City of Guelph

2015 Annual Report – Solid Waste Resource Innovation Centre, ECA No. A170128

Prepared by:

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March, 2016

Project Number: 60487592

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March 22, 2016

Mr. Cameron Walsh, CFM, CET
Interim Manager
Solid Waste Resources
Infrastructure, Development and Enterprise
City of Guelph
1 Carden Street
Guelph, ON N1H 3A1

Dear Mr. Walsh:

Project No: 60487592

Regarding: 2015 Annual Report – Solid Waste Resource Innovation Centre, ECA No. A170128

Enclosed, please find our report for this project, addressing the requirements of the WRIC Environmental Compliance Approval (ECA).

Please do not hesitate to call me should you have any questions about this report. Thank you for allowing AECOM to be of continued service to the City of Guelph.

Sincerely,
AECOM Canada Ltd.

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Senior Geologist
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Executive Summary

The City of Guelph Solid Waste Transfer Station and the Wet-Dry Recycling Centre are adjacent facilities that operate under a combined Amended Provisional Certificate of Approval/Environmental Compliance Approval (C of A/ECA) issued by the Ministry of Environment, dated February 10, 2011. At the request of the MOECC, the annual monitoring reports have been consolidated here to produce one monitoring report for both the sites.

Amendment to ECA #A170128, Notice No. 4, dated January 9, 2015, provided minor changes to the ECA (i.e., amended the pre-amble of the ECA and a few of the definitions, etc.) and removed the references to the groundwater and surface water monitoring program from the waste disposal site C of A/ECA #A170128 and transferred them to the Municipal and Private Sewage Works ECA #9496-9NFKJ9, issued January 7, 2015.

The following table presents a summary of the 2015 Annual Report for the City of Guelph Solid Waste Resource Innovation Centre. The C of A/ECA specifies annual reporting requirements. These have been outlined in the left-hand column below, while the right hand column provides a reference to the section of this report where the reader will find further details.

A. Amended Provisional C of A (Waste Disposal Site)

C of A Annual Report Requirement (Condition N)	Report Reference and Summary
52. The City shall submit an annual report on the operation of the Site for the previous calendar year to the District Manager by March 31st of each year. This report will include the information required as follows: (a) the information required by Condition 63(8) of the Certificate dealing with the Composting Site; *63(8) By March 31st following the end of each operating year, the Owner shall prepare and submit to the District Manager, an Annual Report summarizing the operation of the Composting Site covering the previous calendar year. This Annual Report shall include, as a minimum, the following information:* *63(8)(a) A monthly mass balance of the Organic Waste received, processed and transferred from this composting site, including waste type, quantity, sources and/or disposal destinations;*	• Table 1 (Section 2.1) provides details on the organic materials received, processed and transferred from the site. 19,584 tonnes of material was received by the composting facility. Of the materials received, mixed organic materials constituted 19,084 tonnes (97%), brush constituted 424 tonnes (2%) and paper fiber sludge and amendment/mulch made up the remaining 77 tonnes. During 2015, the site accepted organic material mainly from the City of Guelph (52%) and Region of Waterloo (48%). A total of 4,420 tonnes finished compost was removed from the facility in 2015 (83% of the outgoing organics). All the finished compost was shipped to a farmer in Atwood, Ontario, northwest of Guelph. A total of 874 tonnes of screening, residual compost waste, Overs and organic rejected material from the composting process were shipped to the Transfer Station and then the Waste Management Twin Creeks Landfill in Sarnia, Ontario or to various other locations.
63(8)(b) An annual summary mass balance of the organic waste, the wood waste, the waste wood and the amendment material, received, processed and transferred from this composting site, including waste type, quantity, sources, and/or disposal destination;	• Table 1 (Section 2.1) provides details on the organic materials received, processed and transferred from the site including amendment material. In addition to the 19,084 tonnes of mixed organic material received, 77 tonnes of paper fiber sludge and amendment material/mulch in the form of wood chips from various sources was also accepted at the site.
63(8)(c)An annual summary of any deficiencies, items of non-compliance or process aberrations that occurred at this composting site and any remedial/mitigative action taken to correct them;	• As reported in Section 2.5, there were no deficiencies, items of non-compliance, or process aberrations in 2015.
63(8)(d) a descriptive summary of any spills, incidents or other emergency situations which have occurred at this composting site, any remedial measures taken and the measures taken to prevent future occurrences;	• As reported in Section 2.2, no spills took place in 2015 at the composting site.
63(8)(e) A summary describing any rejected waste including quantity, waste type, reasons for rejection and origin of the rejected waste;	• As reported in Section 2.2, there were 14 tonnes of rejected material from the organics plant due to some contamination of the loads with recycled/blue bag material. There were no others rejected in 2015 coming into the facility. The occasional curbside recyclables collection bag (blue bag) is included in the organics deliveries, which are separated and removed by the staff at the facility.

