

**MOE GUIDELINE D-4 ASSESSMENT
PROPOSED ABBOTTS RESIDENTIAL DEVELOPMENT
LANSDOWNE STREET
THORNBURY, ONTARIO**

for

MS. TAMMY ABBOTTS



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PML Ref.: 19CF012
Report: 2
November 2019

November 11, 2019

PML Ref.: 19CF012
Report: 2

Ms. Tammy Abbotts
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Dear Ms. Abbotts

**MOE Guideline D-4 Assessment
Proposed Abbotts Residential Development
Lansdowne Street
Thornbury, Ontario**

Peto MacCallum Ltd. (PML) is pleased to present the results of the geoenvironmental study conducted to complete a Ministry of the Environment (MOE) Guideline D-4 Assessment for the Proposed Abbotts Residential Development property (referred to herein as the 'Site'). Authorization for the work described in this report was provided by Ms. Tammy Abbotts in the signed Engineering Services Agreement Revised, dated June 18, 2019.

It is understood that Ms. Abbotts is planning a residential development for the 205 m by 51 m wide parcel of land on the east side of Lansdowne Street in Thornbury. The proposed concept plan includes 22 attached townhouse units, all fronting on a proposed single lane road (one-way), connecting Lansdowne Street and Huron Street. The Site covers an approximate plan area of 1.1 ha. A closed waste disposal site (landfill), MECP Inventory Number X 2090 is located southwest of the Site at the corner of Huron Street and Lansdowne Street. The County of Grey and The Town of Blue Mountains Official Plan requires the application of the MOE D-4 Guideline (Land Use On or Near Landfills and Dumps) for proposals for land use changes on or near operating or non-operating landfills.

This MOE Guideline D-4 Assessment was conducted to evaluate the potential for impact on the Site from the former landfill, in order to determine if there will be any adverse effects to the proposed residential development.

Drawing 2-1 shows the Site involved in the study in relation to the landfill.

The results of this MOE Guideline D-4 Assessment indicate there is not a concern of significant adverse affects from the landfill on the proposed residential development at the Site.

It is noted that an additional round of methane gas level readings from all three monitoring wells on-Site is required during frozen conditions. Once the second round of methane gas levels are collected, a separate letter will be issued. In the event that methane levels or any other concerns are raised during the additional monitoring, modifications to our conclusions and/or recommendations in this report may be required



We trust the information presented in this report is sufficient for your present purposes. If you have any questions, please do not hesitate to contact our office.

Sincerely

Peto MacCallum Ltd.

A handwritten signature in blue ink, appearing to read 'Melissa King'.

Melissa King, P. Geo., QP_{ESA}

Associate

Discipline Head, Geoenvironmental and Hydrogeological Services

JR/MAK:jlb/tc



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1. INTRODUCTION

Peto MacCallum Ltd. (PML) is pleased to present the results of the geoenvironmental study conducted to complete a Ministry of the Environment (MOE) Guideline D-4 Assessment for the Proposed Abbotts Residential Development property (referred to herein as the 'Site'). Authorization for the work described in this report was provided by Ms. Tammy Abbotts in the signed Engineering Services Agreement Revised, dated June 18, 2019.

It is understood that Ms. Abbotts is planning a residential development is proposed for the 205 m by 51 m wide parcel of land on the east side of Lansdowne Street in Thornbury. The proposed concept plan includes 22 attached townhouse units, all fronting on a proposed single lane road (one-way), connecting Lansdowne Street and Huron Street. The Site covers an approximate plan area of 1.1 ha. A closed waste disposal site (landfill), MECP Inventory Number X 2090 is located southwest of the Site at the corner of Huron Street and Lansdowne Street. The County of Grey and The Town of Blue Mountains Official Plan requires the application of the MOE D-4 Guideline (Land Use On or Near Landfills and Dumps) for proposals for land use changes on or near operating or non-operating landfills. The MOE D-4 Guideline Assessment (D-4 Assessment) is a guideline to investigate and evaluate the potential for adverse environmental impacts to development within 500 m of the waste footprint of a landfill.

Drawing 2-1 shows the Site involved in the study in relation to the landfill.

A Geotechnical Investigation was carried out concurrently for the Site and the findings were reported under a separate cover (PML Ref. 19CF012, Report 1). It is also noted that an annual ground water level monitoring program is being completed concurrently and the findings will be issued under a separate letter.



2. TERMS OF REFERENCE

PML conducted this assessment to determine if there will be any adverse effects to the proposed residential development from the landfill, considering the following factors as outlined in Section 4.1 of MOE Guideline D-4:

- landfill gas generation and migration;
- ground water and surface water contamination by leachate;
- odour;
- litter;
- contaminant discharges from associated vehicular traffic;
- visual impact;
- dust;
- noise;
- other air emissions;
- fires;
- surface runoff, and
- vectors and vermin.

The objectives of this study were accomplished by completing the following tasks:

Task 1: Reviewing available documents to assess the landfill history, hydrogeologic conditions and landfill and Site operation and development details.

Task 2: Conducting a site reconnaissance of the Site and landfill to enable documentation of site features (landfill configuration, slopes, drainage, vegetation etc.) as well as land use and drainage features adjacent to the landfill.



Task 3: Installing ground water monitoring wells and obtain ground water and methane gas levels in the monitoring wells in addition to soil and ground water samples.

Task 4: Evaluating the background information and field data to assess the Site and surrounding hydrogeologic conditions. Examining the Guideline D-4 criteria and preparing this report including an interpretation of the data to evaluate impacts to the Site, if any, from the landfill in accordance with the objectives of MOE Guideline D-4.

3. INVESTIGATION METHODOLOGY

The scope of work for this assignment included a review of available documents, attendance at the landfill site and the Proposed Abbotts Residential Development property, clearing public utilities, drilling boreholes, installation of ground water monitoring wells, ground water level and methane gas monitoring, soil and ground water sampling and chemical testing, data compilation and evaluation of the information gathered and preparation of this report, discussing the information compiled and the corresponding conclusions and recommendations.

3.1 Field Work

PML attended the Site on June 21, 2019 to layout borehole/monitoring well locations. Borehole drilling, soil sampling and monitoring well installation was completed on July 30, 2019. PML later attended the closed landfill on October 21, 2019, followed by a visit to the Site.

Five boreholes (BH1 to BH5) were advanced to 6.4 to 6.7 m below ground surface (mbgs). Monitoring wells were installed in BH2, BH3 and BH5. The borehole locations were established in the field by PML as shown on Drawing 2-1, appended.

The boreholes were advanced using continuous flight solid stem augers, powered by a track mounted CME-75 drill rig, equipped with an automatic hammer, supplied and operated by a specialist drilling contractor, working under the full-time supervision of a PML technical staff member. The ground surface elevation at the borehole locations was obtained with a Sokkia



SHC5000 Global Navigation Satellite System (GNSS). Vertical and horizontal accuracy of this unit are 0.1 m and 0.5 m, respectively. Co-ordination for clearances of underground utilities was provided by PML. The boreholes were drilled cognizant of the underground utilities.

The samples were field logged and examined for geoenvironmental classification, placed in laboratory provided airtight amber glass containers and/or methanol vials and stored in an insulated cooler for transportation to our laboratory for additional examination. As well, a portion of each soil sample was placed in a sealed plastic bag for later vapour screening. Particular attention was applied to visual and olfactory evidence of potential contamination such as odours and staining during the course of the field work.

The sampling and sample handling procedures were carried out according to the supporting documents of O. Reg. 153/04, as amended and established standards.

Upon completion of the drilling, three ground water monitoring wells were installed (BH2, BH3 and BH5) using clean 50 mm diameter screened and solid PVC Schedule 40 pipe, well gravel, bentonite, j-plugs, well points and stick-up well protectors. The wells were installed to a depth of 6.1 m and were screened at the bottom over lengths of 3.8 to 4.6 m. The annular space of the borehole around the screen was backfilled with clean filter sand (up to at least 0.3 m above the top of the well screen) followed by a bentonite seal and well protector set in concrete.

The details of the monitoring well construction are shown on the appended Log of Borehole/Monitoring Well sheets.

Water levels were measured in the ground water monitoring wells (BH2, BH3 and BH5), on August 23, September 10 and October 21, 2019 using a Heron™ ground water level reader. Purging and development of the wells was completed on August 23 and October 21, 2019 using a combination of fixed volume purging procedures or well evacuation purging as outlined in ASTM D6452-99 (2012).



Monitoring of methane gas concentrations in the wells on-Site was performed using an RKI Eagle Portable Gas Detector with the aid of a Gilair 5 Pump for purging. The RKI Eagle was calibrated using methane by Argus-Hazco.

3.2 Chemical Testing Protocol

Soiland ground water samples were submitted for chemical analysis to Caduceon Laboratories, a CALA accredited laboratory in Lakefield, Ontario. The chemical analyses conducted by Caduceon were in accordance with the O. Reg. 153/04 Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act dated March 9, 2004, amended as of July 1, 2011.

The rationale for sample selection was based on visual and/or olfactory evidence of potential contamination, zones potentially impacted and general Site coverage. The following table summarizes the samples submitted for analysis.

Location	Sample ID	Approximate Depth (m)	Lithology	Type of Chemical Analysis
Soil				
Borehole 1 Northwest portion of the Site	BH1 SS3	1.5 to 2.0	Clayey Silt	Corrosivity
Borehole/Monitoring Well 2 Northeast portion of the Site	BH2 SS6	4.6 to 5.1	Sand and Silt	Metals and inorganics PHCs, VOCs, PAHs, PCBs
Borehole/Monitoring Well 3 Southwest portion of the Site	BH3 SS6	2.3 to 2.5	Clayey Silt	Metals and inorganics PHCs, VOCs, PAHs, PCBs
Borehole 4 South-central portion of the Site	BH4 SS3	4.6 to 5.1	Silt to Clayey Silt	Corrosivity
Borehole/Monitoring Well 5 Southeast portion of the Site	BH5 SS5	4.6 to 5.1	Sand and Silt	Metals and inorganics PHCs, VOCs, PAHs, PCBs



Location	Sample ID	Approximate Depth (m)	Lithology	Type of Chemical Analysis
Ground Water				
Borehole/Monitoring Well 2 Northeast portion of the Site	BH2 08-23-19 and BH2 10-21-19	Screened 1.5 to 6.1	Silt and sand	Metals and inorganics PHCs, VOCs, PAHs, PCBs, Alkalinity, Chloride, Sodium, Sulphate, Hardness
Borehole/Monitoring Well 3 Southwest portion of the Site	BH3 08-23-19 and BH3 10-21-19	Screened 2.4 to 6.2	Sand and silt	Metals and inorganics PHCs, VOCs, PAHs, PCBs, Alkalinity, Chloride, Sodium, Sulphate, Hardness
Borehole/Monitoring Well 5 Southeast portion of the Site	BH5 08-23-19 and BH5 10-21-19	Screened 1.5 to 6.1	Silt and sand	Metals and inorganics PHCs, VOCs, PAHs, PCBs, Alkalinity, Chloride, Sodium, Sulphate, Hardness

Notes: PHCs = Petroleum Hydrocarbon Fractions F1 to F4; VOCs = Volatile Organic Compounds; PAHs = Polycyclic Aromatic Hydrocarbons; PCBs = Polychlorinated Biphenyls

Based on their common use elsewhere as typical landfill indicator parameters, alkalinity, chloride, sodium and hardness were also tested in the ground water.

4. FINDINGS

4.1 Data Review

PML reviewed the following documents for the data review portion of this assignment.

4.1.1 Environmental Reports

PML was provided an Environmental Impact Study titled "Environmental Impact Study, Thornbury Closed Landfill Site, dated July 2010" for the Town of The Blue Mountains and was completed by R.J. Burnside & Associates Limited (File No. MCO 018503).

The study was conducted to determine if lands within 500 m of the landfill will be environmentally impacted and if lands within 500 m are to be subject to additional studies. The study evaluated



background information and completed test pit excavations with supplemental methane gas monitoring.

A total of seven test pits were excavated to depths of 1.4 to 2.5 mbgs at the landfill site. Soil conditions generally involved silty sand to sandy silt fill that was till-like in local cases. Debris was encountered including bricks, garbage bags, glass, metal, burnt paper, wood, concrete blocks, and paper. An oily odour was noted in three test pits, however was associated with nearby asphalt at two test pits.

Water was encountered in two test pits; however, it was noted that the surficial topsoil layer was saturated and was the source of the water infiltration into the test pit in each case.

Methane gas monitoring was completed by assessing methane release from the sidewalls of two test pits at the north portion of the landfill waste footprint. Methane was not detected in air.

Surface water and ground water flow was anticipated to flow north towards Georgian Bay or on a local scale towards Beaver Creek to the west.

Regarding the location of the Site and zones surrounding the landfill that were determined to require additional landfill studies due to potential landfill impacts, the Site was within 500 m of the landfill and the southwest corner of the Site was included in the potential zones for ground water and landfill gas impacts. Due to being within 500 m of the landfill, an MOE Guideline D4 Assessment is required for development.

4.1.2 MECP FOI Records

After a thorough search by the MECP through the files of the Ministry's Barrie District Office, Investigations and Enforcement Branch, Environmental Monitoring and Reporting Branch, Sector Compliance Branch and Safe Drinking Water Branch, records were not found under the current landfill address 130 King Street in Thornbury, Ontario.



It is noted that a previous FOI request was submitted as part of the Environmental Impact Study for the closed landfill and one letter from the MOE (now MECP) to the Town of The Blue Mountains was found, dated August 13, 2004.

The letter comprised an inspection report completed by the MOE for Closed Waste Disposal Site number X2090 on King Street in The Town of Thornbury. Findings of the inspection identified that leachate control, methane gas control and ground water monitoring programs/systems were not in place, however no anticipation of human health impact, environmental impact or legal environmental impairment was identified. The landfill was being used for aggregate and boat trailer storage.

For ease of reference, the MECP records previously searched as part of the Environmental Impact Study are included in Appendix A.

4.1.3 MOE Waste Disposal Site Inventory

The MOE Waste Disposal Site Inventory, June 1991 indicated that the Site No. X 2090 was located at King and Lansdowne, was closed in 1969 and was classed as an A7 site. Class A7 closed waste disposal sites are rural municipal/domestic waste sites with the potential to impact humans, which have been closed more than 20 years at the time of the inventory record.

4.1.4 Zoning Records

The Town of The Blue Mountains Official Plan Schedule A-2 indicated that the Site is zoned Community Living Area, which includes use for single detached, semi-detached and duplex dwellings, townhouse, multiple and apartment dwellings, accessory apartments in single detached, semi-detached and townhouse dwellings, home occupations, bed and breakfast establishments in single detached dwellings parkettes and neighbourhood parks, day nurseries and institutional uses, special needs housing, private home daycare and other similar uses.



4.1.5 Physiography and Topography

The Site is located within the physiographic region known as the Beaver Creek (Chapman and Putnam, 1984). In the vicinity of the Site the land is characterized as a sand plain that varies from sand to fine silt with some gravelly soils.

Topographic data shown on the Natural Resources Canada online mapping website indicated that the Site ranged from elevation 180 to 190 (metric, geodetic). A drainage ditch is located along the north section of the Site.

According to the previous report by others, the landfill waste footprint is flat on top (elevation 190 +/- m) with steep side slopes.

Georgian Bay is located about 100 m to the north and Beaver Creek is located about 150 m to the west.

4.1.6 Proposed Development Plans

The proposed concept plan includes 22 attached townhouse units, all fronting on a proposed single lane road (one-way), connecting Lansdowne Street and Huron Street. Full-depth basements are being considered for all homes, and based on the grading concept to date, may only be partially buried. The Site will be fully serviced.

A preliminary concept plan is provided for reference in Appendix B.

4.1.7 Geotechnical Investigation Report

A geotechnical investigation was completed by PML for the Site (PML Ref.: 19CF012, Report 1, dated October 16, 2019).

Subsurface soil data and ground water level data was used to supplement the findings of this report in the following sections. Please refer to the geotechnical investigation report for particulars.



4.1.8 Aerial Photographs

Aerial photographs for the years 1938, 1962, 1988 and 2002 were reviewed to confirm the timeline of landfill site development. The aerial photographs showing the approximate landfill site boundaries are shown on Figures B-1 to B-4 in Appendix A as part of the Environmental Impact Study.

The 1938 aerial photograph shows the landfill site generally cleared with minor vegetation present and Beaver Creek crossing at its current location. King Street extended further to the west crossing over Beaver Creek to the south of the landfill. The 1962 aerial photograph shows discolouration at the location of the waste footprint with an increase in vegetation surrounding the discoloured area and the entrance to the landfill was at its current location. The 1988 aerial photograph shows some discolouration across the waste footprint which has expanded since 1962, however this may be from storage use of aggregates and miscellaneous items such as plows or boat cribs after the landfill closed in 1969. The 2002 aerial photograph shows generally similar characteristics as noted during PML's site visit to the closed landfill, except the only use appears to be for aggregate storage.

4.2 Site Reconnaissance

4.2.1 Proposed Abbotts Residential Development Visit

PML attended the Site on October 21, 2019 to document Site conditions in relation to the landfill. The Site was rectangular in shape with residential properties surrounding the Site to the north, east and south with a narrow wooded area (proposed one-lane roadway area) separating the Site from the residential properties to the north and east. Lansdowne Street was located to the west. The Site was vacant with vegetation across the surface. Overall the ground surface at the Site was generally flat with a minor slope down towards the north.

No stressed or strained vegetation and no odours or significant litter was noted during the Site visit. Mulch stockpiles and on-Site debris piles consisting of metal and concrete were noted.



The Site was separated from the landfill by residential dwellings, Lansdowne Street and Huron Street. The landfill was not visible from the Site since residential dwellings and wooded land separated the two. The waste footprint of the landfill was approximately 100 m to the southwest of the Site.

4.2.2 Landfill Site Visit

PML attended the landfill on October 21, 2019 after receiving permission from the Town of The Blue Mountains to enter unaccompanied. Access to the landfill is from King Street at the south-central portion of the landfill property. The landfill property was a rectangular shape with the waste disposal footprint located in the east portion of the property. The waste footprint was generally bounded by Huron Street to the north, Lansdowne Street to the east, King Street to the west and Beaver Creek to the West. A gate and surrounding fence were noted but was in disrepair. The waste footprint area was mainly open and was being used for boat crib storage, municipal plow storage and aggregate storage with one tarped roof structure that was open and not in use.

No stressed or strained vegetation was noted during the landfill site visit, however darkened spots were noted on surficial granular material likely caused from pulverized asphalt falling off of transportation vehicles entering and leaving the landfill. The closed landfill was covered over with soil and/or granular material where boats, plows and stockpiled materials remained, however some debris was noted such as wood, plastic and metal items.

4.3 Sampling and Monitoring Well Installation

4.3.1 Summarized Subsurface Conditions

Reference is made to the appended Drawing 2-1, and Log of Borehole/Monitoring Well Sheets BH1 to BH5 from the Geotechnical Investigation (included in Appendix C) for details of the field work including sampling locations, visual soil classification, inferred stratigraphy, soil vapour concentrations and ground water observations.



Due to the soil sampling procedures and limited sample size, the depth demarcations on the borehole logs must be viewed as "transitional" zones between layers, and cannot be construed as exact geologic boundaries between layers. PML would be pleased to assist in defining soil boundaries in the field during construction, if required.

Topsoil was encountered over a thin layer of fill, over deposits of native silt to clayey silt, silt, sand and silt, silty sand, and local layers of sand and clayey silt. A description of the distribution of the subsurface conditions encountered is provided below.

4.3.1.1 Soil

Fill was at the surface of all boreholes. The fill comprised silty sand to sandy silt with trace gravel and trace organics. The upper 0.5 m had topsoil inclusions and this appears to be related some activity on the site prior to the field work, including the digging of a ditch just beyond the north edge of the site along the proposed road and piling material on the site. The fill extended to 0.7 to 1.4 m depth (elevation 178.6 to 181.3). The material had N Values of 5 to 50 indicating variable compaction when the fill was placed. The fill was moist, with moisture contents of 3 to 9%.

In Borehole 1, below the fill a thin local clayey silt layer was revealed from 1.4 to 1.6 m depth (elevation 178.4 to 178.6). The material was hard (N Value 48) and considered drier than plastic limit. Underlying the clayey silt layer, a thin sand layer was present from 1.6 m depth to 2.0 m depth (elevation 178.0 to 178.4). The sand was dense (N Value of 48) and wet (moisture content of 15%).

An upper silty sand layer was beneath the fill to 2.1 m depth (elevation 178.9) in Borehole 3. The layer was dense to compact with depth (N Values of 44 and 20) and moist, with water contents of 4% and 7%.

A silt to clayey silt deposit was revealed in all boreholes, except in Borehole 2. The deposit was below fill or local upper layer in Boreholes 1, 3 and 4 and extended to the 6.5 to 6.7 m depth of exploration. In Borehole 5, the silt to clayey silt deposit occurred between 2.9 and 4.0 m depth (elevation 178 to 179.1). The deposit was layered and also had wet sand seams. N Values were



typically above 30 being Hard, locally 20 or 26 and being very stiff. Moisture content ranged from 10 to 19%, typically about plastic limit to drier than plastic limit.

Underlying the silt to clayey silt/silt in Boreholes 2 and 5, a sand and silt unit was encountered to 6.0 m depth (elevation 175.0 to 176.0). The soil was very dense (N Values greater than 50) and wet (moisture contents of 13 to 21%).

Below the sand and silt unit in boreholes 2 and 5, a silty fine sand deposit was encountered to the 6.4 to 6.5 m depth of exploration. The material had N Values greater than 50 showing very dense conditions. The soil was wet with moisture content of 17 to 20%.

4.3.1 Soil Vapour Concentration

The correlation between combustible vapour concentrations and PHCs in soil is highly dependent on the soil type, moisture content and characteristics of the contaminant of concern. The measured concentration on the headspace of recovered soil samples was 0 to 25 ppm (methane response off), which is not considered to be significant.

4.3.2 Methane Gas Concentration

Methane is an odourless, colourless flammable gas that can be formed by the decay of natural material and is common in landfills, marshes, septic systems, sewers and areas with buried organic soils.

Flammability limits (Explosive Limits) are the minimum and maximum concentrations (in air) of a flammable gas or vapour between which ignition can occur. Concentrations below the lower explosive limit (LEL) are too lean to burn, while concentrations above the upper explosive limit (UEL) are too rich and oxygen levels are too low to support combustion. All concentrations between the LEL and UEL are in the explosive range, and special precautions are required to prevent explosion or ignition.



To collect methane gas concentrations from inside the three wells on-Site, ASTM Method D7663-12 (Reapproved 2018) for Active Soil Gas Sampling in the Vadose Zone for Vapor Intrusive Evaluations was used. Monitoring of methane gas concentrations in the wells on-Site was performed using an RKI Eagle Portable Gas Detector with the aid of a Gilair 5 Pump for purging. The RKI Eagle was calibrated using methane by Argus-Hazco. The methane gas concentrations measured in BH2 and BH3 were less than 1% LEL, and was 12% in BH5, as summarized in the following table:

Location	Methane Gas Concentrations (ppm / %LEL)
	October 21, 2019
BH2	35/0.1
BH3	5/0
BH5	6,000/12

Concentrations equal to or greater than the LEL are considered hazardous. To add a margin of safety, the MECP considers that concentrations greater than 20% LEL may be associated with still higher concentrations, exceeding the LEL. Therefore, methane concentrations greater than 20% LEL warn of conditions which could be potentially hazardous, and further investigation may be warranted and/or gas control systems should be designed to maintain concentrations below this level.

An additional visit will be made during the winter months to obtain methane gas concentrations under frozen conditions, in accordance with the MOE D4 Guideline and will be reported under a separate letter.

4.3.3 Ground Water

Upon completion of the boreholes, free water was noted in BH1 to BH5 at 2.7, 2.9, 2.8, 6.1 and 4.0 m depth, respectively. Cave was encountered at 5.5, 3.7, 5.0 and 4.5 m depth in BH1 to BH3 and BH5, respectively. Cave was not encountered in BH4.



The monitoring well screened interval in BH2, BH3 and BH5 was intended to span the ground water surface to allow for methane gas monitoring. Drawing 2-1 shows the monitoring well locations, ground water elevations, interpreted ground water contours and ground water flow direction and the following table provides a summary of the water levels in BH2, BH3 and BH5.

Location	Ground Surface Elevation (m)	Screened Interval Elevation (m)	Ground Water Levels Depth/Elevation (m)		
			Aug. 23, 2019	Sept. 10, 2019	Oct. 21, 2019
BH2	181.00	179.5 to 174.9	2.8/178.2	2.9/178.1	3.2/177.8
BH3	180.85	178.5 to 174.7	2.4/178.5	2.3/178.6	2.3/178.6
BH5	181.65	180.2 to 175.6	2.7/179.0	2.7/179.0	3.0/178.7

Based on PML Site observations and water level measurements, the ground water table underlying at the Site flows down toward the north to northwest, toward Georgian Bay, which is consistent with the surficial topography at the Site.

4.4 Analytical Findings

4.4.1 Applicable Site Condition Standards

In order to determine the Site Sensitivity, Sections 41 and 43.1 of O. Reg. 153/04, as amended were evaluated by PML as described in Table 1A and 1B, appended.

Potable water for the proposed development will be supplied via a piped municipal distribution system, which utilizes a mix of surface water and ground water, however several water supply wells were located within 250 m of the Site and the Site is within an intake protection zone. The Site is not within 30 m of a water body nor is it apart of an Area of Natural Scientific Interest (ANSI) or Natural Heritage System.



Based on the above factors, PML selected the Generic Criteria of the O. Reg. 153/04, Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act dated April 15, 2011. In particular, the Table 2 (T2) Site Condition Standards (SCSs) for residential/ parkland/institutional (RPI) property use were utilized.

The landfill indicator parameters were compared to the Ontario Drinking Water Quality Standards (ODWQS).

4.4.2 Chemical Test Results

Laboratory certificates of analysis compared to the T2 RPI SCSs for soil and ground water, including the QA report are included in Appendix D. The measured values and corresponding SCSs are shown on the certificates of analysis with the levels exceeding the applicable Standards highlighted in red, if applicable.

4.4.2.1 Soil

Based on the results of chemical analysis, the measured concentrations of metals and inorganics, PHCs, VOCs, PAHs and PCBs met the applicable T2 RPI SCSs. Surficial soil samples submitted for corrosivity had a negligible/low potential to be corrosive.

4.4.2.2 Sediment

Not applicable.

4.4.2.3 Ground Water

Based on the results of chemical analysis, the measured concentrations of metals and inorganics, PHCs, VOCs, PAHs and PCBs met the T2 SCSs with the exception of benzo(a)pyrene in sample BH5 08-23-19.



The measured concentrations of hardness, alkalinity, sodium, sulphate and chloride met the ODWQS, with the exception of hardness in BH2, BH3 and BH5 at concentrations of 2,140, 2,210, 2,420 mg/L respectively, which exceeds the recommended range of 80 to 100 mg/L. It is noted however, that the proposed development will be connected to municipal water. Furthermore, limestone bedrock is in the vicinity of the Site according to MECP well records, which may have an impact on the hardness of the ground water (Ontario ground water typically has elevated hardness).

The relative concentrations of the landfill indicator parameters were not elevated in comparison to each other nor was there a pattern of elevated concentrations closer to the landfill.

4.4.2.4 Surface Water

Not applicable.

4.4.3 QA/QC Data

Soil and ground water samples were analysed by using standard reference methods and the testing methods were referenced in Caduceon Environmental Laboratories Certificates of Analysis, as required by the MECP protocol. Laboratory QA/QC data is included with the Certificates of Analysis provided in Appendix D. Laboratory control standard samples, Matrix spike method and duplicate soil samples were analysed by the laboratory and the results of chemical analysis indicated that the recovery ranges were within the statistically determined control limits.



5. DISCUSSION

This D-4 Assessment was conducted to evaluate the potential for impact on the Site from the former landfill located southwest of the Site, in order to determine if there will be any adverse effects to proposed residential development.

5.1 Landfill Gas Generation and Migration

It is our opinion that proposed residential subdivision development is unlikely to be adversely impacted by subsurface migration of combustible gas originating from the landfill site based on the following rationale:

1. The location of the landfill waste disposal footprint is more than 90 m from the Site and there are associated roadways and underground utilities that are likely to act as pathway interceptors.
2. BH2 was located in the southwest corner of the Site at the nearest portion to the landfill and did not contain soil or ground water contamination.
3. Methane gas readings in the monitoring wells were below 20% LEL during PML's methane monitoring visits. It is noted that methane gas levels were not obtained during frozen temperatures at the time of issuing this report, however will be obtained and reported under a separate cover once the ground has frozen.
4. The landfill has been closed for over 50 years.

5.2 Ground Water and Surface Water Contamination by Leachate

It is our opinion that the proposed residential subdivision development is unlikely to be adversely impacted by ground water contamination by leachate based on the following rationale:

1. The results of chemical testing of soil and ground water generally meet the applicable T2 RPI SCSs, with the exception of benzo(a)pyrene (BH5 in the southeast portion of the Site) in ground water. Since there is no evidence of contamination in BH3 (closest to the landfill) and that BH3 separates the landfill



from BH5 where the benzo(a)pyrene exceedance was found, the exceedance is unlikely to be caused by the landfill;

2. Based on the surficial topography of the Site, landfill and surrounding area it is likely that the shallow ground water underlying the landfill, similar to that of the Site, follows the gradient of the ground surface and Beaver Creek. As such the direction of flow of ground water from below the landfill is anticipated to be to the north to northwest, away from the Site;
3. The Site is separated from the landfill by roads and underground utility corridors which may act as pathway interceptors for contaminant movement and preclude movement of contamination toward the Site;
4. No apparent concentration pattern of alkalinity, sodium, sulphate and chloride, which are common landfill indicator parameters was noted that would indicate consistent higher concentrations in upgradient ground water closest to the landfill;
5. The proposed development will not include potable water from wells on-Site, which will instead utilize the municipal water distribution system; and
6. The landfill has been closed for over 50 years.

5.3 Odour

It is our opinion that the proposed residential townhouse development is unlikely to be adversely impacted by odour from the landfill based on the following rationale:

1. No indication of deleterious odours was noted at the Site or landfill during PML's visit.
2. Being that the Site is located between north latitudes 30° and 60° it is anticipated that the wind direction in the vicinity of the Site will be influenced by the Prevailing Westerlies carrying odours east away from the Site.
3. The landfill has been closed for over 50 years.



5.4 Litter

It is our opinion that litter from the landfill is not a concern based on the following rationale:

1. No significant amount of litter was noted at the Site or landfill during PML's visit.
2. The location of the waste footprint is more than 90 m from the Site and is separated by Lansdowne Street and Huron Street.
3. Being that the Site is located between north latitudes 35° and 60° it is anticipated that the wind direction in the vicinity of the Site will be influenced by the Prevailing Westerlies carrying litter east, away from the Site.
4. The landfill is not operating and has been closed for over 50 years.

5.5 Contaminant Discharges from Associated Vehicular Traffic

It is our opinion that the proposed residential subdivision development is unlikely to be adversely impacted by contaminant discharges from associated vehicular traffic from the landfill since the landfill is not operating (closed for over 50 years) with minor usage to access municipal plows and trailers.

5.6 Visual Impact

It is our opinion that the proposed residential subdivision development is unlikely to be adversely impacted by visual impact from the landfill based on the following rationale:

1. The location of the waste footprint is more than 90 m from the Site and is separated by Lansdowne Street and Huron Street.
2. The landfill site is covered with dense bushes/trees and berm surrounds the waste footprint, which provides a visual barrier.
3. The landfill is not operating and has been closed for over 50 years.



5.7 Dust

It is our opinion that the proposed residential subdivision development is unlikely to be adversely impacted by dust from the landfill since the landfill is not operating (closed for over 50 years) with minor usage to access municipal plows and trailers. The landfill is also surrounded by dense bushes/trees acting as a barrier for dust movement.

5.8 Noise

It is our opinion that the proposed residential subdivision development is unlikely to be adversely impacted by noise from the landfill since the landfill is not operating with minimal on-site traffic.

5.9 Other Air Emissions

It is our opinion the proposed residential subdivision development is unlikely to be adversely impacted by other air emissions from the landfill since no air emissions were noted during PML's visit to the Site or the landfill, the landfill is not operating and has been closed for over 50 years.

5.10 Fires

It is our opinion that fires associated with the landfill are not a concern since the landfill is not operating and has been closed for over 50 years.

5.11 Surface Runoff

It is our opinion that the proposed residential subdivision development is unlikely to be adversely impacted by surface runoff from the landfill based on the following rationale:

1. The location of the waste footprint is more than 90 m from the Site and is separated by Lansdowne Street and Huron Street with ditches.
2. Surface runoff from the landfill site is expected to follow the local topography and flow down to the north and west, away from the Site.



3. The landfill is not operating and has been closed for over 50 years.

5.12 Vectors and Vermin

It is our opinion the proposed residential subdivision development is unlikely to be adversely impacted by vectors and vermin from the landfill since the landfill is not operating and has been closed for over 50 years.

5.13 Ground Settlement

It is our opinion the proposed residential subdivision development is unlikely to be adversely impacted by ground settlement from the landfill since the location of the waste footprint is more than 90 m from the Site and ground settlement should be restricted to the landfill property.

5.14 Hazardous Waste

It is our opinion the development area is unlikely to be adversely impacted by hazardous waste from the landfill since the landfill was classified as receiving rural municipal/domestic waste the waste footprint is more than 90 m from the Site and the landfill is not operating and has been closed for over 50 years.

In addition, previous inspection reports indicated that human health impact, environmental impact or legal environmental impairment was not anticipated.



6. CONCLUSIONS AND RECOMMENDATIONS

This MOE Guideline D-4 Assessment was conducted to evaluate the potential for impact on the Site from the former landfill, in order to determine if there will be any adverse effects to the proposed residential development.

The results of this MOE Guideline D-4 Assessment indicate there is not a concern of significant adverse effects from the landfill on the proposed residential development at the Site.

It is noted that an additional round of methane gas level readings from all three monitoring wells on-Site is required during frozen conditions. Once the additional round of methane gas levels are collected, a separate letter will be issued. In the event that methane gas levels or any other concerns are raised during the additional monitoring, modifications to our conclusions and/or recommendations in this report may be required.

It should be noted soil and ground water conditions between and beyond the sampled locations may differ from those encountered during this assignment. PML should be contacted if impacted soil conditions become apparent during future development to further assess and appropriately handle the materials, if any, and evaluate whether modifications to the conclusions documented in this report are necessary.

The assignment is subject to the Statement of Limitations that is included in Appendix E and must be read in conjunction with this report.



We trust the information presented in this report is sufficient for your present purposes. Please do not hesitate to contact our office should you have any questions.

Sincerely

Peto MacCallum Ltd.

A handwritten signature in blue ink, appearing to read "Joel Robinson", is positioned above the printed name.

Joel Robinson, BSc, EPt, G.I.T.
Project Supervisor
Geoenvironmental and Hydrogeological Services



Melissa King, P.Geo., QP_{ESA}
Associate
Discipline Head, Geoenvironmental and Hydrogeological Services

JR/MAK:jb/tc



TABLE 1A
Site Sensitivity Analysis
Site Condition Standards, Environmentally Sensitive Areas
Section 41, Ontario Regulation 153/04, as amended

Criteria	Decision for the Site
41. (1) This section applies in relation to a property if,	
(a) the property is within an area of natural significance, includes or is adjacent to an area of natural significance or part of such an area, or includes land that is within 30 m of an area of natural significance or part of such area;	No
(b) the soil at the property has a pH value as follows: (i) for surface soil, less than 5 or greater than 9, (ii) for subsurface soil, less than 5 or greater than 11;	No
(c) a qualified person is of the opinion that, given the characteristics of the property and the certifications the qualified person would be required to make in a record of site condition in relation to the property as specified in Schedule A, it is appropriate to apply this section to the property.	No

In Section 41 (1) (a) above, "area of natural significance" means any of the following:

1. A provincial park designated by a regulation under the *Provincial Parks Act*.
2. A conservation reserve established under the *Public Lands Act*.
3. An area of natural and scientific interest (life science) identified by the Ministry of Natural Resources as having provincial significance.
4. A wetland identified by the Ministry of Natural Resources as having provincial significance.
5. An area designated by a municipality in its official plan as environmentally significant, however expressed, including designations of areas as environmentally sensitive, as being of environmental concern and as being ecologically significant.
6. An area designated as an escarpment natural area or an escarpment protection area by the Niagara Escarpment Plan under the *Niagara Escarpment Planning and Development Act*.
7. A habitat of endangered or threatened species identified by the Ministry of Natural Resources.
8. Property within an area designated as a natural core area or natural linkage area within the area to which the Oak Ridges Moraine Conservation Plan under the *Oak Ridges Moraine Conservation Act, 2001*.



TABLE 1B

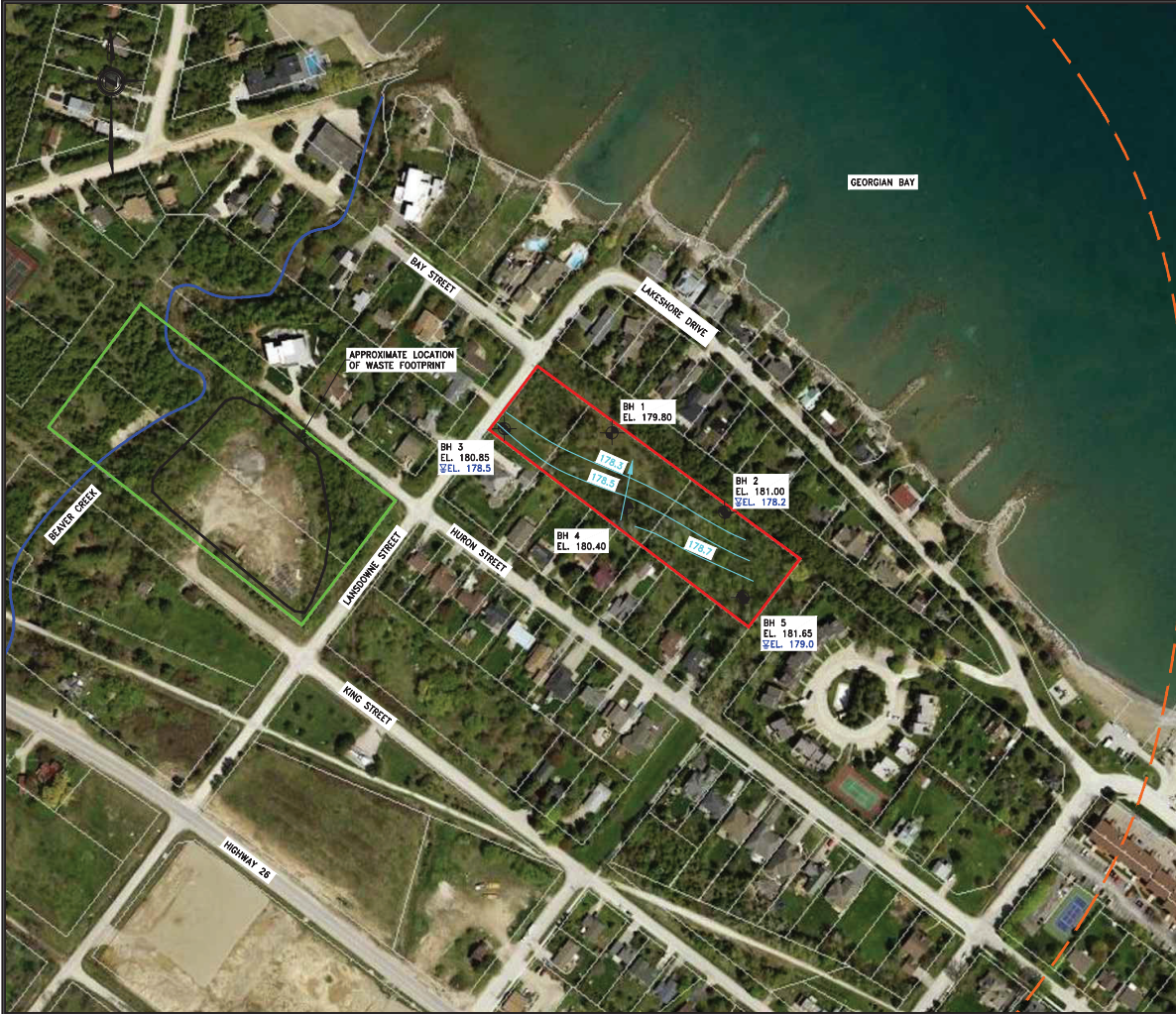
Site Condition Standards, Shallow Soil or Water Body
Section 43.1, Ontario Regulation 153/04, as amended

Criteria	Decision for the Site
43.1. (1) This section applies in relation to a property if,	
(a) the property is a shallow soil property; or	No
(b) the property includes all or part of a water body or is adjacent to a water body or includes land that is within 30 metres of a water body.	No

In Section 43.1 (1) (a) above:

"shallow soil property" means a property of which 1/3 or more of the area consists of soil equal to or less than 2 metres in depth beneath the soil surface, excluding any non-soil surface treatment such as asphalt, concrete or aggregate;

"soil" means, for the purposes of the definition of shallow soil property, unconsolidated naturally occurring mineral particles and other naturally occurring material resulting from the natural breakdown of rock or organic matter by physical, chemical or biological processes that are smaller than 2 millimetres in size or that pass the US #10 sieve, and includes a mixture of soil and rock if less than 50 per cent by mass of the mixture is rock. O. Reg. 511/09, s. 21.

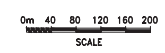


KEY PLAN
THORNBURY, ONTARIO

- LEGEND:
- SITE LIMITS
 - THORNBURY CLOSED LANDFILL SITE
 - 500 m FROM THORNBURY CLOSED LANDFILL SITE
 - 178.7 INFERRED GROUND WATER ELEVATION CONTOUR (AUGUST 23, 2019)
 - INFERRED GROUND WATER FLOW DIRECTION
 - BH 1 EL. 179.80 BOREHOLE 1 SURFACE ELEVATION
 - BH 2 EL. 181.00 BOREHOLE 2 (WITH MONITORING WELL) SURFACE ELEVATION

NOTE:
GROUND WATER LEVELS OBTAINED ON AUGUST 23, 2019.

REFERENCE:
BASE PLAN PRODUCED FROM GIS INFORMATION FROM THE COUNTY OF GREY INTERACTIVE MAPPING SYSTEM.



SITE PLAN

MECP GUIDELINE D4 STUDY
PROPOSED ABBOTTS RESIDENTIAL DEVELOPMENT
LANSDOWNE STREET
THORNBURY, ONTARIO

Peto MacCallum Ltd.
CONSULTING ENGINEERS

DRAWN	JR	DATE	SCALE	PML REF.	DRAWING NO.
CHECKED	MAK	NOV. 2019	AS SHOWN	19CF012	2-1
APPROVED	MAK				

LIST OF ABBREVIATIONS



PENETRATION RESISTANCE

Standard Penetration Resistance N: - The number of blows required to advance a standard split spoon sampler 0.3 m into the subsoil. Driven by means of a 63.5 kg hammer falling freely a distance of 0.76 m.

Dynamic Penetration Resistance: - The number of blows required to advance a 51 mm, 60 degree cone, fitted to the end of drill rods, 0.3 m into the subsoil. The driving energy being 475 J per blow.

DESCRIPTION OF SOIL

The consistency of cohesive soils and the relative density or denseness of cohesionless soils are described in the following terms:

<u>CONSISTENCY</u>	<u>N (blows/0.3 m)</u>	<u>c (kPa)</u>	<u>DENSENESS</u>	<u>N (blows/0.3 m)</u>
Very Soft	0 - 2	0 - 12	Very Loose	0 - 4
Soft	2 - 4	12 - 25	Loose	4 - 10
Firm	4 - 8	25 - 50	Compact	10 - 30
Stiff	8 - 15	50 - 100	Dense	30 - 50
Very Stiff	15 - 30	100 - 200	Very Dense	> 50
Hard	> 30	> 200		
WTLL	Wetter Than Liquid Limit			
WTPL	Wetter Than Plastic Limit			
APL	About Plastic Limit			
DTPL	Drier Than Plastic Limit			

TYPE OF SAMPLE

SS	Split Spoon	ST	Slotted Tube Sample
WS	Washed Sample	TW	Thinwall Open
SB	Scraper Bucket Sample	TP	Thinwall Piston
AS	Auger Sample	OS	Oesterberg Sample
CS	Chunk Sample	FS	Foil Sample
GS	Grab Sample	RC	Rock Core
	PH	Sample Advanced Hydraulically	
	PM	Sample Advanced Manually	

SOIL TESTS

Qu	Unconfined Compression	LV	Laboratory Vane
Q	Undrained Triaxial	FV	Field Vane
Qcu	Consolidated Undrained Triaxial	C	Consolidation
Qd	Drained Triaxial		



Appendix A

Environmental Impact Study

Thornbury Closed Landfill Site



BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

Environmental Impact Study Thornbury Closed Landfill Site

Prepared By:

R.J. Burnside & Associates Limited
15 Townline Orangeville ON L9W 3R4

Prepared for:

Town of The Blue Mountains

July 2010

File No: MCO 018503

The material in this report reflects best judgement in light of the information available at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions made based on it, are the responsibilities of such third parties. R.J. Burnside & Associates Limited accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

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 - A-1 Test Pit Logs
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 - A-3 Site Photographs
- B Historical Air Photos
- C Natural Environment Features Summary
 - C-1 Existing Natural and Socio-Economic Environment
 - C-2 Breeding Bird Atlas Summary
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 - D-2 Town of Blue Mountain Records
 - D-3 MOE Water Well Records Summary
 - D-4 Waste Disposal Sites Inventory

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1.0 Introduction and Background

R.J. Burnside & Associates Limited was retained by the Town of The Blue Mountains to complete an Environmental Impact Study for the two inactive landfills within the municipality, the Thornbury Closed Landfill Site and the Clarksburg Closed Landfill Site (Site). This work was undertaken because the Town of The Blue Mountains is experiencing pressure for increased development. The Official Plans for both the County of Grey and the Town of The Blue Mountains dictate that an assessment be required prior to the development of lands within 500 m of an active or inactive landfill site. A new comprehensive Zoning By law is currently under development such that all lands within 500 m of a closed or active landfill site will be subject to a holding provision. This Holding (H) provision can only be lifted once a study has been prepared by a qualified engineer, and submitted for review in accordance with Ministry of the Environment (MOE) Guideline D-4. A D-4 study must demonstrate that the lands proposed for development are secure from potential methane gas and or leachate migration. If an impact is interpreted, then the remedial measures or conditions will need to be identified prior to development approval being granted.

This report details the results of the Environmental Impact Study for the Thornbury Closed Landfill Site (Site). Site location details are presented in Figure 1 (Site Location Plan), Figure 2 (Regional Plan), and Figure 3 (Site Plan).

The Scope of Work was completed as outlined in our proposal entitled "*Consulting Services to Undertake an Environmental Impact Study Pertaining to Two Inactive Landfills, TBM-2010-12-P-BPL, Detailed Workplan*", April 2010, with minor modifications at the request of the client as the work progressed.

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2.0 Methodology

2.1 Scope and Objectives

The main purpose of this study is to evaluate the Thornbury Closed Landfill Site (Site) and determine whether lands within the 500 m radius of the Site can have the Holding (H) provision lifted. In order to do so, an Environmental Impact Study (EIS) needs to be completed to identify areas potentially affected by leachate and landfill gas migration (beyond the landfill property).

The Request for Proposal (RFP) Addendum 1, issued by the Town of The Blue Mountains on March 23, 2010 specifically states that there was to be no intrusive drilling or monitoring well installations as part of this work plan. Test pits could be excavated only to delimit the extent of waste. The Addendum also clarifies that no environmental reports have previously been issued for the Site. There are no monitoring wells or gas probes present at the Site.

The following work was completed at the Thornbury Closed Landfill Site:

1. Collection of readily available information
2. Test pit excavation to outline the fill area
3. Assessment of Site conditions and potential impact areas
4. Documentation of the results in a report.

2.2 Collection of Background Information

In order to determine whether the Holding (H) Provision can be lifted within 500 m of the Site, the following data sources were reviewed:

- Information available at both the upper and lower tiered municipality (i.e. Official Plans, files, historical records, air photographs, etc.) to determine historical land use
- Geological mapping such as drift thickness, quaternary geology, bedrock topography, bedrock geology, groundwater susceptibility mapping
- Soil Survey of Ontario mapping
- Freedom of Information request to the Ministry of the Environment for relevant information
- Regional groundwater reports that include the study area, if available
- Water well records in the vicinity of the Site
- Ontario Base Mapping to identify surface water features and interpret shallow groundwater flow directions
- Historical air photos to compare changes in land use over time and determine possible limits of fill (disturbed areas)
- Niagara Escarpment Plan

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- Natural Heritage Information Centre database (rare species records and natural areas inventory)
- Federal Species at Risk database (mapping of SAR habitat range)
- Ontario Breeding Bird Atlas
- Conservation Ontario/Department of Fisheries and Oceans mapping of aquatic species at risk
- Grey-Sauble Conservation Authority documents and studies (e.g. watershed studies and watershed report cards).

The information obtained from the above sources have been compiled and relevant information has been incorporated into this report.

2.3 Test Pit Excavation

Prior to breaking ground, underground utility locates were obtained by MultiVIEW Geoservices Inc., a private locating company, to secure public locates. A total of seven test pits were excavated around and within the fill area on May 27, 2010. A backhoe was provided by the Town of The Blue Mountains and Burnside field staff documented subsurface conditions encountered at each test pit location. The test pit locations are presented in Figure 3 and the soil descriptions are presented in the test pit logs in Appendix A-1. The test pit logs detailed: the presence/absence of waste; the nature of the waste; subsurface soil conditions; and, shallow groundwater conditions. Representative soil samples were collected from the test pits and two samples were submitted for grain size analysis (Appendix A-2).

