Prepared By:

Annual Operations & Monitoring Report (2021)

Town Of St. Mary's
St. Mary's Landfill Site
MOECC Certificate of Approval No. A150203

GMBP File: 318007

March 2022

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TOWN OF ST. MARY'S

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1. INTRODUCTION

The St. Mary's Landfill Site is located at 1221 Water Street South, St. Mary's, Ontario, approximately two kilometres southwest of the town of St. Mary's. The site is located on part of Lots 35 and 36 of Thames Concessions, east of Perth County Road 123, as shown in Figure 1. The waste disposal site is owned and operated by the Town of St. Mary's. Landfill operations are conducted under the Ministry of the Environment Conservation and Parks (MECP) Provisional Certificate of Approval (CofA, now referred to as an Environmental Compliance Approval, or ECA) for a Waste Disposal Site No. A150203, issued June 24, 2010 and amended in December 2013, November 2015, September 2016, September 2017, September 2018, October 2019, November 2020, and January 2022. Copies of the C of A for the site and the amendments are provided in Appendix A.

The Ministry of the Environment, Conservation and Parks (MECP) approved a usable area of 8-hectares for landfilling within the 37-hectare Waste Disposal Site. The remaining area is devoted to buffer area, waste receiving, an easement for an existing sewer, and the stormwater collection and management system. Landfilling at the site was initiated in December of 1984 with the construction of Phase I. Based on a review of available information, prior to landfilling at the property, St. Mary's Cement operated a clay and borrow pit on the property until 1977. The approved capacity of the site, as described in the Amended ECA Issued January 10, 2022, is 349,050 m^3 for waste and daily cover material (prior to final cover).

The current site layout, design, approval framework and onsite operations are based on a series of accepted and Ministry approved documents including the following:

- Hydrogeological Investigation, Phase II/III, St. Marys Landfill Site, St. Marys, Ontario, dated November 1992 (revised as per MOE comments) (referred to as Phase II/III Hydrogeologic Investigation).
- Design and Operation Report, Phase II/III, St. Marys Landfill Site, St. Marys, Ontario, dated November 1992 (revised as per MOE comments) (referred to as Phase II/III Design and Operation Report).
- Leachate Treatment and Disposal Alternatives, St. Marys Landfill Site, St. Marys, Ontario, dated November 1992 (revised as per MOE comments) (referred to as Leachate Treatment and Disposal Alternatives Report).
- Addendum: Design and Operations Report Update, St. Marys Landfill Site, St. Marys, Ontario, dated April 2009.
- Design and Operations Report: Addendum – Leaf and Yard Waste Composting Operation, St. Marys Landfill Site, St. Marys, Ontario, dated October 2009.

In addition to the above noted documents, several ECA/CofA amendments have been obtained pertaining to

extending the approved airspace capacity of the Site. The amendments have been completed and applications submitted on an annual basis to provide for approval on interim operational capacity.
Condition 25 (a) through (s) of the Amended ECA requires that an Annual Monitoring and Operations Report be submitted by March 31st of each calendar year to summarize the site operations for the previous calendar year. This report is submitted to meet the annual monitoring and operations reporting requirements specified under Condition 25 of the ECA for the St. Mary's Landfill Site.

2. EXISTING SITE CONDITIONS

The St. Mary's Landfill Site has a usable area of 8-hectares for landfilling within the 37-hectare Waste Disposal Site.

Based on a review of available information, Phase I of the landfill was filled within the first 9 years of landfilling and was completed and finished with final cover in the summer of 1993. Phase I includes a leachate collection system that consists of perforated collection pipes and manholes situated around the perimeter of the closed refuse pile.

The landfill area that is currently in operation consists of the approved 8-cell portion of the landfill footprint identified as Phase II/III. The cells are filled from east to west, cells 1 through to 7, with landfilling in portions of cells 5, 6, 7, and 8 being completed as part of the current operations. Phase II/III also includes a leachate collection system that consists of collection pipes and manholes situated around the perimeter of Phase II/III as well as lateral collector pipes located beneath the waste.

Both the Phase I and Phase II/III systems were reportedly designed to drain into leachate holding tanks. In 1997, a leachate gravity sewer was installed that allows for the leachate to drain to the Town's sanitary sewer system. The Phase I leachate holding tank was reportedly decommissioned in 2008, and the Phase II/III leachate holding tank was incorporated into the gravity sewer system and now contains a leachate shut-off valve. There is currently no on-site leachate storage (i.e., the leachate flows by gravity directly to the sanitary sewer system).

The perimeter of the property is secured with wood and wire fencing and access to the site is through the single gated entrance located off of Water Street South. The landfill layout can be seen in Figure 2.

3. GENERAL SITE OPERATIONS

Landfilling at the St. Mary's Landfill Site began in December of 1984. Prior to landfilling, St. Mary's Cement reportedly operated a clay and borrow pit on the property until 1977. The St. Mary's Landfill Site services the Town of St. Mary's and is approved for the disposal of solid, non-hazardous wastes.

The Bluewater Recycling Association (BRA) provides curbside waste collection services weekly on Tuesday and Friday, and curbside collection of Blue Box recyclables every second week. Leaf and yard waste is collected through specific curbside collection days, a drop-off bin at the landfill, and/or at a convenience depot located at the Town's Municipal Operations Centre.

The current operating hours at the site are Tuesday, Wednesday, and Friday from 8am to 4:30pm; and Saturday from 8am to 12:00pm. A site attendant is present during operating hours. The current site hours are within the limits outlined under Condition 12 of the ECA.

Activities that currently occur at the St. Mary's Landfill waste disposal site include:

- final disposal of solid, non-hazardous waste
- collection and storage for diversion from final disposal of recyclable waste
- composting of leaf and yard waste

A Site Plan is provided in Figure 2.

3.1 Complaints

No complaints related to site conditions or landfilling operations were received during the current reporting period.

4. SITE LIFE EXPECTANCY

During the current reporting period, refuse was placed in cells 5 and 6 of Phase II/III. Additionally, the Town reports that approximately 9,264 m^3 of fill was relocated from cells 4 and 5, and applied as final cover to cells 6, 7, and 8 in spring 2021. Based on the current year's capacity determination survey completed on November 5, 2021, and volumetric calculations, the estimated average annual filling for the 2021 reporting period was approximately 8,889 m^3, which is generally consistent with the 2018 and 2019 measured volumes. Weigh scale records indicate that 6,802 tonnes of waste were disposed of during the current operating year.

To provide an estimate of the waste placement density, it is important to note that the volume of daily covering material is also included in the volumetric survey data. It is estimated that 20 to 30 percent of the filled volume during the operating year would be attributed to daily or intermediate covering soil. For the purposes of this report, it assumed that the daily cover occupies approximately 20% of the volume (or 1:4 ratio of waste to cover). Therefore, the adjusted volume of waste is equal to 7,111 m^3. Based on the reported scaled mass of waste provided by the Town, the resultant density of the placed waste is approximately 956 kg/m3. This calculated density is consistent with the use of a sheepsfoot packer with several passes of the machine, and is considered to represent a good level of waste compaction. The increased density of placed waste represents an increasing trend in recent years and may be attributed to increased operational efficiencies and improvements. The density of placed waste will continue to be monitored on an ongoing basis. Assuming a 1:4 ratio of waste to cover, the average annual volume of cover is estimated to be 1,778 m^3.

For comparison, 7,137 m^3 of capacity was reportedly used in 2020. Assuming a 1:4 ratio of waste to cover, the adjusted waste volume is equal to 5,710 m^3. Weigh scale records for 2020 indicated that 5,921 tonnes of waste were placed at an approximate in-situ density of 1,037 kg/m^3.

The PDO (CRA, 1992 and 2009) considered a total combined air space capacity of 380,500 m^3.

- 104,000 for Phase I
- 140,000 for Phase II, and
- 136,500 for Phase III.

The initial Phase II/III approved capacity was for 276,500 m^3. Since reaching final contours, the Town has been seeking additional capacity through the Environmental Assessment process. In the interim, incremental volume increases have been approved through annual amendments to the ECA. The January 10, 2022 Amended ECA approved a maximum volume of 349,050 m^3 of waste and daily cover (prior to final cover) for continued filling in Phase II/III of the Site.

GMBP calculates that 13,941 m^3 capacity granted under the 2022 Amended ECA remained available as of November 2021. Dividing this by the 2021 annualized rate-of-fill of 8,889 m^3 provides a remaining life of approximately 1.6 years, meaning that filling could continue until about May 2023. However, the Amended ECA states that waste can be disposed at the Site until September 30, 2022. Consequently, sufficient capacity exists within the current notice to allow waste disposal for the full term of the 2022 Amended ECA.

To continue landfilling beyond September 30, 2022, an ECA application must be submitted to the Director by July 31, 2022. Environmental Assessment efforts are currently ongoing to provide approval to continue filling to a new capacity. While this volume hasn't been finalized/approved, it is expected to be in the range of 700,000 m^3, or approximately 40 years of waste placement.

5. RECYCLING/WASTE REDUCTION

The Town of St. Mary's has several waste diversion operations to reduce the amount of landfill disposal and prolong the life of the Site. BRA conducts curbside collection of Blue Box recyclables for the Town every second week. The Site provides one of many additional convenience locations for residents to drop off Blue Box recyclables for collection by BRA.

Leaf and yard waste is collected for composting at the Site through special curbside collection days, a drop-off bin at the landfill, and a convenience depot located at the Town's Municipal Operations Centre. Leaf and yard waste is composted for use as organic cover material at the Site. Wood waste is collected at the Site to be chipped and used for daily cover. The finished compost must meet production requirements and metal testing if it is to be transferred off-site for unrestricted use. While the compost has consistently met requirements, finished compost has not left the Site and has only been used as cover material within the landfill footprint.

In 2005, the Town banned the disposal of e-waste in the landfill. Currently, Greentec in Stratford, Ontario receives e-waste collected in a shipping container at the landfill. The Town also has a partnership with Orange Drop, a recycling program for household hazardous waste and special waste materials. The Town runs a Municipal Hazardous and Special Waste (MHSW) collection program that includes three separate event collection days where MHSW is collected and hauled offsite for disposal in partnership with Photech Environmental.

Based on municipal records provided by the Town, the following quantities of recyclables were diverted from the landfill during the current reporting period:

Diverted Material	2021 Quantity (tonnes)	Receiver
Blue Box Recycling	1,147	BRA
Brush Material	30	Town of St. Mary's
Leaf and Yard Waste	357.5	Town of St. Mary's
E-Waste	6.8	Greentec
Wood Waste	152.5	Town of St. Mary's
Scrap Metal	10	Robson Scrap Metal
MHSW (incl. batteries & aerosol)	30	Photech Environmental
Total	**1,733.80**	

The above noted totals are generally consistent with previous reported totals. In total, 1,733.8 tonnes of material were diverted from the landfill during the current reporting period. It is important that the Town continues to reduce the volume of waste entering the landfill to save landfill capacity as well as divert unacceptable material from being disposed on site.

In addition to the diversion programs, approximately 9,264 m^3 of clean fill material was reportedly relocated from atop Phase II/III and largely placed as final cover atop Cells 6, 7, and 8 during the current reporting period.

6. SUMMARY OF GEOLOGIC SETTING

The geologic conditions at the St. Mary's landfill site have been extensively reviewed as part of previous investigations at the Site and surrounding area. The conditions were presented in the 1992 hydrogeologic study for the site prepared by Conestoga-Rovers & Associates (CRA) and summarized in each of the subsequent Annual monitoring Reports. The geologic conditions at the St. Mary's landfill site were further evaluated using geologic mapping (Chapman and Putnam, 1984) and available borehole logs. Geological properties are summarized in the borehole logs prepared by various other consultants, which are provided in Appendix H.

Key findings of the geologic setting, as provided in the previous Hydrogeologic Assessment and Annual Reports, are summarized below. A summary of the monitoring well locations and well details is provided in Table 1. Additional investigations with respect to the geology of the area were conducted using information from the Ontario Geological Survey (OGS) Open File Report 6191 – An Updated Guide to the Subsurface Paleozoic Stratigraphy of Southern Ontario.

6.1 Topography

The topography around St. Mary's is generally sloping towards the North Thames River and its tributaries. However, the topography on-site is a result of ongoing landfilling activities and historical activities connected to St. Mary's Cement (SMC) operations. These activities include clay mining over most of the Site, overburden stripping and stockpiling east of the watercourse, cement kiln dust stockpiling and rerouting of the watercourse.

The Site has been impacted by industrial activity since the 1960s when the quarry operation to the north began encroaching into what is now the landfill site. It is likely that there were impacts to the groundwater prior to that time due to quarry dewatering. Most of the Site was then disturbed by the SMC borrow pit that mined clay for cement manufacturing. According to the previous AMRs, the borrow pit operations at the Site ended in 1977.

The highest onsite elevation is the cement kiln dust (CKD) stockpile that is situated at an approximate elevation of 334 masl at its highest point (refer to Figure 2). The highest elevations of the fill areas are approximately 327 masl at Phase I and 326 masl at Phase II/III. The lowest elevations on the Site occur along the watercourse. The channel enters the east side of the Site at an elevation of approximately 310 masl and exits the northwest end below 309 masl. The elevation change between SP1-10, the surface water sampling location at the east end of the Site and SP3-93, near the north end, is approximately 1.5 m. This is over a distance of about 660 m resulting in a grade of approximately 0.2%.

Perth County Road 123 is a topographic ridge on the west side of the Site and acts as a drainage divide. West of the ridge, runoff flows west toward the North Thames River. East of the road, runoff is directed east toward the stormwater retention basins and the central watercourse.

Surface water from the cover of the Phase I area is directed through a series of perimeter ditches and swales to channels that enter stormwater Basin A (refer to Figure 2). Surface water from the cover and perimeter of the Phase II/III area is directed to stormwater Basin B by a corrugated steel pipe (CSP) beneath the access roadway. These stormwater basins attenuate peak flows during storm events and allow sedimentation. Based on information provided by the Town, sediment was previously removed from the stormwater control basins during onsite work completed in the fall of 2007. No sediment removal has been undertaken or deemed necessary since that time. Swales, culverts, and outlets are inspected by Town staff on a regular basis to ensure surface water flow is maintained.

The stormwater basins outlet to the watercourse via corrugated steel pipes (CSP). The watercourse leaves the Site through a culvert under Perth Road 123 and eventually discharges into the North Thames River, approximately 500 m downstream of the Site.

Upstream of the Site, the watercourse divides into two branches. The north branch skirts the south edge or the SMC quarry and drains industrial properties and agricultural fields east of the Site. The south branch occupies a vegetated channel between the agricultural fields and the excavated/filled areas on the SMC property. It drains industrial and agricultural land further south and east before crossing James Street and Elginfield Road (Highway 7). According to the previous Hydrogeological Report (CRA), the watercourse drains an approximate area of 607 ha.

6.2 Overburden Soils

The surficial geology of the area is presented on Figures 3 and 4. The regional overburden consists of fine-textured glaciolacustrine deposits and till. In terms of physiographic landforms, the Site exists on undrumlinized till plains. Based on a review of geologic mapping, the surficial materials of the site are characterized as Tavistock Till, glaciolacustrine deposits, and glaciofluvial outwash deposits to the south. Tavistock Till consists of sandy silt to silty clay matrix. Glaciolacustrine deposits consist of silt and clay and minor sand, and glaciofluvial outwash deposits consist of gravel and sand.

Consistent with a review of geologic mapping, nearby well records and on-site monitoring well and borehole logs recorded by Conestoga-Rovers & Associates indicate that overburden materials in the area are most commonly described as clayey silt till and sand with gravel.

Cross-sections have been created based on existing logs from the on-site monitoring wells and boreholes. The locations of the sections are shown in Figure 8 and the cross sections are shown in Figures 9-12.

6.3 Bedrock

The overburden of the Site is underlain predominantly by dolomitic limestone of the Dundee Formation which is characterized by grey to tan brown fossiliferous limestone and minor dolostone. Based on a review of the hydrogeological information that has previously been presented, the Dundee Formation is further underlain by the Lucas Formation of the Detroit River Group. The Detroit River Group consists of three formations, the shallowest being the Lucas Formation, followed by the Amherstburg Formation, and the deepest being the Sylvania Formation. Bedrock of these formations is characterized by tan to grey-brown to dark brown, commonly cherty, fossiliferous limestones, dolostones, and minor shales.

Consistent with a review of the available geologic mapping, nearby well records indicate that the bedrock in the area is most commonly described as grey to brown limestone. Based on nearby well records and bottom depths of on-site monitoring wells, the average depth to bedrock is approximately 30 m below ground surface (mbgs), or at approximately 295 to 300 masl on-site.

7. SUMMARY OF HYDROGEOLOGIC SETTING

Based on the findings of the previous Annual Reports, Hydrogeologic Study, and GMBP review, the limestone bedrock forms the primary aquifer and represents the primary water supply in the area. The Town of St. Mary’s municipal wells and the majority of private wells in the area use the bedrock aquifer. The regional bedrock groundwater flow is east to west, and the inferred on-site bedrock groundwater flow follows that direction, as shown in Figure 7. The St. Mary’s Cement plant is located northeast of the Site within a former limestone quarry. This quarry and the active quarry, located northwest of the Site, across the Thames River, are currently dewatered by pumping systems which discharge to the Thames River.

The North Thames River is west of the Site and at an elevation of approximately 296 masl. According to the Thames-Sydenham and Region Watershed Characterization Summary Report (2008), the upper branches of the Thames River (North, Middle, and South) flow through pre-existing glacial spillways. The elevation of the North Thames River is potentially above the surface of the bedrock and also above the bedrock groundwater level. The top of bedrock at OW32A-02, the closest on-site monitoring well, is at an elevation of 294.35 masl and the water level is at an elevation of 284.88 masl (Fall 2019). At a nearby monitoring well (5001487) just across the river, the top of bedrock is at an elevation of approximately 263.65 masl, and the water level is at an approximate elevation of 261.52 masl. Based on these values, there doesn’t appear to be direct groundwater discharge from the bedrock to the river, near the landfill site.

There are no regional overburden aquifers near the Site. The previously completed documents pertaining to the landfill property also specify that Thames-Sydenham and Region Watershed Characterization Reports indicate that overburden aquifers in the area are sparse and limited to alluvial sands and gravels deposited along rivers and streams. Locally, shallow dug wells are documented to occur in the shallow sand and gravel overburden.

A review of previous AMRs and historical groundwater elevation data indicates that the site is in an area with downward gradients. Based on the relatively low permeability and complex layering of overburden deposits, overburden water levels are relatively complex but overall indicate a consistent gradient towards the central watercourse. Onsite, shallow groundwater has been measured at varying levels from 2.42 mbgs (OW4-84) to 12.56 mbgs (OW5-84) in the overburden wells, while some overburden wells are consistently dry and have been dry since the time of their installations (OW3-84 and OW6-84).

7.1 Water Level Monitoring

Groundwater level measurements are recorded at the location of each on-site monitoring well prior to sampling during each monitoring event. The locations of monitoring wells are presented on Figure 2. Well logs are contained in Appendix H and construction details are contained in Table 1. Historical measured water levels are presented in Table 3. The measured water levels indicate typical seasonal fluctuation. Most of the monitoring wells completed in the shallow overburden display similar amplitudes of 0.5 to 2.0 m in seasonal fluctuations, with the highest water levels typically in the spring. Overburden wells completed in the till or in deeper sand and gravel generally display much less variation than those in the shallow overburden, typically less than 0.5 m in seasonal fluctuations. The water levels in these wells are relatively stable over time.

The water levels in the bedrock wells show a seasonal fluctuation that ranges from 1.0 to 3.0 m. The highest water levels typically occur in the spring. The bedrock wells indicate a slight downward trend in water levels over time.

Anomalous water levels have been measured at OW8A-91 in recent monitoring years. The historical average groundwater elevation at OW8A-91 is 287 masl; however, water levels in the range of 313 masl have been reported since the spring of 2019, with the exception of a water level of 296 masl in spring 2021. OW8A-91 is completed in the bedrock at a depth of 281.89 masl and is located in a low-lying, swampy area of the landfill, where ponded water conditions are observed at certain periods of the year. The exact reason for high water levels at OW8A-91 is unknown but is currently suspected to be related to the well seal, and/or well integrity issues (i.e., a connection with shallow groundwater conditions through a breach in the casing). It is clear that this water level cannot physically occur based on the historical change and relative elevation to the bedrock locations (i.e., a change of 25 m). Based on field review completed during the onsite sampling events, there was no evidence of such a breach (beyond high water levels). In June of 2021, a groundwater elevation of 296 masl was recorded after the well was purged and allowed to recharge for several hours. The November water level data from this well is not used in this report as it is deemed anomalous.

7.2 Overburden Groundwater Flow System

Overburden water table contours and flow direction, based on the water levels measured in the overburden monitoring wells at the time of the fall sampling program and in monitoring wells that were previously measured at the time of the April 2017 measurements, are shown in Figure 6. In developing this figure, the groundwater elevation at OW33-96 has not been used because this monitor is screened in the deep till, at a depth that does not reflect shallow groundwater conditions. It is noted that the groundwater elevations measured in April 2017 for MW04-01, MW04-02, and MW04-03 were used as elevation points for the east side of the Site to provide additional groundwater elevation information since those monitoring wells are no longer accessible for annual measurement.

The overburden groundwater flow direction is generally toward the watercourse east of the fill areas. The groundwater from the observation wells, west of the watercourse, flows in a generally east direction (northeast at the south end and southeast at the north end) toward the watercourse. The groundwater from the monitoring wells (2017), east of the watercourse, flows in a generally southwest direction, toward the watercourse.

The inferred flow direction indicates that the overburden wells to the west, north, and south of the Site are hydraulically upgradient of the landfill, and the overburden wells to the east are hydraulically downgradient.

The horizontal hydraulic gradient west of the watercourse is approximately 0.02 to 0.09, calculated from the current water level measurements. The measured gradient is similar to those noted in previous years. The horizontal hydraulic gradient east of the watercourse ranged from approximately 0.04 to 0.09 in 2021, with the steepest gradients occurring on the south side of the CKD stockpile. This is similar to gradients noted in previous reports.

7.3 Bedrock Groundwater Flow System

Bedrock water table contours and flow direction, based on the water levels measured in bedrock wells at the time of the fall sampling program, are shown in Figure 7. The flow direction across the landfill is inferred to be toward the west-northwest. The horizontal hydraulic gradient ranges from approximately 0.002 to 0.005. The current water level data (besides the anomalous data at OW8A-91) and bedrock groundwater flow is consistent with previous years. OW32A-02 was inaccessible during the current sampling period and therefore the elevation point is based on the fall 2020 water level.

The inferred flow direction indicates that OW8A-91 is up-gradient of the fill area, while OW32A-02 is down-gradient of Phase I and OW9A-91 is down-gradient of Phase II/III. This is generally consistent with the findings presented in previous reports.

7.4 Vertical Groundwater Movement

The on-site observation wells include seven pairs of nested wells. A nest consists of wells in close proximity to each other that are completed to different depths. Estimates of the vertical groundwater gradient between wells in the same nest allow for an assessment of the potential for vertical movement of water between flow systems.

Vertical gradients for the current monitoring year for four of the well nests are calculated in Table 9. The other three nests are not included in this table because at least one well in the nest was dry during either the June or November sampling event. Consistent with previous years, the well nests exhibit downward gradients. All four of the well nests with measurable water levels displayed downward gradients consistent with previous calculated results. The nests that compare an overburden well and a bedrock well indicate that the groundwater elevations in the overburden wells are consistently much higher than the groundwater elevations in the bedrock wells. The magnitude of the gradients is not always meaningful because of dry soils between shallow and deep wells. However, it illustrates that all gradient directions are downward.

The fourth nest compares two wells in the overburden at the location of OW33-96 and OW34-96. Both wells are reported to be completed in the aquitard but at different depths. The relatively high downward gradient of 1.81 in November supports limited hydraulic connection between the shallow and deep overburden, consistent with the occurrence of the low-permeability till between the shallow and deeper well.

8. MONITORING

8.1 Sampling Requirements

8.1.1 Groundwater

The St. Mary's Landfill Site is monitored through a network of 18 groundwater monitoring wells and 5 private wells, as shown on Figure 2. The following table provides a summary of the installation dates for the wells that are currently in the onsite groundwater monitoring network sorted by their year of installation:

Groundwater Wells				
1984	**1991**	**1996**	**2002**	**2016**
OW2-84	OW7-91	OW32-96	OW32A-02	OW36
OW3-84	OW8A-91	OW33-96		
OW4-84	OW8B-91 (Abandoned and replaced by OW8B-10)	OW34-96		
OW5-84	OW9A-91			
OW6-84				

Currently, groundwater samples are collected from all 18 monitoring wells located on the landfill property as well as from MHB, which was reportedly sampled for the first time in May 2015 and was added to the monitoring program in 2016. As per Condition 23.0 of the C of A, the monitoring network is sampled in the spring and fall of each year.

The groundwater monitoring program currently consists of:

- Water levels measured in all groundwater wells and MHB
- Field measurement of pH, conductivity, and temperature measured in all groundwater wells and MHB
- Samples collected for chloride, hardness, phenols, DOC, calcium, magnesium, alkalinity, sodium, nitrate, and nitrite from all groundwater wells and MHB
- OW2-84, OW4-84, OW5-84, OW8B-10, OW9B-91, OW15-91, OW21-91, OW25-91, OW32-96, OW33-96, OW34-96, OW32A-02, OW36, and MHB are sampled additionally for ammonia, TKN, sulfate, boron, iron, manganese, and BTEX (benzene, toluene, ethyl benzene, and xylene)

A summary of the analytical parameters and the groundwater quality results from the current monitoring year are provided in Tables 6 and 7. Historical summaries of the groundwater monitoring results and trend graphs are provided in Appendix D.

8.1.2 Surface Water

The surface water monitoring at the St. Mary's Landfill Site consists of 8 locations, which are sampled twice annually occurring once in the spring and once in the fall. The surface water sampling locations, shown in Figure 2, are as follows:

Surface Water Locations		
Onsite Watercourse	**Basin A**	**Basin B**
SP1-10* (upstream)	SP3A-94 (inlet)	SP1B-94 (inlet)
SP2-93 (midstream)	SP4A-94 (outlet)	SP2B-94 (outlet)
SP3-93 (downstream)	SP5A-94 (inlet)	

* It is noted that SP1-10 replaced SP1-93 and is located at the updated property boundary between the landfill and the St. Mary's Cement property resulting from a property transfer in 2009.

The surface water monitoring program currently consists of:

- Water levels measured and/or flow conditions recorded at all surface water locations
- Flow measurement at SP3-93
- pH, conductivity, and temperature measured in all surface water locations
- Samples collected for chloride, hardness, phenols, BOD, ammonia, turbidity, TDS, suspended solids, total phosphorous, calcium, magnesium, sodium, alkalinity, nitrate, nitrite, iron, and manganese at all surface water locations
- Reporting of sediment build up in stormwater management ponds Basin A and Basin B

A summary of the historical surface water sampling results is provided in Appendix E.

8.1.3 Leachate Monitoring

The leachate collection system discharges to the municipal sanitary sewer. In order to support discharge and evaluate the performance of the landfill, the leachate monitoring program at the St. Mary's Landfill Site includes:

- Measurements to leachate or qualitative observations of flow conditions in all leachate collection system manholes,
- Samples collected for BOD, ammonia, COD, chloride, phenols, nitrate, phosphorous, TKN, total suspended solids, alkalinity, sulphate, calcium, magnesium, aluminium, barium, beryllium, bismuth, cadmium, chromium, cobalt, copper, lead, molybdenum, nickel, potassium, silver, sodium, strontium, tungsten, vanadium, zinc, and VOCs from MH1 (Phase I) and MH3 (Phase II/III).

A summary of the historical leachate monitoring and sampling results is provided in Appendix F.

8.2 Sampling Procedures

For the groundwater sampling, the static groundwater level and well depth are measured in each monitoring well. Each monitoring well is then purged of three casing volumes of stagnant water or until dry, whichever occurs first. After purging, monitoring wells are allowed to recharge with fresh groundwater before sampling occurs. Groundwater purging and sampling is conducted using dedicated Waterra™ tubing and inertial-type pumps. As per the C of A, pH, conductivity, and temperature are measured in the field at each sample location.

Surface water samples are collected by submerging the appropriate sample container into the water body and removing the container when a sufficient volume of sample has been collected. During collection, contact with the bottom of the water body is avoided to prevent stirring-up sediment. When collecting surface water samples, direct dipping of the sample bottle is completed unless the bottle contains preservative. For those samples requiring preservative, a clean unpreserved bottle is used to obtain the sample at each location, and then it is transferred into the appropriate preserved bottle. Field parameter measurements, such as the temperature, pH, conductivity, flow, and sediment build-up are measured and recorded at the time of sampling.

Leachate samples are collected from the manhole using a dedicated bailer. The bailer is lowered into the manhole and the sample is transferred directly into the laboratory provided containers. Samples that are collected for analysis of the selected metals are placed in unpreserved laboratory supplied containers. Sample filtration and the addition of the lab-preservative occur prior to laboratory analysis.

Samples are kept chilled following completion of the sampling program and sent within 24 hours of the sampling event to AGAT Laboratories of Mississauga for analysis. The laboratory Certificates of Analysis are included in Appendix G.

8.3 QA/QC

The Relative Percent Difference (RPD) was calculated to determine the variance between the actual sample and the replicate sample using the following equation:

$$RPD = \frac{(\text{sample result} - \text{duplicate result}) \times 100}{(\text{sample result} + \text{duplicate result}) \div 2}$$

Values which exceed a RPD of 20% are considered 'unacceptable'. In the spring sampling event, the manganese sample taken from OW2-84 showed a RPD value of 44.4%. When looked at further, it is noted that the sample result has a value of 0.007 mg/L and a duplicate a result of 0.011 mg/L. Both results are within the normal range for OW2-84 and this is not an area of concern. A summary table showing the monitoring results for these samples and the associated RPD values is provided as Table 11.

8.4 Background Groundwater Quality Summary

OW2-84 and OW25-91 (overburden) and OW8A-91 (bedrock) are up-gradient of the fill areas and have been used as the background monitoring wells for the Site. The results from these wells are used for calculating the Reasonable Use Criteria (RUC).

OW2-84 is the most northwestern overburden well and is located along the property boundary and considered to be hydraulically upgradient (i.e., northwest) of the Phase I fill area. OW2-84 is screened within a sand and gravel unit approximately 9 to 10 mgbs. OW25-91 is the most southern overburden well and is located along the south property boundary hydraulically upgradient of the Phase II/III fill area. OW25-91 is screened in the silt with some sand and gravel (inferred to be till) at approximately 9 to 10 mbgs and a similar elevation to OW2-84 (approximately 312 to 313 masl).

OW8A-91 is the most southern onsite bedrock monitoring location and is located east of the Phase II/III fill area, approximately 250 m from the eastern property boundary. Since the groundwater flow is inferred to be in a westerly direction within the bedrock system, this well is considered to be upgradient of the landfill.

The range of concentrations reported for primary and secondary leachate indicator parameters over the last 10 years for the background wells are summarized in Table 5. TKN was previously added to the overburden groundwater monitoring program and iron and manganese were added at select wells, including OW25-91. Therefore, these ranges are based on the available data during the recent monitoring periods.

The overburden background concentration utilized for calculation of the RUC is the average concentrations of each leachate indicator parameter measured at OW2-84 and OW25-91 from 2011 to the current monitoring period.

The geochemical signature of the background water quality in the overburden is considered typical of groundwater conditions in a carbonate-rich system with minor influence from anthropogenic sources. Chloride concentrations are typically at or below 10.9 mg/L and sodium concentrations are reported to be below 25 mg/L. Hardness varies between 116 and 706 mg/L with an average concentration of 247 mg/L. The elevated hardness is considered to be naturally occurring and is related to the typical mineralization of the natural groundwater in the area of the site. Alkalinity varies from 140 to 320 mg/L with an average concentration of 225 mg/L. Overall, the nitrogen (nitrate, nitrite, ammonia, and TKN) concentrations are relatively low and show little impact from anthropogenic sources. The DOC is reported to vary between <0.5 and 81 mg/L with an average of 1.6 mg/L, suggesting naturally occurring levels of DOC in the shallow groundwater.

Based on the current and historical groundwater data from the background monitoring wells, the concentration of hardness (as $CaCO_3$) in the natural groundwater is elevated and consistently exceeds the criteria identified in the ODWS. In general, the background groundwater quality at the site is considered to be relatively highly mineralized with consistently low alkalinity concentrations across the Site, with relatively low levels of typical anions and metals.

The bedrock background concentration for each leachate indicator is the average concentrations of OW8A-91 from 2011 to the current monitoring period. Comparison of the overburden and bedrock chemistry indicates that the bedrock is more mineralized than the shallow groundwater. This is considered typical within Southern Ontario within carbonate bedrock systems. A review of the indicator parameters and general chemistry at OW8A-91, OW-7, and OW-32A-02 indicates the primary contributing factors to increased mineralization are increased calcium and magnesium. At these locations, elevated sulphate is coupled with an increase in calcium and magnesium (i.e., hardness) and sodium, with low chloride (typically less than 20 mg/l) and this is consistent with the occurrence of calcium and magnesium sulphate minerals, such as gypsum, commonly found in the carbonate bedrock systems. This contrasts to scenarios of increased hardness due to salt (increased chloride) or dissolution of carbonate minerals, where alkalinity would also tend to increase.

Chloride concentrations were typically less than 20 mg/L at OW8A-91 prior to the anomalous water levels beginning in 2019. Since that time, chloride concentrations have consistently ranged from 20 mg/L to 50 mg/L. These conditions will continue to be monitored along with the anomalous water levels.

The reported average for DOC was approximately 6.4 mg/L, again showing natural occurrence of DOC in the bedrock system. No evidence of anthropogenic impacts were noted in the bedrock wells with the nitrogen (nitrate, nitrite, ammonia, and TKN) with combined concentrations reported to be below 1.5 mg/L. The relatively low levels of nitrogen species present are considered to be naturally occurring and associated with organic content, noted by the DOC concentrations.

9. LEACHATE CHARACTERIZATION

Leachate is produced when surface water percolates down through refuse resulting in impacted water that has the potential to migrate along the surface or in the ground. Landfill derived leachate that enters into the surface water and/or groundwater is often attenuated by natural mechanisms along the water migration pathway. The attenuation of leachate can occur by dilution, biologic activity, and geochemical mechanisms.

9.1 Leachate Quality Data

Currently, leachate monitoring is conducted at MH1 (Phase I) and MH3 (Phase II/III) through sampling, as well as qualitative observations in all other leachate collection manholes on the landfill site. Leachate monitoring is conducted in the spring and fall by GMBP personnel in conjunction with the groundwater and surface water sampling programs, in accordance with the ECA. Table 12 provides the VOC analytical results for the manhole samples collected during the spring and fall sampling.

MH 1 (Phase I) provides catchment for leachate generated within Phase I of the landfill and MH 3 (Phase II/III) provides catchment for leachate generated within Phase II/III. Sampling results of both manholes provides insight on compounds present in the leachate generated on the site and on the strength of the leachate going to the sewage treatment plant.

It has been noted in previous reports that the leachate flow conditions observed during sampling events are typical for the site. Samples of the low flow to stagnant conditions in the manholes may not provide accurate results of the leachate characteristics within the fill areas, and the assessment of the sample analysis should be conducted with this in mind. During the current reporting period, there was insufficient volume of leachate for sampling at both MH1 (Phase I) and MH3 (Phase II/III) in June, and insufficient volume of leachate for sampling at MH1 (Phase I) in

November. Therefore, the following discussion pertains to the MH3 results from November 2021, and these MH1 results from 2019.

Phase I leachate sampling began in 1991, approximately two years before the phase was completed. Phase I was active for 9 years. Phase II/III has been active for 25 years and has a greater volume of waste than Phase I.

Chloride was identified during the 1992 investigation as the critical contaminant for evaluation of groundwater impact. The chloride concentration in Phase I has declined from the highest recorded concentration of 760 mg/L in 1991 to 133 mg/L in 2019 (refer to Table 12). The Phase II/III chloride concentration in 2021 was 227 mg/L. This is much lower than the previous high concentration of 608 mg/L measured in 2019 and 1,750 mg/L that was measured in 2017, and is within the typical historical range. In general, the chloride levels are typical for landfill leachate and are consistent with recent values for both Phase I and Phase II/III.

VOC testing completed in November 2021 detected low levels of BTEX parameters in the leachate from both landfill phases. There have been sporadic occurrences of BTEX parameters since 1991. During the current monitoring period, the Phase II/III concentrations remain low (≤ 8 µg/L), refer to Table 12. In previous monitoring years, Xylene concentrations were mesuredin the Phase I collection system, but remained well below the sewer use by-law requirements. The BTEX concentrations measured in the Phase II/III system during the current monitoring year remain consistent with historical trends.

Other VOCs that have been detected in the Phase I and/or Phase II/III leachate include chlorobenzene and methyl ethyl ketone. Chlorobenzene was previously detected in Phase I in 2019 within the historical limit (2.20 µg/L), and methyl ethyl ketone, which was detected in Phase II/III during the current monitoring year (26.8 µg/L). Both chlorobenzene and methyl ethyl ketone are within the historical ranges for the leachate.

Historical leachate sampling results are presented in Appendix F.

The leachate characteristics are considered typical with several parameters elevated. Elevated concentrations are evident for the suite of standard leachate indicator parameters including, chloride, alkalinity, organic (BOD/COD), nitrogen (as ammonia and TKN), calcium, magnesium, sodium, iron and manganese. The elevated iron and manganese, which are ubiquitous in the environment, are typically elevated due to the low pH and low Eh conditions of the leachate, which control the solubility of most metals. Reducing conditions are typically created through the degradation of organic compounds in waste, creating anaerobic conditions and the production of organic acids, causing dissolution of carbonate minerals (i.e., increases to alkalinity, calcium and magnesium). Reducing conditions can be inferred due to the relative occurrence of ammonia versus nitrate and ammonia.

While chloride concentrations are elevated (i.e., an average of 327 mg/L and 1,171 mg/L at MH-1 and MH-3, respectively), it is noted that the chloride concentrations are coupled with increased alkalinity and a relative sodium increase in the range of 1 to 1.5 to 1 (chloride to sodium). These specific characteristics are shown below:

Parameter	MH-1	MH-3	Overburden Background
	Average Concentration (mg/L)		
Chloride	327	1,171	7.2
Alkalinity	1,549	3,711	225
Sodium	274	891	17
Cl:Na Ratio	1.2	1.3	0.4

As noted in the previous reports, a temporary increasing trend was noted through increased BTEX concentrations reported in 2010, 2011, and 2012. Based on a review of more recent analytical data, the apparent increase in BTEX concentrations has not been repeated since that period and measured concentrations have reduced to typical background levels. Ongoing monitoring for BTEX as part of the established monitoring program is recommended to further evaluate if an increasing trend becomes apparent in any of the onsite monitoring wells.

9.2 Leachate Indicator Parameters

As part of our data review, an analysis of the leachate quality and comparison to the background groundwater quality at the site was conducted. Based on our assessment and on previous reports, the list of leachate indicator parameters for the Site includes the following:

- Chloride, nitrogen, total phosphorus, manganese, and iron
  - In leachate, nitrogen appears in the form of ammonia (reduced) and TKN; In groundwater nitrogen appears in the form of nitrate and TKN. Nitrogen (nitrate, nitrite, ammonia and TKN) is considered to provide potential indications of nutrient impact to groundwater from landfill leachate.
  - Alkalinity is consistently low in the background groundwater and is considered a good indicator to assess potential influence from leachate. Continued monitoring and trend analysis of alkalinity is recommended as an increasing trend would be useful for identifying leachate influence.
  - While sodium is naturally occurring at varied concentrations at the site, it is recommended to analyse for sodium at all locations where chloride is measured to help differentiate the potential sources of chloride.

10. WATER QUALITY RESULTS

To determine the presence or potential impacts from leachate, several indicator parameters are monitored and a trend analysis is conducted to determine changes in water quality over time. The following sections discuss the potential impacts to groundwater and surface water both on-site and leaving the property boundaries, and discuss compliance with the Reasonable Use Criteria. To evaluate potential impacts, several different points of reference were used for comparison including:

1. Comparison to RUC values;
2. Comparison to groundwater quality in all background monitoring wells;
3. Evaluation of long-term analytical trends at each monitoring location; and
4. Comparison of the suite of elevated parameters to the leachate indicator parameters, as established in Section 9.2 of this report.

Section 10.1 discusses potential impacts to groundwater downgradient of the active landfill area, the potential impacts to groundwater leaving the property boundaries, and compliance with the Reasonable Use Criteria. The analysis for the presence/absence of leachate-derived impacts to groundwater includes an evaluation considering the general water chemistry, which includes the metals, natural organic, and inorganic analytes. The groundwater quality results, including a comparison to the RUC, are summarized in Tables 6 and 7 for bedrock and overburden wells, respectively. Historical groundwater sampling results and graphical trends of indicator parameters are included in Appendix D.

Section 10.2 discusses potential landfill impacts to surface water both on-site and leaving the property boundaries, and compliance with the Provincial Water Quality Objectives (PWQO). The analysis for the presence/absence of leachate-derived impacts to surface water includes an evaluation considering the general water chemistry, which includes the metals and inorganic analytes. The surface water quality results, including a comparison to the PWQO and Aquatic Protection Values (APV), are summarized in Table 8. Historical surface water sampling results and graphical trends of indicator parameters are included in Appendix E.

10.1 Groundwater Quality Results

Groundwater samples are collected twice per calendar year, in the spring and in the fall. During the current monitoring period, the sampling occurred on June 2 and November 5. Tables 6 and 7 summarize the 2021 chemical analyses and compare the results to Ontario Drinking Water Quality Standards (ODWQS). These standards and the background water quality were used to calculate Reasonable Use maximum allowable concentrations (MACs). Reasonable Use concentrations apply only to boundary wells but were compared to the results from all wells to help evaluate overall water quality.

The chemical analysis for monitoring wells located near the on-site watercourse can also be compared to the Aquatic Protection Values (APV) to indicate how groundwater discharge can impact surface water quality. The only shallow wells near the channel are OW4-84 and OW36. OW4-84 was dry in June. The APV comparison is discussed further in section 10.2: Surface Water Quality Results.

Chloride is the primary indicator parameter used to determine landfill impacts on groundwater. Chloride concentrations reported during the current monitoring period are shown on Figure 5. Time versus concentration graphs for leachate indicator parameters chloride, hardness, DOC, iron, boron, and manganese are included in Appendix D. Historical groundwater quality data tables are included in Appendix D.

10.1.1 Up-gradient and Cross-gradient Water Quality

Overburden wells OW9B-91, OW15-91, OW21-91, OW32-96, OW33-96, and OW34-96 are up-gradient of, or cross-gradient to the landfill footprint. Bedrock well OW7-91 is up-gradient to Phase I and cross-gradient to Phase II/III. The locations of the onsite monitoring wells are presented on Figure 2.

Phase I Overburden (OW32-96, OW33-96, OW34-96)

OW32-96 is located up-gradient of Phase I; OW33-96 and OW34-96 are located cross-gradient to the Phase I fill area. The groundwater chemistry at these wells is summarized in Table 7.

None of the the above noted monitoring wells display evidence of impacts from landfill leachate. The Chloride concentration has been variable at these locations, with the highest concentrations noted at OW32-96 closest to the County Road, where a generally increasing trend is also noted. However, it is important to note that the alkalinity at all three locations typically remains below 300 mg/L with a stable long-term trend, suggesting that the chloride is not related to landfill leachate. A comparison of the chloride:sodium ratio at OW32-96 is 3.1 and 3.2, in the spring and fall sampling events, respectively. These ratios are consistent with road salt application for de-icing and/or dust suppression.

Elevated hardness (relative to background) is noted at these same locations. The hardness concentrations correlate with the chloride concentrations. Therefore, it is reasonable to expect that the increased hardness is a result of the sodium, calcium, and/or magnesium addition in salt and/or subsequent ion exchange.

Iron concentrations were below the detectable limit for all three of the monitoring locations during the current monitoring period, except for a concentration of 0.018 mg/L at OW33-96 in November. Historical trends indicate iron concentrations are variable with no apparent trend. Manganese concentrations were reported between <0.002 and 0.011 mg/L in 2021, below the RUC. During previous monitoring years, elevated iron and manganese concentrations were periodically measured above the RUC. Based on a review of the analytical findings over the past several years, the fluctuating iron and manganese concentrations are considered to be anomalous findings. Ongoing monitoring and analysis will continue to be completed to determine if a trend becomes apparent.

<u>Phase II/III Overburden (OW9B-91, OW15-91, OW21-91)</u>

OW9B-91, OW15-91, and OW21-91 are located up-gradient of Phase II/III. The groundwater chemistry at these wells in 2021 is summarized in Table 7.

Consistent with groundwater flow direction, no impacts from landfill leachate are apparent. However, increasing influence from road salt applications (road de-icing and dust suppression) has become apparent in recent years.

It is noted that a separate evaluation of the monitoring wells and groundwater quality near the west property boundary was previously completed in June of 2018, and was provided under separate cover. This evaluation pertains directly to monitoring wells OW9B-91, OW15-91, and OW21-91. A summary of the evaluation and findings is provided as follows:

OW9B-91, OW15-91, and OW21-91 are screened in the shallow overburden (silt till with sand and gravel) at depths ranging from 5 to 7 metres (16 to 23 ft.) below ground surface. Comparatively, the deep monitoring wells at the landfill site (i.e., OW9A-91) are screened in the bedrock at depths of greater than 30 to 40 metres (100 to 130 ft.) below surface. The groundwater in the shallow overburden unit is considered to have a higher potential for influence or impact from various anthropogenic sources (i.e., road salting, landfill leachate, spills, releases, etc.) The direction of groundwater flow in the overburden unit has been measured and documented to be from west to east across the subject property. The above noted monitoring wells are hydraulically upgradient of the landfill and are located outside of the limits of the perimeter leachate collection system. The monitoring wells are located directly adjacent to (east and downgradient of) the existing landfill access road and are hydraulically downgradient of Perth County Road 123. It is noted that the topography slopes downward from the road, which is situated at an approximate elevation of 330 metres above sea level (masl), to the landfill at an approximate elevation of 315 masl (a difference in elevation of about 15 metres {50 ft.}) with a pronounced slope extending downward at the location of the access road. Based on a review of the information provided, it is our understanding that the County Road and the landfill access road are salted during the winter months. Additionally, the Town reports that general maintenance of the access road has historically included the use and application of liquid calcium chloride brine during the non-winter months, which started in about 2011/2012 and continued until 2017 for dust suppression purposes. Reportedly, the calcium chloride liquid brine used at times included heavy applications to the landfill access roads directly adjacent to the westerly monitoring wells. Furthermore, the County maintains the adjacent Perth County Road 123, and reports that they have used a liquid magnesium chloride brine product known as *Meltdown*.

A detailed review and evaluation of the analytical results at the three identified monitoring wells was completed including a review of historical data and a long-term trend analysis at these locations. Additionally, a comparison of the results to the nearby shallow overburden monitoring wells and the accompanying deep overburden and bedrock wells was completed. Brief discussion and summation of each monitoring well is provided as follows:

<u>OW9B-91</u>

- From 1991 to 2011 (i.e., collection of 46 groundwater samples), the average calcium concentration measured was 19.8 mg/L,
- From the sampling event in December 2011 to the fall of 2017 (i.e., collection of 16 groundwater samples), the average calcium concentration increased to 152 mg/L and peaked at a concentration of 518 mg/L in 2013,
- Over the same period of time (1991 to 2011) and number of samples, the average chloride concentration measured was 7.6 mg/L,
- From 2011 to 2017, the average chloride concentration increased to 278 mg/L and peaked at a concentration of 426 mg/L in 2015, following the same trend as the measured calcium concetrations,
- The ratio of chloride to calcium measured in the groundwater between 1991 and 2011 was 1:3 and has since changed to a chloride:calcium ratio of just over 2:1.
- The average alkalinity over the last 4 years has remained relatively stable to slightly decreasing with an average concentration of 228 mg/L.

OW15-91

- From 1991 to 2012 (i.e., collection of 49 groundwater samples), the average calcium concentration measured was 21.4 mg/L,
- From 2012 to the fall of 2017 (i.e., collection of 12 groundwater samples), the average calcium concentration increased to 46 mg/L and peaked at a concentration of 98.8 mg/L in 2013,
- Over the same period of time (1991 to 2012) and number of samples, the average chloride concentration measured was 8.1 mg/L,
- From 2012 to 2017, the average chloride concentration increased to 97 mg/L and peaked at a concentration of 149 mg/L in 2017,
- The ratio of chloride to calcium measured in the groundwater between 1991 and 2012 was 1:3 and has since changed to a chloride : calcium ratio of 2:1.
- The average alkalinity over the last 4 years has remained relatively stable with an average concentration of 216 mg/L.

OW21-91

- From 1992 to 1998 (i.e., collection of 17 groundwater samples), the average calcium concentration measured was 32.9 mg/L,
- From 1998 to the fall of 2017 (i.e., collection of 39 groundwater samples), the average calcium concentration increased to 116 mg/L and peaked at a concentration of 202 mg/L in 2012. It is noted that a relatively steady downward trend is observed since the peak concentration in 2012 to a measured concentration of 85 mg/L in the fall of 2017,
- Over the same period of time (1992 to 1998) and number of samples, the average chloride concentration measured was 27 mg/L,
- From 1998 to 2017, the average chloride concentration increased to 250 mg/L and peaked at a concentration of 578 mg/L in 2017,
- The ratio of chloride to calcium measured in the groundwater between 1992 and 1998 was 1:1 and has since changed to a chloride:calcium ratio of just over 3:1.
- The average alkalinity over the last 4 years has remained relatively stable with an average concentration of 211 mg/L.

For reference, the long-term trends discussed above are presented in graphical form within the enclosed trend graphs. It is noted that the magnesium and calcium concentrations have followed a similar trend pattern. The attached long-term trend graphs provide a graphical presentation of the stable long-term trends between the inception of the sampling program to the identified period of time, contrasted by the relatively sudden increase in the calcium, magnesium, and chloride concentrations starting in about 2011 to 2012. Although the graph for OW21-91 displays a slightly different trend pattern than the other monitoring wells, the same increase in parameters is observed. It is noted that the range of dates and the measured increase in calcium, magnesium, and chloride concentrations corresponds to the Town's reported initial use of liquid calcium chloride brine for dust suppression on the landfill entrance/access road. Based on this evaluation, the measured increases reported at the locations of OW9B-91, OW15-91, and OW21-91 are attributed to the use of salt and not to impact from landfill leachate.

Bedrock (OW7-91)

OW7-91 is located east of the fill area and east of stormwater management Basin A, and is up-gradient of Phase I. The groundwater chemistry at this well is summarized in Table 6.

The leachate indicator parameters at OW7-91 were within historical ranges during the current monitoring period and are similar to concentrations in background bedrock well OW8A-91. There is no indication of landfill impact at this well.

10.1.2 Downgradient Water Quality

The down-gradient wells are located to the east of the fill area. Groundwater flow in the shallow overburden is toward the east-northeast.

Phase I Overburden (OW4-84 and OW5-84)

OW4-84 is screened in the shallow overburden down-gradient of Phase I. OW5-84 is screened in the deeper sand and gravel below the till down-gradient of Phase I. OW4-84 was dry in June, therefore sampling data was only recorded for November. The groundwater chemistry at OW4-84 and OW5-84 is summarized in Table 7.

Chloride levels at OW5-84 began exhibiting greater fluctuations in 2006 with a range of 15 to 63 mg/L. Prior to 2006, chloride concentrations at OW5-84 remained at background levels. During the current monitoring program, chloride levels continued to be slightly elevated at this well, with concentrations of 52.2 mg/L and 43.8 mg/L recorded in June and November, respectively. The alkalinity concentrations since 2013 (i.e., the initial measurement period) have remained stable during the period, suggesting the potential for salt influence. The relative concentrations of other indicator parameters, such as DOC and TKN remain similar to background concentrations. Consequently, it appears that increases in chloride are more likely influenced by salting activities, as opposed to landfill leachate.

It is recommended to continue to monitor trends at this monitoring location to assess the potential for leachate influence.

The parameters measured at OW4-84 in November are within the typical historical range.

Phase II/III Overburden (OW8B-10 and OW36)

OW8B-10 and OW36 are screened in the shallow till, down-gradient of Phase II/III. The groundwater chemistry at these wells and at MHB in the current monitoring period is summarized in Table 7.

Concentrations of all parameters at OW8B-10 are at or slightly above background levels but are consistent with historical ranges. There is no indication of landfill impact at this well. Of significance, the measured chloride concentrations remain below 10 mg/L.

While hardness is elevated at OW36 and reported to exceed the RUC, it is evident that this is related to sulphate mineralization, as demonstrated by the elevated sulphate (in the range of 422 to 433 mg/L) and calcium (in the range of 114 to 120 mg/L), without significant increases in other indicator parameters. Chloride is slightly above background, with concentrations of 22.8 mg/L and 22.2 mg/L in spring and fall, which is well below the RUC of 128 mg/L. Consequently, no impacts to landfill leachate are evident.

Continued monitoring will establish the potential for impacts at these downgradient monitoring locations.

MHB (Phase II/III Overburden Manhole)

As previously reported, MHB was added to the monitoring program in 2016 to determine if the groundwater in a sand seam below the clay base of the landfill is being impacted by leachate. The groundwater chemistry at MHB is summarized in Table 7. MHB was not sampled at the time of the fall monitoring event, and therefore sampling data was only recorded for June.

Water quality results at MHB from 2017 to present are compared to the RUC and to the PWQO in Table 10. As previously noted, the groundwater at the location of MHB represents water within a sand seam underlying the clayey landfill base and is subsequently conveyed into the onsite storm drain/creek, which is why the analytical results for this sampling point are also compared to the surface water criteria (i.e., PWQO). Based on the analytical results, the water quality at MHB appears to be somewhat influenced by salt (as with shallow groundwater). Chloride concentrations display a general stable to slightly increasing trend with values in the range of 100 to 127 mg/L. Relative to landfill leachate (Table 12), the water being measured at MHB has notably low alkalinity, in the range of 260 to 330 mg/L (similar to background), and low concentrations of ammonia (0.14 to 0.28 mg/L). This compares to the typical concentrations in the leachate at MH-3 that has an average alkalinity of about 4,000 mg/L, and an average ammonia concentration of 466 mg/L.

With respect to the potential for impacts due to discharge, it is noted that the phenols concentration of 0.003 mg/L, reported in June 2021, slightly exceeds the PWQO of 0.001 mg/L. The water quality from MHB meets the PWQO for all other parameters analyzed. Historical exceedances of iron are noted. Overall, the water quality at MHB is considered to be similar to that of the background water quality in the central creek (SP1-10). The chloride concentrations at MHB are in the range of background water quality, which was measured to be 86.8 mg/L in June. Ammonia is noted to be similar in the background surface water quality samples.

It is recommended to continue monitoring MHB to ensure impacted groundwater is not discharged to surface water. To support monitoring and ongoing evaluation, nitrate and nitrite have been added to the parameter list for MHB. Both parameters were reported below the laboratory detection limits in the current monitoring period.

Bedrock (OW9A-91 and OW32A-02)

There are potentially two down-gradient bedrock wells. OW9A-91 is located at the western portion of the property at the bottom of the slope of the entrance lane to the Site, down-gradient of Phase II/III. OW32A-02 is located near the northwest portion of the Site adjacent Perth Road 123. OW32A-02 was inaccessible in both June and November. The groundwater chemistry at OW9A-91 in 2021 is summarized in Table 6.

The parameters analyzed at OW9A-91 and OW32A-02 typically exhibit the same characteristics as the background bedrock well OW8A-91. Chloride concentrations at OW9A-91 were reported as 5.1 and 4.73 mg/L in June and November, respectively. There is no indication of landfill impact to the bedrock aquifer and based on the differing geochemical signatures and water levels between the bedrock and shallow overburden, it reasonable to expect a level of hydraulic separation between these units. This is consistent with the occurrence of silt till layer above the bedrock system.

10.1.3 Private Well Water Quality

Five private water supply wells are sampled as part of the monitoring program. No samples from the private residential wells were collected as part of the current monitoring period due to the COVID-19 pandemic and the associated health measures. The approximate locations of the private wells are noted on Figure 2. Historical analytical results are provided for reference in Appendix D. The well owners are provided with the results of their water test results annually. Copies of the laboratory reports for their well are sent by mail to each owner.

Private Well	Strata
PW1	Bedrock
PW2	Overburden
PW3	Bedrock
PW4	Bedrock
PW5	Bedrock

Overburden Private Wells

Historically, two overburden private wells (PW1 and PW2) had been monitored as part of the annual monitoring program. However, the overburden well at PW1 was replaced by a bedrock well in 2011.

The historical overburden PW1 was approximately 4.3 m deep (approximately 318.6 masl) with a removable lid. The well was not believed to be hydraulically connected to the overburden aquifer within the landfill because the water elevation within the well did not fluctuate during the previous dewatering activities at the Site. The historical results indicate that this well was highly susceptible to contamination from road salting activities. During the December 2011 monitoring event it was noted that the former well had been replaced with a bedrock well.

PW2 is located topographically higher than the Site and is considered to be in a hydraulically upgradient location as indicated by the shallow groundwater flow patterns. The reported depth suggests it is completed at the same elevation as the meltwater material separating the upper and lower till.

As with overburden PW1, PW2 has displayed historically fluctuating levels of chloride. Chloride has ranged from 22 mg/L (May 1985) to 326 mg/L (September 2003). No samples were collected at PW2 during the current monitoring period due to the COVID-19 pandemicPW2 is reportedly susceptible to seasonal water level fluctuations and has occasionally become dry during summer months. In the past, a licensed water hauler has reportedly filled the well with imported water in such instances. Due to this, the integrity and meaningfulness of the analytical results from this monitoring location is somewhat questionable. Only five samples have been obtained in the last five years, due to the sampling point being inside the residence and due to restricted access. Based on recent analytical results available for this sampling point, chloride concentrations have remained within the typical historical range. The occurrence of the chloride is inferred to be associated with salt application along the road as opposed to landfill leachate.

To differentiate the potential sources of chloride, analysis of alkalinity and sodium has been added to the parameter list and will continue to be analyzed and evaluated once post-covid sampling is re-established and additional data becomes available for this location.

Bedrock Private Wells

Four bedrock private wells are monitored as part of the annual monitoring program and are located between the Site and the Thames River.

As previously reported, the overburden well at PW1 was replaced by a bedrock well in 2011. Due to access issues and constraints, PW1 has not been sampled since the onset of the COVID-19 pandemic. Prior to that, the concentrations of chloride, conductivity, hardness, and DOC in the new bedrock well are consistent with background levels in the bedrock.

Similar to PW1, PW3 has not been sampled since the COVID-19 pandemic started. Only one sample has been obtained from this well in the last seven years. A neighbour advised GMBP that the PW3 property is used as a seasonal recreational property (i.e., a cottage), and therefore the resident is rarely present. The most recent sample was completed in May 2018, and chloride, hardness, and DOC concentrations were consistent with historical concentrations. The reported chloride is considered to be relatively elevated compared to other bedrock locations but was within historical levels. The chloride concentration at PW3 has been consistent since 2009, with concentrations around 60 mg/L.

The groundwater at PW4 has been stable and consistent with background concentrations. PW4 was not sampled during the current monitoring period due to the COVID-19 pandemic. Of note, the chloride concentration has consistently been reported below 5 mg/L (similar to PW1).

PW5 was also not sampled i the current monitoring period due to the COVID-19 pandemic. Chloride concentrations have fluctuated in the past five years at PW5, typically with greater concentrations recorded in the spring and lower concentrations recorded in the fall. The most recent analytical findings indicate that the measured chloride concentration was 9.18 mg/L, which is consistent with background concentrations. Based on the consistent hardness and conductivity in spite of chloride fluctuations, it is recommended to continue to closely monitor annual results from this location.

Based on the analytical results for the private domestic wells from the available monitoring data, there is no indication of landfill leachate impact at the locations of the offsite wells.

To support differentiation of landfill impacts from natural conditions and road salting activities, analysis of alkalinity and sodium were added to the bedrock monitoring locations in 2019. Alkalinity is in the range of 194 to 236 mg/L, and sodium is in the range of 27.9 to 33.5 mg/L, with the highest concentrations at PW4 and the lowest at PW1.

10.1.4 Reasonable Use

MOE Guideline No. B-7 *Incorporation of the Reasonable Use Concept into MOE Groundwater Management Activities*, 1994 states that:

> *In accordance with the appropriate criteria for particular reasonable uses, such as those specified in the Guideline B-1: "Water Management – Guidelines and Procedures of the Ministry of Environment", a change in quality of the groundwaters on the adjacent property will be acceptable only as follows:*
>
> *Quality cannot be degraded by an amount in excess of 50 percent of the difference between background and the quality criteria for any designated reasonable use, except drinking water. In the case of drinking water, the quality must not be degraded by an amount in excess of 50 percent of the difference between background and the Ontario Drinking Water Objectives for non-health related parameters and in excess of 25 percent of the difference between background and the Ontario Drinking Water Objectives for health-related parameters. Background is considered to be quality of the groundwater prior to any man-made contamination.*

The maximum allowable concentration (Cm) of chloride (a common indicator in landfill leachate) that would be acceptable in the groundwater at the property boundary is calculated as:

$$Cm = Cb + x\,(Cr - Cb)$$

The terms are defined as follows:

Cb – Background concentration of the particular contaminant in the groundwater before it has been affected by human activity. In this case, the average 10-year water quality at OW2-84 and OW25-91 was assumed to represent background overburden water quality; the average 10-year water quality at OW8A-91 was assumed to represent background bedrock water quality. The 2012 to 2021 average chloride concentration at wells OW2-84 and OW25-91 is 7.24 mg/L and the 2012 to 2021 average at OW8A-91 is 20.12 mg/L.

Cr – Maximum concentrations of the particular parameter in accordance with the Ontario Drinking Water Quality Standards (ODWQS). This value is 250 mg/L for chloride.

X – A constant that reduces the contamination to a level that is considered by the MECP to have only a negligible effect on the down-gradient use of the water. For chloride, a non-health related parameter, the factor is 0.5.

Therefore: $C_m = 7.24 + 0.5\,(250 – 7.24) = 128.6$ mg/L (overburden)
$C_m = 20.12 + 0.5\,(250 – 20.12) = 135.06$ mg/L (bedrock)

Chloride concentrations in down-gradient wells can then be compared to this maximum allowable concentration. If leachate indicator parameters exceed the reasonable use in down-gradient wells near the property boundary, it indicates that there may be existing potential off-site impacts. In addition to the RUC, a groundwater trigger level of 100 mg/L for chloride was previously established for monitoring wells that represent a boundary condition.

10.1.5 Comparison of Groundwater Chemistry to Reasonable Use

A review of the data indicates that the chloride concentrations recorded at all downgradient boundary wells were below the Reasonable Use Criteria and below the Site boundary trigger concentration of 100 mg/L.

The table below identifies the boundary and sentry groundwater sampling locations where leachate indicator concentrations were measured above the RUC during the current reporting period. These locations do not represent downgradient compliance monitoring locations. Hardness exceeded the RUC at most of the wells due to the Site having naturally hard water, and therefore is not included in the table.

Location	Parameters above the RUC	Probable Cause
OW4-84	DOC, Alkalinity	Naturally reducing conditions
OW21-91	Chloride, Sodium	De-icing operations, Road salt application

Salt related impacts are evident along the west side of the property and upgradient of the landfill. No impacts above the RUC are evident due to landfill related activities. On-site, and directly downgradient of the landfill, only minor potential for impacts are apparent.

10.2 Surface Water Quality Results

Table 8 contains the results of the current sampling with a comparison to the Provincial Water Quality Objectives (PWQO). Long-term trend graphs for chloride, total phosphorus, iron, and TSS are included in Appendix E. Historical surface water quality data are included in Appendix E.

Based on the leachate testing and the background water quality, chloride, total phosphorus and iron were selected as leachate indicator parameters. There are PWQO's for total phosphorus and iron.

The surface water system is dominated by the central creek on-site (i.e., on-site water course). Topography and stormwater management systems (Basin A and Basin B) are directed to the central creek. To ensure protection of the surface water resources, water quality is measured in the stormwater Basins and the central creek (up-, mid-, and downstream).

10.2.1 Basin A

Surface water collected from the covered area within Phase I (i.e., non-contact stormwater) is directed from the perimeter ditches to channels that enter stormwater Basin A at the south (SP3A-94) and north (SP5A-94). The surface water from the basin is discharged to the on-site watercourse.

SP5A-94 was dry in the spring but did have sufficient water for sampling in the fall. This location has been dry or had insufficient water for sampling since 2013. The Basin outlets to the watercourse via a corrugated steel pipe (CSP). The outlet sampling location (SP4A-94) is at the downstream end of the pipe. A sample was collected at SP4A-94 in June but not in November. SP3A-94 was dry in the spring. The concentrations of the leachate indicator parameters at these locations for the current monitoring period are summarized in Table 8. The time versus trend graphs for all sampling points are included in Appendix E.

Historically, chloride levels were highest at the inlet (SP5A-94) which receives water from the north end of Phase I. The concentrations are generally lowest at the south inlet (SP3A-94) and, as expected, the outlet (SP4A-94) is a concentration between.

The water quality at the inlet was recorded in November 2021 for the first time since 2013. Chloride was slightly elevated above the APV with a concentration of 188 mg/L. Iron was reported as 0.17 mg/L, below the PWQO. The analytical results for the current monitoring period are generally consistent with the pre-2013 typical range. Several elevated parameters were reported at the outlet in June of 2021. Chloride was elevated above the APV at a concentration of 355 mg/L, significantly higher than the average concentration of 116 mg/L for this location. Iron at the outlet was reported as 1.17 mg/L, exceeding the PWQO and significantly elevated beyond the typical range. The reported phosphorous concentration of 0.14 mg/L exceeded the PWQO and the typical range for this location. Additional elevated parameters in June 2021 include conductivity, TDS, ammonia, and manganese. The water quality at the south inlet in November 2021 was generally within historical ranges, with the exception of iron, manganese, and phosphorous. Chloride was reported as 7.44 mg/L. Iron was reported as 1.93 mg/L

To differentiate the potential sources of chloride, analysis of alkalinity and sodium was previously added to the parameter list for surface water samples. In June 2021, alkalinity was reported as 200 mg/L at SP4A-94, consistent with recent data. Sodium was reported as 151 mg/L, elevated compared to the 2-year average of 46.6 mg/L in 2019 and 2020.

The water quality at the outlet to Basin A typically includes measured chloride concentrations that are below the APV with iron and total phosphorus concentrations sporadically above the PWQO. Based on the fluctuating chloride concentrations and consistent with a closed site, the water quality appears most influence from surface sources of impact such as salt and organics, as opposed to landfill leachate. Based on the similarity to water quality within the on-site water course, no impacts to surface water resources are expected due to discharges from Basin A.

10.2.2 Basin B

Surface water collected from the covered area and the perimeter of Phase II/III is directed to stormwater Basin B by a corrugated steel pipe (CSP) located beneath the access roadway. Basin B also collects overland flow from agricultural fields to the south via overland flow to the southerly perimeter swale. The inlet sample location (SP1B-94) is located at the discharge of the CSP to Basin B. Like Basin A, Basin B outlets to the watercourse via a CSP. The outlet sampling location (SP2B-94) is at the downstream end of the pipe. Leachate indicator parameters for the current monitoring period are summarized in Table 8.

Chloride concentrations at the inlet (SP1B-94) are typically higher than the outlet (SP2B-94) and occasionally exceed the APV. The outlet from Basin B usually has lower chloride levels and rarely exceeds the APV, indicating a level of attenuation/dilution within Basin B. In June 2021, both SP1B-94 and SP2B-94 had insufficient water for sampling, and in November 2021 SP2B-94 again had insufficient water for sampling.

In November, the inlet sample had several elevated parameters compared to previous years. Phenols, iron, and total phosphorous exceeded the PWQO, with concentrations of 0.025 mg/L, 2.84 mg/L, and 0.23 mg/L, respectively. Additionally, ammonia, TSS, and nitrate were elevated above historical levels, while chloride and sodium were reduced below typical levels. Total phosphorus typically exceeds the PWQO with a historical average concentration of 0.06 mg/L.

To differentiate the potential sources of chloride, analysis of alkalinity and sodium was added to the parameter list for surface water samples in 2019. Alkalinity concentrations in Basin B are in the range of 208 to 364 mg/L, and sodium concentrations are in the range of 32.6 to 102 mg/L. Typically, the concentrations reported at the outlet are below those reported at the inlet.

The elevated parameters are considered to be anomalous and will continue to be monitored. Overall, the water quality at Basin B doesn't appear to be influenced by landfill leachate. Exceedances of the PWQO are attributed to salting and/or naturally occurring conditions, including off-site influence from agricultural fields.

10.2.3 Sediment Accumulation

The most recent sediment depth measured near the T-bar in Basin B was approximately 80 cm. The Basin outlets should be inspected on a regular basis and the structures cleaned of roots/vegetation. The quality at the Basin A outlet is typically better than the quality from Basin B. This may indicate that the continued development on the final cover and vegetation on Phase II/III should assist to improve the overall surface water quality at the Site.

10.2.4 Onsite Watercourse

Concentrations of leachate indicator parameters for the current monitoring period are summarized in Table 8 and are compared with the historical range in upstream surface water quality below.

Indicator	PWQO	Units	Historical SP1-10		SP1-10 Upstream		SP2-93 Midstream		SP3-93 Downstream	
			Low	High	June	Nov	June	Nov	June	Nov
Chloride	-	mg/L	13	887	415	10.9	356	48.5	349	49.1
Phosphorus	0.03	mg/L	0	0.692	0.19	1.33	0.12	0.07	0.14	0.07
Iron	0.3	mg/L	<0.010	127	0.265	21.8	0.65	0.157	0.922	0.159
TSS	-	mg/L	<2.0	500	<10	324	21	<10	11	<10

Analytical results from the current sampling period indicate that the water quality is generally within the historical range at SP2-93 and SP3-93. Several parameters were elevated at SP1-10 in November, however, considering the turbidity of 512 NTU, and the normal levels downstream, these parameters are considered to be anomalous and not representative of actual conditions. Chloride is elevated at all locations in June but reduced significantly at all sample locations at the time of the fall sampling program. Iron is elevated above the PWQO at both SP2-93 and SP3-93 in June and at SP1-10 in November, but the concentrations are within the historical range for SP2-93 and SP3-93. Total Phosphorous typically exceeds the PWQO at all locations. Aside from the elevated iron, there is no discernible difference between the up-, mid-, and downstream sampling locations in June. Therefore, no impacts to surface water features are evident due to the landfill.

A review of the water quality indicates that the water quality is generally reflective of anthropogenic influence from salt (chloride) and agricultural lands (elevated phosphorous).

11. SUMMARY AND CONCLUSIONS

Based on the data presented in this report we conclude the following:

1. The St. Mary's Landfill Site encompasses an area of 37 ha. Of this area, 8 ha is approved for landfilling with an approved capacity of 349,050 m^3 of waste and daily cover, as stated in the Amended ECA, dated January 10, 2022. As of November 2021, the remaining capacity at the St. Mary's Landfill is estimated to be 13,941 m^3. Based on the 2021 fill rate of 8,889 m^3/year, the remaining Site life is approximate 1.6 years. As stated in the Amended ECA, no waste is to be disposed of at the Site beyond September 30, 2022.

2. The Town's recycling efforts in 2021 diverted 1,734 tonnes of leaf and yard waste, e-waste, and recyclables.

3. Observations made during site visits throughout the 2021 operating year indicated that the appearance and operation of the Site was satisfactory.

4. The Town did not receive any formal written complaints in 2021.

5. MHB was added to the sampling program in 2016. Based on the analytical results, the water quality appears to be primarily influenced by salt application, as opposed to leachate. The water quality meets the PWQO and is similar to the background surface water quality of the on-site water course. Consequently, discharge from this feature is not expected to cause impact to the on-site water course.

6. Water quality sampling from the outlet of Basin A and Basin B suggests influence from salting and/or surface sources. No impacts to the on-site watercourse are anticipated due to discharge from the Basins.

7. There was no evidence of surface water quality impacts to the on-site water course due to landfill activities. The water quality at the up-, mid-, and downstream had no discernible difference and was within historical values in the spring. Anomalous conditions were reported in multiple locations in the fall, and will continue to be monitored. A review of the water quality indicates that the water quality is generally reflective of anthropogenic influence from salt (chloride) and agricultural lands (elevated phosphorous).

8. The general direction of overburden groundwater flow is predominantly west to east across the subject property and is inferred to generally flow towards the watercourse east of the fill areas. The direction of groundwater flow within the bedrock aquifer is inferred to be predominantly west, consistent with regional bedrock groundwater flow direction.

9. Monitoring wells OW2-84, OW25-91, and OW8A-91 are considered the background wells at the St. Mary's Landfill Site. The overburden background water quality is determined by using the combined average 10-year groundwater quality reported for OW2-84 and OW25-91, while the bedrock background water quality is determined using the average 10-year groundwater quality reported for OW8A-91. Background conditions are described as being relatively highly mineralized with naturally occurring elevated hardness.

10. Compliance with the RUC is assessed by evaluating the concentrations of a number of characteristic leachate indicator parameters and leachate impact is not represented by elevated concentrations of individual naturally occurring parameters where these are not accompanied by other elevated indicator parameters.

11. The RUC for leachate indicator parameters were not exceeded in the overburden or bedrock groundwater at down-gradient monitoring wells. The concentration of hardness is elevated in each of the onsite monitoring wells due to the natural mineralization of the groundwater at the Site and is unrelated to impact or influence from landfill leachate. The elevated hardness concentrations are accompanied by relatively low, stable alkalinity concentrations across the Site.

12. There is no evidence of off-site impacts to groundwater due to the landfill.

13. It is noted that the COVID-19 pandemic interfered with private well monitoring in 2021 and no private well samples were collected in 2021. Private well sampling will commence in future monitoring events when allowed.

14. The monitoring well locations with the highest chloride concentrations are located in proximity to the west property boundary adjacent to Perth Road 123. Based on a detailed evaluation of the groundwater chemistry at these locations, the measured increases reported at the locations of OW9B-91, OW15-91, and OW21-91 appear to be directly attributable to road salting and dust suppression and are not related to impact from landfill leachate.

12. RECOMMENDATIONS

Based on the Site inspections, analytical data and information provided by the Town, GMBP provides the following recommendations:

1. The groundwater monitoring program should continue on a twice annual basis in the spring and fall as outlined below:

   - Water levels measured in all groundwater wells and MHB,
   - Field measurement of pH, conductivity, and temperature measured in all groundwater wells and MHB,
   - Samples collected for chloride, hardness, phenols, DOC, calcium, alkalinity, nitrate, nitrite, ammonia, sodium and magnesium from all groundwater wells and MHB,
   - OW2-84, OW4-84, OW5-84, OW8B-10, OW9B-91, OW15-91, OW21-91, OW25-91, OW32-96, OW33-96, OW34-96, OW32A-02, OW36, and MHB are sampled additionally for sulphate, boron, iron, manganese, and BTEX (benzene, toluene, ethyl benzene, and xylene).

2. Ongoing sampling, analysis, and long-term trend evaluation should be completed for chloride, alkalinity, calcium, and sodium to differentiate the occurrence of chloride from leachate versus chloride from salting.

3. Leachate sampling should continue twice per year as outlined in the ECA, if there is sufficient leachate for sampling.

4. The surface water monitoring program should continue on a twice annual basis in the spring and fall including the parameters analyzed in 2021, flow monitoring, and measurement of sedimentation in ponds.

5. MHB should continue to be monitored in 2022 and tested for the same parameters as the overburden groundwater wells. If leachate impact is confirmed at MHB, contingency measures should be implemented.

6. The owners of the private wells sampled as part of the annual monitoring program should continue to be notified of the results on an annual basis.

7. Verification of grades in the active landfill area should be regularly monitored to prevent overfilling.

8. The 2022 year-end topographic survey should include the location and volume of waste and daily cover, and location of soil stockpiles imported to the Site.

9. Sufficient capacity exists within the current notice to allow waste disposal until September 30, 2022, i.e., for the full term of the Amended ECA. To continue landfilling beyond September 30, 2022, an ECA application must be submitted to the Director by July 31, 2022.

10. The Site supervisor should conduct a monthly inspection of the landfill. Key areas are the landfill side slopes, leachate seeps, MHB, and stormwater ponds/culverts/outlets.

11. An annual inspection of the leachate sewer line should be conducted and flushing of the line should be scheduled based on the findings on the inspection to ensure that flow is maintained. Consideration could be given to measurement of leachate volumes in the sewer line at the Site boundary to assist in assessing the collection system.

All of which is respectfully submitted,

GM BLUEPLAN ENGINEERING LIMITED

Per:

A.W. Bringleson B.E.S., C.E.T.

M.D. Nelson P.Eng., P.Geo.

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TABLES

Table 1 - Summary of Monitoring Locations and Well Details

Monitoring Well	Date of Installation	Screened Stratigraphy	Elevation (masl)								
			Ground Elevation	Top of Casing	Bottom of Borehole	Well Screen		Sand Pack		Bentonite Seal	
						Bottom	Top	Bottom	Top	Bottom	Top
OVERBURDEN											
OW6-84	25-Sep-84	Silt / Clayey Silt Till	313.93	314.79	299.15	310.73	311.49	310.73	311.75	311.75	311.95
OW32-96	7-Aug-96	Silt Till	322.54	323.43	310.96	311.11	312.63	310.96	316.44	316.44	321.32
OW21-91	9-Dec-91	Silt and Sand Till / Silt and Clay	319.99	320.76	312.29	312.29	313.82	312.29	314.66	314.66	319.39
MW04-01			332.90	333.55		317.83					
MW04-02			329.41	330.12		317.44					
MW04-03			329.33	330.07		313.51					
OW15-91	21-Oct-91	Sand and Gravel	317.82	318.67	311.62	312.33	313.25	312.33	313.91	313.91	317.22
OW8B-10	25-Oct-10	Clay	314.39	315.35	307.99	307.99	308.9	307.99	309.82	309.82	314.39
OW33-96	8-Aug-96	Till	320.66	321.57	307.1	307.25	308.77	307.1	310.81	310.81	319.46
OW34-96	9-Aug-96	Silt Till	320.77	321.59	311.63	311.78	314.83	311.63	316.35	316.35	319.52
OW25-91	11-Dec-91	Silt some Sand / Gravel	322.86	323.42	312.5	313.11	314.02	312.5	315.85	315.85	322.25
OW1-80	27-May-80	Clayey Silt Till	316.02	316.95	308.42	309.12	309.72	308.42	310.02	310.02	310.22
OW2-80	27-May-80	Clayey Silt Till		315.39							
OW3-80	27-May-80	Clayey Silt Till	315.07	316.2	310.47	310.87	311.47	310.47	312.07	312.07	312.27
OW9B-91	1-Oct-91	Gravel	317.74	318.58	311.19	311.64	312.56	311.19	313.17	313.17	317.14
OW17-91	16-Nov-91	Silt Till / Sand / Silt and Sand	317.39	318.39	307.94	311.6	314.65	311.34	315.05	315.05	316.79
OW36	29-Nov-16	Silty Clayey Sand Till	313.78	314.54	306.85	306.85	309.9	306.85	311.04	311.04	313.48
OW1-84	25-Sep-84	Sandy Clayey Silt Till w Gravel	321.87	322.48	312.27	313.49	314.25	312.27	315.37	315.37	316
DP1	24-Nov-15		310.06	311.18	309.35	309.35	309.65				
DP2	24-Nov-15		309.57	310.73	308.9	308.9	309.2				
OW2-84	25-Sep-84	Sand and Gravel	322.19	322.84	312.59	312.66	313.42	312.59	314.11	314.11	315.09
OW4-84	24-Sep-84	Silty Sand / Clayey Silt	314.52	315.36	300.65	311.47	312.23	311.47	312.69	312.69	313.07
DEEP OVERBURDEN											
OW5-84	25-Sep-84	Sand with Gravel	313.93	314.42	299.15	299.15	299.91	299.15	302.2	302.2	302.65
OW3-84	24-Sep-84	Sand with Gravel	314.58	315.04	300.71	300.71	301.47	300.71	303.53	303.53	304.22
DP3	24-Nov-15		308.86	310.01	308.18	303.18	308.48				
OW4-80	27-May-80	Clayey Silt Till	315.10	316.13	304.6	305.3	305.9	304.6	306.1	306.1	306.3
BEDROCK											
OW7-91	4-Oct-91	Limestone	314.50	315.27	275.28	275.49	277.01	275.28	280.67	280.67	314
OW8A-91	3-Oct-91	Limestone	314.00	314.86	281.64	281.89	283.42	281.89	287.64	287.64	313.4
OW9A-91	1-Oct-91	Limestone	317.75	318.49	277.36	277.36	278.89	277.36	280.56	280.56	317.2
MW04-04			314.21	314.98		282.64					
OW35			312.95	313.52		270.87					
OW32A-02	17-Sep-02	Limestone	322.09	322.54	278.81	278.81	281.85	278.81	285.51	285.51	322.09

Table 2: Summary of MECP Water Well Records

MECP No.	Well Location	Easting	Northing	Date Drilled	Static Level (mbgs)	Pumping Rate (L/s)	Use	Notes
7175685	1760 Road 123, Blanshard Twp (PW1)	487094	4787245	23-Aug-11	27.43	1.26	Water Supply	Black Loam - 0.61 mbgs Clay - 28.04 mbgs Limestone - 60.05 mbgs
5002038	1774 Road 123, Blanshard Twp (PW3)	487079.7	4787463	14-Nov-73	29.26	0.32	Water Supply	Clay - 24.38 mbgs Limestone - 48.77 mbgs
5004319	1736 Road 123, Blanshard Twp (PW4)	487083	4787301	15-Aug-96	34.14	0.51	Water Supply	Clay & Sand - 28.65 mbgs Limestone - 56.39 mbgs
5003434	1764 Road 123, Blanshard Twp (PW5)	487101.7	4787476	15-Jun-88	40.23	0.44	Water Supply	Black Loam - 0.31 mbgs Clay - 1.22 mbgs Clay & Sand - 28.35 mbgs Limestone - 56.39 mbgs
5003388	Lot 17 SB, Perth County	487213.7	4786993	26-Oct-87	42.98	0.44	Water Supply	Black Loam - 0.31 mbgs Clay & Sand - 36.27 mbgs Limestone - 52.12 mbgs
5001196	St. Mary's Landfill	487313.7	4787318	12-Aug-47	9.75	0.63	Water Supply	Clay & Stones - 7.32 mbgs Limestone - 32.31 mbgs
5006163	St. Mary's Landfill	487299	4787043	11-Sep-06	-	-	-	Abandonment Record
7155445	1221 Water Street S, St. Mary's	487578	4787041	25-Oct-10	-	-	Observation	Gravel & Sand - 1.22 mbgs Clay - 6.4 mbgs
7274050	Water St, Blanshard Twp	487143	4787039	18-Oct-16	38.1	0.63	Water Supply	Black Loam - 0.61 mbgs Clay & Stones - 6.40 mbgs Hardpan - 31.09 mbgs Limestone - 60.05 mbgs

Table 3 - Groundwater Elevations

Elevations	OW1-80	OW2-80	OW3-80	OW4-80	OW1-84	OW2-84	OW3-84	OW4-84	OW5-84	OW6-84	OW7-91	OW8A-91	OW8B-91	OW8B-10	OW9A-91	OW9B-91	OW15-91	OW17-91	OW21-91	OW25-91	OW32-96	OW32A-02	OW33-96	OW34-96	OW35	OW36
Measuring Point	316.95	315.39	316.10	316.15	322.54	322.86	314.87	314.89	314.42	314.79	315.27	315.19	314.90	315.35	318.49	318.58	318.67	318.39	320.76	323.35	323.48	322.63	321.57	321.64	313.52	314.54
Ground Surface	316.02	-	315.07	315.10	321.87	322.25	313.91	313.91	313.97	313.97	313.94	314.00	313.72	314.39	318.26	318.33	318.34	317.39	319.99	322.81	322.62	322.07	320.66	320.77	312.95	313.78
Screen Top	309.72	NA	311.47	305.90	314.25	313.42	301.47	312.23	299.91	311.49	277.01	283.42		308.90	278.89	312.56	313.25	-	313.82	314.02	312.63	281.85	308.77	314.83		309.90
Screen Bottom	309.12	NA	310.87	305.30	313.49	312.66	300.71	311.47	299.15	310.73	275.49	281.89		307.99	277.36	311.64	312.33	311.59	312.29	313.11	311.11	278.81	307.25	311.78	270.87	306.85
Groundwater Elevation (metres above mean sea level)																										
3-Oct-84			313.72	306.05	317.20	318.17	Dry	312.81	301.55	Dry																
18-Oct-84			313.64	305.81	317.15	317.96	Dry	312.83	301.36	Dry																
29-Oct-84			313.63	305.82	317.17	317.91	Dry	312.80	301.31	Dry																
31-Oct-84			312.78	305.57	317.07	317.86	Dry	312.77	301.22	Dry																
4-Feb-85			313.67	305.64	317.29	318.48	Dry	312.85	301.24	Dry																
8-May-85			313.83	306.07	316.19	318.45	Dry	312.46	301.42	Dry																
14-Aug-85			312.59	306.03	316.55	317.17	Dry	312.06	301.33	Dry																
18-Feb-86	311.35		313.85	306.61	317.52	318.52	Dry	312.80	301.58	Dry																
8-May-86	311.41		313.91	314.54	317.48	318.62	Dry		301.39	Dry																
12-Aug-86	311.48		312.73	312.19	316.89	317.54	Dry	312.18	301.24	Dry																
3-Nov-86	311.73		313.84	314.28	317.67	318.76	Dry	312.84	301.41	Dry																
10-Feb-87	311.96		313.82	314.31	317.48	318.32	Dry	312.87	301.70	Dry																
12-May-87	311.76		313.86	314.14	317.43	318.42	Dry	312.16	301.40	Dry																
13-Aug-87	311.01		311.91	311.59	316.27	317.09	Dry	311.71	301.30	Dry																
3-Nov-87	310.03		311.01	310.47	316.16	316.66	Dry	312.83	301.27	Dry																
28-Jan-88	310.27		313.07	313.52	316.98	317.81	Dry	312.76	301.15	Dry																
24-May-88	311.05		314.13	314.52	317.39	318.18	Dry	313.04	301.38	Dry																
18-Aug-88			311.73	309.91	316.40	317.50	Dry	312.53	301.34	Dry																
8-Nov-88	310.35		314.17	311.89	317.09	318.12	Dry	313.09	301.35	Dry																
2-Feb-89			314.97	311.69	317.39	318.51		313.10	301.35																	
9-May-89	311.01	Dry	315.01	312.64	317.43	317.85	Dry	312.79	301.41	Dry																
28-Aug-89	311.05	Dry	312.36	310.76	316.43	317.46	Dry	312.14	301.34	Dry																
30-Nov-89	311.33	Dry	314.44	311.80	317.46	317.26	Dry	312.88	301.38	Dry																
22-Feb-90	311.03	Dry	315.05	312.45	317.46	318.58	Dry	312.88	301.38																	
28-May-90	311.69	Dry	315.15	312.42	317.47	318.65	Dry	313.01	301.27																	
14-Aug-90	312.36	Dry	315.00	312.54	317.39	318.60	Dry	312.94	301.53	Dry																
5-Nov-90		Dry	315.29	312.20	317.76	319.08	Dry	312.97	301.78	Dry																
4-Feb-91	311.29	Dry	315.09	312.15	317.50	318.66	Dry	312.88	301.69	Dry																
14-May-91	311.81	308.98	315.09	311.61	317.49	318.75	Dry	313.02	301.88	Dry																
26-Aug-91	311.94	309.20	313.43	310.71	316.79	317.80	Dry	312.69	301.62	Dry																
21-Sep-91	311.11	309.28	312.18	309.66				312.83	301.65		286.15	286.41	Dry		285.62	314.10										
26-Sep-91	311.03	309.27	312.20	309.66	316.30	317.19		312.86	301.61		285.99	286.22	Dry		285.54	314.13	314.13									
11-Nov-91	310.95	309.28	313.07	309.79	316.26	317.26	Dry	312.44	301.55	Dry	285.78	286.06	Dry		285.33	314.13	314.13									
22-Nov-91															285.42	314.25	314.26									
3-Dec-91			314.57	310.53	316.61	317.47	Dry	312.87	301.83		286.27	286.47	Dry		285.66	314.36	314.37									
12-Dec-91	310.08	309.21	314.91	310.18	316.82	317.65	Dry	313.04	301.61		286.79	287.04			285.88	314.38	314.38		317.53							
13-Dec-91							Dry								285.99	314.35				314.35						
14-Dec-91							Dry								286.11	314.45	314.44		316.26	314.41						
26-Dec-91	310.40	309.17	315.00	311.16	316.98	317.91	Dry	313.06	301.63		287.53	287.78			286.31	314.42	314.42		316.60	314.37						

Table 3 - Groundwater Elevations

Elevations	OW1-80	OW2-80	OW3-80	OW4-80	OW1-84	OW2-84	OW3-84	OW4-84	OW5-84	OW6-84	OW7-91	OW8A-91	OW8B-91	OW8B-10	OW9A-91	OW9B-91	OW15-91	OW17-91	OW21-91	OW25-91	OW32-96	OW32A-02	OW33-96	OW34-96	OW35	OW36
Measuring Point	316.95	315.39	316.10	316.15	322.54	322.86	314.87	314.89	314.42	314.79	315.27	315.19	314.90	315.35	318.49	318.58	318.67	318.39	320.76	323.35	323.48	322.63	321.57	321.64	313.52	314.54
Ground Surface	316.02	-	315.07	315.10	321.87	322.25	313.91	313.91	313.97	313.97	313.94	314.00	313.72	314.39	318.26	318.33	318.34	317.39	319.99	322.81	322.62	322.07	320.66	320.77	312.95	313.78
Screen Top	309.72	NA	311.47	305.90	314.25	313.42	301.47	312.23	299.91	311.49	277.01	283.42		308.90	278.89	312.56	313.25	-	313.82	314.02	312.63	281.85	308.77	314.83		309.90
Screen Bottom	309.12	NA	310.87	305.30	313.49	312.66	300.71	311.47	299.15	310.73	275.49	281.89		307.99	277.36	311.64	312.33	311.59	312.29	313.11	311.11	278.81	307.25	311.78	270.87	306.85
Groundwater Elevation (metres above mean sea level)																										
23-Jan-92	310.99	309.17	315.10	311.27	317.56	318.35		313.09	301.88		288.30	288.67			286.97	314.61	314.61		316.26	314.54						
3-Feb-92	311.19	309.09	315.10	311.35	317.71	318.46		312.89	301.67		288.37	288.76			285.95	314.49	314.48			314.47						
7-Feb-92			315.12		317.81	318.53		312.93	301.63		288.46	288.73			287.07	314.53	314.51		316.57	314.46						
13-Mar-92	311.53	309.09	315.00	311.35	319.59	318.96		312.98	301.82		289.43	289.68	Dry		287.74	314.59	314.53		316.68	314.53						
25-May-92	311.57	309.01	314.93	311.37	319.86	318.54		312.93	301.80		288.49	288.61	Dry		286.95	314.45	313.84		315.08	314.39						
6-Aug-92	312.10	309.20	314.96	311.39	319.98	318.65		312.64	301.73		287.01	287.35	Dry		286.41	314.47	314.43		315.79	314.40						
2-Nov-92	312.70	309.94	315.13	311.75	319.36	319.01		313.00	301.98		288.90	289.38	Dry		287.56	314.70	314.61		316.11	314.72						
6-Feb-93	312.54	310.10	315.20	311.65	319.50	318.84		312.92	301.98		289.98	290.58	Dry		288.52	314.48	314.51		316.12	314.50						
25-May-93			314.97	311.52	319.80	318.63		Dry	301.99		288.10	288.55	Dry		287.61	314.53	314.43		316.49	314.41						
23-Aug-93			313.64	311.32	319.26	317.90		Dry	301.60		286.30	286.67	Dry		286.22	313.97	313.95		316.12	314.02						
13-Apr-94			315.14	311.75	317.78	318.92	Dry	313.10	302.14	310.89	289.17	289.75	307.84		288.08	315.04	315.04		316.50	315.10						
7-Sep-94			313.49	310.41	317.00	318.26	Dry	Dry	301.92	Dry	285.74	286.14	308.00		285.80	314.70	314.69		314.58	314.77						
28-Apr-95			315.04	307.07	318.63	319.10	Dry	313.11	301.98	Dry	288.00	288.39	308.08		286.99	315.21	315.17		313.23	315.77						
14-Sep-95			312.15	307.14	316.86	317.84	Dry	Dry	301.85	Dry	285.21	285.47	308.28		285.10	314.54	314.53		313.23	314.59						
2-Apr-96			315.02	311.74	317.34	318.62	Dry	312.30	301.86	Dry	288.43	289.07	308.01		287.18	314.97	314.91		316.59	315.19						
5-Sep-96						318.04	Dry	Dry	301.56	Dry	285.97	286.40	308.07		285.75	314.63	314.64		316.06	314.75	316.77		309.12	316.23		
9-Apr-97						318.87	Dry	313.14	302.07	Dry	289.09	289.72	308.36		287.68	315.12	315.07		316.93	315.40	314.53		309.26	317.52		
15-Sep-97						318.01	Dry	Dry	301.90	Dry	285.56	285.97	308.32		285.53	313.69	313.56		315.40	314.32	316.70		309.04	316.04		
7-Apr-98						318.86	Dry	312.08	302.17	Dry	285.56	288.58	308.24		286.87	315.23	315.17		315.36	318.19	317.34		309.32	317.59		
8-Sep-98						317.26	Dry	Dry	301.92	Dry	284.57	284.92	308.25		284.69	314.62	314.58		314.85	315.98	315.56		308.81	315.07		
21-Apr-99						318.37	Dry	Dry	301.94	Dry	286.43	286.93	308.16		285.62	315.37	315.34		316.24	317.63	317.02		309.16	317.39		
1-Sep-99						317.35	Dry	Dry	301.85	Dry	284.74	285.07	308.16		284.56	315.02	314.91		315.19	315.92	315.75		308.81	314.99		
19-Apr-00						318.51	Dry	Dry	302.12	Dry	285.83	286.19	307.89		285.19	315.41	315.27	315.38	316.02	317.84	317.23		309.27	317.56		
6-Sep-00						318.58	Dry	Dry	302.14	Dry	286.18	286.61	308.21		285.64	315.33	315.27	315.32	316.10	317.36	317.29		309.21	317.12		
11-Apr-01						318.75	Dry	312.31	302.07	Dry	288.34	288.92	308.56		287.04	315.57	315.44	315.46	316.22	318.37	317.42		309.42	317.64		
18-Sep-01						317.34	Dry	Dry	301.97	Dry	285.53	285.87	308.42		285.02	314.77	314.70	314.75	315.07	316.07	315.83		308.85	315.06		
2-Apr-02						318.68	Dry	312.35	302.24	Dry	287.13	287.72	308.35		286.08	315.41	315.36	315.39	316.32	318.11	317.41		309.40	317.63		
24-Sep-02						317.60	Dry	Dry	301.98	Dry	285.83	286.23	308.39		285.09	314.86	314.82	314.83	315.56	316.20	315.97		308.93	315.32		
16-Apr-03						318.74	Dry	312.26	301.87	Dry	287.25	287.71	308.28		286.12	315.40	315.36	315.36	316.61	318.21	317.27	285.65	309.27	317.65		
10-Sep-03						317.52	Dry	Dry	301.96	Dry	285.66	286.11	308.31		285.10	315.03	314.97	314.99	315.23	316.27	316.09	284.57	308.94	315.26		
12-May-04						318.73	Dry	312.57	301.86	Dry	287.95	288.57	308.38		286.78	315.45	315.37	315.38	317.16	318.43	317.44	286.22	309.38	317.69		
1-Sep-04						317.84	Dry	Dry	301.78	Dry	285.59	286.14	308.13		285.33	315.28	315.21	315.26	315.53	316.49	316.51	284.75	309.03	315.80		
6-Apr-05						318.74	Dry	312.60	301.92	Dry	286.71	287.06	308.05		285.76	315.38	315.31	315.37	317.43	318.28	317.31	285.29	309.28	317.66		
23-Nov-05						318.02	Dry	Dry	302.22	Dry	284.24	284.80	308.20		284.13	315.35	315.28	315.66	316.85	317.20	316.87	283.70	309.09	315.50		
19-Apr-06						318.76	Dry	312.28	301.96	Dry	287.39	287.95	308.20		286.27	315.38	315.25	315.57	317.61	318.04	317.43	285.77	309.34	317.63		
22-Nov-06						318.98	Dry	312.28	301.87	Dry	286.86	287.27	308.40		285.88	315.40	315.36	Decom	318.08	318.15	317.57	285.39	309.25	317.66		
18-Apr-07						318.78	Dry	312.34	302.20	Dry	287.49	288.25	308.21		286.58	315.38	315.32		317.68	317.97	317.45	285.96	309.46	317.64		
30-Nov-07						317.19	Dry	311.47	301.73	Dry	284.42	284.88	308.38		284.29	315.12	315.04		318.24	316.18	315.65	283.85	308.62	314.46		
9-Apr-08						319.08	Dry	312.31	302.02	Dry	288.43	289.05	308.21		287.08	315.43	315.35		318.22	318.42	317.31	286.54	309.35	317.74		
26-Nov-08						318.77	Dry	313.23	301.94	Dry	286.31	287.25	308.50		285.53	315.35	315.27		319.06	318.14	317.39	285.09	309.37	317.31		
27-Apr-09						318.64	Dry	313.12	302.12	Dry	288.35	289.26	313.80		287.22	315.35	315.29		318.91	318.28	317.34	286.63	309.40	317.58		
29-Nov-09						318.21	Dry	Dry	301.92	Dry	285.61	286.94	313.59		285.60	315.28	315.19		317.97	317.00	317.12	285.10	309.08	316.26		

Table 3 - Groundwater Elevations

Elevations	OW1-80	OW2-80	OW3-80	OW4-80	OW1-84	OW2-84	OW3-84	OW4-84	OW5-84	OW6-84	OW7-91	OW8A-91	OW8B-91	OW8B-10	OW9A-91	OW9B-91	OW15-91	OW17-91	OW21-91	OW25-91	OW32-96	OW32A-02	OW33-96	OW34-96	OW35	OW36
Measuring Point	316.95	315.39	316.10	316.15	322.54	322.86	314.87	314.89	314.42	314.79	315.27	315.19	314.90	315.35	318.49	318.58	318.67	318.39	320.76	323.35	323.48	322.63	321.57	321.64	313.52	314.54
Ground Surface	316.02	-	315.07	315.10	321.87	322.25	313.91	313.91	313.97	313.97	313.94	314.00	313.72	314.39	318.26	318.33	318.34	317.39	319.99	322.81	322.62	322.07	320.66	320.77	312.95	313.78
Screen Top	309.72	NA	311.47	305.90	314.25	313.42	301.47	312.23	299.91	311.49	277.01	283.42		308.90	278.89	312.56	313.25	-	313.82	314.02	312.63	281.85	308.77	314.83		309.90
Screen Bottom	309.12	NA	310.87	305.30	313.49	312.66	300.71	311.47	299.15	310.73	275.49	281.89		307.99	277.36	311.64	312.33	311.59	312.29	313.11	311.11	278.81	307.25	311.78	270.87	306.85
Groundwater Elevation (metres above mean sea level)																										
25-Mar-10						318.66	Dry	311.97	302.18	Dry	286.76	287.53	313.77		285.91	315.36	315.28		318.30	317.80	317.29	285.34	309.37	317.57		
23-Nov-10						318.42	Dry	312.88	302.12	Dry	285.58	286.18			285.38	315.35	315.27		318.99	317.25	317.26	284.74	309.28	316.54		
31-Mar-11						318.90	Dry	Dry	302.33	Dry	287.59	288.43		Dry	286.77	315.41	315.32		318.55	318.00	317.48	286.12	309.44	317.72		
2-Dec-11						319.13	Dry	313.07	302.15	Dry	286.81	287.44		308.33	286.08	315.37	315.27		319.16	318.44	317.57	285.38	309.30	317.77		
26-Apr-12						318.39	Dry	Dry	302.52	Dry	286.48	287.30		308.56	286.04	315.38	315.27		317.81	317.54	317.27	285.32	309.53	317.30		
21-Nov-12						317.86	Dry	Dry	301.91	Dry	285.65	286.14		308.71	286.11	315.33	315.25		317.96	316.93	316.41	284.51	308.80	315.47		
1-May-13						318.76	Dry	312.27	302.23	Dry	287.90	288.85		308.83	286.76	315.36	315.28		318.34	318.08	317.37	NA	309.34	317.68		
28-Oct-13						318.91	Dry	313.16	302.07	Dry	286.61	287.19		309.04	285.77	315.32	315.24		318.88	318.28	317.41	285.22	309.23	317.66		
25-Jun-14						318.34	Dry	Dry	302.45	Dry	286.53	287.38		309.26	285.84	315.34	315.27		316.73	317.14	317.10	285.16	309.46	317.10		
5-Nov-14						318.64	Dry	Dry	302.23	Dry	285.70	286.35		309.15	285.27	315.37	315.29		317.21	317.50	317.39	284.48	309.27	317.00		
27-May-15						318.32	Dry	Dry	302.48	Dry	286.24	286.92		309.18	285.64	315.36	315.28		316.81	317.19	317.15	284.95	309.45	317.23		
29-Sep-15						318.01	Dry	Dry	302.25	Dry	285.26	285.85		308.82	285.03	315.36	315.28		316.58	316.67	316.88	284.32	309.23	315.82		
14-Dec-15						318.46	Dry	Dry	302.40	Dry	285.35	285.92		308.68	285.08	315.46	315.39		317.09	317.37	317.30	284.39	309.40	316.66		
8-Mar-16						318.81	Dry	313.29	302.40	Dry	286.61	287.24		308.82	285.87	315.38	315.30		317.73	317.97	317.45	285.18	309.39	317.67	286.67	
29-Mar-16						318.84	Dry	313.45	302.35	Dry	286.75	287.33		309.06	285.91	315.28	315.20		317.92	318.31	317.44	285.29	309.29	317.71	287.07	
27-Apr-16						318.77	Dry	311.97	302.53	Dry	287.47	288.33		309.16	286.50	315.35	315.18		317.31	317.82	317.47	285.77	309.48	317.63	NA	
31-May-16						318.41	Dry	Dry	302.49	Dry	286.40	287.22		308.53	285.79	315.35	315.27		317.27	317.28	317.23	285.05	309.44	317.29	286.08	
29-Jun-16						318.05	Dry	Dry	302.38	Dry	285.89	286.56		308.65	285.41	315.34	315.27		316.43	316.93	316.87	284.69	309.33	316.49	285.57	
27-Jul-16						317.60	Dry	Dry	302.25	Dry	285.52	286.12		308.71	285.18	315.31	315.25		316.04	316.63	316.18	284.46	309.13	315.38	285.22	
4-Oct-16						317.25	Dry	Dry	302.00	Dry	284.97	285.49		308.83	284.73	315.24	315.16		315.13	316.17	315.61	283.98	308.69	314.49	284.38	
13-Jan-17						318.14	Dry	313.13		Dry				308.71		315.14				318.14	316.67			316.11		
26-Apr-17						318.75	Dry	312.23	302.41	Dry	287.57	288.36		309.00	286.76	315.38	315.30		317.12	318.04	317.38	286.05	309.50	317.74	287.42	307.05
27-Sep-17						318.02	Dry	Dry	302.17	Dry	286.10	286.75		308.83	285.79	315.36	315.28		316.56	316.64	316.73	284.86	309.13	315.57		307.83
14-May-18						318.61	Dry	Dry	302.63	Dry	287.73	288.67		308.88	287.14	315.29	315.30		316.27	317.70	317.39	285.78	309.48	317.61		308.08
25-Oct-18						318.70	Dry	Dry	301.86	Dry	285.98	286.67		309.38	285.61	315.36	315.19		316.09	317.47	317.23	284.69	309.28	316.39		308.57
27-May-19						318.84	Dry	312.47	302.35	Dry	288.25	313.76		309.26	287.33	315.37	315.27		316.14	318.35	317.47	286.34	309.48	317.68		309.57
22-Oct-19						317.78	Dry	Dry	301.94	Dry	285.95	313.88		309.34	285.84	315.37	315.31		315.99	316.99	316.49	284.88	309.03	315.12		309.68
21-May-20						317.55	Dry	Dry	302.11	Dry	287.17	313.68		309.19	Dry	315.37	315.31		316.01	318.04	317.34	Dry	309.34	317.48		309.91
29-Oct-20						317.76	Dry	Dry	301.90	Dry	285.52	313.33		309.37	278.49	315.44	315.31		315.79	316.73	316.44	284.51	308.94	314.84		309.89
2-Jun-21						317.96	Dry	Dry	301.95	Dry	284.77	296.19		308.23	285.51	315.13	314.97		314.83	NA	316.24	NA	308.41	316.21		308.70
5-Nov-21						320.01	Dry	312.67	301.84	Dry	287.26	313.37		309.24	285.79	316.38	316.32		315.86	318.14	317.56	NA	309.35	317.54		310.57

Notes:
NA - Not Available
All elevations measured in meters above mean sea level (m amsl).
Elevations previously reported relative to a local datum. Conversion: geodetic-198.86 m=local datum
Elevations for ground, reference, bottom and groundwater (1980-2012) provided by Conestoga-Rovers & Associates
Observation wells OW1-84, OW2-84, OW3-80, OW4-80, OW3-84, OW4-84, OW5-84, OW6-84 were resurveyed (reference & ground elevation) October 1994.
Observation wells OW25-91 and OW32-96 were resurveyed (reference & ground elevation) November 1999.
Observation wells OW1-80 and OW2-80 were sealed and abandoned in February 1993.
Observation wells OW3-80, OW4-80 and OW1-84 were sealed and abandoned in August 1996.
Observation well OW17-91 was sealed and abandoned in September 2006.
Observation wells OW8A-91 and OW8B-91 were repaired in August and resurveyed in November 2008
Observation well OW8B-91 was abandoned and replaced by OW8B-10 in October 2010 and resurveyed in November of 2010

Table 4 - Leaf and Yard Waste Analytical Results

Leaf and Yard Waste Analytical Results										
Parameter	Units	Category "AA" Criteria	RDL	Analytical Results						
				27-May-15	27-Apr-16	26-Apr-17	25-Oct-18	22-Oct-19	29-Oct-20	5-Nov-21
Arsenic	mg/kg	13	1	4	8	5	4	6	5	3
Cadmium	mg/kg	3	0.5	<0.5	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium	mg/kg	210	2	16	18	16	12	17	20	15
Cobalt	mg/kg	34	0.5	4.6	5.2	5	4.2	5.8	6.6	4.3
Copper	mg/kg	100	1	22	41	28	21	22	24	23
Lead	mg/kg	150	1	43	61	40	20	28	36	22
Mercury	mg/kg	0.8	0.1	<0.10	0.08	NA	<0.10	<0.10	<0.10	0.05
Molybdenum	mg/kg	5	0.5	0.8	1.2	1	0.9	1.1	0.7	0.7
Nickel	mg/kg	62	1	10	12	11	9	12	14	10
Selenium	mg/kg	2	0.8	<0.8	<0.8	<0.8	1.5	0.6	<0.8	<0.8
Zinc	mg/kg	500	5	113	285	111	75	82	89	87

Notes:
1. RDL - Reported Detection Limit
2. mg/kg - milligrams per kilogram
3. NA - not analyzed
4. RDL for Selenium was 0.4 mg/kg in 2018 & 2019 reporting periods

Table 5 - Leachate Indicator Parameters Concentrations in Background Wells (2012 to 2021)

Parameter	Units	Concentrations in Background Wells (2012 to 2021)		
		OW2-84 (overburden)	OW25-91 (overburden)	OW8A-91 (bedrock)
Chloride	mg/L	3.9 - 9.74	5.0 - 10.9	2.5 - 51.9
Conductivity (field)	µS/cm	152 - 391	270 - 748	302 - 1070
Hardness	mg/L	116 - 178	278 - 706	270 - 1230
DOC	mg/L	0.6 - 3.5	1.1 - 3.0	1.2 - 26.0
TKN	mg/L	<0.10 - 0.89	<0.10 - 0.71	NA
Iron	mg/L	<0.010 - 1.22	<0.010 - 1.01	NA
Manganese	mg/L	0.0017 - 0.059	0.025 - 0.051	NA
Boron	mg/L	0.100 - 0.121	0.043 - 0.101	NA

ND - not detected above the Reportable Detection Limit (RDL)

NA - parameter not analyzed

Parameter	Units	Background Concentration	
		Overburden	Bedrock
Chloride	mg/L	7.24	20.1
Conductivity (field)	µS/cm	464	763
Hardness	mg/L	247	441
DOC	mg/L	1.6	6.4
Nitrate	mg/L	0.198	0.08
Nitrite	mg/L	0.144	0.05
Iron	mg/L	0.420	NA
Manganese	mg/L	0.027	NA
Boron	mg/L	0.087	NA

Table 6 - Summary of Bedrock Groundwater Quality

Parameter	ODWS	RUC (Bedrock)	Background		Up/Crossgradient		Downgradient				Off-Site Domestic							
			Bedrock															
			OW8A-91		OW7-91		OW32A-02		OW9A-91		PW1		PW3		PW4		PW5	
	(mg/L)		Jun-21	Nov-21	Jun-21	Nov-21	Jun-21	Nov-21	Jun-21	Nov-21	Jun-21	Nov-21	Jun-21	Nov-21	Jun-21	Nov-21	Jun-21	Nov-21
Calcium	--	--	107	150	73.2	81.6			96.5	46.6								
Chloride	250	135.1	41.2	35.5	4.20	4.27			5.10	4.73								
Hardness	80-100	270.5	**362**	**476**	**400**	**446**			**345**	**253**								
Phenols	--	--	0.004	0.038	0.002	0.006			0.002	0.006								
Magnesium	--	--	23.1	24.6	52.7	58.8			25.2	33.1								
DOC	5.0	5.71	**8.8**	**5.6**	2.2	2.1			2	1.4								
Alkalinity	30-500	420	338	395	177	185			205	212								
Sulphate	500	--	--	--	--	--	NS	NS	--	--	NS	NS	NS	NS	NS	NS	NS	NS
Boron	5.0	--	--	--	--	--			--	--								
Iron	0.3	--	--	--	--	--			--	--								
Manganese	0.1	--	--	--	--	--			--	--								
Sodium	200	113.9	30.4	30.1	33.8	36.9			34	50.9								
Nitrate	10	2.56	<0.05	<0.05	0.64	0.52			1.07	1.38								
Nitrite	1.0	0.29	<0.05	<0.05	<0.05	<0.05			<0.05	<0.05								
BTEX			ND	ND	ND	ND			ND	ND								
Field Measurements																		
pH (Unitless)	6.5-8.5	--	7.09	7.12	7.55	--	NS	NS	--	7.62	NS	NS	NS	NS	NS	NS	NS	NS
Conductivity (uS/cm)	--	--	996	--	1174	--			--	--								

Notes:

1. ODWS = Ontario Drinking Water Standards (June 2003, Revised June 2006)
2. AO: Aesthetic Objective; OG = Operational Guideline; MAC = Maximum Acceptable Concentration; ISW: Insufficient Water; IMAC= Interim Maximum Acceptable Concentration
3. NV = No value specified, NS = No Sample, NM = Not Monitored
4. Values in bold represent results greater than the ODWS
5. Shaded values represent results greater than the Reasonable Use Criteria (RUC)
7. Results presented in mg/L unless otherwise specified; µS/cm = microsiemens per centimeter; µg/L = microsiemens per litre
8. BTEX = benzene, toluene, ethylbenzene and xylene
9. ND = BTEX RDL have not been exceeded (benzene= 5.0 µg/L; toluene=24µg/L, ethylbenzene=2.4µg/L, xylene=0.3µg/L)

Table 7 - Summary of Overburden Groundwater Quality

Parameter	ODWS	RUC (Overburden)	Leachate		Background				Up/Crossgradient											
			MH1	MH3	OW25-91		OW2-84		OW9B-91		OW15-91		OW21-91		OW32-96		OW33-96		OW34-96	
	(mg/L)		Jun-21	Nov-21	Jun-21	Nov-21	Jun-21	Nov-21	Jun-21	Nov-21	Jun-21	Nov-21	Jun-21	Nov-21	Jun-21	Nov-21	Jun-21	Nov-21	Jun-21	Nov-21
Calcium	--	--		178		74.2	26.2	23.8	24.1	54.0	22.5	25.0	83.9	64.7	43.2	41.7	31.9	31.8	56.7	54.1
Chloride	250	128.6		227		9.01	7.60	7.88	89	113	23.4	27.1	271	278	64.4	68.5	41.2	42.6	25.5	24.4
Hardness	80-100	173.5		--		**306**	**137**	**127**	**191**	**296**	**149**	**163**	**558**	**381**	**264**	**255**	**176**	**177**	**295**	**281**
Phenols	--	--		0.05		0.063	0.003	0.005	0.018	0.042	0.003	0.072	0.004	0.075	0.004	0.016	0.004	0.045	0.009	0.041
Magnesium	--	--		51.6		29.4	17.3	16.5	31.7	39.2	22.6	24.4	84.6	53.3	37.9	36.7	23.4	23.6	37.2	35.4
DOC	5.0	3.3		--		1.3	0.9	2.0	1.6	2.3	1.1	1.2	2.3	3.0	0.7	0.8	1.3	1.3	0.7	0.9
Alkalinity	30-500	363		**951**		284	163	163	190	255	216	219	216	234	225	223	219	217	231	230
Sulphate	500	275		116		69.5	21.6	22.9	81.9	74.6	29.4	31.7	115	117	10.9	10.0	19.0	20.0	89.5	91.0
Boron	5.0	1.32	DRY	--	DRY	0.065	0.100	0.118	0.329	0.342	0.770	0.537	0.147	0.139	0.100	0.098	0.205	0.217	0.078	0.085
Iron	0.3	0.360		**10.7**		<0.010	0.034	<0.010	0.054	<0.010	<0.010	0.012	0.012	<0.010	<0.010	<0.010	<0.010	<0.010	0.018	<0.010
Manganese	0.05	0.039		**0.839**		0.025	0.007	0.010	0.009	0.018	0.009	0.035	<0.002	0.004	0.003	<0.002	0.005	0.011	0.002	<0.002
Sodium	200	108.4		196		11.7	22.2	21.7	76.4	74.5	51.6	46.0	157	114	20.6	21.1	42.5	42.1	20.0	19.9
Nitrate	10	2.65		<0.14		<0.05	0.4	0.24	<0.05	<0.05	0.06	0.07	<0.05	<0.05	0.28	0.18	0.11	<0.05	<0.05	<0.05
Nitrite	1.0	0.36		--		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ammonia	--	--		87.6		0.09	<0.02	<0.02	0.02	0.17	0.04	0.14	<0.02	0.03	<0.02	<0.02	0.09	0.16	<0.02	0.06
TKN	--	--		91		0.71	0.40	0.14	0.37	0.39	0.64	0.15	0.14	0.71	0.19	0.79	0.47	0.56	0.27	<0.10
BTEX	--	--				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Field Measurements																				
pH (Unitless)	6.5-8.5	--	DRY	7.09	DRY	7.68	8.00	7.97	8.03	7.62	8.01	7.92	7.86	8.14	7.60	7.88	7.69	7.95	7.76	7.86
Conductivity (uS/cm)	--	--		--		--	391	--	928	--	620	--	1672	--	705	--	544	--	652	--

Parameter	ODWS	RUC (Overburden)	Off-Site Domestic		Downgradient									
			PW2		OW4-84		OW5-84		OW8B-10		OW36		MHB	
	(mg/L)		Jun-21	Nov-21	Jun-21	Nov-21	Jun-21	Nov-21	Jun-21	Nov-21	Jun-21	Nov-21	Jun-21	Nov-21
Calcium	--	--				110.0	55.4	48.5	74.5	72.3	114	120	86.8	
Chloride	250	128.6				0.5	52.2	43.8	7.75	7.72	22.8	22.2	125	
Hardness	80-100	173.5				**368**	**357**	**306**	**405**	**390**	**566**	**581**	**440**	
Phenols	--	--				0.044	0.005	0.046	0.005	0.046	0.003	0.040	0.003	
Magnesium	--	--				22.6	53.0	44.9	53.2	50.9	68.2	68.4	54.2	
DOC	5.0	3.3				**8.4**	1.1	1.1	1.5	1.7	1.0	1.3	4.7	
Alkalinity	30-500	363				367	236	231	247	252	256	291	303	
Sulphate	500	275				22.4	168	121	252	260	433	422	132	
Boron	5.0	1.32	NS	NS	DRY	0.022	0.149	0.149	0.125	0.143	0.193	0.207	0.137	NS
Iron	0.3	0.36				<0.010	0.015	<0.010	<0.010	<0.010	<0.010	0.011	0.030	
Manganese	0.05	0.039				<0.002	0.011	0.018	0.004	<0.002	0.018	0.004	**0.082**	
Sodium	200	108.4				2.7	33.4	29.3	37.2	37.5	48.1	48.8	48.9	
Nitrate	10	2.65				0.92	<0.05	<0.05	0.36	0.30	0.27	<0.05	<0.05	
Nitrite	1.0	0.36				<0.05	<0.05	<0.05	<0.05	0.20	<0.05	<0.05	<0.05	
Ammonia	--	--				<0.02	0.18	0.22	<0.02	<0.02	<0.02	0.04	0.26	
TKN	--	--				0.71	0.52	0.35	0.31	0.18	0.29	0.15	1.69	
BTEX	--	--				ND	ND	ND	ND	ND	ND	ND	ND	
Field Measurements														
pH (Unitless)	6.5-8.5	--	NS	NS	DRY	7.44	7.44	7.74	7.49	7.86	7.26	7.65	7.26	NS
Conductivity (uS/cm)	--	--				--	704	--	924	--	1354	--	1082	

Notes:

1. ODWS = Ontario Drinking Water Standards (June 2003, Revised June 2006)
2. AO: Aesthetic Objective; OG = Operational Guideline; MAC = Maximum Acceptable Concentration; ISW: Insufficient Water; IMAC= Interim Maximum Acceptable Concentration
3. NV = No value specified, NS = No Sample, NM = Not Monitored
4. Values in bold represent results greater than the ODWS
5. Shaded values represent results greater than the Reasonable Use Criteria (RUC)
7. Results presented in mg/L unless otherwise specified; µS/cm = microsiemens per centimeter; µg/L = microsiemens per litre
8. BTEX = benzene, toluene, ethylbenzene and xylene
9. ND = BTEX RDL have not been exceeded (benzene= 5.0 µg/L; toluene=24µg/L, ethylbenzene=2.4µg/L, xylene=0.3µg/L)

Table 8 - Summary of Surface Water Quality

Parameter	Units	CWQG	APV	PWQO	CREEK						PHASE I STORMWATER MANAGEMENT BASIN						PHASE II/III STORMWATER MANAGEMENT BASIN			
					Upgradient		Mid		Downgradient		Inlet		Intlet		Outlet		Inlet		Outlet	
					SP1-10		SP2-93		SP3-93		SP3A-94		SP5A-94		SP4A-94		SP1B-94		SP2B-94	
					Jun-21	Nov-21	Jun-21	Nov-21	Jun-21	Nov-21	Jun-21	Nov-21	Jun-21	Nov-21	Jun-21	Nov-21	Jun-21	Nov-21	Jun-21	Nov-21
Calcium	mg/L	--	--	--	15.9	161	29.2	93.6	42.4	95.9		88.3		134	36.7			131		
Chloride	mg/L	--	180	--	*415*	10.9	*356*	48.5	*349*	49.1		7.44		*188*	*355*			45.6		
Hardness	mg/L	--	--	--	108	506	152	300	190	307		298		455	176			426		
Phenols	mg/L	0.004	0.961	0.001	0.003	**0.009**	0.002	**0.011**	<0.001	**0.014**		**0.013**		**0.016**	0.002			**0.025**		
Field pH	pH	--	--	6.5-8.5	9.83	7.58	8.85	8.05	7.61	8.15		7.25		8.24	7.96			7.58		
Field Conductivity	µS/cm	--	--	--	2274	--	1975	--	1932	--		--		--	2109			--		
Magnesium	mg/L	--	--	--	16.7	25.3	19.1	16.10	20.5	0.02		18.9		29.3	20.6			24.0		
TDS	mg/L	--	--	--	816	328	902	428	908	386		322		736	936			492		
BOD5	mg/L	--	--	--	<2	19	2	<2	<2	<2		5		<2	<2			4		
Ammonia	mg/L	--	--	--	0.12	0.11	0.02	<0.02	0.02	<0.02		0.02		<0.02	0.07			1.33		
Field Temperature	0C	5.5-9.5	--	--	**22.2**	7.17	**24.3**	**10.8**	**23.2**	**11.0**	DRY	7.55	DRY	6.68	**27.2**	DRY	DRY	6.01	DRY	DRY
Unionized Ammonia	µg/L	19	--	20	0.758	0.001	0.276	<0.001	0.020	<0.001		<0.001		<0.001	0.057			0.007		
Iron	mg/L	0.3	--	0.3	0.265	**21.8**	**0.650**	0.157	**0.922**	0.159		**1.93**		0.17	**1.17**			**2.84**		
Manganese	mg/L	--	--	--	0.055	3.11	0.063	0.022	0.171	0.020		0.304		0.033	0.205			0.277		
Alkalinity	mg/L	--	--	--	194	294	186	271	211	270		269		396	200			328		
Sodium	mg/L	--	--	--	154	2.85	146	29.7	145	30.6		4.29		111	151			32.6		
Nitrate as N	mg/L	13	--	--	<0.07	0.33	<0.07	2.81	<0.07	2.83		<0.05		0.19	<0.07			1.68		
Nitrite as N	mg/L	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		<0.05		<0.05	<0.05			<0.05		
Turbidity(1)	NTU	--	--	--	7.1	512	11.9	5.4	6.9	3.9		16.8		3.3	15.0			14.9		
Total Phosphorus	mg/L	0.02	--	0.03	**0.19**	**1.33**	**0.12**	**0.07**	**0.14**	**0.07**		**1.08**		<0.02	**0.14**			**0.23**		
TSS	mg/L	--	--	--	<10	324	21	<10	11	<10		59		<10	72			30		

Notes:
Shaded values exceed the PWQO
Value in *italics* exceed the APV
Bold values exceed the CWQG

Table 9 - Vertical Gradients

Vertical Gradients				
Shallow Well	**OW8B-10**	**OW9B-91**	**OW4-84**	**OW34-96**
Top of Screen	308.9	312.56	312.23	314.83
Bottom of Screen	307.99	311.64	311.47	311.78
June Water Level	308.23	315.13	NA	316.21
Nov Water Level	309.24	316.38	312.67	317.54
Deep Well	**OW8A-91**	**OW9A-91**	**OW7-91**	**OW33-96**
Top of Screen	283.42	278.89	277.01	308.77
Bottom of Screen	281.89	277.36	275.49	307.25
June Water Level	296.19	285.51	284.77	308.41
Nov Water Level	NA	285.79	287.26	309.35
Gradients				
June-21 Gradients	**-0.46**	**-0.86**	**NA**	**-1.72**
Nov-21 Gradients	**NA**	**-0.89**	**-0.71**	**-1.81**

Notes:

- downward gradient

Table 10 - MH B Historical Groundwater Quality Results

MH B Historical Groundwater Quality Results											
Parameter	Units	RUC	PWQO	RDL	Sep-17	Oct-18	May-19	Oct-19	May-20	Oct-20	Jun-21
Chloride	mg/L	128.6	-	0.1	112	104	120	111	127	126	86.8
Hardness	mg/L	173.5	-	0.5	443	435	434	431	438	287	440
Alkalinity	mg/L	363	-	5	303	259	298	295	300	306	303
pH	pH	-	6.5-8.5		7.39	7.50	7.16	7.33	7.12	7.43	7.26
Phenols	mg/L	-	0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.003	0.003
DOC	mg/L	3.3	-	0.5	4.3	4.5	4.7	4.2	4.7	4.8	4.7
Boron	mg/L	1.32	0.2	0.01	0.107	0.106	0.124	0.132	0.128	0.15	0.137
Iron	mg/L	0.36	0.3	0.01	1.06	<0.01	<0.010	<0.010	0.041	0.045	0.03
Manganese	mg/L	0.039	-	0.002	0.092	0.042	0.120	0.046	0.040	0.042	0.082
Ammonia (unionized)	mg/L	-	0.02	0.02	0.001	<0.001	0.001	NA	0.001	0.001	0.001
Benzene	µg/L	-	100	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Ethylbenzene	µg/L	-	-	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	µg/L	-	-	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Xylene	µg/L	-	-	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2

Notes:

1. RDL - Reported Detection Limit
2. Highlighted values exceed the RUC
3. Red values exceed the PWQO
4. NA - not analyzed
5. Ammonia RDL is for total ammonia. The PWQO and analytical results are for unionized ammonia
6. Values for unionized ammonia are calculated based on total ammonia, pH, and temperature

Table 11 - Summary of Duplicate RPD Analysis Results

Parameter	Units	Spring 2021				Fall 2021			
		Sample ID	Sample	Duplicate	Relative % Difference	Sample ID	Sample	Duplicate	Relative % Difference
Inorganics									
Calcium	mg/L	OW2-84	26.2	25.9	1.2	OW2-84	23.8	24.1	1.3
Chloride	mg/L	OW5-84	52.2	51.1	2.1	OW8B-91	7.72	7.75	0.4
Phenols	mg/L	OW9B-91	0.018	0.018	0.0	SP1-10	0.009	0.008	11.8
Magnesium	mg/L	OW2-84	17.3	17.2	0.6	OW2-84	16.5	16.8	1.8
DOC	mg/L	OW15-91	1.1	1.1	0.0	OW2-84	2.0	2.1	4.9
Alkalinity	mg/L	OW7-91	177	178	0.6	MH3	951	968	1.8
Sulphate	mg/L	OW5-84	168	164.0	2.4	OW8B-91	260	261	0.4
Boron	mg/L	OW2-84	0.100	0.112	11.3	OW2-84	0.118	0.122	3.3
Iron	mg/L	OW2-84	0.034	0.03	0.0	OW2-84	<0.010	<0.010	NC
Manganese	mg/L	OW2-84	0.007	0.011	**44.4**	OW2-84	0.01	0.01	0.0
Sodium	mg/L	OW2-84	22.2	22.2	0.0	OW2-85	21.7	21.9	0.9
Nitrate	mg/L	OW5-84	<0.05	<0.05	NC	OW8B-91	0.3	0.31	3.3
Nitrite	mg/L	OW5-84	<0.05	<0.05	NC	OW8B-91	0.17	0.17	0.0
Ammonia	mg/L	MHB	0.26	0.24	8.0	OW15-91	0.14	0.15	6.9
TKN	mg/L	OW2-84	0.4	0.46	14.0	-	-	-	-

Notes:

1. "-" indicates a parameter that did not have a duplicate analysis conducted.

2. NC indicates that the RPD was not calculated. The level of analyte detected in its parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.

