

**PHASE II ENVIRONMENTAL
SITE ASSESSMENT REPORT
EXISTING VACANT PROPERTY
CROFT STREET,
PORT HOPE, ONTARIO
PROJECT NO. G022881E1**

Prepared for:

Roseglen Village For Seniors Inc.
53 Wellington Street
Port Hope, ON
L1A 2M5

GEO-LOGIC INC.

**Geotechnical Engineers
And Hydrogeologists**

**347 Pido Road
Unit 29
Peterborough, Ontario
K9J 6X7**

www.geologic.ca

APRIL 2010

TABLE OF CONTENTS

1.0	EXECUTIVE SUMMARY	2
2.0	INTRODUCTION	2
2.1	SITE DESCRIPTION	2
2.2	PROPERTY OWNERSHIP	2
2.3	CURRENT AND PROPOSED FUTURE USES	3
2.4	APPLICABLE SITE CONDITION STANDARD	3
3.0	BACKGROUND INFORMATION	3
3.1	PHYSICAL SETTING	3
3.2	PAST INVESTIGATIONS	4
4.0	SCOPE OF THE INVESTIGATION	4
4.1	OVERVIEW OF SITE INVESTIGATION	4
4.2	MEDIA INVESTIGATED	5
4.3	PHASE ONE CONCEPTUAL SITE MODEL	6
4.4	DEVIATIONS FROM SAMPLING AND ANALYSIS PLAN	6
4.5	IMPEDIMENTS	6
5.0	INVESTIGATION METHOD	7
5.1	GENERAL	7
5.2	DRILLING AND EXCAVATING	7
5.3	SOIL SAMPLING	7
5.4	FIELD SCREENING MEASUREMENTS	8
5.5	GROUNDWATER: MONITORING WELL INSTALLATION	8
5.6	GROUNDWATER: FIELD MEASUREMENT OF WATER QUALITY PARAMETERS	8
5.7	GROUNDWATER: SAMPLING	9
5.8	SEDIMENT: SAMPLING	9
5.9	ANALYTICAL TESTING	9
5.10	RESIDUE MANAGEMENT PROCEDURES	9
5.11	ELEVATION SURVEYING	10
5.12	QUALITY ASSURANCE AND QUALITY CONTROL MEASURES	10
6.0	REVIEW AND EVALUATION	10
6.1	GEOLOGY	10
6.2	GROUNDWATER: ELEVATIONS AND FLOW DIRECTION	11
6.3	GROUNDWATER: HYDRAULIC GRADIENTS	12
6.4	FINE-MEDIUM SOIL TEXTURE	12
6.5	SOIL: FIELD SCREENING	12
6.6	SOIL QUALITY	12
6.7	GROUNDWATER QUALITY	14
6.8	SEDIMENT QUALITY	15
6.9	QUALITY ASSURANCE AND QUALITY CONTROL RESULTS	15
6.10	PHASE TWO CONCEPTUAL SITE MODEL	16
7.0	CONCLUSIONS	16
7.1	SIGNATURES	16
8.0	REFERENCES	18

TABLES

Table 1: Summary of Groundwater Levels.....	11
Table 2: Summary of Metals Testing in Soil.....	13
Table 3: Summary of PHC and VOC Testing in Soil.....	14
Table 4: Summary of VOCs and PHC Results in Groundwater.....	15

ENCLOSURES

	<u>Plate No.</u>
VICINITY PLAN	1
SITE PLAN	2
PLOT PLAN	3

APPENDICES*

APPENDIX E:	SAMPLING AND ANALYSIS PLAN
APPENDIX F:	SOILS EXPLORATION DATA
APPENDIX G:	CERTIFICATES OF CHEMICAL ANALYSIS

***Note:** Appendix lettering continues in sequence from the Phase I ESA.

PHASE II ENVIRONMENTAL SITE ASSESSMENT REPORT
EXISTING VACANT PROPERTY
CROFT STREET
PORT HOPE, ONTARIO
PROJECT NO. G022881E1

1.0 EXECUTIVE SUMMARY

Based on the results of a Phase I Environmental Site Assessment (ESA) a Phase II ESA was conducted by Geo-Logic for the vacant property located adjacent to 53 Wellington Street in Port Hope, Ontario known as Vacant Land, Croft Street. The property is currently part of 53 Wellington Street and is to be severed. The Property is located within, along with surrounding properties, a municipally serviced area for water and sewer. The property at 53 Wellington Street was first developed in the 1960's as the Port Hope Hospital, it is currently used as the Roseglen Village for Seniors.

The Phase I ESA identified potential environmental concerns in relation to current and historical surrounding land usage. The Phase II ESA investigation included the excavation of nine (9) test holes across the property. From the test holes, soil and groundwater were investigated. The soil and groundwater quality based upon Geo-Logic's testing program met the current MOE Standards.

It is Geo-Logic's opinion that based upon current MOE Standards, the Property is suitable for its currently zoned usage from an environmental perspective.

2.0 INTRODUCTION

2.1 SITE DESCRIPTION

This report presents the results of a Phase II Environmental Site Assessment (ESA) that was completed for an existing vacant site (herein referred to as “the Property”) situated in the Town of Port Hope, Northumberland County. The assessment was conducted to evaluate the environmental concerns of the Property at the request of Mr. Paul Montgomery of Roseglen Village For Seniors Inc., representing the owner of the Property. The work was conducted in accordance with our proposal dated March 12, 2010 (Appendix A).

The Property is located on the east side of the Roseglen Village for Seniors on Wellington Street and is currently vacant. The Property encompasses approximately seventeen (17) acres, the property is divided by an unopened road allowance for Croft Street that currently contains a paved walking trail. The general location of the Property is illustrated on the Vicinity Plan, Plate 1. The location of the Property with respect to surrounding roads and watercourses is illustrated on the Property Plan, Plate 2. Specific details of the Property including test pit locations are illustrated on the Plot Plan, Plate 3. The plans can be reviewed within the Enclosures following the report.

2.2 PROPERTY OWNERSHIP

The Property is owned by the Roseglen Village For Seniors Inc. who has owned the Property since 2002.

2.3 CURRENT AND PROPOSED FUTURE USES

The current use of the Property is undeveloped. The proposed future use of the Property is reportedly residential.

2.4 APPLICABLE SITE CONDITION STANDARD

The applicable site condition standard for this Property falls under the Ministry of the Environment (MOE) Table 2 Full Depth Generic Site Condition Standards in a Potable Groundwater Condition (residential/parkland/institutional property use) (MOE, March 9, 2004, “Soil, Groundwater and Sediment Standards for use Under Part XV.1 of the *Environmental Protection Act*”). This standard is applicable, as although the Property is serviced municipally for water and sewage, as are the surrounding properties, no acceptance of non-potable standards usage from the lower and upper tier municipalities has been requested for this Property. The soils will be compared to the fine to medium grained standards since the predominant soil type across the Property is a relatively fine grained till material.

3.0 BACKGROUND INFORMATION

3.1 PHYSICAL SETTING

The site is situated in the physiographic region known as the Iroquois Plain (Chapman and Putnam, 1984). This region is the area along Lake Ontario that was inundated by glacial Lake Iroquois during late Wisconsinian glaciation. Granular and glacial till soils make up the majority of the on-site overburden. Drumlinized hills occur sporadically throughout the surrounding landscape to the north. The underlying bedrock is normally limestone belonging to the Lindsay Formation. The bedrock is part of the Trenton-Black River Group and is of Middle Ordovician age.

The majority of the Property is grassed with a small wooded area on the south. Overland flow to shallow ditches along the paved walking trail is the primary method of conveying surface water from the Property. The nearest water bodies are the Ganaraska River approximately 1.5km to the west and Lake Ontario located about 4km to the south. There are no areas of natural significance were observed within 30 m of the Property.

3.2 PAST INVESTIGATIONS

A previous investigation was completed at 53 Wellington Street, the investigation was completed on the original property area, not on the property included in this report. The investigation by Geo-Logic in August, 1997 was for testing and inspection related to the removal of an underground storage tank. The tank removal work was carried out under the direct supervision of G.V. Mitchell Maintenance Limited in August 1997. The Geo-Logic report indicated that the Property had a low level of concern from an environmental perspective in the area of the UST. No other environmental investigations were identified.

4.0 SCOPE OF THE INVESTIGATION

4.1 OVERVIEW OF SITE INVESTIGATION

An investigation was conducted of the Property by Geo-Logic to characterize the soil and groundwater at the Site. The investigation considered previous work completed at the Property. The field activities included:

- Test holes excavated by G.V. Mitchell Maintenance Limited;
- Groundwater level measurements completed by Geo-Logic; and
- Temporary piezometer development and sampling completed by Geo-Logic.

The field program involved the excavation of nine (9) test holes and water sampling activities at the existing well and piezometer that was installed during the field activities at the Property.

4.2 MEDIA INVESTIGATED

The soil and groundwater were investigated at the Property with a focus on areas identified in the Phase I Report including:

- Fill in northwest area from original construction
- Illegal dump area (1950's) southwest of the property
- Proximity to an industrial area
- The rail line that was reported along the south border in approximately 1920's to 1940's.
- Underground Storage Tank (UST) removal in 1997

The sampling and analysis plan provided the direction for the field investigation. The sampling and analysis plan can be referred to in Appendix E.

Sampling and analysis were completed for metals, volatile organic compounds (VOCs) including BTEX and PHC in soil and groundwater from selected locations based upon visual and olfactory observations and professional judgment following screening of soil samples and development of the piezometers. VOCs were included based on the rail line and illegal dump site to the south and southwest of the Property.

4.3 PHASE ONE CONCEPTUAL SITE MODEL

A conceptual site model was prepared for the Phase I component of this ESA. The conceptual site model identified the Property as being undeveloped. There were potential areas of concern from adjacent properties as documented by the Phase I Report including:

- Fill along the fence line in northwest area from original construction
- Illegal dump area (1950's) southwest of the property
- Proximity to an industrial area
- The rail line that was reported along the south border in approximately 1920's to 1940's.
- Underground Storage Tank (UST) removal in 1997

The Phase I model helped to determine that the Phase II ESA was required and to locate the primary areas to focus the majority of the investigation.

4.4 DEVIATIONS FROM SAMPLING AND ANALYSIS PLAN

A sampling and analysis plan was prepared based upon information from the Phase I ESA. The sampling plan is provided as Appendix E. The sampling and analysis plan was focused on areas identified in the Phase I ESA for soil and groundwater. Sampling and analysis was reduced based upon soil screening, sample recovery and visual observations of the subsurface conditions.

4.5 IMPEDIMENTS

The south area of the property was treed, several areas were saturated with standing groundwater due to the spring thaw. Test pits were located close to borders of the reported dump site and former rail line.