Photographs taken during the Site investigation are presented in Appendix A-3.

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3.0 Results

3.1 Document Search

3.1.1 Town of The Blue Mountains Official Plan

Section 8.19 of the Town of The Blue Mountains Official Plan (March 2007) details setback buffer requirements for Sewage Treatment Plants and Landfill Sites.

Paragraph (2) states: *"Existing and known former landfill sites are shown on Appendix Map E [provided herein in Appendix D-2]. Land uses and development proposed within the 500 m buffer surrounding a closed or open landfill site...shall be required to undergo an evaluation of their susceptibility to impact such as methane and leachate".*

Paragraph (3) states: *"All land uses and development proposed within the buffer setbacks identified under paragraphs (1) and (2) shall be subject to a relevant study submitted for review by the County and Town to address the current and future impacts, and to assess appropriate design, buffering and separation distances, in conformity with the Ministry of the Environment guidelines and information requirements. Implementation of the study's recommendations may be required under an agreement between the proponent and the Municipality."*

The main purpose of this report is to determine whether these requirements can be removed from all or portions of the land within 500 m of the Thornbury Closed Landfill Site.

3.1.2 Town of The Blue Mountains Historical Information

The Town of The Blue Mountains has very little information their files regarding the Site. A copy of the same MOE inspection report summarized later in the Section 3.1.3 was on file along with two D-4 Studies completed in the vicinity of the Site.

Henderson Paddon & Associates Limited completed a report entitled *"Guideline D-4 Study Proposed Lora Bay Heights Townhouse Development, Thornbury, Ontario"*, dated August 2005. The proposed Lora Bay Heights Townhouse Development located approximately 140 m southwest of the waste fill area at the northeast corner of Peel Street and Highway 26 (August 2008). The report concluded there was no potential for environmental impacts (e.g. from surface water/groundwater contamination, visual impacts, soil contamination, landfill gas) to the proposed development from the former landfill site. There was no need identified for ongoing monitoring or the installation of

Environmental Impact Study
Thornbury Closed Landfill Site

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control devices for the proposed development based on the presence of the Thornbury Closed Landfill Site.

Henderson Paddon & Associates Limited completed a report entitled "*Guideline D-4 Study and Methane Monitoring, Proposed Townhouse Development, Thornbury, Ontario*", dated February 2008. The proposed townhouse development was located immediately east of the Site at the northeast corner of King Street West and Lansdown Street North (February 2008). Groundwater and surface water impacts from the landfill were interpreted to flow toward Nottawasaga Bay (Georgian Bay) away from the proposed development therefore impacts were not expected, however, groundwater sampling would be required to verify this. Soil impacts from the landfill on the proposed development were not expected. The potential for methane gas migration onto the proposed development was investigated with the installation of 5 shallow monitoring wells. Methane gas was measured on five occasions between July 25, 2006 and February 15, 2008. Methane gas was not detected in any of the monitors. The water table was encountered at depths ranging from 0.3 m to 2.2 m. Methane gas was interpreted to migrate in the upper 2 to 3 m of soils. A swale along the west side of the proposed development site was interpreted by the author to provide a venting feature in the event of lateral gas migration from the landfill Site. The report made the following conclusions:

- Confirmation of groundwater flow direction at the Site and characterization of groundwater quality would require installation and sampling of water wells. Consideration should be given to adding a restrictive clause to the development agreement prohibiting installation of groundwater wells
- Potential surface water contamination from the former landfill is not anticipated to impact the site
- There was no evidence of impacts from methane in landfill gas on the Matesa Property nor are such impacts anticipated.

3.1.3 Ministry of the Environment

3.1.3.1 Freedom of Information

The MOE Regional Inventory of Closed Waste Disposal Sites, South-western Region documents that the Thornbury Closed Landfill Site (MOE Site Number: X2090) was closed in 1969. An FOI request was made to the Ministry of the Environment (MOE) to obtain information in their files regarding the Site. The FOI request revealed a letter from the MOE addressed to the Town of The Blue Mountains dated August 13, 2004. The letter detailed the results of an MOE inspection of the Site conducted on July 8, 2004. A copy is presented in Appendix D-1. The 2004 inspection indicated that the Site was being used for aggregate storage and storage of a large number of boat cribs which was

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considered, by the MOE, as a reasonable use for the Site given that it had been closed for more than 25 years. The inspection did not reveal any non-compliance issues. The inspection recommended that a Closure Plan be provided for the Site (in accordance with Ontario Regulation 232) and that the Municipality register the Site on title as a closed waste disposal site (in accordance with Section 197 (2) of the Environmental Protection Act). The inspection also recommended that the Closure Plan include a plan to re-vegetate part or all of the Site to prevent run off.

3.1.3.2 Groundwater Susceptibility

The Site falls within Zone 4, with respect to groundwater susceptibility. This zone is described as follows, *"There is generally high susceptibility to contamination in this area. Most of the surficial soils consist of sand with minor amounts of gravel, and these materials often form aquifers that are unprotected from surface contaminants. Most of the area is flat lying (sand plain) and contaminants that reach groundwater are likely to remaining at shallow depths"*.

Areas immediately south of the Site fall within Zone 6a, where the susceptibility to groundwater is considered variable, however *"since there are no significant shallow aquifers the potential for contaminating major groundwater resources is small"* (Map S100).

3.1.4 Air Photo Search

Historical air photos were reviewed for the Site and surrounding areas. Air photos for 1938, 1962, 1988, and 2002 are included in Appendix B. The historical photographs revealed the following:

- In 1938, the Site was vacant with sparse vegetation. There were no obvious disturbed areas of fill
- In 1962, a small fill area was visible, and the north and west portions of the Site were well vegetated
- In 1988, the fill area appeared vegetated with trees in the northern and western portions of the Site
- In 2002, the fill area was similar to 1988, however, the ground surface is disturbed and is interpreted to be similar to existing conditions.

3.2 Physical Setting

The Thornbury Closed Landfill Site is situated on the north Side of King Street West, between Lansdown Street North and Beaver Creek.

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The gated Site entrance is along King Street West. A soil berm surrounds most of the fill area creating a visual buffer around the site. The fill area is generally level from the entrance and has been covered with soil fill. There are stockpiles of asphalt, mulch, soils, concrete, wooden skids along the northern portion of the site. Several boats and boat cribs line the inside of the berm. Ground surface drops off significantly (more than 3 m in some areas) at the edge of the waste towards Beaver Creek to the west and Huron Street West to the north. Photographs taken during a Site walk over on April 21, 2010 are provided in Appendix A-3.

The Site and surrounding area are situated in the Beaver Valley Physiographic Region. The Beaver Valley is described by Chapman and Putnum (1984) as a well defined region stretching from Flesherton in the south to Thornbury in the north. The geology is complex and includes the following landforms: lake plains, beaches, moraines, steep valley sides, and vertical cliffs. The surficial geology of the Site and surrounding area is shown in Figure 2. The Site is situated on a combination of swamp deposits in the eastern portions, alluvial deposits along Beaver Creek, glaciolacustrine clayey to sandy silt deposits to the south, sandy silt till deposits to the west of Beaver Creek, and glaciolacustrine sand between the Site and Georgian Bay. It is interpreted that the areas designated as Zone 4 on the groundwater susceptibility map (S100) refer to the glaciolacustrine sand deposits documented north of the Site rather than soils on the actual landfill property. The waste is situated on finer grained soils more likely associated with Zone 6a, where groundwater susceptibility to contamination is variable and the potential of impacting a major aquifer is small.

3.3 Surface Water Features

There are two main surface water features in the vicinity of the Site: Georgian Bay located 200 m to the north and Beaver Creek located on the Site along the western edge of the fill area. Beaver Creek is situated in a well defined channel and drains northerly into Georgian Bay.

No leachate seeps were observed discharging from the Site. There was, however, a small swale that drained the northwest corner of the fill area. The swale was dry at the time of the field investigation. Some dark staining was evident on the soils lining the top portions of the swale. The staining was interpreted to be the result of surface water mixing with the asphalt stockpiles situated on top of the waste.

3.4 Natural Features

A summary of the natural features in the vicinity of the Site are described in Appendix C. The following terms were taken into consideration: natural heritage features, rare and

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designated flora and fauna species, wildlife and wildlife habitats, aquatic environment in order to assess development implications.

Portions of the Site and the immediate vicinity are characterized by significant and potentially significant natural heritage and natural hazard features, including:

- The floodplain of the Beaver River
- Potential steep slopes of the Nipissing Ridge
- Woodlands
- Potential habitat for endangered and threatened species
- Potential significant wildlife habitat, including habitat for species of conservation concern and habitat for area-sensitive species.

Fish habitat is not present on the Site but is present in the nearby Beaver Creek. Any development that requires discharge of stormwater or other substances into the Beaver Creek will require consideration for fish communities and fish habitat.

Prior to development on the Site and surrounding areas, the following additional work is recommended:

- A permit from the GSCA, in association with development in a hazard-regulated area (if applicable). This may require floodplain or other hazard-related studies to support the permit application, and
- A detailed Environmental Impact Study ("EIS") is required prior to development. The EIS should include:
 - Field investigations to confirm the presence or absence of significant features
 - An analysis to demonstrate that no negative impacts to the feature or its ecological functions will result from the proposed development.

3.5 Soil Conditions

Seven test pits were excavated on the Site on May 27, 2010. The locations are shown in Figure 3 and the test pit logs are provided in Appendix A-1. Native silt till-like soils were encountered at TP1, TP2 and TP7. These soils were used as a fill over the waste at TP5 located in the northern portions of the fill area. Water laid silt textured soils were encountered at TP3 and TP4 in the south-eastern quadrant of the Site.

3.6 Groundwater Conditions

3.6.1 Water Table

It is assumed that Georgian Bay represents the minimum local water table level at an elevation of approximately 176.8 metres above sea level (masl). It is assumed that the

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water table, in the vicinity of the Site, would not be lower than the level in Georgian Bay. It is more likely that the water level at the Site is higher than the water level in Georgian Bay and similar to the base of Beaver Creek along the west edge of the fill area. Shallow groundwater is interpreted to flow northerly toward Georgian Bay with some localized flow toward Beaver Creek. The groundwater conditions encountered in the test pits excavated on the Site are summarized below.

Table 3.1 Summary of Test Pit Conditions

Test Pit ¹	Groundwater Conditions	Estimated Water Table Elevation
TP1 (185 masl)	Water table below 2.5 m	>182.5
TP2 (187 masl)	Water table below 2.3 m	>184.7
TP3 (183 masl)	Perched water in topsoil at surface Grey at 1.0m	182
TP4 (184 masl)	Perched water in topsoil at surface, Grey at 1.0m	183
TP5 (190 masl)	Water table below 2.5 m	
TP6 (190 masl)	Water table below 2.0 m	>188
TP7 (190 masl)	Water table below 1.5 m	>188.5

Notes:

Ground surface elevations were estimated based on topography presented on the Ontario Base Maps (1:10,000 scale) in conjunction with field observations. The test pit elevations were not surveyed. masl indicates metres above sea level

Ground surface elevations at the Site vary from 183 masl (in the northeast corner) up to 190 masl (near the Site entrance). It is estimated that the water table is greater than 2.5 metres below ground level (mbgl) in the waste and 1 m bgl north of the waste along Huron Street West.

Water levels documented as part of a D-4 Study for a townhouse development proposed east of the Site indicate that the water table was in the order of 2 mbgl in areas immediately east of the Site (Henderson Paddon, 2008).

In summary, it is interpreted that the highest possible water level at the Site would be 2 mbgl (188 masl) and the lowest water table level would be 176.8 masl. The actual water table in the waste is likely closer to 183 masl (based on conditions at TP4) and the base of Beaver Creek.

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3.6.2 Groundwater Flow

The hydraulic conductivity (K) for the two dominant soil types present at the Site estimated as follows:

Silt Till, sandy to clayey – 1×10^{-7} m/s

Lacustrine Silt - 1×10^{-8} m/s

If the highest water table level is assumed to be in the order of 188 masl (at least 2 mbgl in the waste) at the Site and the water table at Georgian Bay (located 200 m north) is assumed to be 176.8 m (Ontario Base Mapping scale 1:10,000) then the resulting gradient (i) would be a maximum of 0.06m/m.

Using the Darcy relationship $v=Ki/n$

Where

K= hydraulic conductivity (1×10^{-7} m/s)

i = gradient (0.06)

n = porosity of (0.3 estimated)

It is estimated that groundwater flows at a maximum rate of 0.6 m/year toward Georgian Bay. At this rate, contaminants could have migrated at least 24 m from the Site since it was closed in 1969 (recognizing that contaminants have been moving from the Site since it was opened years prior to 1969). The glaciolacustrine sand north of the site would allow for more rapid movement of contaminants. Therefore, it is expected that contaminants have likely moved further than 24 m since the Site was opened.

3.7 Methane Gas Conditions

Methane gas readings were collected from the sidewalls of each test pit upon completion. The readings are documented in the test pit logs (Appendix A-1). Methane gas was not detected in the soils at any of the test pit locations.

Methane gas readings were also collected (by others) on several occasions from standpipes installed as part of a D-4 Study for a townhouse development proposed east of the Site (Henderson Paddon, 2008). No methane gas was detected.

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4.0 Impact Assessment

4.1 Groundwater Impacts

Precipitation that falls on a landfill either runs off the waste as surface water or infiltrates into the waste. The portion of water that enters the waste depends on site specific conditions such as surface grading, soil permeability, and vegetation. Water that infiltrates into the waste causes contaminants to leach into the water percolating through it. The resulting mixture is referred to as leachate. The top surface of the fill area is relatively flat with steep side slopes along Beaver Creek and Huron Street West. Under these conditions it is expected that infiltration would be moderately high. Leachate generated from the waste will flow downward into the water table where it will migrate laterally in the direction of groundwater flow (i.e. toward the north with some flow expected toward Beaver Creek to the west).

The extent of groundwater impacts cannot be known without installing groundwater wells and sampling groundwater quality in the vicinity of the Site. It is inferred that groundwater impacts would most likely occur north/northwest of the Site based on interpreted groundwater flow directions. Some local radial effects could also be expected if water table mounding has occurred in the waste, driving shallow groundwater in all directions away from the waste. This would be expected assuming that the infiltration into the waste footprint is greater than the infiltration out of the waste into the underlying soil.

The Ministry of the Environment, Reasonable Use Policy Guideline B-7 (RUP) outlines that a landfill cannot degrade the groundwater quality on an adjacent property by more than 50 percent of the difference between background water quality and the water quality required for use of that property for non health related parameters, and 25% for health related parameters as outlined in the Ontario Drinking Water Standards (ODWS). This can be represented by the formula:

$$C_m = C_b + X(C_r - C_b)$$

Where:

C_m = the maximum concentration of a particular contaminant that would be acceptable in the groundwater beneath the adjacent property.

C_b = the background concentration of the particular contaminant in the groundwater before affected by the landfill. (0 mg/L conservatively assumed in this case).

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Cr = the maximum concentration of the particular contaminant that should, according to provincial water management policy, be present in the groundwater. (The ODWS is 250 mg/L for chloride).

X = 25 percent for health related parameters, 50 percent for non-health related parameters. Chloride is a non-health related parameter therefore X would be 50 percent (0.5).

Thus:

$$\begin{aligned}C_m &= C_b + X(C_r - C_b) \\&= 0 + 0.5(250 - 0) \\&= 125 \text{ mg/L}\end{aligned}$$

The maximum allowable concentration of chloride at the Site boundary according to the RUP would therefore be 125 mg/L. It is estimated that contaminants from the Site (in this case chloride) could migrate up to 320 m in the direction of groundwater flow before concentrations would be reduced to levels below RUP. This estimate is based on the following assumptions:

- Chloride levels in the waste are assumed to be 500 mg/L (which is reasonable given the size and age of the Site)
- The waste fill area occupies a total of 6,427 m² and has a width of 90 m in the direction of groundwater flow
- Infiltration would be slightly higher in the waste than into the native soil downgradient of the Site.

Based on the generalized assumptions listed above, a potential impact zone to groundwater are shown for the area around the Site in Figure 6. The potential impact zones includes an area downgradient of the Site to a distance of 320 m in the direction of groundwater flow as well as a 100 m buffer around the Site to account for possible mounding effects driving groundwater in other directions (i.e. toward the east and south). More detailed groundwater impact zones cannot be delineated around the Site based on the information collected to date.

4.2 Surface Water Impacts

A small, dry, swale, originating at the northwest corner of the waste fill area was black stained with an oily odour in areas closet to the fill. Beaver Creek is located immediately west of the waste fill area and actually transects the landfill property discharging into Georgian Bay. If Beaver Creek represents the water table with shallow groundwater discharging to the creek, there is a potential for the landfill to impact surface water

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quality in the creek. Given that the swale is typically dry, and that the creek has some natural assimilative capacity, it is possible that contributions from the landfill could be too small to measure. Surface water sampling would be required to confirm whether there is a measureable impact on surface water from the Site.

Potential impact zones to surface water are shown in Figure 6 along Beaver Creek from the south edge of the Site down to where Beaver Creek discharges to Georgian Bay.

4.3 Methane Gas Impacts

This Site has been closed for 41 years. Some of the waste was burned before it was buried (TP6) while some was simply buried in place (TP5 and TP6). If the Site was closed in 1969, it infers that most of the waste at the Site has been emplaced and decomposing for more than 40 years. Mild "oily" odours were noted at TP5 and TP6 indicative of continued waste decomposition in some portions of the fill area even though methane gas was not detected during excavation.

The deep Beaver Creek channel, to the west of the fill area could represent the water table and limit the migration of methane gas from the Site toward the west. Ground surface also drops north of the fill area. If the grey soils (1 metre below ground surface at TP3) are assumed to represent the groundwater table to the north of the waste then this also could limit the northerly migration of methane gas. Based on surface topography and inferred water table levels, methane gas would predominantly migrate south and east of the fill area.

As a general guideline, it assumed that methane gas migrates a maximum distance equivalent to ten times the depth to water in the waste. Beyond that distance impacts are unlikely. Three scenarios were considered for estimating the lateral distance landfill gas could travel away from the Site. Details are presented in the following table.

Table 4.1 Methane Gas Migration Scenarios

Scenario	Assumptions	Depth to Water Table in Waste	Estimated Lateral Distance of Methane Gas Migration (m)
1	Assumes water table equivalent to Georgian Bay	13.2 mbgl (190 -176.8 masl)	132
2	Water table m at 1 m below ground surface at TP3	8 mbgl (190-182 masl)	80
3	Water table at 2.2 m as documented in D-4 Study (Feb 2008)	2.2 mbgl	22

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Scenario 1 is the worst case where the water table is the deepest. Scenario 2 is the most likely situation based on the conditions encountered in the test pits excavated on Site. Scenario 3 is also possible, however, water was not found in any of the test pits excavated within the fill area suggesting a deeper water table at the Site. Without Site-specific information regarding methane gas levels and water table elevations a more definitive estimate of potential impact distances and area is not possible.

For planning purposes, it can be assumed that methane would likely not migrate more than 150 m from the Site. A 150 m buffer incorporates a safety margin in the absence of more detailed Site-specific information. It is also assumed that Beaver Creek represents a natural water barrier preventing gas from migrating west of Beaver Creek. These areas would retain their Holding (H) provisions. Areas beyond the potential methane impact zone could have the Holding (H) provisions lifted. This zone is shown on Figure 6.

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5.0 Conclusions

The following conclusions are presented, based on the results of this study.

Groundwater

Leachate generated from the waste will flow downward into the water table where it will migrate laterally in the direction of groundwater flow (i.e. toward the north with some flow expected toward Beaver Creek to the west).

Some local radial effects could also be expected if water table mounding has occurred in the waste, driving shallow groundwater in all directions away from the waste. This would be most notable if the rate of infiltration into the waste is greater than the infiltration into the native soils.

Although groundwater flow rates are interpreted to be slow at the Site restricting the migration of contaminants, the actual subsurface conditions can only be determined through Site specific investigations.

For groundwater a potential impact zone has been delineated up to 320 m downgradient of the Site and 100 m from the Site in other directions. A more detailed (i.e. concise) impact zone cannot be delineated without more Site-specific information.

Surface Water

If Beaver Creek represents the water table with shallow groundwater discharging to the creek there is a potential for the landfill to impact surface water quality in the creek. For surface water a potential impact zone has been identified along Beaver Creek from the south edge of the Site to the discharge point in Georgian Bay. A more detailed (i.e. concise) impact zone cannot be delineated without more Site-specific information.

Landfill Gas

For planning purposes, it can be assumed that methane would likely not migrate more than 150 m from the Site and will not migrate west of Beaver Creek assuming that the creek represents the water table in the vicinity of the Site.

Natural Environment Features

Portions of the Site and surrounding lands are characterized by significant and potentially significant natural heritage and natural hazard features, including:

- The floodplain of the Beaver River
- Potential steep slopes of the Nipissing Ridge
- Woodlands

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- Potential habitat for endangered and threatened species
- Potential significant wildlife habitat, including habitat for species of conservation concern and habitat for area-sensitive species.

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6.0 Recommendations

The following recommendations are presented based on the results of this study.

In order to better define potential impact zones around the Site, the following work is recommended:

- Installation of shallow monitoring wells upgradient (south), within and downgradient (north/northwest) of the waste (screens should straddle the water table, if possible)
- Installation of one deeper well downgradient of the Site to determine whether contaminants are migrating into deeper zones
- Collection of landfill gas measurements at all well locations
- Collection of water levels
- Collection of groundwater quality samples.

The Potential Impact Zones identified in Figure 6 for groundwater, surface water and landfill gas incorporate a safety margin in the absence of more detailed Site specific information. Areas within these zones would retain their Holding (H) provisions. Areas beyond these zones could have the Holding (H) provisions lifted.

Exceptions to the above noted holding provisions could be accommodated on a case by case basis so as to permit the reconstruction or replacement of existing dwellings, additions and alterations to existing dwellings and the construction of accessory buildings.

With respect to the Natural Environment, the following additional work is recommended prior to development on the Site and surrounding areas:

- Obtain a permit from the GSCA, in association with development in a hazard-regulated area (if applicable). This may require floodplain or other hazard-related studies to support the permit application, and
- Conduct a detailed Environmental Impact Study ("EIS") prior to development of the Site. The EIS should include:
 - Field investigations to confirm the presence or absence of significant features
 - An analysis to demonstrate that no negative impacts to the feature or its ecological functions will result from the proposed development.

Environmental Impact Study
Thornbury Closed Landfill Site

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7.0 Study Limitations and Use of Report

R. J. Burnside & Associates Limited (Burnside) has conducted this study in accordance with generally accepted standards and field practices. The conclusions and recommendations in this report are professional opinions, based upon visual observations and limited analytical results for the Site conditions existing at the time of our assessment.

To the best of our knowledge, the information contained in our report is accurate, however, Burnside does not guarantee the accuracy and reliability of the information provided by other persons or agencies, and does not claim responsibility for undisclosed or non-visible environmental concerns that may result in costs for environmental clean-up or remediation.

This report was prepared for the exclusive use of The Town of The Blue Mountains. Any use of, reliance on, or decisions based on this report by a third party, is the responsibility of such third parties. Burnside accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

This report is respectfully submitted by:

R.J. Burnside & Associates Limited

Kim Hawkes, P. Eng.

July 29, 2010

Date

Jim Walls, P.Geo.

July 29, 2010

Date

July 2010

8.0 References

Chapman L.J., and Putnam D.F, (1984). The Physiography of Southern Ontario, Ontario Geological Survey, Special Volume 2, 270p. Accompanied by Map P.2715 (coloured) scale 1:600,000.

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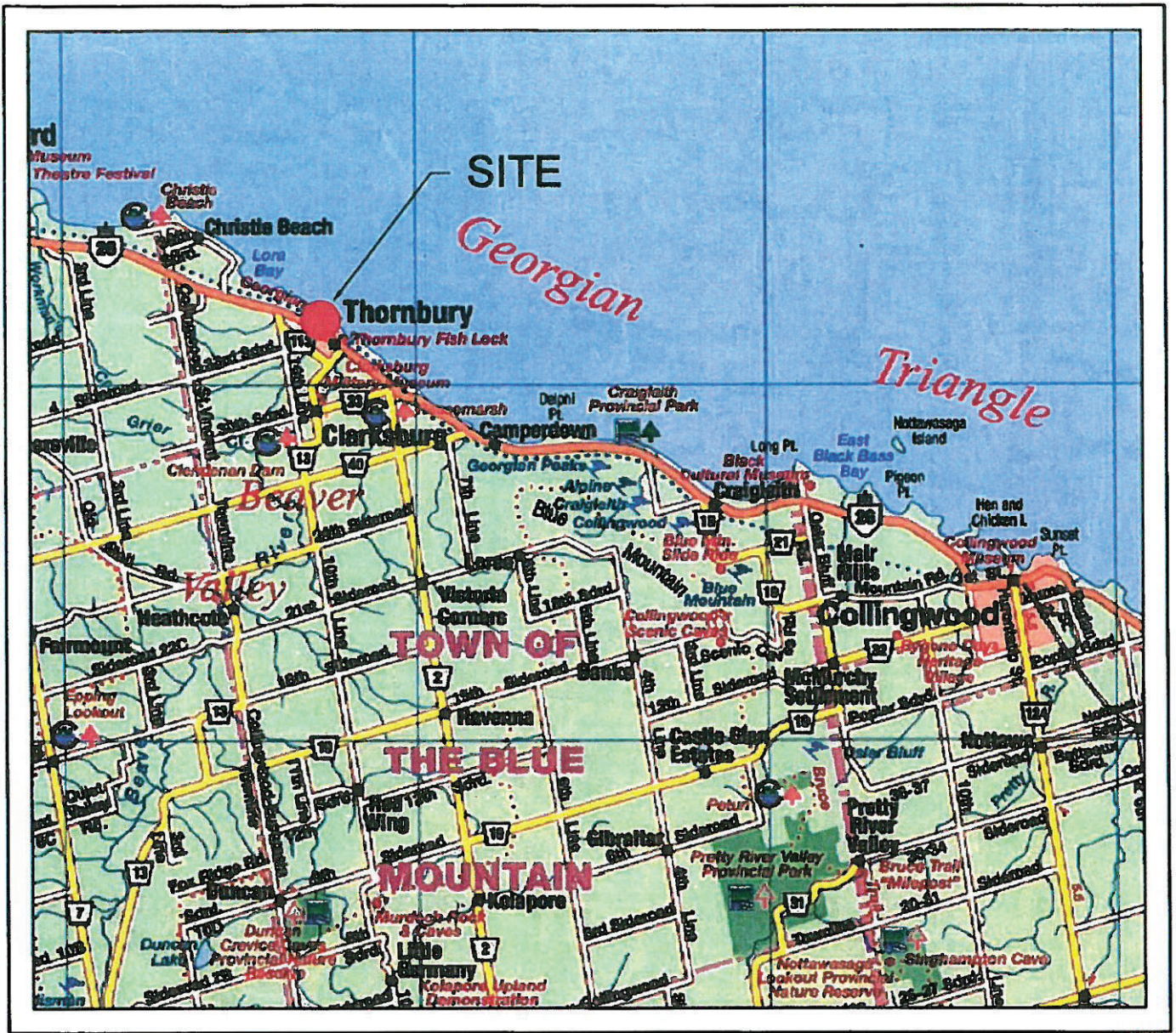
Town of The Blue Mountains, (2007).Official Plan of the Town of The Blue Mountains, March 2007.



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Figures



Map Reference:
Map Art Publishing
Ontario Road Atlas

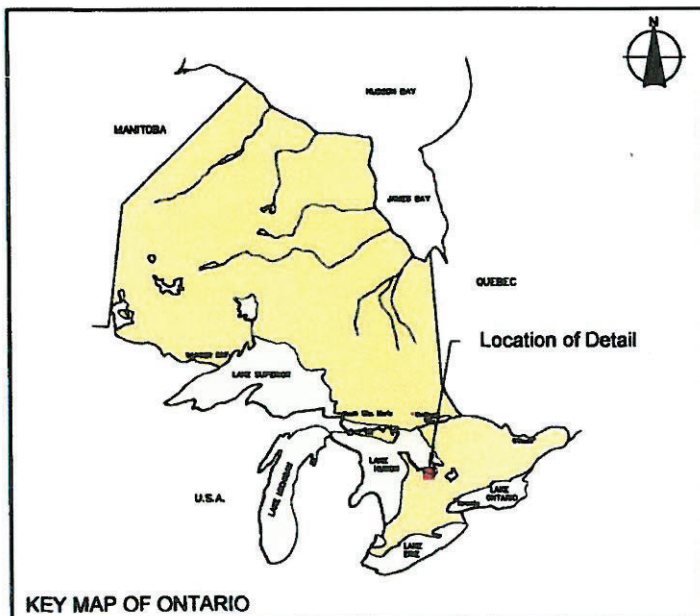


FIGURE 1 - SITE LOCATION MAP TOWN OF THE BLUE MOUNTAINS THORNBURY CLOSED LANDFILL

ENVIRONMENTAL IMPACT STUDY

May 2010

Project Number: MCO018503

Prepared by: C. Sheppard

Verified by: K. Hawkes



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MCO018503 THORNBURY ENVIRONMENTAL IMPACT SL.dwg

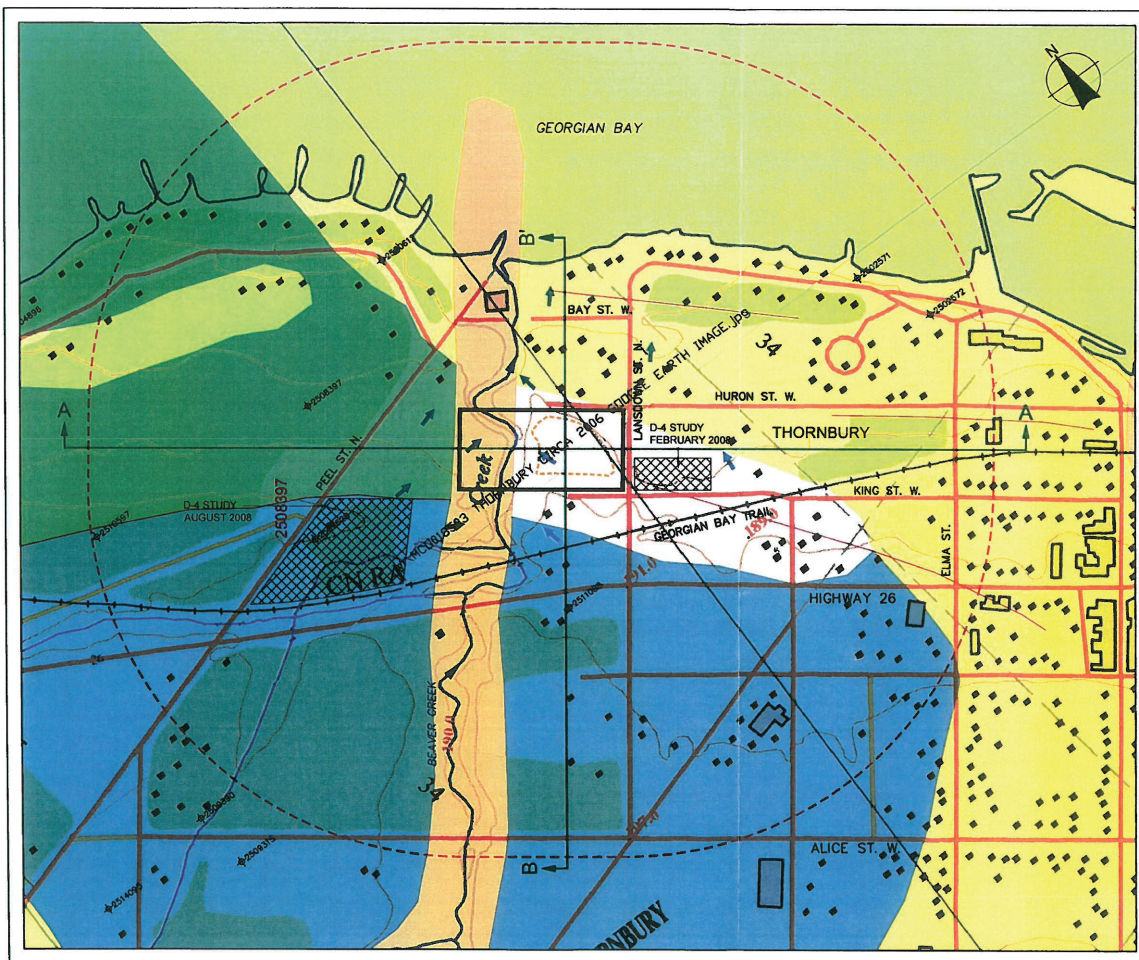


FIGURE 2
TOWN OF THE BLUE MOUNTAINS
THORNBURY CLOSED LANDFILL
ENVIRONMENTAL IMPACT STUDY
REGIONAL PLAN WITH
SURFICIAL GEOLOGY

LEGEND

- APPROXIMATE SITE OUTLINE
- - - 500m SITE BUFFER
- - - APPROXIMATE OUTLINE OF DISTURBED AREA
- 2502570 MOE WELL LOCATION & DESIGNATION (Location determined using MOE well record data)
- INTERPRETED SHALLOW GROUNDWATER FLOW DIRECTION
- SURFACE WATER FLOW DIRECTION
- SANDY SILT TILL
- MODERN ALLUVIUM sand & silt
- GLACIOLACUSTRINE sand, minor fine gravel
- GLACIOLACUSTRINE silt, clayey to sandy
- SWAMP DEPOSITS mud, muck & peat
- D-4 STUDY AREA (Henderson Paddon & Associates Limited, 2008)

Map Source:
 Background 1:10,000 Ontario Base Map obtained from First Base Solutions.
 Quaternary Geology data sources:
 1. Ontario Geological Survey 2003, Surficial Geology of Southern Ontario, Ontario Geological Survey, Miscellaneous Release-Data 128.
 2. Ontario Geological Survey, 1987, Quaternary geology, seamless coverage of the province of Ontario, Ontario Geological Survey, RLS-LS Data Set 14, ISBN0-778-6310-X.
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0 50 100 150 200 250 300 350 400
 Metres

1:5,000
 May 2010
 Project Number: MCO018503
 Prepared by: C. Sheppard
 Projection: UTM Zone 17
 Datum: NAD83
 Verified by: K. Hawkes



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Map File: 2010-05-20-11-12.dwg

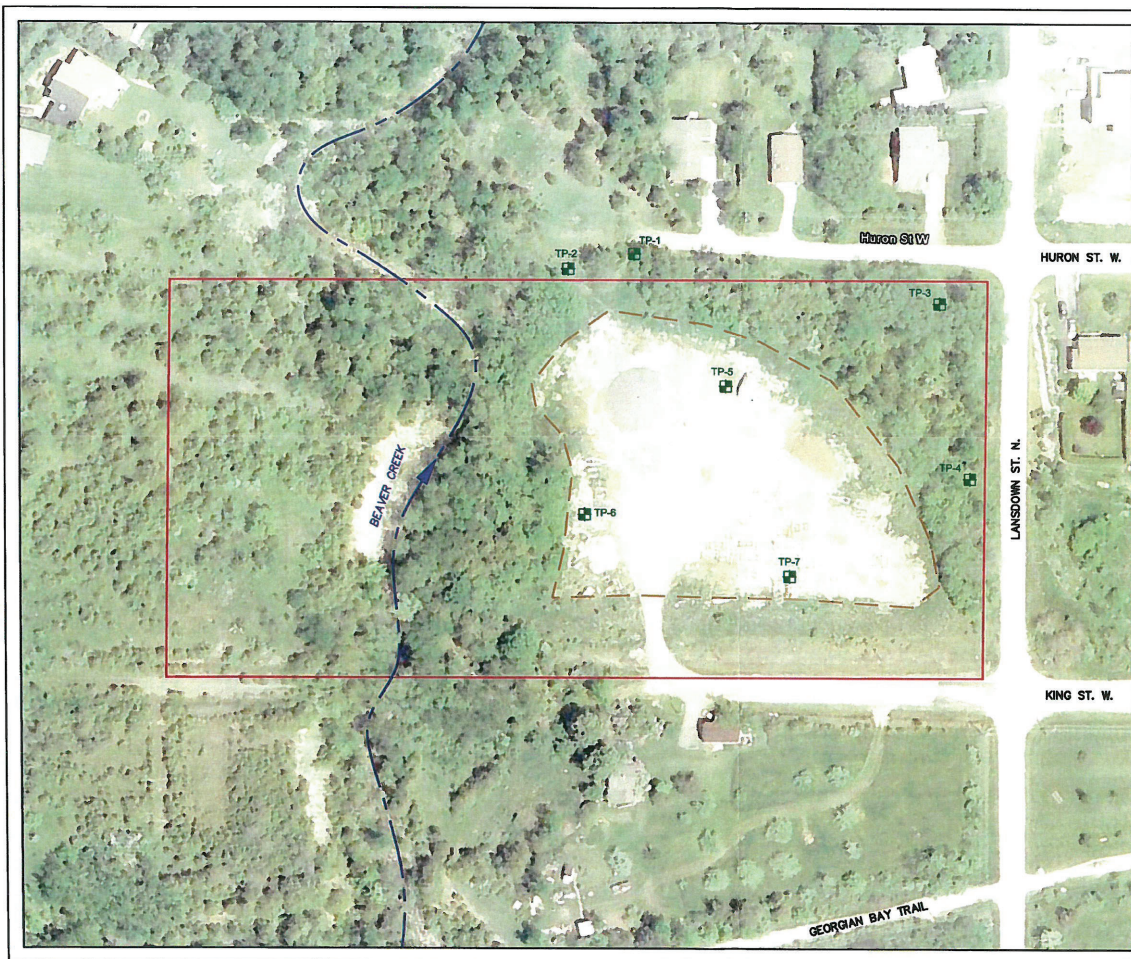


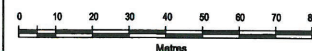
FIGURE 3
TOWN OF THE BLUE MOUNTAINS
THORNBURY CLOSED LANDFILL
ENVIRONMENTAL IMPACT STUDY

SITE PLAN

LEGEND

- APPROXIMATE SITE OUTLINE
- APPROXIMATE OUTLINE OF DISTURBED AREA (INFERRED WASTE LIMIT)
- TP-1 ■ TEXT PIT LOCATION
By Burnside, May 2010
- ▶ SURFACE WATER FLOW DIRECTION

Map Source:
 Background circa 2008 air photo obtained from Google Earth Professional.



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 May 2010
 Project Number: MCO018503
 Prepared by: C. Sheppard

Projection: UTM Zone 17
 Datum: NAD83
 Verified by: K. Hawkins



MCO018503 THORNBURY ENVIRONMENTAL IMPACT STUDY

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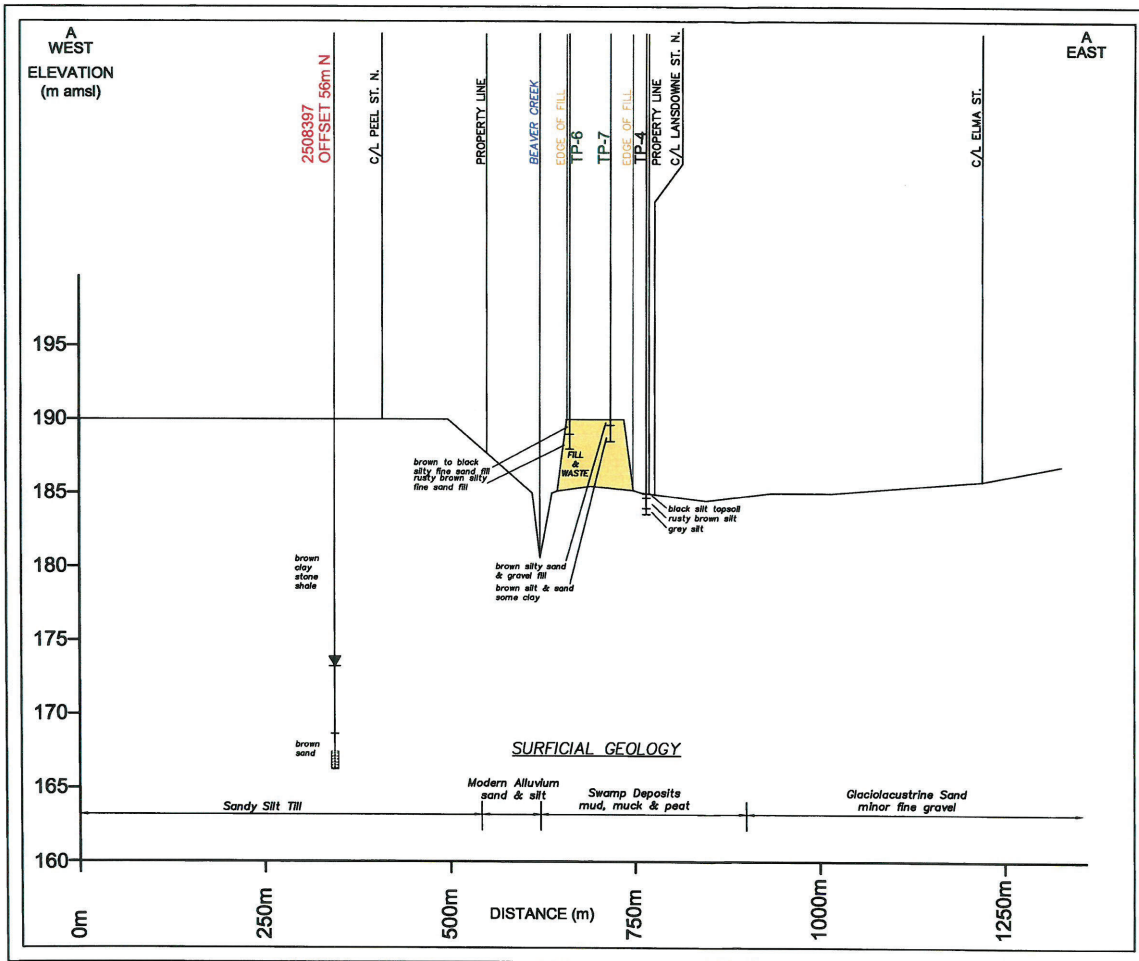
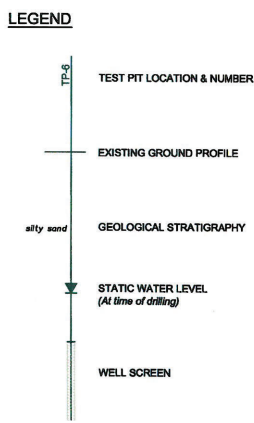


FIGURE 4
 TOWN OF THE BLUE MOUNTAINS
 THORNBURY CLOSED LANDFILL
 ENVIRONMENTAL IMPACT STUDY

CROSS-SECTION A-A



Horizontal Scale 1:5,000
 Vertical Scale 1:250
 Vertical Exaggeration 20x
 July 2010
 Project Number: MCO018503
 Prepared by: C. Sheppard Verified by: K. Hawkes



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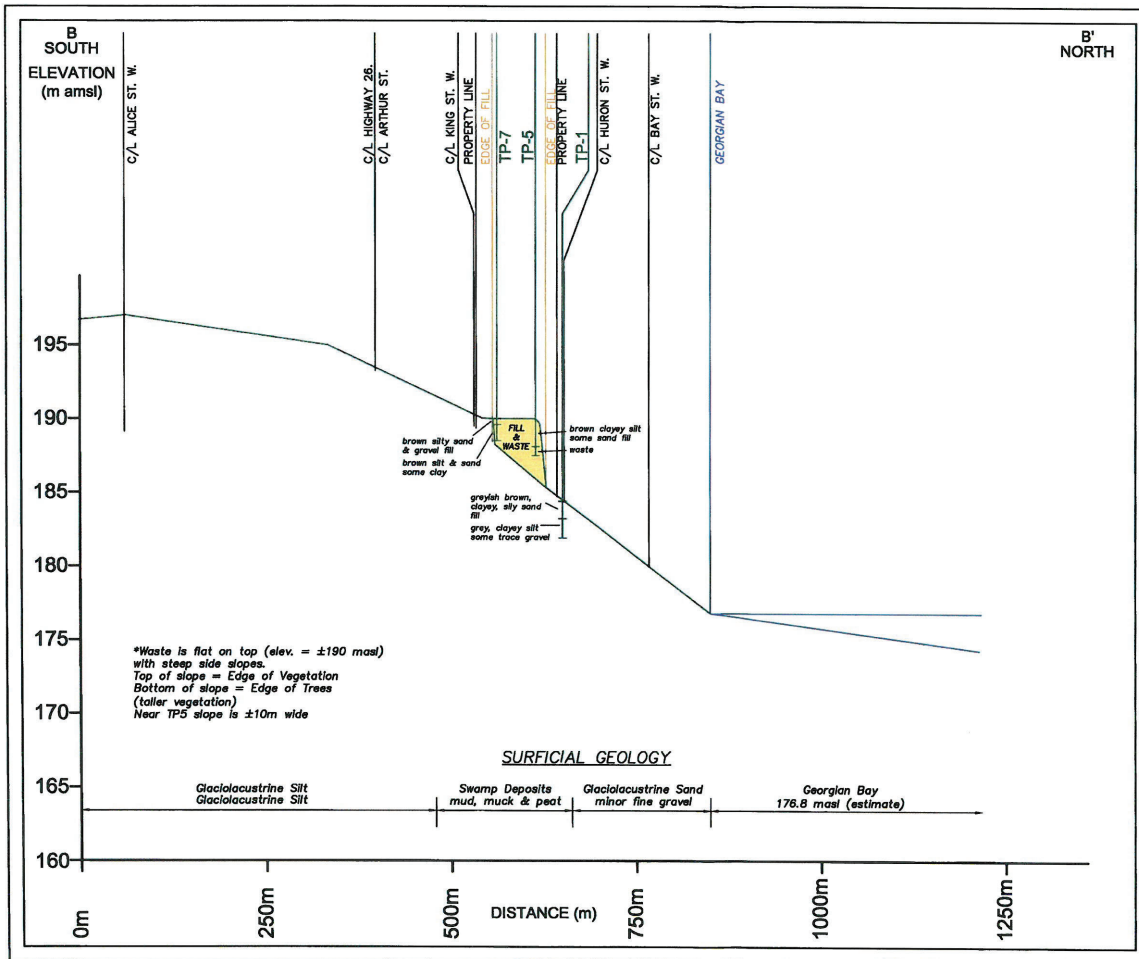
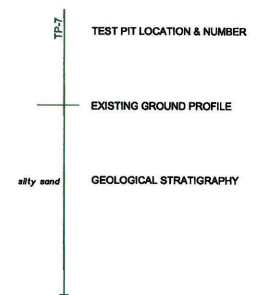


FIGURE 5
TOWN OF THE BLUE MOUNTAINS
THORNBURY CLOSED LANDFILL
ENVIRONMENTAL IMPACT STUDY

CROSS-SECTION B-B

LEGEND



Horizontal Scale 1:5,000
Vertical Scale 1:250
Vertical Exaggeration 20x

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Project Number: MCO018503

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Verified by: K. Hawkes



MCO018503 THORNBURY ENVIRONMENTAL IMPACT X280.dwg

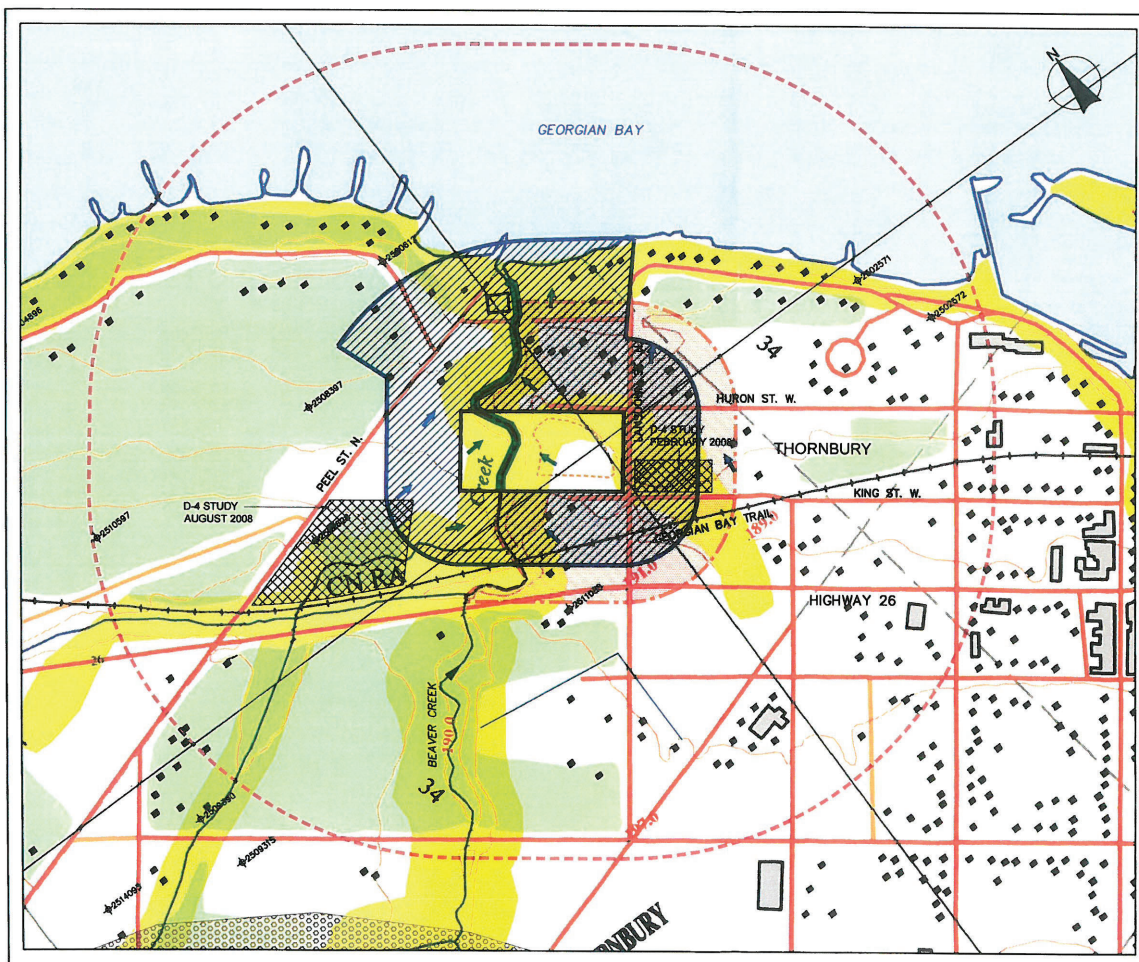


FIGURE 6
TOWN OF THE BLUE MOUNTAINS
THORNBURY CLOSED LANDFILL
ENVIRONMENTAL IMPACT STUDY

**POTENTIAL
IMPACT ZONES**

LEGEND

- APPROXIMATE SITE OUTLINE
- - - 500m SITE BUFFER
- - - APPROXIMATE OUTLINE OF DISTURBED AREA / INFERRED WASTE LIMIT
- MOE WELL LOCATION & DESIGNATION (Location determined using MOE well record data)
- INTERPRETED SHALLOW GROUNDWATER FLOW DIRECTION
- SURFACE WATER FLOW DIRECTION
- ▨ D-4 STUDY AREA (Henderson Paddon & Associates, Limited, 2008)
- ▨ POTENTIAL SURFACE WATER IMPACT ZONE
- ▨ POTENTIAL GROUNDWATER IMPACT ZONE
- - - POTENTIAL LANDFILL GAS IMPACT ZONE
- ▨ REGULATED AREAS FOR DEVELOPMENT, INTERFERENCE WITH WETLANDS, AND ALTERATIONS TO SHORELINES AND WATERCOURSES, ONTARIO REGULATION 151/06 - GSCA
- ▨ DEER WINTERING GROUNDS

