



Soil Engineers Ltd.

CONSULTING ENGINEERS

GEOTECHNICAL • ENVIRONMENTAL • HYDROGEOLOGICAL • BUILDING SCIENCE

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**A REPORT TO
GREEN GINGER DEVELOPMENTS INC.**

PHASE II ENVIRONMENTAL SITE ASSESSMENT

PROPOSED RESIDENTIAL DEVELOPMENT

**271 DUNDAS STREET EAST
TOWN OF OAKVILLE**

Reference No. 1007-E120

June 17, 2011

DISTRIBUTION

3 Copies - Green Ginger Developments Inc.
1 Copy - Soil Engineers Ltd. (Mississauga)



EXECUTIVE SUMMARY

Soil Engineers Ltd. was retained to conduct a Phase II Environmental Site Assessment (ESA) at 271 Dundas Street East in the Town of Oakville.

The purpose of the investigation was to determine the level and extent of the exceedance for Electrical Conductivity in the soil.

The field work was performed at selected locations on the subject site; soil samples were collected and submitted for chemical analyses in accordance with the "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act" (EPA), March 9, 2004.

A review of the results of the analyses for the soil samples indicates that the tested parameters are either below the reportable detection limit or fall within the Table 1, full depth background site condition standards for *All Property Usage other than agricultural*.

Based on our Phases I and II ESAs, we consider there to be low potential for liability attendant to the subject site; the subject site is considered suitable for the proposed residential development, and no further environmental investigation is recommended at this time.



TABLE OF CONTENTS

1.0	INTRODUCTION.....	1
2.0	SCOPE OF WORK.....	3
3.0	TESTING PROGRAMME	4
4.0	FIELD WORK	6
5.0	CHEMICAL ANALYSES AND RESULTS	7
6.0	DISCUSSION AND RECOMMENDATIONS.....	9
7.0	QUALIFICATIONS	11

TABLES

Table 1 - Rationale for Sampling Locations	4
Table 2 - Sample Testing Program.....	8
Table 3 - QA/QC Testing Programme	9

ENCLOSURES

Site Location Plan	Drawing No. 1
Test Pit Location Plan	Drawing No. 2
Borehole Location Plan and Subsurface Profile (Soil Report Reference No. 0008-S099, dated October 2000)	Appendix 'A'
Sampling Location Plan (Letter Report Reference No. 1007-E120, dated November 23, 2010).....	Appendix 'B'
Certificates of Analyses	Appendix 'C'



1.0 INTRODUCTION

Site Location

The subject property, as shown on the Site Location Plan, Drawing No. 1, is located at the northwest quadrant of Dundas Street East (Highway 5) and Trafalgar Road (formerly Seventh Line), in the Town of Oakville.

Site Background

Soil Engineers Ltd. (formerly Soil-Eng Limited) completed a Phase I Environmental Site Assessment (ESA) at the subject site (Report dated December 8, 2010). The purpose of the study was to identify any potential environmental liability associated with the subject site. Throughout the years, the subject lands were mainly used for agricultural and residential purposes. The neighboring properties consist mainly of farmland with associated farmhouses to the north, west and east, across Trafalgar Road. A decommissioned transformer station (now a communication tower) was located in the northeast sector of the site, near Trafalgar Road. A smaller, separate residential property juts into the subject site at the southeast corner (257 Dundas Street East). An animal hospital, a church, four residences and a gas station were situated at the northwest corner of Dundas Street East and Trafalgar Road. A commercial development was located to the south across Dundas Street East.

The Phase I ESA included the review of our geotechnical investigation report (Soil-Eng Limited Report Reference No. 0008-S099, dated October 2000) and the results of chemical analyses of soil samples (Letter Report Reference No. 1007-E120, dated November 23, 2010).



The geotechnical investigation, consisting of 15 boreholes to depths of 4.6 m and 5.0 m, disclosed that beneath a layer of topsoil, the site is generally underlain by a stratum of silty clay till bedding onto shale bedrock. A surficial layer of earth fill was found at one borehole (BH4) located near the former house in the southeast sector of the site. The composition of the earth fill was described as being generally similar to that of the underlying native soils occurring in the area. The locations of the boreholes and detailed descriptions of the conditions were given in the previously mentioned soil report, and a copy of the Borehole Location and Subsurface Profile from the report is included in Appendix 'A'.

