 Days

Date Required:

Rush Confirmation #:

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153
- [X] Table 1
- [ ] Table 2
- [ ] Table 3
- [ ] Table ____
- [X] Res/Park
- [ ] Ind/Comm
- [ ] Agri/ Other
- [ ] Med/ Fine
- [ ] Coarse

FOR RSC (PLEASE CIRCLE) Y / N

Other Regulations
- [ ] CCME
- [ ] MISA
- [ ] PWQO
- [ ] Other (Specify)
- [ ] REG 558 (MIN. 3 DAY TAT REQUIRED)
- [ ] Sanitary Sewer Bylaw
- [ ] Storm Sewer Bylaw

Region ____

Include Criteria on Certificate of Analysis: Y / N

SAMPLES MUST BE KEPT COOL (< 10 °C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

Analysis Requested

	SAMPLE IDENTIFICATION	DATE SAMPLED (YYYY/MM/DD)	TIME SAMPLED (HH:MM)	MATRIX	# OF CONTAINERS SUBMITTED	FIELD FILTERED (CIRCLE) Metals / Hg / CrVI	BTEX/ PHC F1	PHCs F2 - F4	VOCs	REG 153 METALS & INORGANICS	REG 153 ICPMS METALS	REG 153 METALS (Hg, Cr VI, ICPMS Metals, HWS - B)	PAHs	HOLD- DO NOT ANALYZE
1	MW10-7	2019/02/07	10:15	S	3		X	X	X					X
2	MW7-1	2019/02/07	11:15	S	3					X			X	
3	MW7-6		11:[illegible]	S	3		X	X						
4	MW7-7		11:[illegible]	S	3				X					
5	MW7-9		12:20	S	3		X	X	X					X
6	MW9-93		8:45	S	1					X				
7	MW10-91		10:15	S	1								X	
8	MW10-95		10:15	S	3		X	X	X					
9	MW100			S	1				X					
10														

LABORATORY USE ONLY

CUSTODY SEAL Y / N		COOLER TEMPERATURES
Present	Intact	
Y	Y	4/1/1

COOLING MEDIA PRESENT: Y / N

COMMENTS

RELINQUISHED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)	RECEIVED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)	MAXXAM JOB #
Chearan Li [signature]	2019/02/08	2:15	[signature]	2019/02/08	15:00	

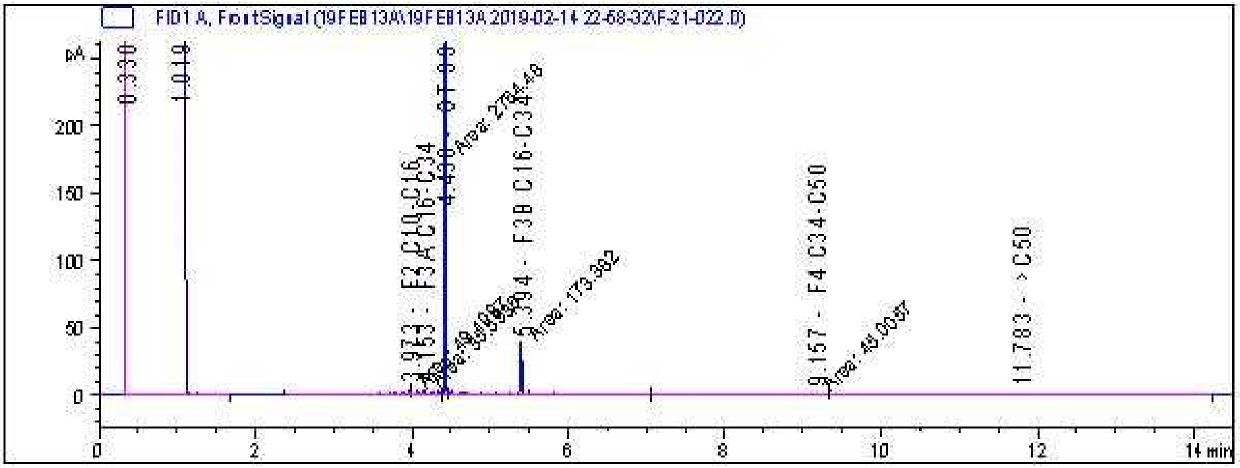
Unless otherwise agreed to in writing, work submitted on this Chain of Custody is subject to Maxxam's standard Terms and Conditions. Signing of this Chain of Custody document is acknowledgment and acceptance of our terms which are available for viewing at www.maxxam.ca/terms. Sample container, preservation, hold time and packages information can be viewed at http://maxxam.ca/wp-content/uploads/Ontario-COC.pdf.

COC-1004 (03/17)

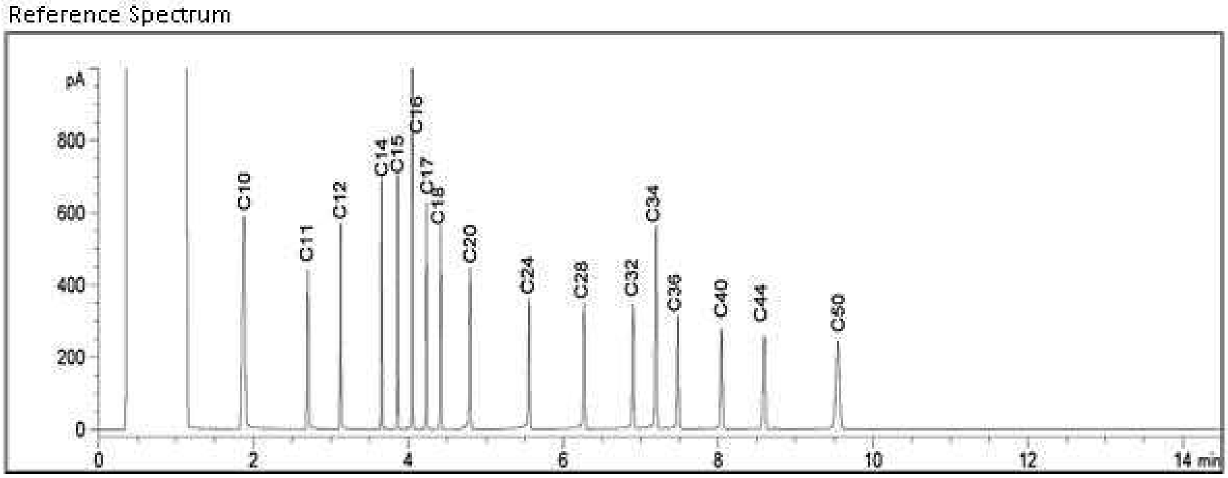
Maxxam Job #: B936015
Report Date: 2019/02/19
Maxxam Sample: IYK274

Terrapex Environmental Ltd
Client Project #: CT2817.00
Client ID: MW2-5

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram



Reference Spectrum

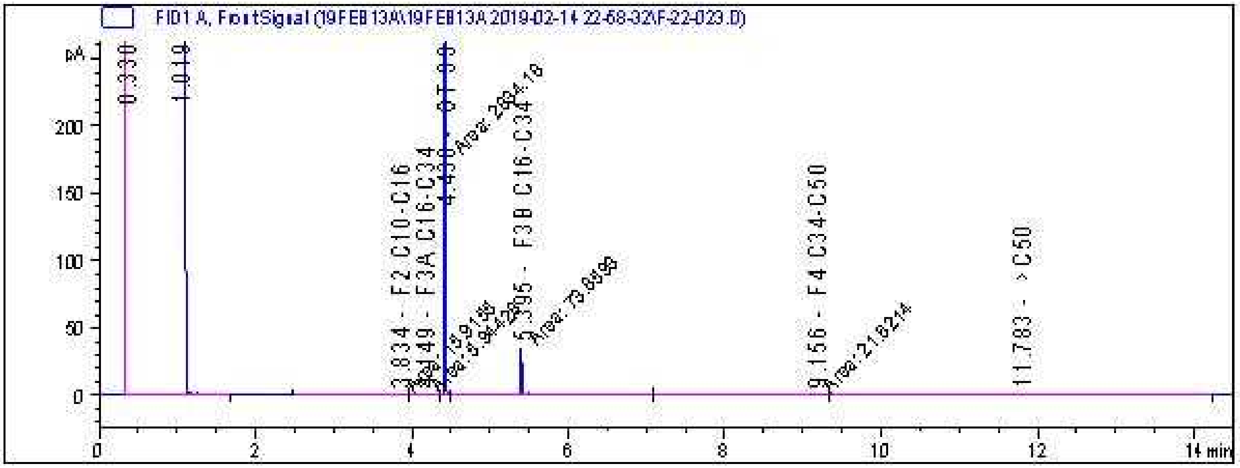


TYPICAL PRODUCT CARBON NUMBER RANGES

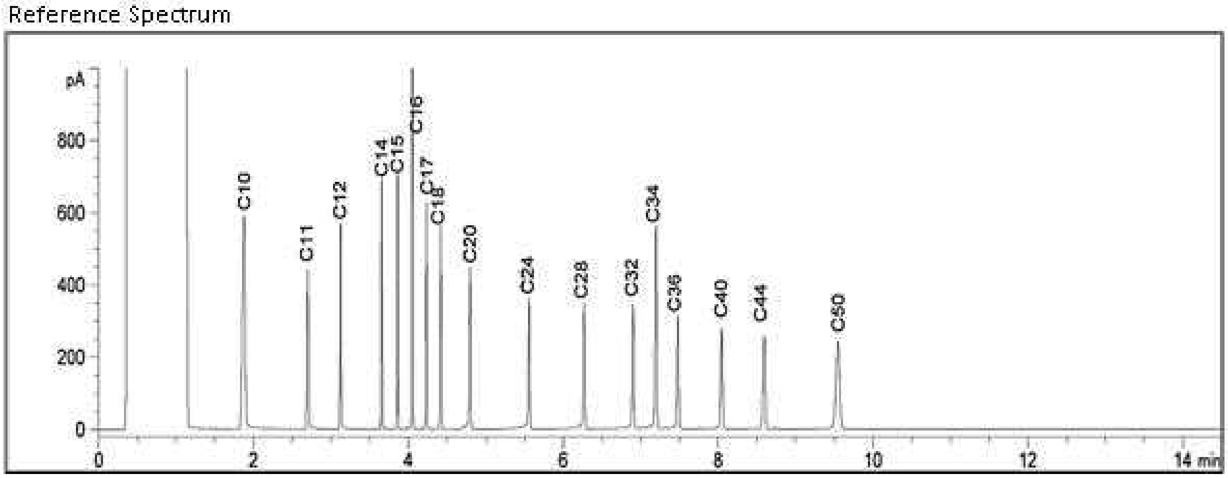
Gasoline: **C6 - C12**	Diesel: **C10 - C24**	Jet Fuels: **C6 - C16**
Varsol: **C8 - C12**	Fuel Oils: **C6 - C32**	Creosote: **C10 - C26**
Kerosene: **C8 - C16**	Motor Oils: **C16 - C50**	Asphalt: **C18 - C50+**

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

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram



Reference Spectrum



TYPICAL PRODUCT CARBON NUMBER RANGES

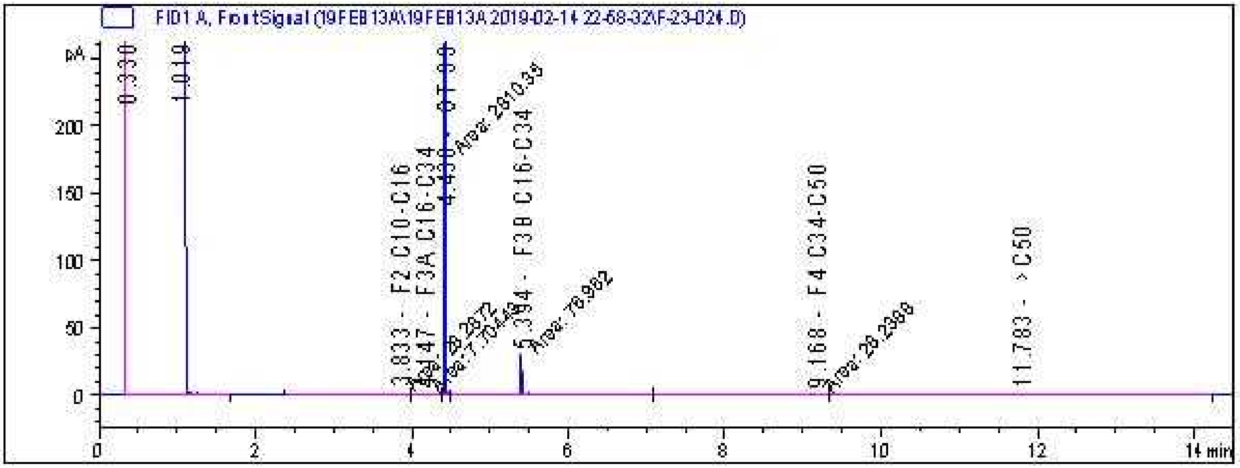
Gasoline: **C6 - C12**	Diesel: **C10 - C24**	Jet Fuels: **C6 - C16**
Varsol: **C8 - C12**	Fuel Oils: **C6 - C32**	Creosote: **C10 - C26**
Kerosene: **C8 - C16**	Motor Oils: **C16 - C50**	Asphalt: **C18 - C50+**

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

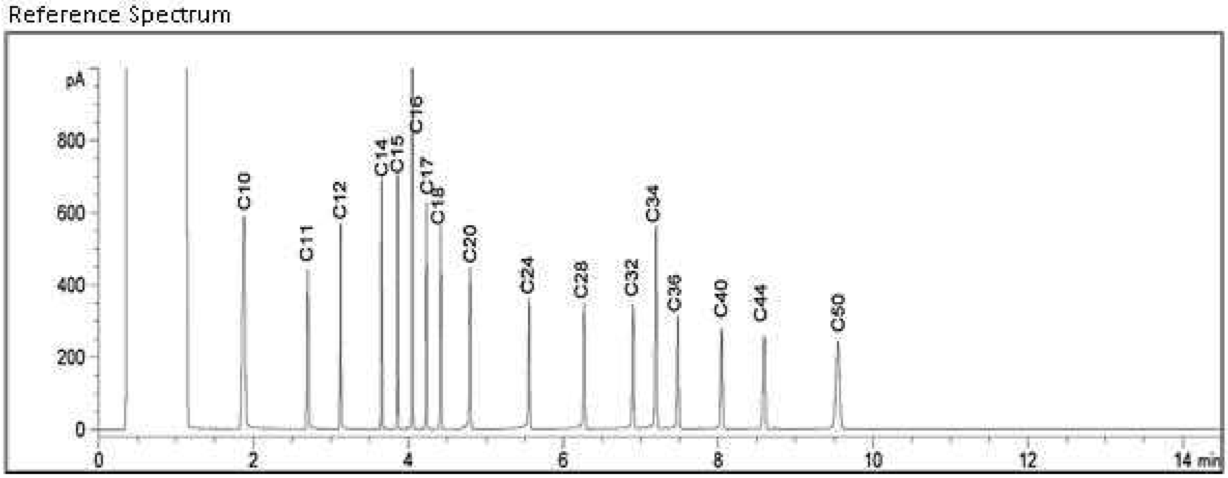
Maxxam Job #: B936015
Report Date: 2019/02/19
Maxxam Sample: IYK278 Lab-Dup

Terrapex Environmental Ltd
Client Project #: CT2817.00
Client ID: MW8-5

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram



Reference Spectrum

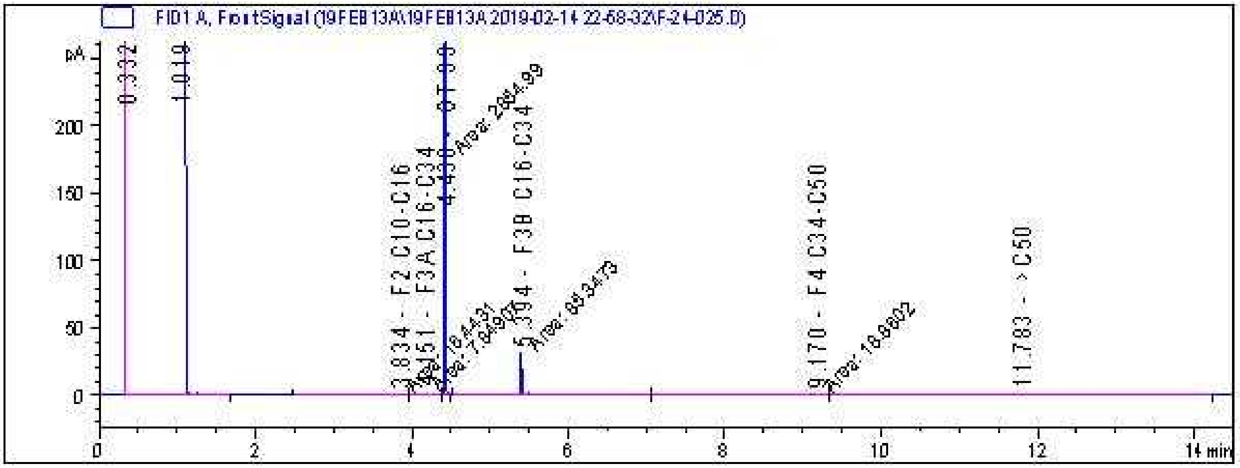


TYPICAL PRODUCT CARBON NUMBER RANGES

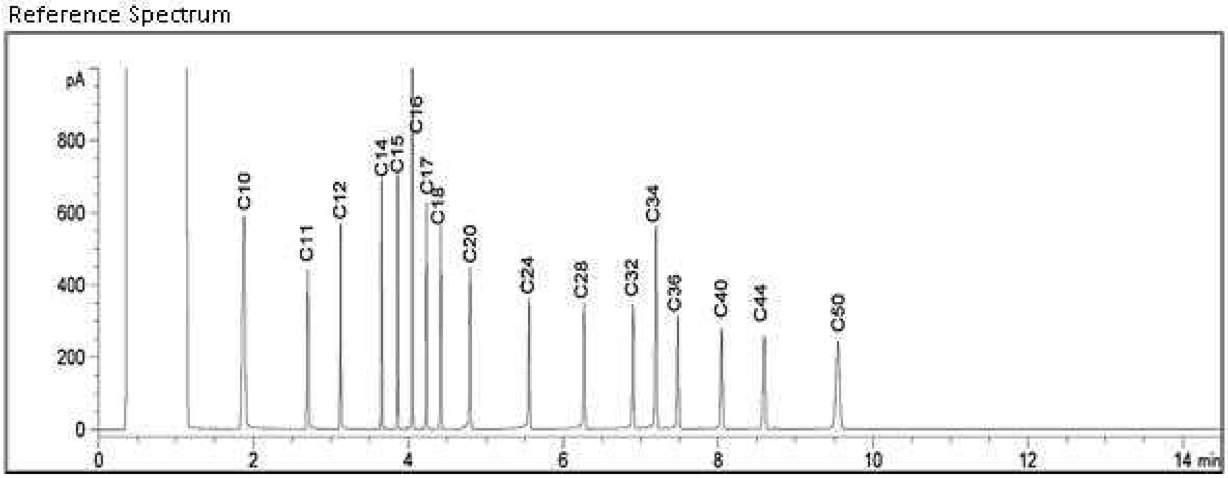
Gasoline: **C6 - C12**	Diesel: **C10 - C24**	Jet Fuels: **C6 - C16**
Varsol: **C8 - C12**	Fuel Oils: **C6 - C32**	Creosote: **C10 - C26**
Kerosene: **C8 - C16**	Motor Oils: **C16 - C50**	Asphalt: **C18 - C50+**

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

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram



Reference Spectrum



TYPICAL PRODUCT CARBON NUMBER RANGES

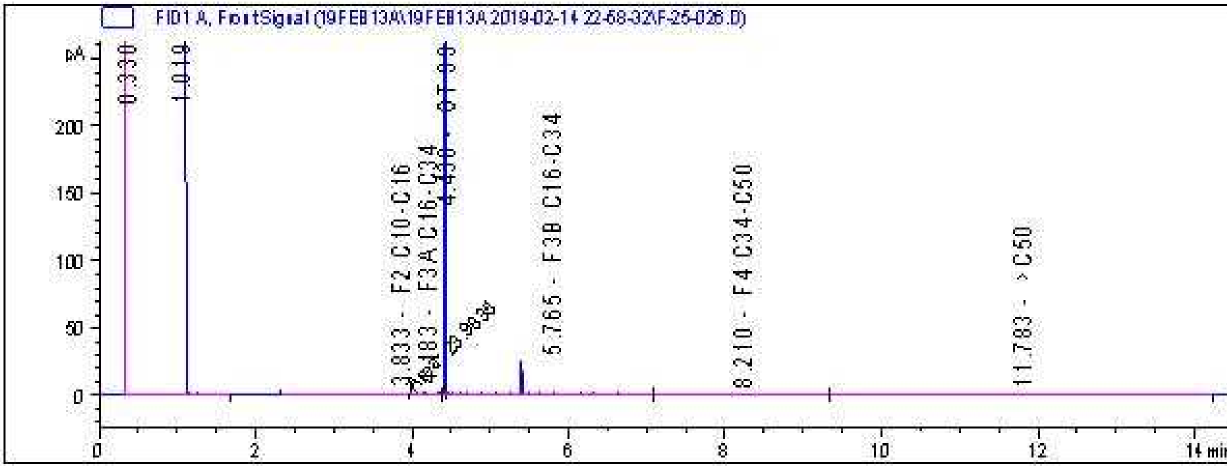
Gasoline: **C6 - C12**	Diesel: **C10 - C24**	Jet Fuels: **C6 - C16**
Varsol: **C8 - C12**	Fuel Oils: **C6 - C32**	Creosote: **C10 - C26**
Kerosene: **C8 - C16**	Motor Oils: **C16 - C50**	Asphalt: **C18 - C50+**

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

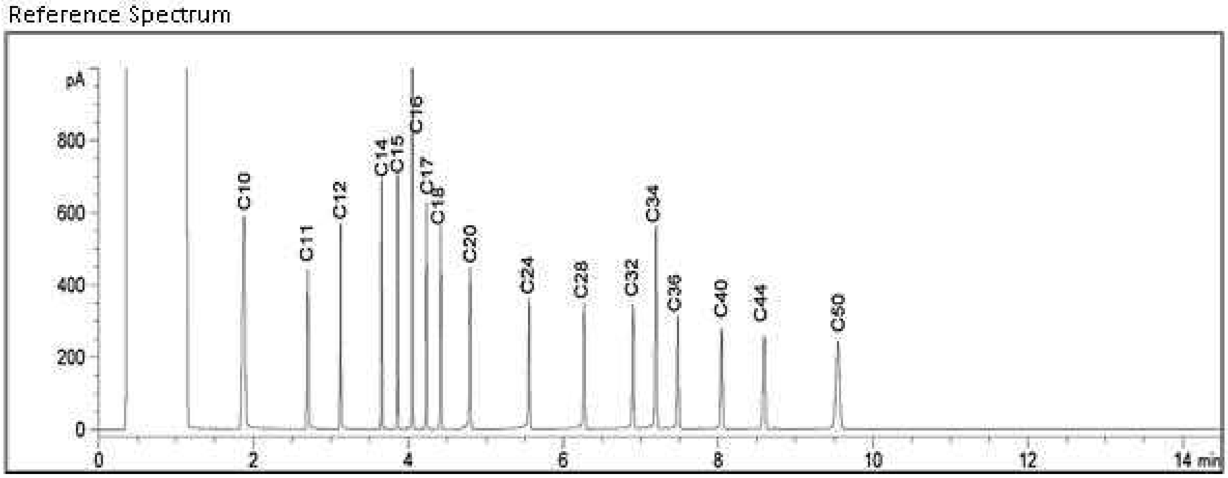
Maxxam Job #: B936015
Report Date: 2019/02/19
Maxxam Sample: IYK285

Terrapex Environmental Ltd
Client Project #: CT2817.00
Client ID: MW7-6

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram



Reference Spectrum



TYPICAL PRODUCT CARBON NUMBER RANGES

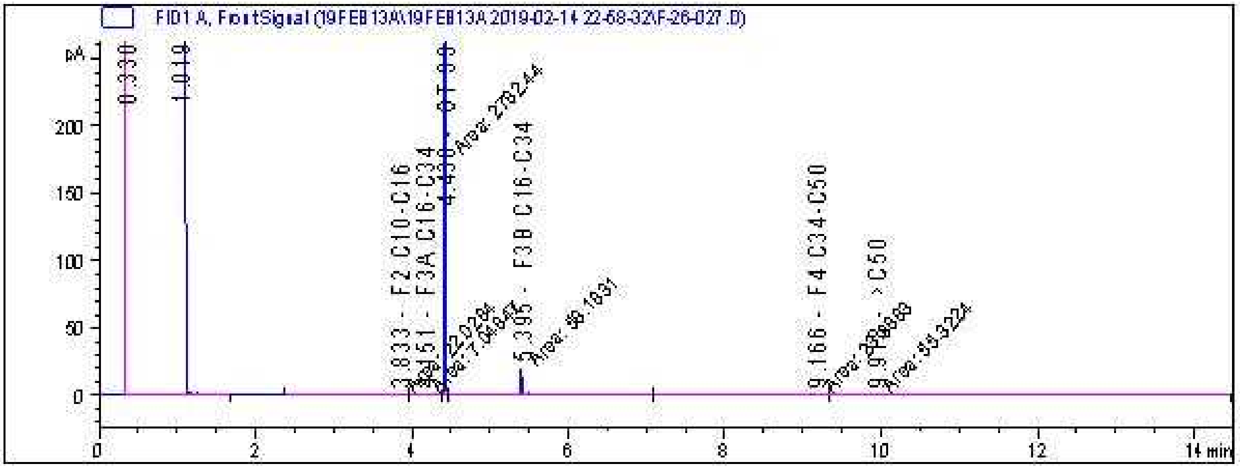
Gasoline: **C6 - C12**	Diesel: **C10 - C24**	Jet Fuels: **C6 - C16**
Varsol: **C8 - C12**	Fuel Oils: **C6 - C32**	Creosote: **C10 - C26**
Kerosene: **C8 - C16**	Motor Oils: **C16 - C50**	Asphalt: **C18 - C50+**

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

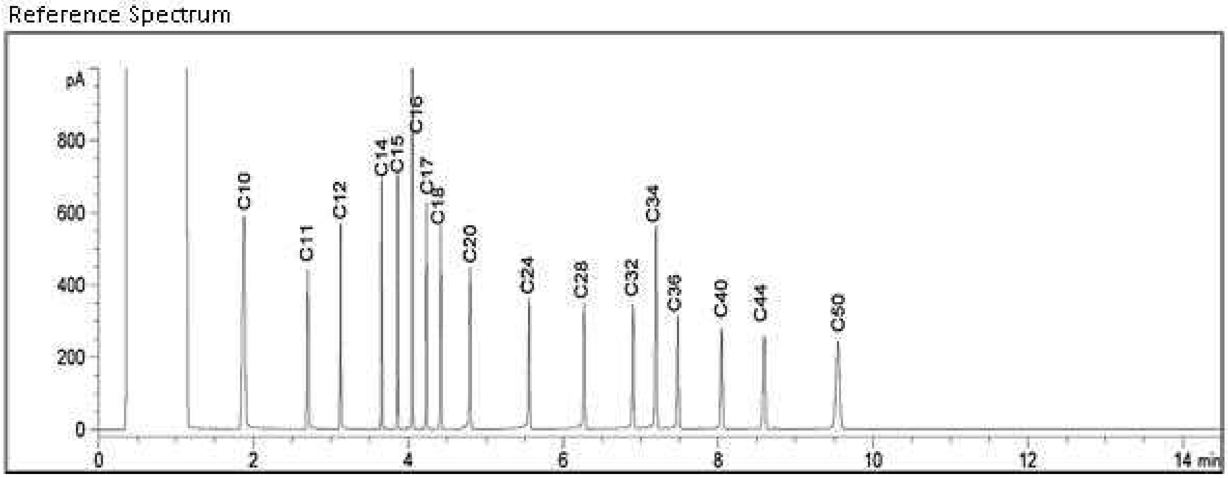
Maxxam Job #: B936015
Report Date: 2019/02/19
Maxxam Sample: IYK290

Terrapex Environmental Ltd
Client Project #: CT2817.00
Client ID: MW10-95

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram



Reference Spectrum



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline: **C6 - C12**	Diesel: **C10 - C24**	Jet Fuels: **C6 - C16**
Varsol: **C8 - C12**	Fuel Oils: **C6 - C32**	Creosote: **C10 - C26**
Kerosene: **C8 - C16**	Motor Oils: **C16 - C50**	Asphalt: **C18 - C50+**

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

Your Project #: CT 2817.00
Site Location: 1294 KINGSTON RD
Your C.O.C. #: 119584

Attention: Chaoran Li

Terrapex Environmental Ltd
90 Scarsdale Rd
Toronto, ON
CANADA M3B 2R7

Report Date: 2019/01/28
Report #: R5574113
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B918849
Received: 2019/01/22, 15:52

Sample Matrix: Soil
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Hot Water Extractable Boron	3	2019/01/24	2019/01/24	CAM SOP-00408	R153 Ana. Prot. 2011
Conductivity	3	2019/01/25	2019/01/25	CAM SOP-00414	OMOE E3530 v1 m
Hexavalent Chromium in Soil by IC (1)	3	2019/01/25	2019/01/28	CAM SOP-00436	EPA 3060/7199 m
Strong Acid Leachable Metals by ICPMS	3	2019/01/24	2019/01/24	CAM SOP-00447	EPA 6020B m
Moisture	3	N/A	2019/01/24	CAM SOP-00445	Carter 2nd ed 51.2 m
pH CaCl2 EXTRACT	3	2019/01/25	2019/01/25	CAM SOP-00413	EPA 9045 D m
Sodium Adsorption Ratio (SAR)	3	N/A	2019/01/28	CAM SOP-00102	EPA 6010C

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

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

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Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Maxxam, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Soils are reported on a dry weight basis unless otherwise specified.