Map Source:
Background 1: 10,000 Ontario Base Map obtained from First Base Solutions
Quaternary Geology data sources:
1. Ontario Geological Survey 2003, Surficial Geology of Southern Ontario, Ontario Geological Survey, Miscellaneous Release—Data 128
2. Ontario Geological Survey, 1997, Quaternary geology, seamless coverage of the province of Ontario, Ontario Geological Survey, ERUS Data Set 14, ISBN 0-7788-6310-X
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Metres

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May 2010
Project Number: MCO018503
Prepared by: C. Sheppard
Projection: UTM Zone 17
Datum: NAD83
Verified by: K. Hawkes

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Appendix A

Field Data



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Appendix A-1

Test Pit Logs

Test Pit Logs

Thornbury Site

TP1 ***Near South Edge of Fill Area***

0 to 1.2 m	Greyish brown, clayey, silty sand fill, gravel, cobbles, and boulders throughout, roots, blocky, moist
1.2 to 2.5 m	Grey, silty sand to sandy silt, some clay, occasional gravel, blocky, mottled orange, moist (till-like)

Notes:

- Several boulders and cobbles at surface making excavation difficult
- The test pit was excavated into the slope such that north face was 2.5 m deep and south face was 1.2 m deep
- No sloughing
- No water entering test pit
- Gas readings in open test pit:
 - CH₄ – 0 % (volume in air)
 - CO₂ – 0%
 - O₂ – 21.2 %
 - Balance – 78.8 %

TP2 ***Near Southwest Corner of Site, Outside Fill Area***

0.0 to 0.2 m	Brown, silt topsoil, loose, roots, moist
0.2 to 0.8 m	Brown, silt to sandy silt, some gravel, dense, blocky, orange and black mottling, moist (till like)
0.8 to 1.8 m	Grey moist sandy silt to silty sand, some gravel, dense, blocky, some black mottling
1.8 to 2.0 m	Grey, silty sand to sand, some silt, some gravel, massive, softer than above, wet
2.0 to 2.3 m	Grey, silty sand, some clay to clayey, blocky, no mottling, moist to wet (till like). Occasional pockets of fine sand, rust and black stained, wet to saturated

Notes:

- No sloughing
- No water entering test pit
- Gas readings in open test pit:
 - CH₄ – 0.0 % (volume in air)
 - CO₂ – 0.4%
 - O₂ – 20.9 %
- Balance – 78.7 %

TP3 ***Near Southeast Corner of Site Outside Fill Area***

0.0 to 0.3 m	Black, topsoil, wet to saturated roots
0.3 to 1.0 m	Brown, very fine sandy silt to silty sand, laminated, layered, some orange staining
1.0 to 1.9 m	Grey, as above

Notes:

- Minor swampy odour
- Soil sample at 1.6 m
- Left excavation open for 10 minutes
- Water at base of test pit entering from base of saturated topsoil layer
- Difficulty getting back onto roadway. Ground was soft

TP4 ***Along The Eastern Edge of Site Outside Fill Area***

0.0 to 0.3 m	Black, silt topsoil, roots, wet
0.3 to 1.0 m	Rusty brown, silt, laminated, rust, black staining, dense, shale-like, moist
1.0 to 1.4 m	Grey as above

Notes:

- Soils similar to TP3
- No sloughing
- No water entering test pit although topsoil was very wet
- Difficulty getting back onto roadway. Ground was soft

TP5 ***Within Southern Portion of Fill Area***

0.0 to 1.9 m	Brown clayey silt, some sand, trace gravel fill, some boulders, some cobbles, dark brown to 0.3 m, brown from 0.3 m to 1.2 m, black below 1.2 m, dry to moist (till like soils)
1.9 to 2.5 m	Waste: bricks, garbage bags, glass, metal, burnt paper, and wood, concrete blocks, paper, moist

Notes:

- Soils similar to TP1
- Sloughing below 1.9 m, could not get below 2.5 m
- No water entering test pit although waste is moist to wet below 1.9 m
- Oily odour
- Grain size analysis completed on sample collected from 0.3 to 0.4 m

TP6 ***Within Western Portion of Fill Area***

0.0 to 1.0 m	Brown to black, silty fine sand fill, some gravel, cobbles and boulders, large asphalt pieces at 0.2 m, concrete, concrete pipe fragment, dry to moist
--------------	--

1.0 to 2.0 m Rusty, brown, silty fine sand fill, as above, more boulders/large cobbles, dry to moist

Notes:

- No sloughing
- No water entering excavation
- Difficulty digging, no water entering test pit although waste is moist to wet below 1.9 m
- Minor oily odour, likely from asphalt

TP7 *Within the Northern Portion of The Waste Fill Area*

0.0 to 0.4 m Brown, silty sand and gravel fill, cobbles, brick fragment, becoming black at 0.3 m

0.4 to 1.5 m Brown, sand and silt, some clay, trace gravel, some cobbles, dense, difficulty digging, blocky, rust mottling, moist (till-like)

Notes:

- No sloughing
- No water entering excavation
- Difficulty digging very dense
- Boulder in test pit, sloughed into excavation some water around it
- Minor oily odour, likely from asphalt.
- Grain size analysis completed on sample collected from 0.5 to 0.7 m



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Appendix A-2

Grain Size Distribution Curves



V. A. WOOD (GUELPH) INCORPORATED
CONSULTING GEOTECHNICAL ENGINEERS

405 YORK ROAD, GUELPH, ONTARIO N1E 3J5
TELEPHONE: (519) 763-3101

RECEIVED

JUN 22 2010

R.J. BURNSIDE & ASSOCIATES
LIMITED

TRANSMITTAL

To: R.J. Burnside & Associates Ltd.
15 Townline
Orangeville, Ontario
L9W 3R4

Attn: Kim Hawkes, P.Eng.

Date: June 16, 2010
Project No.: G3021-0-6
Project: Materials Testing
File No. MCO 018503.1000
Thornbury

Transit: Mail ☒

Enclosed Please Find:

- Two (2) copies Grain Size Distribution Curves (TP 5, 0.3 – 0.4m & TP 7, 0.5 – 0.7m).

Comments:

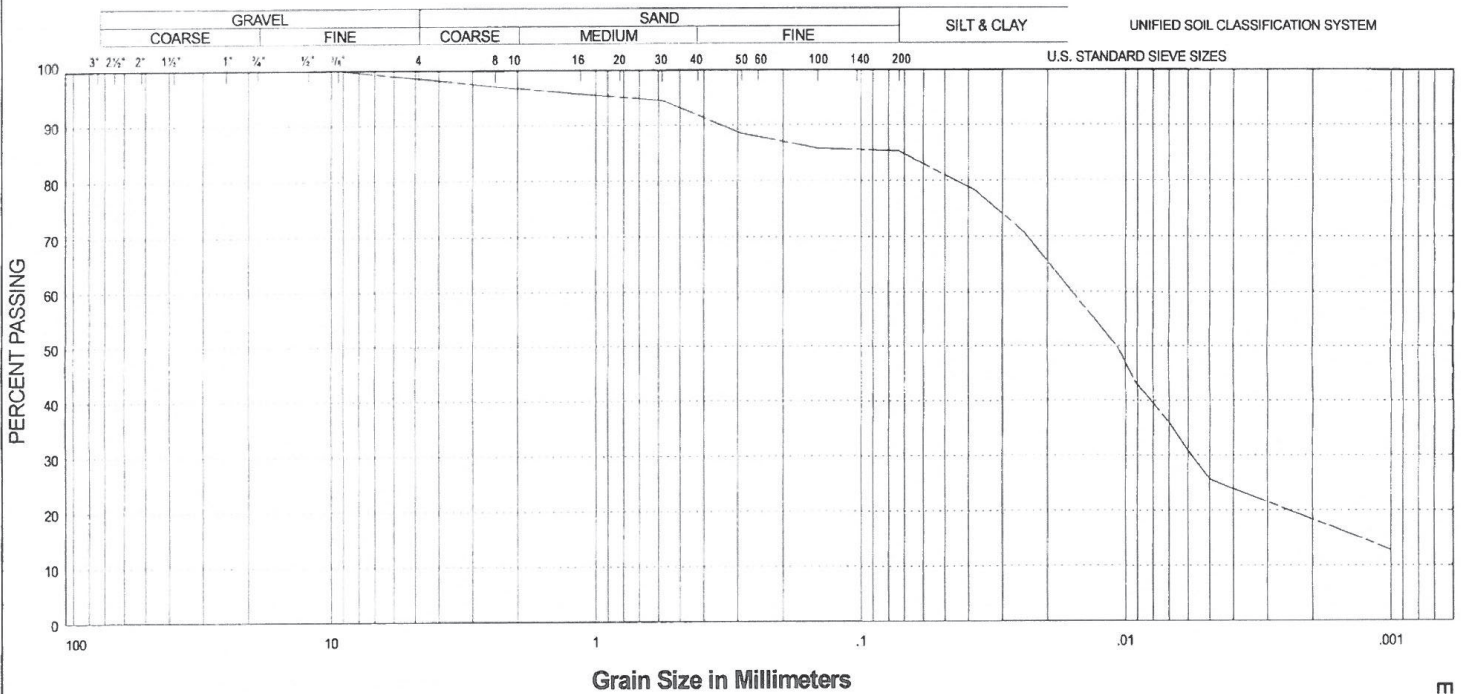
Type of Action:

- ☐ Approved
- ☐ Approved as Noted – Please Correct
- ☐ Revised as Noted – Please Revise & Submit
- ☐ Not Approved
- ☐ For Your Approval – Please Check & Return
- ☒ For Your Information & Use



GRAIN SIZE DISTRIBUTION

OUR REFERENCE N° G3021-0-6



PROJECT: MCO 018503.1000

LOCATION: Thornbury

TEST PIT N°: 5

SAMPLE N°:

DEPTH: 0.3 - 0.4m

ELEVATION:

COEFFICIENT OF UNIFORMITY:

COEFFICIENT OF CURVATURE:

Classification of Sample and Group Symbol:

CLAYEY SILT, some sand, trace gravel

PLASTIC PROPERTIES

LIQUID LIMIT % =

PLASTIC LIMIT % =

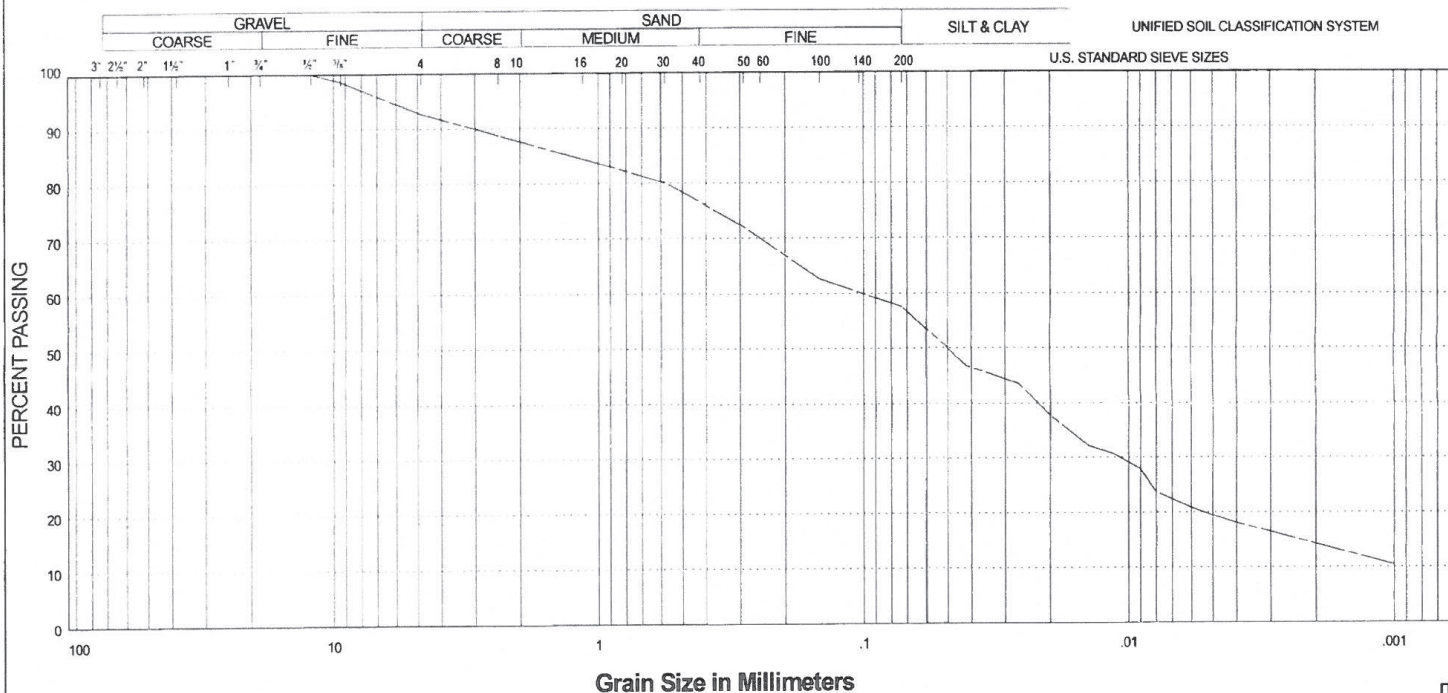
PLASTICITY INDEX % =

MOISTURE CONTENT % =

ENCLOSURE N° 1

GRAIN SIZE DISTRIBUTION

OUR REFERENCE N° G3021-0-6



PROJECT: MCO 018503.1000

LOCATION: Thornbury

TEST PIT N°: 7

SAMPLE N°:

DEPTH: 0.5 - 0.7m

ELEVATION:

COEFFICIENT OF UNIFORMITY:

COEFFICIENT OF CURVATURE:

Classification of Sample and Group Symbol:

SILT AND SAND, some clay, trace gravel

PLASTIC PROPERTIES

LIQUID LIMIT % =

PLASTIC LIMIT % =

PLASTICITY INDEX % =

MOISTURE CONTENT % =

ENCLOSURE N° 2



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Appendix A-3

Site Photographs



Photo 1 Looking south towards King Street West from inside gate.



Photo 2 Stockpile of mulch and asphalt.



Photo 3 Soil stockpiles and boats parked along west side of fill area.



Photo 4 Berm around fill area looking north from southeast corner. Note boat cradles.



Photo 5 **West slope of Beaver Creek.**



Photo 6 **Swale draining northwest corner of the waste fill area.**



Photo 7 Side slope of waste looking south along Beaver Creek.



Photo 8 Metal debris along west side slope.



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Appendix B

Historical Air Photos

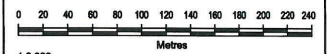
FIGURE B-1
TOWN OF THE BLUE MOUNTAINS
THORNBURY CLOSED LANDFILL
ENVIRONMENTAL IMPACT ASSESSMENT

1938 AIR PHOTO

LEGEND

— APPROXIMATE SITE OUTLINE

Air Photo Source:
 Background 1938 air photo obtained from the National Air Photo Library.



1:3,000
 July 2010
 Project Number: MCO018503
 Prepared by: C. Sheppard
 Projection: UTM Zone 17
 Datum: NAD83
 Verified by: K. Hawkes



MCO018503 THORNBURY ENVIRONMENTAL IMPACT 1938 AP.dwg



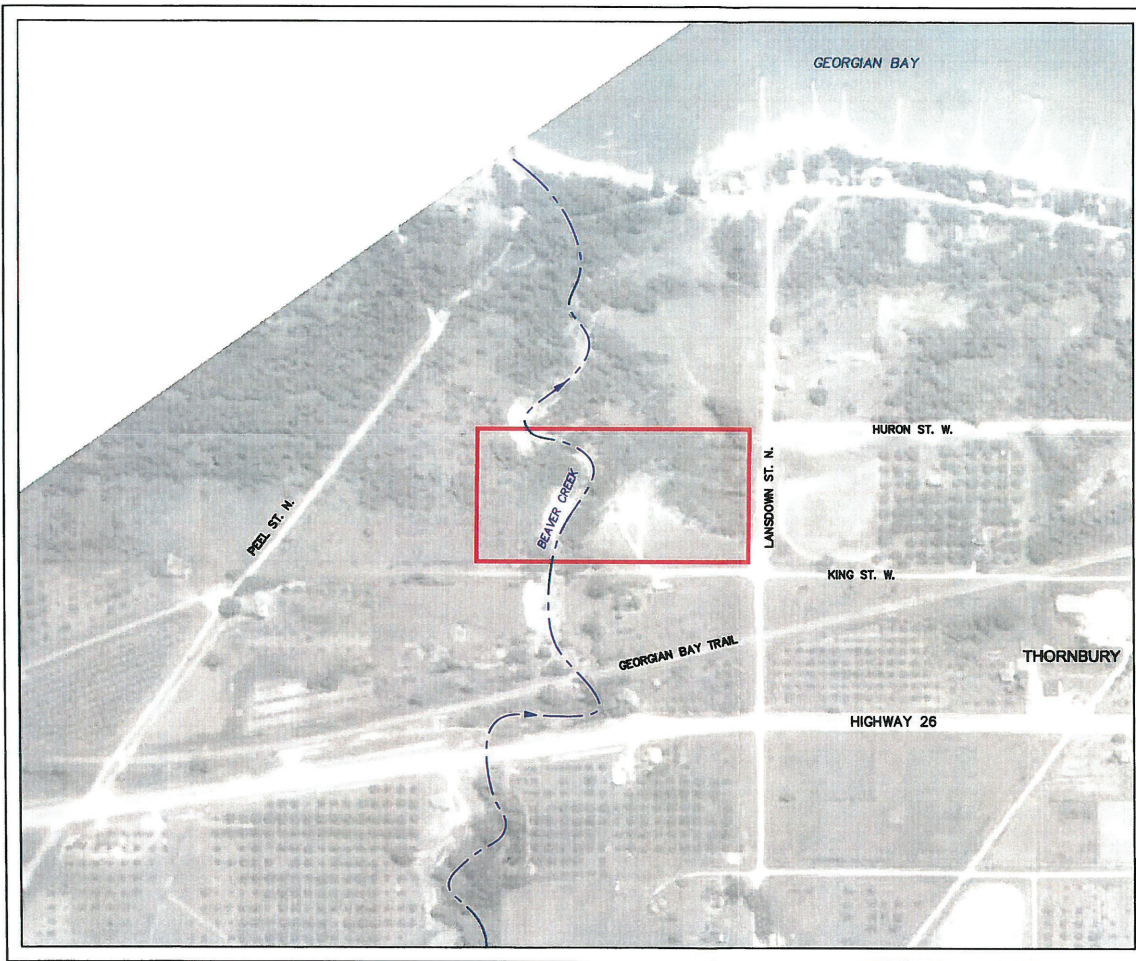


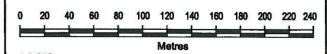
FIGURE B-2
TOWN OF THE BLUE MOUNTAINS
THORNBURY CLOSED LANDFILL
ENVIRONMENTAL IMPACT ASSESSMENT

1962 AIR PHOTO

LEGEND

— APPROXIMATE SITE OUTLINE

Air Photo Source:
 Background 1962 air photo obtained from the National Air Photo Library.



1:3,000
 July 2010
 Project Number: MCO018503
 Prepared by: C. Sheppard

Projection: UTM Zone 17
 Datum: NAD83
 Verified by: K. Hawkes



MCO018503 THORNBURY ENVIRONMENTAL IMPACT 1962 AP.dwg

1962 Air Photo



FIGURE B-3
TOWN OF THE BLUE MOUNTAINS
THORNBURY CLOSED LANDFILL
ENVIRONMENTAL IMPACT ASSESSMENT

1988 AIR PHOTO

LEGEND

— APPROXIMATE SITE OUTLINE

Air Photo Source:
 Background 1988 air photo obtained from the National Air Photo Library.



0 20 40 60 80 100 120 140 160 180 200 220 240
 Metres

1:3,000
 July 2010
 Project Number: MCO018503
 Prepared by: C. Sheppard
 Projection: UTM Zone 17
 Datum: NAD83
 Verified by: K. Hawkes



MCO018503 THORNBURY ENVIRONMENTAL IMPACT 1988 AP.dwg

FIG. B-3: 1988 AIR PHOTO



FIGURE B-4

TOWN OF THE BLUE MOUNTAINS

THORNBURY CLOSED LANDFILL

ENVIRONMENTAL IMPACT ASSESSMENT

2002 AIR PHOTO

LEGEND

— APPROXIMATE SITE OUTLINE

Air Photo Source:
Background 2002 air photo obtained from the National Air Photo Library.

0 20 40 60 80 100 120 140 160 180 200 220 240

Metres

1:3,000

July 2010

Project Number: MCO018503

Prepared by: C. Sheppard

Projection: UTM Zone 17

Datum: NAD83

Verified by: K. Hawkes

MCO018503 THORNBURY ENVIRONMENTAL IMPACT 2002 AP.dwg

100% 2002 11/11/2009

Appendix C
Natural Environment Features Summary



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Appendix C-1
Existing Natural and
Socio-Economic Environment

Thornbury Landfill

Natural and Environmental Features Summary

1.0 Description of the Existing Natural and Socio-Economic Environment

A desktop review was undertaken of existing information, in, and within the vicinity of, the subject lands. Descriptions of the various components of the natural environment were determined based on a review of:

- Aerial photography
- Grey County Official Plan (2000)
- Town of the Blue Mountains Official Plan (2007)
- Natural Heritage Information Centre ("NHIC") database for rare species records
- Federal Species at Risk database for rare species habitat ranges
- Ontario Breeding Bird Atlas ("OBBA") for records of breeding birds
- Conservation Ontario Aquatic Species at Risk mapping, and
- Grey Sauble Conservation Authority Regulation mapping.

1.1 Land Use

1.1.1 Provincial Policy Statement

The Provincial Policy Statement, 2005 ("PPS") provides general policies on land use patterns, resources, and public health and safety that guide development across Ontario.

Seven types of natural heritage features are identified in Section 2.1, of which four are present, or potentially present, on the subject or adjacent lands. These include:

- Significant habitat of endangered or threatened species
- Fish habitat
- Significant woodlands, and
- Significant wildlife habitat.

Development and site alteration is not permitted within significant habitat of endangered and threatened species and may only be permitted within the other features listed if it can be demonstrated that there will be no negative impacts on the natural feature or its ecological function.

Section 3.0 of the PPS addresses natural hazards and indicates that, "development shall generally be directed to areas outside of... b) hazardous lands adjacent to river ... systems which are impacted by flooding hazards and/or erosion hazards." (Section 3.1.1)

The Beaver River is located in close proximity to the subject lands and its floodplain may include all, or portions, of the subject lands.

1.1.2 Official Plans

Grey County Official Plan (2000)

Schedule A of the Grey County Official Plan indicates that portions of the subject lands are designated as “Urban” and “Hazard Lands”.

The Urban designation indicates that development is permitted in accordance with local or secondary plans. The Official Plan of the Town of Blue Mountains will, therefore, provide the appropriate policies for this area.

In Hazard Land-designation areas, development is generally not permitted. The actual boundaries of the Hazard Lands will need to be confirmed with the Grey Sauble Conservation Authority (“GSCA”), see GSCA Regulations, below.

Town of the Blue Mountains Official Plan (2007)

Similar to the County's Official Plan, the Town of the Blue Mountains designates the eastern portion of the property as “Residential” and the western portion as “Hazard Lands”.

Grey Sauble Conservation Authority Regulations (2006)

The Grey Sauble Conservation Authority (“GSCA”) regulates development in or around hazard lands (i.e. floodplains, slopes, wetlands) through the *Development, Interference with Wetlands and Alterations to Shorelines and Watercourses, Ontario Regulation 151/06*. GSCA mapping shows that the portions of the property along the Beaver Creek and its tributary are located within the regulation limit. Development may not be permitted in these areas, in accordance with PPS hazard land policies and O. Reg. 151/06.

The Authority may grant permission for development in regulated areas if, in its opinion, the control of flooding, erosion, pollution or the conservation of land will not be affected by the proposed development. The GSCA will require technical studies to be provided prior to issuing a permit. The specific studies will be confirmed by the GSCA, at the time of permit application.

1.2 Terrestrial Environment

1.2.1 Designated Sites

A review of the Natural Heritage Information Centre (“NHIC”) database did not identify any designated sites on, or in the vicinity of, the site.

1.2.2 Wooded Areas

The Town of the Blue Mountains does not identify Significant Woodlands in its Official Plan. However, Section 8.9 indicates that “Development should be designed to minimize disturbance of wooded areas.” The Plan recognizes that development may result in the loss of wooded areas but also indicates that tree cutting in sensitive areas such as steep slopes and stream valleys should be minimized.

On the subject property, wooded lands are present along the Beaver River and in the eastern portion of the property fronting Landsdown St. Wooded areas, particularly along the Beaver River will need to be maintained as much as possible.

1.2.3 Rare and Designated Flora Species

Significant habitats of endangered and threatened species are protected under the policies of the PPS as well as the *Endangered Species Act*. For other rare species, not listed as endangered or threatened, habitat protection may also be provided through the significant wildlife habitat policies of the PPS. Significant habitat of "species of conservation concern" is considered to be a type of significant wildlife habitat.

The Natural Heritage Information Centre ("NHIC") database and federal Species at Risk Registry ("SARA Registry") were reviewed for records of rare flora in the vicinity of the study area.

Records from the NHIC database documents recorded species sightings while the SARA Registry identifies broad species ranges. Table 1 summarizes designated species that have been reported or that have a potential range in the vicinity of the project location. The table also documents whether suitable habitat is currently present at, or around, the subject lands.

Table 1 Rare and Designated Flora Species

Species	Scientific Name	S-Rank	OESA Designation	SARA Designation	Source of Species Record	Habitat Preference*	Potential to be Located Near Project Location
Shrubby St. John's-wort	<i>Hypericum prolificum</i>	S2	N/A	N/A	NHIC	Field, thickets, prairies and open woods.	There is some potential for this species to be present in the open wooded areas along beaver Creek in the western portion of the property.
Smith's bulrush	<i>Schoenoplectus smithii</i>	S3	N/A	N/A	NHIC	Moist, sandy or muddy shorelines.	Habitat may be present along the shore of the Beaver River.

Species	Scientific Name	S-Rank	OESA Designation	SARA Designation	Source of Species Record	Habitat Preference*	Potential to be Located Near Project Location
American ginseng	<i>Panax quinquefolius</i>	S2	END	END Sched. 1	SARA Registry	Grows in rich, moist, undisturbed and relatively mature deciduous woods in areas of neutral soil with a forest canopy usually dominated by sugar maple, white ash, bitternut hickory, and basswood. Colonies are usually found at the bottom of gentle slopes facing south in a warm and well-drained area.	Habitat is potentially present in the wooded areas on the site.
Butternut	<i>Juglans cinerea</i>	S3?	END	END Sched. 1	SARA Registry	Usually found as a minor component of deciduous stands, and is commonly associated with linden, black cherry, beech, black walnut, elm, hemlock, hickory, oak, red maple, sugar maple, yellow poplar, white ash and yellow birch. Large pure populations also exist on certain flood plains. Butternut grows best in rich, moist, well-drained soils often found along streams or in well-drained gravel sites made up of limestone.	Habitat is potentially present in the wooded areas on the site.

Based on Table 1, above, there is potential for all of the four species listed to be present on the site. Field investigations should be undertaken prior to development to determine if any of these species are present. Additional mitigation measures may be required if one, or more of these species are confirmed on the Site.

1.2.4 Wildlife

The Ontario Breeding Bird Atlas was reviewed for records of birds breeding in the vicinity of the study area. The results of this review are provided in Appendix C-2. Ninety-nine species were identified in OBBA square 17NK43¹. The number of species identified according to each provincial rarity ranking is provided in Table 2 below.

¹ OBBA species lists are provided for 10x10km squares. Species may have been identified anywhere within the square and not necessarily on the site.

Table 2 Provincial Ranking of Bird Species

Provincial Ranking	Description of Ranking	Number of Bird Species with Ranking
S2	Imperiled	1
S4	Apparently Secure	16
S4S5	Secure-Apparently Secure	1
S5	Common and demonstrably secure in the province	76
SE	Exotic or not believed to be a native component of Ontario's flora	5

The S2-ranked species is the great egret, *Casmerodius albus*. It is described in greater detail in Section 1.2.5, Rare and Designated Fauna Species.

1.2.5 Wildlife Habitat

Under the PPS, no development or site alteration is permitted within significant wildlife habitat unless it can be demonstrated that no negative impacts will result. Habitat for area-sensitive species, which are species that require large habitat tracts, is considered to be a type of significant wildlife habitat. The OBBA identified 21 species that are considered to be area-sensitive potentially inhabiting the subject lands and its vicinity, including:

Forest area-sensitive species:

- Cooper's hawk, *Accipiter cooperii*
- Northern parula, *Parula Americana*
- Veery, *Catharus fuscescens*
- White-breasted nuthatch, *Sitta carolinensis*
- Hairy woodpecker, *Picoides villosus*
- American restart, *Setophaga ruticilla*
- Black-and-white warbler, *Miniotilta varia*
- Black-throated green warbler, *Dendroica virens*
- Least flycatcher, *Empidonax minimus*
- Magnolia warbler, *Dendroica magnolia*
- Ovenbird, *Seiurus aurocapillus*
- Red-breasted nuthatch, *Sitta Canadensis*
- Sharp-shinned hawk, *Accipiter striatus*
- Winter wren, *Troglodytes troglodytes*
- Yellow-bellied sapsucker, *Sphyrapicus varius*.

Open Water area-sensitive species:

- Common loon, *Gavia immer*
- Common merganser, *Mergus merganser*.

Open Country area-sensitive species:

- Bobolink, *Dolichonyx oryzivorus*
- Eastern meadowlark, *Sturnella magna*
- Grasshopper sparrow, *Ammodramus savannarum*
- Savannah sparrow, *Passerculus sandwichensis*.

Forested areas are present in the western portion of the property, extending along Beaver Creek. Based on aerial photography, wooded areas are narrow, with large gaps in the canopy and large areas of young and sparsely covered lands. These treed areas are unlikely to provide significant habitat for forest area-sensitive species, although some may inhabit the area from time to time.

Beaver Creek traverses the subject lands. These records are more likely associated with the larger water body of Georgina Bay to the north of the site.

Based on aerial photography, little grassland area appears to be present. Much of the open area is disturbed with little ground cover. Significant habitat for area-sensitive open country species is not present.

Appendix Map D of the Town of Blue Mountains Official Plan shows a deer wintering area immediately adjacent to the site.

1.2.6 Rare and Designated Fauna Species

The Natural Heritage Information Centre (“NHIC”) database, federal Species at Risk Registry (“SARA Registry”) and Ontario Breeding Bird Atlas (“OBBA”) were reviewed for records of rare fauna in the vicinity of the study area.

Records from the NHIC and OBBA databases document recorded species sightings while the SARA Registry identifies broad species ranges. Table 3 summarizes designated species that have been reported or that have a potential range in the vicinity of the project location. The table also documents whether suitable habitat is currently present at, or around, the subject lands.

According to Table 3, above, a number of rare species could potentially be found in the vicinity of the subject lands, including:

- Grey fox
- Spotted turtle
- Eastern hog-nosed snake
- Milksnake
- Spotted turtle, and
- Monarch.

Field investigations to confirm the presence or absence of these species should be undertaken prior to development of the subject lands.

Table 3 Records of Rare and Designated Fauna and Presence of Suitable Habitat

Species	Scientific Name	S-Rank	OESA Designation	SARA Designation	Source of Species Record	Date Last Recorded	Habitat Preference*	Potential to be Located Near Project Location
Mammals								
Grey Fox	<i>Urocyon cinereoargenteus</i>	S1	THR	THR Sched. 1	SARA Registry	N/A	Found on the outskirts of urban areas in deciduous forests and marshes. Their dens are usually located in areas of dense brush, close to water sources and are made out of rock outcrops, hollow trees, underground burrows dug by other animals or piles of brush. The Grey Fox is considered a habitat generalist.	Habitat is potentially present on subject lands.
Birds								
Great Egret	<i>Casmerodius albus</i>	S2	N/A	N/A	OBBA Database	N/A	Build stick nests in mature forests near large water bodies. Nests are often built in large colonies.	Some potential exists due to the proximity to the Georgian Bay shoreline. The record for this species indicates that it was observed in the area during its breeding season but there was no evidence of breeding taking place.
Cerulean Warbler	<i>Dendroica cerulea</i>	S3	SC	SC Sched. 1	SARA Registry	N/A	Found in mature deciduous forests with large trees and open understory in wet bottomland areas or dry ridges in upland locations. They also prefer to nest in older, second growth forests.	Forests appear to be young and may not exhibit the characteristics of a mature forest that are required for this species. Suitable habitat is unlikely to be present.
Least Bittern	<i>Ixobrychus exilis</i>	S4	THR	THR Sched. 1	SARA Registry	N/A	Prefers to nest in freshwater marshes with dense tall aquatic vegetation interspersed in clumps of woody vegetation and open water. They are usually found in marshes greater than 5 ha.	Suitable habitat is not present on the subject lands.
Bats								
Northern long-eared bat	<i>Myotis septentrionalis</i>	S3?	N/A	N/A	NHIC	1939	Hibernation typically occurs in caves, abandoned mines or other crevices. In the summer months, roosting takes place in the cavities of large, mature and decaying trees. Habitats near water sources provide insects for feeding.	This record is from 1939 and is no longer relevant. Hibernation sites are not present on the site. Forests may not be mature enough to provide suitable tree cavities for roosting.
Amphibians/Reptiles								
Eastern Hog-nosed Snake	<i>Heterodon platirhinos</i>	S3	THR	THR Sched. 1	SARA Registry	N/A	Prefer sandy, well-drained habitats such as beaches and dry woods to lay their eggs in burrows and hibernate. Need access to wet areas such as swamps to hunt.	Suitable habitat may be present on the site.
Milksnake	<i>Lampropeltis triangulum</i>	S3	SC	SC Sched. 1	SARA Registry	N/A	Occurs predominantly in rural areas, and in and around buildings, especially old structures. It can be found in a variety of habitats including prairie, pasture, hayfields, rocky hillsides and a wide variety of forest types. Proximity to water and suitable locations for basking and egg-laying are important features of good Milksnake habitat.	Aerial photography indicates that debris piles may be present on the subject lands that could provide habitat for Milksnakes.
Massasauga	<i>Sistrurus catenatus</i>	S3	THR	THR Sched. 1	NHIC	1975	In the Georgian Bay area, they are often found along the Niagara Escarpment, using granite rock tables for basking.	This record is from 1975 and is no longer relevant. Suitable basking areas are not present on the subject lands.
Spotted Turtle	<i>Clemmys guttata</i>	S3	END	END Sched. 1	SARA Registry	N/A	Can be found in ditches, ponds, streams, swamps, bogs, and marshes, and prefer soft muddy substrate with some aquatic vegetation. They require quiet waters, and their presence in swift-flowing bodies indicates marshy areas along the shore.	Suitable habitat may be present along the Beaver River.
Lepidoptera								
Monarch	<i>Danaus plexippus</i>	S4	SC	SC Sched. 1	SARA Registry	N/A	Exists primarily where milkweed (<i>Asclepius</i>) and wildflowers (such as Goldenrod, asters, and Purple Loosestrife) are present including abandoned farmland, along roadsides, and other open spaces where these plants grow.	Habitat is potentially present in open areas on site.
Variegated Meadowhawk	<i>Sympetrum corruptum</i>	S3	N/A	N/A	NHIC	1927	Requires open water habitat for breeding.	This record is from 1927 and is no longer relevant. Suitable habitat may be present but it is unlikely that the species is currently in the area.

1.3 Aquatic Environment

The Beaver River flows northward through the subject lands towards Georgian Bay. Appendix A, Map 2 of the Grey County Official Plan identifies the Beaver River as providing coldwater fish habitat. However, there is potential that the reservoir behind Clendenan Dam warms the water and downstream water temperatures may be unsuitable for coldwater fish species. The Town of the Blue Mountains Official Plan requires development setbacks of 30m for coldwater streams and 15m for warmwater streams. The temperature classification of the Beaver River in this area will need to be confirmed with the Ministry of Natural Resources or GSCA.

The GSCA's Watershed Report Card (GSCA, n.d.) shows that water quality is excellent in the Beaver River system, based on phosphorus levels and benthic invertebrate sampling. Riparian vegetation cover along the Beaver River earned a "fair" score due to a lack of tree, shrub and grass cover along the watercourse to provide shade, bank stabilization and in-stream fish cover.

A review of the Conservation Ontario Aquatic Species at Risk mapping found no records of rare fish or mussel species for the Beaver River in the vicinity of the site.

1.4 Geologic Features

The Nipissing Ridge is a prominent geological feature that forms a bluff along the Georgian Bay shoreline. The Ridge is generally designated as Hazard Lands; however Section 8.18 of the Town of Blue Mountains Official Plan states that, "Given the reduced physical relief and proximity to development in the Thornbury area, the Nipissing Ridge is not identified as Hazard Lands." The subject lands are located as the edge of the Thornbury urban limit and the status of the Nipissing Ridge designation on the property should be confirmed.

2.0 Implications for Development

Table 4 provides a summary of potential natural heritage constraints and their implications for development of the former Clarksburg landfill site.

Table 4 Summary of Natural Heritage Constraints and Implications for Development

Feature	Location	Policy	Development Implications
Hazard Lands	<ul style="list-style-type: none">The entire property is located within the GSCA's regulation limit which is associated with the floodplain of Beaver CreekThe Nipissing Ridge may or may not be designated as a Hazard land on the site.	<ul style="list-style-type: none">Development and site alteration is generally directed away from hazard land areasDevelopment may be permitted by permit from the GSCAHazards associated with the steep slopes of the Nipissing Ridge may need	<ul style="list-style-type: none">A permit will be required for development in GSCA regulated areasBackground studies may be required, such as floodplain delineation, as identified by the GSCASlope stability and other geotechnical studies may be required for development on steep slopes, if present.

Feature	Location	Policy	Development Implications
Woodlands	<ul style="list-style-type: none"> Western portion of the property along the Beaver River and in the eastern portion of the site near Landsdown St. 	<ul style="list-style-type: none"> Loss of wooded areas should be minimized, particularly along watercourses. 	<ul style="list-style-type: none"> A Forest Management Plan, Woodland Conservation Plan or Environmental Impact Study ("EIS") may be required to show how woodlands will be protected.
Significant Habitat of Endangered and Threatened Species	<ul style="list-style-type: none"> There is some potential for butternut and American ginseng to be present in woodlands on, and in the vicinity of, the site. 	<ul style="list-style-type: none"> Development and site alteration are not permitted within significant habitat of endangered and threatened species. 	<ul style="list-style-type: none"> Field investigation, as part of an EIS, should be undertaken prior to development of the site.
Significant Wildlife Habitat	<ul style="list-style-type: none"> Habitat for forest area-sensitive bird species is present on, and around, the site Habitat for "species of conservation concern" (i.e. rare species not designated as endangered or threatened) may be present Deer wintering habitat is identified in close proximity to the site. 	<ul style="list-style-type: none"> Development and site alteration are only permitted if it can be demonstrated that no negative impacts to the feature or its functions will result. 	<ul style="list-style-type: none"> Field investigations are required to confirm the presence or absence of rare species An Environmental Impact Study ("EIS") will be required to demonstrate no negative impacts prior to development.
Fish Habitat	<ul style="list-style-type: none"> Fish habitat is present in the Beaver River which traverses the site Coldwater habitat may be present, depending on how much warming occurs in the upstream Clendenan Dam reservoir. 	<ul style="list-style-type: none"> Development and site alteration is not permitted within fish habitat, except in accordance with provincial and federal regulations. 	<ul style="list-style-type: none"> If any water crossings are required, permission may be required from the GSCA under O. Reg. 151/06 and/or the Department of Fisheries and Oceans under the <i>Fisheries Act</i> Consideration may also need to be given to fish habitat if discharges from stormwater management facilities or sewage treatment facilities or any water takings are part of the development proposal The Town of the Blue

Feature	Location	Policy	Development Implications
			Mountains Official Plan requires a 30m development setback from coldwater streams.

3.0 Conclusions

Portions of the subject lands and their vicinity are characterized by significant and potentially significant natural heritage and natural hazard features, including:

- The floodplain of the Beaver River
- Potential steep slopes of the Nipissing Ridge
- Woodlands
- Potential habitat for endangered and threatened species
- Potential significant wildlife habitat, including habitat for species of conservation concern and habitat for area-sensitive species.

Fish habitat is not present on site but is present in the adjacent Beaver River. Any development that requires discharge of stormwater or other substances into the river will require consideration for fish communities and fish habitat.

Prior to development, the following additional work is required:

- A permit from the GSCA, in association with development in a hazard-regulated area. This may require floodplain or other hazard-related studies to support the permit application, and
- An Environmental Impact Study ("EIS") is required prior to development of the site. The EIS should include:
 - Field investigations to confirm the presence or absence of significant features
 - An analysis to demonstrate that no negative impacts to the feature or its ecological functions will result from the proposed development.