As mentioned, in order to verify the environmental quality of the fill, one representative sample was submitted to AGAT Laboratories for analyses for general metals and inorganics (Letter Report dated November 23, 2010). The results indicated an Electrical Conductivity (EC) level of 2.13 mS/cm, exceeding the Table 1, full depth background site condition standards for non-agricultural property use under the Environmental Protection Act (EPA), with the guideline value being 0.57 mS/cm. The Sampling Location Plan is included in Appendix 'B'.

The Phase I ESA report concluded that the impacted fill material should be delineated and removed from site.

Accordingly, a Phase II ESA was conducted to determine the level and the extent of EC-impacted soil, and our findings and assessment are presented herein. The study was conducted in general conformance with the CSA Standard Z769-00.



2.0 SCOPE OF WORK

Soil Engineers Ltd. in conjunction with the property owner developed the following scope of work:

1. Seven (7) hand-dug test pits to a depth of 0.5 m.
2. Chemical analyses of twenty soil samples, including QA/QC samples, in accordance with "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act" (EPA), March 9, 2004.
3. Preparation of this report containing field and laboratory data and our assessment and recommendations



3.0 TESTING PROGRAMME

The investigation consisted of hand-digging seven test pits and retrieving soil samples for chemical analyses from selected locations on the site based on the findings of our Phase I ESA. In addition, due to the unusually high amounts of precipitation experienced this spring, we re-sampled the area around the initial exceedance to verify whether the concern was justified.

The rationale behind the selection of the test pit locations is detailed in Table 1.

Table 1 - Rationale for Sampling Locations

Test Pit No.	Location	Rationale	Test Conducted
1	Near Borehole 4, northeast corner of site, where high EC* level was detected in earth fill	To determine the level and extent of EC* impact on soil	EC and SAR**
2	Within 5 m radius of Test Pit 1		
3			
4			
5			
6			
7			
8			

* Electrical Conductivity

** Sodium Adsorption Ratio

Representative soil samples retrieved from the test pits were chemically analyzed in accordance with the current guideline criteria as set out in the "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act" (EPA), March 9, 2004.



Rationale for Selected Site Condition Standards

The wooded areas in the north and mid-portions of the site, as well as the areas along Morrison Creek which traverses the site from the northwest section to the southeast corner, are designated Environmentally Sensitive Areas (ESAs) according to Town of Oakville's Map. Therefore, the soil analyses results were compared with the Table 1, full depth background site condition standards for All Other (Non-Agricultural) Types of Property Usage.



4.0 **FIELD WORK**

The field work, consisting of seven test pits to depths ranging from 0.2 to 0.6 m, was conducted on May 30, 2011. The locations are shown on the Test Pit Location Plan, Drawing No. 2.

The test pits were hand dug and chunk samples were retrieved for visual and olfactory observations. Each discrete sample was handled using new disposable nitrile gloves in order to avoid the risk of cross-contamination between the samples. Each sample was split, with part of the sample sealed in a laboratory prepared glass jar and stored in a cooler for delivery to the laboratory and the remaining part of the sample sealed in a Ziploc® bag for soil classification. The field work was recorded by environmental engineering personnel.

Based on visual and olfactory observations, representative soil samples were selected and sent to an MOE-accredited laboratory, recognized for testing under O. Reg. 153/04, for analyses in accordance with the "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act" (EPA), dated March 2004.



5.0 CHEMICAL ANALYSES AND RESULTS

Based on visual and olfactory observations, representative soil samples from each test pit were submitted to AGAT Laboratories for analyses for SAR and EC determination.

A summary of the soil testing programme is given in Table 2:

Table 2 - Sample Testing Program

TP No.	Sample ID	Lab ID	Depth (m)	Material	Test Conducted
1	SA 1	2443153	0.2-0.3	Silty Clay Fill	EC and SAR
2	SA 2	2443155	0.2-0.3		
3	SA 3	2443156	0.2-0.4		
4	SA 4	2443157	0.2-0.4		
5	SA 5	2443158	0.0-0.3		
6	SA 6	2443159	0.0-0.3		
7	SA 7	2443161	0.3 -0.5		

A review of the results of the analyses indicates that the concentrations of the tested parameters lie below the laboratory detection limits and/or within the Table 1, full depth background site condition standards for all other (non-agricultural) types of property usage under Part XV.1 of the EPA.