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Maxxam
A Bureau Veritas Group Company

Your Project #: CT 2817.00
Site Location: 1294 KINGSTON RD
Your C.O.C. #: 119584

Attention: Chaoran Li

Terrapex Environmental Ltd
90 Scarsdale Rd
Toronto, ON
CANADA M3B 2R7

Report Date: 2019/01/28
Report #: R5574113
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B918849
Received: 2019/01/22, 15:52

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Ema Gitej, Senior Project Manager
Email: EGitej@maxxam.ca
Phone# (905)817-5829
==
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B918849
Report Date: 2019/01/28

Terrapex Environmental Ltd
Client Project #: CT 2817.00
Site Location: 1294 KINGSTON RD
Sampler Initials: DM

O.REG 153 METALS PACKAGE (SOIL)

Maxxam ID		IUV405	IUV406	IUV407		
Sampling Date		2019/01/07 09:30	2019/01/07 10:00	2019/01/07 15:30		
COC Number		119584	119584	119584		
	UNITS	BH3-2	BH4-2A	BH5-1B	RDL	QC Batch
Inorganics						
Moisture	%	18	18	16	1.0	5943872
Chromium (VI)	ug/g	<0.2	<0.2	<0.2	0.2	5945591
Metals						
Hot Water Ext. Boron (B)	ug/g	0.12	0.27	0.54	0.050	5944592
Acid Extractable Antimony (Sb)	ug/g	<0.20	<0.20	<0.20	0.20	5944569
Acid Extractable Arsenic (As)	ug/g	2.1	2.4	2.8	1.0	5944569
Acid Extractable Barium (Ba)	ug/g	80	100	120	0.50	5944569
Acid Extractable Beryllium (Be)	ug/g	0.48	0.49	0.78	0.20	5944569
Acid Extractable Boron (B)	ug/g	5.8	6.2	7.4	5.0	5944569
Acid Extractable Cadmium (Cd)	ug/g	<0.10	0.13	0.27	0.10	5944569
Acid Extractable Chromium (Cr)	ug/g	18	18	26	1.0	5944569
Acid Extractable Cobalt (Co)	ug/g	7.0	7.2	9.3	0.10	5944569
Acid Extractable Copper (Cu)	ug/g	15	15	16	0.50	5944569
Acid Extractable Lead (Pb)	ug/g	7.2	10	17	1.0	5944569
Acid Extractable Molybdenum (Mo)	ug/g	<0.50	<0.50	<0.50	0.50	5944569
Acid Extractable Nickel (Ni)	ug/g	14	15	18	0.50	5944569
Acid Extractable Selenium (Se)	ug/g	<0.50	<0.50	<0.50	0.50	5944569
Acid Extractable Silver (Ag)	ug/g	<0.20	<0.20	<0.20	0.20	5944569
Acid Extractable Thallium (Tl)	ug/g	0.14	0.14	0.16	0.050	5944569
Acid Extractable Uranium (U)	ug/g	0.54	0.51	0.63	0.050	5944569
Acid Extractable Vanadium (V)	ug/g	32	29	41	5.0	5944569
Acid Extractable Zinc (Zn)	ug/g	37	41	66	5.0	5944569
Acid Extractable Mercury (Hg)	ug/g	<0.050	<0.050	0.063	0.050	5944569

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam
A Bureau Veritas Group Company

Maxxam Job #: B918849
Report Date: 2019/01/28

Terrapex Environmental Ltd
Client Project #: CT 2817.00
Site Location: 1294 KINGSTON RD
Sampler Initials: DM

RESULTS OF ANALYSES OF SOIL

Maxxam ID		IUV405	IUV406	IUV407		
Sampling Date		2019/01/07 09:30	2019/01/07 10:00	2019/01/07 15:30		
COC Number		119584	119584	119584		
	UNITS	**BH3-2**	**BH4-2A**	**BH5-1B**	**RDL**	**QC Batch**
Calculated Parameters						
Sodium Adsorption Ratio	N/A	1.6	3.1	29		5941077
Inorganics						
Conductivity	mS/cm	0.49	2.4	2.5	0.002	5945739
Available (CaCl2) pH	pH	7.69	7.61	7.71		5945637

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B918849
Report Date: 2019/01/28

Terrapex Environmental Ltd
Client Project #: CT 2817.00
Site Location: 1294 KINGSTON RD
Sampler Initials: DM

TEST SUMMARY

Maxxam ID: IUV405
Sample ID: BH3-2
Matrix: Soil

Collected: 2019/01/07
Shipped:
Received: 2019/01/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hot Water Extractable Boron	ICP	5944592	2019/01/24	2019/01/24	Suban Kanapathippllai
Conductivity	AT	5945739	2019/01/25	2019/01/25	Kazzandra Adeva
Hexavalent Chromium in Soil by IC	IC/SPEC	5945591	2019/01/25	2019/01/28	Rupinder Sihota
Strong Acid Leachable Metals by ICPMS	ICP/MS	5944569	2019/01/24	2019/01/24	Daniel Teclu
Moisture	BAL	5943872	N/A	2019/01/24	Min Yang
pH CaCl2 EXTRACT	AT	5945637	2019/01/25	2019/01/25	Gnana Thomas
Sodium Adsorption Ratio (SAR)	CALC/MET	5941077	N/A	2019/01/28	Automated Statchk

Maxxam ID: IUV406
Sample ID: BH4-2A
Matrix: Soil

Collected: 2019/01/07
Shipped:
Received: 2019/01/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hot Water Extractable Boron	ICP	5944592	2019/01/24	2019/01/24	Suban Kanapathippllai
Conductivity	AT	5945739	2019/01/25	2019/01/25	Kazzandra Adeva
Hexavalent Chromium in Soil by IC	IC/SPEC	5945591	2019/01/25	2019/01/28	Rupinder Sihota
Strong Acid Leachable Metals by ICPMS	ICP/MS	5944569	2019/01/24	2019/01/24	Daniel Teclu
Moisture	BAL	5943872	N/A	2019/01/24	Min Yang
pH CaCl2 EXTRACT	AT	5945637	2019/01/25	2019/01/25	Gnana Thomas
Sodium Adsorption Ratio (SAR)	CALC/MET	5941077	N/A	2019/01/28	Automated Statchk

Maxxam ID: IUV407
Sample ID: BH5-1B
Matrix: Soil

Collected: 2019/01/07
Shipped:
Received: 2019/01/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hot Water Extractable Boron	ICP	5944592	2019/01/24	2019/01/24	Suban Kanapathippllai
Conductivity	AT	5945739	2019/01/25	2019/01/25	Kazzandra Adeva
Hexavalent Chromium in Soil by IC	IC/SPEC	5945591	2019/01/25	2019/01/28	Rupinder Sihota
Strong Acid Leachable Metals by ICPMS	ICP/MS	5944569	2019/01/24	2019/01/24	Daniel Teclu
Moisture	BAL	5943872	N/A	2019/01/24	Min Yang
pH CaCl2 EXTRACT	AT	5945637	2019/01/25	2019/01/25	Gnana Thomas
Sodium Adsorption Ratio (SAR)	CALC/MET	5941077	N/A	2019/01/28	Automated Statchk

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GENERAL COMMENTS

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

Package 1	0.7°C

Cooler custody seal was present and intact.

Results relate only to the items tested.

Maxxam
A Bureau Veritas Group Company

Maxxam Job #: B918849
Report Date: 2019/01/28

QUALITY ASSURANCE REPORT

Terrapex Environmental Ltd
Client Project #: CT 2817.00
Site Location: 1294 KINGSTON RD
Sampler Initials: DM

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
5943872	Moisture	2019/01/24							3.0	20
5944569	Acid Extractable Antimony (Sb)	2019/01/24	93	75 - 125	99	80 - 120	<0.20	ug/g	NC	30
5944569	Acid Extractable Arsenic (As)	2019/01/24	99	75 - 125	101	80 - 120	<1.0	ug/g	2.4	30
5944569	Acid Extractable Barium (Ba)	2019/01/24	NC	75 - 125	97	80 - 120	<0.50	ug/g	6.5	30
5944569	Acid Extractable Beryllium (Be)	2019/01/24	104	75 - 125	99	80 - 120	<0.20	ug/g	7.8	30
5944569	Acid Extractable Boron (B)	2019/01/24	93	75 - 125	99	80 - 120	<5.0	ug/g	5.4	30
5944569	Acid Extractable Cadmium (Cd)	2019/01/24	98	75 - 125	96	80 - 120	<0.10	ug/g	NC	30
5944569	Acid Extractable Chromium (Cr)	2019/01/24	102	75 - 125	99	80 - 120	<1.0	ug/g	3.8	30
5944569	Acid Extractable Cobalt (Co)	2019/01/24	100	75 - 125	100	80 - 120	<0.10	ug/g	2.3	30
5944569	Acid Extractable Copper (Cu)	2019/01/24	NC	75 - 125	103	80 - 120	<0.50	ug/g	1.3	30
5944569	Acid Extractable Lead (Pb)	2019/01/24	101	75 - 125	99	80 - 120	<1.0	ug/g	4.1	30
5944569	Acid Extractable Mercury (Hg)	2019/01/24	93	75 - 125	89	80 - 120	<0.050	ug/g	NC	30
5944569	Acid Extractable Molybdenum (Mo)	2019/01/24	101	75 - 125	96	80 - 120	<0.50	ug/g	NC	30
5944569	Acid Extractable Nickel (Ni)	2019/01/24	NC	75 - 125	99	80 - 120	<0.50	ug/g	2.8	30
5944569	Acid Extractable Selenium (Se)	2019/01/24	101	75 - 125	96	80 - 120	<0.50	ug/g	NC	30
5944569	Acid Extractable Silver (Ag)	2019/01/24	99	75 - 125	99	80 - 120	<0.20	ug/g	NC	30
5944569	Acid Extractable Thallium (Tl)	2019/01/24	98	75 - 125	96	80 - 120	<0.050	ug/g	1.4	30
5944569	Acid Extractable Uranium (U)	2019/01/24	101	75 - 125	96	80 - 120	<0.050	ug/g	0.32	30
5944569	Acid Extractable Vanadium (V)	2019/01/24	NC	75 - 125	99	80 - 120	<5.0	ug/g	2.5	30
5944569	Acid Extractable Zinc (Zn)	2019/01/24	NC	75 - 125	98	80 - 120	<5.0	ug/g	0.97	30
5944592	Hot Water Ext. Boron (B)	2019/01/24	104	75 - 125	94	75 - 125	<0.050	ug/g	0.17	40
5945591	Chromium (VI)	2019/01/28	73	70 - 130	88	80 - 120	<0.2	ug/g	NC	35
5945637	Available (CaCl2) pH	2019/01/25			100	97 - 103			0.34	N/A

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QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
5945739	Conductivity	2019/01/25			102	90 - 110	<0.002	mS/cm	0.30	10

N/A = Not Applicable

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

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

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

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

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

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

VALIDATION SIGNATURE PAGE

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

CHARTERED
Eva Pranjic
CHEMIST

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

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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Phone: 905-817-5700 Fax: 905-817-5779 Toll Free: 800-563-6266
CAM FCD-01191/3

CHAIN OF CUSTODY RECORD

119584 Page 1 of 1

Invoice Information		Report Information (if differs from invoice)		Project Information (where applicable)		Turnaround Time (TAT) Required
Company Name:	Terrapex Environmental	Company Name:	Terrapex Environmental	Quotation #:	TPEX	[X] Regular TAT (5-7 days) Most analyses
Contact Name:	Chaoran Li	Contact Name:		P.O. #/ AFE#:	1294 Kingston Rd.	PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS
Address:	90 Scarsdale Rd, Toronto, ON	Address:		Project #:	CT 2817.00	Rush TAT (Surcharges will be applied)
				Site Location:		[ ] 1 Day [ ] 2 Days [ ] 3-4 Days
Phone: 416-2450011 Fax: 416-245-0012		Phone:	Fax:	Site #:	—	Date Required:
Email:	c.li@terrapex.com	Email:		Sampled By:	D.M. / S.A.	Rush Confirmation #:

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153			Other Regulations	
[X] Table 1	[X] Res/Park	[ ] Med/ Fine	[ ] CCME	[ ] Sanitary Sewer Bylaw
[ ] Table 2	[ ] Ind/Comm	[X] Coarse	[ ] MISA	[ ] Storm Sewer Bylaw
[ ] Table 3	[ ] Agri/ Other		[ ] PWQO	Region
[ ] Table ___			[ ] Other (Specify)	
FOR RSC (PLEASE CIRCLE) Y / N (Y circled)			[ ] REG 558 (MIN. 3 DAY TAT REQUIRED)	

Include Criteria on Certificate of Analysis: Y / N (N circled)

SAMPLES MUST BE KEPT COOL (< 10 °C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

Analysis Requested

	SAMPLE IDENTIFICATION	DATE SAMPLED (YYYY/MM/DD)	TIME SAMPLED (HH:MM)	MATRIX	# OF CONTAINERS SUBMITTED	FIELD FILTERED (CIRCLE) Metals / Hg / CrVI	BTEX/ PHC F1	PHCs F2 - F4	VOCs	REG 153 METALS & INORGANICS	REG 153 ICPMS METALS	REG 153 METALS (Hg, Cr VI, ICPMS Metals, HWS - B) + EC, SAR, pH								HOLD- DO NOT ANALYZE
1	BH3-2	2019/01/07	9:30	Soil	1	N						X								
2	BH4-2A	↓	10:00	Soil	1	N						X								
3	BH5-1B	↓	15:30	Soil	1	N						X								
4																				
5																				
6																				
7																				
8																				
9																				
10																				

LABORATORY USE ONLY		
CUSTODY SEAL Y / N (Y circled)		COOLER TEMPERATURES
Present	Intact	1 / 1 / 0
COOLING MEDIA PRESENT: Y / N (Y circled)		

COMMENTS

22-Jan-19 15:52
Ema Gitej
B918849
FCN ENV-1345

RELINQUISHED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)	RECEIVED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)	MAXXAM JOB #
[signature] Chaoran Li	2019/01/21	13:35	[signature]	2019/01/22	15:52	

Unless otherwise agreed to in writing, work submitted on this Chain of Custody is subject to Maxxam's standard Terms and Conditions. Signing of this Chain of Custody document is acknowledgment and acceptance of our terms which are available for viewing at www.maxxam.ca/terms. Sample container, preservation, hold time and packages information can be viewed at http://maxxam.ca/wp-content/uploads/Ontario-COC.pdf.

COC-1004 (03/17)

maxxam driver

White: Maxxam - Yellow: Client

Your Project #: CT2817.00
Site Location: 1294 KINGSTON RD
Your C.O.C. #: 108382

Attention: Chaoran Li

Terrapex Environmental Ltd
90 Scarsdale Rd
Toronto, ON
CANADA M3B 2R7

Report Date: 2019/02/14
Report #: R5594216
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B934256
Received: 2019/02/07, 14:53

Sample Matrix: Soil
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Hot Water Extractable Boron	1	2019/02/11	2019/02/11	CAM SOP-00408	R153 Ana. Prot. 2011
Free (WAD) Cyanide	1	2019/02/11	2019/02/12	CAM SOP-00457	OMOE E3015 m
Conductivity	1	2019/02/13	2019/02/13	CAM SOP-00414	OMOE E3530 v1 m
Hexavalent Chromium in Soil by IC (1)	1	2019/02/12	2019/02/12	CAM SOP-00436	EPA 3060/7199 m
Strong Acid Leachable Metals by ICPMS	1	2019/02/11	2019/02/11	CAM SOP-00447	EPA 6020B m
Moisture	1	N/A	2019/02/11	CAM SOP-00445	Carter 2nd ed 51.2 m
pH CaCl2 EXTRACT	1	2019/02/11	2019/02/11	CAM SOP-00413	EPA 9045 D m
Sodium Adsorption Ratio (SAR)	1	N/A	2019/02/13	CAM SOP-00102	EPA 6010C

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

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

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing. Maxxam is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Maxxam, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Soils are reported on a dry weight basis unless otherwise specified.

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Your Project #: CT2817.00
Site Location: 1294 KINGSTON RD
Your C.O.C. #: 108382

Attention: Chaoran Li

Terrapex Environmental Ltd
90 Scarsdale Rd
Toronto, ON
CANADA M3B 2R7

Report Date: 2019/02/14
Report #: R5594216
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B934256
Received: 2019/02/07, 14:53

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Ema Gitej, Senior Project Manager
Email: EGitej@maxxam.ca
Phone# (905)817-5829
==
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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Maxxam
A Bureau Veritas Group Company

Maxxam Job #: B934256
Report Date: 2019/02/14

Terrapex Environmental Ltd
Client Project #: CT2817.00
Site Location: 1294 KINGSTON RD
Sampler Initials: JA

O.REG 153 METALS & INORGANICS PKG (SOIL)

Maxxam ID		IYC042		
Sampling Date		2019/02/01 10:00		
COC Number		108382		
	UNITS	**MW6-SS1**	**RDL**	**QC Batch**
Calculated Parameters				
Sodium Adsorption Ratio	N/A	28		5965838
Inorganics				
Conductivity	mS/cm	2.2	0.002	5971255
Moisture	%	18	1.0	5969871
Available (CaCl2) pH	pH	7.83		5969222
WAD Cyanide (Free)	ug/g	<0.01	0.01	5969339
Chromium (VI)	ug/g	<0.2	0.2	5970748
Metals				
Hot Water Ext. Boron (B)	ug/g	0.49	0.050	5969280
Acid Extractable Antimony (Sb)	ug/g	0.21	0.20	5969287
Acid Extractable Arsenic (As)	ug/g	4.8	1.0	5969287
Acid Extractable Barium (Ba)	ug/g	97	0.50	5969287
Acid Extractable Beryllium (Be)	ug/g	0.50	0.20	5969287
Acid Extractable Boron (B)	ug/g	5.4	5.0	5969287
Acid Extractable Cadmium (Cd)	ug/g	0.17	0.10	5969287
Acid Extractable Chromium (Cr)	ug/g	19	1.0	5969287
Acid Extractable Cobalt (Co)	ug/g	7.3	0.10	5969287
Acid Extractable Copper (Cu)	ug/g	16	0.50	5969287
Acid Extractable Lead (Pb)	ug/g	19	1.0	5969287
Acid Extractable Molybdenum (Mo)	ug/g	<0.50	0.50	5969287
Acid Extractable Nickel (Ni)	ug/g	14	0.50	5969287
Acid Extractable Selenium (Se)	ug/g	<0.50	0.50	5969287
Acid Extractable Silver (Ag)	ug/g	<0.20	0.20	5969287
Acid Extractable Thallium (Tl)	ug/g	0.13	0.050	5969287
Acid Extractable Uranium (U)	ug/g	0.47	0.050	5969287
Acid Extractable Vanadium (V)	ug/g	32	5.0	5969287
Acid Extractable Zinc (Zn)	ug/g	51	5.0	5969287
Acid Extractable Mercury (Hg)	ug/g	0.074	0.050	5969287

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B934256
Report Date: 2019/02/14

Terrapex Environmental Ltd
Client Project #: CT2817.00
Site Location: 1294 KINGSTON RD
Sampler Initials: JA

TEST SUMMARY

Maxxam ID: IYC042
Sample ID: MW6-SS1
Matrix: Soil

Collected: 2019/02/01
Shipped:
Received: 2019/02/07

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hot Water Extractable Boron	ICP	5969280	2019/02/11	2019/02/11	Suban Kanapathippllai
Free (WAD) Cyanide	TECH	5969339	2019/02/11	2019/02/12	Barbara Kalbasi Esfahani
Conductivity	AT	5971255	2019/02/13	2019/02/13	Kazzandra Adeva
Hexavalent Chromium in Soil by IC	IC/SPEC	5970748	2019/02/12	2019/02/12	Sally Norouz
Strong Acid Leachable Metals by ICPMS	ICP/MS	5969287	2019/02/11	2019/02/11	Daniel Teclu
Moisture	BAL	5969871	N/A	2019/02/11	Mithunaa Sasitheepan
pH CaCl2 EXTRACT	AT	5969222	2019/02/11	2019/02/11	Gnana Thomas
Sodium Adsorption Ratio (SAR)	CALC/MET	5965838	N/A	2019/02/13	Automated Statchk

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GENERAL COMMENTS

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

Package 1	4.0°C

Results relate only to the items tested.

Maxxam
A Bureau Veritas Group Company

Maxxam Job #: B934256
Report Date: 2019/02/14

QUALITY ASSURANCE REPORT

Terrapex Environmental Ltd
Client Project #: CT2817.00
Site Location: 1294 KINGSTON RD
Sampler Initials: JA

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
5969222	Available (CaCl2) pH	2019/02/11			100	97 - 103			0	N/A
5969280	Hot Water Ext. Boron (B)	2019/02/11	100	75 - 125	101	75 - 125	<0.050	ug/g	1.3	40
5969287	Acid Extractable Antimony (Sb)	2019/02/11	87	75 - 125	101	80 - 120	<0.20	ug/g	14	30
5969287	Acid Extractable Arsenic (As)	2019/02/11	98	75 - 125	100	80 - 120	<1.0	ug/g	0.81	30
5969287	Acid Extractable Barium (Ba)	2019/02/11	NC	75 - 125	100	80 - 120	<0.50	ug/g	3.6	30
5969287	Acid Extractable Beryllium (Be)	2019/02/11	100	75 - 125	105	80 - 120	<0.20	ug/g	1.6	30
5969287	Acid Extractable Boron (B)	2019/02/11	93	75 - 125	102	80 - 120	<5.0	ug/g	0.43	30
5969287	Acid Extractable Cadmium (Cd)	2019/02/11	94	75 - 125	97	80 - 120	<0.10	ug/g	5.9	30
5969287	Acid Extractable Chromium (Cr)	2019/02/11	NC	75 - 125	100	80 - 120	<1.0	ug/g	0.24	30
5969287	Acid Extractable Cobalt (Co)	2019/02/11	95	75 - 125	99	80 - 120	<0.10	ug/g	0.19	30
5969287	Acid Extractable Copper (Cu)	2019/02/11	NC	75 - 125	100	80 - 120	<0.50	ug/g	0.89	30
5969287	Acid Extractable Lead (Pb)	2019/02/11	NC	75 - 125	96	80 - 120	<1.0	ug/g	2.1	30
5969287	Acid Extractable Mercury (Hg)	2019/02/11	84	75 - 125	90	80 - 120	<0.050	ug/g	22	30
5969287	Acid Extractable Molybdenum (Mo)	2019/02/11	92	75 - 125	98	80 - 120	<0.50	ug/g	4.0	30
5969287	Acid Extractable Nickel (Ni)	2019/02/11	91	75 - 125	101	80 - 120	<0.50	ug/g	5.7	30
5969287	Acid Extractable Selenium (Se)	2019/02/11	96	75 - 125	105	80 - 120	<0.50	ug/g	4.9	30
5969287	Acid Extractable Silver (Ag)	2019/02/11	92	75 - 125	97	80 - 120	<0.20	ug/g	20	30
5969287	Acid Extractable Thallium (Tl)	2019/02/11	88	75 - 125	97	80 - 120	<0.050	ug/g	3.5	30
5969287	Acid Extractable Uranium (U)	2019/02/11	91	75 - 125	97	80 - 120	<0.050	ug/g	3.8	30
5969287	Acid Extractable Vanadium (V)	2019/02/11	NC	75 - 125	102	80 - 120	<5.0	ug/g	2.5	30
5969287	Acid Extractable Zinc (Zn)	2019/02/11	NC	75 - 125	100	80 - 120	<5.0	ug/g	1.9	30
5969339	WAD Cyanide (Free)	2019/02/12	100	75 - 125	98	80 - 120	<0.01	ug/g	NC	35
5969871	Moisture	2019/02/11							1.7	20
5970748	Chromium (VI)	2019/02/12	43 (1)	70 - 130	87	80 - 120	<0.2	ug/g	NC	35

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QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	**Parameter**	**Date**	**% Recovery**	**QC Limits**	**% Recovery**	**QC Limits**	**Value**	**UNITS**	**Value (%)**	**QC Limits**
5971255	Conductivity	2019/02/13			102	90 - 110	<0.002	mS/cm	4.1	10

N/A = Not Applicable

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

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

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

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

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

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

(1) The matrix spike recovery was below the lower control limit. This may be due in part to the reducing environment of the sample. The sample was reanalyzed with the same results.

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Maxxam Job #: B934256
Report Date: 2019/02/14

Terrapex Environmental Ltd
Client Project #: CT2817.00
Site Location: 1294 KINGSTON RD
Sampler Initials: JA

VALIDATION SIGNATURE PAGE

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

Anastassia Hamanov, Scientific Specialist

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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Phone: 905-817-5700 Fax: 905-817-5779 Toll Free: 800-563-6266
CAM FCD-01191/3

CHAIN OF CUSTODY RECORD

108382 Page 1 of 1

Invoice Information		Report Information (if differs from invoice)		Project Information (where applicable)		Turnaround Time (TAT) Required
Company Name:	Terrapex Environmental Ltd	Company Name:		Quotation #:	TPEX	[X] Regular TAT (5-7 days) Most analyses
Contact Name:	Chaoran Li	Contact Name:		P.O. #/ AFE#:		PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS
Address:	90 Scarsdale Rd, Toronto	Address:		Project #:	CT2817.00	Rush TAT (Surcharges will be applied): [ ] 1 Day [ ] 2 Days [ ] 3-4 Days
Phone:	416-245-0011 Fax: 416-245-0012	Phone: Fax:		Site Location:	1294 Kingston Rd	
				Site #:		Date Required:
Email:	c.li@terrapex.com	Email:		Sampled By:	Jeff. Au	

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Rush Confirmation #:

Regulation 153: [X] Table 1 [X] Res/Park [ ] Med/ Fine [ ] Table 2 [ ] Ind/Comm [ ] Coarse [ ] Table 3 [ ] Agri/ Other [ ] Table ___

FOR RSC (PLEASE CIRCLE) Y / N

Include Criteria on Certificate of Analysis: Y / N

Other Regulations: [ ] CCME [ ] Sanitary Sewer Bylaw [ ] MISA [ ] Storm Sewer Bylaw [ ] PWQO Region ___ [ ] Other (Specify) [ ] REG 558 (MIN. 3 DAY TAT REQUIRED)

SAMPLES MUST BE KEPT COOL (< 10 °C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

LABORATORY USE ONLY: CUSTODY SEAL Y / N; Present; Intact; COOLER TEMPERATURES 4 / 4 / 4; COOLING MEDIA PRESENT: Y / N

#	SAMPLE IDENTIFICATION	DATE SAMPLED (YYYY/MM/DD)	TIME SAMPLED (HH:MM)	MATRIX	# OF CONTAINERS SUBMITTED	FIELD FILTERED (CIRCLE) Metals / Hg / CrVI	BTEX/ PHC F1	PHCs F2 - F4	VOCs	REG 153 METALS & INORGANICS	REG 153 ICPMS METALS	REG 153 METALS (Hg, Cr VI, ICPMS Metals, HWS - B)								HOLD- DO NOT ANALYZE	COMMENTS
1	MW6-SS1	2019/02/01	10:00	S	1					X											
2																					
3																					
4																					
5																					
6																					
7																					
8																					
9																					
10																					

RELINQUISHED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)	RECEIVED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)
Chaoran L.	2019/02/06	16:00	[illegible]	2019/02/07	14:53

07-Feb-19 14:53
Ema Gitej
B934256
KVG ENV-1375

Unless otherwise agreed to in writing, work submitted on this Chain of Custody is subject to Maxxam's standard Terms and Conditions. Signing of this Chain of Custody document is acknowle[dgment ...] available for viewing at www.maxxam.ca/terms. Sample container, preservation, hold time and packages information can be viewed at http://maxxam.ca/wp-content/uploads/Ontario-COC.pdf.

97345

COC-1004 (03/17)

White: Maxxam ~ Yellow: Client

Maxxam
A Bureau Veritas Group Company

Your Project #: CT2817.00
Site Location: 1294 KINGSTON RD., PICKERING
Your C.O.C. #: 108380

Attention: Chaoran Li

Terrapex Environmental Ltd
90 Scarsdale Rd
Toronto, ON
CANADA M3B 2R7

Report Date: 2019/02/08
Report #: R5588082
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B929073
Received: 2019/02/01, 16:06

Sample Matrix: Soil
Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Methylnaphthalene Sum	1	N/A	2019/02/08	CAM SOP-00301	EPA 8270D m
Hot Water Extractable Boron	1	2019/02/04	2019/02/04	CAM SOP-00408	R153 Ana. Prot. 2011
1,3-Dichloropropene Sum	1	N/A	2019/02/05		EPA 8260C m
Free (WAD) Cyanide	1	2019/02/05	2019/02/06	CAM SOP-00457	OMOE E3015 m
Conductivity	1	2019/02/06	2019/02/06	CAM SOP-00414	OMOE E3530 v1 m
Hexavalent Chromium in Soil by IC (1)	1	2019/02/04	2019/02/05	CAM SOP-00436	EPA 3060/7199 m
Petroleum Hydrocarbons F2-F4 in Soil (2)	1	2019/02/06	2019/02/07	CAM SOP-00316	CCME CWS m
Strong Acid Leachable Metals by ICPMS	1	2019/02/04	2019/02/04	CAM SOP-00447	EPA 6020B m
Moisture	2	N/A	2019/02/02	CAM SOP-00445	Carter 2nd ed 51.2 m
PAH Compounds in Soil by GC/MS (SIM)	1	2019/02/06	2019/02/07	CAM SOP-00318	EPA 8270D m
pH CaCl2 EXTRACT	1	2019/02/05	2019/02/05	CAM SOP-00413	EPA 9045 D m
Sodium Adsorption Ratio (SAR)	1	N/A	2019/02/07	CAM SOP-00102	EPA 6010C
Volatile Organic Compounds and F1 PHCs	1	N/A	2019/02/04	CAM SOP-00230	EPA 8260C m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

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

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing. Maxxam is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Maxxam, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

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Your Project #: CT2817.00
Site Location: 1294 KINGSTON RD., PICKERING
Your C.O.C. #: 108380

Attention: Chaoran Li

Terrapex Environmental Ltd
90 Scarsdale Rd
Toronto, ON
CANADA M3B 2R7

Report Date: 2019/02/08
Report #: R5588082
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B929073
Received: 2019/02/01, 16:06

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

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

(1) Soils are reported on a dry weight basis unless otherwise specified.