BURNSIDE

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Appendix C-2

Breeding Bird Atlas Summary

1	WILDLIFE MASTER SPECIES LIST FOR ONTARIO										
Wildlife Survey Conducted by Ontario Breeding Bird Atlas Square 17N32											
NUM	Species Code	COMMON NAME	SCIENTIFIC NAME	SRANK	NRANK	SARA Status	SARA Schedule	OESA Status	AREA	Area Sensitive	COMMENTS
1	332	ALFL Alder Flycatcher	Empidonax alburnum	S5B,S2N	N5B						
1	363	AMCR American Crow	Corvus brachyrhynchos	S5B,S2N	N5B,N5N						
1	543	AMGO American Goldfinch	Carduelis tristis	S5B,S2N	N5B,N5N						
1	172	AMKE American Kestrel	Falco sparverius	S5B,S2N	N5B,N5N						
1	464	AMRE American Redstart	Setophaga ruticilla	S5B,S2N	N5B				> 100 ha	Yes	
1	420	AMRO American Robin	Turdus migratorius	S5B,S2N	N5B,N7N						
1	529	BACR Baltimore Oriole	Icterus galbula	S5B,S2N	N5B,N2N						
1	377	BANS Bank Swallow	Riparia riparia	S5B,S2N	N5B						
1	373	BARS Barn Swallow	Hirundo rustica	S5B,S2N	N5B						
1	318	BEKI Belted Kingfisher	Ceryle alcyon	S5B,S2N	N5B,N5N						
1	454	BAWW Black and white Warbler	Mniotilta varia	S5B,S2N	N5B				> 100 ha	Yes	
1	286	BBCU Black-billed Cuckoo	Coccyzus erythrophthalmus	S4B,S2N	N5B						
1	387	BOCH Black-capped Chickadee	Parus atricapillus	S5	N5						
1	449	BTNW Black-throated Green Warbler	Dendroica virens	S5B,S2N	N5B				30 ha	Yes	
1	367	BLJA Blue Jay	Cyanocitta cristata	S5	N5B,N5N						
1	524	BOBO Bobolink	Dolichonyx oryzivorus	S4B,S2N	N5B				> 50 ha	Yes	
1	425	BRTH Brown Thrasher	Toxostoma rufum	S5B,S2N	N5B						
1	532	BHCO Brown-headed Cowbird	Molothrus ater	S5B,S2N	N5B,N2N						
1	126	CAGO Canada Goose	Branta canadensis	S5B,S2N	N5B,N5N						
1	428	CEDW Cedar Waxwing	Bombycilla cedrorum	S5B,S2N	N5						
1	430	CSWA Chestnut-sided Warbler	Dendroica pensylvanica	S5B,S2N	N5B						
1	151	CHSW Chimney Swift	Chaetura pelagica	S5B,S2N	N5B	THR		1 THR			
1	508	CHSP Chipping Sparrow	Spizella passerina	S5B,S2N	N5B						
1	375	CLSW Cliff Swallow	Petrochelidon pyrrhonota	S5B,S2N	N5B						
1	534	COGR Common Grackle	Quiscalus quiscula	S5B,S2N	N5B,N2N						
1	74	COLO Common Loon	Gavia immer	S4B,S2N	N5B,N5N					Yes	
1	144	COME Common Merganser	Mergus merganser	S5B,S2N	N5B,N5N				<200 m to water	Yes	
1	304	CONH Common Nighthawk	Chordeiles minor	S4B,S2N	N5B			SC			
1	364	CORA Common Raven	Corvus corax	S5	N5						
1	450	COYE Common Yellowthroat	Geothlypis trichas	S5B,S2N	N5B						
1	154	COHA Cooper's Hawk	Accipiter cooperii	S4B,S2N	N4B,N4N				> 6 ha	Yes	
1	495	DEJU Dark-eyed Junco	Junco hyemalis	S5B,S2N	N5						
1	324	DOWO Downy Woodpecker	Picoides pubescens	S5	N5						
1	418	EABL Eastern Bluebird	Sialia sialis	S4S5B,S2N	N5B,N2N						
1	349	EAKI Eastern Kingbird	Tyrannus tyrannus	S5B,S2N	N5B						
1	535	EAME Eastern Meadowlark	Sturnella magna	S5B,S2N	N5B				> 10 ha	Yes	
1	344	EAPH Eastern Phoebe	Sayornis phoebe	S5B,S2N	N5B						
1	285	EASO Eastern Screech Owl	Otus asio	S5	N5						
1	503	EATO Eastern Towhee	Pipilo erythrophthalmus	S4B,S2N	N4B,N2N						
1	331	EAWP Eastern Wood-pewee	Contopus virens	S5B,S2N	N5B						
1	404	EUST European Starling	Sturnus vulgaris	SE	NE						
1	509	FSPF Field Sparrow	Spizella pusilla	S5B,S2N	N5B						
1	117	GADW Gadwall	Anas strepera	S4B,S2N	N5B,N7N						
1	403	GCKI Golden-crowned Kinglet	Regulus satrapa	S5B,S2N	N5						
1	489	GRSP Grasshopper Sparrow	Ammodramus saviannorum	S4B,S2N	N4B				> 10 ha	Yes	
1	422	GPCA Gray Catbird	Dumetella carolinensis	S5B,S2N	N5B						
1	341	GQFL Great Crested Flycatcher	Myiarchus cinerascens	S5B,S2N	N5B						
1	98	GREG Great Egret	Casmerodius albus	S2B,S2N	N2B,N2N						
1	293	GHOW Great Horned Owl	Bubo virginianus	S5	N5						
1	97	GRHE Green Heron	Butorides virescens	S4B,S2N	N4B,N2N						
1	325	HAWO Hairy Woodpecker	Picoides villosus	S5	N5				4 - 8 ha	Yes	
1	544	HOFI House Finch	Carduelis tristis	SE	N5						
1	474	HOSP House Sparrow	Passer domesticus	SE	NE5						
1	388	HOWR House Wren	Troglodytes aedon	S5B,S2N	N5B						
1	518	IBBU Indigo Bunting	Passerina cyanea	S5B,S2N	N5B						
1	198	IKLL Kidder	Chaulelasmus vociferans	S5B,S2N	N5B,N2N						
1	334	LEFL Least Flycatcher	Empidonax minimus	S5B,S2N	N5B				> 100 ha	Yes	
1	431	MAWA Magnolia Warbler	Dendroica magnolia	S5B,S2N	N5B				30 ha	Yes	
1	113	MALL Mallard	Anas platyrhynchos	S5B,S2N	N5B,N5N						
1	187	MERL Merlin	Falco columbarius	S4B,S2N	N4B,N5B						
1	284	MOOD Mourning Dove	Zenaidura macroura	S5B,S2N	N5						
1	458	MOWA Mourning Warbler	Oporornis philadelphia	S5B,S2N	N5B						
1	135	MUSW Mute Swan	Cygnus olor	SE	NE						
1	459	NAWA Nashville Warbler	Vermivora ruficapilla	S5B,S2N	N5B						
1	514	NOCA Northern Cardinal	Cardinalis cardinalis	S5	N5						
1	319	NOFL Northern Flicker	Colaptes auratus	S5B,S2N	N5B,N7N						
1	428	NOFA Northern Parula	Parula americana	S4B,S2N	N5B				> 100 ha	Yes	
1	378	NRWS Northern Rough-winged Swallow	Stelgidopteryx serripennis	S5B,S2N	N5B						
1	461	OVEN Ovenbird	Salpinctes obsoletus	S5B,S2N	N5B				> 70 ha	Yes	
1	78	PBGR Pied-billed Grebe	Podilymbus podiceps	S4B,S2N	N5B,N5N				1-3 ha		
1	545	PUPF Purple Finch	Carduelis purpureus	S5B,S2N	N5B,N5N						
1	376	PUMA Purple Martin	Progne subis	S4B,S2N	N5B						
1	390	RBNH Red-breasted Nuthatch	Sitta canadensis	S5B,S2N	N5				> 10 ha	Yes	
1	359	REVI Red-eyed Vireo	Vireo olivaceus	S5B,S2N	N5B						

NUM	Species Code	COMMON NAME	SCIENTIFIC NAME	SRANK	NRANK	SARA Status	SARA Schedule	OESA Status	AREA	Area Sensitive	COMMENTS
1	156	RTHA	Red-tailed Hawk	S5B,SZN	NSB,NSN						
1	523	RWBL	Red-winged Blackbird	S5B,SZN	NSB,NZN						
1	278	RODO	Rock Dove	SE	NE						
1	520	RBGR	Rose-breasted Grosbeak	S5B,SZN	NSB						
1	307	TRHU	Ruby-throated Hummingbird	S5B,SZN	NSB						
1	174	RUGR	Ruffed Grouse	S5	NS						
1	499	SAVS	Savannah Sparrow	S5B,SZN	NSB,NZN				> 50 ha	Yes	
1	153	SSHA	Sharp-shinned Hawk	S5B,SZN	NSB,NSN				> 30 ha	Yes	
1	498	SCSP	Song Sparrow	S5B,SZN	NS						
1	202	SPSA	Spotted Sandpiper	S5B,SZN	NSB,NZN						
1	496	SWSP	Swamp Sparrow	S5B,SZN	NSB,NZN						
1	379	TRES	Tree Swallow	S5B,SZN	NSB						
1	408	VEER	Veery	S4B,SZN	NSB						
1	504	VESP	Vesper Sparrow	S4B,SZN	NSB				> 10 ha	Yes	
1	367	WAVI	Warbling Vireo	S5B,SZN	NSB						
1	391	WRNJ	White-breasted Nuthatch	S5	NS				> 10 ha	Yes	
1	510	WTSF	White-throated Sparrow	S5B,SZN	NSB,NZN						
1	178	WTU	Wild Turkey	S4	NSM						
1	336	WFL	Willow Flycatcher	S5B,SZN	NSB						
1	369	WWIR	Winter Wren	S5B,SZN	NS				> 30 ha	Yes	
1	106	WOJU	Wood Duck	S5B,SZN	NZN,NSB						
1	412	WOTH	Wood Thrush	S5B,SZN	NSB						
1	429	YWAR	Yellow Warbler	S5B,SZN	NSB						
1	328	YBSA	Yellow-bellied Sapsucker	S5B,SZN	NSB				2 - 5 ha	Yes	
1	438	YRWA	Yellow-rumped Warbler	S5B,SZN	NSB,NZN						

Rank Definitions

SRANK	NRANK	SARA Status	SARA Schedule	OESA Status	AREA	Area Sensitive	COMMENTS
SX		Presumed Extirpated—Species or community is believed to be extirpated from the nation or state/province.					
SH		Possibly Extirpated (Historical)—The NH or SH rank is reserved for species for which some effort has been made to relocate occurrences.					
S1		Critically Imperiled—Extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation.					
S2		Imperiled—Due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation.					
S3		Vulnerable—Due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.					
S4		Apparently Secure—Uncommon but not rare; some cause for long-term concern due to declines or other factors.					
S5		Secure—Common, widespread, and abundant in the nation or state/province.					
SNR		Unranked—Nation or state/province conservation status not yet assessed.					
SU		Unrankable—Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.					
SNA		Not Applicable —A conservation status rank is not applicable because the species is not a suitable target for conservation activities.					
SNS#		Range Rank —Used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).					
C		Captive/Cultivated; existing in the province only in a cultivated state; introduced population not yet fully established and self-sustaining.					
S?		Not Ranked Yet; or if following a ranking, Rank Uncertain (e.g. S3?), S? species have not had a rank assigned.					
SA		Accidental; of accidental or casual occurrence in the province; far outside its normal range; some species may occasionally breed in the province.					
SAB		Breeding accidental.					
SAN		Non-breeding accidental.					
SE		Exotic; not believed to be a native component of Ontario's flora.					
SR		Reported for Ontario, but without persuasive documentation which would provide a basis for either accepting or rejecting the report.					
SRF		Reported falsely from Ontario.					
SX		Apparently extirpated from Ontario, with little likelihood of rediscovery. Typically not seen in the province for many decades, despite searches at known historic sites.					
SZ		Applies to long distance migrants, winter vagrants, and eruptive species, too transitory in their occurrence(s) to be reliably mapped; most are non-breeders, however, some may occasionally breed.					
SZB		Breeding migrants/vagrants.					
SZN		Non-breeding migrants/vagrants.					
END		Endangered. Any native species that is at risk of extinction or extirpation throughout all or a significant portion of its Ontario range if the limiting factors are not reversed. Protected under the Endangered Species Act.					
EXP		Extirpated. Any native species no longer existing in the wild in Ontario, but existing elsewhere in the wild.					
EXT		Extinct. Any species formerly native to Ontario that no longer exists.					
IND		Indeterminate. Any native species for which there is insufficient scientific information on which to base a status recommendation.					
NIAC		Not In Any COSSARO Category. Any native species evaluated by COSSARO which does not currently meet criteria for assignment to a provincial risk category.					
THR		Threatened. Any native species that is at risk of becoming endangered throughout all or a significant portion of its Ontario range if the limiting factors are not reversed.					
VUL		Vulnerable. Any native species that, on the basis of the best available scientific evidence, is a species of special concern in Ontario, but is not a threatened or endangered species.					
END		Endangered. A species facing imminent extirpation or extinction throughout its range.					
EXP		Extirpated. A species no longer existing in the wild in Canada, but occurring elsewhere in the wild.					
EXT		Extinct. A species that no longer exists.					
IND		Indeterminate. A species for which there is insufficient information to support a status designation.					
NAR		Not At Risk. A species that has been evaluated and found to be not at risk.					
SC		Special Concern. A species of special concern particularly sensitive to human activities or natural events. Does not include an extirpated, endangered or threatened species.					
THR		Threatened. A species likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction.					



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Appendix D

Correspondence and Documentation

Appendix D-1
MOE Freedom of Information
Search Results

Ministry of
the Environment

Freedom of Information and
Protection of Privacy Office

12th Floor
40 St. Clair Avenue West
Toronto ON M4V 1M2
Tel: (416) 314-4075
Fax: (416) 314-4285

Ministère de
l'Environnement

Bureau de l'accès à l'information
et de la protection de la vie privée

12^e étage
40, avenue St. Clair ouest
Toronto ON M4V 1M2
Tél. : (416) 314-4075
Téléc. : (416) 314-4285



June 28, 2010

Kim Hawkes
RJ Burnside & Assoc Ltd
15 Townline
Orangeville, ON L9W 3R4

Dear Kim Hawkes:

RE: Freedom of Information and Protection of Privacy Act Request
Our File #: A-2010-01779, Your Reference #: MCO018503.1

This letter is in response to your request made pursuant to the *Freedom of Information and Protection of Privacy Act* relating to Thornbury Closed Landfill Site - X2090 - King Street, Thornbury.

After a thorough search of the Ministry's Owen Sound Area Office, Investigations and Enforcement Branch, Environmental Monitoring and Reporting Branch, Sector Compliance Branch and Safe Drinking Water Branch, records were located in response to your request. It is my decision to provide full access to the attached information.

In accordance with Section 57 of the *Freedom of Information and Protection of Privacy Act*, detailed below are our charges:


• Search Time 1 hour @ \$30/hour	\$30.00
• Copying 20 pages @ \$0.20/page	\$4.00
• Delivery	3.00
• Total	\$ 37.00
• Deposit Received	- 30.00
• BALANCE WAIVED (NOT REQUIRED)	\$ 7.00

The Environmental Assessment and Approvals Branch has advised that there may be inactive records in the Records Centre. To retrieve these files there is a charge of \$60.00 with no guarantee that any records will be located responsive to your request. If you would like us to retrieve these files, **please forward to me at the above address payment by money order or cheque (made payable to the "Minister of Finance (FOI)") or by credit card in the amount of \$60.00.** Please note, a request for records must usually be answered within 30 calendar days, however Section 27 allows for time extensions under certain circumstances. If you choose to have the files retrieved from the Records Centre, the time for answering your request will be extended for an additional 30 days.

If you object to any decision I have made, you may request a review by contacting the Information and Privacy Commissioner/Ontario, 2 Bloor Street East, Suite 1400, Toronto, ON M4W 1A8 (800-387-0073 or 416-326-3333). Please note that there is a \$25.00 fee and you only have 30 days from receipt of this letter to request a review.

If you have any questions regarding this matter, please contact Erin Coulter at (416) 327-1985.

Yours truly,

f.c. 

Donna Currie
FOI Coordinator
Freedom of Information and Protection of Privacy Office

Attachments



Ministry
of the
Environment



Southwest
Region



Region du
Sud-Ouest

1580 20th Street East
P.O. Box 967,
Owen Sound Ontario
N4K 6H6
519-371-2901
FAX: 519-371-2905

1580, 20 Rue est
P.O. Box 967,
Owen Sound (Ontario)
N4K 6H6
519-371-2901
FAX: 519-371-2905

August 13, 2004

To:

Attention: Mr. Jeff Fletcher
Waste Management Review Co-ordinator
The Corporation of the Town of the Blue Mountains
26 Bridge Street East, P.O. Box 310
Thornbury, Ontario
Canada
N0H 2P0

RE:

Closed Waste Disposal Site #X2090
King Street, Thornbury
County of Grey

Reference Number: 0605-63DP6S

Dear Mr. Fletcher:

Enclosed is the final Ministry of the Environment (MOE) inspection report for Closed Waste Disposal Site number X2090, located on King Street in the Town of Thornbury.

If you have any questions or concerns regarding this inspection report, please contact Mark Powell at the Owen Sound area office, (519) 371-2901.

Yours truly,

Sarah Watts
PCB Site Reduction and Landfill ID Coordinator

File Storage Number: GR BM 09 1/1
K1 600

000001



Ministry of the
Environment

Closed Waste Disposal Site Inspection Report

Client:	The Corporation of the Town of The Blue Mountains Mailing Address: 26 Bridge Street East, P.O. Box 310, Thornbury, Ontario, Canada, N0H 2P0 Physical Address: 26 Bridge Street East, Thornbury, Concession: , Plan: , The Blue Mountains, Town, County of Grey, Ontario, Canada, N0H 2P0 Telephone: (519)599-3131, Extension: 226, FAX: (519)599-2474, email: jcaswell@town.thebluemountains.on.ca Client #: 2018-4EBHVD; Client Type: Municipal Government		
Inspection Site Address:	Thornbury Closed Landfill Site Address: North end, east side of King St. off Landsdown, Concession: , Plan: , The Blue Mountains, Town, County of Grey District Office: Owen Sound GeoReference: Map Datum: NAD83, Zone: 17, Accuracy Estimate: 1-10 metres eg. Good Quality GPS, Method: GPS; UTM-Easting: 542914, UTM Northing: 4934989, UTM Location Description: At gate off King St.		
Contact Name:	Jeff Fletcher	Title:	Waste Management Review Co-ordinator
Contact Telephone:	(519) 599-3131 ext	Contact Fax:	(519) 599-7723
Last Inspection Date:			
Inspection Start Date:	2004/07/08	Inspection Finish Date:	2004/07/08
Region:	Southwestern		

1.0 INTRODUCTION

This inspection was completed with the intent to establish the exact location and status of the closed waste disposal site. The closed landfill site was inspected with attention to both environmental impacts on ground/surface water and the current physical condition of the site (including: vegetative cover, leachate seeps, security fencing, monitoring programs, etc.).

This site is a closed landfill that was used by the town of Thornbury. This site was capped and closed before 1978. The site entrance is located on King St. Currently the site is being used for aggregate storage and also storage for a large number of boat cribs. The use of the site for these purposes is reasonable since the site has been closed for over 25 years.

2.0 INSPECTION OBSERVATIONS

Certificate of Approval Number(s): ☐ Yes ☒ No

2.1 FINANCIAL ASSURANCE

There is no financial assurance required since this is a municipal site.

2.2 CLOSURE PLAN

The Ministry has not received a closure plan for this site.

2.3 ACCESS CONTROL

The entrance to the site is controlled by a locked gate. There is no fencing around the site, but there are berms around most of the site to shield it from view. There were no signs of illegal dumping on site.

2.4 FINAL COVER

The final cover at the site appears intact. The majority of the area of the closed landfill has sparse vegetation growing out of sand and gravel. The area surrounding the landfill had vegetation.

2.5 LEACHATE CONTROL SYSTEM

There is no leachate control system on site.

2.6 METHANE GAS CONTROL SYSTEM

There is no methane gas control system on site.

2.7 MONITORING PROGRAMS:

There are no monitoring programs at this site.

2.8 GROUND WATER/SURFACE WATER IMPACTS

There is a water course nearby and down-gradient from the closed landfill site. There was no run-off at the time of the inspection.

However, there was evidence of prior run-off.

There was some ponding on the landfill surface.

There was no evidence of leachate break out on the site.

The municipality indicated that the nearby residences are serviced with municipal water. No wells were observed in the area during the inspection.

2.9 Registration On Title:

Is the site registered on title as an historic landfill ?

This site is not registered on title as a historic landfill.

3.0 REVIEW OF PREVIOUS NON-COMPLIANCE ISSUES

A review of the district files did not reveal any non-compliance issues related to this inspection.

4.0 SUMMARY OF INSPECTION FINDINGS (HEALTH/ENVIRONMENTAL IMPACT)

Was there any indication of a known or anticipated human health impact during the inspection and/or review of relevant material, related to this Ministry's mandate ?

No

Specifics:

Was there any indication of a known or anticipated environmental impact during the inspection and/or review of relevant material ?

No

Specifics:

Was there any indication of a known or suspected violation of a legal requirement during the inspection and/or review of relevant material which could cause a human health impact or environmental impairment ?

No

Specifics:

Was there any indication of a potential for environmental impairment during the inspection and/or the review of relevant material ?

No

Specifics:

5.0 ACTION(S) REQUIRED

There are no actions required.

6.0 OTHER INSPECTION FINDINGS













It is recommended that the Municipality provide a closure plan for the site as required under Ontario Regulation 232 s.31. Additionally, it is recommended that the Municipality register the site on title as a historic waste disposal site as required by the Environmental Protection Act Section 197 (2). The Municipality should consider as part of their closure plan, a plan to re-vegetate part or all of the site. Vegetation would help prevent run-off from the site.

7.0 INCIDENT REPORT

Not Applicable

8.0 ATTACHMENTS

Required attachments:

       
P7080012.JPG P7080001.JPG P7080002.JPG P7080003.JPG P7080004.JPG P7080005.JPG P7080006.JPG P7080007.JPG
   
P7080008.JPG P7080009.JPG P7080010.JPG P7080011.JPG

PREPARED BY:

Environmental Officer:

Name:

Mark Powell

District Office:

Owen Sound Area Office

Date:

2004/08/10

Signature



REVIEWED BY:

District Supervisor:

Name:

Heather Pollard

District Office:

Owen Sound Area Office

Date:

2004/08/12

Signature:



File Storage Number:

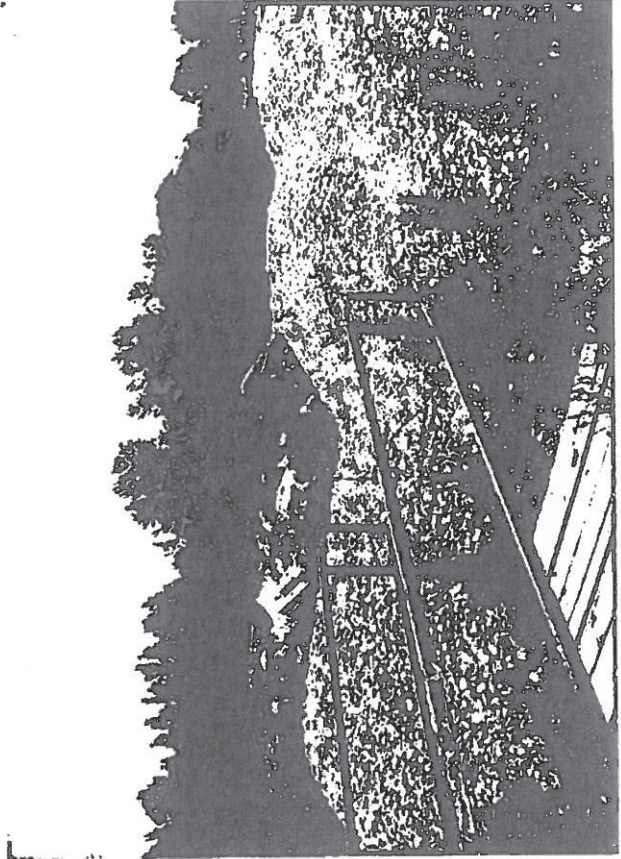
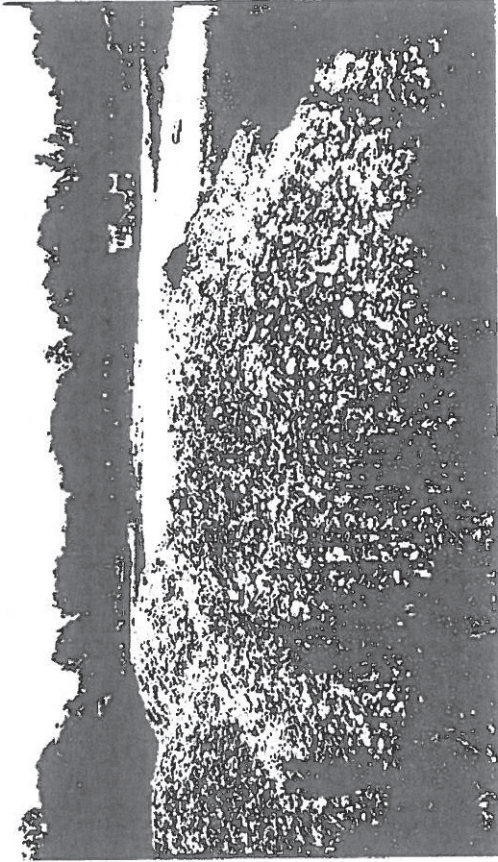
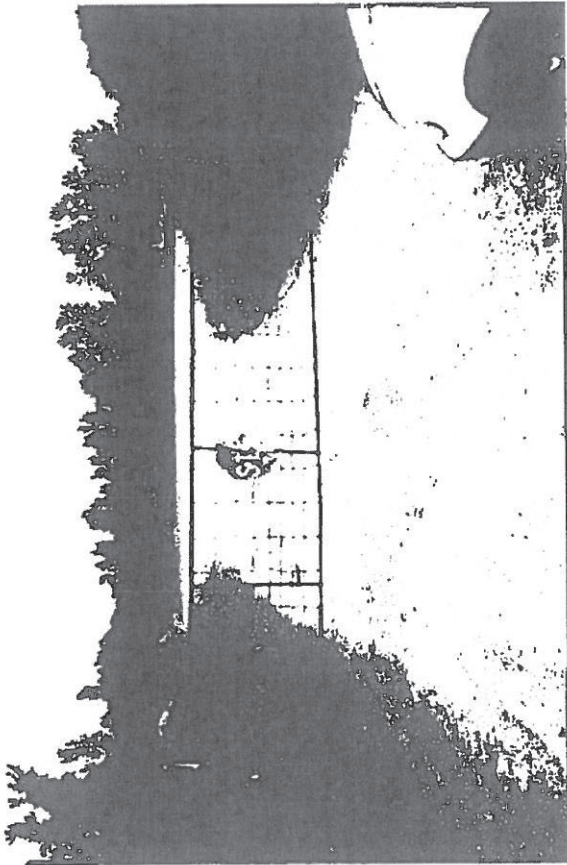
GR BM C9 141

Closed Waste Disposal Site Inspection Report

Note:

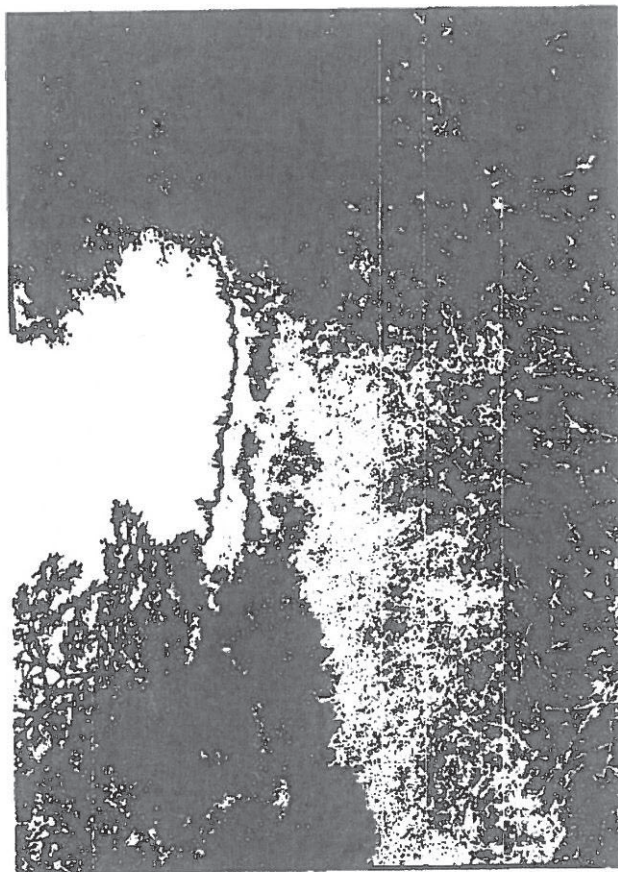
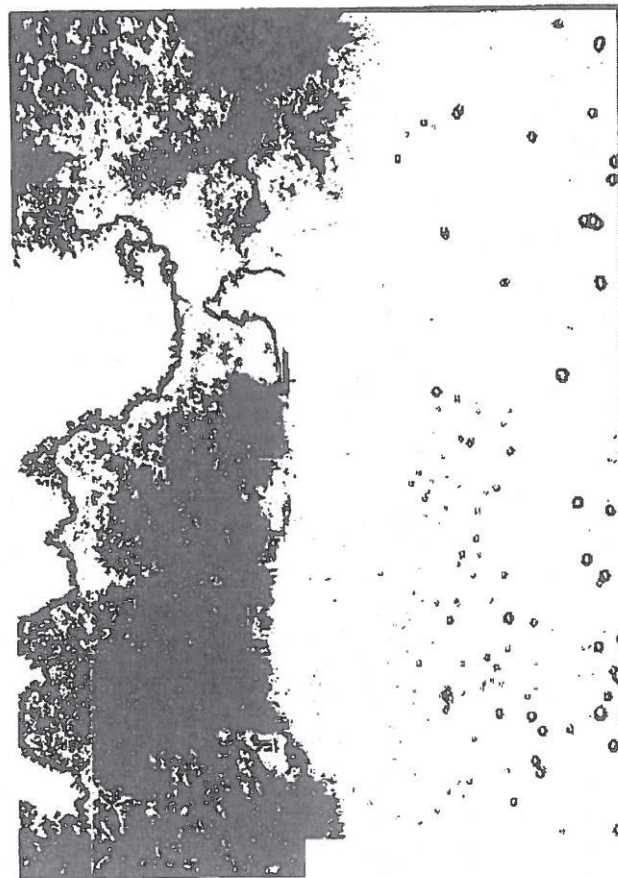
"This inspection report does not in any way suggest that there is or has been compliance with applicable legislation and regulations as they may apply to this facility. It is, and remains, the responsibility of the owner and/or the operating authority to ensure compliance with all applicable legislative and regulatory requirements"

Thonbury - July 08, 2004

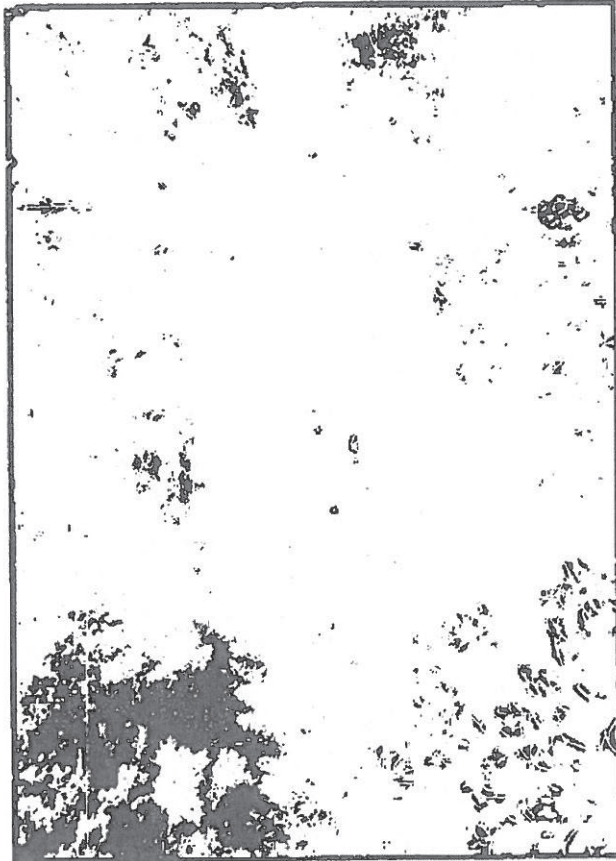
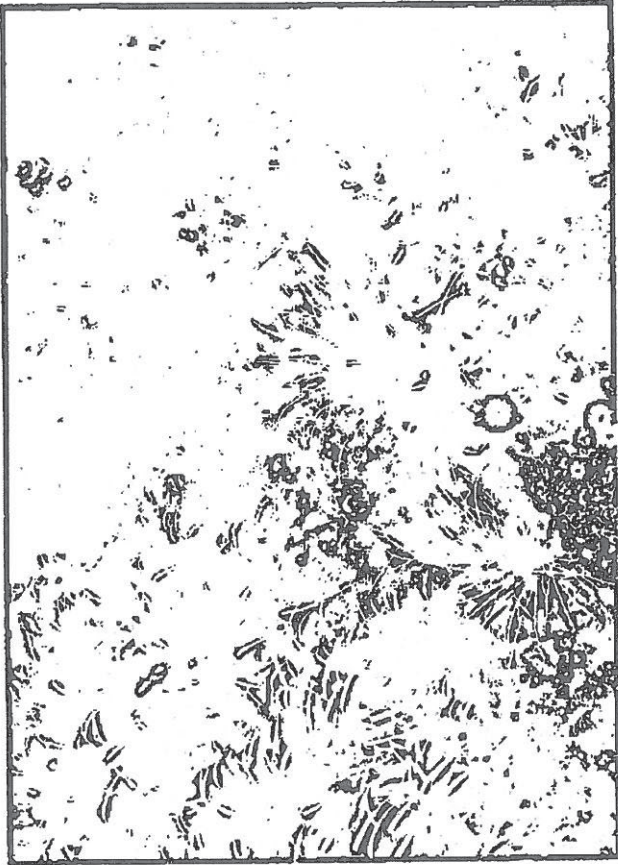


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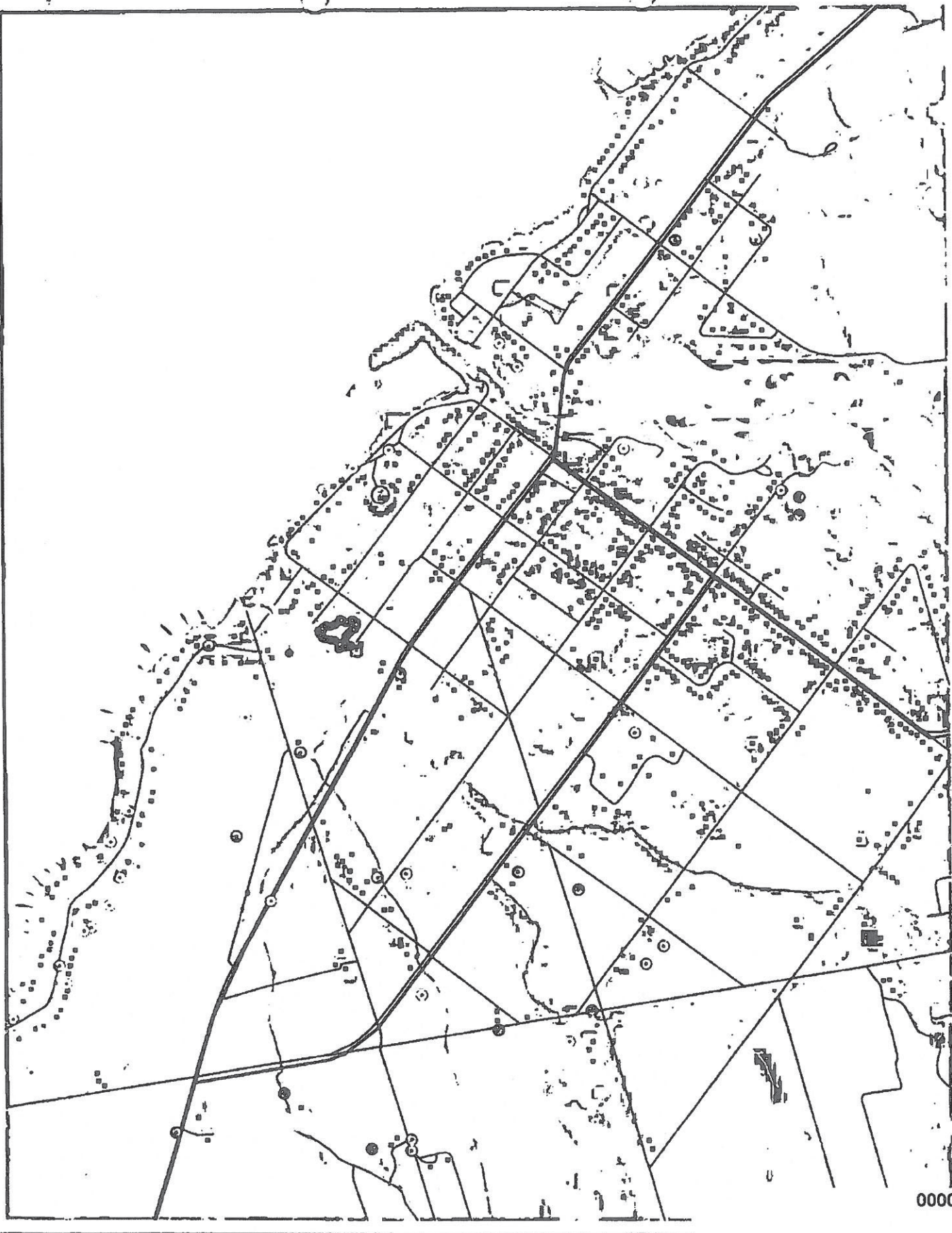
Thonbury, July 08 2004



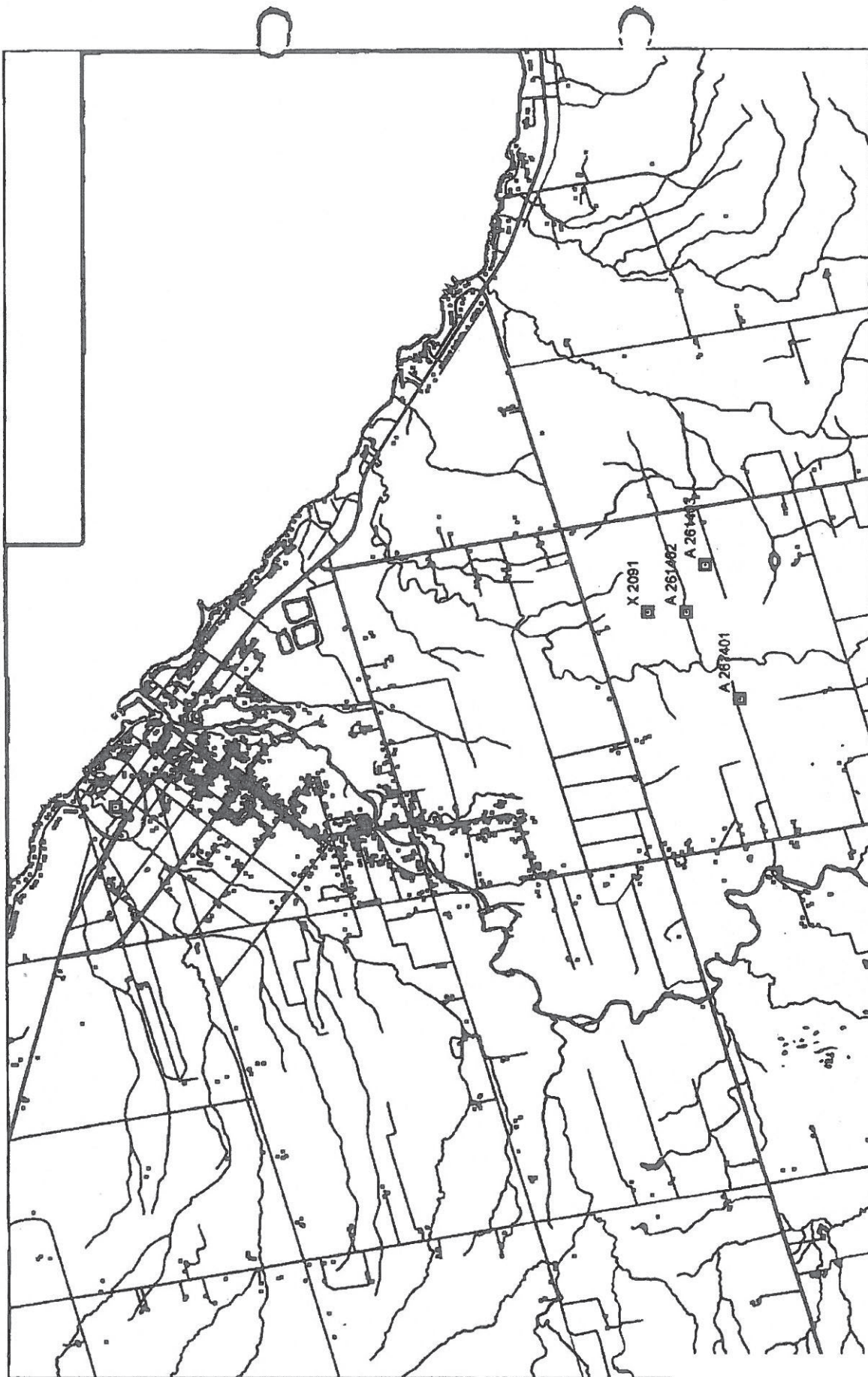
Thorabury - July 08, 2004



LOCATION of X2090



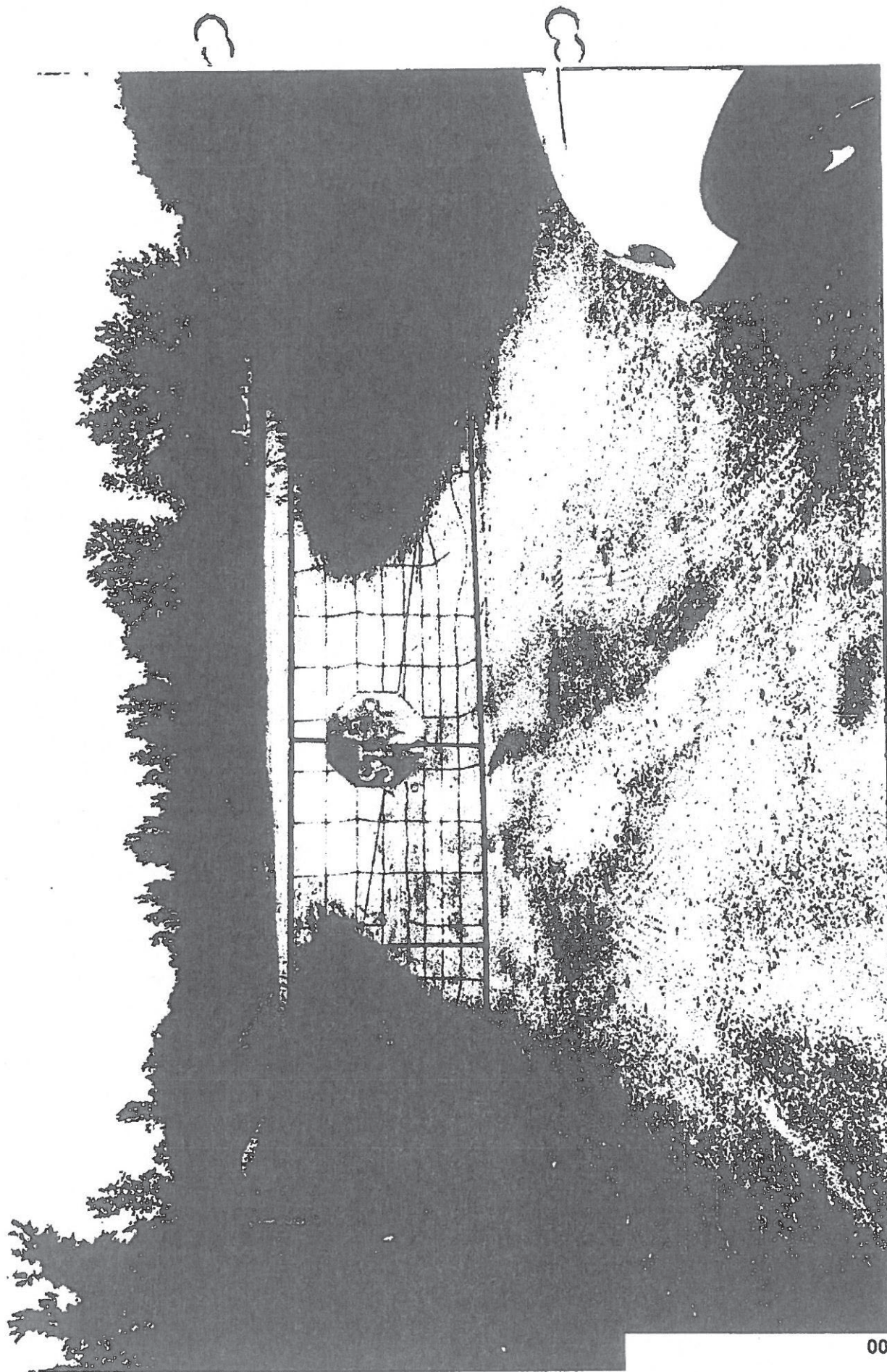
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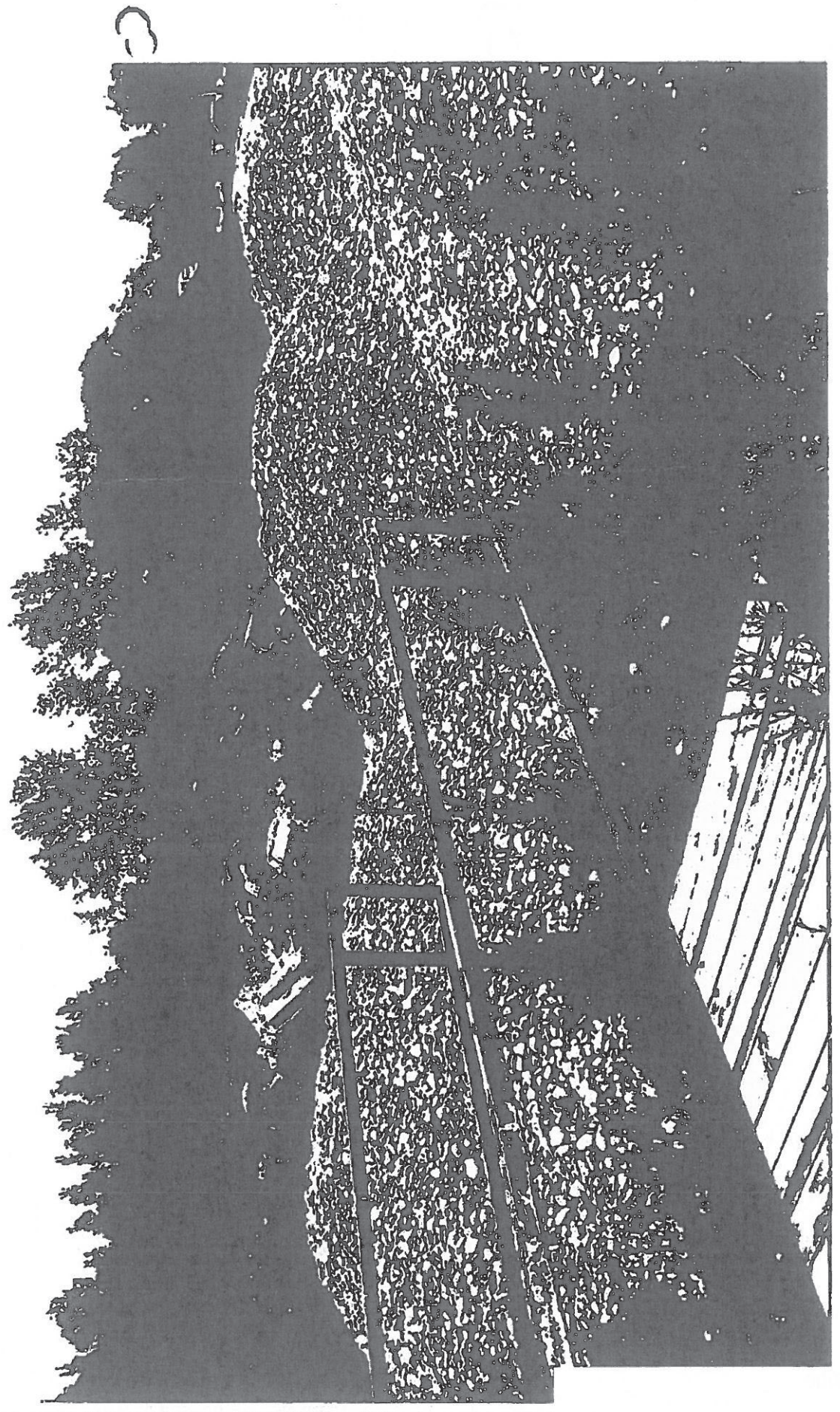
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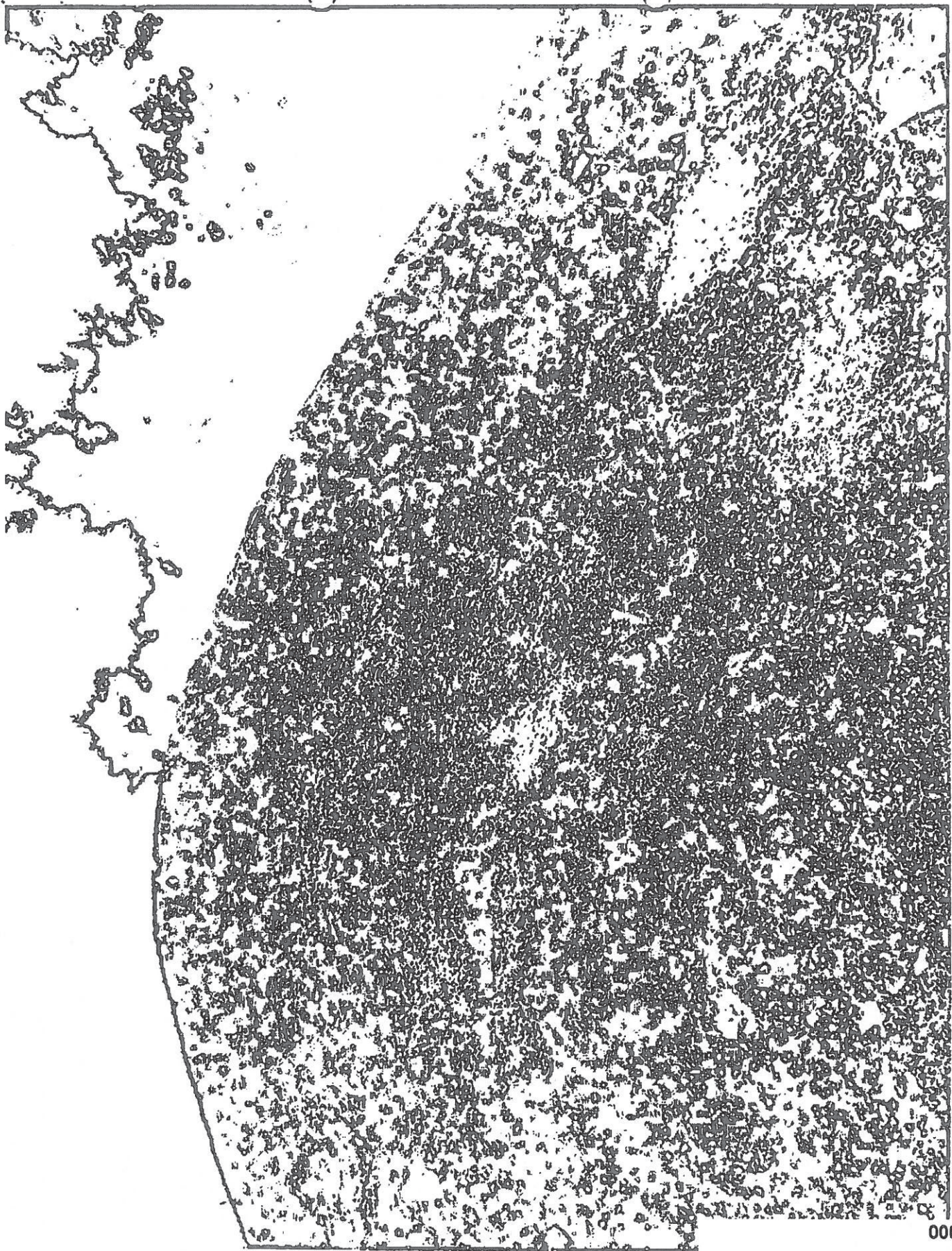


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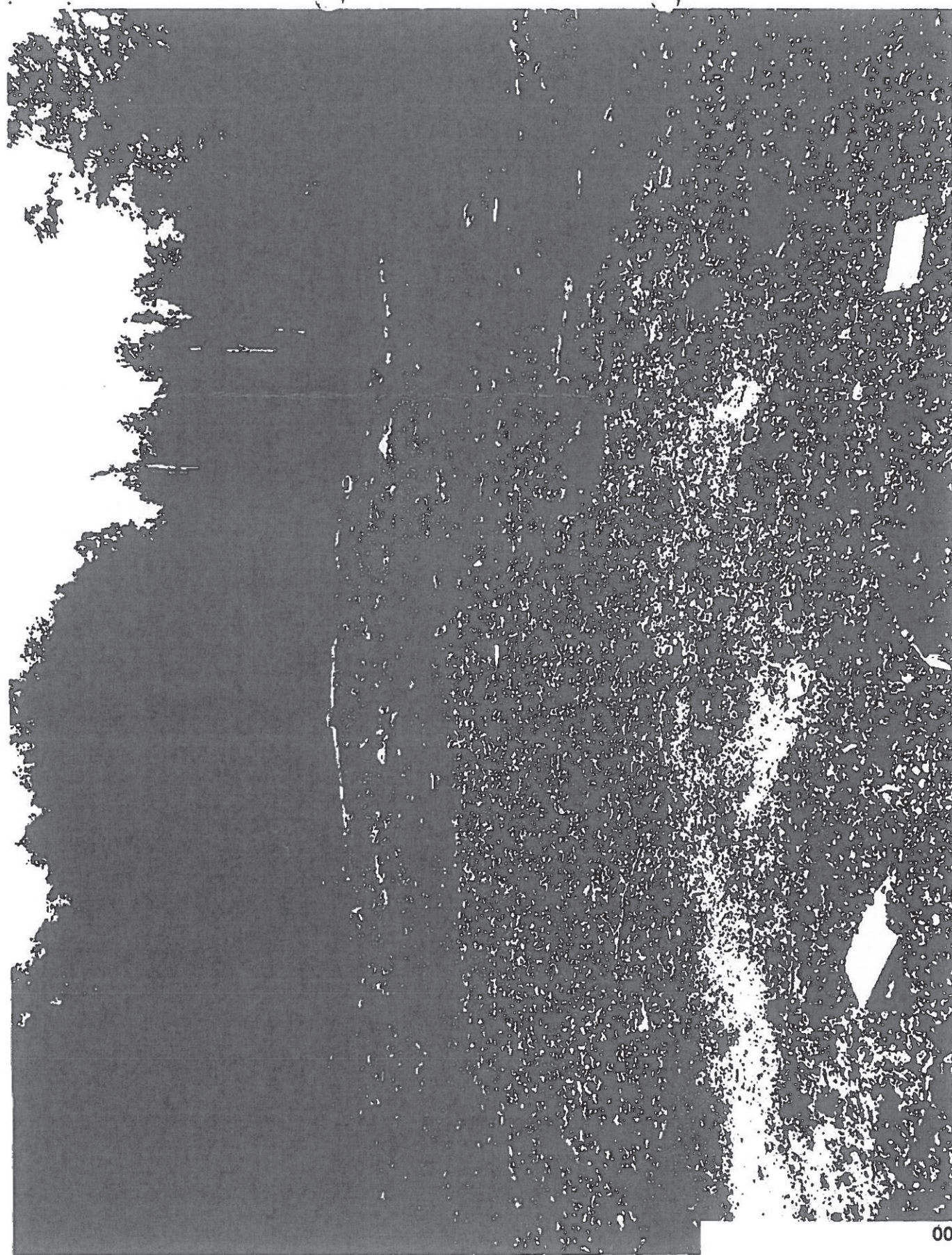