3. Values in exceedence of the RPD guidelines are displayed in **bold.**

Table 12 - Summary of Leachate Quality

Leachate Analytical Results - November 2021					
Parameter	**Units**	**Sewer Use By-Law**	**RDL**	**Phase I - MH1**	**Phase II/III - MH3**
Bromodichloromethane	µg/L		0.40	DRY	<0.40
Bromoform	µg/L		0.20		<0.20
Bromomethane	µg/L		0.40		<0.40
Carbon Tetrachloride	µg/L		0.40		<0.40
Chlorobenzene	µg/L		0.20		<0.20
Dibromochloromethane	µg/L		0.20		<0.20
Chloroethane	µg/L		0.40		<0.40
Chloroform	µg/L	40	0.40		<0.40
Chloromethane	µg/L		0.80		<0.80
1,2-Dichlorobenzene	µg/L	50	0.20		<0.20
1,3-Dichlorobenzene	µg/L		0.20		<0.20
1,4-Dichlorobenzene	µg/L	80	0.20		<0.20
1,1-Dichloroethane	µg/L		0.60		<0.60
1,2-Dichloroethane	µg/L		0.40		<0.40
1,1-Dichloroethylene	µg/L		0.60		<0.60
Methylene Chloride	µg/L	90	0.60		<0.60
trans-1,2-Dichloroethylene	µg/L		0.40		<0.40
1,2-Dichloropropane	µg/L		0.40		<0.40
cis-1,3-Dichloropropene	µg/L		0.40		<0.40
trans-1,3-Dichloropropene	µg/L		0.60		<0.60
1,1,2,2-Tetrachloroethane	µg/L	60	0.20		<0.20
Tetrachloroethylene	µg/L	60	0.40		<0.40
1,1,1-Trichloroethane	µg/L		0.60		<0.60
1,1,2-Trichloroethane	µg/L		0.40		<0.40
Trichloroethylene	µg/L	50	0.40		<0.40
Trichlorofluoromethane	µg/L		0.80		<0.80
Vinyl Chloride	µg/L		0.34		<0.34
Benzene	µg/L	10	0.40		**0.64**
m,p-Xylenes	µg/L		0.40		**6.11**
Ethylbenzene	µg/L	60	0.20		**1.90**
Toluene	µg/L	20	0.40		**3.80**
o-Xylene	µg/L		0.20		**2.05**
Xylenes (Total)	µg/L	300	0.40		**8.16**

Notes:
1. RDL - Reported Detection Limit
2. Values in **bold** are above the RDL
3. Shaded values are above the Town of St. Mary's Sewer Use By-Law No. 46 of 2014 Appendix E

Table 13 - Summary of Stream Flows

Location		Upstream		Basin B		Midstream	Basin A			Downstream	
		SP1-10*		SP1B-94 (Inlet)	SP2B-94 (Outlet)	SP2-93	SP3A-94 (South Inlet)	SP5A-94 (North Inlet)	SP4A-94 (Outlet)	SP3-93	
Reference Elevation		311.240	Flow	314.63	(2)	310.190	314.42	314.62	(2)	310.32 (Shallow) 309.38 (Deep)	Flow Measurement (4)
Feb-93		310.01				309.2				308.44	
Sep-94		310.06		312.45	Dry	309.39	Dry	Dry	Dry	308.9	12.7 L/s
Apr-95		310.25		313.56	Flowing	309.64	313.81	313.48	Flowing	309.23	170 L/s
Sep-95		310.06		312.49	Dry	309.33	Dry	Dry	Dry	309.25	28 L/s
Oct-95	3	310.17		NA	Flowing	309.48	--	313.08	Flowing	309.13	130 L/s
Apr-96		310.19		NA	Flowing	309.49	Dry	Dry	Flowing	309.04	160 L/s
Sep-96		310.08		312.57	Dry	309.32	Dry	Dry	Dry	308.87	9 L/s
Oct-96	3	310.23		NA	Flowing	309.52	313.54	313.03	Flowing	309.11	230 L/s
Apr-97		310.11		313.37	Flowing	309.35	313.63	313.02	Flowing	308.96	58.6 L/s
Sep-97		309.95		NA	Flowing	309.19	Dry	Dry	Flowing	NA	4.7 L/s
Apr-98	3	310.11		NA	Flowing	309.42	313.51	313.06	Flowing	309.06	118 L/s
Apr-98		310.01		312.64	Flowing	309.29	Dry	313.01	Flowing	309.03	220 L/s
Sep-98		309.91		312.1	Flowing	309.22	Dry	Dry	Dry	NA	10 L/s
Apr-99		310.05		312.60	Flowing	309.37	Dry	Flowing	Flowing	309.07	60 L/s
Jun-99	3	310.12		313.33	Flowing	309.41	Dry	Flowing	Flowing	309.06	35 L/s
Sep-99		310.00		313.01	Flowing	309.28	Dry	Dry	Dry	309.01	41 L/s
Apr-00		310.05		313.54	Flowing	309.44	Dry	313.23	Flowing	309.04	146 L/s
Jun-00	3	310.46		313.74	Flowing	310.05	313.69	313.54	Flowing	>309.38	4012 L/s
Sep-00		310.03		313.59	Flowing	309.44	313.77	313.62	Flowing	309.01	98 L/s
Apr-01		310.02		313.39	Flowing	309.70	314.03	313.81	Flowing	309.05	89 L/s
Jun-01	3	310.01		313.49	Dry	309.73	Dry	312.54	Dry	309.08	784 L/s
Sep-01		309.92		Dry	Dry	309.54	Dry	Dry	Dry	308.99	17 L/s
Apr-02		309.96		313.58	Dry	309.61	314.14	313.92	Flowing	Dry	143.62 L/s
Sep-02		309.88		Dry	Dry	309.45	Dry	Dry	Dry	Dry	31.16 L/s
Apr-03		309.93		313.43	Flowing	309.69	Dry	Dry	Dry	309.06	118.52 L/s
Jun-03	3	309.93		313.6	Flowing	309.65	Flowing	Flowing	Flowing	309.06	42.08 L/s
Sep-03		309.82		Dry	Dry	309.50	Dry	Dry	Dry	Dry	28.15 L/s
May-04		309.86		NA		309.81	314.21	NA	Dry	NA	504 L/s
Sep-04		309.78		No Flow	No Flow	309.51	Dry	Dry	Dry	Dry	3.54 L/s
Apr-05		309.89		Bent	No Flow	309.73	Too Deep/No Flow	Too Deep/Low flow	Flowing	309.07	168 L/s
Jul-05	3	309.83		313.41	Flowing	309.66	Dry	Dry	Flowing	NA	NA
Nov-05		309.83		313.51	Flowing	309.67	Dry	Dry	Flowing	NA	20 L/s
Apr-06		310.05		313.18	Flowing	309.70	Too Deep	Flowing	Flowing	309.03	66 L/s
Jul-06	3	310.62		313.48	Flowing	Too Deep	Too Deep	313.73	Flowing	NA	NA
Nov-06		309.98		313.19	Flowing	309.77	Too Deep/No Flow	Flowing	Flowing	309.05	51 L/s
Apr-07		310.00		Dry	Flowing	309.78	313.97	Too Deep/Flowing	Flowing	Dry	69.23 L/s
Nov-07		309.77		313.64	Flowing	Dry	Dry	Dry	Dry	Dry	9.01 L/s
Apr-08		309.98		313.70	Flowing	309.77	T-Bar Removed	Dry	NA	Dry	97.01 L/s
Aug-08		309.94		313.76	Flowing	309.74	Dry	Dry	Flowing	Dry	105.0 L/s
Nov-08		310.23		313.74	Flowing	309.97	Flowing	Flowing	Flowing	309.25	398.82 L/s
Apr-09		310.42		313.49	Flowing	309.85	Dry	Flowing	Flowing	309.15	324.72 L/s
Nov-09		NA		313.20	Flowing	309.36	Dry	Dry	Flowing	Dry	15.41 L/s
Mar-10		309.88		313.79	Flowing	309.69	Dry	Flowing	Flowing	Dry	49.34 L/s
Nov-10		NA		313.84	Flowing	309.78	Dry	Flowing	Flowing	309.255	310.50 L/s
Mar-11		310.39		313.73	Flowing	309.56	Dry	Dry	Flowing	308.88	528.48 L/s
Oct-11		310.08		313.83	Flowing	T-Bar Missing	Dry	Dry	Flowing	309.01	217.41 L/s
Dec-11		310.47		313.84	Flowing	T-Bar Missing	Dry	Dry	Flowing	Dry	639.20 L/s
Apr-12		310.35		313.73	Flowing	Dry	Dry	Dry	Flowing	Dry	48.0 L/s
Aug-12		310.08		313.83	Flowing	T-Bar Missing	Dry	Dry	Flowing	309.01	40.0 L/s
Nov-12		310.47		313.84	Flowing	T-Bar Missing	Dry	Dry	Flowing	Dry	11.12 L/s
May-13		310.83		313.82	Flowing	309.52	Ponded	Dry	Flowing	308.95	(6)
Oct-13		310.94		313.86	Flowing	NA	Ponded	Dry	Flowing	308.98	170.57 L/s
Jun-14		310.79		Trickle	Dry	309.43	Dry	Dry	Dry	308.95	3.13 L/s
Nov-14		310.83		313.87	Flowing	309.55	Ins	Dry	Flowing	309.07	13.61 L/s
May-15		310.80		Trickle	Dry	309.52	Ponded	Dry	Dry	308.91	1.49 L/s
Sep-15		310.75		Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
Mar-16		310.93	167.27 L/s			309.74				309.05	170.55 L/s
Apr-16		310.82	15.04 L/s		Flowing	309.57	Ponded	Dry	Flowing	308.79	16.47 L/s
May-16		310.81	8.88 L/s			309.50				308.73	10.60 L/s
Jun-16		310.79	1.71 L/s			309.44				Dry	0.64 L/s
Jul-16		310.77	Ins			Dry				Dry	Dry
Oct-16		310.80	Ins	Dry	Dry	309.45	Dry	Dry	Dry	308.94	1.84 L/s
Apr-17		310.84	21.0 L/s	313.89	Flowing	309.64	Ponded	Ins	Flowing	309.14	28.8 L/s
Sep-17		310.78	1.43 L/s	313.87	Dry	Dry	Dry	Dry	Dry	308.93	Ins
May-18		--	Low Flow	Low Flow	Low Flow	Low Flow	Ponded	Dry	Flowing	--	Flowing
Oct-18		--	Low Flow	Low Flow	Low Flow	Low FLow	Ponded	Dry	Flowing	--	Flowing
May-19			Standing	Flowing	0.30 m/s	0.31 m/s	Ponded	Dry	0.29 m/s		0.21 m/s
Oct-19			0.19 m/s	0.13 m/s	0.12 m/s	0.13 m/s	Dry	Dry	0.16 m/s		0.14 m/s
May-20			0.30 m/s	Flowing	0.14 m/s	0.16 m/s	Stagnant	Dry	0.15 m/s		0.15 m/s
Oct-20			Flowing	Ponded	Dry	Flowing	Dry	Dry	Low Flow		Low Flow
Jun-21			Low Flow	Stagnant	Stagnant	Low Flow	Stagnant	Dry	Low Flow		Low Flow
Nov-21			Low Flow	Ponded	Stagnant	Low Flow	Ponded	Low Flow	Dry		Low Flow

Notes:

Reference elevation refers to top of staff gauge (T-bar) elevation based on most recent survey information of top of staff gauge.

*	SP1-10 replaced SP1-93 after the Town took ownership of the Site property in 2009		
**	Reference elevation - top of culvert - Surveyed October 12, 2006 used for SP1B as of July 2005.		
(1)	T -bar removed during reconstruction of Retention Pond.	(4)	Rectangular channel cross section assumed
(2)	Water levels are not recorded. Dry or flowing conditions are noted.	(5)	T-Bar elevation not consistent with historical information; Resurveyed in 2009
(3)	Water levels recorded after rainfall event.	(6)	Flow meter did not work properly
Ins	Insufficient water to obtain a sample or flow measurement	Dry	Dry at T-bar
NA	T-bar not accessible (area flooded, bent or missing T-bar, overgrowth of weeds)		

FIGURES

TOWN OF
ST. MARY'S

N

LEGEND

SITE BOUNDARY

SITE LOCATION

2021 ST. MARY'S
ANNUAL MONITORING
REPORT

Figure No. 1

GM BluePlan ENGINEERING

318007

MARCH 2022

N.T.S.

Source: R.J. Burnside & Associates. (2017). St. Mary's Landfill Annual Monitoring Report.

TOWN OF
ST. MARY'S

N

LEGEND

- PROPERTY BOUNDARY
- LIMIT OF REFUSE DISPOSAL
- WATERCOURSE
- LEACHATE COLLECTION SYSTEM
- OBSERVATION WELL
- OBSERVATION WELL (ABANDONED AND SEALED)
- BOREHOLE
- PRIVATE DOMESTIC WELL (APPROXIMATE LOCATION)
- SURFACE WATER MONITORING LOCATION
- TEST PIT
- DRIVE POINT PIEZOMETER
- MONITORING WELL (REMOVED FROM MONITORING PROGRAM)
- MONITORING WELL (NOT SAMPLED)
- MONITORING WELL (SOURCE UNKNOWN)
- STORM WATER MANAGEMENT BASIN
- RELOCATED WASTE FROM DROP-OFF AREA CONSTRUCTION (2013)
- CELL NUMBER
- CELL
- AREA OF FINAL COVER (AS PER CRA)

SITE PLAN

2021 ST. MARY'S ANNUAL MONITORING REPORT

Figure No. 2

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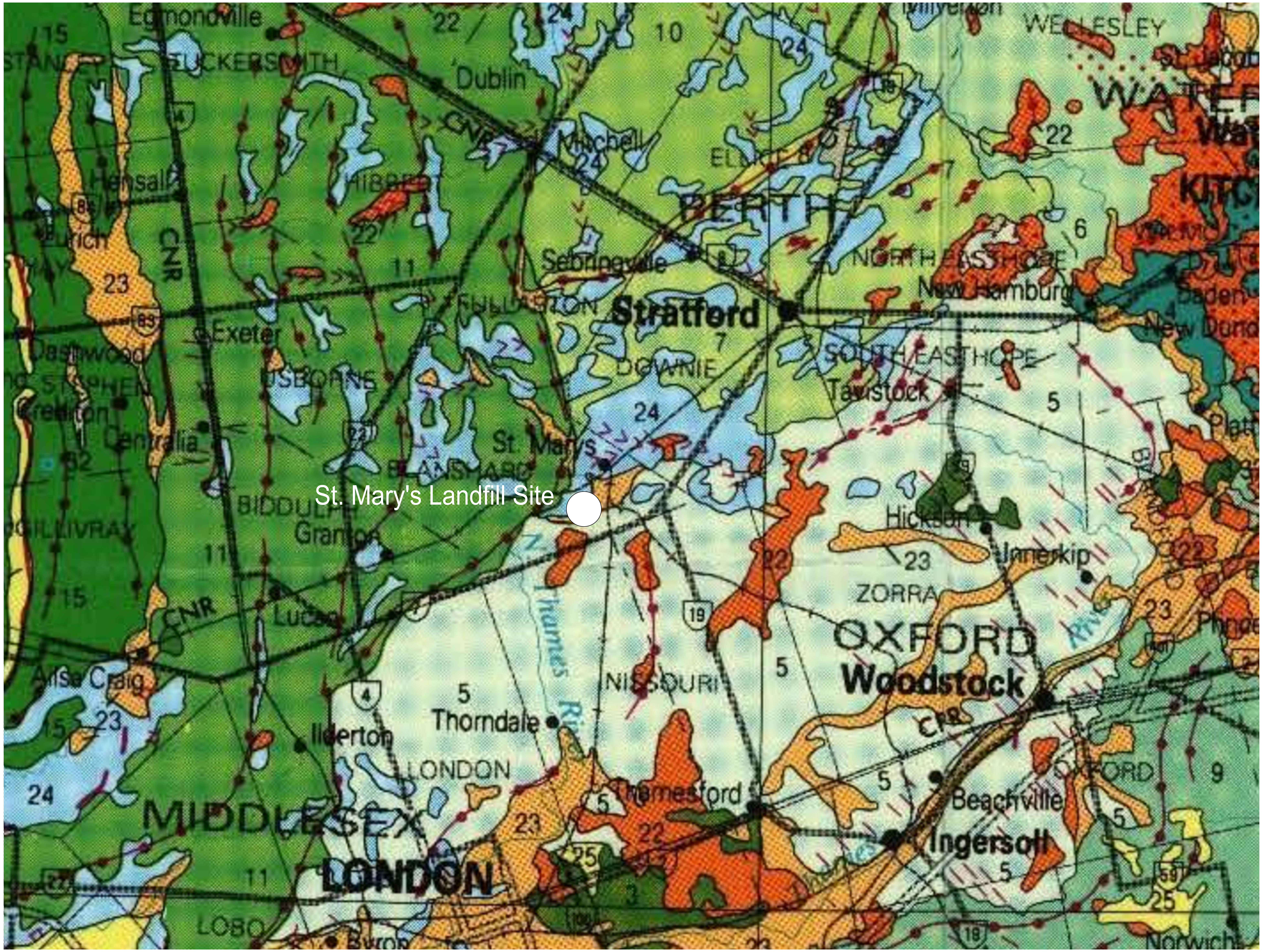
318007

MARCH 2022

N.T.S.



Source: Map 2556, Quaternary Geology of Southern Ontario. Ontario Geological Survey. Ministry of Northern Development and Mines.

TOWN OF
ST. MARY'S

N

LEGEND

Unit	Description
28	**Fluvial deposits:** gravel, sand, silt and clay; deposited on abandoned flood plains, terrace remnants
27	**Glaciomarine and marine deposits:** sand, gravelly sand and gravel; nearshore and beach deposits
26	**Glaciomarine and marine deposits:** silt and clay; basin and quiet water deposits
25	**Glaciolacustrine deposits:** sand, gravelly sand and gravel; nearshore and beach deposits
24	**Glaciolacustrine deposits:** silt and clay, minor sand; basin and quiet water deposits
23	**Glaciofluvial outwash deposits:** gravel and sand; includes proglacial river and deltaic deposits
22	**Glaciofluvial ice-contact deposits:** gravel and sand; minor till; includes esker, kame, end moraine, ice-marginal delta and subaqueous fan deposits
8	**Wartburg Till (Huron–Georgian Bay lobe):** silty clay matrix, high carbonate content in matrix, clast poor
7	**Stratford Till (Huron–Georgian Bay lobe):** sandy silt matrix, strongly calcareous, moderately stony
6	**Mornington Till (Huron–Georgian Bay lobe):** silty clay matrix, moderate to high matrix carbonate content, clast poor.
5	**Tavistock Till (Huron–Georgian Bay lobe):** sandy silt to silt matrix, silty clay matrix in south and in north, moderate to high carbonate content, clast content decreases from moderate to poor northward
4	**Maryhill Till (Erie lobe):** silty clay to clay matrix, moderate to high matrix carbonate content, clast poor
3	**Catfish Creek Till:** sandy silt to silt matrix, strongly calcareous, moderately stony to stony

SURFICIAL
GEOLOGY

2021 ST. MARY'S
ANNUAL MONITORING
REPORT

Figure No. 3

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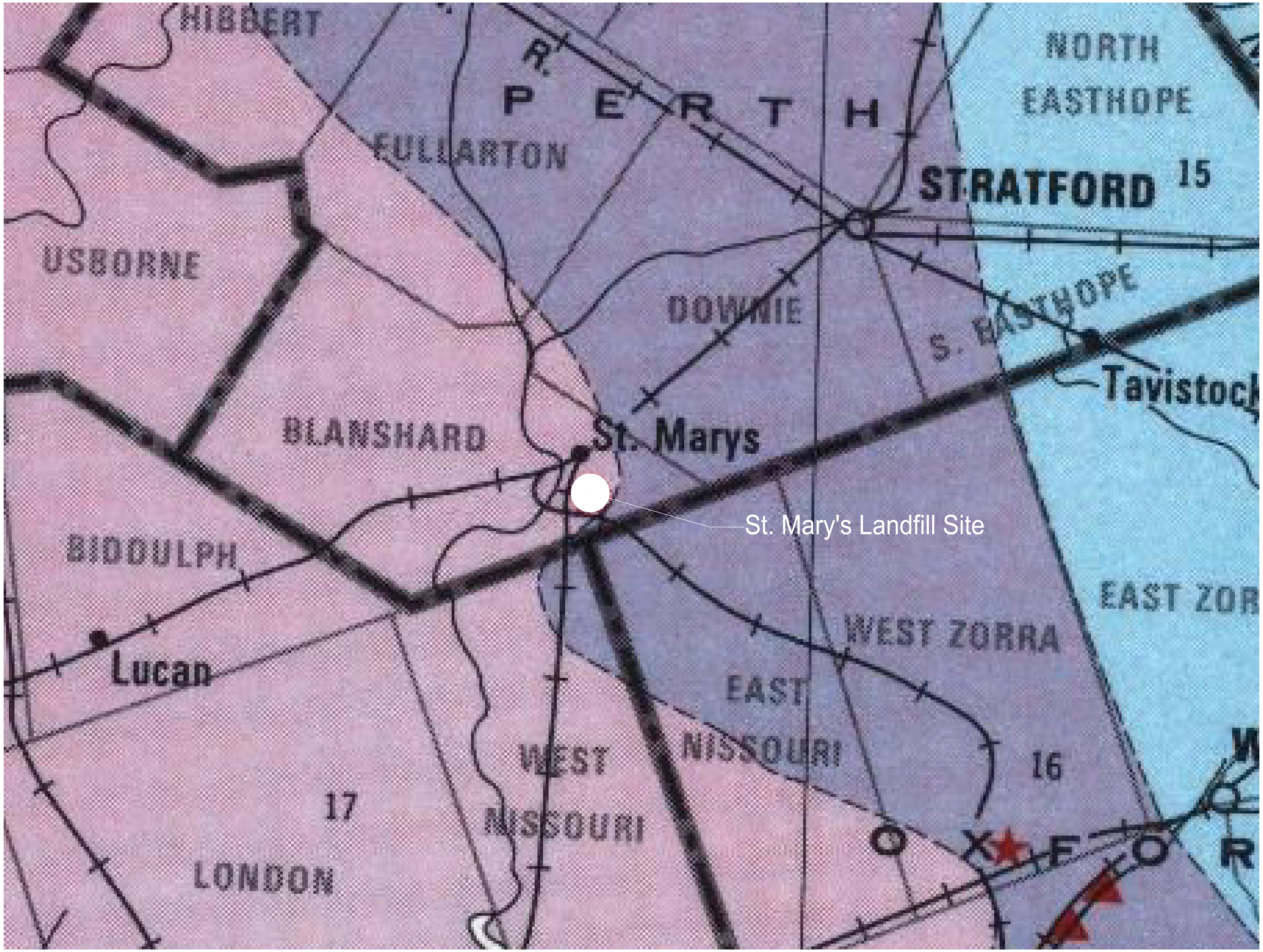
MARCH 2022

N.T.S.



Source: Map 2254, Paleozoic Geology of Southern Ontario. Geological Survey of Canada. Ministry of Natural Resources.

TOWN OF
ST. MARY'S

N

LEGEND

PALEOZOIC
DEVONIAN
UPPER DEVONIAN
PORT LAMBTON FORMATION
20 Grey shale and sandstone.
KETTLE POINT FORMATION
19 Black shale.
MIDDLE DEVONIAN
HAMILTON FORMATION
18 Grey shale and limestone.
DUNDEE FORMATION
17 Limestone.
DETROIT RIVER GROUP
16 Limestone and dolomite.
BOIS BLANC FORMATION
15 Cherty limestone.

BEDROCK
GEOLOGY

2021 ST. MARY'S
ANNUAL MONITORING
REPORT

Figure No. 4

GM BluePlan ENGINEERING

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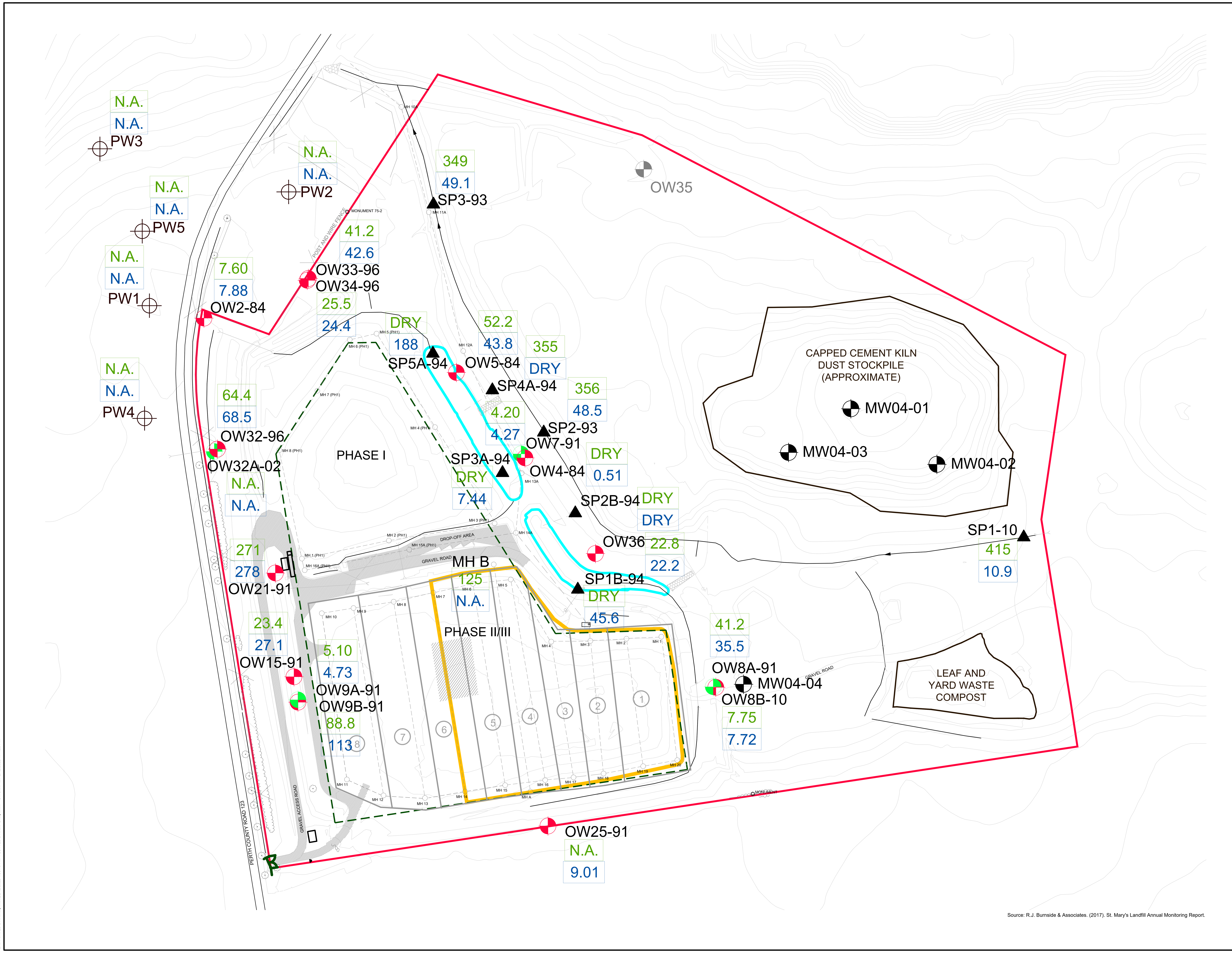
MARCH 2022

N.T.S.



TOWN OF
ST. MARY'S

N

LEGEND

- PROPERTY BOUNDARY
- LIMIT OF REFUSE DISPOSAL
- WATERCOURSE
- LEACHATE COLLECTION SYSTEM
- LEACHATE MANHOLE
- OVERBURDEN WELL
- BEDROCK WELL
- PRIVATE DOMESTIC WELL (APPROXIMATE LOCATION)
- MONITORING WELL (NOT SAMPLED)
- MONITORING WELL (SOURCE UNKNOWN)
- SURFACE WATER MONITORING LOCATION
- STORM WATER MANAGEMENT BASIN

CHLORIDE CONCENTRATIONS:
4.34 MAY 2021
3.92 OCTOBER 2022

CHLORIDE CONCENTRATIONS

2021 ST. MARY'S ANNUAL MONITORING REPORT

Figure No. 5

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MARCH 2022

N.T.S.

TOWN OF
ST. MARY'S

N

LEGEND

OVERBURDEN WELLS

BEDROCK WELLS

MONITORING WELLS (APRIL 2017 DATA)

STORMWATER BASINS

WATERCOURSE

WATER LEVEL CONTOURS

GROUNDWATER FLOW DIRECTION

WATER LEVEL ON NOV. 5, 2021

OVERBURDEN GROUNDWATER FLOW

2021 ST. MARY'S ANNUAL MONITORING REPORT

Figure No. 6

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MARCH 2022

N.T.S.

TOWN OF
ST. MARY'S

N

LEGEND

OVERBURDEN WELLS

BEDROCK WELLS

MONITORING WELLS (APRIL 2017 DATA)

STORMWATER BASINS

WATERCOURSE

WATER LEVEL CONTOURS

GROUNDWATER FLOW DIRECTION

WL - WATER LEVEL ON NOV. 5, 2021

BEDROCK GROUNDWATER FLOW

2021 ST. MARY'S ANNUAL MONITORING REPORT

Figure No. 7

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MARCH 2022

N.T.S.

TOWN OF
ST. MARY'S

N

LEGEND

- OVERBURDEN WELLS
- BEDROCK WELLS
- MONITORING WELLS (APRIL 2017 DATA)
- STORMWATER BASINS
- WATERCOURSE
- CROSS SECTION LOCATIONS

AERIAL PHOTOGRAPH AND CROSS-SECTION LOCATION PLAN

2021 ST. MARY'S ANNUAL MONITORING REPORT

Figure No. 8

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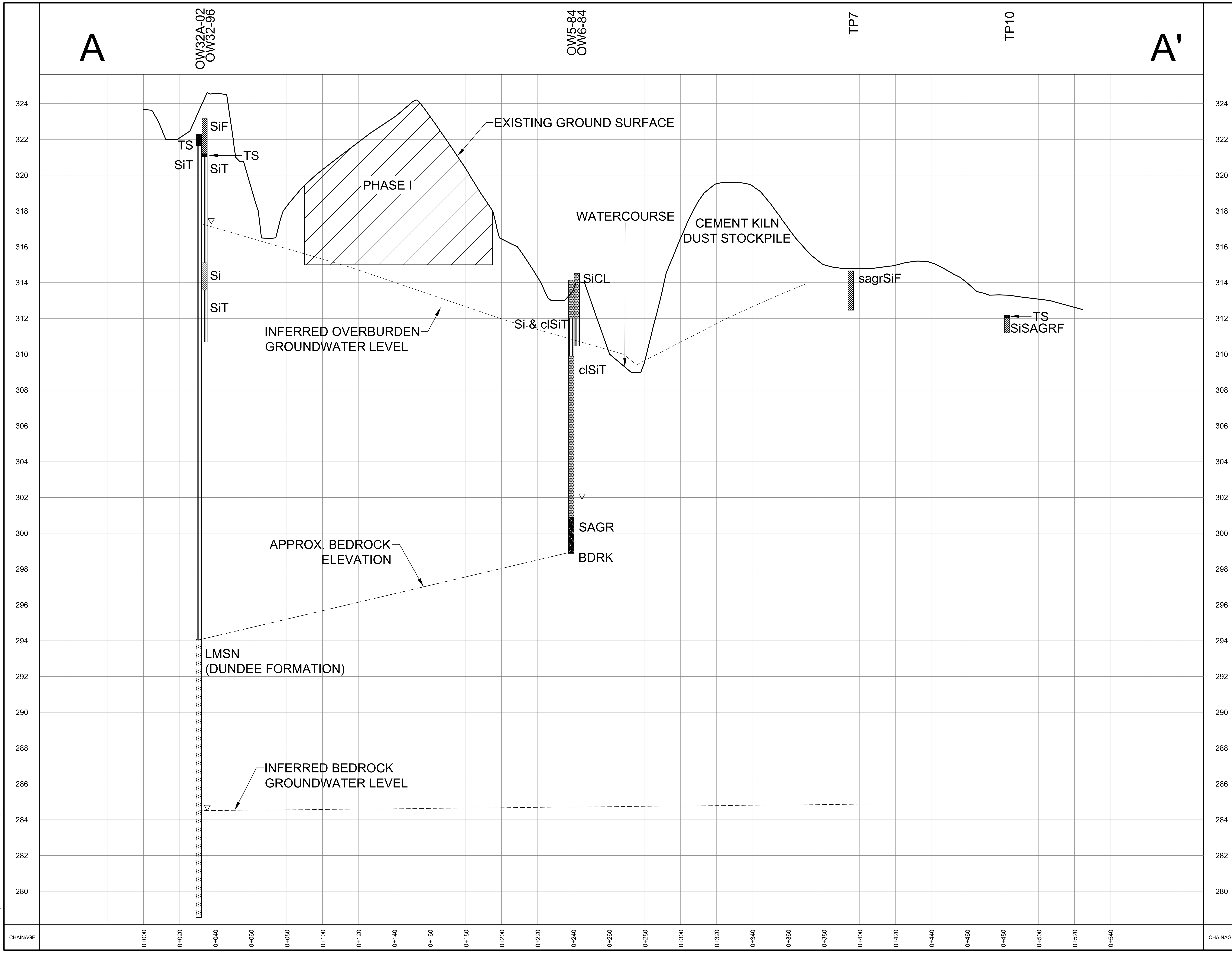
MARCH 2022

N.T.S.



TOWN OF
ST. MARY'S

LEGEND

▽ MEASURED WATER LEVEL (NOVEMBER 2021)

GEOLOGICAL STRATIGRAPHY

OBSERVATION WELL / BOREHOLE

MONITORING WELL WATER LEVEL (APRIL 2017)

cl	clayey	CL	CLAY
si	silty	Si	SILT
sa	sandy	SA	SAND
gr	gravelly	GR	GRAVEL

TS	TOPSOIL
T	TILL
F	FILL
LMSN	LIMESTONE
BDRK	BEDROCK
LAC	LACUSTRINE
GLAC	GLACIOLACUSTRINE

GEOLOGICAL
CROSS SECTION A-A'

2021 ST. MARY'S
ANNUAL MONITORING
REPORT

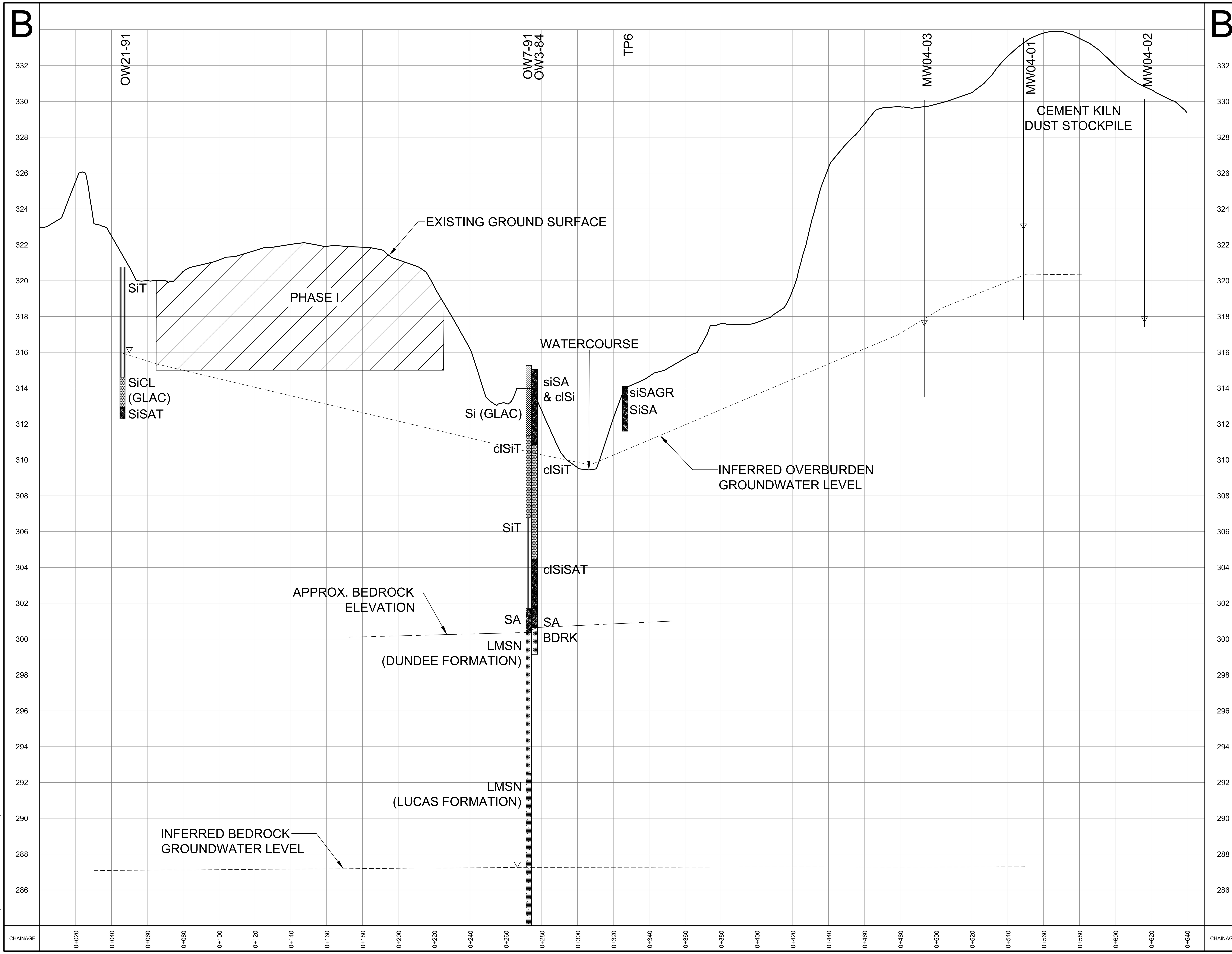
Figure No. 9

BluePlan ENGINEERING

318007

MARCH 2022

N.T.S.



TOWN OF
ST. MARY'S

GEOLOGICAL
CROSS SECTION B-B'

2021 ST. MARY'S
ANNUAL MONITORING
REPORT

Figure No. 10

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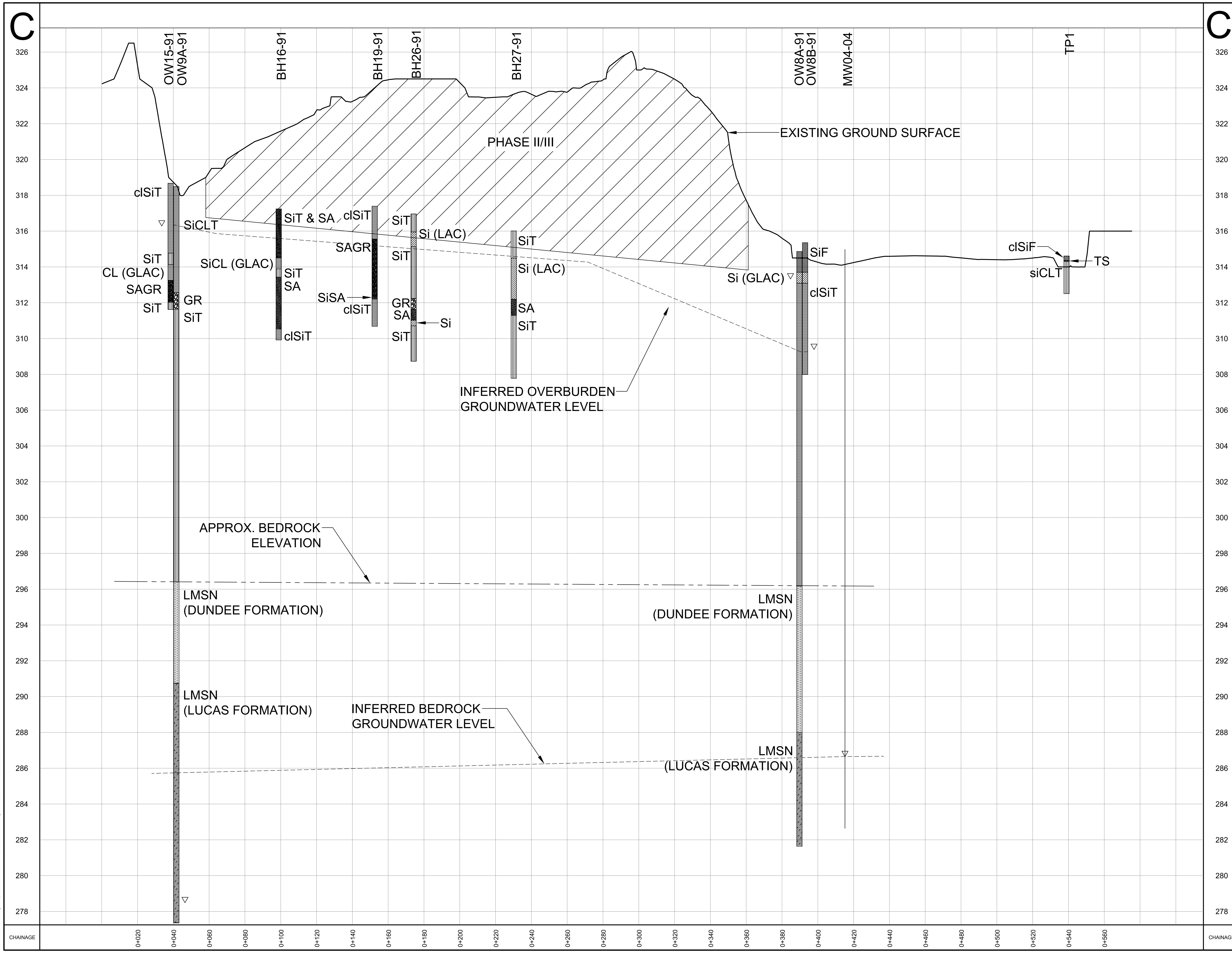
ENGINEERING

318007

MARCH 2022

N.T.S.



TOWN OF
ST. MARY'S

LEGEND

MEASURED WATER LEVEL (NOVEMBER 2021)

GEOLOGICAL STRATIGRAPHY

OBSERVATION WELL / BOREHOLE

MONITORING WELL WATER LEVEL (APRIL 2017)

cl	clayey	CL	CLAY
si	silty	Si	SILT
sa	sandy	SA	SAND
gr	gravelly	GR	GRAVEL

TS	TOPSOIL
T	TILL
F	FILL
LMSN	LIMESTONE
BDRK	BEDROCK
LAC	LACUSTRINE
GLAC	GLACIOLACUSTRINE

GEOLOGICAL CROSS SECTION C-C'

2021 ST. MARY'S ANNUAL MONITORING REPORT

Figure No. 11

GM BluePlan ENGINEERING

318007

MARCH 2022

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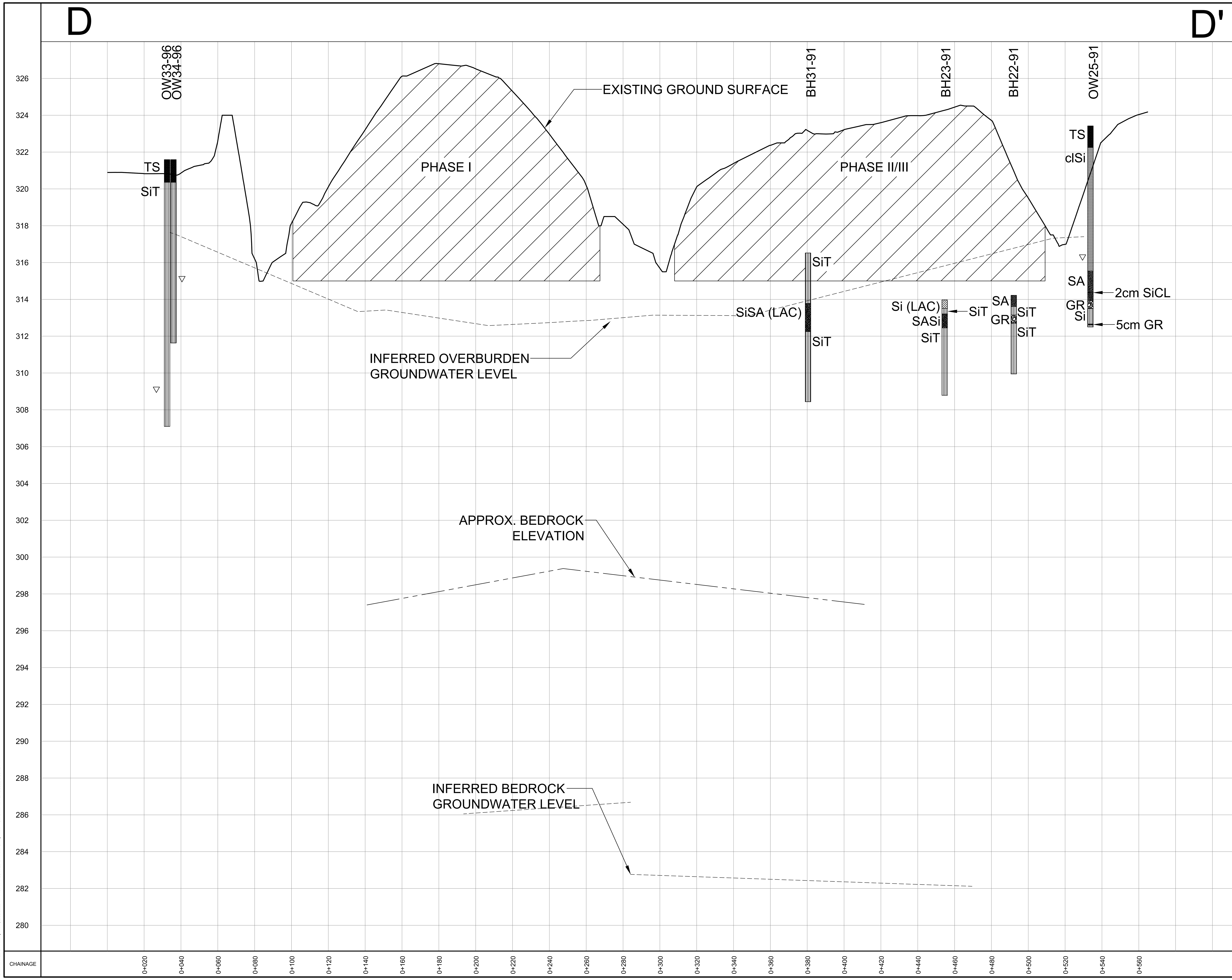


TOWN OF
ST. MARY'S

LEGEND

▽ MEASURED WATER LEVEL (NOVEMBER 2021)

GEOLOGICAL STRATIGRAPHY

OBSERVATION WELL / BOREHOLE

MONITORING WELL WATER LEVEL (APRIL 2017)

cl	clayey	CL	CLAY
si	silty	Si	SILT
sa	sandy	SA	SAND
gr	gravelly	GR	GRAVEL

TS	TOPSOIL
T	TILL
F	FILL
LMSN	LIMESTONE
BDRK	BEDROCK
LAC	LACUSTRINE
GLAC	GLACIOLACUSTRINE

GEOLOGICAL
CROSS SECTION D-D'

2021 ST. MARY'S
ANNUAL MONITORING
REPORT

Figure No. 12

GM BluePlan ENGINEERING

318007

MARCH 2022

N.T.S.

APPENDIX A:
CERTIFICATE OF APPROVAL NO. A150203 & AMENDMENTS

CONTENT COPY OF ORIGINAL

Ministry of the Environment
Ministère de l'Environnement

AMENDED PROVISIONAL CERTIFICATE OF APPROVAL
WASTE DISPOSAL SITE
NUMBER A150203
Issue Date: June 24, 2010

The Corporation of the Town of St. Marys
175 Queen St E.
Post Office Box, No. 998
St. Marys, Ontario
N4X 1B6

Site Location: St. Marys Landfill
Part of Lockhart St., Closed by R90095; Part of Lot 35 Con. Thames (Blanchard) St. Marys; Part of Lots 6, 7, 8, 9, 10, 16 & 17 and all of Lots 12, 13, 14, 18, 19 & 20 Plan 235 St. Marys, County of Perth; Designated as Parts 2 and 3 Plan 44R-4454, Concession Thames

You have applied in accordance with Section 27 of the Environmental Protection Act for approval of:

a 37 hectare Waste Disposal Site consisting of a 8 hectare Landfill, to be used for:

- the final disposal of solid, non-hazardous waste;
- collection and storage for diversion from final disposal of recyclable waste;
- the acceptance, storage, packaging, bulking and subsequent transfer of *Municipal Hazardous or Special Waste*
- the composting of *leaf and yard waste*.

Note: Use of the site for any other type of waste is not approved under this Certificate, and requires obtaining a separate approval amending this Certificate.

For the purpose of this Certificate of Approval and the terms and conditions specified below, the following definitions apply:

(a) "**Act**" means the *Environmental Protection Act,* R.S.O. 1990, C.E-19, as amended;

(b) "**Certificate**" means this entire provisional Certificate of Approval document, issued in accordance with section 39 of the *Act,* and includes any schedules to it, the application and the supporting documentation listed in Schedule "A;

(c) **"*Competent Person*" or "*Competent People*"** means a person or people who has/have the following features:
A. *has/have training and knowledge of the following:*

i. relevant waste management legislation, regulations and guidelines;
ii. major environmental concerns pertaining to the waste to be handled;
iii. contents of the facility's Design and Operating Reports outlined in Items 8, 9 and 10 of Schedule "A" and the Operations and Maintenance Manual required by Condition 24.2 of this *Certificate;*
iv. the terms, conditions and operating requirements of the *Certificate;*
v. the *Fire Code* and how it applies to proper storage and handling of wastes that may be flammable, reactive or oxidizing;
vi. record keeping procedures as outlined in Condition 22 of this *Certificate;*
vii. occupational health and safety concerns pertaining to the wastes to be processed;
viii. specific written procedures for the control of nuisance conditions; and
ix. specific written procedures for refusal of unacceptable waste loads;

B. *through their knowledge, training and experience can carry out any necessary duties in the following, through instruction and practice:*

i. use and operation of any equipment to be used at the *Site;*
ii. operations and management of the *Site,* in accordance with the specific job requirements of each individual *Operator,* including concern for environmental protection and health and safety standards for the *Operator* of the *Site,* identification of unacceptable wastes, procedures for refusing the processing of unacceptable wastes, proper handling of waste, proper procedures for the storage of waste and proper maintenance of the *Site;* and
iii. process monitoring procedures; and

C. *has/have the following training requirements:*
i. is/are provided the necessary training by the Owner to become a *Competent Person* before starting at the *Site* as an *Operator*;

ii. is/are provided training and an annual training update of the *Owner's* environmental emergency plan that is outlined in Conditions 20 of this *Certificate;* and
iii. is/are provided refresher training on the components of a *Competent Person* at least annually.

(d) "**Compost Waste**" means *leaf and yard waste* that has gone through the whole composting process, including curing, but did not meet the Schedule "B" criteria';

(e) **"Cured Compost"** means *leaf and yard waste* that has gone through the whole composting process, including curing, and meets the Schedule "B" criteria;

(f) "**Director**" means any Ministry employee appointed in writing by the Minister pursuant to section 5 of the *Act* as a Director for the purposes of Part V of the *Act;*

(g) "**District Manager**" means the District Manager of the local district office of the Ministry in which the Site is geographically located;

(h) **"Fire Code"** means Regulation 213/07 of the Fire Protection and Prevention Act, 1997;

(i) "**LDR**" means Lands Disposal Restrictions and refers to sections 74 through 85 of Ontario Regulation 347, which prohibits the disposal of listed and characteristic hazardous wastes on land until they have been treated to meet the treatment standards under Ontario Regulation 347;

(j) "**leaf and yard waste**" means waste consisting of natural Christmas trees and other plant materials but not tree limbs or other woody materials in excess of 7 centimetres in diameter or wood waste unless such waste has been ground;

(k) "**Ministry**" and "**MOE**" means the Ontario Ministry of the Environment;

(l) **Municipal Hazardous or Special Waste or MHSW** means household hazardous waste limited to waste classes 112, 114, 122, 145, 147, 148, 212, 213, 242, 252, 253 and 263 and also includes: paints and coatings and their containers; oil filters; oil containers of 30 litres or less for a wide range of oil products such as engine and marine oils, and hydraulic, power steering and transmission fluids; single use, dry cell batteries, e.g., non-rechargeable batteries that can be easily removed and replaced by the consumer; automotive antifreeze (engine coolant) and related containers; pressurized containers such as propane tanks and cylinders; fertilizers and their containers; and pesticides, fungicides, herbicides, insecticides and their containers; generated by households located in the geographic boundaries of the Town of St. Marys;

(m) "**OWRA**" means the *Ontario Water Resources Act,* R.S.O. 1990, c. O.40, as amended;

(n) "**Ontario Regulation 189**" means Ontario Regulation 189/94, Refrigerants, or as amended, made under the *Act;*

(o) "**Ontario Regulation 347**" means Ontario Regulation 347, R.R.O. 1990, General - Waste Management, made under the *Act,* as amended from time to time;

(p) "**Ontario Regulation 903**" means Ontario Regulation 903 – R.R.O. 1990, Wells, amended to Ontario Regulation

128/03, made under the *OWRA;*

(q) "**Operator**" means any person, other than the *Owner's* employees, authorized by the *Owner* as having the charge, management or control of any aspect of the Site;

(r) "**Owner"** means any person that is responsible for the establishment or operation of the Site being approved by this *Certificate,* and includes the The Corporation of the Town of St. Marys**,** its successors and assigns;

(s) "**PA**" means the *Pesticides Act,* R.S.O. 1990, c. P-11, as amended from time to time;

(t) "**PCB**" means monochlorinated and polychlorinated biphenyls or any mixture of them or any mixture that contains one or more of them;

(u) "**Provincial Officer**" means any person designated in writing by the Minister as a provincial officer pursuant to section 5 of the *OWRA* or section 5 of the or section 17 of the *PA*.

(v) "**PWQO**" means the Provincial Water Quality Objectives included in the July 1994 publication entitled *Water Management Policies, Guidelines, Provincial Water Quality Objectives,* as amended from time to time;

(w) **"Recyclable Material"** means any material set out in Schedule 1 of Ontario Regulation 101/94 of the *Act,* as amended from time to time, and scrap wood, building materials, and tires;

(x) "**RUP**" means the Reasonable Use Policy (Guideline B-7) of the Ministry of the Environment;

(y) "**sensitive receptor**" means any location where routine or normal activities occurring at reasonably expected times would experience adverse effect(s) from odour discharges from the Site, including one or a combination of:

(i) private residences or public facilities where people sleep (e.g.: single and multi-unit dwellings, nursing homes, hospitals, trailer parks, camping grounds, etc.);
(ii) institutional facilities (e.g.: schools, churches, community centres, day care centres, recreational centres, etc.);
(iii) outdoor public recreational areas (e.g.: trailer parks, play grounds, picnic areas, etc.); and
(iv) other outdoor public areas where there are continuous human activities (e.g.: commercial plazas and office buildings);

(z) "**Site**" means the entire 37 hectare waste disposal site, including the buffer lands and a landfilling site of approximately 8 hectares at Part of Lockhart St., Closed by R90095; Part of Lot 35 Con. Thames (Blanchard) St. Mary's; Part of Lots 6, 7, 8, 9, 10, 16 & 17 and all of Lots 12, 13, 14, 18, 19 & 20 Plan 235 St. Mary's, County of Perth; Designated as Parts 2 and 3 Plan 44R-4454, Concession Thames. It also includes an easement for ingress, egress and access to maintain and service the existing sewer drain located within Parts 1, 4, 5 and 6 of Plan 44R-4454;

(aa) "**Waste Transfer Station"** means the part of the *Site* that is used to recover waste for reuse or recycling and to store waste and to transfer waste from the *Site* as outlined in Condition 15 of the *Certificate*;

(bb) "**waste electrical and electronic equipment**" means devices listed in Schedules 1 through 7 of Ontario Regulation 393/04, Waste Electrical and Electronic Equipment made under the *Waste Diversion Act* 2002; and

(cc) "**white goods which contain refrigerants**" means white goods which contain, or may contain refrigerants, and which include, but is not restricted to, refrigerators, freezers and air-conditioning systems.

You are hereby notified that this approval is issued to you subject to the terms and conditions outlined below:

TERMS AND CONDITIONS

1.0 Revoke and Replace

1.1 This *Certificate* revokes Provisional Certificate of Approval No. A150203 dated August 4, 1983 and the Notice issued September 4, 1991, issued under Part V of the for this *Site.* The approval given herein, including the terms and conditions set out, replaces all previously issued approvals and related terms and conditions under Part V of the *Act* for this *Site.*

2.0 Compliance

2.1 The *Owner* shall ensure compliance with all the conditions of this *Certificate* and shall ensure that any person authorized to carry out work on or operate any aspect of the *Site* is notified of this *Certificate* and the conditions herein and shall take all reasonable measures to ensure any such person complies with the same.

2.2 Any person authorized to carry out work on or operate any aspect of the *Site* shall comply with the conditions of this *Certificate.*

3.0 In Accordance

3.1 Except as otherwise provided for in this *Certificate,* the *Site* shall be designed, developed, built, operated and maintained in accordance with the applications for this *Certificate,* dated February 4, 1982, and March 31, 2008, the Design and Operation Reports referred to in Item 8, 9, and 10 of Schedule "A" and the supporting documentation listed in Schedule “A”.

3.2 (a) Use of the *Site* for any other type of waste, or other waste management activity, is not approved under this *Certificate,* and requires obtaining a separate approval amending this *Certificate;* and

(b) Applications to amend this *Certificate* shall include submission of a revised Design and Operations Report.

4.0 Interpretation

4.1 Where there is a conflict between a provision of any document, including the application, referred to in this *Certificate* and the conditions of this *Certificate,* the conditions in this *Certificate* shall take precedence.

4.2 Where there is a conflict between the application and a provision in any documents listed in Schedule "A", the application shall take precedence, unless it is clear that the purpose of the document was to amend the application and that the *Ministry* approved the amendment.

4.3 Where there is a conflict between any two documents listed in Schedule "A", other than the application, the document bearing the most recent date shall take precedence.

4.4 The conditions of this *Certificate* are severable. If any condition of this *Certificate,* or the application of any condition of this *Certificate* to any circumstance, is held invalid or unenforceable, the application of such condition to other circumstances and the remainder of this *Certificate* shall not be affected thereby.

5.0 Other Legal Obligations

5.1 The issuance of, and compliance with, this *Certificate* does not:

(a) relieve any person of any obligation to comply with any provision of any applicable statute, regulation or other legal requirement; or
(b) limit in any way the authority of the *Ministry* to require certain steps be taken or to require the *Owner* to furnish any further information related to compliance with this *Certificate.*

5.2 The *Owner* shall ensure that:
(a) all wastes at the *Site* are managed and disposed in accordance with the *Act* and *Ontario Regulation 347;* and
(b) all wastes are transported to and from the *Site* by an approved waste transportation system, as defined under *Ontario Regulation 347.*

5.3 The *Owner* shall ensure that:

(a) all equipment discharging to air operating at the *Site* are approved under Section 9 of the *Act;* and

(b) all effluent is discharged in accordance with *OWRA.*

6.0 <u>Adverse Effect</u>

6.1 The *Owner* shall take steps to minimize and ameliorate any adverse effect on the natural environment or impairment of water quality resulting from the *Site,* including such accelerated or additional monitoring as may be necessary to determine the nature and extent of the effect or impairment.

6.2 Despite an *Owner, Operator* or any other person fulfilling any obligations imposed by this *Certificate,* the person remains responsible for any contravention of any other condition of this *Certificate* or any applicable statute, regulation, or other legal requirement resulting from any or omission that caused the adverse effect to the natural environment or impairment of water quality.

7.0 <u>Change of Owner</u>

7.1 The *Owner* shall notify the *Director,* in writing, and forward a copy of the notification to the *District Manager,* within 30 days of the occurrence of any changes in the following information:

(a) the ownership of the *Site;*
(b) appointment of, or a change in, the *Operator* of the *Site;*
(c) the name or address of the *Owner;* or
(d) the partners, where the *Owner* is or at any time becomes a partnership and a copy of the most recent declaration filed under the *Business Names Act,* R. S. O. 1990, c. B.17, shall be included in the notification.

7.2 No portion of this *Site* shall be transferred or encumbered prior to or after closing of the *Site* unless the *Director* is notified in advance and sufficient financial assurance is deposited with the *Ministry* to ensure that these conditions will be carried out.

7.3 In the event of any change in ownership of the works, other than change to a successor municipality, the *Owner* shall notify the successor of and provide the successor with a copy of this *Certificate,* and the *Owner* shall provide a copy of the notification to the *District Manager* and the *Director.*

8.0 <u>Certificate of Requirement/Registration on Title</u>

8.1 Within ninety (90) days of issue of this Certificate, the *Owner* shall submit to the *Director,* for his/her review, two (2) copies of a completed Certificate of Requirement and a registerable description of the *Site.*

8.2 Within ten (10) calendar days of receiving the Certificate of Requirement authorized by the *Director*, register the Certificate of Requirement in the appropriate Land Registry Office on title to the *Site* and submit to the *Director* the duplicate registered copy immediately following registration.

8.3 Pursuant to Section 197 of the *Act,* neither the *Owner* nor any person having an interest in the Property shall deal with the *Site* in any way without first giving a copy of this *Certificate,* including all amending notices, to each person acquiring an interest in the *Site* as a result of the dealing.

9.0 <u>Inspections</u>

9.1 No person shall hinder or obstruct a *Provincial Officer* from carrying out any and all inspections authorized by the *OWRA,* the *Act,* or the *PA,* of any place to which this *Certificate* relates, and without limiting the foregoing:

(a) to enter upon the premises where the approved works are located, or the location where the records required by the conditions of this *Certificate* are kept;
(b) to have access to, inspect, and copy any records required to be kept by the conditions of this *Certificate;*
(c) to inspect the *Site,* related equipment and appurtenances;

(d) to inspect the prices, procedures, or operations required by the conditions of this *Certificate;* and
(e) to sample and monitor for the purposes of assessing compliance with the terms and conditions of this *Certificate* or the *Act,* the *OWRA* or the *PA.*

10.0 <u>Information and Record Retention</u>

10.1 Any information requested, by the *Ministry,* concerning the *Site* and its operation under this *Certificate,* including but not limited to any records required to be kept by this *Certificate* shall be provided to the *Ministry,* upon request**,** in a timely manner**.**

10.2 The receipt of any information by the *Ministry* or the failure of the *Ministry* to prosecute any person or to require any person to take any action, under this *Certificate* or under any statute, regulation or other legal requirement, in relation to the information, shall not be construed as:

(a) an approval, waiver, or justification by the *Ministry* of any or omission of any person that contravenes any term or condition of this *Certificate* or any statute, regulation or other legal requirement; or
(b) acceptance by the *Ministry* of the information's completeness or accuracy.

10.3 Any information relating to this *Certificate* and contained in *Ministry* files may be made available to the public in accordance with the provisions of the *Freedom of Information and Protection of Privacy Act,* R.S.O. 1990, C. F-31.

10.4 All records and monitoring data pertaining to the operation of the Landfill required by the conditions of this *Certificate* must be retained for the contaminating life span of the Landfill except for as otherwise authorized in writing by the *Director.* All other records required by this *Certificate* shall be kept on the *Owner's* premises for a minimum period of three (3) years from the date of their creation.

11.0 <u>Service Area</u>

11.1 The *Site* shall only accept waste generated within the geographic boundaries of the Town of St. Marys.

12.0 <u>Hours of Operation</u>

12.1 This *Site* is approved to operate from Monday to Saturday from 7:00 a.m. to 7:00 p.m.

12.2 Hours of operation may be changed by the *Owner* at any time, provided that the hours are correctly posted at the *Site* gate, and that suitable public notice is given of any change.

12.3 No waste shall be received for disposal at the *Site* except during operating hours and while the *Site* is under the supervision of a *Competent Person.*

12.4 During non-operating hours, the *Site* entrance gate shall be locked and secured against access by unauthorized persons.

13.0 Signage and Security

13.1 The *Site* shall be maintained in a secure manner, such that unauthorized vehicles cannot enter the *Site.*

13.2 The *Owner* shall limit access to and from the *Site* to the approved hours of operation and when the *Site* is supervised by a *Competent Person.*

13.3 All waste arriving at the *Site* shall be inspected by a *Competent Person* prior to being received at the *Site* to ensure wastes are being managed and disposed of in accordance with this *Certificate,* the *Act* and Regulation 347 of the *Act.*

13.4 The *Owner* shall restrict the public from accessing the Compost Facility and the *MHSW* facility storage areas.

13.5 The *Site* shall be operated and maintained in an environmentally safe manner which ensures the health and safety of all persons and minimizes dust, odours, rodents, birds, litter, vibration, noise and any other adverse effects that may result from the operations at the *Site*.

13.6 The *Owner* shall maintain a sign, readable from the nearest public road, at the entrance to this *Site* stating:

(a) the *Owner's* name;
(b) hours of operation; and
(c) a 24-hour telephone number to be used in the event of an emergency or complaint.

14.0 <u>Landfill Operations</u>

14.1 Except as otherwise provided for in this *Certificate,* the Landfill Operations at the *Site* shall be designed, developed, built, operated and maintained in accordance with the applications for this *Certificate,* dated February 4, 1982, and March 31, 2008, the Design and Operation report dated November 1992, and April 4, 2008, the Addendum to the April 4, 2008 Design and Operations report dated April 2009 and October 2009 and the supporting documentation listed in Schedule "A".

14.2 The *Owner* shall only receive for final disposal at the Landfill solid, non-hazardous waste.

14.3 a) The maximum amount of waste that can be received per day for the landfill site is 125 cubic metres; and

b) The maximum amount of waste that can be received per year for the landfill site is 20,000 cubic metres; and

c) Because of unusual circumstance or an emergency, upon request, the *District Manager* may provide written permission to the *Owner* to exceed the daily maximum of waste that is allowed at the *Site* up to a daily maximum of 300 cubic metres.

14.4 Phase I as described in Schedule "A" of this *Certificate* of the landfill site shall contain a maximum volume of 104,000 cubic metres of waste including daily cover.

14.5 Phase II and Phase III as described in Schedule "A" of this *Certificate* of the landfill site shall contain a maximum combined volume of 276,000 cubic metres of waste including daily cover.

14.6 The maximum top elevation of the landfill for Phase I and for the combined Phases II and Phase III shall be in accordance with plans that are in Items 8 and 9 of Schedule "A"

14.7 The final grade and contours of the landfill site shall be in accordance with the Design and Operation Reports that are identified in Items 8 and 9 of Schedule "A" of this Certificate.

14.8 Cover material shall be applied as follows:

(a) daily cover - at the end of each working day, the active working face shall be covered with a minimum thickness of 150 millimetres of soil cover or an approved thickness of alternative cover material;
(b) intermediate cover - in areas where landfilling has been temporarily discontinued for six (6) months or more, a minimum thickness of 150 millimetres of soil cover, or an approved thickness of alternative cover material, shall be placed;
(c) final cover - in areas where landfilling has been completed to final contours, a minimum 0.6 metre thick layer of final cover soil shall be placed. Fill areas shall be progressively completed and rehabilitated as landfill development reaches final contours.

14.9 i) The following materials may be used as alternative cover material, subject to the requirements detailed in Condition 14.8:

(a) ground woodwaste; and
(b) *Cured Compost;* and
(c) *Compost Waste*

ii) Alternative materials to soil in addition to those listed in section 14.9 may be used as daily or intermediate cover provided that the alternative material has been approved by the *Director.*

14.10 The *Owner* is permitted to process and use ground woodwaste, as defined in *Ontario Regulation 347,* as alternative cover material, subject to the following:
(a) All woodwaste received at the Landfill to be used as alternative cover shall:
(i) first be inspected by a *Competent Person* to ensure that it complies with the definition of woodwaste in *Ontario Regulation 347;*
(ii) be stored in an area where proper visible signage is posted to ensure that no other waste is commingled with it and to state that no removal of this material off-Site be done by *Site* users;

(b) The *Owner* shall ensure that no more than 200 cubic metres of ground woodwaste be stockpiled at the Landfill at any one time;
(c) Any stockpile of ground woodwaste shall be stored in an operating cell of the landfill site so that any leachate from the ground woodwaste drains into the landfill; and
(d) The use of the ground woodwaste as alternative cover shall be discontinued upon written direction from the *District Manager* if found to have a negative impact.

14.11 The *Owner* shall provide to the *Director* a Closure Plan at least two (2) years before the closure of Phase II/III of the landfill site.

14.12 The *Owner* shall ensure that:

(a) all *white goods which contain refrigerants* accepted at the *Site,* which have not been tagged by a licensed technician to verify that the equipment no longer contains refrigerants, are stored in an upright position and in such a manner to allow for the safe handling and removal from the *Site* of refrigerants as required by *Ontario Regulation 189;*
(b) *white goods which contain refrigerants* received on-site shall either have the refrigerant removed prior to removal from the *Site* or shall be shipped off-*Site* only to facilities where the refrigerants can removed by a licensed technician in accordance with *Ontario Regulation 189;* and
(c) a detailed log of all *white goods which contain refrigerants* received is maintained which includes the following information:

(i) date of the record;
(ii) types, quantities and source of *white goods which contain refrigerants* received;
(iii) destination of the white goods; or
(iv) the details on removal of refrigerants, if conducted on *Site,* and the quantities and destination of the refrigerants transferred from the *Site.*

14.13 Any propane cylinders shall be stored in a segregated area in a manner which prevents cylinders from being knocked over or cylinder valves from breaking.

14.14 Any tires shall be placed in a segregated area cleared of vegetation and other waste, in a pile no greater than 3 metres in height and 100 square metres in area.

15.0 <u>Waste Transfer Station</u>

15.1 The *Waste Transfer Station* shall be operated in accordance with the application for a Waste Disposal Site submitted March 31, 2008 and supporting information identified in Schedule A.

15.2 Only *waste electrical and electronic equipment,* cardboard, scrap metal, blue-box recycling materials shall be accepted at the *Waste Transfer Station,*

(i) from the Town of St. Marys;
(ii) from householders responsible for those wastes; and
(iii) from small businesses where such wastes are considered unrelated to the operation of the business; or from small businesses where such waste qualifies for the small quantities exemption defined by *Ontario Regulation 347* except where such waste is produced in small quantities on a regular basis (e.g. printing companies).

15.3 The maximum amount of all waste that may be accepted per day at the *Waste Transfer Station* is 25 tonnes.

15.4 The maximum storage capacity of all wastes at the *Waste Transfer Station* is 100 tonnes.

15.5 Any cardboard stored at the *Waste Transfer Station* shall be stored in a container that has a covering to protect the cardboard from precipitation.

15.6 Waste accepted at the *Waste Transfer Station* shall be stored in a safe and secure manner and shall be properly handled, packaged or contained so as not to pose any threat to the general public, *Site* personnel or the environment.

15.7 The *Owner* shall remove all waste and *Recyclable Materials* from the *Waste Transfer Station* at an interval not exceeding ninety (90) days with the exception of electronic waste which shall be removed before the container holding the electronic waste gets full.

15.8 No radioactive, pathological or biomedical wastes or contaminated radioactive, pathological or biomedical wastes shall be accepted at the *Waste Transfer Station.*

15.9 The *Waste Transfer Station* must be maintained in a secure manner, to prevent unauthorized persons from causing negative off-*Site* impacts.

15.10 All waste destined for diversion shall be segregated either into bins or in designated areas. All bins and designated waste storage areas shall be clearly labelled.

15.11 The *waste electronic and electrical equipment* diversion program shall be operated in accordance with Item 20 of Schedule "A", and in accordance with the following requirements:

(a) the *Owner* shall clearly communicate the hours of operation of the *waste electronic and electrical equipment* diversion program to the public to minimize the amount of waste that is not diverted from Landfill;
(b) the *Owner* may receive a maximum of one (1) cubic metre per day of *waste electrical and electronic equipment;*
(c) a maximum of five (5) cubic metres of *waste electrical and electronic equipment* may be stored at the *Site;*
(d) *waste electrical and electronic equipment* shall be stored in a secure manner for a maximum of six (6) months; and
(e) no disassembly, including manual disassembly, of *waste electrical and electronic equipment* is permitted, apart from the removal of visible batteries.

16.0 *Municipal Hazardous or Special Waste (MHSW)*

16.1 The *MHSW* Facility shall be operated in accordance with the application for a Waste Disposal Site submitted March 31, 2008 and supporting information identified in Schedule A.

16.2 The *MHSW* Facility may accept those wastes that are identified by the definition of *MHSW.*

16.3 The maximum amount of *MHSW* that may be accepted at the *Site* in any one day is one (1) tonne.

16.4 All *MHSW* shall be stored on *Site* in a maximum of two (2) weather resistant, lockable, 20-foot standard storage containers.

16.5 The Maximum amount of *MHSW* that may be stored at the *MHSW* Facility is five (5) tonnes.

16.6 The *Owner* shall ensure that:

(a) the wastes are stored in a safe and secure manner;
(b) the operation of this facility does not interfere with any other activities associated with this *Site;* and
(c) the wastes are properly handled, packaged or contained so as not to pose any threat to the general public, *Site* personnel and the environment.

16.7 (a) Wastes that are collected and stored shall be in amounts which can be safely handled at the *MHSW* Facility. In the event that larger amounts are received than anticipated, the *Owner* shall have extra drums and lab-packed containers available on the premises for the storage of the additional waste collected; and

(b) When the *MHSW* Facility's capacity is reached, arrangements for the removal of waste shall be made as soon as possible, but in any event, within five (5) working days.

16.8 No storage facilities other than those approved under this *Certificate* shall be used, and fixed storage facilities shall not be moved, replaced or altered without amendment to this *Certificate.*

16.9 The storage facilities shall be clearly marked indicating the type and nature of the hazardous waste stored.

16.10 All points of access to the *MHSW* Facility shall be posted to warn that the area contains hazardous materials.

16.11 Smoking restrictions shall be adhered to and non-smoking signs posted as required by regulation.

16.12 The two 20-foot storage containers for *MHSW* shall be weather resistant, lockable, properly ventilated and shall be constructed and used in compliance with the *Fire Code*, any applicable municipal by-law and the Occupational Health and Safety of Ontario and its applicable Regulations.

16.13 The 20-foot storage container, shall be maintained under lock and key and access to these facilities shall be limited to trained *Site* personnel.

16.14 No *PCB's,* pathological waste, severely toxic waste or radioactive waste shall be accepted at the *MHSW* Facility.

16.15 Oil and oil-based paints which have been manufactured prior to 1972; or whose manufacturing date cannot be determined and may contain *PCBs*, shall be handled in the manner prescribed:

(a) the oil and oil-based paints shall not be mixed (bulked) with other paints prior to testing. Paints which are lab-packed are not considered to be mixed under this *Certificate.*
(b) the oil and oil-based paints shall be tested for *PCB* content. The oil and oil-based paint is considered to be a *PCB* waste, if measured levels are equal to or greater than 50 parts per million.
(c) the oil and oil-based paints shall not be distributed for reuse if they have any measurable *PCB* content.
(d) if oil and oil-based paint is found to have *PCBs* at or above 50 ppm, it shall be forthwith reported to the *District Manager* and shall be managed in accordance with *Ontario Regulation 362/92,* Waste Management - *PCBs* made under the *Act,* or removed from the *Site* to an approved *PCB* storage site in accordance with written instructions from the *District Manager.*

16.16 Except as specified in Condition 16.15, paints collected at the *MHSW* Facility may be returned or sold to the general public for reuse provided all transactions are recorded by invoice. Information on the type and volume of paint returned to the public through this *Site* shall be recorded in the report specified in Condition 22.1.

16.17 The *Owner* shall ensure that a *Competent Person* is on duty at all times during the operation of the *MHSW* Facility.

16.18 The local police and fire department shall be informed of the *MHSW* Facility and this *Certificate* and shall be notified in writing of operating hours and any changes to scheduled operating hours prior to the changes being made.

16.19 Except as specified under Conditions 16.16, all waste collected shall be transported from the *MHSW* Facility by an approved waste management system and disposed to an approve waste disposal site certified to accept these types of wastes.

16.20 All containers which hold hazardous waste that have been collected at the *MHSW* depot at the Site shall be labelled that these waste are not subject to *LDR* treatment requirements in accordance with Section 81 of *Ontario Regulation 347.*

17.0 <u>Compost Operations</u>

17.1 The Compost Facility is approved for open windrow composting of a maximum of 300 tonnes per month of *leaf and yard waste.*

17.2 The Compost Facility shall be constructed and operated in accordance with the application for a Provisional Certificate of Approval for a Waste Disposal Site submitted March 31, 2008 and supporting information referenced as Item 10 in Schedule "A".

17.3 The *Owner* shall ensure that incoming waste is visually inspected by a *Competent Person* to ensure that the waste meets the requirements of this *Certificate.*
Unacceptable waste shall be re-directed to Landfill; and

17.4 (a) *Leaf and yard waste* destined for composting shall be removed to the Compost Facility on a weekly basis or whenever the capacity of the designated storage area is reached, whichever occurs first. In the event that the *leaf and yard waste* becomes odourous, the waste shall be immediately diverted to the Landfill.

(b) At least once every year, the *Owner* shall take a representative sample of the incoming yard and leaf waste to ensure that the incoming waste meets the metals criteria listed in Schedule "B". Incoming waste which does not meet the metals criteria listed in Schedule "B" is considered unacceptable waste.

17.5 (a) *Leaf and yard waste* shall be incorporated into windrows within four (4) days of being mixed ; and

(b) Any waste that has exceeded the time restrictions in Conditions 17.5(a) shall be re-directed to the Landfill for immediate burial.

17.6 The *Owner* shall ensure that the following operating criteria are met, as a minimum:

(a) all waste receipt, processing, active composting and curing shall take place in the part of the landfill that is identified by Figure 1.1 that is identified by Item 10 of Schedule "A"
(b) windrows shall be arranged in a manner which permits equipment access to the composting and storage areas for efficient turning of the windrows and to allow access for emergency vehicles;
(c) windrows shall be constructed at bulk densities and heights which promote aerobic conditions;
(d) all waste being composted shall be held at a temperature of at least 55 ^{O}C for a minimum of fifteen (15) days cumulative, to ensure proper bacterial growth and pathogen inactivation;
(e) during composting, the temperature and moisture levels of the windrows shall be monitored and recorded daily during the pathogen inactivation period and a minimum of twice weekly during the remainder of the composting process;
(f) during the fifteen day pathogen inactivation period, the windrows shall be turned a minimum of five (5) times; and
(g) compost shall be cured for six (6) months after the requirements for pathogen inactivation have been satisfied. During the curing phase, windrows shall be turned at least once per month.

17.7 (a) Prior to being released from the Compost Facility for unrestricted use, compost shall be monitored for quality as follows:

(i) a representative composite sample shall be collected for every 1000 tonnes of compost produced;
(ii) samples shall be analysed for criteria listed in Schedule "B";
(iii) all production records shall be reviewed to ensure temperature and residency time requirements for pathogen inactivation have been met;

(b) Compost that met the temperature and residency time requirements for pathogen inactivation and the quality requirements listed in Schedule "B" of this *Certificate,* is considered to be finished compost and may be transferred off *Site* for unrestricted use;

(c) Compost that meets the metals and foreign matter quality requirements listed in Schedule "B" of this *Certificate* but did not achieve the pathogen inactivation time or temperature requirements, or did not meet the Schedule "B" pathogen quality requirements, may be returned to the composting process for re-processing. Alternatively, the compost may be used as alternate cover material; and

(d) Compost that can not meet the metal or foreign matter quality requirements listed in Schedule "B" of this *Certificate* shall be considered *Compost Waste* and shall be re-directed to the Landfill for use as alternate cover material and/or burial.

17.8 (a) The *Owner* shall ensure that the area inside the containment berm surrounding the compost pile be graded to allow for a low-lying sump area that can used to collect leachate from the composting operation; and

(b) The collected leachate may be sprayed onto the landfill to enhance the daily cover;

and

(c) If there is need to direct leachate from the composting operation to the stormwater

detention Basin A or to a body of water, an application and approval to amend Municipal Sewage Certificate of Approval Number 3-1577-92-936 needs to be done.

17.9 There shall be no discharge of wastewater to a body of water from the *Site* unless allowed by an Approval under the *OWRA.*

18.0 <u>Nuisance Control</u>

18.1 (a) The *Site* shall be operated and maintained such that the vermin, vectors, birds, dust, litter, odour, noise and traffic do not create a nuisance.

(b) If at any time, problems such as vermin, vectors, birds, dust, litter, odours, noise or traffic, or other nuisances are generated at the *Site* resulting in complaints, the *Owner* shall take appropriate remedial ion to eliminate the cause of such problems. Appropriate measures may include temporary stoppage of all operations until the problem has been rectified and measures have been undertaken to prevent future occurrence.

18.2 A litter control program shall be established and maintained by the *Owner* near the face of the active cell of the Landfill, at the Compost Facility and at the property line. The litter control program shall include, but not be limited to, regular pick up of litter and use of snow fences around the active cell of the Landfill and Compost Facility as required.

18.3 (a) The *Owner* shall have in place procedures to prevent adverse odour impacts from the Composting Facility including, but not limited to:

(i) reducing the size of windrows to promote aeration;
(ii) identifying unfavourable meteorological conditions and limiting activities which can reasonably be expected to generate odours during times of unfavourable meteorological conditions; and

(b) Notwithstanding Condition 18.4, any odourous composting waste that does not respond to mitigative action within twelve (12) hours of action being taken will be re-directed to the Landfill for immediate burial.

18.4 The *Owner* shall operate and maintain the *Site* so that the maximum 10-minute average concentration of odour at the most impacted *sensitive receptor,* resulting from the operation of the Landfill and/or the *Compost Facility,*shall not be greater than 1.0 odour unit.

19.0 <u>Site Inspections and Maintenance</u>

19.1 The *Owner* shall ensure that all *MHSW* Facility storage facilities are inspected each day that the facility is in operation by a *Competent Person* for spills, leaks or hazardous conditions.

19.2 The *Owner* shall ensure that:
(a) visible portions of the Compost Facility pad are visually inspected on each operating day; and
(b) the pad is visually inspected, and appropriate maintenance performed, as the pad surface is uncovered during windrow turning and/or removal.

19.3 The *Owner* shall ensure that a *Competent Person* performs daily visual inspections of the *Site* to ensure security and cleanliness of the *Site.*

19.4 The *Owner* shall ensure that fire extinguishers are inspected monthly and recharged annually.

19.5 (a) The *Owner* shall develop and put in place a preventative maintenance program, in accordance with manufacturers' recommendations, for all on-site equipment associated with the processing and managing of waste and/or processed materials; and

(b) The preventative maintenance program shall consist of the following as a minimum:

> (i) the program shall specifically stipulate the part of the equipment inspected for all process equipment on *Site;*
> (ii) the frequency of the inspections required and carried out; and
> (iii) the dates of any repairs conducted.

19.6 Any deficiencies noted during the inspection or maintenance activities, that might negatively impact the environment, shall be promptly corrected.

<u>20.0 Environmental Emergency</u>

20.1 Within thirty (30) days of the date of issue of this Notice, the *Owner* shall have in place an Environment Emergency Plan for the operations permitted under the *Certificate.* The Environment Emergency Plan shall include, but is not necessarily limited to:

(a) the prevention of, preparedness for, response to and recovery from an environmental emergency;
(b) a list of contingency equipment and spill clean up materials available to *Site* personnel;
(c) names and telephone numbers of waste management companies available for emergency response; and
(d) a notification protocol, with names and telephone numbers of persons to be contacted, including:

> i. Town of St. Marys personnel,
> ii. the *Ministry* District Office;
> iii. Spills Action Centre;
> iv. Fire Department;
> v. Police Department;
> vi. local Medical Officer of Health; and
> vii. Ministry of Labour.

20.2 The *Owner* shall take immediate measures to clean-up spills and other discharges of any wastes. Spill clean-up material shall be stored at the *Site,* in sealed drums or in an appropriate solid waste container, until such time as it is removed to a facility approved to receive such waste.

20.3 The *Owner* shall require a *Competent Person* to record all spills and upsets in the log book referred to in Condition 22 of the *Certificate*. The information recorded in the log shall include:

(a) the nature of the spill or upset;
(b) the action taken for clean-up; and
(c) corrective action taken to prevent future occurrences.

20.4 The *Owner* shall require a *Competent Person* to immediately notify the *Ministry*'s Spills Action Centre at (416) 325-3000 or 1-800-268-6060 of any reportable spills or upsets.

20.5 The *Owner* shall ensure that adequate fire-fighting and contingency spill clean-up equipment are available at the *Site* and that the *Site* personnel are familiar with the use of such equipment and its location(s) on the *Site.*

20.6 The *Owner* shall ensure that:

(a) the contingency equipment and materials outlined in the Environment Emergency Plan are in a good state of repair, fully operational and immediately available;
(b) all operating personnel are fully trained in the contingency equipment and materials' use and in the procedures to be employed in the event of an emergency;
(c) the Environment Emergency Plan is reviewed and updated on an annual basis as a minimum; and
(d) the local Fire Department and the *District Manager* are given a copy of the Environment Emergency Plan and any amendments that are made to it.

20.7 All *Operators* and employees of the *Owner* at the *Site* shall be *Competent People.*

21.0 Complaints

21.1 If the *Owner* receives complaints regarding the operation of the *Site* which are environmental in nature, or have caused, or are likely to cause, a negative impact to the environment or human health or safety, the *Owner* shall respond to these complaints according to the following procedure:

(a) The *Owner* shall record each complaint and the information recorded shall include:

(i) the date, time and nature of the complaint;
(ii) the name, address and telephone number of the complainant if provided;
(iii) the activities taking place on *Site* at the time of the complaint; and
(iv) meteorological conditions;

(b) The *Owner,* upon notification of the complaint shall initiate appropriate steps to determine all possible causes of the complaint, proceed to take the necessary actions to eliminate the cause of the complaint and forward a formal reply to the complainant; and
(c) The *Owner* shall retain on-*Site* a report written within one (1) week of the complaint date, listing the actions taken to resolve the complaint and any recommendations for remedial measures, and managerial or operational changes to reasonably avoid the reoccurrence of similar incidents.

22.0 Record Keeping

22.1 (a) The *Owner* shall maintain daily written records for waste deposited at the Landfill and managed at the *Waste Transfer Station* for each day the *Site* is in operation. The record shall included, but not necessarily be limited to:
(i) the quantity of waste received for final disposal at the landfill;
(ii) the quantity of waste received at the Waste Transfer Facility.
(iii) the type and quantity of waste transferred from the *Site* for recycling and the destination of the waste diverted;
(iv) a record of activities undertaken that operating day (e.g. placement of cover material);
(v) a description of any out-of-service period of any control, treatment, disposal or monitoring facilities, the reasons for the loss of service, and action taken to restore and maintain service.

(b) The *Owner* shall establish a monthly summary of waste received at the *MHSW* Transfer Facility which shall include, but not necessarily be limited to:
(i) documentation of waste types and quantities;
(ii) the quantity of any paint given to the public
(iii) source of generation;
(iv) ultimate disposal sites;
(v) each incident where the capacity of the facility has been exceeded; and

(vi) spills, upsets and environmental or other problems encountered in operating the *MHSW* Transfer Facility.

(c) The *Owner* shall maintain the following records as a minimum for the Compost Facility:
(i) daily weather data including wind speeds and wind direction;
(ii) types and quantities of waste received;
(iii) date and time of windrow construction and ratio of windrow mixture;
(iv) windrow temperature and moisture readings as appropriate for each stage of processing;
(v) date windrow was broken down and began curing;
(vi) other activities carried out (windrow turning, moisture addition, combining windrows, sampling); and
(vii) laboratory reports of all analysis of feedstocks, mixtures, active and *Cured Compost*.

22.2 The *Owner* shall maintain written records of all inspections and maintenance activities undertaken in accordance with Conditions 19.1 to 19.6 inclusive. All records related to the inspection and preventative maintenance programs shall be available on *Site* for inspection by a *Provincial Officer* upon request.

22.3 The *Owner* shall maintain a written record, at the *Site,* of employee training required by Condition 20.7. The record shall include but not necessarily be limited to:

(a) date of training;
(b) name and signature of person who has been trained; and
(c) description of the training provided.

23.0 Monitoring

23.1 (a) The *Owner* shall ensure compliance with the *RUP.*

(b) The *Owner* shall determine compliance by retaining qualified professionals to monitor groundwater, surface water and leachate in accordance with Schedule "C";

(c) Sampling and analyses in accordance with Schedule "C", shall occur in the spring and fall of each year; and

(d) The monitoring program may be amended from time-to-time with the prior written consent of the *District Manager.*

23.2 The *Owner* shall ensure that all samples are collected using standard sampling methods. The sampling methods followed shall be referenced in the report required by Condition 25.1.

23.3 (a) All monitoring wells which form part of the monitoring program shall be protected from damage. Any groundwater monitoring wells that are damaged shall be repaired or replaced forthwith or properly abandoned in accordance with *Ontario Regulation 903;* and

(b) Any monitoring wells which are no longer required for monitoring, or which need to be closed due to operational changes on the *Site,* shall be property abandoned in accordance with *Ontario Regulation 903.*

23.4 In the event that the results of the monitoring program are such that an off-*Site* exceedance of the criteria set by the *RUP* and/or the *PWQO* has occurred as a result of the operation of the *Site,* the *Owner* shall notify the *District Manager* as soon as reasonably possible and specify the following:

(a) details of the off-site exceedance, confirmatory monitoring requirements and the potential off-site impacts to surface water and groundwater users;
(b) the extent and timing of contingency measures to be implemented;
(c) modifications, if any, which should be made to the monitoring program; and
(d) other mitigation measures, if any, which may be necessary to reduce or prevent off-site impacts.

24.0 General Provisions

24.1 Within one year of issue of this Certificate, the *Owner* shall install a weigh scale at the *Site* to enable a tracking of the quantity of waste entering and leaving the *Site.*

24.2 Within ninety (90) days of issue date of this Certificate, the *Owner* shall maintain a current Operations and Maintenance Manual for the landfill, the *Waste Transfer Station,* the *MHSW* Depot and the composting operation which is consistent with the *Certificate* for the Landfill part of the *Site* for use by *Site* personnel which shall contain, but is not necessarily limited to the following:

(a) a *Site* plan, showing the location of key features and their dimensions at the *Site;*
(b) an outline of the responsibilities of personnel;
(c) personnel training requirements;
(d) proper receiving, handling, storage and recording procedures;
(e) procedures for handling white goods containing refrigerants; and
an outline of the responsibilities of *MHSW* Facility personnel;
(f) operating procedures for the composting area including processing/mixing, windrow formation, turning schedules, parameters and criteria that have to be met;
(g) quality control sampling and testing protocol for the *Site;*
(h) contingency and emergency response procedures including health and safety provisions for workers and best management practices for the control of dust, litter and odour;
(i) Leachate management;
(j) Landfill gas management;
(k) Surface water/Storm water management;
(l) Inspections and monitoring; and
(m) Complaints procedure.

24.3 The Operations and Maintenance Manual referred to in Condition 24.2 shall be:
i) retained at the *Site*;
ii) kept up to date through periodic revisions; and
iii) be available for inspection by *Ministry* staff.

25.0 Annual Report

25.1 By March 31 of each year, The *Owner* shall prepare and submit to the *District Manager* an annual report which summarizes *Site* operations for the previous calendar year. The annual report shall include the following:

(a) an assessment of the egress of contaminants into groundwater and surface water, as determined by sampling and analysis conducted within the previous calendar year;
(b) an assessment of the operation and performance of all engineered facilities, the need to amend the design or operation of the *Site,* and the adequacy of and need to implement the contingency plans;
(c) a report on the status of all monitoring wells and a statement as to compliance with *Ontario Regulation 903;*
(d) plans showing the existing contours of the Landfill; areas of landfilling operation during the reporting period; areas of intended operation during the next reporting period; areas of excavation during the reporting period; the progress of final cover, vegetative cover, and any intermediate cover application; previously existing *Site* facilities; facilities installed during the reporting period; and *Site* preparations and facilities planned for installation during the next reporting period;
(e) graphs showing trends through time for key indicator parameters including chloride, iron and total phosphorous for all surface water monitoring stations and Total Suspended Solids for the discharge points at the Storm Water Management Ponds, SP4A-94 and SP2B-94.
(f) provide information on surface water station SP2-93;
(g) calculations of the volume of waste, daily and intermediate cover, and final cover deposited or placed at the Landfill during the reporting period and a calculation of the total volume of Landfill capacity used during the reporting period;
(h) a calculation of the remaining capacity of the Landfill and an estimate of the remaining Landfill life;
(i) analytical results from testing of alternative cover material;
(j) report on sediment build up in storm water ponds Basin A and Basin B;
(k) once the weigh scale is installed at the *Site,* a summary of the total quantity (tonnes) of waste received at

the *Site* by waste management activity;
(l) a summary of the quantity of waste diverted from final disposal to recycling or reuse;
(m) a summary of the quantity of *MHSW* collected, by waste class code and the final destination of each waste type;
(n) a summary of the amount of *leaf and yard waste* received at the Compost Facility and the amount of finished compost transferred from the *Site;*
(o) a summary of analytical results of samples taken from the finished compost;
(n) a summary of any significant problems encountered during composting or curing;
(p) a summary of any complaints received from any of the waste management activities undertaken at the *Site* and the responses made;
(q) a discussion of any environmental and operational problems that could negatively impact the environment encountered during the operation of the *Site* and during the *Site* inspections and any mitigative actions taken;
(r) any recommendations to minimize environmental impacts from the operation of the *Site* and to improve *Site* operations and monitoring programs in this regard; and
(s) a summary statement as to compliance with all Conditions of this *Certificate* and with the inspection and reporting requirements of the Conditions herein.

26.0 <u>Closure Plan</u>

26.1 At least two (2) years prior to the anticipated date of closure of the Landfill, the *Owner* shall submit to the *Director* for approval, a detailed closure plan pertaining to the termination of landfilling operations at this *Site,* post-closure inspection, maintenance and monitoring, and end use. The plan shall include the following:

(a) a plan showing *Site* appearance after closure;
(b) a description of the proposed end use of the *Site;*
(c) a descriptions of the procedures for closure of the Landfill, including:

(i) advance notification of the public of the Landfill closure;
(ii) posting of a sign at the *Site* entrance indicating the Landfill is closed and identifying any alternative waste disposal arrangements;
(iii) completion, inspection and maintenance of the final cover and landscaping;
(iv) *Site* security;
(v) removal of unnecessary Landfill-related structures, buildings and facilities; and
(vi) final construction of any control, treatment, disposal and monitoring facilities for leachate, groundwater, surface water and landfill gas;

(d) a schedule indicating the time-period for implementing Conditions 26.1(c)(i) to 26.1(c)(vi) inclusive;
(e) descriptions of the procedures for post-closure care of the Landfill, including:

(i) operation, inspection and maintenance of the control, treatment, disposal and monitoring facilities for leachate, groundwater, surface water and Landfill gas;
(ii) record keeping and reporting; and
(iii) complaint contact and response procedures;

(f) an assessment of the adequacy of and need to implement the contingency plans for leachate and methane gas; and
(g) an updated estimate of the contaminating life span of the Landfill, based on the results of the monitoring programs to date.

26.2 (a) Four (4) months prior to the permanent closure of the *MHSW* Transfer Facility, the *Waste Transfer Station* and/or Compost Facility, the *Owner* shall submit to the *District Manager* written notification of the decision to cease the *MHSW* collection program, the composting activities and/or the *Waste Transfer Station*. The written notification shall include a closure plan consisting of:

(i) a plan showing *Site* appearance after closure;
(ii) a description of the procedures to be taken for closure of the *Waste Transfer Station*, the *MHSW* Transfer Facility and/or the Compost Facility; and

(iii) a schedule indicating the time-period for implementing closure activities; and

(b) Within ten (10) days after closure of the *Waste Transfer Station*, the *MHSW* Transfer Facility and/or the Compost Facility, the *Owner* shall inform the *Director,* in writing, that the *Waste Transfer Station*, the *MHSW* Transfer Facility and/or the Compost Facility is/are closed and requesting that this *Certificate* be amended accordingly.

SCHEDULE "A"

This Schedule "A" forms part of this Certificate.

1. Application for a Provisional Certificate of Approval for a Waste Disposal Site, dated February 4, 1982.

2. Application for a Provisional Certificate of Approval for a Waste Disposal Site, dated February March 31, 2008 and signed by Kevin Luckhardt.

3. Hydrogeologic Investigation, St. Marys Landfill Site, Report by Conestoga-Rovers & Associates Limited, dated November 1982.

4. Plans prepared by Conestoga-Rovers & Associates Limited, Project No. 0645, as follows:

TITLE PLAN NO. DATE
Existing Conditions 1 November 1982
Proposed bottom Contours 2 November 1982
Proposed Final Contours 3 November 1982
Cross-Section 4 November 1982
Site Development Plan
Waste Disposal Area 1 5 November 1982
Leachate Collection System 6 November 1982
Surface Water Drainage 7 November 1982

5. Letter dated January 27, 1983 from the Ministry of the Environment Waste Management Approvals Unit to the Town of St. Marys.

6. Letter dated March 21, 1983 from Conestoga-Rovers & Associates Limited to the Ministry of the Environment, Waste Management Approvals Unit.

7. Drawing of Proposed Berm Extension, St. Marys Landfill Site, prepared by Conestoga-Rovers and Associates Limited, dated march 25, 1983.

8. Design and Operation Report Phase II/III prepared by Conestoga Rovers and Associates Limited, dated November 1992.

9. Addendum: Design and Operations Report Update prepared by Conestoga Rovers and Associates dated April 2009

10: Addendum: Design and Operations Report, Leaf and Yard Composting Operations, St. Marys Landfill Site, prepared by Conestoga Rovers and Associates dated October 2009.

11. Letter dated January 8, 2010 with attachments from James R. Yardley, P.Eng. of Conestoga Rovers and Associates, addressed to Jim Chisholm of the Ministry.

SCHEDULE "B"

This Schedule "B" forms part of this Certificate.

Parameter Maximum concentration
<u>Metals</u>
arsenic 13 ppm
cadmium 3 ppm
chromium 210 ppm

cobalt 34 ppm
copper 100 ppm
lead 150 ppm
mercury 0.8 ppm
molybdenum 5 ppm
nickel 62 ppm
selenium 2 ppm
zinc 500 ppm

<u>Foreign material</u>
plastic particles greater than 3 mm in any direction 1%
non-biodegradable material greater than 3 mm in any 2 %
direction

<u>Pathogens</u>
fecal coliforms <1000 MPN*/g of total solids calculated on a dry weight basis
salmonellae <3 MPN*/4g total solids calculated on a dry weight basis

* most probable number

SCHEDULE "C"

This Schedule "C" forms part of this Certificate.

ST. MARYS LANDFILL MONITORING PROGRAM

	Parameters	Field		General Chemistry					Additional		Metals			VOCs
	Monitoring Locations	Hydraulic Monitoring	pH, conductivity, temperature	chloride, hardness, phenols.	DOC	BOD_5, ammonia	turbidity, TDS, suspended solids, total phosphorous	COD, chloride, phenols, nitrate, phosphorous, TKN, TSS	alkalinity, sulphate	boron, iron, manganese, sodium, BTEX	calcium, magnesium	iron, manganese	aluminum, barium, beryllium, bismuth, cadmium, chromium, cobalt, copper, lead, molybdenum, nickel, potassium, silver, sodium, strontium, tungsten, vanadium, zinc	EPA 624 VOCs
Groundwater Wells	OW2-84	×	×	×	X				×	×	×			
	OW3-84	×	×	×	X						×			
	OW4-84	×	×	×	X						×			
	OW5-84	×	×	×	X						×			
	OW6-84	×	×	×	X						×			
	OW7-91	×	×	×	×						×			
	OW8A-91	×	×	×	X						×			
	OW8B-91	×	×	×	×						×			
	OW9A-91	×	×	×	X						×			
	OW9B-91	×	×	×	X						×			
	OW15-91	×	×	×	X				×	×	×			
	OW21-91	×	×	×	×				×	×	×			
	OW25-91	×	×	×	X						×			
	OW32-96	×	×	×	X				×	×	×			
	OW33-96	×	×	×	×						×			
	OW34-96	×	×	×	X				×	×	×			
	OW32A-02	×	×	X	X				×	×	×			
Residential Wells	Riordan (#3)	X	×	×	X						×			
	Hall (#25)	×	×	×	×						X			
	Riordan Farm (#26)	×	×	×	X						X			
	Heard (#27)	×	×	×	×						X			
	McCurdy (#24)	×	×	×	X						X			
Surface Water	SP1-93 (upstream)	×	×	X		X	X				×	X		
	SP2-93 (midstream)	×	×	X		×	X				×	X		
	SP3-93 (downstream)	×	×	×		×	X				×	X		
	SP1B-94 (Basin B inlet)	×	×	X		×	X				×	X		
	SP2B-94 (Basin B outlet)	×	×	X		×	X				×	X		
	SP3A-94 (Basin A inlet)	×	×	X		×	X				×	X		
	SP4A-94 (Basin A outlet)	×	×	×		×	X				×	X		
	SP5A-94 (Basin A inlet)	×	×	X		×	X				×	X		
Leachate Wells	MH1 (Phase I)	X				×		×	×		×	×	×	×
	MH3 (Phase II/III)	X				×		×	×		×	×	×	×
	All Manholes	X												

The reasons for the imposition of these terms and conditions are as follows:

The reason for Condition 1.1 is to clarify that the previously issued Provisional Certificate of Approval No. A150203 issued on August 4, 1980, and any subsequent Notices of amendment, are no longer in effect and has been replaced and superseded by the Terms and Conditions stated in this Certificate.

The reason for Conditions 2.1, 2.2, 5.1, 5.2, 5.3, 6.1, 6.2, 10.2, 10.3 15.1, 15,2, 16.2, 16.15, 16.16. 16.17, 16.19, 16.20, *17.6, 17.8, and 17.9 is to clarify the legal rights and responsibilities of the Owner under this Certificate.*

The reason for Conditions 3.1, 3.2, 14.1, 15.1, 16.1, and 17.2 is to ensure that the Site is designed, operated, monitored and maintained in accordance with the application and supporting documentation submitted by the Owner, and not in a manner which the Director has not been asked to consider.

The reason for Conditions 4.1, 4.2, 4.3 and 4.4 is to clarify how to interpret this Certificate in relation to the application and supporting documentation submitted by the Owner.

The reason for Condition 7.1 is to ensure that the Site is operated under the corporate name which appears on the application form submitted for this approval.

The reason for Condition 7.2 is to restrict potential transfer or encumbrance of the Site without the approval of the Director. Any transfer of encumbrance can be made only on the basis that it will not endanger compliance with this Certificate.

The reason for Condition 7.3 is to ensure that subsequent owners of the Site are informed of the terms and conditions of this Certificate. This also applies to all supporting documentation listed in Schedule "A".

Conditions 8.1, 8.2 and 8.3 are included, pursuant to subsection 197(1) of the Act, to provide that any persons having an interest in the Site are aware that the land has been approved and used for the purposes of waste disposal.

The reason for Condition 9.1 is to ensure that appropriate Ministry staff have ready access to the Site for inspection of the Site and its facilities, equipment, practices and operations required by the conditions in this Certificate. This condition is supplementary to the powers of entry afforded a Provincial Officer pursuant to the Act and OWRA.

The reason for Conditions 10.1 to 10.4 inclusive is to ensure the availability of records and drawings for inspection and information purposes.

The reason for Condition 11.1 is to specify the approved areas from which waste may be accepted at the Site.

The reason for Conditions 12.1, 12.2 and 12.3 is to specify the hours of operation for the Site and a mechanism for amendment of the hours of operation, as required.

The reason for Conditions 13.1, 12.4 and 15.9 is to ensure that the Site is secure when unattended to prevent vandalism or theft.

The reason for Conditions 13.2, 13.3, 13.4, 13.5 and 14.12 is to ensure the safety of the public and the protection of the environment.

The reason for Conditions 13.6 and 16.18 is to ensure that emergency responders and the public have the necessary contact information in the event of an emergency or complaint.

The reason for Condition 14.1, 14.2, 14.3 and 14.14 is to specify the types and quantities of waste that may be accepted for disposal and the placement of the waste at the Site.

The reason for Conditions 14.4, 14.5, 14.6 and 10.7 is to define the maximum amount of waste, including daily cover that is allowed at the landfill site.

The reason for Conditions 14.8, 14.9 and 14.10 is to specify the requirements for use of alternative cover material at the Site.

The reason for Condition 14.11 is to ensure that daily and intermediate cover is used to control potential nuisance effects, to facilitate vehicle access, and to ensure an acceptable appearance is maintained. The proper closure of a landfill requires the application of a final cover which is aesthetically pleasing, controls infiltration, and is suitable for the end use planned for the Site and ensures that waste is not filled beyond approved limits.

Conditions 14.13, 14.14, 15.4, 15.5, 15.6, 15.7, 15.8, 15.10, 15.11, 16.4, 16.5, 16.6, 16.7, 16.8, 16.9, 16.10 16.11, *16.12, 16.13, and 16.14 is included to ensure that waste storage is done in a manner, quantity and/or duration which does not result in a nuisance or a hazard to the health and safety of the environment or people.*

The reason for Condition 16.19 is to ensure that waste is transported to and from the Site in accordance with Ontario Regulation 347.

The reason for Condition 16.20 is to alert receiving waste disposal sites that the listed and/or characteristic waste is exempt from treatment requirements.

The reason for Conditions 14.3, 15.3, 16.3, 17.1 and 15.11(b) is to ensure that the types and quantities of waste received at the Site are in accordance with that approved under this Certificate.

The reason for Condition 17.3 is to ensure that only waste approved under this Certificate are received at the Site.

The reason for Conditions 17.4, 17.5, 17.6, 18.1, 18.2, 18.3, and 18.4 is to ensure that the Site is operated in a manner which does not result in a nuisance or a hazard to the health and safety of the environment or people.

The reason for Conditions 19.1, 19.2, 19.3, 19.4, 19.5 and 19.6 is to ensure that all equipment and facilities are maintained in good working order.

The reason for Conditions 20.1 to 20.6 inclusive is to ensure that the Owner is prepared and properly equipment to take action in the event of a spill, fire or other operation upset.

The reason for Condition 21.1 is to ensure that complaints are properly and quickly resolved and that complaints and follow-up actions have been documented.

The reason for Conditions 22.1, 22.2 and 22.3 is to ensure that detailed records of Site operations are kept for inspection and information purposes.

The reason for Condition 20.7 is to ensure that the Site is only operated in the presence of trained personnel.

The reason for Condition 23.1 is to demonstrate that the landfill is performing as designed and the impacts on the natural environment are acceptable. Regular monitoring allows for the analysis of trends over time and ensures that there is an early warning of potential problems so that any necessary remedial/contingency action can be taken.

The reason for Condition 23.2 is to ensure that samples are collected using established sampling protocol.

The reason for Condition 23.3 is to protect the groundwater.

The reason for Condition 23.4 is to notify the Ministry of off-site groundwater contamination so that appropriate mitigative actions can be taken.

The reason for Condition 24.1 is to provide the Site with the needed technology to be able to track the amount of waste entering and leaving the Site.

The reasons for Conditions 24.2 and 24.3 is to ensure that the Operations and Maintenance Manuals are kept current and reflects actual Site practices and procedures and are current and available for inspection by Ministry staff.

The reason for Condition 25.1 is to ensure a regular review of site development, operations and monitoring data and that the review is documented and any possible improvements to Site design, operations or monitoring programs are identified. An annual report is an important tool used in reviewing Site activities and for determining the effectiveness of Site design.

The reason for Conditions 26.1, 26.2 and 14.11 is to ensure that the Site is closed in accordance with MOE standards and to protect the health and safety of the environment.

This Provisional Certificate of Approval revokes and replaces Certificate(s) of Approval No. A150203 issued on

CONTENT COPY OF ORIGINAL

August 4, 1983.

In accordance with Section 139 of the Environmental Protection Act, R.S.O. 1990, Chapter E-19, as amended, you may by written notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act, provides that the Notice requiring the hearing shall state:

1. The portions of the approval or each term or condition in the approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The Certificate of Approval number;
6. The date of the Certificate of Approval;
7. The name of the Director;
8. The municipality within which the waste disposal site is located;

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
655 Bay Street, 15th Floor
Toronto, Ontario
M5G 1E5

AND

The Director
Section 39, *Environmental Protection Act*
Ministry ofthe Environment
2 St. Clair Avenue West, Floor 12A
Toronto, Ontario
M4V 1L5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 314-4600, Fax: (416) 314-4506 or www.ert.gov.on.ca**

The above noted waste disposal site is approved under Section 39 of the Environmental Protection Act.

DATED AT TORONTO this 24th day of June, 2010

Tesfaye Gebrezghi, P.Eng.
Director
Section 39, *Environmental Protection Act*

JC/
c: District Manager, MOE London - District
Jim Yardley, Conestoga-Rovers and Associates

Content Copy Of Original

Ontario

Ministry of the Environment and Climate Change
Ministère de l'Environnement et de l'Action en matière de changement climatique

AMENDMENT TO ENVIRONMENTAL COMPLIANCE APPROVAL
NUMBER A150203
Notice No. 4
Issue Date: September 5, 2017

The Corporation of the Separated Town of St. Marys
175 Queen St E
Post Office Box, No. 998
St. Marys, Ontario
N4X 1B6

Site Location: St. Marys Landfill
1221 Water Street South
St. Marys Separated Town, County of Perth
N4X 1B6

You are hereby notified that I have amended Approval No. A150203 issued on June 24, 2010 and amended on December 11, 2013, November 16, 2015, and September 2, 2016 for a 37 hectare Waste Disposal Site consisting of a 8 hectare Landfill, as follows:

II. The following Conditions are hereby added to this Approval:

31. No waste shall be disposed of at the Landfill Site under this Approval after **September 30, 2018**, or if the previously approved Site capacity of **307,950 cubic metres** including daily cover is reached, whichever comes first.

32. By **July 31, 2018**, the Owner shall submit to the Director an ECA application, should the Site require further approval of interim capacity. The application shall include the following supporting information:

(a) Updated proposal of interim contours
(b) 2017 Annual Operations and Monitoring Report

III. The following items are hereby added to Schedule "A":

16. Application for approval dated July 18, 2017 including all supporting documents submitted (2016 AMR, et al).

The reason(s) for this amendment to the Approval is (are) as follows:

1. The reasons for Condition 31 is to allow for approval of extending (though not increasing) interim capacity for the Landfill Site, while the Town is waiting for an Environmental Assessment approval for extending landfilling operations beyond existing capacity.

2. The reason for Condition 32 is to ensure that sufficient time is given to the Ministry to process the application, in the event that the Town of St. Marys needs to secure the following year's interim *capacity.*

This Notice shall constitute part of the approval issued under Approval No. A150203 dated June 24, 2010

In accordance with Section 139 of the Environmental Protection Act, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:

a. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;
b. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

Pursuant to subsection 139(3) of the Environmental Protection Act, a hearing may not be required with respect to any terms and conditions in this environmental compliance approval, if the terms and conditions are substantially the same as those contained in an approval that is amended or revoked by this environmental compliance approval.

The Notice should also include:

1. The name of the appellant;
2. The address of the appellant;
3. The environmental compliance approval number;
4. The date of the environmental compliance approval;
5. The name of the Director, and;
6. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary* Environmental Review Tribunal 655 Bay Street, Suite 1500 Toronto, Ontario M5G 1E5	AND	The Director appointed for the purposes of Part II.1 of the Environmental Protection Act Ministry of the Environment and Climate Change 135 St. Clair Avenue West, 1st Floor Toronto, Ontario M4V 1P5

* **Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 326-5370 or** www.ert.gov.on.ca

The above noted activity is approved under s.20.3 of Part II.1 of the Environmental Protection Act.

DATED AT TORONTO this 5th day of September, 2017

Dale Gable, P.Eng.
Director

appointed for the purposes of Part II.1 of
the *Environmental Protection Act*

BH/
c: District Manager, MOECC London - District
Kent Hunter, R.J. Burmside & Associates Limited

Ontario

Ministry of the Environment and Climate Change
Ministère de l'Environnement et de l'Action en matière de changement climatique

AMENDMENT TO ENVIRONMENTAL COMPLIANCE APPROVAL

NUMBER A150203
Notice No. 3
Issue Date: September 6, 2016

The Corporation of the Separated Town of St. Marys
175 Queen St E
Post Office Box, No. 998
St. Marys, Ontario
N4X 1B6

RECEIVED
SEP 19 2016
BURNSIDE

Site Location: St. Marys Landfill
1121 Water St S
Lot 36, Concession Thames
St. Marys Separated Town, County of Perth

You are hereby notified that I have amended Approval No. A150203 issued on June 24, 2010 and amended on December 11, 2013 and November 16, 2015 for a 37 hectare Waste Disposal Site consisting of a 8 hectare Landfill , as follows:

I. Condition 14.5 of this *Approval* is hereby amended as follows:

14.5 Phase II/III of the Landfill *Site* , as described in Schedule "A" of this *Approval* , shall contain a maximum combined volume of 307,950 cubic metres of waste including daily cover.

II. The following Conditions are hereby added to this *Approval* :

29. (a) No waste shall be disposed of at the Landfill *Site* under this *Approval* after **September 30, 2017**, or if the approved interim capacity for the period of October 1, 2016 to September 30, 2017 of 16,100 cubic metres including daily cover is reached, which shall be contained within cells 4, 7 and 8 of Phase II/III, whichever comes first.

(b) Not withstanding Conditions 14.6, 14.7 and 27 (b) of this *Approval* , the maximum top elevation and final contours, restricted to cells 4, 7 and 8B of the Phase II/III area, are extended, in accordance with Item 15 of Schedule "A".

30. By **July 31, 2017**, the *Owner* shall submit to the *Director* an ECA application, should the *Site* require further approval of interim capacity. The application shall include the following supporting

information:

(a) Updated proposal of interim contours
(b) 2016 Annual Operations and Monitoring Report

III. The following items are hereby added to Schedule "A":

15. Letter from The Corporation of the Town of St. Marys - Public Works Department to Dale Gable, Ministry of the Environment and Climate Change signed by Dave Blake, C.E.T. and dated July 25, 2016 including all attachments.

IV. The reasons for this amendment to the *Approval* are as follows:

1. The reasons for Conditions 14.5 and 29 are to allow for approval of extending interim capacity for the Landfill *Site* , while the Town is waiting for an Environmental Assessment approval for extending landfilling operations beyond existing capacity.

2. The reason for Condition 30 is to ensure that sufficient time is given to the *Ministry* to process the application, in the event that the Town of St. Marys needs to secure the following year's interim capacity.

This Notice shall constitute part of the approval issued under Approval No. A150203 dated June 24, 2010

In accordance with Section 139 of the Environmental Protection Act, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:

1. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

Pursuant to subsection 139(3) of the Environmental Protection Act, a hearing may not be required with respect to any terms and conditions in this environmental compliance approval, if the terms and conditions are substantially the same as those contained in an approval that is amended or revoked by this environmental compliance approval.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The environmental compliance approval number;
6. The date of the environmental compliance approval;
7. The name of the Director, and;

8. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary* Environmental Review Tribunal 655 Bay Street, Suite 1500 Toronto, Ontario M5G 1E5	AND	The Director appointed for the purposes of Part II.1 of the Environmental Protection Act Ministry of the Environment and Climate Change 135 St. Clair Avenue West, 1st Floor Toronto, Ontario M4V 1P5

* **Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 326-5370 or www.ert.gov.on.ca**

The above noted activity is approved under s.20.3 of Part II.1 of the Environmental Protection Act.

DATED AT TORONTO this 6th day of September, 2016

THIS NOTICE WAS MAILED
ON Sept. 7, 2016
JC
(Signed)

Dale D. Gable

Dale Gable, P.Eng.
Director
appointed for the purposes of Part II.1 of the
Environmental Protection Act

MT/
c: District Manager, MOECC London - District
Kent Hunter, R.J. Burnside & Associates Limited

Ministry of the Environment and Climate Change
Ministère de l'Environnement et de l'Action en matière de changement climatique

AMENDMENT TO ENVIRONMENTAL COMPLIANCE APPROVAL
NUMBER A150203
Notice No. 2
Issue Date: November 16, 2015

The Corporation of the Separated Town of St. Marys
Post Office Box, No. 998
St. Marys, Ontario
N4X 1B6

Site Location: St. Marys Landfill
1121 Water St S
Lot 36, Concession Thames
St. Marys Separated Town, County of Perth

You are hereby notified that I have amended Approval No. A150203 issued on June 24, 2010 and amended on December 11, 2013 for a 37 hectare Waste Disposal Site consisting of a 8 hectare Landfill , as follows:

I. Condition 14.5 is hereby amended as follows:

14.5 Phase II/III of the Landfill *Site* , as described in Schedule "A" of this *Approval* , shall contain a maximum combined volume of 291,850 cubic metres of waste including daily cover.

II. The following items are hereby added to this *Approval* :

27. (a) No waste shall be disposed of at the Landfill *Site* under this *Approval* after **September 30, 2016**, or if the approved interim capacity of 15,850 cubic metres including daily cover is reached, which shall be contained within cell 8 of Phase II/III, whichever comes first.

(b) Not withstanding Conditions 14.6 and 14.7 of this *Approval* , the maximum top elevation and final contours, restricted to cell 8 of the Phase II/III area, are extended, in accordance with item 14 of Schedule "A".

28. By **July 31, 2016**, the *Owner* shall submit to the *Director* an ECA application, should the *Site* require further approval of interim capacity. The application shall include the following supporting information:
   (a) Updated proposal of interim contours
   (b) 2015 Annual Operations and Monitoring Report

III. The following items are hereby added to Schedule "A":

14. Application for an Environmental Compliance Approval for Landfill amendment - Interim Capacity approval, by Chad Papple, Director of Public Works, The Corporation of the Town of St. Marys, received on July 2, 2015, including the following supporting information:
    (a) Proposed Cell Staging Plan prepared by R.J. Burnside & Associates Limited, Project No. 300032339
    (b) 2014 Annual Operations and Monitoring Report prepared by R.J. Burnside & Associates Limited, Project No. 300032339

IV. The reasons for this amendment to the Approval are as follows:

1. The reasons for Conditions 14.5 and 27 are to allow for approval of extending interim capacity for the Landfill *Site* , while the Town is waiting for an Environmental Assessment approval for extending landfilling operations beyond existing capacity.

2. The reason for Condition 28 is to ensure that sufficient time is given to the *Ministry* to process the application, in the event that the Town of St. Marys needs to secure the following year's interim capacity.

This Notice shall constitute part of the approval issued under Approval No. A150203 dated June 24, 2010

In accordance with Section 139 of the Environmental Protection Act, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:

1. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

Pursuant to subsection 139(3) of the Environmental Protection Act, a hearing may not be required with respect to any terms and conditions in this environmental compliance approval, if the terms and conditions are substantially the same as those contained in an approval that is amended or revoked by this environmental compliance approval.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The environmental compliance approval number;
6. The date of the environmental compliance approval;
7. The name of the Director, and;
8. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
655 Bay Street, Suite 1500
Toronto, Ontario
M5G 1E5

AND

The Director appointed for the purposes of Part II.1 of the Environmental Protection Act
Ministry of the Environment and Climate Change
135 St. Clair Avenue West, 1st Floor
Toronto, Ontario
M4V 1P5

* **Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 326-5370 or www.ert.gov.on.ca**

The above noted activity is approved under s.20.3 of Part II.1 of the Environmental Protection Act.

DATED AT TORONTO this 16th day of November, 2015

Dale D. Gable

Dale Gable, P.Eng.
Director
appointed for the purposes of Part II.1 of the
Environmental Protection Act

MT/
c: District Manager, MOECC London - District
Kent Hunter, R.J. Burnside & Associates Limited

Ontario

Ministry of the Environment
Ministère de l'Environnement

AMENDMENT TO ENVIRONMENTAL COMPLIANCE APPROVAL
NUMBER A150203
Notice No. 1
Issue Date: December 11, 2013

The Corporation of the Town of St. Marys
408 James St S
St. Marys, Ontario
N4X 1B6

Site Location: St. Marys Landfill
Part of Lockhard Street, Closed by R90095, Part of Lot 35 Con. Thames (Blanchard) St. Marys
Part of Lots 6, 7, 8, 9, 10, 16 & 17 and all of Lots 12, 13, 14, 18, 19 & 20 Plan 235 St. Marys, County of Perth; Designated as Parts 2 and 3 Plan 44R-4454, Concession Thames

You are hereby notified that I have amended Approval No. A150203 issued on June 24, 2010 fora waste disposal site, as follows:

I. The following definitions are hereby added:

"*Approval*" means this Environmental Compliance Approval and any Schedules to it, including the application and supporting documentation listed in Schedule "A";

"*Director*" means any *Ministry* employee pursuant to section 20.3 of Part II.1 of the *EPA*;

II. The following conditions are hereby revoked and replaced with:

11.1 The *Site* shall only accept waste generated within the geographic boundaries of the Town of St. Marys, except for MHSW depot which can accept waste from the Town of St. Marys and the Township of Perth South.

16.4 All *MHSW* shall be stored on *Site* in weather resistant, lockable, 20-foot standard storage containers.

III. The following documents are hereby added to Schedule "A":

12. Application for an Environmental Compliance Approval for a Waste Disposal Site from The Corporation of the Town of St. Marys, received on June 14, 2013, including supporting documentation submitted therewith.

13. Letter dated July 22, 2013 from The Corporation of the Town of St. Marys including the following information:

(a) Signature dated June 27, 2013 on page 7 of the application form;
(b) Revised pages 16 and 27 of the application form;
(c) Copy of public notification letter and list of recipients;
(d) Site address confirmation; and
(e) Updated Design and Operations Plan.

The reasons for this amendment to the Approval are as follows:

To expand service area for MHSW to include the Township of Perth South and to update storage containers condition for MHSW.

This Notice shall constitute part of the approval issued under Approval No. A150203 dated June 24, 2010.

In accordance with Section 139 of the Environmental Protection Act, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:

1. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

Pursuant to subsection 139(3) of the Environmental Protection Act, a hearing may not be required with respect to any terms and conditions in this environmental compliance approval, if the terms and conditions are substantially the same as those contained in an approval that is amended or revoked by this environmental compliance approval.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The environmental compliance approval number;
6. The date of the environmental compliance approval;
7. The name of the Director, and;
8. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
655 Bay Street, Suite 1500
Toronto, Ontario
M5G 1E5

AND

The Director appointed for the purposes of Part II.1 of
the Environmental Protection Act
Ministry of the Environment
2 St. Clair Avenue West, Floor 12A
Toronto, Ontario
M4V 1L5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 314-3717 or www.ert.gov.on.ca**

The above noted activity is approved under s.20.3 of Part II.1 of the Environmental Protection Act.

DATED AT TORONTO this 11th day of December, 2013

Dale Gable, P.Eng.
Director
appointed for the purposes of Part II.1 of the
Environmental Protection Act

MC/
c: District Manager, MOE London - District
Dave Blake, C.E.T., The Corporation of the Town of St. Marys

Ministry of the Environment, Conservation and Parks
Ministère de l'Environnement, de la Protection de la nature et des Parcs

AMENDMENT TO ENVIRONMENTAL COMPLIANCE APPROVAL

NUMBER A150203
Notice No. 5
Issue Date: September 20, 2018

The Corporation of the Separated Town of St. Marys
Post Office Box, No. 998
St. Marys, Ontario
N4X 1B6

Site Location: St. Marys Landfill
1221 Water Street South
St. Marys Separated Town, County of Perth

You are hereby notified that I have amended Approval No. A150203 issued on June 24, 2010 and amended on December 11, 2013, November 16, 2015, September 6, 2016 and September 5, 2017 for a 37 hectare Waste Disposal Site consisting of a 8 hectare landfill , as follows:

I. Condition 14.5 of this *Approval* is hereby amended as follows:

14.5 Phase II/III of the Landfill *Site* , as described in Schedule "A" of this *Approval* , shall contain a maximum combined volume of 324,140 cubic metres of waste including daily cover.

II. The following Conditions are hereby added to this *Approval* :

33. (a) The amount of waste disposed of at the Landfill *Site* between October 1, 2018 and September 30, 2019 shall not exceed 16,190 cubic metres including daily cover.

(b) This waste shall be contained within cells 6, 7 and 8 of Phase II/III.

(c) No waste shall be disposed of at the Landfill *Site* after September 30, 2019 unless additional interim capacity is approved by the *Director* .

34. By July 31, 2019, the *Owner* shall submit to the *Director* an ECA application, should the *Site* require further approval of interim capacity. The application shall include the following supporting information:

(a) Updated proposal of interim contours

(b) 2018 Annual Operations and Monitoring Report

III. The following items are hereby added to Schedule "A" of this *Approval* :

17. Letter from The Corporation of the Town of St. Marys - Public Works Department to Dale Gable, Ministry of the Environment signed by Dave Blake, C.E.T. and dated June 20, 2018 including all attachments.

18. Email from Matt Ash, C.E.T., GM BluePlan Engineering Limited, dated September 13, 2018, RE: Approval of interim capacity for St. Marys Landfill Site (MECP Ref no. 5354-B2BLLT).

IV. The reasons for this amendment to the *Approval* are as follows:

1. The reasons for Conditions 14.5 and 33 are to allow for approval of extending interim capacity for the Landfill *Site* , while the Town is waiting for an Environmental Assessment approval for extending landfilling operations beyond existing capacity.

2. The reason for Condition 34 is to ensure that sufficient time is given to the *Ministry* to process the application, in the event that the Town of St. Marys needs to secure the following year's interim capacity.

This Notice shall constitute part of the approval issued under Approval No. A150203 dated June 24, 2010

In accordance with Section 139 of the Environmental Protection Act, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:

a. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;
b. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

Pursuant to subsection 139(3) of the Environmental Protection Act, a hearing may not be required with respect to any terms and conditions in this environmental compliance approval, if the terms and conditions are substantially the same as those contained in an approval that is amended or revoked by this environmental compliance approval.

The Notice should also include:

1. The name of the appellant;
2. The address of the appellant;
3. The environmental compliance approval number;
4. The date of the environmental compliance approval;
5. The name of the Director, and;
6. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal

The Director appointed for the purposes of Part II.1 of the Environmental Protection Act

655 Bay Street, Suite 1500
Toronto, Ontario
M5G 1E5

AND

Ministry of the Environment, Conservation and Parks
135 St. Clair Avenue West, 1st Floor
Toronto, Ontario
M4V 1P5

* **Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 326-5370 or www.ert.gov.on.ca**

The above noted activity is approved under s.20.3 of Part II.1 of the Environmental Protection Act.

DATED AT TORONTO this 20th day of September, 2018

Dale Gable, P.Eng.
Director
appointed for the purposes of Part II.1 of the *Environmental Protection Act*

MT/
c: District Manager, MECP London - District
Jennette Walker, GM BluePlan Engineering Ltd., The Corporation of the Separated Town of St. Marys

Ministry of the Environment, Conservation and Parks
Ministère de l'Environnement, de la Protection de la nature et des Parcs

AMENDMENT TO ENVIRONMENTAL COMPLIANCE APPROVAL

NUMBER A150203
Notice No. 6
Issue Date: October 4, 2019

The Corporation of the Separated Town of St. Marys
175 Queen St E
Post Office Box, No. 998
St. Marys, Ontario
N4X 1B6

Site Location: 1221 Water Street South
St. Marys Separated Town, County of Perth
N4X 1B6

You are hereby notified that I have amended Approval No. A150203 issued on June 24, 2010 and amended on December 11, 2013, November 16, 2015, September 6, 2016, September 5, 2017 and September 20, 2018 for a 37 hectare Waste Disposal Site consisting of a 8 hectare landfill , as follows:

I. Condition 14.5 of this *Approval* is hereby amended as follows:

14.5 Phase II/III of the Landfill *Site,* as described in Schedule "A" of this *Approval,* shall contain a maximum combined volume of 330,050 cubic metres of waste including daily cover.

II. The following Conditions are hereby added to this *Approval:*

35. (a) The amount of waste disposed of at the Landfill *Site* between October 1, 2019 and September 30, 2020 shall not exceed 15,050 cubic metres including daily cover.

(b) This waste shall be contained within cells 5, 6, 7 and 8 of Phase II/III.

(c) No waste shall be disposed of at the Landfill *Site* after September 30, 2020 unless additional interim capacity is approved by the *Director.*

36. By July 31, 2020, the *Owner* shall submit to the *Director* an ECA application, should the *Site* require further approval of interim capacity. The application shall include the following supporting information:

(a) Updated proposal of interim contours.

(b) 2019 Annual Operations and Monitoring Report.

III. The following items are hereby added to Schedule "A" of this *Approval:*

19. Letter dated July 22, 2019 from The Corporation of the Town of St. Marys - Public Works Department addressed to Director, Client Services and Permissions Branch, Ministry of the Environment signed by Dave Blake, C.E.T., including all attachments.

20. Email from Dave Blake, The Corporation of the Town of St. Marys, dated October 4, 2019, Re: clarification on filling in cell 5 of Phase II/III, and working slopes.

IV. The reasons for this amendment to the *Approval* are as follows:

1. The reasons for Conditions 14.5 and 35 are to allow for approval of extending interim capacity for the Landfill *Site,* while the Town is waiting for an Environmental Assessment approval for extending landfilling operations beyond existing capacity.

2. The reason for Condition 36 is to ensure that sufficient time is given to the *Ministry* to process the application, in the event that the Town of St. Marys needs to secure the following year's interim capacity.

This Notice shall constitute part of the approval issued under Approval No. A150203 dated June 24, 2010

In accordance with Section 139 of the Environmental Protection Act, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:

a. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;
b. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

Pursuant to subsection 139(3) of the Environmental Protection Act, a hearing may not be required with respect to any terms and conditions in this environmental compliance approval, if the terms and conditions are substantially the same as those contained in an approval that is amended or revoked by this environmental compliance approval.

The Notice should also include:

1. The name of the appellant;
2. The address of the appellant;
3. The environmental compliance approval number;
4. The date of the environmental compliance approval;
5. The name of the Director, and;
6. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
655 Bay Street, Suite 1500
Toronto, Ontario
M5G 1E5

AND

The Director appointed for the purposes of Part II.1 of the Environmental Protection Act
Ministry of the Environment, Conservation and Parks
135 St. Clair Avenue West, 1st Floor
Toronto, Ontario
M4V 1P5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 326-5370 or www.ert.gov.on.ca**

The above noted activity is approved under s.20.3 of Part II.1 of the Environmental Protection Act.

DATED AT TORONTO this 4th day of October, 2019

Mohsen Keyvani, P.Eng.
Director
appointed for the purposes of Part II.1 of the *Environmental Protection Act*

MT/
c: District Manager, MECP London - District
Al Bringleson, GM Blue Plan Engineering Limited

Ontario

Ministry of the Environment, Conservation and Parks
Ministère de l'Environnement, de la Protection de la nature et des Parcs

AMENDED ENVIRONMENTAL COMPLIANCE APPROVAL
NUMBER A150203
Issue Date: November 16, 2020

The Corporation of the Separated Town of St. Marys
175 Queen St E
Post Office Box, No. 998
St. Marys, Ontario
N4X 1B6

Site Location: 1221 Water Street South
St. Marys Separated Town, County of Perth
N4X 1B6

You have applied under section 20.2 of Part II.1 of the Environmental Protection Act, R.S.O. 1990, c. E. 19 (Environmental Protection Act) for approval of:

a 37 hectare Waste Disposal Site consisting of a 8 hectare Landfill, to be used for:

- the final disposal of solid, non-hazardous waste;
- collection and storage for diversion from final disposal of recyclable waste;
- the acceptance, storage, packaging, bulking and subsequent transfer of Municipal Hazardous or Special Waste
- the composting of leaf and yard waste.

Note: Use of the site for any other type of waste is not approved under this ECA, and requires obtaining a separate approval amending this ECA.

For the purpose of this environmental compliance approval, the following definitions apply:

"**Act**" means the Environmental Protection Act, R.S.O. 1990, C.E-19, as amended;

"**Approval**" or "**ECA**" means this Environmental Compliance Approval and any Schedules to it, including the application and supporting documentation listed in Schedule "A";

"Competent Person" or "Competent People" means a person or people who has/have the following features:

A. has/have training and knowledge of the following:

i. relevant waste management legislation, regulations and guidelines;

ii. major environmental concerns pertaining to the waste to be handled;
iii. contents of the facility's Design and Operating Reports outlined in Items 8, 9 and 10 of Schedule "A" and the Operations and Maintenance Manual required by Condition 24.2 of this ECA;
iv. the terms, conditions and operating requirements of the ECA;
v. the Fire Code and how it applies to proper storage and handling of wastes that may be flammable, reactive or oxidizing;
vi. record keeping procedures as outlined in Condition 22 of this ECA;
vii. occupational health and safety concerns pertaining to the wastes to be processed;
viii. specific written procedures for the control of nuisance conditions; and
ix. specific written procedures for refusal of unacceptable waste loads;

B. through their knowledge, training and experience can carry out any necessary duties in the following, through instruction and practice:
i. use and operation of any equipment to be used at the Site;
ii. operations and management of the Site, in accordance with the specific job requirements of each individual Operator, including concern for environmental protection and health and safety standards for the Operator of the Site, identification of unacceptable wastes, procedures for refusing the processing of unacceptable wastes, proper handling of waste, proper procedures for the storage of waste and proper maintenance of the Site; and
iii. process monitoring procedures; and

C. has/have the following training requirements:
i. is/are provided the necessary training by the Owner to become a Competent Person before starting at the Site as an Operator;
ii. is/are provided training and an annual training update of the Owner's environmental emergency plan that is outlined in Conditions 20 of this ECA; and
iii. is/are provided refresher training on the components of a Competent Person at least annually;

"**Compost Waste**" means leaf and yard waste that has gone through the whole composting process, including curing, but did not meet the Schedule "B" criteria';

"Cured Compost" means leaf and yard waste that has gone through the whole composting process, including curing, and meets the Schedule "B" criteria;

"**Director**" means any Ministry employee pursuant to section 20.3 of Part II.1 of the EPA;

"**District Manager**" means the District Manager of the local district office of the Ministry in which the Site is geographically located;

"Fire Code" means Regulation 213/07 of the Fire Protection and Prevention Act, 1997;

"**LDR**" means Lands Disposal Restrictions and refers to sections 74 through 85 of Regulation 347, which prohibits the disposal of listed and characteristic hazardous wastes on land until they have been treated to meet the treatment standards under Regulation 347;

"**Leaf and yard waste**" means waste consisting of natural Christmas trees and other plant materials but not tree limbs or other woody materials in excess of 7 centimetres in diameter or wood waste unless such waste has been ground;

"**Ministry**" and "**MECP**" means the Ontario Ministry of the Environment, Conservation and Parks;

Municipal Hazardous or Special Waste or MHSW means household hazardous waste limited to waste classes 112, 114, 122, 145, 147, 148, 212, 213, 242, 252, 253 and 263 and also includes: paints and coatings and their containers; oil filters; oil containers of 30 litres or less for a wide range of oil products such as engine and marine oils, and hydraulic, power steering and transmission fluids; single use, dry cell batteries, e.g., non-rechargeable batteries that can be easily removed and replaced by the consumer; automotive antifreeze (engine coolant) and related containers; pressurized containers such as propane tanks and cylinders; fertilizers and their containers; and pesticides, fungicides, herbicides, insecticides and their containers; generated by households located in the geographic boundaries of the Town of St. Marys;

"**Ontario Regulation 189**" means Ontario Regulation 189/94, Refrigerants, or as amended, made under the Act;

"**Ontario Regulation 903**" means Ontario Regulation 903 – R.R.O. 1990, Wells, amended to Ontario Regulation 128/03, made under the OWRA;

"**Operator**" means any person, other than the Owner's employees, authorized by the Owner as having the charge, management or control of any aspect of the Site;

"**Owner"** means any person that is responsible for the establishment or operation of the Site being approved by this ECA, and includes the The Corporation of the Town of St. Marys**,** its successors and assigns;

"**OWRA**" means the Ontario Water Resources Act, R.S.O. 1990, c. O.40, as amended;

"**PA**" means the Pesticides Act, R.S.O. 1990, c. P-11, as amended from time to time;

"PCB" means monochlorinated and polychlorinated biphenyls or any mixture of them or any mixture that contains one or more of them;

"**Provincial Officer**" means any person designated in writing by the Minister as a provincial officer pursuant to section 5 of the OWRA or section 5 of the or section 17 of the PA.