(2) All CCME PHC results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Maxxam conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following “Alberta Environment’s Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Validation of Performance-Based Alternative Methods September 2003”. Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Ema Gitej, Senior Project Manager
Email: EGitej@maxxam.ca
Phone# (905)817-5829
==

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A Bureau Veritas Group Company

Maxxam Job #: B929073
Report Date: 2019/02/08

Terrapex Environmental Ltd
Client Project #: CT2817.00
Site Location: 1294 KINGSTON RD., PICKERING
Sampler Initials: LG

O.REG 153 METALS & INORGANICS PKG (SOIL)

Maxxam ID		IWY772		
Sampling Date		2019/01/31 10:00		
COC Number		108380		
	UNITS	MW9-SS1	RDL	QC Batch
Calculated Parameters				
Sodium Adsorption Ratio	N/A	2.8		5956048
Inorganics				
Conductivity	mS/cm	1.2	0.002	5962184
Moisture	%	20	1.0	5957980
Available (CaCl2) pH	pH	7.70		5959213
WAD Cyanide (Free)	ug/g	<0.01	0.01	5961489
Chromium (VI)	ug/g	<0.2	0.2	5958543
Metals				
Hot Water Ext. Boron (B)	ug/g	0.073	0.050	5958822
Acid Extractable Antimony (Sb)	ug/g	<0.20	0.20	5958803
Acid Extractable Arsenic (As)	ug/g	2.5	1.0	5958803
Acid Extractable Barium (Ba)	ug/g	86	0.50	5958803
Acid Extractable Beryllium (Be)	ug/g	0.52	0.20	5958803
Acid Extractable Boron (B)	ug/g	7.6	5.0	5958803
Acid Extractable Cadmium (Cd)	ug/g	<0.10	0.10	5958803
Acid Extractable Chromium (Cr)	ug/g	19	1.0	5958803
Acid Extractable Cobalt (Co)	ug/g	6.8	0.10	5958803
Acid Extractable Copper (Cu)	ug/g	17	0.50	5958803
Acid Extractable Lead (Pb)	ug/g	7.1	1.0	5958803
Acid Extractable Molybdenum (Mo)	ug/g	<0.50	0.50	5958803
Acid Extractable Nickel (Ni)	ug/g	16	0.50	5958803
Acid Extractable Selenium (Se)	ug/g	<0.50	0.50	5958803
Acid Extractable Silver (Ag)	ug/g	<0.20	0.20	5958803
Acid Extractable Thallium (Tl)	ug/g	0.15	0.050	5958803
Acid Extractable Uranium (U)	ug/g	0.53	0.050	5958803
Acid Extractable Vanadium (V)	ug/g	30	5.0	5958803
Acid Extractable Zinc (Zn)	ug/g	38	5.0	5958803
Acid Extractable Mercury (Hg)	ug/g	<0.050	0.050	5958803

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B929073
Report Date: 2019/02/08

Terrapex Environmental Ltd
Client Project #: CT2817.00
Site Location: 1294 KINGSTON RD., PICKERING
Sampler Initials: LG

O.REG 153 PAHS (SOIL)

Maxxam ID		IWY772		
Sampling Date		2019/01/31 10:00		
COC Number		108380		
	UNITS	**MW9-SS1**	**RDL**	**QC Batch**
Calculated Parameters				
Methylnaphthalene, 2-(1-)	ug/g	<0.0071	0.0071	5956989
Polyaromatic Hydrocarbons				
Acenaphthene	ug/g	<0.0050	0.0050	5963624
Acenaphthylene	ug/g	<0.0050	0.0050	5963624
Anthracene	ug/g	<0.0050	0.0050	5963624
Benzo(a)anthracene	ug/g	<0.0050	0.0050	5963624
Benzo(a)pyrene	ug/g	<0.0050	0.0050	5963624
Benzo(b/j)fluoranthene	ug/g	<0.0050	0.0050	5963624
Benzo(g,h,i)perylene	ug/g	<0.0050	0.0050	5963624
Benzo(k)fluoranthene	ug/g	<0.0050	0.0050	5963624
Chrysene	ug/g	<0.0050	0.0050	5963624
Dibenz(a,h)anthracene	ug/g	<0.0050	0.0050	5963624
Fluoranthene	ug/g	<0.0050	0.0050	5963624
Fluorene	ug/g	<0.0050	0.0050	5963624
Indeno(1,2,3-cd)pyrene	ug/g	<0.0050	0.0050	5963624
1-Methylnaphthalene	ug/g	<0.0050	0.0050	5963624
2-Methylnaphthalene	ug/g	<0.0050	0.0050	5963624
Naphthalene	ug/g	<0.0050	0.0050	5963624
Phenanthrene	ug/g	<0.0050	0.0050	5963624
Pyrene	ug/g	<0.0050	0.0050	5963624
Surrogate Recovery (%)				
D10-Anthracene	%	93		5963624
D14-Terphenyl (FS)	%	100		5963624
D8-Acenaphthylene	%	85		5963624

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam
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Maxxam Job #: B929073
Report Date: 2019/02/08

Terrapex Environmental Ltd
Client Project #: CT2817.00
Site Location: 1294 KINGSTON RD., PICKERING
Sampler Initials: LG

O.REG 153 VOCS BY HS & F1-F4 (SOIL)

Maxxam ID		IWY773		
Sampling Date		2019/01/31 11:00		
COC Number		108380		
	UNITS	**MW9-SS4**	**RDL**	**QC Batch**
Inorganics				
Moisture	%	25	1.0	5957980
Calculated Parameters				
1,3-Dichloropropene (cis+trans)	ug/g	<0.050	0.050	5957181
Volatile Organics				
Acetone (2-Propanone)	ug/g	<0.50	0.50	5958556
Benzene	ug/g	<0.020	0.020	5958556
Bromodichloromethane	ug/g	<0.050	0.050	5958556
Bromoform	ug/g	<0.050	0.050	5958556
Bromomethane	ug/g	<0.050	0.050	5958556
Carbon Tetrachloride	ug/g	<0.050	0.050	5958556
Chlorobenzene	ug/g	<0.050	0.050	5958556
Chloroform	ug/g	<0.050	0.050	5958556
Dibromochloromethane	ug/g	<0.050	0.050	5958556
1,2-Dichlorobenzene	ug/g	<0.050	0.050	5958556
1,3-Dichlorobenzene	ug/g	<0.050	0.050	5958556
1,4-Dichlorobenzene	ug/g	<0.050	0.050	5958556
Dichlorodifluoromethane (FREON 12)	ug/g	<0.050	0.050	5958556
1,1-Dichloroethane	ug/g	<0.050	0.050	5958556
1,2-Dichloroethane	ug/g	<0.050	0.050	5958556
1,1-Dichloroethylene	ug/g	<0.050	0.050	5958556
cis-1,2-Dichloroethylene	ug/g	<0.050	0.050	5958556
trans-1,2-Dichloroethylene	ug/g	<0.050	0.050	5958556
1,2-Dichloropropane	ug/g	<0.050	0.050	5958556
cis-1,3-Dichloropropene	ug/g	<0.030	0.030	5958556
trans-1,3-Dichloropropene	ug/g	<0.040	0.040	5958556
Ethylbenzene	ug/g	<0.020	0.020	5958556
Ethylene Dibromide	ug/g	<0.050	0.050	5958556
Hexane	ug/g	<0.050	0.050	5958556
Methylene Chloride(Dichloromethane)	ug/g	<0.050	0.050	5958556
Methyl Ethyl Ketone (2-Butanone)	ug/g	<0.50	0.50	5958556
Methyl Isobutyl Ketone	ug/g	<0.50	0.50	5958556
Methyl t-butyl ether (MTBE)	ug/g	<0.050	0.050	5958556
Styrene	ug/g	<0.050	0.050	5958556

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B929073
Report Date: 2019/02/08

Terrapex Environmental Ltd
Client Project #: CT2817.00
Site Location: 1294 KINGSTON RD., PICKERING
Sampler Initials: LG

O.REG 153 VOCS BY HS & F1-F4 (SOIL)

Maxxam ID		IWY773		
Sampling Date		2019/01/31 11:00		
COC Number		108380		
	UNITS	**MW9-SS4**	**RDL**	**QC Batch**
1,1,1,2-Tetrachloroethane	ug/g	<0.050	0.050	5958556
1,1,2,2-Tetrachloroethane	ug/g	<0.050	0.050	5958556
Tetrachloroethylene	ug/g	<0.050	0.050	5958556
Toluene	ug/g	<0.020	0.020	5958556
1,1,1-Trichloroethane	ug/g	<0.050	0.050	5958556
1,1,2-Trichloroethane	ug/g	<0.050	0.050	5958556
Trichloroethylene	ug/g	<0.050	0.050	5958556
Trichlorofluoromethane (FREON 11)	ug/g	<0.050	0.050	5958556
Vinyl Chloride	ug/g	<0.020	0.020	5958556
p+m-Xylene	ug/g	<0.020	0.020	5958556
o-Xylene	ug/g	<0.020	0.020	5958556
Total Xylenes	ug/g	<0.020	0.020	5958556
F1 (C6-C10)	ug/g	<10	10	5958556
F1 (C6-C10) - BTEX	ug/g	<10	10	5958556
F2-F4 Hydrocarbons				
F2 (C10-C16 Hydrocarbons)	ug/g	<10	10	5963078
F3 (C16-C34 Hydrocarbons)	ug/g	<50	50	5963078
F4 (C34-C50 Hydrocarbons)	ug/g	<50	50	5963078
Reached Baseline at C50	ug/g	Yes		5963078
Surrogate Recovery (%)				
o-Terphenyl	%	97		5963078
4-Bromofluorobenzene	%	94		5958556
D10-o-Xylene	%	84		5958556
D4-1,2-Dichloroethane	%	108		5958556
D8-Toluene	%	95		5958556

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B929073
Report Date: 2019/02/08

Terrapex Environmental Ltd
Client Project #: CT2817.00
Site Location: 1294 KINGSTON RD., PICKERING
Sampler Initials: LG

TEST SUMMARY

Maxxam ID: IWY772
Sample ID: MW9-SS1
Matrix: Soil

Collected: 2019/01/31
Shipped:
Received: 2019/02/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	5956989	N/A	2019/02/08	Automated Statchk
Hot Water Extractable Boron	ICP	5958822	2019/02/04	2019/02/04	Suban Kanapathippllai
Free (WAD) Cyanide	TECH	5961489	2019/02/05	2019/02/06	Barbara Kalbasi Esfahani
Conductivity	AT	5962184	2019/02/06	2019/02/06	Kazzandra Adeva
Hexavalent Chromium in Soil by IC	IC/SPEC	5958543	2019/02/04	2019/02/05	Rupinder Sihota
Strong Acid Leachable Metals by ICPMS	ICP/MS	5958803	2019/02/04	2019/02/04	Daniel Teclu
Moisture	BAL	5957980	N/A	2019/02/02	Mithunaa Sasitheepan
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	5963624	2019/02/06	2019/02/07	Mitesh Raj
pH CaCl2 EXTRACT	AT	5959213	2019/02/05	2019/02/05	Gnana Thomas
Sodium Adsorption Ratio (SAR)	CALC/MET	5956048	N/A	2019/02/07	Automated Statchk

Maxxam ID: IWY773
Sample ID: MW9-SS4
Matrix: Soil

Collected: 2019/01/31
Shipped:
Received: 2019/02/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
1,3-Dichloropropene Sum	CALC	5957181	N/A	2019/02/05	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	5963078	2019/02/06	2019/02/07	Prabhjot Gulati
Moisture	BAL	5957980	N/A	2019/02/02	Mithunaa Sasitheepan
Volatile Organic Compounds and F1 PHCs	GC/MSFD	5958556	N/A	2019/02/04	Xueming Jiang

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

GENERAL COMMENTS

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

Package 1	-0.3°C

Cooler custody seal was present and intact.

Results relate only to the items tested.

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

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Maxxam Job #: B929073
Report Date: 2019/02/08

QUALITY ASSURANCE REPORT

Terrapex Environmental Ltd
Client Project #: CT2817.00
Site Location: 1294 KINGSTON RD., PICKERING
Sampler Initials: LG

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
5958556	4-Bromofluorobenzene	2019/02/04	101	60 - 140	101	60 - 140	95	%		
5958556	D10-o-Xylene	2019/02/04	100	60 - 130	92	60 - 130	85	%		
5958556	D4-1,2-Dichloroethane	2019/02/04	102	60 - 140	107	60 - 140	104	%		
5958556	D8-Toluene	2019/02/04	102	60 - 140	102	60 - 140	95	%		
5963078	o-Terphenyl	2019/02/06	103	60 - 130	103	60 - 130	100	%		
5963624	D10-Anthracene	2019/02/06	101	50 - 130	99	50 - 130	103	%		
5963624	D14-Terphenyl (FS)	2019/02/06	114	50 - 130	111	50 - 130	109	%		
5963624	D8-Acenaphthylene	2019/02/06	100	50 - 130	97	50 - 130	96	%		
5957980	Moisture	2019/02/02							1.1	20
5958543	Chromium (VI)	2019/02/05	84	70 - 130	86	80 - 120	<0.2	ug/g	NC	35
5958556	1,1,1,2-Tetrachloroethane	2019/02/04	100	60 - 140	101	60 - 130	<0.050	ug/g	NC	50
5958556	1,1,1-Trichloroethane	2019/02/04	98	60 - 140	101	60 - 130	<0.050	ug/g	NC	50
5958556	1,1,2,2-Tetrachloroethane	2019/02/04	100	60 - 140	103	60 - 130	<0.050	ug/g	NC	50
5958556	1,1,2-Trichloroethane	2019/02/04	100	60 - 140	102	60 - 130	<0.050	ug/g	NC	50
5958556	1,1-Dichloroethane	2019/02/04	98	60 - 140	101	60 - 130	<0.050	ug/g	NC	50
5958556	1,1-Dichloroethylene	2019/02/04	96	60 - 140	99	60 - 130	<0.050	ug/g	NC	50
5958556	1,2-Dichlorobenzene	2019/02/04	97	60 - 140	97	60 - 130	<0.050	ug/g	NC	50
5958556	1,2-Dichloroethane	2019/02/04	100	60 - 140	105	60 - 130	<0.050	ug/g	NC	50
5958556	1,2-Dichloropropane	2019/02/04	96	60 - 140	100	60 - 130	<0.050	ug/g	NC	50
5958556	1,3-Dichlorobenzene	2019/02/04	99	60 - 140	98	60 - 130	<0.050	ug/g	NC	50
5958556	1,4-Dichlorobenzene	2019/02/04	98	60 - 140	97	60 - 130	<0.050	ug/g	NC	50
5958556	Acetone (2-Propanone)	2019/02/04	103	60 - 140	111	60 - 140	<0.50	ug/g	NC	50
5958556	Benzene	2019/02/04	98	60 - 140	101	60 - 130	<0.020	ug/g	NC	50
5958556	Bromodichloromethane	2019/02/04	98	60 - 140	102	60 - 130	<0.050	ug/g	NC	50
5958556	Bromoform	2019/02/04	98	60 - 140	102	60 - 130	<0.050	ug/g	NC	50
5958556	Bromomethane	2019/02/04	102	60 - 140	105	60 - 140	<0.050	ug/g	NC	50
5958556	Carbon Tetrachloride	2019/02/04	97	60 - 140	99	60 - 130	<0.050	ug/g	NC	50
5958556	Chlorobenzene	2019/02/04	97	60 - 140	97	60 - 130	<0.050	ug/g	NC	50
5958556	Chloroform	2019/02/04	97	60 - 140	100	60 - 130	<0.050	ug/g	NC	50
5958556	cis-1,2-Dichloroethylene	2019/02/04	97	60 - 140	101	60 - 130	<0.050	ug/g	NC	50
5958556	cis-1,3-Dichloropropene	2019/02/04	93	60 - 140	97	60 - 130	<0.030	ug/g	NC	50
5958556	Dibromochloromethane	2019/02/04	100	60 - 140	102	60 - 130	<0.050	ug/g	NC	50

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A Bureau Veritas Group Company

Maxxam Job #: B929073
Report Date: 2019/02/08

QUALITY ASSURANCE REPORT(CONT'D)

Terrapex Environmental Ltd
Client Project #: CT2817.00
Site Location: 1294 KINGSTON RD., PICKERING
Sampler Initials: LG

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
5958556	Dichlorodifluoromethane (FREON 12)	2019/02/04	105	60 - 140	108	60 - 140	<0.050	ug/g	NC	50
5958556	Ethylbenzene	2019/02/04	94	60 - 140	94	60 - 130	<0.020	ug/g	NC	50
5958556	Ethylene Dibromide	2019/02/04	100	60 - 140	103	60 - 130	<0.050	ug/g	NC	50
5958556	F1 (C6-C10) - BTEX	2019/02/04					<10	ug/g	NC	30
5958556	F1 (C6-C10)	2019/02/04	100	60 - 140	92	80 - 120	<10	ug/g	NC	30
5958556	Hexane	2019/02/04	95	60 - 140	97	60 - 130	<0.050	ug/g	NC	50
5958556	Methyl Ethyl Ketone (2-Butanone)	2019/02/04	104	60 - 140	112	60 - 140	<0.50	ug/g	NC	50
5958556	Methyl Isobutyl Ketone	2019/02/04	105	60 - 140	113	60 - 130	<0.50	ug/g	NC	50
5958556	Methyl t-butyl ether (MTBE)	2019/02/04	95	60 - 140	99	60 - 130	<0.050	ug/g	NC	50
5958556	Methylene Chloride(Dichloromethane)	2019/02/04	92	60 - 140	95	60 - 130	<0.050	ug/g	NC	50
5958556	o-Xylene	2019/02/04	96	60 - 140	96	60 - 130	<0.020	ug/g	NC	50
5958556	p+m-Xylene	2019/02/04	92	60 - 140	91	60 - 130	<0.020	ug/g	NC	50
5958556	Styrene	2019/02/04	99	60 - 140	100	60 - 130	<0.050	ug/g	NC	50
5958556	Tetrachloroethylene	2019/02/04	99	60 - 140	97	60 - 130	<0.050	ug/g	NC	50
5958556	Toluene	2019/02/04	92	60 - 140	92	60 - 130	<0.020	ug/g	NC	50
5958556	Total Xylenes	2019/02/04					<0.020	ug/g	NC	50
5958556	trans-1,2-Dichloroethylene	2019/02/04	99	60 - 140	101	60 - 130	<0.050	ug/g	NC	50
5958556	trans-1,3-Dichloropropene	2019/02/04	98	60 - 140	99	60 - 130	<0.040	ug/g	NC	50
5958556	Trichloroethylene	2019/02/04	96	60 - 140	99	60 - 130	<0.050	ug/g	NC	50
5958556	Trichlorofluoromethane (FREON 11)	2019/02/04	101	60 - 140	102	60 - 130	<0.050	ug/g	NC	50
5958556	Vinyl Chloride	2019/02/04	103	60 - 140	106	60 - 130	<0.020	ug/g	NC	50
5958803	Acid Extractable Antimony (Sb)	2019/02/04	102	75 - 125	108	80 - 120	<0.20	ug/g	14	30
5958803	Acid Extractable Arsenic (As)	2019/02/04	101	75 - 125	105	80 - 120	<1.0	ug/g	0.25	30
5958803	Acid Extractable Barium (Ba)	2019/02/04	NC	75 - 125	101	80 - 120	<0.50	ug/g	0.98	30
5958803	Acid Extractable Beryllium (Be)	2019/02/04	105	75 - 125	106	80 - 120	<0.20	ug/g	0.54	30
5958803	Acid Extractable Boron (B)	2019/02/04	100	75 - 125	105	80 - 120	<5.0	ug/g	4.8	30
5958803	Acid Extractable Cadmium (Cd)	2019/02/04	104	75 - 125	101	80 - 120	<0.10	ug/g	23	30
5958803	Acid Extractable Chromium (Cr)	2019/02/04	98	75 - 125	106	80 - 120	<1.0	ug/g	0.0037	30
5958803	Acid Extractable Cobalt (Co)	2019/02/04	97	75 - 125	104	80 - 120	<0.10	ug/g	3.5	30
5958803	Acid Extractable Copper (Cu)	2019/02/04	99	75 - 125	106	80 - 120	<0.50	ug/g	2.0	30
5958803	Acid Extractable Lead (Pb)	2019/02/04	102	75 - 125	106	80 - 120	<1.0	ug/g	3.1	30
5958803	Acid Extractable Mercury (Hg)	2019/02/04	94	75 - 125	94	80 - 120	<0.050	ug/g		

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A Bureau Veritas Group Company

Maxxam Job #: B929073
Report Date: 2019/02/08

QUALITY ASSURANCE REPORT(CONT'D)

Terrapex Environmental Ltd
Client Project #: CT2817.00
Site Location: 1294 KINGSTON RD., PICKERING
Sampler Initials: LG

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
5958803	Acid Extractable Molybdenum (Mo)	2019/02/04	104	75 - 125	104	80 - 120	<0.50	ug/g	8.0	30
5958803	Acid Extractable Nickel (Ni)	2019/02/04	101	75 - 125	106	80 - 120	<0.50	ug/g	9.7	30
5958803	Acid Extractable Selenium (Se)	2019/02/04	100	75 - 125	102	80 - 120	<0.50	ug/g	NC	30
5958803	Acid Extractable Silver (Ag)	2019/02/04	102	75 - 125	104	80 - 120	<0.20	ug/g	NC	30
5958803	Acid Extractable Thallium (Tl)	2019/02/04	102	75 - 125	105	80 - 120	<0.050	ug/g	12	30
5958803	Acid Extractable Uranium (U)	2019/02/04	99	75 - 125	103	80 - 120	<0.050	ug/g	1.6	30
5958803	Acid Extractable Vanadium (V)	2019/02/04	NC	75 - 125	104	80 - 120	<5.0	ug/g	0.41	30
5958803	Acid Extractable Zinc (Zn)	2019/02/04	NC	75 - 125	109	80 - 120	<5.0	ug/g	6.1	30
5958822	Hot Water Ext. Boron (B)	2019/02/04	96	75 - 125	94	75 - 125	<0.050	ug/g	4.8	40
5959213	Available (CaCl2) pH	2019/02/05			100	97 - 103			0.56	N/A
5961489	WAD Cyanide (Free)	2019/02/06	96	75 - 125	99	80 - 120	<0.01	ug/g	NC	35
5962184	Conductivity	2019/02/06			103	90 - 110	<0.002	mS/cm	0.46	10
5963078	F2 (C10-C16 Hydrocarbons)	2019/02/06	103	50 - 130	100	80 - 120	<10	ug/g	NC	30
5963078	F3 (C16-C34 Hydrocarbons)	2019/02/06	97	50 - 130	94	80 - 120	<50	ug/g	1.3	30
5963078	F4 (C34-C50 Hydrocarbons)	2019/02/06	97	50 - 130	92	80 - 120	<50	ug/g	NC	30
5963624	1-Methylnaphthalene	2019/02/06	109	50 - 130	109	50 - 130	<0.0050	ug/g	NC	40
5963624	2-Methylnaphthalene	2019/02/06	98	50 - 130	98	50 - 130	<0.0050	ug/g	NC	40
5963624	Acenaphthene	2019/02/06	97	50 - 130	99	50 - 130	<0.0050	ug/g	NC	40
5963624	Acenaphthylene	2019/02/06	98	50 - 130	98	50 - 130	<0.0050	ug/g	NC	40
5963624	Anthracene	2019/02/06	93	50 - 130	96	50 - 130	<0.0050	ug/g	NC	40
5963624	Benzo(a)anthracene	2019/02/06	104	50 - 130	103	50 - 130	<0.0050	ug/g	NC	40
5963624	Benzo(a)pyrene	2019/02/06	96	50 - 130	100	50 - 130	<0.0050	ug/g	NC	40
5963624	Benzo(b/j)fluoranthene	2019/02/06	92	50 - 130	98	50 - 130	<0.0050	ug/g	NC	40
5963624	Benzo(g,h,i)perylene	2019/02/06	91	50 - 130	100	50 - 130	<0.0050	ug/g	NC	40
5963624	Benzo(k)fluoranthene	2019/02/06	94	50 - 130	98	50 - 130	<0.0050	ug/g	NC	40
5963624	Chrysene	2019/02/06	99	50 - 130	102	50 - 130	<0.0050	ug/g	NC	40
5963624	Dibenz(a,h)anthracene	2019/02/06	95	50 - 130	89	50 - 130	<0.0050	ug/g	NC	40
5963624	Fluoranthene	2019/02/06	107	50 - 130	109	50 - 130	<0.0050	ug/g	NC	40
5963624	Fluorene	2019/02/06	95	50 - 130	96	50 - 130	<0.0050	ug/g	NC	40
5963624	Indeno(1,2,3-cd)pyrene	2019/02/06	93	50 - 130	104	50 - 130	<0.0050	ug/g	NC	40
5963624	Naphthalene	2019/02/06	88	50 - 130	90	50 - 130	<0.0050	ug/g	NC	40
5963624	Phenanthrene	2019/02/06	96	50 - 130	96	50 - 130	<0.0050	ug/g	NC	40

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QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
5963624	Pyrene	2019/02/06	106	50 - 130	107	50 - 130	<0.0050	ug/g	NC	40

N/A = Not Applicable

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

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

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

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

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

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

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

Maxxam Job #: B929073
Report Date: 2019/02/08

Terrapex Environmental Ltd
Client Project #: CT2817.00
Site Location: 1294 KINGSTON RD., PICKERING
Sampler Initials: LG

VALIDATION SIGNATURE PAGE

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

Anastassia Hamanov, Scientific Specialist

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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Phone: 905-817-5700 Fax: 905-817-5779 Toll Free: 800-563-6266
CAM FCD-01191/3

CHAIN OF CUSTODY RECORD

108380 Page 1 of 1

Invoice Information		Report Information (if differs from invoice)		Project Information (where applicable)		Turnaround Time (TAT) Required
Company Name:	Terrapex Environmental Ltd	Company Name:		Quotation #:	TPEX	[X] Regular TAT (5-7 days) Most analyses
Contact Name:	Chaoran Li	Contact Name:		P.O. #/ AFE#:		PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS
Address:	90 Scarsdale Rd, Toronto	Address:		Project #:	CT2817.00	Rush TAT (Surcharges will be applied)
				Site Location:	1294 Kingston Rd Pickering	[ ] 1 Day [ ] 2 Days [ ] 3-4 Days
Phone:	416-245-0011 Fax: 416-245-0012	Phone:	Fax:	Site #:		
Email:	c.li@terrapex.com	Email:		Sampled By:	L.G	Date Required:

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Rush Confirmation #:

Regulation 153: [X] Table 1; [ ] Table 2; [ ] Table 3; [ ] Table ___; [X] Res/Park; [ ] Ind/Comm; [ ] Agri/ Other; [ ] Med/ Fine; [ ] Coarse

FOR RSC (PLEASE CIRCLE) Y / N (Y circled)

Other Regulations: [ ] CCME; [ ] MISA; [ ] PWQO; [ ] Other (Specify); [ ] REG 558 (MIN. 3 DAY TAT REQUIRED); [ ] Sanitary Sewer Bylaw; [ ] Storm Sewer Bylaw; Region

Include Criteria on Certificate of Analysis: Y / N (N circled)

SAMPLES MUST BE KEPT COOL (< 10 °C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

Analysis Requested

	SAMPLE IDENTIFICATION	DATE SAMPLED (YYYY/MM/DD)	TIME SAMPLED (HH:MM)	MATRIX	# OF CONTAINERS SUBMITTED	FIELD FILTERED (CIRCLE) Metals / Hg / CrVI	BTEX/ PHC F1	PHCs F2 - F4	VOCs	REG 153 METALS & INORGANICS	REG 153 ICPMS METALS	REG 153 METALS (Hg, Cr VI, ICPMS Metals, HWS - B)	PAHS							HOLD- DO NOT ANALYZE	COMMENTS
1	~~BH9-SS1~~ MW9-SS1	2019/01/31	10:00	S	2					X			X								
2	~~BH9-SS4~~ MW9-SS4	2019/01/31	11:00	S	3		X	X	X												
3																					
4																					
5																					
6																					
7																					
8																					
9																					
10																					

LABORATORY USE ONLY

CUSTODY SEAL Y / N (Y circled) — Present | Intact

COOLER TEMPERATURES: 1 | 1 | 1 — 1 — 1 — 1

COOLING MEDIA PRESENT: Y / N (Y circled)

01-Feb-19 16:06
Ema Gitej
B929073
ENV-1260
GK1

RELINQUISHED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)	RECEIVED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)	MAXXAM JOB #
Chaoran Li	2019/02/01	10:50		2019/02/01	16:06	

Unless otherwise agreed to in writing, work submitted on this Chain of Custody is subject to Maxxam's standard Terms and Conditions. Signing of this Chain of Custody document is acknowledgment and acceptance of our terms which are available for viewing at www.maxxam.ca/terms. Sample container, preservation, hold time and packages information can be viewed at http://maxxam.ca/wp-content/uploads/Ontario-COC.pdf.

96659

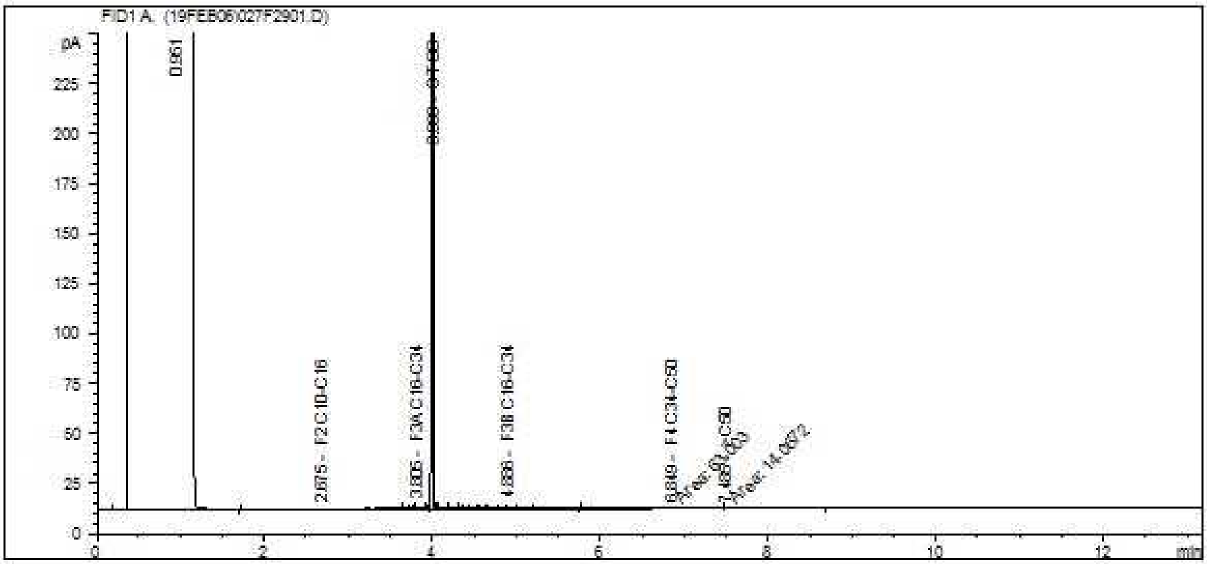
COC-1004 (03/17)

White: Maxxam ~ Yellow: Client

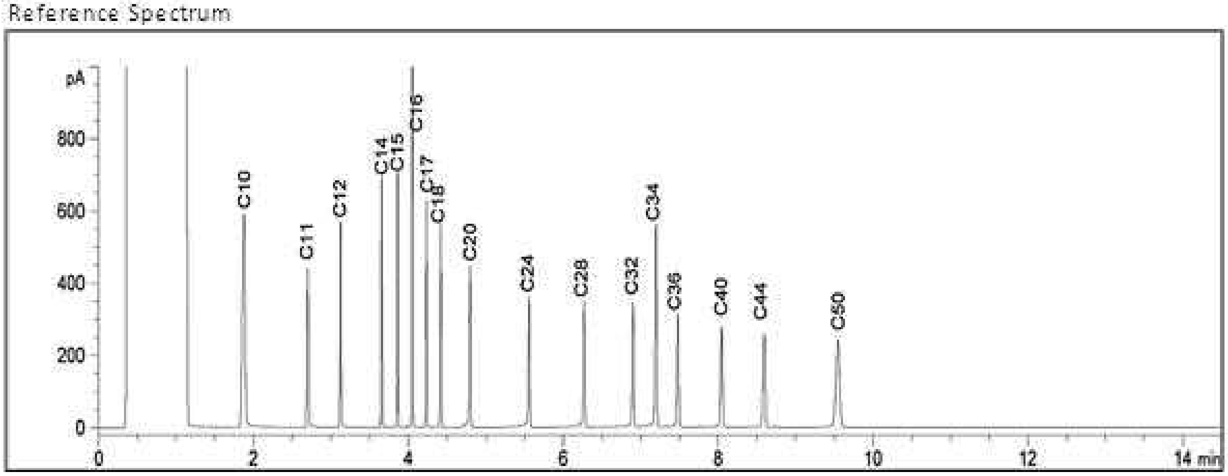
Maxxam Job #: B929073
Report Date: 2019/02/08
Maxxam Sample: IWY773

Terrapex Environmental Ltd
Client Project #: CT2817.00
Project name: 1294 KINGSTON RD., PICKERING
Client ID: MW9-SS4

Petroleum Hydrocarbons F2-F4 in Soil Chromatogram



Reference Spectrum



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline: C6 - C12	Diesel: C10 - C24	Jet Fuels: C6 - C16
Varsol: C8 - C12	Fuel Oils: C6 - C32	Creosote: C10 - C26
Kerosene: C8 - C16	Motor Oils: C16 - C50	Asphalt: C18 - C50+

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

Maxxam
A Bureau Veritas Group Company

Your Project #: CT2817.00
Site Location: 1294 KINGSTON RD, PICKERING
Your C.O.C. #: 108388

Attention: Chaoran Li

Terrapex Environmental Ltd
90 Scarsdale Rd
Toronto, ON
CANADA M3B 2R7

Report Date: 2019/02/25
Report #: R5606703
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B940713
Received: 2019/02/14, 15:26