The Certificates of Analyses for the soil samples are included for your reference in Appendix. 'C'.

**QA/QC Rationale**

A field duplicate for a selected soil sample was submitted to AGAT for analyses for EC and SAR parameters in accordance with Part XV.1 of the EPA.

A summary of the QA/QC soil testing programme is given in Table 3.

Table 3 - QA/QC Testing Programme

TP No.	Sample ID	Lab ID	Depth (m)	Material	Test Conducted
1	Duplicate 1	2443160	0.2-0.3	Silty Clay Fill	EC and SAR

The results for the duplicate soil sample are presented in Appendix 'C'.

A review of the results of the analyses for the QA/QC soil sample shows that the tested parameters yielded similar results to the test samples.



6.0 DISCUSSION AND RECOMMENDATIONS

Soil Engineers Ltd. conducted a Phase I ESA at 271 Dundas Street East, in the Town of Oakville. The Phase I ESA revealed that earth fill is present on the site having Electrical Conductivity levels exceeding the Table 1 soil quality (coarse-textured soils) for all non-agricultural property use under Part XV.1 for the EPA. The measured value was 2.13 mS/cm, with the guideline value being 0.57 mS/cm. The remainder of the tested parameters were found to meet the Table 1 Soil criteria. It was recommended that the impacted fill material be delineated and removed from the site.

Accordingly, a Phase II ESA was conducted to determine the level and extent of the EC exceedance for the soil. On May 30, 2011, seven test pits were hand-dug to a maximum depth of 0.6 m at the area of earth fill in the northeast section of the site. Soil samples were retrieved for chemical analyses for EC and SAR determination.

A review of the results of the analyses indicates that the concentrations of the tested parameters lie below the laboratory detection limits and/or within the Table 1, full depth background site condition standards for all other types of property usage under Part XV.1 of the EPA.

It appears that the EC levels have attenuated over time.

Based on our Phases I and II ESAs, we consider there to be a low potential for liability associated with the subject site and we find the site suitable for the proposed residential development.



7.0 QUALIFICATIONS

Soil Engineers Ltd., formerly known as Soil-Eng Limited (founded in 1976), offers to its clients a range of specialized engineering services. Our company is staffed with both engineers and scientists who draw upon their combined experience to provide a team approach to problem solving, and who are trained to understand the Ontario Ministry of the Environment regulations. We play an integral role in the development of industrial, commercial, institutional and residential subdivisions, complexes, structures, and their related infrastructures, by providing our clients with the needed expertise for their projects.

The review of records and the site visit for this assessment and site remediation were conducted by Mr. Arif Chowdhury. He has a Bachelor's Degree in Environmental Engineering from Carleton University. He has been trained to conduct Phase I and Phase II ESAs, and site remediation, in accordance with the CSA Standard.

Mr. Ian Chiu is the Vice-President of Soil Engineers Ltd. He has a Bachelor's Degree in Applied Science (Civil) from the University of Toronto and is licensed to practice in Ontario (PEO Licence No. 8113706). He has 25 years of experience on various building and engineering projects in Ontario. He supervises the Environmental Services Section, has a comprehensive understanding of its projects, and is responsible for over 500 Phase I and Phase II reports with over 250 Records of Site Condition acknowledged by the MOE.



One must understand that the mandate of Soil Engineers Ltd. is to collect a finite number of soil samples and submit selected samples to chemically characterize the contaminants in the subject site for a Phase II ESA only. No other warranty or representation, expressed or implied, as to the accuracy of the information is included or intended by this assessment.

One must be aware that the subsurface conditions may vary between test pit locations.

Any deleterious debris found on the surface or buried on site must be removed and disposed of properly. It should be noted that the information supplied in this report may not be sufficient to obtain approval for the disposal of any excess soil or materials generated during future construction, and supplementary chemical testing of soil samples may be necessary to obtain such approval.

Should any further adverse environmental conditions become apparent in the future, we request immediate notification in order to provide further assessment and recommendations.