"**PWQO**" means the Provincial Water Quality Objectives included in the July 1994 publication entitled Water Management Policies, Guidelines, Provincial Water Quality Objectives, as amended from time to time;

"Recyclable Material" means any material set out in Schedule 1 of Ontario Regulation 101/94 of the Act, as amended from time to time, and scrap wood, building materials, and tires;

"**Regulation 347**" means Regulation 347, R.R.O. 1990, General - Waste Management, made under the Act, as amended from time to time;

"**RUP**" means the Reasonable Use Policy (Guideline B-7) of the Ministry of the Environment;

"**Sensitive receptor**" means any location where routine or normal activities occurring at reasonably expected times would experience adverse effect(s) from odour discharges from the Site, including one or a combination of:

(i) private residences or public facilities where people sleep (e.g.: single and multi-unit dwellings, nursing homes, hospitals, trailer parks, camping grounds, etc.);
(ii) institutional facilities (e.g.: schools, churches, community centres, day care centres, recreational centres, etc.);
(iii) outdoor public recreational areas (e.g.: trailer parks, play grounds, picnic areas, etc.); and
(iv) other outdoor public areas where there are continuous human activities (e.g.: commercial plazas and office buildings);

"**Site**" means the entire 37 hectare waste disposal site located at 1221 Water Street South, St. Marys Separated Town, County of Perth, including the buffer lands and a landfilling site of approximately 8 hectares at Part of Lockhart St., Closed by R90095; Part of Lot 35 Con. Thames (Blanchard) St. Mary's; Part of Lots 6, 7, 8, 9, 10, 16 & 17 and all of Lots 12, 13, 14, 18, 19 & 20 Plan 235 St. Mary's, County of Perth; Designated as Parts 2 and 3 Plan 44R-4454, Concession Thames. It also includes an easement for ingress, egress and access to maintain and service the existing sewer drain located within Parts 1, 4, 5 and 6 of Plan 44R-4454;

"Waste Transfer Station" means the part of the Site that is used to recover waste for reuse or recycling and to store waste and to transfer waste from the Site as outlined in Condition 15 of the ECA;

"**Waste electrical and electronic equipment**" means devices listed in Schedules 1 through 7 of Ontario Regulation 393/04, Waste Electrical and Electronic Equipment made under the Waste Diversion Act 2002; and

"**White goods which contain refrigerants**" means white goods which contain, or may contain refrigerants, and which include, but is not restricted to, refrigerators, freezers and air-conditioning systems.

You are hereby notified that this environmental compliance approval is issued to you subject to the terms and conditions outlined below:

TERMS AND CONDITIONS

1.0 <u>Revoke and Replace</u>

1.1 This ECA revokes Provisional Certificate of Approval No. A150203 dated August 4, 1983 and the Notice issued September 4, 1991, as well as the ECA No. A150203 issued on June 24, 2010 and subsequent Notices under that ECA, issued under Part V of the Act for this Site. The approval given herein, including the terms and conditions set out, replaces all previously issued approvals and related terms and conditions under Part V of the Act for this Site.

2.0 Compliance

2.1 The Owner shall ensure compliance with all the conditions of this ECA and shall ensure that any person authorized to carry out work on or operate any aspect of the Site is notified of this ECA and the conditions herein and shall take all reasonable measures to ensure any such person complies with the same.

2.2 Any person authorized to carry out work on or operate any aspect of the Site shall comply with the conditions of this ECA.

3.0 In Accordance

3.1 Except as otherwise provided for in this ECA, the Site shall be designed, developed, built, operated and maintained in accordance with the applications for this ECA, dated February 4, 1982, and March 31, 2008, the Design and Operation Reports referred to in Item 8, 9, and 10 of Schedule "A" and the supporting documentation listed in Schedule “A”.

3.2 (a) Use of the Site for any other type of waste, or other waste management activity, is not approved under this ECA, and requires obtaining a separate approval amending this ECA; and

(b) Applications to amend this ECA shall include submission of a revised Design and Operations Report.

4.0 Interpretation

4.1 Where there is a conflict between a provision of any document, including the application, referred to in this ECA and the conditions of this ECA, the conditions in this ECA shall take precedence.

4.2 Where there is a conflict between the application and a provision in any documents listed in Schedule "A", the application shall take precedence, unless it is clear that the purpose of the document was to amend the application and that the Ministry approved the amendment.

4.3 Where there is a conflict between any two documents listed in Schedule "A", other than the application, the document bearing the most recent date shall take precedence.

4.4 The conditions of this ECA are severable. If any condition of this ECA, or the application of any condition of this ECA to any circumstance, is held invalid or unenforceable, the application of such condition to other circumstances and the remainder of this ECA shall not be affected thereby.

5.0 Other Legal Obligations

5.1 The issuance of, and compliance with, this ECA does not:
(a) relieve any person of any obligation to comply with any provision of any applicable statute, regulation or other legal requirement; or
(b) limit in any way the authority of the Ministry to require certain steps be taken or to require the Owner to furnish any further information related to compliance with this ECA.

5.2 The Owner shall ensure that:
(a) all wastes at the Site are managed and disposed in accordance with the Act and Regulation 347; and
(b) all wastes are transported to and from the Site by an approved waste transportation system, as defined under Regulation 347.

5.3 The Owner shall ensure that:
(a) all equipment discharging to air operating at the Site are approved under Section 9 of the Act; and
(b) all effluent is discharged in accordance with OWRA.

6.0 Adverse Effect

6.1 The Owner shall take steps to minimize and ameliorate any adverse effect on the natural environment or impairment of water quality resulting from the Site, including such accelerated or additional monitoring as may be necessary to determine the nature and extent of the effect or impairment.

6.2 Despite an Owner, Operator or any other person fulfilling any obligations imposed by this ECA, the person remains responsible for any contravention of any other condition of this ECA or any applicable statute, regulation, or other legal requirement resulting from any or omission that caused the adverse effect to the natural environment or impairment of water quality.

7.0 Change of Owner

7.1 The Owner shall notify the Director, in writing, and forward a copy of the notification to the District Manager, within 30 days of the occurrence of any changes in the following information:
(a) the ownership of the Site;
(b) appointment of, or a change in, the Operator of the Site;
(c) the name or address of the Owner; or
(d) the partners, where the Owner is or at any time becomes a partnership and a copy of the most recent declaration filed under the Business Names Act, R. S. O. 1990, c. B.17, shall be included in the notification.

7.2 No portion of this Site shall be transferred or encumbered prior to or after closing of the Site unless the Director is notified in advance and sufficient financial assurance is deposited with the Ministry to ensure that these conditions will be carried out.

7.3 In the event of any change in ownership of the works, other than change to a successor municipality, the Owner shall notify the successor of and provide the successor with a copy of this ECA, and the Owner shall provide a copy of the notification to the District Manager and the Director.

8.0 <u>Certificate of Requirement/Registration on Title</u>

8.1 Within ninety (90) days of issue of this ECA, the Owner shall submit to the Director, for his/her review, two (2) copies of a completed Certificate of Requirement and a registerable description of the Site.

8.2 Within ten (10) calendar days of receiving the Certificate of Requirement authorized by the Director, register the Certificate of Requirement in the appropriate Land Registry Office on title to the Site and submit to the Director the duplicate registered copy immediately following registration.

8.3 Pursuant to Section 197 of the Act, neither the Owner nor any person having an interest in the Property shall deal with the Site in any way without first giving a copy of this ECA, including all amending notices, to each person acquiring an interest in the Site as a result of the dealing.

9.0 <u>Inspections</u>

9.1 No person shall hinder or obstruct a Provincial Officer from carrying out any and all inspections authorized by the OWRA, the Act, or the PA, of any place to which this ECA relates, and without limiting the foregoing:
(a) to enter upon the premises where the approved works are located, or the location where the records required by the conditions of this ECA are kept;
(b) to have access to, inspect, and copy any records required to be kept by the conditions of this ECA;
(c) to inspect the Site, related equipment and appurtenances;
(d) to inspect the prices, procedures, or operations required by the conditions of this ECA; and
(e) to sample and monitor for the purposes of assessing compliance with the terms and conditions of this ECA or the Act, the OWRA or the PA.

10.0 <u>Information and Record Retention</u>

10.1 Any information requested, by the Ministry, concerning the Site and its operation under this ECA, including but not limited to any records required to be kept by this ECA shall be provided to the Ministry, upon request, in a timely manner.

10.2 The receipt of any information by the Ministry or the failure of the Ministry to prosecute any person or to require any person to take any action, under this ECA or under any statute, regulation or other legal requirement, in relation to the information, shall not be construed as:
(a) an approval, waiver, or justification by the Ministry of any or omission of any person that contravenes any term or condition of this ECA or any statute, regulation or other legal requirement; or
(b) acceptance by the Ministry of the information's completeness or accuracy.

10.3 Any information relating to this ECA and contained in Ministry files may be made available to the public in accordance with the provisions of the Freedom of Information and Protection of Privacy Act, R.S.O. 1990, C. F-31.

10.4 All records and monitoring data pertaining to the operation of the Landfill required by the conditions of this ECA must be retained for the contaminating life span of the Landfill except for as otherwise authorized in writing by the Director. All other records required by this ECA shall be kept on the Owner's premises for a minimum period of three (3) years from the date of their creation.

11.0 Service Area

11.1 The Site shall only accept waste generated within the geographic boundaries of the Town of St. Marys, except for MHSW depot which can accept waste from the Town of St. Marys and the Township of Perth South.

12.0 Hours of Operation

12.1 This Site is approved to operate from Monday to Saturday from 7:00 a.m. to 7:00 p.m.

12.2 Hours of operation may be changed by the Owner at any time, provided that the hours are correctly posted at the Site gate, and that suitable public notice is given of any change.

12.3 No waste shall be received for disposal at the Site except during operating hours and while the Site is under the supervision of a Competent Person.

12.4 During non-operating hours, the Site entrance gate shall be locked and secured against access by unauthorized persons.

13.0 Signage and Security

13.1 The Site shall be maintained in a secure manner, such that unauthorized vehicles cannot enter the Site.

13.2 The Owner shall limit access to and from the Site to the approved hours of operation and when the Site is supervised by a Competent Person.

13.3 All waste arriving at the Site shall be inspected by a Competent Person prior to being received at the Site to ensure wastes are being managed and disposed of in accordance with this ECA, the Act and Regulation 347 of the Act.

13.4 The Owner shall restrict the public from accessing the Compost Facility and the MHSW facility storage areas.

13.5 The Site shall be operated and maintained in an environmentally safe manner which ensures the health and safety of all persons and minimizes dust, odours, rodents, birds, litter, vibration, noise and any other adverse effects that may result from the operations at the Site.

13.6 The Owner shall maintain a sign, readable from the nearest public road, at the entrance to this Site stating:
(a) the Owner's name;
(b) hours of operation; and
(c) a 24-hour telephone number to be used in the event of an emergency or complaint.

14.0 Landfill Operations

14.1 Except as otherwise provided for in this ECA, the Landfill Operations at the Site shall be designed, developed, built, operated and maintained in accordance with the applications for this ECA, dated February 4, 1982, and March 31, 2008, the Design and Operation report dated November 1992, and April 4, 2008, the Addendum to the April 4, 2008 Design and Operations report dated April 2009 and October 2009 and the supporting documentation listed in Schedule “A”.

14.2 The Owner shall only receive for final disposal at the Landfill solid, non-hazardous waste.

14.3 a) The maximum amount of waste that can be received per day for the landfill site is 125 cubic metres; and

b) The maximum amount of waste that can be received per year for the landfill site is 20,000 cubic metres; and

c) Because of unusual circumstance or an emergency, upon request, the District Manager may provide written permission to the Owner to exceed the daily maximum of waste that is allowed at the Site up to a daily maximum of 300 cubic metres.

14.4 Phase I as described in Schedule "A" of this ECA of the landfill site shall contain a maximum volume of 104,000 cubic metres of waste including daily cover.

14.5 Phase II/III of the Landfill Site, as described in Schedule "A" of this Approval, shall contain a maximum combined volume of 336,050 cubic metres of waste including daily cover.

14.6 The maximum top elevation of the landfill for Phase I and for the combined Phases II and Phase III shall be in accordance with plans that are in Items 8 and 9 of Schedule "A"

14.7 The final grade and contours of the landfill site shall be in accordance with the Design and Operation Reports that are identified in Items 8 and 9 of Schedule "A" of this ECA.

14.8 Cover material shall be applied as follows:

(a) daily cover - at the end of each working day, the active working face shall be covered with a minimum thickness of 150 millimetres of soil cover or an approved thickness of alternative cover material;

(b) intermediate cover - in areas where landfilling has been temporarily discontinued for six (6) months or more, a minimum thickness of 150 millimetres of soil cover, or an approved thickness of alternative cover material, shall be placed;

(c) final cover - in areas where landfilling has been completed to final contours, a minimum 0.6 metre thick layer of final cover soil shall be placed. Fill areas shall be progressively completed and rehabilitated as landfill development reaches final contours.

14.9 i) The following materials may be used as alternative cover material, subject to the requirements detailed in Condition 14.8:

(a) ground woodwaste; and

(b) Cured Compost; and

(c) Compost Waste

ii) Alternative materials to soil in addition to those listed in section 14.9 may be used as daily or intermediate cover provided that the alternative material has been approved by the Director.

14.10 The Owner is permitted to process and use ground woodwaste, as defined in Regulation 347, as alternative cover material, subject to the following:

(a) All woodwaste received at the Landfill to be used as alternative cover shall:

(i) first be inspected by a Competent Person to ensure that it complies with the definition of woodwaste in Regulation 347;

(ii) be stored in an area where proper visible signage is posted to ensure that no other waste is commingled with it and to state that no removal of this material off-Site be done by Site users;

(b) The Owner shall ensure that no more than 200 cubic metres of ground woodwaste be stockpiled at the Landfill at any one time;

(c) Any stockpile of ground woodwaste shall be stored in an operating cell of the landfill site so that any leachate from the ground woodwaste drains into the landfill; and

(d) The use of the ground woodwaste as alternative cover shall be discontinued upon written direction from the District Manager if found to have a negative impact.

14.11 The Owner shall provide to the Director a Closure Plan at least two (2) years before the closure of Phase II/III of the landfill site.

14.12 The Owner shall ensure that:

(a) all white goods which contain refrigerants accepted at the Site, which have not been tagged by a licensed technician to verify that the equipment no longer contains refrigerants, are stored in an upright position and in such a manner to allow for the safe handling and removal from the Site of refrigerants as required by Ontario Regulation 189;

(b) white goods which contain refrigerants received on-site shall either have the refrigerant removed prior to removal from the Site or shall be shipped off-Site only to facilities where the refrigerants can removed by a licensed technician in accordance with Ontario Regulation 189; and

(c) a detailed log of all white goods which contain refrigerants received is maintained which includes the following information:
   (i) date of the record;
   (ii) types, quantities and source of white goods which contain refrigerants received;
   (iii) destination of the white goods; or
   (iv) the details on removal of refrigerants, if conducted on Site, and the quantities and destination of the refrigerants transferred from the Site.

14.13 Any propane cylinders shall be stored in a segregated area in a manner which prevents cylinders from being knocked over or cylinder valves from breaking.

14.14 Any tires shall be placed in a segregated area cleared of vegetation and other waste, in a pile no greater than 3 metres in height and 100 square metres in area.

15.0 Waste Transfer Station

15.1 The Waste Transfer Station shall be operated in accordance with the application for a Waste Disposal Site submitted March 31, 2008 and supporting information identified in Schedule A.

15.2 Only waste electrical and electronic equipment, cardboard, scrap metal, blue-box recycling materials shall be accepted at the Waste Transfer Station,
(i) from the Town of St. Marys;
(ii) from householders responsible for those wastes; and
(iii) from small businesses where such wastes are considered unrelated to the operation of the business; or from small businesses where such waste qualifies for the small quantities exemption defined by Regulation 347 except where such waste is produced in small quantities on a regular basis (e.g. printing companies).

15.3 The maximum amount of all waste that may be accepted per day at the Waste Transfer Station is 25 tonnes.

15.4 The maximum storage capacity of all wastes at the Waste Transfer Station is 100 tonnes.

15.5 Any cardboard stored at the Waste Transfer Station shall be stored in a container that has a covering to protect the cardboard from precipitation.

15.6 Waste accepted at the Waste Transfer Station shall be stored in a safe and secure manner and shall be properly handled, packaged or contained so as not to pose any threat to the general public, Site personnel or the environment.

15.7 The Owner shall remove all waste and Recyclable Materials from the Waste Transfer Station at an interval not exceeding ninety (90) days with the exception of electronic waste which shall be removed before the container holding the electronic waste gets full.

15.8 No radioactive, pathological or biomedical wastes or contaminated radioactive, pathological or biomedical wastes shall be accepted at the Waste Transfer Station.

15.9 The Waste Transfer Station must be maintained in a secure manner, to prevent unauthorized persons from causing negative off-Site impacts.

15.10 All waste destined for diversion shall be segregated either into bins or in designated areas. All bins and designated waste storage areas shall be clearly labelled.

15.11 The waste electronic and electrical equipment diversion program shall be operated in accordance with Item 20 of Schedule "A", and in accordance with the following requirements:
- (a) the Owner shall clearly communicate the hours of operation of the waste electronic and electrical equipment diversion program to the public to minimize the amount of waste that is not diverted from Landfill;
- (b) the Owner may receive a maximum of one (1) cubic metre per day of waste electrical and electronic equipment;
- (c) a maximum of five (5) cubic metres of waste electrical and electronic equipment may be stored at the Site;
- (d) waste electrical and electronic equipment shall be stored in a secure manner for a maximum of six (6) months; and
- (e) no disassembly, including manual disassembly, of waste electrical and electronic equipment is permitted, apart from the removal of visible batteries.

16.0 Municipal Hazardous or Special Waste (MHSW)

16.1 The MHSW Facility shall be operated in accordance with the application for a Waste Disposal Site submitted March 31, 2008 and supporting information identified in Schedule A.

16.2 The MHSW Facility may accept those wastes that are identified by the definition of MHSW.

16.3 The maximum amount of MHSW that may be accepted at the Site in any one day is one (1) tonne.

16.4 All MHSW shall be stored on Site in weather resistant, lockable, 20-foot standard storage containers.

16.5 The Maximum amount of MHSW that may be stored at the MHSW Facility is five (5) tonnes.

16.6 The Owner shall ensure that:
- (a) the wastes are stored in a safe and secure manner;
- (b) the operation of this facility does not interfere with any other activities associated with this Site; and
- (c) the wastes are properly handled, packaged or contained so as not to pose any threat to the general public, Site personnel and the environment.

16.7 (a) Wastes that are collected and stored shall be in amounts which can be safely handled at the MHSW Facility. In the event that larger amounts are received than anticipated, the Owner shall have extra drums and lab-packed containers available on the premises for the storage of the additional waste collected; and

(b) When the MHSW Facility's capacity is reached, arrangements for the removal of waste shall be made as soon as possible, but in any event, within five (5) working days.

16.8 No storage facilities other than those approved under this ECA shall be used, and fixed storage facilities shall not be moved, replaced or altered without amendment to this ECA.

16.9 The storage facilities shall be clearly marked indicating the type and nature of the hazardous waste stored.

16.10 All points of access to the MHSW Facility shall be posted to warn that the area contains hazardous materials.

16.11 Smoking restrictions shall be adhered to and non-smoking signs posted as required by regulation.

16.12 The two 20-foot storage containers for MHSW shall be weather resistant, lockable, properly ventilated and shall be constructed and used in compliance with the Fire Code, any applicable municipal by-law and the Occupational Health and Safety of Ontario and its applicable Regulations.

16.13 The 20-foot storage container, shall be maintained under lock and key and access to these facilities shall be limited to trained Site personnel.

16.14 No PCB's, pathological waste, severely toxic waste or radioactive waste shall be accepted at the MHSW Facility.

16.15 Oil and oil-based paints which have been manufactured prior to 1972; or whose manufacturing date cannot be determined and may contain PCBs, shall be handled in the manner prescribed:

(a) the oil and oil-based paints shall not be mixed (bulked) with other paints prior to testing. Paints which are lab-packed are not considered to be mixed under this ECA.

(b) the oil and oil-based paints shall be tested for PCB content. The oil and oil-based paint is considered to be a PCB waste, if measured levels are equal to or greater than 50 parts per million.

(c) the oil and oil-based paints shall not be distributed for reuse if they have any measurable PCB content.

(d) if oil and oil-based paint is found to have PCBs at or above 50 ppm, it shall be forthwith reported to the District Manager and shall be managed in accordance with Ontario Regulation 362/92, Waste Management - PCBs made under the Act, or removed from the Site to an approved PCB storage site in accordance with written instructions from the District Manager.

16.16 Except as specified in Condition 16.15, paints collected at the MHSW Facility may be returned or sold to the general public for reuse provided all transactions are recorded by invoice. Information on the type and volume of paint returned to the public through this Site shall be recorded in the report specified in Condition 22.1.

16.17 The Owner shall ensure that a Competent Person is on duty at all times during the operation of the MHSW Facility.

16.18 The local police and fire department shall be informed of the MHSW Facility and this ECA and shall be notified in writing of operating hours and any changes to scheduled operating hours prior to the changes being made.

16.19 Except as specified under Conditions 16.16, all waste collected shall be transported from the MHSW Facility by an approved waste management system and disposed to an approve waste disposal site certified to accept these types of wastes.

16.20 All containers which hold hazardous waste that have been collected at the MHSW depot at the Site shall be labelled that these waste are not subject to LDR treatment requirements in accordance with Section 81 of Regulation 347.

17.0 Compost Operations

17.1 The Compost Facility is approved for open windrow composting of a maximum of 300 tonnes per month of leaf and yard waste.

17.2 The Compost Facility shall be constructed and operated in accordance with the application for a Provisional Certificate of Approval for a Waste Disposal Site submitted March 31, 2008 and supporting information referenced as Item 10 in Schedule "A".

17.3 The Owner shall ensure that incoming waste is visually inspected by a Competent Person to ensure that the waste meets the requirements of this Certificate. Unacceptable waste shall be re-directed to Landfill; and

17.4 (a) Leaf and yard waste destined for composting shall be removed to the Compost Facility on a weekly basis or whenever the capacity of the designated storage area is reached, whichever occurs first. In the event that the leaf and yard waste becomes odourous, the waste shall be immediately diverted to the Landfill.

(b) At least once every year, the Owner shall take a representative sample of the incoming yard and leaf waste to ensure that the incoming waste meets the metals criteria listed in Schedule "B". Incoming waste which does not meet the metals criteria listed in Schedule "B" is considered unacceptable waste.

17.5 (a) Leaf and yard waste shall be incorporated into windrows within four (4) days of being mixed; and

(b) Any waste that has exceeded the time restrictions in Conditions 17.5(a) shall be re-directed to the Landfill for immediate burial.

17.6 The Owner shall ensure that the following operating criteria are met, as a minimum:

(a) all waste receipt, processing, active composting and curing shall take place in the part of the landfill that is identified by Figure 1.1 that is identified by Item 10 of Schedule "A"
(b) windrows shall be arranged in a manner which permits equipment access to the composting and storage areas for efficient turning of the windrows and to allow access for emergency vehicles;
(c) windrows shall be constructed at bulk densities and heights which promote aerobic conditions;
(d) all waste being composted shall be held at a temperature of at least 55 ^{o}C for a minimum of fifteen (15) days cumulative, to ensure proper bacterial growth and pathogen inactivation;
(e) during composting, the temperature and moisture levels of the windrows shall be monitored and recorded daily during the pathogen inactivation period and a minimum of twice weekly during the remainder of the composting process;
(f) during the fifteen day pathogen inactivation period, the windrows shall be turned a minimum of five (5) times; and
(g) compost shall be cured for six (6) months after the requirements for pathogen inactivation have been satisfied. During the curing phase, windrows shall be turned at least once per month.

17.7 (a) Prior to being released from the Compost Facility for unrestricted use, compost shall be monitored for quality as follows:

(i) a representative composite sample shall be collected for every 1000 tonnes of compost produced;
(ii) samples shall be analysed for criteria listed in Schedule "B";
(iii) all production records shall be reviewed to ensure temperature and residency time requirements for pathogen inactivation have been met;

(b) Compost that met the temperature and residency time requirements for pathogen inactivation and the quality requirements listed in Schedule "B" of this ECA, is considered to be finished compost and may be transferred off Site for unrestricted use;

(c) Compost that meets the metals and foreign matter quality requirements listed in Schedule "B" of this ECA but did not achieve the pathogen inactivation time or temperature requirements, or did not meet the Schedule "B" pathogen quality requirements, may be returned to the composting process for re-processing. Alternatively, the compost may be used as alternate cover material; and

(d) Compost that can not meet the metal or foreign matter quality requirements listed in Schedule "B" of this ECA shall be considered Compost Waste and shall be re-directed to the Landfill for use as alternate cover material and/or burial.

17.8 (a) The Owner shall ensure that the area inside the containment berm surrounding the compost pile be graded to allow for a low-lying sump area that can used to collect leachate from the composting operation; and

(b) The collected leachate may be sprayed onto the landfill to enhance the daily cover; and

(c) If there is need to direct leachate from the composting operation to the stormwater detention Basin A or to a body of water, an application and approval to amend Municipal Sewage Certificate of Approval Number 3-1577-92-936 needs to be done.

17.9 There shall be no discharge of wastewater to a body of water from the Site unless allowed by an Approval under the OWRA.

18.0 <u>Nuisance Control</u>

18.1 (a) The Site shall be operated and maintained such that the vermin, vectors, birds, dust, litter, odour, noise and traffic do not create a nuisance.

(b) If at any time, problems such as vermin, vectors, birds, dust, litter, odours, noise or traffic, or other nuisances are generated at the Site resulting in complaints, the Owner shall take appropriate remedial ion to eliminate the cause of such problems. Appropriate measures may include temporary stoppage of all operations until the problem has been rectified and measures have been undertaken to prevent future occurrence.

18.2 A litter control program shall be established and maintained by the Owner near the face of the active cell of the Landfill, at the Compost Facility and at the property line. The litter control program shall include, but not be limited to, regular pick up of litter and use of snow fences around the active cell of the Landfill and Compost Facility as required.

18.3 (a) The Owner shall have in place procedures to prevent adverse odour impacts from the Composting Facility including, but not limited to:
(i) reducing the size of windrows to promote aeration;
(ii) identifying unfavourable meteorological conditions and limiting activities which can reasonably be expected to generate odours during times of unfavourable meteorological conditions; and

(b) Notwithstanding Condition 18.4, any odourous composting waste that does not respond to mitigative action within twelve (12) hours of action being taken will be re-directed to the Landfill for immediate burial.

18.4 The Owner shall operate and maintain the Site so that the maximum 10-minute average concentration of odour at the most impacted sensitive receptor, resulting from the operation of the Landfill and/or the Compost Facility,shall not be greater than 1.0 odour unit.

19.0 Site Inspections and Maintenance

19.1 The Owner shall ensure that all MHSW Facility storage facilities are inspected each day that the facility is in operation by a Competent Person for spills, leaks or hazardous conditions.

19.2 The Owner shall ensure that:

(a) visible portions of the Compost Facility pad are visually inspected on each operating day; and

(b) the pad is visually inspected, and appropriate maintenance performed, as the pad surface is uncovered during windrow turning and/or removal.

19.3 The Owner shall ensure that a Competent Person performs daily visual inspections of the Site to ensure security and cleanliness of the Site.

19.4 The Owner shall ensure that fire extinguishers are inspected monthly and recharged annually.

19.5 (a) The Owner shall develop and put in place a preventative maintenance program, in accordance with manufacturers' recommendations, for all on-site equipment associated with the processing and managing of waste and/or processed materials; and

(b) The preventative maintenance program shall consist of the following as a minimum:

(i) the program shall specifically stipulate the part of the equipment inspected for all process equipment on Site;

(ii) the frequency of the inspections required and carried out; and

(iii) the dates of any repairs conducted.

19.6 Any deficiencies noted during the inspection or maintenance activities, that might negatively impact the environment, shall be promptly corrected.

20.0 Environmental Emergency

20.1 Within thirty (30) days of the date of issue of this Notice, the Owner shall have in place an Environment Emergency Plan for the operations permitted under the ECA. The Environment Emergency Plan shall include, but is not necessarily limited to:

(a) the prevention of, preparedness for, response to and recovery from an environmental emergency;

(b) a list of contingency equipment and spill clean up materials available to Site personnel;

(c) names and telephone numbers of waste management companies available for emergency response; and

(d) a notification protocol, with names and telephone numbers of persons to be contacted, including:

i. Town of St. Marys personnel,

ii. the Ministry District Office;

iii. Spills Action Centre;

iv. Fire Department;

v. Police Department;

vi. local Medical Officer of Health; and
vii. Ministry of Labour.

20.2 The Owner shall take immediate measures to clean-up spills and other discharges of any wastes. Spill clean-up material shall be stored at the Site, in sealed drums or in an appropriate solid waste container, until such time as it is removed to a facility approved to receive such waste.

20.3 The Owner shall require a Competent Person to record all spills and upsets in the log book referred to in Condition 22 of the ECA. The information recorded in the log shall include:
(a) the nature of the spill or upset;
(b) the action taken for clean-up; and
(c) corrective action taken to prevent future occurrences.

20.4 The Owner shall require a Competent Person to immediately notify the Ministry's Spills Action Centre at (416) 325-3000 or 1-800-268-6060 of any reportable spills or upsets.

20.5 The Owner shall ensure that adequate fire-fighting and contingency spill clean-up equipment are available at the Site and that the Site personnel are familiar with the use of such equipment and its location(s) on the Site.

20.6 The Owner shall ensure that:
(a) the contingency equipment and materials outlined in the Environment Emergency Plan are in a good state of repair, fully operational and immediately available;
(b) all operating personnel are fully trained in the contingency equipment and materials' use and in the procedures to be employed in the event of an emergency;
(c) the Environment Emergency Plan is reviewed and updated on an annual basis as a minimum; and
(d) the local Fire Department and the District Manager are given a copy of the Environment Emergency Plan and any amendments that are made to it.

20.7 All Operators and employees of the Owner at the Site shall be Competent People.

21.0 Complaints

21.1 If the Owner receives complaints regarding the operation of the Site which are environmental in nature, or have caused, or are likely to cause, a negative impact to the environment or human health or safety, the Owner shall respond to these complaints according to the following procedure:
(a) The Owner shall record each complaint and the information recorded shall include:
(i) the date, time and nature of the complaint;
(ii) the name, address and telephone number of the complainant if provided;
(iii) the activities taking place on Site at the time of the complaint; and
(iv) meteorological conditions;
(b) The Owner, upon notification of the complaint shall initiate appropriate steps to determine all possible causes of the complaint, proceed to take the necessary actions to eliminate the cause of the complaint and forward a formal reply to the complainant; and

(c) The Owner shall retain on-Site a report written within one (1) week of the complaint date, listing the actions taken to resolve the complaint and any recommendations for remedial measures, and managerial or operational changes to reasonably avoid the reoccurrence of similar incidents.

22.0 Record Keeping

22.1 (a) The Owner shall maintain daily written records for waste deposited at the Landfill and managed at the Waste Transfer Station for each day the Site is in operation. The record shall included, but not necessarily be limited to:

- (i) the quantity of waste received for final disposal at the landfill;
- (ii) the quantity of waste received at the Waste Transfer Facility.
- (iii) the type and quantity of waste transferred from the Site for recycling and the destination of the waste diverted;
- (iv) a record of activities undertaken that operating day (e.g. placement of cover material);
- (v) a description of any out-of-service period of any control, treatment, disposal or monitoring facilities, the reasons for the loss of service, and action taken to restore and maintain service.

(b) The Owner shall establish a monthly summary of waste received at the MHSW Transfer Facility which shall include, but not necessarily be limited to:

- (i) documentation of waste types and quantities;
- (ii) the quantity of any paint given to the public
- (iii) source of generation;
- (iv) ultimate disposal sites;
- (v) each incident where the capacity of the facility has been exceeded; and
- (vi) spills, upsets and environmental or other problems encountered in operating the MHSW Transfer Facility.

(c) The Owner shall maintain the following records as a minimum for the Compost Facility:

- (i) daily weather data including wind speeds and wind direction;
- (ii) types and quantities of waste received;
- (iii) date and time of windrow construction and ratio of windrow mixture;
- (iv) windrow temperature and moisture readings as appropriate for each stage of processing;
- (v) date windrow was broken down and began curing;
- (vi) other activities carried out (windrow turning, moisture addition, combining windrows, sampling); and
- (vii) laboratory reports of all analysis of feedstocks, mixtures, active and Cured Compost.

22.2 The Owner shall maintain written records of all inspections and maintenance activities undertaken in accordance with Conditions 19.1 to 19.6 inclusive. All records related to the inspection and preventative maintenance programs shall be available on Site for inspection by a Provincial Officer upon request.

22.3 The Owner shall maintain a written record, at the Site, of employee training required by Condition 20.7. The record shall include but not necessarily be limited to:
(a) date of training;
(b) name and signature of person who has been trained; and
(c) description of the training provided.

23.0 Monitoring

23.1 (a) The Owner shall ensure compliance with the RUP.

(b) The Owner shall determine compliance by retaining qualified professionals to monitor groundwater, surface water and leachate in accordance with Schedule "C";

(c) Sampling and analyses in accordance with Schedule "C", shall occur in the spring and fall of each year; and

(d) The monitoring program may be amended from time-to-time with the prior written consent of the District Manager.

23.2 The Owner shall ensure that all samples are collected using standard sampling methods. The sampling methods followed shall be referenced in the report required by Condition 25.1.

23.3 (a) All monitoring wells which form part of the monitoring program shall be protected from damage. Any groundwater monitoring wells that are damaged shall be repaired or replaced forthwith or properly abandoned in accordance with Ontario Regulation 903; and

(b) Any monitoring wells which are no longer required for monitoring, or which need to be closed due to operational changes on the Site, shall be property abandoned in accordance with Ontario Regulation 903.

23.4 In the event that the results of the monitoring program are such that an off-Site exceedance of the criteria set by the RUP and/or the PWQO has occurred as a result of the operation of the Site, the Owner shall notify the District Manager as soon as reasonably possible and specify the following:
(a) details of the off-site exceedance, confirmatory monitoring requirements and the potential off-site impacts to surface water and groundwater users;
(b) the extent and timing of contingency measures to be implemented;
(c) modifications, if any, which should be made to the monitoring program; and
(d) other mitigation measures, if any, which may be necessary to reduce or prevent off-site impacts.

24.0 General Provisions

24.1 Within one year of issue of this ECA, the Owner shall install a weigh scale at the Site to enable a tracking of the quantity of waste entering and leaving the Site.

24.2 Within ninety (90) days of issue date of this ECA, the Owner shall maintain a current Operations and Maintenance Manual for the landfill, the Waste Transfer Station, the MHSW Depot and the composting operation which is consistent with the ECA for the Landfill part of the Site for use by Site personnel which shall contain, but is not necessarily limited to the following:

(a) a Site plan, showing the location of key features and their dimensions at the Site;
(b) an outline of the responsibilities of personnel;
(c) personnel training requirements;
(d) proper receiving, handling, storage and recording procedures;
(e) procedures for handling white goods containing refrigerants; and
an outline of the responsibilities of MHSW Facility personnel;
(f) operating procedures for the composting area including processing/mixing, windrow formation, turning schedules, parameters and criteria that have to be met;
(g) quality control sampling and testing protocol for the Site;
(h) contingency and emergency response procedures including health and safety provisions for workers and best management practices for the control of dust, litter and odour;
(i) Leachate management;
(j) Landfill gas management;
(k) Surface water/Storm water management;
(l) Inspections and monitoring; and
(m) Complaints procedure.

24.3 The Operations and Maintenance Manual referred to in Condition 24.2 shall be:

i) retained at the Site;
ii) kept up to date through periodic revisions; and
iii) be available for inspection by Ministry staff.

25.0 <u>Annual Report</u>

25.1 By March 31 of each year, The Owner shall prepare and submit to the District Manager an annual report which summarizes Site operations for the previous calendar year. The annual report shall include the following:

(a) an assessment of the egress of contaminants into groundwater and surface water, as determined by sampling and analysis conducted within the previous calendar year;
(b) an assessment of the operation and performance of all engineered facilities, the need to amend the design or operation of the Site, and the adequacy of and need to implement the contingency plans;
(c) a report on the status of all monitoring wells and a statement as to compliance with Ontario Regulation 903;
(d) plans showing the existing contours of the Landfill; areas of landfilling operation during the reporting period; areas of intended operation during the next reporting period; areas of excavation during the reporting period; the progress of final cover, vegetative cover, and any intermediate cover application; previously existing Site facilities; facilities installed during the reporting period; and Site preparations and facilities planned for installation during the next reporting period;

(e) graphs showing trends through time for key indicator parameters including chloride, iron and total phosphorous for all surface water monitoring stations and Total Suspended Solids for the discharge points at the Storm Water Management Ponds, SP4A-94 and SP2B-94.
(f) provide information on surface water station SP2-93;
(g) calculations of the volume of waste, daily and intermediate cover, and final cover deposited or placed at the Landfill during the reporting period and a calculation of the total volume of Landfill capacity used during the reporting period;
(h) a calculation of the remaining capacity of the Landfill and an estimate of the remaining Landfill life;
(i) analytical results from testing of alternative cover material;
(j) report on sediment build up in storm water ponds Basin A and Basin B;
(k) once the weigh scale is installed at the Site, a summary of the total quantity (tonnes) of waste received at the Site by waste management activity;
(l) a summary of the quantity of waste diverted from final disposal to recycling or reuse;
(m) a summary of the quantity of MHSW collected, by waste class code and the final destination of each waste type;
(n) a summary of the amount of leaf and yard waste received at the Compost Facility and the amount of finished compost transferred from the Site;
(o) a summary of analytical results of samples taken from the finished compost;
(n) a summary of any significant problems encountered during composting or curing;
(p) a summary of any complaints received from any of the waste management activities undertaken at the Site and the responses made;
(q) a discussion of any environmental and operational problems that could negatively impact the environment encountered during the operation of the Site and during the Site inspections and any mitigative actions taken;
(r) any recommendations to minimize environmental impacts from the operation of the Site and to improve Site operations and monitoring programs in this regard; and
(s) a summary statement as to compliance with all Conditions of this ECA and with the inspection and reporting requirements of the Conditions herein.

26.0 Closure Plan

26.1 At least two (2) years prior to the anticipated date of closure of the Landfill, the Owner shall submit to the Director for approval, a detailed closure plan pertaining to the termination of landfilling operations at this Site, post-closure inspection, maintenance and monitoring, and end use. The plan shall include the following:
(a) a plan showing Site appearance after closure;
(b) a description of the proposed end use of the Site;
(c) a descriptions of the procedures for closure of the Landfill, including:
    (i) advance notification of the public of the Landfill closure;
    (ii) posting of a sign at the Site entrance indicating the Landfill is closed and identifying any alternative waste disposal arrangements;
    (iii) completion, inspection and maintenance of the final cover and landscaping;
    (iv) Site security;
    (v) removal of unnecessary Landfill-related structures, buildings and facilities; and

(vi) final construction of any control, treatment, disposal and monitoring facilities for leachate, groundwater, surface water and landfill gas;

(d) a schedule indicating the time-period for implementing Conditions 26.1(c)(i) to 26.1(c)(vi) inclusive;

(e) descriptions of the procedures for post-closure care of the Landfill, including:

(i) operation, inspection and maintenance of the control, treatment, disposal and monitoring facilities for leachate, groundwater, surface water and Landfill gas;

(ii) record keeping and reporting; and

(iii) complaint contact and response procedures;

(f) an assessment of the adequacy of and need to implement the contingency plans for leachate and methane gas; and

(g) an updated estimate of the contaminating life span of the Landfill, based on the results of the monitoring programs to date.

26.2 (a) Four (4) months prior to the permanent closure of the MHSW Transfer Facility, the Waste Transfer Station and/or Compost Facility, the Owner shall submit to the District Manager written notification of the decision to cease the MHSW collection program, the composting activities and/or the Waste Transfer Station. The written notification shall include a closure plan consisting of:

(i) a plan showing Site appearance after closure;

(ii) a description of the procedures to be taken for closure of the Waste Transfer Station, the MHSW Transfer Facility and/or the Compost Facility; and

(iii) a schedule indicating the time-period for implementing closure activities; and

(b) Within ten (10) days after closure of the Waste Transfer Station, the MHSW Transfer Facility and/or the Compost Facility, the Owner shall inform the Director, in writing, that the Waste Transfer Station, the MHSW Transfer Facility and/or the Compost Facility is/are closed and requesting that this ECA be amended accordingly.

27.0 <u>Interim Capacity</u>

27. (a) The amount of waste disposed of at the Landfill Site between October 1, 2020 and September 30, 2021 shall not exceed 15,050 cubic metres including daily cover.

(b) This waste shall be contained within cells 5, 6, 7 and 8 of Phase II/III.

(c) No waste shall be disposed of at the Landfill Site after September 30, 2021 unless additional interim capacity is approved by the Director.

28. By July 31, 2021, the Owner shall submit to the Director an ECA application, should the Site require further approval of interim capacity. The application shall include the following supporting information:

(a) Updated proposal of interim contours.

(b) 2020 Annual Operations and Monitoring Report.

SCHEDULE "A"

This Schedule "A" forms part of this ECA.

1. Application for a Provisional Certificate of Approval for a Waste Disposal Site, dated February 4, 1982.

2. Application for a Provisional Certificate of Approval for a Waste Disposal Site, dated February March 31, 2008 and signed by Kevin Luckhardt.

3. Hydrogeologic Investigation, St. Marys Landfill Site, Report by Conestoga-Rovers & Associates Limited, dated November 1982.

4. Plans prepared by Conestoga-Rovers & Associates Limited, Project No. 0645, as follows:

TITLE	PLAN NO.	DATE
Existing Conditions	1	November 1982
Proposed bottom Contours	2	November 1982
Proposed Final Contours	3	November 1982
Cross-Section	4	November 1982
Site Development Plan		
Waste Disposal Area 1	5	November 1982
Leachate Collection System	6	November 1982
Surface Water Drainage	7	November 1982

5. Letter dated January 27, 1983 from the Ministry of the Environment Waste Management Approvals Unit to the Town of St. Marys.

6. Letter dated March 21, 1983 from Conestoga-Rovers & Associates Limited to the Ministry of the Environment, Waste Management Approvals Unit.

7. Drawing of Proposed Berm Extension, St. Marys Landfill Site, prepared by Conestoga-Rovers and Associates Limited, dated march 25, 1983.

8. Design and Operation Report Phase II/III prepared by Conestoga Rovers and Associates Limited, dated November 1992.

9. Addendum: Design and Operations Report Update prepared by Conestoga Rovers and Associates dated April 2009

10. Addendum: Design and Operations Report, Leaf and Yard Composting Operations, St. Marys Landfill Site, prepared by Conestoga Rovers and Associates dated October 2009.

11. Letter dated January 8, 2010 with attachments from James R. Yardley, P.Eng. of Conestoga Rovers and Associates, addressed to Jim Chisholm of the Ministry.

12. Application for an Environmental Compliance Approval for a Waste Disposal Site from The Corporation of the Town of St. Marys, received on June 14, 2013, including supporting documentation submitted therewith.

13. Letter dated July 22, 2013 from The Corporation of the Town of St. Marys including the following information:

    (a) Signature dated June 27, 2013 on page 7 of the application form;
    (b) Revised pages 16 and 27 of the application form;
    (c) Copy of public notification letter and list of recipients;
    (d) Site address confirmation; and
    (e) Updated Design and Operations Plan.

14. Application for an Environmental Compliance Approval for Landfill amendment - Interim Capacity approval, by Chad Papple, Director of Public Works, The Corporation of the Town of St. Marys, received on July 2, 2015, including the following supporting information:
    (a) Proposed Cell Staging Plan prepared by R.J. Burnside & Associates Limited, Project No. 300032339
    (b) 2014 Annual Operations and Monitoring Report prepared by R.J. Burnside & Associates Limited, Project No. 300032339

15. Letter from The Corporation of the Town of St. Marys - Public Works Department to Dale Gable, Ministry of the Environment and Climate Change signed by Dave Blake, C.E.T. and dated July 25, 2016 including all attachments.

16. Application for approval dated July 18, 2017 including all supporting documents submitted (2016 AMR, et al).

17. Letter from The Corporation of the Town of St. Marys - Public Works Department to Dale Gable, Ministry of the Environment signed by Dave Blake, C.E.T. and dated June 20, 2018 including all attachments.

18. Email from Matt Ash, C.E.T., GM BluePlan Engineering Limited, dated September 13, 2018, RE: Approval of interim capacity for St. Marys Landfill Site (MECP Ref no. 5354-B2BLLT).

19. Letter dated July 22, 2019 from The Corporation of the Town of St. Marys - Public Works Department addressed to Director, Client Services and Permissions Branch, Ministry of the Environment signed by Dave Blake, C.E.T., including all attachments.

20. Email from Dave Blake, The Corporation of the Town of St. Marys, dated October 4, 2019, Re: clarification on filling in cell 5 of Phase II/III, and working slopes.

21. Application for an Environmental Compliance Approval for Landfill amendment - Interim Capacity approval, by Dave Blake, Environmental Services Supervisor, The Corporation of the Town of St. Marys, Signed on July 29, 2020, including the following supporting information:
    (a) Annual Operations & Monitoring Report (2019), St. Mary's Landfill Site, MOECC

Certificate of Approval No. A150203. Prepared by GM Blue Plan Engineering, Report dated and signed March 2020 and the pdf published electronically on 03/24/2020 8:27 AM.

SCHEDULE "B"

This Schedule "B" forms part of this ECA.

Parameter	Maximum concentration
Metals	
arsenic	13 ppm
cadmium	3 ppm
chromium	210 ppm
cobalt	34 ppm
copper	100 ppm
lead	150 ppm
mercury	0.8 ppm
molybdenum	5 ppm
nickel	62 ppm
selenium	2 ppm
zinc	500 ppm
Foreign material	
plastic particles greater than 3 mm in any direction	1%
non-biodegradable material greater than 3 mm in any direction	2 %
Pathogens	
fecal coliforms	<1000 MPN*/g of total solids calculated on a dry weight basis
salmonellae	<3 MPN*/4g total solids calculated on a dry weight basis

* most probable number

SCHEDULE "C"

This Schedule "C" forms part of this ECA.

ST. MARYS LANDFILL MONITORING PROGRAM

	Parameters	Field		General Chemistry					Additional		Metals			VOCs
	Monitoring Locations	Hydraulic Monitoring	pH, conductivity, temperature	chloride, hardness, phenols.	DOC	BOD_5, ammonia	turbidity, TDS, suspended solids, total phosphorous	COD, chloride, phenols, nitrate, phosphorous, TKN, TSS	alkalinity, sulphate	boron, iron, manganese, sodium, BTEX	calcium, magnesium	iron, manganese	aluminum, barium, beryllium, bismuth, cadmium, chromium, cobalt, copper, lead, molybdenum, nickel, potassium, silver, sodium, strontium, tungsten, vanadium, zinc	EPA 624 VOCs
Groundwater Wells	OW2-84	x	x	x	X				x	x	x			
	OW3-84	x	x	x	X						x			
	OW4-84	x	x	x	X						x			
	OW5-84	x	x	x	X						x			
	OW6-84	x	x	x	X						x			
	OW7-91	x	x	x	x						x			
	OW8A-91	x	x	x	X						x			
	OW8B-91	x	x	x	x						x			
	OW9A-91	x	x	x	X						x			
	OW9B-91	x	x	x	X						x			
	OW15-91	x	x	x	X				x	x	x			
	OW21-91	x	x	x	x				x	x	x			
	OW25-91	x	x	x	X						x			
	OW32-96	x	x	x	X				x	x	x			
	OW33-96	x	x	x	x						x			
	OW34-96	x	x	x	X				x	x	x			
	OW32A-02	x	x	X	X				x	x	x			
Residential Wells	Riordan (#3)	X	x	x	X						x			
	Hall (#25)	x	x	x	x						X			
	Riordan Farm (#26)	x	x	x	X						X			
	Heard (#27)	x	x	x	x						X			
	McCurdy (#24)	x	x	x	X						X			
Surface Water	SP1-93 (upstream)	x	x	X		X	X				x	X		
	SP2-93 (midstream)	x	x	X		x	X				x	X		
	SP3-93 (downstream)	x	x	x		x	X				x	X		
	SP1B-94 (Basin B inlet)	x	x	X		x	X				x	X		
	SP2B-94 (Basin B outlet)	x	x	X		x	X				x	X		
	SP3A-94 (Basin A inlet)	x	x	X		x	X				x	X		
	SP4A-94 (Basin A outlet)	x	x	x		x	X				x	X		
	SP5A-94 (Basin A inlet)	x	x	X		x	X				x	X		
Leachate Wells	MH1 (Phase I)	X				x		x	x		x	x	x	x
	MH3 (Phase II/III)	X				x		x	x		x	x	x	x
	All Manholes	X												

The reasons for the imposition of these terms and conditions are as follows:

The reason for Condition 1.1 is to clarify that the previously issued Provisional Certificate of Approval No. A150203 issued on August 4, 1980, and any subsequent Notices of amendment, are no longer in effect and has been replaced and superseded by the Terms and Conditions stated in this ECA.

The reason for Conditions 2.1, 2.2, 5.1, 5.2, 5.3, 6.1, 6.2, 10.2, 10.3 15.1, 15,2, 16.2, 16.15, 16.16. 16.17, 16.19, 16.20, 17.6, 17.8, and 17.9 is to clarify the legal rights and responsibilities of the Owner under this ECA.

The reason for Conditions 3.1, 3.2, 14.1, 15.1, 16.1, and 17.2 is to ensure that the Site is designed, operated, monitored and maintained in accordance with the application and supporting documentation submitted by the Owner, and not in a manner which the Director has not been asked to consider.

The reason for Conditions 4.1, 4.2, 4.3 and 4.4 is to clarify how to interpret this ECA in relation to the application and supporting documentation submitted by the Owner.

The reason for Condition 7.1 is to ensure that the Site is operated under the corporate name which appears on the application form submitted for this approval.

The reason for Condition 7.2 is to restrict potential transfer or encumbrance of the Site without the approval of the Director. Any transfer of encumbrance can be made only on the basis that it will not endanger compliance with this ECA.

The reason for Condition 7.3 is to ensure that subsequent owners of the Site are informed of the terms and conditions of this ECA. This also applies to all supporting documentation listed in Schedule "A".

Conditions 8.1, 8.2 and 8.3 are included, pursuant to subsection 197(1) of the Act, to provide that any persons having an interest in the Site are aware that the land has been approved and used for the purposes of waste disposal.

The reason for Condition 9.1 is to ensure that appropriate Ministry staff have ready access to the Site for inspection of the Site and its facilities, equipment, practices and operations required by the conditions in this ECA. This condition is supplementary to the powers of entry afforded a Provincial Officer pursuant to the Act and OWRA.

The reason for Conditions 10.1 to 10.4 inclusive is to ensure the availability of records and drawings for inspection and information purposes.

The reason for Condition 11.1 is to specify the approved areas from which waste may be accepted at the Site.

The reason for Conditions 12.1, 12.2 and 12.3 is to specify the hours of operation for the Site and a mechanism for amendment of the hours of operation, as required.

The reason for Conditions 13.1, 12.4 and 15.9 is to ensure that the Site is secure when unattended to prevent vandalism or theft.

The reason for Conditions 13.2, 13.3, 13.4, 13.5 and 14.12 is to ensure the safety of the public and the protection of the environment.

The reason for Conditions 13.6 and 16.18 is to ensure that emergency responders and the public have the necessary contact information in the event of an emergency or complaint.

The reason for Condition 14.1, 14.2, 14.3 and 14.14 is to specify the types and quantities of waste that may be accepted for disposal and the placement of the waste at the Site.

The reason for Conditions 14.4, 14.5, 14.6 and 10.7 is to define the maximum amount of waste, including daily cover that is allowed at the landfill site.

The reason for Conditions 14.8, 14.9 and 14.10 is to specify the requirements for use of alternative cover material at the Site.

The reason for Condition 14.11 is to ensure that daily and intermediate cover is used to control potential nuisance effects, to facilitate vehicle access, and to ensure an acceptable appearance is maintained. The proper closure of a landfill requires the application of a final cover which is aesthetically pleasing, controls infiltration, and is suitable for the end use planned for the Site and ensures that waste is not filled beyond approved limits.

Conditions 14.13, 14.14, 15.4, 15.5, 15.6, 15.7, 15.8, 15.10, 15.11, 16.4, 16.5, 16.6, 16.7, 16.8, 16.9, 16.10 16.11, 16.12, 16.13, and 16.14 is included to ensure that waste storage is done in a manner, quantity and/or duration which does not result in a nuisance or a hazard to the health and safety of the environment or people.

The reason for Condition 16.19 is to ensure that waste is transported to and from the Site in accordance with Regulation 347.

The reason for Condition 16.20 is to alert receiving waste disposal sites that the listed and/or characteristic waste is exempt from treatment requirements.

The reason for Conditions 14.3, 15.3, 16.3, 17.1 and 15.11(b) is to ensure that the types and quantities of waste received at the Site are in accordance with that approved under this ECA.

The reason for Condition 17.3 is to ensure that only waste approved under this ECA are received at the Site.

The reason for Conditions 17.4, 17.5, 17.6, 18.1, 18.2, 18.3, and 18.4 is to ensure that the Site is operated in a manner which does not result in a nuisance or a hazard to the health and safety of the environment or people.

The reason for Conditions 19.1, 19.2, 19.3, 19.4, 19.5 and 19.6 is to ensure that all equipment and facilities are maintained in good working order.

The reason for Conditions 20.1 to 20.6 inclusive is to ensure that the Owner is prepared and properly equipment to take action in the event of a spill, fire or other operation upset.

The reason for Condition 21.1 is to ensure that complaints are properly and quickly resolved and that complaints and follow-up actions have been documented.

The reason for Conditions 22.1, 22.2 and 22.3 is to ensure that detailed records of Site operations are kept for inspection and information purposes.

The reason for Condition 20.7 is to ensure that the Site is only operated in the presence of trained personnel.

The reason for Condition 23.1 is to demonstrate that the landfill is performing as designed and the impacts on the natural environment are acceptable. Regular monitoring allows for the analysis of trends over time and ensures that there is an early warning of potential problems so that any necessary remedial/contingency action can be taken.

The reason for Condition 23.2 is to ensure that samples are collected using established sampling protocol.

The reason for Condition 23.3 is to protect the groundwater.

The reason for Condition 23.4 is to notify the Ministry of off-site groundwater contamination so that appropriate mitigative actions can be taken.

The reason for Condition 24.1 is to provide the Site with the needed technology to be able to track the amount of waste entering and leaving the Site.

The reasons for Conditions 24.2 and 24.3 is to ensure that the Operations and Maintenance Manuals are kept current and reflects actual Site practices and procedures and are current and available for inspection by Ministry staff.

The reason for Condition 25.1 is to ensure a regular review of site development, operations and monitoring data and that the review is documented and any possible improvements to Site design, operations or monitoring programs are identified. An annual report is an important tool used in reviewing Site activities and for determining the effectiveness of Site design.

The reason for Conditions 26.1, 26.2 and 14.11 is to ensure that the Site is closed in accordance with MECP standards and to protect the health and safety of the environment.

The reason for Condition 27 is to allow for approval of extending interim capacity for the Landfill Site, while the Town is waiting for an Environmental Assessment approval for extending landfilling operations beyond existing capacity.

The reason for Condition 28 is to ensure that sufficient time is given to the Ministry to process the application, in the event that the Town of St. Marys needs to secure the following year's interim capacity.

Upon issuance of the environmental compliance approval, I hereby revoke Approval No(s). A150203 issued on June 24, 2010

In accordance with Section 139 of the Environmental Protection Act, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:

a. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;
b. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

Pursuant to subsection 139(3) of the Environmental Protection Act, a hearing may not be required with respect to any terms and conditions in this environmental compliance approval, if the terms and conditions are substantially the same as those contained in an approval that is amended or revoked by this environmental compliance approval.

The Notice should also include:

1. The name of the appellant;
2. The address of the appellant;
3. The environmental compliance approval number;
4. The date of the environmental compliance approval;
5. The name of the Director, and;
6. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*****
Environmental Review Tribunal
655 Bay Street, Suite 1500
Toronto, Ontario
M5G 1E5

AND

The Director appointed for the purposes of Part II.1 of the Environmental Protection Act
Ministry of the Environment, Conservation and Parks
135 St. Clair Avenue West, 1st Floor
Toronto, Ontario
M4V 1P5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 326-5370 or www.ert.gov.on.ca**

The above noted activity is approved under s.20.3 of Part II.1 of the Environmental Protection Act.

DATED AT TORONTO this 16th day of November, 2020

Mohsen Keyvani, P.Eng.
Director
appointed for the purposes of Part II.1 of the
Environmental Protection Act

CM/
c: District Manager, MECP London - District
Al Bringleson, GM Blue Plan Engineering Ltd.

AMENDED ENVIRONMENTAL COMPLIANCE APPROVAL
NUMBER A150203
Issue Date: January 10, 2022

The Corporation of the Separated Town of St. Marys
175 Queen St E
Post Office Box, No. 998
St. Marys, Ontario
N4X 1B6

Site Location: 1221 Water Street South
St. Marys Separated Town, County of Perth
N4X 1B6

You have applied under section 20.2 of Part II.1 of the Environmental Protection Act, R.S.O. 1990, c. E. 19 (Environmental Protection Act) for approval of:

a 37 hectare Waste Disposal Site consisting of a 8 hectare Landfill, to be used for:
- the final disposal of solid, non-hazardous waste;
- collection and storage for diversion from final disposal of recyclable waste;
- the acceptance, storage, packaging, bulking and subsequent transfer of Municipal Hazardous or Special Waste
- the composting of leaf and yard waste.

Note: Use of the site for any other type of waste is not approved under this ECA, and requires obtaining a separate approval amending this ECA.

For the purpose of this environmental compliance approval, the following definitions apply:

"**Act**" means the Environmental Protection Act, R.S.O. 1990, C.E-19, as amended;

"**Approval**" or "**ECA**" means this Environmental Compliance Approval and any Schedules to it, including the application and supporting documentation listed in Schedule "A";

"Competent Person" or "Competent People" means a person or people who has/have the following features:

A. has/have training and knowledge of the following:

i. relevant waste management legislation, regulations and guidelines;

ii. major environmental concerns pertaining to the waste to be handled;
iii. contents of the facility's Design and Operating Reports outlined in Items 8, 9 and 10 of Schedule "A" and the Operations and Maintenance Manual required by Condition 24.2 of this ECA;
iv. the terms, conditions and operating requirements of the ECA;
v. the Fire Code and how it applies to proper storage and handling of wastes that may be flammable, reactive or oxidizing;
vi. record keeping procedures as outlined in Condition 22 of this ECA;
vii. occupational health and safety concerns pertaining to the wastes to be processed;
viii. specific written procedures for the control of nuisance conditions; and
ix. specific written procedures for refusal of unacceptable waste loads;

B. through their knowledge, training and experience can carry out any necessary duties in the following, through instruction and practice:
i. use and operation of any equipment to be used at the Site;
ii. operations and management of the Site, in accordance with the specific job requirements of each individual Operator, including concern for environmental protection and health and safety standards for the Operator of the Site, identification of unacceptable wastes, procedures for refusing the processing of unacceptable wastes, proper handling of waste, proper procedures for the storage of waste and proper maintenance of the Site; and
iii. process monitoring procedures; and

C. has/have the following training requirements:
i. is/are provided the necessary training by the Owner to become a Competent Person before starting at the Site as an Operator;
ii. is/are provided training and an annual training update of the Owner's environmental emergency plan that is outlined in Conditions 20 of this ECA; and
iii. is/are provided refresher training on the components of a Competent Person at least annually;

"**Compost Waste**" means leaf and yard waste that has gone through the whole composting process, including curing, but did not meet the Schedule "B" criteria';

"Cured Compost" means leaf and yard waste that has gone through the whole composting process, including curing, and meets the Schedule "B" criteria;

“**Director**” means any Ministry employee pursuant to section 20.3 of Part II.1 of the EPA;

“**District Manager**” means the District Manager of the local district office of the Ministry in which the Site is geographically located;

"Fire Code" means Regulation 213/07 of the Fire Protection and Prevention Act, 1997;

"**LDR**" means Lands Disposal Restrictions and refers to sections 74 through 85 of Regulation 347, which prohibits the disposal of listed and characteristic hazardous wastes on land until they have been treated to meet the treatment standards under Regulation 347;

“**Leaf and yard waste**” means waste consisting of natural Christmas trees and other plant materials but not tree limbs or other woody materials in excess of 7 centimetres in diameter or wood waste unless such waste has been ground;

“**Ministry**” and “**MECP**” means the Ontario Ministry of the Environment, Conservation and Parks;

Municipal Hazardous or Special Waste or MHSW means household hazardous waste limited to waste classes 112, 114, 122, 145, 147, 148, 212, 213, 242, 252, 253 and 263 and also includes: paints and coatings and their containers; oil filters; oil containers of 30 litres or less for a wide range of oil products such as engine and marine oils, and hydraulic, power steering and transmission fluids; single use, dry cell batteries, e.g., non-rechargeable batteries that can be easily removed and replaced by the consumer; automotive antifreeze (engine coolant) and related containers; pressurized containers such as propane tanks and cylinders; fertilizers and their containers; and pesticides, fungicides, herbicides, insecticides and their containers; generated by households located in the geographic boundaries of the Town of St. Marys;

"**Ontario Regulation 189**" means Ontario Regulation 189/94, Refrigerants, or as amended, made under the Act;

“**Ontario Regulation 903**” means Ontario Regulation 903 – R.R.O. 1990, Wells, amended to Ontario Regulation 128/03, made under the OWRA;

“**Operator**” means any person, other than the Owner's employees, authorized by the Owner as having the charge, management or control of any aspect of the Site;

“**Owner"** means any person that is responsible for the establishment or operation of the Site being approved by this ECA, and includes the The Corporation of the Town of St. Marys**,** its successors and assigns;

“**OWRA**” means the Ontario Water Resources Act, R.S.O. 1990, c. O.40, as amended;

“**PA**” means the Pesticides Act, R.S.O. 1990, c. P-11, as amended from time to time;

"PCB" means monochlorinated and polychlorinated biphenyls or any mixture of them or any mixture that contains one or more of them;

"**Provincial Officer**" means any person designated in writing by the Minister as a provincial officer pursuant to section 5 of the OWRA or section 5 of the or section 17 of the PA.

"**PWQO**" means the Provincial Water Quality Objectives included in the July 1994 publication entitled Water Management Policies, Guidelines, Provincial Water Quality Objectives, as amended from time to time;

"Recyclable Material" means any material set out in Schedule 1 of Ontario Regulation 101/94 of the Act, as amended from time to time, and scrap wood, building materials, and tires;

"**Regulation 347**" means Regulation 347, R.R.O. 1990, General - Waste Management, made under the Act, as amended from time to time;

"**RUP**" means the Reasonable Use Policy (Guideline B-7) of the Ministry of the Environment;

"**Sensitive receptor**" means any location where routine or normal activities occurring at reasonably expected times would experience adverse effect(s) from odour discharges from the Site, including one or a combination of:

(i) private residences or public facilities where people sleep (e.g.: single and multi-unit dwellings, nursing homes, hospitals, trailer parks, camping grounds, etc.);
(ii) institutional facilities (e.g.: schools, churches, community centres, day care centres, recreational centres, etc.);
(iii) outdoor public recreational areas (e.g.: trailer parks, play grounds, picnic areas, etc.); and
(iv) other outdoor public areas where there are continuous human activities (e.g.: commercial plazas and office buildings);

"**Site**" means the entire 37 hectare waste disposal site located at 1221 Water Street South, St. Marys Separated Town, County of Perth, including the buffer lands and a landfilling site of approximately 8 hectares at Part of Lockhart St., Closed by R90095; Part of Lot 35 Con. Thames (Blanchard) St. Mary's; Part of Lots 6, 7, 8, 9, 10, 16 & 17 and all of Lots 12, 13, 14, 18, 19 & 20 Plan 235 St. Mary's, County of Perth; Designated as Parts 2 and 3 Plan 44R-4454, Concession Thames. It also includes an easement for ingress, egress and access to maintain and service the existing sewer drain located within Parts 1, 4, 5 and 6 of Plan 44R-4454;

"**Waste Transfer Station"** means the part of the Site that is used to recover waste for reuse or recycling and to store waste and to transfer waste from the Site as outlined in Condition 15 of the ECA;

"**Waste electrical and electronic equipment**" means devices listed in Schedules 1 through 7 of Ontario Regulation 393/04, Waste Electrical and Electronic Equipment made under the Waste Diversion Act 2002; and

"**White goods which contain refrigerants**" means white goods which contain, or may contain refrigerants, and which include, but is not restricted to, refrigerators, freezers and air-conditioning systems.

You are hereby notified that this environmental compliance approval is issued to you subject to the terms and conditions outlined below:

TERMS AND CONDITIONS

1.0 <u>Revoke and Replace</u>

1.1 This ECA revokes ECA No. A150203 issued on November 16, 2020 issued under Part V of the Act for this Site. The approval given herein, including the terms and conditions set out, replaces all previously issued approvals and related terms and conditions under Part V of the Act for this Site.

2.0 Compliance

2.1 The Owner shall ensure compliance with all the conditions of this ECA and shall ensure that any person authorized to carry out work on or operate any aspect of the Site is notified of this ECA and the conditions herein and shall take all reasonable measures to ensure any such person complies with the same.

2.2 Any person authorized to carry out work on or operate any aspect of the Site shall comply with the conditions of this ECA.

3.0 In Accordance

3.1 Except as otherwise provided for in this ECA, the Site shall be designed, developed, built, operated and maintained in accordance with the applications for this ECA, dated February 4, 1982, and March 31, 2008, the Design and Operation Reports referred to in Item 8, 9, and 10 of Schedule "A" and the supporting documentation listed in Schedule "A".

3.2 (a) Use of the Site for any other type of waste, or other waste management activity, is not approved under this ECA, and requires obtaining a separate approval amending this ECA; and

(b) Applications to amend this ECA shall include submission of a revised Design and Operations Report.

4.0 Interpretation

4.1 Where there is a conflict between a provision of any document, including the application, referred to in this ECA and the conditions of this ECA, the conditions in this ECA shall take precedence.

4.2 Where there is a conflict between the application and a provision in any documents listed in Schedule "A", the application shall take precedence, unless it is clear that the purpose of the document was to amend the application and that the Ministry approved the amendment.

4.3 Where there is a conflict between any two documents listed in Schedule "A", other than the application, the document bearing the most recent date shall take precedence.

4.4 The conditions of this ECA are severable. If any condition of this ECA, or the application of any condition of this ECA to any circumstance, is held invalid or unenforceable, the application of such condition to other circumstances and the remainder of this ECA shall not be affected thereby.

5.0 <u>Other Legal Obligations</u>

5.1 The issuance of, and compliance with, this ECA does not:

(a) relieve any person of any obligation to comply with any provision of any applicable statute, regulation or other legal requirement; or

(b) limit in any way the authority of the Ministry to require certain steps be taken or to require the Owner to furnish any further information related to compliance with this ECA.

5.2 The Owner shall ensure that:

(a) all wastes at the Site are managed and disposed in accordance with the Act and Regulation 347; and

(b) all wastes are transported to and from the Site by an approved waste transportation system, as defined under Regulation 347.

5.3 The Owner shall ensure that:

(a) all equipment discharging to air operating at the Site are approved under Section 9 of the Act; and

(b) all effluent is discharged in accordance with OWRA.

6.0 <u>Adverse Effect</u>

6.1 The Owner shall take steps to minimize and ameliorate any adverse effect on the natural environment or impairment of water quality resulting from the Site, including such accelerated or additional monitoring as may be necessary to determine the nature and extent of the effect or impairment.

6.2 Despite an Owner, Operator or any other person fulfilling any obligations imposed by this ECA, the person remains responsible for any contravention of any other condition of this ECA or any applicable statute, regulation, or other legal requirement resulting from any or omission that caused the adverse effect to the natural environment or impairment of water quality.

7.0 <u>Change of Owner</u>

7.1 The Owner shall notify the Director, in writing, and forward a copy of the notification to the District Manager, within 30 days of the occurrence of any changes in the following information:

(a) the ownership of the Site;

(b) appointment of, or a change in, the Operator of the Site;

(c) the name or address of the Owner; or

(d) the partners, where the Owner is or at any time becomes a partnership and a copy of the most recent declaration filed under the Business Names Act, R. S. O. 1990, c. B.17, shall be included in the notification.

7.2 No portion of this Site shall be transferred or encumbered prior to or after closing of the Site unless the Director is notified in advance and sufficient financial assurance is deposited with the Ministry to ensure that these conditions will be carried out.

7.3 In the event of any change in ownership of the works, other than change to a successor municipality, the Owner shall notify the successor of and provide the successor with a copy of this ECA, and the Owner shall provide a copy of the notification to the District Manager and the Director.

8.0 Certificate of Requirement/Registration on Title

8.1 If not previously completed, within ninety (90) days of issue of this ECA, the Owner shall submit to the Director, for his/her review, two (2) copies of a completed Certificate of Requirement and a registerable description of the Site.

8.2 Within ten (10) calendar days of receiving the Certificate of Requirement authorized by the Director, register the Certificate of Requirement in the appropriate Land Registry Office on title to the Site and submit to the Director the duplicate registered copy immediately following registration.

8.3 Pursuant to Section 197 of the Act, neither the Owner nor any person having an interest in the Property shall deal with the Site in any way without first giving a copy of this ECA, including all amending notices, to each person acquiring an interest in the Site as a result of the dealing.

9.0 Inspections

9.1 No person shall hinder or obstruct a Provincial Officer from carrying out any and all inspections authorized by the OWRA, the Act, or the PA, of any place to which this ECA relates, and without limiting the foregoing:
(a) to enter upon the premises where the approved works are located, or the location where the records required by the conditions of this ECA are kept;
(b) to have access to, inspect, and copy any records required to be kept by the conditions of this ECA;
(c) to inspect the Site, related equipment and appurtenances;
(d) to inspect the prices, procedures, or operations required by the conditions of this ECA; and
(e) to sample and monitor for the purposes of assessing compliance with the terms and conditions of this ECA or the Act, the OWRA or the PA.

10.0 Information and Record Retention

10.1 Any information requested, by the Ministry, concerning the Site and its operation under this ECA, including but not limited to any records required to be kept by this ECA shall be provided to the Ministry, upon request, in a timely manner.

10.2 The receipt of any information by the Ministry or the failure of the Ministry to prosecute any person or to require any person to take any action, under this ECA or under any statute, regulation or other legal requirement, in relation to the information, shall not be construed as:
(a) an approval, waiver, or justification by the Ministry of any or omission of any person that contravenes any term or condition of this ECA or any statute, regulation or other legal requirement; or
(b) acceptance by the Ministry of the information's completeness or accuracy.

10.3 Any information relating to this ECA and contained in Ministry files may be made available to the public in accordance with the provisions of the Freedom of Information and Protection of Privacy Act, R.S.O. 1990, C. F-31.

10.4 All records and monitoring data pertaining to the operation of the Landfill required by the conditions of this ECA must be retained for the contaminating life span of the Landfill except for as otherwise authorized in writing by the Director. All other records required by this ECA shall be kept on the Owner's premises for a minimum period of three (3) years from the date of their creation.

11.0 <u>Service Area</u>

11.1 The Site shall only accept waste generated within the geographic boundaries of the Town of St. Marys, except for MHSW depot which can accept waste from the Town of St. Marys and the Township of Perth South.

12.0 <u>Hours of Operation</u>

12.1 This Site is approved to operate from Monday to Saturday from 7:00 a.m. to 7:00 p.m.

12.2 Hours of operation may be changed by the Owner at any time, provided that the hours are correctly posted at the Site gate, and that suitable public notice is given of any change.

12.3 No waste shall be received for disposal at the Site except during operating hours and while the Site is under the supervision of a Competent Person.

12.4 During non-operating hours, the Site entrance gate shall be locked and secured against access by unauthorized persons.

13.0 <u>Signage and Security</u>

13.1 The Site shall be maintained in a secure manner, such that unauthorized vehicles cannot enter the Site.

13.2 The Owner shall limit access to and from the Site to the approved hours of operation and when the Site is supervised by a Competent Person.

13.3 All waste arriving at the Site shall be inspected by a Competent Person prior to being received at the Site to ensure wastes are being managed and disposed of in accordance with this ECA, the Act and Regulation 347 of the Act.

13.4 The Owner shall restrict the public from accessing the Compost Facility and the MHSW facility storage areas.

13.5 The Site shall be operated and maintained in an environmentally safe manner which ensures the health and safety of all persons and minimizes dust, odours, rodents, birds, litter, vibration, noise and any other adverse effects that may result from the operations at the Site.

13.6 The Owner shall maintain a sign, readable from the nearest public road, at the entrance to this Site stating:
(a) the Owner's name;
(b) hours of operation; and
(c) a 24-hour telephone number to be used in the event of an emergency or complaint.

14.0 <u>Landfill Operations</u>

14.1 Except as otherwise provided for in this ECA, the Landfill Operations at the Site shall be designed, developed, built, operated and maintained in accordance with the applications for this ECA, dated February 4, 1982, and March 31, 2008, the Design and Operation report dated November 1992, and April 4, 2008, the Addendum to the April 4, 2008 Design and Operations report dated April 2009 and October 2009 and the supporting documentation listed in Schedule "A".

14.2 The Owner shall only receive for final disposal at the Landfill solid, non-hazardous waste.

14.3 a) The maximum amount of waste that can be received per day for the landfill site is 125 cubic metres; and

b) The maximum amount of waste that can be received per year for the landfill site is 20,000 cubic metres; and

c) Because of unusual circumstance or an emergency, upon request, the District Manager may provide written permission to the Owner to exceed the daily maximum of waste that is allowed at the Site up to a daily maximum of 300 cubic metres.

14.4 Phase I as described in Schedule "A" of this ECA of the landfill site shall contain a maximum volume of 104,000 cubic metres of waste including daily cover.

14.5 Phase II/III of the Landfill Site, as described in Schedule "A" of this Approval, shall contain a maximum combined volume of 349,050 cubic metres of waste including daily cover.

14.6 The maximum top elevation of the landfill for Phase I and for the combined Phases II and Phase III shall be in accordance with plans that are in Items 8 and 9 of Schedule "A"

14.7 The final grade and contours of the landfill site shall be in accordance with the Design and Operation Reports that are identified in Items 8 and 9 of Schedule "A" of this ECA.

14.8 Cover material shall be applied as follows:

(a) daily cover - at the end of each working day, the active working face shall be covered with a minimum thickness of 150 millimetres of soil cover or an approved thickness of alternative cover material;

(b) intermediate cover - in areas where landfilling has been temporarily discontinued for six (6) months or more, a minimum thickness of 150 millimetres of soil cover, or an approved thickness of alternative cover material, shall be placed;

(c) final cover - in areas where landfilling has been completed to final contours, a minimum 0.6 metre thick layer of final cover soil shall be placed. Fill areas shall be progressively completed and rehabilitated as landfill development reaches final contours.

14.9 i) The following materials may be used as alternative cover material, subject to the requirements detailed in Condition 14.8:

(a) ground woodwaste; and

(b) Cured Compost; and

(c) Compost Waste

ii) Alternative materials to soil in addition to those listed in section 14.9 may be used as daily or intermediate cover provided that the alternative material has been approved by the Director.

14.10 The Owner is permitted to process and use ground woodwaste, as defined in Regulation 347, as alternative cover material, subject to the following:

(a) All woodwaste received at the Landfill to be used as alternative cover shall:

(i) first be inspected by a Competent Person to ensure that it complies with the definition of woodwaste in Regulation 347;

(ii) be stored in an area where proper visible signage is posted to ensure that no other waste is commingled with it and to state that no removal of this material off-Site be done by Site users;

(b) The Owner shall ensure that no more than 200 cubic metres of ground woodwaste be stockpiled at the Landfill at any one time;

(c) Any stockpile of ground woodwaste shall be stored in an operating cell of the landfill site so that any leachate from the ground woodwaste drains into the landfill; and

(d) The use of the ground woodwaste as alternative cover shall be discontinued upon written direction from the District Manager if found to have a negative impact.

14.11 The Owner shall provide to the Director a Closure Plan at least two (2) years before the closure of Phase II/III of the landfill site.

14.12 The Owner shall ensure that:

(a) all white goods which contain refrigerants accepted at the Site, which have not been tagged by a licensed technician to verify that the equipment no longer contains refrigerants, are stored in an upright position and in such a manner to allow for the safe handling and removal from the Site of refrigerants as required by Ontario Regulation 189;

(b) white goods which contain refrigerants received on-site shall either have the refrigerant removed prior to removal from the Site or shall be shipped off-Site only to facilities where the refrigerants can removed by a licensed technician in accordance with Ontario Regulation 189; and

(c) a detailed log of all white goods which contain refrigerants received is maintained which includes the following information:
   (i) date of the record;
   (ii) types, quantities and source of white goods which contain refrigerants received;
   (iii) destination of the white goods; or
   (iv) the details on removal of refrigerants, if conducted on Site, and the quantities and destination of the refrigerants transferred from the Site.

14.13 Any propane cylinders shall be stored in a segregated area in a manner which prevents cylinders from being knocked over or cylinder valves from breaking.

14.14 Any tires shall be placed in a segregated area cleared of vegetation and other waste, in a pile no greater than 3 metres in height and 100 square metres in area.

15.0 Waste Transfer Station

15.1 The Waste Transfer Station shall be operated in accordance with the application for a Waste Disposal Site submitted March 31, 2008 and supporting information identified in Schedule A.

15.2 Only waste electrical and electronic equipment, cardboard, scrap metal, blue-box recycling materials shall be accepted at the Waste Transfer Station,
   (i) from the Town of St. Marys;
   (ii) from householders responsible for those wastes; and
   (iii) from small businesses where such wastes are considered unrelated to the operation of the business; or from small businesses where such waste qualifies for the small quantities exemption defined by Regulation 347 except where such waste is produced in small quantities on a regular basis (e.g. printing companies).

15.3 The maximum amount of all waste that may be accepted per day at the Waste Transfer Station is 25 tonnes.

15.4 The maximum storage capacity of all wastes at the Waste Transfer Station is 100 tonnes.

15.5 Any cardboard stored at the Waste Transfer Station shall be stored in a container that has a covering to protect the cardboard from precipitation.

15.6 Waste accepted at the Waste Transfer Station shall be stored in a safe and secure manner and shall be properly handled, packaged or contained so as not to pose any threat to the general public, Site personnel or the environment.

15.7 The Owner shall remove all waste and Recyclable Materials from the Waste Transfer Station at an interval not exceeding ninety (90) days with the exception of electronic waste which shall be removed before the container holding the electronic waste gets full.

15.8 No radioactive, pathological or biomedical wastes or contaminated radioactive, pathological or biomedical wastes shall be accepted at the Waste Transfer Station.

15.9 The Waste Transfer Station must be maintained in a secure manner, to prevent unauthorized persons from causing negative off-Site impacts.

15.10 All waste destined for diversion shall be segregated either into bins or in designated areas. All bins and designated waste storage areas shall be clearly labelled.

15.11 The waste electronic and electrical equipment diversion program shall be operated in accordance with Item 20 of Schedule "A", and in accordance with the following requirements:
- (a) the Owner shall clearly communicate the hours of operation of the waste electronic and electrical equipment diversion program to the public to minimize the amount of waste that is not diverted from Landfill;
- (b) the Owner may receive a maximum of one (1) cubic metre per day of waste electrical and electronic equipment;
- (c) a maximum of five (5) cubic metres of waste electrical and electronic equipment may be stored at the Site;
- (d) waste electrical and electronic equipment shall be stored in a secure manner for a maximum of six (6) months; and
- (e) no disassembly, including manual disassembly, of waste electrical and electronic equipment is permitted, apart from the removal of visible batteries.

16.0 Municipal Hazardous or Special Waste (MHSW)

16.1 The MHSW Facility shall be operated in accordance with the application for a Waste Disposal Site submitted March 31, 2008 and supporting information identified in Schedule A.

16.2 The MHSW Facility may accept those wastes that are identified by the definition of MHSW.

16.3 The maximum amount of MHSW that may be accepted at the Site in any one day is one (1) tonne.

16.4 All MHSW shall be stored on Site in weather resistant, lockable, 20-foot standard storage containers.

16.5 The Maximum amount of MHSW that may be stored at the MHSW Facility is five (5) tonnes.

16.6 The Owner shall ensure that:
- (a) the wastes are stored in a safe and secure manner;
- (b) the operation of this facility does not interfere with any other activities associated with this Site; and
- (c) the wastes are properly handled, packaged or contained so as not to pose any threat to the general public, Site personnel and the environment.

16.7 (a) Wastes that are collected and stored shall be in amounts which can be safely handled at the MHSW Facility. In the event that larger amounts are received than anticipated, the Owner shall have extra drums and lab-packed containers available on the premises for the storage of the additional waste collected; and

(b) When the MHSW Facility's capacity is reached, arrangements for the removal of waste shall be made as soon as possible, but in any event, within five (5) working days.

16.8 No storage facilities other than those approved under this ECA shall be used, and fixed storage facilities shall not be moved, replaced or altered without amendment to this ECA.

16.9 The storage facilities shall be clearly marked indicating the type and nature of the hazardous waste stored.

16.10 All points of access to the MHSW Facility shall be posted to warn that the area contains hazardous materials.

16.11 Smoking restrictions shall be adhered to and non-smoking signs posted as required by regulation.

16.12 The two 20-foot storage containers for MHSW shall be weather resistant, lockable, properly ventilated and shall be constructed and used in compliance with the Fire Code, any applicable municipal by-law and the Occupational Health and Safety of Ontario and its applicable Regulations.

16.13 The 20-foot storage container, shall be maintained under lock and key and access to these facilities shall be limited to trained Site personnel.

16.14 No PCB's, pathological waste, severely toxic waste or radioactive waste shall be accepted at the MHSW Facility.

16.15 Oil and oil-based paints which have been manufactured prior to 1972; or whose manufacturing date cannot be determined and may contain PCBs, shall be handled in the manner prescribed:

(a) the oil and oil-based paints shall not be mixed (bulked) with other paints prior to testing. Paints which are lab-packed are not considered to be mixed under this ECA.

(b) the oil and oil-based paints shall be tested for PCB content. The oil and oil-based paint is considered to be a PCB waste, if measured levels are equal to or greater than 50 parts per million.

(c) the oil and oil-based paints shall not be distributed for reuse if they have any measurable PCB content.

(d) if oil and oil-based paint is found to have PCBs at or above 50 ppm, it shall be forthwith reported to the District Manager and shall be managed in accordance with Ontario Regulation 362/92, Waste Management - PCBs made under the Act, or removed from the Site to an approved PCB storage site in accordance with written instructions from the District Manager.

16.16 Except as specified in Condition 16.15, paints collected at the MHSW Facility may be returned or sold to the general public for reuse provided all transactions are recorded by invoice. Information on the type and volume of paint returned to the public through this Site shall be recorded in the report specified in Condition 22.1.

16.17 The Owner shall ensure that a Competent Person is on duty at all times during the operation of the MHSW Facility.

16.18 The local police and fire department shall be informed of the MHSW Facility and this ECA and shall be notified in writing of operating hours and any changes to scheduled operating hours prior to the changes being made.

16.19 Except as specified under Conditions 16.16, all waste collected shall be transported from the MHSW Facility by an approved waste management system and disposed to an approve waste disposal site certified to accept these types of wastes.

16.20 All containers which hold hazardous waste that have been collected at the MHSW depot at the Site shall be labelled that these waste are not subject to LDR treatment requirements in accordance with Section 81 of Regulation 347.

17.0 Compost Operations

17.1 The Compost Facility is approved for open windrow composting of a maximum of 300 tonnes per month of leaf and yard waste.

17.2 The Compost Facility shall be constructed and operated in accordance with the application for a Provisional Certificate of Approval for a Waste Disposal Site submitted March 31, 2008 and supporting information referenced as Item 10 in Schedule "A".

17.3 The Owner shall ensure that incoming waste is visually inspected by a Competent Person to ensure that the waste meets the requirements of this Certificate. Unacceptable waste shall be re-directed to Landfill; and

17.4 (a) Leaf and yard waste destined for composting shall be removed to the Compost Facility on a weekly basis or whenever the capacity of the designated storage area is reached, whichever occurs first. In the event that the leaf and yard waste becomes odourous, the waste shall be immediately diverted to the Landfill.

(b) At least once every year, the Owner shall take a representative sample of the incoming yard and leaf waste to ensure that the incoming waste meets the metals criteria listed in Schedule "B". Incoming waste which does not meet the metals criteria listed in Schedule "B" is considered unacceptable waste.

17.5 (a) Leaf and yard waste shall be incorporated into windrows within four (4) days of being mixed; and

(b) Any waste that has exceeded the time restrictions in Conditions 17.5(a) shall be re-directed to the Landfill for immediate burial.

17.6 The Owner shall ensure that the following operating criteria are met, as a minimum:

(a) all waste receipt, processing, active composting and curing shall take place in the part of the landfill that is identified by Figure 1.1 that is identified by Item 10 of Schedule "A"
(b) windrows shall be arranged in a manner which permits equipment access to the composting and storage areas for efficient turning of the windrows and to allow access for emergency vehicles;
(c) windrows shall be constructed at bulk densities and heights which promote aerobic conditions;
(d) all waste being composted shall be held at a temperature of at least 55 ^{o}C for a minimum of fifteen (15) days cumulative, to ensure proper bacterial growth and pathogen inactivation;
(e) during composting, the temperature and moisture levels of the windrows shall be monitored and recorded daily during the pathogen inactivation period and a minimum of twice weekly during the remainder of the composting process;
(f) during the fifteen day pathogen inactivation period, the windrows shall be turned a minimum of five (5) times; and
(g) compost shall be cured for six (6) months after the requirements for pathogen inactivation have been satisfied. During the curing phase, windrows shall be turned at least once per month.

17.7 (a) Prior to being released from the Compost Facility for unrestricted use, compost shall be monitored for quality as follows:

- (i) a representative composite sample shall be collected for every 1000 tonnes of compost produced;
- (ii) samples shall be analysed for criteria listed in Schedule "B";
- (iii) all production records shall be reviewed to ensure temperature and residency time requirements for pathogen inactivation have been met;

(b) Compost that met the temperature and residency time requirements for pathogen inactivation and the quality requirements listed in Schedule "B" of this ECA, is considered to be finished compost and may be transferred off Site for unrestricted use;

(c) Compost that meets the metals and foreign matter quality requirements listed in Schedule "B" of this ECA but did not achieve the pathogen inactivation time or temperature requirements, or did not meet the Schedule "B" pathogen quality requirements, may be returned to the composting process for re-processing. Alternatively, the compost may be used as alternate cover material; and

(d) Compost that can not meet the metal or foreign matter quality requirements listed in Schedule "B" of this ECA shall be considered Compost Waste and shall be re-directed to the Landfill for use as alternate cover material and/or burial.

17.8 (a) The Owner shall ensure that the area inside the containment berm surrounding the compost pile be graded to allow for a low-lying sump area that can used to collect leachate from the composting operation; and

(b) The collected leachate may be sprayed onto the landfill to enhance the daily cover; and

(c) If there is need to direct leachate from the composting operation to the stormwater detention Basin A or to a body of water, an application and approval to amend Municipal Sewage Certificate of Approval Number 3-1577-92-936 needs to be done.

17.9 There shall be no discharge of wastewater to a body of water from the Site unless allowed by an Approval under the OWRA.

18.0 <u>Nuisance Control</u>

18.1 (a) The Site shall be operated and maintained such that the vermin, vectors, birds, dust, litter, odour, noise and traffic do not create a nuisance.

(b) If at any time, problems such as vermin, vectors, birds, dust, litter, odours, noise or traffic, or other nuisances are generated at the Site resulting in complaints, the Owner shall take appropriate remedial ion to eliminate the cause of such problems. Appropriate measures may include temporary stoppage of all operations until the problem has been rectified and measures have been undertaken to prevent future occurrence.

18.2 A litter control program shall be established and maintained by the Owner near the face of the active cell of the Landfill, at the Compost Facility and at the property line. The litter control program shall include, but not be limited to, regular pick up of litter and use of snow fences around the active cell of the Landfill and Compost Facility as required.

18.3 (a) The Owner shall have in place procedures to prevent adverse odour impacts from the Composting Facility including, but not limited to:
(i) reducing the size of windrows to promote aeration;
(ii) identifying unfavourable meteorological conditions and limiting activities which can reasonably be expected to generate odours during times of unfavourable meteorological conditions; and

(b) Notwithstanding Condition 18.4, any odourous composting waste that does not respond to mitigative action within twelve (12) hours of action being taken will be re-directed to the Landfill for immediate burial.

18.4 The Owner shall operate and maintain the Site so that the maximum 10-minute average concentration of odour at the most impacted sensitive receptor, resulting from the operation of the Landfill and/or the Compost Facility,shall not be greater than 1.0 odour unit.

19.0 Site Inspections and Maintenance

19.1 The Owner shall ensure that all MHSW Facility storage facilities are inspected each day that the facility is in operation by a Competent Person for spills, leaks or hazardous conditions.

19.2 The Owner shall ensure that:
(a) visible portions of the Compost Facility pad are visually inspected on each operating day; and
(b) the pad is visually inspected, and appropriate maintenance performed, as the pad surface is uncovered during windrow turning and/or removal.

19.3 The Owner shall ensure that a Competent Person performs daily visual inspections of the Site to ensure security and cleanliness of the Site.

19.4 The Owner shall ensure that fire extinguishers are inspected monthly and recharged annually.

19.5 (a) The Owner shall develop and put in place a preventative maintenance program, in accordance with manufacturers' recommendations, for all on-site equipment associated with the processing and managing of waste and/or processed materials; and

(b) The preventative maintenance program shall consist of the following as a minimum:
(i) the program shall specifically stipulate the part of the equipment inspected for all process equipment on Site;
(ii) the frequency of the inspections required and carried out; and
(iii) the dates of any repairs conducted.

19.6 Any deficiencies noted during the inspection or maintenance activities, that might negatively impact the environment, shall be promptly corrected.

20.0 Environmental Emergency

20.1 Within thirty (30) days of the date of issue of this Notice, the Owner shall have in place an Environment Emergency Plan for the operations permitted under the ECA. The Environment Emergency Plan shall include, but is not necessarily limited to:
(a) the prevention of, preparedness for, response to and recovery from an environmental emergency;
(b) a list of contingency equipment and spill clean up materials available to Site personnel;
(c) names and telephone numbers of waste management companies available for emergency response; and
(d) a notification protocol, with names and telephone numbers of persons to be contacted, including:
i. Town of St. Marys personnel,
ii. the Ministry District Office;
iii. Spills Action Centre;
iv. Fire Department;
v. Police Department;

vi. local Medical Officer of Health; and
vii. Ministry of Labour.

20.2 The Owner shall take immediate measures to clean-up spills and other discharges of any wastes. Spill clean-up material shall be stored at the Site, in sealed drums or in an appropriate solid waste container, until such time as it is removed to a facility approved to receive such waste.

20.3 The Owner shall require a Competent Person to record all spills and upsets in the log book referred to in Condition 22 of the ECA. The information recorded in the log shall include:
(a) the nature of the spill or upset;
(b) the action taken for clean-up; and
(c) corrective action taken to prevent future occurrences.

20.4 The Owner shall require a Competent Person to immediately notify the Ministry's Spills Action Centre at (416) 325-3000 or 1-800-268-6060 of any reportable spills or upsets.

20.5 The Owner shall ensure that adequate fire-fighting and contingency spill clean-up equipment are available at the Site and that the Site personnel are familiar with the use of such equipment and its location(s) on the Site.

20.6 The Owner shall ensure that:
(a) the contingency equipment and materials outlined in the Environment Emergency Plan are in a good state of repair, fully operational and immediately available;
(b) all operating personnel are fully trained in the contingency equipment and materials' use and in the procedures to be employed in the event of an emergency;
(c) the Environment Emergency Plan is reviewed and updated on an annual basis as a minimum; and
(d) the local Fire Department and the District Manager are given a copy of the Environment Emergency Plan and any amendments that are made to it.

20.7 All Operators and employees of the Owner at the Site shall be Competent People.

21.0 <u>Complaints</u>

21.1 If the Owner receives complaints regarding the operation of the Site which are environmental in nature, or have caused, or are likely to cause, a negative impact to the environment or human health or safety, the Owner shall respond to these complaints according to the following procedure:
(a) The Owner shall record each complaint and the information recorded shall include:
(i) the date, time and nature of the complaint;
(ii) the name, address and telephone number of the complainant if provided;
(iii) the activities taking place on Site at the time of the complaint; and
(iv) meteorological conditions;
(b) The Owner, upon notification of the complaint shall initiate appropriate steps to determine all possible causes of the complaint, proceed to take the necessary actions to eliminate the cause of the complaint and forward a formal reply to the complainant; and

(c) The Owner shall retain on-Site a report written within one (1) week of the complaint date, listing the actions taken to resolve the complaint and any recommendations for remedial measures, and managerial or operational changes to reasonably avoid the reoccurrence of similar incidents.

22.0 Record Keeping

22.1 (a) The Owner shall maintain daily written records for waste deposited at the Landfill and managed at the Waste Transfer Station for each day the Site is in operation. The record shall included, but not necessarily be limited to:
(i) the quantity of waste received for final disposal at the landfill;
(ii) the quantity of waste received at the Waste Transfer Facility.
(iii) the type and quantity of waste transferred from the Site for recycling and the destination of the waste diverted;
(iv) a record of activities undertaken that operating day (e.g. placement of cover material);
(v) a description of any out-of-service period of any control, treatment, disposal or monitoring facilities, the reasons for the loss of service, and action taken to restore and maintain service.

(b) The Owner shall establish a monthly summary of waste received at the MHSW Transfer Facility which shall include, but not necessarily be limited to:
(i) documentation of waste types and quantities;
(ii) the quantity of any paint given to the public
(iii) source of generation;
(iv) ultimate disposal sites;
(v) each incident where the capacity of the facility has been exceeded; and
(vi) spills, upsets and environmental or other problems encountered in operating the MHSW Transfer Facility.

(c) The Owner shall maintain the following records as a minimum for the Compost Facility:
(i) daily weather data including wind speeds and wind direction;
(ii) types and quantities of waste received;
(iii) date and time of windrow construction and ratio of windrow mixture;
(iv) windrow temperature and moisture readings as appropriate for each stage of processing;
(v) date windrow was broken down and began curing;
(vi) other activities carried out (windrow turning, moisture addition, combining windrows, sampling); and
(vii) laboratory reports of all analysis of feedstocks, mixtures, active and Cured Compost.

22.2 The Owner shall maintain written records of all inspections and maintenance activities undertaken in accordance with Conditions 19.1 to 19.6 inclusive. All records related to the inspection and preventative maintenance programs shall be available on Site for inspection by a Provincial Officer upon request.

22.3 The Owner shall maintain a written record, at the Site, of employee training required by Condition 20.7. The record shall include but not necessarily be limited to:
(a) date of training;
(b) name and signature of person who has been trained; and
(c) description of the training provided.

23.0 <u>Monitoring</u>

23.1 (a) The Owner shall ensure compliance with the RUP.

(b) The Owner shall determine compliance by retaining qualified professionals to monitor groundwater, surface water and leachate in accordance with Schedule "C";

(c) Sampling and analyses in accordance with Schedule "C", shall occur in the spring and fall of each year; and

(d) The monitoring program may be amended from time-to-time with the prior written consent of the District Manager.

23.2 The Owner shall ensure that all samples are collected using standard sampling methods. The sampling methods followed shall be referenced in the report required by Condition 25.1.

23.3 (a) All monitoring wells which form part of the monitoring program shall be protected from damage. Any groundwater monitoring wells that are damaged shall be repaired or replaced forthwith or properly abandoned in accordance with Ontario Regulation 903; and

(b) Any monitoring wells which are no longer required for monitoring, or which need to be closed due to operational changes on the Site, shall be property abandoned in accordance with Ontario Regulation 903.

23.4 In the event that the results of the monitoring program are such that an off-Site exceedance of the criteria set by the RUP and/or the PWQO has occurred as a result of the operation of the Site, the Owner shall notify the District Manager as soon as reasonably possible and specify the following:
(a) details of the off-site exceedance, confirmatory monitoring requirements and the potential off-site impacts to surface water and groundwater users;
(b) the extent and timing of contingency measures to be implemented;
(c) modifications, if any, which should be made to the monitoring program; and
(d) other mitigation measures, if any, which may be necessary to reduce or prevent off-site impacts.

24.0 <u>General Provisions</u>

24.1 Within one year of issue of this ECA, the Owner shall install a weigh scale at the Site to enable a tracking of the quantity of waste entering and leaving the Site.

24.2 Within ninety (90) days of issue date of this ECA, the Owner shall maintain a current Operations and Maintenance Manual for the landfill, the Waste Transfer Station, the MHSW Depot and the composting operation which is consistent with the ECA for the Landfill part of the Site for use by Site personnel which shall contain, but is not necessarily limited to the following:

(a) a Site plan, showing the location of key features and their dimensions at the Site;
(b) an outline of the responsibilities of personnel;
(c) personnel training requirements;
(d) proper receiving, handling, storage and recording procedures;
(e) procedures for handling white goods containing refrigerants; and
an outline of the responsibilities of MHSW Facility personnel;
(f) operating procedures for the composting area including processing/mixing, windrow formation, turning schedules, parameters and criteria that have to be met;
(g) quality control sampling and testing protocol for the Site;
(h) contingency and emergency response procedures including health and safety provisions for workers and best management practices for the control of dust, litter and odour;
(i) Leachate management;
(j) Landfill gas management;
(k) Surface water/Storm water management;
(l) Inspections and monitoring; and
(m) Complaints procedure.

24.3 The Operations and Maintenance Manual referred to in Condition 24.2 shall be:

i) retained at the Site;
ii) kept up to date through periodic revisions; and
iii) be available for inspection by Ministry staff.

25.0 Annual Report

25.1 By March 31 of each year, The Owner shall prepare and submit to the District Manager an annual report which summarizes Site operations for the previous calendar year. The annual report shall include the following:

(a) an assessment of the egress of contaminants into groundwater and surface water, as determined by sampling and analysis conducted within the previous calendar year;
(b) an assessment of the operation and performance of all engineered facilities, the need to amend the design or operation of the Site, and the adequacy of and need to implement the contingency plans;
(c) a report on the status of all monitoring wells and a statement as to compliance with Ontario Regulation 903;
(d) plans showing the existing contours of the Landfill; areas of landfilling operation during the reporting period; areas of intended operation during the next reporting period; areas of excavation during the reporting period; the progress of final cover, vegetative cover, and any intermediate cover application; previously existing Site facilities; facilities installed during the reporting period; and Site preparations and facilities planned for installation during the next reporting period;

(e) graphs showing trends through time for key indicator parameters including chloride, iron and total phosphorous for all surface water monitoring stations and Total Suspended Solids for the discharge points at the Storm Water Management Ponds, SP4A-94 and SP2B-94.
(f) provide information on surface water station SP2-93;
(g) calculations of the volume of waste, daily and intermediate cover, and final cover deposited or placed at the Landfill during the reporting period and a calculation of the total volume of Landfill capacity used during the reporting period;
(h) a calculation of the remaining capacity of the Landfill and an estimate of the remaining Landfill life;
(i) analytical results from testing of alternative cover material;
(j) report on sediment build up in storm water ponds Basin A and Basin B;
(k) once the weigh scale is installed at the Site, a summary of the total quantity (tonnes) of waste received at the Site by waste management activity;
(l) a summary of the quantity of waste diverted from final disposal to recycling or reuse;
(m) a summary of the quantity of MHSW collected, by waste class code and the final destination of each waste type;
(n) a summary of the amount of leaf and yard waste received at the Compost Facility and the amount of finished compost transferred from the Site;
(o) a summary of analytical results of samples taken from the finished compost;
(n) a summary of any significant problems encountered during composting or curing;
(p) a summary of any complaints received from any of the waste management activities undertaken at the Site and the responses made;
(q) a discussion of any environmental and operational problems that could negatively impact the environment encountered during the operation of the Site and during the Site inspections and any mitigative actions taken;
(r) any recommendations to minimize environmental impacts from the operation of the Site and to improve Site operations and monitoring programs in this regard; and
(s) a summary statement as to compliance with all Conditions of this ECA and with the inspection and reporting requirements of the Conditions herein.

26.0 Closure Plan

26.1 At least two (2) years prior to the anticipated date of closure of the Landfill, the Owner shall submit to the Director for approval, a detailed closure plan pertaining to the termination of landfilling operations at this Site, post-closure inspection, maintenance and monitoring, and end use. The plan shall include the following:
(a) a plan showing Site appearance after closure;
(b) a description of the proposed end use of the Site;
(c) a descriptions of the procedures for closure of the Landfill, including:
  (i) advance notification of the public of the Landfill closure;
  (ii) posting of a sign at the Site entrance indicating the Landfill is closed and identifying any alternative waste disposal arrangements;
  (iii) completion, inspection and maintenance of the final cover and landscaping;
  (iv) Site security;
  (v) removal of unnecessary Landfill-related structures, buildings and facilities; and

(vi) final construction of any control, treatment, disposal and monitoring facilities for leachate, groundwater, surface water and landfill gas;

(d) a schedule indicating the time-period for implementing Conditions 26.1(c)(i) to 26.1(c)(vi) inclusive;

(e) descriptions of the procedures for post-closure care of the Landfill, including:

(i) operation, inspection and maintenance of the control, treatment, disposal and monitoring facilities for leachate, groundwater, surface water and Landfill gas;

(ii) record keeping and reporting; and

(iii) complaint contact and response procedures;

(f) an assessment of the adequacy of and need to implement the contingency plans for leachate and methane gas; and

(g) an updated estimate of the contaminating life span of the Landfill, based on the results of the monitoring programs to date.

26.2 (a) Four (4) months prior to the permanent closure of the MHSW Transfer Facility, the Waste Transfer Station and/or Compost Facility, the Owner shall submit to the District Manager written notification of the decision to cease the MHSW collection program, the composting activities and/or the Waste Transfer Station. The written notification shall include a closure plan consisting of:

(i) a plan showing Site appearance after closure;

(ii) a description of the procedures to be taken for closure of the Waste Transfer Station, the MHSW Transfer Facility and/or the Compost Facility; and

(iii) a schedule indicating the time-period for implementing closure activities; and

(b) Within ten (10) days after closure of the Waste Transfer Station, the MHSW Transfer Facility and/or the Compost Facility, the Owner shall inform the Director, in writing, that the Waste Transfer Station, the MHSW Transfer Facility and/or the Compost Facility is/are closed and requesting that this ECA be amended accordingly.

27.0 Interim Capacity

27. (a) The amount of waste disposed of at the Landfill Site between October 1, 2021 and September 30, 2022 shall not exceed 13,000 cubic metres including daily cover.

(b) This waste shall be contained within cells 5, 6, 7 and 8 of Phase II/III.

(c) No waste shall be disposed of at the Landfill Site after September 30, 2022 unless additional interim capacity is approved by the Director.

28. By July 31, 2022, the Owner shall submit to the Director an ECA application, should the Site require further approval of interim capacity. The application shall include the following supporting information:

(a) Updated proposal of interim contours.

(b) 2021 Annual Operations and Monitoring Report.

SCHEDULE "A"

This Schedule "A" forms part of this ECA.

1. Application for a Provisional Certificate of Approval for a Waste Disposal Site, dated February 4, 1982.

2. Application for a Provisional Certificate of Approval for a Waste Disposal Site, dated February March 31, 2008 and signed by Kevin Luckhardt.

3. Hydrogeologic Investigation, St. Marys Landfill Site, Report by Conestoga-Rovers & Associates Limited, dated November 1982.

4. Plans prepared by Conestoga-Rovers & Associates Limited, Project No. 0645, as follows:

TITLE	PLAN NO.	DATE
Existing Conditions	1	November 1982
Proposed bottom Contours	2	November 1982
Proposed Final Contours	3	November 1982
Cross-Section	4	November 1982
Site Development Plan		
Waste Disposal Area 1	5	November 1982
Leachate Collection System	6	November 1982
Surface Water Drainage	7	November 1982

5. Letter dated January 27, 1983 from the Ministry of the Environment Waste Management Approvals Unit to the Town of St. Marys.

6. Letter dated March 21, 1983 from Conestoga-Rovers & Associates Limited to the Ministry of the Environment, Waste Management Approvals Unit.

7. Drawing of Proposed Berm Extension, St. Marys Landfill Site, prepared by Conestoga-Rovers and Associates Limited, dated march 25, 1983.

8. Design and Operation Report Phase II/III prepared by Conestoga Rovers and Associates Limited, dated November 1992.

9. Addendum: Design and Operations Report Update prepared by Conestoga Rovers and Associates dated April 2009

10. Addendum: Design and Operations Report, Leaf and Yard Composting Operations, St. Marys Landfill Site, prepared by Conestoga Rovers and Associates dated October 2009.

11. Letter dated January 8, 2010 with attachments from James R. Yardley, P.Eng. of Conestoga Rovers and Associates, addressed to Jim Chisholm of the Ministry.

12. Application for an Environmental Compliance Approval for a Waste Disposal Site from The Corporation of the Town of St. Marys, received on June 14, 2013, including supporting documentation submitted therewith.

13. Letter dated July 22, 2013 from The Corporation of the Town of St. Marys including the following information:

    (a) Signature dated June 27, 2013 on page 7 of the application form;
    (b) Revised pages 16 and 27 of the application form;
    (c) Copy of public notification letter and list of recipients;
    (d) Site address confirmation; and
    (e) Updated Design and Operations Plan.

14. Application for an Environmental Compliance Approval for Landfill amendment - Interim Capacity approval, by Chad Papple, Director of Public Works, The Corporation of the Town of St. Marys, received on July 2, 2015, including the following supporting information:
    (a) Proposed Cell Staging Plan prepared by R.J. Burnside & Associates Limited, Project No. 300032339
    (b) 2014 Annual Operations and Monitoring Report prepared by R.J. Burnside & Associates Limited, Project No. 300032339

15. Letter from The Corporation of the Town of St. Marys - Public Works Department to Dale Gable, Ministry of the Environment and Climate Change signed by Dave Blake, C.E.T. and dated July 25, 2016 including all attachments.

16. Application for approval dated July 18, 2017 including all supporting documents submitted (2016 AMR, et al).

17. Letter from The Corporation of the Town of St. Marys - Public Works Department to Dale Gable, Ministry of the Environment signed by Dave Blake, C.E.T. and dated June 20, 2018 including all attachments.

18. Email from Matt Ash, C.E.T., GM BluePlan Engineering Limited, dated September 13, 2018, RE: Approval of interim capacity for St. Marys Landfill Site (MECP Ref no. 5354-B2BLLT).

19. Letter dated July 22, 2019 from The Corporation of the Town of St. Marys - Public Works Department addressed to Director, Client Services and Permissions Branch, Ministry of the Environment signed by Dave Blake, C.E.T., including all attachments.

20. Email from Dave Blake, The Corporation of the Town of St. Marys, dated October 4, 2019, Re: clarification on filling in cell 5 of Phase II/III, and working slopes.

21. Application for an Environmental Compliance Approval for Landfill amendment - Interim Capacity approval, by Dave Blake, Environmental Services Supervisor, The Corporation of the Town of St. Marys, Signed on July 29, 2020, including the following supporting information:
    (a) Annual Operations & Monitoring Report (2019), St. Mary's Landfill Site, MOECC

Certificate of Approval No. A150203. Prepared by GM Blue Plan Engineering, Report dated and signed March 2020 and the pdf published electronically on 03/24/2020 8:27 AM.

22. Application for an Environmental Compliance Approval for Landfill amendment - Interim Capacity approval, by Dave Blake, Environmental Services Supervisor, The Corporation of the Town of St. Marys, Signed on July 28, 2021, including the following supporting information:
    (a) Annual Operations & Monitoring Report (2020), St. Mary's Landfill Site, MOECC Certificate of Approval No. A150203. Prepared by GM Blue Plan Engineering, March 2021.

SCHEDULE "B"

This Schedule "B" forms part of this ECA.

Parameter	Maximum concentration
Metals	
arsenic	13 ppm
cadmium	3 ppm
chromium	210 ppm
cobalt	34 ppm
copper	100 ppm
lead	150 ppm
mercury	0.8 ppm
molybdenum	5 ppm
nickel	62 ppm
selenium	2 ppm
zinc	500 ppm
Foreign material	
plastic particles greater than 3 mm in any direction	1%
non-biodegradable material greater than 3 mm in any direction	2 %
Pathogens	
fecal coliforms	<1000 MPN*/g of total solids calculated on a dry weight basis
salmonellae	<3 MPN*/4g total solids calculated on a dry weight basis

* most probable number

SCHEDULE "C"

This Schedule "C" forms part of this ECA.

ST. MARYS LANDFILL MONITORING PROGRAM

	Parameters	Field		General Chemistry					Additional		Metals			VOCs
	Monitoring Locations	Hydraulic Monitoring	pH, conductivity, temperature	chloride, hardness, phenols.	DOC	BOD_5, ammonia	turbidity, TDS, suspended solids, total phosphorous	COD, chloride, phenols, nitrate, phosphorous, TKN, TSS	alkalinity, sulphate	boron, iron, manganese, sodium, BTEX	calcium, magnesium	iron, manganese	aluminum, barium, beryllium, bismuth, cadmium, chromium, cobalt, copper, lead, molybdenum, nickel, potassium, silver, sodium, strontium, tungsten, vanadium, zinc	EPA 624 VOCs
Groundwater Wells	OW2-84	x	x	x	X				x	x	x			
	OW3-84	x	x	x	X						x			
	OW4-84	x	x	x	X						x			
	OW5-84	x	x	x	X						x			
	OW6-84	x	x	x	X						x			
	OW7-91	x	x	x	x						x			
	OW8A-91	x	x	x	X						x			
	OW8B-91	x	x	x	x						x			
	OW9A-91	x	x	x	X						x			
	OW9B-91	x	x	x	X						x			
	OW15-91	x	x	x	X				x	x	x			
	OW21-91	x	x	x	x				x	x	x			
	OW25-91	x	x	x	X						x			
	OW32-96	x	x	x	X				x	x	x			
	OW33-96	x	x	x	x						x			
	OW34-96	x	x	x	X				x	x	x			
	OW32A-02	x	x	X	X				x	x	x			
Residential Wells	Riordan (#3)	X	x	x	X						x			
	Hall (#25)	x	x	x	x						X			
	Riordan Farm (#26)	x	x	x	X						X			
	Heard (#27)	x	x	x	x						X			
	McCurdy (#24)	x	x	x	X						X			
Surface Water	SP1-93 (upstream)	x	x	X		X	X				x	X		
	SP2-93 (midstream)	x	x	X		x	X				x	X		
	SP3-93 (downstream)	x	x	x		x	X				x	X		
	SP1B-94 (Basin B inlet)	x	x	X		x	X				x	X		
	SP2B-94 (Basin B outlet)	x	x	X		x	X				x	X		
	SP3A-94 (Basin A inlet)	x	x	X		x	X				x	X		
	SP4A-94 (Basin A outlet)	x	x	x		x	X				x	X		
	SP5A-94 (Basin A inlet)	x	x	X		x	X				x	X		
Leachate Wells	MH1 (Phase I)	X				x		x	x		x	x	x	x
	MH3 (Phase II/III)	X				x		x	x		x	x	x	x
	All Manholes	X												

The reasons for the imposition of these terms and conditions are as follows:

The reason for Condition 1.1 is to clarify that the previously issued Provisional Certificate of Approval No. A150203 issued on August 4, 1980, and any subsequent Notices of amendment, are no longer in effect and has been replaced and superseded by the Terms and Conditions stated in this ECA.

The reason for Conditions 2.1, 2.2, 5.1, 5.2, 5.3, 6.1, 6.2, 10.2, 10.3 15.1, 15,2, 16.2, 16.15, 16.16. 16.17, 16.19, 16.20, 17.6, 17.8, and 17.9 is to clarify the legal rights and responsibilities of the Owner under this ECA.

The reason for Conditions 3.1, 3.2, 14.1, 15.1, 16.1, and 17.2 is to ensure that the Site is designed, operated, monitored and maintained in accordance with the application and supporting documentation submitted by the Owner, and not in a manner which the Director has not been asked to consider.

The reason for Conditions 4.1, 4.2, 4.3 and 4.4 is to clarify how to interpret this ECA in relation to the application and supporting documentation submitted by the Owner.

The reason for Condition 7.1 is to ensure that the Site is operated under the corporate name which appears on the application form submitted for this approval.

The reason for Condition 7.2 is to restrict potential transfer or encumbrance of the Site without the approval of the Director. Any transfer of encumbrance can be made only on the basis that it will not endanger compliance with this ECA.

The reason for Condition 7.3 is to ensure that subsequent owners of the Site are informed of the terms and conditions of this ECA. This also applies to all supporting documentation listed in Schedule "A".

Conditions 8.1, 8.2 and 8.3 are included, pursuant to subsection 197(1) of the Act, to provide that any persons having an interest in the Site are aware that the land has been approved and used for the purposes of waste disposal.

The reason for Condition 9.1 is to ensure that appropriate Ministry staff have ready access to the Site for inspection of the Site and its facilities, equipment, practices and operations required by the conditions in this ECA. This condition is supplementary to the powers of entry afforded a Provincial Officer pursuant to the Act and OWRA.

The reason for Conditions 10.1 to 10.4 inclusive is to ensure the availability of records and drawings for inspection and information purposes.

The reason for Condition 11.1 is to specify the approved areas from which waste may be accepted at the Site.

The reason for Conditions 12.1, 12.2 and 12.3 is to specify the hours of operation for the Site and a mechanism for amendment of the hours of operation, as required.

The reason for Conditions 13.1, 12.4 and 15.9 is to ensure that the Site is secure when unattended to prevent vandalism or theft.

The reason for Conditions 13.2, 13.3, 13.4, 13.5 and 14.12 is to ensure the safety of the public and the protection of the environment.

The reason for Conditions 13.6 and 16.18 is to ensure that emergency responders and the public have the necessary contact information in the event of an emergency or complaint.

The reason for Condition 14.1, 14.2, 14.3 and 14.14 is to specify the types and quantities of waste that may be accepted for disposal and the placement of the waste at the Site.

The reason for Conditions 14.4, 14.5, 14.6 and 10.7 is to define the maximum amount of waste, including daily cover that is allowed at the landfill site.

The reason for Conditions 14.8, 14.9 and 14.10 is to specify the requirements for use of alternative cover material at the Site.

The reason for Condition 14.11 is to ensure that daily and intermediate cover is used to control potential nuisance effects, to facilitate vehicle access, and to ensure an acceptable appearance is maintained. The proper closure of a landfill requires the application of a final cover which is aesthetically pleasing, controls infiltration, and is suitable for the end use planned for the Site and ensures that waste is not filled beyond approved limits.

Conditions 14.13, 14.14, 15.4, 15.5, 15.6, 15.7, 15.8, 15.10, 15.11, 16.4, 16.5, 16.6, 16.7, 16.8, 16.9, 16.10 16.11, 16.12, 16.13, and 16.14 is included to ensure that waste storage is done in a manner, quantity and/or duration which does not result in a nuisance or a hazard to the health and safety of the environment or people.

The reason for Condition 16.19 is to ensure that waste is transported to and from the Site in accordance with Regulation 347.

The reason for Condition 16.20 is to alert receiving waste disposal sites that the listed and/or characteristic waste is exempt from treatment requirements.

The reason for Conditions 14.3, 15.3, 16.3, 17.1 and 15.11(b) is to ensure that the types and quantities of waste received at the Site are in accordance with that approved under this ECA.

The reason for Condition 17.3 is to ensure that only waste approved under this ECA are received at the Site.

The reason for Conditions 17.4, 17.5, 17.6, 18.1, 18.2, 18.3, and 18.4 is to ensure that the Site is operated in a manner which does not result in a nuisance or a hazard to the health and safety of the environment or people.

The reason for Conditions 19.1, 19.2, 19.3, 19.4, 19.5 and 19.6 is to ensure that all equipment and facilities are maintained in good working order.

The reason for Conditions 20.1 to 20.6 inclusive is to ensure that the Owner is prepared and properly equipment to take action in the event of a spill, fire or other operation upset.

The reason for Condition 21.1 is to ensure that complaints are properly and quickly resolved and that complaints and follow-up actions have been documented.

The reason for Conditions 22.1, 22.2 and 22.3 is to ensure that detailed records of Site operations are kept for inspection and information purposes.

The reason for Condition 20.7 is to ensure that the Site is only operated in the presence of trained personnel.

The reason for Condition 23.1 is to demonstrate that the landfill is performing as designed and the impacts on the natural environment are acceptable. Regular monitoring allows for the analysis of trends over time and ensures that there is an early warning of potential problems so that any necessary remedial/contingency action can be taken.

The reason for Condition 23.2 is to ensure that samples are collected using established sampling protocol.

The reason for Condition 23.3 is to protect the groundwater.

The reason for Condition 23.4 is to notify the Ministry of off-site groundwater contamination so that appropriate mitigative actions can be taken.

The reason for Condition 24.1 is to provide the Site with the needed technology to be able to track the amount of waste entering and leaving the Site.

The reasons for Conditions 24.2 and 24.3 is to ensure that the Operations and Maintenance Manuals are kept current and reflects actual Site practices and procedures and are current and available for inspection by Ministry staff.

The reason for Condition 25.1 is to ensure a regular review of site development, operations and monitoring data and that the review is documented and any possible improvements to Site design, operations or monitoring programs are identified. An annual report is an important tool used in reviewing Site activities and for determining the effectiveness of Site design.

The reason for Conditions 26.1, 26.2 and 14.11 is to ensure that the Site is closed in accordance with MECP standards and to protect the health and safety of the environment.

The reason for Condition 27 is to allow for approval of extending interim capacity for the Landfill Site, while the Town is waiting for an Environmental Assessment approval for extending landfilling operations beyond existing capacity.

The reason for Condition 28 is to ensure that sufficient time is given to the Ministry to process the application, in the event that the Town of St. Marys needs to secure the following year's interim capacity.

Upon issuance of the environmental compliance approval, I hereby revoke Approval No(s). A150203 issued on November 16, 2020

In accordance with Section 139 of the *Environmental Protection Act,* you may by written notice served upon me and the Ontario Land Tribunal within 15 days after receipt of this notice, require a hearing by the Tribunal. Section 142 of the *Environmental Protection Act* provides that the notice requiring the hearing ("the Notice") shall state:

a. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;
b. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

Pursuant to subsection 139(3) of the *Environmental Protection Act,* a hearing may not be required with respect to any terms and conditions in this environmental compliance approval, if the terms and conditions are substantially the same as those contained in an approval that is amended or revoked by this environmental compliance approval.

The Notice should also include:

1. The name of the appellant;
2. The address of the appellant;
3. The environmental compliance approval number;
4. The date of the environmental compliance approval;
5. The name of the Director, and;
6. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

Registrar* Ontario Land Tribunal 655 Bay Street, Suite 1500 Toronto, Ontario M5G 1E5 OLT.Registrar@ontario.ca	and	The Director appointed for the purposes of Part II.1 of the *Environmental Protection Act* Ministry of the Environment, Conservation and Parks 135 St. Clair Avenue West, 1st Floor Toronto, Ontario M4V 1P5

*** Further information on the Ontario Land Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349 or 1 (866) 448-2248, or www.oltt.gov.on.ca**

The above noted activity is approved under s.20.3 of Part II.1 of the *Environmental Protection Act.*

DATED AT TORONTO this 10th day of January, 2022

Mohsen Keyvani, P.Eng.
Director
appointed for the purposes of Part II.1 of the
Environmental Protection Act

CM/
c: District Manager, MECP London - District
A. W. Bringleson CET, GM BluePlan Engineering Ltd.

APPENDIX B:
MECP WELL RECORDS

40P/39 2

UTM 17 Z 487300 E
9 R 4787095 N
Elev. 9 R 0987
Basin 23

ONTARIO

The Well Drillers Act
Department of Mines, Province of Ontario

50 № 1196

Water Well Record

County or District Perth Tp. St. Mary's Con. Lot Pt. Lot
Owner [redacted] Address St Marys Ont. Acres
Date Completed Aug 12/47 Cost of Well (not including pump)

Pipe and Casing Record		Pumping Test	
Casing diameter(s)	4"	Date	
Length(s) of casing(s)	24 ft.	Developed Capacity	600 gals per hr.
Length of screen		Duration of Test	1 hr.
Type of screen		Pumping Rate	600 gals per hr.
Type of pump		Drawdown	
Capacity of pump		Static level of completed well	106 ft 32'
Depth of pump setting		Is well a gravel-wall type?	no

Water Record

Kind (fresh or mineral) fresh
Quality (hard, soft, contains iron, sulphur etc.) hard.
Appearance (clear, cloudy, coloured)
For what purpose(s) is the water to be used? Domestic
How far is well from possible source of contamination?
What is source of contamination?
Enclose a copy of any mineral analysis that has been made of water

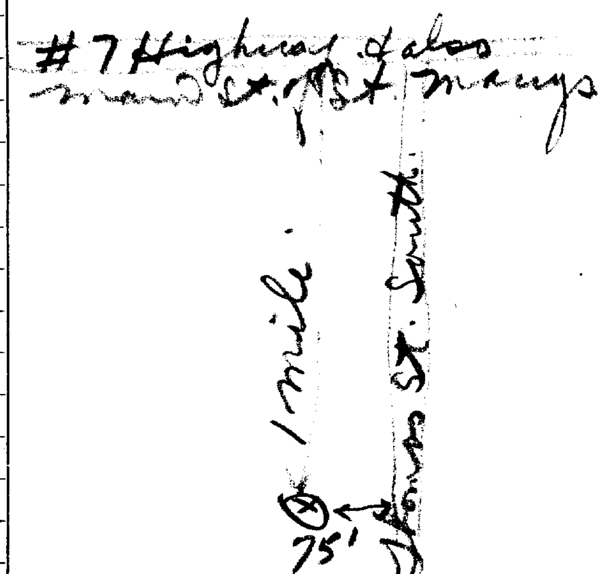
Depth(s) to Water Horizon(s)	Kind of Water	No. of Feet Water Rises
32 ft		

Well Log

Drift and Bedrock Record	From	To
Clay & very stoney.	0 ft.	24 ft.
grey limestone rock	24	106

Location of Well

In diagram below show distances of well from road and lot line



Situation: Is well on upland, in valley, or on hillside? hillside
Drilling Firm McCaly & Hayden
Address
Recorded by Lorne Hayden Address RR4 Denfield
Date Licence Number

CSS.58

MINISTRY OF THE ENVIRONMENT
The Ontario Water Resources Act

WATER WELL RECORD

Ontario

40 P/36

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK ☒ CORRECT BOX WHERE APPLICABLE

11 5002038 MUNICIP. 50011 CON. TR

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC.	LOT
[redacted]	Blanshard	Thames R.	037

[redacted] R.R.#3 St. Marys Onyario. DATE COMPLETED DAY 14 MO. Nov YR. 73

5002038 17 [redacted] 4787240 4 1042 4 23 MAR 20, 1975 51

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	TO
Brown	Clay			0	13
Grey	Clay & Stones			13	80
Grey	Limestone			80	160

31 0013605 0080295 12 0160215

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
0103	☒ FRESH

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	TO
05	☒ STEEL	188	0	0068
05 3/4	☒ OPEN HOLE		68	0160

SCREEN: SIZE(S) OF OPENING (SLOT NO.) / DIAMETER INCHES / LENGTH FEET / MATERIAL AND TYPE / DEPTH TO TOP OF SCREEN FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)

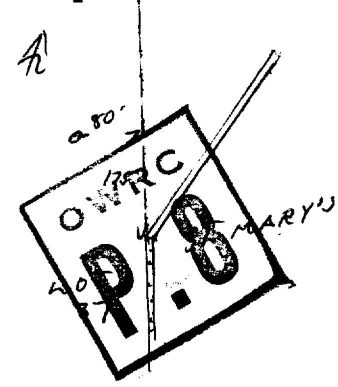
71 PUMPING TEST

- PUMPING TEST METHOD: ☒ PUMP
- PUMPING RATE: 0005 GPM
- DURATION OF PUMPING: 01 HOURS 00 MINS
- ☒ PUMPING
- STATIC LEVEL: 096 FEET
- WATER LEVEL END OF PUMPING: 110 FEET
- WATER LEVELS DURING: 60 MINUTES 110 FEET
- PUMP INTAKE SET AT: 130 FEET
- WATER AT END OF TEST: ☒ CLEAR
- RECOMMENDED PUMP TYPE: ☒ DEEP
- RECOMMENDED PUMP SETTING: 130 FEET
- RECOMMENDED PUMPING RATE: 0005 GPM
- GPM./FT. SPECIFIC CAPACITY: 000.4

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW.

Follow rd. out of St. Marys past past St. Marys Cement plant to top of hill turn right 2nd place on left side.



DRILLERS REMARKS:

- FINAL STATUS OF WELL: ☒ WATER SUPPLY
- WATER USE: 01 ☒ DOMESTIC
- METHOD OF DRILLING: ☒ ROTARY (CONVENTIONAL)

CONTRACTOR

- NAME OF WELL CONTRACTOR: Hadco Well Drilling & Digging Ltd. LICENCE NUMBER 2519
- ADDRESS: P.O.Box 730 Elmira Ontario.
- NAME OF DRILLER OR BORER: R.L.Franklin
- SIGNATURE OF CONTRACTOR: [signature]
- SUBMISSION DATE DAY 6 MO. Dec YR. 73

OFFICE USE ONLY

- DATA SOURCE 1
- CONTRACTOR 2519
- DATE RECEIVED 17 12 73
- DATE OF INSPECTION 26 7 74
- INSPECTOR 7
- REMARKS: CSS.S8
- P 2
- WI

FORM 7 07-091

MINISTRY OF THE ENVIRONMENT COPY

Ministry of the Environment
Ontario

(51)

The Ontario Water Resources Act 40P/29

WATER WELL RECORD

1. PRINT ONLY IN SPACES PROVIDED
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11 | 5003388 | MUNICIP 50601 | CON

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC.	LOT
[redacted]	Blanchard ST. MARYS	South Boundry	~~36~~ 17

VILLIAGE.

[redacted] Marys, Ont.

DATE COMPLETED: DAY 26 MO 10 YR 87

21 | [redacted] 86770 | ELEVATION 1063 | RC | BASIN CODE

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	TO
				0	1
black	topsoil			1	5
brown	clay	sand			
grey	clay	sand and stones		5	119
grey	limestone			119	171

31
32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
171	☒ FRESH

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	TO
5	☒ STEEL	188	0	121
5	☒ OPEN HOLE		121	171

SCREEN

SIZE(S) OF OPENING (SLOT NO.) | DIAMETER INCHES | LENGTH FEET
MATERIAL AND TYPE | DEPTH TO TOP OF SCREEN FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)

71 PUMPING TEST

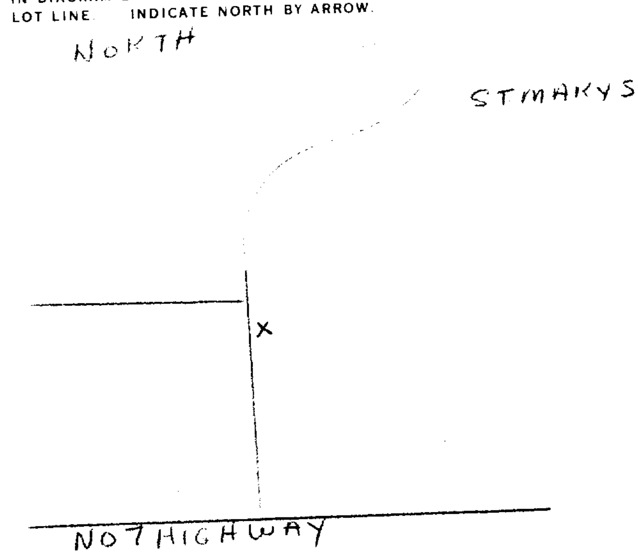
PUMPING TEST METHOD: ☐ PUMP ☒ BAILER
PUMPING RATE: 7 GPM
DURATION OF PUMPING: 1 HOURS MINS
☒ PUMPING ☐ RECOVERY

STATIC LEVEL	WATER LEVEL END OF PUMPING	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
141 FEET	147 FEET	147 FEET	147 FEET	147 FEET	147 FEET

IF FLOWING, GIVE RATE: GPM
PUMP INTAKE SET AT: FEET
WATER AT END OF TEST: ☒ CLEAR ☐ CLOUDY
RECOMMENDED PUMP TYPE: ☐ SHALLOW ☒ DEEP
RECOMMENDED PUMP SETTING: 165 FEET
RECOMMENDED PUMPING RATE: 7 GPM

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW.