5.0 INVESTIGATION METHOD

5.1 GENERAL

In accordance with the Regulation, this section of the report provides a brief description of field methods utilized in the investigation.

5.2 DRILLING AND EXCAVATING

A total of nine (9) test holes were excavated at the Property by G.V. Mitchell Maintenance Limited as part of the subsurface exploration program on April 6, 2010. No boreholes were drilled at the Property during this investigation. The test holes were advanced using a rubber track backhoe. The backhoe's bucket was wiped clean of excess soil between test holes. Grab samples were collected of undisturbed soil from within the backhoe's bucket.

5.3 SOIL SAMPLING

The test hole locations in relation to potential areas of environmental concern, results of the field screening and the sampling plan were used to select soil samples to be analyzed. Soil samples that were collected during the excavation process were collected directly from undisturbed samples from within the backhoe's bucket into laboratory prepared sample bottles. Fresh nitrile gloves were worn when collecting the samples. The field logs with soil descriptions of the sample intervals collected are provided in Appendix F. Three soil samples were collected for analysis of metals (T-3 (0.6 m), T-4(0.6m) and T-6 (1.9 m)) and three samples were collected for analysis of the hydrocarbon parameters PHCs (F1-F4) and Volatile Organic Compounds (VOC's) (T-1 (2.1 m), T-2 (1.4 m) and T-6 (1.9 m)).

The soil samples were kept in a cooler on ice until delivery to Caduceon Environmental Laboratory in Peterborough, Ontario.

5.4 FIELD SCREENING MEASUREMENTS

Field screening measurements were completed using a Thermo GasTector gas detector. The subsurface soil samples obtained during the drilling program were subjected to hydrocarbon vapour testing or “headspace analysis” using the gas detector. The vapour readings from the soils are recorded on the respective logs in Appendix F. No elevated vapour readings were detected in the samples collected.

5.5 GROUNDWATER: MONITORING WELL INSTALLATION

The aim of the temporary piezometer installations was to place the screen straddling the water table so as to measure the thickness of any light non-aqueous phase liquids (i.e. gasoline) floating on the water table, if present. Three (3) piezometers were installed at test pits T-1, T-6 and T-8. No evidence of light non-aqueous phase liquids (i.e. gasoline) was encountered during the investigation.

5.6 GROUNDWATER: FIELD MEASUREMENT OF WATER QUALITY PARAMETERS

Water quality parameters such as pH, temperature or conductivity were not measured during the development of the installed piezometers. The piezometer was developed by purging it dry a total of three (3) times on April 6 before collecting a water sample on April 7.

5.7 GROUNDWATER: SAMPLING

Temporary piezometers were installed in test holes T-1, T-6 and T-8 (see Plot Plan, Plate 8 for location). As noted in Section 5.6, the piezometers were adequately developed prior to collecting water samples. The groundwater sample was collected directly from the piezometer using a clean (i.e. single use) disposable bailer. The groundwater sample was submitted for PHCs and VOCs. The groundwater samples were kept in a cooler on ice until delivery to Caduceon Environmental Laboratory.

5.8 SEDIMENT: SAMPLING

Sediment sampling was not required at the Property during this Phase II ESA.

5.9 ANALYTICAL TESTING

The analytical testing was completed at Caduceon Environmental Laboratory. The laboratory is accredited with the Canadian Association for Laboratory Accreditation (CALA) for the parameters tested for in this investigation.

5.10 RESIDUE MANAGEMENT PROCEDURES

The following outlines the management of residues generated from the Phase II ESA with respect to water from well development and fluids from equipment cleaning. Clean soil cuttings were placed back into the test holes or spread on the ground at the Property. Well development water was re-infiltrated to the ground. Fluids from equipment cleaning were collected and disposed of by Geo-Logic.

5.11 ELEVATION SURVEYING

An elevation survey was not completed of the test hole or temporary piezometer locations. If required, topographic elevations can be inferred from the Ontario Base Map.

5.12 QUALITY ASSURANCE AND QUALITY CONTROL MEASURES

The QAQC measures implemented by the laboratory were maintained throughout the investigation.

6.0 REVIEW AND EVALUATION

6.1 GEOLOGY

Reference is made to the test hole logs in Appendix F for details of the test holes including local soil/geology classification, inferred stratigraphy and groundwater observations. The stratigraphy at the Property in the areas where test holes were advanced was generally comprised of a surficial coverage of topsoil, a layer of clayey silt followed by a sandy silt. A layer of fill, possibly native materials from the original hospitable excavation, was encountered at test pit T-3 to 0.76 m and also at test pit T-4 to 0.80m. The clayey silt layer below the topsoil was brown and ranged in thickness from 0.20 m to 1.14 m and averaged 0.7 m thick. Moistures values for this layer averaged 26.9 percent indicating a wet state. Representative soil samples of the clayey silt layer were subjected to grain size analysis. The results of the testing indicate a soil distribution of 17 to 20 percent sand, 80 to 83 percent silt and clay sized particles by weight. The sandy silt layer below the clayey silt was grey brown and ranged in thickness from 0.23 m to 1.59 m and averaged 0.58 m thick. Moistures values for this layer averaged 18.7 percent indicating a moist to wet state. Representative soil samples of the sandy silt layer were subjected to grain size

analysis. The results of the testing indicate a soil distribution of 0 to 3 percent gravel, 18 to 24 percent sand, 76 to 82 percent silt and clay sized particles by weight.

All test pits were terminated within the underlying sandy silt till. The sandy silt till was described as grey brown in colour and firm in consistency. Moistures values for this layer averaged 15.6 percent indicating a moist state. Representative soil samples were subject to grain size analysis. The results of the testing indicated a soil distribution of 5 percent gravel, 47 percent sand, 48 percent silt and clay sized particles by weight.

6.2 GROUNDWATER: ELEVATIONS AND FLOW DIRECTION

Temporary piezometer were installed in test pits T-1, T-6 and T-8 during the subsurface exploration program (shown on the Plot Plan, Plate 8). Table 1 is provided illustrating the groundwater levels at the Property.

Table 1: Summary of Groundwater Levels

Location	Stick-Up (m)	Water Level (mbtp) April 6, 2010	Water Level (mbtp) April 7, 2010
T1	0.84	0.35	0.37
T6	1.09	0.76	0.49
T8	0.19	0.35	0.37

NOTES: m = metres; mbtp = metres below top of pipe
Flushmount indicates that the monitor is flush with the ground surface.

Based on the regional mapping reviewed and site observations it is inferred that the regional groundwater regime is migrating in a north-to-south direction toward Lake Ontario. Shallow groundwater flow direction is typically perpendicular to surface topography contours. Since the Property topography generally slopes to the south, it is inferred that the flow of groundwater is also toward the south.

6.3 GROUNDWATER: HYDRAULIC GRADIENTS

The groundwater hydraulic gradient was not assessed in this report.

6.4 FINE-MEDIUM SOIL TEXTURE

The soils will be compared to the fine to medium grained standards since the predominant soil type across the Property is a relatively fine grained till material.

6.5 SOIL: FIELD SCREENING

Field screening was completed by Geo-Logic of each sample. Total organic vapours were measured with a Thermo GasTector gas detector. The vapour readings were zero at all test hole locations on the Property.

6.6 SOIL QUALITY

In total, five (5) representative samples of the soil collected on April 6, 2010 were submitted for analysis. The laboratory certificates of analysis are provided in Appendix G.

Three (3) of the samples were submitted for Regulation 153 metals testing. The results of the metals testing in soil are summarized in Table 2 and compared against MOE Table 2 Standards for residential land use (fine to medium grained soil). The results of the testing indicate that these soils meet the current MOE Table 2 Standards.

Table 2: Summary of Metals Testing in Soil

Parameter	Sample Data			MOE Table 2 Standards*
	T6-3 1.2 m	T3-1	T4-1 1.1 m	
Antimony	<0.5	<0.5	<0.5	13
Arsenic	<0.5	2.1	1.8	25
Barium	30	72	138	1000
Beryllium	<0.2	0.5	0.7	1.2
Boron (HWS)	<0.1	0.2	0.2	1.5
Cadmium	<0.5	<0.5	<0.5	12
Chromium (Total)	6	18	28	1000
Chromium (VI)	<0.5	<0.5	<0.5	10
Cobalt	3	7	10	50
Copper	5	8	11	300
Lead	<5	9	7	200
Mercury	<0.005	0.033	0.045	10
Molybdenum	<1	<1	<1	40
Nickel	4	10	15	200
Selenium	<0.5	<0.5	<0.5	10
Silver	<0.2	<0.2	<0.2	25
Thallium	<0.1	0.2	0.2	4.1
Vanadium	13	32	44	250
Zinc	15	45	52	800

Notes:

All analytical results presented as µg/g (parts per million) unless otherwise noted.

"<" indicates parameter is below the laboratory reporting limit

*Ministry of the Environment "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", March 9, 2004, Table 2: Full Depth Generic Site Condition Standards in a potable Ground Water Condition for residential land use (fine to medium textured soils)

HWS = hot water soluble (hot water extract methodology)

Three (3) soil samples were submitted to the laboratory for analysis for the hydrocarbon parameters PHC and volatile organic compounds (VOC's). Samples from T-1, T-2 and T-6 were submitted. All of the parameters tested were reported below their respective detection limits. Portions of the data are summarized below in Table 3. The chemical Certificates of Analysis is presented in Appendix G.

Table 3: Summary of PHC and VOC Testing in Soil

PARAMETER	SAMPLE IDENTIFICATION			MOE Table 2 Standards*
	T-4 2.1 m	T-5 2.1 m	T-6 0.9 m	
Benzene	<0.001	<0.001	<0.001	0.24
Toluene	<0.001	<0.001	<0.001	2.1
Ethylbenzene	<0.001	<0.001	<0.001	0.28
m&p-Xylenes	<0.002	<0.002	<0.002	Total xylenes 25
o-Xylene	<0.001	<0.001	<0.001	
PHC F1 (C ₆ to C ₁₀)	<10	<10	<10	180
PHC F2 (C ₁₀ to C ₁₆)	<5	<5	<5	250
PHC F3 (C ₁₆ to C ₃₄)	<10	<10	<10	800
PHC F4 (C ₃₄ to C ₅₀)	<10	<10	<10	5600
Vinyl Chloride	<0.001	<0.001	<0.001	

Notes:

All analytical results are presented in µg/g (parts per million)

"<" indicates parameter is below the laboratory reporting limit

*MOE Standards. "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", March 9, 2004. Table 2: Full Depth Generic Site Condition Standards in a potable Ground Water Condition for residential land use (fine to medium textured soils)

The results of the testing indicate that these soils meet the current MOE Table 2 Standards.