Sample Matrix: Soil
Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Moisture	2	N/A	2019/02/15	CAM SOP-00445	Carter 2nd ed 51.2 m
OC Pesticides (Selected) & PCB (1)	2	2019/02/22	2019/02/23	CAM SOP-00307	SW846 8081, 8082
OC Pesticides Summed Parameters	2	N/A	2019/02/16	CAM SOP-00307	EPA 8081/8082 m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

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

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing. Maxxam is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Maxxam, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Chlordane (Total) = Alpha Chlordane + Gamma Chlordane

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Report #: R5606703
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B940713
Received: 2019/02/14, 15:26

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Ema Gitej, Senior Project Manager
Email: EGitej@maxxam.ca
Phone# (905)817-5829
==
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam
A Bureau Veritas Group Company

Maxxam Job #: B940713
Report Date: 2019/02/25

Terrapex Environmental Ltd
Client Project #: CT2817.00
Site Location: 1294 KINGSTON RD, PICKERING
Sampler Initials: ALP

O.REG 153 OC PESTICIDES (SOIL)

Maxxam ID		IZJ636	IZJ637		
Sampling Date		2019/02/07 10:15	2019/02/07 10:15		
COC Number		108388	108388		
	UNITS	**MW10-1**	**MW10-91**	**RDL**	**QC Batch**
Inorganics					
Moisture	%	16	14	1.0	5976872
Calculated Parameters					
Chlordane (Total)	ug/g	<0.0020	<0.0020	0.0020	5974833
o,p-DDD + p,p-DDD	ug/g	<0.0020	<0.0020	0.0020	5974833
o,p-DDE + p,p-DDE	ug/g	0.0028	0.0033	0.0020	5974833
o,p-DDT + p,p-DDT	ug/g	<0.0020	<0.0020	0.0020	5974833
Total Endosulfan	ug/g	<0.0020	<0.0020	0.0020	5974833
Total PCB	ug/g	<0.020	<0.020	0.020	5974833
Pesticides & Herbicides					
Aldrin	ug/g	<0.0020	<0.0020	0.0020	5986830
a-Chlordane	ug/g	<0.0020	<0.0020	0.0020	5986830
g-Chlordane	ug/g	<0.0020	<0.0020	0.0020	5986830
o,p-DDD	ug/g	<0.0020	<0.0020	0.0020	5986830
p,p-DDD	ug/g	<0.0020	<0.0020	0.0020	5986830
o,p-DDE	ug/g	<0.0020	<0.0020	0.0020	5986830
p,p-DDE	ug/g	0.0028	0.0033	0.0020	5986830
o,p-DDT	ug/g	<0.0020	<0.0020	0.0020	5986830
p,p-DDT	ug/g	<0.0020	<0.0020	0.0020	5986830
Dieldrin	ug/g	<0.0020	<0.0020	0.0020	5986830
Lindane	ug/g	<0.0020	<0.0020	0.0020	5986830
Endosulfan I (alpha)	ug/g	<0.0020	<0.0020	0.0020	5986830
Endosulfan II (beta)	ug/g	<0.0020	<0.0020	0.0020	5986830
Endrin	ug/g	<0.0020	<0.0020	0.0020	5986830
Heptachlor	ug/g	<0.0020	<0.0020	0.0020	5986830
Heptachlor epoxide	ug/g	<0.0020	<0.0020	0.0020	5986830
Hexachlorobenzene	ug/g	<0.0020	<0.0020	0.0020	5986830
Hexachlorobutadiene	ug/g	<0.0020	<0.0020	0.0020	5986830
Hexachloroethane	ug/g	<0.0020	<0.0020	0.0020	5986830
Methoxychlor	ug/g	<0.0050	<0.0050	0.0050	5986830
Aroclor 1242	ug/g	<0.020	<0.020	0.020	5986830
Aroclor 1248	ug/g	<0.020	<0.020	0.020	5986830
Aroclor 1254	ug/g	<0.020	<0.020	0.020	5986830
Aroclor 1260	ug/g	<0.020	<0.020	0.020	5986830

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B940713
Report Date: 2019/02/25

Terrapex Environmental Ltd
Client Project #: CT2817.00
Site Location: 1294 KINGSTON RD, PICKERING
Sampler Initials: ALP

O.REG 153 OC PESTICIDES (SOIL)

Maxxam ID		IZJ636	IZJ637		
Sampling Date		2019/02/07 10:15	2019/02/07 10:15		
COC Number		108388	108388		
	UNITS	**MW10-1**	**MW10-91**	**RDL**	**QC Batch**
Surrogate Recovery (%)					
2,4,5,6-Tetrachloro-m-xylene	%	88	90		5986830
Decachlorobiphenyl	%	103	113		5986830

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B940713
Report Date: 2019/02/25

Terrapex Environmental Ltd
Client Project #: CT2817.00
Site Location: 1294 KINGSTON RD, PICKERING
Sampler Initials: ALP

TEST SUMMARY

Maxxam ID: IZJ636
Sample ID: MW10-1
Matrix: Soil

Collected: 2019/02/07
Shipped:
Received: 2019/02/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	5976872	N/A	2019/02/15	Navjot Kaur Gill
OC Pesticides (Selected) & PCB	GC/ECD	5986830	2019/02/22	2019/02/23	Li Peng
OC Pesticides Summed Parameters	CALC	5974833	N/A	2019/02/16	Automated Statchk

Maxxam ID: IZJ637
Sample ID: MW10-91
Matrix: Soil

Collected: 2019/02/07
Shipped:
Received: 2019/02/14

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	5976872	N/A	2019/02/15	Navjot Kaur Gill
OC Pesticides (Selected) & PCB	GC/ECD	5986830	2019/02/22	2019/02/23	Li Peng
OC Pesticides Summed Parameters	CALC	5974833	N/A	2019/02/16	Automated Statchk

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GENERAL COMMENTS

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

Package 1	1.3°C

OC Pesticide Analysis: Detection Limits for some parameters were raised due to matrix interferences.

Results relate only to the items tested.

Maxxam
A Bureau Veritas Group Company

Maxxam Job #: B940713
Report Date: 2019/02/25

QUALITY ASSURANCE REPORT

Terrapex Environmental Ltd
Client Project #: CT2817.00
Site Location: 1294 KINGSTON RD, PICKERING
Sampler Initials: ALP

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
5986830	2,4,5,6-Tetrachloro-m-xylene	2019/02/22	80	50 - 130	68	50 - 130	63	%		
5986830	Decachlorobiphenyl	2019/02/22	114	50 - 130	111	50 - 130	76	%		
5976872	Moisture	2019/02/15							0.64	20
5986830	a-Chlordane	2019/02/23	90	50 - 130	92	50 - 130	<0.0020	ug/g	NC	40
5986830	Aldrin	2019/02/23	84	50 - 130	74	50 - 130	<0.0020	ug/g	NC	40
5986830	Aroclor 1242	2019/02/23					<0.015	ug/g	NC	40
5986830	Aroclor 1248	2019/02/23					<0.015	ug/g	NC	40
5986830	Aroclor 1254	2019/02/23					<0.015	ug/g	NC	40
5986830	Aroclor 1260	2019/02/23					<0.015	ug/g	NC	40
5986830	Dieldrin	2019/02/23	95	50 - 130	103	50 - 130	<0.0020	ug/g	NC	40
5986830	Endosulfan I (alpha)	2019/02/23	99	50 - 130	99	50 - 130	<0.0020	ug/g	NC	40
5986830	Endosulfan II (beta)	2019/02/23	82	50 - 130	93	50 - 130	<0.0020	ug/g	NC	40
5986830	Endrin	2019/02/23	83	50 - 130	89	50 - 130	<0.0020	ug/g	NC	40
5986830	g-Chlordane	2019/02/23	86	50 - 130	89	50 - 130	<0.0020	ug/g	NC	40
5986830	Heptachlor epoxide	2019/02/23	77	50 - 130	82	50 - 130	<0.0020	ug/g	NC	40
5986830	Heptachlor	2019/02/23	87	50 - 130	73	50 - 130	<0.0020	ug/g	NC	40
5986830	Hexachlorobenzene	2019/02/23	91	50 - 130	65	50 - 130	<0.0020	ug/g	NC	40
5986830	Hexachlorobutadiene	2019/02/23	79	50 - 130	83	50 - 130	<0.0020	ug/g	NC	40
5986830	Hexachloroethane	2019/02/23	64	50 - 130	83	50 - 130	<0.0020	ug/g	NC	40
5986830	Lindane	2019/02/23	73	50 - 130	71	50 - 130	<0.0020	ug/g	NC	40
5986830	Methoxychlor	2019/02/23	109	50 - 130	115	50 - 130	<0.0050	ug/g	NC	40
5986830	o,p-DDD	2019/02/23	99	50 - 130	104	50 - 130	<0.0020	ug/g	NC	40
5986830	o,p-DDE	2019/02/23	90	50 - 130	93	50 - 130	<0.0020	ug/g	NC	40
5986830	o,p-DDT	2019/02/23	92	50 - 130	96	50 - 130	<0.0020	ug/g	NC	40
5986830	p,p-DDD	2019/02/23	94	50 - 130	104	50 - 130	<0.0020	ug/g	NC	40
5986830	p,p-DDE	2019/02/23	107	50 - 130	101	50 - 130	<0.0020	ug/g	NC	40

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Maxxam Job #: B940713
Report Date: 2019/02/25

QUALITY ASSURANCE REPORT(CONT'D)

Terrapex Environmental Ltd
Client Project #: CT2817.00
Site Location: 1294 KINGSTON RD, PICKERING
Sampler Initials: ALP

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
5986830	p,p-DDT	2019/02/23	97	50 - 130	101	50 - 130	<0.0020	ug/g	NC	40

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

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

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

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

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

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

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

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VALIDATION SIGNATURE PAGE

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

Anastassia Hamanov, Scientific Specialist

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CAM FCD-01191/3

CHAIN OF CUSTODY RECORD 108388 Page 1 of 1

Invoice Information		Report Information (if differs from invoice)		Project Information (where applicable)		Turnaround Time (TAT) Required
Company Name:	Terrapex Environmental Ltd	Company Name:		Quotation #:	TPEX	✓ Regular TAT (5-7 days) Most analyses
Contact Name:	Accounts Payable	Contact Name:	Chaoran Li	P.O. #/ AFE#:		PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS
Address:	90 Scarsdale Rd.	Address:		Project #:	CT2817.00	Rush TAT (Surcharges will be applied)
	Toronto, ON M3B 2R7			Site Location:	1294 Kingston Rd. Pickering	1 Day / 2 Days / 3-4 Days
Phone:	416 245 0011 Fax:	Phone:	Fax:	Site #:		
Email:	accounts.payable@terrapex.com	Email:	C.Li@terrapex.com	Sampled By:	ALPK	Date Required:

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Rush Confirmation #:

Regulation 153: ☑ Table 1 ☑ Res/Park ☐ Med/ Fine ☐ Table 2 ☐ Ind/Comm ☐ Coarse ☐ Table 3 ☐ Agri/ Other ☐ Table ___

FOR RSC (PLEASE CIRCLE) Y / N (Y circled)

Other Regulations: ☐ CCME ☐ Sanitary Sewer Bylaw ☐ MISA ☐ Storm Sewer Bylaw ☐ PWQO Region ☐ Other (Specify) ☐ REG 558 (MIN. 3 DAY TAT REQUIRED)

Include Criteria on Certificate of Analysis: Y / N (N circled)

SAMPLES MUST BE KEPT COOL (< 10 °C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

LABORATORY USE ONLY: CUSTODY SEAL Y / N (Y circled); Present; Intact; COOLER TEMPERATURES 1 / 1 / 2; COOLING MEDIA PRESENT: Y / N (Y circled)

#	SAMPLE IDENTIFICATION	DATE SAMPLED (YYYY/MM/DD)	TIME SAMPLED (HH:MM)	MATRIX	# OF CONTAINERS SUBMITTED	FIELD FILTERED (CIRCLE) Metals / Hg / CrVI	BTEX/ PHC F1	PHCs F2 - F4	VOCs	REG 153 METALS & INORGANICS	REG 153 ICPMS METALS	REG 153 METALS (Hg, Cr VI, ICPMS Metals, HWS - B)	OCP's	HOLD- DO NOT ANALYZE	COMMENTS
1	MW10-1	2019/02/07	10:15	Soil	1								X		Limited recovery
2	MW10-91	↓	↓	Soil	1								X		Limited recovery
3															
4															
5															
6															
7															
8															
9															
10															

14-Feb-19 15:26
Ema Gitej
B940713
DSG ENV-1152

RELINQUISHED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)	RECEIVED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)	MAXXAM JOB #
李超然 Chaoran Li	2019/02/14	9:15	[signature]	2019/02/14	15:26	

Unless otherwise agreed to in writing, work submitted on this Chain of Custody is subject to Maxxam's standard Terms and Conditions. Signing of this Chain of Custody document is acknowledgment and acceptance of our terms which are available for viewing at www.maxxam.ca/terms. Sample container, preservation, hold time and packages information can be viewed at http://maxxam.ca/wp-content/uploads/Ontario-COC.pdf.

COC-1004 (03/17) maxxam driver White: Maxxam - Yellow: Client

Maxxam
A Bureau Veritas Group Company

Your Project #: CT2817.00
Your C.O.C. #: 701400-01-01

Attention: Chaoran Li

Terrapex Environmental Ltd
90 Scarsdale Rd
Toronto, ON
CANADA M3B 2R7

Report Date: 2019/02/25
Report #: R5606267
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B943887
Received: 2019/02/19, 15:34

Sample Matrix: Soil
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Moisture	1	N/A	2019/02/22	CAM SOP-00445	Carter 2nd ed 51.2 m
Polychlorinated Biphenyl in Soil	1	2019/02/23	2019/02/23	CAM SOP-00309	EPA 8082A m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

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

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing. Maxxam is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Maxxam, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Ema Gitej, Senior Project Manager
Email: EGitej@maxxam.ca
Phone# (905)817-5829
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Maxxam Job #: B943887
Report Date: 2019/02/25

Terrapex Environmental Ltd
Client Project #: CT2817.00
Sampler Initials: PH

O.REG 153 PCBS (SOIL)

Maxxam ID		JAB494		
Sampling Date		2019/02/15 15:00		
COC Number		701400-01-01		
	UNITS	GS-1	RDL	QC Batch
Inorganics				
Moisture	%	45	1.0	5986286
PCBs				
Aroclor 1242	ug/g	<0.020	0.020	5988312
Aroclor 1248	ug/g	<0.020	0.020	5988312
Aroclor 1254	ug/g	<0.020	0.020	5988312
Aroclor 1260	ug/g	<0.020	0.020	5988312
Total PCB	ug/g	<0.020	0.020	5988312
Surrogate Recovery (%)				
Decachlorobiphenyl	%	101		5988312

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B943887
Report Date: 2019/02/25

Terrapex Environmental Ltd
Client Project #: CT2817.00
Sampler Initials: PH

TEST SUMMARY

Maxxam ID: JAB494
Sample ID: GS-1
Matrix: Soil

Collected: 2019/02/15
Shipped:
Received: 2019/02/19

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	5986286	N/A	2019/02/22	Amitoj Singh Uppal
Polychlorinated Biphenyl in Soil	GC/ECD	5988312	2019/02/23	2019/02/23	Sarah Huang

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Maxxam Job #: B943887
Report Date: 2019/02/25

Terrapex Environmental Ltd
Client Project #: CT2817.00
Sampler Initials: PH

GENERAL COMMENTS

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

Package 1	3.0°C

Sample JAB494 [GS-1] : PCB Analysis: Detection limits were adjusted for high moisture content.

Results relate only to the items tested.

Maxxam Job #: B943887
Report Date: 2019/02/25

QUALITY ASSURANCE REPORT

Terrapex Environmental Ltd
Client Project #: CT2817.00
Sampler Initials: PH

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
5988312	Decachlorobiphenyl	2019/02/23	87	60 - 130	89	60 - 130	92	%		
5986286	Moisture	2019/02/22							0	20
5988312	Aroclor 1242	2019/02/23					<0.010	ug/g	NC	50
5988312	Aroclor 1248	2019/02/23					<0.010	ug/g	NC	50
5988312	Aroclor 1254	2019/02/23					<0.010	ug/g	NC	50
5988312	Aroclor 1260	2019/02/23	110	30 - 130	107	30 - 130	<0.010	ug/g	NC	50
5988312	Total PCB	2019/02/23	110	30 - 130	107	30 - 130	<0.010	ug/g	NC	50

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

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

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

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

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

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

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VALIDATION SIGNATURE PAGE

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Anastassia Hamanov, Scientific Specialist

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CHAIN OF CUSTODY RECORD

Page 1 of 1

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#4398 Terrapex Environmental Ltd	Company Name:		Quotation #:	B80428	Maxxam Job #:	Bottle Order #:
Attention:	Accounts Payable	Attention:	Chaoran Li	P.O. #:			701400
Address:	90 Scarsdale Rd	Address:		Project:	CT2817.00	COC #:	Project Manager:
	Toronto ON M3B 2R7			Project Name:		C#701400-01-01	Ema Gitej
Tel:	(416) 245-0011 Fax: (416) 245-0012	Tel:	(416) 245-0011 Ext: 232 Fax:	Site #:			
Email:	accounts.payable@terrapex.com	Email:	c.li@terrapex.com	Sampled By:	PH		

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)
- [x] Table 1 [x] Res/Park [ ] Medium/Fine
- [ ] Table 2 [ ] Ind/Comm [ ] Coarse
- [ ] Table 3 [ ] Agri/Other [x] For RSC
- [ ] Table ___

Other Regulations
- [ ] CCME [ ] Sanitary Sewer Bylaw
- [ ] Reg 558 [ ] Storm Sewer Bylaw
- [ ] MISA Municipality ______
- [ ] PWQO
- [ ] Other ______

Special Instructions

Include Criteria on Certificate of Analysis (Y/N)? N

ANALYSIS REQUESTED (PLEASE BE SPECIFIC): Field Filtered (please circle): Metals / Hg / Cr VI; O.Reg 153 VOCs by HS & F1-F4; O.Reg 153 Metals & Inorganics Pkg; O.Reg 153 PAHs; PCBs

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT: [x]
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ______ Time Required: ______
Rush Confirmation Number: ______ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered	O.Reg 153 VOCs by HS & F1-F4	O.Reg 153 Metals & Inorganics Pkg	O.Reg 153 PAHs	PCBs	# of Bottles	Comments
1		GS-1	Feb15,19	15:00	S					X	1	
2												
3												
4												
5												
6												
7												19-Feb-19 15:34
8												Ema Gitej
9												B943887
10												KVG ENV-815

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
李超然 Chaoran Li	19/02/19	10:00	[signature]	2019/02/19	15:34	

Laboratory Use Only				
Time Sensitive	Temperature (°C) on Recei	Custody Seal	Yes	No
	3/3/3 ice	Present	✓	
		Intact	✓	

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO MAXXAM'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.MAXXAM.CA/TERMS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT HTTP://MAXXAM.CA/WP-CONTENT/UPLOADS/ONTARIO-COC.PDF.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

White: Maxxa Yellow: Client

101425

Maxxam Analytics International Corporation o/a Maxxam Analytics

Maxxam
A Bureau Veritas Group Company

Your Project #: CT2817.00
Your C.O.C. #: 701400-05-01

Attention: Chaoran Li

Terrapex Environmental Ltd
90 Scarsdale Rd
Toronto, ON
CANADA M3B 2R7

Report Date: 2019/03/19
Report #: R5634733
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B953411
Received: 2019/02/28, 15:41

Sample Matrix: Soil
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Conductivity	1	2019/03/04	2019/03/04	CAM SOP-00414	OMOE E3530 v1 m
pH CaCl2 EXTRACT	1	2019/03/15	2019/03/15	CAM SOP-00413	EPA 9045 D m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

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

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing. Maxxam is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Maxxam, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Ema Gitej, Senior Project Manager
Email: EGitej@maxxam.ca
Phone# (905)817-5829
==
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

RESULTS OF ANALYSES OF SOIL

Maxxam ID		JCA393		
Sampling Date		2019/02/13 09:00		
COC Number		701400-05-01		
	UNITS	MW1-5	RDL	QC Batch
Inorganics				
Conductivity	mS/cm	0.29	0.002	6000096
Available (CaCl2) pH	pH	7.75		6020244

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B953411
Report Date: 2019/03/19

Terrapex Environmental Ltd
Client Project #: CT2817.00
Sampler Initials: CL

TEST SUMMARY

Maxxam ID:	JCA393	**Collected:**	2019/02/13
Sample ID:	MW1-5	**Shipped:**	
Matrix:	Soil	**Received:**	2019/02/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Conductivity	AT	6000096	2019/03/04	2019/03/04	Kazzandra Adeva
pH CaCl2 EXTRACT	AT	6020244	2019/03/15	2019/03/15	Gnana Thomas

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GENERAL COMMENTS

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

Package 1	-1.0°C

Revised Report[2019/03/19]: pH analysis has been included on sample MW1-5 as per client request.
Cooler custody seal was present and intact.

Results relate only to the items tested.

Maxxam
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Maxxam Job #: B953411
Report Date: 2019/03/19

QUALITY ASSURANCE REPORT

Terrapex Environmental Ltd
Client Project #: CT2817.00
Sampler Initials: CL

			SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
6000096	Conductivity	2019/03/04	102	90 - 110	<0.002	mS/cm	1.0	10
6020244	Available (CaCl2) pH	2019/03/15	100	97 - 103			0.079	N/A

N/A = Not Applicable

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

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

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

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VALIDATION SIGNATURE PAGE

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

Anastassia Hamanov, Scientific Specialist

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CHAIN OF CUSTODY RECORD

Page 1 of 1

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#4398 Terrapex Environmental Ltd	Company Name:		Quotation #:	B80428	Maxxam Job #:	Bottle Order #: 701400
Attention:	Accounts Payable	Attention:	Chaoran Li	P.O. #:			
Address:	90 Scarsdale Rd Toronto ON M3B 2R7	Address:		Project:	CT2817.00	COC #: C#701400-05-01	Project Manager: Ema Gitej
Tel:	(416) 245-0011 Fax: (416) 245-0012	Tel:	(416) 245-0011 Ext: 232 Fax:	Project Name:			
Email:	accounts.payable@terrapex.com	Email:	c.li@terrapex.com	Site #:			
				Sampled By:			

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011): [X] Table 1 [X] Res/Park [ ] Medium/Fine [ ] Table 2 [ ] Ind/Comm [ ] Coarse [ ] Table 3 [ ] Agri/Other [X] For RSC [ ] Table ___

Other Regulations: [ ] CCME [ ] Sanitary Sewer Bylaw [ ] Reg 558 [ ] Storm Sewer Bylaw [ ] MISA Municipality ______ [ ] PWQO [ ] Other

Special Instructions:

Include Criteria on Certificate of Analysis (Y/N)? N

ANALYSIS REQUESTED (PLEASE BE SPECIFIC): Field Filtered (please circle): Metals / Hg / Cr VI; O.Reg 153 VOCs by HS & F1-F4; O.Reg 153 Metals & Inorganics Pkg; O.Reg 153 PAHs; EC

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT: [ ]
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: March 4, 19 Time Required: [X]
Rush Confirmation Number: EEG-20190228-2 (call lab for #)

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered / Metals / Hg / Cr VI	O.Reg 153 VOCs by HS & F1-F4	O.Reg 153 Metals & Inorganics Pkg	O.Reg 153 PAHs	EC	# of Bottles	Comments
1		MW1-5	Feb 13, 19	9:00	S					X	1	
2												
3												
4												
5												
6												
7												
8												
9												
10												

28-Feb-19 15:41
Ema Gitej
B953411
GK1 ENV-1353

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Time Sensitive
Chaoran Li	19/02/28	10:00	[illegible]	2019/02/28	1541		

Laboratory Use Only

Temperature (°C) on Recei	Custody Seal	Yes	No
-1 / -1 / -1	Present	✓	
	Intact	✓	

White: Maxxa Yellow: Client

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SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

103173

Maxxam Analytics International Corporation o/a Maxxam Analytics

Maxxam
A Bureau Veritas Group Company

Your Project #: CT2817.00
Site Location: 1294 KINGSTON RD
Your C.O.C. #: 701400-08-01

Attention: Chaoran Li

Terrapex Environmental Ltd
90 Scarsdale Rd
Toronto, ON
CANADA M3B 2R7

Report Date: 2019/03/05
Report #: R5616663
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B954499
Received: 2019/03/01, 14:58

Sample Matrix: Soil
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Hot Water Extractable Boron	1	2019/03/04	2019/03/04	CAM SOP-00408	R153 Ana. Prot. 2011

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

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

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Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Maxxam, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Ema Gitej, Senior Project Manager
Email: EGitej@maxxam.ca
Phone# (905)817-5829
==
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Maxxam
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Maxxam Job #: B954499
Report Date: 2019/03/05

Terrapex Environmental Ltd
Client Project #: CT2817.00
Site Location: 1294 KINGSTON RD
Sampler Initials: AK

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		JCG250		
Sampling Date		2019/02/07 06:15		
COC Number		701400-08-01		
	UNITS	**MW2-2**	**RDL**	**QC Batch**
Metals				
Hot Water Ext. Boron (B)	ug/g	0.56	0.050	6000536

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B954499
Report Date: 2019/03/05

Terrapex Environmental Ltd
Client Project #: CT2817.00
Site Location: 1294 KINGSTON RD
Sampler Initials: AK

TEST SUMMARY

Maxxam ID: JCG250
Sample ID: MW2-2
Matrix: Soil

Collected: 2019/02/07
Shipped:
Received: 2019/03/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hot Water Extractable Boron	ICP	6000536	2019/03/04	2019/03/04	Suban Kanapathippllai

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GENERAL COMMENTS

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

Package 1	0.7°C

Results relate only to the items tested.

Maxxam Job #: B954499
Report Date: 2019/03/05

QUALITY ASSURANCE REPORT

Terrapex Environmental Ltd
Client Project #: CT2817.00
Site Location: 1294 KINGSTON RD
Sampler Initials: AK

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
6000536	Hot Water Ext. Boron (B)	2019/03/04	105	75 - 125	103	75 - 125	<0.050	ug/g	NC	40

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

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

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

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

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

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VALIDATION SIGNATURE PAGE

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Anastassia Hamanov, Scientific Specialist

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CHAIN OF CUSTODY RECORD

Page 1 of 1

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:	
Company Name:	#4398 Terrapex Environmental Ltd	Company Name:		Quotation #:	B80428
Attention:	Accounts Payable	Attention:	Chaoran Li	P.O. #:	
Address:	90 Scarsdale Rd Toronto ON M3B 2R7	Address:		Project:	CT2817.00
				Project Name:	1294 Kingston Rd
Tel:	(416) 245-0011 Fax: (416) 245-0012	Tel:	(416) 245-0011 Ext: 232 Fax:	Site #:	
Email:	accounts.payable@terrapex.com	Email:	c.li@terrapex.com	Sampled By:	ALPK

Laboratory Use Only:

Maxxam Job #:	Bottle Order #:
	701400
COC #: C#701400-08-01	Project Manager: Ema Gitej

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)	Other Regulations	Special Instructions
☐ Table 1 ☑ Res/Park ☐ Medium/Fine	☐ CCME ☐ Sanitary Sewer Bylaw	
☑ Table 2 ☐ Ind/Comm ☑ Coarse	☐ Reg 558 ☐ Storm Sewer Bylaw	
☐ Table 3 ☐ Agri/Other ☐ For RSC	☐ MISA Municipality	
☐ Table ___	☐ PWQO	
	☐ Other	

Include Criteria on Certificate of Analysis (Y/N)? ___

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT: ☑
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ___ Time Required: ___ ☐
Rush Confirmation Number: ___ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	O Reg 153 VOCs by HS & F1-F4	O Reg 153 Metals & Inorganics Pkg	O Reg 153 PAHs	HWS Boron						# of Bottles	Comments
1		MW2-2	2019/02/07	06:15	Soil	N				X						1	
2																	
3																	
4																	
5																	
6																	
7																	01-Mar-19 14:58
8																	Ema Gitej
9																	B954499
10																	KVG ENV-660

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Time Sensitive	Temperature (°C) on Recei	Custody Seal	Yes	No
Chaoran Li	19/03/01	8:02		2019/03/01	14:58			0/1/1	Present	✓	
									Intact	✓	

Laboratory Use Only

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SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

White: Maxxa Yellow: Client

Maxxam
A Bureau Veritas Group Company

Your Project #: CT2817.00
Your C.O.C. #: 701400-07-01

Attention: Chaoran Li

Terrapex Environmental Ltd
90 Scarsdale Rd
Toronto, ON
CANADA M3B 2R7

Report Date: 2019/03/07
Report #: R5619718
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B954489
Received: 2019/03/01, 14:58

Sample Matrix: Soil
Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Conductivity	2	2019/03/06	2019/03/06	CAM SOP-00414	OMOE E3530 v1 m
Sodium Adsorption Ratio (SAR)	1	N/A	2019/03/07	CAM SOP-00102	EPA 6010C

Remarks:

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Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Maxxam, results relate to the supplied samples tested.
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Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Ema Gitej, Senior Project Manager
Email: EGitej@maxxam.ca
Phone# (905)817-5829
==
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Maxxam
A Bureau Veritas Group Company

Maxxam Job #: B954489
Report Date: 2019/03/07

Terrapex Environmental Ltd
Client Project #: CT2817.00
Sampler Initials: JA

RESULTS OF ANALYSES OF SOIL

Maxxam ID		JCG228		JCG229		
Sampling Date		2019/01/07 10:00		2019/01/07 16:00		
COC Number		701400-07-01		701400-07-01		
	UNITS	**BH4-6**	**QC Batch**	**BH5-5**	**RDL**	**QC Batch**
Calculated Parameters						
Sodium Adsorption Ratio	N/A			22		5997408
Inorganics						
Conductivity	mS/cm	0.67	6004115	4.6	0.002	6004111
RDL = Reportable Detection Limit						
QC Batch = Quality Control Batch						

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TEST SUMMARY

Maxxam ID: JCG228
Sample ID: BH4-6
Matrix: Soil

Collected: 2019/01/07
Shipped:
Received: 2019/03/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Conductivity	AT	6004115	2019/03/06	2019/03/06	Kazzandra Adeva

Maxxam ID: JCG229
Sample ID: BH5-5
Matrix: Soil

Collected: 2019/01/07
Shipped:
Received: 2019/03/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Conductivity	AT	6004111	2019/03/06	2019/03/06	Kazzandra Adeva
Sodium Adsorption Ratio (SAR)	CALC/MET	5997408	N/A	2019/03/07	Automated Statchk

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Maxxam Job #: B954489
Report Date: 2019/03/07

Terrapex Environmental Ltd
Client Project #: CT2817.00
Sampler Initials: JA

GENERAL COMMENTS

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

Package 1	0.7°C

Samples received and analyzed past the recommended hold time for Conductivity as per client request.

Cooler custody seal was present and intact.