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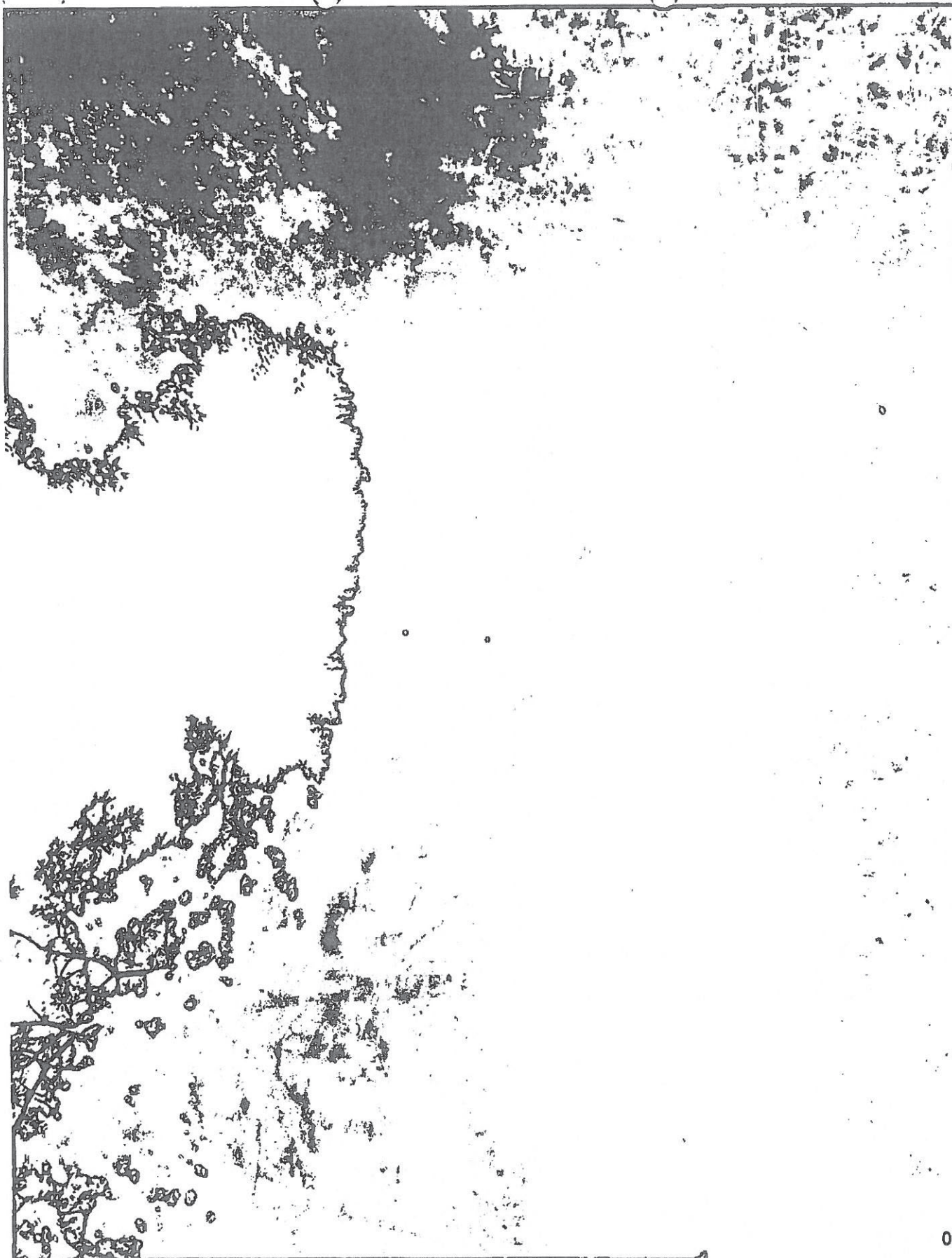




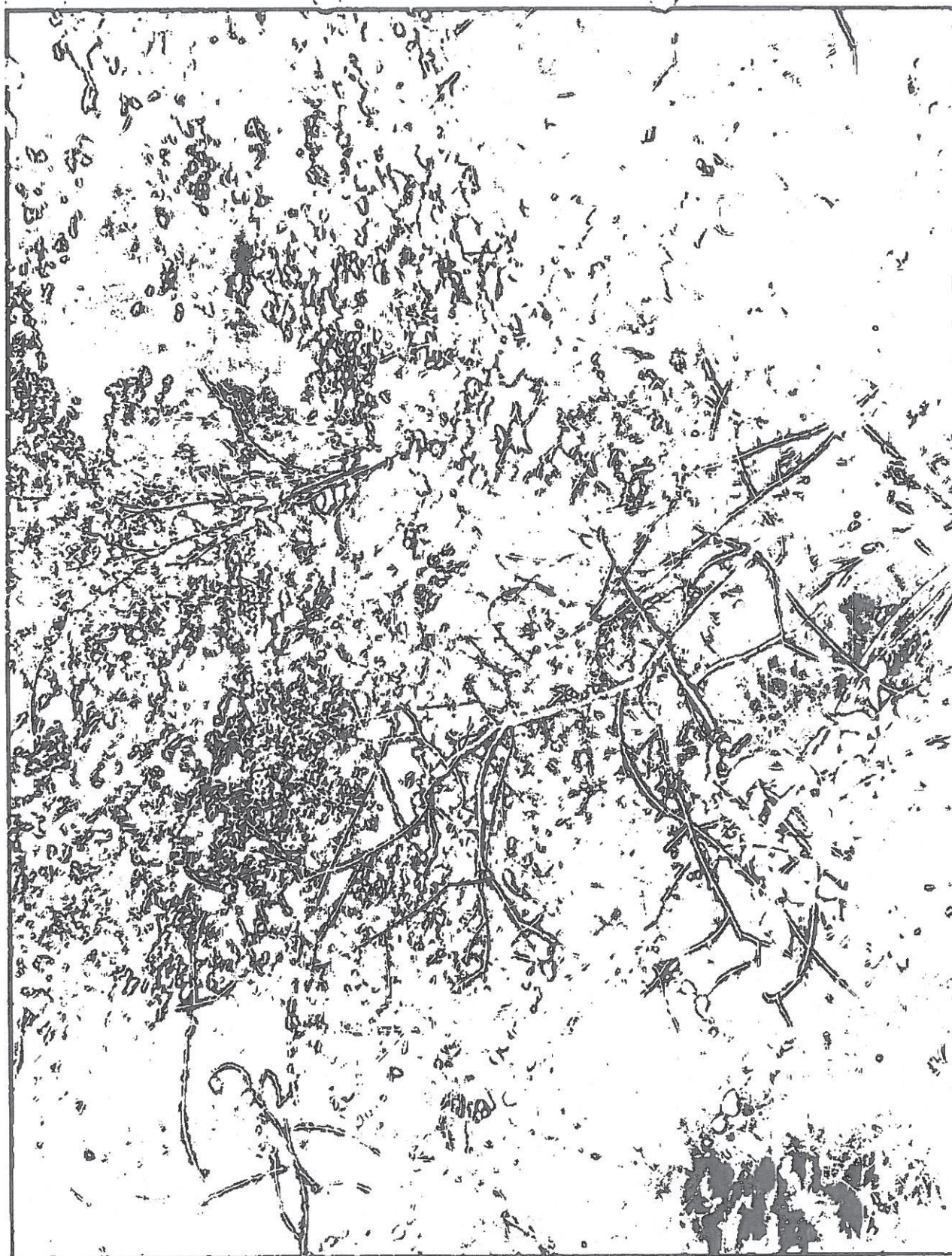
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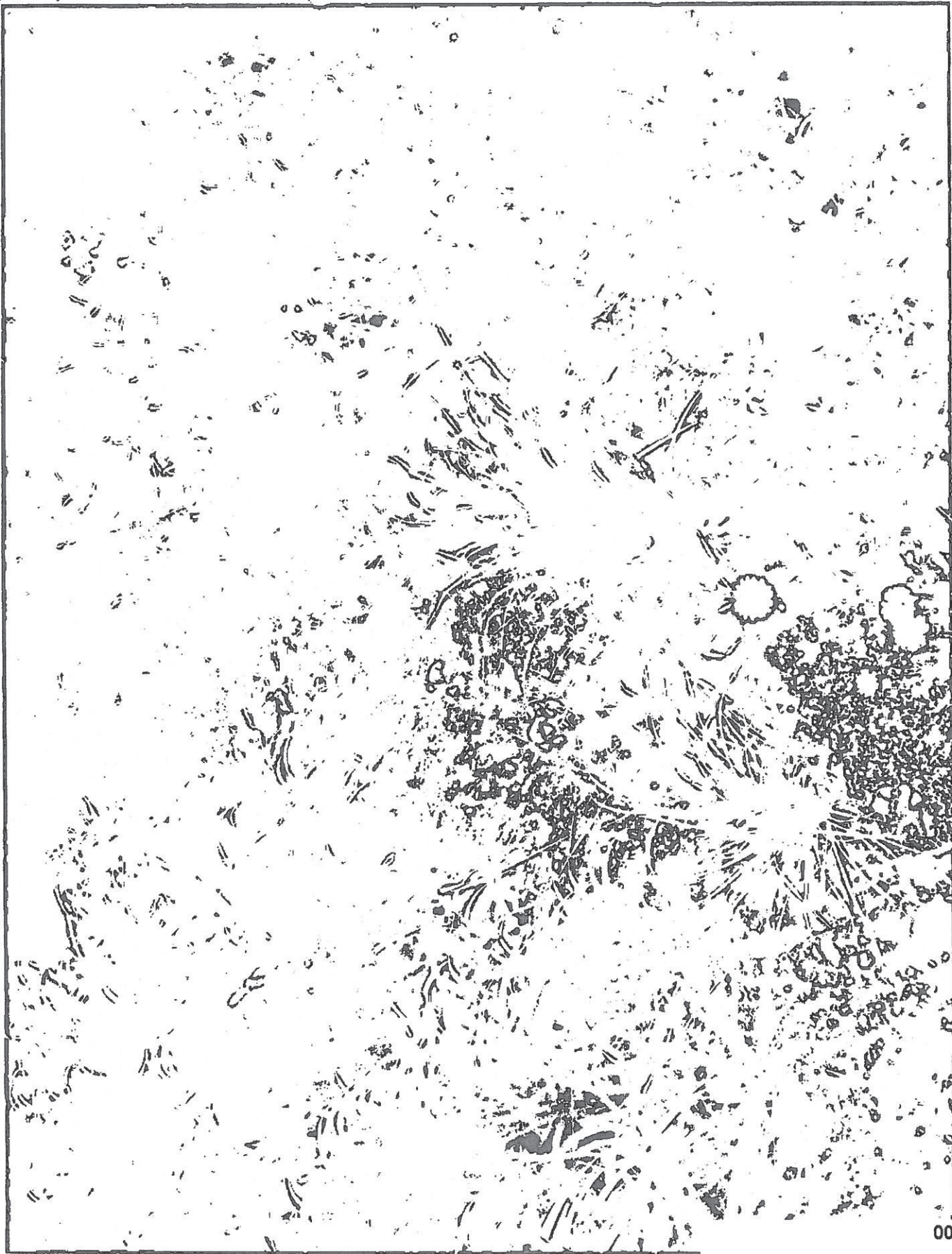
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000015



000016

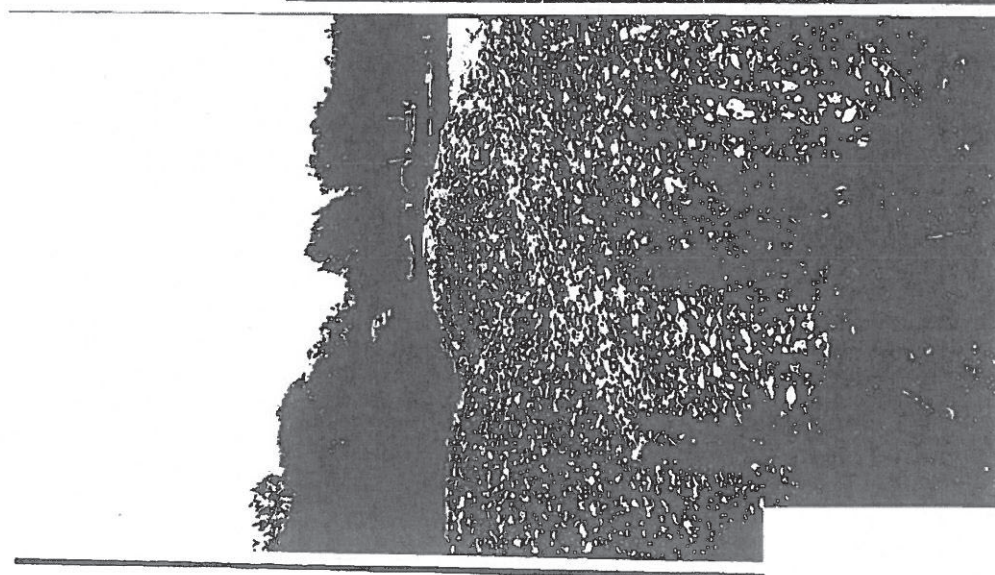
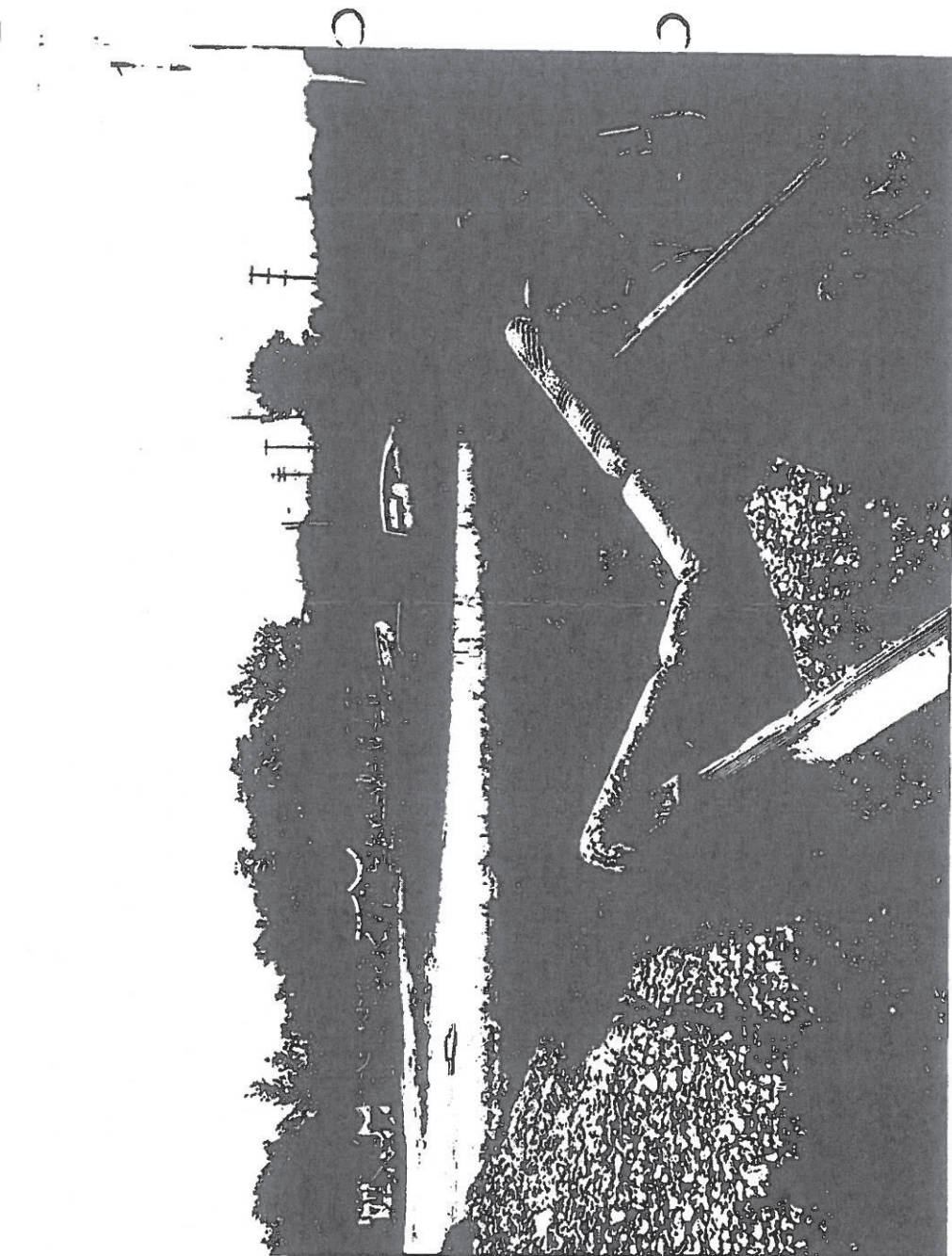


000017



000018





000020



BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

Appendix D-2

Town of Blue Mountain Records



Ministry
of the
Environment

Ministère
de
l'Environnement

Southwestern
Region

Region du
Sud-Ouest

THORN BURY

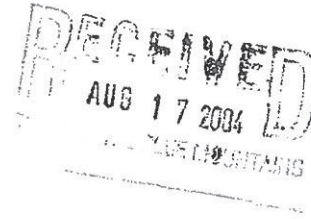
1580 20th Street East
P.O. Box 967,
Owen Sound Ontario
N4K 6H6
519-371-2901
FAX: 519-371-2905

1580, 20 Rue est
P.O. Box 967,
Owen Sound (Ontario)
N4K 6H6
519-371-2901
FAX: 519-371-2905

August 13, 2004

To:

Attention: Mr. Jeff Fletcher
Waste Management Review Co-ordinator
The Corporation of the Town of the Blue Mountains
26 Bridge Street East, P.O. Box 310
Thornbury, Ontario
Canada
N0H 2P0



RE:

Closed Waste Disposal Site #X2090
King Street, Thornbury
County of Grey

Reference Number: 0605-63DP6S

Dear Mr. Fletcher:

Enclosed is the final Ministry of the Environment (MOE) inspection report for Closed Waste Disposal Site number X2090, located on King Street in the Town of Thornbury.

If you have any questions or concerns regarding this inspection report, please contact Mark Powell at the Owen Sound area office, (519) 371-2901.

Yours truly,

Sarah Watts
PCB Site Reduction and Landfill ID Coordinator

File Storage Number: GR BM C9 141



Closed Waste Disposal Site Inspection Report

Client: The Corporation of the Town of The Blue Mountains
 Mailing Address: 26 Bridge Street East, P. O. Box 310, Thornbury, Ontario, Canada, N0H 2P0
 Physical Address: 26 Bridge Street East, Thornbury, Concession: , Plan: , The Blue Mountains, Town,
 County of Grey, Ontario, Canada, N0H 2P0
 Telephone: (519)599-3131, Extension: 226, FAX: (519)599-2474, email:
 jcaswell@town.thebluemountains.on.ca
 Client #: 2018-4EBHVD, Client Type: Municipal Government,

Inspection Site Address: Thornbury Closed Landfill Site
 Address: North end, east side of King St. off Landsdown, Concession: , Plan: , The Blue Mountains,
 Town, County of Grey
 District Office: Owen Sound
 GeoReference: Map Datum: NAD83, Zone: 17, Accuracy Estimate: 1-10 metres eg. Good Quality GPS,
 Method: GPS, UTM Easting: 542914, UTM Northing: 4934989, UTM Location Description: At gate off
 King St.,

Contact Name: Jeff Fletcher **Title:** Waste Management Review
 Co-ordinator

Contact Telephone: (519) 599-3131 ext **Contact Fax:** (519) 599-7723

Last Inspection Date:

Inspection Start Date: 2004/07/08 **Inspection Finish Date:** 2004/07/08

Region: Southwestern

1.0 INTRODUCTION

This inspection was completed with the intent to establish the exact location and status of the closed waste disposal site. The closed landfill site was inspected with attention to both environmental impacts on ground/surface water and the current physical condition of the site (including: vegetative cover, leachate seeps, security fencing, monitoring programs, etc.).

This site is a closed landfill that was used by the town of Thornbury. This site was capped and closed before 1978. The site entrance is located on King St. Currently the site is being used for aggregate storage and also storage for a large number of boat cribs. The use of the site for these purposes is reasonable since the site has been closed for over 25 years.

2.0 INSPECTION OBSERVATIONS

Certificate of Approval Number(s): ☐ Yes ☒ No

2.1 FINANCIAL ASSURANCE

There is no financial assurance required since this is a municipal site.

2.2 CLOSURE PLAN

The Ministry has not received a closure plan for this site.

2.3 ACCESS CONTROL

The entrance to the site is controlled by a locked gate. There is no fencing around the site, but there are berms around most of the site to shield it from view. There were no signs of illegal dumping on site.

2.4 FINAL COVER

The final cover at the site appears intact. The majority of the area of the closed landfill has sparse vegetation growing out of sand and gravel. The area surrounding the landfill had vegetation.

2.5 LEACHATE CONTROL SYSTEM

There is no leachate control system on site.

2.6 METHANE GAS CONTROL SYSTEM

There is no methane gas control system on site.

2.7 MONITORING PROGRAMS:

There are no monitoring programs at this site.

2.8 GROUND WATER/SURFACE WATER IMPACTS

There is a water course nearby and down-gradient from the closed landfill site. There was no run-off at the time of the inspection. However, there was evidence of prior run-off.

There was some ponding on the landfill surface.

There was no evidence of leachate break out on the site.

The municipality indicated that the nearby residences are serviced with municipal water. No wells were observed in the area during the inspection.

2.9 Registration On Title:

Is the site registered on title as an historic landfill ?

This site is not registered on title as a historic landfill.

3.0 REVIEW OF PREVIOUS NON-COMPLIANCE ISSUES

A review of the district files did not reveal any non-compliance issues related to this inspection.

4.0 SUMMARY OF INSPECTION FINDINGS (HEALTH/ENVIRONMENTAL IMPACT)

Was there any indication of a known or anticipated human health impact during the inspection and/or review of relevant material, related to this Ministry's mandate ?

No

Specifics:

Was there any indication of a known or anticipated environmental impact during the inspection and/or review of relevant material ?

No

Specifics:

Was there any indication of a known or suspected violation of a legal requirement during the inspection and/or review of relevant material which could cause a human health impact or environmental impairment ?

No

Specifics:

Was there any indication of a potential for environmental impairment during the inspection and/or the review of relevant material ?

No

Specifics:

5.0 ACTION(S) REQUIRED

There are no actions required.

6.0 OTHER INSPECTION FINDINGS

It is recommended that the Municipality provide a closure plan for the site as required under Ontario Regulation 232 s.31. Additionally, it is recommended that the Municipality register the site on title as a historic waste disposal site as required by the Environmental Protection Act Section 197 (2). The Municipality should consider as part of their closure plan, a plan to re-vegetate part or all of the site. Vegetation would help prevent run-off from the site.

7.0 INCIDENT REPORT

Not Applicable

8.0 ATTACHMENTS

Required attachments:

       
P7080012.JPG P7080001.JPG P7080002.JPG P7080003.JPG P7080004.JPG P7080005.JPG P7080006.JPG P7080007.JPG
   
P7080008.JPG P7080009.JPG P7080010.JPG P7080011.JPG

PREPARED BY:

Environmental Officer:

Name:

Mark Powell

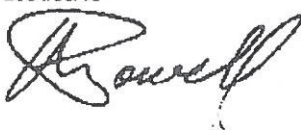
District Office:

Owen Sound Area Office

Date:

2004/08/10

Signature



REVIEWED BY:

District Supervisor:

Name:

Heather Pollard

District Office:

Owen Sound Area Office

Date:

2004/08/12

Signature:



File Storage Number:

GR BM C9 141

Closed Waste Disposal Site Inspection Report

Note:

"This inspection report does not in any way suggest that there is or has been compliance with applicable legislation and regulations as they may apply to this facility. It is, and remains, the responsibility of the owner and/or the operating authority to ensure compliance with all applicable legislative and regulatory requirements"

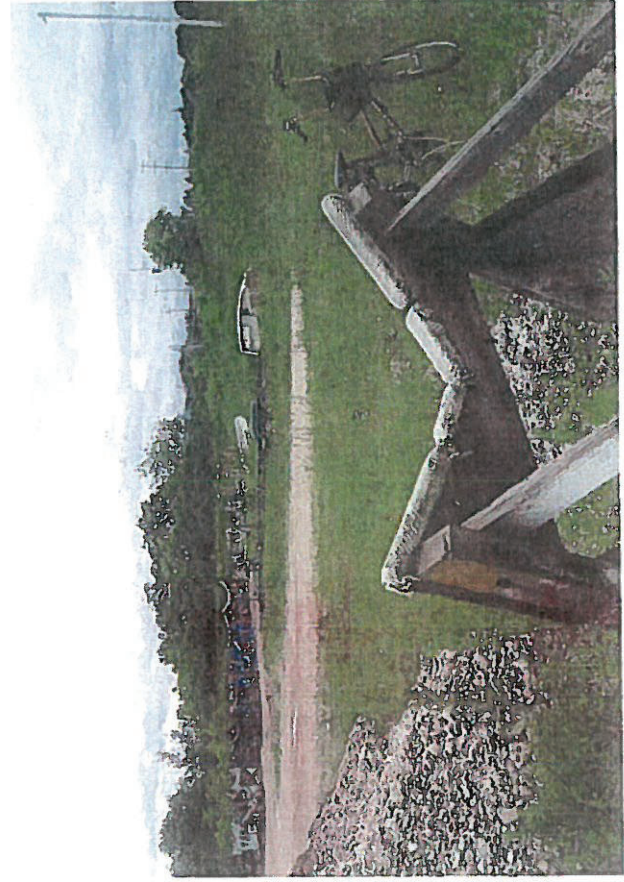
July 08, 2004 - Thornbury



July 08, 2004 - Thornbury



July 08, 2004, Thorburn



**Abandon and Existing Landfill Sites
Town of The Blue Mountains**

May24/2006

Site: Thornbury Closed Site

Roll # 42-42-00-00-17-191-00-0000

Roll # 42-42-00-00-17-213-00-0000

Legal Description: Town Plot Lot 40 to 47 Huron W/S
Town Plot Lot 47 to 48 King E/S

Ownership: Municipal

Type: Natural Attenuation Landfill

Location: See attached map

Status: Closed

Closing Date: Before 1978

Correspondence with MOE: See attached inspection report 2004/07/08

Studies: None



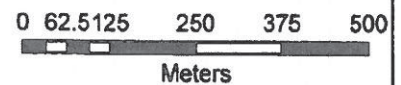
Landfill Site Inventory Town Of The Blue Mountains

Subject Landfill Point

Status: Abandoned

Rollnumber:

Legal Description: Landfill Point Located Under Road Allowance



August 2005



Town of The Blue Mountains Official Plan

Appendix Map 'E'
Landfill Sites, Sewage Treatment Plants,
and Thin Overburden Areas
(As Amended by OPA 4)

- Sewage Treatment Plant
- Abandoned Landfill Site (Known)
- Existing Landfill Site
- Buffer Area Boundary
- Thin Overburden Areas



SCALE 1:80,000
OCTOBER 2005

Appendix D-3

MOE Water Well Records Summary

TOWNSHIP CONCESSION (LOT)	UTM ¹	DATE ² CNTR ³	CASING DIA ⁴	WATER ^{5,6} DETAIL	STAT LVL/PUMP LVL ⁷ RATE ⁸ /TIME HR:MIN	WATER USE ⁹	SCREEN INFO ¹⁰	WELL # (AUDIT#) WELL TAG # DEPTHS TO WHICH FORMATIONS EXTEND ^{5,11}
COLLINGWOOD TOWNSHIP CON 09(028)	17 545014 4931623 ^W	1982/05 4716	06	FR 0083	010 / 022 015 / 3:30	DO		2507703 () BRWN LOAM 0002 BRWN SAND CLAY 0015 GREY CLAY GRVL 0050 BRWN GRVL SAND CLAY 0053 BRWN SAND GRVL SILT 0067 BRWN GRVL CLAY 0078 BRWN GRVL SAND CLAY 0083 BRWN GRVL SAND 0085
COLLINGWOOD TOWNSHIP CON 09(028)	17 544964 4931593 ^W	1973/05 4716	05	FR 0094	008 / 025 008 / 3:0	DO		2504181 () BLCK LOAM 0003 BRWN CLAY 0053 BRWN SILT CLAY 0056 GREY CLAY SAND HPAN 0094 BRWN GRVL SAND 0095 BRWN GRVL 0096
COLLINGWOOD TOWNSHIP CON 09(028)	17 543907 4931116 ^W	1991/04 6433	06 05	FR 0135	012 / 050 025 / 2:0	DO		2511281 () BRWN SAND 0030 CLAY STNS SNDRY 0110 SAND GRVL CMTD 0123 GRVL CLAY SNDRY 0143 BLCK SHLE 0153
COLLINGWOOD TOWNSHIP CON 09(029)	17 542864 4931723 ^W	1978/12 1565	07	FR	/ 009 003 / 60:0	DO		2507036 () LOAM 0001 BRWN CLAY SNDRY 0014 BRWN CLAY GRVL 0025 SAND 0056 SAND SLTY 0060
COLLINGWOOD TOWNSHIP CON 09(029)	17 544907 4932137 ^W	1975/10 4856	05 05	FR 0067	030 / 040 050 / 2:20	DO		2505547 () LOAM 0001 BRWN SAND 0010 BLUE CLAY STNS 0037 BLUE GRVL SAND CLAY 0070
COLLINGWOOD TOWNSHIP CON 09(029)	17 544829 4932248 ^W	1947/06 1725	04	FR 0066	013 / 033 006 / 2:0	DO		2500550 () CSND STNS 0026 CSND FSND 0066
COLLINGWOOD TOWNSHIP CON 09(030)	17 544202 4932752 ^L	2000/12 2576						2514463 (219685) LOAM 0001 BRWN SAND GRVL 0017 GREY SILT GRVL 0039 GREY SILT 0056 GREY GRVL CLAY 0074 GREY GRVL SILT 0078 GREY GRVL STNS CLAY 0102 GREY LMSN SHLE 0133 BLCK LMSN 0149 GREY LMSN 0159 BRWN LMSN 0161 BLCK LMSN 0178
COLLINGWOOD TOWNSHIP CON 09(030)	17 555484 4929838 ^W	1988/09 3741	06	FR 0147	044 / 051 005 / 6:30	DO		2509519 () LOAM 0001 BRWN CLAY GRVL SNDRY 0011 GRVL CMTD 0014 BRWN CLAY GRVL 0022 GREY CLAY GRVL 0033 GRVL CMTD 0042 GREY CLAY CLAY GRVL 0103 SAND SLTY 0145 BLCK GRVL SAND SLTY 0148
COLLINGWOOD TOWNSHIP CON 09(030)	17 543664 4932873 ^W	1977/04 4716	06	FR 0083	036 / 075 003 / 3:0	DO	0085 03	2506034 () BLCK LOAM 0001 BRWN SAND CLAY 0011 BLUE CLAY STNS 0018 GREY CLAY STNS BLDR 0065 GREY GRVL SILT SAND 0083 BRWN SAND 0087 BRWN SAND GRVL 0091
COLLINGWOOD TOWNSHIP CON 09(030)	17 543729 4932948 ^W	1987/09 5502	06	FR 0087	/ 053 005 / 2:0	DO	0083 07	2509205 () LOAM SAND LTCL 0008 GREY CLAY 0046 GREY HPAN STNS 0056 GREY SAND CLAY GRVL 0080 GRVL SAND 0091
COLLINGWOOD TOWNSHIP CON 09(030)	17 544114 4932823 ^W	1967/08 3408	06	FR 0090	025 / 050 030 / 40:0	ST DO	0104 04	2500552 () CLAY GRVL HPAN 0080 FSND GRVL 0100 CSND GRVL 0108

TOWNSHIP CONCESSION (LOT)	UTM ¹	DATE ² CNTR ³	CASING DIA ⁴	WATER ^{5,6} DETAIL	STAT LVL/PUMP LVL ⁷ RATE ⁸ /TIME HR:MIN	WATER USE ⁹	SCREEN INFO ¹⁰	WELL # (AUDIT#) WELL TAG # DEPTHS TO WHICH FORMATIONS EXTEND ^{5,11}
COLLINGWOOD TOWNSHIP CON 09(030)	17 543864 4932873 ^W	1958/11 1106	04 04 04	MN 0150	040 / 145 003 / 3:0	ST DO		2500551 () LOAM 0005 MSND CLAY 0030 QSDN 0050 GRVL MSND 0070 QSDN 0140 BRWN HPAN 0150 SHLE 0200
COLLINGWOOD TOWNSHIP CON 09(030)	17 544240 4933046 ^W	1975/07 3408	07	FR 0075	017 / 070 001 / 24:0	DO	0072 04	2505238 () CLAY GRVL 0075 SAND GRVL 0080
COLLINGWOOD TOWNSHIP CON 09(031)	17 543864 4933053 ^W	1971/10 1350	06	FR 0076 FR 0078	059 / 061 010 / 2:30	ST DO		2503553 () LOAM 0001 BRWN CLAY 0007 GREY CLAY GRVL 0032 GREY GRVL CLAY 0076 GREY GRVL 0078
COLLINGWOOD TOWNSHIP CON 09(031)	17 544102 4933363 ^L	2001/05 2576	06 06	FR 0107	106 / 008 / :0			2514599 (219816) BRWN CLAY STNS 0009 BLUE STNS CLAY SILT 0041 GREY SILT STNS 0063 BLUE SHLE 0065 GREY LMSN SHLE 0092 BLCK LMSN 0107 BRWN LMSN 0118
COLLINGWOOD TOWNSHIP CON 09(031)	17 544298 4933180 ^W	1988/03 5502	06 06	FR 0095	036 / 110 012 / 2:0	DO		2509443 () LOAM LTCL SOFT 0001 GREY HPAN STNS SOFT 0012 GREY CLAY SAND SOFT 0040 GREY CLAY GRVL SOFT 0079 GREY SHLE HARD SOFT 0112 GREY CLAY SOFT 0114
COLLINGWOOD TOWNSHIP CON 09(031)	17 544102 4933363 ^L	2002/07 6433	06 06	FR 0085 FR 0090	057 / 058 010 / 36:0	DO		2515067 (241608) LOAM 0001 BRWN SAND STNY 0029 GREY CLAY STNS 0048 CLAY SAND GRVL 0083 GRVL SAND 0090
COLLINGWOOD TOWNSHIP CON 09(033)	17 543696 4934515 ^L	2000/06 6433	06	FR 0097	046 / 090 003 / 72:0	DO	0096 04	2514281 (215771) BRWN SAND 0036 GREY CLAY SNDY STNS 0057 GREY CLAY SNDY 0064 GRVL SAND CLAY 0067 SAND GRVL CLAY 0068 SAND GRVL 0074 GREY CLAY SNDY GRVL 0094 GRVL CLAY 0095 GRVL 0096 GRVL SAND 0101
COLLINGWOOD TOWNSHIP CON 10(028)	17 543082 4931153 ^L	1994/12 6433	06	FR 0108	006 / 090 008 / 72:0	DO	0103 04 0103 04	2512714 (131232) LOAM 0002 BRWN SAND 0009 BRWN SAND GRVL 0027 SAND CLAY GRVL 0039 GREY CLAY STNS 0058 CLAY SNDY 0061 BRWN SAND 0062 SAND CLAY CMTD 0090 SAND GRVL CMTD 0103 SAND GRVL 0114
COLLINGWOOD TOWNSHIP CON 10(028)	17 542604 4930783 ^W	1967/05 3408	05	FR 0049	020 / 040 010 / 8:0	ST DO	0049 04	2500562 () LOAM 0003 YLLW HPAN 0046 MSND 0053
COLLINGWOOD TOWNSHIP CON 10(028)	17 543594 4931073 ^W	1986/09 5505	05	FR 0082	006 / 076 004 / 5:0	DO	0076 03	2508773 () BLCK LOAM SAND 0001 BRWN SAND 0006 BRWN CLAY STNS SNDY 0021 GREY CLAY STNS SNDY 0088
COLLINGWOOD TOWNSHIP CON 10(028)	17 543118 4930870 ^W	2002/09 6433	06	FR 0106 FR 0101	008 / 010 010 / 15:0	DO	0102 04	2515404 (241614) LOAM 0001 BRWN CLAY SNDY 0015 GREY CLAY SNDY 0063 BRWN SAND GRVL 0070 SAND CMTD CLAY 0090 SAND GRVL CMTD 0099 GRVL LYRD 0106

TOWNSHIP CONCESSION (LOT)	UTM ¹	DATE ² CNTR ³	CASING DIA ⁴	WATER ^{5,6} DETAIL	STAT LVL/PUMP LVL ⁷ RATE ⁸ /TIME HR:MIN	WATER USE ⁹	SCREEN INFO ¹⁰	WELL # (AUDIT#) WELL TAG # DEPTHS TO WHICH FORMATIONS EXTEND ^{5,11}
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COLLINGWOOD TOWNSHIP CON 10(029)	17 542756 4931858 ^W	2004/06 6433	06	FR 0079	-002 / 020 003 / 24:0	DO		2516031 (Z01733) A001638 LOAM 0002 BRWN SAND SOFT CLAY 0068 GREY SAND GRVL 0080
COLLINGWOOD TOWNSHIP CON 10(029)	17 542444 4931643 ^W	1964/10 3408	04	FR 0072		DO		2500565 () PRDG 0010 HPAN CLAY 0052 MSND GRVL 0072
COLLINGWOOD TOWNSHIP CON 10(029)	17 542564 4931673 ^W	1986/08 3813	05	FR 0086	001 / 007 035 / 2:0	DO		2508644 () LOAM 0001 CLAY SAND GRVL 0081 GRVL 0086
COLLINGWOOD TOWNSHIP CON 10(029)	17 542989 4931753 ^L	2000/07 1565	06 06	FR 0075	006 / 007 006 / 24:0	DO		2514410 (212791) LOAM 0001 CLAY SNDY 0035 GREY CLAY GRVL 0053 GRVL CLAY 0070 SAND GRVL 0075
COLLINGWOOD TOWNSHIP CON 10(029)	17 542764 4932023 ^W	1976/06 4716	06	FR 0088	007 / 054 005 / 3:0	DO		2505752 () BRWN LOAM 0001 BRWN SAND 0012 GREY CLAY SILT SOFT 0048 BRWN CLAY 0057 GREY CLAY SAND SILT 0080 GREY GRVL SILT SAND 0088 BRWN GRVL SAND 0091
COLLINGWOOD TOWNSHIP CON 10(029)	17 542695 4932679 ^W	1989/08 2576	06	FR 0067	003 / 007 / 1:30	DO		2510081 () BRWN SAND LOAM 0003 SAND SILT 0014 GREY CLAY 0027 GREY CLAY GRVL 0057 GRVL CLAY 0062 GRVL 0067
COLLINGWOOD TOWNSHIP CON 10(029)	17 542519 4931773 ^W	1964/08 3408	04 04	FR 0068		DO		2500563 () BLUE CLAY 0068
COLLINGWOOD TOWNSHIP CON 10(029)	17 542494 4931753 ^W	1967/06 3408	04	FR 0076	-002 / 010 015 / 24:0	DO		2500567 () HPAN CLAY 0076 GRVL 0079
COLLINGWOOD TOWNSHIP CON 10(029)	17 542664 4931773 ^W	1979/07 4716	05	FR 0065	-008 / 003 015 / 20:0	DO		2506908 () BLCK LOAM 0001 BRWN CLAY SAND 0018 GREY CLAY 0054 GREY CLAY GRVL HPAN 0065 BRWN GRVL SAND 0068
COLLINGWOOD TOWNSHIP CON 10(029)	17 542914 4932023 ^W	1979/10 1565	06 06	FR 0085	018 / 034 003 / 12:0	DO		2507057 () LOAM 0001 CLAY SNDY 0028 CLAY SAND SOFT 0045 GREY CLAY BLDR 0083 GRVL MGRD 0086
COLLINGWOOD TOWNSHIP CON 10(029)	17 542364 4931573 ^W	1979/09 4716	05	FR 0068	005 / 014 010 / 4:0	DO		2506998 () BLCK LOAM 0001 BRWN CLAY SAND 0017 GREY CLAY 0048 GREY CLAY GRVL 0064 BRWN SAND GRVL 0068 BRWN CGVL CSND 0070
COLLINGWOOD TOWNSHIP CON 10(029)	17 542714 4931623 ^W	1983/09 4856	05	FR 0070 FR 0075	/ 030 125 / 1:30	DO		2508044 () BRWN SAND STNS 0007 GREY CLAY SAND BLDR 0062 GREY CLAY STNS QSND 0070 BRWN GRVL 0075
COLLINGWOOD TOWNSHIP CON 10(029)	17 542814 4931768 ^W	1965/10 4716	04	FR 0047	/ 008 010 / 2:0	DO		2500566 () LOAM 0002 LOAM MSND 0011 SILT 0015 CLAY GRVL 0047 CSND GRVL 0049

TOWNSHIP CONCESSION (LOT)	UTM ¹	DATE ² CNTR ³	CASING DIA ⁴	WATER ^{5,6} DETAIL	STAT LVL/PUMP LVL ⁷ RATE ⁸ /TIME HR:MIN	WATER USE ⁹	SCREEN INFO ¹⁰	WELL # (AUDIT#) WELL TAG # DEPTHS TO WHICH FORMATIONS EXTEND ^{5,11}
COLLINGWOOD TOWNSHIP CON 10(029)	17 542789 4931938 ^W	1986/08 3813	05	FR 0075	001 / 012 035 / 2:0	DO		2508646 () LOAM 0001 CLAY SAND 0048 CLAY SAND GRVL 0070 GRVL 0075
COLLINGWOOD TOWNSHIP CON 10(029)	17 542604 4931643 ^W	1986/08 3813	05	FR 0083	001 / 006 035 / 2:0	DO		2508642 () LOAM 0001 CLAY SAND 0054 SAND 0077 GRVL 0083
COLLINGWOOD TOWNSHIP CON 10(029)	17 542714 4931723 ^W	1977/11 4716	04	FR 0042	/ 059 003 / 3:0	DO	0056 03	2506272 () PRDG 0005 BRWN SAND SILT 0042 GREY CLAY 0047 BRWN SAND GRVL 0053 UNKN 0056
COLLINGWOOD TOWNSHIP CON 10(029)	17 542638 4931672 ^W	1988/05 1565	06	FR 0081	001 / 002 015 / 15:0	DO		2509393 () LOAM 0001 BRWN CLAY 0048 CLAY GRVL HARD 0078 SAND GRVL 0081
COLLINGWOOD TOWNSHIP CON 10(029)	17 542708 4932140 ^W	1988/10 3602	06	FR 0009	049 / 100 010 / 1:0	DO		2509560 () BRWN LOAM 0001 BRWN CLAY MGRD 0010 GREY CLAY MGRD CLAY 0040 GREY CLAY STNS STNY 0061 GREY CLAY GRVL STNS 0092 GREY GRVL DRTY WBRG 0108 GREY GRVL CLN WBRG 0110
COLLINGWOOD TOWNSHIP CON 10(029)	17 542644 4931927 ^W	1975/07 1565	07 07	FR 0114	/ 046 004 / 4:0	DO		2505218 () LOAM 0001 CLAY SAND 0018 BRWN SAND GRVL CLAY 0052 GREY CLAY GRVL 0102 GRVL SILT 0112 GRVL 0114
COLLINGWOOD TOWNSHIP CON 10(029)	17 542804 4931928 ^W	1991/09 6433	06	FR 0080	002 / 050 005 / 2:0	DO		2511591 () LOAM 0002 BRWN SAND CLAY LYRD 0050 RED CLAY LYRD 0075 SAND GRVL 0080
COLLINGWOOD TOWNSHIP CON 10(029)	17 542589 4931638 ^W	1986/08 3813	05	FR 0085	001 / 006 035 / 2:0	DO		2508645 () LOAM 0001 CLAY SAND 0054 CLAY GRVL 0081 GRVL 0085
COLLINGWOOD TOWNSHIP CON 10(029)	17 542604 4931643 ^W	1987/10 1565	05	FR 0092	003 / 003 005 / 48:0	DO		2509222 () PRDR 0086 SAND GRVL 0092
COLLINGWOOD TOWNSHIP CON 10(029)	17 542599 4931648 ^W	1986/08 3813	05	FR 0083	001 / 006 035 / 2:0	DO		2508643 () LOAM 0001 CLAY SAND 0048 CLAY GRVL 0078 GRVL 0083
COLLINGWOOD TOWNSHIP CON 10(029)	17 542489 4931753 ^W	1966/10 3805	04	FR 0064	004 / 005 010 / 2:0	DO		2500576 () LOAM CLAY 0005 BLUE CLAY 0025 QSND 0045 GRVL 0065
COLLINGWOOD TOWNSHIP CON 10(029)	17 542814 4931923 ^W	1969/07 4716	04	FR 0076	-001 / 068 005 / 3:0	DO		2502991 () LOAM 0001 SILT MSND 0052 GREY CLAY MSND 0076 BRWN MSND GRVL 0081 GRVL 0083
COLLINGWOOD TOWNSHIP CON 10(029)	17 542364 4931623 ^W	1982/09 4716	05	FR 0070	005 / 007 005 / 19:0	DO		2507774 () BLCK LOAM 0001 YLLW CLAY 0002 BRWN CLAY 0025 GREY CLAY SAND GRVL 0058 BRWN SAND SILT 0064 BLCK SAND 0066 GREY CLAY SAND 0069 GRVL 0070
COLLINGWOOD TOWNSHIP CON 10(029)	17 542314 4931723 ^W	1979/07 4716	05	FR 0065	003 / 060 005 / 20:0	DO		2506907 () BRWN CLAY SAND 0018 GREY CLAY GRVL 0065 GREY GRVL SAND 0068

TOWNSHIP CONCESSION (LOT)	UTM ¹	DATE ² CNTR ³	CASING DIA ⁴	WATER ^{5,6} DETAIL	STAT LVL/PUMP LVL ⁷ RATE ⁸ /TIME HR:MIN	WATER USE ⁹	SCREEN INFO ¹⁰	WELL # (AUDIT#) WELL TAG # DEPTHS TO WHICH FORMATIONS EXTEND ^{5,11}
COLLINGWOOD TOWNSHIP CON 10(029)	17 542764 4932023 ^W	1978/05 3602	05	FR 0090	076 / 085 007 / 2:30	DO	0094 06	2506429 () BRWN LOAM 0001 BRWN CLAY STNS GRVL 0090 BRWN SAND GRVL WBRG 0100
COLLINGWOOD TOWNSHIP CON 10(029)	17 542764 4931573 ^W	1983/09 4856	05 05	FR 0072 FR 0075	002 / 030 075 / 2:0	DO		2508046 () PRDG 0013 GREY CLAY SAND BLDR 0064 GREY CLAY QSND 0068 BRWN GRVL 0075
COLLINGWOOD TOWNSHIP CON 10(029)	17 542364 4931573 ^W	1982/12 4716	05	FR 0072	006 / 055 004 / 3:0	DO		2507803 () BLCK LOAM 0001 YLLW CLAY 0002 BRWN CLAY 0025 GREY CLAY SAND GRVL 0058 BRWN SAND SILT 0064 BLCK SAND 0071 GRVL 0072
COLLINGWOOD TOWNSHIP CON 10(029)	17 542364 4931473 ^W	1982/10 4716	05	FR 0071	006 / 010 005 / 7:0	DO		2507773 () BLCK LOAM 0001 YLLW CLAY SAND 0002 BRWN CLAY SNDY 0025 GREY SAND CLAY 0040 BRWN SAND 0055 BLCK SAND 0060 GREY SAND CLAY 0068 GRVL 0071
COLLINGWOOD TOWNSHIP CON 10(029)	17 542559 4931683 ^W	1964/09 3408	04	FR 0055	/ 030 015 / 6:0	DO		2500564 () CLAY GRVL 0050 MSND GRVL 0055
COLLINGWOOD TOWNSHIP CON 10(029)	17 542664 4931823 ^W	1984/07 4856	05	FR 0084 FR 0086	/ 030 130 / 2:0	DO		2508162 () BLCK LOAM 0001 GREY CLAY SAND 0059 GREY SAND STNS CLAY 0071 GREY GRVL 0086
COLLINGWOOD TOWNSHIP CON 10(029)	17 542698 4932229 ^W	1988/10 3602	06	FR 0090 FR 0096	052 / 085 005 / 4:0	DO		2509559 () BRWN LOAM 0001 BRWN CLAY 0010 GREY CLAY MGRD CLAY 0040 GREY CLAY STNS STNY 0062 GREY CLAY GRVL STNS 0090 GREY GRVL WBRG 0096
COLLINGWOOD TOWNSHIP CON 10(030)	17 542891 4932359 ^U	2003/08 1565				NU		2515873 (262789)
COLLINGWOOD TOWNSHIP CON 10(030)	17 543114 4932698 ^W	2007/07 2576	06	FR 0076	041 / 050 025 / 1:0			7049776 (262159) A061435 CLAY SILT 0002 BRWN CLAY GRVL STNS 0028 GREY SILT CLAY 0068 BRWN SAND GRVL 0076
COLLINGWOOD TOWNSHIP CON 10(030)	17 543214 4932723 ^W	1968/07 3408	05	FR 0075	048 / 060 006 / 6:0	DO		2502650 () HPAN CLAY 0075 GRVL 0080
COLLINGWOOD TOWNSHIP CON 10(030)	17 542844 4932614 ^W	1964/06 3408	04	FR 0035	012 / 025 007 / 8:0	DO		2500570 () CLAY GRVL 0035 MSND GRVL 0044
COLLINGWOOD TOWNSHIP CON 10(030)	17 542714 4931923 ^W	1983/01 3602	06	FR 0105	022 / 080 015 / 2:0	DO	0106 07	2507817 () BRWN CLAY HARD 0060 GREY CLAY STNS 0105 GREY GRVL SAND WBRG 0113
COLLINGWOOD TOWNSHIP CON 10(030)	17 543455 4932662 ^W	2006/01 2576	06	FR 0088	056 / 015 / 1:0	DO	0087 05	2516728 (237433) A033175 LOAM 0001 BRWN CLAY SOFT 0013 GREY CLAY GRVL 0050 GREY GRVL CMTD 0088 GREY SAND GRVL 0092