This report was prepared by Soil Engineers Ltd. for the account of Geen Ginger Developments Inc., and for review by their financial institutions and government agencies, and can be used for development approval purposes by the Town of Oakville and their peer reviewer who may rely on the results of the report. The material in it reflects the judgement of Arif Chowdhury, B.Eng., and Ian Chiu, P.Eng., in light of the information available to it at the time of preparation. Any use which a Third Party makes of this report, or any reliance on decisions to be made based on it, are the responsibility of such Third Parties. Soil Engineers Ltd. accepts no responsibility for damages, if any, suffered by any Third Party as a result of decisions made or actions based on this report.

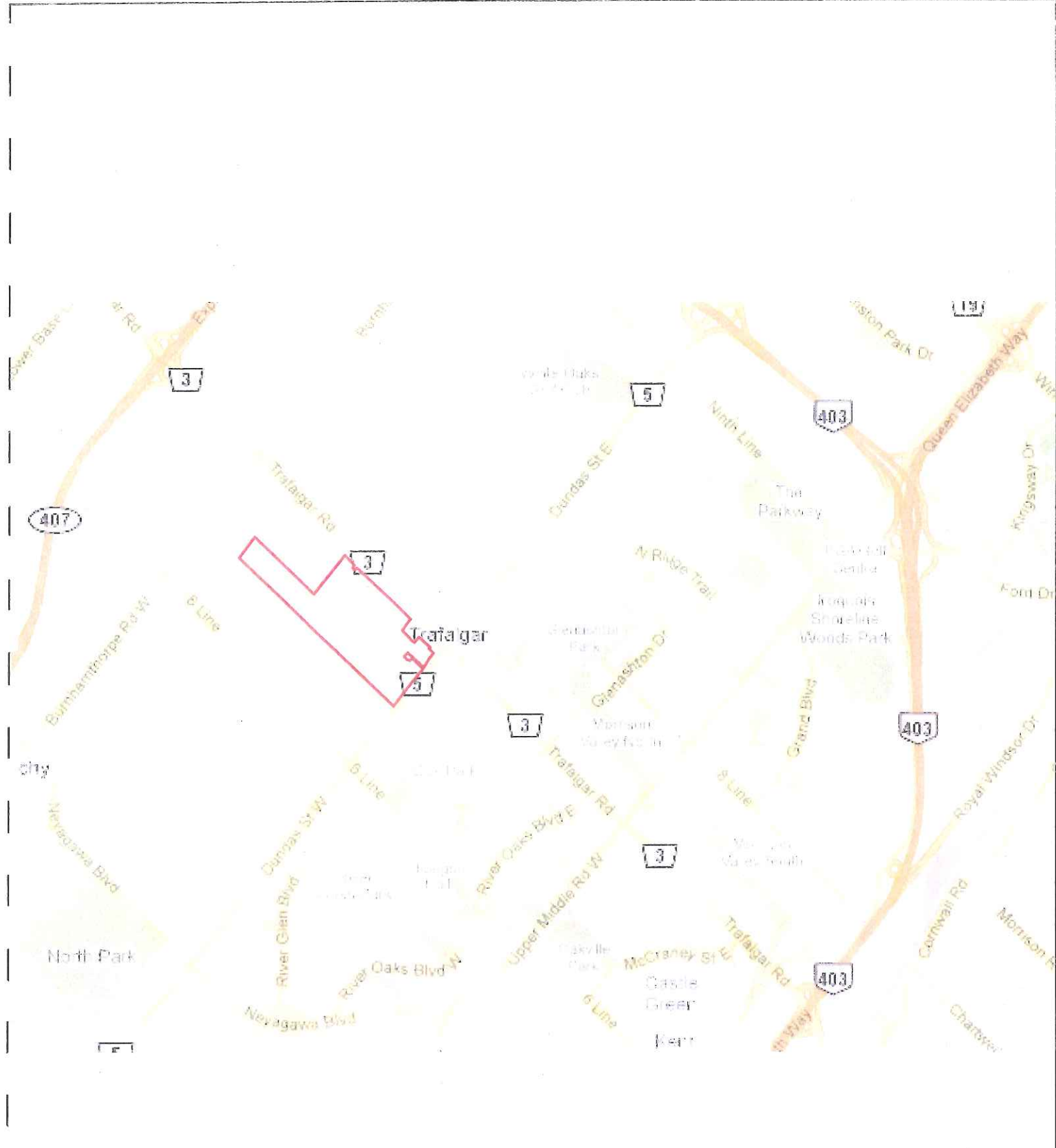
SOIL ENGINEERS LTD.