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

			SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
6004111	Conductivity	2019/03/06	101	90 - 110	<0.002	mS/cm	0	10
6004115	Conductivity	2019/03/06	103	90 - 110	<0.002	mS/cm	0.59	10

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

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

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

Maxxam Job #: B954489
Report Date: 2019/03/07

Terrapex Environmental Ltd
Client Project #: CT2817.00
Sampler Initials: JA

VALIDATION SIGNATURE PAGE

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

Anastassia Hamanov, Scientific Specialist

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel:(905) 817-5700 Toll-free:800-563-6266 Fax:(905) 817-5777 www.maxxam.ca

CHAIN OF CUSTODY RECORD

Page 1 of 1

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#4398 Terrapex Environmental Ltd	Company Name:		Quotation #:	B80428	Maxxam Job #:	Bottle Order #:
Attention:	Accounts Payable	Attention:	Chaoran Li	P.O. #:			701400
Address:	90 Scarsdale Rd	Address:		Project:	CT2817.00	COC #:	Project Manager:
	Toronto ON M3B 2R7			Project Name:		C#701400-07-01	Ema Gitej
Tel:	(416) 245-0011 Fax: (416) 245-0012	Tel:	(416) 245-0011 Ext: 232 Fax:	Site #:			
Email:	accounts.payable@terrapex.com	Email:	c.li@terrapex.com	Sampled By:	J.A		

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011): [X] Table 1 [X] Res/Park [ ] Medium/Fine [ ] Table 2 [ ] Ind/Comm [ ] Coarse [ ] Table 3 [ ] Agri/Other [X] For RSC [ ] Table ___

Other Regulations: [ ] CCME [ ] Sanitary Sewer Bylaw [ ] Reg 558 [ ] Storm Sewer Bylaw [ ] MISA Municipality ___ [ ] PWQO [ ] Other ___

Special Instructions

Include Criteria on Certificate of Analysis (Y/N)? N

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / Cr VI	O.Reg 153 VOCs by HS & F1-F4	O.Reg 153 Metals & Inorganics Pkg	O.Reg 153 PAHs	EC	SAR					# of Bottles	Comments
1	✓	BH4-6	Jan 7,19	10:00	S					X						1	Holding Time expires for EC
2	✓	BH5-5	Jan 7,19	16:00	S					X	X					1	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT: [X]
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ___ Time Required: ___
Rush Confirmation Number: ___ (call lab for #)

HT

01-Mar-19 14:58
Ema Gitej
B954489
KVG ENV-660

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
[signature] / Chaoran Li	19/03/01	11:50	[signature]	2019/03/01	14:58	

Laboratory Use Only			
Time Sensitive	Temperature (°C) on Recei	Custody Seal	Yes	No
	0/1/1	Present	✓	
		Intact	✓	

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO MAXXAM'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.MAXXAM.CA/TERMS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT HTTP://MAXXAM.CA/WP-CONTENT/UPLOADS/ONTARIO-COC.PDF.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

White: Maxxam Yellow: Client

Your Project #: CT2817.00
Your C.O.C. #: 683282-09-01

Attention: Chaoran Li

Terrapex Environmental Ltd
90 Scarsdale Rd
Toronto, ON
CANADA M3B 2R7

Report Date: 2019/03/13
Report #: R5627357
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B961302
Received: 2019/03/08, 14:35

Sample Matrix: Soil
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Conductivity	1	2019/03/12	2019/03/12	CAM SOP-00414	OMOE E3530 v1 m
Sodium Adsorption Ratio (SAR)	1	N/A	2019/03/13	CAM SOP-00102	EPA 6010C

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

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

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing. Maxxam is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Maxxam, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Ema Gitej, Senior Project Manager
Email: EGitej@maxxam.ca
Phone# (905)817-5829
==
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Job #: B961302
Report Date: 2019/03/13

Terrapex Environmental Ltd
Client Project #: CT2817.00
Sampler Initials: JA

RESULTS OF ANALYSES OF SOIL

Maxxam ID		JDR118		
Sampling Date		2019/01/07 16:30		
COC Number		683282-09-01		
	UNITS	**BH5-13**	**RDL**	**QC Batch**
Calculated Parameters				
Sodium Adsorption Ratio	N/A	0.29		6010806
Inorganics				
Conductivity	mS/cm	0.60	0.002	6012490

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B961302
Report Date: 2019/03/13

Terrapex Environmental Ltd
Client Project #: CT2817.00
Sampler Initials: JA

TEST SUMMARY

Maxxam ID: JDR118
Sample ID: BH5-13
Matrix: Soil

Collected: 2019/01/07
Shipped:
Received: 2019/03/08

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Conductivity	AT	6012490	2019/03/12	2019/03/12	Kazzandra Adeva
Sodium Adsorption Ratio (SAR)	CALC/MET	6010806	N/A	2019/03/13	Automated Statchk

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GENERAL COMMENTS

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

Package 1	1.0°C

Sample BH5-13 received past hold time for conductivity analysis. Analysis performed as per clients consent.

Results relate only to the items tested.

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Maxxam Job #: B961302
Report Date: 2019/03/13

QUALITY ASSURANCE REPORT

Terrapex Environmental Ltd
Client Project #: CT2817.00
Sampler Initials: JA

			SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
6012490	Conductivity	2019/03/12	103	90 - 110	<0.002	mS/cm	0.34	10

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

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

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

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Maxxam Job #: B961302
Report Date: 2019/03/13

Terrapex Environmental Ltd
Client Project #: CT2817.00
Sampler Initials: JA

VALIDATION SIGNATURE PAGE

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

Anastassia Hamanov, Scientific Specialist

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CHAIN OF CUSTODY RECORD

Page 1 of 1

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:	
Company Name:	#4398 Terrapex Environmental Ltd	Company Name:		Quotation #:	~~B73103~~
Attention:	Accounts Payable	Attention:	~~[illegible]~~ Chaoran Li	P.O. #:	
Address:	90 Scarsdale Rd	Address:		Project:	~~[illegible]~~ CT2817.00
	Toronto ON M3B 2R7			Project Name:	
Tel:	(416) 245-0011 Fax: (416) 245-0012	Tel:	(416) 245-0011 Ext: 230 Fax:	Site #:	
Email:	accounts.payable@terrapex.com	Email:	c.li ~~[illegible]~~@terrapex.com	Sampled By:	J.A

Laboratory Use Only:	
Maxxam Job #:	Bottle Order #:
	683282
COC #:	Project Manager:
C#683282-09-01	Ema Gitej

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011)
- [x] Table 1 - [x] Res/Park - [ ] Medium/Fine
- [ ] Table 2 - [ ] Ind/Comm - [ ] Coarse
- [ ] Table 3 - [ ] Agri/Other - [x] For RSC
- [ ] Table ___

Other Regulations
- [ ] CCME - [ ] Sanitary Sewer Bylaw
- [ ] Reg 558 - [ ] Storm Sewer Bylaw
- [ ] MISA Municipality ______
- [ ] PWQO
- [ ] Other ______

Special Instructions

Include Criteria on Certificate of Analysis (Y/N)? N

ANALYSIS REQUESTED (PLEASE BE SPECIFIC): Field Filtered (please circle): Metals / Hg / Cr VI; O.Reg 153 PHCs BTEX/F1-F4; EC, SAR

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered / Metals / Hg / Cr VI	O.Reg 153 PHCs BTEX/F1-F4	EC, SAR	# of Bottles	Comments
1	✓	BH5-13	Jan 7, 19	16:30	S			X	1	~~[illegible]~~ passed the hold time for sample EC
2										
3										
4										
5										
6										
7										
8										
9										
10										

Turnaround Time (TAT) Required:
Please provide advance notice for rush projects

Regular (Standard) TAT: [x]
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ______ Time Required: ______
Rush Confirmation Number: ______ *(call lab for #)*

08-Mar-19 14:35
Ema Gitej
B961302
CA2 ENV-1112

RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
[signature] . Chaoran Li	19/03/08	10:43	[signature] TRUSHNA PATEL	2019/03/08	14:35	

Laboratory Use Only				
Time Sensitive	Temperature (°C) on Recei	Custody Seal	Yes	No
	-1/4/0	Present	✓	
		Intact	✓	

White: Maxxa Yellow: Client

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO MAXXAM'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.MAXXAM.CA/TERMS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT HTTP://MAXXAM.CA/WP-CONTENT/UPLOADS/ONTARIO-COC.PDF.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

Maxxam Analytics International Corporation o/a Maxxam Analytics

Maxxam
A Bureau Veritas Group Company

Your Project #: CT2817.00
Your C.O.C. #: 701400-03-01

Attention: Chaoran Li

Terrapex Environmental Ltd
90 Scarsdale Rd
Toronto, ON
CANADA M3B 2R7

Report Date: 2019/03/06
Report #: R5617878
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B946830
Received: 2019/02/21, 16:05

Sample Matrix: Soil
Samples Received: 9

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Hot Water Extractable Boron	2	2019/02/25	2019/02/25	CAM SOP-00408	R153 Ana. Prot. 2011
Conductivity	1	2019/02/25	2019/02/26	CAM SOP-00414	OMOE E3530 v1 m
Conductivity	7	2019/02/26	2019/02/26	CAM SOP-00414	OMOE E3530 v1 m
Hexavalent Chromium in Soil by IC (1)	1	2019/03/01	2019/03/01	CAM SOP-00436	EPA 3060/7199 m
Strong Acid Leachable Metals by ICPMS	1	2019/03/04	2019/03/04	CAM SOP-00447	EPA 6020B m
Moisture	1	N/A	2019/02/28	CAM SOP-00445	Carter 2nd ed 51.2 m
Sodium Adsorption Ratio (SAR)	8	N/A	2019/02/27	CAM SOP-00102	EPA 6010C

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

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

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing. Maxxam is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Maxxam, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Soils are reported on a dry weight basis unless otherwise specified.

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Maxxam
A Bureau Veritas Group Company

Your Project #: CT2817.00
Your C.O.C. #: 701400-03-01

Attention: Chaoran Li

Terrapex Environmental Ltd
90 Scarsdale Rd
Toronto, ON
CANADA M3B 2R7

Report Date: 2019/03/06
Report #: R5617878
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B946830
Received: 2019/02/21, 16:05

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Ema Gitej, Senior Project Manager
Email: EGitej@maxxam.ca
Phone# (905)817-5829
==
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Maxxam Job #: B946830
Report Date: 2019/03/06

Terrapex Environmental Ltd
Client Project #: CT2817.00
Sampler Initials: CL

O.REG 153 METALS PACKAGE (SOIL)

Maxxam ID		JAQ893		
Sampling Date		2019/02/07 14:30		
COC Number		701400-03-01		
	UNITS	**MW2-4**	**RDL**	**QC Batch**
Inorganics				
Moisture	%	13	1.0	5996648
Chromium (VI)	ug/g	<0.2	0.2	5997356
Metals				
Acid Extractable Antimony (Sb)	ug/g	<0.20	0.20	6000177
Acid Extractable Arsenic (As)	ug/g	1.3	1.0	6000177
Acid Extractable Barium (Ba)	ug/g	70	0.50	6000177
Acid Extractable Beryllium (Be)	ug/g	0.38	0.20	6000177
Acid Extractable Boron (B)	ug/g	7.7	5.0	6000177
Acid Extractable Cadmium (Cd)	ug/g	0.11	0.10	6000177
Acid Extractable Chromium (Cr)	ug/g	15	1.0	6000177
Acid Extractable Cobalt (Co)	ug/g	5.5	0.10	6000177
Acid Extractable Copper (Cu)	ug/g	9.7	0.50	6000177
Acid Extractable Lead (Pb)	ug/g	5.5	1.0	6000177
Acid Extractable Molybdenum (Mo)	ug/g	<0.50	0.50	6000177
Acid Extractable Nickel (Ni)	ug/g	11	0.50	6000177
Acid Extractable Selenium (Se)	ug/g	<0.50	0.50	6000177
Acid Extractable Silver (Ag)	ug/g	<0.20	0.20	6000177
Acid Extractable Thallium (Tl)	ug/g	0.089	0.050	6000177
Acid Extractable Uranium (U)	ug/g	0.50	0.050	6000177
Acid Extractable Vanadium (V)	ug/g	22	5.0	6000177
Acid Extractable Zinc (Zn)	ug/g	31	5.0	6000177
Acid Extractable Mercury (Hg)	ug/g	<0.050	0.050	6000177

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam
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Maxxam Job #: B946830
Report Date: 2019/03/06

Terrapex Environmental Ltd
Client Project #: CT2817.00
Sampler Initials: CL

RESULTS OF ANALYSES OF SOIL

Maxxam ID		JAQ890		JAQ891	JAQ892	JAQ893		
Sampling Date		2019/01/31 10:00		2019/02/07 11:45	2019/02/07 09:30	2019/02/07 14:30		
COC Number		701400-03-01		701400-03-01	701400-03-01	701400-03-01		
	UNITS	**MW9-SS5**	**QC Batch**	**MW7-5**	**MW8-5**	**MW2-4**	**RDL**	**QC Batch**
Calculated Parameters								
Sodium Adsorption Ratio	N/A			10	3.5	7.3		5985706
Inorganics								
Conductivity	mS/cm	0.62	5989744	1.9	0.47	1.7	0.002	5989744

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		JAQ894		JAQ895	JAQ896	JAQ897	JAQ898		
Sampling Date		2019/02/07 10:00		2019/02/07 10:30	2019/02/01 13:30	2019/02/07 13:00	2019/02/01 13:00		
COC Number		701400-03-01		701400-03-01	701400-03-01	701400-03-01	701400-03-01		
	UNITS	**MW8-8**	**QC Batch**	**MW2-12**	**MW6-11**	**MW7-14**	**MW6-5**	**RDL**	**QC Batch**
Calculated Parameters									
Sodium Adsorption Ratio	N/A	0.22	5985706	0.27	1.2	0.51	1.4		5985706
Inorganics									
Conductivity	mS/cm			0.24	0.51	0.44	1.3	0.002	5989744

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B946830
Report Date: 2019/03/06

Terrapex Environmental Ltd
Client Project #: CT2817.00
Sampler Initials: CL

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		JAQ893	JAQ895		
Sampling Date		2019/02/07 14:30	2019/02/07 10:30		
COC Number		701400-03-01	701400-03-01		
	UNITS	**MW2-4**	**MW2-12**	**RDL**	**QC Batch**
Metals					
Hot Water Ext. Boron (B)	ug/g	0.080	0.095	0.050	5989027

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam
A Bureau Veritas Group Company

Maxxam Job #: B946830
Report Date: 2019/03/06

Terrapex Environmental Ltd
Client Project #: CT2817.00
Sampler Initials: CL

TEST SUMMARY

Maxxam ID: JAQ890
Sample ID: MW9-SS5
Matrix: Soil

Collected: 2019/01/31
Shipped:
Received: 2019/02/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Conductivity	AT	5989744	2019/02/25	2019/02/26	Kazzandra Adeva

Maxxam ID: JAQ891
Sample ID: MW7-5
Matrix: Soil

Collected: 2019/02/07
Shipped:
Received: 2019/02/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Conductivity	AT	5989744	2019/02/26	2019/02/26	Kazzandra Adeva
Sodium Adsorption Ratio (SAR)	CALC/MET	5985706	N/A	2019/02/27	Automated Statchk

Maxxam ID: JAQ892
Sample ID: MW8-5
Matrix: Soil

Collected: 2019/02/07
Shipped:
Received: 2019/02/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Conductivity	AT	5989744	2019/02/26	2019/02/26	Kazzandra Adeva
Sodium Adsorption Ratio (SAR)	CALC/MET	5985706	N/A	2019/02/27	Automated Statchk

Maxxam ID: JAQ893
Sample ID: MW2-4
Matrix: Soil

Collected: 2019/02/07
Shipped:
Received: 2019/02/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hot Water Extractable Boron	ICP	5989027	2019/02/25	2019/02/25	Suban Kanapathippllai
Conductivity	AT	5989744	2019/02/26	2019/02/26	Kazzandra Adeva
Hexavalent Chromium in Soil by IC	IC/SPEC	5997356	2019/03/01	2019/03/01	Sally Norouz
Strong Acid Leachable Metals by ICPMS	ICP/MS	6000177	2019/03/04	2019/03/04	Viviana Canzonieri
Moisture	BAL	5996648	N/A	2019/02/28	Prgya Panchal
Sodium Adsorption Ratio (SAR)	CALC/MET	5985706	N/A	2019/02/27	Automated Statchk

Maxxam ID: JAQ894
Sample ID: MW8-8
Matrix: Soil

Collected: 2019/02/07
Shipped:
Received: 2019/02/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Sodium Adsorption Ratio (SAR)	CALC/MET	5985706	N/A	2019/02/27	Automated Statchk

Maxxam ID: JAQ895
Sample ID: MW2-12
Matrix: Soil

Collected: 2019/02/07
Shipped:
Received: 2019/02/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hot Water Extractable Boron	ICP	5989027	2019/02/25	2019/02/25	Suban Kanapathippllai
Conductivity	AT	5989744	2019/02/26	2019/02/26	Kazzandra Adeva
Sodium Adsorption Ratio (SAR)	CALC/MET	5985706	N/A	2019/02/27	Automated Statchk

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Maxxam
A Bureau Veritas Group Company

Maxxam Job #: B946830
Report Date: 2019/03/06

Terrapex Environmental Ltd
Client Project #: CT2817.00
Sampler Initials: CL

TEST SUMMARY

Maxxam ID: JAQ896
Sample ID: MW6-11
Matrix: Soil

Collected: 2019/02/01
Shipped:
Received: 2019/02/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Conductivity	AT	5989744	2019/02/26	2019/02/26	Kazzandra Adeva
Sodium Adsorption Ratio (SAR)	CALC/MET	5985706	N/A	2019/02/27	Automated Statchk

Maxxam ID: JAQ897
Sample ID: MW7-14
Matrix: Soil

Collected: 2019/02/07
Shipped:
Received: 2019/02/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Conductivity	AT	5989744	2019/02/26	2019/02/26	Kazzandra Adeva
Sodium Adsorption Ratio (SAR)	CALC/MET	5985706	N/A	2019/02/27	Automated Statchk

Maxxam ID: JAQ898
Sample ID: MW6-5
Matrix: Soil

Collected: 2019/02/01
Shipped:
Received: 2019/02/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Conductivity	AT	5989744	2019/02/26	2019/02/26	Kazzandra Adeva
Sodium Adsorption Ratio (SAR)	CALC/MET	5985706	N/A	2019/02/27	Automated Statchk

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GENERAL COMMENTS

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

Package 1	0.7°C

Revised report (2019/03/06): Samples MW2-12, MW6-11 and MW7-14 have been analyzed for Conductivity; sample MW2-4 has been analyzed for Reg. 153 ICPMS, Hg, Cr VI and Hot Water Extractable Boron as per client request.

Sample JAQ894 [MW8-8] : SAR Analysis: Sodium was not detected. To report SAR the sodium detection limit was used in the calculation. This value represents a maximum ratio.

Results relate only to the items tested.

Maxxam
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Maxxam Job #: B946830
Report Date: 2019/03/06

QUALITY ASSURANCE REPORT

Terrapex Environmental Ltd
Client Project #: CT2817.00
Sampler Initials: CL

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
5989027	Hot Water Ext. Boron (B)	2019/02/25	107	75 - 125	105	75 - 125	<0.050	ug/g	17	40
5989744	Conductivity	2019/02/26			103	90 - 110	<0.002	mS/cm	1.9	10
5996648	Moisture	2019/02/28							0	20
5997356	Chromium (VI)	2019/03/01	52 (1)	70 - 130	85	80 - 120	<0.2	ug/g	NC	35
6000177	Acid Extractable Antimony (Sb)	2019/03/04	95	75 - 125	102	80 - 120	<0.20	ug/g	11	30
6000177	Acid Extractable Arsenic (As)	2019/03/04	92	75 - 125	101	80 - 120	<1.0	ug/g	2.6	30
6000177	Acid Extractable Barium (Ba)	2019/03/04	NC	75 - 125	100	80 - 120	<0.50	ug/g	2.7	30
6000177	Acid Extractable Beryllium (Be)	2019/03/04	94	75 - 125	100	80 - 120	<0.20	ug/g	NC	30
6000177	Acid Extractable Boron (B)	2019/03/04	95	75 - 125	104	80 - 120	<5.0	ug/g	NC	30
6000177	Acid Extractable Cadmium (Cd)	2019/03/04	94	75 - 125	102	80 - 120	<0.10	ug/g	6.5	30
6000177	Acid Extractable Chromium (Cr)	2019/03/04	88	75 - 125	101	80 - 120	<1.0	ug/g	3.9	30
6000177	Acid Extractable Cobalt (Co)	2019/03/04	92	75 - 125	99	80 - 120	<0.10	ug/g	7.3	30
6000177	Acid Extractable Copper (Cu)	2019/03/04	90	75 - 125	99	80 - 120	<0.50	ug/g	2.5	30
6000177	Acid Extractable Lead (Pb)	2019/03/04	NC	75 - 125	105	80 - 120	<1.0	ug/g	18	30
6000177	Acid Extractable Mercury (Hg)	2019/03/04	85	75 - 125	94	80 - 120	<0.050	ug/g	NC	30
6000177	Acid Extractable Molybdenum (Mo)	2019/03/04	95	75 - 125	101	80 - 120	<0.50	ug/g	NC	30
6000177	Acid Extractable Nickel (Ni)	2019/03/04	93	75 - 125	104	80 - 120	<0.50	ug/g	4.5	30
6000177	Acid Extractable Selenium (Se)	2019/03/04	94	75 - 125	104	80 - 120	<0.50	ug/g	NC	30
6000177	Acid Extractable Silver (Ag)	2019/03/04	93	75 - 125	101	80 - 120	<0.20	ug/g	NC	30
6000177	Acid Extractable Thallium (Tl)	2019/03/04	93	75 - 125	103	80 - 120	<0.050	ug/g	NC	30
6000177	Acid Extractable Uranium (U)	2019/03/04	99	75 - 125	108	80 - 120	<0.050	ug/g	10	30
6000177	Acid Extractable Vanadium (V)	2019/03/04	96	75 - 125	103	80 - 120	<5.0	ug/g	19	30
6000177	Acid Extractable Zinc (Zn)	2019/03/04	NC	75 - 125	101	80 - 120	<5.0	ug/g	2.1	30

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

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

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

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

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

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

(1) The matrix spike recovery was below the lower control limit. This may be due in part to the reducing environment of the sample. The sample was reanalyzed with the same results.

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VALIDATION SIGNATURE PAGE

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

Anastassia Hamanov, Scientific Specialist

Brad Newman, Scientific Service Specialist

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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CHAIN OF CUSTODY RECORD Page 1 of 1

INVOICE TO:
Company Name: #4398 Terrapex Environmental Ltd
Attention: Accounts Payable
Address: 90 Scarsdale Rd, Toronto ON M3B 2R7
Tel: (416) 245-0011 Fax: (416) 245-0012
Email: accounts.payable@terrapex.com

REPORT TO:
Company Name:
Attention: Chaoran Li
Address:
Tel: (416) 245-0011 Ext: 232 Fax:
Email: c.li@terrapex.com

PROJECT INFORMATION:
Quotation #: B80428
P.O. #:
Project: CT2817.00
Project Name:
Site #:
Sampled By: C.L

Laboratory Use Only:
Maxxam Job #:
Bottle Order #: 701400
COC #: C#701400-03-01
Project Manager: Ema Gitej

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011): [X] Table 1 [X] Res/Park [ ] Medium/Fine [ ] Table 2 [X] Ind/Comm [ ] Coarse [ ] Table 3 [ ] Agri/Other [X] For RSC [ ] Table ___

Other Regulations: [ ] CCME [ ] Sanitary Sewer Bylaw [ ] Reg 558 [ ] Storm Sewer Bylaw [ ] MISA Municipality ___ [ ] PWQO [ ] Other

Special Instructions

Include Criteria on Certificate of Analysis (Y/N)? N

ANALYSIS REQUESTED (PLEASE BE SPECIFIC): Field Filtered (please circle): Metals / Hg / Cr VI; O.Reg 153 VOCs by HS & F1-F4; O.Reg 153 Metals & Inorganics Pkg; O.Reg 153 PAHs; EC; SAR; PHCS-F4

Turnaround Time (TAT) Required: Please provide advance notice for rush projects
Regular (Standard) TAT: [X]
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.
Job Specific Rush TAT (if applies to entire submission)
Date Required: ___ Time Required: ___
Rush Confirmation Number: ___ (call lab for #)

GK1 ENV-970 — Ema Gitej — B946830 — 21-Feb-19 16:05

#	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	EC	SAR	PHCS-F4	# of Bottles	Comments
1		MW9-SS5	Jan 31, 19	10:00	S	X			1	
2		MW7-5	Feb 7, 19	11:45	S	X	X		1	
3		MW8-5	Feb 7, 19	9:30	S	X	X		1	
4		MW2-4	Feb 7, 19	14:30	S	X	X	X	1	
5		MW8-8	Feb 7, 19	10:00	S	X	X		1	Dry
6		MW2-12	Feb 7, 19	15:30	S	X	X	X	1	Dry — For EC. storage. on hold
7		MW6-11	Feb 1, 19	13:30	S	X	X		1	Dry
8		MW7-14	Feb 7, 19	13:00	S	X	X		1	Dry
9		MW6-5	Feb 1, 19	13:00	S	X	X		1	
10										

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Chaoran Li	19/02/21	14:00	[illegible]	2019/02/21	1605	

Laboratory Use Only: Time Sensitive; Temperature (°C) on Recei 3 / 0 / -1; Custody Seal: Present Yes X; Intact Yes X

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO MAXXAM'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.MAXXAM.CA/TERMS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT HTTP://MAXXAM.CA/WP-CONTENT/UPLOADS/ONTARIO-COC.PDF.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

White: Maxxa Yellow: Client

101788

Maxxam Analytics International Corporation o/a Maxxam Analytics

Maxxam
A Bureau Veritas Group Company

Your Project #: CT2817.00
Site Location: 1294 KINGSTON RD, PICKERING
Your C.O.C. #: 706221-01-01

Attention: Chaoran Li

Terrapex Environmental Ltd
90 Scarsdale Rd
Toronto, ON
CANADA M3B 2R7

Report Date: 2019/03/08
Report #: R5621527
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B956082
Received: 2019/03/04, 14:29

Sample Matrix: Water
Samples Received: 10

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
1,3-Dichloropropene Sum	8	N/A	2019/03/07		EPA 8260C m
Chloride by Automated Colourimetry	7	N/A	2019/03/06	CAM SOP-00463	EPA 325.2 m
Chromium (VI) in Water	7	N/A	2019/03/06	CAM SOP-00436	EPA 7199 m
Free (WAD) Cyanide	7	N/A	2019/03/05	CAM SOP-00457	OMOE E3015 m
Petroleum Hydrocarbons F2-F4 in Water (1)	7	2019/03/07	2019/03/07	CAM SOP-00316	CCME PHC-CWS m
Mercury	7	2019/03/06	2019/03/06	CAM SOP-00453	EPA 7470A m
Dissolved Metals by ICPMS	4	N/A	2019/03/05	CAM SOP-00447	EPA 6020B m
Dissolved Metals by ICPMS	3	N/A	2019/03/06	CAM SOP-00447	EPA 6020B m
Volatile Organic Compounds and F1 PHCs	7	N/A	2019/03/07	CAM SOP-00230	EPA 8260C m
Volatile Organic Compounds in Water	2	N/A	2019/03/06	CAM SOP-00228	EPA 8260C m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

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

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing. Maxxam is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Maxxam, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) All CCME PHC results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Maxxam conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following "Alberta Environment's

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Maxxam
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Your Project #: CT2817.00
Site Location: 1294 KINGSTON RD, PICKERING
Your C.O.C. #: 706221-01-01

Attention: Chaoran Li

Terrapex Environmental Ltd
90 Scarsdale Rd
Toronto, ON
CANADA M3B 2R7

Report Date: 2019/03/08
Report #: R5621527
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B956082
Received: 2019/03/04, 14:29

Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Validation of Performance-Based Alternative Methods September 2003". Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Ema Gitej, Senior Project Manager
Email: EGitej@maxxam.ca
Phone# (905)817-5829
==
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Job #: B956082
Report Date: 2019/03/08

Terrapex Environmental Ltd
Client Project #: CT2817.00
Site Location: 1294 KINGSTON RD, PICKERING
Sampler Initials: AL

O.REG 153 METALS & INORGANICS PKG (WTR)

Maxxam ID		JCP929		JCP930	JCP931		JCP932		
Sampling Date		2019/03/01 13:45		2019/03/01 14:30	2019/03/01 14:30		2019/03/01 11:20		
COC Number		706221-01-01		706221-01-01	706221-01-01		706221-01-01		
	UNITS	MW2A	RDL	MW4A	MW44	RDL	MW7	RDL	QC Batch
Inorganics									
WAD Cyanide (Free)	ug/L	<1	1	<1	<1	1	2	1	6002631
Dissolved Chloride (Cl-)	mg/L	2700	20	410	400	4.0	3600	40	6002481
Metals									
Chromium (VI)	ug/L	<0.50	0.50	<0.50	<0.50	0.50	<0.50	0.50	6002476
Mercury (Hg)	ug/L	<0.1	0.1	<0.1	<0.1	0.1	<0.1	0.1	6004230
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	0.50	0.53	0.50	<0.50	0.50	6002446
Dissolved Arsenic (As)	ug/L	<1.0	1.0	<1.0	<1.0	1.0	1.2	1.0	6002446
Dissolved Barium (Ba)	ug/L	110	2.0	260	250	2.0	880	2.0	6002446
Dissolved Beryllium (Be)	ug/L	<0.50	0.50	<0.50	<0.50	0.50	<0.50	0.50	6002446
Dissolved Boron (B)	ug/L	50	10	27	28	10	140	10	6002446
Dissolved Cadmium (Cd)	ug/L	<0.10	0.10	<0.10	<0.10	0.10	<0.10	0.10	6002446
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	<5.0	<5.0	5.0	<5.0	5.0	6002446
Dissolved Cobalt (Co)	ug/L	2.8	0.50	1.9	2.0	0.50	1.5	0.50	6002446
Dissolved Copper (Cu)	ug/L	1.5	1.0	<1.0	2.7	1.0	1.1	1.0	6002446
Dissolved Lead (Pb)	ug/L	<0.50	0.50	<0.50	<0.50	0.50	<0.50	0.50	6002446
Dissolved Molybdenum (Mo)	ug/L	1.5	0.50	12	12	0.50	26	0.50	6002446
Dissolved Nickel (Ni)	ug/L	9.1	1.0	5.3	6.2	1.0	4.6	1.0	6002446
Dissolved Selenium (Se)	ug/L	<2.0	2.0	<2.0	<2.0	2.0	<2.0	2.0	6002446
Dissolved Silver (Ag)	ug/L	<0.10	0.10	<0.10	<0.10	0.10	<0.10	0.10	6002446
Dissolved Sodium (Na)	ug/L	1500000	500	63000	63000	100	2200000	500	6002446
Dissolved Thallium (Tl)	ug/L	0.054	0.050	<0.050	<0.050	0.050	<0.050	0.050	6002446
Dissolved Uranium (U)	ug/L	7.6	0.10	12	11	0.10	2.1	0.10	6002446
Dissolved Vanadium (V)	ug/L	1.2	0.50	0.95	1.0	0.50	0.88	0.50	6002446
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	23	20	5.0	23	5.0	6002446

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B956082
Report Date: 2019/03/08

Terrapex Environmental Ltd
Client Project #: CT2817.00
Site Location: 1294 KINGSTON RD, PICKERING
Sampler Initials: AL

O.REG 153 METALS & INORGANICS PKG (WTR)