14419

DRILLERS REMARKS

FINAL STATUS OF WELL

☒ WATER SUPPLY ☐ OBSERVATION WELL ☐ TEST HOLE ☐ RECHARGE WELL ☐ ABANDONED, INSUFFICIENT SUPPLY ☐ ABANDONED, POOR QUALITY ☐ UNFINISHED ☐ DEWATERING

WATER USE

☒ DOMESTIC ☒ STOCK ☐ IRRIGATION ☐ INDUSTRIAL ☐ OTHER ☐ COMMERCIAL ☐ MUNICIPAL ☐ PUBLIC SUPPLY ☐ COOLING OR AIR CONDITIONING ☐ NOT USED

METHOD OF CONSTRUCTION

☐ CABLE TOOL ☒ ROTARY (CONVENTIONAL) ☐ ROTARY (REVERSE) ☐ ROTARY (AIR) ☐ AIR PERCUSSION ☐ BORING ☐ DIAMOND ☐ JETTING ☐ DRIVING ☐ DIGGING ☐ OTHER

CONTRACTOR

NAME OF WELL CONTRACTOR: Mervin Jones
WELL CONTRACTOR'S LICENCE NUMBER: 3009
ADDRESS: R.r. 3, Thorndale, Ont.
NAME OF WELL TECHNICIAN: Murray S. Jones
WELL TECHNICIAN'S LICENCE NUMBER: T0668
SIGNATURE OF TECHNICIAN/CONTRACTOR: Mervin Jones
SUBMISSION DATE: DAY 26 MO 10 YR 87

OFFICE USE ONLY

DATA SOURCE | CONTRACTOR | DATE RECEIVED NOV 04 1987
DATE OF INSPECTION 2/9/88 | INSPECTOR
REMARKS
CSS.S8

MINISTRY OF THE ENVIRONMENT COPY

FORM NO. 0506 (11/86) FORM 9

Ministry of the Environment
Ontario

(30)

The Ontario Water Resources Act
WATER WELL RECORD

5003434 | 50001 SB

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11

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY ETC.	PLAN
[redacted]	[redacted]ARD	THAMES	295

[redacted] R. #3 St. Marys, Ontario NOM 2V0

DATE COMPLETED: DAY 15 MO 6 YR 88

[redacted]87253 | ELEVATION 1060 | BASIN CODE

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
Black	Topsoil			0	1
Brown	Clay	Stones		1	4
Grey	Clay	Sand and Stones		4	93
Grey	Limestone			93	185

31

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
185	☒ FRESH

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
5	☒ STEEL	188	0	94
5	☒ OPEN HOLE		94	185

SCREEN

SIZE(S) OF OPENING (SLOT NO.) | DIAMETER INCHES | LENGTH FEET
MATERIAL AND TYPE | DEPTH TO TOP OF SCREEN FEET

61 PLUGGING & SEALING RECORD

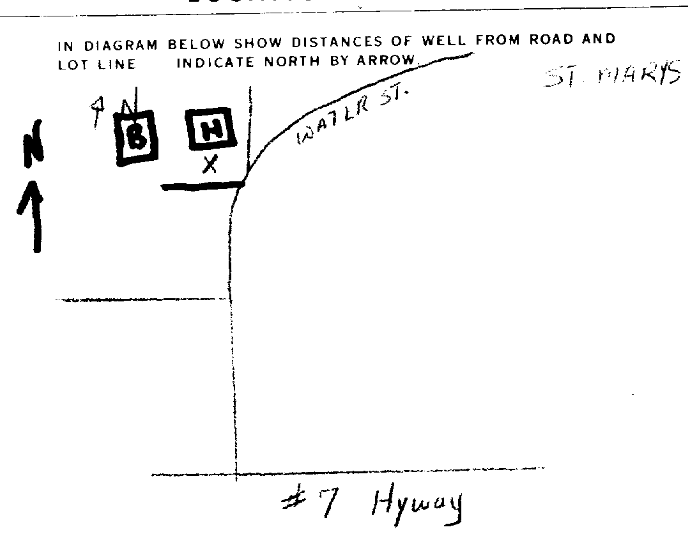
DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)

71 PUMPING TEST

PUMPING TEST METHOD	☐ PUMP ☒ BAILER
PUMPING RATE	7 GPM
DURATION OF PUMPING	1 HOURS
STATIC LEVEL	132 FEET
WATER LEVEL END OF PUMPING	156 FEET
WATER LEVELS DURING	☒ PUMPING ☐ RECOVERY
15 MINUTES	156 FEET
30 MINUTES	156 FEET
45 MINUTES	156 FEET
60 MINUTES	156 FEET
IF FLOWING, GIVE RATE	GPM
PUMP INTAKE SET AT	FEET
WATER AT END OF TEST	☒ CLEAR ☐ CLOUDY
RECOMMENDED PUMP TYPE	☐ SHALLOW ☒ DEEP
RECOMMENDED PUMP SETTING	180 FEET
RECOMMENDED PUMPING RATE	7 GPM

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW.



27648

DRILLERS REMARKS

FINAL STATUS OF WELL

☒ WATER SUPPLY
☐ OBSERVATION WELL
☐ TEST HOLE
☐ RECHARGE WELL
☐ ABANDONED, INSUFFICIENT SUPPLY
☐ ABANDONED, POOR QUALITY
☐ UNFINISHED
☐ DEWATERING

WATER USE

☒ DOMESTIC
☐ STOCK
☐ IRRIGATION
☐ INDUSTRIAL
☐ OTHER
☐ COMMERCIAL
☐ MUNICIPAL
☐ PUBLIC SUPPLY
☐ COOLING OR AIR CONDITIONING
☐ NOT USED

METHOD OF CONSTRUCTION

☐ CABLE TOOL
☒ ROTARY (CONVENTIONAL)
☐ ROTARY (REVERSE)
☐ ROTARY (AIR)
☐ AIR PERCUSSION
☐ BORING
☐ DIAMOND
☐ JETTING
☐ DRIVING
☐ DIGGING
☐ OTHER

CONTRACTOR

NAME OF WELL CONTRACTOR: Mervin Jones
WELL CONTRACTOR'S LICENCE NUMBER: 3009
ADDRESS: R. R. #3 Thorndale, Ontario NOM 2P0
NAME OF WELL TECHNICIAN: Murray S. Jones
WELL TECHNICIAN'S LICENCE NUMBER: T 0068
SIGNATURE OF TECHNICIAN/CONTRACTOR: Mervin Jones
SUBMISSION DATE: DAY 16 MO 6 YR 88

OFFICE USE ONLY

DATA SOURCE | CONTRACTOR 3009 | DATE RECEIVED JUN 22 1988
DATE OF INSPECTION | INSPECTOR
REMARKS

CSS.S8

MINISTRY OF THE ENVIRONMENT COPY

FORM NO. 0506 (11/86) FORM 9

Ministry of the Environment
Ontario

The Ontario Water Resources Act
WATER WELL RECORD

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK ☒ CORRECT BOX WHERE APPLICABLE

11 | 5004319 | MUNICIP 50001 | CON. T.R.

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC.	LOT
Perth	Blanshard	Thames River	37 6-7

[redacted] R.R.3, St.Marys, Ontario, N4x 1c6
1740 Perth Rd. 23

DATE COMPLETED: DAY 15 MO 8 YR 96

NORTHING | RC | ELEVATION | RC | BASIN CODE

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	TO
grey	clay	sand and stones		0	94
grey	limestone			94	185

31
32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
185	1 ☒ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	TO
5	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC	188	0	95
5	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☒ CONCRETE 4 ☒ OPEN HOLE 5 ☐ PLASTIC		95	185
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC			

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET

MATERIAL AND TYPE	DEPTH TO TOP OF SCREEN FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)

71 PUMPING TEST

PUMPING TEST METHOD	1 ☐ PUMP 2 ☒ BAILER
PUMPING RATE	8 GPM
DURATION OF PUMPING	1 HOURS MINS
STATIC LEVEL	112 FEET
WATER LEVEL END OF PUMPING	155 FEET
WATER LEVELS DURING	1 ☒ PUMPING 2 ☐ RECOVERY
15 MINUTES	155 FEET
30 MINUTES	155 FEET
45 MINUTES	155 FEET
60 MINUTES	155 FEET
IF FLOWING GIVE RATE	GPM
PUMP INTAKE SET AT	FEET
WATER AT END OF TEST	1 ☒ CLEAR 2 ☐ CLOUDY
RECOMMENDED PUMP TYPE	☐ SHALLOW ☒ DEEP
RECOMMENDED PUMP SETTING	170 FEET
RECOMMENDED PUMPING RATE	8 GPM

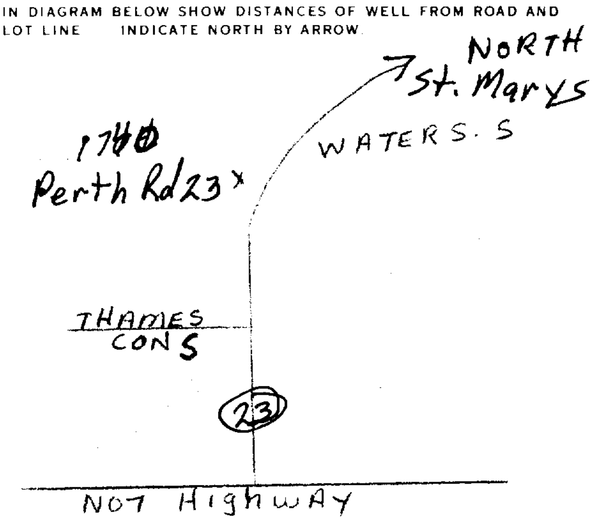
FINAL STATUS OF WELL
1 ☒ WATER SUPPLY
2 ☐ OBSERVATION WELL
3 ☐ TEST HOLE
4 ☐ RECHARGE WELL
5 ☐ ABANDONED, INSUFFICIENT SUPPLY
6 ☐ ABANDONED, POOR QUALITY
7 ☐ UNFINISHED
☐ DEWATERING

WATER USE
1 ☒ DOMESTIC
2 ☐ STOCK
3 ☐ IRRIGATION
4 ☐ INDUSTRIAL
☐ OTHER
5 ☐ COMMERCIAL
6 ☐ MUNICIPAL
7 ☐ PUBLIC SUPPLY
8 ☐ COOLING OR AIR CONDITIONING
9 ☐ NOT USED

METHOD OF CONSTRUCTION
1 ☐ CABLE TOOL
2 ☒ ROTARY (CONVENTIONAL)
3 ☐ ROTARY (REVERSE)
4 ☐ ROTARY (AIR)
5 ☐ AIR PERCUSSION
6 ☐ BORING
7 ☐ DIAMOND
8 ☐ JETTING
9 ☐ DRIVING
☐ DIGGING
☐ OTHER

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW.



DRILLERS REMARKS
146532

CONTRACTOR

NAME OF WELL CONTRACTOR	Mervin Jones Drilling LTD
WELL CONTRACTOR'S LICENCE NUMBER	3009
ADDRESS	R.R.3, Thorndale, Ontario, NOM 2po
NAME OF WELL TECHNICIAN	Murray S, Jones
WELL TECHNICIAN'S LICENCE NUMBER	T0068
SIGNATURE OF TECHNICIAN/CONTRACTOR	Murray S Jones
SUBMISSION DATE	DAY 16 MO. 8 YR. 96

OFFICE USE ONLY

DATA SOURCE	
CONTRACTOR	3009
DATE RECEIVED	AUG 27 1996
DATE OF INSPECTION	
INSPECTOR	
REMARKS	CSS.ES

MINISTRY OF THE ENVIRONMENT COPY

FORM NO. 0506 (11/86) FORM 9

Ontario | Ministry of the Environment

Well Tag Number (Place sticker and print number below)

N/A

Well Record

Regulation 903 Ontario Water Resources Act

Instructions for Completing Form

- For use in the **Province of Ontario** only. This document is a permanent **legal** document. Please retain for future reference.
- All Sections **must** be completed in full to avoid delays in processing. Further instructions and explanations are available on the back of this form.
- Questions regarding completing this application can be directed to the Water Well Management Coordinator at 416-235-6203.
- **All metre measurements shall be reported to 1/10th of a metre.**
- Please print clearly in blue or black ink only.

Ministry Use Only

MUN	CON	LOT

Well Owner's Information and Location of Well Information

[redacted]

St Mary's Landfill | 36 | Thames

RR#/Street Number/Name | City/Town/Village: St. Mary's | Site/Compartment/Block/Tract etc.

GPS Reading NAD 83 | Zone 17 | Easting 0487299 | Northing 4787043 | Unit Make/Model | Mode of Operation: ☐ Undifferentiated ☐ Averaged ☐ Differentiated, specify

Log of Overburden and Bedrock Materials (see instructions)

General Colour	Most common material	Other Materials	General Description	Depth Metres From	To
			Abandonment	0m	6.1m

Hole Diameter

Depth Metres From	To	Diameter Centimetres
0	6.1	20.3

Water Record

Water found at ___ Metres / Kind of Water

☐ m ☐ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other:

☐ m ☐ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other:

☐ m ☐ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other:

After test of well yield, water was ☐ Clear and sediment free ☐ Other, specify

Chlorinated ☑ Yes ☐ No

Construction Record

Inside diam centimetres	Material	Wall thickness centimetres	Depth Metres From	To
Casing				
5.25	☐ Steel ☐ Fibreglass ☑ Plastic ☐ Concrete ☐ Galvanized		0	3.0
	☐ Steel ☐ Fibreglass ☑ Plastic ☐ Concrete ☐ Galvanized		~~3.0~~	~~6.1~~
	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized			
Screen				
Outside diam	☐ Steel ☐ Fibreglass ☑ Plastic ☐ Concrete ☐ Galvanized	Slot No. 10	3.0	6.1
No Casing or Screen				
	☐ Open hole			

Test of Well Yield

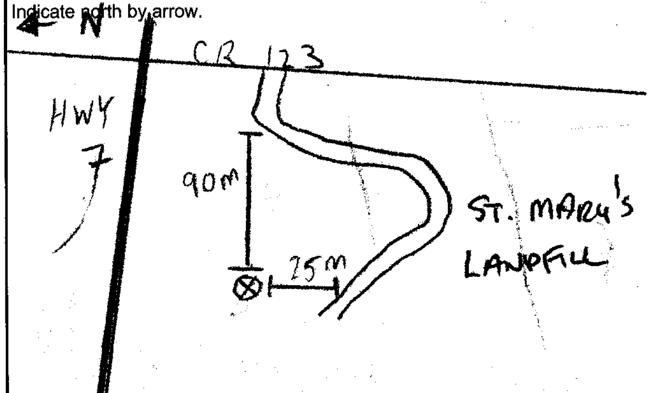
Pumping test method	Draw Down Time min	Water Level Metres	Recovery Time min	Water Level Metres
Pump intake set at - (metres)	Static Level			
Pumping rate - (litres/min)	1		1	
Duration of pumping ___hrs + ___ min	2		2	
Final water level end of pumping ___ metres	3		3	
Recommended pump type. ☐ Shallow ☐ Deep	4		4	
Recommended pump depth. ___ metres	5		5	
Recommended pump rate. (litres/min)	10		10	
	15		15	
If flowing give rate - (litres/min)	20		20	
	25		25	
If pumping discontinued, give reason.	30		30	
	40		40	
	50		50	
	60		60	

Plugging and Sealing Record ☐ Annular space ☑ Abandonment

Depth set at - Metres From	To	Material and type (bentonite slurry, neat cement slurry) etc.	Volume Placed (cubic metres)
0	6.1	Bentonite	0.19

Location of Well

In diagram below show distances of well from road, lot line, and building. Indicate north by arrow.



Method of Construction

☐ Cable Tool ☐ Rotary (air) ☐ Diamond ☐ Digging
☑ Rotary (conventional) ☐ Air percussion ☐ Jetting ☐ Other
☐ Rotary (reverse) ☐ Boring ☐ Driving

Water Use

☐ Domestic ☐ Industrial ☐ Public Supply ☒ Other ABANDON
☐ Stock ☐ Commercial ☐ Not used
☐ Irrigation ☐ Municipal ☐ Cooling & air conditioning

Final Status of Well

☐ Water Supply ☐ Recharge well ☐ Unfinished ☐ Abandoned, (Other)
☐ Observation well ☐ Abandoned, insufficient supply ☐ Dewatering
☐ Test Hole ☑ Abandoned, poor quality ☐ Replacement well

Audit No. Z 54367 | Date Well Completed 2006 09 11

Was the well owner's information package delivered? ☐ Yes ☒ No | Date Delivered YYYY — MM — DD —

Well Contractor/Technician Information

Name of Well Contractor: Altech Drilling + Investigative Services | Well Contractor's Licence No.: 7282

Business Address (street name, number, city etc.): 140 Bathurst Dr. Waterloo, On N2V 1V7

Name of Well Technician (last name, first name): MILLARD DAVID | Well Technician's Licence No.: T3358

Signature of Technician/Contractor: X D. Millard | Date Submitted 2006 10 11

Ministry Use Only

Data Source | Contractor 7282

Date Received OCT 18 2006 | Date of Inspection

Remarks | Well Record Number

0506E (09/03) Contractor's Copy ☐ Ministry's Copy ☒ Well Owner's Copy ☐ *Cette formule est disponible en français*

Ontario Ministry of the Environment

Measurements recorded in: ☑ Metric ☐ Imperial

Well Tag No. *(Place Sticker and/or Print Below)* A108429

Well Record

Regulation 903 Ontario Water Resources Act

Well Owner's Information

First Name	Last Name / Organization	E-mail Address	☐ Well Constructed by Well Owner
	Corporation of the Town of St. Marys	tsmythe@town.stmarys.on.ca	

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. (inc. area code)
408 James Street South	St. Marys	ON	N4X 1B6	519 284 2340

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
1221 Water St. South	Town of St. Marys	35	Thames Concession

County/District/Municipality	City/Town/Village	Province	Postal Code
Perth County	St. Marys	Ontario	

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	17	487578	4787041		

Overburden and Bedrock Materials/Abandonment Sealing Record *(see instructions on the back of this form)*

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
Brown	Gravel	Sand	Packed	0.0	1.22
Grey	Clay		Dense	1.22	6.4

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
0.0	4.57	Bentonite chip	0.59

Results of Well Yield Testing

After test of well yield, water was: ☐ Clear and sand free ☐ Other, specify

If pumping discontinued, give reason:

Pump intake set at (m/ft)

Pumping rate (l/min / GPM)

Duration of pumping ___ hrs + ___ min

Final water level end of pumping (m/ft)

If flowing give rate (l/min / GPM)

Recommended pump depth (m/ft)

Recommended pump rate (l/min / GPM)

Well production (l/min / GPM)

Disinfected? ☐ Yes ☐ No

Draw Down Time (min)	Water Level (m/ft)	Recovery Time (min)	Water Level (m/ft)
Static Level			
1		1	
2		2	
3		3	
4		4	
5		5	
10		10	
15		15	
20		20	
25		25	
30		30	
40		40	
50		50	
60		60	

Method of Construction

☐ Cable Tool ☐ Diamond ☐ Rotary (Conventional) ☐ Jetting ☐ Rotary (Reverse) ☐ Driving ☑ Boring ☐ Digging ☐ Air percussion ☐ Other, specify

Well Use

☐ Public ☐ Commercial ☐ Not used ☐ Domestic ☐ Municipal ☐ Dewatering ☐ Livestock ☐ Test Hole ☑ Monitoring ☐ Irrigation ☐ Cooling & Air Conditioning ☐ Industrial ☐ Other, specify

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	To
5.39	Plastic	0.47	0.0	5.49

Status of Well

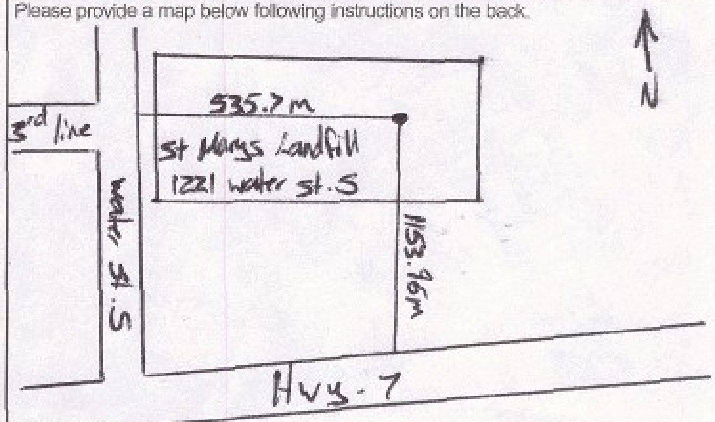
☐ Water Supply ☐ Replacement Well ☐ Test Hole ☐ Recharge Well ☐ Dewatering Well ☒ Observation and/or Monitoring Hole ☐ Alteration (Construction) ☐ Abandoned, Insufficient Supply ☐ Abandoned, Poor Water Quality ☐ Abandoned, other, specify ☐ Other, specify

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	To
6.03	Plastic	10	5.49	6.4

Map of Well Location

Please provide a map below following instructions on the back.



Water Details

Water found at Depth (m/ft) Kind of Water: ☐ Fresh ☐ Untested ☐ Gas ☐ Other, specify

Water found at Depth (m/ft) Kind of Water: ☐ Fresh ☐ Untested ☐ Gas ☐ Other, specify

Water found at Depth (m/ft) Kind of Water: ☐ Fresh ☐ Untested ☐ Gas ☐ Other, specify

Hole Diameter

Depth (m/ft) From	To	Diameter (cm/in)
0.0	6.4	20.9

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
Altech Drilling & Investigative Services Ltd.	7282

Business Address (Street Number/Name)	Municipality
3217 Hawkesville Hill Drive	Elmira

Province	Postal Code	Business E-mail Address
ON	N3B 2Z3	lmorley@altechworld.com

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
519 664 3331	Morley, Luke

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
5568		20101201

Comments:

Well owner's information package delivered	Date Package Delivered	Ministry Use Only
☐ Yes ☒ No	YYYYMMDD	Audit No. Z102059
	Date Work Completed: 20101025	Received DEC 03 2010

0506E (12/2007) Ministry's Copy

Ontario Ministry of the Environment

Well Tag No. *(Place Sticker and/or Print Below)*
A109023

Well Record

Regulation 903 Ontario Water Resources Act

Measurements recorded in: ☐ Metric ☐ Imperial

[redacted]

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
1760 Road 123	Blanshard Township	37	TR

County/District/Municipality	City/Town/Village	Province	Postal Code
Perth	Kirkton	Ontario	N0K 1K0

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	17	487094	4787245		

Overburden and Bedrock Materials/Abandonment Sealing Record *(see instructions on the back of this form)*

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	To
Black	Top Soil			0	2
Brown	Clay	Stones		2	7
Grey	Clay			7	92
Grey	Limestone			92	197

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
0	24	Benseal Slurry	400 lbs
24	98	Quickgel Slurry	

Method of Construction

☐ Cable Tool ☐ Diamond
☒ Rotary (Conventional) ☐ Jetting
☐ Rotary (Reverse) ☐ Driving
☐ Boring ☐ Digging
☐ Air percussion
☐ Other, *specify*

Well Use

☐ Public ☐ Commercial ☐ Not used
☒ Domestic ☐ Municipal ☐ Dewatering
☐ Livestock ☐ Test Hole ☐ Monitoring
☐ Irrigation ☐ Cooling & Air Conditioning
☐ Industrial
☐ Other, *specify*

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	To
6 5/8"	Steel	0.188 Wall	+2	98
Open hole			98	197

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	To

Status of Well

☒ Water Supply
☐ Replacement Well
☐ Test Hole
☐ Recharge Well
☐ Dewatering Well
☐ Observation and/or Monitoring Hole
☐ Alteration (Construction)
☐ Abandoned, Insufficient Supply
☐ Abandoned, Poor Water Quality
☐ Abandoned, other, *specify*
☐ Other, *specify*

Results of Well Yield Testing

After test of well yield, water was:
☒ Clear and sand free
☐ Other, *specify*

If pumping discontinued, give reason: CLEAR

Pump intake set at (m/ft): 175

Pumping rate (l/min / GPM): 30

Duration of pumping: 1 hrs + 30 min

Final water level end of pumping (m/ft): 99

If flowing give rate (l/min / GPM): NOT FLOWING

Recommended pump depth (m/ft): 175

Recommended pump rate (l/min / GPM): 20

Well production (l/min / GPM): 30

Disinfected? ☒ Yes ☐ No

Draw Down Time (min)	Water Level (m/ft)	Recovery Time (min)	Water Level (m/ft)
Static Level	90		99
1	91.3	1	98.5
2	92.6	2	98.1
3	93.9	3	97.7
4	94.11	4	97.1
5	96.3	5	96.5
10	98.4	10	94.5
15	99	15	92.3
20	99	20	91.1
25	99	25	90
30	99	30	90
40	99	40	90
50	99	50	90
60	99	60	90

Water Details

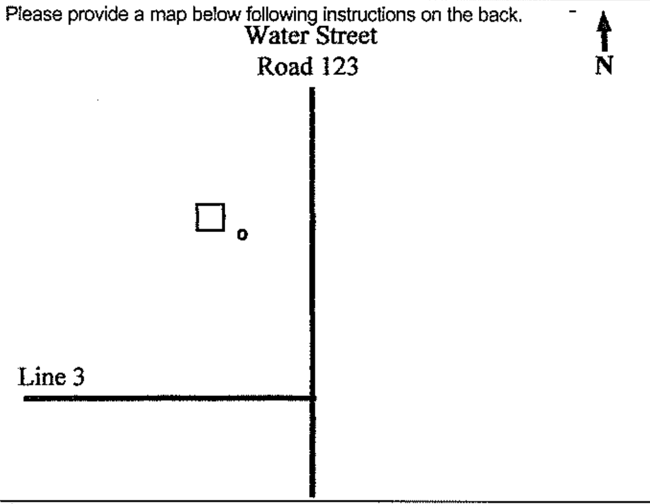
Water found at Depth 189 (m/ft) ☐ Gas — Kind of Water: ☒ Fresh ☐ Untested ☐ Other, *specify*
Water found at Depth 195 (m/ft) ☐ Gas — Kind of Water: ☒ Fresh ☐ Untested ☐ Other, *specify*
Water found at Depth (m/ft) ☐ Gas — Kind of Water: ☐ Fresh ☐ Untested ☐ Other, *specify*

Hole Diameter

Depth (m/ft) From	To	Diameter (cm/in)
0	197	9

Map of Well Location

Please provide a map below following instructions on the back.



Comments: Well is 70 feet off road

Well Contractor and Well Technician Information

Business Name of Well Contractor: HAYDEN WATER WELLS CO.,INC.
Well Contractor's Licence No.: 7090
Business Address (Street Number/Name): 35339 Saintsbury Line RR # 1
Municipality: Lucan
Province: Ontario
Postal Code: N0M2J0
Business E-mail Address: haydenwaterwells@on.aibn.com
Bus.Telephone No. *(inc. area code)*: 5192270057
Name of Well Technician (Last Name, First Name): Hayden, Jay
Well Technician's Licence No.: 1034
Signature of Technician and/or Contractor:
Date Submitted: Y Y Y Y M M D D

Well owner's information package delivered: ☒ Yes ☐ No
Date Package Delivered: 20110823
Date Work Completed: 20110823

Ministry Use Only

Audit No. Z136378
Received JAN 27 2012

Well ID

Well ID Number: 7274050
Well Audit Number: *Z246734*
Well Tag Number: *A190705*

This table contains information from the original well record and any subsequent updates.

Well Location

Address of Well Location	WATER ST
Township	BLANSHARD TOWNSHIP
Lot	037
Concession	TR
County/District/Municipality	PERTH
City/Town/Village	ST MARY'S
Province	ON
Postal Code	n/a
UTM Coordinates	NAD83 — Zone 17 Easting: 487143.00 Northing: 4787039.00
Municipal Plan and Sublot Number	
Other	

Overburden and Bedrock Materials Interval

General Colour	Most Common Material	Other Materials	General Description	Depth From	Depth To
BLCK	LOAM		LOAM	0 ft	2 ft
BRWN	CLAY	STNS	HARD	2 ft	21 ft
GREY	HPAN	BLDR	HARD	21 ft	102 ft
GREY	LMSN		HARD	102 ft	155 ft
BRWN	LMSN			155 ft	197 ft

Annular Space/Abandonment Sealing Record

Depth From	Depth To	Type of Sealant Used (Material and Type)	Volume Placed
0 ft	23 ft	HIGH SOLIDS BENTONITE	
23 ft	106 ft	GEL/ SAND SLURRY	

Method of Construction & Well Use

Method of Construction	Well Use
Rotary (Convent.)	
AIR ROTARY	Domestic

Status of Well

Water Supply

Construction Record - Casing

Inside Diameter	Open Hole or material	Depth From	Depth To
6 inch	STEEL	-2 ft	113 ft
6 inch	OPEN HOLE	113 ft	197 ft

Construction Record - Screen

Outside Diameter	Material	Depth From	Depth To

Well Contractor and Well Technician Information

Well Contractor's Licence Number: 7090

Results of Well Yield Testing

After test of well yield, water was	CLEAR
If pumping discontinued, give reason	
Pump intake set at	180 ft
Pumping Rate	10 GPM
Duration of Pumping	1 h:0 m
Final water level	131 ft
If flowing give rate	
Recommended pump depth	180 ft
Recommended pump rate	10 GPM
Well Production	

Disinfected? Y

Draw Down & Recovery

Draw Down Time (min)	Draw Down Water level	Recovery Time (min)	Recovery Water level
SWL	125 ft		
1	127.5 ft	1	127.08 ft
2	128.33 ft	2	126.25 ft
3	128.92 ft	3	125.33 ft
4	129.33 ft	4	125 ft
5	129.83 ft	5	125 ft
10	131 ft	10	125 ft
15	131 ft	15	125 ft
20	131 ft	20	125 ft
25	131 ft	25	125 ft
30	131 ft	30	125 ft
40	131 ft	40	125 ft
45		45	
50	131 ft	50	125 ft
60	131 ft	60	125 ft

Water Details

Water Found at Depth	Kind
192 ft	Fresh

Hole Diameter

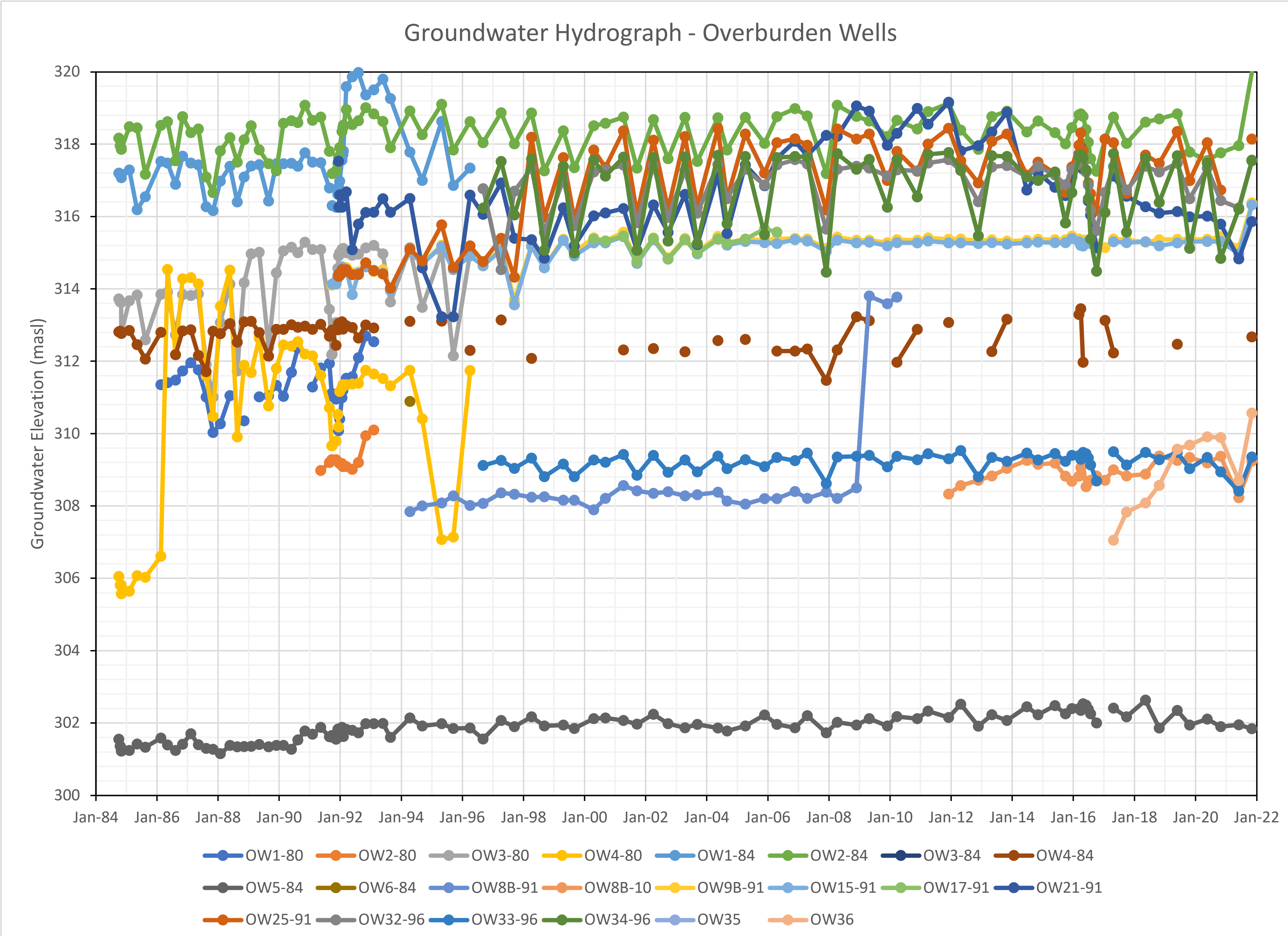
Depth From	Depth To	Diameter
0 ft	113 ft	10 inch
113 ft	197 ft	6 inch

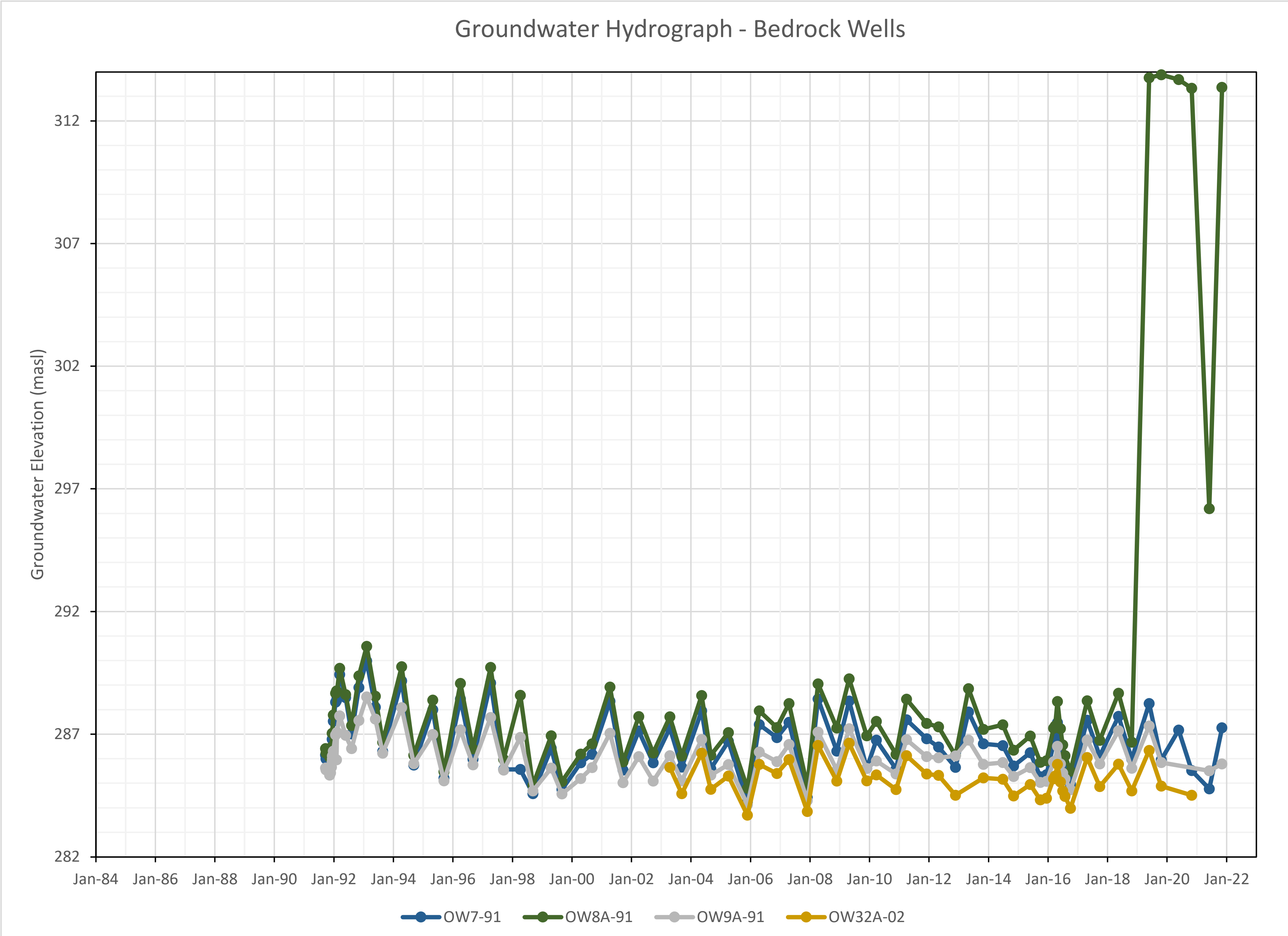
Audit Number: Z246734

Date Well Completed: October 18, 2016

Date Well Record Received by MOE: October 28, 2016

APPENDIX C:
HISTORICAL GROUNDWATER ELEVATION DATA (HYDROGRAPHS)


Groundwater Hydrograph - Overburden Wells
Groundwater Elevation (masl)
320
318
316
314
312
310
308
306
304
302
300
Jan-84
Jan-86
Jan-88
Jan-90
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Jan-10
Jan-12
Jan-14
Jan-16
Jan-18
Jan-20
Jan-22
OW1-80
OW2-80
OW3-80
OW4-80
OW1-84
OW2-84
OW3-84
OW4-84
OW5-84
OW6-84
OW8B-91
OW8B-10
OW9B-91
OW15-91
OW17-91
OW21-91
OW25-91
OW32-96
OW33-96
OW34-96
OW35
OW36



GM BluePlan ENGINEERING

TOWN OF ST. MARY'S
ANNUAL OPERATIONS MONITORING REPORT (2021)
GMBP FILE 318007
MARCH 2022

APPENDIX D:
HISTORICAL GROUNDWATER QUALITY ANALYTICAL RESULTS
(TABLES & GRAPHS)

Historical Groundwater Chemistry - St. Mary's Landfill

Well	Sampling Date	Notes	Calcium	Chloride	Hardness	Phenols	Field pH	Field Conductivity	Magnesium	DOC		Alkalinity	Sulphate	Boron	Iron	Manganese	Sodium	Nitrate	Nitrite	Ammonia	TKN	Benzene	m,p-Xylene	Ethylbenzene	Toluene	o-Xylene	Xylene Mixture (Total)
CRA Units (1981 - 2012)			mg/L	mg/L	mg/L	µg/L		µS/cm	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L					mg/L	mg/L	mg/L	mg/L	mg/L	
Burnside Units (2013 -)			mg/L	mg/L	mg/L	mg/L		µS/cm	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
OW3-80	Jun-81			15.0	238		8.30	590	21.0																		
OW3-80	Oct-84		52.0	3.5	266	<1.0	8.00	610	33.0	1.6																	
OW3-80	Feb-85		50.0	4.5	252	1.0	7.87	600	30.8	2.0																	
OW3-80	May-85		50.5	3.5	250	4.5	7.96	640	30.0	2.6																	
OW3-80	Aug-85		48.0	3.5	244	3.0	7.96	590	30.2	3.0																	
OW3-80	Feb-86		43.5	6.0	221	<1.0	7.90	447	27.2	2.6																	
OW3-80	May-86		44.5	3.5	232	<1.0	7.74	565	29.2	1.3																	
OW3-80	Aug-86		45.5	3.5	229	<1.0	8.02	580	28.0	2.0																	
OW3-80	Nov-86		44.5	2.5	224	<1.0	7.85	515	27.4	1.6																	
OW3-80	Feb-87		45.5	3.5	229	<1.0	7.97	555	28.0	1.4																	
OW3-80	May-87		44.5	4.0	226	<1.0	7.91	605	27.8	1.6																	
OW3-80	Aug-87		43.5	4.0	220	<1.0	8.04	530	27.0	2.8																	
OW3-80	Jan-88		109.2	3.4	502	<1.0	7.45	870	55.6	1.1																	
OW3-80	May-88		88.4	2.9	426	<1.0	7.00	894	49.7	1.6																	
OW3-80	Aug-88		72.8	2.9	355	<1.0	7.45	745	41.9	2.0																	
OW3-80	Nov-88		282.5	46.3	1315	<1.0	6.98	2210	147.8	3.1																	
OW3-80	Feb-89		423	733	2001	1.5	6.76	3800	229	2.8																	
OW3-80	May-89		474	1115	2470	2.5	7.14	393	312	3.3																	
OW3-80	Aug-89		181	186	856	<1.0	6.93	1672	98	2.6																	
OW3-80	Nov-89		227	309	1111	<1.0	7.00	1862	132	2.5																	
OW3-80	Feb-90		517	1442	2405	1.0	6.96	4390	270																		
OW3-80	May-90		128	256	577	<1.0	7.30	1333	62	2.0																	
OW3-80	Aug-90		182	270	834	<1.0	7.09	1560	92	3.2																	
OW3-80	Nov-90		108	65	476	2.5	7.60	840	50	1.5																	
OW3-80	Feb-91		99.0	30.6	437	<1.0	7.90	795	46.1	4.1																	
OW3-80	Apr-91		95.4	31.4	442	<1.0	7.28	680	49.4	1.2																	
OW3-80	Aug-91		122	59.7	565	<1.0	6.44	1159	63	2.6																	
OW3-80	Nov-91		354	436	1700	3.0	6.90	1340	182	12.0																	
OW3-80	Dec-91		506	978	2464	<1.0	7.03	1483	243	7.5																	
OW3-80	Feb-92		317	717	1398	1.5	7.06	2010	147	2.2																	
OW3-80	May-92		125	135	574	<1.0	7.20	840	63.5	2.3																	
OW3-80	Aug-92		294	630	1361	1.5	7.02	4200	152	2.4																	
OW3-80	Nov-92		139	139	623	<1.0	7.22	845	67.1	1.4																	
OW3-80	Feb-93		129	122	578	<1.0	7.28	680	62.1	<0.5																	
OW3-80	May-93		106	107	483	<1.0	7.20	750	53.0	2.6	U																
OW3-80	Aug-93		91.9	72.5	428	<1.0	8.00	900	48.1	3.0																	
OW3-80	Apr-94		154	141	678	<1.0	7.10	1400	71.3	<0.5																	
OW3-80	Sep-94		202	217	916	<2.0	7.50	1500	100	<0.5																	
OW3-80	Apr-95		209	255	919	<1.0	7.00	1600	96.4	7.0	U																
OW3-80	Sep-95		180	250	818	<1.0	7.20	1600	89.6	28.4	U																
OW3-80	Apr-96		158	31	694	<1.0	7.56	1880	72.7	<0.5																	
OW3-80	Sep-96		sealed and abandoned August 1996																								

Well	Sampling Date	Notes	Calcium	Chloride	Hardness	Phenols	Field pH	Field Conductivity	Magnesium	DOC		Alkalinity	Sulphate	Boron	Iron	Manganese	Sodium	Nitrate	Nitrite	Ammonia	TKN	Benzene	m,p-Xylene	Ethylbenzene	Toluene	o-Xylene	Xylene Mixture (Total)
CRA Units (1981 - 2012)			mg/L	mg/L	mg/L	µg/L		µS/cm	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L					mg/L	mg/L	mg/L	mg/L	mg/L	
Burnside Units (2013 -)			mg/L	mg/L	mg/L	mg/L		µS/cm	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
OW4-80	Oct-84		-	-	-	1.0	-	-	-	2.0																	
OW4-80	Feb-85		89.5	10.5	413	<1.0	7.76	1180	46.0	1.3																	
OW4-80	May-85		88.5	8.5	402	10.5	7.80	1270	44.0	4.0																	
OW4-80	Aug-85		89.5	9.5	413	1.5	7.75	1260	46.0	2.5																	
OW4-80	Feb-86		82.5	10.5	371	<1.0	7.93	1050	40.0	13.5																	
OW4-80	May-86		110.0	12.0	605	<1.0	7.60	1280	80.0	1.5																	
OW4-80	Aug-86		85.5	11.5	517	<1.0	7.82	1220	74.0	2.0																	
OW4-80	Nov-86		101.0	11.0	516	<1.0	7.80	995	64.0	2.0																	
OW4-80	Feb-87		125.0	14.0	725	<1.0	7.68	1310	100.0	2.5																	
OW4-80	May-87		132.0	15.0	713	<1.0	7.62	1370	93.0	2.9																	
OW4-80	Aug-87		105.0	13.5	567	<1.0	7.26	1040	74.0	2.0																	
OW4-80	Nov-87		113.2	12.6	575	<1.0	7.63	1050	70.8	2.0																	
OW4-80	Jan-88		123.8	13.3	621	<1.0	7.20	1020	75.7	1.4																	
OW4-80	May-88		175.5	19.3	923	<1.0	6.94	1554	117.6	1.6																	
OW4-80	Aug-88		191.0	36.6	979	<1.0	7.29	1615	121.6	2.3																	
OW4-80	Nov-88		164.0	17.8	849	<1.0	6.85	1487	106.5	1.6																	
OW4-80	Feb-89		162	94.2	850	<1.0	7.05	1458	108	1.5																	
OW4-80	May-89		222	295	1058	1.0	6.98	2130	122	3.4																	
OW4-80	Aug-89		617	1609	3067	3.0	6.90	4600	370	15.5																	
OW4-80	Nov-89		411	1155	2053	2.0	6.80	3180	249	1.0	U																
OW4-80	Feb-90		422	1035	2077	1.0	7.08	3220	248																		
OW4-80	May-90		554	1267	2650	1.0	7.10	3090	307	2.5																	
OW4-80	Aug-90		430	1248	2113	<1.0	7.01	3300	252	2.0																	
OW4-80	Aug-90	D	450	1208	2147	<1.0	7.01	3300	248	1.8																	
OW4-80	Nov-90		276	690	1329	5.5	6.80	2040	155	2.1																	
OW4-80	Feb-91		206	410	972	<1.0	7.50	1969	111	2.8																	
OW4-80	Apr-91		130	210	626	<1.0	7.31	1396	73	1.8																	
OW4-80	Aug-91		105	164	485	<1.0	6.54	1504	54	2.2																	
OW4-80	Nov-91		114	146	483	1.0	6.70	1068	59.1	<0.5																	
OW4-80	Dec-91		127	160	566	<1.0	7.33	906	65.7	<0.5																	
OW4-80	Feb-92		126	235	624	<1.0	7.23	1050	75	1.6																	
OW4-80	May-92		173	422	834	<1.0	7.34	1400	97.5	3.8																	
OW4-80	Aug-92		226	524	1092	3.0	7.22	3900	128	1.5																	
OW4-80	Nov-92		148	284	701	1.5	7.29	1300	80.4	1.5																	
OW4-80	Feb-93		111	150	526	<1.0	7.28	860	60.4	1.0																	
OW4-80	May-93		112	137	284	<1.0	7.30	625	63.5	3.5	U																
OW4-80	Aug-93		115	142	560	<1.0	7.80	1300	66.4	3.0																	
OW4-80	Apr-94		145	160	683	<1.0	7.50	1500	78.0	<0.5																	
OW4-80	Sep-94		155	175	737	<2.0	8.20	1500	85.0	<0.5																	
OW4-80	Apr-95		263	421	1192	<1.0	7.10	2000	130	16.5																	
OW4-80	Sep-95		188	294	865	<1.0	7.30	1700	96.1	23.5	U																
OW4-80	Apr-96		140	232	646	<1.0	7.50	1980	72.1	<0.5																	
OW4-80	Sep-96		sealed and abandoned August 1996																								

Well	Sampling Date	Notes	Calcium		Chloride		Hardness	Phenols		Field pH	Field Conductivity	Magnesium	DOC		Alkalinity	Sulphate	Boron	Iron	Manganese	Sodium	Nitrate	Nitrite	Ammonia	TKN	Benzene	m,p-Xylene	Ethylbenzene	Toluene	o-Xylene	Xylene Mixture (Total)
CRA Units (1981 - 2012)			mg/L		mg/L		mg/L	µg/L			µS/cm	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L					mg/L	mg/L	mg/L	mg/L	mg/L	
Burnside Units (2013 -)			mg/L		mg/L		mg/L	mg/L			µS/cm	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
OW1-84	Oct-84		43.5		3.0		241	<1.0		7.93	500	32.2	0.9																	
OW1-84	May-85		48.5		7.5		247	1.0		7.89	535	30.6	1.5																	
OW1-84	Aug-85		48		14.0		245	<1.0		7.80	530	30.4	1.4																	
OW1-84	Feb-86		100		172		401	<1.0		7.97	955	36.6	2.3																	
OW1-84	May-86		86.5		148		374	<1.0		7.72	1030	38.2	1.4																	
OW1-84	Aug-86		49		35.5		256	<1.0		8.05	630	32.4	1.5																	
OW1-84	Nov-86		55.5		59.0		283	<1.0		7.95	655	35.0	1.4																	
OW1-84	Feb-87		59.5		81.5		288	<1.0		7.96	760	33.8	1.2																	
OW1-84	May-87		53.5		50.5		271	<1.0		8.00	700	33.2	1.3																	
OW1-84	Aug-87		39		21.5		231	<1.0		8.20	535	32.4	1.1																	
OW1-84	Nov-87		53.3		23.9		232	<1.0		7.97	565	34.6	--																	
OW1-84	Jan-88		50.6		21.9		255	<1.0		7.53	490	31.1	0.9																	
OW1-84	May-88		47.3		27.2		252	<1.0		7.60	585	32.5	1.8																	
OW1-84	Aug-88		48.4		18.9		257	<1.0		7.47	507	32.9	1.6																	
OW1-84	Nov-88		48.2		20.1		252	<1.0		7.15	543	31.8	0.8																	
OW1-84	Feb-89		46.9		28.9		252	<1.0		7.14	540	32.8	0.7																	
OW1-84	May-89		45.4		22.0		247	<1.0		7.50	513	32.5	0.8																	
OW1-84	Aug-89		49.7		19.0		260	<1.0		7.33	486	33.0	0.8																	
OW1-84	Nov-89		21.2		3.7		118	<1.0		7.60	290	15.8	0.5	U																
OW1-84	Feb-90		45		18.8		251	<0.1		7.70	470	33.5	0.2																	
OW1-84	May-90		46.2		20.3		256	<1.0		7.55	423	34.0	1.2																	
OW1-84	Aug-90		45.1		27.4		250	<1.0		7.31	463	33.2	1.1																	
OW1-84	Nov-90		49.4		21.5		266	1.5		7.30	360	34.5	0.9																	
OW1-84	Feb-91		43.8		28.0		259	<1.0		8.10	487	36.4	2.0																	
OW1-84	May-91		40.6		24.4		246	<1.0		7.68	400	35.1	1.3																	
OW1-84	Aug-91		49.1		32.1		268	<1.0		7.90	615	35.2	1.5																	
OW1-84	Nov-91		41.8		31.2		256	<1.0		7.30	450	31.8	<0.5																	
OW1-84	Dec-91		57.6		29.9		272	<1.0		7.58	429	42.8	4.5																	
OW1-84	Feb-92		279		579		900	1.0		6.80	1780	49.1	4.6																	
OW1-84	May-92		195		483		658	1.0	U	7.09	1430	41.4	4.7																	
OW1-84	Aug-92		256		706		831	14.0		7.28	3400	46.5	9.7																	
OW1-84	Nov-92		302		631		946	1.5		6.94	2000	46.5	4.6																	
OW1-84	Feb-93		293		516		926	<1.0		6.8	1600	47.1	15																	
OW1-84	May-93		271		692		850	<1.0		7.10	2150	42.0	<0.5																	
OW1-84	Aug-93		289		975		908	<1.0		7.40	3200	45.4	<0.5																	
OW1-84	Apr-94		124		194		496	<1.0		7.40	1200	45.2	<0.5																	
OW1-84	Sep-94		76.1		136		349	<2.0		8.20	800	38.6	<0.5																	
OW1-84	Apr-95		263		500		844	76		7.20	1800	45.5	15.5																	
OW1-84	Sep-95		80.9		90.5		391	<1.0		7.60	700	45.9	32.5	U																
OW1-84	Apr-96		99.6		218		379	<1.0		7.81	2820	31.6	<0.5																	
OW1-84	Sep-96		sealed and abandoned August 1996																											

Well	Sampling Date	Notes	Calcium	Chloride		Hardness	Phenols	Field pH	Field Conductivity	Magnesium	DOC		Alkalinity	Sulphate	Boron	Iron	Manganese	Sodium	Nitrate	Nitrite	Ammonia	TKN	Benzene	m,p-Xylene	Ethylbenzene	Toluene	o-Xylene	Xylene Mixture (Total)
CRA Units (1981 - 2012)			mg/L	mg/L		mg/L	µg/L		µS/cm	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L					mg/L	mg/L	mg/L	mg/L	mg/L	
Burnside Units (2013 -)			mg/L	mg/L		mg/L	mg/L		µS/cm	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
OW2-84	Oct-84		22.5	1.0		120	<1.0	8.20	349	15.4	0.8																	
OW2-84	Feb-85		96.0	7.0		305	<1.0	7.54	630	15.8	1.3																	
OW2-84	May-85		35.0	2.0		154	1.0	8.10	405	16.2	0.9																	
OW2-84	Aug-85		25.5	1.0		130	5.5	8.11	332	16.0	1.3																	
OW2-84	Feb-86		25.0	5.5		127	<1.0	7.98	284	15.6	1.1																	
OW2-84	May-86		22.0	2.0		121	<1.0	8.07	331	16.0	0.9																	
OW2-84	Aug-86		22.5	1.5		122	<1.0	8.14	346	16.0	1.1																	
OW2-84	Nov-86		23.5	1.5		129	<1.0	8.20	334	17.0	1.0																	
OW2-84	Feb-87		24.0	2.0		133	<1.0	8.08	347	17.6	0.7																	
OW2-84	May-87		24.0	2.0		129	<1.0	8.05	365	16.8	1.1																	
OW2-84	Aug-87		22.5	2.5		125	<1.0	8.14	319	16.8	1.0																	
OW2-84	Nov-87		26.1	1.61		137	<1.0	8.08	347	17.5	1.1																	
OW2-84	Jan-88		24.9	4.08		126	<1.0	7.70	300	15.4	0.8																	
OW2-84	May-88		24.5	1.58		127	<1.0	7.72	335	16.0	1.0																	
OW2-84	Aug-88		24.1	1.96		127	<1.0	7.60	315	16.2	1.8																	
OW2-84	Nov-88		24.7	3.22		126	<1.0	7.48	343	15.7	0.8																	
OW2-84	Feb-89		23.2	1.8		123	1.0	7.35	312	15.7	0.8																	
OW2-84	May-89		23.1	1.6		128	<1.0	7.68	309	17.0	0.8																	
OW2-84	Aug-89		25.9	2.3		135	<1.0	7.54	306	17.1	0.8																	
OW2-84	Nov-89		44.8	15.7		247	<1.0	7.70	466	32.7	0.8	U																
OW2-84	Feb-90		22.2	2.6		122	1.0	7.40	305	16.2	1.0																	
OW2-84	May-90		26.5	2.6		133	<1.0	7.85	263	16.3	1.7																	
OW2-84	Aug-90		23.8	2.6		128	<1.0	7.40	307	16.6	0.8																	
OW2-84	Nov-90		22.8	2.2		123	2.0	7.40	220	16.0	0.6																	
OW2-84	Feb-91		22.5	1.6		123	<1.0	8.30	300	16.2	0.7	U																
OW2-84	May-91		19.8	0.7		120	<1.0	8.35	246	17.0	0.5																	
OW2-84	Aug-91		22.4	2.1		123	<1.0	6.71	390	16.2	1.6																	
OW2-84	Nov-91		41.8	1.89		125	<1.0	7.60	330	31.8	<0.5																	
OW2-84	Nov-91	D	23.5	2.43		118	<1.0	7.60	330	15.8	3.5																	
OW2-84	Dec-91		28.7	2.46		133	<1.0	7.93	315	19.7	7.5																	
OW2-84	Feb-92		26.1	3.2	U	141	<1.0	7.60	248	18.4	0.5																	
OW2-84	Feb-92	D	24.9	3.1	U	135	<1.0	7.60	248	17.7	0.8																	
OW2-84	May-92		29.6	1.6		150	<1.0	7.88	250	18.4	2.1																	
OW2-84	Aug-92		28.1	1.9		152	<1.0	8.04	650	19.9	1.0																	
OW2-84	Nov-92		25.9	2.4		138	<1.0	7.76	250	17.7	0.6																	
OW2-84	Feb-93		48	4.4		193	<1.0	7.70	250	17.8	6.0																	
OW2-84	May-93		24.8	1.95		129	<1.0	8.20	290	16.3	5.8	U																
OW2-84	May-93	D	23.2	2.17		122	<1.0	NA	NA	15.6	2.5	U																
OW2-84	Aug-93		22.4	1.95		125	<1.0	8.00	300	16.8	<0.5																	
OW2-84	Apr-94		29.2	2.19		143	<1.0	7.90	300	17.1	<0.5																	
OW2-84	Sep-94		28	2.01		141	<2.0	8.80	300	17.2	<0.5																	
OW2-84	Apr-95		26.2	16.7		136	<1.0	7.80	300	17.2	12.5	U																
OW2-84	Sep-95		38.2	2.27		182	<1.0	7.80	300	21.1	58.7	U																
OW2-84	Apr-96		24.6	1.98		131	<1.0	8.50	320	17.0	<0.5																	
OW2-84	Sep-96		27.3	1.79		142	<1.0	8.45	307	17.9	<0.5																	
OW2-84	Sep-96	D	27.2	<0.1		141	<1.0	8.45	307	17.8	<0.5																	
OW2-84	Apr-97		33.7	2.47		164	<1.0	8.70	300	19.5	<0.5																	
OW2-84	Sep-97		30.4	2.22		160	<1.0	8.80	300	20.5	<0.5																	
OW2-84	Apr-98		25.1	2.13		135	<1.0	8.00	318	17.7	1.8																	
OW2-84	Sep-98		31.0	1.8		160	<1.0	7.95	280	20.0	0.8																	
OW2-84	Apr-99		27.5	4.74		144	<1.0	8.00	306	18.4	1.4																	
OW2-84	Sep-99		25	2.46	U	127	<1.0	7.96	365	15.8	3.7	U																
OW2-84	Apr-00		28	2.8		149	<2.0	7.77	434	19.2	2.7	U																
OW2-84	Sep-00		27.4	2.47		151	<2.0	8.04	326	20.1	2.3																	
OW2-84	Apr-01		28.1	<3.0		146	<2.0	7.58	309	18.3	1.3																	
OW2-84	Sep-01		29.2	<3.0		157	<1.0	8.00	318	20.3	1.1																	
OW2-84	Apr-02		25.2	<3.0		134	<1.0	7.27	324	17.2	4.9	U																
OW2-84	Sep-02		31	2.7		164	<1.0	5.30	231	21	2.1	U																
OW2-84	Apr-03		28	4.6		147	1.0	8.10	337	19	2.0		170	20.1	0.15	0.038	0.015	25					<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	
OW2-84	Sep-03	1	25	4.35		149	1.0	7.99	236	17	2.9		166	23.3	0.13	<0.0055	0.015	22					<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	
OW2-84	May-04	1	25.3	3.02		135	<2	8.05	339	17.5	<1.0		-	-	-	-	-	-					-	-	-	-	-	
OW2-84	Sep-04		28.4	6.37		144	<2	8.29	281	17.7	<1.0		158	23	0.108	0.223	0.021	22.1					<0.00004	<0.0001	<0.00005	0.0004	<0.00004	
OW2-84	Apr-05		26.1	3.84		138	<2	7.79	333	17.6	<1.0		164	19.1	0.124	0.081	0.016	23.6					<0.00004	<0.0001	<0.00005	<0.00004	<0.00004	

Well	Sampling Date	Notes	Calcium	Chloride	Hardness	Phenols		Field pH	Field Conductivity	Magnesium	DOC		Alkalinity	Sulphate	Boron	Iron	Manganese	Sodium	Nitrate	Nitrite	Ammonia	TKN	Benzene	m,p-Xylene	Ethylbenzene	Toluene	o-Xylene	Xylene Mixture (Total)
CRA Units (1981 - 2012)			mg/L	mg/L	mg/L	µg/L			µS/cm	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L					mg/L	mg/L	mg/L	mg/L	mg/L	
Burnside Units (2013 -)			mg/L	mg/L	mg/L	mg/L			µS/cm	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
OW2-84	Nov-05		25.5	3.12	133	<1.0		7.47	282	16.9	<1.0		150	19.3	0.091	0.144	0.0137	22.2					<0.00004	<0.0001	<0.00005	<0.00004	<0.00004	
OW2-84	Apr-06		23.5	4	130	<1		8.85	320	18.4	1.0	U	160	20	0.17	<0.05	0.014	23.5					<0.0005	<0.001	<0.0005	<0.0005	<0.0005	
OW2-84	Apr-06	D	25.3	4	140	<1		NA	NA	19.1	1.0	U	150	19	0.18	<0.05	0.015	24.8					-	-	-	-	-	
OW2-84	Nov-06		26	4	150	1.0	U	7.53	330	20	1.0		160	19	0.12	<0.05	0.016	26					<0.5	<1	<0.5	<0.5	<0.5	
OW2-84	Apr-07		23.5	4	120	<1		8.12	302	15.4	<1.0		160	19	0.09	<0.05	0.014	19.2					<0.5	<1	<0.5	<0.5	<0.5	
OW2-84	Nov-07		27.2	4	140	<1		8.09	330	17.3	6.0	J	160	18	0.11	<0.05	0.002	28					<0.5	<1	<0.5	<0.5	<0.5	
OW2-84	Nov-07	D	27.5	4	140	<1		NA	NA	18.4	3.0	J	160	18	0.12	<0.05	0.002	28					<0.5	<1	<0.5	<0.5	<0.5	
OW2-84	Apr-08		25.6	5	130	1.0		7.72	339	-	<1.0		160	20	0.12	<0.05	<0.001	21.7					<0.5	<1	<0.5	<0.5	<0.5	
OW2-84	Nov-08		28.1	9	150	<1		7.14	320	18.2	1.0		-	-	-	-	-	-					-	-	-	-	-	
OW2-84	Apr-09		24.6	4.7	133	1.0		8.15	312	17.4	1.8		161	19.7	0.119	<0.050	0.0021	21.9					<0.50	<1.0	<0.50	<0.50	<0.50	
OW2-84	Nov-09		25.2	6.4	134	3.0		7.64	366	17.2	<1.0		163	19.1	0.115	<0.050	0.0120	22.3					<0.50	<1.0	<0.50	<0.50	<0.50	
OW2-84	Mar-10		24.8	3.6	123	<1.0		8.37	352	14.8	1.0		162	19.9	0.125	0.129	0.0132	21.0					<0.50	<1.0	<0.50	<0.50	<0.50	
OW2-84	Nov-10		31.8	3.8	158	<1.0		6.88	263	19.2	2.0		166	19.2	0.124	<0.050	0.0078	26.5					<0.50	<1.0	<0.50	<0.50	<0.50	
OW2-84	Mar-11		23.7	3.9	128	<1.0		8.18	351	16.6	1.3		163	19.4	0.117	<0.050	0.0017	24.6					<0.50	<1.0	<0.50	<0.50	<0.50	
OW2-84	Dec-11		39.5	4.3	175	<1.0		8.16	350	18.6	<1.0		159	19.9	0.108	<0.050	0.0047	22.7					<0.50	<1.0	<0.50	<0.50	<0.50	
OW2-84	Apr-12		32.1	4.1	146	<1.0		8.42	377	15.9	<1.0		-	-	-	-	-	-					-	-	-	-	-	
OW2-84	Nov-12		41.4	4.4	178	<1.0		7.36	288	18.0	1.9		-	-	-	-	-	-					-	-	-	-	-	
OW2-84	May-13		31.8	4.98	161	<0.001		7.86	358	19.7	1.0		-	-	-	-	-	-					-	-	-	-	-	
OW2-84	Oct-13		25.7	4.73	134	<0.001		7.98	339	16.9	2.7		160	21.2	0.104	<0.010	0.013	23.3					<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW2-84	Jun-14		26.0	4.98	137	<0.001		7.84	343	17.6	0.8		158	21.0	0.110	<0.010	0.014	21.9					<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW2-84	Nov-14		25.2	5.72	135	<0.001		8.11	337	17.4	1.2		154	22.2	0.112	<0.010	0.012	22.7					<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW2-84	May-15		27.2	5.75	138	<0.001		7.83	357	17.0	2.9		165	22.2	0.100	<0.010	0.013	22.8					<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW2-84	Sep-15		26.5	7.08	139	<0.001		7.91	273	17.8	0.8		154	23.2	0.109	<0.010	0.013	23.2					<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW2-84	Apr-16		27.0	6.48	140	<0.001		8.09	293	17.7	1.2		166	22.8	0.101	<0.010	0.012	23.6	0.23	<0.05	0.06		<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW2-84	Oct-16		25.0	5.84	132	<0.001		NA	NA	16.8	0.9		161	22.1	0.114	0.713	0.016	21.6	<0.05	<0.05	0.17	0.44	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW2-84	Apr-17		25.4	5.96	133	<0.001		8.36	294	17.0	1.1		164	19.9	0.110	<0.010	0.012	23.2	0.21	<0.05	0.05	0.12	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW2-84	Sep-17		23.9	6.44	130	<0.001		NA	NA	17.0	1.5		165	23.2	0.100	<0.010	0.014	22.6	0.31	<0.05	<0.02	<0.10	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW2-84	May-18		25.7	7.88	136			8.1	266	17.4	1.9		180	23.9	0.121	1.22	0.059	22.5					<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW2-84	Oct-18		23.9	5.9	126	<0.001		7.96	152.5	16.0	1.5		140	20.3	0.105	<0.01	0.012	21.9			<0.02	0.49	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW2-84	May-19		23.1	9.74	124	<0.001		7.82	320	16.2	0.6		165	25.7	0.116	<0.010	0.012	20.8	0.15	<0.05	0.08	<0.10	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW2-84	Oct-19		25.0	7.06	131	<0.001		7.82	288	16.7	3.5		157	23.5	0.115	<0.010	0.014	22.3	0.11	0.39	0.09	<0.10	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW2-84	May-20		24.8	6.25	129	<0.001		8.05	388.8	16.2	1.1		162	21.1	0.119	<0.010	0.006	22.2	<0.25	<0.25	<0.02	0.11	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW2-84	Oct-20		21.6	7.61	116	0.013		7.94	253.8	15.0	3.2		162	23.2	0.107	0.114	0.018	21.7	0.29	0.08	0.61	0.89	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW2-84	Jun-21		26.2	7.6	137	0.003		8.00	390.8	17.3	0.9		163	21.6	0.100	0.034	0.007	22.2	0.40	<0.05	<0.02	0.4	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW2-84	Nov-21		23.8	7.88	127	0.005		7.97		16.5	2		163	22.9	0.118	<0.010	0.01	21.7	0.24	<0.05	<0.02	0.14	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
Minimum			19.8	0.7	116.0	0.0		5.3	152.5	14.8	0.5		140.0	18.0	0.1	0.0	0.0	19.2	0.1	0.0	0.0	0.1						
Maximum			96.0	16.7	305.0	5.5		8.9	650.0	32.7	58.7		180.0	25.7	0.2	1.2	0.1	28.0	0.4	0.0	0.2	0.5	0.0					
Average			27.5	4.0	140.2	0.6		7.9	317.7	17.7	2.3		160.9	21.0	0.1	0.1	0.0	23.0	0.2	0.0	0.1	0.2	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20

BluePlan ENGINEERING

Historical Groundwater Chemistry - St. Mary's Landfill

Well	Sampling Date	Notes	Calcium		Chloride		Hardness	Phenols		Field pH	Field Conductivity	Magnesium	DOC		Alkalinity	Sulphate	Boron	Iron	Manganese	Sodium	Nitrate	Nitrite	Ammonia	TKN	Benzene	m,p-Xylene	Ethylbenzene	Toluene	o-Xylene	Xylene Mixture (Total)
CRA Units (1981 - 2012)			mg/L		mg/L		mg/L	µg/L			µS/cm	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L					mg/L	mg/L	mg/L	mg/L	mg/L	
Burnside Units (2013 -)			mg/L		mg/L		mg/L	µg/L			µS/cm	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
OW4-84	Oct-84		185.0		5.5		973	<1.0		7.69	1600	124.0	2.1																	
OW4-84	Feb-85		140.0		6.0		861	<1.0		7.53	1600	124.0	1.4																	
OW4-84	May-85		148.0		3.5		872	3.0		7.75	1725	122.0	2.6																	
OW4-84	Aug-85		142.0		12.5		874	11.0		7.65	1700	126.0	2.5																	
OW4-84	Feb-86		125.0		13.0		683	<1.0		7.84	1160	90.0	6.5																	
OW4-84	May-86		115.0		15.5		724	3.0		7.77	1480	106.0	3.1																	
OW4-84	Aug-86		105.0		47.0		600	<1.0		7.77	1020	82.0	3.4																	
OW4-84	Nov-86		115.0		30.5		625	<1.0		7.72	1140	82.0	1.9																	
OW4-84	Feb-87		112.0		34.0		589	1.5		7.65	1170	75.0	2.1																	
OW4-84	May-87		148.4		33.3		719	<1.0		7.56	1200	84.2	2.1																	
OW4-84	Aug-87		114.4		34.6		539	<1.0		7.18	910	61.4	2.4																	
OW4-84	Nov-87		101.4		35.8		519	<1.0		7.03	1000	64.4	2.4																	
OW4-84	Jan-88		110.0		36.2		538	<1.0		7.31	1050	63.3	2.6																	
OW4-84	May-88		109.2		40.7		523	<1.0		6.50	1015	60.7	2.5																	
OW4-84	Aug-88		99.0		56.3		491	2.5		7.05	913	59	3.2																	
OW4-84	Nov-88		99.3		76.6		488	3.5		7.32	934	58	3.9																	
OW4-84	Feb-89		106		114		529	1.5		7.13	1030	64	3.2																	
OW4-84	May-89		109		139		549	2.5		7.20	957	67	3.9																	
OW4-84	Aug-89		122		206		626	3.5		7.05	1131	78.0	--																	
OW4-84	Nov-89		124		254		640	1.5		7.15	1055	80.1	5.5																	
OW4-84	Feb-90		122		218		701	<1.0		7.21	1090	96.0	6.1																	
OW4-84	May-90		-		-		-	-		-	-	-	-																	
OW4-84	Aug-90		135		339		717	<1.0		7.80	1274	92	9.2																	
OW4-84	Nov-90		-		-		-	-		-	-	-	-																	
OW4-84	Feb-91		123		312		662	<1.0		6.33	1519	86	9.6																	
OW4-84	May-91		130		301		733	<1.0		7.50	949	99.0	1.0	U																
OW4-84	Aug-91		125		331		674	<1.0		7.50	949	84.9	<0.5																	
OW4-84	Nov-91	2	135		296		723	<1.0		7.20	859	87.6	<0.5																	
OW4-84	Feb-92		124		329		693	9.0		6.91	1030	93.0	10.7																	
OW4-84	May-92		127		354		704	6.0		7.21	1200	93.8	9.3																	
OW4-84	Aug-92		129		279		745	10.6		7.54	2806	103	9.4																	
OW4-84	Nov-92	3	100		17.5		484	<1.0		7.17	620	56.7	1.0																	
OW4-84	Feb-93		117		288		618	<1.0		7.33	940	79.2	11.0																	
OW4-84	May-93		Dry																											
OW4-84	Aug-93		Dry																											
OW4-84	Apr-94		140		260		688	<1.0		7.10	1600	82.3	<0.5																	
OW4-84	Sep-94		Dry																											
OW4-84	Apr-95		231		182		1059	<1.0		7.0	1800	117	16.5																	
OW4-84	Sep-95		Dry																											
OW4-84	Apr-96		92.9		49.7		382	<1.0		7.97	1020	36.4	<0.5																	
OW4-84	Sep-96		Dry																											
OW4-84	Apr-97		43.5		30.9		245	2.0		8.10	800	33.1	4.5																	
OW4-84	Sep-97		Dry																											
OW4-84	Apr-98		165		79.9		669	17		7.61	1110	62.4	11.2																	
OW4-84	Sep-98		Dry																											
OW4-84	Apr-99		Dry																											
OW4-84	Sep-99		Dry																											
OW4-84	Apr-00		Dry																											
OW4-84	Sep-00		Dry																											

Historical Groundwater Chemistry - St. Mary's Landfill

Well	Sampling Date	Notes	Calcium	Chloride	Hardness	Phenols		Field pH	Field Conductivity	Magnesium	DOC		Alkalinity	Sulphate	Boron	Iron	Manganese	Sodium	Nitrate	Nitrite	Ammonia	TKN	Benzene	m,p-Xylene	Ethylbenzene	Toluene	o-Xylene	Xylene Mixture (Total)
CRA Units (1981 - 2012)			mg/L	mg/L	mg/L	µg/L			µS/cm	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L					mg/L	mg/L	mg/L	mg/L	mg/L	
Burnside Units (2013 -)			mg/L	mg/L	mg/L	mg/L			µS/cm	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
OW4-84	Apr-01		152	31.3	564	<2.0		7.04	1230	44.7	9.7																	
OW4-84	Apr-02		78.3	5.6	268	<1.0		6.80	603	17.5	3.4	U																
OW4-84	Sep-02		Dry																									
OW4-84	Apr-03		90	8.85	374	1.0		7.68	883	20	6.4																	
OW4-84	Sep-03		Dry																									
OW4-84	May-04	1	82.2	1.2	279	<2		7.55	520	17.9	6																	
OW4-84	Sep-04		Dry																									
OW4-84	Apr-05		64.1	1.87	216	<2		7.48	378	13.6	<1.0																	
OW4-84	Nov-05		Dry																									
OW4-84	Apr-06		89.3	4	290	1	U	8.31	466	16.4	5																	
OW4-84	Nov-06		92	<2	310	1	U	7.10	552	19	8																	
OW4-84	Apr-07		85.4	4	280	12		7.43	543	17.2	6																	
OW4-84	Nov-07		Dry																									
OW4-84	Apr-08		64.7	6	210	3		7.52	424	-	7																	
OW4-84	Nov-08		99.7	8	330	1		6.95	579	20.3	7																	
OW4-84	Apr-09		60.5	2.7	195	9		7.31	355	10.8	11.2																	
OW4-84	Nov-09		Dry																									
OW4-84	Mar-10		106	4.3	345	<1.0		7.71	801	19.2	10.7																	
OW4-84	Nov-10		97.3	3.6	329	<1.0		6.62	487	21.0	16.4																	
OW4-84	Mar-11		Dry																									
OW4-84	Dec-11		105	<2.0	345	2		7.89	562	20.4	8.5																	
OW4-84	Apr-12		Dry																									
OW4-84	Nov-12		Dry																									
OW4-84	May-13		710	0.88	2450	<0.001		7.90	453	164	6.5																	
OW4-84	Oct-13		86.2	0.58	279	<0.001		7.49	524	15.6	8.6		275	14.8	0.023	<0.010	<0.002	2.17										
OW4-84	Jun-14		Dry																									
OW4-84	Nov-14		Dry																									
OW4-84	May-15		Dry																									
OW4-84	Sep-15		Dry																									
OW4-84	Apr-16		Ins																									
OW4-84	Oct-16		Dry																									
OW4-84	Apr-17		71.1	0.69	235	<0.001		7.59	368	14.0	5.9		244	7.8	0.015	0.036	<0.002	1.55	3.46	<0.05	<0.02	1.93	<0.20	<0.20	<0.10	0.41	<0.10	<0.20
OW4-84	Sep-17		Dry																									
OW4-84	May-18		Dry																									
OW4-84	May-19		86.9	1.12	286	0.002		7.07	538	16.7	7.7		295	7.02	0.032	<0.010	0.105	1.53	4.65	0.06	0.1	1.23	<0.20	0.22	0.12	0.41	<0.10	0.22
OW4-84	Oct-19		Dry																									
OW4-84	May-20		Dry																									
OW4-84	Oct-20		Dry																									
OW4-84	Jun-21		Dry																									
OW4-84	Nov-21		110	0.51	368	0.044		7.44		22.6	8.4		367	22.4	0.022	<0.010	<0.002	2.67	0.92	<0.05	<0.02	0.71	<0.20	0.23	<0.10	0.36	<0.10	0.23
Minimum			19.8	0.51	116	0		5.30	152.5	10.8	0.5		140	7.0	0.015	0.0025	0.0017	1.53	0.05	0.03	0.01	0.05						
Maximum			710.0	354.00	2450	0.0005		8.85	2806	164.0	58.7		367	25.7	0.180	1.22	0.105	2.67	4.65	0.39	0.61	1.93		0.23	0.12	0.41		0.23
Average			121.8	91.61	563	3.86		7.35	977.718	63.2	5.5		264.2	11.8	0.021	<0.019	0.05335	15.93	2.27	0.09	0.14	0.56	<0.20	0.225	0.12	0.393333	<0.10	0.225

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Historical Groundwater Chemistry - St. Mary's Landfill

Well	Sampling Date	Notes	Calcium		Chloride		Hardness	Phenols		Field pH	Field Conductivity	Magnesium	DOC		Alkalinity	Sulphate	Boron	Iron	Manganese	Sodium	Nitrate	Nitrite	Ammonia	TKN	Benzene	m,p-Xylene	Ethylbenzene	Toluene	o-Xylene	Xylene Mixture (Total)
CRA Units (1981 - 2012)			mg/L		mg/L		mg/L	µg/L			µS/cm	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L					mg/L	mg/L	mg/L	mg/L	mg/L	
Burnside Units (2013 -)			mg/L		mg/L		mg/L	mg/L			µS/cm	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
OW5-84	Oct-84		30.5		13.0		196	<1.0		8.12	500	29.0	1.3																	
OW5-84	Feb-85		24.5		5.5		159	<1.0		7.86	424	23.8	1.2																	
OW5-84	May-85		26.0		1.0		161	<1.0		8.18	435	23.4	0.9																	
OW5-84	Aug-85		25.0		1.0		164	<1.0		8.12	400	24.6	1.9																	
OW5-84	Feb-86		25.5		17.0		160	<1.0		8.13	393	23.4	1.1																	
OW5-84	May-86		24.5		4.0		159	<1.0		8.03	399	23.8	1.9																	
OW5-84	Aug-86		24.5		10.0		161	1.0		8.15	416	24.2	1.2																	
OW5-84	Nov-86		25.5		25.5		164	<1.0		8.12	396	24.4	0.9																	
OW5-84	Feb-87		25.5		1.0		163	<1.0		8.08	404	24.0	0.8																	
OW5-84	May-87		26.5		1.0		166	<1.0		8.05	439	24.2	2.0																	
OW5-84	Aug-87		25.5		1.5		162	<1.0		8.10	400	23.8	1.3																	
OW5-84	Nov-87		30.4		0.6		182	<1.0		8.04	422	25.7	0.8																	
OW5-84	Jan-88		30.2		1.1		173	<1.0		7.54	360	23.7	0.8																	
OW5-84	May-88		27.3		1.0		166	<1.0		7.60	408	23.7	1.3																	
OW5-84	Aug-88		27.6		1.1		166	<1.0		7.70	384	23.5	1.4																	
OW5-84	Nov-88		29.0		0.63		169	<1.0		6.81	406	23.3	0.8																	
OW5-84	Nov-88	D	27.3		0.71		162	1.0		NA	NA	22.7	0.7																	
OW5-84	Feb-89		28.5		0.8		170	<1.0		7.58	390	23.9	0.7																	
OW5-84	May-89		33.1		0.7		184	<1.0		8.27	410	24.5	1.1																	
OW5-84	Aug-89		32.6		1.5		187	1.0		7.60	411	25.5	0.8																	
OW5-84	Nov-89		26.7		1.2		164	<1.0		7.50	381	23.7	0.5	U																
OW5-84	Feb-90		28.1		1.6		168	<1.0		7.80	382	23.7																		
OW5-84	May-90		27.0		1.9		165	<1.0		7.50	370	23.7	1.3																	
OW5-84	Aug-90		27.1		1.3		168	<1.0		7.78	340	24.3	1.4																	
OW5-84	Nov-90		24.9		1.2		155	3.5		8.00	800	22.4	0.8																	
OW5-84	Feb-91		25.7		0.8		160	<1.0		8.40	363	23.2	2.8																	
OW5-84	May-91		25.6		<0.1		163	<1.0		7.98	344	24.1	0.5																	
OW5-84	Aug-91		26.1		0.7		163	<1.0		6.71	479	23.8	1.2																	
OW5-84	Nov-91	4	27.4		1.3		174	<1.0		7.90	370	25.5	0.5	U																
OW5-84	Nov-91		26.2		0.96		169	<1.0		7.90	370	23.1	<0.5																	
OW5-84	Dec-91		29.7		1.11		172	<1.0		7.83	349	27.9	<0.5																	
OW5-84	Feb-92		103		1	U	329	<1.0		7.15	1,000	17.3	1.8																	
OW5-84	May-92		25.6		1.0		168	<1.0		7.95	290	25.2	0.5																	
OW5-84	Aug-92		29.8		0.9		188	2.0		8.02	720	27.6	0.7																	
OW5-84	Nov-92		31.4		0.7		198	<1.0		7.60	275	29.1	0.3																	
OW5-84	Feb-93		26.7		1.7		159	<1.0		7.77	260	22.4	4																	
OW5-84	May-93		24.9		0.67		154	<1.0		7.90	330	22.3	<0.5																	
OW5-84	Aug-93		26.9		0.79		168	<1.0		8.20	400	24.5	<0.5																	
OW5-84	Apr-94		27.4		0.90		170	<1.0		7.70	400	24.8	<0.5																	
OW5-84	Apr-94	D	26.6		0.81		164	<1.0		7.70	400	23.7	<0.5																	
OW5-84	Sep-94		30.7		0.74		178	<2.0		8.50	1,400	24.6	<0.5																	
OW5-84	Apr-95		29.8		17.6		182	<1.0		7.50	400	26.1	12.5	U																
OW5-84	Sep-95		40		0.79		223	<1.0		7.80	400	30	29.6	U																
OW5-84	Apr-96		27.8		9.34		171	<1.0		7.81	400	24.7	<0.5																	
OW5-84	Sep-96		31.8		0.94		190	<1.0		8.04	381	26.9	12																	
OW5-84	Apr-97		26.4		1.21		178	<1.0		8.60	400	27.3	<0.5																	
OW5-84	Sep-97		36.4		1.34	J	226	<1.0		8.60	400	32.9	<0.5																	
OW5-84	Sep-97	D	34.5		3.1	J	229	<1.0		8.60	400	34.8	0.8																	
OW5-84	Apr-98		29.2		1.38		182	<1.0		7.80	404	26.6	2.6																	
OW5-84	Sep-98		36.8		1.34		214	<1.0		7.91	369	29.7	<0.5																	
OW5-84	Apr-99		31.5		1.94		190	<1.0		7.86	364	27	0.5																	
OW5-84	Sep-99		30		2.36	U	173	<1.0		7.83	492	23.7	3.3	U																

Well	Sampling Date	Notes	Calcium		Chloride		Hardness	Phenols		Field pH	Field Conductivity	Magnesium	DOC		Alkalinity	Sulphate	Boron	Iron	Manganese	Sodium	Nitrate	Nitrite	Ammonia	TKN	Benzene	m,p-Xylene	Ethylbenzene	Toluene	o-Xylene	Xylene Mixture (Total)
CRA Units (1981 - 2012)			mg/L		mg/L		mg/L	µg/L			µS/cm	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L					mg/L	mg/L	mg/L	mg/L	mg/L	
Burnside Units (2013 -)			mg/L		mg/L		mg/L	mg/L			µS/cm	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
OW5-84	Apr-00		33.4		1.75		204	<2.0		7.77	434	29.2	1.4	U																
OW5-84	Apr-00	D	33.4		1.72		204	<2.0		7.77	434	29.3	1.0	U																
OW5-84	Sep-00		32		2.55		203	<2.0		7.80	425	29.8	2.0																	
OW5-84	Apr-01		34		<3.0		203	<2.0		7.38	415	28.6	17																	
OW5-84	Sep-01		37		<3.0		225	<1.0		7.99	440	32.3	1.0																	
OW5-84	Apr-02		31.5		<3.0		197	<1.0		7.31	438	28.7	1.8	U																
OW5-84	Sep-02		40		3.7		240	2.0	U	6.63	327	34	1.2	U																
OW5-84	Apr-03		37		5.75		214	1.0		7.83	467	35	2.7																	
OW5-84	Sep-03	1	28		5.6		212	1.0		8.27	315	23	5.7																	
OW5-84	May-04	1	32.7		4.85		202	<2		8.01	466	29.2	<1.0																	
OW5-84	Sep-04		32.8		5.57		203	<2		8.03	425	29.4	<1.0																	
OW5-84	Sep-04	D	32.1		5.57		199	<2		8.03	425	28.9	<1.0																	
OW5-84	Apr-05		32.8		5.92		204	<2		7.51	470	29.6	<1.0																	
OW5-84	Nov-05		34.8		13.7		217	<1.0		7.31	454	31.5	<1.0																	
OW5-84	Apr-06		64.8		57		430	<1		8.49	920	65	1.0	U																
OW5-84	Nov-06		66		60		440	10	U	7.16	913	68	2.0																	
OW5-84	Apr-07		50.3		48		330	<1		7.66	710	49	1.0																	
OW5-84	Nov-07		35.8		<2		250	2	U	8.01	560	39.8	<1.0																	
OW5-84	Apr-08		35.8		13		230	<1		7.67	519	-	<1.0																	
OW5-84	Nov-08		41.0		15		250	2.0		7.21	560	36.6	1.0																	
OW5-84	Apr-09		41.3		18.9		255	1.0		7.87	532	36.9	1.4																	
OW5-84	Nov-09		40.5		16.2		247	<1.0		7.75	605	35.4	2.3																	
OW5-84	Mar-10		53.7		33.8		303	<1.0		7.75	920	41.0	3.5																	
OW5-84	Nov-10		39.8		17.1		251	<1.0		6.74	439	36.7	3.5																	
OW5-84	Mar-11		63.4		43.8		405	3.4		8.01	960	59.9	1.6																	
OW5-84	Dec-11		62.4		20.9		319	<1.0		7.80	611	39.5	1.1																	
OW5-84	Apr-12		71.3		40.1		368	<1.0		7.51	805	46.1	<1.0																	
OW5-84	Nov-12		66.4		21.9		325	<1.0		6.93	485	38.8	<1.0																	
OW5-84	May-13		57.3		43.2		372	<1.0		7.59	829	55.6	2.3																	
OW5-84	May-13	D	58.8		42.9		366	0.001				53.2	1.5																	
OW5-84	Oct-13		45.0		25.7		276	<0.001		7.50	628	39.8	1.6		224	92.9	0.13	0.576	0.014	32.1										
OW5-84	Jun-14		57.2		45.3		377	<0.001		7.45	854	56.9	0.9		228	174	0.143	0.700	0.022	38.3					<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW5-84	Nov-14		43.9		29.8		279	<0.001		7.89	635	41.2	1.1		231	102	0.144	0.456	0.02	30.6					<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW5-84	Nov-14	D	44.1		29.5		280	<0.001				41.2	0.9																	
OW5-84	May-15		54.4		46.7		354	<0.001		7.42	877	52.9	1.2		248	165	0.136	0.764	0.02	37.0					<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW5-84	Sep-15		47.7		36.2		299	<0.001		7.56	686	43.6	1.0		218	108	0.137	0.608	0.017	32.2					<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW5-84	Apr-16		64.1		62.7		421	<0.001		7.99	839	63.3	1.6		248	208	0.130	0.830	0.027	42.1	<0.25	<0.25	0.20	0.28	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW5-84	Apr-16	D	61.8		61.4		405	<0.001				60.9	1.7		245	204	0.137	0.830	0.027	40.6	<0.25	<0.25	0.22	0.26						
OW5-84	Oct-16		44.3		32.1		282	<0.001		7.92	552	41.6	1.1		226	106	0.145	0.522	0.019	29.4	<0.25	<0.25	0.25	1.51	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW5-84	Apr-17		49.9		37.4		317	<0.001		7.58	606	46.8	1.2		233	125	0.140	0.669	0.017	32.1	<0.25	<0.25	0.20	0.33	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW5-84	Sep-17		44.3		33.9		288	<0.001		7.86	567	43.0	1.3		238	108	0.133	0.629	0.019	31.0	<0.25	<0.25	0.38	1.00	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW5-84	Sep-17		44.7		34.0		290	<0.001				43.4	1.3		249	108	0.132	0.584	0.021	31.5	<0.25	<0.25	0.39	0.72						
OW5-84	May-18		60.4		52.6		394			8.30	566	59.1	1.2																	
OW5-84	Oct-18		47.1		33.4		290	<0.001		6.81	644	41.9	1.3		196	121	0.139	<0.01	0.017	31.2			0.14	0.31	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW5-84	May-19		59.8		63.5		388	0.002		7.32	894	58.0	0.9		247	212	0.144	<0.01	0.021	36.6	<0.25	<0.25	0.24	0.52	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW5-84	Oct-19		49.5		39.3		310	0.002		7.51	560	45.3	0.8		225	127	0.146	<0.010	0.026	31.8	<0.10	<0.10	0.07	<0.10	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW5-84	May-20		57.7		54.3		364	0.002		7.41	958	53.5	1.4		236	179	0.142	<0.010	0.024	38.7	<0.25	<0.25	0.12	0.40	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW5-84	Oct-20		43.4		38.2		286	0.006		7.95	531	43.2	1.1		232	111	0.160	0.095	0.016	30.8	<0.10	<0.10	0.14	0.47	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW5-84	Jun-21		55.4		52.2		357	0.005		7.44	704	53.0	1.1		236	168	0.149	0.015	0.011	33.4	<0.05	<0.05	0.18	0.52	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW5-84	Nov-21		48.5		43.8		306	0.046		7.74		44.9	1.1		231	121	0.149	<0.010	0.018	29.3	<0.05	<0.05	0.22	0.35	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
Minimum			24.5		0.6	0.0	154.0	0.0		6.6	260.0	17.3	0.3		196.0	92.9	0.130	0.015	0.011	29.3	0.000	0.1	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Maximum			103.0		63.5	0.0	440.0	10.0		8.6	1400.0	68.0	29.6		249.0	212.0	0.160	0.830	0.027	42.1	0.000	0.1	0.4	1.5	0.0	0.0	0.0	0.0	0.0	0.0
Average			38.2		16.0	0.0	233.9	0.7		7.8	517.0	33.6	1.9		232.8	141.1	0.141	0.560	0.020	33.8	0.000	0.1	0.2	0.6	0.0	0.0	0.0	0.0	0.0	0.0

Well	Sampling Date	Notes	Calcium		Chloride		Hardness	Phenols		Field pH	Field Conductivity	Magnesium	DOC		Alkalinity	Sulphate	Boron	Iron	Manganese	Sodium	Nitrate	Nitrite	Ammonia	TKN	Benzene	m,p-Xylene	Ethylbenzene	Toluene	o-Xylene	Xylene Mixture (Total)
CRA Units (1981 - 2012)			mg/L		mg/L		mg/L	µg/L			µS/cm	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L					mg/L	mg/L	mg/L	mg/L	mg/L	
Burnside Units (2013 -)			mg/L		mg/L		mg/L	µg/L			µS/cm	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
OW7-91	Nov-91		79.1		10.2		392	<1.0		7.40	615	45.2	7.0																	
OW7-91	Dec-91		84.0		8.99		445	<1.0		7.30	546	49.7	7.5	U																
OW7-91	Dec-91	D	90.2		8.67		440	<1.0		7.32	546	52.9	<0.5	J																
OW7-91	Feb-92		79.3		9.4		398	1.0		7.72	600	48.4	1.5																	
OW7-91	Jun-92		87.2		34.0		435	<1.0		7.34	660	52.6	0.9																	
OW7-91	Aug-92		104		19.8		515	<1.0		7.79	1,800	62.0	1.1																	
OW7-91	Nov-92	5	101		17.5		683	8.5		7.17	1,200	104	9.4																	
OW7-91	Feb-93		82.3		16.1		405	<1.0		7.42	505	48.5	<0.5																	
OW7-91	Feb-93	D	82.4		19.2		408	<1.0		NA	NA	49.0	<0.5																	
OW7-91	May-93		95.0		42.2		444	<1.0		7.40	760	50.3	3.6	U																
OW7-91	Aug-93		90.4		27.4		434	<1.0		8.20	900	50.7	<0.5																	
OW7-91	Aug-93	D	86.3		27.4		424	<1.0		NA	NA	50.6	<0.5																	
OW7-91	Apr-94		96.4		20.9		464	<1.0		7.40	900	54.2	<0.5																	
OW7-91	Sep-94		87.5		14.9		426	<2.0		8.40	900	50.4	<0.5																	
OW7-91	Apr-95		97.1		16.9		505	<1.0		7.30	900	63.8	1.5	J,U																
OW7-91	Apr-95	D	102		20.6		528	<1.0		7.30	900	66.5	5.0	J,U																
OW7-91	Sep-95		108		14.3		517	<1.0		7.90	900	60	31.6	U																
OW7-91	Apr-96		85.7		10		423	<1.0		7.46	1,110	50.8	<0.5																	
OW7-91	Sep-96		104		15.6		498	<1.0		8.18	1,030	58	1.5																	
OW7-91	Apr-97		125		14.2		588	<1.0		8.30	1,000	67.1	1.1																	
OW7-91	Sep-97		111		15.6		551	<1.0		8.30	1,000	66.5	<0.5																	
OW7-91	Apr-98		100		12.6		495	<1.0		7.45	1,050	59.5	0.9																	
OW7-91	Sep-98		126		8.32		588	<1.0		7.55	1,090	66.5	0.9																	
OW7-91	Apr-99		121		11.9		594	<1.0		7.44	1,100	70.8	1.3																	
OW7-91	Sep-99		124		2.7	U	588	<1.0		7.28	1,250	67.4	2.8	U																
OW7-91	Apr-00		116		12.1		550	<2.0		7.32	1,100	63.2	1.1	U																
OW7-91	Sep-00		103		11.1		555	<2.0		7.46	1,070	72.3	2.0																	
OW7-91	Apr-01		99.6		<3.0		487	<2.0		7.08	922	57.8	<0.5																	
OW7-91	Apr-01	D	94.2		<3.0		486	<2.0		7.08	922	60.8	10.8																	
OW7-91	Sep-01		106		8.78		553	<1.0		7.34	1010	70.0	1.3																	
OW7-91	Sep-01	D	102		10.3		542	<1.0		7.34	1010	69.6	1.5																	
OW7-91	Apr-02		87.8		8.8		446	<1.0		6.99	1010	55	3.2	U																
OW7-91	Sep-02		53		7.6		388	<1.0		4.07	730	53	3.0	U																
OW7-91	Apr-03		100		8.9		472	1		7.65	1010	66	1.5																	
OW7-91	Sep-03	1	74		9.25		479	1		8.07	709	45	3.9																	
OW7-91	May-04	1	90.3		12.4		450	<2		7.70	959	54.4	<1.0																	
OW7-91	Sep-04		92.1		11.8		454	<2		7.78	865	54.4	<1.0																	
OW7-91	Apr-05		93.6		12.1		456	<2		7.24	1040	54	2																	
OW7-91	Nov-05		101		17.5		468	<1.0		7.26	884	52.6	<1.0																	
OW7-91	Apr-06		40.5		9.0		300	1	U	8.10	890	48.9	2.0	U																
OW7-91	Nov-06		91		7.0		450	10	U	6.99	404	55.0	2.0																	
OW7-91	Apr-07		88		9.0		410	<1		7.44	910	45.1	1.0																	
OW7-91	Nov-07		88.8		8.0		500	3	U	7.65	940	67	<1.0																	
OW7-91	Apr-08		98.5		11.0		450	<1		7.28	935	-	<1.0																	
OW7-91	Nov-08		114		9.0		520	<1		6.77	932	57.3	1.0																	
OW7-91	Apr-09		94.5		14.9		447	<1		7.55	552	51.3	1.6																	
OW7-91	Nov-09		99.3		11.3		462	1		7.50	990	52.1	<1.0																	
OW7-91	Mar-10		102.0		9.3		448	<1.0		7.63	1100	46.8	2.5																	
OW7-91	Nov-10		118.0		19.4		548	<1.0		6.57	1020	61.5	<1.0																	

Well	Sampling Date	Notes	Calcium		Chloride		Hardness	Phenols		Field pH	Field Conductivity	Magnesium	DOC		Alkalinity	Sulphate	Boron	Iron	Manganese	Sodium	Nitrate	Nitrite	Ammonia	TKN	Benzene	m,p-Xylene	Ethylbenzene	Toluene	o-Xylene	Xylene Mixture (Total)
CRA Units (1981 - 2012)			mg/L		mg/L		mg/L	µg/L			µS/cm	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L					mg/L	mg/L	mg/L	mg/L	mg/L	
Burnside Units (2013 -)			mg/L		mg/L		mg/L	mg/L			µS/cm	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
OW7-91	Mar-11		101		8.8		467	<1.0		7.81	1030	52.1	2.9																	
OW7-91	Dec-11		418		11		1270	<1.0		7.64	970	55.6	2.4																	
OW7-91	Apr-12		251		10.5		818	<1.0		7.38	1060	46.6	1.2																	
OW7-91	Nov-12		346		7.1		1080	<1.0		6.72	733	53.4	1.1																	
OW7-91	May-13		105		15.6		494	<0.001		7.26	1022	56.3	1.4																	
OW7-91	Oct-13		92.9		9.43		443	<0.001		7.31	965	51.3	1.9																	
OW7-91	Jun-14		84.4		5.52		439	<0.001		7.52	945	55.4	1.2																	
OW7-91	Nov-14		80.5		5.92		410	<0.001		7.54	961	50.7	6.1																	
OW7-91	May-15		84.5		5.70		429	<0.001		7.38	989	52.9	3.0																	
OW7-91	Sep-15		84.3		7.05		434	<0.001		7.46	970	54.2	2.3																	
OW7-91	Apr-16		79.5		4.22		419	<0.001		7.96	800	53.6	5.6																	
OW7-91	Oct-16		60.7		4.95		383	<0.001		8.27	789	56.2	1.3																	
OW7-91	Apr-17		76.0		3.20		414	<0.001		7.64	831	54.5	1.5																	
OW7-91	Sep-17		72.5		3.77		405	<0.001		7.68	798	54.4	3.9																	
OW7-91	May-18		74.7		4.34		411			8.32	703	54.4	1.4																	
OW7-91	Oct-18		74.4		3.92		393	<0.001		7.79	748	50.4	1.9																	
OW7-91	May-19		77.5		4.56		413	<0.001		7.53	845	53.3	2.8		182					35.3	0.38	<0.25								
OW7-91	Oct-19		73.7		3.99		396	<0.001		7.58	703	51.4	0.8		180					34.9	0.54	<0.25								
OW7-91	May-20		74.0		3.77		396	<0.001		7.59	999	51.3	1.7		177					38.0	0.56	<0.25								
OW7-91	Oct-20		62.7		4.44		345	0.001		7.58	703	45.7	1.5		184					32.8	0.65	<0.25								
OW7-91	Jun-21		73.2		4.20		400	0.002		7.55	1174	52.7	2.2		177					33.8	0.64	<0.05								
OW7-91	Nov-21		81.6		4.27		446	0.006				58.8	2.1		185					36.9	0.52	<0.05								
Minimum			40.5		2.7	0.0	300.0	0.0		4.1	404.0	45.0	0.5		177.0					32.8	0.4	<0.25								
Maximum			418.0		42.2	0.0	1270.0	10.0		8.4	1800.0	104.0	31.6		185.0					38.0	0.7	<0.25								
Average			101.8		11.5	0.0	487.5	0.8		7.5	910.5	56.3	2.5		180.3					34.9	0.5	<0.25								
OW8A-91	Nov-91		56.5		2.32		256	<1		7.30	NA	33.1	<0.5																	
OW8A-91	Dec-91		82.2		3.08		438	<1		7.44	546	52.1	4.5																	
OW8A-91	Feb-92		57.0		3.4	U	297	5.5		7.99	490	37.6	1.0																	
OW8A-91	May-92		79.1		9.0		412	<1.0		7.50	600	52.1	0.9																	
OW8A-91	Aug-92		86.0		4.0		428	<1.0		7.37	1400	51.7	1.1																	
OW8A-91	Nov-92		93.3		7.1		475	<1.0		7.79	555	58.6	1.2																	
OW8A-91	Feb-93		73.3		14.8		372	<1.0		7.77	440	45.9	<0.5																	
OW8A-91	Feb-93	D	73.4		64.8	U	371	<1.0		NA	NA	45.7	<0.5																	
OW8A-91	May-93		85.5		77.4		406	<1.0		7.70	1200	46.8	7.2	U																
OW8A-91	Aug-93		82.3		12.3		407	<1.0		7.50	800	48.9	<0.5																	
OW8A-91	Apr-94		48.8		2.71		246	<1.0		7.80	600	30.1	<0.5																	
OW8A-91	Sep-94		80.5		10.0		389	<2.0		8.10	800	45.6	<0.5																	
OW8A-91	Sep-94	D	83.8		9.74		405	<2.0		8.10	800	47.5	<0.5																	
OW8A-91	Apr-95		101		15.4		498	<1.0		7.30	800	59.7	1.0	U																
OW8A-91	Sep-95		90.0		38.7		405	<1.0		7.90	700	43.8	24.2	U																
OW8A-91	Apr-96		80.2		7.87		409	<1.0		7.90	1010	50.7	<0.5																	
OW8A-91	Sep-96		103		6.04		468	<1.0		8.14	930	51.2	2.0																	
OW8A-91	Apr-97		104		6.26		506	<1.0		8.10	900	59.8	<0.5																	
OW8A-91	Sep-97		106		8.6		485	<1.0		7.90	800	53.5	<0.5																	
OW8A-91	Apr-98		79.4		3.13		416	<1.0		7.53	852	52.9	3.5																	
OW8A-91	Sep-98		81.4		8.33		375	<1.0		7.61	656	41.6	1.1																	
OW8A-91	Apr-99		110		3.46		495	<1.0		7.37	970	53.4	1.0																	
OW8A-91	Sep-99		78.2		5.21		340	<1.0		7.54	846	35.3	2.1	U																
OW8A-91	Apr-00		116		3.08		529	<2.0		7.41	1010	58.1	1.2	U																
OW8A-91	Sep-00		101		3.64		525	<2.0		7.62	990	66.3	4.6																	

Well	Sampling Date	Notes	Calcium		Chloride		Hardness	Phenols		Field pH	Field Conductivity	Magnesium	DOC		Alkalinity	Sulphate	Boron	Iron	Manganese	Sodium	Nitrate	Nitrite	Ammonia	TKN	Benzene	m,p-Xylene	Ethylbenzene	Toluene	o-Xylene	Xylene Mixture (Total)
CRA Units (1981 - 2012)			mg/L		mg/L		mg/L	µg/L			µS/cm	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L					mg/L	mg/L	mg/L	mg/L	mg/L	
Burnside Units (2013 -)			mg/L		mg/L		mg/L	mg/L			µS/cm	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
OW8A-91	Apr-01		97.7		18.2		453	<2.0		7.18	990	50.7	0.8																	
OW8A-91	Sep-01		97.7		<3.0		471	<1.0		7.25	839	55.1	1.2																	
OW8A-91	Apr-02		88.1		10.5		459	2	U	6.90	970	58.1	3.3	U																
OW8A-91	Sep-02		42.0		2.3		335	1	U	8.02	626	42.0	3.4	U																
OW8A-91	Apr-03		95.0		8.6		476	1.0		7.53	1000	59.0	1.6																	
OW8A-91	Sep-03	1	70.0		4.55		441	1.0		8.08	756	40.0	6.2																	
OW8A-91	May-04	1	84.8		14.1		432	<2		7.76	943	53.5	<1.0																	
OW8A-91	Sep-04		52.3		3.84		270	<2		7.96	600	33.8	<1.0																	
OW8A-91	Apr-05		91.2		3.01		456	<2		7.46	990	55.5	<1.0																	
OW8A-91	Nov-05		56.2		1.54		275	<1.0		8.14	679	32.6	<1.0																	
OW8A-91	Apr-06		49.7		10		350	<1		8.12	970	54.5	2.0	U																
OW8A-91	Nov-06		100		6		490	16		6.97	964	59.0	2.0																	
OW8A-91	Apr-07		90.3		17		440	<1		7.52	1010	51.0	2.0																	
OW8A-91	Nov-07		60.1		2		300	2	U	8.17	687	36.5	1.0																	
OW8A-91	Apr-08		99.4		11		470	<1		7.31	960	-	<1.0																	
OW8A-91	Nov-08		113		<6		530	<1		6.79	940	60.0	1.0																	
OW8A-91	Apr-09		78.6		16.2		393	<1		7.51	930	47.9	2.8																	
OW8A-91	Nov-09		95.5		<6.0		469	<1.0		7.53	970	56.1	<1.0																	
OW8A-91	Mar-10		103		3.4		460	<1.0		7.36	1140	49.1	2.2																	
OW8A-91	Nov-10		97.3		3.2		451	<1.0		7.00	930	50.5	1.7																	
OW8A-91	Mar-11		105		9.4		513	<1.0		7.86	1070	60.7	3.2																	
OW8A-91	Dec-11		389		6.6		1230	<1.0		7.67	1050	63.1	1.4																	
OW8A-91	Apr-12		230		3		787	<1.0		7.41	960	51.5	1.3																	
OW8A-91	Nov-12		396		2.5		1170	<1.0		6.76	626	43.6	1.2																	
OW8A-91	May-13		97.3		14.5		489	<0.001		7.36	1022	59.8	1.3																	
OW8A-91	Oct-13		103		7.02		498	<0.001		7.34	1063	58.4	1.6																	
OW8A-91	Jun-14		104		14.5		335	<0.001		7.42	702	18.3	6.1																	
OW8A-91	Nov-14		75.1		11.4		279	<0.001		7.38	570	22.1	14.5																	
OW8A-91	May-15		95.0		16.5		315	<0.001		7.17	760	18.9	5.5																	
OW8A-91	Sep-15		NA																											
OW8A-91	Apr-16		85.5		14.1		270	<0.001		7.89	510	13.8	6.2																	
OW8A-91	Oct-16		147		24.2		477	<0.001		7.45	881	26.7	4.8																	
OW8A-91	Apr-17		87.3		20.7		280	<0.001		7.46	550	15.0	4.2																	
OW8A-91	Sep-17		126		14.2		394	<0.001		7.20	760	19.3	6.7																	
OW8A-91	May-18		94		14.6		303			7.77	444	16.7	3.2																	
OW8A-91	Oct-18		108		17.2		350	<0.003		7.72	302	19.6	4.8																	
OW8A-91	May-19		108		16.7		338	0.001		6.97	824	16.7	6.1		366					21.5	0.08	<0.05								
OW8A-91	Oct-19		161		51.9		497	0.001		6.82	859	23.1	8.4		298					25.0	<0.25	<0.25								
OW8A-91	May-20		119		20.4		366	0.002		6.92	871	16.7	5.6		301					33.4	<0.25	<0.25								
OW8A-91	Oct-20		125		42.1		393	0.075		7.20	681	19.7	26.0		333					25.7	<0.25	<0.25								
OW8A-91	Jun-21		107		41.2		362	0.004		7.09	996	23.1	8.8		338					30.4	<0.05	<0.05								
OW8A-91	Nov-21		150		35.5		476	0.038		7.12		24.6	5.6		395					30.1	<0.05	<0.05								
Minimum			42.0		1.5	0.0	246.0	0.0		6.8	302.0	13.8	0.5		298					21.5	0.1	<0.05								
Maximum			396.0		77.4	0.0	1230.0	0.0		8.2	1400.0	66.3	24.2		366					25.0	0.1	<0.05								
Average			102.2		13.5	0.0	435.0	0.9		7.5	818.6	42.6	24.2		366					25.0	0.1	<0.05								

Historical Groundwater Chemistry - St. Mary's Landfill

Well	Sampling Date	Notes	Calcium	Chloride	Hardness	Phenols	Field pH	Field Conductivity	Magnesium	DOC		Alkalinity	Sulphate	Boron	Iron	Manganese	Sodium	Nitrate	Nitrite	Ammonia	TKN	Benzene	m,p-Xylene	Ethylbenzene	Toluene	o-Xylene	Xylene Mixture (Total)
CRA Units (1981 - 2012)			mg/L	mg/L	mg/L	µg/L		µS/cm	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L					mg/L	mg/L	mg/L	mg/L	mg/L	
Burnside Units (2013 -)			mg/L	mg/L	mg/L	mg/L		µS/cm	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
OW8B-91	Apr-94		Ins																								
OW8B-91	Sep-94		Ins																								
OW8B-91	Apr-95		Ins																								
OW8B-91	Sep-95		35.9	1.62	312	<1.0	8.40	500	54.1	34	U																
OW8B-91	Apr-96		7.34	1.10	224	<1.0	8.77	587	49.9	<0.5																	
OW8B-91	Sep-96		8.12	1.52	232	<1.0	9.21	515	51.4	17.0																	
OW8B-91	Apr-97		18.5	1.19	246	<1.0	9.50	900	48.6	0.9																	
OW8B-91	Sep-97		17.8	3.50	254	<1.0	10.50	500	51.0	0.8																	
OW8B-91	Apr-98		7.53	<0.10	188	<1.0	9.25	470	41.2	5.2																	
OW8B-91	Sep-98		15.0	1.11	221	<1.0	9.28	421	44.7	2.8																	
OW8B-91	Apr-99		8.2	1.52	188	<1.0	9.77	432	40.7	2.0																	
OW8B-91	Sep-99		7.24	1.6U	170	<1.0	9.48	518	36.8	8.8																	
OW8B-91	Apr-00		5.48	1.82	194	<2.0	9.31	484	43.7	1.9	U																
OW8B-91	Sep-00		8.59	1.73	215	<2.0	9.02	473	46.9	1.6																	
OW8B-91	Apr-01		20.4	<3.0	224	<2.0	8.50	496	42.1	1.4																	
OW8B-91	Sep-01		16.4	3.1	205	<1.0	8.44	476	39.9	1.1																	
OW8B-91	Apr-02		13.2	<3.0	183	<1.0	8.75	460	36.4	2.1	U																
OW8B-91	Sep-02		24.0	3.1	225	6.0	8.34	370	40.0	1.8	U																
OW8B-91	Apr-03		12.0	4.75	186	1.0	9.12	479	39.0	1.9																	
OW8B-91	Sep-03	1	9.9	4.85	195	1.0	9.24	348	30.0	3.6																	
OW8B-91	May-04	1	18.5	3.29	191	<2	8.81	502	35.3	<1.0																	
OW8B-91	Sep-04		19.5	6.71	239	<2	9.84	507	46.2	<1.0																	
OW8B-91	Apr-05		8.13	2.51	190	<2	8.44	551	41.1	<1.0																	
OW8B-91	Nov-05		16.8	4.14	203	<1.0	8.18	467	30.1	<1.0																	
OW8B-91	Apr-06		11.3	5.0	190	<1	10.69	459	40.0	1.0	U																
OW8B-91	Nov-06		27.0	6.0	270	<1	7.80	582	50.0	3.0																	
OW8B-91	Apr-07		12.1	4.0	190	<1	9.18	560	38.1	1.0																	
OW8B-91	Nov-07		73.0	8.0	590	270	7.15	1080	98.0	7.0																	
OW8B-91	Apr-08		60.4	6	440	<1	7.29	940	-	2.0																	
OW8B-91	Nov-08		74.0	32	440	<1	7.56	1030	61.0	2.0																	
OW8B-91	Apr-09		58.8	29.4	364	<1	8.09	1030	52.7	3.5																	
OW8B-91	Nov-09		54.5	28.1	324	<2.0	7.76	920	45.7	4.0																	
OW8B-91	Mar-10		57.8	76.6	320	<1.0	8.09	1080	42.7	4.4																	
OW8B-91	Oct-10		Sealed and abandoned October 2010; replaced by OW8B-10																								

Historical Groundwater Chemistry - St. Mary's Landfill

Well	Sampling Date	Notes	Calcium		Chloride		Hardness	Phenols		Field pH	Field Conductivity	Magnesium	DOC		Alkalinity	Sulphate	Boron	Iron	Manganese	Sodium	Nitrate	Nitrite	Ammonia	TKN	Benzene	m,p-Xylene	Ethylbenzene	Toluene	o-Xylene	Xylene Mixture (Total)
CRA Units (1981 - 2012)			mg/L		mg/L		mg/L	µg/L			µS/cm	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L					mg/L	mg/L	mg/L	mg/L	mg/L	
Burnside Units (2013 -)			mg/L		mg/L		mg/L	mg/L			µS/cm	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
OW8B-10	Nov-10		Dry																											
OW8B-10	Mar-11		Dry																											
OW8B-10	Dec-11		Dry																											
OW8B-10	Apr-12		130		20.6		588	<1.0		7.35	1300	64.1	4.7																	
OW8B-10	Nov-12		146		16.0		697	<1.0		6.69	931	80.3	3.7																	
OW8B-10	May-13		133		15.0		665	<0.001		7.50	1161	80.9	4.4																	
OW8B-10	Oct-13		105		11.4		539	<0.001		7.26	1128	67.2	3.1		271	372	0.153	<0.010	0.023	45.1										
OW8B-10	Jun-14		103		10.6		545	<0.001		7.59	1112	69.8	2.4		244	358	0.145	<0.010	0.007	44.1					<0.20	<0.20	<0.10	0.93	<0.10	<0.20
OW8B-10	Nov-14		93.3		10.6		493	<0.001		7.35	1060	63.1	3.7		251	360	0.183	<0.010	0.004	41.6					<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW8B-10	May-15		94.0		10.5		487	<0.001		7.41	1052	61.2	2.2		256	344	0.143	<0.010	0.006	43.0					<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW8B-10	Sep-15		95.4		12.5		498	<0.001		7.48	1025	63.2	1.9		249	350	0.150	<0.010	0.004	42.8					<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW8B-10	Apr-16		94.8		10.5		504	<0.001		7.75	827	64.8	4.1		262	338	0.131	<0.010	0.007	43.0	0.59	<0.25	0.03	0.32	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW8B-10	Oct-16		87.2		8.96		464	<0.001		7.77	912	59.8	2.1		254	322	0.158	<0.010	0.003	39.5	0.65	<0.25	0.05	0.93	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW8B-10	Apr-17		84.2		7.79		454	<0.001		7.56	816	59.3	2.3		253	328	0.141	<0.010	<0.002	39.7	0.62	<0.25	<0.02	0.25	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW8B-10	Sep-17		83.2		8.63		451	<0.001		7.66	801	59	1.9		257	319	0.141	<0.010	0.002	41.6	0.59	<0.25	<0.02	0.21	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW8B-10	May-18		81.3		8.67		434			8.11	669	56	1.6		214	288	0.147	<0.010	0.002	38.7					<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW8B-10	Oct-18		80.5		7.59		414	<0.001		7.77	392.5	51.7	1.8		221	277	0.15	0.03	<0.002	38.3			<0.02	<0.10	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW8B-10	May-19		73.5		8.91		391	<0.001		7.51	951	50.5	1.3		245	280	0.144	<0.010	<0.002	36.1	0.34	<0.25	0.09	<0.10	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW8B-10	Oct-19		75.2		7.94		399	<0.001		7.47	729	51.2	1.4		249	267	0.157	<0.010	<0.002	38.0	0.34	<0.25	<0.02	<0.10	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW8B-10	May-20		73.4		8.18		390	<0.001		7.51	962	50.3	1.9		243	275	0.13	0.014	<0.002	41.2	0.40	<0.25	<0.02	0.17	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW8B-10	Oct-20		59.5		8.16		328	0.013		7.74	657	43.6	2.9		255	268	0.175	0.030	<0.002	35.4	0.30	<0.25	<0.02	0.13	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW8B-10	Jun-21		74.5		7.75		405	0.005		7.49	924	53.2	1.5		247	252	0.125	<0.010	0.004	37.2	0.36	<0.05	<0.02	0.31	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW8B-10	Nov-21		72.3		7.72		390	0.046		7.86		50.9	1.7		252	260	0.143	<0.010	<0.002	37.5	0.30	0.2	<0.02	0.18	<0.20	<0.20	<0.10	0.33	<0.10	<0.20
Minimum			59.5	#	7.6	0.0	328.0	0.0	#	6.7	392.5	43.6	1.3	##	214.0	252.0	0.1	0.0	0.0	35.4	0.3	0.2	0.0	0.1						
Maximum			146.0	#	20.6	0.0	697.0	0.0	#	8.1	1300.0	80.9	4.7	##	271.0	372.0	0.2	0.0	0.0	45.1	0.7	0.2	0.1	0.9						
Average			92.0	#	10.4	##	476.8	0.0	#	7.5	916.3	60.0	2.5	##	248.4	309.3	0.1	0.0	0.0	40.2	0.4	0.2	0.1	0.3						
OW9A-91	Nov-91		41.4		3.44		209	<1		6.50	NA	23.6	<0.5																	
OW9A-91	Dec-91		57.6		2.17		312	<1		7.53	475	37.3	6.5																	
OW9A-91	Feb-92		20.2		7.6		135	1.0		8.16	310	20.4	1.2																	
OW9A-91	May-92		57.5		3.5		293	<1.0		7.61	460	36.2	0.9																	
OW9A-91	Aug-92		59.5		2.0		301	<1.0		7.65	970	37.0	1.3																	
OW9A-91	Nov-92		74.4		3.1		366	<1.0		7.74	500	43.7	0.9	U																
OW9A-91	Feb-93		67.9		3.7		325	<1.0		7.74	405	37.8	<0.5																	
OW9A-91	May-93		52.9		3.31		263	<1.0		7.80	540	31.8	0.9	U																
OW9A-91	Aug-93		55.4		2.14		286	<1.0		7.50	600	35.8	<0.5																	
OW9A-91	Apr-94		82.1		4.33		395	<1.0		7.60	800	46.1	<0.5																	
OW9A-91	Sep-94		58.2		1.76		292	<2.0		8.50	600	35.5	<0.5																	
OW9A-91	Apr-95		58.9		35		292	<1.0		7.70	600	35.3	3	U																
OW9A-91	Sep-95		68.2		2.56		323	<1.0		7.90	600	37.1	25.9	J,U																
OW9A-91	Sep-95	D	68.6		2.44		323	<1.0		7.90	600	36.9	9.8	J,U																
OW9A-91	Apr-96		65.6		10.4		320	<1.0		7.79	762	37.9	<0.5																	
OW9A-91	Apr-96	D	67.4		3.38		328	<1.0		7.79	762	38.9	<0.5																	
OW9A-91	Sep-96		62.1		1.92		312	<1.0		8.57	622	38	<0.5																	
OW9A-91	Apr-97		43.6		3.62		302	<1.0		8.20	900	46.9	1.5																	
OW9A-91	Apr-97	D	43.6		3.59		316	<1.0		8.20	800	50.2	3.0																	
OW9A-91	Sep-97		67.3		2.1		339	<1.0		8.30	600	41.6	<0.5																	
OW9A-91	Apr-98		65.5		2.98		330	<1.0		7.62	703	40.5	3.5																	
OW9A-91	Sep-98		64.4		1.53		324	<1.0		7.94	564	39.6	0.8																	
OW9A-91	Apr-99		66.5		4.74		310	<1.0		7.65	588	35	0.8																	
OW9A-91	Sep-99		29.4		1.94	U	276	<1.0		7.59	711	49.3	3.4	U																
OW9A-91	Apr-00		60		2.19		303	<2.0		7.81	640	32.7	0.7	U																
OW9A-91	Sep-00		60.6		1.89		308	<2.0		7.75	654	38.1	1.8																	

Well	Sampling Date	Notes	Calcium	Chloride	Hardness	Phenols		Field pH	Field Conductivity	Magnesium	DOC		Alkalinity	Sulphate	Boron	Iron	Manganese	Sodium	Nitrate	Nitrite	Ammonia	TKN	Benzene	m,p-Xylene	Ethylbenzene	Toluene	o-Xylene	Xylene Mixture (Total)
CRA Units (1981 - 2012)			mg/L	mg/L	mg/L	µg/L			µS/cm	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L					mg/L	mg/L	mg/L	mg/L	mg/L	
Burnside Units (2013 -)			mg/L	mg/L	mg/L	mg/L			µS/cm	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
OW9A-91	Apr-01		85.2	6.2	426	<2.0		7.22	833	51.7	0.7																	
OW9A-91	Sep-01		60.2	<3.0	308	<1.0		7.52	640	38.4	1.8																	
OW9A-91	Apr-02		63.3	<3.0	322	<1.0		7.09	738	39.8	3.0	U																
OW9A-91	Sep-02		33	2.1	251	<1.0		8.14	481	41	3.2	U																
OW9A-91	Apr-03		60	4.35	327	1		7.60	701	41	2.4																	
OW9A-91	Sep-03	1	43	3.85	307	1		8.15	476	27	9.4																	
OW9A-91	May-04	1	83	7.38	409	<2		7.65	892	49	<1.0																	
OW9A-91	Sep-04		59	2.64	298	<2		8.42	650	36.6	<1.0																	
OW9A-91	Apr-05		58	2.17	292	<2		7.35	687	35.7	<1.0																	
OW9A-91	Apr-05	D	58.2	2.13	294	<2		7.35	687	36	<1.0																	
OW9A-91	Nov-05		55.5	2.17	274	<1.0		7.14	585	32.8	<1.0																	
OW9A-91	Apr-06		21.4	4	220	<1		8.44	707	40	2.0	U																
OW9A-91	Nov-06		61	2	310	1	U	7.22	302	39	2.0																	
OW9A-91	Apr-07		78	5	360	<1		7.53	753	40	2.0																	
OW9A-91	Nov-07		60	<2	300	1	U	7.84	671	37	<1.0																	
OW9A-91	Apr-08		76.8	4	370	<1		7.53	835	-	<1.0																	
OW9A-91	Nov-08		73.4	<6	340	<1		6.92	686	37	<1.0																	
OW9A-91	Apr-09		92.4	11.2	427	<1		7.48	930	47.6	2.1																	
OW9A-91	Nov-09		69.0	<6.0	325	2		7.56	785	37	2.8																	
OW9A-91	Mar-10		79.3	2.6	345	<1.0		7.83	807	35.8	1.8																	
OW9A-91	Nov-10		84.4	<2.0	392	<1.0		6.78	552	44.1	2.5																	
OW9A-91	Mar-11		86.2	2.7	400	<1.0		7.96	878	44.8	2.1																	
OW9A-91	Dec-11		227	2.1	728	<1.0		7.67	748	38.8	1.4																	
OW9A-91	Apr-12		214	2.5	679	<1.0		7.42	68	34.9	1.0																	
OW9A-91	Nov-12		247	<2.0	764	<1.0		6.77	571	35.6	1.2																	
OW9A-91	May-13		80.5	4.37	397	<0.001		7.44	873	47.6	2.0																	
OW9A-91	Oct-13		65.4	2.30	314	<0.001		7.43	723	36.6	1.2																	
OW9A-91	Jun-14		61.2	2.64	304	<0.001		7.36	740	36.6	1.5																	
OW9A-91	Nov-14		57.9	3.35	285	<0.001		7.29	720	34.2	5.5																	
OW9A-91	May-15		55.5	3.64	268	<0.001		7.41	764	31.5	3.6																	
OW9A-91	Sep-15		57.5	5.92	273	<0.001		7.27	728	31.4	2.9																	
OW9A-91	Apr-16		53.1	4.75	252	<0.001		7.62	584	29.0	4.9																	
OW9A-91	Oct-16		52.3	3.94	252	<0.001		7.60	634	29.4	1.1																	
OW9A-91	Apr-17		49.8	3.32	253	<0.001		6.92	581	31.3	1.4																	
OW9A-91	Sep-17		48.0	3.07	246	<0.001		7.49	625	30.7	3.0																	
OW9A-91	May-18		49.3	5.28	260			8.12	576	33.3	1.4			It is presumed that, the samples for OW9A and OW9B were missed labled in the field - have been corrected in this spreadsheet														
OW9A-91	Oct-18		41.4	4.06	227	<0.001		7.88	550	29.9	2.5																	
OW9A-91	May-19		44.1	6.74	234	<0.001		7.68	659	30	2.0		197					42.3	0.76	<0.05								
OW9A-91	Oct-19		44.7	4.75	243	0.002		7.77	550	31.9	3.2		190					42.3	0.92	<0.10								
OW9A-91	May-20		INS																									
OW9A-91	Oct-20		36.6	4.82	203	0.008		8.12	488.3	27.2	1.7		207					45.1	1.82	<0.10								
OW9A-91	Jun-21		96.5	5.1	345	0.002				25.2	2.0		205					34	1.07	<0.05								
OW9A-91	Nov-21		46.6	4.73	253	0.006		7.62		33.1	1.4		212					50.9	1.38	<0.05								
Minimum			20.2	1.5	135.0	0.0		6.5	68.0	20.4	0.5		190.0					42.3	0.8	<0.05								
Maximum			247.0	35.0	764.0	2.0		8.6	970.0	51.7	25.9		197.0					42.3	0.9	<0.05								
Average			67.8	4.2	325.5	0.5		7.6	652.1	37.3	2.4		200.2					42.8	1.1	<0.05								

Well	Sampling Date	Notes	Calcium		Chloride		Hardness	Phenols		Field pH	Field Conductivity	Magnesium	DOC		Alkalinity	Sulphate	Boron	Iron	Manganese	Sodium	Nitrate	Nitrite	Ammonia	TKN	Benzene	m,p-Xylene	Ethylbenzene	Toluene	o-Xylene	Xylene Mixture (Total)
CRA Units (1981 - 2012)			mg/L		mg/L		mg/L	µg/L			µS/cm	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L					mg/L	mg/L	mg/L	mg/L	mg/L	
Burnside Units (2013 -)			mg/L		mg/L		mg/L	mg/L			µS/cm	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
OW9B-91	Nov-91		16.0		6.44		119	3		7.30	NA	17.5	<0.5																	
OW9B-91	Dec-91		22.0		4.42		148	<1		8.22	365	22.2	6.0																	
OW9B-91	Feb-92		51.3		4.9	U	263	<1.0		7.65	449	32.8	1.2																	
OW9B-91	May-92		22.7		3.9		145	<1.0		8.24	300	21.3	0.7																	
OW9B-91	Aug-92		20.5		2.4		141	<1.0		8.17	660	21.7	0.5																	
OW9B-91	Nov-92		23.7		2.6		148	<1.0		8.07	340	21.5	0.7																	
OW9B-91	Feb-93		19.2		3.8		121	<1.0		8.28	250	17.8	3																	
OW9B-91	May-93		17.1		1.98		125	<1.0		8.6	350	<0.5	20																	
OW9B-91	Aug-93		16.8		1.51		120	<1.0		8.5	400	<0.5	19																	
OW9B-91	Apr-94		19.3		1.55		126	<1.0		8.40	300	18.8	<0.5																	
OW9B-91	Sep-94		20.2		0.88		126	<2.0		8.70	400	18.4	<0.5																	
OW9B-91	Apr-95		19.2		17		134	<1.0		8.20	400	20.8	6	U																
OW9B-91	Sep-95		29.4		1.12		169	<1.0		8.10	400	23.2	22	U																
OW9B-91	Apr-96		15.6		1.29		114	<1.0		8.22	390	18.2	<0.5																	
OW9B-91	Sep-96		19.2		1.2		129	<1.0		8.33	371	19.7	13																	
OW9B-91	Apr-97		20.1		2.79		134	<1.0		8.70	400	20.4	0.9																	
OW9B-91	Sep-97		19.2		1.48		143	<1.0		8.70	400	23.0	2.6																	
OW9B-91	Apr-98		16.5		1.34		120	<1.0		8.21	389	19.1	2.6																	
OW9B-91	Sep-98		22.4		1.31		148	<1.0		8.19	340	22.4	0.5																	
OW9B-91	Apr-99		22.4		5.31		151	<1.0		8.18	361	23.2	0.6																	
OW9B-91	Sep-99		17.2		2.63	U	115	<1.0		8.05	435	17.5	3.0	U																
OW9B-91	Apr-00		17.5		2.69		128	<2.0		8.38	404	20.4	5.0																	
OW9B-91	Sep-00		20.9		4.16		142	<2.0		8.18	408	21.9	2.1																	
OW9B-91	Apr-01		19.3		<3.0		135	<2.0		7.81	393	21.0	2.5																	
OW9B-91	Sep-01		16.8		<3.0		130	<1.0		8.22	398	21.4	1.0																	
OW9B-91	Apr-02		16.8		<3.0		124	<1.0		7.61	397	20.0	0.8																	
OW9B-91	Sep-02		14.0		3.3		121	<1.0		5.94	312	21.0	1.1	U																
OW9B-91	Apr-03		18.0		4.15		132	1.0		8.22	400	22.0	2.4																	
OW9B-91	Sep-03	1	13.0		4.2		128	1.0		8.34	284	15.0	6.2																	
OW9B-91	Sep-03	D,1	14.0		4.15		128	1.0		8.35	284	15.0	5.2																	
OW9B-91	May-04	1	14.7		2.44		115	<2		8.30	410	19.1	<1.0																	
OW9B-91	Sep-04		17.8		5.71		123	<2		8.55	355	19.1	<1.0																	
OW9B-91	Apr-05		14.1		2.59		111	<2		8.22	397	18.4	<1.0																	
OW9B-91	Nov-05		16.8		4.32		122	<1.0		7.57	373	19.3	<1.0																	
OW9B-91	Nov-05	D	17.8		4.40		124	<1.0		7.57	373	19.4	<1.0																	
OW9B-91	Apr-06		37.5		24		230	<1		8.84	623	32.4	1.0	U																
OW9B-91	Nov-06		19.0		7		140	<1		7.79	568	23.0	2.0																	
OW9B-91	Apr-07		15.3		8		120	<1		8.28	430	19.5	<1.0																	
OW9B-91	Nov-07		17.6		10		130	2	U	8.42	457	21.3	<1.0																	
OW9B-91	Apr-08		14.4		10		130	<1		8.57	534	-	<1.0																	
OW9B-91	Nov-08		21.5		17		160	<1		7.49	530	25.0	1.0																	
OW9B-91	Apr-09		14.7		13.7		131	2		8.32	479	22.9	1.1																	
OW9B-91	Nov-09		19.4		18.1		152	1		8.12	651	25.1	1.7																	
OW9B-91	Mar-10		31.4		39.9		209	<1.0		8.11	950	31.7	3.3																	
OW9B-91	Nov-10		24.5		25.4		184	<1.0		7.07	553	29.8	2.1																	