TOWNSHIP CONCESSION (LOT)	UTM ¹	DATE ² CNTR ³	CASING DIA ⁴	WATER ^{5,6} DETAIL	STAT LVL/PUMP LVL ⁷ RATE ⁸ /TIME HR:MIN	WATER USE ⁹	SCREEN INFO ¹⁰	WELL # (AUDIT#) WELL TAG # DEPTHS TO WHICH FORMATIONS EXTEND ^{5,11}
COLLINGWOOD TOWNSHIP CON 10(030)	17 542325 4932080 ^H	1974/11 1565	07	FR 0059	004 / 047 003 / 1:30	DO	0058 03	2505037 () LOAM 0001 BRWN CLAY GRVL STNS 0006 GREY CLAY GRVL 0024 GREY GRVL CLAY 0035 GREY CLAY GRVL 0042 GREY GRVL CLAY 0047 GREY CLAY GRVL 0050 BRWN CLAY GRVL 0055 GREY GRVL CLAY 0057 GRVL SAND 0062
COLLINGWOOD TOWNSHIP CON 10(030)	17 542894 4932359 ^H	1998/10 1565	06	FR 0083	002 / 005 005 / 24:0	DO		2513700 (185902) LOAM 0001 BRWN CLAY SANDY 0010 BRWN CLAY SOFT 0055 BRWN CLAY GRVL 0080 SAND GRVL CSND 0085
COLLINGWOOD TOWNSHIP CON 10(030)	17 543001 4932680 ^H	2007/07 2576	06	FR 0076	040 / 050 025 / 1:0			7049849 (262158) A061446 LOAM 0001 GREY STNS CLAY GRVL 0021 GREY GRVL SLTY 0044 BRWN SAND GRVL 0076
COLLINGWOOD TOWNSHIP CON 10(030)	17 543024 4932483 ^H	1966/11 3805	04 04	FR 0085	020 / 025 008 / 24:0	ST DO		2500577 () LOAM 0012 BLUE CLAY 0057 QSND 0070 GRVL 0091
COLLINGWOOD TOWNSHIP CON 10(030)	17 542714 4932370 ^H	1974/05 4716	05	FR 0098	053 / 058 / 3:0	DO		2504618 () PRDR 0060 BRWN GRVL SAND SILT 0067 GREY CLAY GRVL SILT 0071 GREY GRVL 0096 BRWN GRVL SAND 0098 BRWN GRVL CSND 0100
COLLINGWOOD TOWNSHIP CON 10(030)	17 543124 4932601 ^H	1989/10 1565	06	FR 0083 FR 0073	046 / 052 013 / 3:0	DO	0079 04	2510275 () BRWN CLAY SANDY SLTY 0006 GREY CLAY SLTY SOFT 0040 GREY CLAY GRVL 0060 BRWN GRVL SAND CLAY 0073 SAND MGRD 0083
COLLINGWOOD TOWNSHIP CON 10(030)	17 542814 4932574 ^H	1979/09 4716	05	FR 0087 FR 0074	051 / 055 010 / :0	DO		2506999 () BLCK LOAM 0001 BRWN SAND CLAY 0009 BRWN CLAY 0033 GREY CLAY SAND 0069 GREY SAND SILT 0074 BRWN GRVL SAND SILT 0079 GREY CLAY GRVL SAND 0087 BRWN CGVL CSND 0089
COLLINGWOOD TOWNSHIP CON 10(030)	17 542891 4932359 ^H	2003/08 1565				NU		2515874 (262782)
COLLINGWOOD TOWNSHIP CON 10(030)	17 542792 4931773 ^H	2005/11 1565	06	FR 0075	001 / 001 004 / 18:0	DO		2516654 (241013) A030520 LOAM 0001 BRWN CLAY SAND 0048 BRWN SAND FGVL 0057 BRWN GRVL SAND 0069 BRWN SAND GRVL 0077
COLLINGWOOD TOWNSHIP CON 10(030)	17 543048 4932557 ^H	1990/05 5507	06	FR 0095	057 / 068 010 / 2:0	DO		2510730 () SAND 0047 CLAY STNS 0087 GRVL 0095
COLLINGWOOD TOWNSHIP CON 10(030)	17 542364 4932094 ^H	1973/05 1565	07 07	FR 0076	005 / 063 002 / 1:0	DO		2504219 () BRWN CLAY SNDS GRVL 0018 GREY CLAY GRVL 0076 GRVL CLAY 0079 GREY SHLE 0085

TOWNSHIP CONCESSION (LOT)	UTM ¹	DATE ² CNTR ³	CASING DIA ⁴	WATER ^{5,6} DETAIL	STAT LVL/PUMP LVL ⁷ RATE ⁸ /TIME HR:MIN	WATER USE ⁹	SCREEN INFO ¹⁰	WELL # (AUDIT#) WELL TAG # DEPTHS TO WHICH FORMATIONS EXTEND ^{5,11}
COLLINGWOOD TOWNSHIP CON 10(030)	17 543114 4932723 ^W	1984/04 3602	06	UK 0112 UK 0176 FR 0195	060 / 180 003 / 1:0	DO		2508115 () BRWN LOAM 0001 BRWN CLAY STKY 0020 GREY CLAY STNS HARD 0084 GREY CLAY STNS GRVL 0098 GREY GRVL SAND DRTY 0100 GREY CLAY HARD 0112 GREY GRVL SILT WBRG 0120 GREY CLAY SILT CLAY 0176 GREY GRVL SILT FCRD 0177 BLCK LMSN HARD 0200
COLLINGWOOD TOWNSHIP CON 10(030)	17 542894 4932359 ^U	1998/07 1565	06	FR 0079 FR 0083	055 / 057 008 / 8:0	DO	0079 04	2513572 (194148) CLAY SNDY 0010 BRWN CLAY SOFT 0025 GREY CLAY GRVL 0059 GRVL CLAY 0070 GRVL CMTD 0075 GRVL SAND 0083
COLLINGWOOD TOWNSHIP CON 10(030)	17 542165 4932502 ^W	1988/04 3602	06	FR 0096	057 / 064 011 / 18:0	DO		2509304 () BRWN LOAM 0001 GREY CLAY CLAY SOFT 0016 GREY CLAY GRVL GVLY 0045 GREY CLAY GRVL SHLE 0095 GREY GRVL CGVL WBRG 0096
COLLINGWOOD TOWNSHIP CON 10(030)	17 542790 4932780 ^W	1990/04 2576	06	FR 0039	012 / 015 / 2:0	DO		2510551 () FILL 0002 YLLW CLAY GRVL 0030 GRVL STNS 0032 GREY SAND 0036 GREY SAND GRVL 0039
COLLINGWOOD TOWNSHIP CON 10(030)	17 542694 4932588 ^W	1962/11 1106	04	FR 0041	015 / 020 004 / 4:0	IN		2500568 () GRVL STNS 0020 GREY HPAN CLAY 0040 GRVL 0041
COLLINGWOOD TOWNSHIP CON 10(030)	17 542724 4932404 ^W	1969/03 4716	04	FR 0063	053 / 063 005 / 5:0	DO		2502802 () FILL 0003 CLAY 0018 SILT CLAY 0038 GRVL CLAY 0063 GRVL 0065 CLAY 0066
COLLINGWOOD TOWNSHIP CON 10(030)	17 542882 4932564 ^W	1990/02 2576	06	FR 0055	031 / 018 / 1:0	DO		2510486 () LOAM 0001 GREY CLAY GRVL 0009 BRWN GRVL SAND 0026 GREY CLAY STNS 0037 GREY GRVL SAND LYRD 0050 GRVL 0055
COLLINGWOOD TOWNSHIP CON 10(030)	17 543254 4932748 ^W	1987/08 3741	06	FR 0066	031 / 034 015 / 2:0	DO		2508965 () LOAM FILL 0001 GREY CLAY 0005 GRVL CMTD 0026 GRVL 0032 CLAY SAND GRVL 0039 GRVL CMTD 0047 CGVL SAND 0056 CSND GRVL 0063 CGVL SAND 0067
COLLINGWOOD TOWNSHIP CON 10(030)	17 542605 4932043 ^W	1988/08 1565	06 06	FR 0131	012 / 049 003 / 12:0	DO		2509515 () LOAM 0001 BRWN CLAY SOFT 0055 GREY CLAY GRVL 0089 GREY GRVL CLAY 0129 SAND GRVL 0131
COLLINGWOOD TOWNSHIP CON 10(030)	17 542894 4932359 ^U	1999/09 6433	06	FR 0043	012 / 025 010 / 3:30	DO		2514088 (206948) LOAM 0003 CLAY SNDY 0016 BLDR 0019 BRWN STNS SNDY 0030 BRWN SAND CLAY 0039 BRWN SAND GRVL 0045
COLLINGWOOD TOWNSHIP CON 10(030)	17 542734 4932128 ^W	1987/06 3602	06	FR 0078 FR 0057	028 / 065 010 / 1:0	DO		2508930 () BRWN LOAM 0001 BRWN STNS GRVL 0010 BRWN GRVL CLAY 0025 BRWN CLAY STNS 0056 GREY SILT SAND SLTY 0062 GREY CLAY GVLY 0077 GREY GRVL CLN WBRG 0078
COLLINGWOOD TOWNSHIP CON 10(030)	17 542624 4932284 ^W	1963/10 3408	05	FR 0072	022 / 040 010 / 9:0	DO		2500569 () LOAM 0004 HPAN 0072 GRVL 0076

TOWNSHIP CONCESSION (LOT)	UTM ¹	DATE ² CNTR ³	CASING DIA ⁴	WATER ^{5,6} DETAIL	STAT LVL/PUMP LVL ⁷ RATE ⁸ /TIME HR:MIN	WATER USE ⁹	SCREEN INFO ¹⁰	WELL # (AUDIT#) WELL TAG # DEPTHS TO WHICH FORMATIONS EXTEND ^{5,11}
COLLINGWOOD TOWNSHIP CON 10(030)	17 542269 4932544 ^W	1966/10 3805	04	FR 0067	004 / 004 010 / 2:0	DO		2500575 () BRWN LOAM CLAY 0005 BLUE CLAY 0025 QSND 0045 GRVL 0068
COLLINGWOOD TOWNSHIP CON 10(030)	17 542864 4932273 ^W	1979/08 3602	06	FR 0087	065 / 080 010 / 50:0	DO		2506910 () BRWN LOAM 0001 BRWN CLAY HARD 0035 GREY SHLE FCRD 0042 GREY CLAY GRVL 0080 GREY SHLE CLAY LYRD 0087 BRWN GRVL SAND WBRG 0090
COLLINGWOOD TOWNSHIP CON 10(030)	17 542714 4932774 ^W	1980/01 5507	06	FR 0052	013 / 020 008 / 4:0	DO	0052 05	2507315 () GRVL 0015 BLUE CLAY STNS 0045 GRVL 0058
COLLINGWOOD TOWNSHIP CON 10(030)	17 543014 4932623 ^W	1976/08 1565	06 06	FR 0045	030 / 031 003 / 7:0	DO		2505785 () LOAM 0001 CLAY BLDR SNDY 0012 GREY CLAY GRVL 0032 BRWN GRVL CLAY LYRD 0044 GRVL CSND 0047
COLLINGWOOD TOWNSHIP CON 10(030)	17 542864 4932624 ^W	1987/09 5502	06	FR 0081	065 / 070 020 / 1:30	DO		2509124 () BRWN SAND SOFT 0012 GREY CLAY STNS SOFT 0045 SAND CLAY 0070 GRVL 0081
COLLINGWOOD TOWNSHIP CON 10(030)	17 542714 4932273 ^W	1979/09 4716	05	FR 0085	053 / 061 005 / 5:0	DO		2507000 () BLCK LOAM 0001 BRWN CLAY SNDY 0027 GREY CLAY 0050 GREY SILT SAND CLAY 0060 GREY CLAY 0071 GREY CLAY GRVL CMTD 0085 BRWN CGVL CSND 0087
COLLINGWOOD TOWNSHIP CON 10(030)	17 542220 4932561 ^W	1975/06 1565	07	FR 0112	077 / 090 003 / 4:0	DO		2505212 () LOAM 0001 SAND 0030 GREY CLAY GRVL 0042 BRWN CLAY GRVL 0046 BRWN CLAY SAND BLDR 0064 GREY CLAY GRVL 0073 GRVL SILT 0110 GRVL 0113
COLLINGWOOD TOWNSHIP CON 10(030)	17 542471 4932527 ^W	2003/05 2576	06	UK 0076	046 / 008 / 2:0	DO	0073 03	2515490 (251888) BLCK LOAM 0002 BRWN CLAY STNS 0020 BRWN CLAY SNDY 0043 GREY CLAY SNDY 0060 GREY GRVL SAND 0076
COLLINGWOOD TOWNSHIP CON 10(030)	17 543214 4932723 ^W	1983/07 3602		FR 0085	050 / 080 020 / 1:0	DO		2507940 () BRWN CLAY SAND 0015 GREY CLAY SNDS GRVL 0080 GREY GRVL WBRG 0090
COLLINGWOOD TOWNSHIP CON 10(030)	17 542262 4934915 ^W	1988/05 5507	06	FR 0084	043 / 056 010 / 24:0	DO	0078 04	2509390 () FILL 0004 CSND 0024 CLAY STNS SOFT 0073 GRVL SAND 0084
COLLINGWOOD TOWNSHIP CON 10(030)	17 542526 4931772 ^W	1988/08 1565	06	FR 0064	/ 012 / 10:0	DO		2509513 () LOAM 0001 CLAY SNDY 0008 GREY CLAY SOFT 0045 BRWN CLAY GRVL 0062 GRVL SAND 0064
COLLINGWOOD TOWNSHIP CON 10(030)	17 542764 4932113 ^W	1970/07 4716	04	FR 0089	060 / 086 002 / 3:0	DO		2503275 () BRWN LOAM 0001 RED CLAY 0012 GREY CLAY SILT 0043 GREY CLAY SNDS 0072 BRWN CLAY STNS SILT 0089 BRWN GRVL CSND 0091
COLLINGWOOD TOWNSHIP CON 10(030)	17 542890 4932359 ^W	2001/03 6433	06 06	FR 0078	042 / 048 006 / 12:0	DO		2514566 (224515) SAND SILT STNS 0015 GREY CLAY STNS 0068 CLAY SAND 0073 GRVL CSND 0078

TOWNSHIP CONCESSION (LOT)	UTM ¹	DATE ² CNTR ³	CASING DIA ⁴	WATER ^{5,6} DETAIL	STAT LVL/PUMP LVL ⁷ RATE ⁸ /TIME HR:MIN	WATER USE ⁹	SCREEN INFO ¹⁰	WELL # (AUDIT#) WELL TAG # DEPTHS TO WHICH FORMATIONS EXTEND ^{5,11}
COLLINGWOOD TOWNSHIP CON 10(030)	17 542744 4932424 ^W	1970/08 4716	04	FR 0048	038 / 040 005 / 2:0	DO		2503280 () BRWN LOAM 0001 BRWN CLAY STNS 0008 GREY CLAY STNS 0042 GREY MSND CLAY STNS 0046 BRWN MSND GRVL 0048 BRWN GRVL CSND 0050
COLLINGWOOD TOWNSHIP CON 10(030)	17 543449 4932683 ^W	1966/10 4716	04	FR 0055		NU		2500573 () LOAM MSND 0005 CLAY STNS 0030 CLAY GRVL 0055 MSND SILT 0063 CLAY 0105 SILT 0115
COLLINGWOOD TOWNSHIP CON 10(030)	17 543427 4932823 ^W	1966/10 4716	04 04	FR 0036	032 / 047 003 / 10:0	DO		2500574 () LOAM MSND 0005 CLAY 0010 CLAY SILT 0025 STNS CLAY 0036 GRVL SILT 0050 CSND GRVL 0054
COLLINGWOOD TOWNSHIP CON 10(030)	17 542964 4932674 ^W	1976/12 1565	06 06	FR 0045	029 / 030 003 / 24:0	DO		2505970 () LOAM 0001 CLAY GRVL STNS 0045 GRVL PCKD 0048
COLLINGWOOD TOWNSHIP CON 10(030)	17 542705 4932368 ^W	1974/04 4716	05	FR 0059	029 / 055 003 / 9:0	DO		2504557 () BRWN LOAM 0001 BRWN CLAY SAND 0014 GREY CLAY 0032 GREY CLAY STNS GRVL 0051 GREY CLAY STNS SILT 0059 BRWN GRVL SAND 0060
COLLINGWOOD TOWNSHIP CON 10(030)	17 543082 4932672 ^W	1989/10 1565	06	FR 0060	035 / 036 005 / 2:0	DO		2510274 () BRWN CLAY 0022 GREY CLAY GRVL 0046 CLAY SAND GRVL 0052 GRVL SAND 0060
COLLINGWOOD TOWNSHIP CON 10(030)	17 542614 4932324 ^W	1981/10 4716	05	FR 0073	048 / 060 005 / 2:0	DO		2507564 () BLCK LOAM 0001 BRWN CLAY STNS 0012 BRWN SAND 0020 GREY CLAY STNS GRVL 0073 BLCK SAND SILT 0076 BRWN GRVL CSND 0078
COLLINGWOOD TOWNSHIP CON 10(030)	17 542864 4932624 ^W	1984/07 4856	05	FR 0028	014 / 020 015 / 1:0	DO		2508163 () BRWN SAND GRVL BLDR 0026 BRWN CGVL 0030
COLLINGWOOD TOWNSHIP CON 10(030)	17 542986 4932659 ^W	1990/02 2576	06	FR 0056 FR 0048	030 / 015 / 1:0	DO		2510485 () FILL 0002 BRWN GRVL SAND 0012 GREY STNS GRVL CLAY 0036 GREY GRVL CLAY SAND 0040 GRVL SAND 0049 GRVL 0056
COLLINGWOOD TOWNSHIP CON 10(030)	17 542890 4932359 ^W	2003/05 2576				NU		2515581 (238754)
COLLINGWOOD TOWNSHIP CON 10(030)	17 542675 4932044 ^W	1988/11 1565	06	FR 0110	010 / 017 005 / 16:0	DO		2509746 () FILL 0002 BRWN CLAY SOFT 0051 GREY CLAY GRVL BLDR 0060 BRWN CLAY GRVL 0109 GRVL FSND CLN 0110
COLLINGWOOD TOWNSHIP CON 10(030)	17 542172 4932824 ^W	1989/08 6226	36	FR 0009	008 / 014 001 / 2:30	DO		2510694 () BLCK LOAM PEAT LOOS 0001 YLLW SAND SOFT PCKD 0009 BLUE CLAY STNS CMTD 0015
COLLINGWOOD TOWNSHIP CON 10(030)	17 542664 4932073 ^W	1980/05 4716	06	FR 0127	063 / 094 005 / 3:0	DO		2507207 () BRWN LOAM 0001 RED CLAY 0018 GREY CLAY 0049 GREY CLAY GRVL HPAN 0116 GREY CLAY SILT 0121 BRWN SAND SILT GRVL 0127 BRWN GRVL CSND 0129

TOWNSHIP CONCESSION (LOT)	UTM ¹	DATE ² CNTR ³	CASING DIA ⁴	WATER ^{5,6} DETAIL	STAT LVL/PUMP LVL ⁷ RATE ⁸ /TIME HR:MIN	WATER USE ⁹	SCREEN INFO ¹⁰	WELL # (AUDIT#) WELL TAG # DEPTHS TO WHICH FORMATIONS EXTEND ^{5,11}
COLLINGWOOD TOWNSHIP CON 10(030)	17 542724 4932138 ^W	1965/04 3602	04	FR 0100	040 / 060 004 / 8:0	DO		2500571 () PRDG 0020 CLAY 0045 HPAN 0092 MSND CLAY 0100 CSND GRVL 0104
COLLINGWOOD TOWNSHIP CON 10(030)	17 542854 4932083 ^W	1966/03 4303	04	FR 0092	036 / 078 004 / 5:0	DO		2500572 () BLUE SILT 0075 CLAY GRVL 0091 GRVL 0092
COLLINGWOOD TOWNSHIP CON 10(030)	17 542894 4932359 ^L	1999/10 1565	06	FR	051 / 054 004 / 48:0	DO		2514104 (194127) LOAM 0001 CLAY STNS BLDR 0030 BRWN CLAY GRVL 0081 SAND GRVL 0083
COLLINGWOOD TOWNSHIP CON 10(031)	17 542839 4932809 ^W	1960/08 1106	04	FR 0021	011 / 013 008 / 4:0	DO		2500589 () LOAM 0002 CLAY BLDR 0020 GRVL 0022
COLLINGWOOD TOWNSHIP CON 10(031)	17 542864 4932744 ^W	1967/11 4716	05	FR 0040	006 / 012 015 / 4:0	NU		2500611 () CLAY MSND STNS 0018 MSND 0020 MSND GRVL 0040
COLLINGWOOD TOWNSHIP CON 10(031)	17 542429 4932967 ^W	1959/10 3807	04	FR 0078	058 / 068 004 / 3:0	DO		2500586 () LOAM CLAY 0006 BRWN CLAY STNS 0015 GREY CLAY STNS 0077 GRVL 0078
COLLINGWOOD TOWNSHIP CON 10(031)	17 542444 4933199 ^W	1960/06 3807	04					2500588 () BRWN CLAY 0030 QSND 0033 GREY CLAY BLDR 0063
COLLINGWOOD TOWNSHIP CON 10(031)	17 543034 4932761 ^W	1960/11 1106	04	FR 0029	010 / 012 010 / 1:30	DO		2500591 () PRDG 0012 YLLW MSND STNS 0027 CSND 0029
COLLINGWOOD TOWNSHIP CON 10(031)	17 542904 4932753 ^W	1961/04 1106	04	FR 0025	010 / 012 006 / 1:0	DO		2500593 () CLAY STNS 0024 GRVL 0025
COLLINGWOOD TOWNSHIP CON 10(031)	17 543489 4932920 ^W	1964/11 3408	04 04	FR 0087	055 / 055 005 / 4:0	DO		2500604 () CLAY GRVL 0080 GRVL 0087
COLLINGWOOD TOWNSHIP CON 10(031)	17 542793 4932978 ^L	1993/10 2576	06	MN 0050	012 / 045 / 1:0	PS DO	0053 03	2512396 (132739) GRVL STNS 0007 GREY SILT CLAY 0021 GREY SILT 0029 GREY GRVL SILT WBRG 0033 GREY SILT GRVL 0050 GREY GRVL CSND WBRG 0056
COLLINGWOOD TOWNSHIP CON 10(031)	17 542849 4932974 ^W	1957/12 1106	04	FR 0051	036 / 039 005 / 2:0	DO		2500582 () LOAM 0005 CLAY 0025 GREY CLAY STNS 0045 GRVL 0051
COLLINGWOOD TOWNSHIP CON 10(031)	17 542714 4932844 ^W	1969/05 2801	02	FR 0032	013 / 018 016 / 8:30	NU	0050 10	2502845 () MSND GRVL BLDR 0006 CLAY GRVL BLDR 0027 CLAY GRVL 0032 SILT MSND GRVL 0060 CLAY GRVL BLDR 0070 GREY CLAY 0077 BLCK SHLE 0080
COLLINGWOOD TOWNSHIP CON 10(031)	17 542978 4932814 ^W	1974/05 4716	05	FR 0040	010 / 016 020 / 2:0	DO		2504620 () BRWN CLAY STNS 0005 BRWN CLAY STNS BLDR 0016 GREY GRVL CLAY STNS 0038 BRWN SAND 0040 BRWN GRVL CSND 0043
COLLINGWOOD TOWNSHIP CON 10(031)	17 542369 4932692 ^W	2004/08 6433	07	FR 0080	047 / 051 007 / 8:0	DO		2516188 (Z17792) A001650 BRWN LOAM 0000 BRWN SAND STNS 0012 GREY CLAY STNS 0058 GREY CLAY GRVL 0067 GREY SAND GRVL 0081

TOWNSHIP CONCESSION (LOT)	UTM ¹	DATE ² CNTR ³	CASING DIA ⁴	WATER ^{5,6} DETAIL	STAT LVL/PUMP LVL ⁷ RATE ⁸ /TIME HR:MIN	WATER USE ⁹	SCREEN INFO ¹⁰	WELL # (AUDIT#) WELL TAG # DEPTHS TO WHICH FORMATIONS EXTEND ^{5,11}
COLLINGWOOD TOWNSHIP CON 10(031)	17 542137 4932699 ^W	1989/05 2576	06 06			NU		2509912 () LOAM 0001 BRWN GRVL CLAY 0009 GREY CLAY GRVL 0047 GREY CLAY SAND FGSD 0066 GREY SHLE 0119 BRWN SHLE LMSN 0136
COLLINGWOOD TOWNSHIP CON 10(031)	17 543204 4932835 ^W	1989/03 4868	30 30	FR 0008 FR 0035	008 / / :0	DO NU		2510052 () BRWN CLAY SILT HARD 0008 BRWN SAND LOOS 0010 GREY CLAY STNS HARD 0035 GREY LMSN VERY HARD 0036
COLLINGWOOD TOWNSHIP CON 10(031)	17 543135 4932628 ^W	2007/07 1565	06	FR 0070 FR 0071	046 / 048 006 / 5:30	DO		7052113 (240947) A037120 BRWN CLAY SAND 0015 GREY CLAY GRVL 0060 GREY GRVL PCKD 0066 BRWN SAND GRVL 0071
COLLINGWOOD TOWNSHIP CON 10(031)	17 542614 4932924 ^W	1970/07 4716	04	FR 0091	039 / 070 006 / 2:0	DO	0094 03	2503293 () BRWN LOAM STNS 0001 GREY CLAY 0010 BRWN MSND 0018 GREY SILT CLAY MSND 0060 GREY MSND SILT 0091 BLCK MSND 0097 BRWN MSND 0098 GREY CLAY 0102 BLCK SHLE 0115
COLLINGWOOD TOWNSHIP CON 10(031)	17 542379 4932754 ^W	1958/04 1106	04	FR 0072	041 / 043 005 / 1:0	PS DO		2500583 () GRVL 0007 CLAY MSND 0012 QSND 0032 GREY CLAY 0062 GREY CLAY STNS 0072 MSND 0082 CSND 0084
COLLINGWOOD TOWNSHIP CON 10(031)	17 543234 4932874 ^W	1976/10 3602	04	FR 0070	052 / 060 008 / 1:0	DO	0068 03	2505890 () BRWN CLAY SAND 0060 GREY CLAY GRVL HARD 0070 BRWN GRVL SAND WBRG 0076
COLLINGWOOD TOWNSHIP CON 10(031)	17 542564 4933049 ^W	1977/09 4716	05	FR 0068	042 / 050 005 / 3:0	DO		2506207 () BLCK LOAM 0001 BRWN LOAM SAND 0017 GREY CLAY 0048 GREY CLAY SAND HPAN 0068 BRWN GRVL CSND 0071
COLLINGWOOD TOWNSHIP CON 10(031)	17 542717 4932836 ^W	1988/08 3741	06	FR 0052	014 / 017 008 / 4:0	DO		2509518 () PRDG 0004 GREY CLAY GRVL 0032 GRVL CMTD 0045 SAND GRVL 0052
COLLINGWOOD TOWNSHIP CON 10(031)	17 542108 4932637 ^W	1975/12 1565	06 06					2505496 () LOAM 0001 CLAY SAND 0027 RED CLAY GRVL 0038 GREY CLAY GRVL 0055 BRWN CLAY GRVL SNDY 0080 GREY GRVL CLAY SLTY 0104 BRWN GRVL CLAY SLTY 0127 FGVL SILT LYRD 0131 GREY SHLE 0144
COLLINGWOOD TOWNSHIP CON 10(031)	17 542814 4933224 ^W	1969/05 2801	02	FR 0059	036 / 040 008 / 3:0	NU		2502844 () LOAM 0001 BRWN SILT MSND 0003 MSND GRVL 0009 MSND GRVL CLAY 0018 CLAY GRVL BLDR 0041 CLAY GRVL 0059 MSND GRVL BLDR 0087 CLAY SILT 0120 GREY CLAY 0127
COLLINGWOOD TOWNSHIP CON 10(031)	17 542514 4932974 ^W	1980/10 4716	05	FR 0098	038 / 098 002 / 7:0	DO		2507303 () BLCK LOAM 0001 BRWN CLAY GRVL STNS 0024 GREY CLAY 0047 GREY CLAY SAND 0082 GREY SILT SAND 0096 GREY SAND FGVL CLAY 0108 BLCK CLAY 0110

TOWNSHIP CONCESSION (LOT)	UTM ¹	DATE ² CNTR ³	CASING DIA ⁴	WATER ^{5,6} DETAIL	STAT LVL/PUMP LVL ⁷ RATE ⁸ /TIME HR:MIN	WATER USE ⁹	SCREEN INFO ¹⁰	WELL # (AUDIT#) WELL TAG # DEPTHS TO WHICH FORMATIONS EXTEND ^{5,11}
COLLINGWOOD TOWNSHIP CON 10(031)	17 543060 4932781 ^W	1974/05 4716	05	FR 0068	026 / 030 007 / 2:0	DO		2504619 () BRWN LOAM 0001 BRWN CLAY GRVL STNS 0010 GREY CLAY GRVL STNS 0059 BRWN SAND CLAY GRVL 0065 BRWN SAND GRVL SILT 0068 BRWN GRVL CSND 0070
COLLINGWOOD TOWNSHIP CON 10(031)	17 542642 4932641 ^W	1960/01 1319	04	FR 0039	015 / 026 002 / 1:0	DO		2500587 () LOAM 0002 YLLW CLAY 0014 BLUE CLAY 0026 CSND 0033 GRVL 0044
COLLINGWOOD TOWNSHIP CON 10(031)	17 542804 4932744 ^W	1961/04 1106	06	FR 0036	012 / 014 010 / 1:30	DO		2500592 () CLAY STNS 0023 GRVL CLAY 0028 CLAY MSND 0034 GRVL 0036
COLLINGWOOD TOWNSHIP CON 10(031)	17 542914 4933274 ^W	1973/08 4716	05	FR 0074	054 / 060 006 / 3:0	DO		2504268 () BRWN CLAY 0012 BRWN CLAY SAND 0018 GREY CLAY 0037 GREY CLAY SAND GRVL 0066 GREY SILT GRVL 0072 BRWN SAND GRVL 0074 BRWN GRVL CSND 0076
COLLINGWOOD TOWNSHIP CON 10(031)	17 542414 4932574 ^W	1987/08 1565	06 06	FR 0057	010 / 023 006 / 48:0	DO		2509097 () LOAM 0001 GRVL BLDR CLAY 0015 GREY CLAY GRVL 0049 GRVL STNS CLAY 0055 SAND GRVL CMTD 0060
COLLINGWOOD TOWNSHIP CON 10(031)	17 542449 4932574 ^W	1987/08 3741	06	FR 0040	014 / 018 010 / 4:0	DO		2508964 () GREY CLAY GRVL 0027 GRVL CMTD 0038 CSND GRVL 0040
COLLINGWOOD TOWNSHIP CON 10(031)	17 542714 4932674 ^W	1979/12 5507	06	FR 0045	013 / 020 008 / 4:0	DO	0042 05	2507131 () GRVL 0015 BLUE CLAY STNS 0045 GRVL 0051
COLLINGWOOD TOWNSHIP CON 10(031)	17 542764 4932919 ^W	1958/06 1106	04	FR 0043	014 / 020 006 / 2:0	DO		2500584 () LOAM 0005 GREY HPAN STNS 0035 GRVL CLAY 0043 GRVL 0045
COLLINGWOOD TOWNSHIP CON 10(031)	17 542684 4932784 ^W	1965/11 4716	04 04	FR 0045	019 / 047 002 / 8:0	DO		2500606 () LOAM 0005 CLAY 0010 MSND SILT 0013 CLAY 0035 CLAY GRVL 0045 MSND GRVL 0058
COLLINGWOOD TOWNSHIP CON 10(031)	17 542446 4932594 ^W	1962/09 1106	06 06	FR 0048	025 / 030 005 / 3:0	DO		2500596 () GRVL STNS 0015 GREY HPAN CLAY GRVL 0048
COLLINGWOOD TOWNSHIP CON 10(031)	17 542366 4932694 ^W	1964/03 3408	04	FR 0082	050 / 065 012 / 8:0	DO		2500598 () YLLW HPAN STNS 0070 GREY GRVL 0083
COLLINGWOOD TOWNSHIP CON 10(031)	17 542724 4933164 ^W	1965/10 4716	04	FR 0058	037 / 045 005 / 5:0	DO		2500605 () LOAM 0005 CLAY 0010 MSND SILT 0016 CLAY 0035 GRVL SILT 0043 CLAY GRVL 0057 GRVL MSND 0059 GRVL 0060
COLLINGWOOD TOWNSHIP CON 10(031)	17 542564 4932904 ^W	1965/10 3602	04 04	FR 0100	050 / 095 009 / 2:0	DO		2500607 () LOAM 0001 HPAN FSND 0043 GRVL 0046 CLAY MSND 0053 CLAY 0063 GRVL CLAY 0070 CLAY HPAN 0080 GRVL CLAY 0090 HPAN 0100 BLUE SHLE 0128
COLLINGWOOD TOWNSHIP CON 10(031)	17 542964 4933324 ^W	1972/09 4716	05	FR 0079	058 / 063 008 / 1:0	DO		2503906 () BLCK LOAM 0001 BRWN SAND 0012 GREY CLAY SILT 0031 GREY CLAY GRVL 0079 BRWN GRVL CSND 0082 BRWN GRVL 0083

TOWNSHIP CONCESSION (LOT)	UTM ¹	DATE ² CNTR ³	CASING DIA ⁴	WATER ^{5,6} DETAIL	STAT LVL/PUMP LVL ⁷ RATE ⁸ /TIME HR:MIN	WATER USE ⁹	SCREEN INFO ¹⁰	WELL # (AUDIT#) WELL TAG # DEPTHS TO WHICH FORMATIONS EXTEND ^{5,11}
COLLINGWOOD TOWNSHIP CON 10(031)	17 542185 4932605 ⁹	1976/02 1565	06 06	FR 0110	069 / 104 001 / 36:0	DO		2505561 () SAND CLAY 0028 GREY CLAY GRVL 0035 BRWN CLAY GRVL 0056 CLAY SILT GRVL 0070 GRVL SILT CLAY 0089 BLDR 0091 CSND 0092 CLAY GRVL SILT 0100 GREY CLAY 0109 GRVL SAND 0112
COLLINGWOOD TOWNSHIP CON 10(031)	17 542429 4932639 ⁹	1987/08 1565	06	FR 0065	021 / 026 012 / 12:0	DO		2509096 () BRWN CLAY GRVL 0014 GREY CLAY 0015 CLAY SNDY 0049 GRVL SAND CLAY 0060 SAND GRVL CMTD 0065
COLLINGWOOD TOWNSHIP CON 10(031)	17 542208 4932740 ⁹	1990/07 6433	06	FR 0108	070 / 003 / 84:0	DO	0108 04	2510819 () BRWN SAND 0030 GREY CLAY STNS BLDR 0060 CLAY STNS 0100 GREY CLAY SILT GRVL 0108 CGVL 0112 CLAY STNS 0120
COLLINGWOOD TOWNSHIP CON 10(031)	17 543099 4932889 ⁹	1963/10 3408	04	FR 0025	009 / 015 005 / 2:0	DO		2500597 () PRDG 0010 HPAN GRVL 0025 GRVL 0031
COLLINGWOOD TOWNSHIP CON 10(031)	17 542684 4932784 ⁹	1966/06 4716	04	FR 0085 UK 0073	020 / 080 003 / 1:0	DO		2500608 () PRDR 0058 MSND CLAY 0073 GRVL 0075 GREY HPAN 0081 STNS MSND 0093
COLLINGWOOD TOWNSHIP CON 10(031)	17 542414 4932894 ⁹	1972/07 4716	05	FR 0085	039 / 067 010 / 3:0	DO		2503827 () BRWN LOAM 0001 BRWN CLAY GRVL 0006 BRWN SAND SILT 0012 GREY CLAY SILT 0028 BRWN CLAY 0067 GREY CLAY GRVL 0085 BLCK GRVL CSND 0088
COLLINGWOOD TOWNSHIP CON 10(031)	17 542214 4932874 ⁹	1977/04 1565	06 06					2506082 () SAND 0026 GREY CLAY STNS 0047 BRWN CLAY SNDY 0071 GREY CLAY SLTY 0111 SILT GRVL LYRD 0135 BLCK SHLE 0182 BLCK SHLE HARD 0195
COLLINGWOOD TOWNSHIP CON 10(031)	17 542414 4932974 ⁹	1972/05 4716	05	FR 0082	036 / 040 010 / 2:30	DO		2503799 () BLCK LOAM 0001 BRWN SAND GRVL 0010 GREY CLAY 0066 GREY CLAY SILT 0072 GREY CLAY SAND SILT 0080 BRWN SAND GRVL 0081 BRWN GRVL CSND 0082
COLLINGWOOD TOWNSHIP CON 10(031)	17 542694 4932664 ⁹	1954/11 1725	04	FR 0046	030 / 041 002 / 3:0	DO		2500578 () CLAY STNS 0020 MSND GRVL STNS 0046
COLLINGWOOD TOWNSHIP CON 10(031)	17 542964 4932829 ⁹	1961/10 1106	04	FR 0022	014 / 014 005 / 4:0	DO		2500594 () CLAY STNS 0012 MSND CLAY 0015 MSND GRVL 0025
COLLINGWOOD TOWNSHIP CON 10(031)	17 542404 4932594 ⁹	1968/07 3408	05	FR 0043	015 / 020 010 / 8:0	DO		2502651 () GRVL BLDR 0043 GRVL 0046
COLLINGWOOD TOWNSHIP CON 10(031)	17 542644 4932674 ⁹	1972/07 4716	05	UK 0037	014 / 016 015 / 2:0	DO		2503826 () BRWN LOAM 0002 BRWN CLAY GRVL STNS 0012 GREY CLAY GRVL 0034 GREY CLAY SILT 0037 BRWN GRVL CSND 0040
COLLINGWOOD TOWNSHIP CON 10(031)	17 542464 4932574 ⁹	1972/09 1565	05	FR 0050	018 / 024 008 / 0:30	DO		2504019 () CLAY GRVL 0007 HPAN 0019 CLAY SAND GRVL 0056 GRVL 0057

TOWNSHIP CONCESSION (LOT)	UTM ¹	DATE ² CNTR ³	CASING DIA ⁴	WATER ^{5,6} DETAIL	STAT LVL/PUMP LVL ⁷ RATE ⁸ /TIME HR:MIN	WATER USE ⁹	SCREEN INFO ¹⁰	WELL # (AUDIT#) WELL TAG # DEPTHS TO WHICH FORMATIONS EXTEND ^{5,11}
COLLINGWOOD TOWNSHIP CON 10 (031)	17 543414 4932873 ^N	1980/05 3602	06	FR 0082	040 / 075 025 / 1:0	DO		2507239 () BRWN LOAM 0001 GREY CLAY HARD 0030 GREY CLAY SNDS 0060 GREY STNS 0065 GREY CLAY SNDS 0082 BRWN GRVL WBRG 0086
COLLINGWOOD TOWNSHIP CON 10 (031)	17 542514 4932974 ^N	1977/09 4716	05	FR 0082	039 / 073 006 / 3:0	DO		2506219 () BRWN LOAM 0001 BRWN CLAY SNDR 0012 GREY CLAY 0051 GREY CLAY SAND HPAN 0078 GREY SAND CLAY 0081 BRWN SAND 0082 BRWN GRVL SAND 0084
COLLINGWOOD TOWNSHIP CON 10 (031)	17 543229 4932939 ^N	1964/06 3408	04	FR 0065	050 / 070 008 / 5:0	DO		2500599 () GREY HPAN GRVL 0065 MSND GRVL 0080
COLLINGWOOD TOWNSHIP CON 10 (031)	17 542974 4932613 ^N	1964/08 3408	04 04	FR 0050	029 / 040 006 / 5:0	DO		2500602 () BLUE CLAY GRVL 0060
COLLINGWOOD TOWNSHIP CON 10 (031)	17 542714 4932674 ^N	1977/08 4716	05	FR 0040	015 / 021 015 / 3:0	DO		2506153 () BRWN LOAM 0001 BRWN CLAY STNS GRVL 0018 GREY CLAY STNS 0037 BRWN SILT GRVL SAND 0040 BRWN GRVL SAND 0042
COLLINGWOOD TOWNSHIP CON 10 (031)	17 543038 4932632 ^N	2007/08 1565	06	FR 0062	043 / 044 007 / 18:0	DO		7052114 (Z40945) A037121 BRWN SAND CLAY STNS 0008 BRWN CLAY 0016 GREY CLAY GRVL BLDR 0054 BRWN GRVL PCKD 0062 BRWN SAND GRVL 0073
COLLINGWOOD TOWNSHIP CON 10 (031)	17 543177 4932154 ^N	2007/07 1565	06	FR 0082 FR 0085	048 / 054 007 / 24:0	DO		7052115 (Z40946) A037131 BRWN CLAY STNS SAND 0007 BRWN CLAY SILT 0018 GREY CLAY GRVL LYRD 0075 GREY GRVL CSND LYRD 0080 BRWN SAND GRVL 0085
COLLINGWOOD TOWNSHIP CON 10 (031)	17 542826 4932734 ^N	1955/07 1725	04	FR 0024	013 / 023 006 / 4:0	CO DO		2500580 () GRVL MSND STNS 0024
COLLINGWOOD TOWNSHIP CON 10 (031)	17 543424 4932876 ^N	1964/08 3408	04	FR 0070	050 / 060 007 / 10:0	DO		2500601 () PRDG 0020 GRVL HPAN 0065 MSND GRVL 0081
COLLINGWOOD TOWNSHIP CON 10 (031)	17 543244 4932864 ^N	1964/09 3408	04 04	FR 0059	030 / 045 005 / 10:0	DO		2500603 () CLAY GRVL 0050 MSND GRVL 0059
COLLINGWOOD TOWNSHIP CON 10 (031)	17 542604 4933084 ^N	1962/07 1106	06	FR 0060	040 / 050 004 / 2:0	DO		2500595 () GRVL 0010 BRWN CLAY 0060 MSND GRVL 0067
COLLINGWOOD TOWNSHIP CON 10 (031)	17 542439 4932894 ^N	1967/08 4716	05					2500610 () LOAM 0001 CLAY GRVL 0009 MSND SILT 0018 CLAY 0042 CLAY GRVL 0090 BRWN CLAY 0105 BLCK CLAY SHLE 0120
COLLINGWOOD TOWNSHIP CON 10 (031)	17 542789 4932977 ^N	2001/02 2576	06	FR 0036	009 / 020 / 1:0	DO	0033 03	2514514 (219790) BRWN GRVL FILL 0001 BRWN SILT GRVL 0017 BRWN SAND GRVL WBRG 0028 BRWN CGVL 0036

TOWNSHIP CONCESSION (LOT)	UTM ¹	DATE ² CNTR ³	CASING DIA ⁴	WATER ^{5,6} DETAIL	STAT LVL/PUMP LVL ⁷ RATE ⁸ /TIME HR:MIN	WATER USE ⁹	SCREEN INFO ¹⁰	WELL # (AUDIT#) WELL TAG # DEPTHS TO WHICH FORMATIONS EXTEND ^{5,11}
COLLINGWOOD TOWNSHIP CON 10(031)	17 543264 4932874"	1978/04 4716	05	FR 0077	048 / 065 010 / 3:0	DO		2506430 () BRWN CLAY SNDY 0026 GREY SILT SAND CLAY 0032 GREY CLAY SAND HPAN 0077 BRWN GRVL SAND 0079
COLLINGWOOD TOWNSHIP CON 10(031)	17 542724 4932824"	1958/12 1106	04	FR 0035	013 / 022 004 / 2:0	DO		2500585 () LOAM 0005 CLAY GRVL 0033 GRVL 0035
COLLINGWOOD TOWNSHIP CON 10(031)	17 542354 4932654"	1954/12 1725	04	FR 0086	043 / 065 005 / 5:0	DO		2500579 () CLAY STNS GRVL 0050 MSND GRVL STNS 0086
COLLINGWOOD TOWNSHIP CON 10(031)	17 542844 4932754"	1956/06 1319	04 04	FR 0023	008 / 015 005 / 1:0	IN		2500581 () YLLW CLAY 0003 HPAN STNS 0017 GRVL 0025
COLLINGWOOD TOWNSHIP CON 10(031)	17 543011 4933139"	1960/08 1106	04	FR 0049	038 / 045 004 / 4:0	DO		2500590 () CLAY STNS 0048 GRVL 0050
COLLINGWOOD TOWNSHIP CON 10(031)	17 542814 4932844"	1964/07 3408	04	FR 0038	006 / 022 006 / 4:0	DO		2500600 () PRDG 0010 GRVL STNS 0038 GRVL 0045
COLLINGWOOD TOWNSHIP CON 10(031)	17 542344 4932619"	1966/11 4716	04 04	FR 0083	050 / 075 006 / 4:0	DO		2500609 () LOAM 0001 MSND 0003 GRVL 0018 CLAY GRVL 0083 GRVL CSND 0087
COLLINGWOOD TOWNSHIP CON 10(031)	17 542724 4933174"	1968/06 4716	04	FR 0069	036 / 067 005 / 3:0	DO		2502652 () LOAM 0001 CLAY LOAM 0006 CLAY 0021 CLAY BLDG 0030 GREY CLAY GRVL 0057 MSND GRVL 0069 CSND GRVL 0072
COLLINGWOOD TOWNSHIP CON 10(031)	17 542431 4932805"	1973/09 4716	05					2504356 () BLCK LOAM 0001 BRWN CLAY STNS 0008 BRWN SAND SILT 0012 BRWN CLAY 0034 GREY CLAY 0086 GREY SILT FSND GRVL 0087 BRWN CLAY 0101 BRWN SILT SAND 0102 BLCK SHLE 0106
COLLINGWOOD TOWNSHIP CON 10(031)	17 543807 4932892"	1989/03 2576	06	FR 0076	039 / 015 / 1:30	DO		2509868 () BRWN CLAY GRVL 0010 GREY GRVL SAND 0038 GREY SAND STNS GRVL 0048 GREY CLAY GRVL 0065 BRWN GRVL CLAY SAND 0071 GRVL SAND 0073 CGVL 0076
COLLINGWOOD TOWNSHIP CON 10(031)	17 542334 4932624"	1971/11 4716	04	FR 0071 FR 0074	051 / 060 006 / 1:30	DO		2503652 () BLCK LOAM 0002 BRWN CLAY STNS 0023 GREY CLAY STNS 0049 GREY CLAY SAND GRVL 0068 BRWN SAND GRVL 0071 BRWN GRVL 0074
COLLINGWOOD TOWNSHIP CON 10(032)	17 542451 4933318"	2004/09 1565	06	FR 0106	059 / 084 005 / 18:30	DO	0103 07	2516254 (Z12819) A012756 LOAM 0001 BRWN CLAY SNDY 0017 BRWN CLAY SLTY 0055 BRWN CLAY SAND GRVL 0087 BRWN GRVL CLAY LYRD 0092 BRWN SILT CLAY LYRD 0110