6.7 GROUNDWATER QUALITY

Representative groundwater samples were collected from temporary piezometers installed in representative test holes. Groundwater samples were collected and submitted for laboratory analysis for VOC's and PHC's. All parameters were reported below their respective detection limits. Selected results including BTEX and PHC's are summarized in Table 4. The complete list of parameters tested and Certificate of Analysis is included in Appendix G. The groundwater samples meet the current MOE Table 2 Standards for PHC and VOC's in a potable groundwater condition (all types of property uses).

Table 4: Summary of VOCs and PHC Results in Groundwater

PARAMETER	SAMPLE IDENTIFICATION		MOE Table 2 Standards*
	T6-W1 Apr. 7, 2010	T1-W1 Apr. 7, 2010	
Benzene	<0.5	<0.5	5
Toluene	<0.5	<0.5	2.1
Ethylbenzene	<0.5	<0.5	2.4
m & p-Xylenes	<1.0	<1.0	Total xylenes
o-Xylene	<0.5	<0.5	300
Vinyl Chloride	<0.2	<0.2	1.3
Trichloroethylene	<0.1	<0.1	50
Tetrachloroethylene	<0.2	<0.2	5
PHC F1 (C6 – C10)	<50	<50	1000
PHC F2 (>C10 – C16)	<50	<60	
PHC F3 (>C16 – C34)	<500	<600	1000
PHC F4 (>C34 – C50)	<500	<600	

NOTES: All units in ppb (µg/L).

*Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the *Environmental Protection Act, March 9, 2004*

Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition – all types of property uses.

“<” = less than the laboratory reporting limit

PHC = petroleum hydrocarbons

6.8 SEDIMENT QUALITY

This section is not applicable as sediment was not sampled.

6.9 QUALITY ASSURANCE AND QUALITY CONTROL RESULTS

The laboratory QAQC results were maintained throughout the investigation and were within acceptable tolerances and limits.

6.10 PHASE TWO CONCEPTUAL SITE MODEL

Based on the investigative work completed, the Phase II conceptual site model is not required, as the potential areas of concern have been addressed. The potentially contaminating activities of the former UST at 53 Wellington Street, illegal dump site to the southwest, proximity to a chemical industry and former rail line in surrounding properties have been assessed and are not of environmental concern based on current MOE Table 2 Standards.

7.0 CONCLUSIONS

The supporting data upon which our conclusions are based have been presented in the previous sections of this report. The environmental assessment represents a "snapshot" in time. Consideration has been given to the known Property history, the physical setting, adjacent land use and current regulatory requirements in developing the terms of reference for this study. Geo-Logic Inc. cannot guarantee the reliability of information provided by others. However, whenever possible, verification of authenticity was attempted.

Based on our observations, the information collected, and the present land use, it is our professional opinion that the potential environmental concerns presented in the Phase I ESA report have been adequately addressed in the Phase II ESA and that the Property identified as Part of 53 Wellington Street in Port Hope, Ontario is suitable for its currently zoned usage and proposed residential development.

7.1 SIGNATURES

The following signatures are provided of Geo-Logic staff that prepared and conducted the Phase II ESA. Mr. Nyle McIlveen, the qualified person with respect to this project, has provided his opinion and confirms that the findings and conclusions in this document were completed in accordance with the Regulation 153/04, as amended.

Following the References section of this report is the Statement of Limitations. These limitations are an integral part of this report. Should questions arise regarding any aspect of our report, please contact our office.

Sincerely yours,

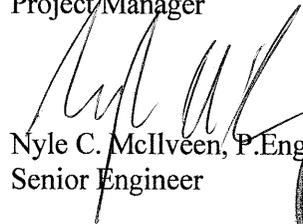
Geo-Logic Inc.
GEOTECHNICAL ENGINEERS
AND HYDROGEOLOGISTS



Bruce Selman
Environmental Technician



Steven J. Gagné, H.B.Sc.
Project Manager



Nyle C. McIlveen, P.Eng.
Senior Engineer



/bs

8.0 REFERENCES

Chapman and Putnam, 1973. *The Physiography of Southern Ontario*, 2nd Edition. University of Toronto Press.

Ministry of the Environment, 2004. Ontario Regulation 153/04: Records of Site Condition – Part XV.1 of the Act (*Environmental Protection Act* 153/04, as amended).

Geo-Logic Inc., August 27, 1997. *Inspection and Testing Report: Underground Storage Tank Removal*. Northumberland Health Care Centre, Port Hope. Project No. 97-G-473.

STATEMENT OF LIMITATIONS

The conclusions in this report are based on available background documentation and discussions with appropriate people associated with the property. Therefore, our liability is limited to interpreting accurately the information made available to us and assessing the property information at the test hole and well locations investigated during the Phase II ESA.

This document has been prepared by Geo-Logic Inc. for the sole use of Mr. Paul Montgomery of Roseglen Village for Seniors Inc., the owner of the property in assessing the environmental concerns of the section of the property identified as Part of 53 Wellington Street, Port Hope, Ontario. The material in it reflects Geo-Logic Inc.'s best judgment in the light of the information available to us at the time of our investigation. Geo-Logic Inc. accepts no responsibility for unauthorized re-use of this report for other purposes or any use by third parties. Any reliance on or decision to be made based on it, is the responsibility of the third parties. Geo-Logic Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

The conclusions in this report are based on available background documentation and discussions with appropriate people associated with the property and should not be construed as a legal opinion. An experienced environmental lawyer should be retained to review the report to render a legal opinion of the environmental liabilities associated with the property. This report is only applicable to the project site described in the introduction of the text.

APPENDIX E

SAMPLING AND ANALYSIS PLAN

APPENDIX F

SOILS EXPLORATION DATA

APPENDIX G

CERTIFICATES OF CHEMICAL ANALYSIS

Log of Test Pit: T-1

Project No: G022881E1

Project: Environmental Site Assessment

Location: 53 Wellington Street, Port Hope

GEO-LOGIC INC.
347 Pido Road, Unit 29
PETERBOROUGH, Ontario
K9J 6X7



SUBSURFACE PROFILE				SAMPLE			MOISTURE CONTENT				Piezometer Data	REMARKS
DEPTH	SYMBOL	DESCRIPTION	DEPTH (m)	NUMBER	TYPE	Vapours (ppm)	% dry weight					
							20	40	60	80		
0		Ground Surface	0.00									
0		TOPSOIL	0.20									
1		Brown Clayey Silt, Some Sand, Wet		1	GS	0						27mm Piezometer installed
2												
3												0.35m on April 6, 2010
3	1	Grey Brown Sandy SILT, Moist, Compact Seepage at 1.0m	1.07									0.37m on April 7, 2010
4												
5		Grey Brown Sandy Silt Till, Some Gravel, Occasional Cobble	1.52									
6												
7	2											Vapours Trace-Teclor Model 1238ME Gas Detector
7				3	GS	0						
8		End of Test Pit	2.34									Testpit wet upon completion
9												
10	3											
11												
12												

Completion Depth (m): 2.34

Excavating Company: G.V. Mitchell Ltd.

Date of Excavation: April 6, 2010

Excavating Equipment: Rubber Track Mini Excavator

Geologist/Technologist: B. Selman

Sampling: Grab Sample

Log of Test Pit: T-2

Project No: G022881E1

Project: Environmental Site Assessment

Location: 53 Wellington Street, Port Hope

GEO-LOGIC INC.
347 Pido Road, Unit 29
PETERBOROUGH, Ontario
K9J 6X7



SUBSURFACE PROFILE				SAMPLE			MOISTURE CONTENT % dry weight 20 40 60 80	Piezometer Data	REMARKS
DEPTH	SYMBOL	DESCRIPTION	DEPTH (m)	NUMBER	TYPE	Vapours (ppm)			
0		Ground Surface	0.00						
0	***	TOPSOIL	0.24						
1		Brown Clayey Silt, Some Sand, Wet		1	GS	0			
1.14			1.14						
4		Grey Brown Sandy SILT, Moist, Compact	1.37						
5		Grey Brown Sandy Silt Till, Some Gravel, Occasional Cobble		2	GS	0			
6		Some seepage 2.0m						Vapours Trace-Teclor Model 1238ME Gas Detector	
8		End of Test Pit	2.44	3	GS	0		Testpit dry upon completion	

Completion Depth (m): 2.44

Excavating Company: G.V. Mitchell Ltd.

Date of Excavation: April 6, 2010

Excavating Equipment: Rubber Track Mini Excavator

Geologist/Technologist: B. Selman

Sampling: Grab Sample

Log of Test Pit: T-3

Project No: G022881E1

Project: Environmental Site Assessment

Location: 53 Wellington Street, Port Hope

GEO-LOGIC INC.
347 Pido Road, Unit 29
PETERBOROUGH, Ontario
K9J 6X7



SUBSURFACE PROFILE				SAMPLE			MOISTURE CONTENT % dry weight 20 40 60 80	Piezometer Data	REMARKS
DEPTH	SYMBOL	DESCRIPTION	DEPTH (m)	NUMBER	TYPE	Vapours (ppm)			
0		Ground Surface	0.00						
0		TOPSOIL	0.20						
1		Br Sandy Silt FILL, Moist		1	GS	0			
2			0.76						
3		Grey Brown Sandy SILT, Moist, Compact		2	GS	0			
4			1.14						
5		Grey Brown Sandy Silt Till, Some Gravel, Occasional Cobble		3	GS	0			
6									
7									
8			2.36	4	SS				
8		End of Test Pit							
9									
10									
11									
12									

Vapours Trace-Teclor
Model 1238ME Gas
Detector

Testpit dry upon completion

Completion Depth (m): 2.36

Excavating Company: G.V. Mitchell Ltd.

Date of Excavation: April 6, 2010

Excavating Equipment: Rubber Track Mini Excavator

Geologist/Technologist: B. Selman

Sampling: Grab Sample

Plate No.: F-3

Log of Test Pit: T-4

Project No: G022881E1

Project: Environmental Site Assessment

Location: 53 Wellington Street, Port Hope

GEO-LOGIC INC.
347 Pido Road, Unit 29
PETERBOROUGH, Ontario
K9J 6X7



SUBSURFACE PROFILE				SAMPLE			MOISTURE CONTENT % dry weight 20 40 60 80	Piezometer Data	REMARKS
DEPTH	SYMBOL	DESCRIPTION	DEPTH (m)	NUMBER	TYPE	Vapours (ppm)			
0		Ground Surface	0.00						
0		TOPSOIL	0.20						
1		Brown Sandy Silt FILL, Moist, Compact							
2			0.84	1	GS	0			
3		Brown Sandy SILT, Moist, Compact							
4			1.32	2	GS	0			
5		Grey Brown Sandy Silt Till, Some Gravel, Occasional Cobble							
6		Seepage at 1.8m							
7			2.29	3	GS	0			
8		End of Test Pit							
9									
10									
11									
12									

Vapours Trace-Teclor
Model 1238ME Gas
Detector

Testpit dry upon completion

Completion Depth (m): 2.29

Excavating Company: G.V. Mitchell Ltd.