Well	Sampling Date	Notes	Calcium	Chloride		Hardness	Phenols	Field pH	Field Conductivity	Magnesium	DOC		Alkalinity	Sulphate	Boron	Iron	Manganese	Sodium	Nitrate	Nitrite	Ammonia	TKN	Benzene	m,p-Xylene	Ethylbenzene	Toluene	o-Xylene	Xylene Mixture (Total)
CRA Units (1981 - 2012)			mg/L	mg/L		mg/L	µg/L		µS/cm	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L					mg/L	mg/L	mg/L	mg/L	mg/L	
Burnside Units (2013 -)			mg/L	mg/L		mg/L	mg/L		µS/cm	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
OW9B-91	Mar-11		18.2	21.8		147	<1.0	8.44	619	24.6	1.6																	
OW9B-91	Dec-11		143	28.3		503	<1.0	8.16	568	35.4	2.1																	
OW9B-91	Apr-12		128	176		621	<1.0	7.43	1640	72.8	4.1																	
OW9B-91	Nov-12		127	161		596	<1.0	6.88	48	68.0	8.8																	
OW9B-91	May-13		518	192		1940	<0.001	7.30	1450	156	6.1																	
OW9B-91	Oct-13		99.7	194		505	<0.001	6.82	1347	62.2	7.5																	
OW9B-91	Jun-14		117	257		563	<0.001	6.87	1573	65.7	4.4																	
OW9B-91	Nov-14		112	302		542	<0.001	6.78	1590	63.6	5.8																	
OW9B-91	May-15		129	311		586	<0.001	6.96	1628	64.2	3.9		329	120	0.336	2.54	0.101	114					<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW9B-91	May-15	D	107	309		515	<0.001			60.3	3.9																	
OW9B-91	Sep-15		152	402		674	<0.001	7.49	1763	71.5	4.5		347	106	0.391	3.11	0.126	113					<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW9B-91	Sep-15	D	160	426		703	<0.001			73.8	4.7																	
OW9B-91	Apr-16		115	304		519	<0.001	6.95	1371	56.3	3.9		285	117	0.285	2.52	0.099	97.5	<0.25	<0.25	0.58	0.56	<0.20	<0.20	<0.10	0.38	<0.10	<0.20
OW9B-91	Oct-16		180	327		769	<0.001	6.87	1589	77.7	6.0		330	318	0.434	3.64	0.155	107	<0.5	<0.5	0.12	1.03	<0.20	<0.20	<0.10	0.24	<0.10	<0.20
OW9B-91	Apr-17		122	292		539	<0.001	6.83	1234	57.0	3.9		278	153	0.322	2.35	0.107	98.9	<0.25	<0.25	0.37	0.85	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW9B-91	Apr-17	D	123	293		543	<0.001			57.3	3.8		277	148	0.326	2.38	0.109	98.0	<0.25	<0.25	0.39	0.86						
OW9B-91	Sep-17		107	219		474	<0.001	6.94	1114	50.3	5.2		375	107	0.382	2.32	0.111	96.5	<0.25	<0.25	0.32	0.63	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW9B-91	May-18		45.0	99.9		252		8.33	637	34.0	2.2	vere missed labled in the field - have been corrected in this spreadsheet																
OW9B-91	Oct-18		69.2	140		335	<0.001	7.66	855	39.5	3.1		235	86.2	0.322	<0.01	0.029	81.7			0.12	0.39	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW9B-91	May-19		55.1	151		310	<0.001	7.38	1028	41.8	2.2		260	111	0.705	<0.01	0.018	76.9	<0.25	<0.25	0.12	0.38	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW9B-91	Oct-19		44.8	106		259	<0.001	7.54	695	35.8	2.6		223	86.9	0.495	<0.010	0.026	77.7	<0.25	<0.25	0.24	<0.10	<0.20	<0.20	0.12	0.47	<0.10	<0.20
OW9B-91	May-20		29.9	125		206	<0.001	7.73	1043	31.9	2.6		235	104	0.351	0.031	<0.002	85.6	<0.25	<0.25	0.03	0.17	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW9B-91	Oct-20		22.8	82.3		165	0.003	7.54	695	26.3	2.1		196	80.7	0.413	0.012	0.003	75.4	<0.10	<0.10	<0.02	0.16	<0.40	<0.40	<0.20	<0.40	<0.20	<0.40
OW9B-91	Jun-21		24.1	88.8		191	0.018	8.03	928	31.7	1.6		190	81.9	0.329	0.054	0.009	76.4	<0.05	<0.05	0.02	0.37	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW9B-91	Nov-21		54	113		296	0.042	7.62		39.2	2.3		255	74.6	0.342	<0.010	0.018	74.5	<0.05	<0.05	0.17	0.39	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
Minimum			13.0	0.9		111.0	0.0	5.9	48.0	15.0	0.3		223.0	86.2	0.3	2.3	0.0	76.9			0.1	0.4				0.2		
Maximum			518.0	426.0		1940.0	2.0	8.8	1763.0	156.0	22.0		375.0	318.0	0.7	3.6	0.2	114.0			0.6	1.0				0.5		
Average			54.1	79.3		275.5	0.5	7.9	635.7	34.5	3.8		293.9	135.3	0.4	2.7	0.1	96.1			0.3	0.7				0.4		
OW15-91	Nov-91		22.1	6.65		162	1	7.30	NA	23.7	<0.5																	
OW15-91	Dec-91		25.4	3.75		169	1	7.99	369	28.6	<0.5																	
OW15-91	Feb-92		20.1	7	U	153	<1	8.67	320	25.0	1.2																	
OW15-91	May-92		21.9	7.8		158	1.0	8.51	300	25.0	0.8																	
OW15-91	Aug-92		20.1	4.0		162	<1	8.30	660	27.2	1.1																	
OW15-91	Nov-92		21.0	4.3		158	<1	8.10	585	25.6	0.7																	
OW15-91	Feb-93		19.5	1.7		141	<1	8.32	220	22.5	<0.5																	
OW15-91	May-93		16.9	2.24		145	<1	8.60	340	25.0	1.6	U																
OW15-91	Aug-93		18.4	2.11		143	<1	8.20	300	23.5	<0.5																	
OW15-91	Apr-94		17.4	4.14		127	<1	8.70	400	20.3	<0.5																	
OW15-91	Sep-94		20.2	2.19		138	<2	8.80	400	21.4	<0.5																	
OW15-91	Apr-95		19.1	15.2		149	<1	8.00	400	24.6	13	U																
OW15-91	Sep-95		27.8	3.47		177	<1	8.10	300	26.1	46.7	U																
OW15-91	Apr-96		17.8	2.04		132	2	8.22	384	21.2	<0.5																	
OW15-91	Sep-96		20.0	2.19		148	<1	8.42	364	23.8	2.0																	
OW15-91	Apr-97		17.8	1.39		126	<1	8.50	300	19.7	1.9																	
OW15-91	Sep-97		23.8	2.87		174	<1	8.40	400	27.9	<0.5																	
OW15-91	Apr-98		16.3	2.09		132	<1	8.28	371	22.1	3.5																	
OW15-91	Sep-98		20.9	1.68		154	<1	8.19	346	24.7	0.9																	
OW15-91	Apr-99		17.3	4.74		138	<1	8.36	339	23.0	1.6																	
OW15-91	Sep-99		15.7	7.5		118	<1	8.13	369	19.2	2.9	U																
OW15-91	Apr-00		18.6	2.64		150	<2	8.35	375	25.1	4.5																	
OW15-91	Sep-00		20.4	2.77		158	<2	8.10	382	25.9	0.8																	
OW15-91	Sep-00	D	20.3	3.12		156	<2.0	8.10	382	25.5	1.4																	

Well	Sampling Date	Notes	Calcium	Chloride	Hardness	Phenols		Field pH	Field Conductivity	Magnesium	DOC		Alkalinity	Sulphate
CRA Units (1981 - 2012)			mg/L	mg/L	mg/L	µg/L			µS/cm	mg/L	mg/L		mg/L	mg/L
Burnside Units (2013 -)			mg/L	mg/L	mg/L	mg/L			µS/cm	mg/L	mg/L		mg/L	mg/L
OW15-91	Apr-01		17.7	<3	148	<2		7.95	345	25.3	<0.5			
OW15-91	Sep-01		16.9	<3	145	<1		7.88	367	25.0	1.1			
OW15-91	Apr-02		12.9	<3	121	2	U	7.73	361	21.6	1.2	U		
OW15-91	Sep-02		17.0	2.4	158	2		7.34	265	28.0	3.1	U		
OW15-91	Apr-03		16.0	4.35	141	1.0		8.13	385	25.0	1.0		194	16.4
OW15-91	Sep-03	1	19.0	4.15	148	1.0		8.31	260	25.0	5.7		207	13.8
OW15-91	May-04	1	16.6	2.4	135	<2		8.17	397	22.8	<1.0		-	-
OW15-91	Sep-04		20.1	7	145	<2		8.44	344	23.1	<1.0		202	21.4
OW15-91	Apr-05		22.5	2.19	155	<2		7.97	370	24.0	<1.0		188	15.1
OW15-91	Nov-05		20.4	2.6	144	<1		7.70	339	22.7	<1.0		204	14.5
OW15-91	Apr-06		15.6	4	140	1	U	9.16	376	24.2	2.0	U	190	17
OW15-91	Nov-06		20.0	5	160	1	U	7.58	397	26.0	1.0		210	17
OW15-91	Apr-07		15.8	7	110	6	J	8.14	356	17.5	<1.0		180	20
OW15-91	Nov-07		22.8	11	150	1	U	8.26	554	22.8	<1.0		200	36
OW15-91	Apr-08		15.2	4	120	6		8.22	394	-	<1.0		210	17
OW15-91	Nov-08		92.9	131	410	<1		7.11	864	42.2	2.0		-	-
OW15-91	Apr-09		27.0	16.4	160	9		7.63	454	22.6	2.8		202	47.9
OW15-91	Nov-09		23.5	12.7	143	28		7.86	528	20.5	<1.0		211	36.3
OW15-91	Mar-10		19.3	6.2	116	60		8.13	447	16.5	1.5		209	22
OW15-91	Nov-10		18.5	10.0	123	<5		7.49	373	18.6	1.2	J	212	28
OW15-91	Nov-10	D	17.4	10.7	129	<5		7.49	373	20.8	5.7	J	214	28.7
OW15-91	Mar-11		18.6	7.4	125	3.7		8.26	442	19.2	1.7		214	22
OW15-91	Dec-11		29.8	6.1	151	<1.0		8.44	424	18.5	1.3		196	19.1
OW15-91	Apr-12		26.5	3.6	137	2.0		8.05	432	17.1	1.0		200	18.8
OW15-91	Nov-12		29.2	14.5	153	<1.0		7.35	423	19.4	<1.0		229	29.5
OW15-91	May-13		98.8	60.0	436	<0.001		7.78	703	46.0	3.9			
OW15-91	Oct-13		35.3	70.0	241	<0.001		7.72	740	37.1	3.4		220	71.9
OW15-91	Jun-14		33.5	50.9	240	<0.001		7.77	684	38.0	2.1		220	66.9
OW15-91	Jun-14	D	32.4	48.1	233	<0.001				36.9	2.1			
OW15-91	Nov-14		31.3	64.8	227	<0.001		7.79	688	36.2	3.2		214	61.5
OW15-91	May-15		35.1	67.3	243	<0.001		7.59	743	37.8	1.9		235	55.8
OW15-91	Sep-15		42.3	99.0	296	<0.001		7.69	808	46.2	2.1		236	67.8
OW15-91	Apr-16		44.1	127	310	<0.001		7.64	714	48.6	2.4		264	56.1
OW15-91	Oct-16		48.7	142	340	<0.001		7.65	878	53.1	3.8		278	63.6
OW15-91	Oct-16	D	49.8	142	348	<0.001				54.2	4.2		270	62.5
OW15-91	Apr-17		51.2	149	353	<0.001		7.38	842	54.6	2.3		259	74.8
OW15-91	Sep-17		53.0	148	366	<0.001		7.60	888	56.8	2.8		280	88.5
OW15-91	May-18		31.7	60.8	220			8.30	566	34.1	1.5		217	51.4
OW15-91	Oct-18		34.1	59.8	219	<0.001		7.70	562	32.4	1.7		207	45.3
OW15-91	May-19		27.8	46.4	176	<0.001		7.85	561	25.8	1.1		221	36.3
OW15-91	Oct-19		27.7	40.6	172	<0.001		7.47	489	24.9	2.4		220	50.9
OW15-91	May-20		27.3	34	165	<0.001		7.75	589.8	23.4	1.4		215	34.8
OW15-91	Oct-20		22.2	43.6	148	0.003		8.32	451	22.4	1.7		214	55.8
OW15-91	Jun-21		22.5	23.4	149	0.003		8.01	620	22.6	1.1		216	29.4
OW15-91	Nov-21		25.0	27.1	163	0.072		7.92		24.4	1.2		219	31.7
Minimum			12.9	1.4	110.0	0.0		7.1	220.0	16.5	0.3		180.0	13.8
Maximum			98.8	149.0	436.0	60.0		9.2	888.0	56.8	46.7		280.0	88.5
Average			26.6	28.2	180.8	3.3		8.0	463.6	27.9	3.2		218.6	39.2

Well	Sampling Date	Notes	Boron	Iron	Manganese	Sodium	Nitrate	Nitrite	Ammonia	TKN	Benzene	m,p-Xylene	Ethylbenzene	Toluene	o-Xylene	Xylene Mixture (Total)
CRA Units (1981 - 2012)			mg/L	mg/L	mg/L	mg/L					mg/L	mg/L	mg/L	mg/L	mg/L	
Burnside Units (2013 -)			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
OW15-91	Apr-01															
OW15-91	Sep-01															
OW15-91	Apr-02															
OW15-91	Sep-02															
OW15-91	Apr-03		0.41	0.1	0.0032	44					<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	
OW15-91	Sep-03	1	0.44	0.029	0.0055	41					<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	
OW15-91	May-04	1	-	-	-	-					-	-	-	-	-	
OW15-91	Sep-04		0.384	0.154	0.01	40.4					<0.00004	<0.0001	<0.00005	0.0006	<0.00004	
OW15-91	Apr-05		0.296	0.076	0.004	40.5					<0.00004	<0.0001	<0.00005	<0.00004	<0.00004	
OW15-91	Nov-05		0.222	0.133	0.00792	37.5					<0.00004	0.00015	0.00005	0.00009	0.00005	
OW15-91	Apr-06		0.4	<0.05	0.003	39.9					<0.0005	<0.001	<0.0005	<0.0005	<0.0005	
OW15-91	Nov-06		0.32	<0.05	0.008	48					<0.5	<1	<0.5	<0.5	<0.5	
OW15-91	Apr-07		0.22	<0.05	0.006	41.1					<0.5	<1	<0.5	<0.5	<0.5	
OW15-91	Nov-07		0.27	<0.05	0.008	60					<0.5	<1	<0.5	<0.5	<0.5	
OW15-91	Apr-08		0.39	<0.05	0.007	53					<0.5	<1	<0.5	<0.5	<0.5	
OW15-91	Nov-08		-	-	-	-					-	-	-	-	-	
OW15-91	Apr-09		0.304	<0.050	0.104	47.2					<0.50	<1.0	<0.50	<0.50	<0.50	
OW15-91	Nov-09		0.374	<0.050	0.0480	50.3					<0.50	<1.0	<0.50	<0.50	<0.50	
OW15-91	Mar-10		0.383	0.19	0.0298	43.0					<0.50	<1.0	<0.50	<0.50	<0.50	
OW15-91	Nov-10		0.408	0.329	0.0445	062					<0.50	<1.0	<0.50	1.07	<0.50	
OW15-91	Nov-10	D	0.475	0.405	0.0516	65.8					<0.50	<1.0	<0.50	1.02	<0.50	
OW15-91	Mar-11		0.308	<0.050	0.0089	46.2					<0.50	<1.0	<0.50	<0.50	<0.50	
OW15-91	Dec-11		0.517	0.099	0.0097	57.5					<0.50	<1.0	<0.50	<0.50	<0.50	
OW15-91	Apr-12		0.254	0.122	0.0054	40.6					<0.50	<1.0	<0.50	<0.50	<0.50	
OW15-91	Nov-12		0.537	0.123	0.0076	66.8					<0.50	<1.0	<0.50	<0.50	<0.50	
OW15-91	May-13															
OW15-91	Oct-13		0.375	0.051	0.042	66.3					<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW15-91	Jun-14		0.337	0.404	0.025	52.4					<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW15-91	Jun-14	D														
OW15-91	Nov-14		0.393	0.226	0.040	56.2					<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW15-91	May-15		0.379	0.364	0.026	54.1					<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW15-91	Sep-15		0.350	0.313	0.020	60.5					<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW15-91	Apr-16		0.329	0.403	0.034	60.8	<0.25	<0.25	0.16	0.25	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW15-91	Oct-16		0.566	0.501	0.070	63.4	<0.25	<0.25	0.25	0.40	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW15-91	Oct-16	D	0.561	0.5	0.068	64.1	<0.25	<0.25	0.24	0.56						
OW15-91	Apr-17		0.392	0.498	0.045	64.8	<0.25	<0.25	0.14	0.37	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW15-91	Sep-17		0.608	0.634	0.039	71.9	<0.25	<0.25	0.18	0.37	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW15-91	May-18		0.677	0.12	0.014	64.1					<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW15-91	Oct-18		0.612	<0.01	0.026	57.4			<0.02	<0.10	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW15-91	May-19		0.619	<0.01	0.005	54	0.2	<0.05	0.09	<0.10	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW15-91	Oct-19		0.910	<0.010	0.017	60.9	0.11	<0.05	<0.02	<0.10	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW15-91	May-20		0.550	0.013	0.009	56.6	0.12	<0.05	<0.02	<0.10	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW15-91	Oct-20		0.927	0.035	0.020	58.7	0.13	<0.05	<0.02	<0.10	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW15-91	Jun-21		0.770	<0.010	0.009	51.6	0.06	<0.05	0.04	0.64	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW15-91	Nov-21		0.537	0.012	0.035	46	0.07	<0.05	0.14	0.15	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
Minimum			0.2	0.0	0.003	37.5	0.1		0.09	0.3				0.0		
Maximum			0.9	0.6	0.104	71.9	0.2		0.25	0.6				1.1		
Average			0.4	0.2	0.024	53.8	0.1		0.15	0.4				0.5		

Well	Sampling Date	Notes	Calcium		Chloride		Hardness	Phenols		Field pH	Field Conductivity	Magnesium	DOC		Alkalinity	Sulphate	Boron	Iron	Manganese	Sodium	Nitrate	Nitrite	Ammonia	TKN	Benzene	m,p-Xylene	Ethylbenzene	Toluene	o-Xylene	Xylene Mixture (Total)
CRA Units (1981 - 2012)			mg/L		mg/L		mg/L	µg/L			µS/cm	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L					mg/L	mg/L	mg/L	mg/L	mg/L	
Burnside Units (2013 -)			mg/L		mg/L		mg/L	mg/L			µS/cm	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
OW17-91	Dec-91		100		8.35		516	<1		7.97	643	72.1	<0.5																	
OW17-91	Feb-92		64.1		6.3		412	<1.0		8.91	568	61	1.2																	
OW17-91	May-92		72.9		5.6		444	<1.0		8.76	493	63.6	1.2																	
OW17-91	Aug-92		74.6		5.2		447	1.0		7.87	1340	63.3	1.4																	
OW17-91	Nov-92		101		5.6		555	<1.0		7.76	695	73.2	1.0																	
OW17-91	Feb-93		95.7		7.4		519	<1.0		7.59	550	68.1	<0.5																	
OW17-91	May-93		95.7		5.73		531	<1.0		7.70	840	70.9	4.3	U																
OW17-91	Aug-93		98.6		4.48		531	<1.0		7.80	900	69.1	<0.5																	
OW17-91	Apr-94		89.4		4.49		488	<1.0		7.50	900	64.2	<0.5																	
OW17-91	Sep-94		78.8		2.88		439	<2.0		8.30	800	58.8	<0.5																	
OW17-91	Apr-95		52.7		17.1		330	<1.0		7.70	500	48.3	13	U																
OW17-91	Sep-95		65.2		6.28		374	<1.0		7.60	700	51.3	42.4	U																
OW17-91	Apr-96		36.3		1.19		222	<1.0		7.89	569	31.9	<0.5																	
OW17-91	Sep-96		70.8		10.5		408	<1.0		7.91	707	56.1	5.5																	
OW17-91	Apr-97		35.5		1.20		229	<1.0		8.40	500	34	<0.5																	
OW17-91	Sep-97		46.9		1.48		284	<1.0		8.40	500	40.5	0.8																	
OW17-91	Apr-98		36.8		1.17		222	<1.0		7.76	461	31.5	1.8																	
OW17-91	Sep-98		44.4		1.73		257	<1.0		7.81	406	35.5	1.1																	
OW17-91	Apr-99		41.1		5.88		240	<1.0		7.70	546	33.3	1																	
OW17-91	Sep-99		79.4		37.8		443	<1.0		7.6	940	59.5	3.4	U																
OW17-91	Apr-00		90.8		28.8		505	<2.0		7.55	882	67.6	2.6	U																
OW17-91	Sep-00		79.3		30.2		484	<2.0		7.49	828	69.4	4.9																	
OW17-91	Apr-01		88.8		44.5		513	<2.0		7.12	920	70.8	1.1																	
OW17-91	Sep-01		90.1		63.3		519	<1.0		7.49	865	71.3	2.8																	
OW17-91	Apr-02		106		65.5		614	<1.0		6.88	1170	84.9	2.1	U																
OW17-91	Apr-02	D	114		80.7		662	2	U	6.88	1170	91.7	2.4	U																
OW17-91	Sep-02		140		76		700	<1.0		6.43	647	85	5.2	U																
OW17-91	Apr-03		140		67.3		625	1		7.47	1040	96	4.3																	
OW17-91	Apr-03	D	130		64.4		627	1		7.47	1040	92	5.2																	
OW17-91	Sep-03	1	77		50		507	2		7.62	754	49	8.7																	
OW17-91	Apr-04	1	75.8		40.2		409	<2		7.66	853	53.4	<1.0																	
OW17-91	Apr-04	1	77.9		44.2		421	<2		7.65	865	54.9	<1.0																	
OW17-91	Sep-04		111		95.2		578	<2		8.00	940	73.2	<1.0																	
OW17-91	Apr-05		75		29.4		261	<2		7.33	560	18	19																	
OW17-91	Nov-05		101		120		493	<1.0		6.43	1,060	58.7	10																	
OW17-91	Apr-06		83.6		77		440	<1		8.13	970	55.4	10																	
OW17-91	Nov-06		sealed and abandoned September 11, 2006																											
OW21-91	Feb-92		57.6		55.9		347	<1.0		8.75	320	49.2	0.8																	
OW21-91	May-92		20.2		22.2		191	1.0		8.92	392	34.0	1.4																	
OW21-91	Aug-92		31.2		21.3		222	2.0		8.53	1050	34.8	1.8																	
OW21-91	Nov-92		50.4		43.4		271	3.5		7.85	430	35.2	2.3																	
OW21-91	Feb-93		41		50.6		269	<1.0		8.11	430	40.4	3.0																	
OW21-91	May-93		33.2		27.4		241	<1.0		8.50	560	38.5	4.9	U																
OW21-91	Aug-93		38.8		25		260	<1.0		8.20	600	39.7	<0.5																	
OW21-91	Apr-94		27.0		42.3		218	<1.0		8.40	500	36.7	<0.5																	
OW21-91	Sep-94		28.8		12.6		214	<2.0		8.90	500	34.4	<0.5																	
OW21-91	Apr-95		24.8		11.7		164	<1.0		8.30	400	39.2	13.5	U																
OW21-91	Sep-95		42.9		5.05		278	<1.0		8.10	500	41.4	11.4	U																

Well	Sampling Date	Notes	Calcium		Chloride		Hardness	Phenols		Field pH	Field Conductivity	Magnesium	DOC		Alkalinity	Sulphate	Boron	Iron	Manganese	Sodium	Nitrate	Nitrite	Ammonia	TKN	Benzene	m,p-Xylene	Ethylbenzene	Toluene	o-Xylene	Xylene Mixture (Total)
CRA Units (1981 - 2012)			mg/L		mg/L		mg/L	µg/L			µS/cm	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L					mg/L	mg/L	mg/L	mg/L	mg/L	
Burnside Units (2013 -)			mg/L		mg/L		mg/L	mg/L			µS/cm	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
OW21-91	Apr-96		15.9		29.4		188	<1.0		8.84	582	35.9	<0.5																	
OW21-91	Sep-96		33.2		16.3		246	<1.0		8.31	528	39.7	6.5																	
OW21-91	Apr-97		30.7		29.8		285	3		9.10	60	50.5	1.0																	
OW21-91	Sep-97		29		29.6		250	<1.0		7.70	800	43.1	0.8																	
OW21-91	Apr-98		21.4		24.4		197	<1.0		8.54	521	34.9	5.2																	
OW21-91	Sep-98		33.2		13.6		256	<1.0		8.28	473	42.0	0.7																	
OW21-91	Apr-99		67.2		123		340	<1.0		8.91	1010	41.8	3.0																	
OW21-91	Sep-99		48		183		401	<1.0		8.02	1400	68.3	6.8																	
OW21-91	Apr-00		79.6		145		447	<2.0		8.13	1310	60.3	1.8	U																
OW21-91	Sep-00		77.7		122		459	<2.0		7.83	1220	64.4	3.8																	
OW21-91	Apr-01		77.7		121		418	<2.0		7.58	1070	54.4	1.7																	
OW21-91	Sep-01		88.5		189		510	<1.0		7.66	1300	70.1	3.5																	
OW21-91	Apr-02		84.1		140		446	<1.0		7.45	1190	57.4	3.3	U																
OW21-91	Sep-02		120		140		604	<1.0		6.80	930	74.0	4.9	U																
OW21-91	Apr-03		94		136		478	1.0		7.87	1220	59.0	3.8		260	194	0.074	0.22	0.0081	96					<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	
OW21-91	Sep-03	1	90		126		448	1.0		8.14	847	55.0	9.2		271	167	0.073	0.52	0.011	88					<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	
OW21-91	May-04	1	90		73.7		421	<2		7.88	1030	47.6	<1.0		-	-	-	-	-	-					-	-	-	-	-	
OW21-91	Sep-04		99.2		87.5		505	<2		8.50	1170	62.4	<1.0		270	272	0.015	0.038	<0.002	80.4					<0.00004	<0.0001	<0.00005	0.0004	<0.00004	
OW21-91	Apr-05		133		338		619	<2		7.61	1710	69.6	<1.0		200	169	0.05	0.325	0.033	112					<0.00004	<0.0001	<0.00005	<0.00004	<0.00004	
OW21-91	Nov-05		108		237		484	<1.0		7.22	1400	52.1	<1.0		215	171	0.0572	0.323	0.00838	110					0.00005	<0.0001	0.00006	0.00017	0.00004	
OW21-91	Apr-06		119		176		510	2	U	8.43	1320	52.1	1.0	U	280	197	0.18	0.17	0.005	106					<0.0005	<0.001	<0.0005	<0.0005	<0.0005	
OW21-91	Nov-06		113		145		500	1	U	7.20	1190	54.0	3.0		320	162	<0.05	<0.05	0.005	97					<0.5	<1	<0.5	<0.5	<0.5	
OW21-91	Apr-07		119		168		490	<1		7.60	1310	46.7	2.0		300	196	<0.05	<0.05	0.008	66					<0.5	<1	<0.5	<0.5	<0.5	
OW21-91	Nov-07		185		556		940	2	U	7.82	1430	115.0	2.0		250	273	0.06	<0.05	0.01	154					<0.5	<1	<0.5	<0.5	<0.5	
OW21-91	Apr-08		133		325		520	<1		7.92	1570	-	2.0		240	122	<0.05	<0.05	0.015	110					<0.5	<1	<0.5	<0.5	<0.5	
OW21-91	Nov-08		126		224		460	<1		7.11	1500	33.9	3.0		-	-	-	-	-	-					-	-	-	-	-	
OW21-91	Apr-09		119		291		483	<1		7.55	1550	45.1	2.9		275	165	<0.050	<0.050	0.0089	123					<0.50	<1.0	<0.50	<0.50	<0.50	
OW21-91	Nov-09		121		209		532	<1.0		7.86	1260	56.0	3.0		315	232	0.063	<0.050	0.0078	109					<0.50	<1.0	<0.50	<0.50	<0.50	
OW21-91	Mar-10		123		226		451	90		7.89	1620	34.7	2.8		297	172	<0.050	0.503	0.0107	094					<0.50	<1.0	<0.50	<0.50	<0.50	
OW21-91	Nov-10		126		229		619	8.0		7.36	1180	73.7	3.7		317	168	0.065	0.88	0.0217	152					<0.50	<1.0	<0.50	<0.50	<0.50	
OW21-91	Mar-11		96		201		423	1.7		8.16	1360	44.4	2.8		310	110	<0.050	<0.050	0.0049	96.6					<0.50	<1.0	<0.50	<0.50	<0.50	
OW21-91	Dec-11		117		72		398	<1.0		7.67	853	25.8	3.4		352	102	<0.050	<0.050	0.0020	58.2					<0.50	<1.0	<0.50	<0.50	<0.50	
OW21-91	Apr-12		167		379		666	<1.0		0.57	2050	60.5	3.0		271	266	<0.050	<0.050	0.0096	124					<0.50	<1.0	<0.50	<0.50	<0.50	
OW21-91	Nov-12		202		365		746	26		6.87	1810	58.7	3.3		294	189	<0.050	<0.050	<0.0010	146					<0.50	<1.0	<0.50	<0.50	<0.50	
OW21-91	Nov-12	D	185		364		693	5		6.87	1810	56.4	3.3		287	189	<0.050	<0.050	<0.0010	146					<0.50	<1.0	<0.50	<0.50	<0.50	
OW21-91	May-13		114		204		476	0.002		7.94	1373	46.5	3.5																	
OW21-91	Oct-13		136		317		533	0.022		7.17	1430	47.0	3.1		249	133	0.084	0.445	0.016	105					<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW21-91	Jun-14		101		228		483	0.005		7.97	1408	56.1	2.4		231	174	0.085	0.030	0.004	99.9					<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW21-91	Nov-14		125		224		455	<0.001		7.05	1630	34.6	3.7		232	93.1	0.161	0.162	0.007	55.6					<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW21-91	May-15		119		344		551	0.028		7.75	1232	61.7	2.7		206	183	0.114	0.226	0.005	104					<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW21-91	Sep-15		176		578		798	0.023		8.44	1525	87.1	2.8		193	191	0.167	0.253	0.005	128					<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW21-91	Apr-16		137		521		631	<0.001		7.83	1505	70.2	2.8		171	109	0.164	0.313	0.006	112	<0.5	<0.5	0.04	0.18	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW21-91	Oct-16		104		368		589	<0.001		6.91	1438	80.0	3.0		138	226	0.177	0.326	0.007	102	<0.25	<0.25	0.04	0.38	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW21-91	Apr-17		121		499		572	0.013		7.62	1577	65.5	2.7		125	130	0.211	0.246	0.007	140	<0.25	<0.25	<0.02	0.20	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW21-91	Sep-17		85.1		365		453	0.006		8.24	1271	58.4	3.5		155	160	0.215	0.053	0.004	131	<0.25	0.41	<0.02	0.18	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW21-91	May-18		72.4		257		402			8.78	991	53.7	2.5		173	163	0.209	0.08	0.003	116					<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW21-91	Oct-18		88.3		271		447	0.003		7.85	1282	54.9	3.0		210	122	0.237	<0.01	0.004	115			<0.02	0.15	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW21-91	May-19		71.2		299		406	<0.001		7.7	1200	55.4	2.6		213	110	0.166	<0.01	0.003	107	<0.25	1.96	<0.02	0.56	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW21-91	Oct-19		81.7		252		447	0.002		7.66	1138	58.9	2.2		243	152	0.216	<0.010	0.004	110	<0.25	<0.25	<0.02	<0.10	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW21-91	May-20		60.1		251		373	0.001		7.43	821	54.2	2.6		207	134	0.157	<0.010	0.002	107	<0.25	<0.25	<0.02	0.11	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW21-91	Oct-20		39.2		250		296	0.007		8.28	917	48.2	3.3		188	139	0.190	<0.010	0.003	100	<0.25	<0.25	<0.02	0.18	<0.40	<0.40	<0.20	<0.40	<0.20	<0.20
OW21-91	Jun-21		83.9		271		558	0.004		7.86	1672	84.6	2.3		216	115	0.147	0.012	<0.002	157	<0.05	<0.05	<0.02	0.14	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW21-91	Nov-21		64.7		278		381	0.075		8.14		53.3	3.0		234	117	0.139	<0.010	0.004	114	<0.05	<0.05	0.03	0.71	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
Minimum			15.9		5.1		164.0	0.0		0.6	60.0	25.8	0.0		125.0	93.1	0.0	0.0	0.0	55.6	0.0	0.4	0.0	0.2						
Maximum			202.0		578.0		940.0	90.0		9.1	2050.0	115.0	13.5		352.0	273.0	0.2	0.9	0.0	154.0	0.0	2.0	0.0	0.6						
Average			90.0		188.0		439.2	4.4		7.8	1104.4	52.4	3.1		244.9	172.5	0.1	0.2	0.0	108.7	0.0	1.2	0.0	0.3						

Well	Sampling Date	Notes	Calcium		Chloride		Hardness	Phenols		Field pH	Field Conductivity	Magnesium	DOC		Alkalinity	Sulphate	Boron	Iron	Manganese	Sodium	Nitrate	Nitrite	Ammonia	TKN	Benzene	m,p-Xylene	Ethylbenzene	Toluene	o-Xylene	Xylene Mixture (Total)
CRA Units (1981 - 2012)			mg/L		mg/L		mg/L	µg/L			µS/cm	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L					mg/L	mg/L	mg/L	mg/L	mg/L	
Burnside Units (2013 -)			mg/L		mg/L		mg/L	mg/L			µS/cm	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
OW25-91	Feb-92		30.4		3.5	U	194	<1.0		7.32	300	28.6	0.6																	
OW25-91	May-92		24.7		4.6		208	1.5		8.28	362	35.4	0.8																	
OW25-91	Aug-92		29.7		4.2		221	1.5		7.71	760	35.5	1.1																	
OW25-91	Nov-92		39.7		4.3		257	<1.0		7.98	340	38.2	0.6																	
OW25-91	Feb-93		48.7		5.96		288	<1.0		7.85	305	40.3	<0.5																	
OW25-91	May-93		42.4		5.87		250	<1.0		7.90	440	35	2.1	U																
OW25-91	Aug-93		33.8		4.28		221	<1.0		8.20	400	33.2	<0.5																	
OW25-91	Apr-94		43.9		4.60		297	<1.0		7.70	500	45.6	<0.5																	
OW25-91	Sep-94		41.0		2.78		266	<2.0		8.50	500	39.8	<0.5																	
OW25-91	Apr-95		90.6		3.15		509	<1.0		7.40	700	68.6	15.5																	
OW25-91	Sep-95		67.4		4.44		437	<1.0		7.70	600	65.2	81	U																
OW25-91	Apr-96		36.3		8.84		222	<1.0		7.59	787	31.9	<5.0																	
OW25-91	Sep-96		91.5		6.6		448	<1.0		8.50	602	53.3	6																	
OW25-91	Apr-97		43.5		5.07		338	<1.0		8.40	800	55.6	1.8																	
OW25-91	Sep-97		74.3		1.58		401	<1.0		8.70	500	52.4	1.7																	
OW25-91	Apr-98		87.2		5.3		417	<1.0		7.30	704	48.3	0.9																	
OW25-91	Sep-98		91.6		4.99		469	<1.0		7.50	602	58.4	<0.5																	
OW25-91	Apr-99		121		7.01		511	<1.0		7.28	749	50.8	2.4																	
OW25-91	Sep-99		48.8		5.82		438	<1.0		7.24	843	46.3	3.6	U																
OW25-91	Apr-00		123		7.09		527	<2.0		7.50	821	53.4	4.1																	
OW25-91	Sep-00		125		8.51		527	<2.0		7.34	808	52.1	2.1																	
OW25-91	Apr-01		126		17.9		494	<2.0		6.96	741	43.6	1.1																	
OW25-91	Sep-01		103		9.2		448	<1.0		7.29	708	46.3	1.2																	
OW25-91	Apr-02		95.6		9.7		395	<1.0		6.79	695	37.9	3.7	J,U																
OW25-91	Sep-02		110		8		456	2	U	6.64	505	44	3.3	U																
OW25-91	Apr-03		110		8.8		400	1		7.44	687	42	6.7																	
OW25-91	Sep-03	1	81		7.3		394	1		7.62	471	29	6.3																	
OW25-91	May-04		99.8		6.3		395	<2		7.42	713	35.4	<1.0																	
OW25-91	Sep-04		91.7		6.26		369	<2		8.26	620	33.9	<1.0																	
OW25-91	Apr-05		94.7		6.46		381	<2		7.15	702	35.2	<1.0																	
OW25-91	Nov-05		91.4		6.88		366	<1		7.02	592	33.5	<1.0																	
OW25-91	Apr-06		90.9		7		390	<1		8.01	662	39.4	2	U																
OW25-91	Nov-06		100		7		400	1	U	7.22	689	37	2.0																	
OW25-91	Apr-07		85		5		330	<1		7.33	612	29	<1.0																	
OW25-91	Nov-07		80		5		350	2	U	7.60	642	37	<1.0																	
OW25-91	Apr-08		90.7		5		360	<1		7.13	680	-	<1.0																	
OW25-91	Nov-08		100		12		400	<1		6.72	699	36.6	<1.0																	
OW25-91	Apr-09		94		6.7		359	<1		7.29	641	30.3	1.7																	
OW25-91	Nov-09		86.1		4.9		355	<1.0		7.46	748	34.1	2.2																	
OW25-91	Mar-10		97.0		5.2		358	<1.0		7.66	730	28.1	1.7																	
OW25-91	Nov-10		87.6		5.0		373	<1.0		6.73	502	37.6	2.5																	
OW25-91	Mar-11		94		5.0		373	<1.0		7.82	748	33.7	2.0																	
OW25-91	Dec-11		123		7.3		449	<1.0		7.48	719	34.2	2.0																	
OW25-91	Apr-12		97.7		6.7		368	1.7		7.23	720	30.1	1.1																	
OW25-91	Nov-12		106		6.8		410	<1.0		6.69	587	35.4	1.1																	
OW25-91	May-13		196		8.84		706	<0.001		7.18	709	52.5	1.9																	
OW25-91	Oct-13		104		7.30		383	0.002		7.33	678	30.0	1.3																	
OW25-91	Jun-14		94.5		7.85		368	<0.001		7.24	684	32.1	1.1																	
OW25-91	Nov-14		89.8		8.31		352	<0.001		7.09	640	31.0	2.4																	
OW25-91	Nov-14	D	90.8		8.15		353	<0.001				30.7	1.8																	
OW25-91	May-15		70.5		7.37		302	<0.001		7.05	666	30.5	1.3																	
OW25-91	Sep-15		88.9		8.42		354	<0.001		7.39	656	32.1	1.2																	

Well	Sampling Date	Notes	Calcium		Chloride		Hardness	Phenols		Field pH	Field Conductivity	Magnesium	DOC		Alkalinity	Sulphate	Boron	Iron	Manganese	Sodium	Nitrate	Nitrite	Ammonia	TKN	Benzene	m,p-Xylene	Ethylbenzene	Toluene	o-Xylene	Xylene Mixture (Total)
CRA Units (1981 - 2012)			mg/L		mg/L		mg/L	µg/L			µS/cm	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L					mg/L	mg/L	mg/L	mg/L	mg/L	
Burnside Units (2013 -)			mg/L		mg/L		mg/L	mg/L			µS/cm	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
OW25-91	Apr-16		92.3		8.57		356	<0.001		7.34	553	30.6	1.7		320	74.3	0.044	0.696	0.045	8.91	<0.10	<0.10	0.13	0.16	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW25-91	Oct-16		81.5		7.32		331	<0.001		7.50	508	30.9	3.0		288	71.5	0.064	0.705	0.039	10.7	<0.25	<0.25	0.11	0.45	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW25-91	Apr-17		94.4		8.24		363	<0.001		7.30	555	30.9	1.7		320	72.1	0.052	1.01	0.038	8.07	<0.05	<0.05	0.03	0.18	<0.20	<0.20	<0.10	0.26	<0.10	<0.20
OW25-91	Sep-17		79.0		8.04		329	<0.001		7.61	493	31.9	1.4		301	73.2	0.066	0.668	0.039	12.3	<0.25	<0.25	0.05	0.19	<0.20	<0.20	<0.10	0.41	<0.10	<0.20
OW25-91	Sep-17	D	78.2		7.39		325	<0.001				31.6	1.5		299	72.9	0.064	0.656	0.04	12.1	<0.25	<0.25	0.05	0.24						
OW25-91	May-18		86.0		9.21		344			7.73	529	31.5	1.3																	
OW25-91	Oct-18		75.4		6.51		309	<0.001		7.56	270.5	29.4	1.2		252	69.4	0.077	<0.01	0.041	13.1			<0.02	0.13	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW25-91	May-19		89.3		10.9		334	<0.001		7.13	649	26.9	1.1		268	95.8	0.043	<0.01	0.041	7.58	<0.25	<0.25	<0.02	<0.10	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW25-91	Oct-19		66.1		7.44		291	<0.001		7.40	476	30.7	1.3		269	73.9	0.101	<0.010	0.026	14.1	<0.05	<0.05	0.05	<0.10	<0.20	<0.20	0.11	0.43	<0.10	<0.20
OW25-91	May-20		94.2		10.9		349	<0.001		7.21	736	27.6	1.6		302	80.6	0.043	<0.010	0.03	7.99	<0.10	<0.10	<0.02	0.16	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW25-91	Oct-20		63.0		7.92		278	0.038		7.80	426.8	29.2	2.9		264	78.2	0.098	0.015	0.051	15.3	<0.05	<0.05	<0.02	0.24	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW25-91	Jun-21		NA																											
OW25-91	Nov-21		74.2		9.01		306	0.063		7.68		29.4	1.3		284	69.5	0.065	<0.010	0.025	11.7	<0.05	<0.05	0.09	0.71	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
Minimum			24.7		1.6		194.0	0.0		6.6	270.5	26.9	0.5		252.0	69.4	0.043	0.66	0.0	7.6	0.1	0.1	0.0	0.1				0.3		
Maximum			196.0		17.9		706.0	2.0		8.7	843.0	68.6	81.0		320.0	95.8	0.101	1.01	0.0	14.1	0.3	0.3	0.1	0.5				0.4		
Average			84.4		6.7		372.8	0.6		7.5	617.1	38.7	3.4		296.7	72.2	0.061	0.75	0.0	10.9	0.2	0.2	0.1	0.2				0.3		
OW32-96	Sep-96		60.2		110		378	<1.0		7.93	811	55.2	2.25																	
OW32-96	Apr-97		38.5		43.6		278	8		8.40	400	44.1	0.8																	
OW32-96	Sep-97		49.9		69.1		342	<1.0		8.60	600	52.9	0.8																	
OW32-96	Apr-98		40.6		53.2		275	<1.0		7.75	579	42.1	2.6																	
OW32-96	Sep-98		48.7		44		316	<1.0		7.79	500	47.3	0.9																	
OW32-96	Apr-99		40.8		33.1		267	<1.0		7.8	470	40.0	1.4																	
OW32-96	Sep-99		35.9		>12.0	J,U	230	<1.0		7.73	516	34.1	5.1	J,U																
OW32-96	Sep-99	D	35.5		41	J,U	229	<1.0		7.73	516	34.0	2.8	J,U																
OW32-96	Apr-00		59.4		31.4		331	<2.0		7.69	518	44.5	2.3	U																
OW32-96	Sep-00		45.1		32.3		287	<2.0		7.72	495	42.4	1.9																	
OW32-96	Apr-01		42.7		39.6		264	<2.0		7.37	511	38.3	<0.5																	
OW32-96	Sep-01		46		38.1		303	<1.0		7.67	549	45.6	1.2																	
OW32-96	Apr-02		33.1		15.2		221	<1.0		7.29	445	33.7	5.2	U																
OW32-96	Sep-02		45		38		310	2	U	6.90	392	48.0	2.4	U																
OW32-96	Apr-03		46		44.8		286	1.0		7.71	558	45.0	1.8		257	15.4	0.2	<0.0055	0.025	30					<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	
OW32-96	Sep-03	1	38		16.4		239	1.0		8.19	334	32.0	7.7		234	11.2	0.098	<0.0055	0.014	19					<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	
OW32-96	May-04	1	41.7		51.1		271	<2		7.91	618	40.6	<1.0		-	-	-	-	-	-					-	-	-	-	-	
OW32-96	Sep-04		35.7		25.0		217	<2		8.08	405	31.1	<1.0		224	10.9	0.078	0.118	0.003	18.4					<0.00004	<0.0001	<0.00005	0.0004	<0.00004	
OW32-96	Apr-05		35.5		14.7		219	<2		7.63	451	31.6	<1.0		220	7.38	0.115	0.089	0.012	18.4					<0.00004	<0.0001	<0.00005	<0.00004	<0.00004	
OW32-96	Nov-05		36.9		24.7		225	<1		7.37	400	32.2	<1.0		219	8.42	0.256	0.132	0.00787	20.1					<0.00004	<0.00004	<0.00005	0.00006	<0.00004	
OW32-96	Apr-06		39.3		18		250	<1		8.67	456	37.5	1.0	U	230	9	0.34	<0.05	0.007	24.3					<0.0005	<0.001	<0.0005	<0.0005	<0.0005	
OW32-96	Nov-06		38		19		250	2	U	7.35	462	37.0	1.0		230	8	0.1	<0.05	0.009	23					<0.5	<1	<0.5	<0.5	<0.5	
OW32-96	Apr-07		31		20		190	<1		7.86	397	27.3	2.0		220	8	0.06	<0.05	0.003	16.7					<0.5	<1	<0.5	<0.5	<0.5	
OW32-96	Nov-07		36		21		230	2	U	8.00	482	33.7	<1.0		230	8	0.08	<0.05	0.006	22.3					<0.5	<1	<0.5	<0.5	<0.5	
OW32-96	Apr-08		37.6		37		240	1		7.78	494	-	<1.0		240	9	0.17	<0.05	<0.001	22.4					<0.5	<1	<0.5	<0.5	<0.5	
OW32-96	Nov-08		59.4		9		270	45		7.00	551	28.8	1.0		-	-	-	-	-	-					-	-	-	-	-	
OW32-96	Apr-09		35.9		29.6		214	<1		7.78	462	30.3	1.4		238	7.9	0.109	<0.050	<0.0010	18					<0.50	<1.0	<0.50	<0.50	<0.50	
OW32-96	Nov-09		39.0		30.0		235	6.0		7.65	543	33.4	1.5		233	7.6	0.104	<0.050	0.0037	19.3					<0.50	<1.0	<0.50	<0.50	<0.50	
OW32-96	Mar-10		37.8		36.4		215	<1.0		7.97	554	29.2	3.2		233	7.5	0.126	<0.050	0.0019	18.4					<0.50	<1.0	<0.50	<0.50	<0.50	
OW32-96	Nov-10		36.0		25.8		228	<1.0		6.80	439	33.5	1.4		236	7	0.078	<0.050	0.0019	19.4					<0.50	<1.0	<0.50	<0.50	<0.50	
OW32-96	Mar-11		38.6		30.9		232	<1.0		8.12	544	32.9	1.8		247	6.4	0.087	<0.050	<0.0010	17.6					<0.50	<1.0	<0.50	<0.50	<0.50	
OW32-96	Dec-11		55.0		28.0		280	<1.0		7.91	491	34.6	1.2		192	5.9	0.078	<0.050	0.0036	18.50					<0.50	<1.0	<0.50	<0.50	<0.50	
OW32-96	Apr-12		49.7		40.2		256	<1.0		7.80	531	32.0	<1.0		232	7.1	0.076	<0.050	<0.0010	18.70					<0.50	<1.0	<0.50	<0.50	<0.50	
OW32-96	Nov-12		54.0		33.4		271	<1.0		6.91	404	33.1	1.2		245	6.2	0.071	<0.050	0.0027	17.50					<0.50	<1.0	<0.50	<0.50	<0.50	
OW32-96	May-13		51.7		46.6		287	<0.001		7.66	629	38.3	1.0																	
OW32-96	Oct-13		41.0		39.0		243	<0.001		7.71	531	34.1	1.3		230	7.76	0.216	0.233	0.023	19.9					<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW32-96	Oct-13	D	42.3		42.8		252	<0.001				35.6	0.9																	

Historical Groundwater Chemistry - St. Mary's Landfill

Well	Sampling Date	Notes	Calcium	Chloride	Hardness	Phenols		Field pH	Field Conductivity	Magnesium	DOC		Alkalinity	Sulphate	Boron	Iron	Manganese	Sodium	Nitrate	Nitrite	Ammonia	TKN	Benzene	m,p-Xylene	Ethylbenzene	Toluene	o-Xylene	Xylene Mixture (Total)
CRA Units (1981 - 2012)			mg/L	mg/L	mg/L	µg/L			µS/cm	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L					mg/L	mg/L	mg/L	mg/L	mg/L	
Burnside Units (2013 -)			mg/L	mg/L	mg/L	mg/L			µS/cm	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
OW32-96	Jun-14		40.7	42.0	249	<0.001		7.63	552	35.7	0.8		223	7.98	0.135	<0.010	0.006	20.3					<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW32-96	Nov-14		39.6	42.0	239	<0.001		7.67	517	34.1	1.8		221	8.09	0.179	0.025	0.014	19.2					<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW32-96	May-15		41.0	49.7	245	<0.001		7.45	563	34.6	0.9		230	8.55	0.126	<0.010	0.007	22.2					<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW32-96	Sep-15		43.0	56.9	258	<0.001		7.94	446	36.5	0.8		221	9.48	0.116	0.064	0.018	22.1					<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW32-96	Sep-15	D	42.0	53.2	253	<0.001				35.9	0.7																	
OW32-96	Apr-16		40.3	50.3	243	<0.001		8.24	466	34.6	1.0		235	9.14	0.132	0.058	0.012	19.6	0.12	<0.10	0.03	0.16	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW32-96	Oct-16		39.9	46.9	241	<0.001		NA	NA	34.4	2.9		225	8.93	0.092	0.013	0.006	19.2	<0.25	<0.25	0.13	0.46	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW32-96	Apr-17		49.4	143	325	<0.001		7.58	716	48.9	0.8		247	11.6	0.095	0.045	0.003	42.7	<0.25	<0.25	<0.02	0.11	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW32-96	Apr-17	D	52.2	150	333	<0.001				49.1	0.8		246	12.3	0.098	0.038	0.003	43.3	<0.25	<0.25	<0.02	<0.10						
OW32-96	Sep-17		40.6	66.1	256	<0.001		7.91	459	37.5	1.1		239	10.0	0.079	<0.010	0.009	24.1	<0.25	<0.25	0.12	0.22	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW32-96	May-18		52.3	160.0	335			8.00	612	49.7	1.3		226	12.6	0.232	1.24	0.065	52.7					<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW32-96	Oct-18		43.5	75.5	259	<0.001		7.81	645	36.5	0.9		203	10.8	0.093	<0.01	<0.002	27.6			<0.02	<0.10	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW32-96	May-19		41.5	71.4	252	<0.001		7.48	533	36.1	0.7		224	12.6	0.102	<0.010	<0.002	23	0.3	<0.05	<0.02	0.23	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW32-96	Oct-19		44.9	92.8	272	<0.001		7.29	557	38.9	1.5		230	10.7	0.151	<0.010	0.025	31.9	0.19	<0.10	0.15	<0.10	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW32-96	May-20		41.0	65.7	244	<0.001		7.49	653	34.4	1.1		224	10.9	0.086	<0.010	<0.002	21.2	0.12	<0.10	<0.02	<0.10	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW32-96	Oct-20		38.5	77.0	240	0.007		7.74	459.4	34.9	1.8		230	14.4	0.142	0.017	0.042	27.7	0.14	<0.10	0.2	0.31	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW32-96	Jun-21		43.2	64.4	264	0.004		7.60	7.05	37.9	0.7		225	10.9	0.1	<0.010	0.003	20.6	0.28	<0.05	<0.02	0.19	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW32-96	Nov-21		41.7	68.5	255	0.016		7.88		36.7	0.8		223	10.0	0.098	<0.010	<0.002	21.1	0.18	<0.05	<0.02	0.79	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
Minimum			31.4	9.0	190.0	0.0		6.8	334.0	27.3	0.3		192.0	5.9	0.060	0.00	0.0	16.7	0.1	0.0	0.0	0.05						
Maximum			60.2	160.0	378.0	45.0		8.7	811.0	55.2	7.7		257.0	15.4	0.340	1.24	0.1	52.7	0.3	0.0	0.1	0.46						
Average			42.9	47.4	262.6	2.4		7.7	512.9	37.8	1.6		230.0	9.1	0.127	0.11	0.0	23.4	0.2	0.0	0.1	0.18						
OW33-96	Sep-96		54.7	36.3	248	<1.0		8.17	504	27.2	7.0																	
OW33-96	Apr-97		18.9	7.73	101	<1.0		8.80	300	13.0	2.6																	
OW33-96	Sep-97		23.3	4.85	131	<1.0		8.60	300	17.8	2.6																	
OW33-96	Apr-98		19.7	5.24	106	<1.0		8.00	309	13.8	2.6																	
OW33-96	Sep-98		24.7	4.37	127	<1.0		8.07	266	24.7	0.9																	
OW33-96	Sep-98	D	24.5	4.37	125	<1.0		8.07	266	24.5	<0.5																	
OW33-96	Apr-99		24.9	5.31	128	<1.0		8.00	286	15.9	0.6																	
OW33-96	Sep-99		22.7	<0.10	113	<1.0		7.80	417	13.6	5.2	U																
OW33-96	Apr-00		25.7	2.83	135	<2.0		7.90	333	17.3	1.2	U																
OW33-96	Sep-00		25.4	3.39	133	<2.0		7.97	329	17.0	2.8																	
OW33-96	Apr-01		23.2	<3.0	128	<2.0		7.54	308	17.0	<0.5																	
OW33-96	Sep-01		25.7	<3.0	136	<1.0		8.08	338	17.5	1.0																	
OW33-96	Apr-02		21.5	<3.0	115	<1.0		7.45	334	15.0	1.3																	
OW33-96	Sep-02		28.0	2.9	148	8		5.82	261	19.0	3.3	U																
OW33-96	Apr-03		25.0	4.65	133	1		8.01	347	18.0	1.5																	
OW33-96	Sep-03	1	20.0	4.65	131	1		8.19	234	13.0	8.1																	
OW33-96	May-04	1	23.1	3.43	123	<2		8.04	357	15.9	<1.0																	
OW33-96	Sep-04		24.5	6.71	25.3	<2		8.21	322	16.0	<1.0																	
OW33-96	Apr-05		23.4	4.38	124	<2		7.22	348	16.0	<1.0																	
OW33-96	Nov-05		24.3	5.49	126	<1.0		7.42	308	15.9	<1.0																	
OW33-96	Apr-06		24.3	8	140	1	U	8.83	364	18.1	1	U																
OW33-96	Nov-06		25.0	11	140	<1		7.41	383	19.0	2																	
OW33-96	Apr-07		22.8	16	120	<1		7.98	379	15.5	2																	
OW33-96	Nov-07		29.9	17	160	3	U	8.11	443	20.7	<1.0																	
OW33-96	Apr-08		27.0	23	140	<1		7.86	465	-	<1.0																	
OW33-96	Nov-08		28.7	24	140	<1		7.32	456	17.0	2																	
OW33-96	Apr-09		24.5	27.1	130	<1		7.76	431	16.6	1.8																	
OW33-96	Nov-09		28.1	19.1	144	1.0		7.73	491	18.1	1.9																	
OW33-96	Mar-10		25.9	20.6	125	<1.0		8.05	492	14.8	2.1																	
OW33-96	Nov-10		26.3	20.6	140	<1.0		6.92	352	18.1	1.1																	
OW33-96	Mar-11		25.7	30.0	134	<1.0		8.23	506	17.1	1.7																	
OW33-96	Dec-11		38.2	32.5	171	<1.0		7.96	522	18.5	2.6																	
OW33-96	Apr-12		34.3	34.7	154	1.5		7.85	532	16.6	1.2																	
OW33-96	Nov-12		40.6	27.0	182	<1.0		7.13	385	19.6	1.2																	
OW33-96	May-13		156	33.8	565	<0.001		7.72	496	42.6	1.8																	
OW33-96	Oct-13		29.3	31.4	155	<0.001		8.02	501	19.9	1.4																	

GM BluePlan ENGINEERING

Well	Sampling Date	Notes	Calcium		Chloride		Hardness	Phenols		Field pH	Field Conductivity	Magnesium	DOC		Alkalinity	Sulphate	Boron	Iron	Manganese	Sodium	Nitrate	Nitrite	Ammonia	TKN	Benzene	m,p-Xylene	Ethylbenzene	Toluene	o-Xylene	Xylene Mixture (Total)
CRA Units (1981 - 2012)			mg/L		mg/L		mg/L	µg/L			µS/cm	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L					mg/L	mg/L	mg/L	mg/L	mg/L	
Burnside Units (2013 -)			mg/L		mg/L		mg/L	mg/L			µS/cm	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
OW33-96	Jun-14		30.8		36.4		171	<0.001		7.87	547	22.8	1.3																	
OW33-96	Nov-14		29.1		29.0		156	<0.001		8.01	486	20.3	1.6																	
OW33-96	May-15		29.6		32.8		159	<0.001		7.60	533	20.6	2.0																	
OW33-96	Sep-15		31.4		37.1		168	<0.001		7.76	506	21.8	1.2																	
OW33-96	Apr-16		32.2		41.2		174	<0.001		8.02	448	22.7	2.1		234	21.2	0.253	<0.010	0.022	50.4	0.14	<0.10	0.12	0.19	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW33-96	Oct-16		29.7		33.5		161	<0.001		8.62	433	21.1	3.4		209	20.3	0.259	0.480	0.013	45.1	<0.25	<0.25	0.04	0.58	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW33-96	Apr-17		33.1		42.9		183	<0.001		7.76	468	24.3	1.4		223	26.3	0.249	0.082	0.008	50	<0.10	<0.10	<0.02	<0.10	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW33-96	Sep-17		30.1		35.9		165	<0.001		7.83	413	21.8	1.3		220	22.5	0.221	0.427	0.015	45.9	<0.05	<0.05	<0.02	0.11	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW33-96	May-18		32.1		41.1		178			8.24	430	23.8	1.4		210	22.4									<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW33-96	Oct-18		32.1		32.7		167	<0.001		7.90	219	21	1.2		184	19.8	0.224	<0.01	0.008	44.1			<0.02	<0.10	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW33-96	May-19		31.1		45.8		168	<0.001		7.66	491	22	1.1		212	22	0.241	<0.01	0.007	43.8	0.14	<0.05	0.09	0.32	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW33-96	Oct-19		31		38.7		167	<0.001		8.00	469	21.8	1.5		212	20	0.243	<0.010	0.015	43.9	0.06	<0.05	<0.02	<0.10	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW33-96	May-20		32.2		41.7		173	<0.001		7.67	511.4	22.4	1.5		215	19.3	0.205	<0.010	0.007	46.2	0.2	<0.05	0.03	0.13	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW33-96	Oct-20		25.4		39.1		145	0.004		8.03	354.6	19.8	2.9		217	19.3	0.264	0.043	<0.002	42.1	0.07	<0.05	<0.02	<0.10	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW33-96	Jun-21		31.9		41.2		176	0.004		7.69	544	23.4	1.3		219	19	0.205	<0.010	0.005	42.5	0.11	<0.05	0.09	0.47	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW33-96	Nov-21		31.8		42.6		177	0.045		7.95		23.6	1.3		217	20	0.217	<0.010	0.011	42.1	<0.05	<0.05	0.16	0.56	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
Minimum			18.9		2.8		25.3	0.0		5.8	219.0	13.0	0.0		184.0	19.8	0.221	0.1	0.007	43.8	0.06	0.0	0.0	0.1	0.0					
Maximum			156.0		45.8		565.0	8.0		8.8	547.0	42.6	8.1		234.0	26.3	0.259	0.5	0.022	50.4	0.14	0.0	0.1	0.6	0.0					
Average			30.5		21.1		151.9	0.9		7.9	398.1	19.2	1.8		213.0	21.8	0.241	0.2	0.013	45.0	0.11	0.0	0.0	0.2	0.0					
OW34-96	Sep-96		45.8		10.4		226	<1.0		8.04	455	27.0	3.0																	
OW34-96	Apr-97		33.9		10.1		218	<1.0		8.40	400	32.5	1.0																	
OW34-96	Sep-97		48.1		10		268	<1.0		8.40	400	36.0	<0.5																	
OW34-96	Apr-98		43.6		10.4		240	<1.0		7.81	487	31.9	1.8																	
OW34-96	Sep-98		49.8		6.86		270	<1.0		7.88	441	35.3	1.3																	
OW34-96	Apr-99		51.6		9.24		273	<1.0		7.8	463	34.9	1.7																	
OW34-96	Sep-99		42.9		8.9		228	<1.0		7.63	523	29.3	3.8	U																
OW34-96	Apr-00		56.2		10.9		301	<2.0		7.65	554	39.1	2.2	U																
OW34-96	Sep-00		51.6		12.2		289	<2.0		7.70	540	39.0	2.7																	
OW34-96	Apr-01		57.8		12.9		298	<2.0		7.33	535	37.2	1.0																	
OW34-96	Sep-01		53.6		11.2		301	<1.0		7.71	536	40.5	1.9																	
OW34-96	Apr-02		48.7		10.7		273	2	U	7.25	559	36.8	3.1	U																
OW34-96	Sep-02		62.0		12		332	1		5.64	429	43.0	2.1	U																
OW34-96	Apr-03		57.0		12.2		302	1.0		7.66	576	40.0	1.4		252	74.8	0.15	0.047	0.014	23					<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	
OW34-96	Sep-03	1	53.0		11.9		291	1.0		8.16	403	37.0	5.8		240	66.7	0.17	0.03	0.027	24					<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	
OW34-96	May-04	1	50.9		13.1		278	<2		7.84	584	36.5	<1.0		-	-	-	-	-	-					-	-	-	-	-	
OW34-96	Sep-04		49.1		17.5		269	<2		8.01	496	35.5	<1.0		228	91.1	0.116	0.14	0.015	23.3					<0.00004	<0.0001	<0.00005	0.0004	<0.00004	
OW34-96	Apr-05		51.6		13.4		280	<2		7.45	577	36.7	<1.0		234	79.5	0.119	0.125	0.011	23.1					<0.00004	<0.0002	<0.00006	<0.00004	<0.00005	
OW34-96	Nov-05		49.8		13.5		265	<1		7.33	484	34.2	<1.0		211	68.4	0.105	0.178	0.0075	22.9					<0.00004	<0.0001	<0.00005	0.00008	<0.00004	
OW34-96	Apr-06		54.2		13		300	3	U	8.57	563	39.2	1	U	200	80	0.22	0.06	0.003	22.9					<0.0005	<0.001	<0.0005	<0.0005	<0.0005	
OW34-96	Nov-06		53.0		13		300	2	U	7.23	571	40.0	1.0		230	79	0.11	<0.05	0.015	24					<0.5	<1	<0.5	<0.5	<0.5	
OW34-96	Apr-07		42.4		13		240	<1		7.80	505	31.5	2.0		210	79	0.09	<0.05	0.004	19.9					<0.5	<1	<0.5	<0.5	<0.5	
OW34-96	Nov-07		44.2		13		260	<1		7.94	562	37.5	<1.0		220	74	0.11	<0.05	0.022	28					<0.5	<1	<0.5	<0.5	<0.5	
OW34-96	Apr-08		54.1		13		290	2		7.59	592	-	<1.0		240	99	0.12	<0.05	0.005	22.7					<0.5	<1	<0.5	<0.5	<0.5	
OW34-96	Apr-08	D	55.2		13		310	2		7.59	592	-	<1.0		-	-	-	-	-	-					-	-	-	-	-	
OW34-96	Nov-08		61.0		19		320	<1		7.03	589	40.6	<1.0		-	-	-	-	-	-					-	-	-	-	-	
OW34-96	Nov-08	D	60.6		18		320	<1		7.03	589	40.5	<1.0		-	-	-	-	-	-					-	-	-	-	-	
OW34-96	Apr-09		53.6		13.3		279	<1		7.56	543	35.4	1.2		230	87.2	0.091	<0.05	0.0031	18.9					<0.50	<1.0	<0.50	<0.50	<0.50	
OW34-96	Apr-09		53.6		14.0		277	<1		7.56	543	34.8	1.6		232	87.3	0.093	<0.05	0.0031	18.9					<0.50	<1.0	<0.50	<0.50	<0.50	
OW34-96	Nov-09		51.4		14.4		276	2	J	7.71	652	35.9	1.4		229	83.6	0.097	<0.05	0.0174	20.7					<0.50	<1.0	<0.50	<0.50	<0.50	
OW34-96	Nov-09	D	51.4		14.5		278	12	J	7.71	652	36.4	<1.0		228	83.2	0.099	0.05	0.0186	20.7					<0.50	<1.0	<0.50	<0.50	<0.50	
OW34-96	Mar-10		50.6		13.5		248	<1.0		8.12	485	29.7	1.4		219	80.8	0.104	<0.05	0.0079	18.4					<0.50	<1.0	<0.50	<0.50	<0.50	
OW34-96	Mar-10	D	51.7		13.3		254	<1.0		8.12	485	30.4	1.4		212	81.0	0.107	<0.05	0.0085	19.2					<0.50	<1.0	<0.50	<0.50	<0.50	
OW34-96	Nov-10		53.0		13.8		302	<1.0		6.83	436	41.3	2		236	78.7	0.109	<0.050	0.025	026					<0.50	<1.0	<0.50	<0.50	<0.50	
OW34-96	Mar-11		56.0		15.5		293	<1.0		8.09	642	37.1	1.3		248	81.6	0.090	<0.050	0.0015	19.9					<0.50	<1.0	<0.50	<0.50	<0.50	
OW34-96	Mar-11	D	56.5		15.3		294	<1.0		8.08	642	37.3	1.2		252	81.5	0.092	<0.050	0.0014	19.4					<0.50	<1.0	<0.50	<0.50	<0.50	
OW34-96	Dec-11		65.8		15.6		311	<1.0		7.82	577	35.7	1.4		230	77.8	0.092	<0.050	0.0144	20.7					<0.50	<1.0	<0.50	<0.50	<0.50	
OW34-96	Apr-12		60.5		17.8		280	<1.0		7.63	595	31.4	1.3		228	83.4	0.067	<0.050	0.0038	18.4					<0.50	<1.0	<0.50	<0.50	<0.50	
OW34-96	Apr-12	D	61.1		17		283	<1.0		7.63	595	31.8	<1.0		214	81.9	0.068	<0.050	0.0042	18.5					<0.50	<1.0	<0.50	<0.50	<0.50	
OW34-96	Nov-12		73.5		15		333	<1.0		6.95	464	36.3	<1.0		237	82.1	0.096	<0.050	0.0142	22.1					<0.50	<1.0	<0.50	<0.50	<0.50	
OW34-96	May-13		116		16.6		503	<0.001		7.46	600	51.9	2.1																	
OW34-96	Oct-13		52.6		14.9		276	<0.001		7.70	590	35.2	1.1		226	84.1	0.095	<0.010	0.009	23.2					<0.20	<0.20	<0.10	<0.20	<0.10	<0.20

Well	Sampling Date	Notes	Calcium	Chloride	Hardness	Phenols		Field pH	Field Conductivity	Magnesium	DOC		Alkalinity	Sulphate	Boron	Iron	Manganese	Sodium	Nitrate	Nitrite	Ammonia	TKN	Benzene	m,p-Xylene	Ethylbenzene	Toluene	o-Xylene	Xylene Mixture (Total)
CRA Units (1981 - 2012)			mg/L	mg/L	mg/L	µg/L			µS/cm	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L					mg/L	mg/L	mg/L	mg/L	mg/L	
Burnside Units (2013 -)			mg/L	mg/L	mg/L	mg/L			µS/cm	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
OW34-96	Jun-14		54.5	17.5	293	<0.001		7.50	628	38.1	0.8		223	85.6	0.094	<0.010	0.004	22.7					<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW34-96	Nov-14		52.7	18.6	280	<0.001		7.68	587	36.1	1.3		220	90.5	0.107	<0.010	0.004	22.4					<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW34-96	May-15		52.2	18.6	276	<0.001		7.07	609	35.3	1.2		229	85.7	0.094	<0.010	0.003	22.9					<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW34-96	Sep-15		57.6	23.7	295	<0.001		7.49	626	36.8	0.8		222	91.6	0.089	<0.010	<0.002	22.1					<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW34-96	Apr-16		59.8	25.7	298	<0.001		7.72	515	36.1	1.2		243	95.7	0.084	<0.010	<0.002	19.9	<0.10	<0.10	0.05	0.18	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW34-96	Oct-16		49.5	17.1	266	<0.001		7.84	485	34.7	3.4		225	79.2	0.098	<0.010	0.003	21.9	<0.25	<0.25	0.05	0.28	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW34-96	Apr-17		58.4	18.9	309	<0.001		7.67	556	39.7	1.1		243	111	0.099	0.02	0.002	22.1	<0.10	<0.10	<0.02	<0.10	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW34-96	Sep-17		56.6	20.2	297	<0.001		7.70	509	37.7	1.5		239	105	0.082	<0.010	0.004	22.3	<0.25	<0.25	<0.02	0.11	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW34-96	May-18		sample missed or lost					7.94	463																			
OW34-96	Oct-18		55.3	18.9	259	<0.001		7.80	275.1	33.4	0.9		205	87.2	0.092	<0.01	<0.002	20.6			<0.02	<0.10	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW34-96	May-19		54.0	31.5	273	<0.001		7.49	577	33.5	0.8		219	83.6	0.096	<0.010	0.005	19.8	0.08	<0.05	<0.02	<0.10	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW34-96	Oct-19		49.7	22.0	264	<0.001		7.39	479	34	1.3		223	84.0	0.109	<0.010	0.007	22.4	<0.05	<0.05	<0.02	<0.10	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW34-96	May-20		57.8	26.8	289	<0.001		7.55	704	35.1	1.3		223	96.7	0.084	<0.010	<0.002	21.3	<0.10	<0.10	<0.02	0.13	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW34-96	Oct-20		38.6	21.5	215	0.005		7.90	421.3	28.8	1.7		334	92.2	0.099	0.017	<0.002	20.6	<0.25	<0.25	<0.02	0.12	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW34-96	Jun-21		56.7	25.5	295	0.009		7.76	652	37.2	0.7		231	89.5	0.078	0.018	0.002	20	<0.05	<0.05	<0.02	0.27	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW34-96	Nov-21		54.1	24.4	281	0.041		7.86		35.4	0.9		230	91.0	0.085	<0.010	<0.002	19.9	<0.05	<0.05	0.06	<0.10	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
Minimum			33.9	6.9	218.0	0.0		5.6	275.1	27.0	0.5		200.0	66.7	0.067	0.02	0.001	18.4			0.1	0.1						
Maximum			116.0	31.5	503.0	12.0		8.6	652.0	51.9	5.8		252.0	111.0	0.220	0.18	0.027	28.0			0.1	0.3						
Average			54.5	14.9	285.6	1.4		7.6	533.6	36.2	1.5		227.9	84.1	0.104	0.08	0.009	21.6			0.1	0.2						
OW32A-02	Apr-03		52.0	4.25	257	1.0		7.70	573	30.0	1.2		197	115	0.17	0.74	0.012	32					<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	
OW32A-02	Sep-03		26.0	4.5	209	<1.0		5.28	446	35.0	3.7	J,U	203	116	0.12	0.93	0.0092	24					<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	
OW32A-02	Sep-03	D	25.0	4.5	202	<1.0		5.28	446	34.0	2.2	J,U	-	-	-	-	-	-					-	-	-	-	-	
OW32A-02	May-04	1	45.1	1.87	217	<2		7.90	535	25.3	<1.0		-	-	-	-	-	-					-	-	-	-	-	
OW32A-02	Sep-04		49.1	4.77	226	<2		8.01	460	25.2	<1.0		196	94.5	0.124	0.179	0.008	28.7					<0.00004	<0.0001	<0.00005	0.0004	<0.00004	
OW32A-02	Apr-05		43.2	1.71	208	<2		7.47	514	24.4	<1.0		190	86.7	0.132	0.104	0.008	29.6					<0.00004	<0.0001	<0.00005	<0.00004	<0.00004	
OW32A-02	Nov-05		44.5	2.26	210	<1.0		7.30	446	23.9	<1.0		184	75.5	0.11	0.143	0.00668	29					<0.00004	<0.0001	<0.00005	0.00004	<0.00004	
OW32A-02	Apr-06		22.0	3.0	160	1.0	U	8.46	507	25.6	1	U	200	95	0.25	0.05	0.008	29					<0.0005	<0.001	<0.0005	<0.0005	<0.0005	
OW32A-02	Nov-06		46.0	3.0	230	1.0	U	7.25	521	29.0	2		200	91	0.14	<0.05	0.008	33					<0.5	<1	<0.5	<0.5	<0.5	
OW32A-02	Nov-06	D	47.0	4.0	240	1.0	U	7.25	521	29.0	1		210	91	0.14	0.05	0.009	33					<0.5	<1	<0.5	<0.5	<0.5	
OW32A-02	Apr-07		42.6	3.0	200	<1		7.72	468	22.8	1		190	103	0.1	<0.05	0.007	25.1					<0.5	<1.0	<0.5	<0.5	<0.5	
OW32A-02	Nov-07		46.6	3.0	230	2.0	U	7.92	528	27.1	<1.0		200	97	0.12	<0.05	0.011	34					<0.5	<1.0	<0.5	<0.5	<0.5	
OW32A-02	Apr-08		41.3	<2	190	2.0		7.61	473	-	<1.0		200	75	0.15	<0.05	0.007	28.8					<0.5	<1.0	<0.5	<0.5	<0.5	
OW32A-02	Nov-08		40.1	55	240	<1		7.21	447	35.2	<1.0		230	10	0.08	<0.05	0.007	19.2					<0.5	<1.0	<0.5	<0.5	<0.5	
OW32A-02	Apr-09		50.4	3.8	232	<1		7.65	515	25.8	1.7		205	111	0.126	<0.050	0.0092	26.5					<0.50	<1.0	<0.50	<0.50	<0.50	
OW32A-02	Nov-09		52.9	3.7	243	2.0		7.59	620	27.0	<1.0		215	112	0.130	<0.050	0.0111	29.1					<0.50	<1.0	<0.50	<0.50	<0.50	
OW32A-02	Mar-10		59.3	3.5	252	<1.0		7.99	612	25.3	2.1		198	115	<0.50	0.82	<0.010	26.6					<0.50	<1.0	<0.50	<0.50	<0.50	
OW32A-02	Nov-10		55.9	3.4	258	<1.0		6.80	439	28.8	1.3		211	108	<0.50	0.63	0.0110	31.1					<0.50	<1.0	<0.50	<0.50	<0.50	
OW32A-02	Mar-11		56.2	4.0	254	<1.0		8.06	607	27.5	2.2		215	108	0.133	<0.050	0.0085	29.8					<0.50	<1.0	<0.50	<0.50	<0.50	
OW32A-02	Dec-11		154	3.6	495	<1.0		7.83	560	27.0	1.1		198	109	0.13	1.01	0.0087	28.2					<0.50	<1.0	<0.50	<0.50	<0.50	
OW32A-02	Dec-11	D	157	3.7	507	<1.0		7.83	560	27.9	1.0		204	110	0.127	1.06	0.0093	28.9					<0.50	<1.0	<0.50	<0.50	<0.50	
OW32A-02	Apr-12		148	4.4	477	<1.0		7.52	586	25.9	1.1		199	117	0.096	0.84	0.0077	27					<0.50	<1.0	<0.50	<0.50	<0.50	
OW32A-02	Nov-12		199	3.7	613	<1.0		6.84	457	28.4	1.1		210	99.3	0.115	0.905	0.0085	30.9					<0.50	<1.0	<0.50	<0.50	<0.50	
OW32A-02	May-13		Ins																									
OW32A-02	Oct-13		53.7	4.32	249	<0.001		NA	NA	28.0	1.6		210	118	0.123	0.851	0.012	31.4					<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW32A-02	Jun-14		54.0	4.64	258	<0.001		7.44	632	29.9	1.2		199	127	0.132	0.991	0.011	29.1					<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW32A-02	Nov-14		49.9	4.83	239	<0.001		7.52	583	27.8	2.1		201	128	0.143	0.775	0.011	29.1					<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW32A-02	May-15		50.6	5.34	240	<0.001		7.17	612	27.6	1.4		207	124	0.130	0.769	0.008	30.0					<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW32A-02	May-15	D	50.0	5.27	239	<0.001				27.6	1.4																	
OW32A-02	Sep-15		53.2	7.23	253	<0.001		7.91	488	29.2	1.2		197	127	0.125	0.726	0.011	31.0					<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW32A-02	Apr-16		50.0	7.31	241	<0.001		7.92	521	28.2	1.3		213	129	0.123	0.783	0.010	29.6	<0.10	<0.10	0.18	0.30	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW32A-02	Apr-16	D	50.0	7.09	240	<0.001				27.9	1.3		211	129	0.121	0.792	0.010	29.6	<0.10	<0.10	0.20	0.31						
OW32A-02	Oct-16		48.6	5.29	235	<0.001		8.07	507	27.6	3.0		208	117	0.136	0.610	0.011	28.4	<0.25	<0.25	0.80	1.09	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW32A-02	Oct-16	D	47.8	5.21	231	<0.001				27.2	3.8		210	126	0.139	0.618	0.012	27.9	<0.25	<0.25	0.76	0.93						
OW32A-02	Apr-17		51.4	3.71	248	<0.001		7.59	539	29.1	1.3		209	141	0.136	0.768	0.011	30.4	<0.10	<0.10	0.20	0.31	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW32A-02	Sep-17		48.9	4.83	242	<0.001		7.71	478	29.1	1.6		217	133	0.128	0.743	0.011	31.8	<0.25	<0.25	0.15	0.49	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW32A-02	May-18		56.6	3.59	273			7.99	403	31.9	1.7		183	166									<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW32A-02	Oct-18		56.5	3.61	262	<0.001		7.77	535	29.3	2.2		189	145	0.129	<0.01	0.048	30.0			<0.02	0.16	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW32A-02	May-19		52.1	3.38	257	<0.001		7.52	597	30.7	1.3		186	191	0.13	<0.010	0.037	28.3	0.13	<0.05	0.28	0.77	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW32A-02	Oct-19		62.8	3.75	283	<0.001		7.20	536	30.6	1.3		224	164	0.152	<0.010	0.002	30.4	0.12	<0.10	<0.02	<0.10	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW32A-02	May-20		DRY																									
OW32A-02	Oct-20		62.7	3.56	274	0.004		7.34	569	28.6	2.0		280	207	0.159	0.015	<0.002	28.2	<0.25	<0.25	<0.02	0.13	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW32A-02	Jun-21		NA																									

Historical Groundwater Chemistry - St. Mary's Landfill

Well	Sampling Date	Notes	Calcium	Chloride	Hardness	Phenols	Field pH	Field Conductivity	Magnesium	DOC	Alkalinity	Sulphate	Boron	Iron	Manganese	Sodium	Nitrate	Nitrite	Ammonia	TKN	Benzene	m,p-Xylene	Ethylbenzene	Toluene	o-Xylene	Xylene Mixture (Total)
CRA Units (1981 - 2012)			mg/L	mg/L	mg/L	µg/L		µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L					mg/L	mg/L	mg/L	mg/L	mg/L	
Burnside Units (2013 -)			mg/L	mg/L	mg/L	mg/L		µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
OW36	Sep-17		119	20.6	607	<0.001	7.46	1061	75.2	2.9	291	485	0.246	<0.010	0.046	59.6	0.98	<0.25	0.03	0.35	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW36	May-18		123	19.4	617		8.2	1005	75.2	1.7	256	478	0.214	<0.010	0.019	55.7					<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW36	Oct-18		133	18.7	634	<0.001	7.52	962	73.4	1.9	245	471	0.208	<0.01	0.007	55.5			<0.02	0.14	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW36	May-19		121	26.5	599	<0.001	7.31	1129	72.0	1.2	232	490	0.186	<0.010	0.006	50	1.28	<0.25	<0.02	0.10	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW36	Oct-19		120	24.4	590	<0.001	7.13	1020	70.4	1.9	246	483	0.204	<0.010	0.007	50.4	1.09	<0.25	<0.02	<0.10	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW36	May-20		128	25.6	621	<0.001	7.35	1390	73.2	1.8	255	499	0.186	<0.010	0.005	54.1	0.40	<0.25	<0.02	0.20	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW36	Oct-20		98.5	25.6	493	0.005	7.53	885	60.1	1.5	261	488	0.225	<0.010	0.004	45.9	<0.25	<0.25	<0.02	0.11	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW36	Jun-21		114	22.8	566	0.003	7.26	1354	68.2	1	256	433	0.193	<0.010	0.018	48.1	0.27	<0.05	<0.02	0.29	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
OW36	Nov-21		120.0	22.2	581	0.04	7.65		68.4	1.3	291	422	0.207	0.011	0.004	48.8	<0.05	<0.05	0.04	0.15	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
MHB	May-15		91.8	96.9	448	<0.001	7.48	812	53.1	5.2																
MHB	Apr-16		93.4	103	456	<0.001	7.65	830	54.2	6.4	296	159	0.101	0.135	0.084	44.4	<0.25	<0.25	0.19	0.34	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
MHB	Oct-16		89.0	99.1	440	<0.001	7.70	929	52.8	NA	272	152	0.117	0.090	0.091	42.4	<0.25	<0.25	0.18	0.48	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
MHB	Apr-17		89.2	97.4	444	<0.001	7.41	862	53.7	4.2	331	147	0.108	0.372	0.076	43.4	<0.25	<0.25	0.16	0.21	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
MHB	Sep-17		87.4	112	443	<0.001	7.39	888	54.6	4.3	303	156	0.107	1.060	0.092	47.1	<0.25	<0.25	0.21	0.47	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
MHB	May-18		sample missed																							
MHB	Oct-18		89.5	104	435	<0.001	7.50	564	51.3	4.5	259	142	0.106	<0.01	0.042	46.9			0.14	0.34	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
MHB	May-19		88.4	120	434	<0.001	7.16	893	51.8	4.7	298	148	0.124	<0.010	0.120	46.9	<0.25	<0.25	0.28	0.75	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
MHB	Oct-19		87.4	111	431	<0.001	7.33	839	51.6	4.2	295	138	0.132	<0.010	0.046	48.4	<0.25	<0.25	0.22	0.33	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
MHB	May-20		88.7	127	438	<0.001	7.12	1190	52.5	4.7	300	144	0.128	0.041	0.040	54.9	<0.25	<0.25	0.19	0.56	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
MHB	Oct-20		55.2	126	287	0.003	7.43	777	36.2	4.8	306	142	0.15	0.045	0.042	37.7	<0.25	<0.25	0.18	0.67	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
MHB	Jun-21		86.8	125	440	0.003	7.26	1082	54.2	4.7	303	132	0.137	0.030	0.082	48.9	<0.05	<0.05	0.26	1.69	<0.20	<0.20	<0.10	<0.20	<0.10	<0.20
MHB	NA																									

Well	Sampling Date	Notes	Calcium		Chloride		Hardness	Phenols		Field pH	Field Conductivity	Magnesium	DOC		Alkalinity	Sulphate	Boron	Iron	Manganese	Sodium	Nitrate	Nitrite	Ammonia	TKN	Benzene	m,p-Xylene	Ethylbenzene	Toluene	o-Xylene	Xylene Mixture (Total)
CRA Units (1981 - 2012)			mg/L		mg/L		mg/L	µg/L			µS/cm	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L					mg/L	mg/L	mg/L	mg/L	mg/L	
Burnside Units (2013 -)			mg/L		mg/L		mg/L	mg/L			µS/cm	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
PW1	Feb-85		120		72.5		355	<1.0		7.47	860	13.4	1.9																	
PW1	May-85		118		60		339	<1.0		7.53	755	10.6	1.4																	
PW1	Feb-86		108		64		319	<1.0		7.49	690	11.8	1.5																	
PW1	May-86		102		67.5		299	<1.0		7.61	725	10.8	1.2																	
PW1	Aug-86		185		920		564	1.0		7.34	3390	24.6	1.3																	
PW1	Nov-86		122		76		365	<1.0		7.44	870	14.6	2.5																	
PW1	Feb-87		118		47		345	<1.0		7.62	770	12.2	1.7																	
PW1	May-87		140		142		410	<1.0		7.36	1140	14.6	1.7																	
PW1	Aug-87		220		660		667	<1.0		7.21	2950	28.4	1.3																	
PW1	Jan-88		115		104.4		337	<1.0		-	-	12.1	1.8																	
PW1	May-88		210.5		576.1		622	<1.0		6.57	2340	23.3	1.8																	
PW1	Aug-88		175.6		564		538	<1.0		7.25	2310	24.1	1.3																	
PW1	Nov-88		215		625.2		645	<1.0		6.86	2920	26.0	1.6																	
PW1	Feb-89		98.3		43.5		286	<1.0		7.05	624	9.85	2.0																	
PW1	May-89		165		200		477	<1.0		7.06	1130	15.6	1.5																	
PW1	Aug-89		32.3		37.8		107	-		7.28	314	6.4	8.2																	
PW1	Nov-89		192		669		606	<1.0		7.00	2010	30.5	3.0																	
PW1	Feb-90		89		37		262	<1.0		7.20	530	9.8	2.4																	
PW1	May-90		276		770		809	<1.0		7.00	2150	28.9	1.0																	
PW1	Aug-90		212		903		642	<1.0		6.75	2580	27.1	1.1																	
PW1	Nov-90		155		84		446	<1.0		7.40	760	14.3	2.7																	
PW1	Feb-91		109		49.2		316	<1.0		8.0	639	10.6	1.9																	
PW1	Feb-91	D	110		49.6		317	<1.0		8.0	639	10.1	2.0																	
PW1	May-91		120		167		351	<1.0		7.29	850	12.4	1.5																	
PW1	Aug-91		170		1106		505	<1.0		6.54	2910	19.5	1.2																	
PW1	Nov-91		108		270		403	<1.0		7.8	956	32.4	0.8	U																
PW1	Feb-92		103		283		329	<1.0	J	7.15	1000	17.3	1.8																	
PW1	Feb-92	D	102		266		324	3.5	J	7.15	1000	16.7	1.8																	
PW1	May-92		131		224		383	<1.0		7.48	762	13.5	1.6																	
PW1	Aug-92		257		1351		768	<1.0		7.29	6180	30.7	0.9																	
PW1	Aug-92	D	253		1136		755	<1.0		7.29	6180	30.0	1.1																	
PW1	Nov-92		214		399		629	<1.0		7.49	1900	22.8	1.6																	
PW1	Nov-92	D	201		390		593	<1.0		7.49	1900	22.1	1.6																	
PW1	Feb-93		101		26.4		283	<1.0		7.38	420	7.6	<0.5																	
PW1	May-93		163		257		465	<1.0		7.30	820	14.1	<0.5																	
PW1	Aug-93		228		1114		683	<1.0		7.30	3500	27.6	<0.5																	
PW1	Apr-94		114		79.4		333	<1.0		7.5	800	11.7	<0.5																	
PW1	Apr-94	D	115		80.4		336	<1.0		7.50	800	11.8	<0.5																	
PW1	Sep-94		226		849		678	<2.0		7.40	3400	27.6	<0.5																	
PW1	Apr-95		146		155		418	<1.0		7.1	1000	13.1	7	U																
PW1	Sep-95		212		767		625	<1.0		7.1	2600	23.2	<0.5	U																
PW1	Apr-96		106		90.5		309	<1.0		7.54	825	10.8	<0.5																	
PW1	Sep-96		194		577		561	<1.0		7.4	2540	18.7	8.5																	
PW1	Sep-96		194		569		563	<1.0		7.4	2540	19.2	16																	
PW1	Apr-97		159		70.2		457	<1.0		8.1	1100	15	1.7																	
PW1	Sep-97		232		845		688	<1.0		7.3	3000	26.5	10.4																	
PW1	Apr-98		126		55.7		370	<1.0		7.53	773	13.4	2.6																	
PW1	Sep-98		212		613		618	<1.0		7.12	2640	21.5	0.6																	
PW1	Sep-98		214		622		624	<1.0		7.12	2640	21.7	0.6																	
PW1	Apr-99		281		550		793	<1.0		7.32	2380	22.2	1.7	U																
PW1	Sep-99		240		989		701	<1.0		7.08	3820	24.7	3.3	U																

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Historical Groundwater Chemistry - St. Mary's Landfill

Well	Sampling Date	Notes	Calcium		Chloride		Hardness	Phenols		Field pH	Field Conductivity	Magnesium	DOC		Alkalinity	Sulphate	Boron	Iron	Manganese	Sodium	Nitrate	Nitrite	Ammonia	TKN	Benzene	m,p-Xylene	Ethylbenzene	Toluene	o-Xylene	Xylene Mixture (Total)
CRA Units (1981 - 2012)			mg/L		mg/L		mg/L	µg/L			µS/cm	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L					mg/L	mg/L	mg/L	mg/L	mg/L	
Burnside Units (2013 -)			mg/L		mg/L		mg/L	mg/L			µS/cm	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
PW1	Apr-00		269		647		790	<2.0		6.95	2710	28.7	3.3	U																
PW1	Sep-00		264		1020		763	<2.0		6.59	3960	25.2	2.2																	
PW1	Apr-01		172		266		491	<2.0		7.16	1290	14.9	13.4																	
PW1	Sep-01		265		1260		759	<1.0		6.83	4598	23.6	2.7																	
PW1	Apr-02		185		394		532	2	U	6.69	1800	17	2.4	U																
PW1	Sep-02		290		1300		852	3	U	7.28	4570	31	4.8	U																
PW1	Apr-03		250		892		763	1		6.91	3500	33	2.8																	
PW1	Sep-03	1	300		1760		809	1		7.22	5840	36	3.5																	
PW1	May-04	1	178		369		520	<2		7.41	1810	18.5	<1.0																	
PW1	Sep-04		264		1710		789	<2		7.32	5110	31.4	<1.0																	
PW1	Apr-05		332		1220		982	<2		6.79	4540	37.3	<1.0																	
PW1	Nov-05		290		1970		873	<1		6.90	6310	36	<1.0																	
PW1	Apr-06		240		568		690	2		7.8	2360	22.5	1	U																
PW1	Nov-06		266		1810		800	8		6.43	4900	34	4																	
PW1	Apr-07		217		1220		630	<1		6.88	3780	37.2	1																	
PW1	Nov-07		51.6	U	169		160	3	J,U	7.83	847	7	1																	
PW1	Nov-07	D	50.8	U	165		160	1	J,U	7.83	847	7	1																	
PW1	Apr-08		269		1010		790	2		7.03	362	28.8	2																	
PW1	Nov-08	6	268		1940		840	<1		6.78	6200	42.4	5																	
PW1	Apr-09		264		1090		773	<1		7.06	3600	27.3	3.7																	
PW1	Nov-09		207		2070		634	5.0		6.87	6580	28.7	4.6																	
PW1	Mar-10		293		1440		875	<1.0		7.34	5470	34.9	4.5																	
PW1	Nov-10		209		1540		618	<1.0		NA	NA	23.7	4.7																	
PW1	Mar-11		237		1130		717	<1.0		7.63	436	30.3	4.9																	
PW1	Dec-11		63.7		2.8		286	<1.0		7.67	603	30.9	1.4																	
PW1	Apr-12		NS		-		-	-		-	-	-	-																	
PW1	Nov-12		NS		-		-	-		-	-	-	-																	
PW1	May-13		49.3		3.82		247	0.001		7.38	622	30.2	1.3																	
PW1	Oct-13		Resident not present - no sample																											
PW1	Jun-14		57.4		3.79		285	<0.001		7.38	690	34.4	0.9																	
PW1	Nov-14		50.5		4.48		250	<0.001		7.72	591	30.0	0.9																	
PW1	May-15		52.4		3.52		258	<0.001		7.47	664	30.9	1.2																	
PW1	Sep-15		58.7		4.36		286	<0.001		8.81	573	33.8	0.9																	
PW1	Apr-16		55.9		4.02		275	<0.001		7.78	523	32.9	1.1																	
PW1	Oct-16		51.3		3.67		256	<0.001		7.99	555	31.1	3.0																	
PW1	Apr-17		52.0		2.90		264	<0.001		7.54	544	32.5	1.2																	
PW1	Sep-17		51.7		4.54		262	<0.001		7.74	543	32.3	1.3																	
PW1	May-18		Resident not present - no sample																											
PW1	Oct-18		50.7		3.93		246	<0.001		7.68	316.5	29.1	1.8																	
PW1	May-19		48.0		5.67		242	<0.001		7.59	656	29.6	1.1		196					27.9	0.11	<0.05								
PW1	Oct-19		51.4		3.81		254	<0.001		7.37	593	30.6	1.6		194					29.6	0.10	0.10								
PW1	May-20		COVID19 - no sample																											
PW1	Oct-20		COVID19 - no sample																											
PW1	Jun-21		COVID19 - no sample																											

Historical Groundwater Chemistry - St. Mary's Landfill

Well	Sampling Date	Notes	Calcium		Chloride		Hardness	Phenols		Field pH	Field Conductivity	Magnesium	DOC		Alkalinity	Sulphate	Boron	Iron	Manganese	Sodium	Nitrate	Nitrite	Ammonia	TKN	Benzene	m,p-Xylene	Ethylbenzene	Toluene	o-Xylene	Xylene Mixture (Total)
CRA Units (1981 - 2012)			mg/L		mg/L		mg/L	µg/L			µS/cm	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L					mg/L	mg/L	mg/L	mg/L	mg/L	
Burnside Units (2013 -)			mg/L		mg/L		mg/L	mg/L			µS/cm	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
PW2	May-85		60		22		258	<1.0		7.56	605	26.2	0.7																	
PW2	Feb-86		62.5		27.5		271	<1.0		7.32	670	27.8	0.9																	
PW2	May-86		108		45.5		329	<1.0		7.51	675	14.2	1.8																	
PW2	Aug-86		94.5		23.5		286	<1.0		7.40	650	12	1.8																	
PW2	Nov-86		112		200		411	1		7.76	1410	31.8	1																	
PW2	Feb-87		130		88.5		398	<1.0		7.63	940	17.8	1.7																	
PW2	May-87		118		54.5		359	<1.0		7.41	850	15.6	2.4																	
PW2	Aug-87		125		162		466	<1.0		7.76	1340	37.2	0.9																	
PW2	Nov-87		132		75.5		509	<1.0		7.43	1140	43.53	1.2																	
PW2	May-88		108		79.2		332.6	<1.0		6.82	806	15.19	1.8																	
PW2	Aug-88		124		214.9		461.2	<1.0		7.25	1450	36.7	1.4																	
PW2	Feb-89		125.2		122		378	<1.0		7.12	922	15.8	1.9																	
PW2	Apr-89		131		74.7		390	5.5		7.15	839	15.2	1.9																	
PW2	Aug-89		133		158		490	<1.0		7.58	548	38.2	1																	
PW2	Nov-89		68.9		95.7		239	1.5		7.40	608	16.1	1.3	U																
PW2	Feb-90		122		145		372	<1.0		6.88	783	16.3	1.8																	
PW2	May-90		121		110		368	<1.0		7.30	639	16	1.7																	
PW2	Aug-90		121		115		371	<1.0		7.35	770	16.6	0.9																	
PW2	Nov-90		140		119		418	1		7.50	740	16.6	2.4																	
PW2	Feb-91		100		55.2		299	<1.0		8.20	652	12	1.8																	
PW2	May-91		Not Sampled																											
PW2	Aug-91		Not Sampled																											
PW2	Nov-91		Not Sampled																											
PW2	Feb-92		98.2		152		307	<1.0		7.27	592	14.9	1.5																	
PW2	May-92		Not Sampled																											
PW2	Aug-92		99.9		75.1		310	<1.0		7.83	1300	14.7	1.7																	
PW2	Nov-92		90.6		76.5		292	<1.0		7.90	600	15.8	1.6																	
PW2	Feb-93		97.7		33.7		284	<1.0		7.70	400	9.8	<0.5																	
PW2	May-93		Not Sampled																											
PW2	Aug-93		123		240		487	<1.0		7.90	1600	43.6	<0.5																	
PW2	Apr-94		115		126		343	<1.0		7.50	700	13.5	<0.5																	
PW2	Sep-94		Not Sampled																											
PW2	Apr-95		122		130		367	<1.0		7.50	1000	15.1	6	U																
PW2	Sep-95		133		197		493	<1.0		7.40	1400	39	93.8	U																
PW2	Apr-96		88.1		77.7		267	<1.0		7.45	710	11.5	<0.5																	
PW2	Sep-96		120		61.4		358	<1.0		7.7	753	14.1	<0.5																	
PW2	Apr-97		120		37.1		356	<1.0		7.90	600	13.7	1.4																	
PW2	Apr-97	D	120		40.2		356	<1.0		7.9	600	13.8	1.2																	
PW2	Sep-97		161		238		605	<1.0		8.00	1500	49.4	2.6																	
PW2	Apr-98		105		98.4		321	<1.0		7.59	765	14.2	1.8																	
PW2	Sep-98		173		245		625	<1.0		7.52	1670	47	<0.5																	
PW2	Apr-99		118		103		353	<1.0		7.72	678	14.1	1.1	U																
PW2	Sep-99		148		277		521	<1.0		7.34	1770	36.7	3.2	U																
PW2	Sep-99	D	144		276		516	<1.0		7.34	1770	37.8	2.8	U																
PW2	Apr-00		130		136		395	<2.0		7.28	1070	17.1	1.3	U																
PW2	Sep-00		155		132		463	<2.0		7.16	1190	18.5	1.5																	
PW2	Apr-01		105		74.4		315	<2.0		7.16	717	12.8	1.5																	
PW2	Sep-01		159		291		591	<1.0		7.34	1930	47.2	1.0																	
PW2	Apr-02		104		134		309	<1.0		7.15	855	11.9	2.6	U																
PW2	Sep-02		150		300		585	<1.0		7.15	1760	51	2.6	U																
PW2	Apr-03		100		119		321	1		7.67	842	15	2.2																	
PW2	Sep-03	1	140		326		548	1		7.71	1710	44	5.5																	
PW2	May-04	1	101		95.6		305	<2		7.63	854	13.1	<1.0																	
PW2	Sep-04		95.7		116		296	<2		7.71	802	13.8	<1.0																	

Well	Sampling Date	Notes	Calcium	Chloride	Hardness	Phenols	Field pH	Field Conductivity	Magnesium	DOC	Alkalinity	Sulphate	Boron	Iron	Manganese	Sodium	Nitrate	Nitrite	Ammonia	TKN	Benzene	m,p-Xylene	Ethylbenzene	Toluene	o-Xylene	Xylene Mixture (Total)
CRA Units (1981 - 2012)			mg/L	mg/L	mg/L	µg/L		µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L					mg/L	mg/L	mg/L	mg/L	mg/L	
Burnside Units (2013 -)			mg/L	mg/L	mg/L	mg/L		µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
PW2	Apr-05		69.1	58.6	283	<2	7.18	717	26.9	<1.0																
PW2	Nov-05		67.2	60.4	273	<1.0	6.99	620	25.6	<1.0																
PW2	Apr-06		113	107	340	<1.0	8.29	824	13.6	1 U																
PW2	Nov-06		118	101	360	<1.0	7.08	867	16	3																
PW2	Apr-07		89.2	71	270	<1	7.50	701	10.4	1																
PW2	Nov-07		114 U	55	410	2U	7.56	885	31.4	1																
PW2	Apr-08		86.3	89	260	2	-	-	11.5	2																
PW2	Nov-08	7	Not Sampled																							
PW2	Apr-09		81.4	70.6	244	<1	7.64	638	10	2.8																
PW2	Nov-09	8	Not Sampled																							
PW2	Mar-10		95.9	127	281	<1.0	-	-	10	2.8																
PW2	Nov-10		101	169	301	<1.0	7.14	1020	11.9	4.4																
PW2	Mar-11		94	142	288	2.1	7.95	-	13.1	2.5																
PW2	Dec-11		Not Sampled																							
PW2	Apr-12		Not Sampled																							
PW2	Nov-12		Not Sampled																							
PW2	May-13		Resident not present - no sample																							
PW2	Oct-13		94.7	131	285	<0.001	7.56	891	11.7	2.0																
PW2	Jun-14		Resident not present - no sample																							
PW2	Nov-14		Resident not present - no sample																							
PW2	May-15		105	137	317	<0.001	7.23	988	13.3	1.8																
PW2	Sep-15		Resident not present - no sample																							
PW2	Apr-16		Resident not present - no sample																							
PW2	Oct-16		Resident not present - no sample																							
PW2	Apr-17		78.3	123	238	<0.001	7.59	683	10.2	2.4																
PW2	Sep-17		52.4	81	170	<0.001	7.88	515	9.39	1.9																
PW2	May-18		Resident not present - no sample																							
PW2	Oct-18		87.9	142	287	<0.001	7.53	509	16.3	2																
PW2	May-19		83.0	83.0	247	<0.001	7.28	720	9.56	2	314					71.3	1.28	<0.25								
PW2	Oct-19		Not Sampled - Resident indicated that well is dry																							
PW2	May-20		COVID19 - no sample																							
PW2	Oct-20		COVID19 - no sample																							
PW2	Jun-21		COVID19 - no sample																							

Well	Sampling Date	Notes	Calcium	Chloride	Hardness	Phenols	Field pH	Field Conductivity	Magnesium	DOC		Alkalinity	Sulphate	Boron	Iron	Manganese	Sodium	Nitrate	Nitrite	Ammonia	TKN	Benzene	m,p-Xylene	Ethylbenzene	Toluene	o-Xylene	Xylene Mixture (Total)
CRA Units (1981 - 2012)			mg/L	mg/L	mg/L	µg/L		µS/cm	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L					mg/L	mg/L	mg/L	mg/L	mg/L	
Burnside Units (2013 -)			mg/L	mg/L	mg/L	mg/L		µS/cm	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
PW3	Feb-85		118	82.5	358	<1.0	7.46	865	15.4	1.8																	
PW3	May-85		93	36.0	287	<1.0	7.43	675	13.2	1.7																	
PW3	Feb-86		128	28.5	501	<1.0	7.54	1850	44	0.7																	
PW3	May-86		64.5	36.5	288	<1.0	7.42	660	30.8	0.08																	
PW3	Aug-86		71.5	49.0	306	1	7.58	865	31	1																	
PW3	Nov-86		74.5	47.0	322	<1.0	7.49	720	33	1.3																	
PW3	Feb-87		76.5	52.5	316	<1.0	7.51	780	30.4	1.1																	
PW3	May-87		79.5	45.0	332	<1.0	7.40	845	32.4	1.3																	
PW3	Aug-87		81	66.0	345	<1.0	7.51	850	34.6	1.2																	
PW3	Nov-87		92	96.8	375	<1.0	7.38	955	35.21	1.1																	
PW3	Jan-88		86.9	76.5	346	<1.0	-	-	31.16	1																	
PW3	Jan-88	D	86.7	75.9	347	<1.0	-	-	31.67	0.9																	
PW3	Aug-88		82.8	65.8	340.9	<1.0	7.30	835	32.49	1.5																	
PW3	Nov-88		83.5	81.6	332.6	<1.0	7.23	887	30.05	1.1																	
PW3	Feb-89		79.9	69.9	319	<1.0	6.87	792	29	1.1																	
PW3	May-89		79.3	69.1	314	1.5	7.23	764	28.1	0.9																	
PW3	Aug-89		88.9	82.1	353	<1.0	7.00	1140	31.7	1.4																	
PW3	Nov-89		83.3	98.9	338	<1.0	7.20	765	31.4	1.1	U																
PW3	Feb-90		80.5	85.8	326	<1.0	6.72	740	30.3	0.7																	
PW3	May-90		77.2	74.9	314	<1.0	7.00	638	29.3	0.6																	
PW3	Aug-90		85.5	77.9	337	<1.0	7.35	660	29.8	0.7																	
PW3	Nov-90		80	76.5	320	<1.0	7.40	600	29.2	1.1																	
PW3	Nov-90	D	79.3	76.5	319	<1.0	7.4	600	29.3	1																	
PW3	Feb-91		80.1	70.9	318	<1.0	8.10	651	28.6	1																	
PW3	May-91		Not Sampled																								
PW3	Aug-91		77.2	74.1	311	<1.0	7.36	814	28.7	0.8																	
PW3	Nov-91		78.9	76.6	323	<1.0	7.5	582	30.5	1	U																
PW3	Feb-92		78.1	73.8	328	<1.0	7.19	560	32.1	0.9																	
PW3	May-92		77.0	66.7	320	<1.0	7.40	506	30.9	1.1																	
PW3	Aug-92		91.0	32.1	411	9.0	7.70	1330	44.5	1.1																	
PW3	Nov-92		78.7	60.0	329	<1.0	7.65	505	32.1	0.7																	
PW3	Feb-93		311	57.4	76.4	<1.0	7.55	430	29.3	<0.5																	
PW3	May-93		68.9	43.9	294	<1.0	7.90	680	29.6	<0.5																	
PW3	Aug-93		71.1	60.6	299	<1.0	7.90	800	29.4	<0.5																	
PW3	Apr-94		76.0	53.6	314	<1.0	7.30	700	30.1	<0.5																	
PW3	Sep-94		80.7	47.0	344	<2.0	7.80	700	34.7	<0.5																	
PW3	Apr-95		78	64.5	339	<1.0	7.2	700	35	4.5	U																
PW3	Apr-95	D	85.8	51.7	345	<1.0	7.3	1000	31.7	29.7	U																
PW3	Sep-95		80.6	58.6	341	<1.0	7.20	700	34	3.5	U																
PW3	Apr-96		67.3	55.1	285	<1.0	7.76	732	28.5	<0.5																	
PW3	Sep-96		74.1	59.5	302	<1.0	7.65	673	28.3	0.5																	
PW3	Apr-97		98.0	64.9	404	<1.0	8.10	800	38.6	<0.5																	
PW3	Sep-97		80.6	56.2	331	<1.0	7.80	700	31.5	0.8																	
PW3	Apr-98		70.8	62.1	296	<1.0	7.92	750	28.9	2.6																	
PW3	Sep-98		86.0	47.8	361	<1.0	7.33	634	35.5	<0.5																	
PW3	Apr-99		85.7	53	328	<1.0	7.43	646	27.6	<0.5																	
PW3	Apr-99	D	85.4	54.7	327	<1.0	7.43	646	27.6	0.6	U																
PW3	Sep-09		79.2	57.8	305	<1.0	7.16	725	25.9	2.2	U																
PW3	Apr-00		77.4	51.9	325	<2.0	7.52	727	32	2.6	U																
PW3	Sep-00		77.8	43.5	334	<2.0	7.45	728	33.9	<0.5																	
PW3	Sep-00	D	75.2	42	321	<2.0	7.45	728	32.3	<0.5																	
PW3	Apr-01		81.6	74.1	322	<2.0	7.24	699	28.7	0.5																	
PW3	Sep-01		82.3	59.9	336	<1.0	7.23	695	31.6	1.2																	

Well	Sampling Date	Notes	Calcium		Chloride		Hardness	Phenols		Field pH	Field Conductivity	Magnesium	DOC		Alkalinity	Sulphate	Boron	Iron	Manganese	Sodium	Nitrate	Nitrite	Ammonia	TKN	Benzene	m,p-Xylene	Ethylbenzene	Toluene	o-Xylene	Xylene Mixture (Total)
CRA Units (1981 - 2012)			mg/L		mg/L		mg/L	µg/L			µS/cm	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L					mg/L	mg/L	mg/L	mg/L	mg/L	
Burnside Units (2013 -)			mg/L		mg/L		mg/L	mg/L			µS/cm	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
PW3	Apr-02		13.0	J	62.8		292	<1.0		7.21	720	28	1	J,U																
PW3	Sep-02		53.0		59		264	2	U	5.61	517	32	2.4	U																
PW3	Apr-03		67.0		63.3		319	1		7.24	744	29	1.5																	
PW3	Sep-03		73.0		53		313	1		7.54 (1)	542	30	5.3																	
PW3	May-04		69.2		57.6		266	<2		7.65 (1)	713	27.4	<1.0																	
PW3	Sep-04		67.5		50.7		279	<2		7.76	643	26.9	<1.0																	
PW3	Apr-05		99.1		118		299	<2		7.28	822	12.5	<1.0																	
PW3	Nov-05		59.7		89.1		196	<1		7.74	519	11.3	<1.0																	
PW3	Nov-05	D	58.0		88.8		191	<1		7.74	519	11.1	<1.0																	
PW3	Apr-06		45.1		61		230	<1		8.20	700	27.9	1	U																
PW3	Apr-06	D	44.7		61		230	<1		8.20	700	28	1	U																
PW3	Nov-06		73.0		61		310	2	U	6.99	706	32	1																	
PW3	Apr-07		63.6		61		260	<1		7.39	632	24.3	<1.0																	
PW3	Nov-07		68.5	U	59		290U	2	U	7.61	695	29.6	<1.0																	
PW3	Apr-08		71.4		64		300	1		7.44	722	30.3	<1.0																	
PW3	Nov-08		81.3		18		330	<1		7.06	669	29.8	1																	
PW3	Apr-09		66.1		66.1		277	<1		7.50	657	27.1	1.9																	
PW3	Nov-09		73.3		59.5		301	2.0		7.35	745	28.6	<1.0																	
PW3	Mar-10		74.9		58.5		286	<1.0		7.67	778	24.1	1.4																	
PW3	Nov-10		81.4		58		328	<1.0		6.53	531	30.2	2.1																	
PW3	Mar-11		237		113		717	<1.0		7.63	436	30.3	4.9																	
PW3	Dec-11		63.7		2.8		286	<1.0		7.67	603	30.9	1.4																	
PW3	Mar-11		74.7		60.5		315	<1.0		7.87	753	31.2	1.5																	
PW3	Dec-11		82.0		60.3		338	<1.0		7.93	712	32.4	1.9																	
PW3	Apr-12		71.2		58.4		286	<1.0		7.38	689	26.1	1.5																	
PW3	Apr-12		68.9		58.6		277	<1.0		7.38	689	25.6	1.4																	
PW3	Nov-12		81.2		55.7		318	<1.0		6.75	574	28.0	1.1																	
PW3	May-13		64.3		62.8		269	<0.001		7.28	726	26.4	1.2																	
PW3	Oct-13		Resident not present - no sample																											
PW3	Jun-14		Resident not present - no sample																											
PW3	Nov-14		Resident not present - no sample																											
PW3	May-15		Resident not present - no sample																											
PW3	Sep-15		Resident not present - no sample																											
PW3	Apr-16		Resident not present - no sample																											
PW3	Oct-16		Resident not present - no sample																											
PW3	Apr-17		Resident not present - no sample																											
PW3	Sep-17		Resident not present - no sample																											
PW3	May-18		63.5		64.2		276					28.5	1																	
PW3	Oct-18		Resident not present - no sample																											
PW3	May-19		Resident not present - no sample																											
PW3	Oct-19		Resident not present - no sample																											
PW3	May-20		COVID19 - no sample																											
PW3	Oct-20		COVID19 - no sample																											
PW3	Jun-21		COVID19 - no sample																											

Well	Sampling Date	Notes	Calcium		Chloride		Hardness	Phenols		Field pH	Field Conductivity	Magnesium	DOC		Alkalinity	Sulphate	Boron	Iron	Manganese	Sodium	Nitrate	Nitrite	Ammonia	TKN	Benzene	m,p-Xylene	Ethylbenzene	Toluene	o-Xylene	Xylene Mixture (Total)
CRA Units (1981 - 2012)			mg/L		mg/L		mg/L	µg/L			µS/cm	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L					mg/L	mg/L	mg/L	mg/L	mg/L	
Burnside Units (2013 -)			mg/L		mg/L		mg/L	mg/L			µS/cm	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
PW4	Sep-96		59		1.44		300	<1.0		8.00	634	37.1	<0.5																	
PW4	Apr-97		47.9		2.53		245	<1.0		8.20	700	30.4	<0.5																	
PW4	Sep-97		61.1		1.43		329	<1.0		7.40	700	42.9	<0.5																	
PW4	Apr-98		56.2		1.98		286	<1.0		7.72	641	35.3	4.3																	
PW4	Apr-98	D	57		1.62		290	<1.0		7.72	641	35.9	6.0																	
PW4	Sep-98		Not Sampled																											
PW4	Apr-99		65.4		1.77		309	<1.0		7.62	620	35.3	<0.5																	
PW4	Sep-99		51.5		2.41	U	252	<1.0		7.33	704	29.8	2.4	U																
PW4	Apr-00		57.8		1.53		294	<2.0		7.51	655	36.4	1.1	U																
PW4	Apr-00	D	58.5		1.53		297	<2.0		7.51	655	36.6	1.3	U																
PW4	Sep-00		59.5		1.95		306	<2.0		7.61	680	38.3	<0.5																	
PW4	Apr-01		66.7		3		339	<2.0		9.39	736	41.8	<0.5																	
PW4	Apr-01	D	75.0		<3.0		359	<2.0		9.39	736	41.6	9.0																	
PW4	Sep-01		64.7		<3.0		330	<1.0		7.32	675	40.8	1.3																	
PW4	Apr-02		61		<3.0		310	<1.0		7.21	710	38.4	3.9	U																
PW4	Sep-02		13		2.1		197	<1.0		7.69	505	40	1	U																
PW4	Sep-02	D	17		2.2		204	3	U	7.69	505	41	2.5	U																
PW4	Apr-03		58		4.25		326	1		7.08	701	36	1.7																	
PW4	Apr-03	D	50		4.45		324	1		7.08	701	35	1.3																	
PW4	Sep-03	1	54		3.7		317	1		8.11	592	35	4.3																	
PW4	Sep-03	D,1	54		3.75		317	1		8.15	592	35	4.6																	
PW4	May-04	1	74.8		4.44		371	<2		7.69	828	44.7	<1.0																	
PW4	May-04	D,1	74.8		4.81		370	<2		7.78	827	44.6	<1.0																	
PW4	Sep-04		60.1		1.94		303	<2		7.89	663	37.2	<1.0																	
PW4	Apr-05		60.8		2.14		306	<2		7.38	727	37.4	<1.0																	
PW4	Nov-05		56.6		1.79		280	<1.0		7.08	585	33.6	<1.0																	
PW4	Apr-06		21.8	U	3		210	<1.0		8.20	765	38.7	2	U																
PW4	Nov-06		100		3		490	6		7.38	321	59	2																	
PW4	Apr-07		74.6		4		340	<1		7.56	723	37.2	2																	
PW4	Nov-07		65.9	U	3		330U	1U		7.88	697	39.1	<1.0																	
PW4	Apr-08		89.7		4		430	<1		7.39	871	49.8	3	J																
PW4	Apr-08	D	88.7		4		430	<1		7.39	871	49.9	1	J																
PW4	Nov-08		74.1		7		340	< 1		7.29	653	37.6	2																	
PW4	Apr-09		85		7.7		402	<1		7.39	783	46.1	1.4																	
PW4	Apr-09	D	85		7.7		402	<1		7.39	783	46.1	1.4																	
PW4	Nov-09		72.5		<6.0		342	<1.0		7.27	790	39.1	3.2	J																
PW4	Nov-09	D	76.8		<6.0		356	3	J	7.27	790	39.8	2.1	J																
PW4	Mar-10		78		5.7		341	<1.0		7.97	910	35.5	3.1																	
PW4	Nov-10		80.6		<2.0		374	<1.0		6.61	558	41.9	5.4																	
PW4	Mar-11		75.3		2.6		357	<1.0		7.81	784	41.2	1.4																	
PW4	Mar-11	D	73.5		2.6		359	<1.0		7.93	784	42.6	1.6																	
PW4	Dec-11		77.9		<6.0		356	<1.0		7.76	723	39.2	1.8																	

Well	Sampling Date	Notes	Calcium	Chloride		Hardness	Phenols	Field pH	Field Conductivity	Magnesium	DOC		Alkalinity	Sulphate	Boron	Iron	Manganese	Sodium	Nitrate	Nitrite	Ammonia	TKN	Benzene	m,p-Xylene	Ethylbenzene	Toluene	o-Xylene	Xylene Mixture (Total)
CRA Units (1981 - 2012)			mg/L	mg/L		mg/L	µg/L		µS/cm	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L					mg/L	mg/L	mg/L	mg/L	mg/L	
Burnside Units (2013 -)			mg/L	mg/L		mg/L	mg/L		µS/cm	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
PW4	Apr-12		78.7	2.6		364	<1.0	7.40	752	40.7	1.2																	
PW4	Nov-12		73.4	2.2		336	<1.0	6.66	564	37.2	2.2																	
PW4	May-13		67.9	3.84		344	<0.001	7.37	835	42.4	1.7																	
PW4	Oct-13		63.3	2.00		311	0.001	7.58	732	37.1	1.1																	
PW4	Jun-14		67.2	3.03		335	<0.001	7.38	806	40.6	1.1																	
PW4	Nov-14		63.1	2.45		310	<0.001	7.67	740	37.0	1.1																	
PW4	May-15		60.8	3.09		299	<0.001	7.34	761	35.8	1.2																	
PW4	Sep-15		66.9	3.50		321	<0.001	8.75	605	37.5	1.1																	
PW4	Apr-16		71.2	3.66		347	<0.001	7.50	687	41.0	1.1																	
PW4	Oct-16		61.4	2.09		298	<0.001	7.91	672	35.2	3.0																	
PW4	Apr-17		64.3	2.08		320	<0.001	7.57	637	38.6	1.2																	
PW4	Sep-17		65.1	2.10		317	<0.001	7.61	648	37.6	1.4																	
PW4	May-18		Resident not present - no sample																									
PW4	Oct-18		65.2	1.84		306	<0.001	7.60	375.9	34.7	1.6																	
PW4	May-19		73.6	4.76		357	<0.001	7.44	738	42.0	1.1		212					32.2	<0.25	<0.25								
PW4	Oct-19		63	2.10		308	<0.001	6.99	648	36.5	1.9		234					33.5	<0.25	<0.25								
PW4	May-20		COVID19 - no sample																									
PW4	Oct-20		56.9	2.23		277	0.003	7.37	513	32.7	1.5		236					32.6	<0.10	<0.10								
PW4	Jun-21		COVID19 - no sample																									
PW5	Aug-88		39.2	3.1		203	<1.0	7.57	487	25.4	1.4																	
PW5	Nov-88		37.3	3.1		196	<1.0	6.81	483	24.9	0.9																	
PW5	Feb-89		36.9	3.1		196	<1.0	7.21	494	25.1	0.8																	
PW5	May-89		47.1	3.6		234	1.0	7.63	567	28.2	0.7																	
PW5	Aug-89		35.9	2.9		188	<1.0	7.13	428	23.9	0.8																	
PW5	Nov-89		34.4	3.2		185	<1.0	7.70	440	24.0	20	U																
PW5	Feb-90		34.6	4.0		187	<1.0	7.57	437	24.4	0.3																	
PW5	May-90		0.3	3.2		1	<1.0	7.50	495	0.1	0.4																	
PW5	Aug-90		41.6	2.6		209	<1.0	7.43	420	25.6	<0.1																	
PW5	Nov-90		39.2	3.1		198	<1.0	7.40	370	24.3	0.7																	
PW5	Feb-91		Not Sampled																									
PW5	May-91		41.5	1.6		208	<1.0	7.50	380	25.3	0.6																	
PW5	Aug-91		38.1	2.3		198	<1.0	6.47	543	25	0.6																	
PW5	Nov-91		43.4	3		224	<1.0	7.50	237	28.0	0.9	U																
PW5	Feb-92		41.9	2.8	U	219	<1.0	7.35	400	27.8	0.6																	
PW5	May-92		59.3	2.7		306	<1.0	7.63	492	38.4	1.2																	
PW5	May-92	D	58.9	2.3		304	<1.0	7.63	492	38.1	1.0																	
PW5	Aug-92		55.2	2.7		282	<1.0	7.74	875	34.9	0.8																	
PW5	Nov-92		56.4	2.4		281	<1.0	7.35	390	34.1	0.7																	

Historical Groundwater Chemistry - St. Mary's Landfill

Well	Sampling Date	Notes	Calcium		Chloride		Hardness	Phenols		Field pH	Field Conductivity	Magnesium	DOC		Alkalinity	Sulphate	Boron	Iron	Manganese	Sodium	Nitrate	Nitrite	Ammonia	TKN	Benzene	m,p-Xylene	Ethylbenzene	Toluene	o-Xylene	Xylene Mixture (Total)
CRA Units (1981 - 2012)			mg/L		mg/L		mg/L	µg/L			µS/cm	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L					mg/L	mg/L	mg/L	mg/L	mg/L	
Burnside Units (2013 -)			mg/L		mg/L		mg/L	mg/L			µS/cm	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
PW5	Feb-93		41.0		2.8		208	<1.0		7.62	340	25.7	<0.5																	
PW5	May-93		49.9		2.7		246	<1.0		7.60	425	29.5	4.7	J																
PW5	May-93	D	49.1		2.8		250	<1.0		NA	NA	30.9	1.5	U																
PW5	Aug-93		52.3		2.9		1	<1.0		7.80	500	32.2	<0.5																	
PW5	Aug-93	D	51.6		3.4		266	<1.0		-	-	33.3	<0.5																	
PW5	Apr-94		43.8		3.23		222	<1.0		7.6	500	27.4	<0.5																	
PW5	Sep-94		41.6		3.64		212	<2.0		8.1	400	26.3	<0.5																	
PW5	Apr-95		43.5		14.8		224	<1.0		7.5	400	27.9	3	U																
PW5	Sep-95		52.6		3.64		250	<1.0		8	500	28.8	11.2	J,U																
PW5	Sep-95	D	52		3.73		255	<1.0		8	500	30.3	7.2	J,U																
PW5	Apr-96		47		3.04		237	<1.0		7.73	581	29.1	<0.5																	
PW5	Sep-96		53.2		4		257	<1.0		8.03	550	30.2	<0.5																	
PW5	Apr-97		43.2		3.79		250	<1.0		8.30	500	34.6	0.6																	
PW5	Sep-97		54		2.23		270	<1.0		8.00	500	32.8	<0.5																	
PW5	Sep-97	D	54.6		NA		282	<1.0		8.00	500	35.4	<0.5																	
PW5	Apr-98		45.5		4.62		235	<1.0		7.62	530	29.5	0.9																	
PW5	Sep-98		55.4		4.63		276	<1.0		7.66	502	33.5	<0.5																	
PW5	Apr-99		46		7.01		236	<1.0		7.73	510	29.4	<0.5																	
PW5	Sep-99		40.1		7.23		199	<1.0		7.59	529	24.1	1.8	U																
PW5	Apr-00		46.6		7.22		242	<2.0		7.84	541	30.5	1.8	U																
PW5	Sep-00		55.8		5.32		285	<2.0		7.57	616	35.3	<0.5																	
PW5	Apr-01		58.9		5.8		289	<2.0		7.16	573	34.4	0.9																	
PW5	Sep-01		61.0		3.9		309	<1.0		7.41	635	38.8	1.3																	
PW5	Sep-01	D	61.9		3.2		315	<1.0		7.41	635	31.6	1.3																	
PW5	Apr-02		46.9		9.3		247	3	U	7.23	581	31.5	2.5	J,U																
PW5	Apr-02	D	46.4		9.7		244	<1.0		7.23	581	31.2	0.7																	
PW5	Sep-02		37		6.4		245	2.5		6.98	464	37	3.9	U																
PW5	Apr-03		51		7.05		287	1		7.53	600	34	1.4																	
PW5	Sep-03		54		10.9		265	1		7.65 (1)	433	33	6.0																	
PW5	Apr-04		49		12		254	<2		7.83 (1)	591	31.9	<1.0																	
PW5	Sep-04		46.7		19.2		249	<2		7.95	543	32.2	<1.0																	
PW5	Sep-04	D	46		19.3		246	<2		7.95	-	31.8	<1.0																	
PW5	Apr-05		54.9		10.2		281	<2		7.29	652	34.9	<1.0																	
PW5	Apr-05	D	54		10.1		279	<2		7.29	652	35	<1.0																	
PW5	Nov-05		47.7		26.4		251	<1		7.59	533	32	<1.0																	
PW5	Apr-06		38.8		16		240	<1		8.31	602	35.2	1	U																
PW5	Nov-06		52		24		280	2	J,U	7.09	613	37	2.0																	
PW5	Nov-06	D	53		24		290	10	J	-	-	38	1.0																	
PW5	Apr-07		49.8		24		250	<1		7.48	520	31	<1.0																	
PW5	Nov-07		68	U	35		330	2	U	7.81	665	39.5	<1.0																	
PW5	Apr-08		56.2		27		290	<1		7.53	635	35.9	<1.0																	
PW5	Nov-08		60		<2		300	<1		7.24	608	35.4	1																	
PW5	Nov-08	D	59.9		<2		300					35.9	1																	
PW5	Apr-09		55		25.1		275	<1		7.62	577	33.4	1.4																	
PW5	Nov-09		63.2		9.4		304	<1		7.32	756	35.5	2.0																	

Well	Sampling Date	Notes	Calcium	Chloride	Hardness	Phenols	Field pH	Field Conductivity	Magnesium	DOC	Alkalinity	Sulphate	Boron	Iron	Manganese	Sodium	Nitrate	Nitrite	Ammonia	TKN	Benzene	m,p-Xylene	Ethylbenzene	Toluene	o-Xylene	Xylene Mixture (Total)
CRA Units (1981 - 2012)			mg/L	mg/L	mg/L	µg/L		µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L					mg/L	mg/L	mg/L	mg/L	mg/L	
Burnside Units (2013 -)			mg/L	mg/L	mg/L	mg/L		µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
PW5	Mar-10		61.3	11.5	276	<1.0	7.78	1000	29.9	1.9																
PW5	Mar-10	D	65.5	11.8	299	<1.0	-	-	32.9	1.6																
PW5	Nov-10		67.1	12.5	324	<1.0	6.65	505	37.9	1.6																
PW5	Nov-10	D	67.7	12.6	326	<1.0	-	-	38	1.8																
PW5	Mar-11		56.8	23.6	289	<1.0	7.96	705	35.7	1.7																
PW5	Dec-11		80.1	9.9	356	<1.0	7.93	707	37.9	1.3																
PW5	Dec-11	D	80.4	10.6	369	<1.0	-	-	41	1.3																
PW5	Apr-12		59.8	38.5	303	<1.0	7.41	693	37.2	<1.0																
PW5	Nov-12		63.2	33.7	314	<1.0	6.76	554	37.9	<1.0																
PW5	Nov-12	D	63.7	36.2	314	<1.0	-	-	37.5	1																
PW5	May-13		57.7	26.8	294	<0.001	7.45	720	36.5	2.2																
PW5	Oct-13		63.6	14.1	311	0.001	7.63	699	36.9	1.1																
PW5	Jun-14		57.0	31.9	294	<0.001	7.39	699	36.8	0.8																
PW5	Nov-14		56.4	37.5	295	<0.001	7.60	678	37.5	1.0																
PW5	May-15		56.7	29.4	291	<0.001	7.54	732	36.2	1.1																
PW5	Sep-15		64.4	16.3	319	<0.001	9.02	619	38.5	1.0																
PW5	Apr-16		60.0	32.4	299	<0.001	7.87	604	36.2	1.1																
PW5	Oct-16		58.8	9.26	291	<0.001	7.99	582	34.9	3.4																
PW5	Apr-17		58.4	36.7	296	<0.001	7.58	600	36.4	1.2																
PW5	Sep-17		55.0	4.83	276	<0.001	7.79	561	33.7	1.2																
PW5	May-18		55.9	29.1	285		7.89	595	35.2	1.1																
PW5	Oct-18		60.5	6.02	291	<0.001	7.65	338.1	33.9	1.1																
PW5	May-19		53.9	9.48	271	<0.001	7.66	685	33.1	1.1	195					29.4	<0.05	<0.05								
PW5	Oct-19		58.4	7.74	289	<0.001	7.25	589	34.8	1.7	198					31.1	<0.25	<0.25								
PW5	May-20		COVID19 - no sample																							
PW5	Oct-20		51.5	9.18	262	0.002	7.85	493.5	32.4	2.0	201					30.6	<0.10	<0.10								
PW5	Jun-21		COVID19 - no sample																							

Notes:

mg/L	milligrams per litre	DOC	dissolved organic carbon	Dry	no water in well at time of sampling	RDL	reported detection limit
µS/cm	micro-siemens per centimetre	ODWQS	Ontario Drinking Water Quality Standards	Ins	insufficient water to obtain a sample	MDL	method detection limit
µg/L	micrograms per litre	APV	Aquatic Protection Value	NA	not analyzed	<1.0	not detected above stated MDL or RDL

U	the analyte was analyzed for, but was not detected above the reported sample quantitation limit
J	the analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample
J,U	the analyte was not detected above the reported sample quantitation limit. However, the reported sample quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample
1	pH was measured in laboratory
2	these results originally reported as OW5-84 data
3	these results appear to have been wrongly identified and are suspected as belonging to OW7-91
4	these results originally reported as OW4-84 data
5	these results appear to have been wrongly identified and are suspected as belonging to OW4-84
6	well inaccessible due to snow cover, sampled from kitchen tap
7	no permission to sample granted by property owner
8	well pump not functioning

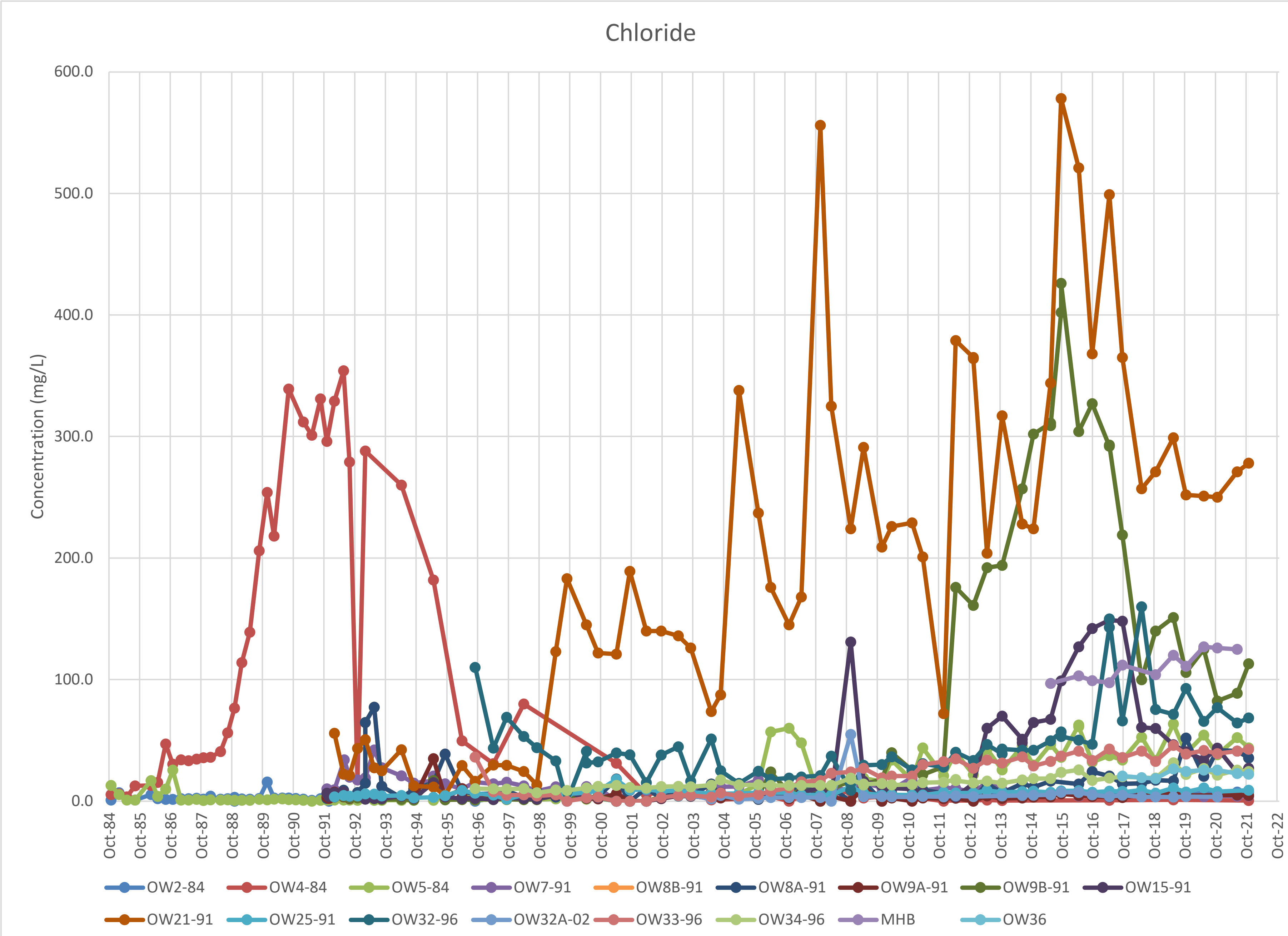
Reasonable Use - maximum allowable concentration, MOE Guideline B-7

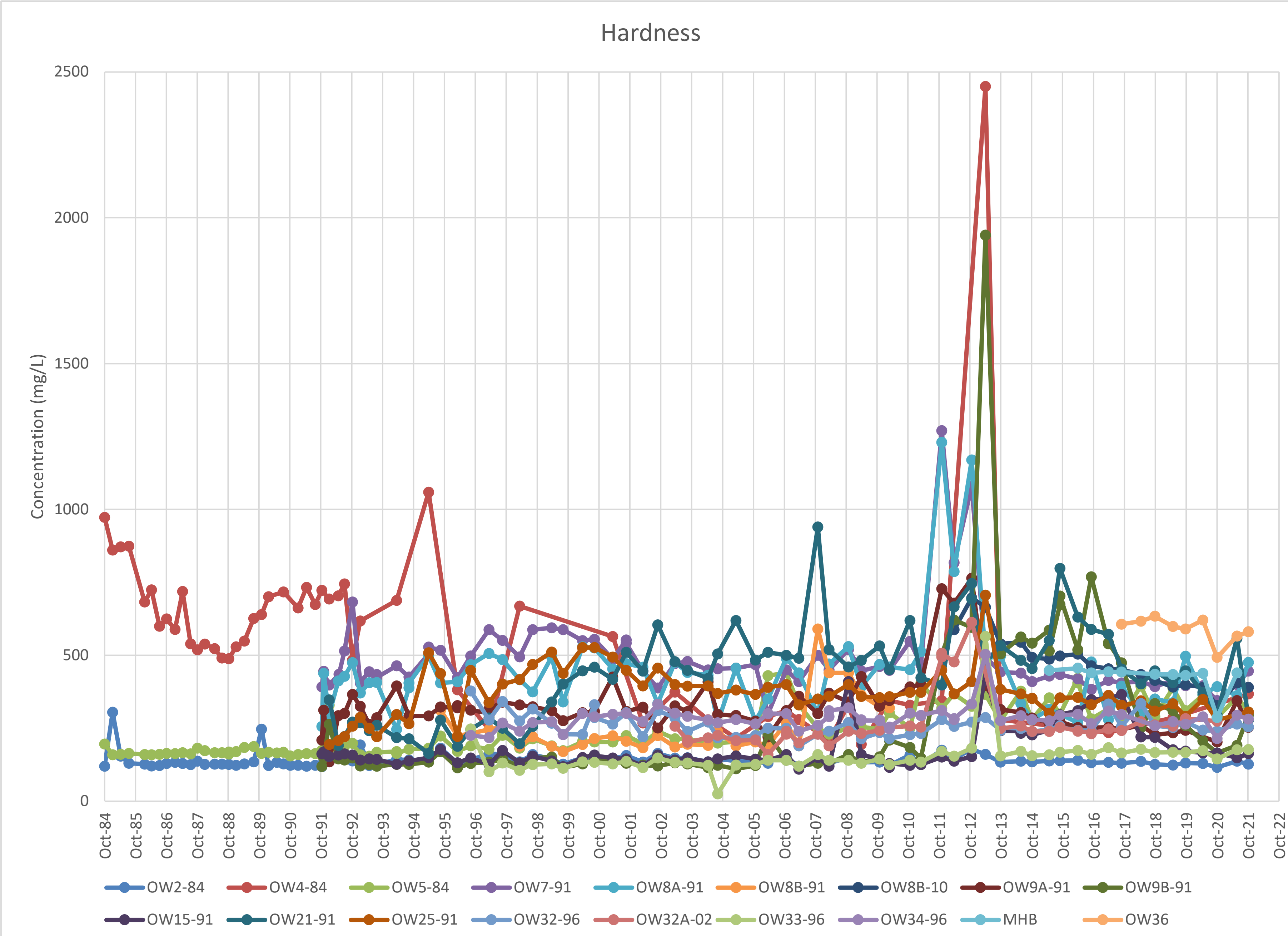
Reasonable Use calculations are based on reported detection limited if reported result is less than detection

Overburden background concentration is average of the 2016 results from OW2-84 and OW25-91

Bedrock background concentration is average of the 2016 results from OW8A-91

PW1 - owner drilled a new well in August 2011. Water samples from 1985 to March 2011 taken from overburden well. Samples after August 2011 taken from drilled bedrock well.