TOWNSHIP CONCESSION (LOT)	UTM ¹	DATE ² CNTR ³	CASING DIA ⁴	WATER ^{5,6} DETAIL	STAT LVL/PUMP LVL ⁷ RATE ⁸ /TIME HR:MIN	WATER USE ⁹	SCREEN INFO ¹⁰	WELL # (AUDIT#) WELL TAG # DEPTHS TO WHICH FORMATIONS EXTEND ^{5,11}
COLLINGWOOD TOWNSHIP CON 10(034)	17 541832 4934580 ^W	1989/05 2576	06 06			NU		2509915 () LOAM 0001 SAND CLAY 0014 GREY CLAY GRVL 0075 GREY GRVL CLAY 0082 CLAY GRVL SILT 0116 GRVL DRY 0123 CLAY GRVL 0127 BLUE SHLE 0138 BRWN SHLE 0143 GREY SHLE LMSN 0206 BRWN SHLE 0230 GREY LMSN 0257
COLLINGWOOD TOWNSHIP CON 10(035)	17 542380 4935302 ^U	1999/10 3602	06	FR 0143 UK 0160	060 / 080 055 / 1:0	DO		2514093 (209612) BRWN LOAM 0001 GREY CLAY STNS 0016 GREY SHLE HARD 0035 GREY CLAY SOFT 0100 GREY CLAY GRVL 0140 BLCK ROCK SHLE 0160
COLLINGWOOD TOWNSHIP CON 10(035)	17 542451 4935597 ^W	1974/10 3741	06 06	FR 0103 FR 0106	025 / 030 015 / 28:0	DO		2504896 () GRVL BLDR CLAY 0015 SAND SILT CLAY 0037 SAND SILT CLAY 0072 GREY CLAY 0097 GREY LMSN SHLE 0110
COLLINGWOOD TOWNSHIP CON 10(035)	17 542197 4935208 ^W	1990/04 2576	06	FR 0137	062 / 015 / 1:30	DO		2510597 () YLLW CLAY STNS 0008 GREY CLAY GRVL 0040 GREY CLAY SAND 0050 GREY SAND 0085 GREY QSDN 0130 BLCK STNS 0134 GREY SAND GRVL CLAY 0137
COLLINGWOOD TOWNSHIP CON 10(035)	17 542365 4935649 ^W	1967/01 2801	02	UK 0015 FR 0090	025 / 028 020 / 3:0	DO	0090 15	2500613 () MSND GRVL 0001 CLAY GRVL BLDR 0011 FSND CLAY BLDR 0015 CLAY SILT GRVL 0020 SILT FSND CLAY 0027 SILT CLAY GRVL 0062 SILT 0072 CLAY SILT 0090 SHLE STNS 0105
COLLINGWOOD TOWNSHIP CON 10(035)	17 542915 4935374 ^W	1964/10 3408	04 04	FR 0049	010 / 015 008 / 3:0	DO		2500612 () PRDG 0015 CLAY HPAN 0035 MSND GRVL 0049
COLLINGWOOD TOWNSHIP CON 10(035)	17 542265 4935624 ^W	1977/01 1565	06 06	FR 0114	032 / 034 004 / 99:59	DO		2505966 () GREY CLAY STNS BLDR 0040 GREY CLAY SAND SLTY 0045 GREY CLAY SLTY 0095 GREY SILT 0112 BLCK SHLE 0124
COLLINGWOOD TOWNSHIP CON 10(035)	17 542715 4935274 ^W	1985/07 3602	06	FR 0078 FR 0070	055 / 065 010 / 1:30	DO	0074 04	2508397 () BRWN CLAY STNS SHLE 0070 BRWN SAND CLN WBRG 0078
COLLINGWOOD TOWNSHIP CON 10(035)	17 542295 4935574 ^W	1976/06 1565	06 06	FR 0113	030 / 032 004 / 99:59	DO		2505700 () GREY CLAY STNS BLDR 0040 GRVL CLAY STNS 0048 SAND SILT 0085 SILT 0111 BLCK SHLE 0125 BRWN LMSN 0129
COLLINGWOOD TOWNSHIP CON 11(028)	17 541764 4930673 ^W	1981/04 3030	30 36	FR 0021	021 / / :0	DO		2507577 () BRWN LOAM 0001 BRWN GRVL 0005 BRWN CLAY SNDY 0017 BRWN SAND 0025 BLUE CLAY 0032
COLLINGWOOD TOWNSHIP CON 11(028)	17 541664 4930723 ^W	1981/06 3030	36 30	FR 0010	010 / 012 045 / 0:5	IN		2507579 () BRWN LOAM 0001 BRWN GRVL 0015 BRWN CLAY 0025
COLLINGWOOD TOWNSHIP CON 11(028)	17 541664 4930823 ^W	1981/06 3030	36	UK 0020 UK 0025 UK 0013	013 / 045 / 0:10	IN		2507578 () BRWN LOAM 0001 BRWN GRVL 0015 BRWN CLAY 0032

TOWNSHIP CONCESSION (LOT)	UTM ¹	DATE ² CNTR ³	CASING DIA ⁴	WATER ^{5,6} DETAIL	STAT LVL/PUMP LVL ⁷ RATE ⁸ /TIME HR:MIN	WATER USE ⁹	SCREEN INFO ¹⁰	WELL # (AUDIT#) WELL TAG # DEPTHS TO WHICH FORMATIONS EXTEND ^{5,11}
COLLINGWOOD TOWNSHIP CON 11(028)	17 541957 4930533 ^W	1991/12 6433	06	FR 0075	050 / 012 / 3:0	DO	0068 03 0068 04	2511642 () GRVL FILL 0006 LOAM 0008 BRWN CLAY 0010 RED CLAY 0040 GRVL 0050 RED CLAY STNS 0055 BLUE CLAY STNS 0067 SAND MGRD 0082
COLLINGWOOD TOWNSHIP CON 11(028)	17 542414 4930773 ^W	1987/04 3741	06	FR 0056	021 / 039 004 / 4:0	DO		2508910 () SAND 0005 GRVL SAND 0010 BRWN CLAY SOFT SNDY 0019 BRWN CLAY GRVL 0027 SAND GRVL CMTD 0032 CSND SILT 0045 GRVL CLAY 0055 CSND GRVL 0056
COLLINGWOOD TOWNSHIP CON 11(031)	17 541414 4932359 ^W	1966/06 4716	04	FR 0030 FR 0128	030 / / :0	NU		2500628 () PRDG 0014 GRVL 0020 BRWN CLAY 0030 GREY HPAN STNS 0080 MSND 0085 GREY HPAN STNS 0108 BRWN CLAY STNS 0120 SILT CSND 0130 BLUE CLAY SHLE 0160
COLLINGWOOD TOWNSHIP CON 11(031)	17 541614 4932374 ^W	1985/05 3602	06	FR 0096	040 / 085 010 / 1:0	DO		2508363 () BRWN LOAM 0001 BRWN SAND CLAY SNDY 0020 GREY CLAY STNS STNY 0095 GREY GRVL WBRG MGRD 0096
COLLINGWOOD TOWNSHIP CON 11(031)	17 541104 4932274 ^W	1964/11 3408	04	FR 0042	006 / 020 012 / 6:0	ST DO		2500627 () PRDG 0010 HPAN GRVL 0040 GRVL 0047
COLLINGWOOD TOWNSHIP CON 11(031)	17 540964 4932174 ^W	1985/06 4856	05	FR 0081	044 / 065 012 / 2:0	DO		2508372 () BRWN SAND 0034 GREY CLAY SAND STNS 0071 GREY GRVL BLDR 0081
COLLINGWOOD TOWNSHIP CON 11(031)	17 541621 4932379 ^W	2005/03 1565	06			DO		2516507 (Z22027) A021765 BRWN FILL 0002 GREY CLAY LYRD FGVL 0068 GREY CLAY GRVL HPAN 0108 BRWN CLAY SLTY 0118 GREY CLAY LYRD SAND 0145 GREY SHLE LYRD CLAY 0160 GREY SHLE DKCL 0200
COLLINGWOOD TOWNSHIP CON 11(031)	17 541384 4932394 ^W	1966/06 4716	04	FR 0030	030 / / :0	NU		2500629 () BRWN CLAY 0002 GRVL 0020 BRWN CLAY 0030 GREY HPAN STNS 0080
COLLINGWOOD TOWNSHIP CON 11(033)	17 541273 4933791 ^L	2000/06 6433	06 05	FR 0155	/ 125 003 / 3:0	DO		2514280 (215770) LOAM 0002 BRWN SAND 0035 GREY CLAY SNDY STNS 0055 GREY CLAY SNDY HARD 0068 GRVL CLAY 0069 GREY CLAY STNS 0074 GREY CLAY 0096 GREY CLAY STNS SAND 0105 BRWN CLAY SOFT 0118 BRWN CLAY SNDY SOFT 0149 BRWN CLAY SNDY STNS 0152 BLUE SHLE 0185
COLLINGWOOD TOWNSHIP CON 11(033)	17 541240 4934019 ^W	1987/09 1804	06	FR 0130 FR 0140	032 / 050 020 / 4:40	ST DO		2509098 () BLCK LOAM 0002 BRWN SAND 0014 BRWN CLAY 0071 GREY HPAN STNS 0120 BRWN GRVL 0140
COLLINGWOOD TOWNSHIP CON 11(033)	17 541115 4933974 ^W	1985/05 3429	06		001 / 061 007 / 2:45	DO	0086 08 0086 08	2508394 () BLCK LOAM 0001 BRWN FSND SILT 0022 GREY CLAY GRVL 0038 GREY CLAY GRVL SILT 0074 BRWN FSND CLAY 0082 BRWN CSND 0086 GREY GRVL CLAY 0094

TOWNSHIP CONCESSION (LOT)	UTM ¹	DATE ² CNTR ³	CASING DIA ⁴	WATER ^{5,6} DETAIL	STAT LVL/PUMP LVL ⁷ RATE ⁸ /TIME HR:MIN	WATER USE ⁹	SCREEN INFO ¹⁰	WELL # (AUDIT#) WELL TAG # DEPTHS TO WHICH FORMATIONS EXTEND ^{5,11}
COLLINGWOOD TOWNSHIP CON 11(033)	17 541165 4934064 ^u	1965/04 3602	04	FR 0090	004 / 020 005 / 20:0	DO IN	0089 04	2500630 () LOAM 0001 FSND 0020 CLAY 0040 FSND 0065 CLAY 0090 MSND GRVL 0093
COLLINGWOOD TOWNSHIP CON 11(034)	17 541171 4934405 ^u	1993/07 3030	36	FR 0006 UK 0037	006 / / :0	DO		2512259 (124126) BRWN LOAM 0001 BRWN SAND 0006 BRWN SAND STNS WBRG 0008 GREY CLAY 0012 GREY CLAY STNS 0060
COLLINGWOOD TOWNSHIP CON 11(034)	17 541799 4934386 ^u	1974/08 3741	06 06					2504846 () LOAM 0001 CLAY SAND LOAM 0015 CLAY GRVL 0028 GRVL CLAY SAND 0052 CLAY 0096 SAND SILT 0112 GRVL SILT CLAY 0119 GREY SHLE 0140
COLLINGWOOD TOWNSHIP CON 11(034)	17 540508 4934154 ^u	2005/09 2576	06	FR 0120 FR 0125	015 / 025 005 / 1:0	DO	0120 05	2516547 (Z36341) A033124 BRWN SAND BLDR 0012 GREY CLAY SILT 0115 GREY SAND GRVL 0125
COLLINGWOOD TOWNSHIP CON 11(034)	17 540715 4934124 ^u	1984/05 4856	05	FR 0136	/ 100 010 / 3:0	DO	0132 03	2508150 () BRWN CLAY STNS BLDR 0133 GREY SAND GRVL STNS 0136 GREY CLAY 0145
COLLINGWOOD TOWNSHIP CON 11(034)	17 541171 4934405 ^u	1993/11 6433	06	FR 0052	/ 027 004 / 99:59	DO	0050 04	2512402 (131202) LOAM 0002 CLAY SNDY 0018 CLAY BLDR 0024 CLAY STNS 0033 GREY CLAY HARD 0041 GREY CLAY SOFT 0049 SAND GRVL 0054
COLLINGWOOD TOWNSHIP CON 11(035)	17 541500 4934934 ^u	1964/10 3408	04 04	FR 0100	002 / 080 002 / 8:0	IR		2500631 () MSND GRVL 0112
COLLINGWOOD TOWNSHIP CON 11(035)	17 541525 4934824 ^u	1968/04 4716	05	FR 0111	-004 / 001 / :0	DO	0112 04	2502653 () FRDR 0111 GRVL MSND SILT 0116 CLAY GRVL 0117
COLLINGWOOD TOWNSHIP CON 11(035)	17 541070 4935009 ^u	1994/10 6433	06	FR 0042	012 / 024 005 / 60:0	DO		2512715 (131226) LOAM 0002 CLAY SNDY 0020 CLAY SNDY BLDR 0023 CLAY STNS 0038 SAND GRVL 0048
COLLINGWOOD TOWNSHIP CON 11(035)	17 541495 4934824 ^u	1966/12 4716	05 05	UK 0008 FR 0103	/ 060 003 / 16:0	DO		2500633 () BRWN MSND 0008 MSND SILT 0033 GREY HPAN 0065 CLAY SILT 0084 GREY CLAY 0103 GRVL MSND 0112
COLLINGWOOD TOWNSHIP CON 11(035)	17 541655 4935174 ^u	1964/10 3408	04	FR 0110	070 / 085 010 / :0	DO	0111 04	2500632 () HPAN STNS 0070 FSND 0110 MSND 0122
COLLINGWOOD TOWNSHIP 09(030)	17 542733 4932385 ^u	2009/08 1565	06	FR 0098	057 / 057 007 / 24:0	DO		7129261 (Z105473) A078596 LOAM 0001 BRWN CLAY SOFT 0018 BLDR 0020 GREY CLAY STNS GRVL 0098 SAND GRVL 0102
COLLINGWOOD TOWNSHIP 10(028)	17 642563 4931647 ^u	2009/09 6433						7133058 (Z105909) A081987
COLLINGWOOD TOWNSHIP 10(031)	17 542962 4932749 ^u	2007/08 1565	06	FR 0040	012 / 012 007 / 20:0	DO		7051895 (Z67461) A037136 BRWN SAND GRVL STNS 0020 BRWN CLAY GRVL SNDY 0031 BRWN SAND GRVL 0040

Notes:

1. UTM in Zone, Easting, Northing and Datum is NAD83; L: UTM estimated from Centroid of Lot; W: UTM not from Lot Centroid
2. Date Work Completed
3. Well Contractor Licence Number
4. Casing diameter in inches
5. Unit of Depth in Feet
6. See Table 4 for Meaning of Code

7. STAT LVL: Static Water Level in Feet ; PUMP LVL: Water Level After Pumping in Feet
8. Pump Test Rate in GPM, Pump Test Duration in Hour : Minutes
9. See Table 3 for Meaning of Code
10. Screen Depth and Length in feet
11. See Table 1 and 2 for Meaning of Code

1. Core Material and Descriptive terms									
Code	Description	Code	Description	Code	Description	Code	Description	Code	Description
BLDR	BOULDERS	FCRD	FRACTURED	IRFM	IRON FORMATION	PORS	POROUS	SOFT	SOFT
BSLT	BASALT	FGRD	FINE-GRAINED	LIMY	LIMY	PRDG	PREVIOUSLY DUG	SPST	SOAPSTONE
CGRD	COARSE-GRAINED	FGVL	FINE GRAVEL	LMSN	LIMESTONE	PRDR	PREV. DRILLED	STKY	STICKY
CGVL	COARSE GRAVEL	FILL	FILL	LOAM	TOPSOIL	QRTZ	QUARTZITE	STNS	STONES
CHRT	CHERT	FLDS	FELDSPAR	LOOS	LOOSE	QSND	QUICKSAND	STNY	STONEY
CLAY	CLAY	FLNT	FLINT	LTCL	LIGHT-COLOURED	QTZ	QUARTZ	THIK	THICK
CLN	CLEAN	FOSS	FOSILIFEROUS	LYRD	LAYERED	ROCK	ROCK	THIN	THIN
CLYY	CLAYEY	FSND	FINE SAND	MARL	MARL	SAND	SAND	TILL	TILL
CMTD	CEMENTED	GNIS	GNEISS	MGRD	MEDIUM-GRAINED	SHLE	SHALE	UNKN	UNKNOWN TYPE
CONG	CONGLOMERATE	GRNT	GRANITE	MGVL	MEDIUM GRAVEL	SHLY	SHALY	VERY	VERY
CRYS	CRYSTALLINE	GRSN	GREENSTONE	MREL	MARBLE	SHRP	SHARP	WBRG	WATER-BEARING
CSND	COARSE SAND	GRVL	GRAVEL	MSND	MEDIUM SAND	SHST	SCHIST	WDFR	WOOD FRAGMENTS
DKCL	DARK-COLOURED	GRWK	GREYWACKE	MUCK	MUCK	SILT	SILT	WTHD	WEATHERED
DLMT	DOLOMITE	GVLY	GRAVELLY	OBDR	OVERBURDEN	SLTE	SLATE		
DNSE	DENSE	GYPS	GYPSUM	PCKD	PACKED	SLTY	SILTY		
DRTY	DIRTY	HARD	HARD	PEAT	PEAT	SNDS	SANDSTONE		
DRY	DRY	HPAN	HARDPAN	PGVL	PEA GRAVEL	SNDY	SANDY		

2. Core Color	
Code	Description
WHIT	WHITE
GREY	GREY
BLUE	BLUE
GRN	GREEN
YLLW	YELLOW
BRWN	BROWN
RED	RED
BLCK	BLACK
BLGY	BLUE-GREY

3. Water Use			
Code	Description	Code	Description
DO	Domestic	OT	Other
ST	Livestock	TH	Test Hole
IR	Irrigation	DE	Dewatering
IN	Industrial	MO	Monitoring
CO	Commercial		
MN	Municipal		
PS	Public		
AC	Cooling And A/C		
NU	Not Used		

4. Water Detail			
Code	Description	Code	Description
FR	Fresh	GS	Gas
SA	Salty	IR	Iron
SU	Sulphur		
MN	Mineral		
UK	Unknown		

Appendix D-4
Waste Disposal Sites Inventory

REGIONAL INVENTORY OF CLOSED WASTE DISPOSAL SITES
REGION: SOUTHWESTERN

HAP ID NO	SITE NO	COUNTY	MUNICIPALITY	LOT OR STREET NO	CONCESS	NTS	ZONE	UTM COORDINATES		DATE CLOSED	CLAS
								EAST	NORTH	YEAR/MON/DAY	
50	X 6061	ESSEX	WINDSOR	Russell Street		40J06	17	327775	4683975	1955 * *	NP
51	X 6062	ESSEX	WINDSOR	Dieppe Avenue		40J07	17	340160	4689300	1952 * *	NP
52	X 6063	ESSEX	WINDSOR	Giles Blvd East		40J06	17	332700	4685500	1910 * *	NP
53	X 6064	ESSEX	WINDSOR	Charles Street East		40J06	17	334775	4682950	1945 * *	NP
54	X 6065	ESSEX	WINDSOR	Walker Road		40J07	17	335750	4685990	* * *	A7
55	X 6066	ESSEX	WINDSOR	E.C. Row Ave. E.		40J07	17	341050	4684150	* * *	A7
1	A 260201	GREY	DURHAM	27	1	41A02	17	513950	4890100	1979 12 31	A6
2	A 260501	GREY	SYDENHAM	26	9	41A10	17	517900	4935770	1974 8 31	A6
3	A 260801	GREY	FLESHERTON	151	DURHAM	41A07	17	536800	4900420	1974 7 30	A6
4	A 261201	GREY	ARTEMESIA	136	2	41A07	17	532610	4901000	1973 5 31	B6
5	A 261202	GREY	ARTEMESIA	171	1	41A02	17	539550	4898550	1972 12 31	B6
6	A 261203	GREY	ARTEMESIA	25	9	41A07	17	537410	4905800	1975 5 31	A6
7	A 261205	GREY	ARTEMESIA	95	1	41A07	17	527150	4908290	1974 7 30	A6
8	A 261402	GREY	COLLINGWOOD	26	9	41A09	17	544450	4930250	1973 6 30	A6
9	A 261403	GREY	COLLINGWOOD	PT 26 SE1/4	9	41A09	17	544825	4930100	1977 3 30	A6
10	A 261501	GREY	DERBY	PT 7 N1/2	2	41A10	17	504240	4928070	1983 11 15	A4
11	A 261601	GREY	EGREMONT	18 DIV.3	1	41A02	17	516850	4877740	1976 7 15	B5
12	A 261603	GREY	EGREMONT	18	1	41A02	17	516850	4877740	1976 5 28	A6
13	A 261701	GREY	EUPHRASIA	10	6	41A02	17	535480	4916650	1979 7 30	A6
14	A 261801	GREY	GLENELG	12	6	41A02	17	522450	4898100	1974 7 30	B6
16	A 261902	GREY	HOLLAND	10	1 W.T.S	41A07	17	512350	4917350	1974 10 31	B7
17	A 262001	GREY	KEPPEL	41	25	41A15	17	505550	4957560	1974 5 31	A6
18	A 262101	GREY	NORMANBY	Albert St. & Alfred St.		41A02	17	505910	4877690	1975 11 26	A6
19	A 262401	GREY	ST. VINCENT	PT 27	6	41A10	17	529390	4945850	1974 7 30	A6
20	A 262601	GREY	SULLIVAN	4	1 WTSR	41A07	17	507750	4922350	1974 11 30	A6
21	X 2077	GREY	OWEN SOUND	17 St. E. & 2nd Ave. E.		41A10	17	532700	4939250	1946 * *	A7
22	X 2078	GREY	OWEN SOUND	19 St. E. & 8th Ave. E.		41A10	17	532550	4939400	1953 * *	A7
23	X 2079	GREY	OWEN SOUND	24 St. E. & 3rd Ave. E.		41A10	17	532350	4939800	1952 10 *	A7
24	X 2080	GREY	OWEN SOUND	19 St. E. & 9th Ave. E.		41A10	17	532500	4938950	1958 * *	A7
25	X 2081	GREY	OWEN SOUND	5 St. A. & 2nd Ave. N.		41A07	17	504350	4924950	1955 6 *	A7

* Year\Month\Day unknown.

REGIONAL INVENTORY OF CLOSED WASTE DISPOSAL SITES
REGION: SOUTHWESTERN

MAP ID NO.	SITE NO	COUNTY	MUNICIPALITY	LOT OR STREET NO	CONCESS	NTS	ZONE	UTM COORDINATES EAST NORTH	DATE CLOSED YEAR/MON/DAY	CLAS
26	X 2082	GREY	OWEN SOUND	7 St. E. & 7th Ave. E.		41A10	17	533550 4938250	1955 8 *	A7
27	X 2083	GREY	OWEN SOUND	Victoria Park		41A10	17	533050 4938450	1956 10 *	A7
28	X 2084	GREY	OWEN SOUND	18 St. E. & 7th Ave. E.		41A10	17	531500 4939650	1959 9 *	A7
29	X 2085	GREY	OWEN SOUND	18 St. E. & 9th Ave. E.		41A10	17	531650 4939450	1970 * *	A7
30	X 2086	GREY	OWEN SOUND	19 St. E. & 8th Ave. E.		41A10	17	531950 4939750	1950 10 *	A7
31	X 2087	GREY	MEAFORD	Berry Street		41A10	17	532400 4939150	1929 * *	A7
32	X 2088	GREY	MEAFORD	Coleman Street		41A10	17	533100 4938900	1910 * *	A7
33	X 2089	GREY	MEAFORD	Fuller Street		41A10	17	532850 4939300	1946 * *	A7
34	X 2090	GREY	THORNHURST	King & Lansdowne		41A09	17	542900 4934750	1969 * *	A7
61	X 2091	GREY	COLLINGWOOD	26	9	41A09	17	544450 4930550	* * *	B8
35	X 2093	GREY	SYDENHAM	15	9	41A10	17	511550 4934350	* * *	B8
36	X 2094	GREY	DERBY	PT 6 W	2	41A07	17	506460 4925200	1969 * *	B8
37	X 2095	GREY	EUPHRASIA	12-13	6	41A07	17	534850 4918500	* * *	B8
38	X 2096	GREY	HOLLAND	31	1 E T S	41A07	17	516950 4915860	1973 * *	B8
39	X 2097	GREY	HOLLAND	10	1	41A07	17	512800 4917850	1971 * *	B8
40	X 2098	GREY	HOLLAND	18	1E EGR	41A07	17	510550 4913550	1971 * *	B8
41	X 2099	GREY	HOLLAND	61	1 W T S	41A07	17	521250 4911350	1960 * *	A8
42	X 2100	GREY	HOLLAND	PT 5 SW	12 E G	41A07	47	522660 4925350	1960 * *	B8
43	X 2101	GREY	KEPPEL	PT 41	22	41A10	17	505450 4954750	1972 * *	B6
44	X 2102	GREY	KEPPEL	PT 5 W	GEORGIA	41A15	17	507500 4956600	1976 * *	B6
45	X 2103	GREY	SULLIVAN	20	7	41A02	17	503950 4898950	1970 * *	B8
46	X 2104	GREY	SYDENHAM	PT 22-23	7	41A10	17	511250 4937650	1960 * *	B8
47	X 2105	GREY	SYDENHAM	12	5	41A10	17	514700 4933460	1965 * *	B8
48	X 2106	GREY	SYDENHAM	22	NCR	41A10	17	511750 4937300	1950 * *	B8
49	X 2107	GREY	SYDENHAM	29	1	41A10	17	520650 4944800	1960 * *	B8
50	X 2108	GREY	SYDENHAM	PT 15 E	9	41A10	17	511640 4934350	1940 * *	B8
51	X 5146	GREY	DURHAM	Lambton Street		41A02	17	514700 4891250	1960 * *	A7
52	X 5147	GREY	DURHAM	49-52, 7780	PLAN 50	41A02	17	514050 4891900	1955 * *	A8
53	X 5148	GREY	BENTINCK	1	9	41A03	17	495750 4897350	1958 * *	B8
54	X 5149	GREY	BENTINCK	25	4	41A02	17	506500 4894350	1971 * *	B8

* Year/Month/Day unknown.

THORNHURST
SITE
08
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REGIONAL INVENTORY OF CLOSED WASTE DISPOSAL SITES
REGION: SOUTHWESTERN

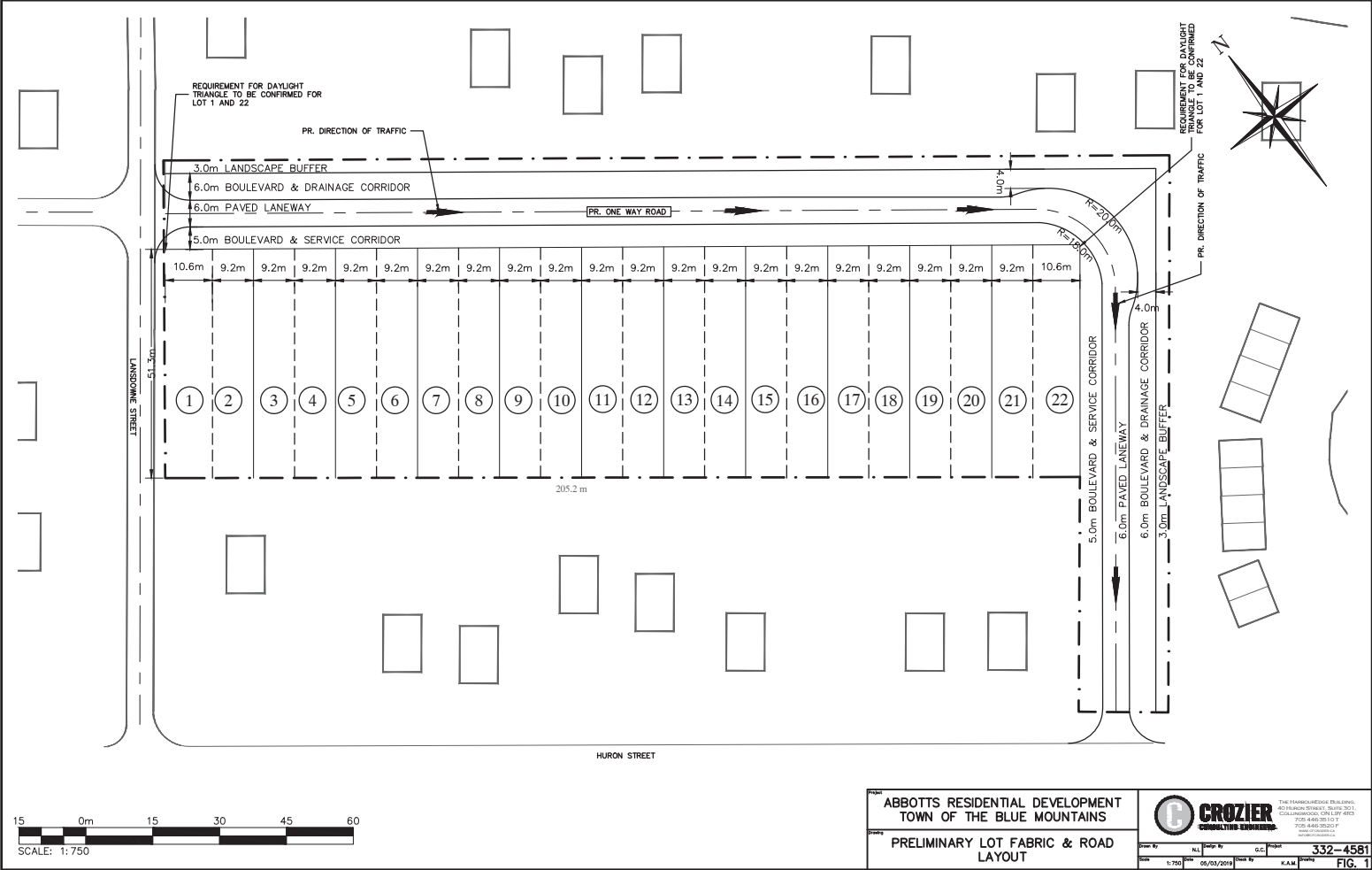
MAP	SITE			LOT			UTM COORDINATES	DATE CLOSED	
ID NO	NO	COUNTY	MUNICIPALITY	OR STREET NO	CONCESS	NTS	ZONE EAST NORTH	YEAR/MON/DAY	CLAS
55	X 5150	GREY	BENTINCK	11	1 NDR	41A03	17 499650 4889200	1959 * *	B8
56	X 5151	GREY	HANOVER	7th Ave. & 10th St.		41A03	17 497600 4889150	* * *	A7
57	X 5152	GREY	HANOVER	Hanover Park		41A03	17 498550 4889300	1945 * *	A7
58	X 5153	GREY	GLENELG	PT OF 6 WE	6	41A02	17 522250 4898750	1974 * *	B6
59	X 5154	GREY	ARTEMESIA	.171	1 ESTR	41A02	17 539250 4898250	1973 * *	B8
60	X 5155	GREY	ARTEMESIA	135-136	2 WSTR	41A07	17 531750 4901450	1960 * *	B8
1	A 160501	HURON	WINGHAM	Corner of Hwys. 4 & 86		40P14	17 474450 4858125	1979 12 31	A5
2	A 161102	HURON	ASHFIELD	1	FRONT	40P13	17 442090 4858600	1974 7 30	B6
3	A 161801	HURON	COLBORNE	PT 1	2	40P12	17 445190 4844650	1974 7 30	A6
4	A 161504	HURON	HAY	16	11-12	40P05	17 447800 4805225	1972 6 30	A6
5	A 161601	HURON	HOWICK	PT 25 E1/2	16	40P15	17 497500 4867570	1974 7 30	B6
6	A 162001	HURON	STANLEY	RANGE B&C	RANGE B	40P05	17 444650 4823120	1975 12 31	B5
7	A 162101	HURON	STEPHEN	PT 8 NE1/2	SOUTH B	40P05	17 458750 4790880	1976 11 30	A2
35	A 162201	HURON	TUCKERSMITH	PT 9	2 HURON	40P11	17 468280 4820920	1989 12 31	A3
8	A 162301	HURON	TURNBERRY	52	1	40P14	17 483700 4854770	1972 12 31	B4
9	X 2069	HURON	GODERICH	BLOCK A	A	40P12	17 444150 4843040	1960 * *	A8
10	X 2070	HURON	GODERICH	2	1	40P12	17 441850 4841750	1954 * *	B8
11	X 2071	HURON	ASHFIELD	1	FRONT C	40P13	17 442850 4858450	1972 * *	B8
12	X 2072	HURON	ASHFIELD	9	4	40P13	17 450110 4856500	1971 * *	B8
13	X 2073	HURON	COLBORNE	PT 7	2 W DIV	40P13	17 445150 4844650	1971 * *	B8
14	X 2074	HURON	WAWANOSH, EAST	39	13	40P14	17 470770 4857600	* * *	B8
15	X 2075	HURON	GODERICH	PT 80	MARTLAN	40P12	17 452450 4834200	1964 * *	B8
16	X 2076	HURON	WAWANOSH, WEST	20	3	40P13	17 454400 4851410	* * *	B8
17	X 5130	HURON	STANLEY	4	RANGE B	40P12	17 445360 4823450	1975 * *	B8
18	X 5131	HURON	STANLEY	4	RANGE D	40P12	17 444650 4823100	1954 * *	B8
19	X 5132	HURON	TUCKERSMITH	12	3	40P11	17 466450 4820750	1960 * *	B8
20	X 5134	HURON	TUCKERSMITH	PT 8 N	1	40P06	17 460250 4809550	1930 * *	B8
21	X 5136	HURON	STEPHEN	23	N.BOUND	40P05	17 448650 4798950	1964 * *	A8
22	X 5137	HURON	STEPHEN	PT 3 E	5	40P05	17 457750 4790900	1973 * *	A8
23	X 5139	HURON	STEPHEN	11	5	40P05	17 457450 4794200	1950 * *	A8

* Year\Month\Day unknown.



Appendix B

Preliminary Concept Plan





Appendix C

Geotechnical Borehole Logs

LOG OF BOREHOLE NO. 1

17T 543175.5E 4935076N

1 of 1

PROJECT Proposed Abbots Residential Development

LOCATION Lansdowne Street, Thornbury, Ontario

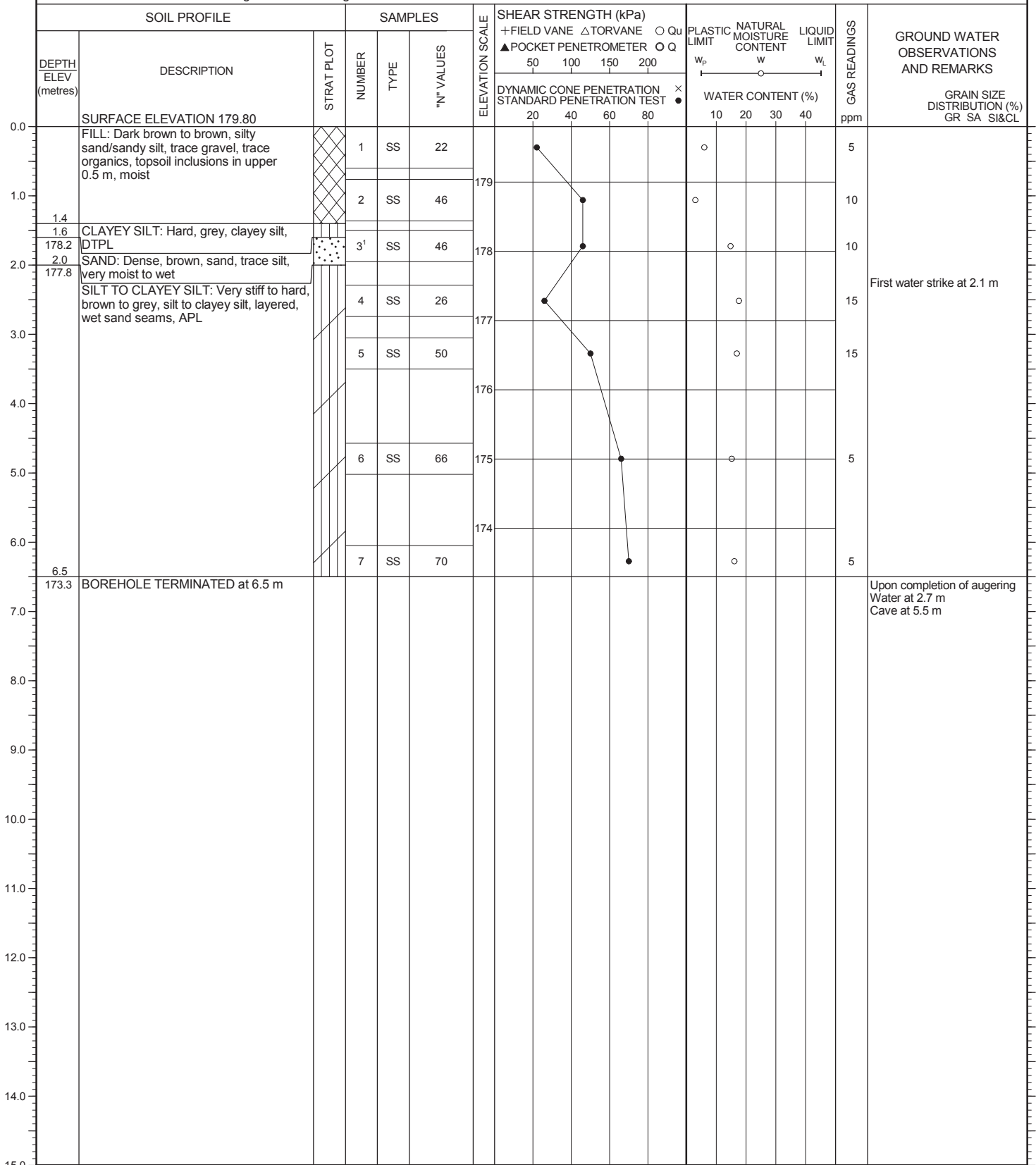
BORING METHOD Continuous Flight Solid Stem Augers

BORING DATE July 30, 2019

PML REF. 19CF012

ENGINEER GW

TECHNICIAN JR



NOTES 1 - Soil sample submitted for chemical testing.

LOG OF BOREHOLE/MONITORING WELL NO. 2

1 of 1

17T 543233.5E 4935021N

PROJECT Proposed Abbots Residential Development

LOCATION Lansdowne Street, Thornbury, Ontario

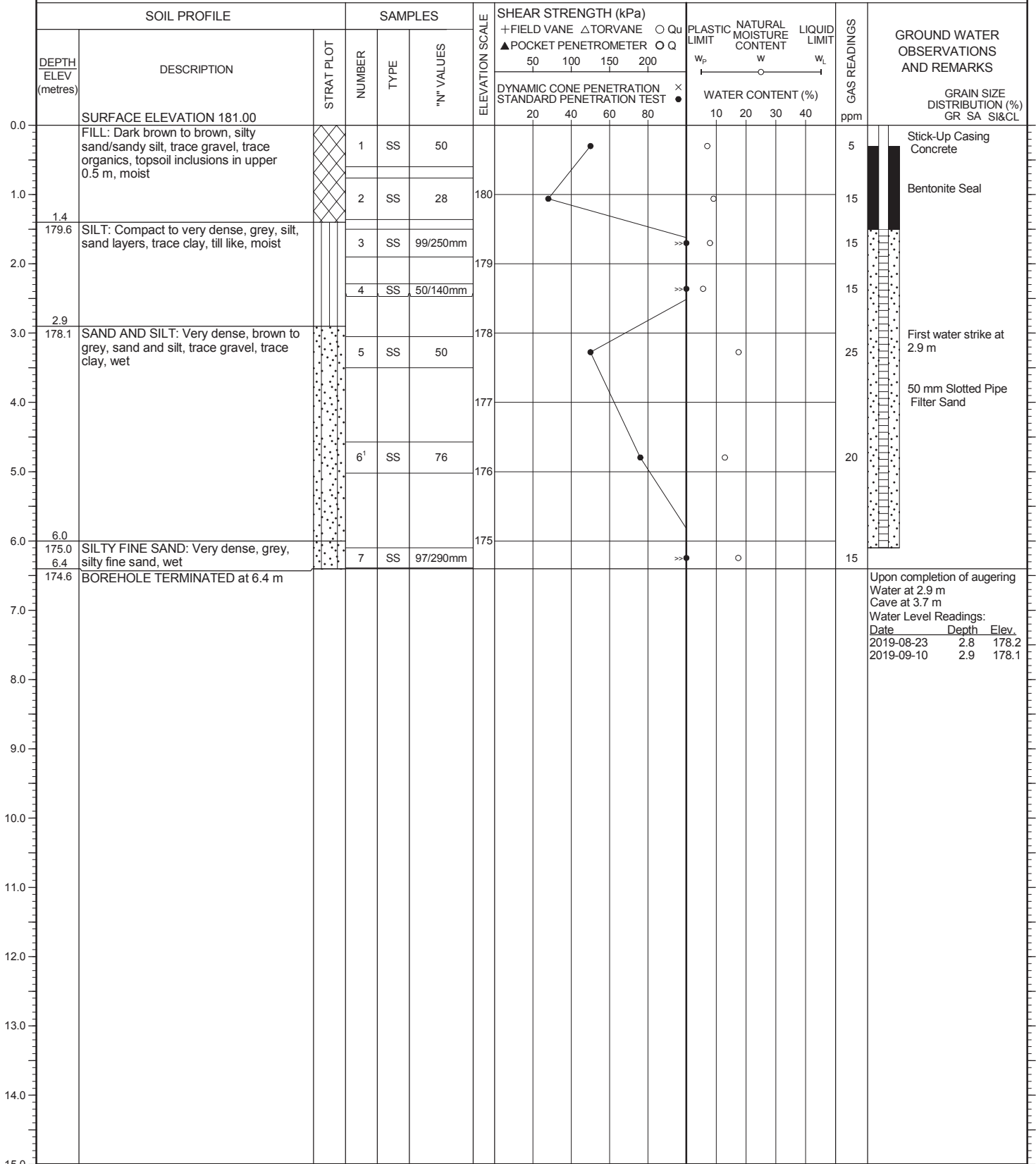
BORING METHOD Continuous Flight Solid Stem Augers

BORING DATE July 30, 2019

PML REF. 19CF012

ENGINEER GW

TECHNICIAN JR



NOTES 1 - Soil sample submitted for chemical testing.

LOG OF BOREHOLE/MONITORING WELL NO. 3

1 of 1

17T 543113.3E 4935062N

PROJECT Proposed Abbots Residential Development

LOCATION Lansdowne Street, Thornbury, Ontario

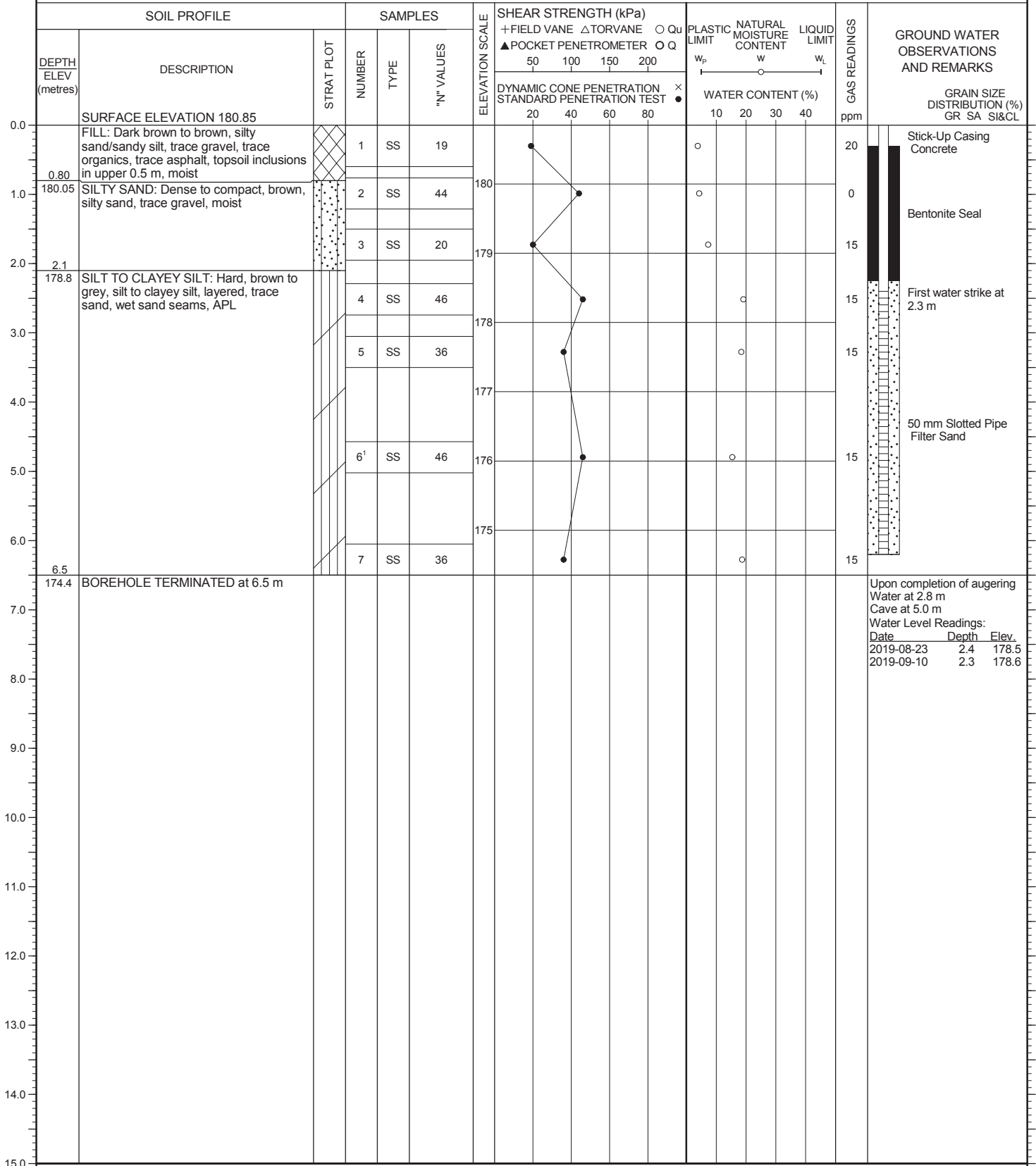
BORING METHOD Continuous Flight Solid Stem Augers

BORING DATE July 30, 2019

PML REF. 19CF012

ENGINEER GW

TECHNICIAN JR



NOTES 1 - Soil sample submitted for chemical testing.

LOG OF BOREHOLE NO. 4

17T 543178.1E 4935010N

1 of 1

PROJECT Proposed Abbots Residential Development

LOCATION Lansdowne Street, Thornbury, Ontario

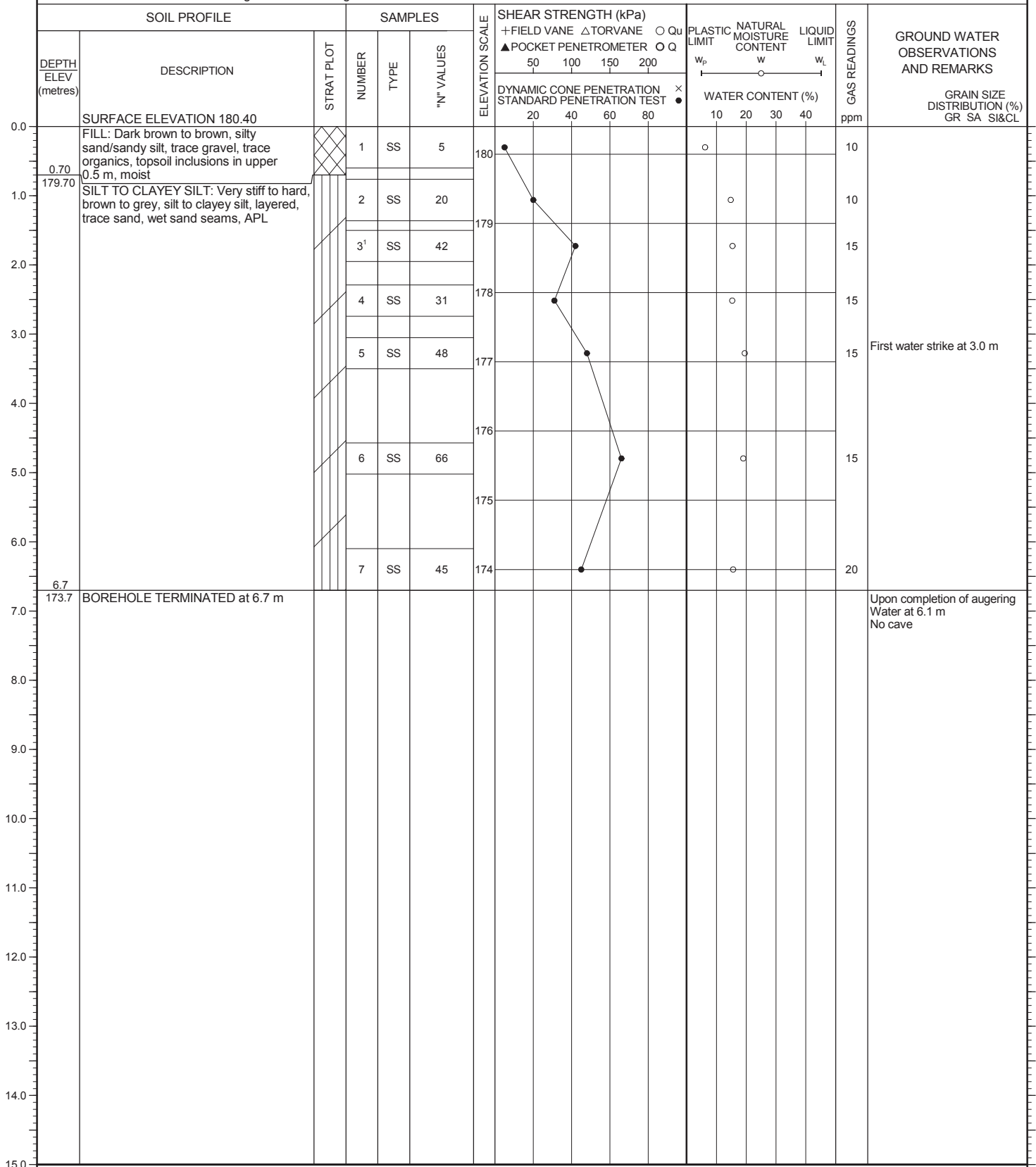
BORING METHOD Continuous Flight Solid Stem Augers

BORING DATE July 30, 2019

PML REF. 19CF012

ENGINEER GW

TECHNICIAN JR



NOTES 1 - Soil sample submitted for chemical testing.