Date of Excavation: April 6, 2010

Excavating Equipment: Rubber Track Mini Excavator

Geologist/Technologist: B. Selman

Sampling: Grab Sample

Log of Test Pit: T-5

Project No: G022881E1

Project: Environmental Site Assessment

Location: 53 Wellington Street, Port Hope

GEO-LOGIC INC.
347 Pido Road, Unit 29
PETERBOROUGH, Ontario
K9J 6X7



SUBSURFACE PROFILE				SAMPLE			MOISTURE CONTENT				Piezometer Data	REMARKS
DEPTH	SYMBOL	DESCRIPTION	DEPTH (m)	NUMBER	TYPE	Vapours (ppm)	% dry weight					
							20	40	60	80		
0		Ground Surface	0.00									
0	***	TOPSOIL	0.24									
1	•••	Brown Clayey Silt, Some Sand, Wet Seepage 0.6m	0.84	1	GS	0						
2	•••		0.84									
3	•••	Grey Brown Sandy SILT, Moist, Compact	1.22	2	GS	0						
4	•••		1.22									
5	•••	Grey Brown Sandy Silt Till, Some Gravel, Occasional Cobble	2.29	3	GS	0						
6	•••		2.29									
7	•••		2.29									
8		End of Test Pit										
9												
10												
11												
12												

Vapours Trace-Teclor
Model 1238ME Gas
Detector

Testpit dry upon completion

Completion Depth (m): 2.29

Excavating Company: G.V. Mitchell Ltd.

Date of Excavation: April 6, 2010

Excavating Equipment: Rubber Track Mini Excavator

Geologist/Technologist: B. Selman

Sampling: Grab Sample

Log of Test Pit: T-6

Project No: G022881E1

Project: Environmental Site Assessment

Location: 53 Wellington Street, Port Hope

GEO-LOGIC INC.
347 Pido Road, Unit 29
PETERBOROUGH, Ontario
K9J 6X7



SUBSURFACE PROFILE				SAMPLE			MOISTURE CONTENT				Piezometer Data	REMARKS
DEPTH	SYMBOL	DESCRIPTION	DEPTH (m)	NUMBER	TYPE	Vapours (ppm)	% dry weight					
							20	40	60	80		
0		Ground Surface	0.00									
0		TOPSOIL	0.20									
1		Brown Clayey Silt, Some Sand, Wet										27mm Piezometer installed
2			0.69	1	GS	0						Water Level
3		Grey Brown Sandy SILT, Moist, Compact Seepage at 1.0m										0.76m on April 6, 2010
4			1.32	2	GS	0						0.49m on April 7, 2010
5		Brown SAND, Some Gravel, Wet										
6			1.83									
7		Grey Brown Sandy Silt Till, Some Gravel, Occasional Cobble										Vapours Trace-Teclor Model 1238ME Gas Detector
7			2.13	3	GS	0						
7		End of Test Pit										
8												Testpit wet upon completion
9												
10												
11												
12												

Completion Depth (m): 2.13

Excavating Company: G.V. Mitchell Ltd.

Date of Excavation: April 6, 2010

Excavating Equipment: Rubber Track Mini Excavator

Geologist/Technologist: B. Selman

Sampling: Grab Sample

Log of Test Pit: T-7

Project No: G022881E1

Project: Environmental Site Assessment

Location: 53 Wellington Street, Port Hope

GEO-LOGIC INC.
347 Pido Road, Unit 29
PETERBOROUGH, Ontario
K9J 6X7



SUBSURFACE PROFILE				SAMPLE			MOISTURE CONTENT				Piezometer Data	REMARKS
DEPTH	SYMBOL	DESCRIPTION	DEPTH (m)	NUMBER	TYPE	Vapours (ppm)	% dry weight					
							20	40	60	80		
0		Ground Surface	0.00									
0	***	TOPSOIL	0.24									
1		Brown Sandy SILT, Wet, Compact										
2		Seepage at 0.7m		1	GS	0						
3												
3	1			2	GS	0						
4												
5												
6		Brown Silty SAND, Wet	1.83									
7	2			3	GS	0						
8												
9		End of Test Pit	2.68									
10	3											
11												
12												

Vapours Trace-Teclor
Model 1238ME Gas
Detector

Completion Depth (m): 2.68

Excavating Company: G.V. Mitchell Ltd.

Date of Excavation: April 6, 2010

Excavating Equipment: Rubber Track Mini Excavator

Geologist/Technologist: B. Selman

Sampling: Grab Sample

Log of Test Pit: T-8

Project No: G022881E1

Project: Environmental Site Assessment

Location: 53 Wellington Street, Port Hope

GEO-LOGIC INC.
347 Pido Road, Unit 29
PETERBOROUGH, Ontario
K9J 6X7



SUBSURFACE PROFILE				SAMPLE			MOISTURE CONTENT % dry weight 20 40 60 80	Piezometer Data	REMARKS
DEPTH	SYMBOL	DESCRIPTION	DEPTH (m)	NUMBER	TYPE	Vapours (ppm)			
0		Ground Surface	0.00						
0		TOPSOIL							
1		Brown Clayey SILT, Some Sand, Wet	0.41					27mm Piezometer installed	
2		Seepage at 0.7m		1	GS	0		Water Level	
3		Grey Brown Sandy SILT, Wet, Compact	0.84					0.35m on April 6, 2010	
4								0.37m on April 7, 2010	
5		Grey Brown Sand Silt TILL, Some Gravel	1.52	2	GS	0			
5		End of Test Pit	1.62						
6								Vapours Trace-Teclor Model 1238ME Gas Detector	
7									
8								Testpit wet upon completion	
9									
10									
11									
12									

Completion Depth (m): 1.52

Excavating Company: G.V. Mitchell Ltd.

Date of Excavation: April 6, 2010

Excavating Equipment: Rubber Track Mini Excavator

Geologist/Technologist: B. Selman

Sampling: Grab Sample

Log of Test Pit: T-9

Project No: G022881E1

Project: Environmental Site Assessment

Location: 53 Wellington Street, Port Hope

GEO-LOGIC INC.
347 Pido Road, Unit 29
PETERBOROUGH, Ontario
K9J 6X7



SUBSURFACE PROFILE				SAMPLE			MOISTURE CONTENT				Piezometer Data	REMARKS
DEPTH	SYMBOL	DESCRIPTION	DEPTH (m)	NUMBER	TYPE	Vapours (ppm)	% dry weight					
							20	40	60	80		
0		Ground Surface	0.00									
0		TOPSOIL										
1			0.43									
2		Brown Clayey Silt, Some Sand, Wet		1	GS	0						
3												
4		Seepage at 1.1M	1.14									
5												
6		Grey Brown Sandy SILT, Moist, Compact	1.52	2	GS	0						
7												
8		Grey Brown Sandy Silt Till, Some Gravel, Occasional Cobble										
9												
10												
11												
12		End of Test Pit	2.13	3	GS	0						

Vapours Trace-Teclor Model 1238ME Gas Detector

Testpit wet upon completion

Completion Depth (m): 2.13

Excavating Company: G.V. Mitchell Ltd.

Date of Excavation: April 6, 2010

Excavating Equipment: Rubber Track Mini Excavator

Geologist/Technologist: B. Selman

Sampling: Grab Sample



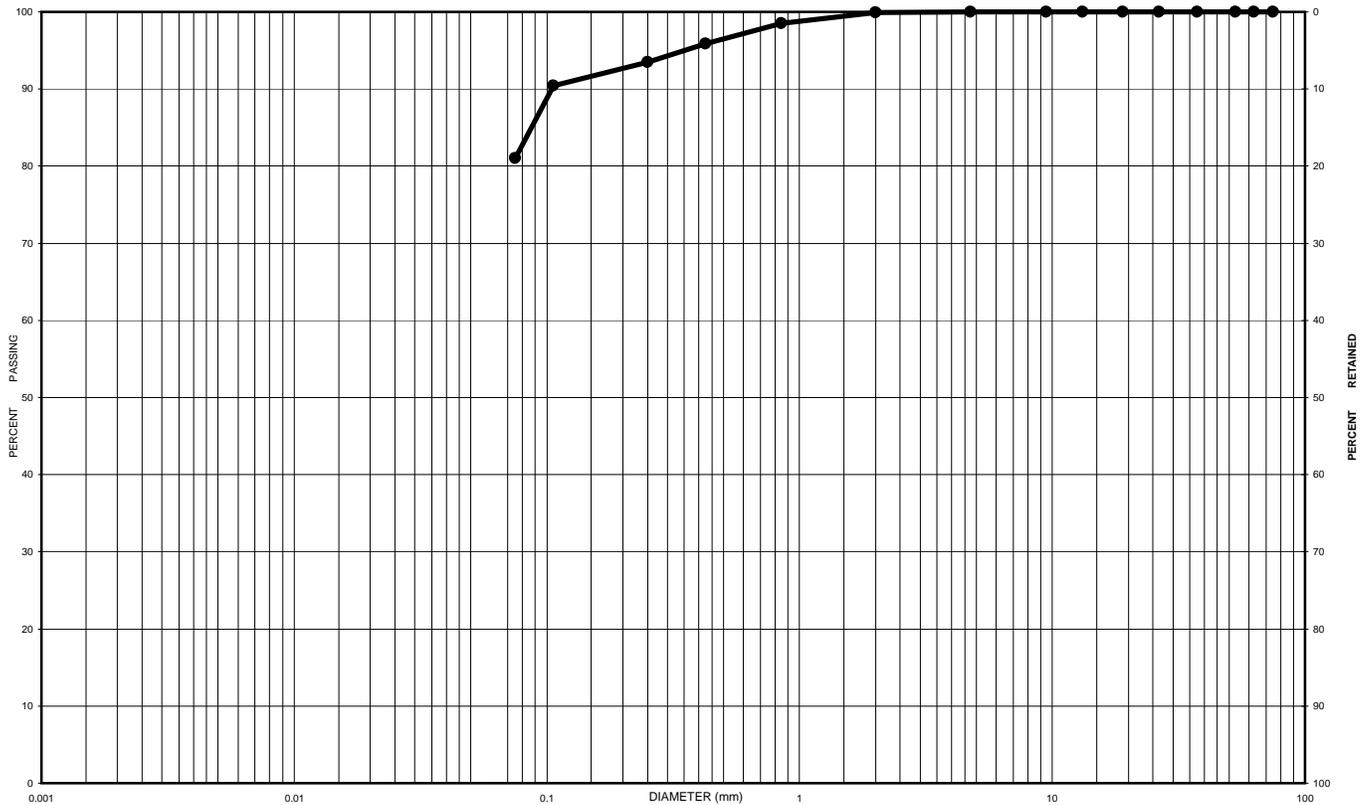
GEO-LOGIC INC. 347 Pido Road Unit 29 Peterborough, ON, K9J 6X7 Tel: (705) 749-3317 Fax: (705) 749-9248