Chloride
Concentration (mg/L)
600.0
500.0
400.0
300.0
200.0
100.0
0.0
Oct-84
Oct-85
Oct-86
Oct-87
Oct-88
Oct-89
Oct-90
Oct-91
Oct-92
Oct-93
Oct-94
Oct-95
Oct-96
Oct-97
Oct-98
Oct-99
Oct-00
Oct-01
Oct-02
Oct-03
Oct-04
Oct-05
Oct-06
Oct-07
Oct-08
Oct-09
Oct-10
Oct-11
Oct-12
Oct-13
Oct-14
Oct-15
Oct-16
Oct-17
Oct-18
Oct-19
Oct-20
Oct-21
Oct-22
OW2-84
OW4-84
OW5-84
OW7-91
OW8B-91
OW8A-91
OW9A-91
OW9B-91
OW15-91
OW21-91
OW25-91
OW32-96
OW32A-02
OW33-96
OW34-96
MHB
OW36



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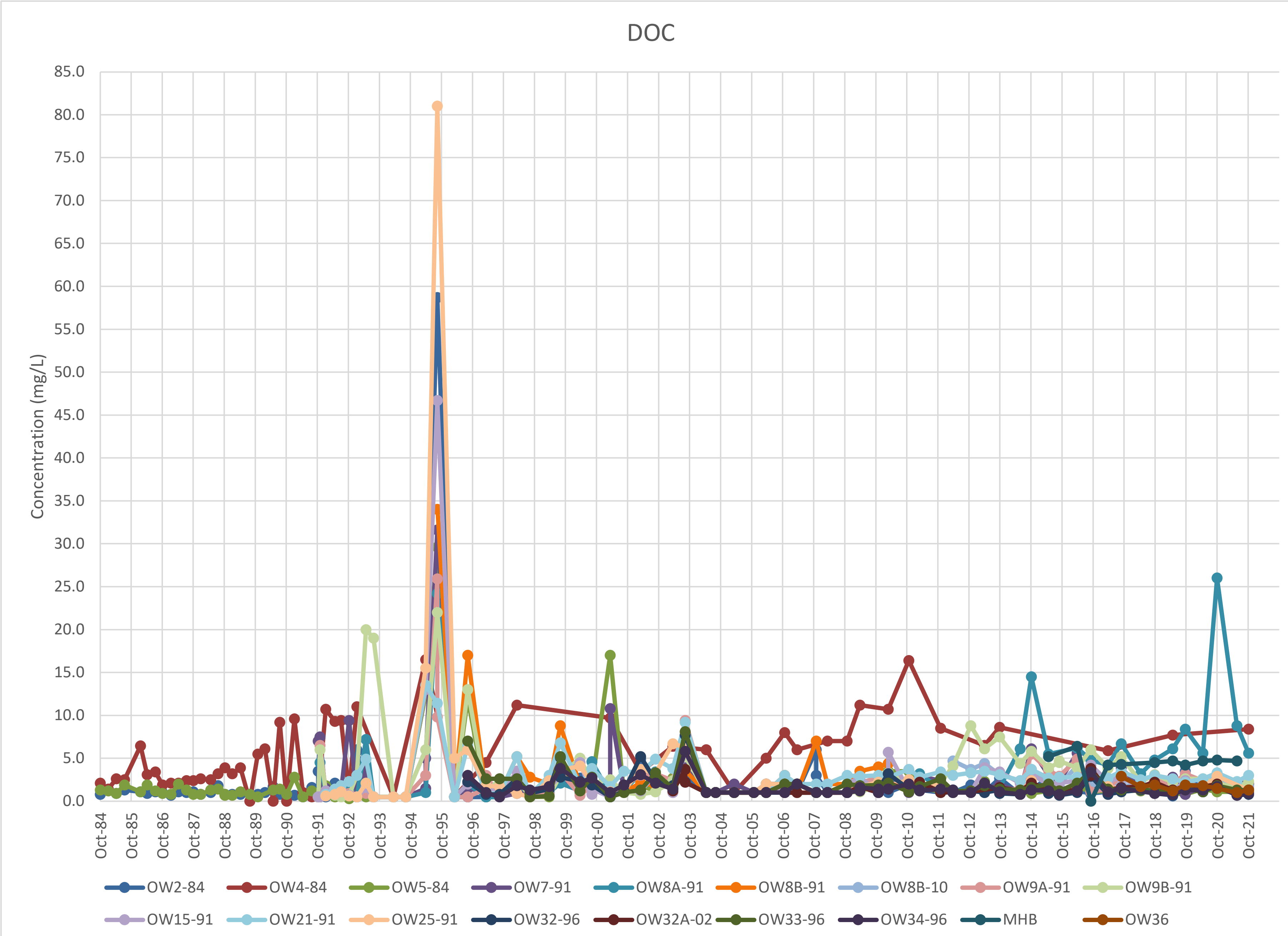
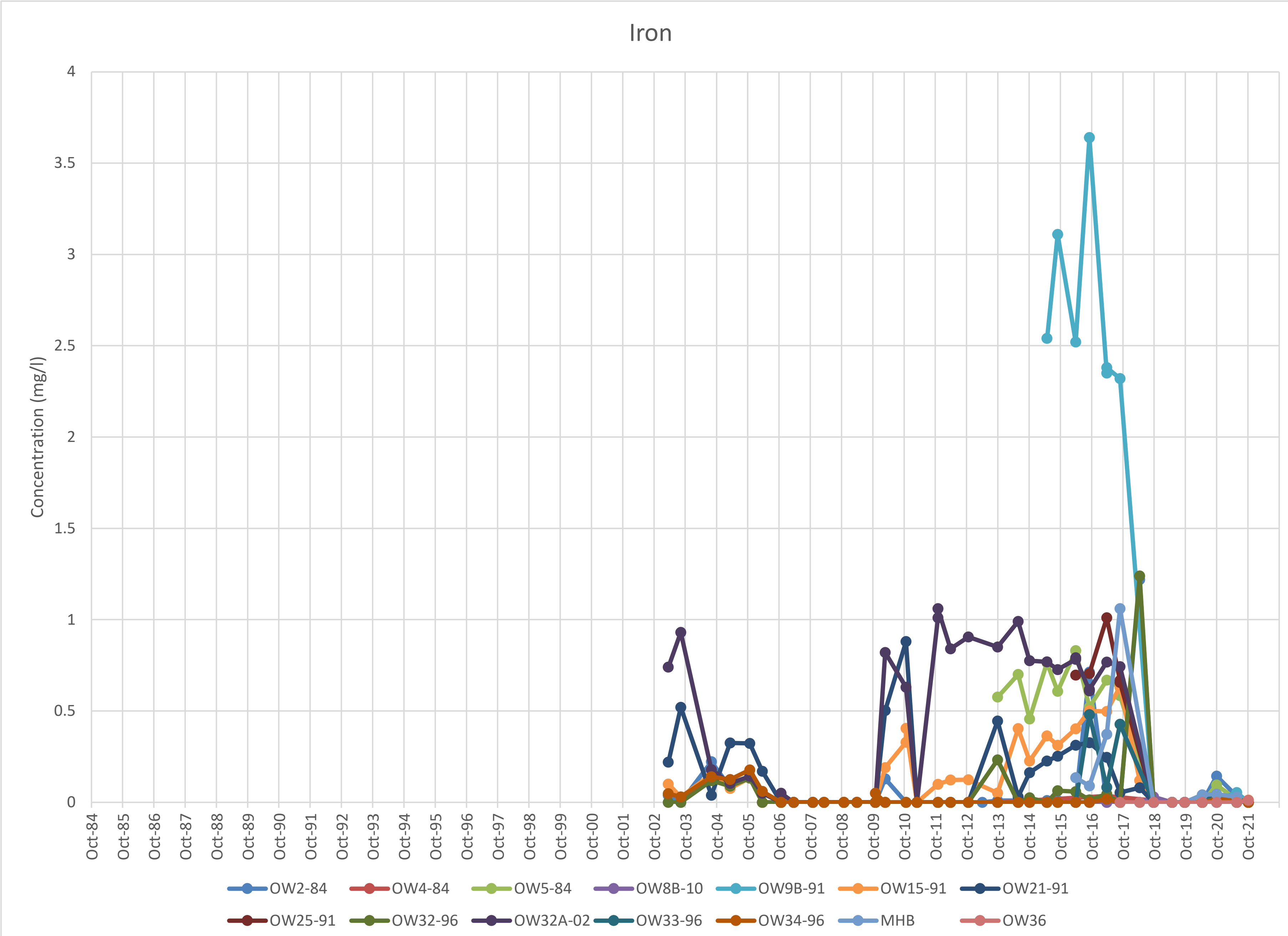

DOC
Concentration (mg/L)
85.0
80.0
75.0
70.0
65.0
60.0
55.0
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
Oct-84 Oct-85 Oct-86 Oct-87 Oct-88 Oct-89 Oct-90 Oct-91 Oct-92 Oct-93 Oct-94 Oct-95 Oct-96 Oct-97 Oct-98 Oct-99 Oct-00 Oct-01 Oct-02 Oct-03 Oct-04 Oct-05 Oct-06 Oct-07 Oct-08 Oct-09 Oct-10 Oct-11 Oct-12 Oct-13 Oct-14 Oct-15 Oct-16 Oct-17 Oct-18 Oct-19 Oct-20 Oct-21
OW2-84 OW4-84 OW5-84 OW7-91 OW8A-91 OW8B-91 OW8B-10 OW9A-91 OW9B-91
OW15-91 OW21-91 OW25-91 OW32-96 OW32A-02 OW33-96 OW34-96 MHB OW36



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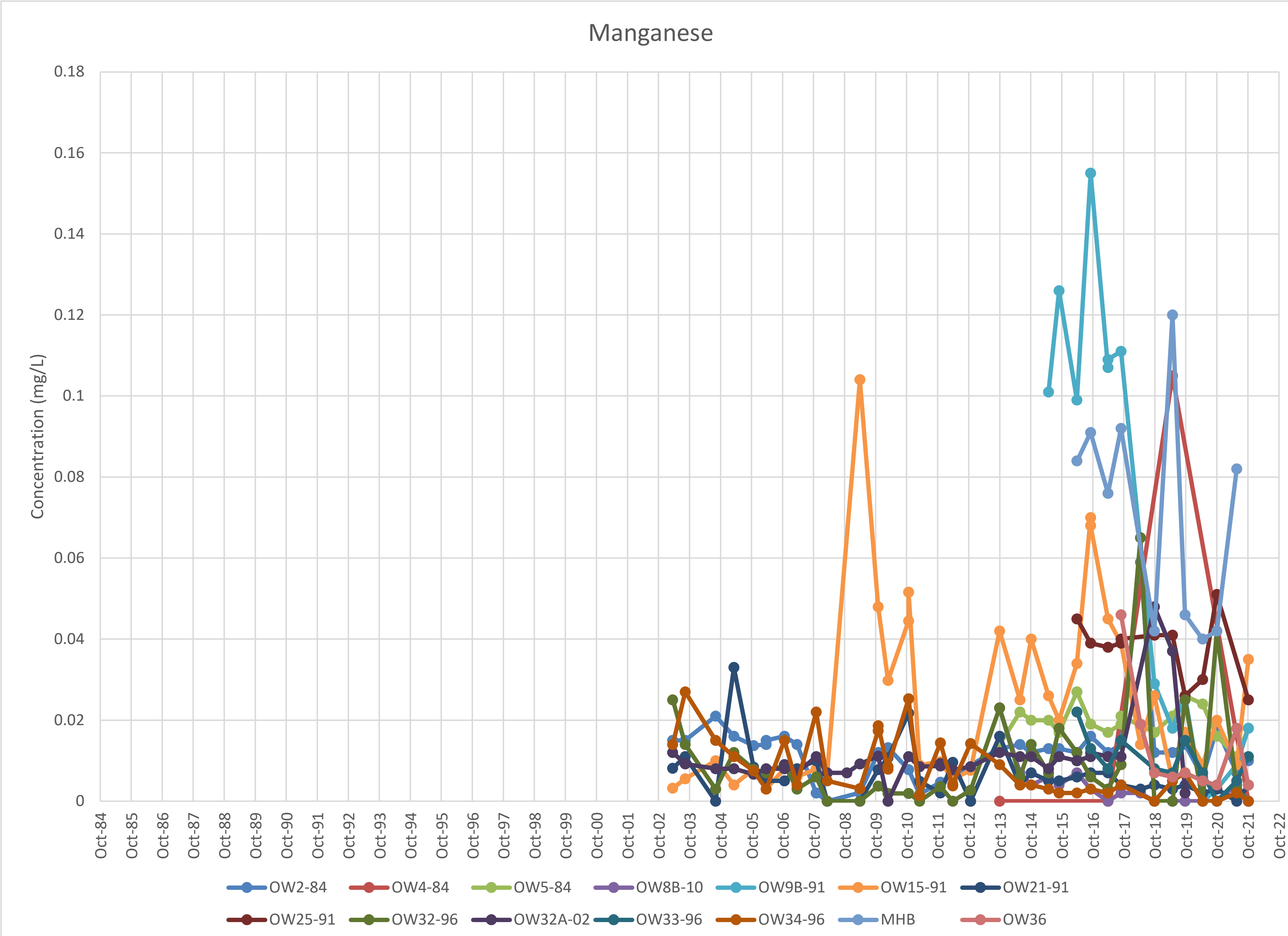

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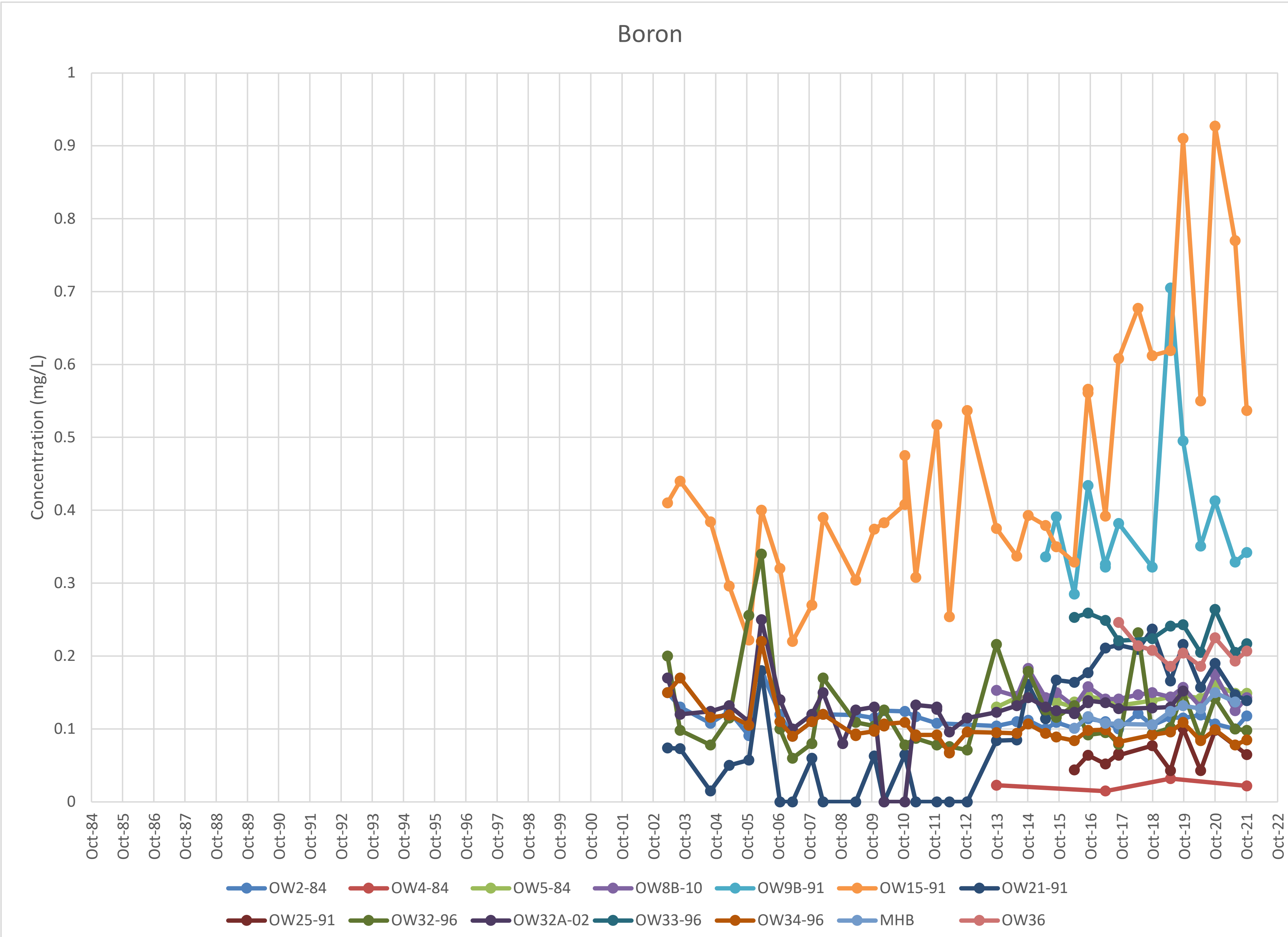

GM BluePlan ENGINEERING

TOWN OF ST. MARY'S
ANNUAL OPERATIONS MONITORING REPORT (2020)
GMBP FILE: 318007
MARCH 2021

APPENDIX E:
HISTORICAL SURFACE WATER QUALITY ANALYTICAL RESULTS (TABLES & GRAPHS)

Location	Sampling Date	Notes	Calcium	Chloride	Hardness	Phenols	Field pH	Field Conductivity	Magnesium	TDS	BOD_5	Ammonia	Field Temperature	Unionized Ammonia	Iron	Manganese	Turbidity(1)	Total Phosphorus	TSS	Alkalinity	Nitrate as N	Nitrite as N	Sodium
CRA Units (1981 - 2012)			mg/L	mg/L	mg/L	µg/L		µS/cm	mg/L	mg/L	mg/L	mg/L	^{0}C	mg/L	mg/L	mg/L	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Burnside Units ('13 - '14)			mg/L	mg/L	mg/L	mg/L		µS/cm	mg/L	mg/L	mg/L	mg/L	^{0}C	µg/L	mg/L	mg/L	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
SP1-93	May-85		73	64	328	5.5	8.39	920	35.4	559.7	3.9	0.055			0.9	0.17	21						
SP1-93	Aug-85		80	272	365	5	7.57	1580	40	970	1.56	0.085			1.32	0.266	38						
SP1-93	Feb-86		97.5	200	320	1.5	7.86	1000	18.6	726	5.6	0.28			3.85	0.27	210						
SP1-93	May-86		43.5	53	181	1.5	8.32	520	17.6	371.4		0.005			0.19	0.016	3.7						
SP1-93	Aug-86		91	305	376	1	8.00	1240	36	764	1.1	0.005			0.24	0.012	8.1						
SP1-93	Nov-86		97.5	34	324	<1.0	8.08	610	19.4	425.9	1.82	<0.005			0.28	0.024	8.3						
SP1-93	May-87		97.5	235	395	1	7.59	1520	36.6	796	4.76	0.13			0.06	0.315							
SP1-93	Aug-87		71.5	138	274	1	7.51	950	23	614	6.9	0.015			3.04	0.336	97						
SP1-93	Nov-87		99.2	148.6	405	<1.0	7.78	1300	38.2	714	0.88	0.011			0.8	0.044							
SP1-93	May-88		83.5	89.0	279.5	<1.0	7.30		17.18														
SP1-93	Aug-88		84.1	90.0	370.5	<1.0	7.45	1044	38.89														
SP1-93	Nov-88		63.7	21.1	218	<1.0	6.24	434	14.25														
SP1-93	Feb-89		83.6	53.2	269	1.5	7.56	587	14.5	386	2.48	0.148			0.34	0.014	10						
SP1-93	May-89		87.4	136	338	1	7.97	920	29.1	620	1.58	0.034			0.33	0.068	7.7						
SP1-93	Aug-89		73.5	127	352	1	7.40	1020	40.8	734	2.04				1.88	0.128	71						
SP1-93	Nov-89		95.7	183	338	1.5	7.70	770	24	500+	1.76				2.8	0.1	129						
SP1-93	Feb-90		99.1	44.8	358	2.5	7.22	557	26.7	428	4.12				3.6	0.14	169						
SP1-93	May-90		96.2	115	329	<1.0	7.45	737	21.5	491+	4.52				0.37	0.033	21						
SP1-93	Aug-90		88.9	67.1	320	<1.0	7.76	660	23.7	429					0.76	0.03	22						
SP1-93	Nov-90		136	52.2	457	8.5	7.90	340	28.4	221	2.96	0.039			20.4	0.47	>200						
SP1-93	Feb-91																						
SP1-93	May-91		87	178	339	<1.0	8.05	977	29.5	772	3.84	0.02			1.45	0.207	45						
SP1-93	Aug-91		101	167	429	<1.0	6.78	1255	42.9	812	3.2	0.053			4.5	0.166	192						
SP1-93	Nov-91		850	887	2842	<1.0	7.80	2050	174	2314	23	0.169			127	4.44							
SP1-93	Nov-91		128	138			7.80	2050	48.2	815		0.28			10.5	0.477	270	0.692	500				
SP1-93	Dec-91		92.5	114			8.41	684	22.2	642		0.29			1.18	0.058	36	0.109	22				
SP1-93	Feb-92		148	365	691	2.5	7.80	492	78	320+	0.9	0.768			0.27	0.117	3.9						
SP1-93	May-92		76.4	118	281	2.0U	8.59	580	21.9	377+	2.40U	0.038U			1.26	0.137	28						
SP1-93	Aug-92		97.6	92.5	343	4.5	8.22	1430	24.1	550	3	0.013			2.22	0.103	76.2						
SP1-93	Aug-92	D	97.7	91.9	344	3.0	8.22	1430	24.2	550	3	0.009			2.76	0.122	99.6						
SP1-93	Nov-92		75.9	51.7	256	21	7.98	345	16.1	224	2.8	0.052U			5.48	0.158	181.5						
SP1-93	Feb-93		19.1	170	58.4	<1.0	8.46	440	2.6	570	4.0	0.25			3.75	0.75	45						
SP1-93	May-93		81.2	109	345	2.8	8.70	860	34.6	574	3.0	0.14			0.7	0.12	18.1						
SP1-93	Apr-94		80.5	59.6	259	<1.0	8.50	700	14.2	444	<2.0	<0.02			0.27	0.05	21	0.133	15				
SP1-93	Sep-94		82.3	201	373	<2.0*	8.50	1200	40.6	844	<2.0	<0.01			0.24	0.07	6.5	<0.10	4				
SP1-93	Apr-95		79.7				8.20	600	12.2	411	<2.0	0.07			0.19	0.04	25	0.18	13				
SP1-93	Sep-95		98.2	188	441	<1.0	8.00	1100	47.6	812	<2.0	0.01			0.14	0.31	8.5	0.02	4				
SP1-93	Sep-95	D	93.7	186	429	<1.0	8.00	1100	47.4	844	<2.0	<0.01			0.15	0.38	0.93	0.02	6				
SP1-93	Oct-95	2		95.6			8.78(1)												396				
SP1-93	Apr-96		75.8	94.1	265	<1.0	8.48	697	18.4	492	<5.0	0.07			0.218	0.023	10.8	<0.01	13				
SP1-93	Apr-96	D	74.5	87.2	261	<1.0	8.48	697	18.2	490	<5.0	0.07			0.218	0.023	10.8	<0.01	18				
SP1-93	Sep-96		85.6	126	366	<1.0	8.4	1140	37	790	1.43	0.034			0.46	0.039	16.2	0.08	14.4				

Location	Sampling Date	Notes	Calcium	Chloride	Hardness	Phenols	Field pH	Field Conductivity	Magnesium	TDS	BOD_5	Ammonia	Field Temperature	Unionized Ammonia	Iron	Manganese	Turbidity[1]	Total Phosphorus	TSS	Alkalinity	Nitrate as N	Nitrite as N	Sodium
CRA Units (1981 - 2012)			mg/L	mg/L	mg/L	µg/L		µS/cm	mg/L	mg/L	mg/L	mg/L	°C	mg/L	mg/L	mg/L	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Burnside Units ('13 - '14)			mg/L	mg/L	mg/L	mg/L		µS/cm	mg/L	mg/L	mg/L	mg/L	°C	µg/L	mg/L	mg/L	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
SP1-93	Oct-96	2		46.2			8.30(1)	600											196				
SP1-93	Apr-97		136	204	498	<1.0	9.5	1200	38.6	700	2.5	<0.004			0.16	0.047	4.4	0.06	7				
SP1-93	Sep-97		104	375	446	<1.0	7.60	1700	45.3	1250	<5.0	0.023			0.256	0.177	18.3	0.11	13				
SP1-93	Apr-98	2		103			8.06(1)	856											5				
SP1-93	Apr-98		85.6	141	302	<1.0	8.42	981	21.4	652	<4.0 UJ	0.078U			0.261	0.04	9.4	0.07	14				
SP1-93	Sep-98		109	203	475	<1.0	8.22	1450	49.2	854	2.1	.038U			0.327	0.063	12.9	0.440 U	7				
SP1-93	Sep-98	D	112	201	487	<1.0	8.22	1450	50.4	896	3.7	0.042U			0.307	0.063	13.5	0.440 U	8				
SP1-93	Apr-98		94.8	85.5	356	<1.0	8.55	815	29	592	<6.0	0.005			0.099	0.029	2.6	0.150 U	<1				
SP1-93	Jun-99	2		78															4				
SP1-93	Sep-99		85.9	116	366	<1.0	7.82	1300	37	882	<6.0	0.123U			0.357	0.052	16	0.18	10				
SP1-93	Apr-00		106	108	403	<2.0*	8.33	1040	33.6	644	<4	<0.009			0.087	0.0359	2.5	0.03	3				
SP1-93	Jun-00	2		50.2			7.65	519											74				
SP1-93	Sep-00		94.2	71.1	346	<2.0*	8.07	840	26.8	195	4.5	0.091			0.304	0.068	0.5	0.1	15				
SP1-93	Apr-01		105	142	350	<2.0*	7.79	950	21.3	664	<4.0	<0.05			0.405	0.106	19	<0.10	40				
SP1-93	Jun-01	2		102			7.73	950											12				
SP1-93	Sep-01		95.3	265	434	<1.0	7.73	1660	47.5	921	5	0.13			0.265	0.129	9.8	0.11	3				
SP1-93	Apr-02		80.5	147	272	<1.0	7.76	920	17.2	587	<4.0	0.08			0.2	0.032	12.2J	<0.01	20				
SP1-93	Apr-02	D	80.3	146	271	<1.0	7.76	920	17.1	584	<4.0	0.09			0.2	0.032	27.0J	0.01	18				
SP1-93	Sep-02		79	250	337	<1.0	6.20	1050	34	958	3.7	0.57			1.7	0.16	95	<0.01	133				
SP1-93	Oct-02	2		590			7.85	2510											82				
SP1-93	Apr-03		98	135	300	1	8.35	940	23	503	<3.0	<0.05			0.5	0.038	12.4	0.04	20				
SP1-93	Jun-03	2		173			8.12	1080											23				
SP1-93	Sep-03		130	442	584	1	8.17	2080	42	1340	<3.0	<0.5			0.58	0.14	21	0.09	28				
SP1-93	Sep-03	D	130	441	585	1	8.18 (1)	2080	41	1400	<3.0	<0.5			0.48	0.14	25.9	0.08	35				
SP1-93	May-04		86.8	74.4	281	<2.0*	8.30/8.13(1)	670/740(1)	15.6	462	<5.0	0.03		0.002/0.0014	0.356	0.028	3.1 J	0.09	15				
SP1-93	Sep-04		107	506	435	<2.0*	8.33	2340	40.6	1430	<5.0	<0.02		<0.0015	0.806 UJ	0.243 UJ	2.5 J	0.21	<12				
SP1-93	Sep-04	D	107	489	438	<2.0*	8.33	2340	41.5	1430	<5.0	<0.02		<0.0015	0.570 UJ	0.132 UJ	2.0 J	0.2	<12				
SP1-93	Apr-05		75.4	89.4	240	<2.0*	8.13	717	12.7	708	<5	0.02		0.00039	0.505	0.028	1.6	0.05	<12				
SP1-93	Jul-05	2		112			8.45	756											<12				
SP1-93	Nov-05		89.6	141	297	<1.0	7.58	940	17.8	492	<5	0.09		0.00031	0.86	0.03	5.1	0.06	20				
SP1-93	Apr-06		70	81	230	<1.0	9.49	704	14	440	<2	<0.05		<0.01942	<0.5 *	0.03	6	0.03 U	11				
SP1-93	Apr-06	D	72	92	240	<1.0	9.49	704	14	440	<2	<0.05		<0.01942	<0.5 *	0.03	6.7	0.03 U	12				
SP1-93	Jul-06	2		58			7.85	571											47				
SP1-93	Nov-06		95	66	310	<1.0	7.74	729	18	460	<2	<0.05		<0.00033	0.12	0.024 U	5.1	0.064 U	3				
SP1-93	Nov-06	D	95	67	310	2	7.74	729	18	450	<2	<0.05		<0.00033	0.13	0.023 U	5.7	0.083 U	3				
SP1-93	Apr-07		72.3	119	240	<1.0	8.72	709	13.3	440	3	<0.05		0.00326	0.21	0.021	3.4	0.086	19				
SP1-93	Nov-07		83.8	244	300	2	8.41	1410	21.3	780	<2	0.1		0.0022	0.47J	0.051	9.5	0.072	79				
SP1-93	Apr-08		65.9	74	210	<1.0	9.02	616	10.9	370	<2	<0.05		<0.00757	0.32	0.026	6.8	0.077	5				
SP1-93	Aug-08	2		147			7.97	779							4.3			0.12	85				
SP1-93	Nov-08		88.8	67	280	<1.0	7.15	668	14.5	390	<2	0.07		0.0001	0.41	0.018	5.6	0.052	5				
SP1-93	Apr-09		78.6	74.8	244	<1.0	8.36	556	11.5	384	3.2	0.077		0.005870	0.937	0.0428	19.2	0.118	22.4				
SP1-93	Nov-09		95.7	149	318	2	7.99	1060	19.2	612	2.3	<0.050			0.672	0.0626	12.4	0.0415	16.8				
SP1-93	Mar-10		Moved to SP1-10																				

Location	Sampling Date	Notes	Calcium	Chloride	Hardness	Phenols	Field pH	Field Conductivity	Magnesium	TDS	BOD_5	Ammonia	Field Temperature	Unionized Ammonia	Iron	Manganese	Turbidity[1]	Total Phosphorus	TSS	Alkalinity	Nitrate as N	Nitrite as N	Sodium
CRA Units (1981 - 2012)			mg/L	mg/L	mg/L	µg/L		µS/cm	mg/L	mg/L	mg/L	mg/L	^0C	mg/L	mg/L	mg/L	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Burnside Units ('13 - '14)			mg/L	mg/L	mg/L	mg/L		µS/cm	mg/L	mg/L	mg/L	mg/L	^0C	µg/L	mg/L	mg/L	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
SP1-10	Mar-10		82.6	102	257	<1.0	8.77	950	12.2	416	2	<0.050	5.4		0.122	0.018	2.3	0.039	8.8				
SP1-10	May-10			111			8.38								< 0.050			0.051	3.6				
SP1-10	Nov-10		70.5	99.7	231	<1.0	7.25	550	13.3	446	5.1	0.051	8.3	0.00007	2.98	0.072	76	0.355	36.4				
SP1-10	Mar-11		77.6	118	254	1.5	8.58	882	14.6	466	< 2.0	< 0.050	4.8	<0.00223	0.139	0.0146	2.7	0.0197	< 3.0				
SP1-10	Oct-11			48			8.27	648					11.5		0.854			0.0893	26.0				
SP1-10	Dec-11		81.4	39.2	251	<1.0	8.24	556	11.7	350	< 2.0	0.068	4.9	0.00365	0.850	0.0211	26	0.0716	10				
SP1-10	Apr-12		62.3	12.9	239	<1.0	8.38	1590	20.2	882	<2.0	0.096	8.6	0.00365	0.381	0.0668	139	0.0363	12				
SP1-10	Apr-12	D	62.6	12.9	240	<1.0	8.38	1590	20.4	884	<2.0	0.095	8.6	0.00365	0.398	0.0689	139	0.0334	12				
SP1-10	Aug-12			306			8.53	1500							0.294		60	0	10.8				
SP1-10	Nov-12		90.1	151	294	<1.0	7.47	828	16.7	648	<2.0	<0.050	4.8	<0.00018	0.113	0.0239	29	0.0181	< 2.0				
SP1-10	Nov-12	D	90.4	150	294	<1.0	7.47	828	16.7	646	<2.0	<0.050	4.8	<0.00018	0.118	0.0239	29	0.0189	< 2.0				
SP1-10	May-13		56.8	93.0	191	<0.001	8.83	674	11.9	340	<5	0.02	15.0	3.12	0.10	0.017	6.2	0.04	<10				
SP1-10	Oct-13		70.3	41.9	218	<0.001	7.45	564	10.4	348	<5	0.11	7.6	0.47	0.19	0.017	15.3	0.12	14				
SP1-10	Jun-14		37.4	195	141	0.002	7.24	996	11.5	554	<5	0.89	20.9	6.49	0.30	0.072	21.5	0.34	16				
SP1-10	Nov-14		96.2	75.6	307	<0.001	7.45	720	16.2	456	<5	0.04	7.3	0.17	0.30	0.062	45.0	<0.02	39				
SP1-10	May-15		66.7	290	227	<0.001	8.39	1313	14.7	826	6.00	0.78	12.3	40.33	0.54	0.305	34.2	0.47	25				
SP1-10	Sep-15		14.0	633	69.3	0.004	NA	3952	8.35	1520	<5	0.95	16.67	NA	0.79	0.121	118	0.40	81				
SP1-10	Sep-15	D	13.6	627	66.8	0.004			7.98	1560	<5	1.00			0.79	0.124	109	0.42	70				
SP1-10	Apr-16		59.3	105	203	<0.001	8.59	650	13.3	374	<5	0.04	6.67	2.10	0.11	0.047	14.6	0.08	17				
SP1-10	Oct-16		46.8	176	151	<0.001	8.66	1276	8.23	586	<5	0.18	14.21	18.93	0.50	0.053	78.3	0.14	36				
SP1-10	Apr-17		62.5	74.6	203	<0.001	8.48	598	11.30	358	<5	0.02	11.56	1.19	0.18	0.030	12.9	0.06	10				
SP1-10	Sep-17		34.4	327	136	<0.001	8.65	1404	12.1	744	5	0.24	19.9	35.85	0.38	0.105	44.8	0.22	35				
SP1-10	May-18		34.9	158	141	0.001	9.25	778	13.1	472	<5	0.08	16.22		0.078	0.037	11.6	0.05	20				
SP1-10	Oct-18		87.2	84	280	<0.001	8.38	640	15.0	488	<5	0.02	11.6		<0.010	0.020	5.7	0.05	<10				
SP1-10	May-19		125.0	187	581	0.029			65.4	1650	73	0.40		0.009	0.742	0.248	617.0	3.40	482	943	<0.25	<0.25	42.9
SP1-10	Oct-19		70.6	83.7	226	0.004	8.32	591	12.0	402	<5	0.03	NA	NA	0.366	0.048	42.0	0.19	28	199	1.50	<0.25	40.00
SP1-10	May-20		82.9	86.9	268	<0.001	8.09	804	14.72	434	<5	<0.02	20	<0.001	0.174	0.027	2.2	0.05	<10	209	5.84	<0.25	41.20
SP1-10	Oct-20		40.5	199	154	0.002	8.95	745	12.95	596	2	0.08	9.4	0.011	0.147	0.009	18.4	0.05	24	174	0.28	<0.25	76.67
SP1-10	Jun-21		15.9	415	108	0.003	9.83	2274	16.70	816	<2	0.12	22.2	0.758	0.265	0.055	7.1	0.19	<10	194	<0.07	<0.05	154.00
SP1-10	Nov-21		161.0	10.9	506	0.009	7.58		25.30	328	19	0.11	7.17	0.001	21.8	3.110	512.0	1.33	324	294	0.33	<0.05	2.85
SP2-93	Oct-13		71.8	41.8	224	<0.001	7.85	596	10.8	360	<5	0.08	7.9	0.88	0.25	0.027	15.2	0.11	22				
SP2-93	Jun-14		42.7	183	156	<0.001	7.24	1246	12.0	576	<5	0.36	23.6	3.19	0.43	0.069	16.1	0.25	18				
SP2-93	Nov-14		97.7	78.1	314	<0.001	8.43	782	17.0	466	<5	<0.02	8.1	0.83	0.80	0.128	99.2	<0.02	308				
SP2-93	May-15		63.1	312	226	<0.001	7.95	1664	16.7	846	7.00	0.44	25.2	21.47	0.89	0.170	48.3	0.42	40				
SP2-93	Sep-15		Dry																				
SP2-93	Apr-16		67.5	109	229	<0.001	8.61	672	14.7	406	<5	0.04	10.8	2.98	0.24	0.067	17.5	0.07	20				
SP2-93	Oct-16		53.6	199	173	<0.001	7.75	983	9.62	636	<5	0.07	17.07	1.23	0.75	0.077	38.6	0.15	18				
SP2-93	Apr-17		65.9	77.4	214	<0.001	8.44	637	11.90	372	<5	0.02	15.14	1.41	0.17	0.037	10.4	0.06	<10				
SP2-93	Sep-17		35.3	351	142	<0.001	8.47	1493	13.0	834	5	0.03	20.9	3.33	0.72	0.108	350	0.44	44				
SP2-93	May-18		40.0	158	159	0.001	9.05	828	14.3	518	<5	0.05	17.53		0.206	0.030	10.8	0.09	18				
SP2-93	Oct-18		93.3	82.6	296	<0.001	8.19	377.5	15.4	490	<5	<0.02	12.7		<0.010	0.018	11.9	0.05	13				
SP2-93	May-19		67.3	57.2	213	0.002	7.91	608	10.9	336	<5	0.03	22.03	0.001	<0.010	<0.002	13.7	0.08	13	223	3.12	<0.05	28
SP2-93	Oct-19		68.5	78.7	221	0.004	7.85	544	12.2	432	<5	0.02	NA	NA	0.451	0.049	42.8	0.20	24	187	1.33	<0.25	37.9
SP2-93	May-20		83.0	83.3	270	<0.001	8.00	819	15.29	466	<5	<0.02	17.1	<0.001	0.176	0.037	3.2	0.07	<10	228	5.18	<0.25	41.5
SP2-93	Oct-20		49.83	188	182	0.001	7.82	776	14.03	598	2	0.02	11	<0.001	0.577	0.051	8.2	0.06	16	194	<0.25	<0.25	70.5
SP2-93	Jun-21		29.20	356	152	0.002	8.85	1975	19.10	902	2	0.02	24.3	0.276	0.65	0.063	11.9	0.12	21	186	<0.07	<0.05	146
SP2-93	Nov-21		93.60	48.5	300	0.011	8.05		16.10	428	<2	<0.02	10.8	<0.001	0.157	0.022	5.4	0.07	<10	271	2.81	<0.05	29.7
SP3-93	May-85		72.0	70	328	6	8.54	925	36	582.6	1.44	<0.005			0.84	0.102	15.6						
SP3-93	Aug-85	2	88.5	270	383	4.5	7.83	1560	39.2	1014.8	0.8	0.015			6.25	0.25	238						
SP3-93	May-86		81.0	128	305	1.5	7.92	865	24.8	570		0.13			4.55	0.315	139						
SP3-93	Aug-86	2	87.5	160	370	1	7.64	1240	36.6	812	0.94	<0.005			0.76	0.046	27						
SP3-93	Nov-86		99.5	42.5	327	<1.0	8.16	715	19	478	2.38	0.005			0.68	0.034	21						
SP3-93	May-87		92.5	220	382	<1.0	7.73	1470	36.6	776	5.04	0.005			0.8	0.345							
SP3-93	Aug-87	2	78.0	140	296	<1.0	7.88	1000	24.4	628	4.2	0.015			3.3	0.138	134						

Location	Sampling Date	Notes	Calcium	Chloride	Hardness	Phenols	Field pH	Field Conductivity	Magnesium	TDS	BOD_5	Ammonia	Field Temperature	Unionized Ammonia	Iron	Manganese	Turbidity[1]	Total Phosphorus	TSS	Alkalinity	Nitrate as N	Nitrite as N	Sodium
CRA Units (1981 - 2012)			mg/L	mg/L	mg/L	µg/L		µS/cm	mg/L	mg/L	mg/L	mg/L	°C	mg/L	mg/L	mg/L	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Burnside Units ('13 - '14)			mg/L	mg/L	mg/L	mg/L		µS/cm	mg/L	mg/L	mg/L	mg/L	°C	µg/L	mg/L	mg/L	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
SP3-93	Nov-87		111.2	157.8	454	<1.0	7.85		42.68	768	0.6	0.041			2.16	0.1							
SP3-93	May-88		84.8	86.4	286.6	<1.0	7.45	810	18.1														
SP3-93	May-88	D	83.3	91.6	282.6	<1.0	7.45	810	18.05														
SP3-93	Aug-88	2	82.5	89.5	364.1	<1.0	7.52	1058	38.32														
SP3-93	Nov-88		99.6	96.7	336	<1.0	6.46	868	21.12														
SP3-93	Feb-89		83.2	57.6	268	1.5	7.64	617	14.5	416	2.92	0.172			0.26	0.01	7.5						
SP3-93	May-89		84.2	133	332	1.5	8.04	1009	29.5	682	1.8	0.051			0.29	0.029	1.8						
SP3-93	May-89	D	84.4	123	333	1.5	8.04	1009	29.6	648	1.68	0.063			0.28	0.025	1.68						
SP3-93	Aug-89	2	84.8	138	385	1	7.55	1068	42.1	748	1.64				0.3	0.018	10.4						
SP3-93	Nov-89		87.9	191	316	1	7.70	780	23.3	500+	1.56				0.61	0.03	20						
SP3-93	Feb-90		108.0	87.8	389	3.5	7.16	700	29.1	530	2.16				7.4	0.2	340						
SP3-93	May-90		92.4	119	320	<1.0	7.52	740	21.6	481	1.48				0.017	0.014	8.1						
SP3-93	Aug-90	2	87.7	71.6	314	<1.0	7.79	660	23	429					0.7	0.028	23						
SP3-93	Nov-90		421.0	53.7	1390	9	8.40	730	82	474	5.12	0.194			68.2	1.49	>200						
SP3-93	May-91		84.5	178	339	<1.0	8.17	954	31	746	2.16	0.036			0.34	0.054	10						
SP3-93	Aug-91	2	120.0	183	493	1	6.74	1282	46.8	830	3.2	0.103			9.35	0.458	385						
SP3-93	Nov-91		123.0	699	538	<1.0	8.00	2180	56	2046	2.4	0.289			2	0.59	77						
SP3-93	Nov-91		106.0	127			8.00	2180	43.6	824		0.28			4.12	0.439	168	0.308	120.0				
SP3-93	Dec-91		89.6	117			8.25	648	21.9	640		0.21			1.07	0.046	43	0.101	38.0				
SP3-93	Feb-92		97.7	130	327	<1.0	7.58	510	20.1	332+	0.7	0.025			1.11	0.051	39						
SP3-93	May-92		72.5	133	275	4.0U	8.22	580	22.7	377+	2.00U	0.043U			0.45	0.075	18						
SP3-93	Aug-92	2	95.8	86.2	339	3.5	8.45	1600	24.1	550	16.0U	0.01			1.26	0.059	463						
SP3-93	Nov-92		84.7	94	300	16.5	7.62	480	21.5	312	4.1	0.045U			8.74	0.233	341						
SP3-93	Nov-92	D	77.8	98.5	283	18.5	7.62	480	20.3	312	3.3	0.050U			8.43	0.233	266						
SP3-93	Feb-93		20.5	106	61.9	<1.0	8.32	450	2.6	514	<2.0	0.39			6.88	1.12	33						
SP3-93	May-93		70.4	64.6	312	<1.0	8.10	570	33.1	540	3	0.37			1.5	0.28	38						
SP3-93	Aug-93	2	Dry																				
SP3-93	Apr-94		82.0	65.1	265	<1.0	8.5	700	14.6	444	<2.0	<0.02			0.23	0.05	17	0.121	9				
SP3-93	Apr-94	D	79.2	57.1	255	<1.0	8.50	700	14	456	<2.0	<0.02			0.23	0.04	17.5	0.146	6.0				
SP3-93	Sep-94		75.2	87.3	344	<2.0*	8.50	1000	38	686	<2.0	<0.01			0.22	0.08	10.9	<0.10	6.0				
SP3-93	Apr-95		76.9				7.8	600	11.5	456	<2.0	0.06			0.12	0.04	28	0.21	5.0				
SP3-93	Sep-95		83.5	74.2	387	<1.0	8.00	800	533	606	<0.2	0.02			0.12	0.28	9.5	0.01	6.0				
SP3-93	Oct-95	2		86.9			8.51[1]												75.0				

Location	Sampling Date	Notes	Calcium	Chloride	Hardness	Phenols	Field pH	Field Conductivity	Magnesium	TDS	BOD_5	Ammonia	Field Temperature	Unionized Ammonia	Iron	Manganese	Turbidity[1]	Total Phosphorus	TSS	Alkalinity	Nitrate as N	Nitrite as N	Sodium
CRA Units (1981 - 2012)			mg/L	mg/L	mg/L	µg/L		µS/cm	mg/L	mg/L	mg/L	mg/L	°C	mg/L	mg/L	mg/L	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Burnside Units ('13 - '14)			mg/L	mg/L	mg/L	mg/L		µS/cm	mg/L	mg/L	mg/L	mg/L	°C	µg/L	mg/L	mg/L	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
SP3-93	Apr-96		74.5	118	261	2	8.39	770	18.3	504	<5.0	0.04			0.167	0.017	6.2	<0.001	5.0				
SP3-93	Nov-96		91.0	178	395	<1.0	8.49	1290	40.7	926	<2.0	0.11			0.38	0.036	12.1	0.07	13.0				
SP3-93	Sep-96	D	90.2	177	387	<1.0	8.49	1290	39.2	941	2.09	0.036			0.36	0.036	13	0.06	8.3				
SP3-93	Oct-96	2		112			8.00	900											165.0				
SP3-93	Apr-97		146.0	228	535	3	8.90	1200	41.4	687	5.4	0.015			0.316	0.117	9	0.11	14.0				
SP3-93	Sep-97		107.0	390	454	<1.0	7.90	1800	45.3	1280	<5.0	<0.004			0.447	0.145	13.9	0.07	19.0				
SP3-93	Sep-97	D	116.0	390	471	<1.0	7.90	1800	44	1260	<5.0	<0.004			0.441	0.128	11.8	0.07	37.0				
SP3-93	Apr-98	2		102			8.05(1)	813											8.0				
SP3-93	Apr-98	D,1		99.4			8.05	495															
SP3-93	Apr-98		83	131	296	<1.0	8.28	955	21.5	630	<4.0UJ	0.053U			0.406	0.042	6	0.06	3.0				
SP3-93	Sep-98		142.0	291	567	<1.0	8.1	1800	51.7	1150	3.3	0.082U			0.319	0.06	13.6	0.60 U	9.0				
SP3-93	Apr-99		101.0	94.7 J	378	<1.0	8.53	837	30.5	646	<4.0	0.0005J			0.113	0.03	3.5	0.15 U	<1				
SP3-93	Apr-99	D	100.0	172 J	376	<1.0	8.53	837	30.6	760	<4.0	0.028J			0.117	0.03	3.3	0.15 U	<1				
SP3-93	Jun-99	2		75.7															1.0				
SP3-93	Sep-99		87.9	136	376	<1.0	7.56	1320	38.1	932	<6.0	0.053U			0.27	0.029	40	0.14	35.0				
SP3-93	Apr-00		108.0	95.3	405	<2.0*	8.36	1010	32.7	656	<6	<0.009			0.091	0.0245	2.3	0.03	2.0				
SP3-93	Jun-00	2		29			7.77	420											253.0				
SP3-93	Sep-00		93.0	8610	343	<2.0*	8.08	856	26.8	212	<4	0.027			0.215	0.016	7.9	0.05	15.0				
SP3-93	Apr-01		107.0	145	357	<2.0*	7.71	906	21.8	672	3.4	<0.05			0.294	0.098	17	<0.10	29.0				
SP3-93	Jun-01	2		140			7.72	980											10.0				
SP3-93	Sep-01		92.5	296	436	6	7.68	1620	49.9	968	<4.0	<0.05			0.255	0.0878	11	0.09	6.0				
SP3-93	Apr-02		78.4	136	266	<1.0	7.80	920	17	562	<4.0	0.07			0.25	0.038	6.9	<0.01	17.0				
SP3-93	Sep-02		110.0	180	390	<1.0	5.20	933	31	858	<2.0	0.17			0.4	0.075	18.5	0.03	6.5				
SP3-93	Oct-02	2		400			7.80	1980											29.0				
SP3-93	Apr-03		100.0	139	308	1	6.26	980	23	545	<3.0	<0.05			0.34	0.043	5.9	0.2	7.0				
SP3-93	Jun-03	2		146			8.02	1020											20.0				
SP3-93	Sep-03		150.0	462	577	1	8.16(1)	2150	43	1410	5	<0.05			1.8	0.16	156	0.38	218.0				
SP3-93	May-04		87.7	78.7	286	<2.0*	8.18/8.09(1)	694/774(1)	16.3	522	<5	0.13	19.6	0.0072 / 0.0059	0.486	0.056	2.3J	0.1	13.0				
SP3-93	Sep-04		111.0	498	448	<2.0*	8.39	2480	41.2	1490	<5	<0.02	18.2	<0.00157	0.539 U	0.105U	3.8J	0.15	13.0				
SP3-93	Apr-05		76.8	84.9	247	<2.0*	7.89	704	13.5	770	<5	0.04		0.00044	0.691	0.05	1.6	0.05	<12				
SP3-93	Jul-05	2		115			8.29	753											<12				
SP3-93	Nov-05		89.2	137	297	<1.0	7.50	818	17.9	480	<5	0.06		0.00017	0.649	0.03	5.2	0.07	<12				
SP3-93	Apr-06		70.0	90	230	<1.0	9.36	712	13	450	<2	<0.05		<0.0173	0.6	0.04	6.6	0.025 U	6.0				
SP3-93	Jul-06	2		42			7.71	442											42.0				
SP3-93	Nov-06		107.0	65	350	<1.0	7.63	311	21	450	<2	<0.05		< 0.00024	0.84	0.09	22	0.22	110.0				
SP3-93	Apr-07		72.7	115	240	<1.0			14.5	460	<2	<0.05			0.27	0.033	2.7	0.07	7.0				
SP3-93	Nov-07		101.0	236	350	2JU	8.10	1430	23.8	850	<2	0.12		0.00128	0.96 J	0.163	13.5	0.081	26.0				
SP3-93	Nov-07	D	98.8	239	350	4JU	8.10	1430	24	850	<2	0.12		0.00128	0.97 J	0.164	13.4	0.087	27.0				

Location	Sampling Date	Notes	Calcium	Chloride	Hardness	Phenols	Field pH	Field Conductivity	Magnesium	TDS	BOD_5	Ammonia	Field Temperature	Unionized Ammonia	Iron	Manganese	Turbidity(1)	Total Phosphorus	TSS	Alkalinity	Nitrate as N	Nitrite as N	Sodium
CRA Units (1981 - 2012)			mg/L	mg/L	mg/L	µg/L		µS/cm	mg/L	mg/L	mg/L	mg/L	°C	mg/L	mg/L	mg/L	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Burnside Units ('13 - '14)			mg/L	mg/L	mg/L	mg/L		µS/cm	mg/L	mg/L	mg/L	mg/L	°C	µg/L	mg/L	mg/L	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
SP3-93	Apr-08		69.9	72	220	<1.0	8.26	630	11.3	380	<2	<0.05	9.5	< 0.00157	0.52	0.04	9.2	0.091	23.0				
SP3-93	Aug-08	2		158			7.61	732					16.6		1.71			0.11	37.0				
SP3-93	Nov-08		85.3	68	270	<1.0	7.18	647	14.5	380	<2	0.11	2.7	0.00017	0.42	0.018	5.8	0.051	7.0				
SP3-93	Nov-08	D	84.1	68	270	<1.0	7.18	647	14.6	400	<2	0.07		0.00011	0.4	0.017	6.3	0.052	5.0				
SP3-93	Apr-09		66.7	73.9	210	<1.0	8.28	566	10.5	386	3.5	0.075	19.3	0.005017	0.786	0.0303	19.5	0.102	17.6				
SP3-93	Nov-09		96.1	147	318	2	7.88	1080	18.9	616	<2.0	<0.050	5.8	< 0.000499	0.604	0.0729	6.5	0.0174	4.0				
SP3-93	Nov-09	D	97.6	154	325	2	7.88	1080	19.8	642	<2.0	<0.050		< 0.000499	0.635	0.0731	6.3	0.0215	4.4				
SP3-93	Mar-10		83.7	99	260	<1.0	8.45	960	12.3	442	<2.0	<0.050	5.2		0.198	0.0290	3.2	0.0416	5.2				
SP3-93	Mar-10	D	84.1	97.4	262	<1.0	8.45	960	12.7	450	<2.0	<0.050	5.2		0.216	0.0296	2.8	0.0327	4.4				
SP3-93	May-10			108			8.38								<0.050			0.0434	5.6				
SP3-93	Nov-10		68.3	84.4	229	<1.0	6.89	512	14.2	442	3.9	0.052	8.6		3.08	0.071	67	0.3080	41.3				
SP3-93	Mar-11		70.6	11.2	238	1.4	8.48	879	15.1	482	<2.0	<0.050	4.7	< 0.0017	0.181	0.0276	3.9	0.0232	4.4				
SP3-93	Oct-11			48.1			8.21	670					10.8		0.543			0.0834	19.6				
SP3-93	Dec-11		77.1	39.6	242	<1.0	7.78	748	11.9	360	<2.0	0.061	4.6		0.996	0.0228	27	0.0774	13.6				
SP3-93	Apr-12		56.4	41.9	223	<1.0	7.63	1630	20.0	924	<2.0	0.052	8.5	0.00036	0.669	0.162	148	0.0544	26.8				
SP3-93	Aug-12			302			8.38	1620					23		0.297		31.7		8.4				
SP3-93	Nov-12		94.9	160	310	<1.0	6.99	853	17.7	686	<2.0	<0.050	4.3	<0.00006	0.278	0.0546	46	0.0143	4.0				
SP3-93	May-13		59.2	94.4	200	<0.001	8.55	653	12.6	366	<5	0.02	19.3	2.36	0.12	0.034	8.7	0.04	<10				
SP3-93	May-13	D	58.2	92.2	196	<0.001			12.4	374	<5	0.02			0.14	0.028	8.3	0.04	<10				
SP3-93	Oct-13		73.4	44.6	229	0.004	8.05	604	11.0	374	<5	0.07	8.0	1.22	0.23	0.023	14.4	0.10	19				
SP3-93	Oct-13	D	73.1	44.4	227	<0.001			10.9	378	<5	0.07			0.20	0.022	15.1	0.11	20				
SP3-93	Jun-14		43.2	185	156	<0.001	7.24	1014	11.7	572	<5	0.29	21.6	2.23	0.55	0.079	12.8	0.24	13				
SP3-93	Nov-14		98.8	78.2	318	<0.001	7.55	772	17.4	468	<5	<0.02	8.1	0.11	0.36	0.068	23.5	<0.02	18				
SP3-93	May-15		62.7	319	226	<0.001	8.18	1663	16.8	888	<5	0.42	26.0	35.44	0.69	0.129	21.4	0.34	20				
SP3-93	May-15	D	61.1	318	219	<0.001			16.1	840	5.00	0.42			0.72	0.134	24.1	0.32	<10				
SP3-93	Sep-15		Dry																				
SP3-93	Apr-16		66.8	111	228	<0.001	8.41	685	14.8	406	<5	0.03	10.69	1.44	0.22	0.052	9.8	0.07	12				
SP3-93	Apr-16	D	66.2	112	226	<0.001			14.7	412	<5	0.04			0.23	0.051	10.1	<0.02	12				
SP3-93	Oct-16		58.6	199	187	<0.001	7.93	1027	9.81	652	<5	0.05	15.93	1.22	0.52	0.057	18.2	0.10	<10				
SP3-93	Apr-17		66.3	75	215	<0.001	8.33	668	12.0	380	<5	0.02	16.04	1.19	0.20	0.034	10.4	0.07	<10				
SP3-93	Apr-17	D	66.8	75.5	216	<0.001			12.0	380	<5	<0.02			0.20	0.035	11.9	0.06	<10				
SP3-93	Sep-17		36.4	335	144	<0.001	8.08	1504	12.9	830	<5	0.04	20.4	1.87	0.67	0.074	26.5	0.33	22				
SP3-93	May-18		49.9	154	290	<0.001	8.74	797	14.6	508	<5	0.06	15.14		0.36	0.064	12.0	0.09	15				
SP3-93	Oct-18		92.7	84.4	295	<0.001	8.22	390.1	15.5	500	<5	<0.02	13.9		<0.010	0.013	14.7	<0.02	11				
SP3-93	May-19		60.4	56.7	194	<0.001	7.88	586	10.6	354	<5	0.12	22.43	0.004	<0.010	<0.002	16.1	0.09	18	225	3.16	<0.05	27.8
SP3-93	Oct-19		66.1	76.2	214	0.005	7.77	545	11.8	410	<5	<0.02	NA	NA	0.483	0.055	48.6	0.21	26	178	1.37	<0.10	36.7
SP3-93	May-20		88.5	82.3	287	<0.001	7.89	835	16.06	490	<5	<0.02	18.2	<0.001	0.401	0.047	21.2	0.07	<10	235	5.47	<0.25	42.2
SP3-93	Oct-20		56.8	186	204	0.002	7.98	763	15.13	606	3	<0.02	10.6	<0.001	0.992	0.094	10.7	0.05	<10	196	<0.25	<0.25	74.94
SP3-93	Jun-21		42.4	349	190	<0.001	7.61	1932	20.50	908	<2	0.02	23.2	0.02	0.922	0.171	6.9	0.14	11	211	<0.07	<0.05	145
SP3-93	Nov-21		95.9	49.1	307	0.014	8.15		16.30	386	<2	<0.02	11	<0.001	0.159	0.02	3.9	0.07	<10	270	2.83	<0.05	30.6

Location	Sampling Date	Notes	Calcium	Chloride	Hardness	Phenols	Field pH	Field Conductivity	Magnesium	TDS	BOD_5	Ammonia	Field Temperature	Unionized Ammonia	Iron	Manganese	Turbidity[1]	Total Phosphorus	TSS	Alkalinity	Nitrate as N	Nitrite as N	Sodium
CRA Units (1981 - 2012)			mg/L	mg/L	mg/L	µg/L		µS/cm	mg/L	mg/L	mg/L	mg/L	^0C	mg/L	mg/L	mg/L	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Burnside Units ('13 - '14)			mg/L	mg/L	mg/L	mg/L		µS/cm	mg/L	mg/L	mg/L	mg/L	^0C	µg/L	mg/L	mg/L	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
SP1B-94	Apr-94		62.7	42.6	216	<1.0	8.20	500	14.4	354	<2.0	<0.02			0.72	0.06	76	0.111	26				
SP1B-94	Sep-94		61.3	98	235	<2.0*	8.70	900	19.8	530	3	<0.01			0.14	0.05	6.4	<0.10	12				
SP1B-94	Apr-95		71.8				8.00	500	12.8	384	6.0	0.02			0.24	0.05	102	0.18	27				
SP1B-94	Sep-95		81.8	101	275	<1.0	7.70	700	17.3	453	4.0	0.97			0.38	0.31	24	0.08	15				
SP1B-94	Oct-95	2		72.8			7.94[1]												27				
SP1B-94	Apr-96		58.3	28.4	192	<1.0	8.05	374	11.4	268	<5.0	0.03			0.219	<0.015	13	<0.01	4				
SP1B-94	Sep-96		69.4	54.6	235	<1.0	8.34	600	14.9	465	5.21	0.038			0.2	0.034	2.5	0.02	4.1				
SP1B-94	Oct-96	2		53			7.40[1]	-											78				
SP1B-94	Apr-97		143	94.8	510	30	8.00	1000	37.2	670	185	11.0			1.26	1.11	20	0.52	35				
SP1B-94	May-97		126	84.2	449	20	8.00	900	32.6	550	19.6J	0.214			2.08	0.144	52	0.32	50				
SP1B-94	Sep-97		131.0	64.7	479	<1.0	7.40	900	36.9	628	21.0	<0.004			1.45	0.621	34	0.06	4				
SP1B-94	Apr-98	2		45.4			7.88[1]	495											11				
SP1B-94	Apr-98		52.8	106	192	<1.0	8.13	490	14.7	334	<4.0UJ	0.046U			0.257	0.018	6.8	0.04	4 U				
SP1B-94	Sep-98		123	138	430	<1.0	7.31	1010	29.8	633	4.5	0.065U			0.182	0.097	4.1	0.13 U	<1.0				
SP1B-94	Apr-99		79.7	51.4	273	<1.0	7.94	532	17.9	384	2.2	0.005			0.186	0.03	6.7	0.08 U	<1.0				
SP1B-94	Jun-99	2		130															13				
SP1B-94	Jun-99	D		138															13				
SP1B-94	Sep-99		61.9	67	236	<1.0	7.75	678	19.7	488	<6.0	0.115U			0.143	0.018	12	0.09 U	10				
SP1B-94	Apr-00		89.7	46.6	330	<2.0*	8.10	673	25.8	468	<4	<0.009			0.118	0.0143	3.5	0.1	<1				
SP1B-94	Jun-00	2		26.4			7.51	443											14				
SP1B-94	Sep-00		49.4	20.2	174	<2.0*	7.81	396	12.4	284	4.3	0.144			0.234 J	0.031	11	0.01	13 J				
SP1B-94	Sep-00	D	44.1	20.2	160	<2.0*	7.81	396	12	264	<4	0.146			0.326 J	0.029	13	0.02	13 J				
SP1B-94	Apr-01		83.3	49.4	289	<2.0*	7.67	679	19.6	528	2.8	<0.05			0.292	0.028	10	<0.10	5				
SP1B-94	Jun-01	2		60.5			7.73	781											<2				
SP1B-94	Jun-01	D		57.2			7.73	781											4				
SP1B-94	Sep-01		Dry																				
SP1B-94	Apr-02		75.5	56.7	285	<1.0	7.47	662	23.5	419	<4.0	0.12			0.17	0.017	3.4	<0.01	4				
SP1B-94	Sep-02		Dry																				
SP1B-94	Oct-02	2		88			7.59	1600											38				
SP1B-94	Apr-03		83	42.5	266	1	8.31	600	25	355	<3.0	<0.05			0.37	0.031	10.1	<0.02	5				
SP1B-94	Jun-03	2		39			8.01	634											<1.0				
SP1B-94	Sep-03		Dry																				
SP1B-94	May-04		70.2	70.2	274	16	8.21/7.52[1]	698/784[1]	23.9	514	24	2.22	22	0.154/0.033	0.401	0.127	3.8J	0.25	27				
SP1B-94	Sep-04		Dry																				
SP1B-94	Apr-05		25.6	230	92	<2*	8.34	766	6.81	874	<5	0.05		0.00165	0.885	0.078	4.4	<0.05	<12				
SP1B-94	Jul-05	2		108			8.14	680											<12				

Location	Sampling Date	Notes	Calcium	Chloride	Hardness	Phenols	Field pH	Field Conductivity	Magnesium	TDS	BOD_5	Ammonia	Field Temperature	Unionized Ammonia	Iron	Manganese	Turbidity[1]	Total Phosphorus	TSS	Alkalinity	Nitrate as N	Nitrite as N	Sodium
CRA Units (1981 - 2012)			mg/L	mg/L	mg/L	µg/L		µS/cm	mg/L	mg/L	mg/L	mg/L	^0C	mg/L	mg/L	mg/L	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Burnside Units ('13 - '14)			mg/L	mg/L	mg/L	mg/L		µS/cm	mg/L	mg/L	mg/L	mg/L	^0C	µg/L	mg/L	mg/L	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
SP1B-94	Nov-05		71.2	98.8	242	<1.0	8.02	649	15.5	418	<5	0.09		0.00086	1.2	0.125	12	0.05	25				
SP1B-94	Apr-06		107	107	400	<1	8.87	1090	32	710	<2	<0.05		< 0.00609	1.1	0.1	65	0.12	120				
SP1B-94	Jul-06	2		90			7.50	785											30				
SP1B-94	Nov-06		130	94	490	<1	7.47	1080	41	740	<2	<0.05		< 0.00016	0.31	0.1	4.4	0.044 U	6				
SP1B-94	Apr-07		102	125	380	2	7.87	1070	30.5	710	7	0.57		0.0053	1.03	0.131	3.8	0.120	13				
SP1B-94	Nov-07		142	184	510	3	7.95	1350	37.4	800	2	0.06		0.00048	0.56 J	0.119	8.1	0.210	68				
SP1B-94	Apr-08		98	144	350	23	7.44	1060	25	660	48	4	9.6	0.01973	4.1	0.74	37	0.840	45				
SP1B-94	Aug-08	2		146			7.96	763					18		4.8			0.180	120				
SP1B-94	Aug-08	D		140			7.96	763					18		4.3			0.180	120				
SP1B-94	Nov-08		194	182	620	21	7.10	1100	33	790	90	0.71	0.6	0.00077	15.8	1.02	143	0.930	250				
SP1B-94	Apr-09		96.4	158	341	<1.0	7.80	1120	24.3	764	11.3	0.274	18.9	0.00617	2.3	0.761	43	0.5440	26.4				
SP1B-94	Nov-09		Dry																				
SP1B-94	Mar-10		146	195	498	6	7.94	1630	32.5	838	37	0.319	4.1	0.003185568	15.5	1.400	26	0.5740	66				
SP1B-94	May-10			143			8.17								0.537			0.0796	12.4				
SP1B-94	Nov-10		160	164	527	<1.0	6.71	1340	31.1	956	3.7	0.389	7.9		0.618	0.151	16.5	0.0907	18.4				
SP1B-94	Mar-11		108	168	370	2	7.95	1250	24.2	738	20.5	0.052	4.8	0.00056	4.67	1.120	27	0.098	20				
SP1B-94	Oct-11			96			8.07	1010					9.8		0.48			0.0562	5.6				
SP1B-94	Dec-11		104	70.1	384	<1.0	8.32	851	30.3	566	<2.0	<0.050	3.4		0.742	0.111	25	0.049	11.6				
SP1B-94	Apr-12		145	11.8	524	<1.0	7.83	1410	39.1	866	<2.0	0.051	7.2	< 0.00051	0.512	0.162	57	0.291	40.5				
SP1B-94	Aug-12			231			8.29	1540					24		0.08		51		8				
SP1B-94	Aug-12	D		230			8.29	1540					24		0.123		51		8				
SP1B-94	Nov-12		171	189	585	<5.0	7.35	1410	38.5	1040	2.4	0.137	5.9	< 0.00041	0.237	0.121	80	0.0225	21.2				
SP1B-94	May-13		86.7	141	317	<0.001	7.78	1021	24.5	518	<5	0.02	18.2	0.41	0.45	0.101	19.5	0.07	16				
SP1B-94	Oct-13		165	226	569	0.002	7.78	1550	38.2	922	<5	<0.02	5.7	0.16	0.44	0.758	9.8	0.12	<10				
SP1B-94	Jun-14		Dry																				
SP1B-94	Nov-14		230	505	778	<0.001	6.24	1770	49.5	1430	<5	<0.02	6.1	0.005	0.18	0.266	4.4	<0.02	<10				
SP1B-94	May-15		Ins																				
SP1B-94	Sep-15		Dry																				
SP1B-94	Apr-16		137	247	474	<0.001	7.99	989	32.1	812	<5	0.08	5.2	0.98	0.19	0.071	5.8	0.05	<10				
SP1B-94	Oct-16		Dry																				
SP1B-94	Apr-17		124	194	437	<0.001	7.90	1044	31.0	726	<5	<0.02	9.76	0.29	0.14	0.072	14.2	0.06	<10				
SP1B-94	Sep-17		Dry																				
SP1B-94	May-18		73.0	237	290	0.001	8.87	829	26.1	738	<5	<0.07	16.7		0.768	0.100	19.6	0.09	18				
SP1B-94	Oct-18		86.4	180	337	0.003	7.85	944	29.5	704	<5	<0.04	11.5		<0.010	0.002	7.5	0.04	<10				
SP1B-94	May-19		99.4	165	343	<0.001	7.65	1059	23.0	620	<5	0.04	21.93	0.001	<0.010	0.056	7.3	0.06	<10	358	0.59	<0.25	77.9
SP1B-94	Oct-19		154	187	522	0.002	7.74	1145	33.4	986	<5	<0.02	NA	NA	<0.010	0.015	3.3	0.07	<10	302	<0.25	<0.25	102
SP1B-94	May-20		130.6	177	457	0.001	7.87	1402	31.9	812	<5	<0.02	16.3	<0.001	0.219	0.044	3.6	0.06	11	364	<0.25	<0.25	101
SP1B-94	Oct-20		110.6	139	382	0.004	7.89	681	25.64	670	<2	<0.02	9	<0.001	0.989	0.058	20.5	0.05	15	250	<0.25	<0.25	73.6
SP1B-94	Jun-21		Dry																				
SP1B-94	Nov-21		131.0	45.6	426	0.025	7.58		24.00	492	4	1.33	6.01	0.007	2.84	0.277	14.9	0.23	30	328	1.68	<0.05	32.6

Location	Sampling Date	Notes	Calcium	Chloride	Hardness	Phenols	Field pH	Field Conductivity	Magnesium	TDS	BOD_5	Ammonia	Field Temperature	Unionized Ammonia	Iron	Manganese	Turbidity[1]	Total Phosphorus	TSS	Alkalinity	Nitrate as N	Nitrite as N	Sodium
CRA Units (1981 - 2012)			mg/L	mg/L	mg/L	µg/L		µS/cm	mg/L	mg/L	mg/L	mg/L	°C	mg/L	mg/L	mg/L	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Burnside Units ('13 - '14)			mg/L	mg/L	mg/L	mg/L		µS/cm	mg/L	mg/L	mg/L	mg/L	°C	µg/L	mg/L	mg/L	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
SP2B-94	Apr-94		61.9	39.7	214	<1.0	8.10	500	14.4	326	<2.0	<0.02			0.6	0.04	63	0.102	10				
SP2B-94	Sep-94		Dry																				
SP2B-94	Apr-95		70.1				7.80	500	12.5	394	4	0.04			0.22	0.04	98	0.01	19				
SP2B-94	Apr-95	D	71.8				7.80	500	12.7	362	7	0.05			0.16	0.04	97	0.31	23				
SP2B-94	Sep-95		Dry																				
SP2B-94	Oct-95	2		714			7.96[1]												48				
SP2B-94	Apr-96		59.1	33.5	196	<1.0	8.01	409	11.9	281	<5.0	0.06			0.299	0.019	18.1	<0.01	10				
SP2B-94	Sep-96		Dry																				
SP2B-94	Oct-96	2		47.3			7.9[1]	600											11				
SP2B-94	Apr-97		150	96.3	534	44	8	1000	38.7	683	225	5.5			1.27	1.18	18	0.12	36				
SP2B-94	May-97		86.2	85.7	343	8	8	700	31	550	10.7J	0.567			0.17	0.124	46	0.25	48				
SP2B-94	Sep-97		105	54.1	356	<1.0	7.5	700	22.7	473	20	<0.004			0.508	0.08	11.3	0.06	24				
SP2B-94	Apr-98	2		46.7			7.94[1]	510											6				
SP2B-94	Apr-98		48.4	49.4	177	<1.0	9.13	498	13.7	322	<4.0UJ	0.073U			0.269	0.028	8.5	0.05	8				
SP2B-94	Sep-98		109	128	397	<1.0	7.76	1010	30.4	838	9.9	0.178			1.38	0.255	>200	0.44 U	523				
SP2B-94	Apr-99		91	49.2	306	<1.0	7.87	561	19.2	402	<6.0	0.048			0.523	0.097	12.1	0.11	18				
SP2B-94	Jun-99	2		71.9															7				
SP2B-94	Sep-99		53.8	62.7	217	<1.0	8.01	1010	20.1	396	<6.0	0.058U			0.203	0.051	6	0.05 U*	<1				
SP2B-94	Sep-99	D	52.3	59.6	209	<1.0	8.01	1010	18.9	443	<6.0	0.055U			0.18	0.044	7	0.05 U*	1				
SP2B-94	Apr-00		93.6	44	345	<2.0*	8.12	689	26.9	440	<6	0.06			0.296	0.0359	9.8	0.04	<1				
SP2B-94	Jun-00	2		28			7.55	447											24				
SP2B-94	Sep-00		50.2	20.3	176	<2.0*	7.84	395	12.4	67	4.2	0.031			0.224	0.044	14	0.02	14				
SP2B-94	Apr-01		77.8	43.9	275	<2.0*	7.34	557	19.5	512	<4.0	0.06			0.231	0.018	7.8	<0.10*	5				
SP2B-94	Jun-01	2		52.5			8.04	560											10				
SP2B-94	Sep-01		70.2	105	301	<1.0	7.85	789	30.6	482	<4.0	0.07			0.836	0.212	31	0.06	34				
SP2B-94	Sep-01	D	63.7	100	286	<1.0	7.85	789	30.8	504	5.8	<0.05			0.577	0.103	47	0.07	35				
SP2B-94	Apr-02		71.6	55.4	270	<1.0	7.48	662	22.1	419	<4.0	0.07			0.18	0.018	3.7	0.01	6				
SP2B-94	Sep-02		160	45	494	<1.0	6.80	722	23	798	2.6	<0.05			0.44	0.055	12.2	<0.01	8				
SP2B-94	Sep-02	D	160	45	494	<1.0	6.80	722	23	776	2.6	<0.05			0.43	0.056	27	<0.01	10.5				
SP2B-94	Oct-02	2		53			7.75	1110											3.7				
SP2B-94	Apr-03		82	41.6	264	1	8.31	599	23	393	<3.0	<0.05			0.31	0.024	11.6	<0.02	15				
SP2B-94	Jun-03	2		39			8.51	447											5				
SP2B-94	Sep-03		61	66	266	1	8.05[1]	494	22	407	<5.0	0.16			1	0.33	20.7	0.15	20				
SP2B-94	May-04		79.3	73.2	302	28	7.84/7.25[1]	763/858[1]	25.2	556	51	3.25	19.2	0.082/0.021	0.619	0.219	7.5J	0.48	47				
SP2B-94	Sep-04		No Flow																				

Location	Sampling Date	Notes	Calcium	Chloride	Hardness	Phenols	Field pH	Field Conductivity	Magnesium	TDS	BOD_5	Ammonia	Field Temperature	Unionized Ammonia	Iron	Manganese	Turbidity[1]	Total Phosphorus	TSS	Alkalinity	Nitrate as N	Nitrite as N	Sodium
CRA Units (1981 - 2012)			mg/L	mg/L	mg/L	µg/L		µS/cm	mg/L	mg/L	mg/L	mg/L	°C	mg/L	mg/L	mg/L	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Burnside Units ('13 - '14)			mg/L	mg/L	mg/L	mg/L		µS/cm	mg/L	mg/L	mg/L	mg/L	°C	µg/L	mg/L	mg/L	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
SP2B-94	Apr-05		70.3	101	253	<2	8.34	766	18.8	548	<5	1.05		0.03948	0.883	0.065	117	0.1	36				
SP2B-94	Jul-05	2		108			8.30	655											<12				
SP2B-94	Nov-05		72.7	99.8	245	3	7.57	652	15.9	400	<5	0.05		0.00017	1.53	0.194	13	0.07	33				
SP2B-94	Apr-06		92	80	330	<1.0	8.68	815	23	560	6	0.07		0.00668	2.7	0.29	73	0.22	50				
SP2B-94	Jul-06	2		37			7.63	355						-					220				
SP2B-94	Nov-06		102	62	370	1	7.57	817	28	550	<2	0.05		0.00023	0.7	0.064	31	0.086	10				
SP2B-94	Apr-07		99.6	112	360	<1	8.05	762	26.7	670	12	1.1		0.01737	1.42	0.291	18	0.31	47				
SP2B-94	Nov-07		106	157	390	6	7.95	1120	30.4	670	16	0.06		0.0005	0.74J	0.188	21	0.15	26				
SP2B-94	Apr-08		77.9	59	260	1	8.00	625	16.1	400	9	0.89	11.5	0.0182	1.89	0.35	25	0.19	48				
SP2B-94	Aug-08	2		168			7.96	307					18.3		1.12			0.039	14				
SP2B-94	Nov-08		97.1	127	330	21	7.15	979	22.1	650	52	0.38	1.3	0.00049	1.57	0.506	27	0.35	36				
SP2B-94	Apr-09		69	77.8	236	<1.0	8.29	605	15.6	442	9.1	0.107	22.4	0.009007	2.23	0.173	73	0.217	55.2				
SP2B-94	Nov-09		90	104	324	1	7.80	999	24.1	608	6.5	<0.050	7.6	< 0.00048	1.07	0.102	15.8	0.122	77.2				
SP2B-94	Mar-10		105	122	347	<1.0	8.23	1200	20.7	646	17.8	0.072	6.4		3.3	0.482	33	0.610	63.3				
SP2B-94	May-10			126			8.28								0.579			0.048	18.8				
SP2B-94	Nov-10		97.5	93.2	337	<1.0	7.34	657	22.8	568	<2.0	<0.050	8.9		1.18	0.046	34	0.052	15.2				
SP2B-94	Mar-11		83.2	126	290	2.7	8.08	988	20.1	550	11	<0.050	4.3	< 0.0007	2.12	0.365	20	0.082	24				
SP2B-94	Oct-11			52.4			8.13	757					10.9		0.524			0.0714	8.8				
SP2B-94	Dec-11		81.9	36.9	286	<1.0	8.23	642	19.8	420	<2.0	0.118	4.1		1.24	0.0864	50	0.0885	15.2				
SP2B-94	Apr-12		83.4	164	335	<1.0	7.74	1140	30.9	654	3.3	0.058	7.5	< 0.00058	1.28	0.548	36	0.0611	60.8				
SP2B-94	Aug-12			247			8.29	1360					25.7		0.553		50		21.2				
SP2B-94	Nov-12		132	127	461	<1.0	7.21	888	32.0	762	<2.0	<0.050	6.3	0.00521	1.5	0.137	49	0.0489	27.2				
SP2B-94	May-13		87.8	139	321	<0.001	7.94	945	24.7	532	<5	0.02	18.2	0.59	0.45	0.088	17.1	0.07	23				
SP2B-94	Oct-13		89.9	92.6	303	0.003	7.60	843	19.0	530	<5	<0.02	7.0	0.12	0.36	0.294	27.2	0.09	19				
SP2B-94	Jun-14		Dry																				
SP2B-94	Nov-14		129	282	451	<0.001	7.93	1357	31.3	834	<5	<0.02	8.5	0.28	0.76	0.268	27.3	<0.02	60				
SP2B-94	May-15		Dry																				
SP2B-94	Sep-15		Ins																				
SP2B-94	Apr-16		55.0	158	226	<0.001	8.37	672	21.5	430	<5	0.02	10.4	0.86	0.25	0.042	14.1	<0.02	<10				
SP2B-94	Oct-16		Dry																				
SP2B-94	Apr-17		59.2	139	231	<0.001	8.11	767	20.3	460	<5	<0.02	13.94	0.63	0.68	0.053	34.1	0.07	20				
SP2B-94	Sep-17		Dry																				
SP2B-94	May-18		44.9	157	171	<0.001	8.87	829	14.3	522	<5	0.08	16.7	0.19	0.205	0.061	13.7	0.06	14				
SP2B-94	Oct-18		86.7	176	337	0.003	7.82	746	29.3	704	9	0.05	11	0.66	<0.010	0.002	45.3	0.31	201				
SP2B-94	May-19		57.4	54.3	201	0.003	7.72	625	13.9	328	<5	<0.02	25.96	<0.001	<0.010	<0.002	6.8	0.04	<10	210	<0.05	<0.05	38.1
SP2B-94	Oct-19		74.3	85.8	238	0.003	8.18	593	12.8	442	<5	<0.02	NA	NA	0.332	0.039	26.9	0.15	12	208	1.42	<0.25	40.4
SP2B-94	May-20		88.5	81.5	287	<0.001	8.07	825	16.01	468	<5	<0.02	19.7	<0.001	0.144	0.03	2.6	0.04	<10	220	5.43	<0.25	43.5
SP2B-94	Oct-20		Dry																				
SP2B-94	Jun-21		Dry																				
SP2B-94	Nov-21		Dry																				

Location	Sampling Date	Notes	Calcium	Chloride	Hardness	Phenols	Field pH	Field Conductivity	Magnesium	TDS	BOD_5	Ammonia	Field Temperature	Unionized Ammonia	Iron	Manganese	Turbidity(1)	Total Phosphorus	TSS	Alkalinity	Nitrate as N	Nitrite as N	Sodium
CRA Units (1981 - 2012)			mg/L	mg/L	mg/L	µg/L		µS/cm	mg/L	mg/L	mg/L	mg/L	^0C	mg/L	mg/L	mg/L	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Burnside Units ('13 - '14)			mg/L	mg/L	mg/L	mg/L		µS/cm	mg/L	mg/L	mg/L	mg/L	^0C	µg/L	mg/L	mg/L	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
SP3A-94	Apr-94		103	177	414	<1.0	8.00	1300	38	868	<2.0	<0.02			0.5	0.06	39	0.108	27				
SP3A-94	Sep-94		Dry																				
SP3A-94	Apr-95		118				7.80	1000	38.5	744	2	0.04			0.22	0.06	41	<0.01	6				
SP3A-94	Sep-95		Dry																				
SP3A-94	Oct-95	2		427			8.01(1)												7				
SP3A-94	Apr-96		94.2	146	408	<1.0	7.66	1350	42	838	<5.0	0.01			0.282	0.036	1.8	<0.01	3				
SP3A-94	Sep-96		Dry																				
SP3A-94	Oct-96	2		211			8.00(1)												15				
SP3A-94	Apr-97		164	119	691	7	8.20	900	68.4	613	3.9	0.691			3.52	0.144	85	0.09	123				
SP3A-94	Sep-97		Dry																				
SP3A-94	Apr-98	2		119			7.41(1)	1100											11				
SP3A-94	Apr-98		Dry																				
SP3A-94	Sep-98		Dry																				
SP3A-94	Apr-99		Dry																				
SP3A-94	Jun-99	2		132															18				
SP3A-94	Sep-99		Dry																				
SP3A-94	Apr-00		Dry																				
SP3A-94	Jun-00	2		39.7			7.74	871											8 J				
SP3A-94	Jun-00			38.8			7.74	871											4 J				
SP3A-94	Sep-00		62.3	49.5	227	<2.0*	7.92	606	17.3	104	5.7	0.036			0.217	0.026	3.7	0.05	9				
SP3A-94	Apr-01		148	55.3	580	<2.0*	7.36	784	51	880	<4.0	<0.05			0.253	0.283	5.4	<0.10*	9				
SP3A-94	Jun-01	2		60.3			7.95	910											11				
SP3A-94	Sep-01		Dry																				
SP3A-94	Apr-02		96.8	64.3	382	<1.0	7.14	845	34.1	578	<4.0	0.05			0.16	0.014	5.5	<0.01	5				
SP3A-94	Sep-02		Dry																				
SP3A-94	Oct-02	2		120			7.30	1640											220				
SP3A-94	Apr-03		Dry																				
SP3A-94	Jun-03	2		55.5			7.31	1050											9				
SP3A-94	Jun-03			56.9			7.31	1050											17				
SP3A-94	Sep-03		Dry																				
SP3A-94	May-04		92.7	58.9	353	3	8.06/7.78(1)	697/836(1)	29.5	532	<5	0.06	20.7	0.003/0.001	0.526	0.183	2.9J	0.04 U	<12				
SP3A-94	Sep-04		Dry																				
SP3A-94	Apr-05		Too deep; no flow																				

Location	Sampling Date	Notes	Calcium	Chloride	Hardness	Phenols	Field pH	Field Conductivity	Magnesium	TDS	BOD_5	Ammonia	Field Temperature	Unionized Ammonia	Iron	Manganese	Turbidity[1]	Total Phosphorus	TSS	Alkalinity	Nitrate as N	Nitrite as N	Sodium
CRA Units (1981 - 2012)			mg/L	mg/L	mg/L	µg/L		µS/cm	mg/L	mg/L	mg/L	mg/L	^0C	mg/L	mg/L	mg/L	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Burnside Units ('13 - '14)			mg/L	mg/L	mg/L	mg/L		µS/cm	mg/L	mg/L	mg/L	mg/L	^0C	µg/L	mg/L	mg/L	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
SP3A-94	Jul-05	2		30.3			7.64	643											<12				
SP3A-94	Nov-05		Dry																				
SP3A-94	Apr-06		Too deep; no flow																				
SP3A-94	Jul-06	2		23			7.72	346											16 J				
SP3A-94	Jul-06	D		23			7.72	346											18 J				
SP3A-94	Nov-06		Dry																				
SP3A-94	Apr-07		Dry				8.59																
SP3A-94	Nov-07		Dry																				
SP3A-94	Apr-08		121	8	440	<1	8.02	722	34.2	490	<2	<0.05	13.7	< 0.00126	0.04	0.012	9.5	0.035	10				
SP3A-94	Aug-08	2		25			8.87	377					17.9		1.6			0.034	17				
SP3A-94	Nov-08		121	9	460	<1	7.25	770	37.9	530	<2	0.08	1.2	0.00013	0.23	0.062	0.65	0.012	6				
SP3A-94	Apr-09		Dry																				
SP3A-94	Nov-09		Dry																				
SP3A-94	Mar-10		Dry																				
SP3A-94	May-10			22.4			8.23								0.72			0.690	121				
SP3A-94	Nov-10		Dry																				
SP3A-94	Oct-11		85.1	121	320	3.7	8.35	1060	26.2	594	< 2.0	<0.050	7.5		0.089	0.0024	2.4	0.008	< 3.0				
SP3A-94	Aug-12			57.9											1.84				47.6				
SP3A-94	Nov-12		102	12.6	350	<1.0	7.32	630	23.1	576	< 2.0	<0.050	2.3	< 0.00010	0.122	0.0056	14	0.0204	2.0				
SP3A-94	May-13		69.3	13.7	255	<0.001	7.56	525	19.9	298	<5	0.02	21.0	0.30	0.24	0.05	5.6	0.03	<10				
SP3A-94	Oct-13		60.8	9.23	197	<0.001	7.85	839	10.9	268	<5	<0.02	7.1	0.21	0.16	0.009	15.2	0.03	11				
SP3A-94	Jun-14		Dry																				
SP3A-94	Nov-14		Ins																				
SP3A-94	May-15		50.3	9.18	222	<0.001	7.49	332	23.4	292	8.00	<0.02	23.5	0.31	0.58	0.105	32.8	0.13	16				
SP3A-94	Sep-15		Dry																				
SP3A-94	Apr-16		85.1	4.41	330	<0.001	7.25	588	28.6	342	<5	0.02	12.5	0.08	0.29	0.020	12.1	0.04	10				
SP3A-94	Oct-16		Dry																				
SP3A-94	Apr-17		64.4	4.82	230	<0.001	7.25	469	16.9	284	<5	<0.02	15.19	0.10	0.28	0.020	8.1	0.08	<10				
SP3A-94	Sep-17		Dry																				
SP3A-94	May-18		77.8	4.42	284	0.002	7.75	443	21.7	308	5	<0.02	13.7	0.50	0.24	0.055	4.6	0.10	12				
SP3A-94	Oct-18		73.4	8.04	246	0.002	7.27	431.1	15.2	326	5	0.02	11.7	0.08	<0.010	0.015	2.2	0.42	12				
SP3A-94	May-19		57.3	2.34	215	0.003	7.42	490	17.4	290	11	<0.02	22.05	<0.001	<0.010	<0.002	17.4	0.04	26	248	<0.05	<0.05	4.7
SP3A-94	Oct-19		Dry																				
SP3A-94	May-20		Dry																				
SP3A-94	Oct-20		Dry																				
SP3A-94	Jun-21		Dry																				
SP3A-94	Nov-21		88.3	7.44	298	0.013	7.25		18.9	322	5	0.02	7.55	<0.001	1.93	0.304	16.8	1.08	59	269	<0.05	<0.05	4.29
SP4A-94	Apr-94		76.9	109	299	<1.0	8.00	900	26.1	650	<2.0	<0.02			0.54	0.04	46	0.089	8.0				

Location	Sampling Date	Notes	Calcium	Chloride	Hardness	Phenols	Field pH	Field Conductivity	Magnesium	TDS	BOD_5	Ammonia	Field Temperature	Unionized Ammonia	Iron	Manganese	Turbidity[1]	Total Phosphorus	TSS	Alkalinity	Nitrate as N	Nitrite as N	Sodium
CRA Units (1981 - 2012)			mg/L	mg/L	mg/L	µg/L		µS/cm	mg/L	mg/L	mg/L	mg/L	^0C	mg/L	mg/L	mg/L	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Burnside Units ('13 - '14)			mg/L	mg/L	mg/L	mg/L		µS/cm	mg/L	mg/L	mg/L	mg/L	^0C	µg/L	mg/L	mg/L	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
SP4A-94	Sep-94		Dry																				
SP4A-94	Apr-95		83.2				8	700	21	491	6	0.04			0.21	0.04	67	<0.01	27				
SP4A-94	Sep-95		Dry																				
SP4A-94	Oct-95			71			8.14[(1)]												42				
SP4A-94	Apr-96		65	190	267	<1.0	8.41	1260	25.4	792	<5.0	0.006			0.249	<0.015	14.3	<0.01	6.0				
SP4A-94	Sep-96		Dry																				
SP4A-94	Oct-96			140			7.9[(1)]												76				
SP4A-94	Apr-97		116	234	521	<1.0J	8.90	1300	56.2	727	<2.0	<0.004			0.184	0.017	6.9	0.06J	6.0				
SP4A-94	Apr-97	D	115	243	521	3J	8.90	1300	56.9	773	3.4	<0.004			0.178	0.017	7.6	0.02J	6.0				
SP4A-94	Sep-97		181	207	659	<1.0	7.80	1600	50.4	1140	20.0	0.009			0.212	0.042	15.3	0.04	1.0				
SP4A-94	Apr-98			100			8.06	857											32				
SP4A-94	Apr-98		74.1	146	315	<1.0	7.90	1220	31.5	728	<4.0UJ	0.062U			0.223	<0.015	11.4	0.02	3 UJ				
SP4A-94	Apr-98	D	77.6	146	328	<1.0	7.90	1220	32.7	736	<4.0	0.056			0.2	0.15	11.8	0.02	1 UJ				
SP4A-94	Sep-98		Dry																				
SP4A-94	Apr-99		140	215	537	<1.0	8.07	1580	45.5	1040	<6.0	0.044			0.268	0.07	13.5	0.10 U	9.0				
SP4A-94	Jun-99	2		200															53				
SP4A-94	Sep-99		Dry																				
SP4A-94	Apr-00		144	209	566	<2.0*	8.01	1590	50.1	936	<6	<0.009			0.31	0.0287	14	0.04	15				
SP4A-94	Apr-00	D	145	211	269	<2.0*	8.01	1590	50.3	1010	<6	<0.009			0.312	0.0284	13.9	0.03	13				
SP4A-94	Jun-00	2		54.3			7.58	649											18				
SP4A-94	Sep-00		59.3	73.6	236	<2.0*	7.98	710	21.3	704	4.1	0.028			0.173	0.002	1.7	0.03	8.0				
SP4A-94	Apr-01		90.8	109	344	<2.0*	7.55	823	28.4	752	<4.0	0.05			0.177	0.018	11	<0.10*	52				
SP4A-94	Jun-01	2		162			7.91	1170											<2				
SP4A-94	Sep-01		Dry																				
SP4A-94	Apr-02		72.7	102	284	<1.0	7.73	845	24.9	542	<4.0	<0.05			0.2	0.007	7.1	<0.01	10				
SP4A-94	Sep-02		Dry																				
SP4A-94	Oct-02	2		110			7.50	1150											2.5				
SP4A-94	Apr-03		100	86.1	339	1	8.10	837	31	499	<3.0	<0.05			0.47	0.026	14.1	<0.02	1.0				
SP4A-94	Jun-03	2		91.8			8.14	734											16				
SP4A-94	Sep-03		Dry																				
SP4A-94	May-04		79.5	75.4	294	<2.0*	8.20	731	23.3	522	<5	0.03	20.6	0.00185	0.318	0.015	4.2J	0.02 U	<12				
SP4A-94	May-04	D	79.4	82	294	<2.0*	8.20	797	23.2	522	<5	0.03		0.00189	0.321	0.014	4.3J	0.02 U	<12				
SP4A-94	Sep-04		Dry																				
SP4A-94	Apr-05		79	58.9	284	<2.0*	7.90	710	21.1	498	<5	<0.02		< 0.00028	0.437	0.013	2.1	<0.05	<12				
SP4A-94	Apr-05	D	79.4	58.8	285	<2.0*	7.90	710	21	474	<5	<0.02		< 0.00028	0.412	0.012	2.3	<0.05	<12				
SP4A-94	Jul-05	2		46.4			7.99	683											<12				
SP4A-94	Nov-05		101	100	349	<1.0	7.50	797	23.6	580	<5	<0.02		< 0.00006	0.512	<0.01	4.6	0.03	<12				
SP4A-94	Nov-05	D	99.3	98.5	345	<1.0	7.50	797	23.6	588	<5	<0.02		< 0.00006	0.503	<0.01	4.6	<0.02	<12				

Location	Sampling Date	Notes	Calcium	Chloride	Hardness	Phenols	Field pH	Field Conductivity	Magnesium	TDS	BOD_5	Ammonia	Field Temperature	Unionized Ammonia	Iron	Manganese	Turbidity[1]	Total Phosphorus	TSS	Alkalinity	Nitrate as N	Nitrite as N	Sodium
CRA Units (1981 - 2012)			mg/L	mg/L	mg/L	µg/L		µS/cm	mg/L	mg/L	mg/L	mg/L	°C	mg/L	mg/L	mg/L	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Burnside Units ('13 - '14)			mg/L	mg/L	mg/L	mg/L		µS/cm	mg/L	mg/L	mg/L	mg/L	°C	µg/L	mg/L	mg/L	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
SP4A-94	Apr-06		82	91	280	<1.0	8.83	799	18	510	<2	<0.05		< 0.00779	0.5	0.03	4.8	0.024 U	15				
SP4A-94	Jul-06	2		32			7.55	289											32				
SP4A-94	Nov-06		97	68	350	<1.0	7.54	805	27	510	<2	<0.05		< 0.00022	0.1	0.017 U	4.5	0.019 U	7.0				
SP4A-94	Apr-07		68.2	81	260	<1.0	8.26	683	22.8	470	<2	<0.05		< 0.00126	0.19	0.006	2.8	0.18	6.0				
SP4A-94	Nov-07		Dry																				
SP4A-94	Apr-08		101	108	350	<1.0	8.24	896	24.3	560	<2	<0.05	12.7	< 0.00191	0.84	0.037	23	0.066	110				
SP4A-94	Aug-08	2		17			8.25	349					17.6		6.8			0.18	99				
SP4A-94	Nov-08		110	105	390	<1.0	7.41	944	27.5	580	<2	0.06	0.8	0.00014	0.23	0.011	3.5	<0.006	7.0				
SP4A-94	Apr-09		62.6	107	252	<1.0	8.49	735	23.3	488	2.6	0.065	24.5	0.00941	0.331	0.0083	15.1	0.0202	18				
SP4A-94	Apr-09	D	58.4	107	251	<1.0	8.49	735	25.6	514	2.6	10.063U		0.00941	0.321 U	0.0088	13.9	0.0201	16.4 U				
SP4A-94	Nov-09		121	230	469	<1.0	7.98	1420	40.4	918	<2.0	< 0.050	7.7	< 0.000729	0.247	0.0071	5.3	0.0091	<3.0				
SP4A-94	Mar-10		92.1	140	330	<1.0	8.43	1260	24.4	634	<2.0	< 0.050	6.3		0.125	0.003	4.2	0.0109 U	<3.0				
SP4A-94	May-10			106			8.40								< 0.050			0.0167	5.6				
SP4A-94	May-10			106			8.40								< 0.050			0.0103	6.4				
SP4A-94	Nov-10		104	130	370	<1.0	7.27	1020	26.9	658	<2.0	< 0.050	8.1		0.142	0.0087	8.7	0.0161	3.6				
SP4A-94	Nov-10		105	130	376	<1.0	7.27	1020	27.5	644	<2.0	< 0.050	8.1		0.164	0.0068	8.6	0.0142	3.6				
SP4A-94	Mar-11		85.1	121	320	3.7	8.35	1060	26.2	594	<2.0	<0.050	7.5	<0.00165	0.089	0.0024	2.4	0.008	<3.0				
SP4A-94	Oct-11			88.7			8.30	970					12.7		<0.050			0.0078	<3.0				
SP4A-94	Oct-11	D		89			8.27	970					12.7		<0.050			0.0071	3.6				
SP4A-94	Dec-11		101	61.8	355	<1.0	8.13	813	25.0	506	<2.0	<0.050	5.6	< 0.00087	0.059	0.004	6	0.0056	3.6				
SP4A-94	Aug-12			14.2			7.28	408					30.2		1.6		62		4.4				
SP4A-94	Nov-12		122	140	450	<1.0	7.32	920	35.2	762	<2.0	<0.050	7.2	< 0.00015	0.085	0.003	68	0.0034	<2.0				
SP4A-94	May-13		77.7	116	293	<0.001	8.13	904	24.0	492	<5	0.02	24.7	1.39	0.12	0.009	10.4	0.03	16				
SP4A-94	Oct-13		103	77.3	351	<0.001	8.06	852	22.8	528	<5	<0.02	9.0	0.39	0.05	0.003	3.6	<0.02	<10				
SP4A-94	Jun-14		Dry																				
SP4A-94	Nov-14		112	154	420	<0.001	8.38	1118	34.2	696	<5	<0.02	9.0	0.79	0.09	0.004	6.9	<0.02	<10				
SP4A-94	May-15		Dry																				
SP4A-94	Sep-15		Dry																				
SP4A-94	Apr-16		97.5	174	361	<0.001	8.46	1108	28.6	620	<5	<0.02	15.9	1.55	0.09	0.007	15.2	<0.02	12				
SP4A-94	Oct-16		Dry																				
SP4A-94	Apr-17		82.2	135	299	<0.001	8.04	1017	22.7	534	<5	<0.02	19.17	0.79	0.39	0.026	59.1	0.06	52				
SP4A-94	Sep-17		Dry																				
SP4A-94	May-18		49.7	149	184	<0.001	8.83	811	14.6	494	<5	<0.07	16.21	0.16	0.333	0.078	10.2	0.09	<10				
SP4A-94	Oct-18		92.7	83.9	295	<0.001	8.18	739	15.5	502	<5	<0.02	14.3	0.75	<0.010	0.018	59.5	0.06	10				
SP4A-94	May-19		69.7	57	221	<0.001	7.94	605	11.4	332	<5	0.04	21.81	0.002	0.04	<0.002	13.7	0.09	10	223	3.11	<0.05	28.8
SP4A-94	Oct-19		67.3	78.2	218	0.004	7.99	523	12.1	390	<5	<0.02	NA	NA	0.426	0.05	43.4	0.23	28	182	1.36	<0.10	37.0
SP4A-94	May-20		88.3	86	289	<0.001	7.92	847	16.60	470	<5	<0.02	17.3	<0.001	0.235	0.04	4.0	0.05	<10	241	4.64	<0.25	44.1
SP4A-94	Oct-20		53.06	185	194	<0.001	7.98	776	14.99	622	<2	0.02	11.2	<0.001	0.429	0.043	9.3	0.05	<10	192	<0.25	<0.25	76.49
SP4A-94	Jun-21		36.70	355	176	0.002	7.96	2109	20.60	936	<2	0.07	27.2	0.057	1.17	0.205	15.0	0.14	72	200	<0.07	<0.05	151.00
SP4A-94	Nov-21		Dry																				
SP5A-94	Apr-94		86	138	326	<1.0	8.20	1000	27.1	728	<2.0	<0.02			0.49	0.05	35	0.064	10				
SP5A-94	Apr-95		105				8.10	1200	27.7	818	<2.0	0.03			0.05	0.05	26	<0.01	19				

Location	Sampling Date	Notes	Calcium	Chloride	Hardness	Phenols	Field pH	Field Conductivity	Magnesium	TDS	BOD_5	Ammonia	Field Temperature	Unionized Ammonia	Iron	Manganese	Turbidity(1)	Total Phosphorus	TSS	Alkalinity	Nitrate as N	Nitrite as N	Sodium
CRA Units (1981 - 2012)			mg/L	mg/L	mg/L	µg/L		µS/cm	mg/L	mg/L	mg/L	mg/L	°C	mg/L	mg/L	mg/L	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Burnside Units ('13 - '14)			mg/L	mg/L	mg/L	mg/L		µS/cm	mg/L	mg/L	mg/L	mg/L	°C	µg/L	mg/L	mg/L	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
SP5A-94	Sep-95		Dry																				
SP5A-94	Oct-95	2		224			8.13(1)												7				
SP5A-94	Apr-96		73.3	291	311	2	8.37	1680	31	1003	<5.0	<0.004			0.134	<0.015	20.2	<0.01	26				
SP5A-94	Sep-96		Dry																				
SP5A-94	Oct-96	2		120			8.00(1)	-											49				
SP5A-94	Apr-97		139	216	541	3	9.10	1200	47.1	773	5.4	0.011			0.426	0.032	15	0.8	110				
SP5A-94	Sep-97		210	588	799	<1.0	7.70	3200	66.8	1600	56	0.032			0.123	0.165	>200	0.04	262				
SP5A-94	Apr-98	2		119			8.1	1110											6				
SP5A-94	Apr-98		90.2	210	352	<1.0	8.28	1430	30.8	864	<4.0UJ	0.05U			0.385	0.022	9.9	0.05	13				
SP5A-94	Sep-98		Dry																				
SP5A-94	Apr-99		134	223	498	<1.0	8.17	1670	39.8	1030	<6.0	0.015			0.236	0.019	16.2	0.01 U	24				
SP5A-94	Jun-99	2		466															59				
SP5A-94	Sep-99		Dry																				
SP5A-94	Apr-00		145	220	557	<2.0*	8.15	1630	47.3	976	<6	<0.009			0.149	0.0157	6.4	0.02	8				
SP5A-94	Jun-00	2		96			7.89	846											32				
SP5A-94	Sep-00		72.5	107	274	<2.0*	7.99	811	22.6	768	5.7	0.098			0.16	0.048	2	0.28	15				
SP5A-94	Apr-01		137	196	489	<2.0*	7.75	1370	35.7	912	<4.0	<0.05			0.174	0.019	7.1	<0.1	13				
SP5A-94	Apr-01	D	141	197	496	<2.0*	7.75	1370	34.9	952	<4.0	<0.05			0.196	0.02	8.6	0.1	17				
SP5A-94	Jun-01	2		169			7.96	1370											6				
SP5A-94	Sep-01		Dry																				
SP5A-94	Apr-02		103	156	380	<1.0	7.70	1080	29.9	717	<4.0	12.5			0.24	0.011	8.8	<0.01	21				
SP5A-94	Sep-02		Dry																				
SP5A-94	Oct-02	2		230			7.91	1850											18				
SP5A-94	Apr-03		130	144	336	1	8.23	1180	34	636	<3.0	<0.05			0.44	0.032	16.1	0.07	18				
SP5A-94	Apr-03		120	148	383	1	8.23	1180	35	647	<3.0	<0.05			0.39	0.028	15.1	<0.02	8				
SP5A-94	Jun-03	2		215			7.31	1190											128				
SP5A-94	Sep-03		Dry																				
SP5A-94	May-04		107	114	378	<2.0*	8.15/8.15(1)	975/1080(1)	27	690	<5	0.03	22.3	0.00186	0.898	0.092	11.5J	0.07	71				
SP5A-94	Sep-04		Dry																				
SP5A-94	Apr-05		96.2	120	335	<2*	7.88	1050	22.9	646	<5	<2		< 0.02653	0.381	0.016	1.6	<0.05	<12				
SP5A-94	Jul-05	2		135			7.97	1350											20				
SP5A-94	Nov-05		Dry																				
SP5A-94	Apr-06		114	165	390	<1.0	8.85	1160	25	840	<2	<0.05		< 0.00675	0.7	0.04	17	0.033 U	24				
SP5A-94	Jul-06	2		97			7.73	761											3				
SP5A-94	Nov-06		120	111	440	<1	7.58	1050	33	670	<2	<0.05		< 0.00021	0.11	0.02 U	2.5	0.016 U	6				
SP5A-94	Apr-07		100	155	360	<1	8.11	1000	27.2	710	<2	<0.05		< 0.00088	0.21	0.013	2.4	0.02	3				
SP5A-94	Nov-07		101	71	390	2	8.11	1080	33.8	660	<2	<0.05		< 0.00054	0.16J	0.004	2.5	0.015	4				
SP5A-94	Apr-08		104	118	350	<1	7.94	1020	21.5	610	-	<0.05	11.2	0.00087	0.26	0.013	5.7	0.033	21				
SP5A-94	Apr-08	D	97.9	117	330	<1	7.40	1020	21.4	600	<2	<0.05		0.00025	0.28	0.011	5.7	0.027	15				
SP5A-94	Aug-08	2		58			8.10	650					17.2		0.66			0.044	12				
SP5A-94	Nov-08		123	147	430	<1	7.26	1060	29.4	740	<2	0.11	2	0.00019	0.15	0.012	1.6	0.009	4				
SP5A-94	Apr-09		93.2	114	320	<1.0	8.12	990	21.2	620	<2.0	0.062	20.7	0.00323	0.314	0.0225	7.1	0.0211	13.2				
SP5A-94	Nov-09		Dry																				
SP5A-94	Mar-10		108	152	368	<1.0	8.20	1380	23.8	682	<2.0	0.051	5.1		0.169	0.013	1.86	0.037	18.8				

Location	Sampling Date	Notes	Calcium	Chloride	Hardness	Phenols	Field pH	Field Conductivity	Magnesium	TDS	BOD_5	Ammonia	Field Temperature	Unionized Ammonia	Iron	Manganese	Turbidity[1]	Total Phosphorus	TSS	Alkalinity	Nitrate as N	Nitrite as N	Sodium
CRA Units (1981 - 2012)			mg/L	mg/L	mg/L	µg/L		µS/cm	mg/L	mg/L	mg/L	mg/L	^0C	mg/L	mg/L	mg/L	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Burnside Units ('13 - '14)			mg/L	mg/L	mg/L	mg/L		µS/cm	mg/L	mg/L	mg/L	mg/L	^0C	µg/L	mg/L	mg/L	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
SP5A-94	May-10			124			8.32								0.393			0.033	80.4				
SP5A-94	Nov-10		115	162	391	<1.0	7.08	1120	25.4	712	<2.0	<0.050	7.8		0.246	0.021	4.3	0.035	102				
SP5A-94	Mar-11		89	133	324	<1.0	8.26	1120	24.7	622	<2.0	<0.050	4.7	< 0.00083	0.311	0.019	2.7	0.015	38				
SP5A-94	Mar-11	D	93.9	133	337	1.0	8.14	1120	25	622	<2.0	<0.050	4.7	< 0.00083	0.442	0.0234	1.86	0.0191	58				
SP5A-94	Oct-11			100			8.10	1070							1.23			0.0457	92				
SP5A-94	Dec-11		124	73.6	414	<1.0	8.00	950	25.5	558	<2.0	<0.050	4.6	< 0.00060	0.402	0.062	5.8	0.0234	40				
SP5A-94	Apr-12		145	148	529	<1.0	7.57	520	40.2	950	3	<0.050	7.8	< 0.00029	2.34	0.182	32	0.061	184				
SP5A-94	Aug-12			15.4			7.13	427					30.6		1.32		83		3.6				
SP5A-94	Nov-12		149	140	530	<1.0	7.09	759	38.4	782	<2.0	<0.050	4.2	< 0.00007	2.22	0.14	39	0.145	68.5				
SP5A-94	May-13		Dry																				
SP5A-94	Oct-13		Dry																				
SP5A-94	Jun-14		Dry																				
SP5A-94	Nov-14		Dry																				
SP5A-94	May-15		Dry																				
SP5A-94	Sep-15		Dry																				
SP5A-94	Apr-16		Dry																				
SP5A-94	Oct-16		Dry																				
SP5A-94	Apr-17		Ins																				
SP5A-94	Sep-17		Dry																				
SP5A-94	May-18		DRY																				
SP5A-94	Oct-18		DRY																				
SP5A-94	May-19		DRY																				
SP5A-94	Oct-19		DRY																				
SP5A-94	May-20		Dry																				
SP5A-94	Oct-20		Dry																				
SP5A-94	Jun-21		Dry																				
SP5A-94	Nov-21		134	188	455	0.016	8.24		29.3	736	<2	<0.02	6.68	<0.001	0.17	0.033	3.3	<0.02	<10	396	0.19	<0.05	111

Notes:

mg/L	milligrams per litre	BOD5	biochemical oxygen demand	TSS	total suspended solids	$\boxed{350}$	exceeds PWQO
µg/L	micrograms per litre	NTU	nephelometric turbidity units	TDS	total dissolved solids	350	exceeds CWQG
µS/cm	micro-siemens per centimetre	Ins	insufficient water to obtain a sample	NA	not analyzed	***350***	exceeds APV
Dry	sampling location was dry during monitoring event; no sample taken			MDL	method detection limit	<1.0	not detected above stated MDL

1 value measured in laboratory

2 monitoring after rainfall event

* MDL exceeds PWQO

506/489 duplicate samples were submitted for analysis

Un-ionized ammonia calculated using lab reported ammonia, field temperature and field pH

CWQG Canadian Water Quality Guideline for the Protection of Aquatic Life

APV Aquatic Protection Value: Table 3.1 Rationale for the Development of Soil and Groundwater Standards for Use at Contaminated Sites in Ontario

PWQO Provincial Water Quality Objectives. Where both a PWQO and an interim PWQO exist, the interim is provide.

U the analyte was analyzed for, but was not detected above the reported sample quantitation limit

J the analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample

UJ the analyte was not detected above the reported sample quantitation limit; however, the reported sample quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample

APPENDIX F:
HISTORICAL LEACHATE QUALITY RESULTS

Historical Leachate Chemistry - St. Mary's Landfill

Location	Phase	Sampling Date	Total Alkalinity	BOD	BOD Soluble	Chloride	COD	COD Soluble	Ammonia	TKN	Nitrate	Nitrite	Fluoride	Phenols	Hardness	TDS	TSS	Sulphate	TOC	DOC	Total Phosphorous	Aluminum	Barium	Beryllium	Bismuth	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Molybdenum	Nickel	Phosphorous	Potassium	Silver	Sodium	Strontium	Titanium	Tungsten	Vanadium	Zinc	Field pH	Field Conductivity	Field Temperature
		Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L		µS/cm	°C
		RDL Jun 14	5	5		1.0	25		2	10	0.5			0.001			10	1.0			0.05	0.004	0.002	0.001	0.002	0.002	0.25	0.003	0.001	0.003	0.010	0.002	0.25	0.002	0.002	0.003		0.25	0.002	0.25	0.005		0.010	0.002	0.005			
		RDL Nov 14	5	125		10	50		2	10	1.0			0.002			10	10			0.5	0.004	0.002	0.001	0.002	0.002	0.25	0.003	0.001	0.003	0.010	0.002	0.25	0.002	0.002	0.003		0.25	0.002	0.25	0.005		0.010	0.002	0.005			
		RDL May 15	5	5		10	100		10	10	1.0			0.002			10	10			0.5	0.004	0.002	0.001	0.002	0.001	0.05	0.003	0.001	0.003	0.010	0.002	0.25	0.002	0.002	0.003		0.25	0.002	0.25	0.005		0.010	0.002	0.005			
		RDL Sept 15	5	5		10	10		10	1.0	2.5			0.001			10	10			0.05	0.004	0.002	0.001	0.002	0.001	0.05	0.003	0.001	0.003	0.010	0.002	0.05	0.002	0.002	0.003		0.05	0.002	0.05	0.005		0.010	0.002	0.005			
		RDL Apr 16	5	125		10	100		1.0	1.0	1.0			0.002			10	10			0.5	0.004	0.002	0.001	0.002	0.002	0.25	0.003	0.001	0.003	0.010	0.002	0.25	0.002	0.001	0.003		0.25	0.002	0.25	0.005		0.010	0.002	0.005			
		RDL Apr 17	5	5		0.50	25		10	10	0.25			0.001			10	0.50			0.25	0.004	0.002	0.001	0.002	0.002	0.25	0.003	0.001	0.003	0.010	0.002	0.25	0.002	0.001	0.003		0.25	0.002	0.25	0.005		0.010	0.002	0.004			
		RDL Sept 17	50	125		4.0	150		10	5	1.0			0.01			10	2.0			0.8	0.004	0.002	0.001	0.002	0.002	1.0	0.003	0.001	0.003	0.10	0.002	1.0	0.002	0.002	0.003		1.0	0.002	1.0	0.005		0.010	0.002	0.004			
		RDL May 19	5	5		0.5	5		1.0	0.5	0.25	0.25		0.001	0.5		10	0.5		1.0	0.02	0.004	0.002	0.001	0.002	0.001	0.25	0.003	0.001	0.003	0.010	0.001	0.25	0.002	0.002	0.003		0.25	0.002	0.25	0.005		0.010	0.002	0.005			
MH-1	I	Nov-91	2706			660			209	250	0.36	<0.10		0.045	837	3716		100		110		0.085 U,F	0.211		<0.04		190		0.013 U,L	0.076	7.92	0.052 U,L	184	0.394		0.031	--	374		557	3.18	0.009		0.008 U,L	0.175	7.1	3860	
MH-1	I	Dec-91	2781	63	41	760	428	371	248	304	0.36	<0.10		0.042	1008	3840	39	79.5	238	109		0.484	0.392		<0.04		263		0.01	0.124	18.9	0.023 U,F	193	0.48		0.027	1.96	384		651	3.22	0.037		0.013	0.105	7.91	2840	
MH-1	I	Jan-92	2484	45	37	573	1017	707	163	185	<0.10	<0.10		0.036	1340	3328	38	75.3																												6.93		
MH-1	I	May-93		28		405			57.2					0.04	1130	2043											225				15		138	1.15														
MH-1	I	Aug-93		88		673	441				<0.1			0.048																																		
MH-1	I	Sep-94		26		684	385		230	232	<0.1			0.065			27				1.37	0.105	0.357				250	0.006	0.009	0.197	18.8	0.073	162	0.334	0.012	0.025	0.865	296		492	3.46	0.018	0.046	0.016	0.079	7.4	4400	
MH-1	I	Sep-95		19		193	61		3.32	60.6	3.84			0.012			214				0.26	1.53	0.32				95.1	0.008		3.03	12.4	0.196	25.7	0.131		0.01		22.1	0.052	121	1.2	0.03		0.007	0.453	7.3	1100	
MH-1	I	Sep-96		101		321	211		67	88.7	2.2			0.007			177				0.37	0.165	0.126	<0.001	<0.04	<0.003	128	<0.005	<0.005	4.57	6.28	0.052	62.4	0.161	0.007	<0.01	0.45	98.3	<0.007	239	2.68	0.004	<0.05	0.006	0.034	7.7	2650	
MH-1	I	Apr-97		24		161	206		101	80	<0.1			0.018			126				1.12	0.539		<0.050	<0.050	0.0007	43.8	<0.010	0.0038	0.053	29	0.005	134	0.837	<0.010	0.013	1.12	89.1	<0.0001	218	1.98	<0.050	<0.050	0.012	0.072	6.9	2900	
MH-1	I	Sep-98		213		605	347		136	196	<0.1			0.016			380				15.8	14.7	18.9			<0.0001	548	0.034	<0.0004	0.05	694	<0.001	225	0.995	0.041	0.073	15.8	225	<0.0001	451	10.1			0.064	0.141	6.5	4300	
MH-1	I	Oct-99		5.9		114	--		3.92	16.7	0.55			<0.002			16				0.19	0.111	0.0881				150			0.005	0.886	0.0064	24.1	0.195		0.0086	0.059	21.9		56.1	0.78	0.0012		0.002	0.0052			
MH-1	I	Sep-00		87.3		13.5	524		147	147	<0.04			<0.002			1400				10.9	0.62	1.54	<0.004	<0.04	<0.004	249	<0.02	<0.008	<0.0084	288	<0.02	129	0.632	<0.024	<0.024	8.52	228	<0.016	449	3.53	0.071	<0.08	<0.016	0.08	6.69	4990	
MH-1	I	Sep-01		119		592	1110		151	197	0.11			<0.001			4200					<0.10	0.176	<0.002		<0.001	351	<0.02	<0.003	<0.02	4.38	<0.01	338	0.98	<0.01	0.112		561	<0.001	1410	2.44				0.206	6.74	5530	
MH-1	I	Sep-02		5.3		190	23		110	110	<0.10			0.005			89.5				0.33	0.19	0.2	<0.001	<0.001	0.0008	250	0.03	0.0066	0.031	4.8	0.004	120	0.54	0.002	0.013		120	<0.0001	220	2.1	0.021	<0.01	<0.001	0.042	7.05	2910	
MH-1	I	Apr-03		5		40.6	29		1.4	2.6	0.7			0.001			3				<0.02	0.2	0.055	<0.0007	<0.0011	<0.0005	100	0.001	<0.0005	0.0072	0.53	<0.0011	19	0.029	0.0018	0.0034		12	<0.0003	38	0.34	0.007	<0.0005	0.0011	0.041	7.69	646	
MH-1	I	Sep-03		39		527	237		195	197	<0.5			0.014			102				2.38	<0.04	0.562	<0.001	<0.023	<0.003	213	<0.005	<0.005	<0.004	39.4	<0.025	186	0.378	<0.006	<0.01	2.43	259	<0.007	424	2.53	0.013	<0.03	<0.003	0.019	7.54 (1)	5330	
MH-1	I	Sep-04	2210	21		432	218		3.89	173	0.34J			0.055			82	55.9			1.15		0.203	<0.002	<0.002	<0.001	204	0.007	0.007	0.014J	1.4	<0.002	131	0.37	<0.002	0.01	1.15	370	<0.002	204	2.15	0.006	<0.01	0.003	0.11	9.49	485	
MH-1	I	Nov-05	1330	83		226	98		97.9	139	<0.5			0.025			52	22.4			0.61	0.028	0.228	<0.005	<0.01	<0.01	216	<0.01	<0.005	<0.006	17.6	<0.01	78.7	0.611	<0.01	<0.01	0.61	93.9	<0.005	175	1.82	<0.01		<0.005	0.02	6.39	2910	
MH-1	I	Nov-06	280	5		42	30		0.78	1.6	<2			<0.001			17	<40			0.04	0.06	0.07	<0.001	<0.001	<0.0001	97	<0.001	0.0029	0.005	0.51	0.009	17	0.054	<0.001	0.005	0.04	7.4	<0.0001	24	0.4	<0.002	<0.01	<0.001	0.013	6.94	663	
MH-1	I	Nov-07	1300	20		328	150		77	100	<2			0.005			36	157			1.8	0.6	0.5	<0.01	<0.01	<0.001	240	<0.5	<0.008	<0.01	26.6J	<0.01	116	0.55	<0.01	<0.02	1.8	140	<0.001	267	2.19	0.04	<0.1	<0.01	0.05	7.00	3450	
MH-1	I	Nov-08	1100	11		164	80		69	77	0.4			0.006			79	97			0.73	<0.1	0.2	<0.01	<0.01	<0.001	258	<0.01	<0.008	<0.01	16.6	<0.01	83	0.72	<0.01	<0.02		80	<0.001	140	1.84	<0.02	<0.1	<0.01	0.15	6.18	2680	
MH-1	I	Nov-09	1740	13.0 J		408	167		149	154	<2.0			0.0090			64.0	59.1			1.65	<0.10	0.35	<0.010	<0.010	<0.001	259	<0.010	<0.008	<0.010	29.2	<0.010	121	0.607	<0.010	<0.020		141	<0.001	294	2.47	<0.020	<0.10 UJ	<0.010	<0.030	6.8	4440	
MH-1	I	Nov-10	794	4.3		123	66		43.9	44.1	0.25			0.0030			17.3	37.0			0.39	0.029	0.144	<0.0010	<0.0010	<0.00010	162	0.0015	0.00092	0.0025	8.99	<0.0010	43	0.431	0.0013	<0.0020	0.385	43	<0.0001	99.3	1.09	0.005	<0.010	0.0013	<0.0030	6.4	7800	
MH-1	I	Dec-11	1040	7		122	170		51.9	59.4	<1.0			<0.0010			85	40.3			4.71	0.13	<0.10	<0.010	<0.010	<0.0010	32.8	<0.010	<0.0050	<0.010	0.57	<0.010	11.2	0.244	<0.010	<0.020	4.71	17	<0.0001	39.2	0.123	<0.020		<0.010	0.057	7.21	2360	
MH-1	I	Nov-12	1540	4.8		<40	170		107	114	<2.0			<0.01			49	<40			1.19	0.057	0.33	<0.001	<0.001	<0.0001	230	0.00225	0.00473	0.0013	23.1	<0.001	80.4	0.686	<0.001	0.0061	1.19	94	<0.0001	185	2.22	0.0123		0.0022	0.0087	6.42	2894	
MH-1	I	Jun-14	1530	84		352	387		114	119	<0.5			0.004			12000	41.4			0.36	0.024	0.274	<0.001	<0.002	<0.002	276	0.005	0.006	<0.003	52.3	<0.002	100	0.625	<0.002	<0.003		115	<0.002	215	2.84		<0.010	<0.002	0.009	6.62	>3999	14.3
MH-1	I	Nov-14	1230	250		268	311		111	186	<1.0			0.015			7400	30.0			79.4	0.006	0.346	<0.001	<0.002	<0.002	210	0.003	0.007	<0.003	53.4	<0.002	78.5	0.547	<0.002	<0.003		82.9	<0.002	176	3.02		<0.010	<0.002	0.007	NA	NA	NA
MH-1	I	May-15	1650	45		261	244		120	236	<1.0			0.007			10500	48.0			1.6	0.012	0.252	<0.001	<0.002	<0.001	188	<0.003	0.004	<0.003	30.7	<0.002	85.0	0.657	<0.002	0.004		110	<0.002	201	2.03		<0.010	<0.002	0.008	6.85	1506	9.81
MH-1	I	Sep-15	1640	51		423	131		142	141	<2.5			0.021			30800	44.2			0.28	0.006	0.307	<0.001	<0.002	<0.001	240	0.003	0.006	<0.003	46.2	<0.002	107	0.356	<0.002	0.01		130	<0.002	262	2.6		<0.010	0.002	<0.005	8.53	3312	12.06
MH-1	I	Apr-16	1350	18		203	121		91	87.3	<1.0			0.017			1630	63.9			16.6	0.005	0.174	<0.001	<0.002	<0.002	227	<0.003	0.003	<0.003	13.8	<0.002	78	0.555	<0.001	<0.003		90.2	<0.002	135	1.69		<0.010	<0.002	<0.005	6.76	2342	6.91
MH-1	I	Oct-16	Ins																																													
MH-1	I	Apr-17	1180	6		145	117		72	68.4	<0.25			0.003			232	50.2			9.7	0.078	0.816	<0.001	<0.002	<0.002	218	<0.003	0.004	<0.003	121	<0.002	65	0.725	0.001	<0.003		64.1	<0.002	106	1.9		<0.010	0.004	0.022	6.80	2087	9.87
MH-1	I	Sep-17	Ins																																													
MH-1	I	May-18	Ins																																													
MH-1	I	Oct-18	Ins																																													
MH-1	I	May-19	976	<5		133	60		53.2	54.5	0.41	<0.25		0.021	710		27	28.5		22.1	0.7	0.007	0.131	<0.001	<0.002	<0.001	197	<0.003	0.002	<0.003	0.085	<0.001	53	0.686	<0.002	<0.003		49.4	<0.002	83.7	1.34		<0.010	<0.002	0.023	6.63	1854	21.36
MH-1	I	May-20	Ins																																													
MH-1	I	Jun-21	Ins																																													
MH-3	II/III	May-93		1777		320			43.8					0.256	1442	2847											426				12		91.9	5.6														
MH-3	II/III	Aug-93		1358		322	2235				<0.1			1.11																																		
MH-3	II/III	Sep-94		4695		1126	7348		930	1012	<0.10			1.9			520				13.1	0.709	0.107				367	0.047	0.015	0.808	6.07	0.053	365	2.33		0.064	9.63	456		1040	2.02	0.073	0.043	0.027	0.568	8	8200	
MH-3	II/III	Sep-95		3854		1610	6569		1132	1691	<0.10			0.991			180				5.3	2.25	2.29				531	0.068	0.014	6.89	22.9	0.139	470	3.78		0.1	0.93	664		1440	3.08	0.127	0.06	0.038	1.91	7.4	9300	
MH-3	II/III	Sep-96		2063		1635	2323		466	550	<0.10			0.447			71				0.45	0.543	0.162	<0.001	<0.04	<0.003	234	0.039	0.014	0.741	7.09	0.05	327	1.33	<0.006	0.08	4.91	497	<0.007	1270	2.31	0.078	<0.05	0.021	0.208	7.59	9500	
MH-3	II/III	Apr-97		1349		1294	2645		252	271	<0.10			0.599			80				4.8	1.39		<0.050	<0.050	0.0016	43.9	0.039	0.0188	0.078	22.2	0.012	383	20	0.023	0.078	4.8	344	<0.0001	871	5.07	<0.050	<0.050	0.035	1.59	7.3	7000	
MH-3	II/III	Sep-98		297		1580	1080		733	797	<0.1			0.027			131				7.4	0.971	0.208			<0.0001	269	0.032	<0.0004	0.023	2.97	<0.001	408	0.696	0.017	0.128	7.4	494	<0.0001	1030	2.61			0.023	0.142	7.1	9300	
MH-3	II/III	Oct-99		20.7		762			32	34.2	1.59			0.008			40				1.76	0.25	0.0914			0.0016	201	0.0109	0.00637	0.0273	2.57	0.0134	162	0.376	0.0072	0.0104	1.27	273	0.002	542	0.751	0.0156	0.003	0.0113	0.0535			
MH-3	II/III	Sep-00		108		13	596		187	211	1.79			<0.002			100				8.64	0.697	0.159	<0.004	<0.04	<0.004	222	0.025	<0.008	<0.0084	4.47	<0.02	166	1.26	<0.024	<0.024	4.86	302	<0.016	671	1.35	0.108	<0.08	0.09	0.126	7.5	6250	
MH-3	II/III	Sep-01		120		1910	1030		544	626	0.04			<0.001			24					<0.10	2.32	<0.002		<0.001	274	<0.02	<0.003	<0.02	290	<0.01	177	0.36	<0.01	<0.01		235	<0.001	516	4.23				0.183	7.07	13400	
MH-3	II/III	Sep-02		35		740	80		130	130	<0.5			0.003			45.3				3.2	0.38 J	0.14	<0.001	<0.001	0.011J	350	<0.001	0.011	0.11	5.0 J	0.010J	120	1.1	0.018J	0.053		190	<0.0001	480	1.6	0.042J	<0.01	<0.001	0.19J	7.41	5010	
MH-3	II/III	Sep-02		36		700	90		130	130	<0.5			0.004			44.7				3.2	0.26	0.12	<0.001	<0.001	0.0002	320	<0.001	0.01	0.13	4	0.007	110	1	0.01	0.047		180	<0.0001	430	1.4	0.024	<0.01	<0.001	0.15			
MH-3	II/III	Apr-03		675		1180	1640		373	407	<1.5			0.04			2190				13	9.3	0.71	0.0007	<0.0011	0.0008	340	0.055	0.033	0.063	100	0.02	260	1.7	0.0076	0.12		320	0.0021	770	1.7	0.2	0.0072	0.019	0.36	7.09	10000	
MH-3	II/III	Sep-03		447		2480	1450		1050	1170	0.6			0.034			20				9	0.3	0.218	<0.001	<0.023	<0.003	146	0.086	0.028	<0.004	1.82	<0.025	335	0.589	<0.006	0.15	9.4	775	<0.007	1720	1.5	0.16	<0.03	0.028	0.165	7.77 (1)	15700	
MH-3	II/III	Sep-04	6110	201		3050	1480		46	1140	<0.05UJ			0.271			42	102			5.69		0.195	<0.002	<0.002	<0.001	200	0.098	0.03	0.016	2.5	0.008	300	0.817	0.006	0.155	5.69	1510	0.002	610	1.82	0.145	<0.01	0.042	0.369	10.04	14800	
MH-3	II/III	Nov-05	4580	117		1690	897		744	751	<5.0			0.082			130	95.8			3.43	0.237	0.214	<0.005	<0.01	<0.01	219	0.072	0.026	0.006	3.49	<0.01	244	0.803	<0.01	0.108	3.43	541	<0.005	1300	1.61	0.098		0.027	0.073	7.03	11900	
MH-3	II/III	Nov-06	4690	125		1670	1300		630	1050	<2			0.094			80	58			10	0.2	0.24	<0.01	<0.01	<0.001	330	0.08	0.017	<0.01	1	<0.01	270	0.9	<0.01	0.09	10	500	<0.001	1300	1.6	<0.02	<0.01	<0.01	0.25	6.93	13900	
MH-3	II/III	Nov-07	5000	210		1670	1300		720	810	<2			0.068			160	147			7.6	1.1	0.2	<0.01	<0.01	<0.001	281	<3	0.025	0.01	4.1J	<0.01	262	1.19	<0.01	0.1	7.6	530	<0.001	1370	1.76	0.12	<0.1	0.02	0.1	7.64	12300	
MH-3	II/III	Nov-08	2200	921		1010	2200		220	330	<0.5			0.436			21	104			8.4	0.5	0.1	<0.01	<0.01	<0.001	385	0.05	0.011	0.05	6.1	0.02	122	2.6	<0.01	0.06		210	<0.001	670	1.49	0.06	<0.1	0.01	1.03	6.37	6470	
MH-3	II/III	Nov-09	4440	563		1520	2030		541	845	<2.0			0.406			49	<40			10.5	0.58	0.36	<0.010	<0.010	<0.0010	369	0.071	0.032	<0.010	5.78	<0.010	246	1.85	<0.010	0.119		520	<0.001	1400	2.3	0.142	<0.10 UJ	0.026	0.183	7.25	1320	
MH-3	II/III	Nov-10	1710	926		719	1940			182	<0.50			0.13			58.7	435			2.57	0.96	0.25	<0.010	<0.010	<0.0010	342	0.026	0.0119	0.039	6.36	0.012	149	2.27	<0.010	0.064	2.57	153	<0.0010	516	1.83	0.077	<0.10	<0.010	0.608	6.57	5100	
MH-3	II/III	Dec-11	2100	598		547	1500		136	200	<1.0			0.256			68	105			4.76	1.11	0.151	<0.0010	<0.0010	0.00024	303	0.0196	0.0105	0.0183	5	0.0069	130	1.7	0.0036	0.0471	4.76	171	<0.00010	399	1.43	0.0662		0.0092	0.54	7.25	5056	
MH-3	II/III	Nov-12	4100	388		71.2	1540		455	479	<2.0			<0.1			80	<40			10.0	1.07	0.3	<0.010	<0.010	<0.00090	381	0.0669	0.0178	0.011	9.1	<0.010	197	2.65	<0.010	0.086	10	350	<0.0010	1040	2.05	0.197		0.03	0.183	6.29	9170	
MH-3	II/III	Jun-14	3220	389		968	770		574	731	<1.0			0.040			5640	146			11.8	0.106	0.154	<0.001	<0.002	<0.002	303	0.031	0.018	<0.003	5.08	<0.002	154	1.44	<0.002	0.049		294	<0.002	688	1.94		<0.010	0.009	0.041	6.95	>3999	16.6
MH-3	II/III	Nov-14	3370	573		1370	729		591	610	<5			0.045			1570	103			15.7	0.120	0.191	<0.001	<0.002	<0.002	303	0.061	0.023	0.005	0.446	<0.002	187	2.08	0.003	0.099		354	<0.002	978	2.65		<0.010	0.018	0.021	7.23	>3999	12.1
MH-3	II/III	May-15	4510	1410		1210	3320		504	1130	<5			0.715			NR	378			39.9	0.118	0.193	<0.001	<0.002	<0.001	548	0.047	0.012	<0.003	0.980	<0.002	256	4.29	<0.002	0.056		389	<0.002	1040	2.33		<0.010	0.017	0.027	6.98	7873	13.10
MH-3	II/III	Sep-15	4940	232		1760	692		414	620	<5			0.072			1050	265			10.4	0.115	0.200	<0.002	<0.004	<0.002	445	0.054	0.020	<0.006	1.060	<0.004	250	2.53	<0.004	0.096		466	<0.004	1140	2.21		<0.020	0.019	0.013	12.95	5923	14.58
MH-3	II/III	Apr-16	4240	1990		1200	4560		458	581	<5			0.505			4780	32			24.2	0.122	0.174	<0.002	<0.004	<0.004	587	0.038	0.008	<0.006	0.219	<0.004	239	4.28	<0.002	0.04		402	<0.004	947	2.16		<0.020	0.009	0.048	7.25	8303	11.45
MH-3	II/III	Oct-16	No results - sample bottles were misplaced by the laboratory																																												
MH-3	II/III	Apr-17	3000	1030		770	2120		326	330	<1.00			0.434			1740	4.7			13.1	1.040	0.271	<0.001	<0.002	<0.002	375	0.037	0.019	0.019	38.7	0.008	158	3.38	0.002	0.05		243	<0.002	600	1.84		<0.010	0.009	0.459	6.93	7094	12.18
MH-3	II/III	Sep-17	5720	456		1750	1790		685	855	<1.0			0.130			7900	21			10.0	0.158	0.254	<0.001	<0.002	<0.002	278	0.087	0.017	<0.003	0.9	<0.002	277	1.47	0.002	0.103		460	<0.002	1300	2.09		<0.010	0.027	0.011	7.22	10861	13.46
MH-3	II/III	May-18	Ins																																													
MH-3	II/III	Oct-18	Ins																																													
MH-3	II/III	May-19	1910	917		608	1670		179	238	<1.0	<1.0		0.312	1200		58	20.5		594	7.3	0.104	0.079	<0.001	<0.002	<0.001	296	0.024	0.006	0.009	1.73	0.004	111	1.82	<0.002	0.02		178	<0.002	466	1.11		<0.010	0.006	0.062	6.69	4523	16.84
MH-3	II/III	May-20	Ins																																													
MH-3	II/III	Jun-21	Ins																																													
MH-3	II/III	Nov-21	951	20		227	175		87.6	91	<0.14			0.05			28	116			1.1	0.886	0.117	<0.002	<0.004	<0.002	178	0.008	0.004	0.009	10.7	0.005	51.6	0.839	<0.004	0.015		65.5	<0.004	196	0.839		<0.020	0.006	<0.040	7.09		10.17
		MIN				13											3				0.04										0.085																	
		MAX				3050											30800				79.4										694																	
Minimum			1710	20.7	0	13	80	0	32	34.2	0.04	0	0	0.003	1200	2847	20	4.7	0	594	0.45	0.104	0.079	0.0007	0	0.0002	43.9	0.0109	0.006	0.005	0.219	0.004	91.9	0.36	0.002	0.0104	0.93	153	0.002	399	0.751	0.0156	0.003	0.006	0.011	6.29	1320	11.45
Maximum			6110	4695	0	3050	7348	0	1132	1691	1.79	0	0	1.9	1442	2847	7900	435	0	594	39.9	9.3	2.32	0.0007	0	0.0016	587	0.098	0.033	6.89	290	0.139	470	20	0.023	0.155	10	1510	0.0021	1720	5.07	0.2	0.06	0.09	1.91	12.95	15700	16.84
Average			3711	871.9	#DIV/0!	1171	1903	#DIV/0!	443.8	600.1	1.005	#DIV/0!	#DIV/0!	0.32638	1321	2847	927.6	133	#DIV/0!	594	9.183	0.9331852	0.3506	0.0007	#DIV/0!	0.000888	318	0.04894	0.016977	0.45313	19.834	0.0255929	225	2.48484	0.00814	0.07813	5.817	402.2	0.002033	891.3	2.023	0.1057	0.0283	0.02306	0.33834	7.44889	8730	13.39

Notes:

Analytical Sources:

1991 to 1997	Novamann	BOD	Biochemical Oxygen Demand	1	Value measured in Laboratory.	<1.0	not detected above stated RDL
1998 to 2002	CAS Laboratories	COD	Chemical Oxygen Demand	2	Prior to 1998, leachate samples were collected from the Phase I leachate holding tank.	NR	non-reportable due to the sample matrix
2003	Maxxam Analytical	DOC	Dissolved Organic Carbon	3	2000 Leachate sample was collected from MH-16A due to insufficient flow at MH-1	*	Semi quantitative only
2004 to 2005	AGAT Laboratories	TDS	Total Dissolved Solids	4	2004 to 2006 leachate samples were collected from MH-15A due to insufficient flow at MH-1.	U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit
2005 to 2010	ALS Laboratories	TKN	Total Kjeldahl Nitrogen	5	Town of St. Marys Sewer Use By-Law No. 46 of 2014 Appendix E	J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample
2011 to 2012	Not reported	TOC	Total Organic Carbon	Ins	Insufficient leachate in manhole to obtain a sample	UJ	The analyte was not detected above The reported sample quantitation limit. However, the reported sample quantitation limit is approximate
2012 to present	AGAT Laboratories	TSS	Total Suspended Solids	RDL	Reported Detection Limit.		and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample

APPENDIX G:
2021 LABORATORY CERTIFICATES OF ANALYSIS

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*Notes

Disclaimer:

- *All work conducted herein has been done using accepted standard protocols, and generally accepted practices and methods. AGAT test methods may incorporate modifications from the specified reference methods to improve performance.*
- *All samples will be disposed of within 30 days after receipt unless a Long Term Storage Agreement is signed and returned. Some specialty analysis may be exempt, please contact your Client Project Manager for details.*
- *AGAT's liability in connection with any delay, performance or non-performance of these services is only to the Client and does not extend to any other third party. Unless expressly agreed otherwise in writing, AGAT's liability is limited to the actual cost of the specific analysis or analyses included in the services.*
- *This Certificate shall not be reproduced except in full, without the written approval of the laboratory.*
- *The test results reported herewith relate only to the samples as received by the laboratory.*
- *Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, warranties of merchantability, fitness for a particular purpose, or non-infringement. AGAT assumes no responsibility for any errors or omissions in the guidelines contained in this document.*
- *All reportable information as specified by ISO/IEC 17025:2017 is available from AGAT Laboratories upon request.*

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		RD	25 3321	25 3322	25 332	25 332	25 332	25 332	25 3330	25 3331
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uene		0 20	0 20	0 20	0 20	0 20	0 20	0 20	0 20	0 20
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Results relate only to the items tested. Results apply to samples as received.