Maxxam ID		JCP934		JCP935		JCP936			JCP936		
Sampling Date		2019/03/01 12:00		2019/03/01 13:30		2019/03/01 10:00			2019/03/01 10:00		
COC Number		706221-01-01		706221-01-01		706221-01-01			706221-01-01		
	UNITS	**MW8**	**RDL**	**MW9**	**RDL**	**MW10**	**RDL**	**QC Batch**	**MW10 Lab-Dup**	**RDL**	**QC Batch**
Inorganics											
WAD Cyanide (Free)	ug/L	<1	1	<1	1	<1	1	6002631			
Dissolved Chloride (Cl-)	mg/L	890	10	3800	40	1000	10	6002481			
Metals											
Chromium (VI)	ug/L	<0.50	0.50	<0.50	0.50	<0.50	0.50	6002476	<0.50	0.50	6002476
Mercury (Hg)	ug/L	<0.1	0.1	<0.1	0.1	<0.1	0.1	6004230			
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	<0.50	0.50	<0.50	0.50	6002446			
Dissolved Arsenic (As)	ug/L	<1.0	1.0	<1.0	1.0	<1.0	1.0	6002446			
Dissolved Barium (Ba)	ug/L	360	2.0	1500	2.0	350	2.0	6002446			
Dissolved Beryllium (Be)	ug/L	<0.50	0.50	<0.50	0.50	<0.50	0.50	6002446			
Dissolved Boron (B)	ug/L	73	10	28	10	22	10	6002446			
Dissolved Cadmium (Cd)	ug/L	<0.10	0.10	<0.10	0.10	<0.10	0.10	6002446			
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	<5.0	5.0	<5.0	5.0	6002446			
Dissolved Cobalt (Co)	ug/L	0.66	0.50	1.1	0.50	<0.50	0.50	6002446			
Dissolved Copper (Cu)	ug/L	<1.0	1.0	<1.0	1.0	<1.0	1.0	6002446			
Dissolved Lead (Pb)	ug/L	<0.50	0.50	<0.50	0.50	<0.50	0.50	6002446			
Dissolved Molybdenum (Mo)	ug/L	<0.50	0.50	<0.50	0.50	2.8	0.50	6002446			
Dissolved Nickel (Ni)	ug/L	2.3	1.0	6.0	1.0	2.0	1.0	6002446			
Dissolved Selenium (Se)	ug/L	<2.0	2.0	<2.0	2.0	<2.0	2.0	6002446			
Dissolved Silver (Ag)	ug/L	<0.10	0.10	<0.10	0.10	<0.10	0.10	6002446			
Dissolved Sodium (Na)	ug/L	380000	100	1100000	500	260000	100	6002446			
Dissolved Thallium (Tl)	ug/L	<0.050	0.050	<0.050	0.050	<0.050	0.050	6002446			
Dissolved Uranium (U)	ug/L	1.1	0.10	1.0	0.10	1.2	0.10	6002446			
Dissolved Vanadium (V)	ug/L	0.82	0.50	<0.50	0.50	1.2	0.50	6002446			
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	<5.0	5.0	<5.0	5.0	6002446			

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

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Maxxam Job #: B956082
Report Date: 2019/03/08

Terrapex Environmental Ltd
Client Project #: CT2817.00
Site Location: 1294 KINGSTON RD, PICKERING
Sampler Initials: AL

O.REG 153 VOCS BY HS & F1-F4 (WATER)

Maxxam ID		JCP929	JCP930			JCP930		
Sampling Date		2019/03/01 13:45	2019/03/01 14:30			2019/03/01 14:30		
COC Number		706221-01-01	706221-01-01			706221-01-01		
	UNITS	**MW2A**	**MW4A**	**RDL**	**QC Batch**	**MW4A Lab-Dup**	**RDL**	**QC Batch**
Calculated Parameters								
1,3-Dichloropropene (cis+trans)	ug/L	<0.50	<0.50	0.50	6000288			
Volatile Organics								
Acetone (2-Propanone)	ug/L	<10	<10	10	6000236			
Benzene	ug/L	<0.20	<0.20	0.20	6000236			
Bromodichloromethane	ug/L	<0.50	<0.50	0.50	6000236			
Bromoform	ug/L	<1.0	<1.0	1.0	6000236			
Bromomethane	ug/L	<0.50	<0.50	0.50	6000236			
Carbon Tetrachloride	ug/L	<0.20	<0.20	0.20	6000236			
Chlorobenzene	ug/L	<0.20	<0.20	0.20	6000236			
Chloroform	ug/L	<0.20	<0.20	0.20	6000236			
Dibromochloromethane	ug/L	<0.50	<0.50	0.50	6000236			
1,2-Dichlorobenzene	ug/L	<0.50	<0.50	0.50	6000236			
1,3-Dichlorobenzene	ug/L	<0.50	<0.50	0.50	6000236			
1,4-Dichlorobenzene	ug/L	<0.50	<0.50	0.50	6000236			
Dichlorodifluoromethane (FREON 12)	ug/L	<1.0	<1.0	1.0	6000236			
1,1-Dichloroethane	ug/L	<0.20	<0.20	0.20	6000236			
1,2-Dichloroethane	ug/L	<0.50	<0.50	0.50	6000236			
1,1-Dichloroethylene	ug/L	<0.20	<0.20	0.20	6000236			
cis-1,2-Dichloroethylene	ug/L	<0.50	<0.50	0.50	6000236			
trans-1,2-Dichloroethylene	ug/L	<0.50	<0.50	0.50	6000236			
1,2-Dichloropropane	ug/L	<0.20	<0.20	0.20	6000236			
cis-1,3-Dichloropropene	ug/L	<0.30	<0.30	0.30	6000236			
trans-1,3-Dichloropropene	ug/L	<0.40	<0.40	0.40	6000236			
Ethylbenzene	ug/L	<0.20	<0.20	0.20	6000236			
Ethylene Dibromide	ug/L	<0.20	<0.20	0.20	6000236			
Hexane	ug/L	<1.0	<1.0	1.0	6000236			
Methylene Chloride(Dichloromethane)	ug/L	<2.0	<2.0	2.0	6000236			
Methyl Ethyl Ketone (2-Butanone)	ug/L	<10	<10	10	6000236			
Methyl Isobutyl Ketone	ug/L	<5.0	<5.0	5.0	6000236			
Methyl t-butyl ether (MTBE)	ug/L	<0.50	<0.50	0.50	6000236			
Styrene	ug/L	<0.50	<0.50	0.50	6000236			
1,1,1,2-Tetrachloroethane	ug/L	<0.50	<0.50	0.50	6000236			
1,1,2,2-Tetrachloroethane	ug/L	<0.50	<0.50	0.50	6000236			

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

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O.REG 153 VOCS BY HS & F1-F4 (WATER)

Maxxam ID		JCP929	JCP930			JCP930		
Sampling Date		2019/03/01 13:45	2019/03/01 14:30			2019/03/01 14:30		
COC Number		706221-01-01	706221-01-01			706221-01-01		
	UNITS	**MW2A**	**MW4A**	**RDL**	**QC Batch**	**MW4A Lab-Dup**	**RDL**	**QC Batch**
Tetrachloroethylene	ug/L	<0.20	<0.20	0.20	6000236			
Toluene	ug/L	0.29	0.34	0.20	6000236			
1,1,1-Trichloroethane	ug/L	<0.20	<0.20	0.20	6000236			
1,1,2-Trichloroethane	ug/L	<0.50	<0.50	0.50	6000236			
Trichloroethylene	ug/L	<0.20	<0.20	0.20	6000236			
Trichlorofluoromethane (FREON 11)	ug/L	<0.50	<0.50	0.50	6000236			
Vinyl Chloride	ug/L	<0.20	<0.20	0.20	6000236			
p+m-Xylene	ug/L	0.81	0.82	0.20	6000236			
o-Xylene	ug/L	0.39	0.39	0.20	6000236			
Total Xylenes	ug/L	1.2	1.2	0.20	6000236			
F1 (C6-C10)	ug/L	<25	<25	25	6000236			
F1 (C6-C10) - BTEX	ug/L	<25	<25	25	6000236			
F2-F4 Hydrocarbons								
F2 (C10-C16 Hydrocarbons)	ug/L	<100	<100	100	6007177	<100	100	6007177
F3 (C16-C34 Hydrocarbons)	ug/L	<200	<200	200	6007177	<200	200	6007177
F4 (C34-C50 Hydrocarbons)	ug/L	<200	<200	200	6007177	<200	200	6007177
Reached Baseline at C50	ug/L	Yes	Yes		6007177	Yes		6007177
Surrogate Recovery (%)								
o-Terphenyl	%	103	104		6007177	104		6007177
4-Bromofluorobenzene	%	94	94		6000236			
D4-1,2-Dichloroethane	%	99	100		6000236			
D8-Toluene	%	100	101		6000236			

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

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Maxxam Job #: B956082
Report Date: 2019/03/08

Terrapex Environmental Ltd
Client Project #: CT2817.00
Site Location: 1294 KINGSTON RD, PICKERING
Sampler Initials: AL

O.REG 153 VOCS BY HS & F1-F4 (WATER)

Maxxam ID		JCP932	JCP933	JCP934	JCP935	JCP936		
Sampling Date		2019/03/01 11:20	2019/03/01 11:20	2019/03/01 12:00	2019/03/01 13:30	2019/03/01 10:00		
COC Number		706221-01-01	706221-01-01	706221-01-01	706221-01-01	706221-01-01		
	UNITS	**MW7**	**MW77**	**MW8**	**MW9**	**MW10**	**RDL**	**QC Batch**
Calculated Parameters								
1,3-Dichloropropene (cis+trans)	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	6000288
Volatile Organics								
Acetone (2-Propanone)	ug/L	<10	<10	<10	<10	<10	10	6000236
Benzene	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	6000236
Bromodichloromethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	6000236
Bromoform	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	6000236
Bromomethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	6000236
Carbon Tetrachloride	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	6000236
Chlorobenzene	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	6000236
Chloroform	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	6000236
Dibromochloromethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	6000236
1,2-Dichlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	6000236
1,3-Dichlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	6000236
1,4-Dichlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	6000236
Dichlorodifluoromethane (FREON 12)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	6000236
1,1-Dichloroethane	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	6000236
1,2-Dichloroethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	6000236
1,1-Dichloroethylene	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	6000236
cis-1,2-Dichloroethylene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	6000236
trans-1,2-Dichloroethylene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	6000236
1,2-Dichloropropane	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	6000236
cis-1,3-Dichloropropene	ug/L	<0.30	<0.30	<0.30	<0.30	<0.30	0.30	6000236
trans-1,3-Dichloropropene	ug/L	<0.40	<0.40	<0.40	<0.40	<0.40	0.40	6000236
Ethylbenzene	ug/L	<0.20	<0.20	0.23	<0.20	<0.20	0.20	6000236
Ethylene Dibromide	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	6000236
Hexane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	6000236
Methylene Chloride(Dichloromethane)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	6000236
Methyl Ethyl Ketone (2-Butanone)	ug/L	<10	<10	<10	<10	<10	10	6000236
Methyl Isobutyl Ketone	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	6000236
Methyl t-butyl ether (MTBE)	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	6000236
Styrene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	6000236
1,1,1,2-Tetrachloroethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	6000236
1,1,2,2-Tetrachloroethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	6000236

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B956082
Report Date: 2019/03/08

Terrapex Environmental Ltd
Client Project #: CT2817.00
Site Location: 1294 KINGSTON RD, PICKERING
Sampler Initials: AL

O.REG 153 VOCS BY HS & F1-F4 (WATER)

Maxxam ID		JCP932	JCP933	JCP934	JCP935	JCP936		
Sampling Date		2019/03/01 11:20	2019/03/01 11:20	2019/03/01 12:00	2019/03/01 13:30	2019/03/01 10:00		
COC Number		706221-01-01	706221-01-01	706221-01-01	706221-01-01	706221-01-01		
	UNITS	**MW7**	**MW77**	**MW8**	**MW9**	**MW10**	**RDL**	**QC Batch**
Tetrachloroethylene	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	6000236
Toluene	ug/L	0.22	0.22	0.54	<0.20	<0.20	0.20	6000236
1,1,1-Trichloroethane	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	6000236
1,1,2-Trichloroethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	6000236
Trichloroethylene	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	6000236
Trichlorofluoromethane (FREON 11)	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	6000236
Vinyl Chloride	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	6000236
p+m-Xylene	ug/L	<0.20	<0.20	1.2	<0.20	<0.20	0.20	6000236
o-Xylene	ug/L	<0.20	<0.20	0.53	<0.20	<0.20	0.20	6000236
Total Xylenes	ug/L	<0.20	<0.20	1.8	<0.20	<0.20	0.20	6000236
F1 (C6-C10)	ug/L	<25	<25	<25	<25	<25	25	6000236
F1 (C6-C10) - BTEX	ug/L	<25	<25	<25	<25	<25	25	6000236
F2-F4 Hydrocarbons								
F2 (C10-C16 Hydrocarbons)	ug/L	<100	<100	<100	<100	<100	100	6007177
F3 (C16-C34 Hydrocarbons)	ug/L	<200	<200	<200	<200	<200	200	6007177
F4 (C34-C50 Hydrocarbons)	ug/L	<200	<200	<200	<200	<200	200	6007177
Reached Baseline at C50	ug/L	Yes	Yes	Yes	Yes	Yes		6007177
Surrogate Recovery (%)								
o-Terphenyl	%	105	104	106	105	107		6007177
4-Bromofluorobenzene	%	95	94	94	94	94		6000236
D4-1,2-Dichloroethane	%	99	99	100	100	100		6000236
D8-Toluene	%	100	101	100	100	100		6000236

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Report Date: 2019/03/08

Terrapex Environmental Ltd
Client Project #: CT2817.00
Site Location: 1294 KINGSTON RD, PICKERING
Sampler Initials: AL

O.REG 153 VOCS BY HS (WATER)

Maxxam ID		JCP937			JCP938		
Sampling Date		2019/03/01			2019/02/25 12:30		
COC Number		706221-01-01			706221-01-01		
	UNITS	TRIP BLANK	RDL	QC Batch	TRIP SPIKE	RDL	QC Batch
Calculated Parameters							
1,3-Dichloropropene (cis+trans)	ug/L	<0.50	0.50	6000288			
Volatile Organics							
Acetone (2-Propanone)	ug/L	<10	10	6002384	95	10	6002384
Benzene	ug/L	<0.20	0.20	6002384	85	0.20	6002384
Bromodichloromethane	ug/L	<0.50	0.50	6002384	90	0.50	6002384
Bromoform	ug/L	<1.0	1.0	6002384	90	1.0	6002384
Bromomethane	ug/L	<0.50	0.50	6002384	85	0.50	6002384
Carbon Tetrachloride	ug/L	<0.20	0.20	6002384	85	0.20	6002384
Chlorobenzene	ug/L	<0.20	0.20	6002384	90	0.20	6002384
Chloroform	ug/L	<0.20	0.20	6002384	90	0.20	6002384
Dibromochloromethane	ug/L	<0.50	0.50	6002384	90	0.50	6002384
1,2-Dichlorobenzene	ug/L	<0.50	0.50	6002384	90	0.50	6002384
1,3-Dichlorobenzene	ug/L	<0.50	0.50	6002384	85	0.50	6002384
1,4-Dichlorobenzene	ug/L	<0.50	0.50	6002384	85	0.50	6002384
Dichlorodifluoromethane (FREON 12)	ug/L	<1.0	1.0	6002384	70	1.0	6002384
1,1-Dichloroethane	ug/L	<0.20	0.20	6002384	90	0.20	6002384
1,2-Dichloroethane	ug/L	<0.50	0.50	6002384	90	0.50	6002384
1,1-Dichloroethylene	ug/L	<0.20	0.20	6002384	85	0.20	6002384
cis-1,2-Dichloroethylene	ug/L	<0.50	0.50	6002384	85	0.50	6002384
trans-1,2-Dichloroethylene	ug/L	<0.50	0.50	6002384	85	0.50	6002384
1,2-Dichloropropane	ug/L	<0.20	0.20	6002384	90	0.20	6002384
cis-1,3-Dichloropropene	ug/L	<0.30	0.30	6002384	80	0.30	6002384
trans-1,3-Dichloropropene	ug/L	<0.40	0.40	6002384	80	0.40	6002384
Ethylbenzene	ug/L	<0.20	0.20	6002384	85	0.20	6002384
Ethylene Dibromide	ug/L	<0.20	0.20	6002384	90	0.20	6002384
Hexane	ug/L	<1.0	1.0	6002384	45	1.0	6002384
Methylene Chloride(Dichloromethane)	ug/L	<2.0	2.0	6002384	85	2.0	6002384
Methyl Ethyl Ketone (2-Butanone)	ug/L	<10	10	6002384	95	10	6002384
Methyl Isobutyl Ketone	ug/L	<5.0	5.0	6002384	90	5.0	6002384
Methyl t-butyl ether (MTBE)	ug/L	<0.50	0.50	6002384	85	0.50	6002384
Styrene	ug/L	<0.50	0.50	6002384	75	0.50	6002384
1,1,1,2-Tetrachloroethane	ug/L	<0.50	0.50	6002384	90	0.50	6002384
1,1,2,2-Tetrachloroethane	ug/L	<0.50	0.50	6002384	95	0.50	6002384

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B956082
Report Date: 2019/03/08

Terrapex Environmental Ltd
Client Project #: CT2817.00
Site Location: 1294 KINGSTON RD, PICKERING
Sampler Initials: AL

O.REG 153 VOCS BY HS (WATER)

Maxxam ID		JCP937			JCP938		
Sampling Date		2019/03/01			2019/02/25 12:30		
COC Number		706221-01-01			706221-01-01		
	UNITS	**TRIP BLANK**	**RDL**	**QC Batch**	**TRIP SPIKE**	**RDL**	**QC Batch**
Tetrachloroethylene	ug/L	<0.20	0.20	6002384	80	0.20	6002384
Toluene	ug/L	<0.20	0.20	6002384	85	0.20	6002384
1,1,1-Trichloroethane	ug/L	<0.20	0.20	6002384	85	0.20	6002384
1,1,2-Trichloroethane	ug/L	<0.50	0.50	6002384	95	0.50	6002384
Trichloroethylene	ug/L	<0.20	0.20	6002384	85	0.20	6002384
Trichlorofluoromethane (FREON 11)	ug/L	<0.50	0.50	6002384	80	0.50	6002384
Vinyl Chloride	ug/L	<0.20	0.20	6002384	80	0.20	6002384
p+m-Xylene	ug/L	<0.20	0.20	6002384	80	0.20	6002384
o-Xylene	ug/L	<0.20	0.20	6002384	80	0.20	6002384
Total Xylenes	ug/L	<0.20	0.20	6002384			
Surrogate Recovery (%)							
4-Bromofluorobenzene	%	93		6002384	96		6002384
D4-1,2-Dichloroethane	%	102		6002384	102		6002384
D8-Toluene	%	95		6002384	100		6002384

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B956082
Report Date: 2019/03/08

Terrapex Environmental Ltd
Client Project #: CT2817.00
Site Location: 1294 KINGSTON RD, PICKERING
Sampler Initials: AL

TEST SUMMARY

Maxxam ID: JCP929
Sample ID: MW2A
Matrix: Water

Collected: 2019/03/01
Shipped:
Received: 2019/03/04

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
1,3-Dichloropropene Sum	CALC	6000288	N/A	2019/03/07	Automated Statchk
Chloride by Automated Colourimetry	KONE	6002481	N/A	2019/03/06	Alina Dobreanu
Chromium (VI) in Water	IC	6002476	N/A	2019/03/06	Lang Le
Free (WAD) Cyanide	SKAL/CN	6002631	N/A	2019/03/05	Xuanhong Qiu
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	6007177	2019/03/07	2019/03/07	Prabhjot Gulati
Mercury	CV/AA	6004230	2019/03/06	2019/03/06	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	6002446	N/A	2019/03/06	Matthew Ritenburg
Volatile Organic Compounds and F1 PHCs	GC/MSFD	6000236	N/A	2019/03/07	Rebecca McClean

Maxxam ID: JCP930
Sample ID: MW4A
Matrix: Water

Collected: 2019/03/01
Shipped:
Received: 2019/03/04

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
1,3-Dichloropropene Sum	CALC	6000288	N/A	2019/03/07	Automated Statchk
Chloride by Automated Colourimetry	KONE	6002481	N/A	2019/03/06	Alina Dobreanu
Chromium (VI) in Water	IC	6002476	N/A	2019/03/06	Lang Le
Free (WAD) Cyanide	SKAL/CN	6002631	N/A	2019/03/05	Xuanhong Qiu
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	6007177	2019/03/07	2019/03/07	Prabhjot Gulati
Mercury	CV/AA	6004230	2019/03/06	2019/03/06	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	6002446	N/A	2019/03/05	Matthew Ritenburg
Volatile Organic Compounds and F1 PHCs	GC/MSFD	6000236	N/A	2019/03/07	Rebecca McClean

Maxxam ID: JCP930 Dup
Sample ID: MW4A
Matrix: Water

Collected: 2019/03/01
Shipped:
Received: 2019/03/04

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	6007177	2019/03/07	2019/03/07	Prabhjot Gulati

Maxxam ID: JCP931
Sample ID: MW44
Matrix: Water

Collected: 2019/03/01
Shipped:
Received: 2019/03/04

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chloride by Automated Colourimetry	KONE	6002481	N/A	2019/03/06	Alina Dobreanu
Chromium (VI) in Water	IC	6002476	N/A	2019/03/06	Lang Le
Free (WAD) Cyanide	SKAL/CN	6002631	N/A	2019/03/05	Xuanhong Qiu
Mercury	CV/AA	6004230	2019/03/06	2019/03/06	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	6002446	N/A	2019/03/05	Matthew Ritenburg

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Maxxam Job #: B956082
Report Date: 2019/03/08

Terrapex Environmental Ltd
Client Project #: CT2817.00
Site Location: 1294 KINGSTON RD, PICKERING
Sampler Initials: AL

TEST SUMMARY

Maxxam ID: JCP932
Sample ID: MW7
Matrix: Water

Collected: 2019/03/01
Shipped:
Received: 2019/03/04

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
1,3-Dichloropropene Sum	CALC	6000288	N/A	2019/03/07	Automated Statchk
Chloride by Automated Colourimetry	KONE	6002481	N/A	2019/03/06	Alina Dobreanu
Chromium (VI) in Water	IC	6002476	N/A	2019/03/06	Lang Le
Free (WAD) Cyanide	SKAL/CN	6002631	N/A	2019/03/05	Xuanhong Qiu
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	6007177	2019/03/07	2019/03/07	Prabhjot Gulati
Mercury	CV/AA	6004230	2019/03/06	2019/03/06	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	6002446	N/A	2019/03/06	Matthew Ritenburg
Volatile Organic Compounds and F1 PHCs	GC/MSFD	6000236	N/A	2019/03/07	Rebecca McClean

Maxxam ID: JCP933
Sample ID: MW77
Matrix: Water

Collected: 2019/03/01
Shipped:
Received: 2019/03/04

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
1,3-Dichloropropene Sum	CALC	6000288	N/A	2019/03/07	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	6007177	2019/03/07	2019/03/07	Prabhjot Gulati
Volatile Organic Compounds and F1 PHCs	GC/MSFD	6000236	N/A	2019/03/07	Rebecca McClean

Maxxam ID: JCP934
Sample ID: MW8
Matrix: Water

Collected: 2019/03/01
Shipped:
Received: 2019/03/04

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
1,3-Dichloropropene Sum	CALC	6000288	N/A	2019/03/07	Automated Statchk
Chloride by Automated Colourimetry	KONE	6002481	N/A	2019/03/06	Alina Dobreanu
Chromium (VI) in Water	IC	6002476	N/A	2019/03/06	Lang Le
Free (WAD) Cyanide	SKAL/CN	6002631	N/A	2019/03/05	Xuanhong Qiu
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	6007177	2019/03/07	2019/03/07	Prabhjot Gulati
Mercury	CV/AA	6004230	2019/03/06	2019/03/06	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	6002446	N/A	2019/03/05	Matthew Ritenburg
Volatile Organic Compounds and F1 PHCs	GC/MSFD	6000236	N/A	2019/03/07	Rebecca McClean

Maxxam ID: JCP935
Sample ID: MW9
Matrix: Water

Collected: 2019/03/01
Shipped:
Received: 2019/03/04

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
1,3-Dichloropropene Sum	CALC	6000288	N/A	2019/03/07	Automated Statchk
Chloride by Automated Colourimetry	KONE	6002481	N/A	2019/03/06	Alina Dobreanu
Chromium (VI) in Water	IC	6002476	N/A	2019/03/06	Lang Le
Free (WAD) Cyanide	SKAL/CN	6002631	N/A	2019/03/05	Xuanhong Qiu
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	6007177	2019/03/07	2019/03/07	Prabhjot Gulati
Mercury	CV/AA	6004230	2019/03/06	2019/03/06	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	6002446	N/A	2019/03/06	Matthew Ritenburg
Volatile Organic Compounds and F1 PHCs	GC/MSFD	6000236	N/A	2019/03/07	Rebecca McClean

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Maxxam Job #: B956082
Report Date: 2019/03/08

Terrapex Environmental Ltd
Client Project #: CT2817.00
Site Location: 1294 KINGSTON RD, PICKERING
Sampler Initials: AL

TEST SUMMARY

Maxxam ID: JCP936
Sample ID: MW10
Matrix: Water

Collected: 2019/03/01
Shipped:
Received: 2019/03/04

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
1,3-Dichloropropene Sum	CALC	6000288	N/A	2019/03/07	Automated Statchk
Chloride by Automated Colourimetry	KONE	6002481	N/A	2019/03/06	Alina Dobreanu
Chromium (VI) in Water	IC	6002476	N/A	2019/03/06	Lang Le
Free (WAD) Cyanide	SKAL/CN	6002631	N/A	2019/03/05	Xuanhong Qiu
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	6007177	2019/03/07	2019/03/07	Prabhjot Gulati
Mercury	CV/AA	6004230	2019/03/06	2019/03/06	Ron Morrison
Dissolved Metals by ICPMS	ICP/MS	6002446	N/A	2019/03/05	Matthew Ritenburg
Volatile Organic Compounds and F1 PHCs	GC/MSFD	6000236	N/A	2019/03/07	Rebecca McClean

Maxxam ID: JCP936 Dup
Sample ID: MW10
Matrix: Water

Collected: 2019/03/01
Shipped:
Received: 2019/03/04

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chromium (VI) in Water	IC	6002476	N/A	2019/03/06	Lang Le

Maxxam ID: JCP937
Sample ID: TRIP BLANK
Matrix: Water

Collected: 2019/03/01
Shipped:
Received: 2019/03/04

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
1,3-Dichloropropene Sum	CALC	6000288	N/A	2019/03/07	Automated Statchk
Volatile Organic Compounds in Water	GC/MS	6002384	N/A	2019/03/06	Manpreet Sarao

Maxxam ID: JCP938
Sample ID: TRIP SPIKE
Matrix: Water

Collected: 2019/02/25
Shipped:
Received: 2019/03/04

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Volatile Organic Compounds in Water	GC/MS	6002384	N/A	2019/03/06	Manpreet Sarao

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GENERAL COMMENTS

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

Package 1	1.0°C
Package 2	-0.3°C

Sample JCP938 [TRIP SPIKE] : VOC Analysis: Trip Spike results are expressed as percent recoveries.

Results relate only to the items tested.