GRAIN SIZE DISTRIBUTION CHART

Client:	Roseglen	Ref No.:	G022881E1
Project:	ESA	Location:	53 Wellington, Port Hope
Borehole No.:	TP7	Sample No.:	1
Depth:	18"	Enclosure:	F-10

UNIFIED SOIL CLASSIFICATION SYSTEM

CLAY & SILT	SAND			GRAVEL	
	FINE	MEDIUM	COARSE	FINE	COARSE



CLAY	SILT	V. FINE	FINE	MEDIUM	COARSE	FINE GRAVEL	GRAVEL
		SAND					

U.S. BUREAU OF SOILS CLASSIFICATION

Sample No.	Depth	Description	Gravel	Sand	Silt	Clay	Class.
TP7, 1	18"		0	19	81		

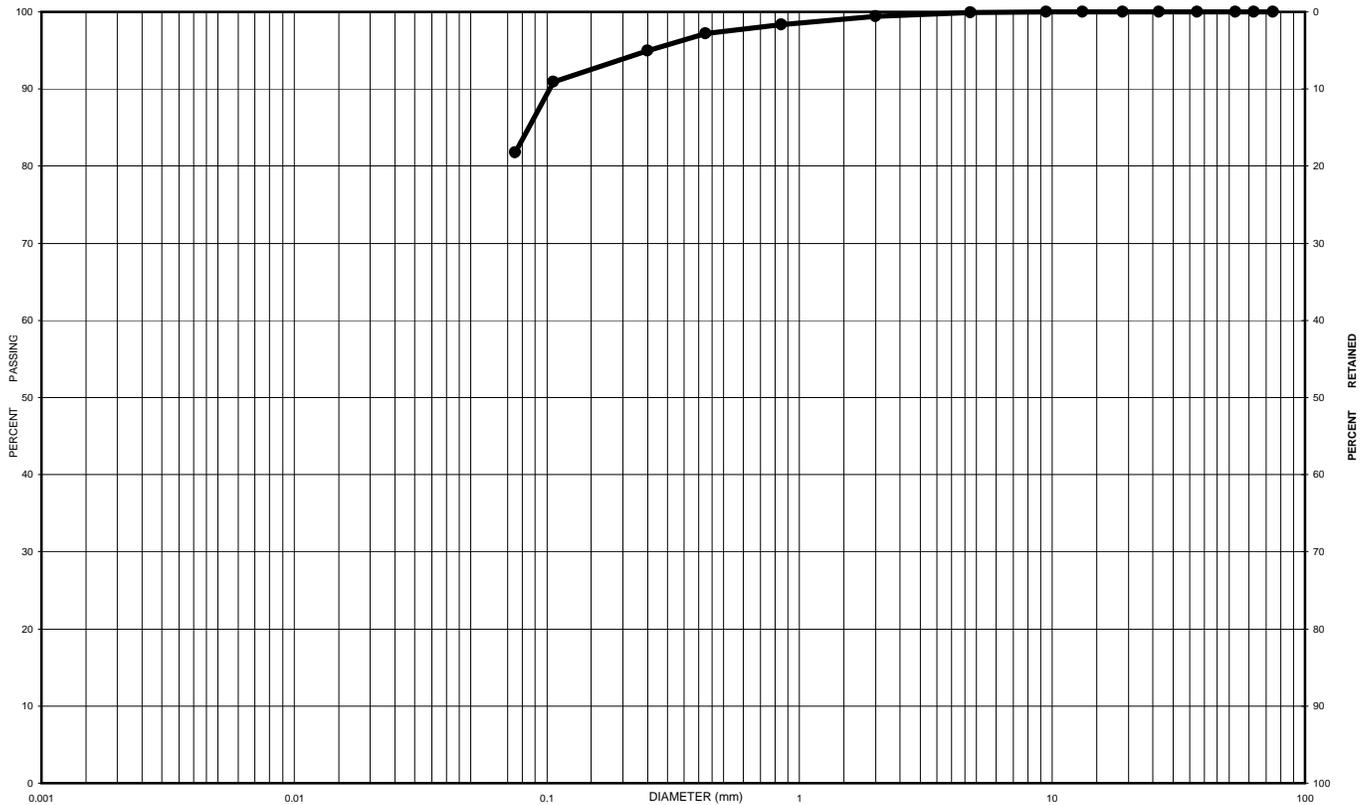


GEO-LOGIC INC. 347 Pido Road Unit 29 Peterborough, ON, K9J 6X7 Tel: (705) 749-3317 Fax: (705) 749-9248

GRAIN SIZE DISTRIBUTION CHART

Client:	Roseglen	Ref No.:	G022881E1
Project:	ESA	Location:	53 Wellington, Port Hope
Borehole No.:	TP7	Sample No.:	2
Depth:	42"	Enclosure:	F-11

UNIFIED SOIL CLASSIFICATION SYSTEM					
CLAY & SILT	SAND			GRAVEL	
	FINE	MEDIUM	COARSE	FINE	COARSE



CLAY	SILT	V. FINE	FINE	MEDIUM	COARSE	FINE GRAVEL	GRAVEL
		SAND					

U.S. BUREAU OF SOILS CLASSIFICATION

Sample No.	Depth	Description	Gravel	Sand	Silt	Clay	Class.
TP7, 2	42"		0	18	82		



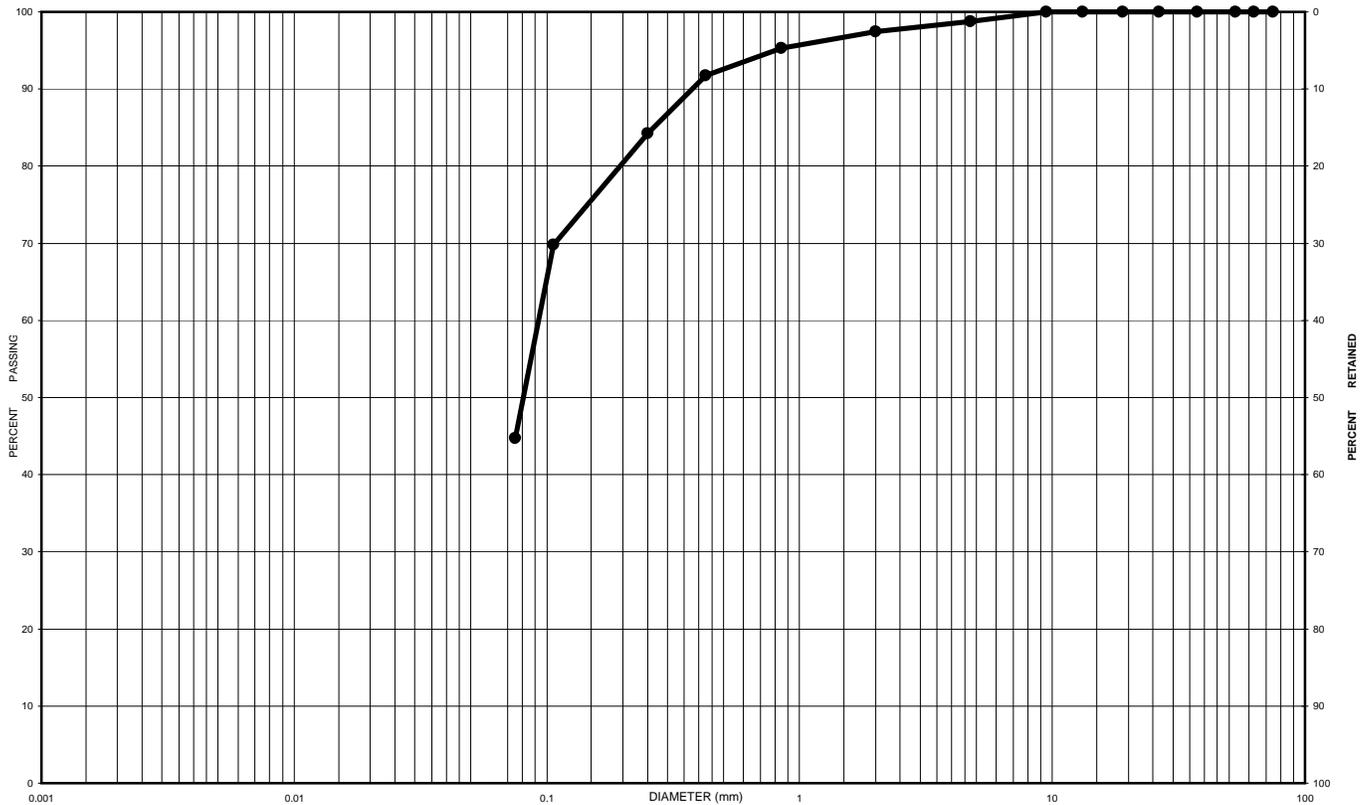
GEO-LOGIC INC. 347 Pido Road Unit 29 Peterborough, ON, K9J 6X7 Tel: (705) 749-3317 Fax: (705) 749-9248

GRAIN SIZE DISTRIBUTION CHART

Client:	Roseglen	Ref No.:	G022881E1
Project:	ESA	Location:	53 Wellington, Port Hope
Borehole No.:	TP7	Sample No.:	3
Depth:	100"	Enclosure:	F-12

UNIFIED SOIL CLASSIFICATION SYSTEM

CLAY & SILT	SAND			GRAVEL	
	FINE	MEDIUM	COARSE	FINE	COARSE



CLAY	SILT	V. FINE	FINE	MEDIUM	COARSE	FINE GRAVEL	GRAVEL
		SAND					

U.S. BUREAU OF SOILS CLASSIFICATION

Sample No.	Depth	Description	Gravel	Sand	Silt	Clay	Class.
TP7, 3	100"		1	54	45		



GEO-LOGIC INC. 347 Pido Road Unit 29 Peterborough, ON, K9J 6X7 Tel: (705) 749-3317 Fax: (705) 749-9248

GRAIN SIZE DISTRIBUTION CHART

Client:	Roseglen	Ref No.:	G022881E1
Project:	ESA	Location:	53 Wellington, Port Hope
Borehole No.:	TP9	Sample No.:	1
Depth:	18"	Enclosure:	F-13