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e		0 10	0	0 12	52 2	5	0 10		23 4
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u ate		0 10	21	0 10	1	252	0 10	1	2 4
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D ss e an a n		0 5	0	0 5	1 1	1 5	0 5	1	1 1
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D ss e a u		0 05	2 2	0 10	55 4	4 5	0 05	24 1	22 5
D ss e Ma nes u		0 05	1 3	0 10	53 0	53 2	0 05	31	22
D ss e u		0 05	22 2	0 10	33 4	3 2	0 05	4	51
D ss e B n		0 010	0 100	0 010	0 14	0 125	0 010	0 32	0 0
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Certified By:

Amanjot Bhela

CHARTERED AMANJOT BHELA CHEMIST
ASSOCIATION OF THE CHEMICAL PROFESSION OF ONTARIO

Results relate only to the items tested. Results apply to samples as received.

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N t te as N		0 05	0 05	0 05	0 05	0 05	0 05	0 05	0 05	0 05
u ate		0 10	115	0 10	10	1 0	5	0 10	433	132
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D ss e an a n		0 5	2 3	0 5	0	1 3	0	0 5	1 0	4
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D ss e a u		0 25	3	0 05	43 2	31	5	0 25	114	
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D ss e u		0 25	15	0 05	20	42 5	20 0	0 25	4 1	4
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Certified By:

Amanjot Bhela

CHARTERED AMANJOT BHELA CHEMIST

Results relate only to the items tested. Results apply to samples as received.

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A n a as N			0 02	0 12	0 02	0 0	0 02
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25 333	4A 4	N	u a e ate a a ete s	en s		0 001	0 002
25 333	4A 4	N	u a e ate a a ete s	ta l n		0 3	1 1
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IEN NAME: M B UE AN
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A A R RDER: 21 5 41
A EN I N : ate a nt e
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R Date: Jun 14, 2021			DU I A E				RE EREN E MA ERIA			ME D B AN I E			MA RI I E		
ARAME ER	Bat	a e I	Du 1	Du 2	R D	Met B an	Measu e a ue	A e ta e ts e	A e ta e ts U e	Re e	A e ta e ts e	A e ta e ts U e	Re e	A e ta e ts e	A e ta e ts U e
un ate a a ete s															
A a nt as a 3	25 0034		14	151	3 4	5	0	0	120	NA			NA		
e	25 3322	25 3322	52 2	51 1	2 1	0 10		0	130	103	0	120	10	0	130
N t ate as N	25 3322	25 3322	0 05	0 05	NA	0 05		0	130	104	0	120	103	0	130
N t te as N	25 3322	25 3322	0 05	0 05	NA	0 05	10	0	130	10	0	120	111	0	130
u ate	25 3322	25 3322	1	1 4	2 4	0 10	104	0	130	103	0	120	NA	0	130
A n a as N	25 0545		0 02	0 02	NA	0 02	100	0	130		0	120	104	0	130
ta e a N t en	25 3321	25 3321	0 40	0 4	NA	0 10	101	0	130	101	0	120		0	130
D ss e an a n	25 04		4	5 0	2 0	0 5		0	110	10	0	110	105	0	120
en s	255 400		0 001	0 001	NA	0 001		0	110	101	0	110	1	0	120
D ss e a u	25 3321	25 3321	2 2	25	1 2	0 05	101	0	130	101	0	120		0	130
D ss e Ma nes u	25 3321	25 3321	1 3	1 2	0	0 05	102	0	130	103	0	120		0	130
D ss e u	25 3321	25 3321	22 2	22 2	0 0	0 05		0	130		0	120	4	0	130
D ss e B n	25 3321	25 3321	0 100	0 112	11 3	0 010		0	130	103	0	120	10	0	130
D ss e I n	25 3321	25 3321	0 034	0 034	NA	0 010	103	0	130	10	0	120		0	130
D ss e Man anese	25 3321	25 3321	0 00	0 011	NA	0 002	11	0	130	11	0	120		0	130

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A a nt as a 3	25 3323	25 3323	1	1	0	5	1	0	120	NA			NA		
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N t ate as N	25 3322	25 3322	0 05	0 05	NA	0 05		0	130	104	0	120	103	0	130
N t te as N	25 3322	25 3322	0 05	0 05	NA	0 05	10	0	130	10	0	120	111	0	130
D ss e an a n	25 04		4	5 0	2 0	0 5		0	110	10	0	110	105	0	120
en s	255 400		0 001	0 001	NA	0 001		0	110	101	0	110	1	0	120
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D ss e Ma nes u	25 3321	25 3321	1 3	1 2	0	0 05	102	0	130	103	0	120		0	130
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N t te as N	25 3322	25 3322	0 05	0 05	NA	0 05	10	0	130	10	0	120	111	0	130
A n a as N	25 3334	25 3334	0 2	0 24	0	0 02		0	130	100	0	120		0	130
ta s us	255 3		0 02	0 02	NA	0 02	102	0	130		0	120	101	0	130
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ta u	25 0		5 2	5 22	1 3	0 10	100	0	130		0	120		0	130
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Certified By:

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a ness as a 3 a u ate	ME 3 105	e E A 4 010 200 M 2340 B	A U A I N
A a n t as a 3	IN R 3 000	M e M 2320 B	I RA E
e	IN R 3 004	e M 4110 B	I N R MA RA
N t ate as N	IN R 3 004	e M 4110 B	I N R MA RA
N t te as N	IN R 3 004	M 4110 B	I N R MA RA
u ate	IN R 3 004	e M 4110 B	I N R MA RA
A n a as N	IN R 3 05	e M 4500 N 3	A A IA
ta e a N t en	IN R 3 04	e E A 351 2 an M 4500 N R D	A A IA
D ss e an a n	IN R 3 04	e M 5310 B	IMAD U ARB N ANA ER
en s	IN R 3 0 2	e M 5530 D	A A IA
D ss e a u	ME 3 105	e E A 010D	I E
D ss e Ma nes u	ME 3 105	e E A 010D	I E
D ss e u	ME 3 105	e E A 010D	I E
D ss e B n	ME 3 103	e E A 200 an E A 3005A	I M
D ss e I n	ME 3 103	e E A 200 an E A 3005A	I M
D ss e Man anese	ME 3 103	e E A 200 an E A 3005A	I M
a t at n D	R 001		I RA I N
a t at n Meta s	R 001		I RA I N
ta D ss e s	IN R 3 02	e E A 1 4, N M E E313 , M 2540 ,D	BA AN E
ta us en e s	IN R 3 02	e E A 1 4, N M E E313 , M 2540 ,D	BA AN E
ta s us	IN R 3 022	e M 4500 B an M 4500 E	E R ME ER
u t	IN R 3 044	e M 2130 B	NE E ME ER
ta a u	ME 3 105	e E A 010D	I E
ta Ma nes u	ME 3 105	e E A 010D	I E
ta u	ME 3 105	e E A 010D	I E
ta I n	ME 3 103	e E A 200 , 3005A, 3010A 020B	I M
ta Man anese	ME 3 103	e E A 200 , 3005A, 3010A 020B	I M

AGAT Laboratories

ULG BIK

5835 Coopers Avenue
Mississauga, Ontario L4Z 1Y2
Ph: 905.712.5100 Fax: 905.712.5122
webearth.agatlabs.com

Laboratory Use Only

Work Order #: 21T756417

Cooler Quantity:

Arrival Temperatures: See attached

Custody Seal Intact: ☐Yes ☐No ☐N/A

Notes:

Chain of Custody Record

If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water consumed by humans)

Report Information:

Company: GMBluePlan Engineering
Contact: Kate Charpontier
Address: 975 Wallace Ave N, Listowel, ON N4W1M6
Phone: 519-291-9339 Fax:
Reports to be sent to:
1. Email: kate.charpontier@gmblueplan.ca
2. Email:

Regulatory Requirements:

(Please check all applicable boxes)

☐ Regulation 153/04 — Table ___ (Indicate One) ☐Ind/Com ☐Res/Park ☐Agriculture; Soil Texture (Check One) ☐Coarse ☐Fine

☐ Excess Soils R406 — Table ___ (Indicate One)

☐ Regulation 558

☐ CCME

☐ Sewer Use ☐Sanitary ☐Storm — Region

☐ Prov. Water Quality Objectives (PWQO)

☐ Other ___ (Indicate One)

Is this submission for a **Record of Site Condition?** ☐ Yes ☑ No

Report Guideline on *Certificate of Analysis* ☐ Yes ☑ No

Turnaround Time (TAT) Required:

Regular TAT (Most Analysis) ☑ 5 to 7 Business Days

Rush TAT (Rush Surcharges Apply) ☐ 3 Business Days ☐ 2 Business Days ☐ Next Business Day

OR Date Required (Rush Surcharges May Apply):

Please provide prior notification for rush TAT
*TAT is exclusive of weekends and statutory holidays

For 'Same Day' analysis, please contact your AGAT CPM

Project Information:

Project: 318007
Site Location: St. Mary's Landfill
Sampled By: KC/AV
AGAT ID #: 192120 PO:

Please note: If quotation number is not provided, client will be billed full price for analysis.

Invoice Information:

Bill To Same: Yes ☑ No ☐

Company:
Contact:
Address:
Email:

Sample Matrix Legend

B	Biota
GW	Ground Water
O	Oil
P	Paint
S	Soil
SD	Sediment
SW	Surface Water

Analysis columns: Field Filtered - Metals, Hg, CrVI, DOC (Y/N); O. Reg 153: Metals & Inorganics; Metals - ☐ CrVI, ☐ Hg, ☐ HWSB; BTEX, F1-F4 PHCs; Analyze F4G if required ☐ Yes ☐ No; PAHs; Total PCBs ☐ Aroclor; VOC; O. Reg 558: Landfill Disposal Characterization TCLP: TCLP: ☐ M&I ☐ VOCs ☐ ABNs ☐ B(a)P ☐ PCBs; O. Reg 406: Excess Soils SPLP Rainwater Leach SPLP: ☐ Metals ☐ VOCs ☐ SVOCs; Excess Soils Characterization Package pH, ICPMS Metals, BTEX, F1-F4; Salt - EC/SAR; GW Analysis; Residential GW Analysis; Potentially Hazardous or High Concentration (Y/N)

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Field Filtered Y/N	GW Analysis	Residential GW Analysis
OW2-84	06/02/21	AM PM		GW	red cap bottles rinsed out	N	✓	
OW5-84	↓	AM PM		↓	↓	↓	✓	
OW7-91		AM PM						✓
OW8A-91		AM PM						✓
OW9A-91		AM PM			*partial sample ~~[illegible]~~			✓
OW8B-10		AM PM					✓	
OW9B-91		AM PM					↓	
OW15-91		AM PM						
OW21-91		AM PM						
OW32-96		AM PM						
OW33-96	↓	AM PM		↓	↓	↓	↓	

Samples Relinquished By (Print Name and Sign)	Date	Time	Samples Received By (Print Name and Sign)	Date	Time
Kate Charpontier KC	06/03/21	10:00 AM	SIMRAN Sh	June 4/21	9:50 am

Page 1 of 2

Nº: T 117918

AGAT Laboratories

5835 Coopers Avenue
Mississauga, Ontario L4Z 1Y2
Ph: 905.712.5100 Fax: 905.712.5122
webearth.agatlabs.com

Chain of Custody Record

If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water consumed by humans)

Laboratory Use Only

Work Order #:

Cooler Quantity:

Arrival Temperatures:

Custody Seal Intact: ☐Yes ☐No ☐N/A

Notes:

Report Information:

Company: GM BluePlan Engineering
Contact: Kate Charpontier
Address: 975 Wallace Ave N, Listowel, ON N4W1M6
Phone: 519-291-9339 Fax:
Reports to be sent to:
1. Email: Kate.charpontier@gmblueplan.ca
2. Email:

Regulatory Requirements:

(Please check all applicable boxes)

☐ Regulation 153/04 — Table (Indicate One): ☐Ind/Com ☐Res/Park ☐Agriculture
Soil Texture (Check One): ☐Coarse ☐Fine

☐ Excess Soils R406 — Table (Indicate One)
☐ Regulation 558
☐ CCME

☐ Sewer Use: ☐Sanitary ☐Storm — Region
☐ Prov. Water Quality Objectives (PWQO)
☐ Other — Indicate One

Is this submission for a **Record of Site Condition?** ☐ Yes ☑ No

Report Guideline on *Certificate of Analysis* ☐ Yes ☑ No

Turnaround Time (TAT) Required:

Regular TAT (Most Analysis) ☑ 5 to 7 Business Days

Rush TAT (Rush Surcharges Apply)

☐ 3 Business Days ☐ 2 Business Days ☐ Next Business Day

OR Date Required (Rush Surcharges May Apply):

Please provide prior notification for rush TAT
*TAT is exclusive of weekends and statutory holidays

For 'Same Day' analysis, please contact your AGAT CPM

Project Information:

Project: 318007
Site Location: St. Mary's Landfill
Sampled By: KC/AV
AGAT ID #: 192120 PO:

Please note: If quotation number is not provided, client will be billed full price for analysis.

Invoice Information:

Bill To Same: Yes ☑ No ☐

Company:
Contact:
Address:
Email:

Sample Matrix Legend

B	Biota
GW	Ground Water
O	Oil
P	Paint
S	Soil
SD	Sediment
SW	Surface Water

Analysis columns: Field Filtered - Metals, Hg, CrVI, DOC (Y/N); O. Reg 153: Metals & Inorganics; Metals - ☐ CrVI, ☐ Hg, ☐ HWSB; BTEX, F1-F4 PHCs; Analyze F4G if required ☐ Yes ☐ No; PAHs; Total PCBs; ☐ Aroclor; VOC; O. Reg 558: Landfill Disposal Characterization TCLP: TCLP: ☐ M&I ☐ VOCs ☐ ABNs ☐ B(a)P ☐ PCBs; O. Reg 406: Excess Soils SPLP Rainwater Leach SPLP: ☐ Metals ☐ VOCs ☐ SVOCs; Excess Soils Characterization Package pH, ICPMS Metals, BTEX, F1-F4; Salt - EC/SAR; GW Analysis; SW Analysis; Potentially Hazardous or High Concentration (Y/N)

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Field Filtered Y/N	GW Analysis	SW Analysis
OW34-96	06/02/21	AM PM		GW	red cap bottles rinsed out	N	✓	
OW36	↓	AM PM		↓	↓	↓	↓	
MHB	↓	AM PM		↓	↓	↓	↓	
SP1-10	↓	AM PM		SW		↓		✓
SP2-93	↓	AM PM		↓		↓		↓
SP4A-94	↓	AM PM		↓		↓		↓
SP3-93	↓	AM PM		↓		↓		↓
		AM PM						
		AM PM						
		AM PM						
		AM PM						

Samples Relinquished By (Print Name and Sign):	Date	Time	Samples Received By (Print Name and Sign):	Date	Time
Kate Charpontier KCharpontier	06/03/21	10:00AM			

Page 2 of 2

Nº: T 117919

AGAT Laboratories

Sample Temperature Log

Client: GM Blue Plan

COC# or Work Order #: ____

# of Coolers: 3 (warm ice-packs)

# of Submissions: ____

Arrival Temperatures - Branch/Driver				Arrival Temperatures - Laboratory			
Cooler #1:	14.6	15.2	15.6	Cooler #1:			
Cooler #2:	13.4	15.0	14.6	Cooler #2:			
Cooler #3:	16.8	15.2	15.4	Cooler #3:			
Cooler #4:				Cooler #4:			
Cooler #5:				Cooler #5:			
Cooler #6:				Cooler #6:			
Cooler #7:				Cooler #7:			
Cooler #8				Cooler #8			
Cooler #9:				Cooler #9:			
Cooler #10:				Cooler #10:			

IR Gun ID: ____ IR Gun ID: ____

Taken By: SIMRAN [signature] Taken By: ____

Date (yyyy/mm/dd): 2021/06/04 Time: 9 : 50 AM / PM ✓ Date (yyyy/mm/dd): ____ Time: ___:___ AM / PM

Instructions for use of this form: 1) complete all fields of info including total # of coolers and # of submissions rec'd, 2) photocopy and place in each submission prior to giving a WO#, 3) Proceed as normal, write the WO# and scan (please make sure to scan along with the COC)

Document ID: SR-78-9511.003
Date Issued: 2017-2-23

Page:____ of ____

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ER I N : 1

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*Notes

Disclaimer:

- All work conducted herein has been done using accepted standard protocols, and generally accepted practices and methods. AGAT test methods may incorporate modifications from the specified reference methods to improve performance.
- All samples will be disposed of within 30 days after receipt unless a Long Term Storage Agreement is signed and returned. Some specialty analysis may be exempt, please contact your Client Project Manager for details.
- AGAT's liability in connection with any delay, performance or non-performance of these services is only to the Client and does not extend to any other third party. Unless expressly agreed otherwise in writing, AGAT's liability is limited to the actual cost of the specific analysis or analyses included in the services.
- This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
- The test results reported herewith relate only to the samples as received by the laboratory.
- Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, warranties of merchantability, fitness for a particular purpose, or non-infringement. AGAT assumes no responsibility for any errors or omissions in the guidelines contained in this document.
- All reportable information as specified by ISO/IEC 17025:2017 is available from AGAT Laboratories upon request.

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Certified By:

CHARTERED NIVINE BASILY CHEMIST
ASSOCIATION OF THE CHEMICAL PROFESSION OF ONTARIO

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Ben ene		0 20	0 20	0 20	0 20	0 20	0 20	0 20	0 20	0 20
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ene		0 20	0 20	0 23	0 20	0 20	0 20	0 20	0 20	0 20
ene		0 10	0 10	0 10	0 10	0 10	0 10	0 10	0 10	0 10
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a a ete	Un t					
		AM E DE RI I N:	32	33	34	3
		AM E E:	ate	ate	ate	ate
		DA E AM ED:	2021 11 05	2021 11 05	2021 11 05	2021 11 05
		RD	31 1 30	31 1 31	31 1 32	31 1 33
Ben ene		0 20	0 20	0 20	0 20	0 20
uene		0 20	0 20	0 20	0 20	0 20
Et en ene		0 10	0 10	0 10	0 10	0 10
ene		0 20	0 20	0 20	0 20	0 20
ene		0 10	0 10	0 10	0 10	0 10
enes ta		0 20	0 20	0 20	0 20	0 20
u ate	Un t	A e ta e ts				
uene	Re e	50 140	102	1	102	102
4 B u en ene	Re e	50 140				

ents: RD Re te Dete t n t u e ne tan a

31 1 22 31 1 33 Resu ts e ate n t t e te s teste
enes t ta s a a u ate a a ete e a u ate a ue s t e su ene ene e a u ate a a ete s n n a e te e a a ete s t at a e nents t e a uat n a e
a e te

Ana s s e e at A A nt un ess a e

Certified By:

AGAT Laboratories

5 35 ER A ENUE
MI I AU A, N ARI
ANADA 4 1 2
E 05 12 5100
A 05 12 5122
tt : a ata s

e t ate Ana s s

A A R RDER: 21 2 03
R JE : 31 00

IEN NAME: M B UE AN
AM IN I E:

A EN I N : ate a nt e
AM ED B :

at e an un s E A 24 n ate			
DA E RE EI ED: 2021 11 10			DA E RE R ED: 2021 11 1
		AM E DE RI I N:	M 3
		AM E E:	ate
		DA E AM ED:	2021 11 05
a a ete	Un t	RD	31 1 41
D u et ane		0 40	0 40
et ane		0 0	0 0
n e		0 34	0 34
B et ane		0 40	0 40
et ane		0 40	0 40
u et ane		0 0	0 0
A et ne		2 0	2 0
1,1 D et ene		0 0	0 0
D et ane		0 0	0 0
t ans 1,2 et ene		0 40	0 40
Met te t ut et e		0 40	0 40
1,1 D et ane		0 0	0 0
Met Et et ne		2 0	2
s 1,2 D et ene		0 40	0 40
		0 40	0 40
1,2 D et ane		0 40	0 40
1,1,1 et ane		0 0	0 0
a n et a e		0 40	0 40
Ben ene		0 40	0 4
1,2 D ane		0 40	0 40
et ene		0 40	0 40
B et ane		0 40	0 40
s 1,3 D ene		0 40	0 40
Met ls ut et ne		2 0	2 0
t ans 1,3 D ene		0 0	0 0
1,1,2 et ane		0 40	0 40
uene		0 40	3 0
2 e an ne		2 0	2 0
D et ane		0 20	0 20
1,2 D et ane		0 20	0 20

Certified By: NPopukoloff

Laboratories

e t ate Ana s s

A A R RDER: 21 2 03
R JE : 31 00

5 35 ER A ENUE
MI I AU A, N ARI
ANADA 4 1 2
E 05 12 5100
A 05 12 5122
tt : a ata s

IEN NAME: M B UE AN
AM IN I E:

A EN I N : ate a nt e
AM ED B :

at e an un s E A 24 n ate

DA E RE EI ED: 2021 11 10 DA E RE R ED: 2021 11 1

		AM E DE RI I N:	M 3
		AM E E:	ate
		DA E AM ED:	2021 11 05
a a ete	Un t	RD	31 1 41
et a et ene		0 40	0 40
1,1,1,2 et a et ane		0 20	0 20
en ene		0 2	0 2
Et en ene		0 20	1 0
ene		0 40	11
B		0 20	0 20
t ene		0 20	0 20
1,1,2,2 et a et ane		0 20	0 20
ene		0 20	2 05
1,3 D en ene		0 20	0 20
1,4 D en ene		0 20	0 20
1,2 D en ene		0 20	0 20
1,2,4 en ene		0 0	0 0
1,3,5 et en ene		0 40	0 40
1,3 D ene s ans		0 30	0 30
enes ta		0 20	1
n e ane		0 40	0 40

u ate	Un t	A e ta e ts	
uene	Re e	50 140	
4 B u en ene	Re e	50 140	100

ents: RD Re te Dete t n t u e ne tan a

31 1 41 D ut n a t 2
e sa e as ute e ause t as a e e t n ete t n t as een e te t e ut n a t use
enes t ta s a a u ate a a ete e a u ate a ue s t e su ene ene
1,3 D ene t ta s a a u ate a a ete e a u ate a ue s t e su s 1,3 D ene an ans 1,3 D ene e a u ate a a ete s n a e te e
a a ete s t at a e nents t e a u at n a e a e te

Ana s s e e at A A nt un ess a e

Certified By:

5 35 ER A ENUE
MI I AU A, N ARI
ANADA 4 1 2
E 05 12 5100
A 05 12 5122
tt : a at a s

IEN NAME: M B UE AN
AM IN I E:

A EN I N : ate a nt e
AM ED B :

un ate a a ete s

DA E RE EI ED: 2021 11 10

DA E RE R ED: 2021 11 1

a a ete	Un t	AM E DE RI I N: AM E E: DA E AM ED: RD	2 4 ate 2021 11 05 31 1 22	4 4 ate 2021 11 05 31 1 23	5 4 ate 2021 11 05 31 1 24	RD	B 1 ate 2021 11 05 31 1 25	B 1 ate 2021 11 05 31 1 2	RD	15 1 ate 2021 11 05 31 1 2
a ness as a 3 a u ate		0 5	12	3	30	0 5	3 0	2	0 5	1 3
A a nt as a 3		5	1 3	3	231	5	252	255	5	21
e		0 10		0 51	43	0 12	2	113	0 10	2 1
Nt ate as N		0 05	0 24	0 2	0 05	0 05	0 30	0 05	0 05	0 0
Nt te as N		0 05	0 05	0 05	0 05	0 05	0 1	0 05	0 05	0 05
u ate		0 10	22	22 4	121	0 10	2 0	4	0 10	31
A n a as N		0 02	0 02	0 02	0 22	0 02	0 02	0 1	0 02	0 14
Dss e a u		0 05	23	110	4 5	0 10	2 3	54 0	0 05	25 0
Dss e Ma nes u		0 05	1 5	22	44	0 10	50	3 2	0 05	24 4
Dss e u		0 05	21	2	2 3	0 10	3 5	4 5	0 05	4 0
Dss e B n		0 010	0 11	0 022	0 14	0 010	0 143	0 342	0 010	0 53
Dss e I n		0 010	0 010	0 010	0 010	0 010	0 010	0 010	0 010	0 012
Dss e Man anese		0 002	0 010	0 002	0 01	0 002	0 002	0 01	0 002	0 035
ta e a Nt en		0 10	0 14	0 1	0 35	0 10	0 1	0 3	0 10	0 15
Dss e an a n		0 5	2 0	4	1 1	0 5	1	2 3	0 5	1 2
en s		0 001	0 005	0 044	0 04	0 001	0 04	0 042	0 001	0 0 2
a t at n D			2021 11 11	2021 11 11	2021 11 11		2021 11 11	2021 11 11		2021 11 11
a t at n Meta s			2021 11 11	2021 11 11	2021 11 11		2021 11 11	2021 11 11		2021 11 11

Certified By: Iris Verástegui

5 35 ER A ENUE
MI I AU A, N ARI
ANADA 4 1 2
E 05 12 5100
A 05 12 5122
tt : a at a s

IEN NAME: M B UE AN
AM IN I E:

A EN I N : ate a nt e
AM ED B :

un ate a a ete s

DA E RE EI ED: 2021 11 10 DA E RE R ED: 2021 11 1

		AM E DE RI I N:	21 1		25 1	32	33	34		3
		AM E E:	ate		ate	ate	ate	ate		ate
		DA E AM ED:	2021 11 05		2021 11 05	2021 11 05	2021 11 05	2021 11 05		2021 11 05
a a ete	Un t	RD	31 1 2	RD	31 1 2	31 1 30	31 1 31	31 1 32	RD	31 1 33
a ness as a 3 a u ate		0 5	3 1	0 5	30	255	1	2 1	0 5	5 1
A a nt as a 3		5	234	5	2 4	223	21	230	5	2 1
e		0 12	2	0 10	01	5	42	24 4	0 12	22 2
N t ate as N		0 05	0 05	0 05	0 05	0 1	0 05	0 05	0 05	0 05
N t te as N		0 05	0 05	0 05	0 05	0 05	0 05	0 05	0 05	0 05
u ate		0 10	11	0 10	5		20 0	1 0	0 10	422
A n a as N		0 02	0 03	0 02	0 0	0 02	0 1	0 0	0 02	0 04
D ss e a u		0 25	4	0 05	4 2	41	31	54 1	0 25	120
D ss e Ma nes u		0 25	53 3	0 05	2 4	3	23	35 4	0 25	4
D ss e u		0 25	114	0 05	11	21 1	42 1	1	0 25	4
D ss e B n		0 010	0 13	0 010	0 0 5	0 0	0 21	0 0 5	0 010	0 20
D ss e I n		0 010	0 010	0 010	0 010	0 010	0 010	0 010	0 010	0 011
D ss e Man anese		0 002	0 004	0 002	0 025	0 002	0 011	0 002	0 002	0 004
ta e a N t en		0 10	0 1	0 10	0 1	0	0 5	0 10	0 10	0 15
D ss e an a n		0 5	3 0	0 5	1 3	0	1 3	0	0 5	1 3
en s		0 001	0 0 5	0 001	0 0 3	0 01	0 045	0 041	0 001	0 040
a t at n D			2021 11 11		2021 11 11	2021 11 11	2021 11 11	2021 11 11		2021 11 11
a t at n Meta s			2021 11 11		2021 11 11	2021 11 11	2021 11 11	2021 11 11		2021 11 11

ents: RD Re te Dete t n t u e ne tan a
31 1 2 31 1 33 D ut n e u e , RD as een n ease a n
Ana s s e e at A A nt un ess a e

Certified By: Iris Verástegui

5 35 ER A ENUE
MI I AU A, N ARI
ANADA 4 1 2
E 05 12 5100
A 05 12 5122
tt : a ata s

AGAT Laboratories

e t ate Ana s s

A A R RDER: 21 2 03
R JE : 31 00

IEN NAME: M B UE AN
AM IN I E:

A EN I N : ate a nt e
AM ED B :

ea ate a a ete s

DA E RE EI ED: 2021 11 10

DA E RE R ED: 2021 11 1

a a ete	Un t	RD	AM E DE RI I N: M 3 AM E E: ate DA E AM ED: 2021 11 05 31 1 41
B D 5		2	20
ta us en e s		10	2
A a n t as a 3		5	51
e		0 4	22
N t ate as N		0 14	0 14
u ate		0 3	11
A n a as N		0 4	
e a en De an		10	1 5
ta e a N t en		0 55	1 0
ta s us		0 0	1 10
en s		0 001	0 050
ta a u		0 32	1
ta Ma nes u		0 34	51
ta tass u		1 15	5 5
ta u		0 45	1
ta A u nu		0 020	0
ta Ba u		0 004	0 11
ta Be u		0 002	0 002
ta B s ut		0 004	0 004
ta a u		0 002	0 002
ta u		0 00	0 00
ta a t		0 002	0 004
ta e		0 00	0 00
ta I n		0 020	10
ta ea		0 002	0 005
ta Man anese		0 004	0 3
ta M enu		0 004	0 004
ta N e		0 00	0 015
ta e		0 004	0 004
ta t nt u		0 010	0 3

Certified By: Iris Verástegui

Results relate only to the items tested. Results apply to samples as received.

Laboratories

e t ate Ana s s

A A R RDER: 21 2 03
R JE : 31 00

5 35 ER A ENUE
MI I AU A, N ARI
ANADA 4 1 2
E 05 12 5100
A 05 12 5122
tt : a at a s

IEN NAME: M B UE AN
AM IN I E:

A EN I N : ate a nt e
AM ED B :

ea ate a a ete s

DA E RE EI ED: 2021 11 10 — DA E RE R ED: 2021 11 1

		AM E DE RI I N:	M 3
		AM E E:	ate
		DA E AM ED:	2021 11 05
a a ete	Un t	RD	31 1 41
ta un sten		0 020	0 020
ta ana u		0 004	0 00
ta n		0 040	0 040

ents: RD Re te Dete t n t u e ne tan a
31 1 41 D ut n e u e , RD as een n ease a n
Ana s s e e at A A nt un ess a e

Certified By: Iris Verástegui

AGAT Laboratories

5 35 ER A ENUE
MI I AU A, N ARI
ANADA 4 1 2
E 05 12 5100
A 05 12 5122
tt : a at a s

e t ate Ana s s

A A R RDER: 21 2 03
R JE : 31 00

IEN NAME: M B UE AN
AM IN I E:

A EN I N : ate a nt e
AM ED B :

Res ent a e a a ete s

DA E RE EI ED: 2021 11 10 DA E RE R ED: 2021 11 1

		AM E DE RI I N:	1	A 1		A 1
		AM E E:	ate	ate		ate
		DA E AM ED:	2021 11 05	2021 11 05		2021 11 05
a a ete	Un t	RD	31 1 03	31 2015	RD	31 201
a ness as a 3 a u ate		0 5	44	4	0 5	253
A a n t as a 3		5	1 5	3 5	5	212
e		0 12	4 2	35 5	0 10	4 3
N t ate as N		0 05	0 52	0 05	0 05	1 3
N t te as N		0 05	0 05	0 05	0 05	0 05
D ss e an a n		0 5	2 1	5	0 5	1 4
en s		0 001	0 00	0 03	0 001	0 00
ta a u		0 1	1	150	0 1	4
ta Ma nes u		0 1	5	24	0 1	33 1
ta u		0 22	3	30 1	0 22	50
a t at n D			2021 11 11	2021 11 11		2021 11 11

ents: RD Re te Dete t n t u e ne tan a
31 1 03 31 201 D ut n e u e , RD as een n ease a n
Ana s s e e at A A nt un ess a e

Certified By: Iris Verástegui

5 35 ER A ENUE
MI I AU A, N ARI
ANADA 4 1 2
E 05 12 5100
A 05 12 5122
tt : a at a s

IEN NAME: M B UE AN
AM IN I E:

A EN I N : ate a nt e
AM ED B :

u a e ate a ete s

DA E RE EI ED: 2021 11 10

DA E RE R ED: 2021 11 1

			AM E DE RI I N:	1 10		2 3	3 3	1B 4		3A 4
			AM E E:	ate		ate	ate	ate		ate
			DA E AM ED:	2021 11 05		2021 11 05	2021 11 05	2021 11 05		2021 11 05
a a ete	Un t		RD	31 2032	RD	31 2053	31 2054	31 2055	RD	31 205
B D 5			2	1	2	2	2	4	2	5
a ness as a 3 a u ate			0 5	50	0 5	300	30	42	0 5	2
ta D ss e s			10	32	10	42	3	4 2	10	322
ta us en e s			10	324	10	10	10	30	10	5
A a n t as a 3			5	2 4	5	2 1	2 0	32	5	2
e			0 10	10	0 10	4 5	4 1	45	0 10	44
N t ate as N			0 05	0 33	0 05	2 1	2 3	1	0 05	0 05
N t te as N			0 05	0 05	0 05	0 05	0 05	0 05	0 05	0 05
A n a as N			0 02	0 11	0 02	0 02	0 02	1 33	0 02	0 02
ta s us			0 0	1 33	0 02	0 0	0 0	0 23	0 0	1 0
en s		0 001	0 001	0 00	0 001	0 011	0 014	0 025	0 001	0 013
u t	N U		0 5	512	0 5	5 4	3	14	0 5	1
ta a u			0 1	1 1	0 1	3	5	131	0 1	3
ta Ma nes u			0 1	25 3	0 1	1 1	1 3	24 0	0 1	1
ta u			0 22	2 5	0 22	2	30	32	0 22	4 2
ta I n		0 3	0 020	21	0 010	0 15	0 15	2 4	0 010	1 3
ta Man anese			0 004	3 11	0 002	0 022	0 020	0 2	0 002	0 304

Certified By: Iris Verástegui

Results relate only to the items tested. Results apply to samples as received.

AGAT Laboratories

e t ate Ana s s

A A R RDER: 21 2 03
R JE : 31 00

5 35 ER A ENUE
MI I AU A, N ARI
ANADA 4 1 2
E 05 12 5100
A 05 12 5122
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IEN NAME: M B UE AN
AM IN I E:

A EN I N : ate a nt e
AM ED B :

u a e ate a ete s

DA E RE EI ED: 2021 11 10

DA E RE R ED: 2021 11 1

			AM E DE RI I N:	5A 4
			AM E E:	ate
			DA E AM ED:	2021 11 05
a a ete	Un t		RD	31 205
B D 5			2	2
a ness as a 3 a u ate			0 5	455
ta D ss e s			10	3
ta us en e s			10	10
A a n t as a 3			5	3
e			0 12	1
N t ate as N			0 05	0 1
N t te as N			0 05	0 05
A n a as N			0 02	0 02
ta s us			0 02	0 02
en s		0 001	0 001	0 01
u t	N U		0 5	3 3
ta a u			0 1	134
ta Ma nes u			0 1	2 3
ta u			0 22	111
ta I n		0 3	0 010	0 1 0
ta Man anese			0 002	0 033

ents: RD Re te Dete t n t u e ne tan a : Re e s t a a e e e t u e ne e e en e u ent
u e ne a ues a e ene a e e en e n e u e nes e a a n t e e e ant t e nten e use Re e e t t t e a a e stan a e u at nte etat n
31 2032 31 205 D ut n e u e , RD as een n ease a n
Ana s s e e at A A nt un ess a e

Certified By: Iris Verástegui

5 35 ER A ENUE
MI I AU A, N ARI
ANADA 4 1 2
E 05 12 5100
A 05 12 5122
tt : a at a s

IEN NAME: M B UE AN

A EN I N : ate a nt e

AM EID	AM E I E	UIDE INE	ANA I A A E	ARAME ER	UNI	UIDE A UE	RE U
31 2032	1 10	N	u a e ate a ete s	en s		0 001	0 00
31 2032	1 10	N	u a e ate a ete s	ta l n		0 3	21
31 2053	2 3	N	u a e ate a ete s	en s		0 001	0 011
31 2054	3 3	N	u a e ate a ete s	en s		0 001	0 014
31 2055	1B 4	N	u a e ate a ete s	en s		0 001	0 025
31 2055	1B 4	N	u a e ate a ete s	ta l n		0 3	2 4
31 205	3A 4	N	u a e ate a ete s	en s		0 001	0 013
31 205	3A 4	N	u a e ate a ete s	ta l n		0 3	1 3
31 205	5A 4	N	u a e ate a ete s	en s		0 001	0 01

5 35 ER A ENUE
MI I AU A, N ARI
ANADA 4 1 2
E 05 12 5100
A 05 12 5122
tt : a ata s

ua t Assu an e

IEN NAME: M B UE AN

A A R RDER: 21 2 03

R JE : 31 00

A EN I N : ate a nt e

AM IN I E:

AM ED B :

Ana s s

R Date: N 1 , 2021			DU I A E			Met B an	RE EREN E MA ERIA			ME D B AN I E			MA RI I E		
ARAME ER	Bat	a e I	Du 1	Du 2	R D		Measu e a ue	A e ta e ts		Re e	A e ta e ts		Re e	A e ta e ts	
								e	U e		e	U e		e	U e
Me u n AA															
Me u	31 20 2	31 20 2	0 05	0 04	NA	0 01	102	0	130	102	0	120	10	0	130

ents: NA s n es N t A a e
Du ate NA: esu ts a e un e 5 t e RD an n t e a u ate

Meta an n															
A sen	31 500		4	3	NA	1	112	0	130	102	0	120	105	0	130
a u	31 500		0 5	0 5	NA	0 5	112	0	130	104	0	120	100	0	130
u	31 500		1	1	NA	5	101	0	130	101	0	120	5	0	130
a t	31 500			0	4 4	0 5	4	0	130	104	0	120		0	130
e	31 500		14	14	0 0	1 0	5	0	130	105	0	120		0	130
ea	31 500				0 0	1	10	0	130	10	0	120	100	0	130
M enu	31 500		0	0	NA	0 5	10	0	130	104	0	120	10	0	130
N e	31 500		13	13	0 0	1		0	130	102	0	120		0	130
e en u	31 500		0	0	NA	0	130	0	130		0	120		0	130
n	31 500		35	3	2	5	100	0	130	102	0	120	102	0	130

ents: NA s n es N t A a e
Du ate NA: esu ts a e un e 5 t e RD an n t e a u ate

Certified By:

CHARTERED NIVINE BASILY CHEMIST
ASSOCIATION OF THE CHEMICAL PROFESSION OF ONTARIO

5 35 ER A ENUE
MI I AU A, N ARI
ANADA 4 1 2
E 05 12 5100
A 05 12 5122
tt : a at a s

Laboratories

ua t Assu an e

IEN NAME: M B UE AN | A A R RDER: 21 2 03
R JE : 31 00 | A EN I N : ate a nt e
AM IN I E: | AM ED B :

a e an s Ana s s

R Date: N 1 , 2021			DU I A E			Met B an	RE EREN E MA ERIA			ME D B AN I E			MA RI I E		
ARAME ER	Bat	a e I	Du 1	Du 2	R D		Measu e a ue	A e ta e ts e	A e ta e ts U e	Re e	A e ta e ts e	A e ta e ts U e	Re e	A e ta e ts e	A e ta e ts U e
at e an un s E A 24 n ate															
D u et ane	31 523		0 20	0 20	NA	0 20	3	50	140	4	50	140	4	50	140
et ane	31 523		0 40	0 40	NA	0 40	1	50	140	10	50	140	10	50	140
n e	31 523		0 1	0 1	NA	0 1	10	50	140	104	50	140	2	50	140
B et ane	31 523		0 20	0 20	NA	0 20		50	140	2	50	140	5	50	140
et ane	31 523		0 20	0 20	NA	0 20	10	50	140	10	50	140	10	50	140
u et ane	31 523		0 40	0 40	NA	0 40		50	140	3	50	140	100	50	140
A et ne	31 523		1 0	1 0	NA	1 0	10	50	140	103	50	140	101	50	140
1,1 D et ene	31 523		0 30	0 30	NA	0 30		50	140	1	0	130	1	50	140
D et ane	31 523		0 30	0 30	NA	0 30	101	50	140	112	0	130	114	50	140
t ans 1,2 et ene	31 523		0 20	0 20	NA	0 20		50	140	115	0	130	101	50	140
Met te t ut et e	31 523		0 20	0 20	NA	0 20	104	50	140	10	0	130		50	140
1,1 D et ane	31 523		0 30	0 30	NA	0 30		50	140	5	0	130	115	50	140
Met Et et ne	31 523		1 0	1 0	NA	1 0	105	50	140	100	50	140	101	50	140
s 1,2 D et ene	31 523		0 20	0 20	NA	0 20	1	50	140	11	0	130	0	50	140
	31 523		0 20	0 20	NA	0 20	3	50	140	3	0	130	4	50	140
1,2 D et ane	31 523		0 20	0 20	NA	0 20	0	50	140	2	0	130		50	140
1,1,1 et ane	31 523		0 30	0 30	NA	0 30		50	140	0	0	130	3	50	140
a n et a e	31 523		0 20	0 20	NA	0 20		50	140	3	0	130	5	50	140
Ben ene	31 523		0 20	0 20	NA	0 20	0	50	140		0	130	1	50	140
1,2 D ane	31 523		0 20	0 20	NA	0 20	5	50	140	2	0	130	5	50	140
et ene	31 523		0 20	0 20	NA	0 20		50	140	5	0	130	0	50	140
B et ane	31 523		0 20	0 20	NA	0 20	10	50	140	10	0	130	1	50	140
s 1,3 D ene	31 523		0 20	0 20	NA	0 20	101	50	140		0	130	115	50	140
Met ls ut et ne	31 523		1 0	1 0	NA	1 0	102	50	140	100	50	140		50	140
t ans 1,3 D ene	31 523		0 30	0 30	NA	0 30	10	50	140		0	130	4	50	140
1,1,2 et ane	31 523		0 20	0 20	NA	0 20		50	140	10	0	130	10	50	140
uene	31 523		0 45	0 35	NA	0 20	103	50	140		0	130		50	140
2 e an ne	31 523		1 0	1 0	NA	1 0		50	140		50	140	102	50	140
D et ane	31 523		0 10	0 10	NA	0 10	2	50	140	11	0	130		50	140
1,2 D et ane	31 523		0 10	0 10	NA	0 10		50	140	114	0	130	10	50	140
et a et ene	31 523		0 20	0 20	NA	0 20	100	50	140		0	130	1	50	140
1,1,1,2 et a et ane	31 523		0 10	0 10	NA	0 10	111	50	140	103	0	130		50	140
en ene	31 523		0 1	0 1	NA	0 1	3	50	140		0	130		50	140
Et en ene	31 523		0 10	0 10	NA	0 10	110	50	140	5	0	130		50	130
ene	31 523		0 41	0 2	NA	0 20	105	50	140	10	0	130	10	50	140
B	31 523		0 10	0 10	NA	0 10	115	50	140	105	0	130	100	50	140
t ene	31 523		0 10	0 10	NA	0 10	103	50	140	1	0	130		50	140
1,1,2,2 et a et ane	31 523		0 10	0 10	NA	0 10		50	140	11	0	130	11	50	140
ene	31 523		0 10	0 10	NA	0 10	11	50	140	3	0	130	5	50	140

5 35 ER A ENUE
MI I AU A, N ARI
ANADA 4 1 2
E 05 12 5100
A 05 12 5122
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IEN NAME: M B UE AN
R JE : 31 00
AM IN I E:

A A R RDER: 21 2 03
A EN I N : ate a nt e
AM ED B :

a e an s Ana s s nt nue

R Date: N 1 , 2021			DU I A E				RE EREN E MA ERIA			ME D B AN I E			MA RI I E		
ARAME ER	Bat	a e I	Du 1	Du 2	R D	Met B an	Measu e a ue	A e ta e ts e	U e	Re e	A e ta e ts e	U e	Re e	A e ta e ts e	U e
1,3 D en ene	31 523		0 10	0 10	NA	0 10	101	50	140	4	0	130	4	50	140
1,4 D en ene	31 523		0 10	0 10	NA	0 10	10	50	140	103	0	130		50	140
1,2 D en ene	31 523		0 10	0 10	NA	0 10	10	50	140	103	0	130	100	50	140
1,2,4 en ene	31 523		0 30	0 30	NA	0 30	104	50	140	105	0	130	4	50	140
1,3,5 et en ene	31 523		0 20	0 20	NA	0 20	105	50	140	0	0	130	1	50	140
n e ane	31 523		1 0	0 0	NA	0 20		50	140	0	0	130	0	50	140
Re 153 511 B E ate															
Ben ene	31 523		0 20	0 20	NA	0 20	0	50	140		0	130	1	50	140
uene	31 523		0 45	0 35	NA	0 20	103	50	140		0	130		50	140
Et en ene	31 523		0 10	0 10	NA	0 10	110	50	140	5	0	130		50	140
ene	31 523		0 41	0 2	NA	0 20	105	50	140	10	0	130	10	50	140
ene	31 523		0 10	0 10	NA	0 10	11	50	140	3	0	130	5	50	140

ents: en t e a e a e t e sa e an u ate esu ts s ess t an 5 t e RD , t e Re at e e ent D e en e R D e n ate as N t A a e NA

Certified By:

5 35 ER A ENUE
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ANADA 4 1 2
E 05 12 5100
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IEN NAME: M B UE AN
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R Date: N 1 , 2021			DU I A E				RE EREN E MA ERIA			ME D B AN I E			MA RI I E		
ARAME ER	Bat	a e I	Du 1	Du 2	R D	Met B an	Measu e a ue	A e ta e ts e	A e ta e ts U e	Re e	A e ta e ts e	A e ta e ts U e	Re e	A e ta e ts e	A e ta e ts U e
ea ate a a ete s															
B D 5	31 205	31 205	5		NA	2	100	5	125						
ta us en e s	31 1520		54 0	5100	4	10	100	0	120						
A a nt as a 3	31 1 41	31 1 41	51		1	5		0	120						
e	31 1 25	31 1 25	2	5	0 4	0 10	1	0	130	104	0	120	102	0	130
Nt ate as N	31 1 25	31 1 25	0 30	0 31	3 3	0 05	5	0	130	105	0	120	105	0	130
u ate	31 1 25	31 1 25	2 0	2 1	0 4	0 10	4	0	130	103	0	120	NA	0	130
A n a as N	31 3350		0 31	0 30	3 3	0 02	100	0	130		0	120	103	0	130
e a en De an	31 3 04		15	15	NA	5	2	0	120	5	0	110	3	0	130
ta e a Nt en	31 3 04		0 4	0 4	0 0	0 10		0	130	100	0	120		0	130
ta s us	31 3 04		0 04	0 04	NA	0 02	102	0	130	102	0	120		0	130
en s	320 5		0 003	0 003	NA	0 001		0	110	103	0	110	11	0	120
ta a u	31 004		311	312	0 3	0 10		0	130		0	120		0	130
ta Ma nes u	31 004		5 4	5 5	1	0 10	100	0	130		0	120		0	130
ta tass u	31 004		20 5	20 3	1 0	0 50		0	130		0	120		0	130
ta u	31 004		1 4	1 4	0 0	0 10		0	130		0	120	101	0	130
ta A u nu	31 534		0 0 1	0 0	2	0 010		0	130	105	0	120	101	0	130
ta Ba u	31 534		0 005	0 005	NA	0 002		0	130	101	0	120		0	130
ta Be u	31 534		0 001	0 001	NA	0 001	103	0	130	104	0	120	10	0	130
ta B s ut	31 534		0 002	0 002	NA	0 002		0	130	10	0	120	104	0	130
ta a u	31 534		0 001	0 001	NA	0 001	10	0	130	10	0	120	10	0	130
ta u	31 534		0 003	0 003	NA	0 003	100	0	130	102	0	120	101	0	130
ta a t	31 534		0 001	0 001	NA	0 001	101	0	130	10	0	120	102	0	130
ta e	31 534		0 003	0 003	NA	0 003		0	130	105	0	120	103	0	130
ta I n	31 534		0 35	0 34	2	0 010	103	0	130	10	0	120	103	0	130
ta ea	31 534		0 001	0 001	NA	0 001		0	130	102	0	120		0	130
ta Man anese	31 534		0 0	0 0	1 0	0 002	102	0	130	10	0	120	102	0	130
ta M enu	31 534		0 002	0 002	NA	0 002	104	0	130	10	0	120	104	0	130
ta N e	31 534		0 003	0 003	NA	0 003	100	0	130	104	0	120	102	0	130
ta e	31 534		0 002	0 002	NA	0 002		0	130	104	0	120	100	0	130
ta t nt u	31 534		0 023	0 023	NA	0 005		0	130	105	0	120		0	130
ta un sten	31 534		0 010	0 010	NA	0 010	0	0	130	3	0	120	1	0	130
ta ana u	31 534		0 002	0 002	NA	0 002	101	0	130	104	0	120	101	0	130
ta n	31 534		0 020	0 020	NA	0 020	102	0	130	105	0	120	101	0	130
un ate a a ete s															
A a nt as a 3	31 1 41	31 1 41	51		1	5		0	120						
e	31 1 25	31 1 25	2	5	0 4	0 10	1	0	130	104	0	120	102	0	130
Nt ate as N	31 1 25	31 1 25	0 30	0 31	3 3	0 05	5	0	130	105	0	120	105	0	130
Nt te as N	31 1 25	31 1 25	0 1	0 1	NA	0 05	5	0	130	101	0	120	10	0	130

5 35 ER A ENUE
MI I AU A, N ARI
ANADA 4 1 2
E 05 12 5100
A 05 12 5122
tt : a ata s

AGAT Laboratories

ua t Assu an e

IEN NAME: M B UE AN
R JE : 31 00
AM IN I E:

A A R RDER: 21 2 03
A EN I N : ate a nt e
AM ED B :

ate Ana s s nt nue

R Date: N 1 , 2021			DU I A E				RE EREN E MA ERIA			ME D B AN I E			MA RI I E		
ARAME ER	Bat	a e I	Du 1	Du 2	R D	Met B an	Measu e a ue	A e ta e ts e	U e	Re e	A e ta e ts e	U e	Re e	A e ta e ts e	U e
u ate	31 1 25	31 1 25	2 0	2 1	0 4	0 10	4	0	130	103	0	120	NA	0	130
A n a as N	31 3350		0 31	0 30	3 3	0 02	100	0	130		0	120	103	0	130
D ss e a u	31 1 22	31 1 22	23	24 1	1 3	0 05	5	0	130		0	120	4	0	130
D ss e Ma nes u	31 1 22	31 1 22	1 5	1	1	0 05		0	130	101	0	120		0	130
D ss e u	31 1 22	31 1 22	21	21	0	0 05		0	130	100	0	120	5	0	130
D ss e B n	31 1 22	31 1 22	0 11	0 122	3 3	0 010	100	0	130	101	0	120	111	0	130
D ss e I n	31 1 22	31 1 22	0 010	0 010	NA	0 010	104	0	130		0	120		0	130
D ss e Man anese	31 1 22	31 1 22	0 010	0 010	0 0	0 002	100	0	130		0	120		0	130
ta e a N t en	31 3 04		0 4	0 4	0 0	0 10		0	130	100	0	120		0	130
D ss e an a n	31 1 22	31 1 22	2 0	2 1	NA	0 5	105	0	110	105	0	110	100	0	120
en s	320 5		0 003	0 003	NA	0 001		0	110	103	0	110	11	0	120
Res ent a e a a ete s															
A a n t as a 3	31 1 41	31 1 41	51		1	5		0	120						
e	31 1 25	31 1 25	2	5	0 4	0 10	1	0	130	104	0	120	102	0	130
N t ate as N	31 1 25	31 1 25	0 30	0 31	3 3	0 05	5	0	130	105	0	120	105	0	130
N t te as N	31 1 25	31 1 25	0 1	0 1	NA	0 05	5	0	130	101	0	120	10	0	130
D ss e an a n	31 1 22	31 1 22	2 0	2 1	NA	0 5	105	0	110	105	0	110	100	0	120
en s	320 5		0 003	0 003	NA	0 001		0	110	103	0	110	11	0	120
ta a u	31 004		311	312	0 3	0 10		0	130		0	120		0	130
ta Ma nes u	31 004		5 4	5 5	1	0 10	100	0	130		0	120		0	130
ta u	31 004		1 4	1 4	0 0	0 10		0	130		0	120	101	0	130
u a e ate a ete s															
B D 5	31 205	31 205	5		NA	2	100	5	125						
ta D ss e s	31 3 04		442	4 2	4 4	10		0	120						
ta us en e s	31 1520		54 0	5100	4	10	100	0	120						
A a n t as a 3	31 1 41	31 1 41	51		1	5		0	120						
e	31 1 25	31 1 25	2	5	0 4	0 10	1	0	130	104	0	120	102	0	130
N t ate as N	31 1 25	31 1 25	0 30	0 31	3 3	0 05	5	0	130	105	0	120	105	0	130
N t te as N	31 1 25	31 1 25	0 1	0 1	NA	0 05	5	0	130	101	0	120	10	0	130
A n a as N	31 1 2	31 1 2	0 14	0 15		0 02	101	0	130	100	0	120		0	130
ta s us	31 3 04		0 04	0 04	NA	0 02	102	0	130	102	0	120		0	130
en s	31 2032	31 2032	0 00	0 00	11	0 001	104	0	110	105	0	110		0	120
u t	31 2032	31 2032	512	511	0 2	0 5	101	0	120						
ta a u	31 004		311	312	0 3	0 10		0	130		0	120		0	130
ta Ma nes u	31 004		5 4	5 5	1	0 10	100	0	130		0	120		0	130
ta u	31 004		1 4	1 4	0 0	0 10		0	130		0	120	101	0	130
ta I n	31 534		0 35	0 34	2	0 010	103	0	130	10	0	120	103	0	130
ta Man anese	31 534		0 0	0 0	1 0	0 002	102	0	130	10	0	120	102	0	130

5 35 ER A ENUE
MI I AU A, N ARI
ANADA 4 1 2
E 05 12 5100
A 05 12 5122
tt : a ata s

ua t Assu an e

IEN NAME: M B UE AN

R JE : 31 00

AM IN I E:

A A R RDER: 21 2 03

A EN I N : ate a nt e

AM ED B :

ate Ana s s nt nue

R Date: N 1 , 2021			DU I A E			Met B an	RE EREN E MA ERIA			ME D B AN I E			MA RI I E		
ARAME ER	Bat	a e I	Du 1	Du 2	R D		Measu e a ue	A e ta e ts		Re e	A e ta e ts		Re e	A e ta e ts	
								e	U e		e	U e		e	U e

ents: NA s n es N t A a e
I t e R D a ue s NA, t e esu ts t e u ates a e un e 5 t e RD an n t e a u ate
Mat s e: e e e nat e n ent at n Mat s e a e tan e ts n t a

Certified By: Iris Verástegui

AGAT Laboratories

5 35 ER A ENUE
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IEN NAME: M B UE AN

R JE : 31 00

AM IN I E:

A A R RDER: 21 2 03

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ARAME ER	A A	I ERA URE RE EREN E	ANA I A E NI UE
Ana s s			
Me u	ME 3 101	E A 4 4 1B 245 5	AA
A sen	ME 3 103	e E A 3050B an E A 020B an N M E	I M
a u	ME 3 103	e E A 3050B an E A 020B an N M E	I M
u	ME 3 103	e E A 3050B an E A 020B an N M E	I M
a t	ME 3 103	e E A 3050B an E A 020B an N M E	I M
e	ME 3 103	e E A 3050B an E A 020B an N M E	I M
ea	ME 3 103	e E A 3050B an E A 020B an N M E	I M
M enu	ME 3 103	e E A 3050B an E A 020B an N M E	I M
N e	ME 3 103	e E A 3050B an E A 020B an N M E	I M
e en u	ME 3 103	e E A 3050B an E A 020B an N M E	I M
n	ME 3 103	e E A 3050B an E A 020B an N M E	I M

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ARAME ER	A A	I ERA URE RE EREN E	ANA I A E NI UE
a e an s Ana s s			
Ben ene	1 5001	e E A 4 5030 2 0D	M
uene	1 5001	e E A 4 5030 2 0D	M
Et en ene	1 5001	e E A 4 5030 2 0D	M
ene	1 5001	e E A 4 5030 2 0D	M
ene	1 5001	e E A 4 5030 2 0D	M
enes ta	1 5001	e E A 4 5030 2 0D	M
uene	1 5001	e E A 5030B E A 2 0D	M
4 B u en ene	1 5001	e E A 5030B E A 2 0D	M
D u et ane	1 5001	e E A 5030B E A 2 0D	M
et ane	1 5001	e E A 5030B E A 2 0D	M
n e	1 5001	e E A 5030B E A 2 0D	M
B et ane	1 5001	e E A 5030B E A 2 0D	M
et ane	1 5001	e E A 5030B E A 2 0D	M
u et ane	1 5001	e E A 5030B E A 2 0D	M
A et ne	1 5001	e E A 5030B E A 2 0D	M
1,1 D et ene	1 5001	e E A 5030B E A 2 0D	M
D et ane	1 5001	e E A 5030B E A 2 0D	M
t ans 1,2 et ene	1 5001	e E A 5030B E A 2 0D	M
Met te t ut et e	1 5001	e E A 5030B E A 2 0D	M
1,1 D et ane	1 5001	e E A 5030B E A 2 0D	M
Met Et et ne	1 5001	e E A 5030B E A 2 0D	M
s 1,2 D et ene	1 5001	e E A 5030B E A 2 0D	M
	1 5001	e E A 5030B E A 2 0D	M
1,2 D et ane	1 5001	e E A 5030B E A 2 0D	M
1,1,1 et ane	1 5001	e E A 5030B E A 2 0D	M
a n et a e	1 5001	e E A 5030B E A 2 0D	M
Ben ene	1 5001	e E A 5030B E A 2 0D	M

5 35 ER A ENUE
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ARAME ER	A A	I ERA URE RE EREN E	ANA I A E NI UE
1,2 D ane	1 5001	e 2 0D E A 5030B E A	M
et ene	1 5001	e 2 0D E A 5030B E A	M
B et ane	1 5001	e 2 0D E A 5030B E A	M
s 1,3 D ene	1 5001	e 2 0D E A 5030B E A	M
Met ls ut et ne	1 5001	e 2 0D E A 5030B E A	M
t ans 1,3 D ene	1 5001	e 2 0D E A 5030B E A	M
1,1,2 et ane	1 5001	e 2 0D E A 5030B E A	M
uene	1 5001	e 2 0D E A 5030B E A	M
2 e an ne	1 5001	e 2 0D E A 5030B E A	M
D et ane	1 5001	e 2 0D E A 5030B E A	M
1,2 D et ane	1 5001	e 2 0D E A 5030B E A	M
et a et ene	1 5001	e 2 0D E A 5030B E A	M
1,1,1,2 et a et ane	1 5001	e 2 0D E A 5030B E A	M
en ene	1 5001	e 2 0D E A 5030B E A	M
Et en ene	1 5001	e 2 0D E A 5030B E A	M
ene	1 5001	e 2 0D E A 5030B E A	M
B	1 5001	e 2 0D E A 5030B E A	M
t ene	1 5001	e 2 0D E A 5030B E A	M
1,1,2,2 et a et ane	1 5001	e 2 0D E A 5030B E A	M
ene	1 5001	e 2 0D E A 5030B E A	M
1,3 D en ene	1 5001	e 2 0D E A 5030B E A	M
1,4 D en ene	1 5001	e 2 0D E A 5030B E A	M
1,2 D en ene	1 5001	e 2 0D E A 5030B E A	M
1,2,4 en ene	1 5001	e 2 0D E A 5030B E A	M
1,3,5 et en ene	1 5001	e 2 0D E A 5030B E A	M
1,3 D ene s ans	1 5001	e 2 0D E A 5030B E A	M
enes ta	1 5001	e 2 0D E A 5030B E A	M
n e ane	1 5001	e 2 0D E A 5030B E A	M

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IEN NAME: M B UE AN

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A A R RDER: 21 2 03

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ARAME ER	A A	I ERA URE RE EREN E	ANA I A E NI UE
4 B u en ene	1 5001	e E A 5030B E A 2 0D	M

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a ness as a 3 a u ate	ME 3 105	e E A 4 010 200 M 2340 B	A U A I N
A a n t as a 3	IN R 3 000	M e M 2320 B	I RA E
e	IN R 3 004	e M 4110 B	I N R MA RA
N t ate as N	IN R 3 004	e M 4110 B	I N R MA RA
N t te as N	IN R 3 004	M 4110 B	I N R MA RA
u ate	IN R 3 004	e M 4110 B	I N R MA RA
A n a as N	IN R 3 05	e M 4500 N 3	A A IA
D ss e a u	ME 3 105	e E A 010D	I E
D ss e Ma nes u	ME 3 105	e E A 010D	I E
D ss e u	ME 3 105	e E A 010D	I E
D ss e B n	ME 3 103	e E A 200 an E A 3005A	I M
D ss e I n	ME 3 103	e E A 200 an E A 3005A	I M
D ss e Man anese	ME 3 103	e E A 200 an E A 3005A	I M
ta e a N t en	IN R 3 04	e E A 351 2 an M 4500 N R D	A A IA
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en s	IN R 3 0 2	e M 5530 D	A A IA
a t at n D	R 001		I RA I N
a t at n Meta s	R 001		I RA I N
B D 5	IN R 3 00	M e M 5210 B	D ME ER
ta us en e s	IN R 3 02	e E A 1 4, N M E E313 , M 2540 ,D	BA AN E
e a en De an	IN R 3 042	e M 5220 A an M 5220 D	E R ME ER
ta s us	IN R 3 022	e M 4500 B an M 4500 E	E R ME ER
ta a u	ME 3 105	e E A 010D	I E
ta Ma nes u	ME 3 105	e E A 010D	I E
ta tass u	ME 3 105	e E A 010D	I E
ta u	ME 3 105	e E A 010D	I E
ta A u nu	ME 3 103	e E A 200 , 3005A, 3010A 020B	I M
ta Ba u	ME 3 103	e E A 200 , 3005A, 3010A 020B	I M
ta Be u	ME 3 103	e E A 200 , 3005A, 3010A 020B	I M
ta B s ut	ME 3 103	e E A 200 , 3005A, 3010A 020B	I M
ta a u	ME 3 103	e E A 200 , 3005A, 3010A 020B	I M
ta u	ME 3 103	e E A 200 , 3005A, 3010A 020B	I M
ta a t	ME 3 103	e E A 200 , 3005A, 3010A 020B	I M
ta e	ME 3 103	e E A 200 , 3005A, 3010A 020B	I M
ta I n	ME 3 103	e E A 200 , 3005A, 3010A 020B	I M

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ta Man anese	ME 3 103	e E A 200 , 3005A, 3010A 020B	I M
ta M enu	ME 3 103	e E A 200 , 3005A, 3010A 020B	I M
ta N e	ME 3 103	e E A 200 , 3005A, 3010A 020B	I M
ta e	ME 3 103	e E A 200 , 3005A, 3010A 020B	I M
ta t nt u	IN R 3 003	e E A 200 , 3005A, 3010A 020B	I M
ta un sten	ME 3 103	e E A 200 , 3005A, 3010A 020B	I M
ta ana u	ME 3 103	e E A 200 , 3005A, 3010A 020B	I M
ta n	ME 3 103	e E A 200 , 3005A, 3010A 020B	I M
ta D ss e s	IN R 3 02	e E A 1 4, N M E E313 , M 2540 ,D	BA AN E
u t	IN R 3 044	e M 2130 B	NE E ME ER

AGAT Laboratories

CHAIN OF CUSTODY RECORD

4lg

5835 Coopers Avenue
Mississauga, Ontario; L4Z 1Y2
Phone: 905-712-5100; Fax: 905-712-5122
Toll free: 800-856-6261
www.agatlabs.com
http://webearth.agatlabs.com

LABORATORY USE ONLY

Arrival Condition: ☐ Good ☐ Poor (complete "notes")

Arrival Temperature: See attached AGAT WO #: 21T828039.

Notes: ___ ike

Client Information

Company: GM BluePlan Engineering

Contact: Kate Charpontier

Address: 975 Wallace Ave N, Listowel ON N4W 1M6

Phone: 5192919339 Fax:

Project: 318007 PO:

AGAT Quotation #: 192120

Please note, if quotation number is not provided, client will be billed full price for analysis.

Invoice To Same as Above? Yes/No (circle)

Company: SAME AS ABOVE

Contact:

Address:

Phone: Fax:

Report Information - reports to be sent to:

1. Name: Kate Charpontier
   Email: kate.charpontier@gmblueplan.ca
2. Name: Matt Ash
   Email: matt.ash@gmblueplan.ca

Report Format

☐ Single Sample per page

☐ Multiple Samples per page

☐ Results by fax

Regulatory Requirements

☐ Regulation 153 Table ___ (Indicate one)
☐ Ind/Com
☐ Res/Park
☐ Agriculture
Soil Texture (check one) ☐ Coarse ☐ Med/Fine

☐ Sewer Use Region ___ (Indicate one)
☐ Sanitary
☐ Storm

☐ Regulation 558
☐ CCME
☐ Other (indicate) ___

☐ Prov. Water Quality Objectives (PWQO)
☐ Nutrient Management Act (NMA)

Is this a drinking water sample (potable water intended for human consumption)? ☐ Yes ☑ No (If "Yes" please use the Drinking Water Chain of Custody Record)

Turnaround Time (TAT) Required*

Regular TAT:
☑ 5 to 7 Working Days

Rush TAT: (please provide prior notification)
Rush Surcharges Apply
☐ 3 to 5 Working Days
☐ 2 Working Days
☐ 1 Working Day

OR

DATE REQUIRED (Rush surcharges may apply): ___

*TAT is exclusive of weekends and statutory holidays

Sample Identification	Date Sampled	Time Sampled	Sample Matrix	# of Containers	Comments Site/ Sample Information	Metals and Inorganics	Metal Scan (exclud Hg, B, Cr6)	CCME Fractions 1 to 4	VOCs	PAHs	PCBs	TCLP Metals/Inorganics	TCLP	Storm Sewer Use	Sanitary Sewer Use	GW Quote	Residential Quote	SW Quote	Soil Quote	Leachate Quote		LABORATORY USE ONLY LAB SAMPLE ID
MH3	11/5/21		Leachate		NO FILTER															X		
OW6-84	11/5/21		GW		NO FILTER											X						
OW2-84	11/5/21		GW		NO FILTER											X						
OW4-84	11/5/21		GW		NO FILTER											X						
OW5-84	11/5/21		GW		NO FILTER											X						
OW8B-10	11/5/21		GW		NO FILTER											X						
OW9B-10	11/5/21		GW		NO FILTER											X						
OW15-91	11/5/21		GW		NO FILTER											X						
OW21-91	11/5/21		GW		NO FILTER											X						
OW25-91	11/5/21		GW		NO FILTER											X						
OW32-96	11/5/21		GW		NO FILTER											X						
OW33-96	11/5/21		GW		NO FILTER											X						
OW34-96	11/5/21		GW		NO FILTER											X						
OW36	11/5/21		GW		NO FILTER											X						

Samples Relinquished By (print name & sign)	Date/Time	Samples Received By (print name & sign)	Date/Time
Kate Charpontier K Charpontier	11/8/2021	Simai 21/11/10	904

Pink Copy – Client
Yellow + Golden Copy - AGAT
White Copy - AGAT

PAGE 1 of 2

NO:

Document ID: DIV-78-1511.004 Date Issued: September 22, 2009

AGAT Laboratories

CHAIN OF CUSTODY RECORD

5835 Coopers Avenue
Mississauga, Ontario; L4Z 1Y2
Phone: 905-712-5100; Fax: 905-712-5122
Toll free: 800-856-6261
www.agatlabs.com
http://webearth.agatlabs.com

LABORATORY USE ONLY
Arrival Condition: ☐ Good ☐ Poor (complete "notes")
Arrival Temperature: ______ AGAT WO #: ______
Notes: ______

Client Information

Company: GM BluePlan Engineering
Contact: Kate Charpontier
Address: 975 Wallace Ave N, Listowel ON N4W 1M6
Phone: 5192919339 Fax:
Project: 318007 PO:
AGAT Quotation #: 192120

Please note, if quotation number is not provided, client will be billed full price for analysis.

Invoice To

Same as Above? Yes/No (circle)
Company: SAME AS ABOVE
Contact:
Address:
Phone: Fax:

Report Information - reports to be sent to:

1. Name: Kate Charpontier
Email: kate.charpontier@gmblueplan.ca
2. Name: Matt Ash
Email: matt.ash@gmblueplan.ca

Regulatory Requirements

☐ Regulation 153 Table ______ (Indicate one) ☐ Ind/Com ☐ Res/Park ☐ Agriculture
Soil Texture (check one) ☐ Coarse ☐ Med/Fine
☐ Sewer Use Region ______ (Indicate one) ☐ Sanitary ☐ Storm
☐ Regulation 558
☐ CCME
☐ Other (indicate) ______
☐ Prov. Water Quality Objectives (PWQO)
☐ Nutrient Management Act (NMA)

Is this a drinking water sample (potable water intended for human consumption)?
☐ Yes ☑ No (If "Yes" please use the Drinking Water Chain of Custody Record)

Report Format

☐ Single Sample per page
☐ Multiple Samples per page
☐ Results by fax

Turnaround Time (TAT) Required*

Regular TAT:
☑ 5 to 7 Working Days

Rush TAT: (please provide prior notification)
Rush Surcharges Apply
☐ 3 to 5 Working Days
☐ 2 Working Days
☐ 1 Working Day

OR

DATE REQUIRED (Rush surcharges may apply): ______

*TAT is exclusive of weekends and statutory holidays

Sample Identification	Date Sampled	Time Sampled	Sample Matrix	# of Containers	Comments Site/ Sample Information	Metals and Inorganics	Metal Scan (exclud Hg, B, Cr6)	CCME Fractions 1 to 4	VOCs	PAHs	PCBs	TCLP Metals/Inorganics	TCLP	Storm Sewer Use	Sanitary Sewer Use	GW Quote	Residential Quote	SW Quote	Soil Quote	Leachate Quote		LABORATORY USE ONLY LAB SAMPLE ID
OW7-91	11/5/21		GW		NO FILTER												X					
OW8A-91	11/5/21		GW		NO FILTER												X					
OW9A-91	11/5/21		GW		NO FILTER												X					
OW32A-02	11/5/21		GW		NO FILTER											X						
MHB	11/5/21		GW		NO FILTER											X						
SP1-10	11/5/21		SW		NO FILTER													X				
SP2-93	11/5/21		SW		NO FILTER													X				
SP3-93	11/5/21		SW		NO FILTER													X				
SP1B-94	11/5/21		SW		NO FILTER													X				
SP2B-94	11/5/21		SW		NO FILTER													X				
SP3A-94	11/5/21		SW		NO FILTER													X				
SP4A-94	11/5/21		SW		NO FILTER													X				
SP5A-94	11/5/21		SW		NO FILTER													X				
Compost Pile	11/5/21		S		NO FILTER														X			

Samples Relinquished By (print name & sign)	Date/Time	Samples Received By (print name & sign)	Date/Time		
Kate Charpontier K Charpontier	11/8/2021	Sima Z 21/11/10	904	Pink Copy – Client	PAGE 2 of 2
Samples Relinquished By (print name & sign)	Date/Time	Samples Received By (print name & sign)	Date/Time	Yellow + Golden Copy - AGAT White Copy - AGAT	NO:

AGAT Laboratories

Sample Temperature Log

Client: GM BluePlan Engineering COC# or Work Order #: ______

# of Coolers: 4 (ice # of Submissions: ______

Arrival Temperatures - Branch/Driver				Arrival Temperatures - Laboratory			
Cooler #1:	7.6	5.7	5.9	Cooler #1:			
Cooler #2:	6.3	6	5.2	Cooler #2:			
Cooler #3:	4.8	5.1	5.6	Cooler #3:			
Cooler #4:	7.3	7	6.7	Cooler #4:			
Cooler #5:				Cooler #5:			
Cooler #6:				Cooler #6:			
Cooler #7:				Cooler #7:			
Cooler #8				Cooler #8			
Cooler #9:				Cooler #9:			
Cooler #10:				Cooler #10:			

IR Gun ID: ______ IR Gun ID: ______

Taken By: Simon Z Taken By: ______

Date (yyyy/mm/dd): 21/11/10 Time: 9:04 AM / PM Date (yyyy/mm/dd): ______ Time: ___:___ AM / PM

Instructions for use of this form: 1) complete all fields of info including total # of coolers and # of submissions rec'd, 2) photocopy and place in each submission prior to giving a WO#, 3) Proceed as normal, write the WO# and scan (please make sure to scan along with the COC)

Document ID: SR-78-9511.003
Date Issued: 2017-2-23

Page:______ of ______

APPENDIX H:
MONITORING WELL BOREHOLE AND TEST PIT LOGS

Project Name: ST. MARYS LANDFILL SITE
Job No. 979-645
Client: TOWN OF ST. MARYS
Borehole Type: Hollow Stem Auger
Location: On Site

Borehole No. OW1-80
Date Completed May 27, 1980
Geologist/Engineer ESR
Elevation Top of Casing, 316.946m AMS

Depth (Elev.)	Stratigraphy	Description & Remarks	Sample Number	Sample Type	Sample Blows/Foot	Penetration Test Blows/Foot (20 40 60 80)
		Grey clayey-silt till				
3m			13	AS		
6.1m			14	AS		
7.6m			15	SS	100	

Piezometer or Standpipe Installation

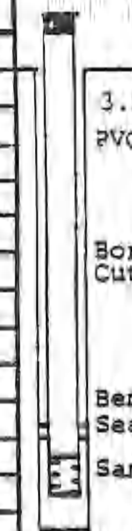


FIGURE 2.1

Conestoga - Rovers & Associates

Project Name: ST. MARYS LANDFILL SITE
Job No. 979-645
Client: TOWN OF ST. MARYS
Borehole Type: Hollow Stem Auger
Location: On Site

Borehole No. OW2-80
Date Completed May 27, 1980
Geologist/Engineer ESR
Elevation Top of Casing, 315.386m AMSL

Profile			Sample			Penetration Test Blows/Foot	Piezometer or Standpipe Installation
Depth (Elev.)	Stratigraphy	Description & Remarks	Number	Type	Blows/Foot	20 40 60 80	
		Grey clayey-silt till					
3m							
6.1m							
6.4m							

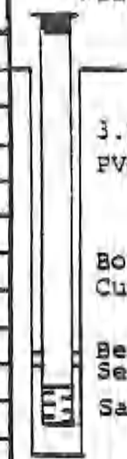


FIGURE 2.2

Conestoga - Rovers & Associates

Project Name: ST. MARYS LANDFILL SITE
Job No. 979-645
Client: TOWN OF ST. MARYS
Borehole Type: Hollow Stem Auger
Location:

Borehole No. OW3-80
Date Completed May 27, 1980
Geologist/Engineer ESR
Elevation Top of casing, 316.197m AMS

Profile			Sample			Penetration Test Blows/Foot	Piezometer or Standpipe Installation
Depth (Elev.)	Stratigraphy	Description & Remarks	Number	Type	Blows/Foot	20 40 60 80	
		Grey clayey silt till					
1.8m		Grey, clayey silt					
2.4m							
3m		Grey clayey silt till	~~11~~	~~AS~~			
4.6m			12	SS	40		

FIGURE 2.3
Conestoga - Rovers & Associates

Project Name: ST. MARYS LANDFILL SITE
Job No. 979-645
Client: TOWN OF ST. MARYS
Borehole Type: Hollow Stem Auger
Location:

Borehole No. OW4-80
Date Completed May 27, 1980
Geologist/Engineer ESR
Elevation Top of Casing, 318.126m AMSL

Depth (Elev.)	Stratigraphy	Profile: Description & Remarks	Sample Number	Type	Blows/Foot	Penetration Test Blows/Foot (20 40 60 80)	Piezometer or Standpipe Installation
							Threaded Plug
		Grey clayey silt till	1	SS	37		3.8cm Ø PVC pipe
1.2m							
1.8m		Grey clayey silt	2	SS	53		
			3	SS	56		Borehole Cuttings
3m		Grey clayey silt till	4	SS			
			5	SS	28		
			6	SS	31		
			7	SS	31		
6.1m			8	SS			
			9	SS	62		
							Bentonite Seal
9.1m			10	SS	100		
							Sand
10.2m		Rock					Well Screen 3.8cm x .6m slotted PVC pipe wrapped with fiberglass cloth

FIGURE 2.4

Conestoga - Rovers & Associates

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : ST. MARYS LANDFILL SITE

JOB Nº : 9-645

CLIENT : TOWN OF ST. MARYS

HOLE TYPE : HOLLOW STEM AUGER

LOCATION :

HOLE Nº : OW1-84

DATE COMPLETED: SEPTEMBER 25, 1984

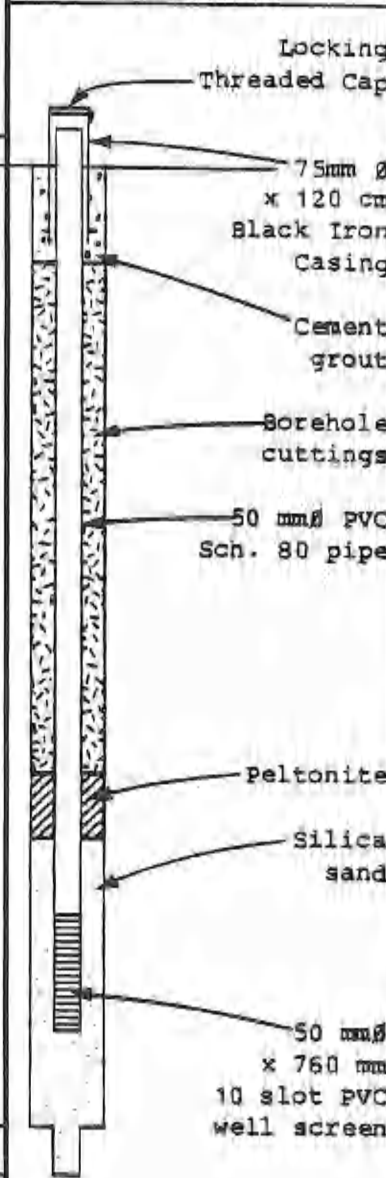
GEOLOGIST/ENGINEER : PSB

GROUND ELEVATION:* 321.87 m AMSL

TOP OF PIPE ELEVATION:* 322.484 M AMSL

PROFILE: DEPTH (ELEVATION)	PROFILE: STRATIGRAPHY DESCRIPTION & REMARKS	SAMPLE: NUMBER	SAMPLE: TYPE	SAMPLE: BLOWS/FT.
0.0 / 321.87	Sandy clayey silt till with gravel			
0.91 / 320.96				
5.87 / 316.00				
6.50 / 315.37				
8.38 / 313.49				
9.14 / 312.73	Sandy clayey silt till with wet gravel seams	1	SS	89
9.60 / 312.27				

MONITOR INSTALLATION



* REFER TO "WATER ELEVATIONS" TABLE FOR CURRENT REFERENCE ELEVATIONS

▼ WATER FOUND ▽ STATIC WATER LEVEL ◯ GRAIN SIZE ANALYSIS SS — SPLIT SPOON SAMPLE

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: ST. MARYS LANDFILL SITE
HOLE Nº: OW2-84
JOB Nº: 9-645
DATE COMPLETED: SEPTEMBER 25, 1984
CLIENT: TOWN OF ST. MARYS
GEOLOGIST/ENGINEER: PSB
HOLE TYPE: HOLLOW STEM AUGER
GROUND ELEVATION:* 322.25 m AMSL
LOCATION:
TOP OF PIPE ELEVATION:* 322.841 m AMSL

PROFILE

DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS
0.0 / 322.25 – 0.91 / 321.34	Brown clayey silt till with minor gravel
7.10 / 315.15	
8.08 / 314.17	
9.45 / 312.80	Brown sand and gravel
9.60 / 312.65	Brown clayey silt till

MONITOR INSTALLATION

SAMPLE

NUMBER	TYPE	BLOWS/FT
1	SS	21
2	SS	27
3	SS	72
4	SS	61

* REFER TO "WATER ELEVATIONS" TABLE FOR CURRENT REFERENCE ELEVATIONS

▼ WATER FOUND ▽ STATIC WATER LEVEL ◯ GRAIN SIZE ANALYSIS SS — SPLIT SPOON SAMPLE

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : ST. MARYS LANDFILL SITE

HOLE Nº : OW3-84, OW4-84 - page 1 of

JOB Nº : 9-645

DATE COMPLETED: SEPTEMBER 24, 1984

CLIENT : TOWN OF ST. MARYS

GEOLOGIST/ENGINEER : PSB

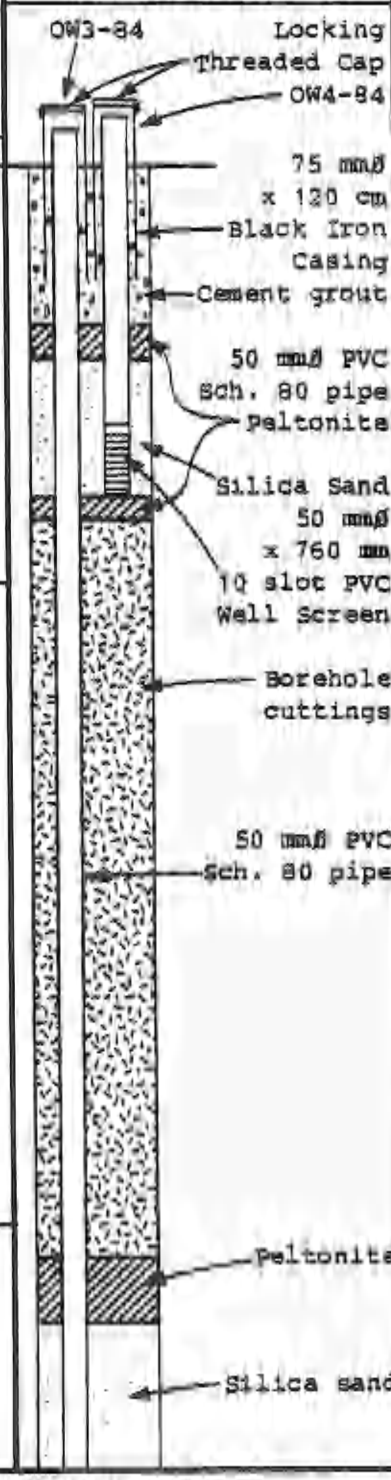
HOLE TYPE : HOLLOW STEM AUGER

GROUND ELEVATION:* 314.52 m AMSL

LOCATION :

TOP OF PIPE ELEVATION:* 315.035, 315.364 m AMSL

PROFILE		MONITOR INSTALLATION	SAMPLE		
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS/FT
0.0 314.52					
1.45 313.07			1	SS	48
1.83 312.69					
3.05 311.47	Interbedded moist to wet brown silty sand and clayey silt with minor gravel		2	SS	88
3.66 310.86					
	Dry brown clayey silt till with minor gravel		3	SS	54
			4	SS	64
			5	SS	180
			6	SS	183
10.06 304.46					
10.36 304.16	Moist brown clayey silt till with sand and minor gravel		7	SS	150
11.05 303.47					
12.19 302.33			8	SS	102



* REFER TO "WATER ELEVATIONS" TABLE FOR CURRENT REFERENCE ELEVATIONS

▼ WATER FOUND ▽ STATIC WATER LEVEL ◯ GRAIN SIZE ANALYSIS SS — SPLIT SPOON SAMPLE

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : ST. MARYS LANDFILL SITE

HOLE Nº: OW3-84, OW4-84 - page 2 of

JOB Nº : 9-645

DATE COMPLETED: SEPTEMBER 24, 1984

CLIENT : TOWN OF ST. MARYS

GEOLOGIST/ENGINEER : PSB

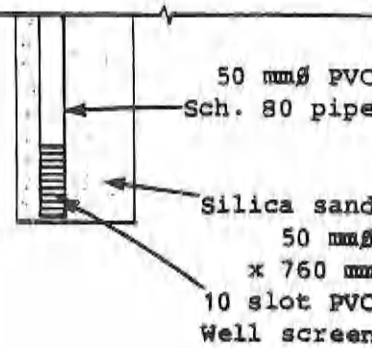
HOLE TYPE : HOLLOW STEM AUGER

GROUND ELEVATION:* 314.52 m AMSL

LOCATION :

TOP OF PIPE ELEVATION:* 315.035, 315.364 m AMSL

PROFILE		MONITOR INSTALLATION	SAMPLE		
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS/FT.
12.19 / 302.33	Moist brown clayey silt till with sand and minor gravel				
13.11 / 301.41	Moist brown medium sand with fine sand and fine gravel		9	SS	60
13.87 / 300.65	Bedrock				



* REFER TO "WATER ELEVATIONS" TABLE FOR CURRENT REFERENCE ELEVATIONS

▼ WATER FOUND ▽ STATIC WATER LEVEL ◯ GRAIN SIZE ANALYSIS SS — SPLIT SPOON SAMPLE

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: ST. MARYS LANDFILL SITE
HOLE Nº: OW5-84, OW6-84 - page 1 o

JOB Nº: 9-645
DATE COMPLETED: SEPTEMBER 25, 1984

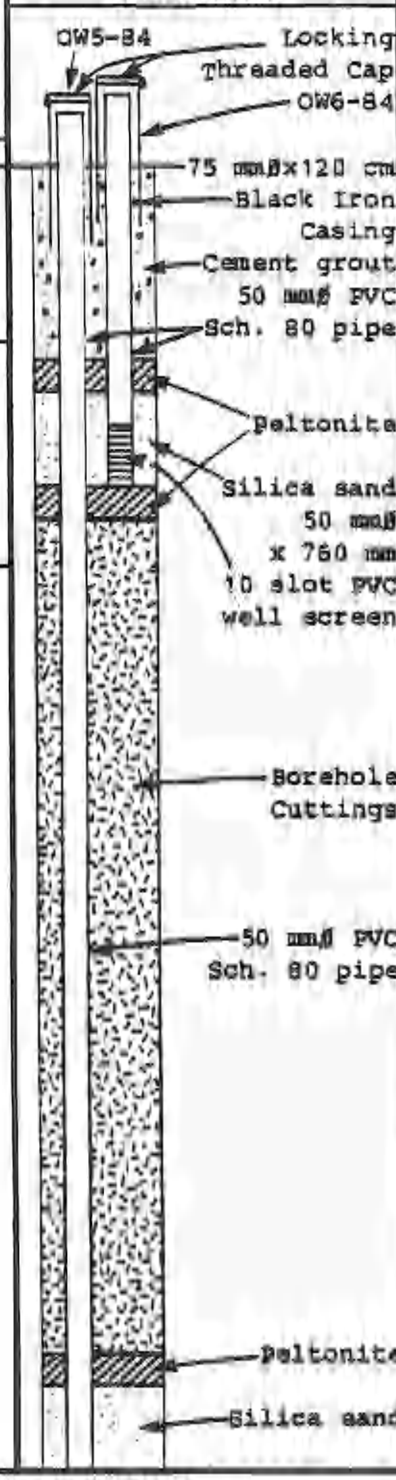
CLIENT: TOWN OF ST. MARYS
GEOLOGIST/ENGINEER: PSB

HOLE TYPE: HOLLOW STEM AUGER
GROUND ELEVATION:* 313.97 m AMSL

LOCATION:
TOP OF PIPE ELEVATION:* 314.423, 314.794

DEPTH (ELEVATION)	PROFILE – STRATIGRAPHY DESCRIPTION & REMARKS	SAMPLE NUMBER	TYPE	BLOWS/FT.
0.0 / 313.97				
1.68 / 312.29	Dry gray silt with clay and minor fine sand	1	SS	98
1.98 / 311.99				
3.20 / 310.77	Interbedded dry gray brown silt and clayey silt till with minor gravel	2	SS	38
3.81 / 310.16				
		3	SS	48
	Dry brown clayey silt till with cobbles	4	SS	55
		5	SS	90
		6	SS	144
		7	SS	260
11.28 / 302.69				
11.73 / 302.24				
12.19 / 301.78				

MONITOR INSTALLATION



* REFER TO "WATER ELEVATIONS" TABLE FOR CURRENT REFERENCE ELEVATIONS

▼ WATER FOUND ▽ STATIC WATER LEVEL ○ GRAIN SIZE ANALYSIS SS — SPLIT SPOON SAMPLE

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: ST. MARYS LANDFILL SITE

HOLE Nº: OW5-84, OW6-84 - page 2 of

JOB Nº: 9-645

DATE COMPLETED: SEPTEMBER 25, 1984

CLIENT: TOWN OF ST. MARYS

GEOLOGIST/ENGINEER: PSB

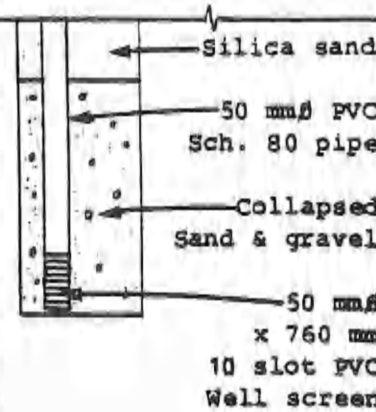
HOLE TYPE: HOLLOW STEM AUGER

GROUND ELEVATION:* 313.97 m AMSL

LOCATION:

TOP OF PIPE ELEVATION:* 314.423, 314.794 m AM

PROFILE		MONITOR INSTALLATION	SAMPLE		
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS/FT.
12.19- 301.78-	Dry brown clayey silt till with cobbles		8	SS	165
12.80- 301.17-	Wet brown coarse sand with gravel and medium sand		9	SS	108
14.33- 299.64-					
14.78- 299.19-	Bedrock				



* REFER TO "WATER ELEVATIONS" TABLE FOR CURRENT REFERENCE ELEVATIONS

▼ WATER FOUND ▽ STATIC WATER LEVEL ◯ GRAIN SIZE ANALYSIS SS — SPLIT SPOON SAMPLE

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

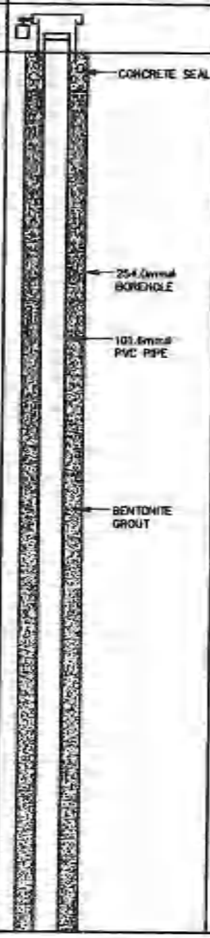
(L-01)

PROJECT NAME: ST. MARY'S LANDFILL
PROJECT NO.: 0645
CLIENT: TOWN OF ST. MARY'S
LOCATION: AS PER PLAN

HOLE DESIGNATION: OW7-91 (Page 1 of 5)
DATE COMPLETED: OCTOBER 4, 1991
DRILLING METHOD: 159mm ID HSA
CRA SUPERVISOR: J.C. MUGFORD

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION m AMSL	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE
	REFERENCE POINT (Top of Riser) GROUND SURFACE	315.270 314.50			
1.0, 2.0, 3.0	ML-SILT(GLACIOLACUSTINE), trace to little clay, sandy partings (up to 3mm thick) between varved laminations (3 to 20mm thick), non-cohesive, fractured (0.0 to 0.61m BGS), light brown and moist (0.0 and 0.91m BGS), grey and wet (0.91 to 1.52m BGS) — trace clay, non-cohesive, thin varves (2 to to 5mm thick) with frequent sandy partings, light grey and brown, wet, dilatant		1CS, 2CS		
4.0, 5.0, 6.0, 7.0	ML-SILT(TILL), some clay, little sand, frequent pebbles, very hard, cohesive, light to medium grey-brown, damp, one oblique fracture with silty face — frequent cobbles, occasional horizontal fractures, 4.6 to 5.2m BGS, very hard, and less damp below 5.2M — trace to little sand, no apparent fractures — augering refusal at 6.4m change to 6 1/8" air rotary	311.35	3CS, 4CS, 5CS		
8.0, 9.0, 10.0, 11.0, 12.0	ML-SILT(TILL), some fine sand, some gravel, trace to little clay, extremely dense, non-cohesive light brown, moist	306.77	6SS		>100
13.0	SP-SAND, fine to medium grained, poorly graded, brown, damp to moist	301.70			

MONITOR INSTALLATION



NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

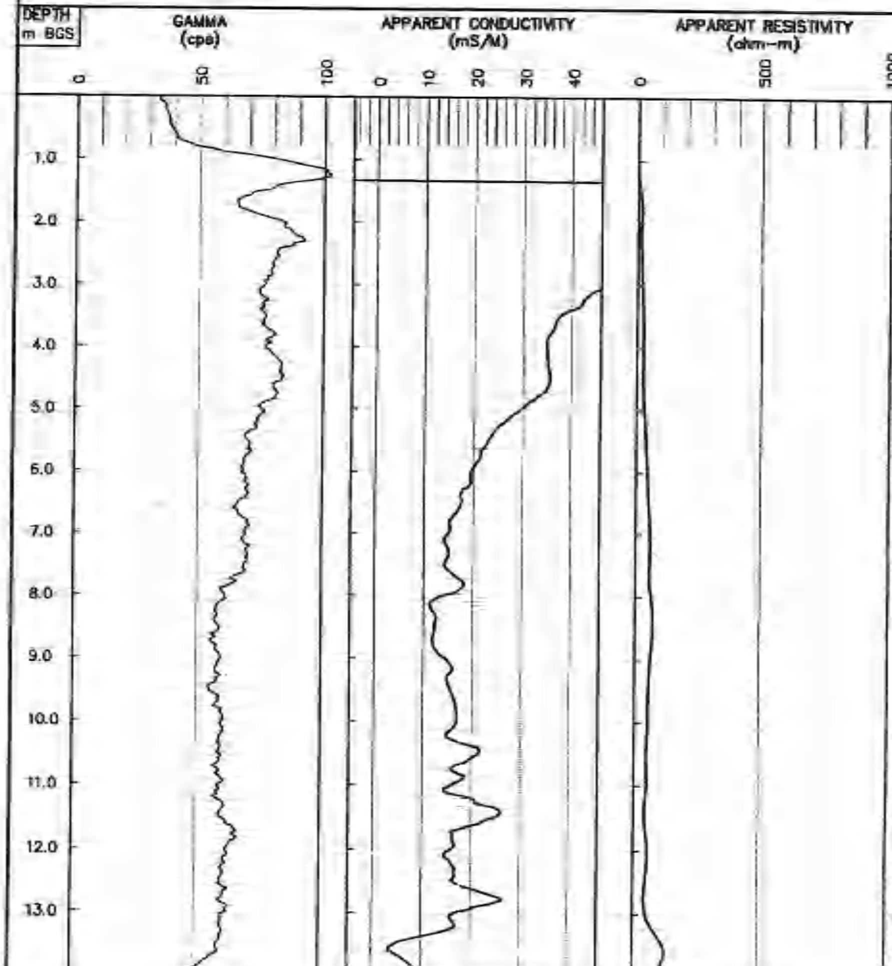
GRAIN SIZE ANALYSIS ◯ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG (GEOPHYSICS)

(L-01)

PROJECT NAME: ST. MARY'S LANDFILL
PROJECT NO.: 0645
CLIENT: TOWN OF ST. MARY'S
LOCATION: AS PER PLAN

HOLE DESIGNATION: OW7-91 (Page 1 of 5)
DATE LOGGED: OCTOBER 11, 1991
DRILLING METHOD: 159mm ID HSA
SURVEY BY HYD-ENG GEOPHYSICS INC.



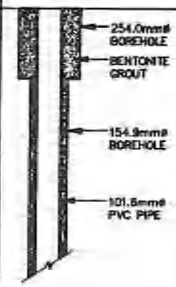
STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-01)

PROJECT NAME: ST. MARY'S LANDFILL
PROJECT NO.: 0645
CLIENT: TOWN OF ST. MARY'S
LOCATION: AS PER PLAN

HOLE DESIGNATION: OW7-91 (Page 2 of 5)
DATE COMPLETED: OCTOBER 4, 1991
DRILLING METHOD: 159mm ID HSA
CRA SUPERVISOR: J.C. MUGFORD

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION m AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE
	- fine to medium gravel					
14.0	END OF OVERBURDEN HOLE @ 14.12 m BGS	300.40				
15.0						
16.0						
17.0						
18.0						
19.0						
20.0						
21.0						
22.0						
23.0						
24.0						
25.0						
26.0						



NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

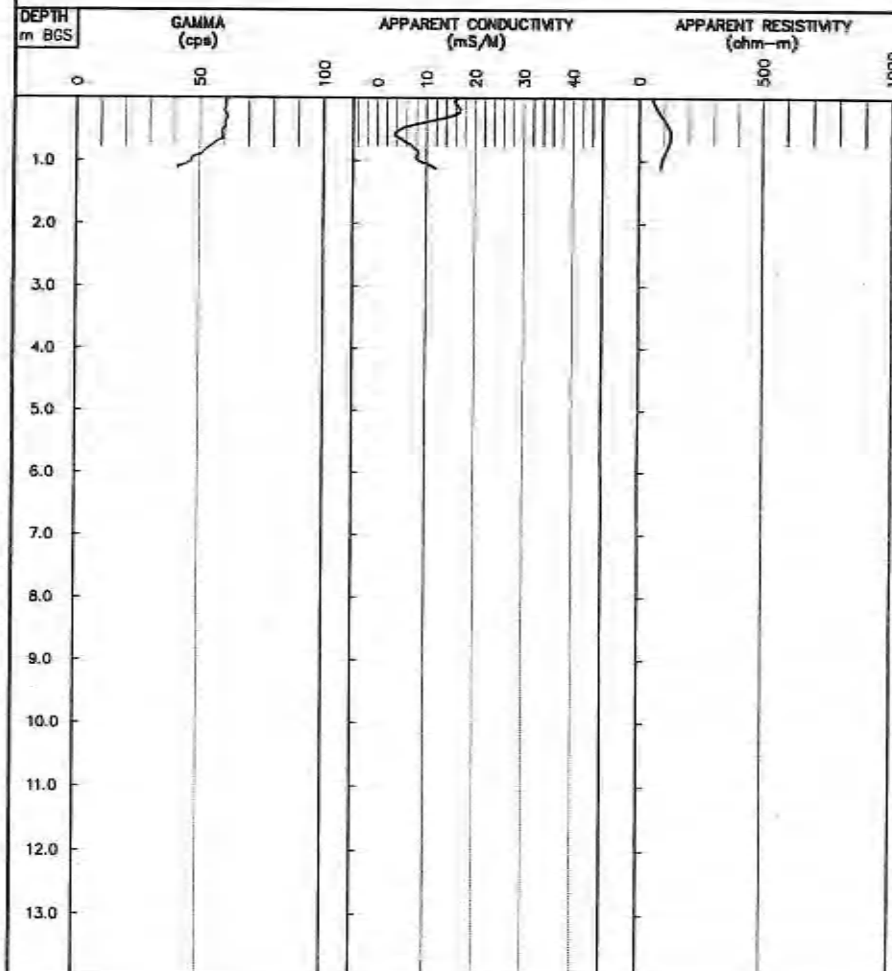
GRAIN SIZE ANALYSIS ◯ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG (GEOPHYSICS)

(L-01)

PROJECT NAME: ST. MARY'S LANDFILL
PROJECT NO.: 0645
CLIENT: TOWN OF ST. MARY'S
LOCATION: AS PER PLAN

HOLE DESIGNATION: OW7-91 (Page 2 of 5)
DATE LOGGED: OCTOBER 11, 1991
DRILLING METHOD: 159mm ID HSA
SURVEY BY HYD-ENG GEOPHYSICS INC.



STRATIGRAPHIC AND INSTRUMENTATION LOG (BEDROCK)

(L-02)

PROJECT NAME: ST. MARY'S LANDFILL
PROJECT NO.: 0645
CLIENT: TOWN OF ST. MARY'S
LOCATION: AS PER PLAN

HOLE DESIGNATION: OW7-91 (Page 3 of 5)
DATE COMPLETED: OCTOBER 4, 1991
DRILLING METHOD: 15cm AIR ROTARY / HQ 6.4cm CORE
CRA SUPERVISOR: J.C. MUGFORD

DEPTH m BGS	DESCRIPTION OF STRATA	ELEVATION m AMSL	MONITOR INSTALLATION	BEDROCK INTERVAL	RUN NUMBER	CORE RECOVERY %	RQD %	WATER RETURN %
	See Overburden log		254.0mmØ BOREHOLE; BENTONITE GROUT					
14.0	LIMESTONE(Dundee Formation): grey, hard, interbeds of brown argillaceous limestone (as described from drilling returns)	300.37						
15.0								
16.0								
17.0			154.9mmØ BOREHOLE					
18.0	– argillaceous limestone, soft, brown, interbeds of hard grey limestone							
19.0			101.6mmØ PVC PIPE					
20.0								
21.0								
22.0	LIMESTONE(Lucas Formation):	292.50						
23.0								
24.0								
25.0								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

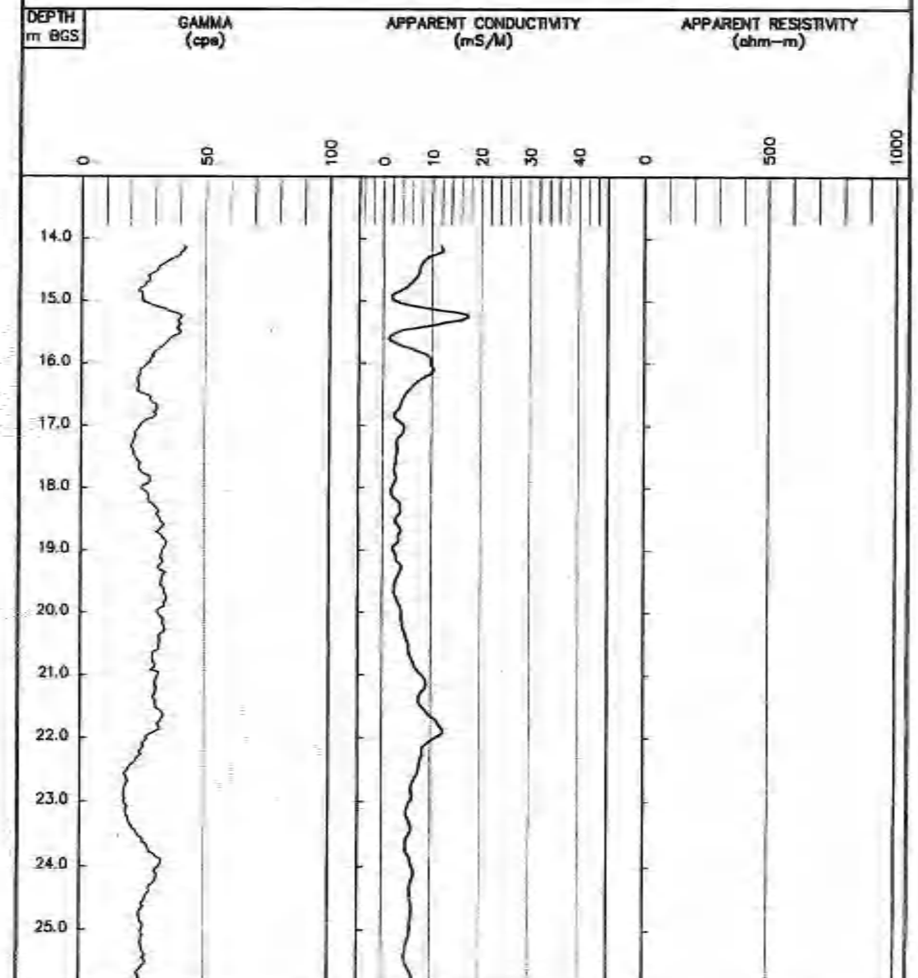
WATER FOUND   STATIC WATER LEVEL   NM – NOT MEASURED

STRATIGRAPHIC AND INSTRUMENTATION LOG (GEOPHYSICS)

(L-02)

PROJECT NAME: ST. MARY'S LANDFILL
PROJECT NO.: 0645
CLIENT: TOWN OF ST. MARY'S
LOCATION: AS PER PLAN

HOLE DESIGNATION: OW7-91 (Page 3 of 5)
DATE COMPLETED: OCTOBER 11, 1991
DRILLING METHOD: 15cm AIR ROTARY / HQ 6.4cm CORE
SURVEY BY HYD-ENG GEOPHYSICS INC.



STRATIGRAPHIC AND INSTRUMENTATION LOG (BEDROCK)

(L-02)

PROJECT NAME: ST. MARY'S LANDFILL
PROJECT NO.: 0645
CLIENT: TOWN OF ST. MARY'S
LOCATION: AS PER PLAN

HOLE DESIGNATION: OW7-91 (Page 4 of 5)
DATE COMPLETED: OCTOBER 4, 1991
DRILLING METHOD: 15cm AIR ROTARY / HQ 6.4cm CORE
CRA SUPERVISOR: J.C. MUGFORD

DEPTH (m BGS)	DESCRIPTION OF STRATA	ELEVATION (m AMSL)	MONITOR INSTALLATION	BIDENTDRERCVKAL	RNUUMMBER	CORE RECOVERY (%)	RQD (%)	WATER RETURN (%)
26.0	– damp		BENTONITE GROUT					
27.0			154.9mmØ BOREHOLE					
28.0		285.99	101.6mmØ PVC PIPE					
29.0								
30.0	– few thin shale interbeds							
31.0								
32.0								
33.0								
34.0								
35.0	– light to dark brown, sugary to porous/granular texture, layered							
	– grey (35.66 to 35.81m BGS)		SAND PACK					
36.0					1	100	30	
37.0	– grey with occasional brown layers, brown rock is medium to high porosity, grey rock is low porosity, well fractured, some small vugs and solution cavities, stylolites							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

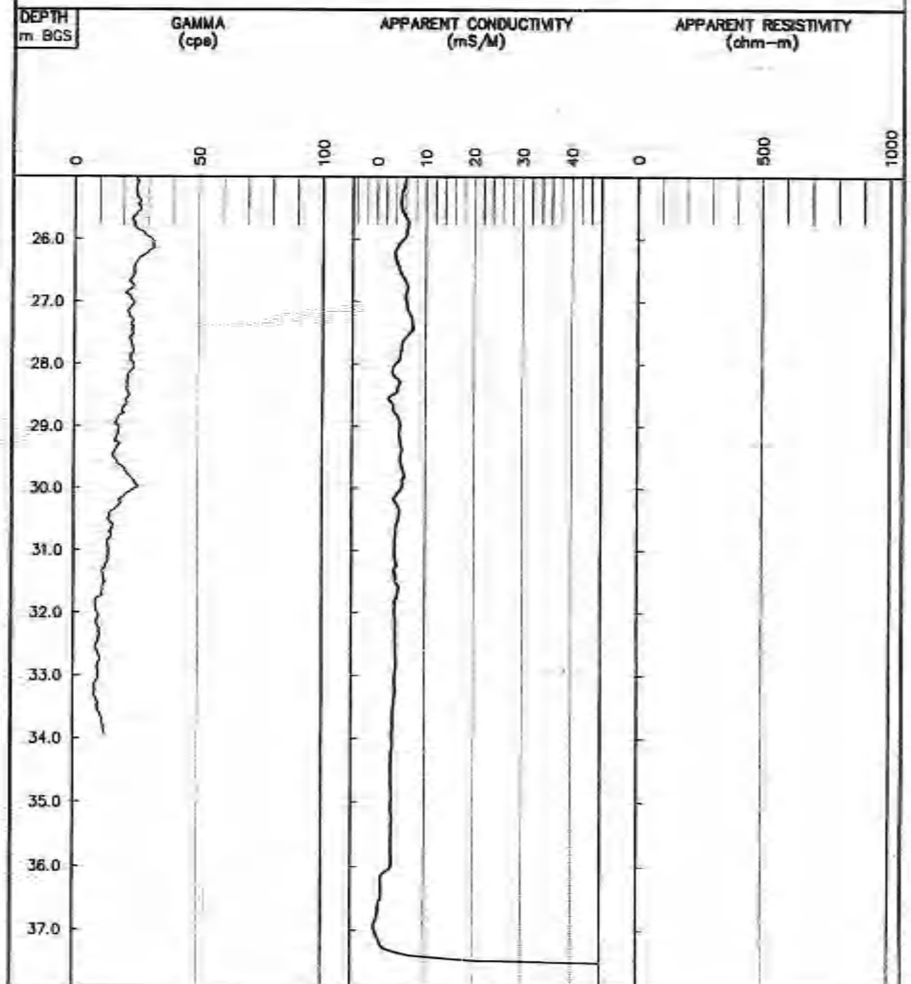
▽ WATER FOUND ▼ STATIC WATER LEVEL (OCT 26, 1991) NM – NOT MEASURED

STRATIGRAPHIC AND INSTRUMENTATION LOG (GEOPHYSICS)

(L-02)

PROJECT NAME: ST. MARY'S LANDFILL
PROJECT NO.: 0645
CLIENT: TOWN OF ST. MARY'S
LOCATION: AS PER PLAN

HOLE DESIGNATION: OW7-91 (Page 4 of 5)
DATE COMPLETED: OCTOBER 11, 1991
DRILLING METHOD: 15cm AIR ROTARY / HQ 6.4cm CORE
SURVEY BY HYD-ENG GEOPHYSICS INC.



STRATIGRAPHIC AND INSTRUMENTATION LOG (BEDROCK)

(L-02)

PROJECT NAME: ST. MARY'S LANDFILL
PROJECT NO.: 0645
CLIENT: TOWN OF ST. MARY'S
LOCATION: AS PER PLAN

HOLE DESIGNATION: OW7-91 (Page 5 of 5)
DATE COMPLETED: OCTOBER 4, 1991
DRILLING METHOD: 15cm AIR ROTARY / HQ 6.4cm CORE
CRA SUPERVISOR: J.C. MUGFORD

DEPTH m BGS	DESCRIPTION OF STRATA	ELEVATION m AMSL	MONITOR INSTALLATION	BIT DRECORD INTERVAL	RUN NUMBER	CORE RECOVERY %	RQD %	WATER RETURN %
38.0	- fractured (@ 37.95m BGS) - fractured (@ 38.40m BGS) - fractured (@ 38.71m BGS) - (as indicated by drilling rate)		101.6mmØ PVC PIPE; SAND PACK; WELL SCREEN; 154.9mmØ BOREHOLE					
39.0	END OF HOLE @ 39.22 m BGS.	275.28	SCREEN DETAILS: Screened Interval: 37.49 to 39.01m BGS Length -1.5m Diameter -101.6mm Slot # 10 Material -Stainless Steel Sand pack interval: 33.83 to 39.22m BGS Material -# 3 Silica Sand					
40.0								
41.0								
42.0								
43.0								
44.0								
45.0								
46.0								
47.0								
48.0								
49.0								

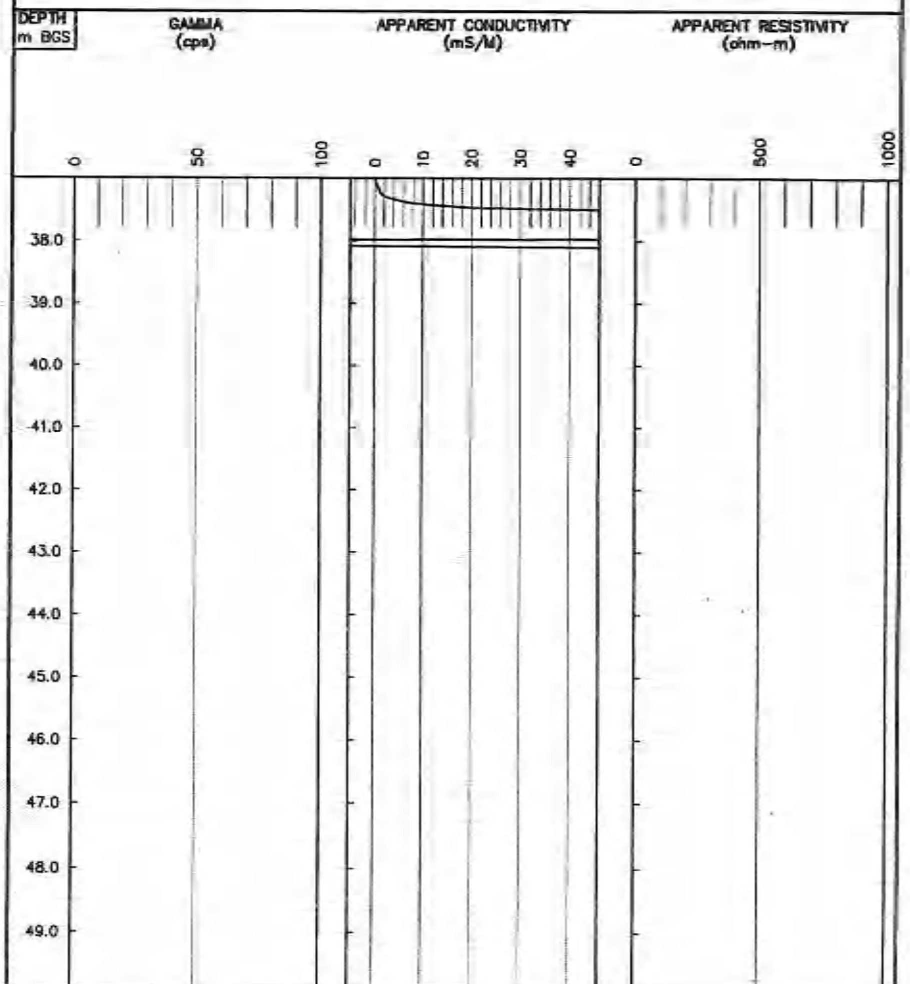
NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE.
▽ WATER FOUND ▼ STATIC WATER LEVEL NM - NOT MEASURED

STRATIGRAPHIC AND INSTRUMENTATION LOG (GEOPHYSICS)

(L-02)

PROJECT NAME: ST. MARY'S LANDFILL
PROJECT NO.: 0645
CLIENT: TOWN OF ST. MARY'S
LOCATION: AS PER PLAN

HOLE DESIGNATION: OW7-91 (Page 5 of 5)
DATE COMPLETED: OCTOBER 11, 1991
DRILLING METHOD: 15cm AIR ROTARY / HQ 6.4cm CORE
SURVEY BY HYD-ENG GEOPHYSICS INC.



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

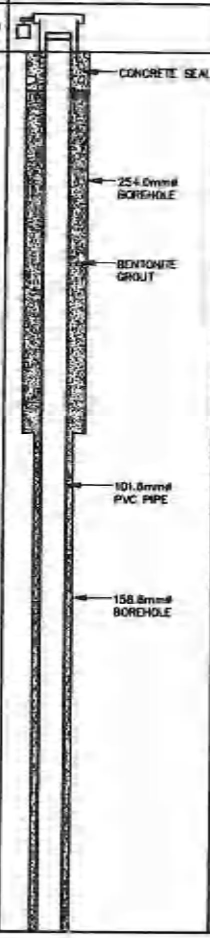
(L-03)

PROJECT NAME: ST. MARY'S LANDFILL
PROJECT NO.: 0645
CLIENT: TOWN OF ST. MARY'S
LOCATION: AS PER PLAN

HOLE DESIGNATION: OWBA-91 (Page 1 of 4)
DATE COMPLETED: OCTOBER 3, 1991
DRILLING METHOD: 6 1/4" ID HSA
CRA SUPERVISOR: J.C. MUGFORD

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION m AMSL	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE
	REFERENCE POINT (Top of Riser)	314.860			
	GROUND SURFACE	314.00			
	ML-SILT(FILL), some clay, some cobbles, hard, brown, damp	313.70			
1.0	ML-SILT(GLACIOLACUSTRINE), little to some fine grained sand, trace clay, tan, damp	313.09	1CS	X	
	ML/CL-SILT(TILL), some clay, some sand, some pebbles and cobbles, extremely hard, massive, no fracturing, brown, damp				
2.0	– becomes light brown to grey, lots of cobbles		2CS	X	
3.0					
4.0	– preferential parting in horizontal plane, fewer cobbles and gravel, damp to moist		3CS	X	
5.0	– some pebbles and small cobbles				
	– more fractured		4CS	X	
6.0	– fewer pebbles, some horizontal fracturing, minor vertical fracturing, less damp				
7.0			5CS	X	
8.0					
9.0	– little fine sand, little gravel, very hard, damp to moist				
10.0	– boulder				
11.0			6SS	X	>100
12.0					
13.0					

MONITOR INSTALLATION



NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

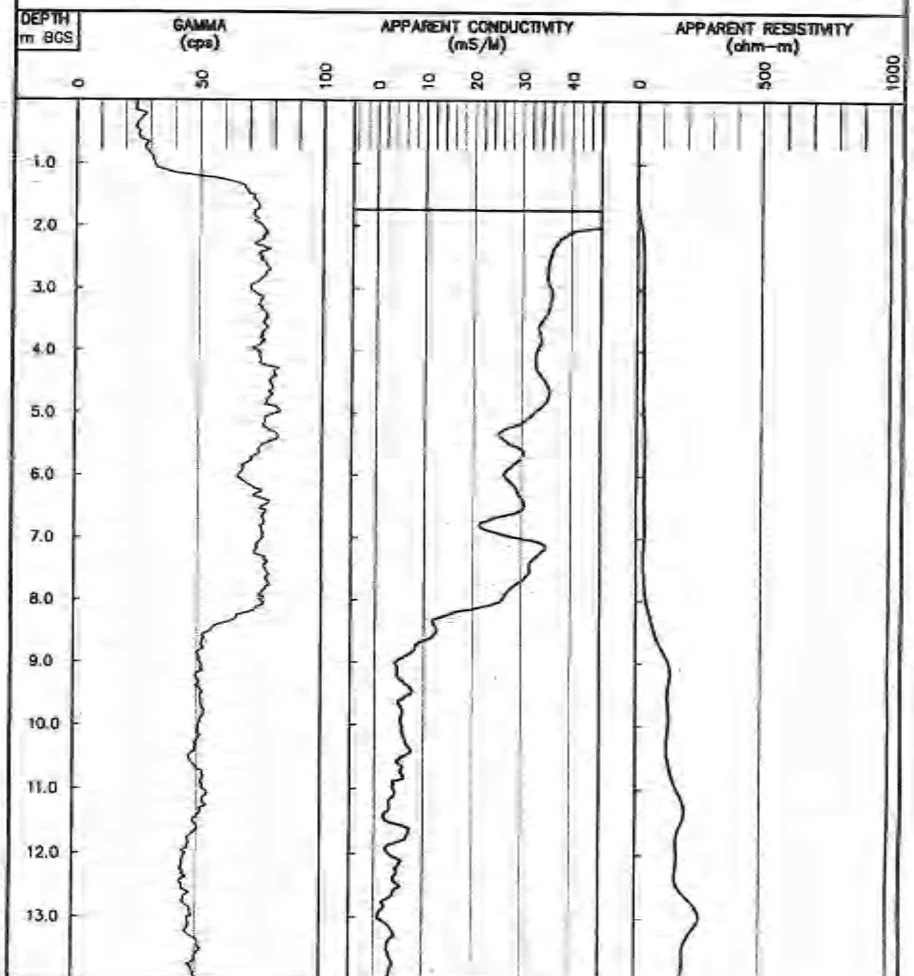
GRAIN SIZE ANALYSIS ◯ WATER FOUND ∇ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG (GEOPHYSICS)

(L-03)

PROJECT NAME: ST. MARY'S LANDFILL
PROJECT NO.: 0645
CLIENT: TOWN OF ST. MARY'S
LOCATION: AS PER PLAN

HOLE DESIGNATION: OWBA-91 (Page 1 of 4)
DATE COMPLETED: OCTOBER 11, 1991
DRILLING METHOD: 6 1/4" ID HSA
SURVEY BY HYD-ENG GEOPHYSICS INC.