LOG OF BOREHOLE/MONITORING WELL NO. 5

1 of 1

17T 543268.2E 4934953N

PROJECT Proposed Abbots Residential Development

LOCATION Lansdowne Street, Thornbury, Ontario

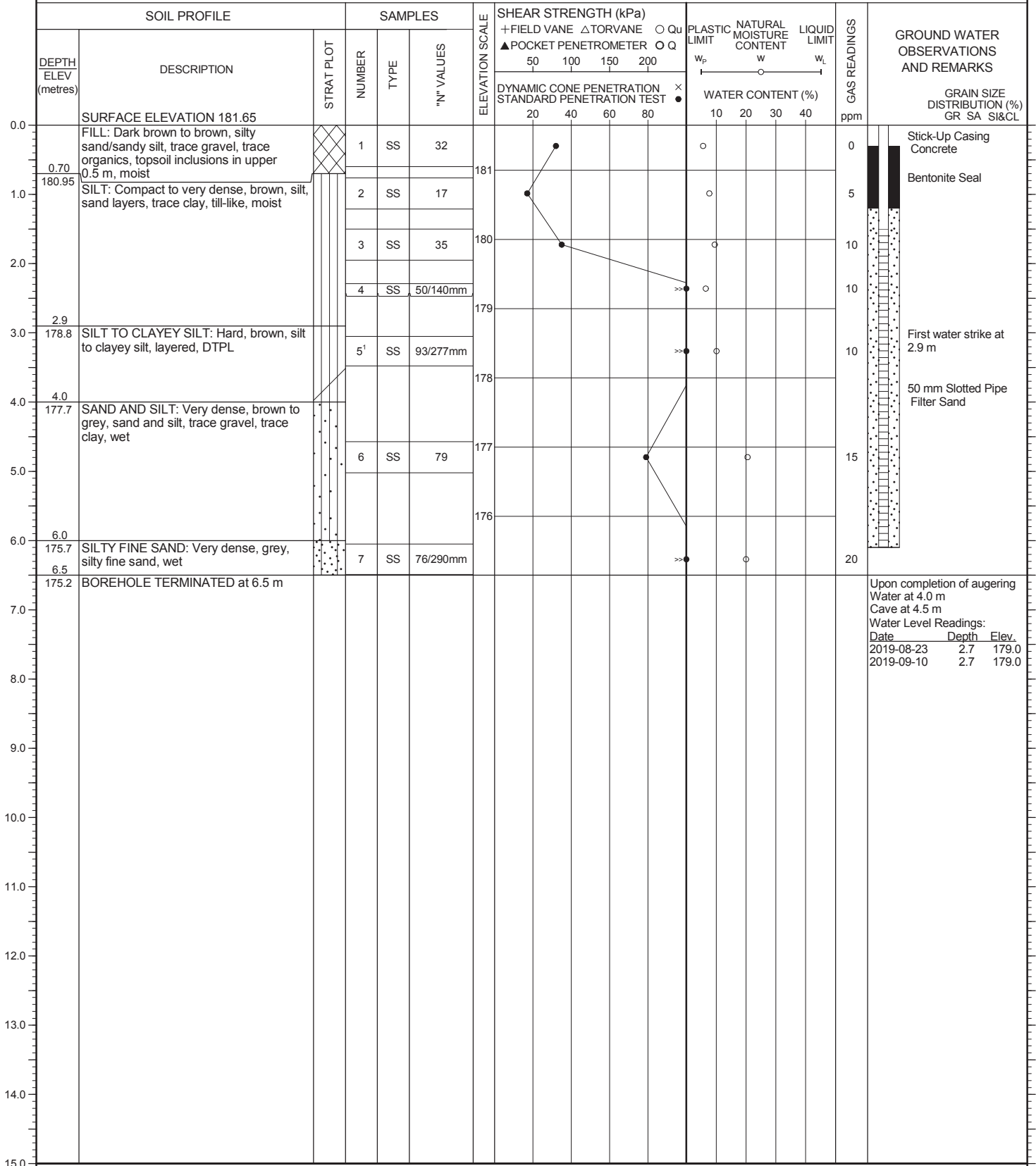
BORING METHOD Continuous Flight Solid Stem Augers

BORING DATE July 30, 2019

PML REF. 19CF012

ENGINEER GW

TECHNICIAN JR



NOTES 1 - Soil sample submitted for chemical testing.



Appendix D

Laboratory Certificates of Analysis



Soil

C.O.C.: ---

REPORT No. B19-23665 (i)

Rev. 1

Report To:

Peto MacCallum Ltd

19 Churchill Drive,
Barrie ON L4N 8Z5

Attention: Joel Robinson

Caduceon Environmental Laboratories

112 Commerce Park Drive

Barrie ON L4N 8W8

Tel: 705-252-5743

Fax: 705-252-5746

DATE RECEIVED: 31-Jul-19

JOB/PROJECT NO.:

DATE REPORTED: 31-Oct-19

SAMPLE MATRIX: Soil

P.O. NUMBER: 19CF012

WATERWORKS NO.

Parameter	Qty	Site Analyzed	Analyst Initials	Date Analyzed	Lab Method	Reference Method
Cyanide	3	Kingston	US	06-Aug-19	A-CN s K	in house
Conductivity	3	Richmond Hill	ABL	03-Aug-19	A-COND-02 s RH	MOEE3530
pH	3	Richmond Hill	ABL	02-Aug-19	A-pH-02 (rh)	MOEE3530
Chromium (VI)	3	Holly Lane	LMG	02-Aug-19	D-CRVI-02 (o)	EPA7196A
Mercury	3	Holly Lane	PBK	08-Aug-19	D-HG-01 (o)	EPA 7471A
Sodium Adsorption Ratio	3	Holly Lane	AHM	08-Aug-19	D-ICP-01 SAR (o)	SM 3120
Metals - ICP-OES	3	Holly Lane	AHM	08-Aug-19	D-ICP-02 (o)	EPA 6010
Metals - ICP-MS	3	Holly Lane	TPR	07-Aug-19	D-ICPMS-01 (o)	EPA 6020

µg/g = micrograms per gram (parts per million) and is equal to mg/Kg

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, analysis, QC requirements and limits for holding time were met. If analyzed for F4 and F4G they are not to be summed but the greater of the two numbers are to be used in application to the CWS PHC QC will be made available upon request.

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 2 - RPI Soil - Table 2 - Res./Parkland/Institutional Soil Std



R.L. = Reporting Limit

Test methods may be modified from specified reference method unless indicated by an *

Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

Steve Garrett

Director of Laboratory Services

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Rev. 1

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Attention: Joel Robinson

Caduceon Environmental Laboratories

112 Commerce Park Drive

Barrie ON L4N 8W8

Tel: 705-252-5743

Fax: 705-252-5746

DATE RECEIVED: 31-Jul-19

JOB/PROJECT NO.:

DATE REPORTED: 31-Oct-19

P.O. NUMBER: 19CF012

SAMPLE MATRIX: Soil

WATERWORKS NO.

Client I.D. Sample I.D. Date Collected			BH 2 SS 6 B19-23665-1 30-Jul-19	BH 3 SS 6 B19-23665-2 30-Jul-19	BH 5 SS 5 B19-23665-3 30-Jul-19	O. Reg. 153 Tbl. 2 - RPI Soil	
Parameter	Units	R.L.					
pH @25°C	pH Units		7.98	8.03	7.99		
Conductivity @25°C	mS/cm	0.07	0.12	0.20	0.26	0.7	
Cyanide (Free)	µg/g	0.05	< 0.05	< 0.05	< 0.05	0.051	
Sodium Adsorption Ratio	units		0.138	0.385	0.168	5	
Antimony	µg/g	0.5	< 0.5	< 0.5	< 0.5	7.5	
Arsenic	µg/g	0.5	1.6	4.3	2.5	18	
Barium	µg/g	1	9	40	21	390	
Beryllium	µg/g	0.2	< 0.2	0.5	0.3	4	
Boron	µg/g	0.5	11.9	23.5	16.2	120	
Cadmium	µg/g	0.5	< 0.5	< 0.5	< 0.5	1.2	
Chromium	µg/g	1	9	21	11	160	
Chromium (VI)	µg/g	0.2	< 0.2	< 0.2	< 0.2	8	
Cobalt	µg/g	1	3	11	6	22	
Copper	µg/g	1	14	22	27	140	
Lead	µg/g	5	< 5	6	< 5	120	
Mercury	µg/g	0.005	0.006	0.013	0.008	0.27	
Molybdenum	µg/g	1	< 1	< 1	< 1	6.9	
Nickel	µg/g	1	7	23	12	100	
Selenium	µg/g	0.5	< 0.5	< 0.5	< 0.5	2.4	
Silver	µg/g	0.2	< 0.2	< 0.2	< 0.2	20	
Thallium	µg/g	0.1	< 0.1	< 0.1	< 0.1	1	
Uranium	µg/g	0.1	0.4	0.6	0.4	23	
Vanadium	µg/g	1	10	23	14	86	
Zinc	µg/g	3	10	40	24	340	

1 Revised report to change guidelines as per client request.

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 2 - RPI Soil - Table 2 - Res./Parkland/Institutional Soil Std



R.L. = Reporting Limit

Test methods may be modified from specified reference method unless indicated by an *

Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

Steve Garrett

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Rev. 1

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Caduceon Environmental Laboratories

112 Commerce Park Drive

Barrie ON L4N 8W8

Tel: 705-252-5743

Fax: 705-252-5746

DATE RECEIVED: 31-Jul-19

JOB/PROJECT NO.:

DATE REPORTED: 31-Oct-19

P.O. NUMBER: 19CF012

SAMPLE MATRIX: Soil

WATERWORKS NO.

Summary of Exceedances

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 2 - RPI Soil - Table 2 - Res./Parkland/Institutional Soil Std



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DATE RECEIVED: 31-Jul-19

JOB/PROJECT NO.:

DATE REPORTED: 31-Oct-19

SAMPLE MATRIX: Soil

P.O. NUMBER: 19CF012

WATERWORKS NO.

Parameter	Qty	Site Analyzed	Analyst Initials	Date Analyzed	Lab Method	Reference Method
% Moisture	3	Richmond Hill	FAL	02-Aug-19	A-% moisture RH	
PHC(F2-F4)	3	Kingston	KPR	04-Aug-19	C-PHC-S-001 (k)	CWS Tier 1
VOC's	3	Richmond Hill	FAL	02-Aug-19	C-VOC-02 (rh)	EPA 8260
PHC(F1)	3	Richmond Hill	FAL	02-Aug-19	C-VPHS-01 (rh)	CWS Tier 1

µg/g = micrograms per gram (parts per million) and is equal to mg/Kg

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, analysis, QC requirements and limits for holding time were met.

If analyzed for F4 and F4G they are not to be summed but the greater of the two numbers are to be used in application to the CWS PHC

QC will be made available upon request.

O. Reg. 153 - Soil, Ground Water and Sediment Standards

Tbl. 2 - RPI Soil - Table 2 - Res./Parkland/Institutional Soil Std



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DATE RECEIVED: 31-Jul-19

JOB/PROJECT NO.:

DATE REPORTED: 31-Oct-19

P.O. NUMBER: 19CF012

SAMPLE MATRIX: Soil

WATERWORKS NO.

Parameter	Client I.D. Sample I.D. Date Collected		BH 2 SS 6 B19-23665-1 30-Jul-19	BH 3 SS 6 B19-23665-2 30-Jul-19	BH 5 SS 5 B19-23665-3 30-Jul-19	O. Reg. 153 Tbl. 2 - RPI Soil	
	Units	R.L.					
Acetone	µg/g	0.5	< 0.5	< 0.5	< 0.5	16	
Benzene	µg/g	0.02	< 0.02	< 0.02	< 0.02	0.21	
Bromodichloromethane	µg/g	0.02	< 0.02	< 0.02	< 0.02	1.5	
Bromoform	µg/g	0.02	< 0.02	< 0.02	< 0.02	0.27	
Bromomethane	µg/g	0.05	< 0.05	< 0.05	< 0.05	0.05	
Carbon Tetrachloride	µg/g	0.05	< 0.05	< 0.05	< 0.05	0.05	
Monochlorobenzene (Chlorobenzene)	µg/g	0.02	< 0.02	< 0.02	< 0.02	2.4	
Chloroform	µg/g	0.02	< 0.02	< 0.02	< 0.02	0.05	
Dibromochloromethane	µg/g	0.02	< 0.02	< 0.02	< 0.02	2.3	
Dichlorobenzene, 1,2-	µg/g	0.05	< 0.05	< 0.05	< 0.05	1.2	
Dichlorobenzene, 1,3-	µg/g	0.05	< 0.05	< 0.05	< 0.05	4.8	
Dichlorobenzene, 1,4-	µg/g	0.05	< 0.05	< 0.05	< 0.05	0.083	
Dichlorodifluoromethane	µg/g	0.05	< 0.05	< 0.05	< 0.05	16	
Dichloroethane, 1,1-	µg/g	0.02	< 0.02	< 0.02	< 0.02	0.47	
Dichloroethane, 1,2-	µg/g	0.02	< 0.02	< 0.02	< 0.02	0.05	
Dichloroethylene, 1,1-	µg/g	0.02	< 0.02	< 0.02	< 0.02	0.05	
Dichloroethene, cis-1,2-	µg/g	0.02	< 0.02	< 0.02	< 0.02	1.9	
Dichloroethene, trans-1,2-	µg/g	0.02	< 0.02	< 0.02	< 0.02	0.084	
Dichloropropane, 1,2-	µg/g	0.02	< 0.02	< 0.02	< 0.02	0.050	
Dichloropropene, cis-1,3-	µg/g	0.02	< 0.02	< 0.02	< 0.02		
Dichloropropene, trans-1,3-	µg/g	0.02	< 0.02	< 0.02	< 0.02		
Dichloropropene 1,3- cis+trans	µg/g	0.02	< 0.02	< 0.02	< 0.02	0.050	
Ethylbenzene	µg/g	0.05	< 0.05	< 0.05	< 0.05	1.1	

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 2 - RPI Soil - Table 2 - Res./Parkland/Institutional Soil Std



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19 Churchill Drive,
Barrie ON L4N 8Z5

Attention: Joel Robinson

Caduceon Environmental Laboratories

112 Commerce Park Drive

Barrie ON L4N 8W8

Tel: 705-252-5743

Fax: 705-252-5746

DATE RECEIVED: 31-Jul-19

JOB/PROJECT NO.:

DATE REPORTED: 31-Oct-19

P.O. NUMBER: 19CF012

SAMPLE MATRIX: Soil

WATERWORKS NO.

Parameter	Client I.D. Sample I.D. Date Collected		BH 2 SS 6 B19-23665-1 30-Jul-19	BH 3 SS 6 B19-23665-2 30-Jul-19	BH 5 SS 5 B19-23665-3 30-Jul-19	O. Reg. 153 Tbl. 2 - RPI Soil	
	Units	R.L.					
Dibromoethane, 1,2- (Ethylene Dibromide)	µg/g	0.02	< 0.02	< 0.02	< 0.02	0.05	
Hexane	µg/g	0.02	< 0.02	< 0.02	< 0.02	2.8	
Methyl Ethyl Ketone	µg/g	0.5	< 0.5	< 0.5	< 0.5	16	
Methyl Isobutyl Ketone	µg/g	0.5	< 0.5	< 0.5	< 0.5	1.7	
Methyl-t-butyl Ether	µg/g	0.05	< 0.05	< 0.05	< 0.05	0.75	
Dichloromethane (Methylene Chloride)	µg/g	0.05	< 0.05	< 0.05	< 0.05	0.10	
Styrene	µg/g	0.05	< 0.05	< 0.05	< 0.05	0.7	
Tetrachloroethane, 1,1,1,2-	µg/g	0.02	< 0.02	< 0.02	< 0.02	0.058	
Tetrachloroethane, 1,1,2,2-	µg/g	0.05	< 0.05	< 0.05	< 0.05	0.05	
Tetrachloroethylene	µg/g	0.05	< 0.05	< 0.05	< 0.05	0.28	
Toluene	µg/g	0.2	< 0.2	< 0.2	< 0.2	2.3	
Trichloroethane, 1,1,1-	µg/g	0.02	< 0.02	< 0.02	< 0.02	0.38	
Trichloroethane, 1,1,2-	µg/g	0.02	< 0.02	< 0.02	< 0.02	0.05	
Trichloroethylene	µg/g	0.05	< 0.05	< 0.05	< 0.05	0.061	
Trichlorofluoromethane	µg/g	0.02	< 0.02	< 0.02	< 0.02	4.0	
Vinyl Chloride	µg/g	0.02	< 0.02	< 0.02	< 0.02	0.020	
Xylene, m,p-	µg/g	0.03	< 0.03	< 0.03	< 0.03		
Xylene, o-	µg/g	0.03	< 0.03	< 0.03	< 0.03		
Xylene, m,p,o-	µg/g	0.03	< 0.03	< 0.03	< 0.03	3.1	
PHC F1 (C6-C10)	µg/g	10	< 10	< 10	< 10	55	
PHC F2 (>C10-C16)	µg/g	5	< 5	8	9	98	
PHC F3 (>C16-C34)	µg/g	10	10	27	23	300	
PHC F4 (>C34-C50)	µg/g	10	< 10	< 10	< 10	2800	
% moisture	%		13.9	14.2	8.6		

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 2 - RPI Soil - Table 2 - Res./Parkland/Institutional Soil Std



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Attention: Joel Robinson

Caduceon Environmental Laboratories

112 Commerce Park Drive

Barrie ON L4N 8W8

Tel: 705-252-5743

Fax: 705-252-5746

DATE RECEIVED: 31-Jul-19

JOB/PROJECT NO.:

DATE REPORTED: 31-Oct-19

P.O. NUMBER: 19CF012

SAMPLE MATRIX: Soil

WATERWORKS NO.

Summary of Exceedances

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 2 - RPI Soil - Table 2 - Res./Parkland/Institutional Soil Std



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JOB/PROJECT NO.:

DATE REPORTED: 31-Oct-19

SAMPLE MATRIX: Soil

P.O. NUMBER: 19CF012

WATERWORKS NO.

Parameter	Qty	Site Analyzed	Analyst Initials	Date Analyzed	Lab Method	Reference Method
Comment	3	Default Site	CS	06-Aug-19	C-Arochlor Comment	-
SVOC	3	Kingston	sge	08-Aug-19	C-NAB-S-001 (k)	EPA 8270
OC Pesticides	3	Kingston	CS	06-Aug-19	C-PESTCL-01 K	EPA 8080

µg/g = micrograms per gram (parts per million) and is equal to mg/Kg

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

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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.

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Barrie ON L4N 8W8

Tel: 705-252-5743

Fax: 705-252-5746

DATE RECEIVED: 31-Jul-19

JOB/PROJECT NO.:

DATE REPORTED: 31-Oct-19

P.O. NUMBER: 19CF012

SAMPLE MATRIX: Soil

WATERWORKS NO.

	Client I.D. Sample I.D. Date Collected		BH 2 SS 6 B19-23665-1 30-Jul-19	BH 3 SS 6 B19-23665-2 30-Jul-19	BH 5 SS 5 B19-23665-3 30-Jul-19		O. Reg. 153 Tbl. 2 - RPI Soil	
Parameter	Units	R.L.						
Poly-Chlorinated Biphenyls (PCB's)	µg/g	0.3	< 0.3	< 0.3	< 0.3		0.35	
Aroclor	-		-	-	-			
Acenaphthene	µg/g	0.05	< 0.05	< 0.05	< 0.05		7.9	
Acenaphthylene	µg/g	0.05	< 0.05	< 0.05	< 0.05		0.15	
Anthracene	µg/g	0.05	< 0.05	< 0.05	< 0.05		0.67	
Benzo(a)anthracene	µg/g	0.05	< 0.05	< 0.05	< 0.05		0.50	
Benzo(a)pyrene	µg/g	0.05	< 0.05	< 0.05	< 0.05		0.3	
Benzo(b)fluoranthene	µg/g	0.05	< 0.05	< 0.05	< 0.05		0.78	
Benzo(b+k)fluoranthene	µg/g	0.05	< 0.05	< 0.05	< 0.05			
Benzo(g,h,i)perylene	µg/g	0.05	< 0.05	< 0.05	< 0.05		6.6	
Benzo(k)fluoranthene	µg/g	0.05	< 0.05	< 0.05	< 0.05		0.78	
Chrysene	µg/g	0.05	< 0.05	< 0.05	< 0.05		7.0	
Dibenzo(a,h)anthracene	µg/g	0.05	< 0.05	< 0.05	< 0.05		0.1	
Fluoranthene	µg/g	0.05	< 0.05	< 0.05	< 0.05		0.69	
Fluorene	µg/g	0.05	< 0.05	< 0.05	< 0.05		62	
Indeno(1,2,3,-cd)pyrene	µg/g	0.05	< 0.05	< 0.05	< 0.05		0.38	
Methylnaphthalene,1-	µg/g	0.05	< 0.05	< 0.05	< 0.05		0.99	
Methylnaphthalene,2-	µg/g	0.05	< 0.05	< 0.05	< 0.05		0.99	
Methylnaphthalene 2-(1-)	µg/g	0.05	< 0.05	< 0.05	< 0.05		0.99	
Naphthalene	µg/g	0.05	< 0.05	< 0.05	< 0.05		0.60	
Phenanthrene	µg/g	0.05	< 0.05	< 0.05	< 0.05		6.2	
Pyrene	µg/g	0.05	< 0.05	< 0.05	< 0.05		78	

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 2 - RPI Soil - Table 2 - Res./Parkland/Institutional Soil Std



R.L. = Reporting Limit

Test methods may be modified from specified reference method unless indicated by an *

Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

Steve Garrett

Director of Laboratory Services

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C.O.C.: ---

REPORT No. B19-23665 (iii)

Rev. 1

Report To:

Peto MacCallum Ltd

19 Churchill Drive,
Barrie ON L4N 8Z5

Attention: Joel Robinson

Caduceon Environmental Laboratories

112 Commerce Park Drive

Barrie ON L4N 8W8

Tel: 705-252-5743

Fax: 705-252-5746

DATE RECEIVED: 31-Jul-19

JOB/PROJECT NO.:

DATE REPORTED: 31-Oct-19

P.O. NUMBER: 19CF012

SAMPLE MATRIX: Soil

WATERWORKS NO.

Summary of Exceedances

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 2 - RPI Soil - Table 2 - Res./Parkland/Institutional Soil Std



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Steve Garrett

Director of Laboratory Services

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TESTING REQUIREMENTS

REPORT NUMBER (Lab Use)

☒ O.Reg 153 ☐ RPI ☐ ICC ☐ Yes ☐ No ☐ Agricultural ☐ Provincial Water Quality Objectives ☐ Sewer Use By-Law: ☐ Table 1 ☐ Medium/Fine ☐ Coarse ☐ MISA Guidelines ☐ O.Reg 558 Leachate Analysis ☐ Disposal Site: ☐ Landfill Monitoring ☐ Other: ☐ Record of Site Condition (O.Reg 153)

B19-23665

Are any samples to be submitted intended for Human Consumption under any Drinking Water Regulations? ☐ Yes ☒ No (If yes, submit all Drinking Water Samples on a Drinking Water Chain of Custody)

Indicate Laboratory Samples are submitted to: ☐ Kingston ☐ Ottawa ☐ Richmond Hill ☐ Windsor ☐ Barrie ☒ London

Organization: Peto MacCallum Ltd.	Address and Invoicing Address (if different) 19 Churchill Drive, Barrie, ON L4N8Z5, barrie@petomacallum.com		ANALYSES REQUESTED (Print Test in Boxes)										TURNAROUND SERVICE REQUESTED (see back page)	
Contact: J.Robinson			Metals & Inorganics	PHC's	PAH's	VOC's	PCB's	Corrosivity Analysis	Suspected Highly Contaminated	<input type="checkbox"/> Platinum 200% Surcharge <input type="checkbox"/> Gold 100% Surcharge <input type="checkbox"/> Silver 50% Surcharge <input checked="" type="checkbox"/> Bronze 25% Surcharge <input checked="" type="checkbox"/> Standard 5-7 days <input type="checkbox"/> Specific Date:				
Tel: 705-734-3900	Quote No.:	Project Name: 19CF012												
Fax: 705-734-9911	P.O. No.:	Additional Info: akimberley@petomacallum.com												
Email: jrobinson@petomacallum.com														

* Sample Matrix Legend: WW=Waste Water, SW=Surface Water, GW=Groundwater, LS=Liquid Sludge, SS=Solid Sludge, S=Soil, Sed=Sediment, PC=Paint Chips, F=Filter, Oil = Oil

Lab No:	Sample Identification	S.P.L.	Sample Matrix *	Date Collected (yy-mm-dd)	Time Collected	Indicate Test For Each Sample By Using A Check Mark In The Box Provided										Field pH	Field Temp.	# Bottles Sample	Field Filtered(Y/N)
BH 1 SS 3			S	2019-07-30														1	
BH 2 SS 3	(BH2 SS6)		S	2019-07-30		x	x	x	x	x								4	
BH 3 SS 6			S	2019-07-30		x	x	x	x	x								4	
BH 4 SS 3			S	2019-07-30														1	
BH 5 SS 5			S	2019-07-30		x	x	x	x	x								4	
	1 Jar -> O																		
	1 Jar -> R																		
	P cup + vials -> RH																		

SAMPLE SUBMISSION INFORMATION		SHIPPING INFORMATION		REPORTING / INVOICING		SAMPLE RECEIVING INFORMATION (LABORATORY USE ONLY)	
Sampled by: Joel Robinson	Submitted by: Niklas Gardlund	Client's Courier <input type="checkbox"/>	Invoice <input type="checkbox"/>	Report by Fax <input type="checkbox"/>	Report by Email <input checked="" type="checkbox"/>	Received By (print): <i>STP</i>	Signature: <i>STP</i>
Print: <i>Joel Robinson</i>	Sign: <i>Niklas</i>	Caduceon's Courier <input type="checkbox"/>	# of Pieces	Invoice by Email <input checked="" type="checkbox"/>	Invoice by Mail <input type="checkbox"/>	Date Received (yy-mm-dd): 19/07/31	Time Received: 16:00
Date (yy-mm-dd)/Time: 2019-07-31	Date (yy-mm-dd)/Time: 2019-07-31	Drop Off <input checked="" type="checkbox"/>	Caduceon (Pick-up) <input type="checkbox"/>			Laboratory Prepared Bottles: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Sample Temperature °C: 13.0						Labeled by: <i>ES</i>	

C.O.C.: ---

REPORT No. B19-23664

Report To:

Peto MacCallum Ltd

19 Churchill Drive,
Barrie ON L4N 8Z5

Attention: Joel Robinson

Caduceon Environmental Laboratories

112 Commerce Park Drive

Barrie ON L4N 8W8

Tel: 705-252-5743

Fax: 705-252-5746

DATE RECEIVED: 31-Jul-19

JOB/PROJECT NO.:

DATE REPORTED: 09-Aug-19

P.O. NUMBER: 19CF012

SAMPLE MATRIX: Soil

WATERWORKS NO.

			Client I.D.	BH 1 SS 3	BH 4 SS 3		
			Sample I.D.	B19-23664-1	B19-23664-2		
			Date Collected	30-Jul-19	30-Jul-19		
Parameter	Units	R.L.	Reference Method	Date/Site Analyzed			
pH @25°C	pH Units		SM 4500H	07-Aug-19/O	8.00	9.11	
Resistivity	ohms·cm		SM 2510B	08-Aug-19/O	3580	5950	
REDOX potential	mV		In-House	07-Aug-19/R	179	181	
Chloride	µg/g	5	SM4110C	08-Aug-19/O	7	18	
Sulphate	µg/g	10	SM4110C	08-Aug-19/O	220	60	
Sulfide	µg/g	0.1	In-House	07-Aug-19	< 0.1 ¹	< 0.1 ¹	

¹ Subcontracted to Testmark Labs



Christine Burke
Lab Manager

R.L. = Reporting Limit

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Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

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Ground Water

C.O.C.: G0020

REPORT No. B19-26775 (i)

Rev. 1

Report To:

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19 Churchill Drive,
Barrie ON L4N 8Z5

Attention: Joel Robinson

Caduceon Environmental Laboratories

112 Commerce Park Drive

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Tel: 705-252-5743

Fax: 705-252-5746

DATE RECEIVED: 26-Aug-19

JOB/PROJECT NO.:

DATE REPORTED: 31-Oct-19

SAMPLE MATRIX: Groundwater

P.O. NUMBER: 19CF012

WATERWORKS NO.

Parameter	Qty	Site Analyzed	Analyst Initials	Date Analyzed	Lab Method	Reference Method
Cyanide	3	Kingston	US	29-Aug-19	A-CN-001 (k)	SM 4500CN
Conductivity	3	Holly Lane	SYL	28-Aug-19	A-COND-02 (o)	SM 2510B
pH	3	Holly Lane	SYL	28-Aug-19	A-PH-01 (o)	SM 4500H
Chromium (VI)	3	Holly Lane	LMG	30-Aug-19	D-CRVI-01 (o)	MOE E3056
Mercury	3	Holly Lane	PBK	29-Aug-19	D-HG-02 (o)	SM 3112 B
Metals - ICP-OES	3	Holly Lane	AHM	03-Sep-19	D-ICP-01 (o)	SM 3120
Metals - ICP-MS	3	Holly Lane	TPR	29-Aug-19	D-ICPMS-01 (o)	EPA 200.8

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 2 - PGW - Table 2 - Potable Ground Water



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Steve Garrett

Director of Laboratory Services

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C.O.C.: G0020

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Tel: 705-252-5743

Fax: 705-252-5746

DATE RECEIVED: 26-Aug-19

JOB/PROJECT NO.:

DATE REPORTED: 31-Oct-19

P.O. NUMBER: 19CF012

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Parameter	Units	R.L.	Client I.D. Sample I.D. Date Collected	BH 2 08-23-19 B19-26775-1 23-Aug-19	BH 3 08-23-19 B19-26775-2 23-Aug-19	BH 5 08-23-19 B19-26775-3 23-Aug-19	O. Reg. 153 Tbl. 2 - PGW	
pH @25°C	pH Units			7.50	7.80	7.43		
Conductivity @25°C	mS/cm	0.001		1.02	0.649	1.01		
Cyanide (Free)	µg/L	5		< 5	< 5	< 5	66	
Sodium	µg/L	200		25300	27400	56000	490000	
Antimony	µg/L	0.1		0.2	0.2	0.2	6	
Arsenic	µg/L	0.1		1.3	3.9	1.7	25	
Barium	µg/L	1		91	43	102	1000	
Beryllium	µg/L	0.1		< 0.1	< 0.1	< 0.1	4	
Boron	µg/L	5		45	552	52	5000	
Cadmium	µg/L	0.015		< 0.015	< 0.015	< 0.015	2.7	
Chromium	µg/L	2		< 2	< 2	< 2	50	
Chromium (VI)	µg/L	10		< 10	< 10	< 10	25	
Cobalt	µg/L	0.1		0.6	0.2	0.9	3.8	
Copper	µg/L	2		< 2	3	< 2	87	
Lead	µg/L	0.02		0.05	0.15	0.05	10	
Mercury	µg/L	0.02		< 0.02	< 0.02	< 0.02	0.29	
Molybdenum	µg/L	0.1		1.2	4.2	0.8	70	
Nickel	µg/L	0.2		3.6	0.8	4.8	100	
Selenium	µg/L	1		< 1	< 1	< 1	10	
Silver	µg/L	0.1		< 0.1	< 0.1	< 0.1	1.5	
Thallium	µg/L	0.05		< 0.05	< 0.05	< 0.05	2	
Uranium	µg/L	0.05		1.32	0.89	0.51	20	
Vanadium	µg/L	0.1		0.4	0.8	0.4	6.2	
Zinc	µg/L	5		< 5	< 5	< 5	1100	

1 Chromium (VI) result is based on total chromium

2 Revised report to change guidelines as per client request.

O. Reg. 153 - Soil, Ground Water and Sediment Standards

Tbl. 2 - PGW - Table 2 - Potable Ground Water



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Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

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C.O.C.: G0020

REPORT No. B19-26775 (i)

Rev. 1

Report To:

Peto MacCallum Ltd

19 Churchill Drive,
Barrie ON L4N 8Z5

Attention: Joel Robinson

Caduceon Environmental Laboratories

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Tel: 705-252-5743

Fax: 705-252-5746

DATE RECEIVED: 26-Aug-19

JOB/PROJECT NO.:

DATE REPORTED: 31-Oct-19

P.O. NUMBER: 19CF012

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Summary of Exceedances

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 2 - PGW - Table 2 - Potable Ground Water



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REPORT No. B19-26775 (ii)

Rev. 1

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Attention: Joel Robinson

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DATE RECEIVED: 26-Aug-19

JOB/PROJECT NO.:

DATE REPORTED: 31-Oct-19

SAMPLE MATRIX: Groundwater

P.O. NUMBER: 19CF012

WATERWORKS NO.

Parameter	Qty	Site Analyzed	Analyst Initials	Date Analyzed	Lab Method	Reference Method
PHC(F2-F4)	3	Kingston	KPR	28-Aug-19	C-PHC-W-001 (k)	MOE E3421
VOC's	3	Richmond Hill	JE	29-Aug-19	C-VOC-02 (rh)	EPA 8260
PHC(F1)	3	Richmond Hill	JE	29-Aug-19	C-VPHW-01 (rh)	MOE E3421

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 2 - PGW - Table 2 - Potable Ground Water



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DATE RECEIVED: 26-Aug-19

JOB/PROJECT NO.:

DATE REPORTED: 31-Oct-19

P.O. NUMBER: 19CF012

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Parameter	Client I.D. Sample I.D. Date Collected		BH 2 08-23-19 B19-26775-1 23-Aug-19	BH 3 08-23-19 B19-26775-2 23-Aug-19	BH 5 08-23-19 B19-26775-3 23-Aug-19	O. Reg. 153 Tbl. 2 - PGW	
	Units	R.L.					
Acetone	µg/L	30	< 30	< 30	< 30	2700	
Benzene	µg/L	0.5	< 0.5	< 0.5	< 0.5	5	
Bromodichloromethane	µg/L	2	< 2	< 2	< 2	16	
Bromoform	µg/L	5	< 5	< 5	< 5	25	
Bromomethane	µg/L	0.5	< 0.5	< 0.5	< 0.5	0.89	
Carbon Tetrachloride	µg/L	0.2	< 0.2	< 0.2	< 0.2	0.79	
Monochlorobenzene (Chlorobenzene)	µg/L	0.5	< 0.5	< 0.5	< 0.5	30	
Chloroform	µg/L	1	< 1	< 1	< 1	2.4	
Dibromochloromethane	µg/L	2	< 2	< 2	< 2	25	
Dichlorobenzene, 1,2-	µg/L	0.5	< 0.5	< 0.5	< 0.5	3	
Dichlorobenzene, 1,3-	µg/L	0.5	< 0.5	< 0.5	< 0.5	59	
Dichlorobenzene, 1,4-	µg/L	0.5	< 0.5	< 0.5	< 0.5	1	
Dichlorodifluoromethane	µg/L	2	< 2	< 2	< 2	590	
Dichloroethane, 1,1-	µg/L	0.5	< 0.5	< 0.5	< 0.5	5	
Dichloroethane, 1,2-	µg/L	0.5	< 0.5	< 0.5	< 0.5	1.6	
Dichloroethylene, 1,1-	µg/L	0.5	< 0.5	< 0.5	< 0.5	1.6	
Dichloroethene, cis-1,2-	µg/L	0.5	< 0.5	< 0.5	< 0.5	1.6	
Dichloroethene, trans-1,2-	µg/L	0.5	< 0.5	< 0.5	< 0.5	1.6	
Dichloropropane, 1,2-	µg/L	0.5	< 0.5	< 0.5	< 0.5	5	
Dichloropropene, cis-1,3-	µg/L	0.5	< 0.5	< 0.5	< 0.5		
Dichloropropene, trans-1,3-	µg/L	0.5	< 0.5	< 0.5	< 0.5		
Dichloropropene 1,3- cis+trans	µg/L	0.5	< 0.5	< 0.5	< 0.5	0.5	
Ethylbenzene	µg/L	0.5	< 0.5	< 0.5	< 0.5	2.4	

O. Reg. 153 - Soil, Ground Water and Sediment Standards

Tbl. 2 - PGW - Table 2 - Potable Ground Water



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Attention: Joel Robinson

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Tel: 705-252-5743

Fax: 705-252-5746

DATE RECEIVED: 26-Aug-19

JOB/PROJECT NO.:

DATE REPORTED: 31-Oct-19

P.O. NUMBER: 19CF012

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Parameter	Client I.D. Sample I.D. Date Collected		BH 2 08-23-19 B19-26775-1 23-Aug-19	BH 3 08-23-19 B19-26775-2 23-Aug-19	BH 5 08-23-19 B19-26775-3 23-Aug-19	O. Reg. 153 Tbl. 2 - PGW	
	Units	R.L.					
Dibromoethane, 1,2- (Ethylene Dibromide)	µg/L	0.2	< 0.2	< 0.2	< 0.2	0.2	
Hexane	µg/L	5	< 5	< 5	< 5	51	
Methyl Ethyl Ketone	µg/L	20	< 20	< 20	< 20	1800	
Methyl Isobutyl Ketone	µg/L	20	< 20	< 20	< 20	640	
Methyl-t-butyl Ether	µg/L	2	< 2	< 2	< 2	15	
Dichloromethane (Methylene Chloride)	µg/L	5	< 5	< 5	< 5	50	
Styrene	µg/L	0.5	< 0.5	< 0.5	< 0.5	5.4	
Tetrachloroethane, 1,1,1,2-	µg/L	0.5	< 0.5	< 0.5	< 0.5	1.1	
Tetrachloroethane, 1,1,2,2-	µg/L	0.5	< 0.5	< 0.5	< 0.5	1	
Tetrachloroethylene	µg/L	0.5	< 0.5	< 0.5	< 0.5	1.6	
Toluene	µg/L	0.5	0.6	0.5	< 0.5	24	
Trichloroethane, 1,1,1-	µg/L	0.5	< 0.5	< 0.5	< 0.5	200	
Trichloroethane, 1,1,2-	µg/L	0.5	< 0.5	< 0.5	< 0.5	4.7	
Trichloroethylene	µg/L	0.5	< 0.5	< 0.5	< 0.5	1.6	
Trichlorofluoromethane	µg/L	5	< 5	< 5	< 5	150	
Vinyl Chloride	µg/L	0.2	< 0.2	< 0.2	< 0.2	0.5	
Xylene, m,p-	µg/L	1.0	< 1.0	< 1.0	< 1.0		
Xylene, o-	µg/L	0.5	< 0.5	< 0.5	< 0.5		
Xylene, m,p,o-	µg/L	1.1	< 1.1	< 1.1	< 1.1	300	
PHC F1 (C6-C10)	µg/L	50	< 50	< 50	< 50	750	
PHC F2 (>C10-C16)	µg/L	50	< 50	< 50	< 50	150	
PHC F3 (>C16-C34)	µg/L	400	< 400	< 400	< 400	500	
PHC F4 (>C34-C50)	µg/L	400	< 400	< 400	< 400	500	

O. Reg. 153 - Soil, Ground Water and Sediment Standards

Tbl. 2 - PGW - Table 2 - Potable Ground Water



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Rev. 1

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Attention: Joel Robinson

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Fax: 705-252-5746

DATE RECEIVED: 26-Aug-19

JOB/PROJECT NO.:

DATE REPORTED: 31-Oct-19

P.O. NUMBER: 19CF012

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Summary of Exceedances

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 2 - PGW - Table 2 - Potable Ground Water



R.L. = Reporting Limit

Test methods may be modified from specified reference method unless indicated by an *

Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

Steve Garrett

Director of Laboratory Services

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Caduceon Environmental Laboratories.

C.O.C.: G0020

REPORT No. B19-26775 (iii)

Rev. 1

Report To:

Peto MacCallum Ltd

19 Churchill Drive,
Barrie ON L4N 8Z5

Attention: Joel Robinson

Caduceon Environmental Laboratories

112 Commerce Park Drive

Barrie ON L4N 8W8

Tel: 705-252-5743

Fax: 705-252-5746

DATE RECEIVED: 26-Aug-19

JOB/PROJECT NO.:

DATE REPORTED: 31-Oct-19

SAMPLE MATRIX: Groundwater

P.O. NUMBER: 19CF012

WATERWORKS NO.

Parameter	Qty	Site Analyzed	Analyst Initials	Date Analyzed	Lab Method	Reference Method
Comment	3	Default Site	CS	29-Aug-19	C-Arochlor Comment	-
SVOC	3	Kingston	sge	29-Aug-19	C-NAB-W-001 (k)	EPA 8270
PCB's	3	Kingston	CS	29-Aug-19	C-PCB-03 K	EPA 8082

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 2 - PGW - Table 2 - Potable Ground Water



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DATE RECEIVED: 26-Aug-19

JOB/PROJECT NO.:

DATE REPORTED: 31-Oct-19

P.O. NUMBER: 19CF012

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Parameter	Client I.D. Sample I.D. Date Collected		BH 2 08-23-19 B19-26775-1 23-Aug-19	BH 3 08-23-19 B19-26775-2 23-Aug-19	BH 5 08-23-19 B19-26775-3 23-Aug-19	O. Reg. 153 Tbl. 2 - PGW	
	Units	R.L.					
Poly-Chlorinated Biphenyls (PCB's)	µg/L	0.05	< 0.05	< 0.05	< 0.05	3	
Aroclor	-		-	-	-		
Acenaphthene	µg/L	0.05	< 0.05	< 0.05	< 0.05	4.1	
Acenaphthylene	µg/L	0.05	< 0.05	< 0.05	< 0.05	1	
Anthracene	µg/L	0.05	< 0.05	< 0.05	0.05	2.4	
Benzo(a)anthracene	µg/L	0.05	< 0.05	0.05	0.07	1	
Benzo(a)pyrene	µg/L	0.01	< 0.01 ¹	< 0.01 ¹	0.028 ¹	0.01	
Benzo(b)fluoranthene	µg/L	0.05	< 0.05	< 0.05	0.05	0.1	
Benzo(b+k)fluoranthene	µg/L	0.1	< 0.1	< 0.1	0.11		
Benzo(g,h,i)perylene	µg/L	0.05	< 0.05	< 0.05	0.05	0.2	
Benzo(k)fluoranthene	µg/L	0.05	< 0.05	< 0.05	0.05	0.1	
Chrysene	µg/L	0.05	< 0.05	0.05	0.08	0.1	
Dibenzo(a,h)anthracene	µg/L	0.05	< 0.05	< 0.05	< 0.05	0.2	
Fluoranthene	µg/L	0.05	< 0.05	< 0.05	0.06	0.41	
Fluorene	µg/L	0.05	< 0.05	< 0.05	< 0.05	120	
Indeno(1,2,3,-cd)pyrene	µg/L	0.05	< 0.05	< 0.05	0.06	0.2	
Methylnaphthalene,1-	µg/L	0.05	< 0.05	< 0.05	< 0.05	3.2	
Methylnaphthalene,2-	µg/L	0.08	< 0.08	< 0.08	< 0.08	3.2	
Methylnaphthalene 2-(1-)	µg/L	1	< 1	< 1	< 1	3.2	
Naphthalene	µg/L	0.05	< 0.05	< 0.05	< 0.05	11	
Phenanthrene	µg/L	0.05	< 0.05	< 0.05	0.08	1	
Pyrene	µg/L	0.05	< 0.05	< 0.05	0.08	4.1	

¹ blank subtracted results for benzo(a)pyrene

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 2 - PGW - Table 2 - Potable Ground Water



R.L. = Reporting Limit

Test methods may be modified from specified reference method unless indicated by an *

Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

Steve Garrett

Director of Laboratory Services

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C.O.C.: G0020

REPORT No. B19-26775 (iii)

Rev. 1

Report To:

Peto MacCallum Ltd

19 Churchill Drive,
Barrie ON L4N 8Z5

Attention: Joel Robinson

Caduceon Environmental Laboratories

112 Commerce Park Drive

Barrie ON L4N 8W8

Tel: 705-252-5743

Fax: 705-252-5746

DATE RECEIVED: 26-Aug-19

JOB/PROJECT NO.:

DATE REPORTED: 31-Oct-19

P.O. NUMBER: 19CF012

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Summary of Exceedances

Table 2 - Potable Ground Water

Table 2 - Potable Ground Water		
BH 5 08-23-19	Found Value	Limit
Benzo(a)pyrene (µg/L)	0.028	0.01

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 2 - PGW - Table 2 - Potable Ground Water



R.L. = Reporting Limit

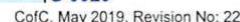
Test methods may be modified from specified reference method unless indicated by an *

Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

Steve Garrett

Director of Laboratory Services

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C.O.C.: G0083

REPORT No. B19-34058

Report To:

Peto MacCallum Ltd

19 Churchill Drive,
Barrie ON L4N 8Z5

Attention: Joel Robinson

Caduceon Environmental Laboratories

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Tel: 705-252-5743

Fax: 705-252-5746

DATE RECEIVED: 22-Oct-19

JOB/PROJECT NO.:

DATE REPORTED: 30-Oct-19

P.O. NUMBER: 19CF012

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

			Client I.D.	BH2 10-21-19	BH3 10-21-19	BH5 10-21-19	
			Sample I.D.	B19-34058-1	B19-34058-2	B19-34058-3	
			Date Collected	21-Oct-19	21-Oct-19	21-Oct-19	
Parameter	Units	R.L.	Reference Method	Date/Site Analyzed			
Alkalinity(CaCO ₃) to pH4.5	mg/L	5	SM 2320B	23-Oct-19/O	482	232	440
Chloride	mg/L	0.5	SM4110C	29-Oct-19/O	12.9	22.2	35.4
Sulphate	mg/L	1	SM4110C	29-Oct-19/O	55	12	26
Hardness (as CaCO ₃)	mg/L	1	SM 3120	28-Oct-19/O	2140	2210	2420
Sodium	mg/L	0.2	SM 3120	25-Oct-19/O	13.8	32.0	64.5



R.L. = Reporting Limit

Test methods may be modified from specified reference method unless indicated by an *

Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

Steve Garrett

Director of Laboratory Services

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Appendix E

Statement of Limitations

STATEMENT OF LIMITATIONS



This report is prepared for and made available for the sole use of the client named. Peto MacCallum Ltd. (PML) hereby disclaims any liability or responsibility to any person or entity, other than those for whom this report is specifically issued, for any loss, damage, expenses, or penalties that may arise or result from the use of any information or recommendations contained in this report. The contents of this report may not be used or relied upon by any other person without the express written consent and authorization of PML.

This report shall not be relied upon for any purpose other than as agreed with the client named without the written consent of PML. It shall not be used to express or imply warranty as to the fitness of the property for a particular purpose. A portion of this report may not be used as a separate entity; that is to say the report is to be read in its entirety at all times.

The report is based solely on the scope of services which are specifically referred to in this report. No physical or intrusive testing has been performed, except as specifically referenced in this report. This report is not a certification of compliance with past or present regulations, codes, guidelines and policies.

The scope of services carried out by PML is based on details of the proposed development and land use to address certain issues, purposes and objectives with respect to the specific site as identified by the client. Services not expressly set forth in writing are expressly excluded from the services provided by PML. In other words, PML has not performed any observations, investigations, study analysis, engineering evaluation or testing that is not specifically listed in the scope of services in this report. PML assumes no responsibility or duty to the client for any such services and shall not be liable for failing to discover any condition, whose discovery would require the performance of services not specifically referred to in this report.

The findings and comments made by PML in this report are based on the conditions observed at the time of PML's site reconnaissance. No assurances can be made and no assurances are given with respect to any potential changes in site conditions following the time of completion of PML's field work. Furthermore, regulations, codes and guidelines may change at any time subsequent to the date of this report and these changes may effect the validity of the findings and recommendations given in this report.

The results and conclusions with respect to site conditions are therefore in no way intended to be taken as a guarantee or representation, expressed or implied, that the Site is free from any contaminants from past or current land use activities or that the conditions in all areas of the Site and beneath or within structures are the same as those areas specifically sampled.

Any investigation, examination, measurements or sampling explorations at a particular location may not be representative of conditions between sampled locations. Soil, ground water, surface water, or building material conditions between and beyond the sampled locations may differ from those encountered at the sampling locations and conditions may become apparent during construction which could not be detected or anticipated at the time of the intrusive sampling investigation.

STATEMENT OF LIMITATIONS



Budget estimates contained in this report are to be viewed as an engineering estimate of probable costs and provided solely for the purposes of assisting the client in its budgeting process. It is understood and agreed that PML will not in any way be held liable as a result of any budget figures provided by it.

The Client expressly waives its right to withhold PML's fees, either in whole or in part, or to make any claim or commence an action or bring any other proceedings, whether in contract, tort, or otherwise against PML in any way connected with advice or information given by PML relating to the cost estimate or Environmental Remediation/Cleanup and Restoration or Soil and Ground Water Management Plan Cost Estimate.

Environmental site assessment studies are performed in different phases by the application of different levels of effort and expense. The phase or phases in this report and the level of effort proposed for this assignment were based solely on PML's understanding of the client's needs as described in the scope of services contained in this report.

This assessment does not wholly eliminate uncertainty regarding the potential for existing or future costs, hazards or losses in connection with the subject property and must be viewed as a mechanism to reduce risk rather than eliminate the risk of contamination concerns.

The parties agree that PML cannot and does not warrant or represent that bids or negotiated prices will not vary from the Environmental Remediation/Cleanup and Restoration or Soil and Ground Water Management Plan Cost Estimate. The parties further agree that nothing in their agreement shall be deemed to be a cost condition or representation that the project cleanup can be completed for the amount of the Environmental Remediation/Cleanup and Restoration or Soil and Ground Water Management Plan Cost Estimate or any other amount.