UNIFIED SOIL CLASSIFICATION SYSTEM					
CLAY & SILT	SAND			GRAVEL	
	FINE	MEDIUM	COARSE	FINE	COARSE



CLAY	SILT	V. FINE	FINE	MEDIUM	COARSE	FINE GRAVEL	GRAVEL
		SAND					
U.S. BUREAU OF SOILS CLASSIFICATION							

Sample No.	Depth	Description	Gravel	Sand	Silt	Clay	Class.
TP9, 1	18"		0	15	85		



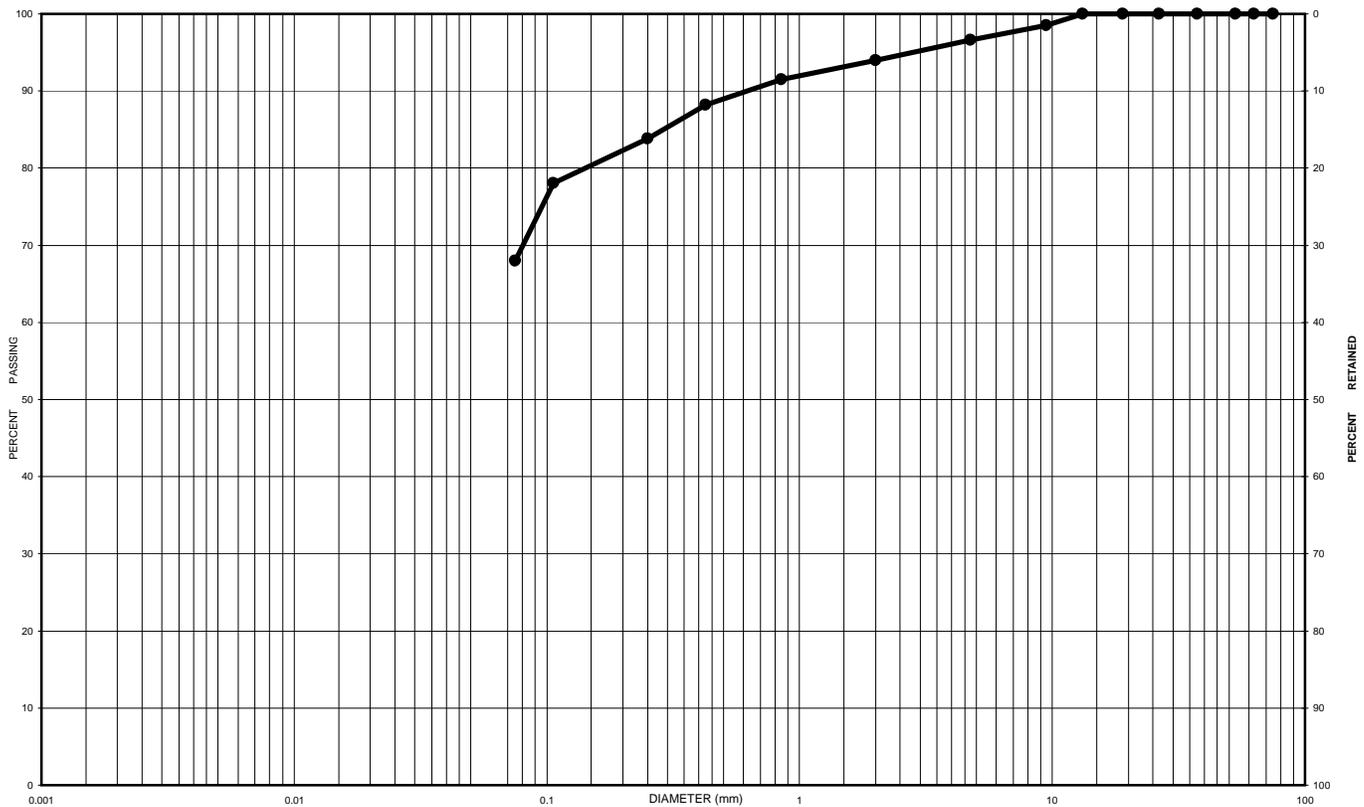
GEO-LOGIC INC. 347 Pido Road Unit 29 Peterborough, ON, K9J 6X7 Tel: (705) 749-3317 Fax: (705) 749-9248

GRAIN SIZE DISTRIBUTION CHART

Client:	Roseglen	Ref No.:	G022881E1
Project:	ESA	Location:	53 Wellington, Port Hope
Borehole No.:	TP9	Sample No.:	2
Depth:	48"	Enclosure:	F-14

UNIFIED SOIL CLASSIFICATION SYSTEM

CLAY & SILT	SAND			GRAVEL	
	FINE	MEDIUM	COARSE	FINE	COARSE



CLAY	SILT	V. FINE	FINE	MEDIUM	COARSE	FINE GRAVEL	GRAVEL
		SAND					

U.S. BUREAU OF SOILS CLASSIFICATION

Sample No.	Depth	Description	Gravel	Sand	Silt	Clay	Class.
TP9, 2	48"		3	29	68		



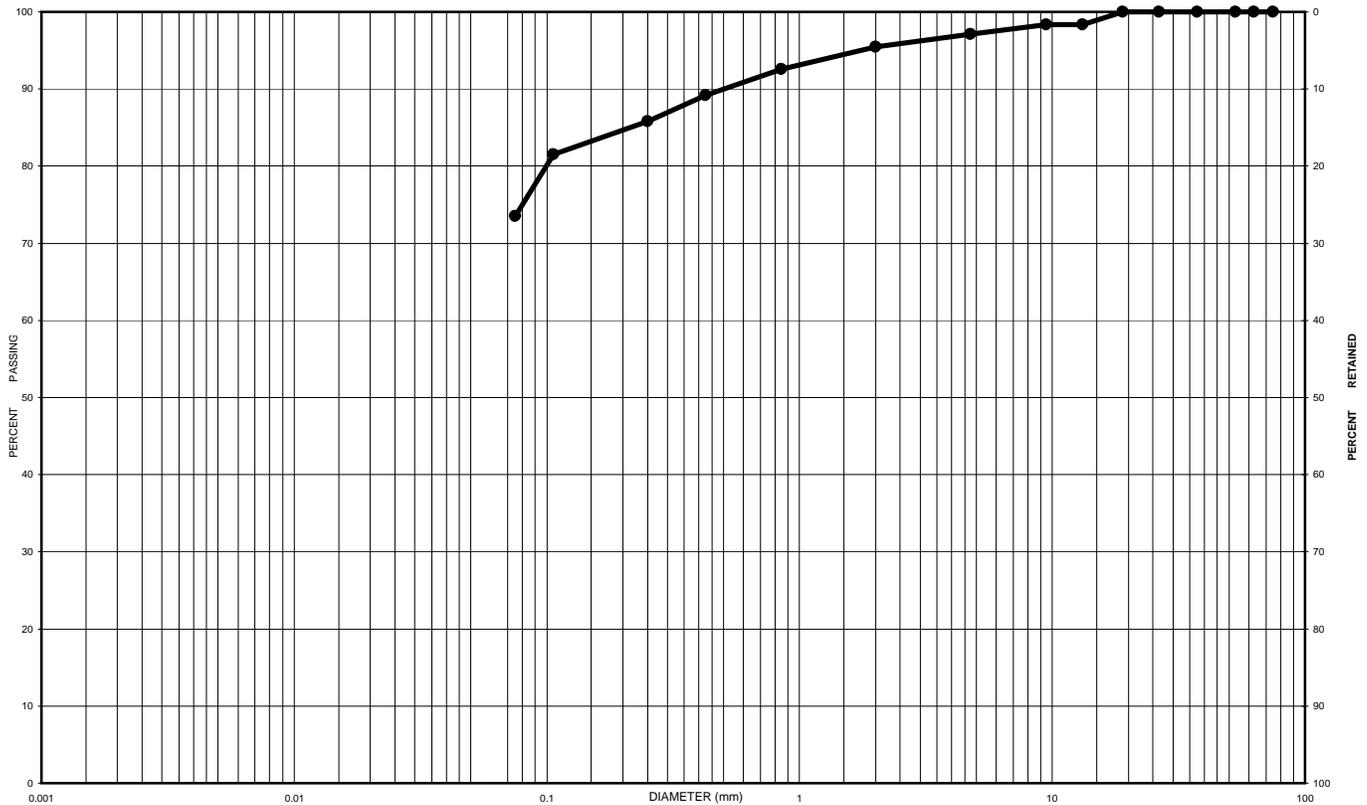
GEO-LOGIC INC. 347 Pido Road Unit 29 Peterborough, ON, K9J 6X7 Tel: (705) 749-3317 Fax: (705) 749-9248

GRAIN SIZE DISTRIBUTION CHART

Client:	Roseglen	Ref No.:	G022881E1
Project:	ESA	Location:	53 Wellington, Port Hope
Borehole No.:	TP9	Sample No.:	3
Depth:	78"	Enclosure:	F-15

UNIFIED SOIL CLASSIFICATION SYSTEM

CLAY & SILT	SAND			GRAVEL	
	FINE	MEDIUM	COARSE	FINE	COARSE



CLAY	SILT	V. FINE	FINE	MEDIUM	COARSE	FINE GRAVEL	GRAVEL
		SAND					

U.S. BUREAU OF SOILS CLASSIFICATION

Sample No.	Depth	Description	Gravel	Sand	Silt	Clay	Class.
TP9, 3	78"		2	24	74		

APPENDIX G

CERTIFICATES OF CHEMICAL ANALYSIS

Geo-Logic Inc.

C.O.C.: C13381

REPORT No. B10-08678 (i)

Report To:

Geologic Inc.
 347 Pido Road Unit 29
 Peterborough, ON, K9J 6X7

Attention: Bruce Selman

Caduceon Environmental Laboratories

160 Charlotte St. Suite 206
 Peterborough, Ontario, K9J 2T8
 Tel: 705-748-1506
 Fax: 705-748-6514

DATE RECEIVED: 07-Apr-10

JOB/PROJECT NO.: Roseglen

DATE REPORTED: 13-Apr-10

P.O. NUMBER: G022881E1

SAMPLE MATRIX: Soil

WATERWORKS NO.