Arif Chowdhury, P.Eng.

Ian Chiu, P.Eng.

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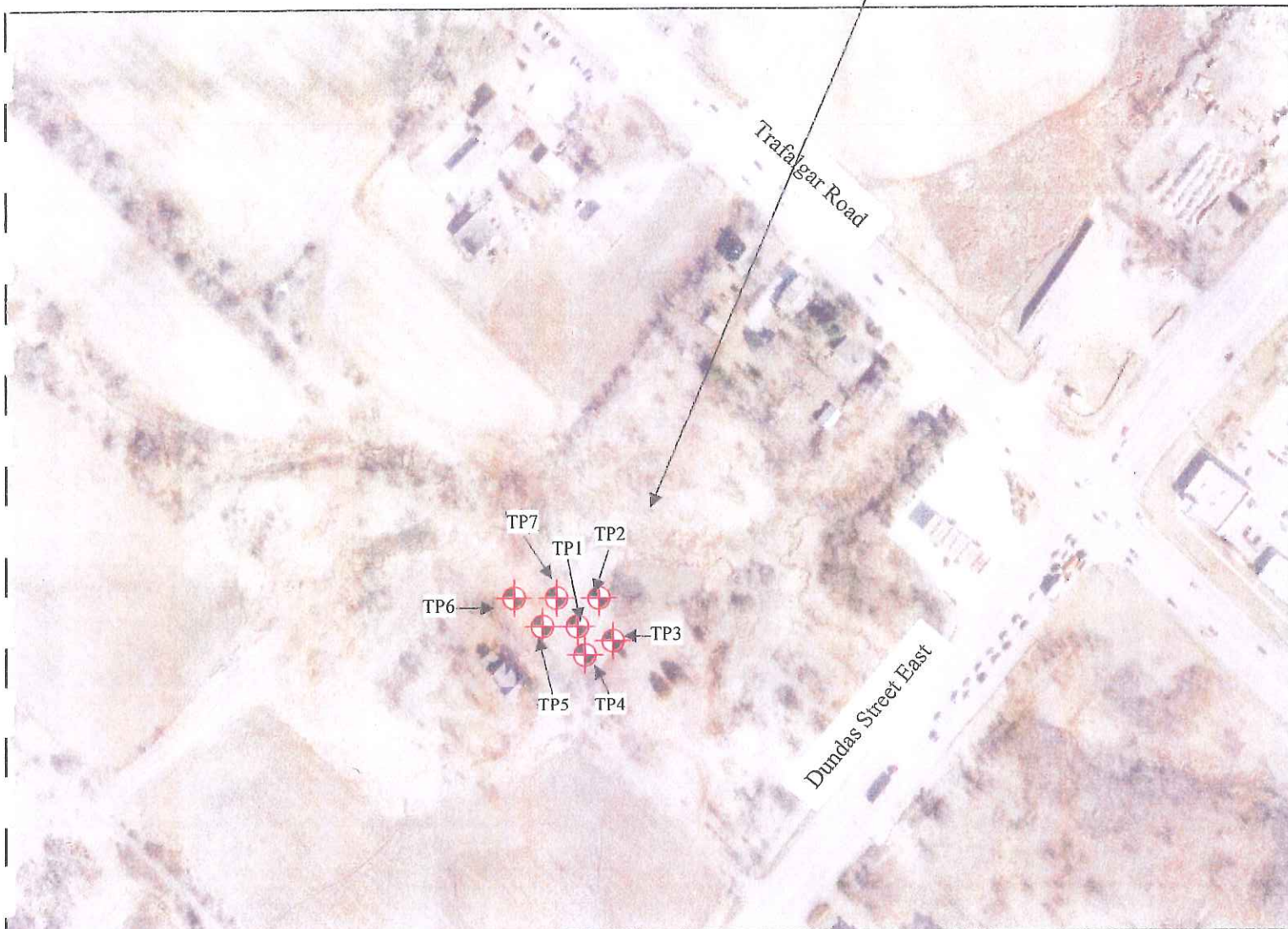
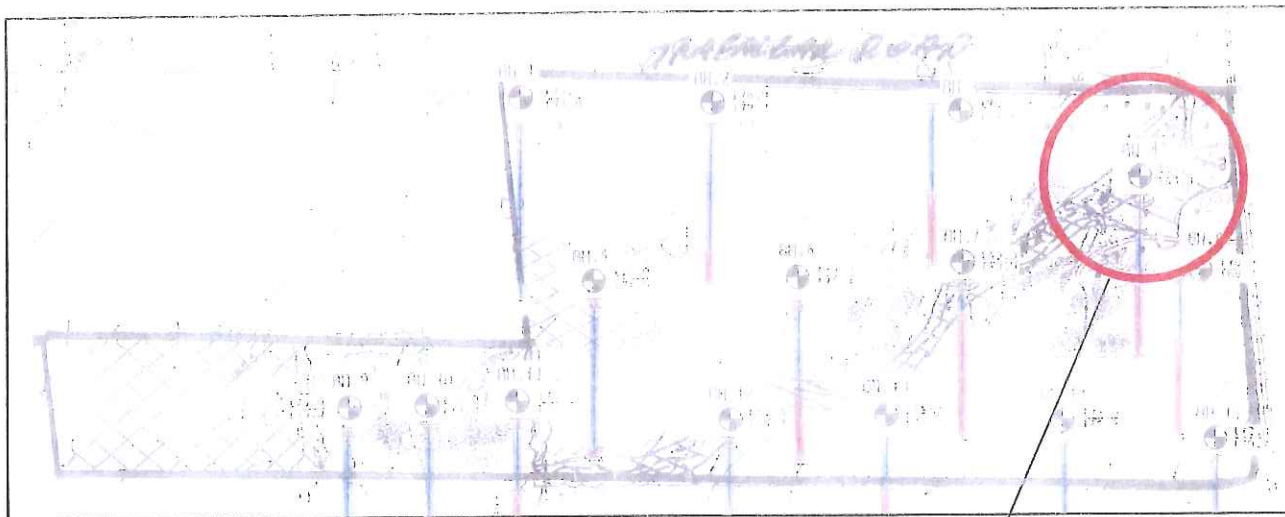