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-03)

PROJECT NAME: ST. MARY'S LANDFILL
PROJECT NO.: 0645
CLIENT: TOWN OF ST. MARY'S
LOCATION: AS PER PLAN

HOLE DESIGNATION: OW8A-91 (Page 2 of 4)
DATE COMPLETED: OCTOBER 3, 1991
DRILLING METHOD: 6 1/4" ID HSA
CRA SUPERVISOR: J.C. MUGFORD

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION m AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE
14.0	– boulder, moist		158.8mmø BOREHOLE			
15.0	– firm, moist to wet, dilatant					
16.0				7SS	☒	75
17.0			101.6mmø PVC PIPE			
18.0	END OF OVERBURDEN HOLE @ 17.83 m BGS. CONTINUED ON BEDROCK LOG	296.17				
19.0						
20.0						
21.0						
22.0						
23.0						
24.0						
25.0						
26.0						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

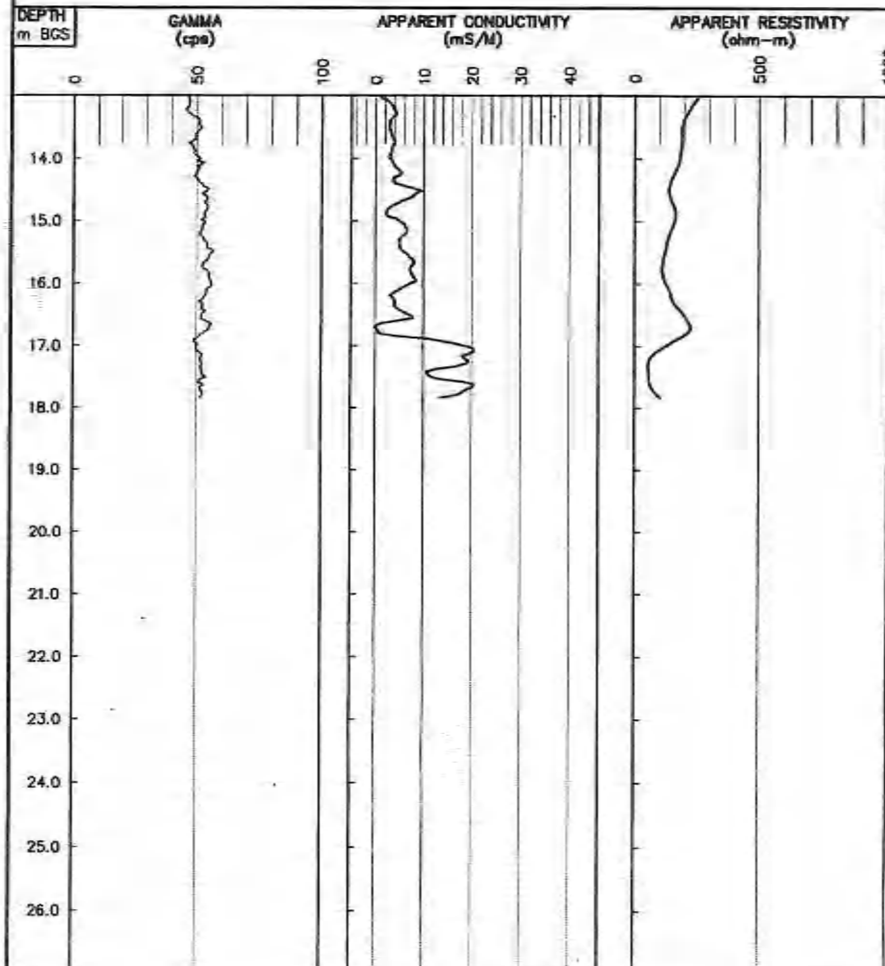
GRAIN SIZE ANALYSIS ◯ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG (GEOPHYSICS)

(L-03)

PROJECT NAME: ST. MARY'S LANDFILL
PROJECT NO.: 0645
CLIENT: TOWN OF ST. MARY'S
LOCATION: AS PER PLAN

HOLE DESIGNATION: OW8A-91 (Page 2 of 4)
DATE COMPLETED: OCTOBER 11, 1991
DRILLING METHOD: 6 1/4" ID HSA
SURVEY BY HYD-ENG GEOPHYSICS INC.



STRATIGRAPHIC AND INSTRUMENTATION LOG (BEDROCK)

(L-04)

PROJECT NAME: ST. MARY'S LANDFILL
PROJECT NO.: 0645
CLIENT: TOWN OF ST. MARY'S
LOCATION: AS PER PLAN

HOLE DESIGNATION: OWBA-91 (Page 3 of 4)
DATE COMPLETED: OCTOBER 3, 1991
DRILLING METHOD: 15cm AIR ROTARY / HQ CORE
CRA SUPERVISOR: J.C. MUGFORD

DEPTH m BGS	DESCRIPTION OF STRATA	ELEVATION m AMSL	MONITOR INSTALLATION	BIT DEPTH RECORD	RUN NUMBER	CORE RECOVERY %	RQD %	WATER RETURN %
	See Overburden log							
17.0								
18.0	LIMESTONE(Dundee Formation): light brown to brown and light to dark grey, fine grained, sugary texture argillaceous, soft, dry (as described from drilling returns)	296.17						
19.0								
20.0			158.8mmØ BOREHOLE					
21.0								
22.0			BENTONITE GROUT					
23.0								
24.0								
25.0			101.6mmØ PVC PIPE					
26.0	LIMESTONE(Lucas Formation):	288.00	BENTONITE PELLET SEAL					
27.0			SAND PACK					
28.0	– water bearing fracture (28.19 to 28.35m BGS)	286.22						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

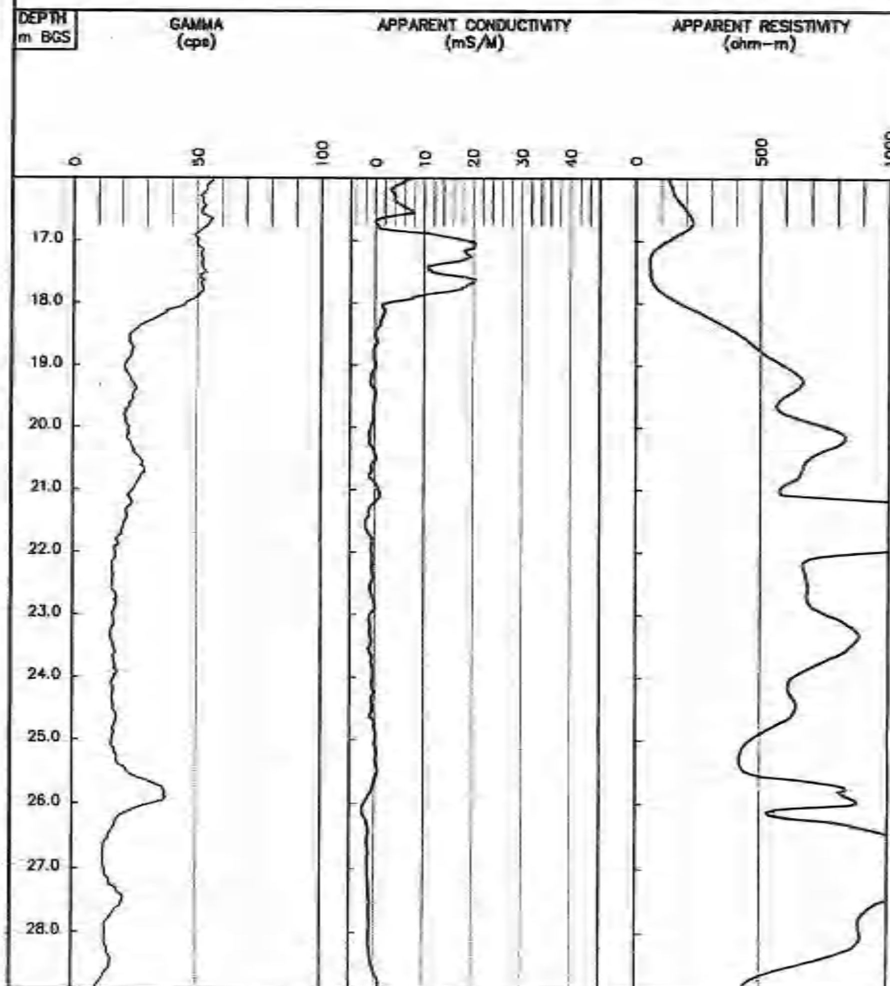
▽ WATER FOUND ▼ STATIC WATER LEVEL (OCT 26/91) NM – NOT MEASURED.

STRATIGRAPHIC AND INSTRUMENTATION LOG (GEOPHYSICS)

(L-04)

PROJECT NAME: ST. MARY'S LANDFILL
PROJECT NO.: 0645
CLIENT: TOWN OF ST. MARY'S
LOCATION: AS PER PLAN

HOLE DESIGNATION: OWBA-91 (Page 3 of 4)
DATE COMPLETED: OCTOBER 11, 1991
DRILLING METHOD: 15cm AIR ROTARY / HQ CORE
SURVEY BY HYD-ENG GEOPHYSICS INC.



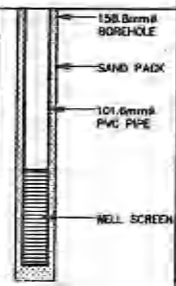
STRATIGRAPHIC AND INSTRUMENTATION LOG (BEDROCK)

(L-04)

PROJECT NAME: ST. MARY'S LANDFILL
PROJECT NO.: 0645
CLIENT: TOWN OF ST. MARY'S
LOCATION: AS PER PLAN

HOLE DESIGNATION: OWBA-91 (Page 4 of 4)
DATE COMPLETED: OCTOBER 3, 1991
DRILLING METHOD: 15cm AIR ROTARY / HQ CORE
CRA SUPERVISOR: J.C. MUGFORD

DEPTH (m BGS)	DESCRIPTION OF STRATA	ELEVATION (m AMSL)	MONITOR INSTALLATION	BIT OR CORE VAL	RUN NUMBER	CORE RECOVERY (%)	RQD (%)	WATER RETURN (%)
29.0 – 33.0	- light grey to brown, solution cavities and vugs (up to 2cm thick) with calcite infilling, stylolites - iron staining (28.35 to 28.65m BGS) - brown (28.65m to 29.11m BGS) - water bearing fracture (@ 28.80m BGS) - grey (29.11 to 29.72m BGS) - water bearing fracture (@ 29.11m BGS) - brown (29.72 to 32.00m BGS) - water bearing fracture (29.72m BGS) - porous (29.72 to 29.87m BGS) - water bearing fracture (@ 30.02m BGS) - water bearing fracture (@ 30.33m BGS) - rough and open water bearing fracture (@ 30.94m BGS) - porous (31.89 to 31.55m BGS) - water bearing fracture (@ 31.69m BGS) - water bearing fracture (@ 32.00m BGS) - grey (32.00 to 32.36m BGS) END OF HOLE @ 32.36 m BGS.	281.64	158.8mmØ BOREHOLE SAND PACK 101.6mmØ PVC PIPE WELL SCREEN		1	100	40	



SCREEN DETAILS:
Screened Interval:
30.58 to 32.11m BGS
Length -1.5m
Diameter -101.6mm
Slot # 10
Material -Stainless Steel
Sand pack interval:
26.36 to 32.10m BGS
Material -# 3 Silica Sand

Depth scale (m BGS): 29.0, 30.0, 31.0, 32.0, 33.0, 34.0, 35.0, 36.0, 37.0, 38.0, 39.0, 40.0

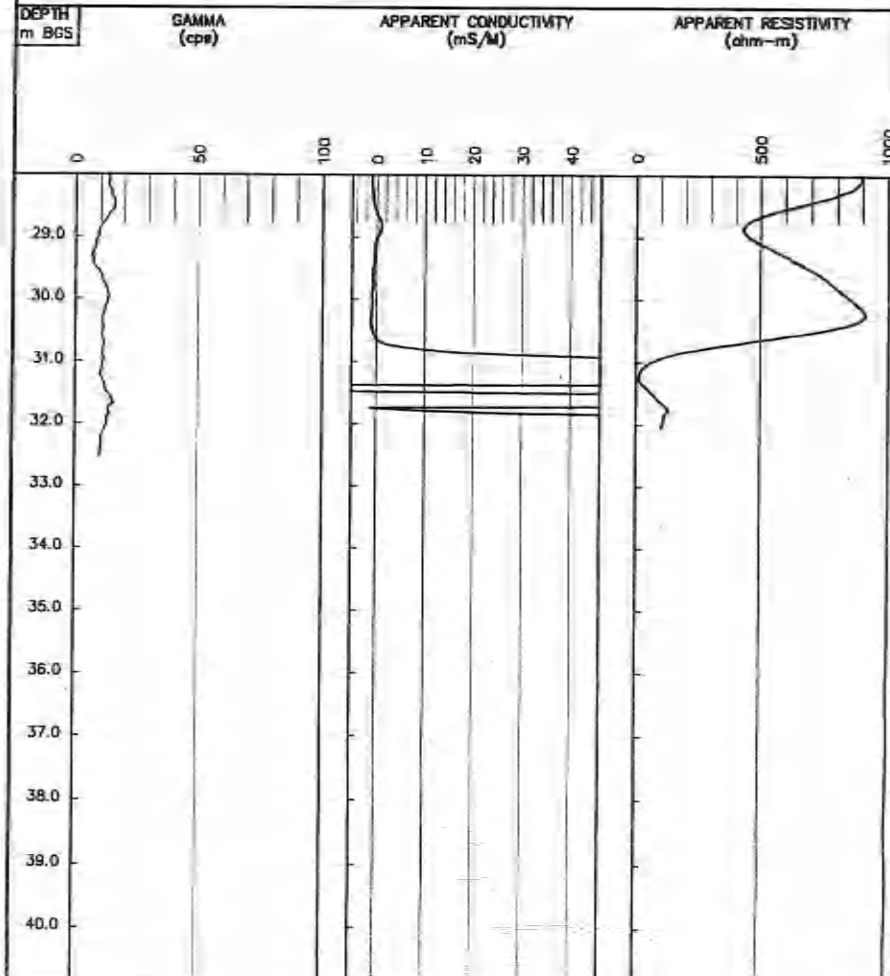
NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
▽ WATER FOUND ▼ STATIC WATER LEVEL NM – NOT MEASURED

STRATIGRAPHIC AND INSTRUMENTATION LOG (GEOPHYSICS)

(L-04)

PROJECT NAME: ST. MARY'S LANDFILL
PROJECT NO.: 0645
CLIENT: TOWN OF ST. MARY'S
LOCATION: AS PER PLAN

HOLE DESIGNATION: OWBA-91 (Page 4 of 4)
DATE COMPLETED: OCTOBER 11, 1991
DRILLING METHOD: 15cm AIR ROTARY / HQ CORE
SURVEY BY HYD-ENG GEOPHYSICS INC.



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-05)

PROJECT NAME: ST. MARY'S LANDFILL

PROJECT NO.: 0645

CLIENT: TOWN OF ST. MARY'S

LOCATION: AS PER PLAN

HOLE DESIGNATION: OW8B-91

DATE COMPLETED: OCTOBER 4, 1991

DRILLING METHOD: 15cm AIR ROTARY

CRA SUPERVISOR: J.C. MUGFORD

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION m AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE
	REFERENCE POINT (Top of Riser)	314.690				
	GROUND SURFACE	313.72				
	For stratigraphy from 0.0 to 5.49m BGS see log OW8A-91		CONCRETE SEAL			
1.0						
2.0			158.8mmø BOREHOLE; CEMENT/BENTONITE GROUT			
3.0			50.8mmø PVC PIPE			
4.0			BENTONITE PELLET SEAL			
5.0			SAND PACK			
	ML/CL-SILT(TILL), some clay, some sand, some stone, very hard, medium grey to brown, very damp	308.23	WELL SCREEN	1SS	☒	>100
6.0		307.67				
	END OF HOLE @ 6.05 m BGS.		SCREEN DETAILS:			
	NOTES:		Screened Interval: 5.13 to 6.05m BGS			
7.0	1. At completion borehole remained dry.		Length -0.9m			
			Diameter -50.8mm			
8.0			Slot # 10			
			Material -Stainless Steel			
			Sand pack interval: 3.96 to 6.05m BGS			
9.0			Material -# 3 Silica Sand			
10.0						
11.0						
12.0						
13.0						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

GRAIN SIZE ANALYSIS ◯ WATER FOUND ▽ STATIC WATER LEVEL ▼

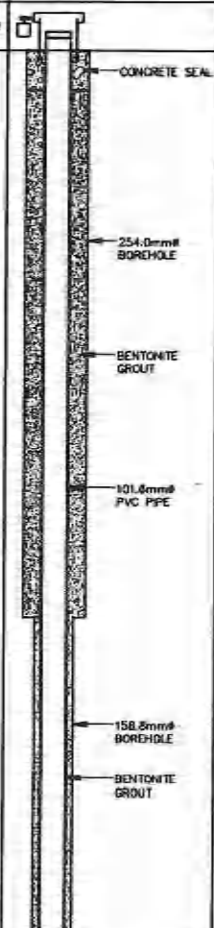
STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-06)

PROJECT NAME: ST. MARY'S LANDFILL
PROJECT NO.: 0645
CLIENT: TOWN OF ST. MARY'S
LOCATION: AS PER PLAN

HOLE DESIGNATION: OW9A-91 (Page 1 of 4)
DATE COMPLETED: OCTOBER 1, 1991
DRILLING METHOD: 159mm ID HSA
CRA SUPERVISOR: J.C. MUGFORD

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION m AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE
	REFERENCE POINT (Top of Riser)	318.490				
	GROUND SURFACE	317.75				
	For stratigraphy from 0.0 to 6.55m BGS see log OW9B-91					
1.0						
2.0						
3.0						
4.0						
5.0						
6.0						
	ML-SILT(TILL), little to some fine sand and gravel, little to some clay, very compacted, damp	311.20				
7.0						
8.0						
9.0						
10.0						
11.0						
	– boulder					
12.0	– sand content increasing					
13.0						



NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

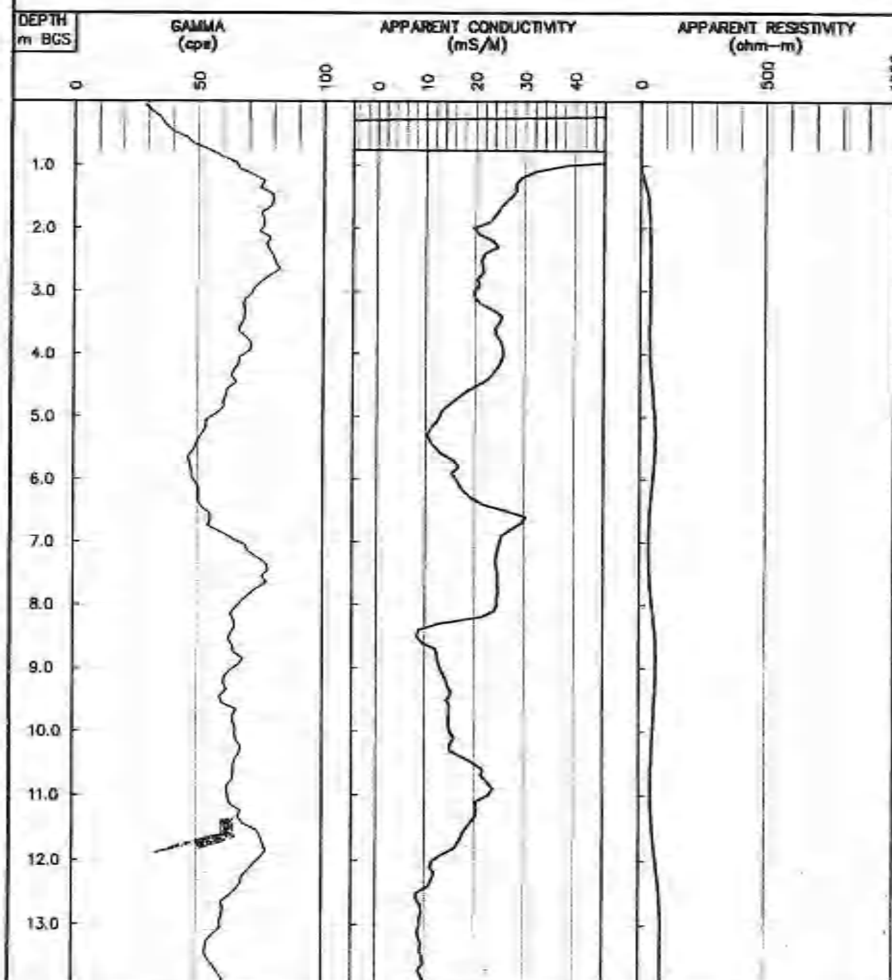
GRAIN SIZE ANALYSIS ◯ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG (GEOPHYSICS)

(L-06)

PROJECT NAME: ST. MARY'S LANDFILL
PROJECT NO.: 0645
CLIENT: TOWN OF ST. MARY'S
LOCATION: AS PER PLAN

HOLE DESIGNATION: OW9A-91 (Page 1 of 4)
DATE COMPLETED: OCTOBER 11, 1991
DRILLING METHOD: 159mm ID HSA
SURVEY BY HYD-ENG GEOPHYSICS INC.



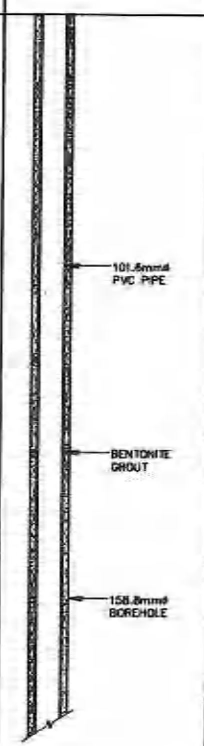
STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-06)

PROJECT NAME: ST. MARY'S LANDFILL
PROJECT NO.: 0645
CLIENT: TOWN OF ST. MARY'S
LOCATION: AS PER PLAN

HOLE DESIGNATION: OW9A-91 (Page 2 of 4)
DATE COMPLETED: OCTOBER 1, 1991
DRILLING METHOD: 159mm ID HSA
CRA SUPERVISOR: J.C. MUGFORD

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION m AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE
14.0						
15.0						
16.0	– few pebbles, very dense					
17.0			101.6mmØ PVC PIPE			
18.0						
19.0						
20.0	– becoming clayey silt		BENTONITE GROUT			
21.0						
	BEDROCK END OF OVERBURDEN HOLE @ 21.34 m BGS.	296.41				
22.0			158.8mmØ BOREHOLE			
23.0						
24.0						
25.0						
26.0						



NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

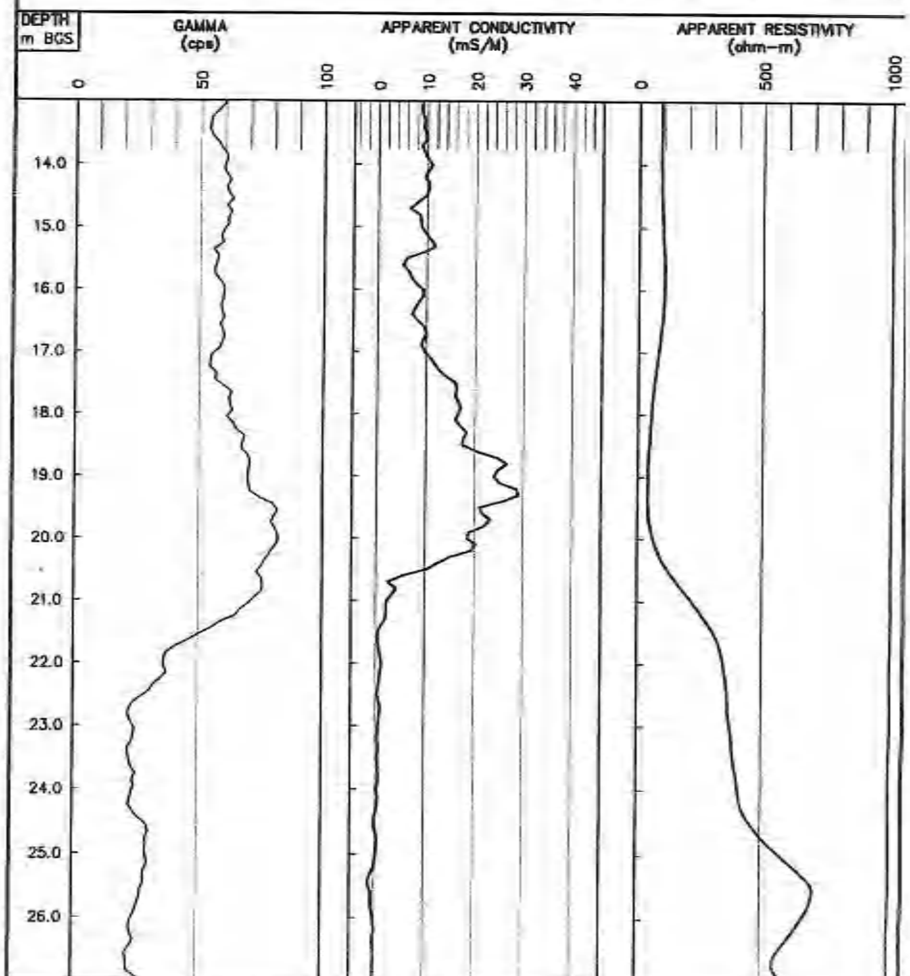
GRAIN SIZE ANALYSIS ◯ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(GEOPHYSICS)

(L-05)

PROJECT NAME: ST. MARY'S LANDFILL
PROJECT NO.: 0645
CLIENT: TOWN OF ST. MARY'S
LOCATION: AS PER PLAN

HOLE DESIGNATION: OW9A-91 (Page 2 of 4)
DATE COMPLETED: OCTOBER 11, 1991
DRILLING METHOD: 159mm ID HSA
SURVEY BY HYD-ENG GEOPHYSICS INC.



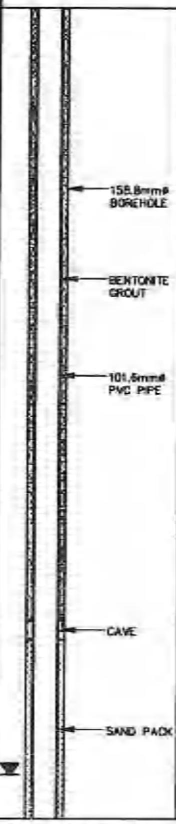
STRATIGRAPHIC AND INSTRUMENTATION LOG (BEDROCK)

(L-07)

PROJECT NAME: ST. MARY'S LANDFILL
PROJECT NO.: 0645
CLIENT: TOWN OF ST. MARY'S
LOCATION: AS PER PLAN

HOLE DESIGNATION: OW9A-91 (Page 3 of 4)
DATE COMPLETED: OCTOBER 4, 1991
DRILLING METHOD: 15cm AIR ROTARY / HQ CORE
CRA SUPERVISOR: J.C. MUGFORD

DEPTH m BGS	DESCRIPTION OF STRATA	ELEVATION m AMSL	MONITOR INSTALLATION	BIT RECOVERY (BIENDTREORCVKAL)	RUN NUMBER	CORE RECOVERY %	RQD %	WATER RETURN %
	Overburden							
21.0								
	LIMESTONE(Dundee Formation): cream/beige, rock flour	296.41						
22.0								
23.0			158.8mmø BOREHOLE					
24.0	– light brown, softer		BENTONITE GROUT					
25.0								
26.0			101.6mmø PVC PIPE					
27.0	LIMESTONE(Lucas Formation):	290.75						
28.0								
29.0								
30.0	– light brown argillaceous limestone, soft, damp		CAVE					
31.0			SAND PACK					
32.0		285.54 ▼						



NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

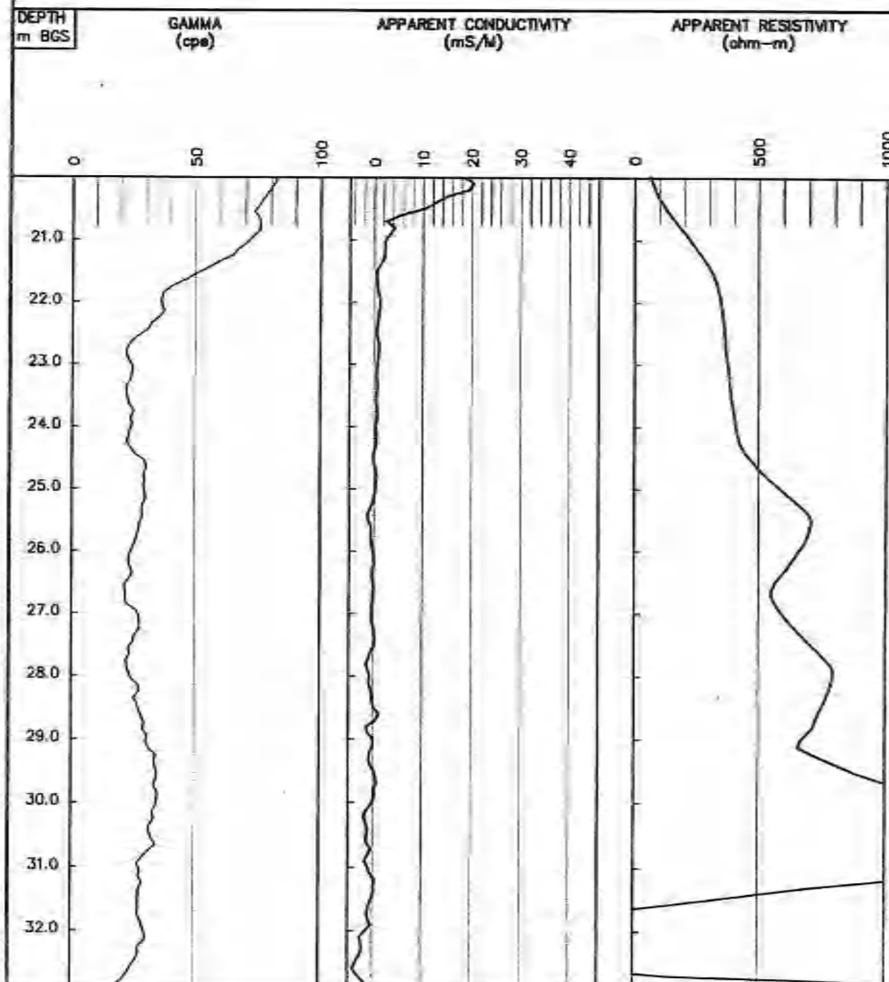
▽ WATER FOUND ▼ STATIC WATER LEVEL (OCT 26/91) NM – NOT MEASURED

STRATIGRAPHIC AND INSTRUMENTATION LOG (GEOPHYSICS)

(L-07)

PROJECT NAME: ST. MARY'S LANDFILL
PROJECT NO.: 0645
CLIENT: TOWN OF ST. MARY'S
LOCATION: AS PER PLAN

HOLE DESIGNATION: OW9A-91 (Page 3 of 4)
DATE COMPLETED: OCTOBER 11, 1991
DRILLING METHOD: 15cm AIR ROTARY / HQ CORE
SURVEY BY HYD-ENG GEOPHYSICS INC.



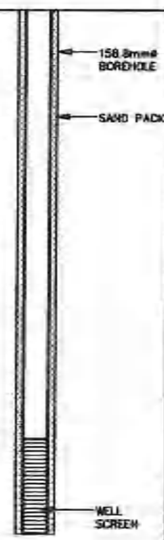
STRATIGRAPHIC AND INSTRUMENTATION LOG (BEDROCK)

(L-07)

PROJECT NAME:	ST. MARY'S LANDFILL	HOLE DESIGNATION:	OW9A-91 (Page 4 of 4)
PROJECT NO.:	0645	DATE COMPLETED:	OCTOBER 4, 1991
CLIENT:	TOWN OF ST. MARY'S	DRILLING METHOD:	15cm AIR ROTARY / HQ CORE
LOCATION:	AS PER PLAN	CRA SUPERVISOR:	J.C. MUGFORD

DEPTH (m BGS)	DESCRIPTION OF STRATA	ELEVATION (m AMSL)	MONITOR INSTALLATION	BEDROCK INTERVAL	RUN NUMBER	CORE RECOVERY (%)	RQD (%)	WATER RETURN (%)
33.0 – 37.0	– light brown to buff argillaceous limestone, medium to high porosity – lighter colored with slight color laminations – water bearing fracture (@ 36.58m BGS)							
38.0 – 40.0	– darker colored with high concentrations of stylolites – water bearing fracture (@ 38.25m BGS) – water bearing fracture (@ 38.40m BGS) – water bearing fracture (@ 38.86m BGS) – water bearing fracture (@ 39.17m BGS) – water bearing fracture (@ 39.47m BGS)				1	100	45	
40.39	END OF HOLE @ 40.39 m BGS.	277.36						

Depth scale: 33.0, 34.0, 35.0, 36.0, 37.0, 38.0, 39.0, 40.0, 41.0, 42.0, 43.0, 44.0



SCREEN DETAILS:
Screened Interval:
38.86 to 40.39m BGS
Length –1.5m
Diameter –50.8mm
Slot # 10
Material –Stainless Steel
Sand pack Interval:
37.19 to 40.39m BGS
Material –# 3 Silica Sand

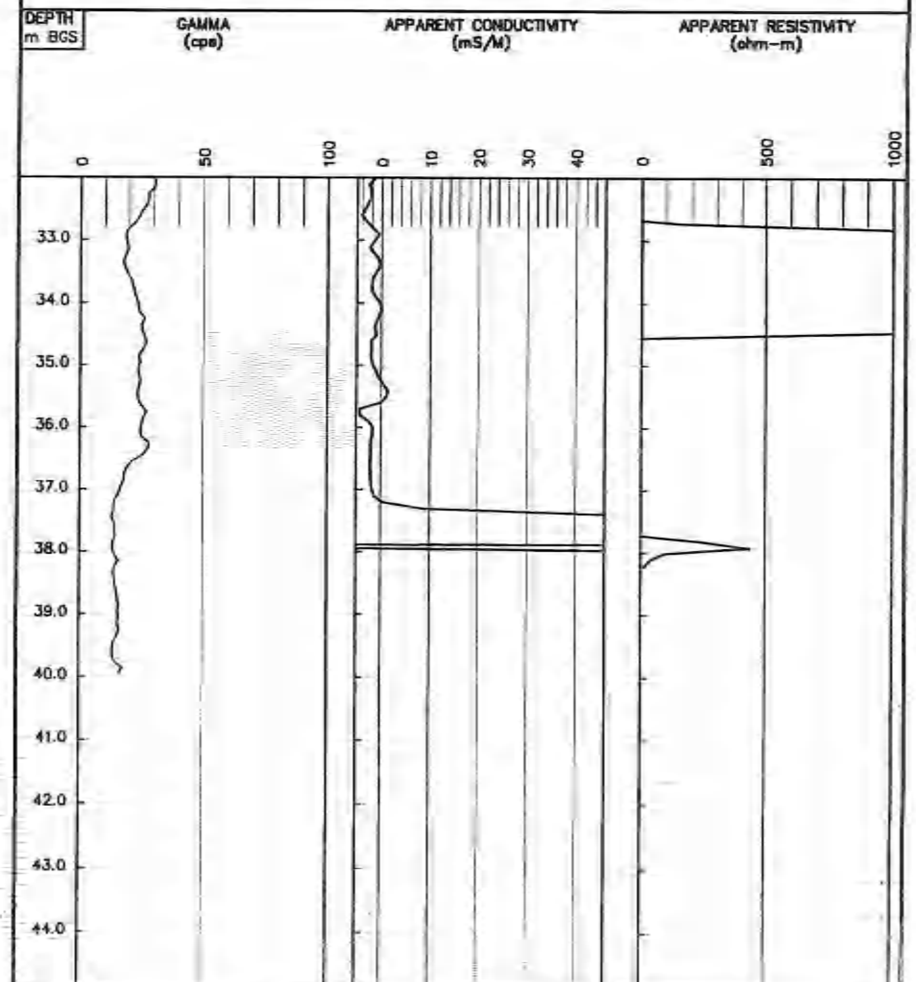
NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

▽ WATER FOUND ▼ STATIC WATER LEVEL NM – NOT MEASURED

STRATIGRAPHIC AND INSTRUMENTATION LOG (GEOPHYSICS)

(L-07)

PROJECT NAME:	ST. MARY'S LANDFILL	HOLE DESIGNATION:	OW9A-91 (Page 4 of 4)
PROJECT NO.:	0645	DATE COMPLETED:	OCTOBER 11, 1991
CLIENT:	TOWN OF ST. MARY'S	DRILLING METHOD:	15cm AIR ROTARY / HQ CORE
LOCATION:	AS PER PLAN		SURVEY BY HYD-ENG GEOPHYSICS INC.



STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-08)

PROJECT NAME: ST. MARY'S LANDFILL
PROJECT NO.: 0645
CLIENT: TOWN OF ST. MARY'S
LOCATION: AS PER PLAN

HOLE DESIGNATION: OW9B-91
DATE COMPLETED: OCTOBER 1, 1991
DRILLING METHOD: 108mm ID HSA
CRA SUPERVISOR: J.C. MUGFORD

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION m AMSL	SAMPLE NUMBER	SAMPLE STATE	'N' VALUE
	REFERENCE POINT (Top of Riser)	318.580			
	GROUND SURFACE	317.74			
0.0–5.18	ML/CL-SILT(TILL), some clay, some sand and small pebbles, rootlets, stiff to hard, well fractured, grey to brown, damp to moist - well developed sub-vertical fracture (0.3 to 0.45m BGS) - hard, some pebbles (small to large), no obvious fracturing	314.13	1CS, 2CS, 3CS, 4CS	X	
5.18–6.10	GM-GRAVEL, fine to medium grained, some sand, silt and stones, few cobbles, saturated	312.56	5CS	X	
6.10–6.55	ML-SILT(TILL), little to some fine grained sand and fine gravel, little clay, very compacted, damp to moist - trace fine grained sand, trace clay, extremely dense, non-plastic, laminated, light grey and brown, damp	311.64	6SS	X	>100
6.55	END OF HOLE @ 6.55 m BGS.	311.19			

Depth scale: 1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 7.0, 8.0, 9.0, 10.0, 11.0, 12.0, 13.0

MONITOR INSTALLATION

SCREEN DETAILS:
Screened Interval:
5.18 to 6.10m BGS
Length -0.9m
Diameter -50.8mm
Slot # 10
Material -Stainless Steel
Sand pack interval:
4.57 to 6.55m BGS
Material -# 3 Silica Sand

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

GRAIN SIZE ANALYSIS ⬭ WATER FOUND ▽ STATIC WATER LEVEL ▼ (OCT 26, 1991)

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

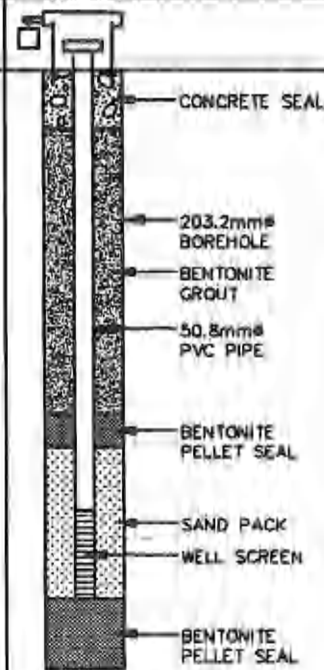
(L-14)

PROJECT NAME: ST. MARY'S LANDFILL
PROJECT NO.: 0645
CLIENT: TOWN OF ST. MARY'S
LOCATION: AS PER PLAN

HOLE DESIGNATION: OW15-91
DATE COMPLETED: OCTOBER 21, 1991
DRILLING METHOD: 108mm ID HSA
CRA SUPERVISOR: J.C. MUGFORD

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION m AMSL	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE
	REFERENCE POINT (Top of Riser)	318.670			
	GROUND SURFACE	317.82			
	ML/CL-SILT(TILL), some clay and sand, damp to moist				
1.0					
2.0					
3.0		314.77			
	ML-SILT(TILL), some clay and sand, trace gravel, slightly layered, firm, light brown, damp to moist	314.13	1CS (3.5 - 4.6m)		
4.0	ML/CL-SILT and CLAY(GLACIOLACUSTRINE), trace gravel, little very fine sand, layered, tan, moist				
	SW/GW-SAND and GRAVEL, medium to coarse, some cobbles, salt and pepper color, saturated	313.25	2CS (4.6 - 5.8m)		
5.0					
6.0	ML-SILT(TILL), some clay and sand, cobbles, dense, light brown, moist	312.03	3CS		
	END OF HOLE @ 6.20 m BGS.	311.62	4CS		
7.0					
8.0					
9.0					
10.0					
11.0					
12.0					
13.0					

MONITOR INSTALLATION



SCREEN DETAILS:
Screened Interval:
4.57 to 5.49m BGS
Length -0.9m
Diameter -50.8mm
Slot # 10
Material -Stainless Steel
Sand pack interval:
3.91 to 5.49m BGS
Material -# 3 Silica Sand

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

GRAIN SIZE ANALYSIS ⬭ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

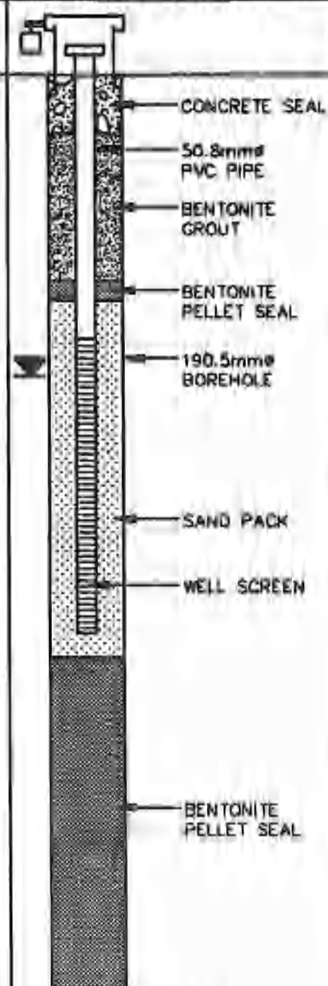
(L-18)

PROJECT NAME: ST. MARY'S LANDFILL
PROJECT NO.: 0645
CLIENT: TOWN OF ST. MARY'S
LOCATION: AS PER PLAN

HOLE DESIGNATION: OW17-91
DATE COMPLETED: NOVEMBER 16, 1991
DRILLING METHOD: 95mm ID HSA
CRA SUPERVISOR: J.C. MUGFORD

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION m AMSL
	REFERENCE ELEVATION (Top of Riser)	318.39
	GROUND SURFACE	317.39
	ML/CL-SILT(TILL), some clay, little sand, little gravel, few cobbles, very stiff, grey, damp	
1.0	- very cobbly	
3.0		314.26
	ML/SM-SILT and SAND, very fine grained, compact, brown, saturated	314.04
4.0	SW-SAND, little fine gravel, coarse grained, well graded, compact, brown, saturated	313.73
	ML/CL-SILT(TILL), some clay, little sand and gravel, stiff, grey, moist - sand and gravel seams, wet (4.88 to 4.98m BGS and 5.08 to 5.13m BGS)	313.07
6.0	ML-SILT(TILL), some sand, little to some clay, little gravel, very hard, light brown, damp - sand seam, wet (5.49 to 5.59m BGS)	311.90
9.45	END OF HOLE @ 9.45 m BGS.	307.94

MONITOR INSTALLATION



SCREEN DETAILS:
Screened Interval:
2.74 to 5.79m BGS
Length -3.0m
Diameter -50.8mm
Slot # 10
Material -PVC
Sand pack interval:
2.34 to 6.05m BGS
Material -# 2 Filter

SAMPLE

NUMBER	STATE	'N' VALUE
1CS		
2CS		
3SS		26
4SS		20
5SS		41
6SS		>60
7SS		53
8SS		53
9SS		58
10SS		>50
11SS		>70

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

GRAIN SIZE ANALYSIS ◯ WATER FOUND ▽ STATIC WATER LEVEL ▼ (NOV 22, 1991)

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

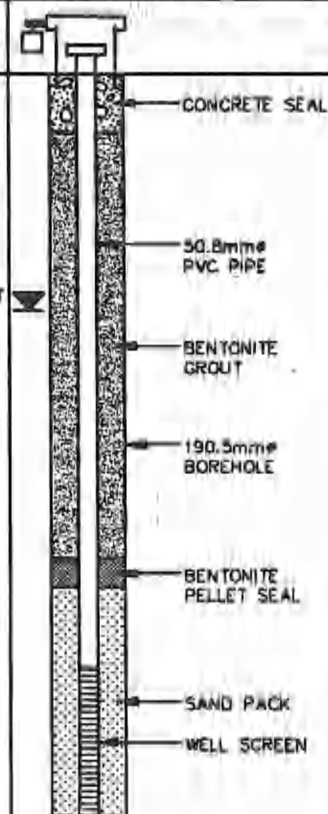
(L-26)

PROJECT NAME: ST. MARY'S LANDFILL
PROJECT NO.: 0645
CLIENT: TOWN OF ST. MARY'S
LOCATION: AS PER PLAN

HOLE DESIGNATION: OW21-91
DATE COMPLETED: DECEMBER 9, 1991
DRILLING METHOD: 95mm ID HSA
CRA SUPERVISOR: J.C. MUGFORD

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION m AMSL
	REFERENCE POINT (Top of Riser)	320.760
	GROUND SURFACE	319.99
	ML-SILT(TILL), little to some clay and sand, trace gravel, damp	
1.0	- hard, moist to wet	
2.0	- damp	317.53
3.0		
4.0	- very hard, damp	
5.0		
	ML/CL-SILT and CLAY (GLACIOLACUSTRINE), little sand and fine gravel, damp - little to some clay and fine sand, extremely dense, non-cohesive, tan, damp, layered - moist - some sand and clay, little fine gravel, very hard, brown, damp	314.61
6.0		
7.0	ML-SILT and SAND(TILL), little clay, little gravel, extremely hard, light brown to grey, damp to moist	312.92
8.0	END OF HOLE @ 7.70 m BGS.	312.29
9.0		
10.0		
11.0		
12.0		
13.0		

MONITOR INSTALLATION



SCREEN DETAILS:
Screened Interval:
6.17 to 7.70m BGS
Length -1.5m
Diameter -50.8mm
Slot # 10
Material -Stainless Steel
Sand pack interval:
5.33 to 7.70m BGS
Material -# 2 Filter

SAMPLE NUMBER	STATE	'N' VALUE
1SS	X	68
2SS	X	71
3SS	X	>100
4SS	X	93
5SS	X	>100

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

GRAIN SIZE ANALYSIS ⬭ WATER FOUND ▽ STATIC WATER LEVEL ▼ (DEC 12, 1991)

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

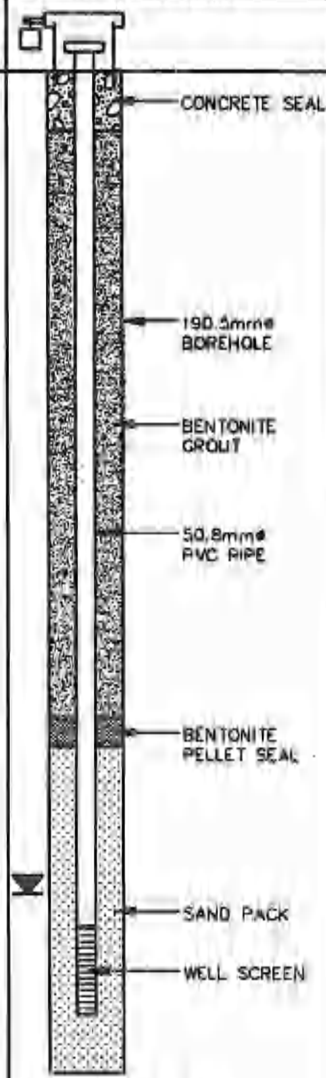
(L-24)

PROJECT NAME: ST. MARY'S LANDFILL
PROJECT NO.: 0645
CLIENT: TOWN OF ST. MARY'S
LOCATION: AS PER PLAN

HOLE DESIGNATION: OW25-91
DATE COMPLETED: DECEMBER 11, 1991
DRILLING METHOD: 95mm ID HSA
CRA SUPERVISOR: J.C. MUGFORD

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION m AMSL	SAMPLE NUMBER	STATE	'N' VALUE
	REFERENCE POINT (Top of Riser)	323.420			
	GROUND SURFACE	322.86			
	OL–SILT(TOPSOIL), little sand and clay, organics, black, moist				
1.0	ML/CL–SILT, some clay, little to some sand, stiff, light brown, moist, cohesive	322.25			
2.0			1AR	X	
3.0	– hard, grey–brown				
4.0			2AR	X	
5.0	– stone		3AR	X	
6.0			4SS	X	41
7.0					
	SP–SAND, trace silt and fine gravel, fine to medium grained fining upwards, very dense, salt and pepper colour, dry	315.54			
8.0	– silt and clay layer (2cm thick)		5SS	X	50
	– medium grained, wet	314.35	6SS	X	37
9.0	GW–GRAVEL, some sand and silt, fine, wet	313.93			
	ML–SILT, some sand, little to some clay, few large pebbles, very stiff, light grey–brown, moist to wet	313.50	7SS	X	28
10.0	– gravel seam (5cm thick)		8SS	X	49
	END OF HOLE @ 10.36 m BGS.	312.50			
11.0					
12.0					
13.0					

MONITOR INSTALLATION



SCREEN DETAILS:
Screened Interval:
8.84 to 9.75m BGS
Length –0.9m
Diameter –50.8mm
Slot # 10
Material –Stainless Steel
Sand pack interval:
7.01 to 10.36m BGS
Material –# 2 Filter

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

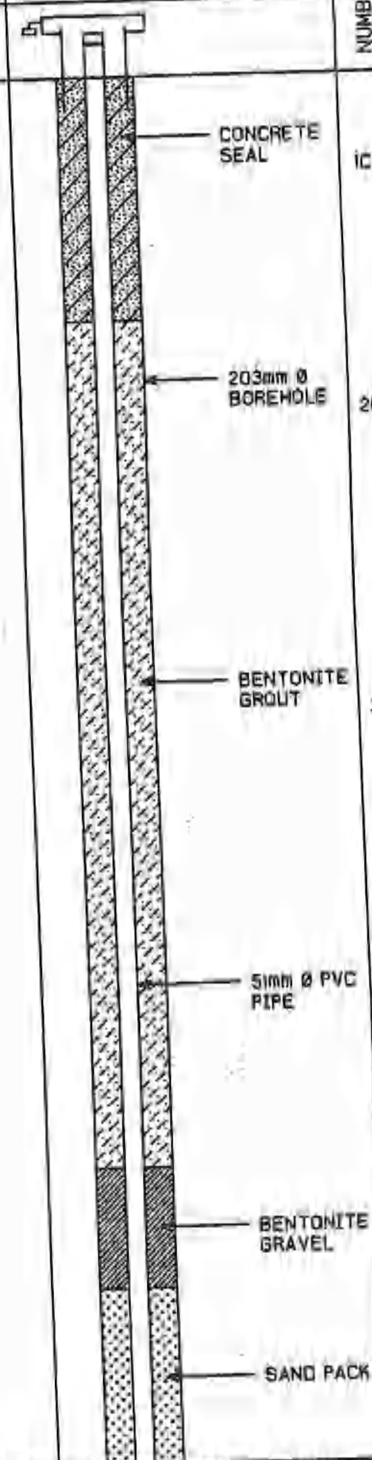
GRAIN SIZE ANALYSIS ( ) WATER FOUND ▽ STATIC WATER LEVEL ▼ (DEC 13, 1991)

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: ST. MARYS LANDFILL
PROJECT NUMBER: 0645
CLIENT: TOWN OF ST. MARYS
LOCATION: AS PER PLAN

HOLE DESIGNATION: OW32-96
DATE COMPLETED: AUGUST 7, 1996
DRILLING METHOD: 108mm ID HSA
CRA SUPERVISOR: J. MUGFORD

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. m AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	STATE	'N' VALUE	PID (ppm)
	REFERENCE POINT (Top of Riser)	323.43					
	GROUND SURFACE	322.54					
	ML-SILT (FILL), little sand and clay, trace gravel, brown, damp		CONCRETE SEAL	1CS			
-0.5	- light and dark grey						
-1.0		321.47					
	ML-SILT (BURIED TOPSOIL), little sand and clay, little vegetal matter, dark brown, moist	321.32					
-1.5	ML-SILT (TILL), little sand and clay, firm, some fine fracturing, highly mottled light grey and brown		203mm Ø BOREHOLE	2CS			
-2.0	- some fine sand, wet (2.0 to 2.3m BGS)						
	- little coarse sand and fine gravel, stiff, slightly mottled, moist to wet						
-2.5	- little gravel, hard augering, light brown, moist						
-3.0			BENTONITE GROUT	3CS			
-3.5	- becoming grey, moist						
-4.0	- grey, damp to moist						
-4.5			51mm Ø PVC PIPE	4CS			
-5.0	- massive						
-5.5			BENTONITE GRAVEL				
-6.0	- boulder			5CS			
-6.5			SAND PACK				



NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼

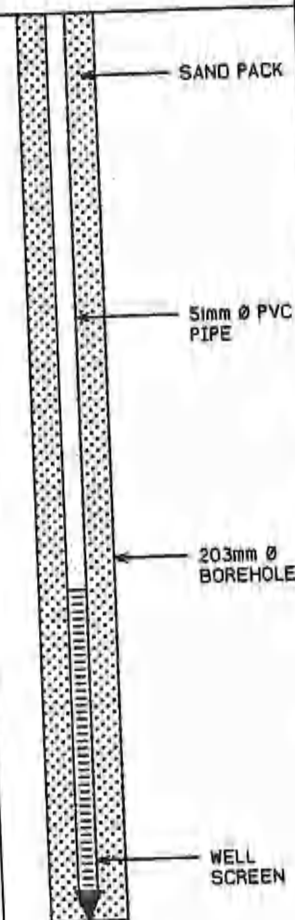
(OVERBURDEN)

PROJECT NAME: ST. MARYS LANDFILL
PROJECT NUMBER: 0645
CLIENT: TOWN OF ST. MARYS
LOCATION: AS PER PLAN

HOLE DESIGNATION: OW32-96
DATE COMPLETED: AUGUST 7, 1996
DRILLING METHOD: 108mm ID HSA
CRA SUPERVISOR: J. MUGFORD

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. m AMSL	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
		315.38				
7.5	ML-SILT (WATER LAID TILL), trace to little fine sand, trace clay, slightly stratified, light grey, damp to moist		6CS			
8.0						
8.5		313.85				
9.0	ML-SILT (TILL), little sand, gravel and clay, massive, grey-brown, moist		7CS			
9.5						
10.0			8CS			
10.5	- seams of wet sand and silt @ 10.36 to 10.59 and 10.92 to 10.97m BGS					
11.0	- massive till		9CS			
11.5		310.96				
	END OF HOLE @ 11.58m BGS					
12.0						
12.5						
13.0						
13.5						

MONITOR INSTALLATION



SCREEN DETAILS
Screened Interval:
9.91 to 11.43m BGS
Length: 1.52m
Diameter: 51mm
Slot Size: #10
Material: PVC
Sand Pack:
6.10 to 11.58m BGS
Material: #1 Silica Sand

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼

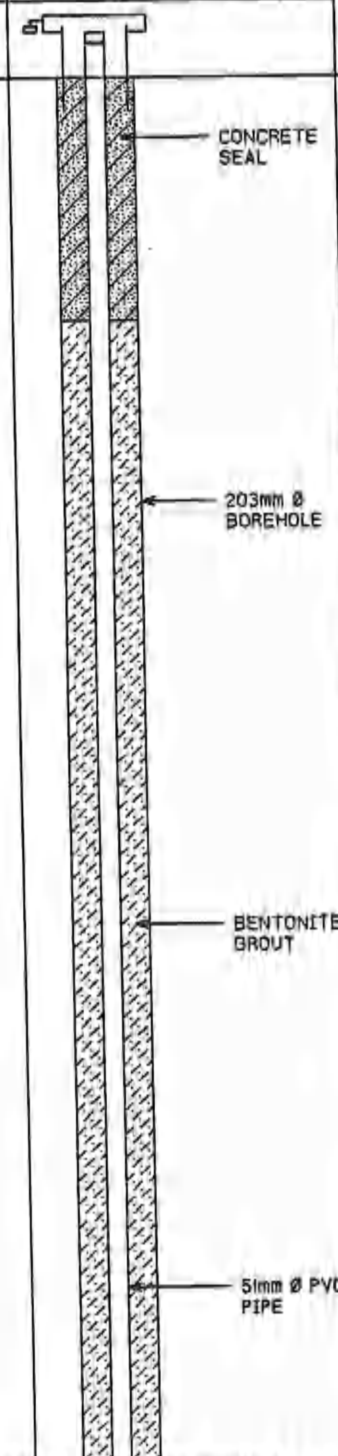
STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

PROJECT NAME: ST. MARYS LANDFILL
PROJECT NUMBER: 0645
CLIENT: TOWN OF ST. MARYS
LOCATION: AS PER PLAN

HOLE DESIGNATION: OW33-96
DATE COMPLETED: AUGUST 8, 1996
DRILLING METHOD: 108mm ID HSA
CRA SUPERVISOR: J. MUGFORD

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. m AMSL	SAMPLE NUMBER	STATE	'N' VALUE	PID (ppm)
	REFERENCE POINT (Top of Riser)	321.57				
	GROUND SURFACE	320.86				
	ML-SILT (TOPSOIL), little sand, little vegetal matter, dark brown, moist					
	ML-SILT (TILL), little sand, trace gravel and clay, firm, light brown, damp to moist	320.36				
0.5			1CS			
1.0	- massive					
1.5						
	- stone		2CS			
2.0						
2.5	- moist					
3.0	- hard, damp					
			3CS			
3.5						
4.0	- massive, grey, damp to moist					
4.5						
			4CS			
5.0	- 25mm seam of wet sand, silt and gravel @ 5.03m BGS					
	- slightly stratified below 5.03m BGS					
5.5	- highly stratified					
6.0	- wet (dilatant) outwash silts					
	- massive, very hard, grey, damp to moist		5CS			
6.5						

MONITOR INSTALLATION



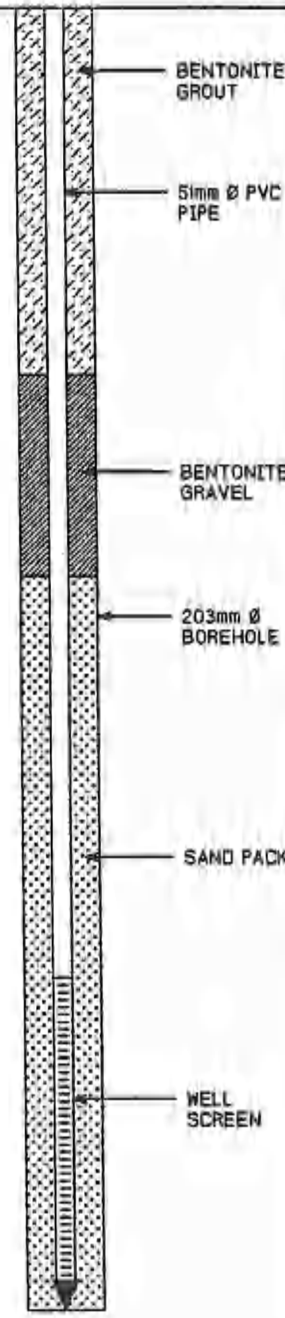
NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

PROJECT NAME: ST. MARYS LANDFILL
PROJECT NUMBER: 0645
CLIENT: TOWN OF ST. MARYS
LOCATION: AS PER PLAN

HOLE DESIGNATION: OW33-96
DATE COMPLETED: AUGUST 8, 1996
DRILLING METHOD: 108mm ID HSA
CRA SUPERVISOR: J. MUGFORD

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. m AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
				5CS			
7.5							
8.0				6CS			
8.5	- sand and gravel, some silt, wet 8.61 to 8.71m BGS - till with little gravel, damp to moist - cobbles @ 8.84, 9.14, 9.45 and 9.75m BGS						
9.0							
9.5				7CS			
10.0	- very moist - hard, dry						
10.5							
11.0				8CS			
11.5	- damp to moist						
12.0							
12.5	- layers of silt, sand and clay - very moist to wet (12.70 to 12.75m BGS) - dry			9CS			
13.0							
13.5	- some sand, hard, brown, damp to moist Refusal END OF HOLE @ 13.56m BGS	307.10		10CS			



NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ⊻ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

PROJECT NAME: ST. MARYS LANDFILL
PROJECT NUMBER: 0645
CLIENT: TOWN OF ST. MARYS
LOCATION: AS PER PLAN

HOLE DESIGNATION: OW33-96
DATE COMPLETED: AUGUST 8, 1996
DRILLING METHOD: 108mm ID HSA
CRA SUPERVISOR: J. MUGFORD

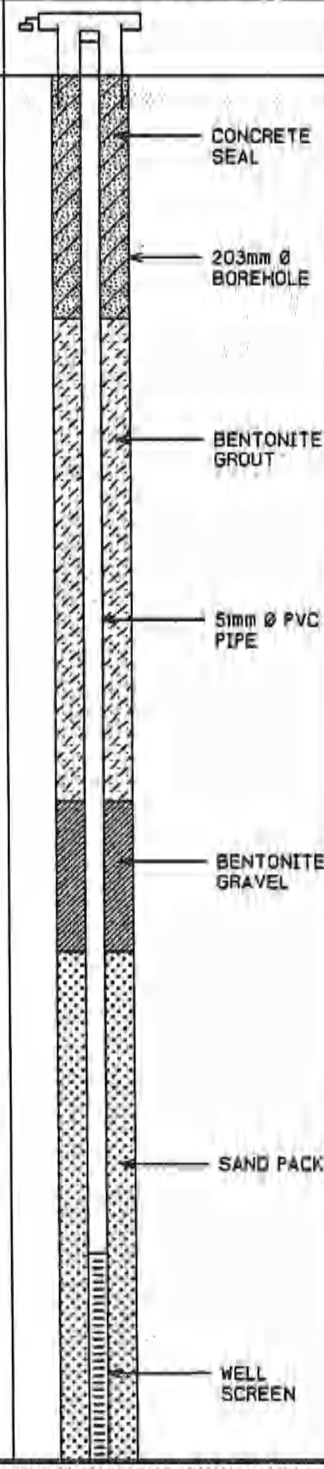
DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. m AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	'N' VALUE	PID (ppm)
14.5			SCREEN DETAILS Screened Interval: 11.89 to 13.41m BGS Length: 1.52m Diameter: 51mm Slot Size: #10 Material: PVC Sand Pack: 9.85 to 13.56m BGS Material: #1 Silica Sand				
15.0							
15.5							
16.0							
16.5							
17.0							
17.5							
18.0							
18.5							
19.0							
19.5							
20.0							
20.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: ST. MARYS LANDFILL
PROJECT NUMBER: 0645
CLIENT: TOWN OF ST. MARYS
LOCATION: AS PER PLAN

HOLE DESIGNATION: OW34-96
DATE COMPLETED: AUGUST 9, 1996
DRILLING METHOD: 108mm ID HSA
CRA SUPERVISOR: J. MUGFORD

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. m AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
	REFERENCE POINT (Top of Riser) GROUND SURFACE	321.59 320.77					
-0.5 -1.0 -1.5 -2.0 -2.5 -3.0 -3.5 -4.0 -4.5 -5.0 -5.5 -6.0 -6.5	Refer to OW33-96 for stratigraphic details.						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼

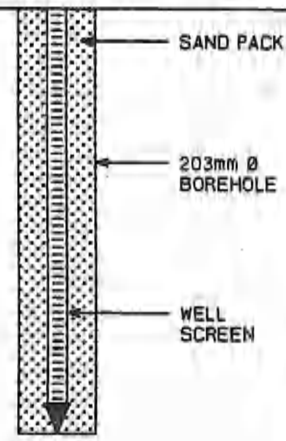
STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: ST. MARYS LANDFILL
PROJECT NUMBER: 0645
CLIENT: TOWN OF ST. MARYS
LOCATION: AS PER PLAN

HOLE DESIGNATION: OW34-96
DATE COMPLETED: AUGUST 9, 1996
DRILLING METHOD: 108mm ID HSA
CRA SUPERVISOR: J. MUGFORD

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. m AMSL	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE	SAMPLE PID (ppm)
7.5						
	ML-SILT (TILL), little sand, clay and gravel, trace cobbles, very hard, massive, brown, damp to moist	313.15				
8.0			1CS	X		
8.5	- dry to damp - wet					
9.0			2CS	X		
	END OF HOLE @ 9.14m BGS	311.83				
9.5						
10.0						
10.5						
11.0						
11.5						
12.0						
12.5						
13.0						
13.5						

MONITOR INSTALLATION



SCREEN DETAILS
Screened interval:
5.94 to 8.99m BGS
Length: 3.05m
Diameter: 51mm
Slot Size: #10
Material: PVC
Sand Pack:
4.42 to 9.14m BGS
Material: #1 Silica Sand

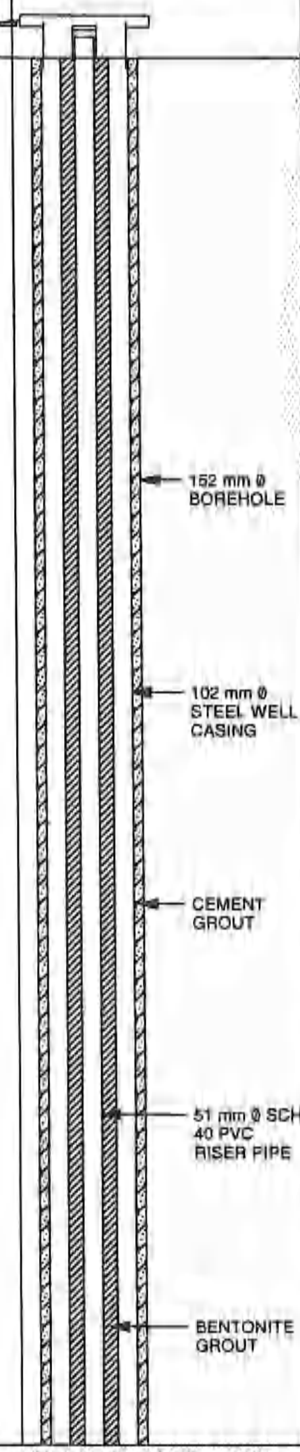
NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: St. Marys Landfill
PROJECT NUMBER: 645
CLIENT: Town of St. Marys
LOCATION: Town of St. Marys

HOLE DESIGNATION: MW32A-02
DATE COMPLETED: September 17, 2002
DRILLING METHOD: MUD ROTARY
FIELD PERSONNEL: B. KEMPEL

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. m	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (%)	SAMPLE 'N' VALUE
	TOP OF RISER	322.640					
	GROUND SURFACE	322.09					
	TOPSOIL	321.93					
	ML - SILT (TILL), trace to with sand, trace to with clay, mottled grey and brown						
3.66	- grey at 3.66m BGS						



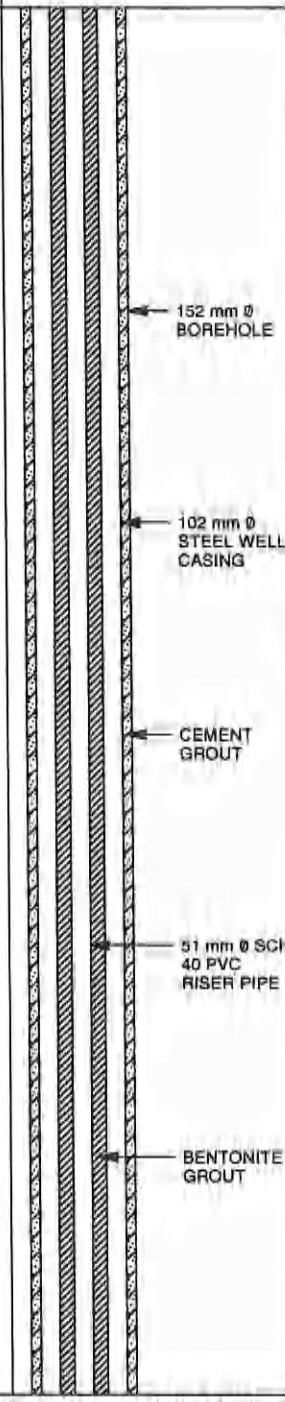
NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: St. Marys Landfill
PROJECT NUMBER: 645
CLIENT: Town of St. Marys
LOCATION: Town of St. Marys

HOLE DESIGNATION: MW32A-02
DATE COMPLETED: September 17, 2002
DRILLING METHOD: MUD ROTARY
FIELD PERSONNEL: B. KEMPEL

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. m	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (%)	SAMPLE 'N' VALUE
10.5							
11.0							
11.5							
12.0							
12.5							
13.0							
13.5							
14.0							
14.5							
15.0							
15.5							
16.0							
16.5							
17.0							
17.5							
18.0							
18.5							
19.0							
19.5							



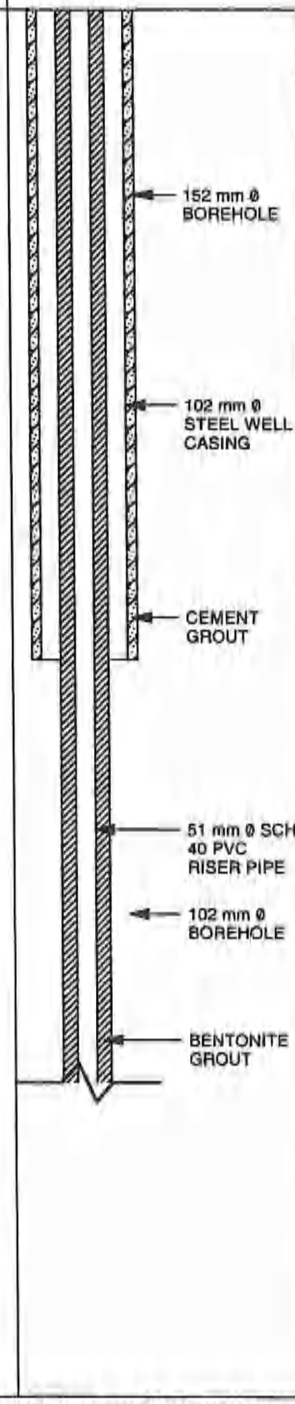
NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

PROJECT NAME: St. Marys Landfill
PROJECT NUMBER: 645
CLIENT: Town of St. Marys
LOCATION: Town of St. Marys

HOLE DESIGNATION: MW32A-02
DATE COMPLETED: September 17, 2002
DRILLING METHOD: MUD ROTARY
FIELD PERSONNEL: B. KEMPEL

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. m	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (%)	SAMPLE 'N' VALUE
20.5							
21.0							
21.5							
22.0							
22.5							
23.0							
23.5							
24.0	- with cobbles at 23.77m BGS						
24.5	- 2' thick quartz boulder at 24.69m BGS						
25.0							
25.5							
26.0							
26.5							
27.0							
27.5							
28.0	END OF OVERBURDEN HOLE @ 27.74m BGS						
28.5							
29.0							
29.5							



NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG MW32A.GPJ CRA_CORP.GDT 6/13/03

STRATIGRAPHIC AND INSTRUMENTATION LOG (BEDROCK)

PROJECT NAME: St. Marys Landfill
PROJECT NUMBER: 645
CLIENT: Town of St. Marys
LOCATION: Town of St. Marys

HOLE DESIGNATION: MW32A-02
DATE COMPLETED: September 17, 2002
DRILLING METHOD: MUD ROTARY
FIELD PERSONNEL: B. KEMPEL

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. m	MONITOR INSTALLATION	RUN NUMBER	CORE RECOVERY %	RQD %
27.5			BENTONITE GROUT			
28.0	BEDROCK - LIMESTONE (Dundee Formation), light brown, competent	294.35				
28.5						
29.0			102 mm ø BOREHOLE	1		
29.5						
30.0						
30.5			51 mm ø SCH 40 PVC RISER PIPE			
31.0						
31.5						
32.0						
32.5				2		
33.0						
33.5						
34.0						
34.5						
35.0						
35.5				3		
36.0			BENTONITE HOLEPLUG			
36.5						

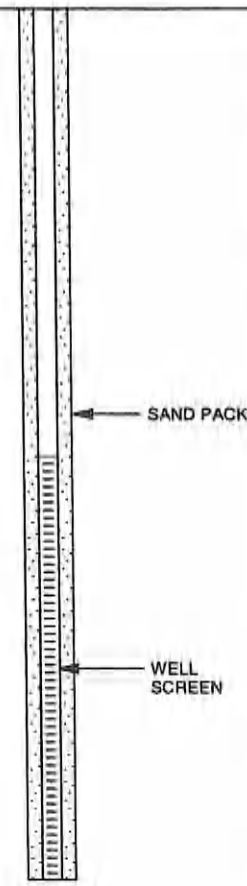
NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STRATIGRAPHIC AND INSTRUMENTATION LOG (BEDROCK)

PROJECT NAME: St. Marys Landfill
PROJECT NUMBER: 645
CLIENT: Town of St. Marys
LOCATION: Town of St. Marys

HOLE DESIGNATION: MW32A-02
DATE COMPLETED: September 17, 2002
DRILLING METHOD: MUD ROTARY
FIELD PERSONNEL: B. KEMPEL

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. m	MONITOR INSTALLATION	RUN NUMBER	CORE RECOVERY %	RQD %
37.5						
38.0						
38.5				4		
39.0						
39.5						
40.0			SAND PACK			
40.5	- begin to lose drilling fluid to formation at 40.23m BGS					
41.0						
41.5						
42.0			WELL SCREEN	5		
42.5						
43.0						
43.5	END OF BOREHOLE @ 43.28m BGS	278.80				
44.0						
44.5						
45.0						
45.5						
46.0						
46.5						



WELL DETAILS
Screened interval:
281.85 to 278.80m
Length: 3.05m
Diameter: 51mm
Slot Size: 10
Sand Pack:
285.51 to 278.80m
Material: #2 SILCA SAND

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

LOG OF DRILLING OPERATIONS

OW36

BURNSIDE

R.J. Burnside & Associates Limited
292 Speedvale Avenue West, Guelph, Ontario N1H 1C4
telephone (519) 823-4995 fax (519) 836-5477

Client: **Town of St. Marys**	Project Name: **St. Marys Landfill**	Logged by: **C. Martin**
Project No.: **300032339.2016**	Location: **St. Marys**	Ground (m amsl): **313.78**
Drilling Co.:	Date Started: **11/29/2016**	Static Water Level Depth (m):
Drilling Method: **Hollow Stem Auger**	Date Completed: **11/29/2016**	Sand Pack Depth (m) : **2.74 - 6.93**

Surface Elevation (m): **313.78**

Stratigraphic Description	Elev. (m)	Depth (m)
Light brown SILT (ML); massive; soft; cohesive; low plasticity; dry	312.41	1.37
Grey/brown SILT, some clay, some gravel (subangular to subrounded), trace sand (ML); massive; firm; cohesive; medium plasticity; moist	311.40	2.38
Dark brown SILT and CLAY, some gravel (subangular to subrounded), trace sand (ML-CL); massive; stiff to very stiff; cohesive; medium plasticity; moist to wet	310.59	3.19
Medium brown SILT, some gravel (subangular to subrounded), trace to some sand, trace to some clay (ML); massive; very stiff; cohesive; low plasticity; till; moist	306.85	6.93

Well construction: cement; bentonite seal; silica sand pack; screen; bottom 6.93

Sample Num.	Type
1	SS
2	SS
3	SS
4	SS
5	SS
6	SS
7	SS
8	SS

Depth Scale (ft) (m): 5.0, 10.0, 15.0, 20.0 ft; 1.0, 2.0, 3.0, 4.0, 5.0, 6.0 m

Prepared By: **C. Martin** Checked By: **J. Rutherford** Date Prepared: **11/29/2016**

This borehole log was prepared for hydrogeological and/or environmental purposes and does not necessarily contain information suitable for a geotechnical assessment of the subsurface conditions. Borehole data requires interpretation by R. J. Burnside & Associates Limited personnel before use by others.

LEGEND	MONITORING WELL DATA	SAMPLE TYPE			
▼ Water found @ time of drilling	Pipe: **51 mm dia. PVC**	AC	Auger Cutting	SS	Split Spoon
▽ Static Water Level -	Screen: **51 mm dia. PVC #10 slot**	CS	Continuous	AR	Air Rotary
		RC	Rock Core	WC	Wash Cuttings

Ontario Ministry of the Environment

Well Tag No. *(Place Sticker and/or Print Below)*

Well Record

Regulation 903 Ontario Water Resources Act

Measurements recorded in: ☐ Metric ☐ Imperial

Page ___ of ___

Well Owner's Information

First Name	Last Name / Organization	E-mail Address	☐ Well Constructed by Well Owner

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. *(inc. area code)*

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession

County/District/Municipality	City/Town/Village	Province	Postal Code
		Ontario	

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 8 3					

Overburden and Bedrock Materials/Abandonment Sealing Record *(see instructions on the back of this form)*

General Colour	Most Common Material	Other Materials	General Description	Depth *(m/ft)* From	Depth *(m/ft)* To

Annular Space

Depth Set at *(m/ft)* From	To	Type of Sealant Used *(Material and Type)*	Volume Placed *(m³/ft³)*

Results of Well Yield Testing

After test of well yield, water was: ☐ Clear and sand free ☐ Other, *specify*

If pumping discontinued, give reason:

Pump intake set at *(m/ft)*

Pumping rate *(l/min / GPM)*

Duration of pumping ___ hrs + ___ min

Final water level end of pumping *(m/ft)*

If flowing give rate *(l/min / GPM)*

Recommended pump depth *(m/ft)*

Recommended pump rate *(l/min / GPM)*

Well production *(l/min / GPM)*

Disinfected? ☐ Yes ☐ No

Draw Down Time *(min)*	Draw Down Water Level *(m/ft)*	Recovery Time *(min)*	Recovery Water Level *(m/ft)*
Static Level			
1		1	
2		2	
3		3	
4		4	
5		5	
10		10	
15		15	
20		20	
25		25	
30		30	
40		40	
50		50	
60		60	

Method of Construction

☐ Cable Tool ☐ Diamond
☐ Rotary (Conventional) ☐ Jetting
☐ Rotary (Reverse) ☐ Driving
☐ Boring ☐ Digging
☐ Air percussion
☐ Other, *specify*

Well Use

☐ Public ☐ Commercial ☐ Not used
☐ Domestic ☐ Municipal ☐ Dewatering
☐ Livestock ☐ Test Hole ☐ Monitoring
☐ Irrigation ☐ Cooling & Air Conditioning
☐ Industrial
☐ Other, *specify*

Construction Record - Casing

Inside Diameter *(cm/in)*	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness *(cm/in)*	Depth *(m/ft)* From	To

Status of Well

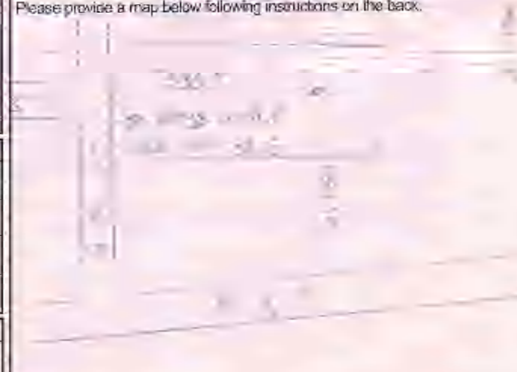
☐ Water Supply
☐ Replacement Well
☐ Test Hole
☐ Recharge Well
☐ Dewatering Well
☐ Observation and/or Monitoring Hole
☐ Alteration (Construction)
☐ Abandoned, Insufficient Supply
☐ Abandoned, Poor Water Quality
☐ Abandoned, other, *specify*
☐ Other, *specify*

Construction Record - Screen

Outside Diameter *(cm/in)*	Material (Plastic, Galvanized, Steel)	Slot No.	Depth *(m/ft)* From	To

Map of Well Location

Please provide a map below following instructions on the back.



Comments:

Water Details

Water found at Depth ___ *(m/ft)* Kind of Water: ☐ Fresh ☐ Untested ☐ Gas ☐ Other, *specify*

Water found at Depth ___ *(m/ft)* Kind of Water: ☐ Fresh ☐ Untested ☐ Gas ☐ Other, *specify*

Water found at Depth ___ *(m/ft)* Kind of Water: ☐ Fresh ☐ Untested ☐ Gas ☐ Other, *specify*

Hole Diameter

Depth *(m/ft)* From	To	Diameter *(cm/in)*

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.

Business Address (Street Number/Name)	Municipality

Province	Postal Code	Business E-mail Address

Bus.Telephone No. *(inc. area code)*	Name of Well Technician (Last Name, First Name)

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted

Well owner's information package delivered	Date Package Delivered	Ministry Use Only
☐ Yes ☒ No	Date Work Completed	Audit No. Z 10 1018

Well Owner's Copy

Ontario | Ministry of the Environment

Measurements recorded in: ☐ Metric ☐ Imperial

Well Tag No. *(Place Sticker and/or Print Below)*

Well Record

Regulation 903 Ontario Water Resources Act

Page ____ of ____

Well Owner's Information

First Name	Last Name / Organization	E-mail Address	☐ Well Constructed by Well Owner
	[illegible]	[illegible]	

Mailing Address (Street Number/Name)	Municipality	Province	Postal Code	Telephone No. *(inc. area code)*
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Well Location

Address of Well Location (Street Number/Name)	Township	Lot	Concession
[illegible]	[illegible]	[illegible]	[illegible]

County/District/Municipality	City/Town/Village	Province	Postal Code
[illegible]	[illegible]	Ontario	

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 8 3	1 7	[illegible]	[illegible]		

Overburden and Bedrock Materials/Abandonment Sealing Record *(see instructions on the back of this form)*

General Colour	Most Common Material	Other Materials	General Description	Depth *(m/ft)* From	To
			[illegible]		

Annular Space

Depth Set at *(m/ft)* From	To	Type of Sealant Used *(Material and Type)*	Volume Placed *(m³/ft³)*

Results of Well Yield Testing

After test of well yield, water was:
☐ Clear and sand free
☐ Other, specify

If pumping discontinued, give reason:

Pump intake set at *(m/ft)*

Pumping rate *(l/min / GPM)*

Duration of pumping
hrs + min

Final water level end of pumping *(m/ft)*

If flowing give rate *(l/min / GPM)*

Recommended pump depth *(m/ft)*

Recommended pump rate *(l/min / GPM)*

Well production *(l/min / GPM)*

Disinfected?
☐ Yes ☐ No

Draw Down Time *(min)*	Water Level *(m/ft)*	Recovery Time *(min)*	Water Level *(m/ft)*
Static Level			
1		1	
2		2	
3		3	
4		4	
5		5	
10		10	
15		15	
20		20	
25		25	
30		30	
40		40	
50		50	
60		60	

Method of Construction

☐ Cable Tool ☐ Diamond
☐ Rotary (Conventional) ☐ Jetting
☐ Rotary (Reverse) ☐ Driving
☐ Boring ☐ Digging
☐ Air percussion
☐ Other, specify

Well Use

☐ Public ☐ Commercial ☐ Not used
☐ Domestic ☐ Municipal ☐ Dewatering
☐ Livestock ☐ Test Hole ☐ Monitoring
☐ Irrigation ☐ Cooling & Air Conditioning
☐ Industrial
☐ Other, specify

Construction Record - Casing

Inside Diameter *(cm/in)*	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness *(cm/in)*	Depth *(m/ft)* From	To

Construction Record - Screen

Outside Diameter *(cm/in)*	Material (Plastic, Galvanized, Steel)	Slot No.	Depth *(m/ft)* From	To

Status of Well

☐ Water Supply
☐ Replacement Well
☐ Test Hole
☐ Recharge Well
☐ Dewatering Well
☐ Observation and/or Monitoring Hole
☐ Alteration (Construction)
☐ Abandoned, Insufficient Supply
☐ Abandoned, Poor Water Quality
☑ Abandoned, other, specify [illegible]
☐ Other, specify

Map of Well Location

Please provide a map below following instructions on the back.

Comments:

Water Details

Water found at Depth (m/ft) Kind of Water: ☐ Fresh ☐ Untested ☐ Gas ☐ Other, specify
Water found at Depth (m/ft) Kind of Water: ☐ Fresh ☐ Untested ☐ Gas ☐ Other, specify
Water found at Depth (m/ft) Kind of Water: ☐ Fresh ☐ Untested ☐ Gas ☐ Other, specify

Hole Diameter

Depth *(m/ft)* From	To	Diameter *(cm/in)*
[illegible]	[illegible]	[illegible]

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
[illegible]	[illegible]

Business Address (Street Number/Name)	Municipality
[illegible]	[illegible]

Province	Postal Code	Business E-mail Address
	[illegible]	

Bus.Telephone No. *(inc. area code)*	Name of Well Technician (Last Name, First Name)
[illegible]	

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
[illegible]		[illegible]

Well owner's information package delivered ☐ Yes ☐ No

Date Package Delivered [illegible]

Date Work Completed [illegible]

Ministry Use Only

Audit No. Z [illegible] 053

Received

0506E (12/2007) **Well Owner's Copy**

Table B.1
Borehole Details
St. Marys Landfill

Borehole	*Date*	*Ground Elevation (amsl)*	*Borehole Depth (bgs)*	*Borehole Depth (amsl)*	*Location*
BH10-91	15-Oct-91	317.37	20.12	297.25	Phase II/III
BH11-91	10-Oct-91	316.25	17.68	298.57	Phase II/III
BH12-91	16-Oct-91	317.07	19.96	297.11	Phase II/III
BH13-91	18-Oct-91	313.79	15.54	298.25	Phase II/III
BH14-91	21-Oct-91	317.60	7.57	310.03	Phase II/III
BH16-91	21-Oct-91	317.24	7.32	309.92	Phase II/III
BH18-91	16-Nov-91	317.00	7.47	309.53	Phase II/III
BH19-91	16-Nov-91	317.39	6.71	310.68	Phase II/III
BH20-91	9-Dec-91	315.62	6.71	308.91	Phase II/III
BH22-91	10-Dec-91	314.22	4.27	309.95	Phase II/III
BH23-91	11-Dec-91	313.97	5.18	308.79	Phase II/III
BH24-91	11-Dec-91	313.97	4.57	309.40	Phase II/III
BH26-91	12-Dec-91	316.96	8.23	308.73	Phase II/III
BH27-91	12-Dec-91	316.01	8.23	307.78	Phase II/III
BH28-91	12-Dec-91	313.50	6.55	306.95	Phase II/III
BH29-91	13-Dec-91	314.24	6.71	307.53	Phase II/III
BH30-91	13-Dec-91	317.61	8.23	309.38	Phase II/III
BH31-91	13-Dec-91	316.52	8.08	308.44	Phase II/III

Notes:
All measurmetns are in metres
amsl - above mean sea level
bgs - below ground surface

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

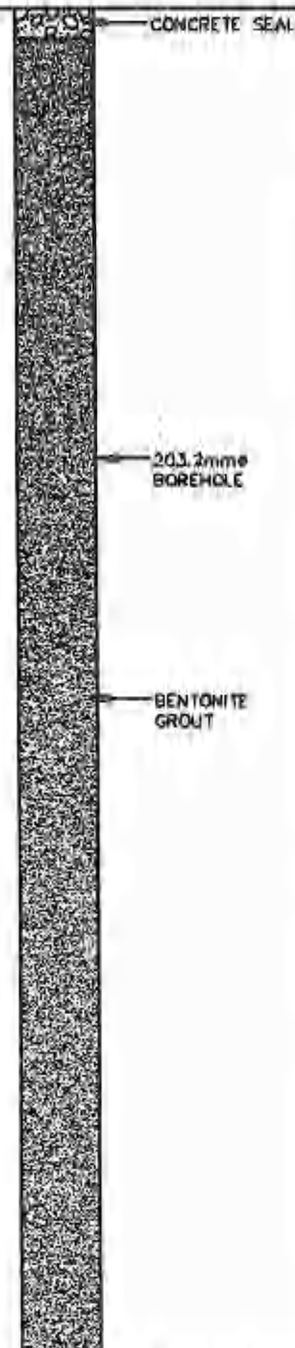
(L-09)

PROJECT NAME: ST. MARY'S LANDFILL
PROJECT NO.: 0645
CLIENT: TOWN OF ST. MARY'S
LOCATION: AS PER PLAN

HOLE DESIGNATION: BH10-91 (Page 1 of 2)
DATE COMPLETED: OCTOBER 15, 1991
DRILLING METHOD: 108mm ID HSA
CRA SUPERVISOR: J.C. MUGFORD

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION m AMSL	SAMPLE NUMBER	STATE	'N' VALUE
	GROUND SURFACE	317.37			
1.0	ML-SILT(TILL), little fine sand, little to some clay, little gravel, stoney, soft, moist, fractured to 0.30m - very hard, light brown, dry to damp - little to some clay, some sand, very stiff, light to medium grey-brown, damp		1CS	X	
2.0			2CS (1.2 - 2.1m)	X	
3.0	- some clay, softer, massive, moist		3CS	X	
4.0	ML-SILT(GLACIOLACUSTRINE), some clay, soft, layered, moist to wet, dilatant - some clay, occasional pebble, more massive, less layering	313.56		X	
5.0	GW/SW-GRAVEL and SAND, gravel is fine, sand is fine to coarse grained, little to some silt, brown, saturated	312.19	4CS	X	
6.0	ML-SILT, (GLACIOLACUSTRINE), trace to some clay, few pebbles, slightly layered, light brown and grey, damp	311.43			
7.0	ML-SILT(TILL), some clay, some sand, occasional pebbles, stones, very hard, stiff, brown to dark brown, damp - increasing gravel content	310.97	5CS	X	
8.0			6CS (7.3 - 8.5m)	X	
9.0	SW-SAND, fine to coarse grained, some coarse gravel, little to some silt, brown, saturated	308.84			
10.0	ML-SILT(TILL), some clay, little to some coarse sand and gravel, few cobbles, very hard, stiff, brown and grey, damp - few cobbles	308.68	7CS	X	
11.0			8CS	X	
12.0	- fine to coarse sand seam wtih some silt and gravel, wet (2cm thick) - horizontal fracturing				
13.0			9CS	X	

MONITOR INSTALLATION



NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

GRAIN SIZE ANALYSIS ( ) WATER FOUND ▽ STATIC WATER LEVEL ▼

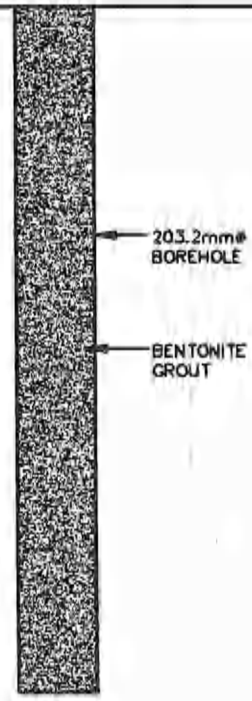
STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-09)

PROJECT NAME: ST. MARY'S LANDFILL
PROJECT NO.: 0645
CLIENT: TOWN OF ST. MARY'S
LOCATION: AS PER PLAN

HOLE DESIGNATION: BH10-91 (Page 2 of 2)
DATE COMPLETED: OCTOBER 15, 1991
DRILLING METHOD: 108mm ID HSA
CRA SUPERVISOR: J.C. MUGFORD

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION m AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE
14.0				10CS		
15.0				11CS		
16.0						
17.0				12CS		
	- fine to medium grained sand seam, little silt, wet, (6cm thick)					
18.0	- trace sand, moist					
19.0				13CS		
				14CS		
20.0	LIMESTONE (BEDROCK)	297.56				
	END OF HOLE @ 20.12 m BGS.	297.25				
21.0						
22.0						
23.0						
24.0						
25.0						
26.0						



NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

GRAIN SIZE ANALYSIS ◯ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-10)

PROJECT NAME: ST. MARY'S LANDFILL
PROJECT NO.: 0645
CLIENT: TOWN OF ST. MARY'S
LOCATION: AS PER PLAN

HOLE DESIGNATION: BH11-91 (Page 1 of 2)
DATE COMPLETED: OCTOBER 10, 1991
DRILLING METHOD: 108mm ID HSA
CRA SUPERVISOR: J.C. MUGFORD

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION m AMSL	MONITOR INSTALLATION	SAMPLE NUMBER
	GROUND SURFACE	316.25		
	SM–SAND, some silt, some roots, loose, brown, moist	316.10	CONCRETE SEAL	
1.0	ML–SILT(TILL), little to some clay and sand, little gravel, hard, very stiff, light brown and grey, damp	315.34		1CS
	ML/SM–SILT and SAND(GLACIOLACUSTRINE), fine grained, little clay, trace pebbles			
2.0	ML/CL–SILT(TILL), some clay, little sand, trace gravel, hard, very stiff, unfractured, light brown to grey, damp to moist	314.42		2CS (1.8 - 3.1m)
3.0				
4.0	SM/ML–SILT(GLACIOLACUSTRINE), some fine grained sand, trace clay, poorly graded, well layered (undulating), tan, damp to moist – fine sand seam, little to some silt, saturated (4.45m to 4.50m BGS)	312.44		3CS
5.0			203.2mm BOREHOLE	4CS
6.0				
7.0	ML/CL–SILT(TILL), some clay, some fine to coarse gravel, little sand, few cobbles, very hard, stiff, light brown to grey, damp – oblique fracture with silt infilling – dry to damp	310.00	BENTONITE GROUT	5CS
8.0				6CS
9.0				
10.0	– 2cm wet pocket (@ 9.9m BGS) – softer (10.0m to10.5m BGS)			7CS
11.0				8CS
12.0				
13.0	ML–SILT(GLACIOLACUSTRINE), little to some clay, little fine sand, occasional pebble, layered, varved, light grey to light brown, damp to moist	303.45		9CS

SAMPLE columns: NUMBER | STATE | 'N' VALUE

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

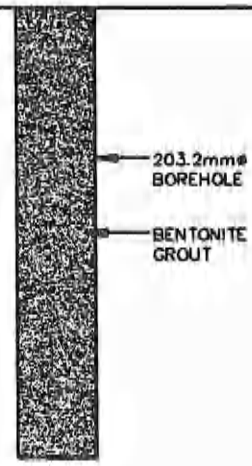
GRAIN SIZE ANALYSIS ⬭ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-10)

PROJECT NAME: ST. MARY'S LANDFILL
PROJECT NO.: 0645
CLIENT: TOWN OF ST. MARY'S
LOCATION: AS PER PLAN

HOLE DESIGNATION: BH11-91 (Page 2 of 2)
DATE COMPLETED: OCTOBER 10, 1991
DRILLING METHOD: 108mm ID HSA
CRA SUPERVISOR: J.C. MUGFORD



DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION m AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE
14.0						
	ML–SILT(TILL), little to some fine sand and clay, little gravel, very dense, hard, damp	301.95		10CS	X	
15.0						
16.0	– becoming silt with some sand and little clay, partially cemented			11CS	X	
17.0				12CS	X	
	LIMESTONE(BEDROCK), light grey and brown, layered, massive	298.88				
18.0	END OF HOLE @ 17.68 m BGS.	298.57				
19.0						
20.0						
21.0						
22.0						
23.0						
24.0						
25.0						
26.0						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

GRAIN SIZE ANALYSIS ◯ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-11)

PROJECT NAME: ST. MARY'S LANDFILL

PROJECT NO.: 0645

CLIENT: TOWN OF ST. MARY'S

LOCATION: AS PER PLAN

HOLE DESIGNATION: BH12-91 (Page 1 of 2)

DATE COMPLETED: OCTOBER 16, 1991

DRILLING METHOD: 108mm ID HSA

CRA SUPERVISOR: J.C. MUGFORD

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION m AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE
	GROUND SURFACE	317.07				
	ML-SILT(TILL), some clay, little sand, trace gravel, few cobbles, soft, well fractured, light brown to brown, damp		CONCRETE SEAL	1CS		
1.0	- very hard, occasional fracture					
2.0				2CS		
3.0	ML-SILT(OUTWASH), some very fine grained sand, trace clay, occasional pebble, compact, poorly graded, tan, saturated	314.17		3CS (2.9 - 4.1m)		
4.0	ML-SILT(TILL), some clay, some sand, little gravel, hard, very stiff, slight horizontal fracturing and layering, brown, damp	312.96	203.2mm⌀ BOREHOLE	4CS (4.3 - 5.8m)		
5.0						
6.0				5CS		
7.0	- trace to little gravel, frequent pebbles and cobbles, stiff, medium brown, damp		BENTONITE GROUT			
8.0	- sand, silt and gravel seam (8.23 to 8.38m BGS)			6CS		
9.0	- wet seam					
	- wet seam			7CS		
10.0	- little clay and sand, trace gravel, crumbly and fissile, light brown-grey, dry to damp					
11.0				8CS		
	- dry sand seam (2cm thick)					
12.0				9CS		
13.0	- frequent sub-horizontal to oblique fractures, dark brown, moist (13.4 to 14.3m BGS)					

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

GRAIN SIZE ANALYSIS ◯ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-11)

PROJECT NAME: ST. MARY'S LANDFILL
PROJECT NO.: 0645
CLIENT: TOWN OF ST. MARY'S
LOCATION: AS PER PLAN

HOLE DESIGNATION: BH12-91

DATE COMPLETED: OCTOBER 16, 1991
DRILLING METHOD: 108mm ID HSA
CRA SUPERVISOR: J.C. MUGFORD

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION m AMSL	SAMPLE NUMBER
14.0	– occasional thin varved intervals		10CS
15.0	– oblique fractures, moist (14.94 to 15.40m BGS) – little clay, trace to little gravel, hard, blocky structure, medium brown–grey, damp		11CS
16.0			
17.0	– less pebbles		12CS
18.0	– layered silts (18.29 to 19.20m BGS)		
19.0			13CS
	SP–SAND, fine grained, little to some silt, poorly graded, dry	297.87	14CS
20.0	LIMESTONE(BEDROCK) END OF HOLE @ 19.96 m BGS.	297.11	
21.0			
22.0			
23.0			
24.0			
25.0			
26.0			

MONITOR INSTALLATION

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

GRAIN SIZE ANALYSIS ⬭ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-12)

PROJECT NAME: ST. MARY'S LANDFILL
PROJECT NO.: 0645
CLIENT: TOWN OF ST. MARY'S
LOCATION: AS PER PLAN

HOLE DESIGNATION: BH13-91 (Page 1 of 2)
DATE COMPLETED: OCTOBER 18, 1991
DRILLING METHOD: 108mm ID HSA
CRA SUPERVISOR: J.C. MUGFORD

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION m AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE
	GROUND SURFACE	313.79				
	ML-SILT(OUTWASH), little sand, little clay, few pebbles, stiff, interlayered, brown and tan, damp		CONCRETE SEAL	1CS		
1.0	ML/CL-SILT(TILL), some clay, some sand, trace gravel, hard, stiff, damp - fractured	312.88				
2.0	- fine to coarse grained sand seam, trace silt, wet (2cm thick)			2CS		
3.0				3CS		
4.0	- horizontal fracture, shiny			4CS		
5.0			203.2mmØ BOREHOLE	5CS (4.6 - 5.6m)		
6.0	- no fractures observed			6CS		
7.0			BENTONITE GROUT			
8.0				7CS		
9.0	- frequent horizontal to sub-vertical fractures, shiny, smooth, moist (9.14 to 10.67m BGS)			8CS		
10.0	- dry to damp					
11.0	- little to some clay, damp			9CS		
12.0	ML-SILT and SAND(TILL), little gravel, trace to little clay, compact, non-cohesive, tan to light brown, moist, partially cemented	301.54		10CS		
13.0						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

GRAIN SIZE ANALYSIS ◯ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-12)

PROJECT NAME: ST. MARY'S LANDFILL
PROJECT NO.: 0645
CLIENT: TOWN OF ST. MARY'S
LOCATION: AS PER PLAN

HOLE DESIGNATION: BH13-91 (Page 2 of 2)
DATE COMPLETED: OCTOBER 18, 1991
DRILLING METHOD: 108mm ID HSA
CRA SUPERVISOR: J.C. MUGFORD

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION m AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE
14.0			203.2mmø BOREHOLE; BENTONITE GROUT	11CS (13.3 – 14.8m)		
15.0	– very moist			12CS		
	LIMESTONE(BEDROCK)	298.25				
16.0	END OF HOLE @ 15.54 m BGS.					
17.0						
18.0						
19.0						
20.0						
21.0						
22.0						
23.0						
24.0						
25.0						
26.0						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

GRAIN SIZE ANALYSIS ◯ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-13)

PROJECT NAME: ST. MARY'S LANDFILL
PROJECT NO.: 0645
CLIENT: TOWN OF ST. MARY'S
LOCATION: AS PER PLAN

HOLE DESIGNATION: BH14-91
DATE COMPLETED: OCTOBER 21, 1991
DRILLING METHOD: 108mm ID HSA
CRA SUPERVISOR: J.C. MUGFORD

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION m AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE
	GROUND SURFACE	317.60				
	ML/CL-SILT(TILL), some sand and clay, damp		CONCRETE SEAL			
1.0						
2.0			203.2mmø BOREHOLE			
3.0	ML-SILT(GLACIOLACUSTRINE), some clay, little fine grained sand, few pebbles, soft to firm, layered, light brown to brown, moist	314.60				
4.0			BENTONITE GROUT	1CS		
	ML-SILT(TILL), little to some sand, little clay, trace gravel, few cobbles, firm, light brown, moist	313.13				
5.0				2CS		
	ML-SILT(OUTWASH), little to some very fine sand, trace clay, occasional pebble, compact, tan, wet – occasional fine to medium grained sand seam, wet (2cm thick)	312.42		3CS		
6.0						
	ML/CL-SILT(TILL), some clay and sand, trace gravel, very stiff, medium to dark brown, moist – damp	311.20				
7.0				4CS		
	END OF HOLE @ 7.57 m BGS.	310.03				
8.0						
9.0						
10.0						
11.0						
12.0						
13.0						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

GRAIN SIZE ANALYSIS ⬭ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-15)

PROJECT NAME: ST. MARY'S LANDFILL
PROJECT NO.: 0645
CLIENT: TOWN OF ST. MARY'S
LOCATION: AS PER PLAN

HOLE DESIGNATION: BH16-91
DATE COMPLETED: OCTOBER 21, 1991
DRILLING METHOD: 108mm ID HSA
CRA SUPERVISOR: J.C. MUGFORD

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION m AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE
	GROUND SURFACE	317.24				
	ML–SILT(TILL), some clay and sand, damp to moist		CONCRETE SEAL			
1.0						
2.0			203.2mmø BOREHOLE			
3.0	ML/CL–SILT and CLAY(GLACIOLACUSTRINE), trace to little fine sand, layered, firm, tan to light brown, moist	314.50		1CS (2.7 – 3.4m)		
	ML–SILT(TILL), some fine grained sand, little clay, firm, tan, saturated	313.89				
4.0	SW–SAND, coarse grained, little silt, little gravel, little fine grained sand, saturated	313.43	BENTONITE GROUT			
5.0				2CS		
				3CS		
6.0	– some gravel			4CS		
7.0	ML/CL–SILT(TILL), some clay, stiff, brown, damp to moist	310.53				
	– fine to medium grained sand seam, wet (20cm thick)	309.92				
8.0	END OF HOLE @ 7.32 m BGS.					
9.0						
10.0						
11.0						
12.0						
13.0						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

GRAIN SIZE ANALYSIS ◯ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-17)

PROJECT NAME: ST. MARY'S LANDFILL

PROJECT NO.: 0645

CLIENT: TOWN OF ST. MARY'S

LOCATION: AS PER PLAN

HOLE DESIGNATION: BH18-91

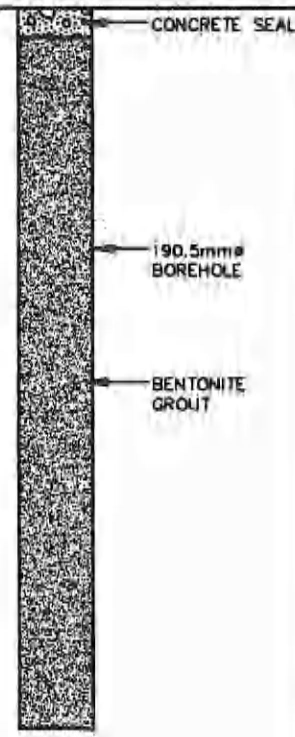
DATE COMPLETED: NOVEMBER 16, 1991

DRILLING METHOD: 95mm ID HSA

CRA SUPERVISOR: J.C. MUGFORD

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION m AMSL	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE
	GROUND SURFACE	317.00			
	GM-GRAVEL(FILL), some silt, some sand, loose brown, moist				
1.0	ML-SILT(TILL), some sand, little to some clay, little gravel, hard, light brown, damp to moist	316.39			
2.0			1SS		50
3.0	- damp		2SS		52
4.0	ML/CL-SILT and CLAY(GLACIOLACUSTRINE), occasional pebble, hard, layered, damp	313.42	3SS		48
5.0	ML-SILT(OUTWASH), little sand and clay, fining upwards, very dense, brown, wet, dilatant	312.12	4SS		77
6.0	ML-SILT(TILL), some sand, some clay, little gravel, grey-brown, hard, damp to moist	311.77	5SS		79
	SW-SAND, trace silt, well graded, medium dense, salt and pepper colour, saturated	310.75	6SS		27
7.0	ML/CL-SILT(TILL), some clay, some sand, little gravel, hard, grey-brown, damp	310.29	7SS		43
	END OF HOLE @ 7.47 m BGS.	309.53			
8.0					
9.0					
10.0					
11.0					
12.0					
13.0					

MONITOR INSTALLATION



NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

GRAIN SIZE ANALYSIS ⬭ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-18)

PROJECT NAME: ST. MARY'S LANDFILL

PROJECT NO.: 0645

CLIENT: TOWN OF ST. MARY'S

LOCATION: AS PER PLAN

HOLE DESIGNATION: BH19-91

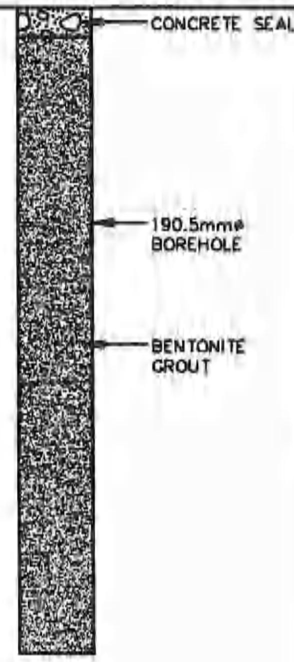
DATE COMPLETED: NOVEMBER 16, 1991

DRILLING METHOD: 95mm ID HSA

CRA SUPERVISOR: J.C. MUGFORD

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION m AMSL	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE
	GROUND SURFACE	317.39			
	ML/CL-SILT(TILL), some clay and sand, moist				
1.0					
2.0	SW/GM-SAND and GRAVEL, little silt, loose, wet, occasional silt layer	315.56			
3.0			1SS	X	35
4.0	- coarse grained sand				
5.0	SM-SILT and SAND, very fine grained, very dense, light brown, wet	312.36	2SS	X	80
	ML/CL-SILT(TILL), some clay, some sand, little gravel, hard, medium brown-grey, damp	312.21			
6.0			3SS	X	76
7.0	END OF HOLE @ 6.71 m BGS.	310.68			
8.0					
9.0					
10.0					
11.0					
12.0					
13.0					

MONITOR INSTALLATION



NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

GRAIN SIZE ANALYSIS ◯ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-19)

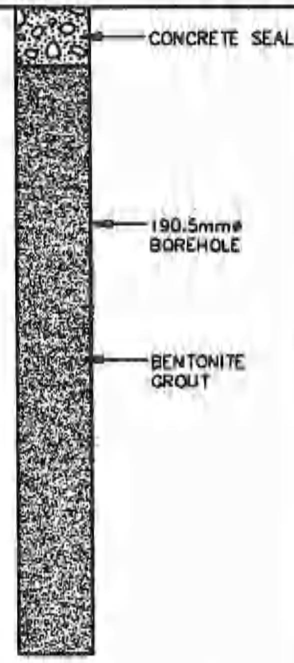
PROJECT NAME: ST. MARY'S LANDFILL
PROJECT NO.: 0645
CLIENT: TOWN OF ST. MARY'S
LOCATION: AS PER PLAN

HOLE DESIGNATION: BH20-91
DATE COMPLETED: DECEMBER 9, 1991
DRILLING METHOD: 95mm ID HSA
CRA SUPERVISOR: J.C. MUGFORD

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION m AMSL
	GROUND SURFACE	315.62
	ML-SILT(TILL), little to some clay and sand, trace gravel, hard, damp	
	ML-SILT(TILL, REWORKED LACUSTRINE), some clay, trace to little fine sand, hard, light brown, damp	314.09
	- few dark brown moist clayey seams, few small pebbles, no obvious layering	
	- laminated silt and clay layers, hard, light brown, damp	313.09
	ML/SM-SILT(LACUSTRINE), little to some very fine sand, trace clay, tan, dilatant, wet, dense, trace layering, non-cohesive	
	- very dense, slight layering, few dilatant sand pores	311.50
	- undulating silt and sand bedding layers (2 to 4cm thick)	
	ML-SILT(TILL), some clay and sand, trace gravel, hard, brown	
	- fine to medium sand and silt layers, wet (0.5 to 1.5cm thick @ 4.27, 4.36, 4.45 and 4.54m BGS)	
	- little to some sand, few large pebbles, extremely hard, damp	
	- little gravel	308.91
	END OF HOLE @ 6.71 m BGS.	

Depth scale (m BGS): 1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 7.0, 8.0, 9.0, 10.0, 11.0, 12.0, 13.0

MONITOR INSTALLATION



SAMPLE NUMBER	STATE	'N' VALUE
1SS	X	69
2SS	X	69
3SS	X	91
4SS	X	86
5SS	X	77
6SS	X	76
7SS	X	67
8SS	X	54
9SS	X	54

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

GRAIN SIZE ANALYSIS ◯ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

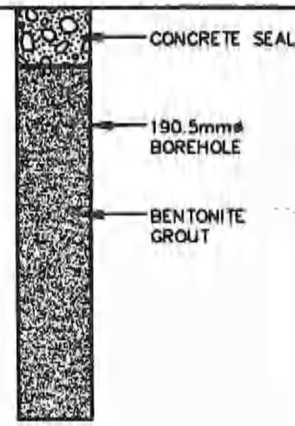
(L-21)

PROJECT NAME: ST. MARY'S LANDFILL
PROJECT NO.: 0645
CLIENT: TOWN OF ST. MARY'S
LOCATION: AS PER PLAN

HOLE DESIGNATION: BH22-91
DATE COMPLETED: DECEMBER 10, 1991
DRILLING METHOD: 95mm ID HSA
CRA SUPERVISOR: J.C. MUGFORD

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION m AMSL	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE
	GROUND SURFACE	314.22			
	SW-SAND, little silt, trace gravel, fine to medium grained, loose, brown, saturated	313.61	1SS		21
1.0	ML-SILT(TILL), some sand, little gravel, trace to little clay, hard, brown, moist	313.15	2SS		74
	GW-GRAVEL, some sand, little silt, saturated	312.70			
2.0	ML-SILT(TILL), some sand, little clay and gravel, hard, light brown, moist		3SS		53
			4SS		50
3.0	- some clay, grey				
	- very stoney (3.66 to 4.27m BGS)		5SS		40
4.0					
	END OF HOLE (REFUSAL) @ 4.27 m BGS.	309.95			
5.0					
6.0					
7.0					
8.0					
9.0					
10.0					
11.0					
12.0					
13.0					

MONITOR INSTALLATION



NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

GRAIN SIZE ANALYSIS ⬭ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-22)

PROJECT NAME: ST. MARY'S LANDFILL
PROJECT NO.: 0645
CLIENT: TOWN OF ST. MARY'S
LOCATION: AS PER PLAN

HOLE DESIGNATION: BH23-91
DATE COMPLETED: DECEMBER 11, 1991
DRILLING METHOD: 95mm ID HSA
CRA SUPERVISOR: J.C. MUGFORD

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION m AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE
	GROUND SURFACE	313.97				
	ML-SILT(LACUSTRINE), little to some very fine sand, trace clay, occasional small pebble, non-cohesive, medium dense, tan, moist	313.51	CONCRETE SEAL	1SS	X	25
1.0	ML-SILT(TILL), some sand, little clay, little gravel, stiff, brown, damp	313.21		2SS	X	56
	SM-SAND and SILT, some gravel, very dense, brown, moist to wet	312.45	190.5mmØ BOREHOLE	3SS	X	38
2.0	ML-SILT(TILL), some clay and sand, trace gravel, hard, brown, damp to moist - stones and gravel (2.29to 3.05m BGS)					
3.0	- damp		BENTONITE GROUT	4SS	X	60
4.0						
	- stoney			5SS	X	>100
5.0						
	END OF HOLE @ 5.18 m BGS.	308.79				
6.0						
7.0						
8.0						
9.0						
10.0						
11.0						
12.0						
13.0						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

GRAIN SIZE ANALYSIS ⬭ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-23)

PROJECT NAME: ST. MARY'S LANDFILL
PROJECT NO.: 0645
CLIENT: TOWN OF ST. MARY'S
LOCATION: AS PER PLAN

HOLE DESIGNATION: BH24-91
DATE COMPLETED: DECEMBER 11, 1991
DRILLING METHOD: 95mm ID HSA
CRA SUPERVISOR: J.C. MUGFORD

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION m AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE
	GROUND SURFACE	313.97				
	ML–SILT(TILL), some sand and clay, little gravel, hard, light brown, damp		CONCRETE SEAL			
1.0				1AR	X	
	– stoney, brown		190.5mmø BOREHOLE			
2.0			BENTONITE GROUT	2AR	X	
3.0						
4.0				3AR	X	
	END OF HOLE @ 4.57 m BGS.	309.40				
5.0						
6.0						
7.0						
8.0						
9.0						
10.0						
11.0						
12.0						
13.0						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

GRAIN SIZE ANALYSIS ⬭ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-25)

PROJECT NAME: ST. MARY'S LANDFILL
PROJECT NO.: 0645
CLIENT: TOWN OF ST. MARY'S
LOCATION: AS PER PLAN

HOLE DESIGNATION: BH26-91
DATE COMPLETED: DECEMBER 12, 1991
DRILLING METHOD: 95mm ID HSA
CRA SUPERVISOR: J.C. MUGFORD

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION m AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE
	GROUND SURFACE	316.96				
	ML-SILT(TILL), some clay and sand, little gravel, hard, grey-brown, moist, cohesive		CONCRETE SEAL			
1.0	ML/SM-SILT(LACUSTRINE), some fine sand, little clay, very dense, tan, moist to wet, faint layering, non-cohesive	315.95		1SS	X	38
2.0	ML-SILT(TILL, REWORKED LACUSTRINE), some fine sand, little to some clay, trace gravel light grey-brown, damp to moist, cohesive -occasional clay seam with thin (.5cm thick) silt and fine sand layering, damp to moist, occasional moist oblique fracture	315.13		2SS	X	40
			190.5mmø BOREHOLE	3SS	X	28
3.0				4SS	X	38
4.0	- trace fine pebbles		BENTONITE GROUT	5SS	X	47
5.0	GW-GRAVEL, some sand, trace silt, stoney, very dense, saturated	312.24		6SS	X	76
	SW-SAND, some gravel, fine to coarse grained, very dense, salt and pepper colour, saturate	311.63		7SS	X	43
6.0	ML/SM-SILT, some fine sand, trace clay, tan, saturated	311.02				
	ML-SILT(TILL), some sand and clay, trace to little gravel, hard, light grey-brown, damp to moist	310.71		8SS	X	36
7.0						
8.0				9SS	X	80
	END OF HOLE @ 8.23 m BGS.	308.73				
9.0						
10.0						
11.0						
12.0						
13.0						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

GRAIN SIZE ANALYSIS ◯ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-26)

PROJECT NAME: ST. MARY'S LANDFILL
PROJECT NO.: 0645
CLIENT: TOWN OF ST. MARY'S
LOCATION: AS PER PLAN

HOLE DESIGNATION: BH27-91
DATE COMPLETED: DECEMBER 12, 1991
DRILLING METHOD: 95mm ID HSA
CRA SUPERVISOR: J.C. MUGFORD

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION m AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE
	GROUND SURFACE	316.01				
	ML-SILT(TILL), some sand and clay, little gravel, light brown, damp		CONCRETE SEAL			
1.0						
	ML-SILT(LACUSTRINE), some clay and fine sand, dense, tan, damp, layered	314.49				
2.0				1SS	X	40
3.0			190.5mm⌀ BOREHOLE	2SS	X	47
4.0	SW-SAND, some gravel, fine to coarse grained, well graded, very dense, saturated	312.20	BENTONITE GROUT			
5.0	ML-SILT(TILL), some sand and clay, little gravel, very hard, light brown, damp to moist	311.29		3SS	X	50
6.0				4SS	X	>50
7.0						
8.0				5SS	X	94
	END OF HOLE @ 8.23 m BGS.	307.78				
9.0						
10.0						
11.0						
12.0						
13.0						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

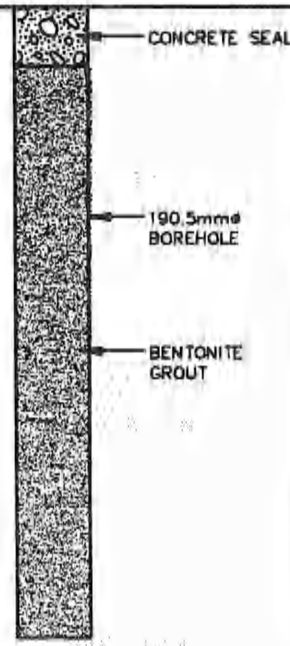
GRAIN SIZE ANALYSIS ⬭ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-27)

PROJECT NAME:	ST. MARY'S LANDFILL	HOLE DESIGNATION:	BH28-91
PROJECT NO.:	0645	DATE COMPLETED:	DECEMBER 12, 1991
CLIENT:	TOWN OF ST. MARY'S	DRILLING METHOD:	95mm ID HSA
LOCATION:	AS PER PLAN	CRA SUPERVISOR:	J.C. MUGFORD

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION m AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE
	GROUND SURFACE	*313.50*				
	ML-SILT(TILL), some sand and clay, little gravel, very stoney, hard, brown, damp		CONCRETE SEAL			
1.0						
2.0			190.5mmø BOREHOLE	1SS	X	32
3.0	- moist		BENTONITE GROUT	2SS	X	44
4.0	- damp			3SS	X	
5.0						
6.0				4SS	X	54
	END OF HOLE @ 6.55 m BGS.	*306.95*				
7.0						
8.0						
9.0						
10.0						
11.0						
12.0						
13.0						



NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

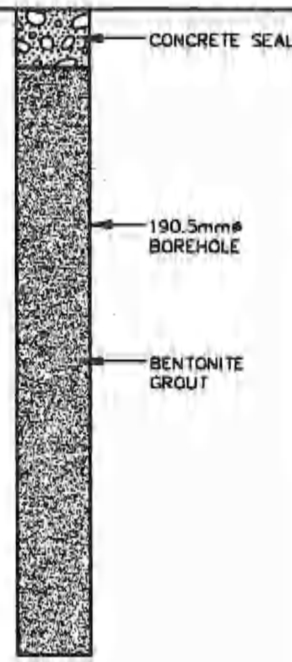
GRAIN SIZE ANALYSIS ⬭ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-28)

PROJECT NAME: ST. MARY'S LANDFILL
PROJECT NO.: 0645
CLIENT: TOWN OF ST. MARY'S
LOCATION: AS PER PLAN

HOLE DESIGNATION: BH29-91
DATE COMPLETED: DECEMBER 13, 1991
DRILLING METHOD: 95mm ID HSA
CRA SUPERVISOR: J.C. MUGFORD



DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION m AMSL	SAMPLE NUMBER	SAMPLE STATE	'N' VALUE
	GROUND SURFACE	314.24			
	GW-GRAVEL(FILL), some silt and sand, dense, moist				
1.0	ML-SILT(TILL), some clay and sand, little gravel, hard, brown, damp	313.33			
2.0	- sand seam (0.5cm thick)		1SS	X	32
3.0	- very hard		2SS	X	43
4.0					
5.0			3SS	X	66
6.0			4SS	X	86
7.0	END OF HOLE @ 6.71 m BGS.	307.53			
8.0					
9.0					
10.0					
11.0					
12.0					
13.0					

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

GRAIN SIZE ANALYSIS ◯ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(L-29)

PROJECT NAME: ST. MARY'S LANDFILL
PROJECT NO.: 0645
CLIENT: TOWN OF ST. MARY'S
LOCATION: AS PER PLAN

HOLE DESIGNATION: BH30-91
DATE COMPLETED: DECEMBER 13, 1991
DRILLING METHOD: 95mm ID HSA
CRA SUPERVISOR: J.C. MUGFORD

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION m AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE
	GROUND SURFACE	317.61				
	ML-SILT(TILL), some sand and clay, little gravel, stoney, hard, brown, damp		CONCRETE SEAL			
1.0				1AR		
2.0						
	ML-SILT(LACUSTRINE), some clay, little to some fine sand, medium dense, tan, moist	315.32	190.5mmø BOREHOLE	2AR		
3.0	ML/SM-SILT(OUTWASH), some fine sand, trace clay, very dense, tan, wet - fine to medium grained sand and silt seam, wet (3.35 to 3.51m and 3.81 to 4.11m BGS)	314.56		3SS		72
4.0	- occasional pebble, coarsely layered, very dense, wet		BENTONITE GROUT	4SS		>50
5.0	- silt with little fine sand and clay			5SS		>100
	ML-SILT(TILL), some clay and sand, little gravel, stoney, very hard, brown, damp	312.43		6SS		36
6.0	- moist			7SS		36
7.0						
8.0				8SS		69
	END OF HOLE @ 8.23 m BGS.	309.38				
9.0						
10.0						
11.0						
12.0						
13.0						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

GRAIN SIZE ANALYSIS ◯ WATER FOUND ▽ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

(L-30)

PROJECT NAME: ST. MARY'S LANDFILL
PROJECT NO.: 0645
CLIENT: TOWN OF ST. MARY'S
LOCATION: AS PER PLAN

HOLE DESIGNATION: BH31-91
DATE COMPLETED: DECEMBER 13, 1991
DRILLING METHOD: 95mm ID HSA
CRA SUPERVISOR: J.C. MUGFORD

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEVATION m AMSL	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE STATE	SAMPLE 'N' VALUE
	GROUND SURFACE	*316.52*				
	ML–SILT(TILL), some sand and clay, trace gravel, hard, brown, damp		CONCRETE SEAL			
1.0						
2.0				1SS	X	49
	ML/SM–SILT(LACUSTRINE), little fine sand, little to some clay, hard, tan, moist to wet gradational layering – silt with some fine sand (3.20 to 3.51m BGS)	*313.78*	190.5mmø BOREHOLE			
3.0						
				2SS	X	58
4.0						
	ML–SILT(TILL), some sand and clay, little gravel, hard, brown, damp	*312.25*	BENTONITE GROUT			
5.0				3SS	X	52
6.0				4SS	X	46
7.0	– very hard, dry to damp					
8.0				5SS	X	>100
	END OF HOLE @ 8.08 m BGS.	*308.44*				
9.0						
10.0						
11.0						
12.0						
13.0						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

GRAIN SIZE ANALYSIS ⬭ WATER FOUND ∇ STATIC WATER LEVEL ▼

Test Pit Logs

St. Marys Landfill

Test Pit No	Depth Interval	Soil Description	Soil Sample No.	Soil Sample Depth	Groundwater
TP 1		Elevation: 314.61 masl			
	0 - 0.25	Medium grey clayey SILT; friable; contains roots; moist (FILL)			
	0.25 - 0.30	Dark grey SILT, organic matter (TOPSOIL)			
	0.30 - 2.10	Medium grey silty CLAY, some sand, some gravel; bedded to 0.66 then massive; stiff to very stiff; moist (TILL) Becoming gravlly at bottom of pit with sandy seams, trace cobbles; wet	S1 S2	0.45 1.0	No water seepage observed
TP 2		Elevation: 316.14 masl			
	0 - 1.75	Light to medium grey gravelly SILT, some clay, some sand, some cobbles; weathered; soft to firm; moist becoming wet around 1.0 m Becoming sandy at bottom of pit Steel pipe in pit bottom (FILL)	S1 S2	1.05 1.75	No water seepage observed
TP 3		Elevation: 318.52 masl			
	0 - 2.70	Medium grey gravelly sandy SILT, trace clay, some cobbles (rounded to subrounded); loose to soft; some caving of pit sidewalls; moist (FILL) Wet seams and inclusions of stiff clay and hard till below 2.2 m	S1 S2 S3	1.05 2.25 2.70	No water seepage observed
TP 4		Elevation: 316.34 masl			
	0 - 0.20	Medium brown SILT, some organic matter (TOPSOIL)			
	0.20 - 2.30	Light brown SILT, some gravel, some sand, trace cobbles, trace boulder; seams of stiff clay; stiff; weathered (FILL)	S1	1.00	
	2.30 - 2.60	Black SILT, some sand; wire fragment; slight odour; moist (FILL)			No water seepage observed
TP 5		Elevation: 318.29 masl			
	0 - 0.60	Light brown cobbly SILT, some sand, some gravel; loose, friable; moist (FILL)			
	0.60 - 1.90	Light grey SILT and fine SAND; low plastic; massive; dense; moist (native waterlaid deposit)	S1	1.40	
	1.90 - 2.00	Medium grey SILT and CLAY, some sand, some gravel, trace cobbles; hard; moist (TILL)	S2	2.00	No water seepage observed

Test Pit Logs

St. Marys Landfill

Test Pit No	Depth Interval	Soil Description	Soil Sample No.	Soil Sample Depth	Groundwater
TP 6		Elevation: 314.10 masl			
	0 - 0.70	Light brown silty SAND and GRAVEL, some cobbles; compact; saturated	S1	0.35	
	0.70 - 2.50	Light grey SILT and fine SAND; low plastic; massive; dense; moist (native waterlaid deposit) Becoming saturated around 2.3-2.4 m	S2 S3	1.2 2.5	No water seepage observed Cattails in water filled depression nearby likely due to poor drainage and not a shallow water table
TP 7		Elevation: 314.93 masl			
	0 - 2.20	Light brown sandy, gravelly SILT, some cobbles (rounded/subrounded), trace small boulders; massive; stiff; moist (FILL) Caving sidewalls Becoming saturated around 1.9 m	S1 S2	1.4 2.2	No water seepage observed
TP 8		Elevation: 314.62 masl			
	0 - 0.25	Medium brown SILT and CLAY, some organic matter containing roots; friable; moist to wet (TOPSOIL)			
	0.25 - 1.50	Medium grey-brown SILT and CLAY, trace sand, trace gravel, trace cobbles; fractured to 0.5 m very stiff to hard; moist (TILL)	S1	0.90	No water seepage observed
TP 9		Elevation: 314.14 masl			
	0 - 0.30	Dark brown SILT, some fine sand, some organic matter; wet (TOPSOIL)			
	0.30 - 0.60	Meduim brown SILT, fine sand; moist			
	0.60 - 0.75	Mediumb rown silty fine to coarse SAND & fine GRAVEL; loose to compact; wet	S1	0.65	
	0.75 - 1.40	Light grey silty fine SAND; varved; dense; moist	S2	1..3	No water seepage observed
TP 10		Elevation: 312.47 masl			
	0 - 0.15	Medium brown SILT, some sand, some gravel, some organic matter (TOPSOIL)			
	0.15 - 1.00	Meduim brown SILT, SAND, GRAVEL (rounded), ROCK fragments (angular) (FILL) Difficult to dig below 1.0 m due to amount of rock rubble	S1	1.00	Water seepage around 1.0 m

Test Pit Logs

St. Marys Landfill

Test Pit No	Depth Interval	Soil Description	Soil Sample No.	Soil Sample Depth	Groundwater
TP 11		Elevation: 313.23 masl			
	0 - 0.30	Medium grey SILT and CLAY, some sand, trace gravel, some organic matter (FILL)			
	0.30 - 1.40	Medium grey CLAY and SILT, some sand, trace gravel, trace cobbles (rounded); weathered to 1.3 m; very stiff to hard; moist (TILL)	S1	1.30	No water seepage observed
TP 12		Elevation: 314.14 masl			
	0 - 0.10	Dark brown SILT, organic matter (TOPSOIL)			
	0.10 - 1.30	Light grey-brown SILT, some clay, trace sand, trace gravel; stiff to very stiff; moist	S1	1.30	No water seepage observed
TP 13		Elevation: 315.86 masl			
	0 - 0.15	Medium grey CLAY and SILT, trace organic matter; loose; moist			
	0.15 - 1.30	Medium grey CLAY and SILT, trace sand, trace gravel, trace cobbles; weathered to 0.7 m; very stiff to hard; moist (TILL)	S1	0.80	No water seepage observed
CKD		Elevation: 323.94 masl			
	0 - 0.30	Dark Brown SILT, some organic matter; moist (TOPSOIL)			
	0.30 - 0.50	Light grey, silt like, loose, dry (cement kiln dust)	S1	0.50	No water seepage observed

Logged on November 5, 2015 by J. Rutherford

All measurements are in metres unless otherwise indicated.

Soil samples will be retained for three months from date of report.