Client I.D.:	TP 6 - 3	TP 3 - 1	TP 4 - 1	
Sample I.D.:	B10-08678-1	B10-08678-4	B10-08678-5	
Date Collected:	06-Apr-10	06-Apr-10	06-Apr-10	

Parameter	Units	M.D.L.	Reference Method	Date/Site Analyzed				
Antimony	µg/g	0.5	EPA 6020	09-Apr-10/O	< 0.5	< 0.5	< 0.5	
Arsenic	µg/g	0.5	EPA 6020	09-Apr-10/O	< 0.5	2.1	1.8	
Barium	µg/g	1	EPA 6010	09-Apr-10/O	30	72	138	
Beryllium	µg/g	0.2	EPA 6010	09-Apr-10/O	< 0.2	0.5	0.7	
Boron (Hot Water Ext.)	µg/g	0.1	EPA 200.7	09-Apr-10/O	< 0.1	0.2	0.2	
Cadmium	µg/g	0.5	EPA 6010	09-Apr-10/O	< 0.5	< 0.5	< 0.5	
Chromium	µg/g	1	EPA 6010	09-Apr-10/O	6	18	28	
Chromium (VI)	µg/g	0.5	EPA7196	08-Apr-10/O	< 0.5	< 0.5	< 0.5	
Cobalt	µg/g	1	EPA 6010	09-Apr-10/O	3	7	10	
Copper	µg/g	1	EPA 6010	09-Apr-10/O	5	8	11	
Lead	µg/g	5	EPA 6010	09-Apr-10/O	< 5	9	7	
Mercury	µg/g	0.005	EPA 7471A	09-Apr-10/O	< 0.005	0.033	0.045	
Molybdenum	µg/g	1	EPA 6010	09-Apr-10/O	< 1	< 1	< 1	
Nickel	µg/g	1	EPA 6010	09-Apr-10/O	4	10	15	
Silver	µg/g	0.2	EPA 6010	09-Apr-10/O	< 0.2	< 0.2	< 0.2	
Selenium	µg/g	0.5	EPA 6020	09-Apr-10/O	< 0.5	< 0.5	< 0.5	



Michelle Dubien
 Lab Supervisor

M.D.L. = Method Detection Limit
 Site Analyzed: K-Kingston W-Windsor O-Ottawa P-Peterborough M-Moncton

The analytical results reported herein refer to the samples as received. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

C.O.C.: C13381

REPORT No. B10-08678 (i)

Report To:

Geologic Inc.
 347 Pido Road Unit 29
 Peterborough, ON, K9J 6X7

Attention: Bruce Selman

Caduceon Environmental Laboratories

160 Charlotte St. Suite 206
 Peterborough, Ontario, K9J 2T8
 Tel: 705-748-1506
 Fax: 705-748-6514

DATE RECEIVED: 07-Apr-10

JOB/PROJECT NO.: Roseglen

DATE REPORTED: 13-Apr-10

P.O. NUMBER: G022881E1

SAMPLE MATRIX: Soil

WATERWORKS NO.

Client I.D.:	TP 6 - 3	TP 3 - 1	TP 4 - 1	
Sample I.D.:	B10-08678-1	B10-08678-4	B10-08678-5	
Date Collected:	06-Apr-10	06-Apr-10	06-Apr-10	

Parameter	Units	M.D.L.	Reference Method	Date/Site Analyzed				
Thallium	µg/g	0.1	EPA 6020	09-Apr-10/O	< 0.1	0.1	0.2	
Vanadium	µg/g	1	EPA 6010	09-Apr-10/O	13	32	44	
Zinc	µg/g	1	EPA 6010	09-Apr-10/O	15	45	42	

µg/g = micrograms per gram (parts per million)

F1 C6-C10 hydrocarbons in µg/g, (F1-btex if requested)

F2 C10-C16 hydrocarbons in µg/g, (F2-naph if requested)

F3 C16-C34 hydrocarbons in µg/g, (F3-pah if requested)

F4 C34-C50 hydrocarbons in µg/g

This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.

Any deviations from the method are noted and reported for any particular sample.

nC6 and nC10 response factor is within 30% of response factor for toluene:

nC10,nC16 and nC34 response factors within 10% of each other:

C50 response factors within 70% of nC10+nC16+nC34 average:

Linearity is within 15%:

All results expressed on a dry weight basis.

Unless otherwise noted all chromatograms returned to baseline by the retention time of nC50.

Unless otherwise noted all extraction and analysis limits for holding time were met.

QC will be made available upon request.



M.D.L. = Method Detection Limit

Site Analyzed: K-Kingston W-Windsor O-Ottawa P-Peterborough M-Moncton

Michelle Dubien

Lab Supervisor

The analytical results reported herein refer to the samples as received. Reproduction of this analytical report in full or in part is prohibited without prior consent from

C.O.C.: C13381

REPORT No. B10-08678 (ii)

Report To:

Geologic Inc.
 347 Pido Road Unit 29
 Peterborough, ON, K9J 6X7

Attention: Bruce Selman

Caduceon Environmental Laboratories

160 Charlotte St. Suite 206
 Peterborough, Ontario, K9J 2T8

Tel: 705-748-1506

Fax: 705-748-6514

DATE RECEIVED: 07-Apr-10

JOB/PROJECT NO.: Roseglen

DATE REPORTED: 13-Apr-10

P.O. NUMBER: G022881E1

SAMPLE MATRIX: Soil

WATERWORKS NO.

Client I.D.:	TP 6 - 3	TP 2 - 2	TP 1 - 3	
Sample I.D.:	B10-08678-1	B10-08678-2	B10-08678-3	
Date Collected:	06-Apr-10	06-Apr-10	06-Apr-10	

Parameter	Units	M.D.L.	Reference Method	Date/Site Analyzed				
Benzene	µg/g	0.001	EPA 8260	08-Apr-10/O	< 0.001	< 0.001	< 0.001	
Bromoform	µg/g	0.001	EPA 8260	08-Apr-10/O	< 0.001	< 0.001	< 0.001	
Bromodichloromethane	µg/g	0.001	EPA 8260	08-Apr-10/O	< 0.001	< 0.001	< 0.001	
Bromomethane	µg/g	0.001	EPA 8260	08-Apr-10/O	< 0.001	< 0.001	< 0.001	
Carbon Tetrachloride	µg/g	0.001	EPA 8260	08-Apr-10/O	< 0.001	< 0.001	< 0.001	
Monochlorobenzene (Chlorobenzene)	µg/g	0.001	EPA 8260	08-Apr-10/O	< 0.001	< 0.001	< 0.001	
Chloroform	µg/g	0.001	EPA 8260	08-Apr-10/O	< 0.001	< 0.001	< 0.001	
Dibromochloromethane	µg/g	0.001	EPA 8260	08-Apr-10/O	< 0.001	< 0.001	< 0.001	
Dibromoethane, 1,2- (Ethylene Dibromide)	µg/g	0.001	EPA 8260	08-Apr-10/O	< 0.001	< 0.001	< 0.001	
Dichlorobenzene, 1,2-	µg/g	0.001	EPA 8260	08-Apr-10/O	< 0.001	< 0.001	< 0.001	
Dichlorobenzene, 1,3-	µg/g	0.001	EPA 8260	08-Apr-10/O	< 0.001	< 0.001	< 0.001	
Dichlorobenzene, 1,4-	µg/g	0.001	EPA 8260	08-Apr-10/O	< 0.001	< 0.001	< 0.001	
Dichloroethane, 1,1-	µg/g	0.001	EPA 8260	08-Apr-10/O	< 0.001	< 0.001	< 0.001	
Dichloroethane, 1,2-	µg/g	0.001	EPA 8260	08-Apr-10/O	< 0.001	< 0.001	< 0.001	



Michelle Dubien
 Lab Supervisor

M.D.L. = Method Detection Limit
 Site Analyzed: K-Kingston W-Windsor O-Ottawa P-Peterborough M-Moncton

The analytical results reported herein refer to the samples as received. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

C.O.C.: C13381

REPORT No. B10-08678 (ii)

Report To:

Geologic Inc.

347 Pido Road Unit 29
 Peterborough, ON, K9J 6X7

Attention: Bruce Selman

Caduceon Environmental Laboratories

160 Charlotte St. Suite 206
 Peterborough, Ontario, K9J 2T8
 Tel: 705-748-1506
 Fax: 705-748-6514

DATE RECEIVED: 07-Apr-10

JOB/PROJECT NO.: Roseglen

DATE REPORTED: 13-Apr-10

P.O. NUMBER: G022881E1

SAMPLE MATRIX: Soil

WATERWORKS NO.

Client I.D.:	TP 6 - 3	TP 2 - 2	TP 1 - 3	
Sample I.D.:	B10-08678-1	B10-08678-2	B10-08678-3	
Date Collected:	06-Apr-10	06-Apr-10	06-Apr-10	

Parameter	Units	M.D.L.	Reference Method	Date/Site Analyzed				
Dichloroethene, cis-1,2-	µg/g	0.001	EPA 8260	08-Apr-10/O	< 0.001	< 0.001	< 0.001	
Dichloroethene, 1,1-	µg/g	0.001	EPA 8260	08-Apr-10/O	< 0.001	< 0.001	< 0.001	
Dichloroethene, trans-1,2-	µg/g	0.001	EPA 8260	08-Apr-10/O	< 0.001	< 0.001	< 0.001	
Dichloropropane, 1,2-	µg/g	0.001	EPA 8260	08-Apr-10/O	< 0.001	< 0.001	< 0.001	
Dichloropropene, trans-1,3-	µg/g	0.001	EPA 8260	08-Apr-10/O	< 0.001	< 0.001	< 0.001	
Dichloropropene, cis-1,3-	µg/g	0.001	EPA 8260	08-Apr-10/O	< 0.001	< 0.001	< 0.001	
Ethylbenzene	µg/g	0.001	EPA 8260	08-Apr-10/O	< 0.001	< 0.001	< 0.001	
Dichloromethane (Methylene Chloride)	µg/g	0.001	EPA 8260	08-Apr-10/O	< 0.001	< 0.001	< 0.001	
Methyl Ethyl Ketone	µg/g	0.01	EPA 8260	08-Apr-10/O	< 0.01	< 0.01	< 0.01	
Styrene	µg/g	0.001	EPA 8260	08-Apr-10/O	< 0.001	< 0.001	< 0.001	
Tetrachloroethane, 1,1,1,2-	µg/g	0.001	EPA 8260	08-Apr-10/O	< 0.001	< 0.001	< 0.001	
Tetrachloroethane, 1,1,2,2-	µg/g	0.001	EPA 8260	08-Apr-10/O	< 0.001	< 0.001	< 0.001	
Tetrachloroethylene	µg/g	0.001	EPA 8260	08-Apr-10/O	< 0.001	< 0.001	< 0.001	
Toluene	µg/g	0.001	EPA 8260	08-Apr-10/O	< 0.001	< 0.001	< 0.001	
Trichlorobenzene, 1,2,4-	µg/g	0.001	EPA 8260	08-Apr-10/O	< 0.001	< 0.001	< 0.001	



Michelle Dubien
 Lab Supervisor

M.D.L. = Method Detection Limit
 Site Analyzed: K-Kingston W-Windsor O-Ottawa P-Peterborough M-Moncton

The analytical results reported herein refer to the samples as received. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

C.O.C.: C13381

REPORT No. B10-08678 (ii)

Report To:

Geologic Inc.
 347 Pido Road Unit 29
 Peterborough, ON, K9J 6X7

Attention: Bruce Selman

Caduceon Environmental Laboratories

160 Charlotte St. Suite 206
 Peterborough, Ontario, K9J 2T8

Tel: 705-748-1506

Fax: 705-748-6514

DATE RECEIVED: 07-Apr-10

JOB/PROJECT NO.: Roseglen

DATE REPORTED: 13-Apr-10

P.O. NUMBER: G022881E1

SAMPLE MATRIX: Soil

WATERWORKS NO.