Approximate Site Location

Project North

Source: Google Map
© 2010 Google Map


 Soil Engineers Ltd.	Title Site Location Plan	Project Proposed Residential Development 271 Dundas Street East Town of Oakville	Reference No. 1007-E120	Date June 7, 2011	Scale NTS	Drawing No. 1
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Approximate Sampling Location



Project North

	Title	Project	Reference No.	Date	Scale	Drawing No.
 Soil Engineers Ltd.	Test Pit Location Plan Sampling Date: May 30, 2011	Proposed Residential Development 271 Dundas Street East Town of Oakville	1007-E120	June 7, 2011	NTS	2



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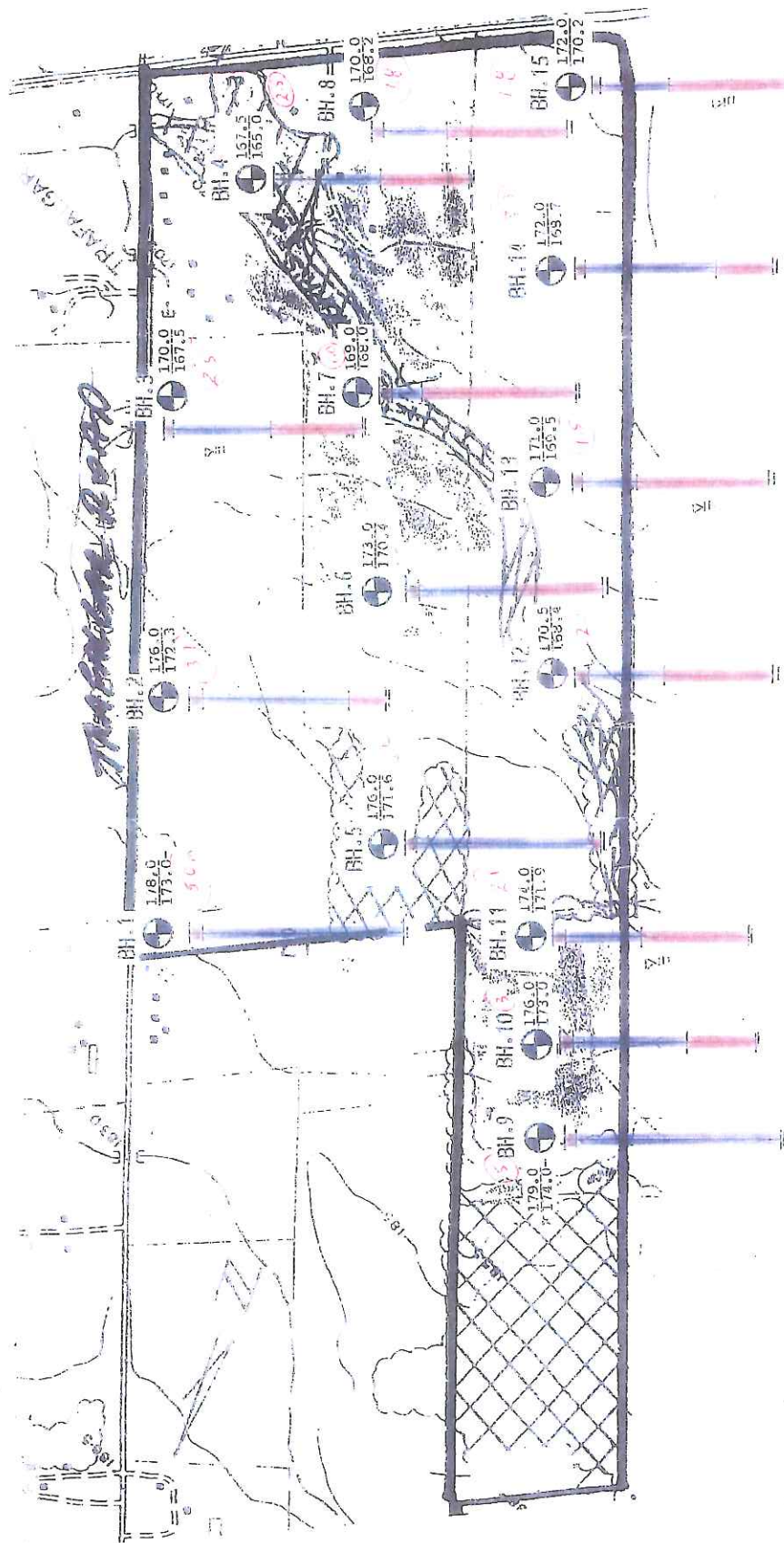
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APPENDIX 'A'

BOREHOLE LOCATION PLAN AND SUBSURFACE PROFILE (SOIL REPORT REFERENCE NO. 0008-S099, DATED OCTOBER 2000)