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Maxxam Job #: B956082
Report Date: 2019/03/08

QUALITY ASSURANCE REPORT

Terrapex Environmental Ltd
Client Project #: CT2817.00
Site Location: 1294 KINGSTON RD, PICKERING
Sampler Initials: AL

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
6000236	4-Bromofluorobenzene	2019/03/06	98	70 - 130	97	70 - 130	93	%		
6000236	D4-1,2-Dichloroethane	2019/03/06	102	70 - 130	97	70 - 130	97	%		
6000236	D8-Toluene	2019/03/06	103	70 - 130	104	70 - 130	102	%		
6002384	4-Bromofluorobenzene	2019/03/06	102	70 - 130	100	70 - 130	97	%		
6002384	D4-1,2-Dichloroethane	2019/03/06	101	70 - 130	98	70 - 130	103	%		
6002384	D8-Toluene	2019/03/06	103	70 - 130	104	70 - 130	94	%		
6007177	o-Terphenyl	2019/03/07	108	60 - 130	110	60 - 130	107	%		
6000236	1,1,1,2-Tetrachloroethane	2019/03/07	94	70 - 130	90	70 - 130	<0.50	ug/L	NC	30
6000236	1,1,1-Trichloroethane	2019/03/07	99	70 - 130	96	70 - 130	<0.20	ug/L	NC	30
6000236	1,1,2,2-Tetrachloroethane	2019/03/07	87	70 - 130	79	70 - 130	<0.50	ug/L	NC	30
6000236	1,1,2-Trichloroethane	2019/03/07	99	70 - 130	92	70 - 130	<0.50	ug/L	NC	30
6000236	1,1-Dichloroethane	2019/03/07	99	70 - 130	94	70 - 130	<0.20	ug/L	NC	30
6000236	1,1-Dichloroethylene	2019/03/07	99	70 - 130	96	70 - 130	<0.20	ug/L	NC	30
6000236	1,2-Dichlorobenzene	2019/03/07	94	70 - 130	90	70 - 130	<0.50	ug/L	NC	30
6000236	1,2-Dichloroethane	2019/03/07	99	70 - 130	90	70 - 130	<0.50	ug/L	NC	30
6000236	1,2-Dichloropropane	2019/03/07	97	70 - 130	91	70 - 130	<0.20	ug/L	NC	30
6000236	1,3-Dichlorobenzene	2019/03/07	99	70 - 130	97	70 - 130	<0.50	ug/L	NC	30
6000236	1,4-Dichlorobenzene	2019/03/07	96	70 - 130	93	70 - 130	<0.50	ug/L	NC	30
6000236	Acetone (2-Propanone)	2019/03/07	94	60 - 140	81	60 - 140	<10	ug/L	NC	30
6000236	Benzene	2019/03/07	NC	70 - 130	93	70 - 130	<0.20	ug/L	1.9	30
6000236	Bromodichloromethane	2019/03/07	94	70 - 130	88	70 - 130	<0.50	ug/L	NC	30
6000236	Bromoform	2019/03/07	85	70 - 130	78	70 - 130	<1.0	ug/L	NC	30
6000236	Bromomethane	2019/03/07	93	60 - 140	91	60 - 140	<0.50	ug/L	NC	30
6000236	Carbon Tetrachloride	2019/03/07	99	70 - 130	97	70 - 130	<0.20	ug/L	NC	30
6000236	Chlorobenzene	2019/03/07	95	70 - 130	91	70 - 130	<0.20	ug/L	NC	30
6000236	Chloroform	2019/03/07	100	70 - 130	94	70 - 130	<0.20	ug/L	NC	30
6000236	cis-1,2-Dichloroethylene	2019/03/07	98	70 - 130	92	70 - 130	<0.50	ug/L	NC	30
6000236	cis-1,3-Dichloropropene	2019/03/07	89	70 - 130	76	70 - 130	<0.30	ug/L	NC	30
6000236	Dibromochloromethane	2019/03/07	90	70 - 130	84	70 - 130	<0.50	ug/L	NC	30
6000236	Dichlorodifluoromethane (FREON 12)	2019/03/07	101	60 - 140	100	60 - 140	<1.0	ug/L	NC	30
6000236	Ethylbenzene	2019/03/07	NC	70 - 130	92	70 - 130	<0.20	ug/L	0.83	30
6000236	Ethylene Dibromide	2019/03/07	92	70 - 130	84	70 - 130	<0.20	ug/L	NC	30

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Maxxam Job #: B956082
Report Date: 2019/03/08

QUALITY ASSURANCE REPORT(CONT'D)

Terrapex Environmental Ltd
Client Project #: CT2817.00
Site Location: 1294 KINGSTON RD, PICKERING
Sampler Initials: AL

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
6000236	F1 (C6-C10) - BTEX	2019/03/07					<25	ug/L	13	30
6000236	F1 (C6-C10)	2019/03/07	88	60 - 140	96	60 - 140	<25	ug/L	6.7	30
6000236	Hexane	2019/03/07	100	70 - 130	97	70 - 130	<1.0	ug/L	NC	30
6000236	Methyl Ethyl Ketone (2-Butanone)	2019/03/07	92	60 - 140	80	60 - 140	<10	ug/L	NC	30
6000236	Methyl Isobutyl Ketone	2019/03/07	90	70 - 130	81	70 - 130	<5.0	ug/L	NC	30
6000236	Methyl t-butyl ether (MTBE)	2019/03/07	92	70 - 130	87	70 - 130	<0.50	ug/L	NC	30
6000236	Methylene Chloride(Dichloromethane)	2019/03/07	94	70 - 130	88	70 - 130	<2.0	ug/L	NC	30
6000236	o-Xylene	2019/03/07	91	70 - 130	88	70 - 130	<0.20	ug/L	1.9	30
6000236	p+m-Xylene	2019/03/07	93	70 - 130	91	70 - 130	<0.20	ug/L	1.2	30
6000236	Styrene	2019/03/07	91	70 - 130	86	70 - 130	<0.50	ug/L	NC	30
6000236	Tetrachloroethylene	2019/03/07	98	70 - 130	97	70 - 130	<0.20	ug/L	NC	30
6000236	Toluene	2019/03/07	92	70 - 130	89	70 - 130	<0.20	ug/L	1.6	30
6000236	Total Xylenes	2019/03/07					<0.20	ug/L	1.7	30
6000236	trans-1,2-Dichloroethylene	2019/03/07	100	70 - 130	96	70 - 130	<0.50	ug/L	NC	30
6000236	trans-1,3-Dichloropropene	2019/03/07	90	70 - 130	75	70 - 130	<0.40	ug/L	NC	30
6000236	Trichloroethylene	2019/03/07	99	70 - 130	96	70 - 130	<0.20	ug/L	NC	30
6000236	Trichlorofluoromethane (FREON 11)	2019/03/07	101	70 - 130	99	70 - 130	<0.50	ug/L	NC	30
6000236	Vinyl Chloride	2019/03/07	99	70 - 130	95	70 - 130	<0.20	ug/L	NC	30
6002384	1,1,1,2-Tetrachloroethane	2019/03/06	98	70 - 130	98	70 - 130	<0.50	ug/L	NC	30
6002384	1,1,1-Trichloroethane	2019/03/06	94	70 - 130	96	70 - 130	<0.20	ug/L	NC	30
6002384	1,1,2,2-Tetrachloroethane	2019/03/06	99	70 - 130	95	70 - 130	<0.50	ug/L	NC	30
6002384	1,1,2-Trichloroethane	2019/03/06	97	70 - 130	95	70 - 130	<0.50	ug/L	NC	30
6002384	1,1-Dichloroethane	2019/03/06	94	70 - 130	96	70 - 130	<0.20	ug/L	NC	30
6002384	1,1-Dichloroethylene	2019/03/06	91	70 - 130	94	70 - 130	<0.20	ug/L	NC	30
6002384	1,2-Dichlorobenzene	2019/03/06	96	70 - 130	96	70 - 130	<0.50	ug/L	NC	30
6002384	1,2-Dichloroethane	2019/03/06	97	70 - 130	95	70 - 130	<0.50	ug/L	NC	30
6002384	1,2-Dichloropropane	2019/03/06	95	70 - 130	95	70 - 130	<0.20	ug/L	NC	30
6002384	1,3-Dichlorobenzene	2019/03/06	97	70 - 130	98	70 - 130	<0.50	ug/L	NC	30
6002384	1,4-Dichlorobenzene	2019/03/06	99	70 - 130	100	70 - 130	<0.50	ug/L	NC	30
6002384	Acetone (2-Propanone)	2019/03/06	103	60 - 140	96	60 - 140	<10	ug/L	NC	30
6002384	Benzene	2019/03/06	93	70 - 130	94	70 - 130	<0.20	ug/L	NC	30
6002384	Bromodichloromethane	2019/03/06	95	70 - 130	95	70 - 130	<0.50	ug/L	NC	30

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Maxxam Job #: B956082
Report Date: 2019/03/08

QUALITY ASSURANCE REPORT(CONT'D)

Terrapex Environmental Ltd
Client Project #: CT2817.00
Site Location: 1294 KINGSTON RD, PICKERING
Sampler Initials: AL

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
6002384	Bromoform	2019/03/06	98	70 - 130	94	70 - 130	<1.0	ug/L	NC	30
6002384	Bromomethane	2019/03/06	93	60 - 140	92	60 - 140	<0.50	ug/L	NC	30
6002384	Carbon Tetrachloride	2019/03/06	94	70 - 130	97	70 - 130	<0.20	ug/L	NC	30
6002384	Chlorobenzene	2019/03/06	95	70 - 130	95	70 - 130	<0.20	ug/L	NC	30
6002384	Chloroform	2019/03/06	95	70 - 130	96	70 - 130	<0.20	ug/L	0.35	30
6002384	cis-1,2-Dichloroethylene	2019/03/06	95	70 - 130	96	70 - 130	<0.50	ug/L	NC	30
6002384	cis-1,3-Dichloropropene	2019/03/06	99	70 - 130	91	70 - 130	<0.30	ug/L	NC	30
6002384	Dibromochloromethane	2019/03/06	97	70 - 130	95	70 - 130	<0.50	ug/L	NC	30
6002384	Dichlorodifluoromethane (FREON 12)	2019/03/06	97	60 - 140	102	60 - 140	<1.0	ug/L	NC	30
6002384	Ethylbenzene	2019/03/06	97	70 - 130	99	70 - 130	<0.20	ug/L	NC	30
6002384	Ethylene Dibromide	2019/03/06	100	70 - 130	97	70 - 130	<0.20	ug/L	NC	30
6002384	Hexane	2019/03/06	97	70 - 130	101	70 - 130	<1.0	ug/L	NC	30
6002384	Methyl Ethyl Ketone (2-Butanone)	2019/03/06	109	60 - 140	102	60 - 140	<10	ug/L	NC	30
6002384	Methyl Isobutyl Ketone	2019/03/06	111	70 - 130	106	70 - 130	<5.0	ug/L	NC	30
6002384	Methyl t-butyl ether (MTBE)	2019/03/06	95	70 - 130	96	70 - 130	<0.50	ug/L	NC	30
6002384	Methylene Chloride(Dichloromethane)	2019/03/06	90	70 - 130	89	70 - 130	<2.0	ug/L	NC	30
6002384	o-Xylene	2019/03/06	96	70 - 130	100	70 - 130	<0.20	ug/L	NC	30
6002384	p+m-Xylene	2019/03/06	100	70 - 130	102	70 - 130	<0.20	ug/L	NC	30
6002384	Styrene	2019/03/06	100	70 - 130	104	70 - 130	<0.50	ug/L	NC	30
6002384	Tetrachloroethylene	2019/03/06	95	70 - 130	97	70 - 130	<0.20	ug/L	1.4	30
6002384	Toluene	2019/03/06	96	70 - 130	97	70 - 130	<0.20	ug/L	NC	30
6002384	Total Xylenes	2019/03/06					<0.20	ug/L	NC	30
6002384	trans-1,2-Dichloroethylene	2019/03/06	94	70 - 130	97	70 - 130	<0.50	ug/L	NC	30
6002384	trans-1,3-Dichloropropene	2019/03/06	104	70 - 130	93	70 - 130	<0.40	ug/L	NC	30
6002384	Trichloroethylene	2019/03/06	94	70 - 130	96	70 - 130	<0.20	ug/L	1.3	30
6002384	Trichlorofluoromethane (FREON 11)	2019/03/06	92	70 - 130	96	70 - 130	<0.50	ug/L	NC	30
6002384	Vinyl Chloride	2019/03/06	94	70 - 130	97	70 - 130	<0.20	ug/L	NC	30
6002446	Dissolved Antimony (Sb)	2019/03/05	107	80 - 120	103	80 - 120	<0.50	ug/L	NC	20
6002446	Dissolved Arsenic (As)	2019/03/05	101	80 - 120	100	80 - 120	<1.0	ug/L	3.8	20
6002446	Dissolved Barium (Ba)	2019/03/05	100	80 - 120	98	80 - 120	<2.0	ug/L	0.011	20
6002446	Dissolved Beryllium (Be)	2019/03/05	103	80 - 120	102	80 - 120	<0.50	ug/L	NC	20
6002446	Dissolved Boron (B)	2019/03/05	101	80 - 120	103	80 - 120	<10	ug/L	0.88	20

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Maxxam
A Bureau Veritas Group Company

Maxxam Job #: B956082
Report Date: 2019/03/08

QUALITY ASSURANCE REPORT(CONT'D)

Terrapex Environmental Ltd
Client Project #: CT2817.00
Site Location: 1294 KINGSTON RD, PICKERING
Sampler Initials: AL

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
6002446	Dissolved Cadmium (Cd)	2019/03/05	100	80 - 120	101	80 - 120	<0.10	ug/L	NC	20
6002446	Dissolved Chromium (Cr)	2019/03/05	100	80 - 120	99	80 - 120	<5.0	ug/L	NC	20
6002446	Dissolved Cobalt (Co)	2019/03/05	101	80 - 120	100	80 - 120	<0.50	ug/L	2.2	20
6002446	Dissolved Copper (Cu)	2019/03/05	104	80 - 120	102	80 - 120	<1.0	ug/L	NC	20
6002446	Dissolved Lead (Pb)	2019/03/05	94	80 - 120	100	80 - 120	<0.50	ug/L	NC	20
6002446	Dissolved Molybdenum (Mo)	2019/03/05	111	80 - 120	106	80 - 120	<0.50	ug/L	1.4	20
6002446	Dissolved Nickel (Ni)	2019/03/05	94	80 - 120	97	80 - 120	<1.0	ug/L	1.5	20
6002446	Dissolved Selenium (Se)	2019/03/05	102	80 - 120	101	80 - 120	<2.0	ug/L	NC	20
6002446	Dissolved Silver (Ag)	2019/03/05	84	80 - 120	102	80 - 120	<0.10	ug/L	NC	20
6002446	Dissolved Sodium (Na)	2019/03/05	121 (1)	80 - 120	98	80 - 120	<100	ug/L		
6002446	Dissolved Thallium (Tl)	2019/03/05	96	80 - 120	101	80 - 120	<0.050	ug/L	NC	20
6002446	Dissolved Uranium (U)	2019/03/05	99	80 - 120	99	80 - 120	<0.10	ug/L	1.2	20
6002446	Dissolved Vanadium (V)	2019/03/05	101	80 - 120	99	80 - 120	<0.50	ug/L	2.4	20
6002446	Dissolved Zinc (Zn)	2019/03/05	96	80 - 120	99	80 - 120	<5.0	ug/L	NC	20
6002476	Chromium (VI)	2019/03/06	99	80 - 120	100	80 - 120	<0.50	ug/L	NC	20
6002481	Dissolved Chloride (Cl-)	2019/03/06	NC	80 - 120	101	80 - 120	<1.0	mg/L	1.9	20
6002631	WAD Cyanide (Free)	2019/03/05	110	80 - 120	106	80 - 120	<1	ug/L	NC	20
6004230	Mercury (Hg)	2019/03/06	97	75 - 125	101	80 - 120	<0.1	ug/L	NC	20
6007177	F2 (C10-C16 Hydrocarbons)	2019/03/07	101	50 - 130	104	60 - 130	<100	ug/L	NC	30
6007177	F3 (C16-C34 Hydrocarbons)	2019/03/07	95	50 - 130	99	60 - 130	<200	ug/L	NC	30
6007177	F4 (C34-C50 Hydrocarbons)	2019/03/07	91	50 - 130	93	60 - 130	<200	ug/L	NC	30

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

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

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

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

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

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

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

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

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VALIDATION SIGNATURE PAGE

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

Anastassia Hamanov, Scientific Specialist

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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Maxxam Analytics International Corporation o/a Maxxam Analytics
6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel:(905) 817-5700 Toll-free:800-563-6266 Fax:(905) 817-5777 www.maxxam.ca

CHAIN OF CUSTODY RECORD

Page 1 of 1

INVOICE TO:	REPORT TO:	PROJECT INFORMATION:	Laboratory Use Only:
Company Name: #4398 Terrapex Environmental Ltd	Company Name: Terrapex	Quotation #: B80428	Maxxam Job #: / Bottle Order #: 706221
Attention: Accounts Payable	Attention: Chaoran Li	P.O. #: —	
Address: 90 Scarsdale Rd, Toronto ON M3B 2R7	Address: 90 SCARSDALE RD, TORONTO	Project: CT2817.00	COC #: C#706221-01-01
Tel: (416) 245-0011 Fax: (416) 245-0012	Tel: (416) 245-0011 Ext: 232 Fax:	Project Name: 1294 Kingston Rd, Pickering	Project Manager: Ema Gitej
Email: accounts.payable@terrapex.com	Email: c.li@terrapex.com	Site #: —	
		Sampled By: ALOK / MM	

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE MAXXAM DRINKING WATER CHAIN OF CUSTODY

Regulation 153 (2011): ☐ Table 1 ☒ Res/Park ☐ Medium/Fine ☒ Table 2 ☐ Ind/Comm ☐ Coarse ☐ Table 3 ☐ Agri/Other ☒ For RSC ☐ Table ___

Other Regulations: ☐ CCME ☐ Sanitary Sewer Bylaw ☐ Reg 558 ☐ Storm Sewer Bylaw ☐ MISA Municipality ___ ☐ PWQO ☐ Other ___

Special Instructions:

Include Criteria on Certificate of Analysis (Y/N)? N

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Field Filtered (please circle): Metals / Hg / CrVI	O Reg 153 VOCs by HS & F1-F4	O Reg 153 Metals & Inorganics Pkg	REG 153 VOCs	# of Bottles	Comments
1		MW2A	MAR 1/19	13:45	GW	Y	X	X		10	
2		MW4A	↓	14:30	GW	Y	X	X		10	
3		MW44	↓	14:30	GW	Y		X		5	
4		MW7	↓	11:20	GW	Y	X	X		10	04-Mar-19 14:29
5		MW77	↓	11:20	GW	N	X			5	Ema Gitej
6		MW8	↓	12:00	GW	Y	X	X		10	B956082
7		MW9	↓	15:30	GW	Y	X	X		10	THP ENV-1414
8		MW10	MAR 1/19	10:00	GW	Y	X	X		10	
9		TRIP BLANK	MAR 1/19	—	GW	N			X	2	LOT 3621
10		TRIP SPIKE	FEB 25/19	12:30	GW	N			X	2	LOT 1071

Turnaround Time (TAT) Required: Please provide advance notice for rush projects

Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ___ Time Required: ___
Rush Confirmation Number: ___ (call lab for #)

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
Alan Li / ALAN LI	19/03/04	11:30	COLENE LUKITAO	2019/03/04	14:29	Ø

Laboratory Use Only				
Time Sensitive	Temperature (°C) on Recei 3/0/0, 0/-2/1	Custody Seal	Yes	No
		Present	✓	
		Intact	✓	

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO MAXXAM'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.MAXXAM.CA/TERMS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT HTTP://MAXXAM.CA/WP-CONTENT/UPLOADS/ONTARIO-COC.PDF.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

White: Maxxa Yellow: Client

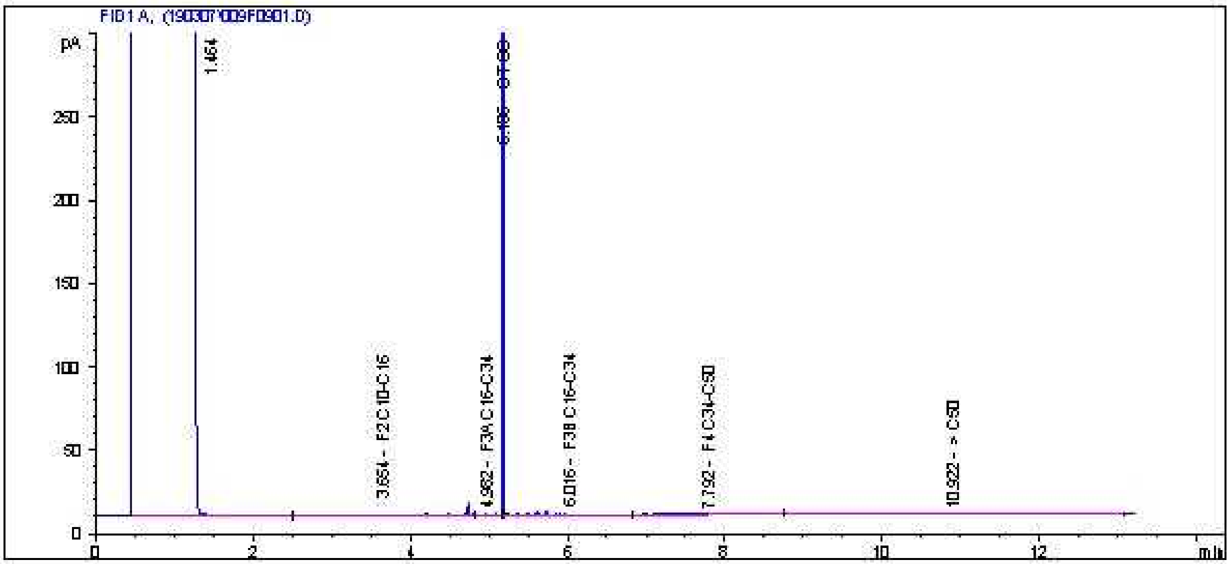
WB#103522

Maxxam Analytics International Corporation o/a Maxxam Analytics

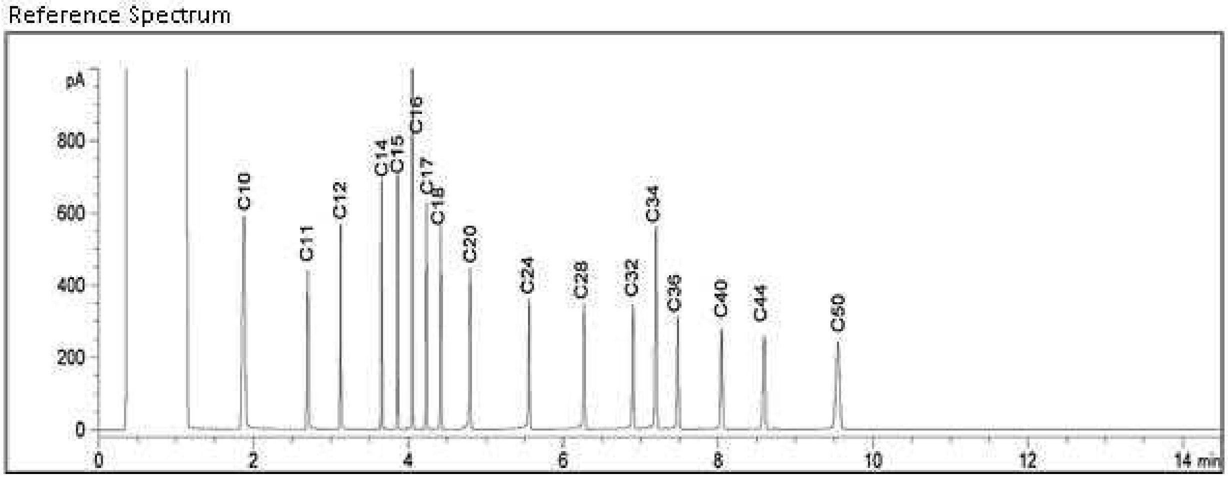
Maxxam Job #: B956082
Report Date: 2019/03/08
Maxxam Sample: JCP929

Terrapex Environmental Ltd
Client Project #: CT2817.00
Project name: 1294 KINGSTON RD, PICKERING
Client ID: MW2A

Petroleum Hydrocarbons F2-F4 in Water Chromatogram



Reference Spectrum



TYPICAL PRODUCT CARBON NUMBER RANGES

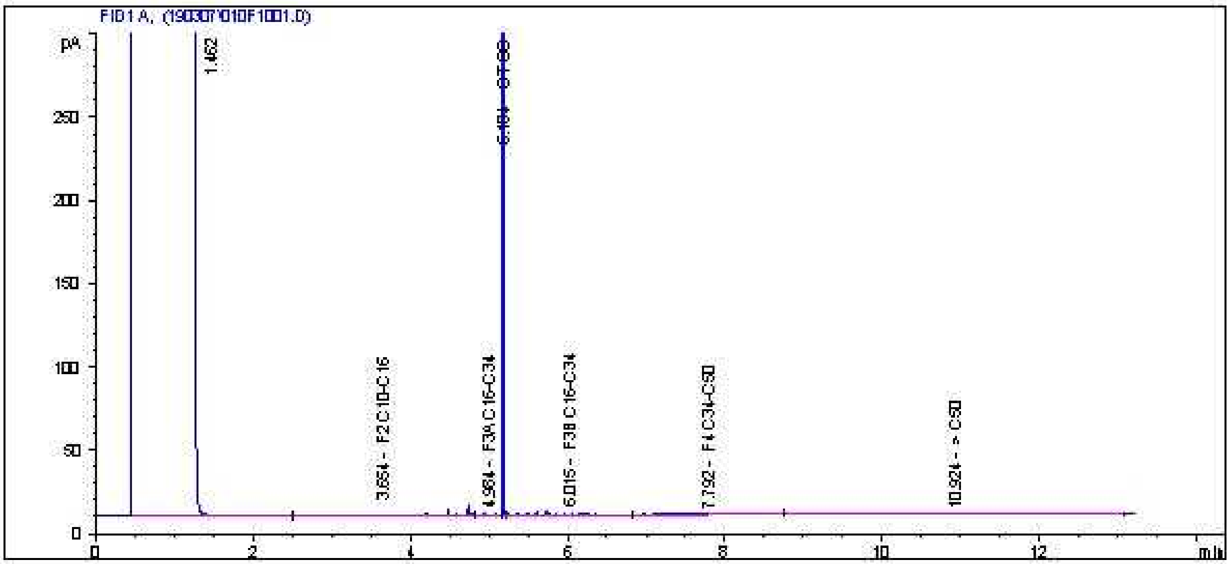
Gasoline: **C6 - C12**	Diesel: **C10 - C24**	Jet Fuels: **C6 - C16**
Varsol: **C8 - C12**	Fuel Oils: **C6 - C32**	Creosote: **C10 - C26**
Kerosene: **C8 - C16**	Motor Oils: **C16 - C50**	Asphalt: **C18 - C50+**

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

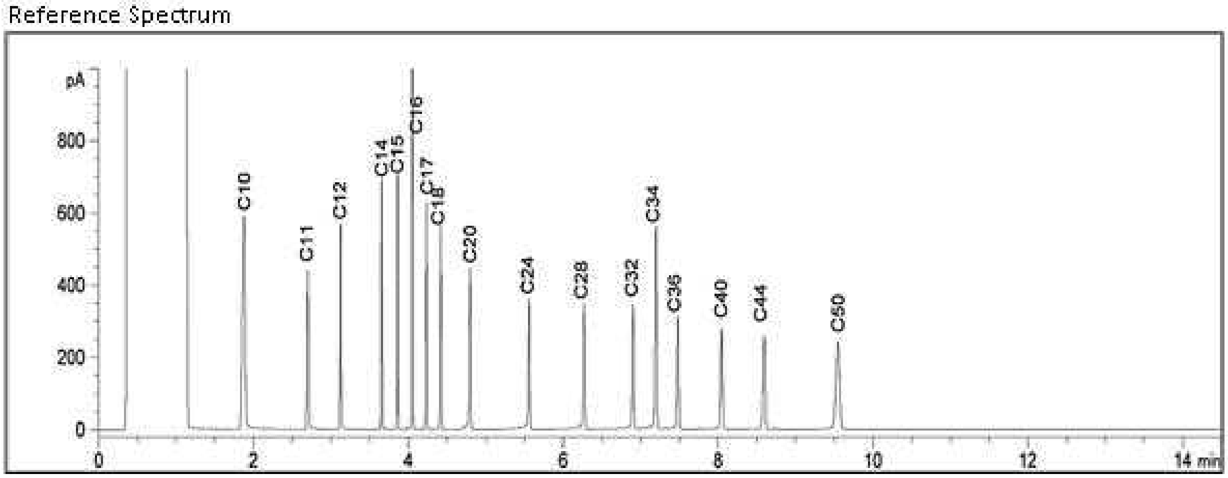
Maxxam Job #: B956082
Report Date: 2019/03/08
Maxxam Sample: JCP930

Terrapex Environmental Ltd
Client Project #: CT2817.00
Project name: 1294 KINGSTON RD, PICKERING
Client ID: MW4A

Petroleum Hydrocarbons F2-F4 in Water Chromatogram



Reference Spectrum



TYPICAL PRODUCT CARBON NUMBER RANGES

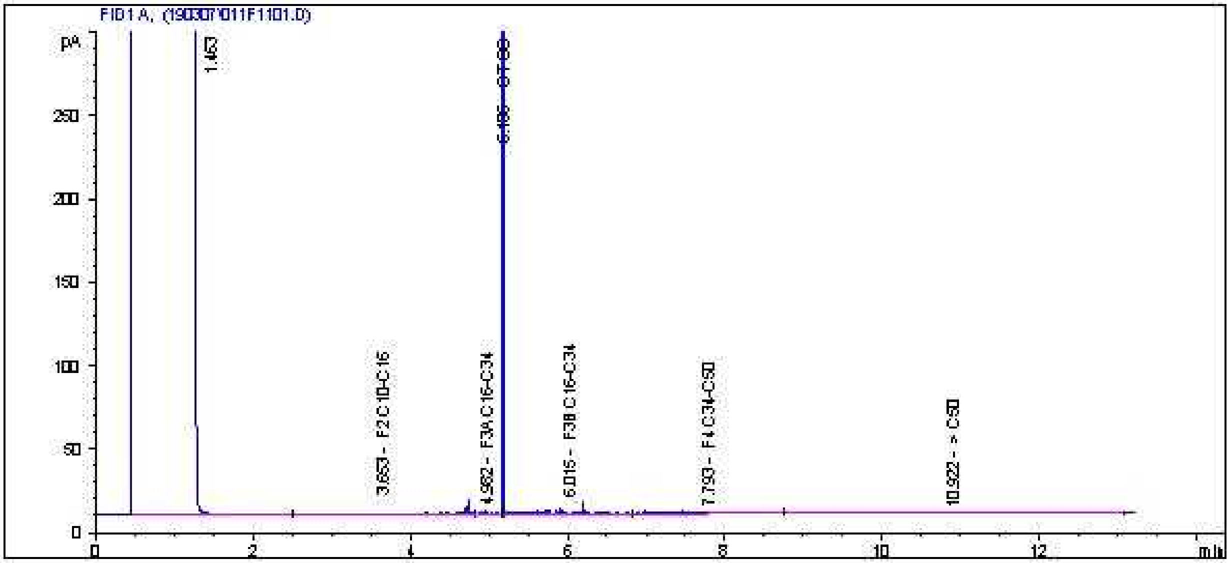
Gasoline: **C6 - C12**	Diesel: **C10 - C24**	Jet Fuels: **C6 - C16**
Varsol: **C8 - C12**	Fuel Oils: **C6 - C32**	Creosote: **C10 - C26**
Kerosene: **C8 - C16**	Motor Oils: **C16 - C50**	Asphalt: **C18 - C50+**

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

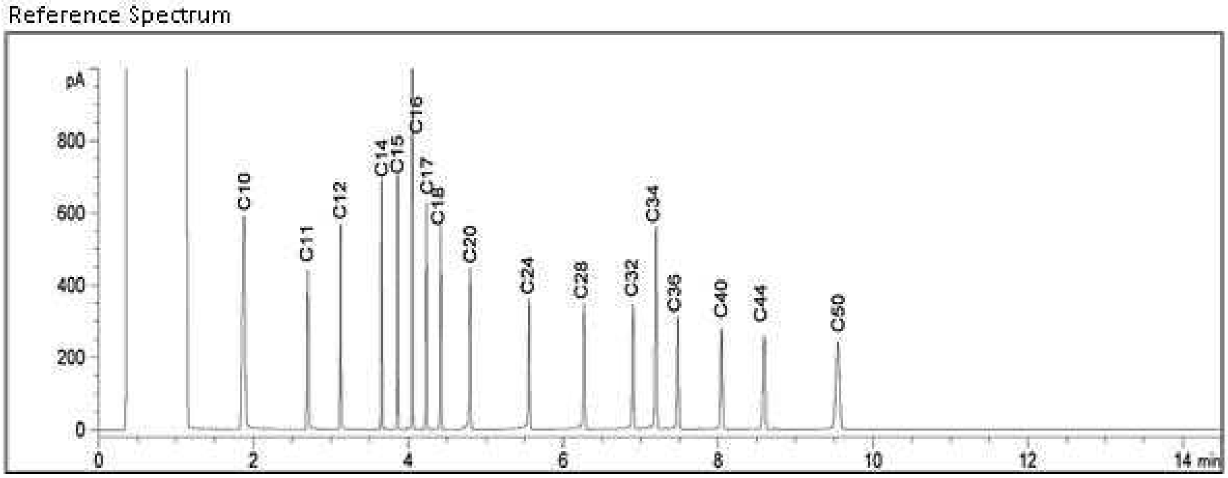
Maxxam Job #: B956082
Report Date: 2019/03/08
Maxxam Sample: JCP930 Lab-Dup

Terrapex Environmental Ltd
Client Project #: CT2817.00
Project name: 1294 KINGSTON RD, PICKERING
Client ID: MW4A

Petroleum Hydrocarbons F2-F4 in Water Chromatogram



Reference Spectrum



TYPICAL PRODUCT CARBON NUMBER RANGES

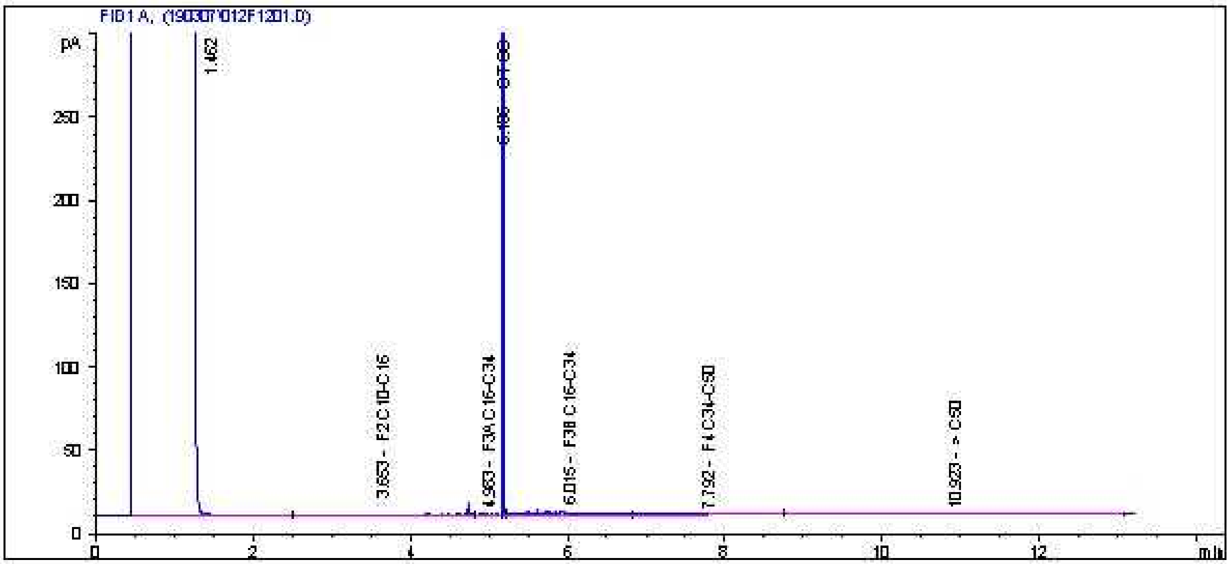
Gasoline: **C6 - C12**	Diesel: **C10 - C24**	Jet Fuels: **C6 - C16**
Varsol: **C8 - C12**	Fuel Oils: **C6 - C32**	Creosote: **C10 - C26**
Kerosene: **C8 - C16**	Motor Oils: **C16 - C50**	Asphalt: **C18 - C50+**