Client I.D.:	TP 6 - 3	TP 2 - 2	TP 1 - 3	
Sample I.D.:	B10-08678-1	B10-08678-2	B10-08678-3	
Date Collected:	06-Apr-10	06-Apr-10	06-Apr-10	

Parameter	Units	M.D.L.	Reference Method	Date/Site Analyzed				
Trichloroethane,1,1,1-	µg/g	0.001	EPA 8260	08-Apr-10/O	< 0.001	< 0.001	< 0.001	
Trichloroethane,1,1,2-	µg/g	0.001	EPA 8260	08-Apr-10/O	< 0.001	< 0.001	< 0.001	
Trichloroethylene	µg/g	0.001	EPA 8260	08-Apr-10/O	< 0.001	< 0.001	< 0.001	
Vinyl Chloride	µg/g	0.001	EPA 8260	08-Apr-10/O	< 0.001	< 0.001	< 0.001	
Xylene, m,p-	µg/g	0.002	EPA 8260	08-Apr-10/O	< 0.002	< 0.002	< 0.002	
Xylene, o-	µg/g	0.001	EPA 8260	08-Apr-10/O	< 0.001	< 0.001	< 0.001	
PHC F1 (C6-C10)	µg/g	10	CWS Tier1	08-Apr-10/K	< 10	< 10	< 10	
Comment-purgeable	-		-	08-Apr-10	-	-	-	
PHC F2 (>C10-C16)	µg/g	5	CWS Tier1	13-Apr-10/K	< 5	< 5	< 5	
PHC F3 (>C16-C34)	µg/g	10	CWS Tier1	13-Apr-10/K	< 10	< 10	< 10	
PHC F4 (>C34-C50)	µg/g	10	CWS Tier1	13-Apr-10/K	< 10	< 10	< 10	
Comment-extractable	-		-	13-Apr-10	-	-	-	

µg/g = micrograms per gram (parts per million)

F1 C6-C10 hydrocarbons in µg/g, (F1-btex if requested)

F2 C10-C16 hydrocarbons in µg/g, (F2-naph if requested)

F3 C16-C34 hydrocarbons in µg/g, (F3-pah if requested)

F4 C34-C50 hydrocarbons in µg/g

This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.

Any deviations from the method are noted and reported for any particular sample.

nC6 and nC10 response factor is within 30% of response factor for toluene:

nC10,nC16 and nC34 response factors within 10% of each other:

C50 response factors within 70% of nC10+nC16+nC34 average:

Linearity is within 15%:

All results expressed on a dry weight basis.

Unless otherwise noted all chromatograms returned to baseline by the retention time of nC50.

Unless otherwise noted all extraction and analysis limits for holding time were met.

QC will be made available upon request.



M.D.L. = Method Detection Limit

Site Analyzed: K-Kingston W-Windsor O-Ottawa P-Peterborough M-Moncton

Michelle Dubien

Lab Supervisor

The analytical results reported herein refer to the samples as received. Reproduction of this analytical report in full or in part is prohibited without prior consent from

C.O.C.: C13382

REPORT No. B10-08677

Report To:

Geologic Inc.

347 Pido Road Unit 29
 Peterborough, ON, K9J 6X7

Attention: Bruce Selman

Caduceon Environmental Laboratories

160 Charlotte St. Suite 206
 Peterborough, Ontario, K9J 2T8
 Tel: 705-748-1506
 Fax: 705-748-6514

DATE RECEIVED: 07-Apr-10

JOB/PROJECT NO.: Roseglen

DATE REPORTED: 09-Apr-10

P.O. NUMBER: G022881E1

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Client I.D.:	T6 - W1	T1 - W1		
Sample I.D.:	B10-08677-1	B10-08677-2		
Date Collected:	07-Apr-10	07-Apr-10		

Parameter	Units	M.D.L.	Reference Method	Date/Site Analyzed				
Benzene	µg/L	0.5	EPA 8260	09-Apr-10/O	< 0.5	< 0.5		
Bromodichloromethane	µg/L	0.1	EPA 8260	09-Apr-10/O	< 0.1	< 0.1		
Bromoform	µg/L	0.1	EPA 8260	09-Apr-10/O	< 0.1	< 0.1		
Bromomethane	µg/L	0.3	EPA 8260	09-Apr-10/O	< 0.3	< 0.3		
Carbon Tetrachloride	µg/L	0.2	EPA 8260	09-Apr-10/O	< 0.2	< 0.2		
Monochlorobenzene (Chlorobenzene)	µg/L	0.2	EPA 8260	09-Apr-10/O	< 0.2	< 0.2		
Chloroform	µg/L	0.3	EPA 8260	09-Apr-10/O	< 0.3	< 0.3		
Dibromochloromethane	µg/L	0.1	EPA 8260	09-Apr-10/O	< 0.1	< 0.1		
Dibromoethane, 1,2- (Ethylene Dibromide)	µg/L	0.1	EPA 8260	09-Apr-10/O	< 0.1	< 0.1		
Dichlorobenzene, 1,2-	µg/L	0.1	EPA 8260	09-Apr-10/O	< 0.1	< 0.1		
Dichlorobenzene, 1,3-	µg/L	0.1	EPA 8260	09-Apr-10/O	< 0.1	< 0.1		
Dichlorobenzene, 1,4-	µg/L	0.2	EPA 8260	09-Apr-10/O	< 0.2	< 0.2		
Dichloroethane, 1,1-	µg/L	0.1	EPA 8260	09-Apr-10/O	< 0.1	< 0.1		
Dichloroethane, 1,2-	µg/L	0.1	EPA 8260	09-Apr-10/O	< 0.1	< 0.1		
Dichloroethene, 1,1-	µg/L	0.1	EPA 8260	09-Apr-10/O	< 0.1	< 0.1		
Dichloroethene, cis-1,2-	µg/L	0.1	EPA 8260	09-Apr-10/O	< 0.1	< 0.1		
Dichloroethene, trans-1,2-	µg/L	0.1	EPA 8260	09-Apr-10/O	< 0.1	< 0.1		
Dichloropropane, 1,2-	µg/L	0.1	EPA 8260	09-Apr-10/O	< 0.1	< 0.1		
Dichloropropene, cis-1,3-	µg/L	0.1	EPA 8260	09-Apr-10/O	< 0.1	< 0.1		
Dichloropropene, trans-1,3-	µg/L	0.1	EPA 8260	09-Apr-10/O	< 0.1	< 0.1		
Ethylbenzene	µg/L	0.5	EPA 8260	09-Apr-10/O	< 0.5	< 0.5		
Dichloromethane (Methylene Chloride)	µg/L	0.3	EPA 8260	09-Apr-10/O	< 0.3	< 0.3		
Methyl Ethyl Ketone	µg/L	10	EPA 8260	09-Apr-10/O	< 10	< 10		



Michelle Dubien
 Lab Supervisor

M.D.L. = Method Detection Limit
 Site Analyzed=K-Kingston, W-Windsor, O-Ottawa, P-Peterborough, M-Moncton

The analytical results reported herein refer to the samples as received. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

C.O.C.: C13382

REPORT No. B10-08677

Report To:

Geologic Inc.
 347 Pido Road Unit 29
 Peterborough, ON, K9J 6X7

Attention: Bruce Selman

Caduceon Environmental Laboratories

160 Charlotte St. Suite 206
 Peterborough, Ontario, K9J 2T8
 Tel: 705-748-1506
 Fax: 705-748-6514

DATE RECEIVED: 07-Apr-10

JOB/PROJECT NO.: Roseglen

DATE REPORTED: 09-Apr-10

P.O. NUMBER: G022881E1

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Client I.D.:	T6 - W1	T1 - W1		
Sample I.D.:	B10-08677-1	B10-08677-2		
Date Collected:	07-Apr-10	07-Apr-10		

Parameter	Units	M.D.L.	Reference Method	Date/Site Analyzed				
Styrene	µg/L	0.5	EPA 8260	09-Apr-10/O	< 0.5	< 0.5		
Tetrachloroethane,1,1,1,2-	µg/L	0.1	EPA 8260	09-Apr-10/O	< 0.1	< 0.1		
Tetrachloroethane,1,1,2,2-	µg/L	0.4	EPA 8260	09-Apr-10/O	< 0.4	< 0.4		
Tetrachloroethylene	µg/L	0.2	EPA 8260	09-Apr-10/O	< 0.2	< 0.2		
Toluene	µg/L	0.5	EPA 8260	09-Apr-10/O	< 0.5	< 0.5		
Trichlorobenzene,1,2,4-	µg/L	0.2	EPA 8260	09-Apr-10/O	< 0.2	< 0.2		
Trichloroethane,1,1,1-	µg/L	0.1	EPA 8260	09-Apr-10/O	< 0.1	< 0.1		
Trichloroethane,1,1,2-	µg/L	0.1	EPA 8260	09-Apr-10/O	< 0.1	< 0.1		
Trichloroethylene	µg/L	0.1	EPA 8260	09-Apr-10/O	< 0.1	< 0.1		
Vinyl Chloride	µg/L	0.2	EPA 8260	09-Apr-10/O	< 0.2	< 0.2		
Xylene, m,p-	µg/L	1.0	EPA 8260	09-Apr-10/O	< 1.0	< 1.0		
Xylene, o-	µg/L	0.5	EPA 8260	09-Apr-10/O	< 0.5	< 0.5		
PHC F1 (C6-C10)	µg/L	50	CWS Tier 1	08-Apr-10/K	< 50	< 50		
Comment-purgeable	-		-	08-Apr-10	-	-		
PHC F2 (>C10-C16)	µg/L	50	MOE TPH-E3397A	09-Apr-10/K	< 50	< 60	¹	
PHC F3 (>C16-C34)	µg/L	500	MOE TPH-E3397A	09-Apr-10/K	< 500	< 600	¹	
PHC F4 (>C34-C50)	µg/L	500	MOE TPH-E3397A	09-Apr-10/K	< 500	< 600	¹	
Comment-extractable	-		-	09-Apr-10	-	-		

¹ Note: Elevated MDL due to low sample volume.



Michelle Dubien
 Lab Supervisor

M.D.L. = Method Detection Limit
 Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,P-Peterborough,M-Moncton

The analytical results reported herein refer to the samples as received. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.