REFERENCE NO. 1007-E120



BOREHOLE LOCATION PLAN AND SUBSURFACE PROFILE

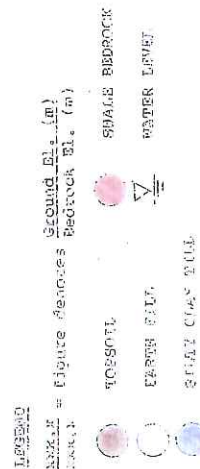
Ref No. 0009-Seg

Date October 2000

Drawing No 1

Scale 1:5000

SOIL-BAG LIMITED





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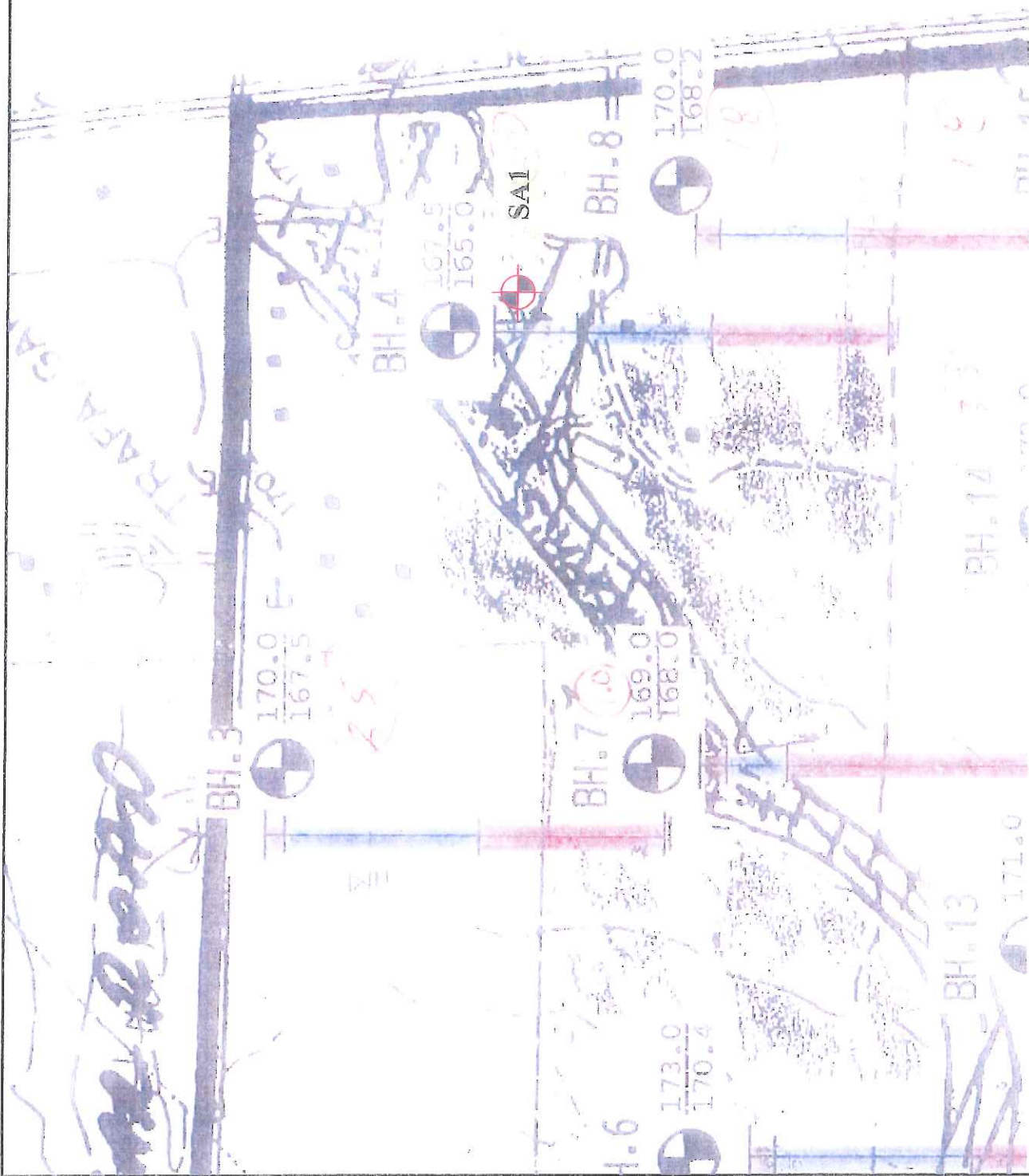
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APPENDIX 'B'

SAMPLING LOCATION PLAN

LETTER REPORT REFERENCE NO. 1007-E120, DATED NOVEMBER 23, 2010

REFERENCE NO. 1007-E120



Soil Engineers Ltd.

Title	Sampling Location Plan
Project	Proposed Residential Development 271 Dundas Street East Town of Oakville
Reference No.	1007-E120
Date	November 22, 2010
Scale	NTS
Drawing No.	1



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APPENDIX 'C'

CERTIFICATES OF ANALYSES

REFERENCE NO. 1007-E120

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http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 11T497877

PROJECT NO: 1007-E120

ATTENTION TO: Arif Chowdhury

CLIENT NAME: SOIL ENGINEERS LIMITED

EC & SAR in Soil - Table 1

DATE SAMPLED: Jun 01, 2011	DATE RECEIVED: Jun 01, 2011			DATE REPORTED: Jun 02, 2011			SAMPLE TYPE: Soil				
Parameter	Unit	G / S	RDL	SA1	SA2	SA3	SA4	SA5	SA6	Duplicate 1	SA7
Electrical Conductivity (2:1)	mS/cm	0.57	0.002	0.140	0.453	0.389	0.194	0.188	0.304	0.202	0.201
Sodium Adsorption Ratio (2:1)	N/A	2.4	N/A	0.063	0.089	0.157	0.078	0.124	0.615	0.080	0.188

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard; Refers to T1(All)
2443153-2443161 EC & SAR determined on the extract obtained from the 2:1 leaching procedure (2 parts DI water:1 part soil).

Certified By:

Elizabeth Polakowska