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

Maxxam Job #: B956082
Report Date: 2019/03/08
Maxxam Sample: JCP932

Terrapex Environmental Ltd
Client Project #: CT2817.00
Project name: 1294 KINGSTON RD, PICKERING
Client ID: MW7

Petroleum Hydrocarbons F2-F4 in Water Chromatogram



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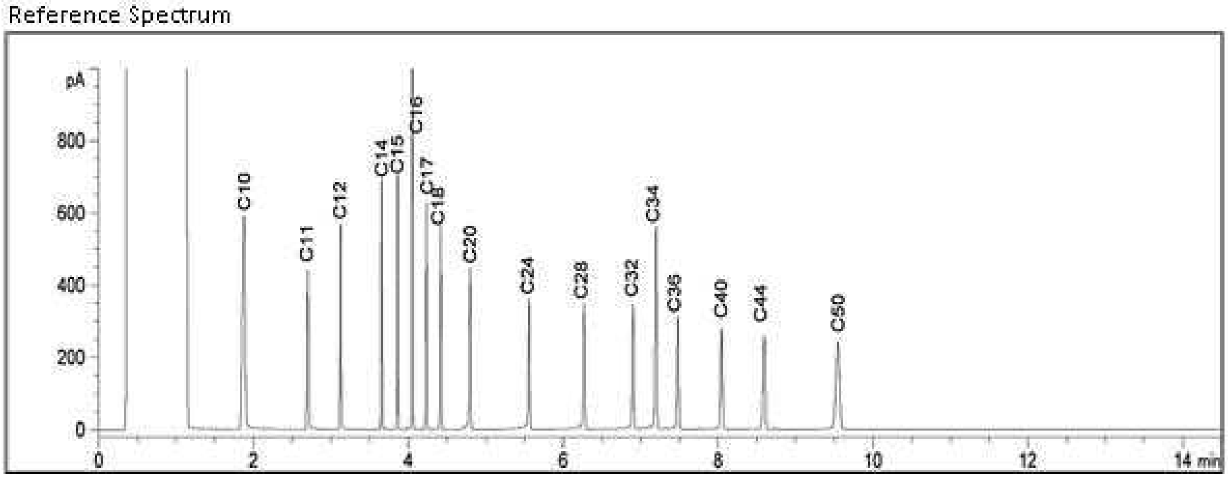


TYPICAL PRODUCT CARBON NUMBER RANGES

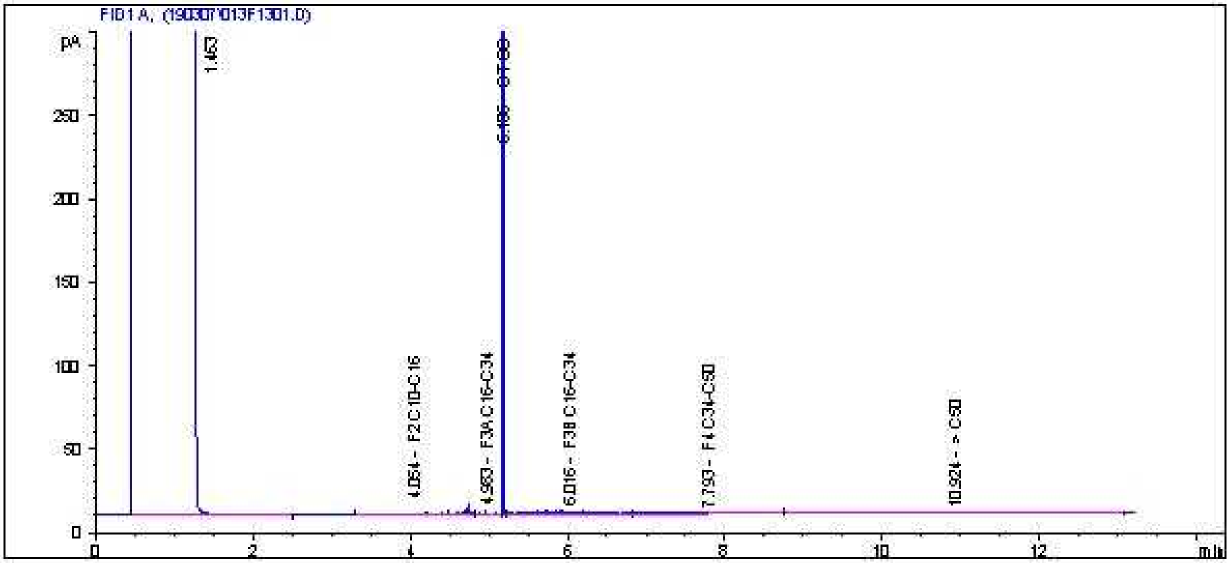
Gasoline: **C6 - C12**	Diesel: **C10 - C24**	Jet Fuels: **C6 - C16**
Varsol: **C8 - C12**	Fuel Oils: **C6 - C32**	Creosote: **C10 - C26**
Kerosene: **C8 - C16**	Motor Oils: **C16 - C50**	Asphalt: **C18 - C50+**

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

Maxxam Job #: B956082
Report Date: 2019/03/08
Maxxam Sample: JCP933

Terrapex Environmental Ltd
Client Project #: CT2817.00
Project name: 1294 KINGSTON RD, PICKERING
Client ID: MW77

Petroleum Hydrocarbons F2-F4 in Water Chromatogram



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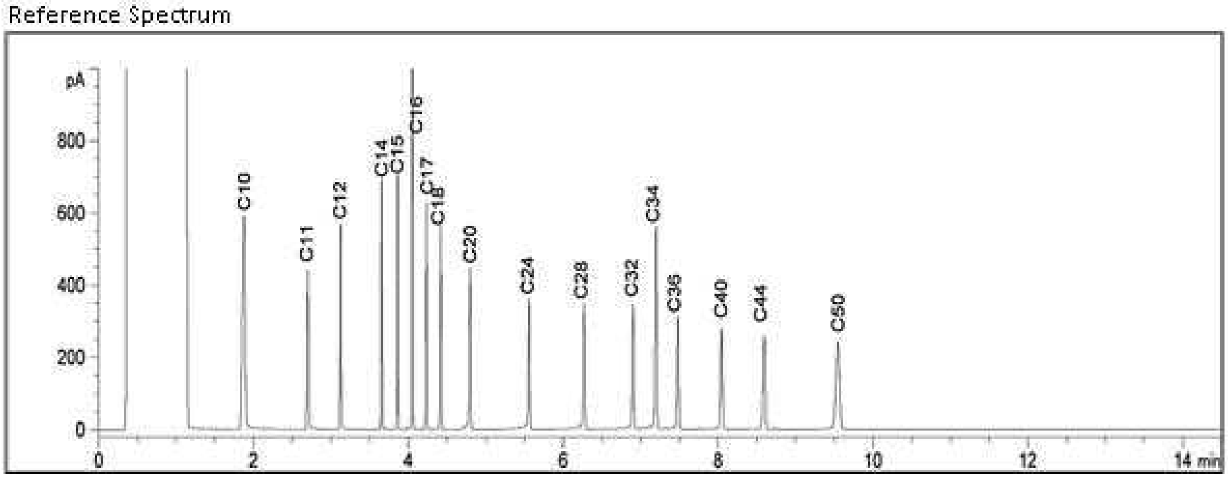


TYPICAL PRODUCT CARBON NUMBER RANGES

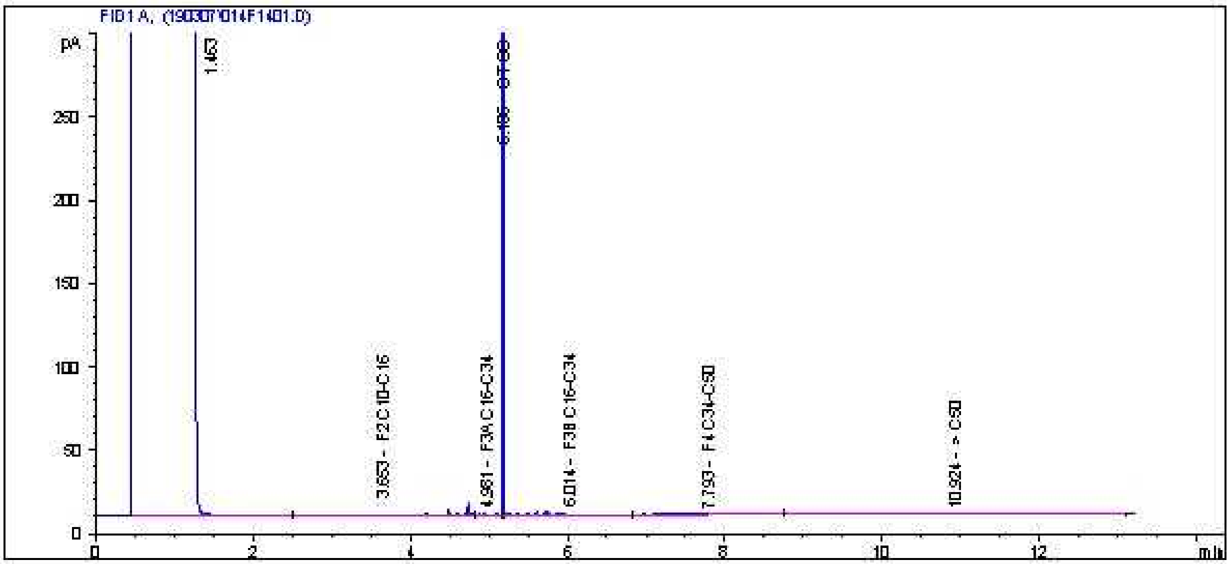
Gasoline: **C6 - C12**	Diesel: **C10 - C24**	Jet Fuels: **C6 - C16**
Varsol: **C8 - C12**	Fuel Oils: **C6 - C32**	Creosote: **C10 - C26**
Kerosene: **C8 - C16**	Motor Oils: **C16 - C50**	Asphalt: **C18 - C50+**

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

Maxxam Job #: B956082
Report Date: 2019/03/08
Maxxam Sample: JCP934

Terrapex Environmental Ltd
Client Project #: CT2817.00
Project name: 1294 KINGSTON RD, PICKERING
Client ID: MW8

Petroleum Hydrocarbons F2-F4 in Water Chromatogram



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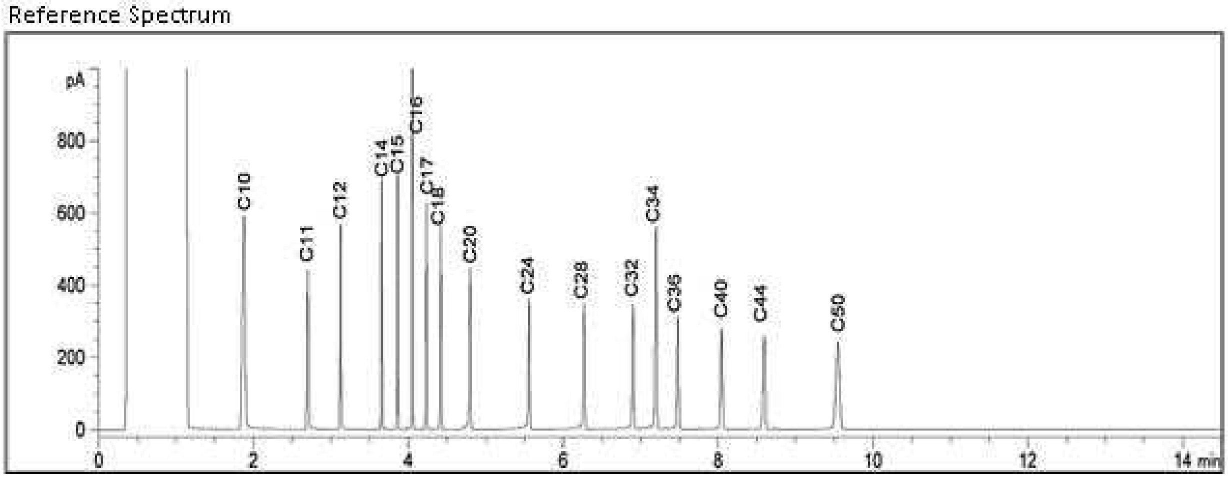
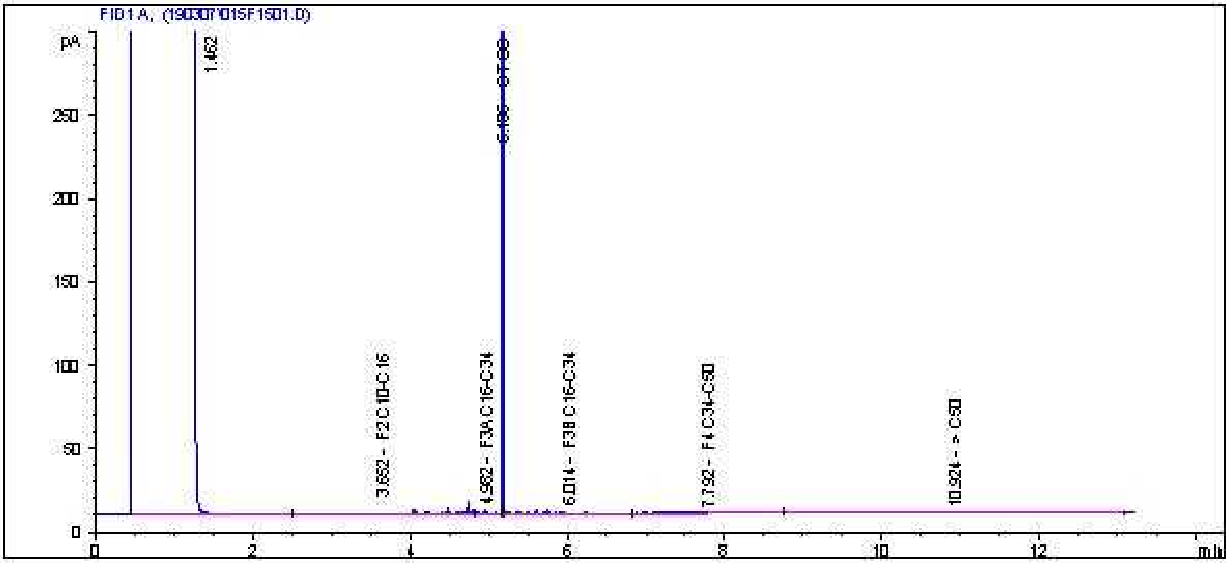


TYPICAL PRODUCT CARBON NUMBER RANGES

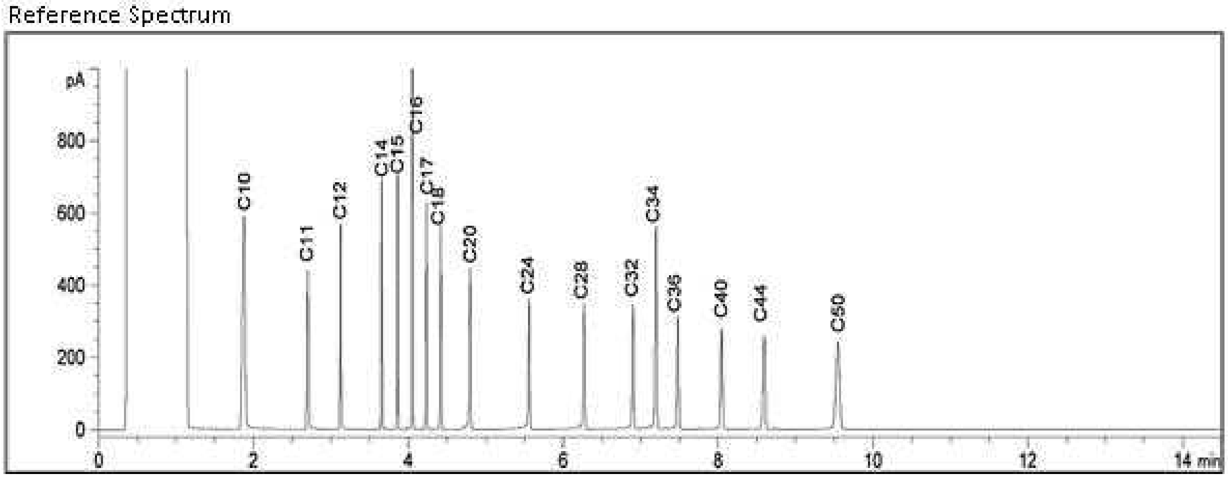
Gasoline: **C6 - C12**	Diesel: **C10 - C24**	Jet Fuels: **C6 - C16**
Varsol: **C8 - C12**	Fuel Oils: **C6 - C32**	Creosote: **C10 - C26**
Kerosene: **C8 - C16**	Motor Oils: **C16 - C50**	Asphalt: **C18 - C50+**

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

Petroleum Hydrocarbons F2-F4 in Water Chromatogram



Reference Spectrum



TYPICAL PRODUCT CARBON NUMBER RANGES

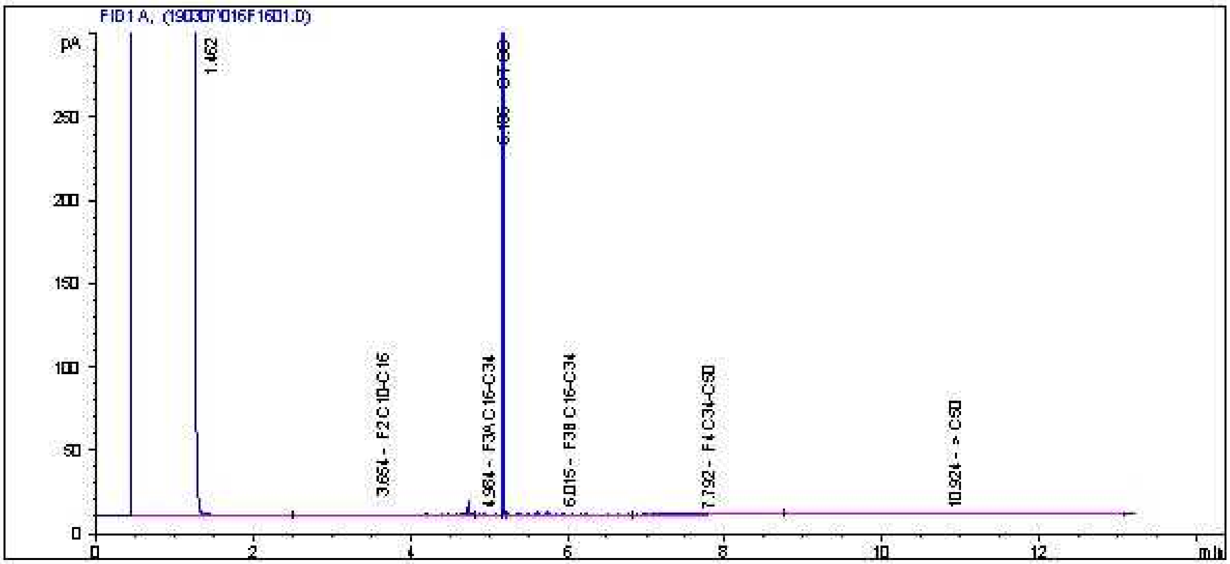
Gasoline: **C6 - C12**	Diesel: **C10 - C24**	Jet Fuels: **C6 - C16**
Varsol: **C8 - C12**	Fuel Oils: **C6 - C32**	Creosote: **C10 - C26**
Kerosene: **C8 - C16**	Motor Oils: **C16 - C50**	Asphalt: **C18 - C50+**

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

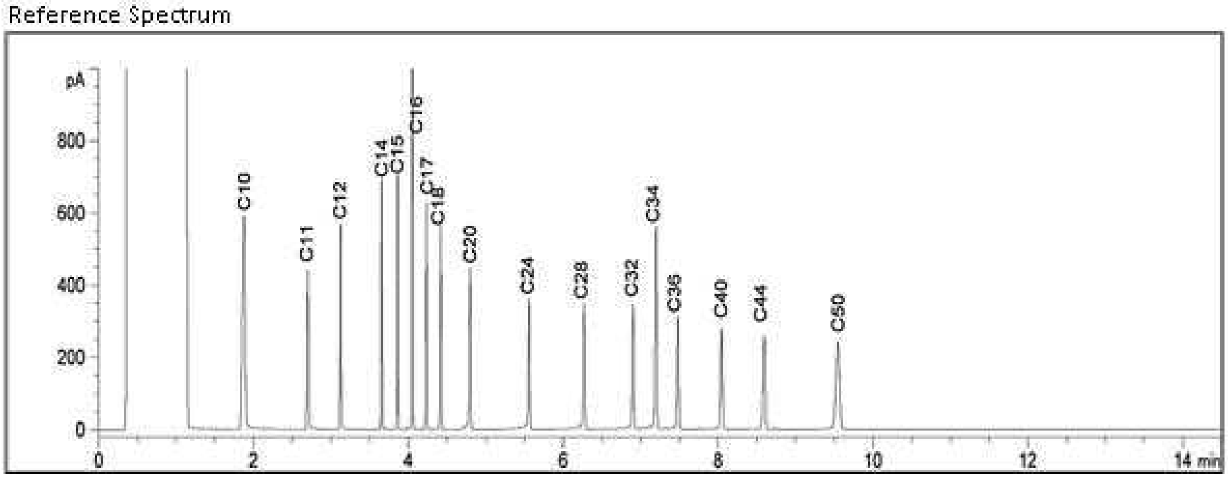
Maxxam Job #: B956082
Report Date: 2019/03/08
Maxxam Sample: JCP936

Terrapex Environmental Ltd
Client Project #: CT2817.00
Project name: 1294 KINGSTON RD, PICKERING
Client ID: MW10

Petroleum Hydrocarbons F2-F4 in Water Chromatogram



Reference Spectrum



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline: **C6 - C12**	Diesel: **C10 - C24**	Jet Fuels: **C6 - C16**
Varsol: **C8 - C12**	Fuel Oils: **C6 - C32**	Creosote: **C10 - C26**
Kerosene: **C8 - C16**	Motor Oils: **C16 - C50**	Asphalt: **C18 - C50+**

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

APPENDIX VI

QUALIFICATIONS OF THE ASSESSORS

CHAORAN LI, P.Geo.

Area of Expertise:	Phase I and Phase II ESAs, Remediation		
Proposed Position:	Project Manager		
Education:	BSc. (Hon.) Environmental Chemistry MEnvSc. Environmental Science	2010 In progress	University of Toronto University of Toronto
Professional Associations:	Association of Professional Geoscientists of Ontario (APGO)		
Safety Training:	Standard First Aid and CPR Petroleum Oriented Safety Training (POST) Workplace Hazardous Materials Information System (WHMIS)		

Experience:		
	Terrapex Environmental Ltd.	2018 to present
	Sirati and Partners Consultants Ltd.	2017 to 2018
	Soil Engineers Ltd.	2014 to 2017
	Vertex Environmental Inc.	2011 to 2014

Mr. Li is a licensed professional geoscientist (P.Geo.) at Terrapex Environmental with over seven years of experience in the environmental industry. Mr. Li is a Project manager, coordinating and supervising site assessment and remediation projects for commercial, industrial, government and petroleum clients. Mr. Li has experience managing and conducting Phase I/One Environmental Site Assessments (ESAs) including historical research, site inspection, report preparation, and Phase II/Two ESAs including borehole drilling, soil logging, well installation, topographical surveys, materials and supplies sourcing, test pit excavation, contaminated soil remedial excavation, collecting of various media samples (soil, groundwater, surface water) in accordance with Provincial protocols, and report preparation.

Representative projects include the following:

Various Ontario Realty Corporation: Completion of Phase I/One ESAs and Phase II/Two ESAs and monitoring programs at various development sites in Ontario, including commercial, residential and vacant lots.

Regional Municipality: Managed a municipality project including Phase One Environmental Site Assessments including historical background search, soil logging and sampling, installation of monitoring wells, groundwater quality assessment, groundwater quality assessments and surveying.

Federal Government: Conducted high-resolution delineation screening program as part of the extensive assessment of a former airfield in Newfoundland and Labrador, where the site were found to be impacted with petroleum hydrocarbons, possibly from historical oiling practices.

Petroleum Company: Conducted high-resolution delineation screening program by using membrane interface probe system as part of the assessment at a site in the chemical valley of Sarnia, Ontario.

Various Clients: Supervision of decommissioning of underground storage tanks, removal of facilities and removal of contaminated soil, at numerous private residential and commercial properties.

Industrial Clients: Coordinated a brownfield in-situ remediation program a site in southwestern Ontario, which has TCE impacts affected both the overburden and the fractured bedrock layers. Implemented chemical oxidant injection as well as down-gradient hydraulic monitoring.

Various Clients: Managed direct removal of hazardous materials from sites, supervised confirmatory sampling events and prepared summary reports including events descriptions, technical drawings, plans, and cross-section.

Industrial Clients: Experienced with construction, optimization, and operation of water, soil vapor, and multiphase extraction systems for various contaminated industrial site. Supervised and implemented groundwater and soil sampling programs for remediation design purposes.

STEVEN RUMINSKY, P.Eng., P.Geo., QP_{ESA}, QP_{RA}

Education:	B.E.S. Environmental Studies	1983	University of Waterloo
	B.A.Sc. Geological Engineering (Management Sciences Option)	1987	University of Waterloo

Courses Completed:
Standard First Aid and CPR
Petroleum Oriented Safety Training (POST)
Workplace Hazardous Materials Information System (WHMIS)
Basic Safety Orientation (BSO) Sarnia-Lambton Industrial Educational Cooperative (IEC)

Professional Associations:
Licensed Professional Engineer, Association of Professional Engineers of Ontario
Licensed Professional Geoscientist, Association of Professional Geoscientists of Ontario

Mr. Ruminsky is the Toronto Branch Manager and Senior Project Manager at Terrapex Environmental Ltd. He is qualified as a QP_{ESA} and QP_{RA} under the MOE's Regulation 153/04. Prior to joining Terrapex, he was General Manager, Hydrogeology at Decommissioning Consulting Services Limited (DCS) and has spent one year at Trow Associates Inc. He has 25 years of experience in the management and assessment of contaminated sites, waste disposal sites and mine sites. Prior to consulting in the environmental field, he worked eight years with the Ontario Ministry of the Environment (MOE) where he was a waste management hydrogeologist, an Area Supervisor, and was a member of the inaugural Audit Team for audits of Records of Site Condition.

He has worked internationally in the Caribbean (Guyana, Belize, St. Kitts and Nevis), Chile, India, the Middle East (West Bank and Oman) and the United States, and has conducted studies in Mexico and Montserrat.

Mr. Ruminsky has overseen numerous Phase One and Phase Two Environmental Site Assessments (ESAs), site remediation programs, risk assessment (RA) projects and hydrogeologic investigations. Since 2008, he has been a member of a vendor of record (VOR) team retained by the MOE to review risk assessments submitted in accordance with Ontario Regulation 153/04. He has filed 45 Records of Site Condition (RSCs) to date.

Representative projects include the following:

Prepared permit to take water (PTTW) application and Hydrogeologic Study to Support Category 3 PTTW for construction dewatering at Build Toronto's 411 Victoria Park Avenue site.

Technical leader (QP_{RA}) for completion of a risk assessment for the conversion of the former Algoma Street Incinerator (City of Toronto) to parkland land use. Also managed supplemental Phase 2 site characterization studies for the project.

Prepared hydrogeological assessment and pre- and post-development water balance assessment of Mount Albert Pit fill site.

Completed wellhead Protection Area study and Risk Management Plan for site plan approval of a works yard in King Township (Schomberg). Work done in accordance with South Georgian Bay Lake Simcoe Source Protection Plan.

Prepared hydrogeologic assessments and obtained Category 3 Permits To Take Water (PTTWs) from Ministry of the Environment and Climate Change for remedial groundwater extraction programs at two former retail petroleum facilities.

Investigation of groundwater contamination in bedrock originating from the former Aerospace Maintenance and Development Unit (AMDU) landfill adjacent to Canadian Forces Base Trenton in Ontario

Soil, groundwater and remedial options evaluation of former Port Hope Coal Gasification Plant, Port Hope, Ontario.

Project manager for the hydrogeologic investigation of a former gasoline spill, Dies Property, Mohawks of Bay of Quinte (MBQ), near Shannonville, Ontario. Liaison with MBQ Band representatives, Department of Indian and Northern Affairs and Public Works and Government Services Canada staff.

Project Manager for investigation of petroleum hydrocarbon contamination in groundwater, Langton Ontario. Project was undertaken for the Ontario Ministry of the Environment. Contaminant distribution and remedial alternatives costing was prepared.

Oversaw the preparation of annual groundwater monitoring reports for Inmet's Winston Lake minesite (Schrieber, Ontario) from 2004 through 2013.

Undertook the groundwater characterization of Inmet's Sturgeon Lake mine (Ignace, Ontario) and assisted the design team in preparing the tailings seep remediation plans for submission to the Ministry of the Environment.

Prepared the hydrogeological assessment and hydrogeological monitoring program for Algoma Steel's MacLeod Mine Closure Plan, and responded to Ontario Ministry of Northern Development and Mines' comments on the plan.

Supervised the hydrogeologic modeling for the Princess Mine closure plan in Sydney Mines, Nova Scotia.

Project manager and senior reviewer for screening level review (SLR) reports prepared for approximately 100 properties in the proposed Rouge National Urban Park (Markham-Pickering-Toronto Ontario).

Lead reviewer for historic review of approximately 100 retail petroleum and bulk petroleum facilities as part of a due diligence assessment. Project manager for Phase II investigation of six of the retail facilities.

Oversight of remediation of former Dow Chemical lands in Sarnia, Ontario on behalf of the purchaser (TransAlta Corporation). Management of semi-annual groundwater monitoring and reporting program.

Phase Two environmental site assessment and site remediation activities at a former resort hotel (commercial land use) for redevelopment as recreational waterfront lots (residential land use).

Review of existing information for the Port Hope Small Scale Sites component of the Port Hope Area Initiative (PHAI). Files for 549 sites were reviewed; historical summaries were prepared and individual workplans were developed including borehole location plans, soil sampling plans and radiation survey recommendations.

Preparation of site characterization studies (QP_{ESA}) for the risk assessment for redevelopment of Block 40 of the former Dow Chemical Plant in Sarnia as part of TransAlta's Bluewater Energy Park.

Preparation of investigation program and conceptual remediation plan for Katedan Industrial District, Hyderabad, India.

Preparation of remedial options analysis and costing for chromium hazardous waste remediation, Hoogli District, West Bengal, India.