A. Amended Provisional C of A (Waste Disposal Site)

C of A Annual Report Requirement (Condition N)	Report Reference and Summary
63(8)(f) The quantity, by weight and volume of compost and residues produced and the quantity of compost and residues removed from the facility;	• Table 1 (Section 2.1) shows that 4,420 tonnes of finished compost was removed from the facility. 874 tonnes of screening and residual compost waste, Overs and organic rejected material from the composting process were shipped to the Transfer Station and then the Waste Management Twin Creeks Landfill in Sarnia, Ontario or to various other locations.
63(8)(g) Any environmental and operational problems, that could negatively impact the environment, encountered during the operation of the composting site or identified during the facility inspections and any mitigative actions taken;	• There were minor issues with the operation of the biofilter at the composting facility. An action plan was developed and submitted to the Ministry to address the issues. The facility operators continue to assess the operation of the biofilter and further recommendations will be brought forward in 2016.
63(8)(h) Any changes to the WRIC Environmental Emergency Plan, the Operations Manual or the Closure Plan that have been approved by the Director since the last Annual report;	• As reported in Section 2.2, there were no changes to the WRIC Environmental Emergency Plan, the Operations Manual or the Closure Plan since the last annual report.
63(8)(i) Any recommendations to minimize environmental impacts from the operation of the composting site and to improve the composting site operations and monitoring programs in this regard;	• As discussed in Section 2.5, there were no deficiencies/non-compliance or environmental/operational issues related to the compost facility in 2015. The facility is operating as designed.
63(8)(j) A summary of any complaints received and the responses made, as required by the C of A (Air/Noise) for the composting site;	• Section 2.3 discusses the 31 odour complaints from 39 complainants received by staff at the Waste Resource Innovation Centre in 2015. As a result of the several confirmed odours (10) from the WRIC site, the MOECC visited the site and provided recommendations for site housekeeping for storage of material, which, at this time, was believed to be the source of odours. In addition, the City directed the plant operator to investigate possible causes of the odours and a control action plan was implemented.
63(8)(k) A description of the compost distribution/markets;	• As reported in Section 2.2, all compost produced at the site was shipped to a farmer in Atwood, Ontario, northwest of Guelph.
63(8)(l) Conclusions from the advanced pathogen testing as the results relate to the pasteurization temperature monitoring; and	• Section 2.4 reports samples taken from the maturation hall of the compost stream indicate that all compost that has been shipped off of the site has passed the conditions for a Class A compost under the CCME Guidelines and the conditions within the C of A/ECA. • Temperature monitoring logs of the tunnels at the composting facility show that pasteurisation at 55 degrees C was maintained for 72 hours, as required.
63(8)(m) A condition-by-condition analysis of compliance with all Conditions of this Certificate.	• Section 2.6 reports that the City is not aware of any non-compliance issues for 2015.
52(b) A monthly summary of the waste and/or recyclable materials received at the Site, including quantity, source and Ontario Regulation 347 waste classes;	• Table 2 (Section 5.1) provides details of the incoming materials. 136,226 tonnes of material was received by the site. The compost facility received 19,584 tonnes of organics (14% of the materials received in 2015). Recyclables and mixed dry materials constituted 64,523 tonnes (47%) of the total materials received at the site. This included about 59,610 tonnes of paper products and 3 tonnes of plastics. There were 7,935 tonnes (5%) brush, leaves, yard waste and mixed organics received. Non-recyclable materials (mixed solid waste organic rejected s) constituted 43,574 tonnes (29%) of the total materials received at the site in 2015. • Recyclables accepted by the WRIC originated mainly from the United States (54%) and the City of Guelph (26%). Materials accepted at the Transfer Station were mainly from the City of Guelph, of which 62% was mixed solid waste. The Regulation 347 waste classes received at the site are summarized on Table 2.
52(c) A monthly summary of wastes and/or recyclable materials processed at the Site, including quantity and Ontario Regulation 347 waste classes.	• Table 3 (Section 5.2) provides details on processed waste at the site. There were 46,899 tonnes of outgoing materials from the Material Recovery (MRF), mainly paper and cardboard products. 6,116 tonnes of material remained in inventory (excluding the compost facility) at the end of 2015. Materials that are accepted by the site are either diverted to be re-used or sent to the landfill for disposal.

A. Amended Provisional C of A (Waste Disposal Site)

C of A Annual Report Requirement (Condition N)	Report Reference and Summary
52(d) A monthly summary of wastes and/or recyclable materials transferred off-Site, including quantity, destination, and Ontario Regulation 347 waste classes.	• Table 3 (Section 5.2) provides details on the outgoing materials. Of the 120,319 tonnes of outgoing material, 46,899 tonnes (39%) is processed on-site through the Material Recovery facility (MRF) and 4,420 tonnes (9%) of finished compost was produced. 133 tonnes went from the organic compost plant to residual compost waste (Overs). The remaining 80,906 tonnes (67%) is shipped off-site to other destinations. • Of the 65,080 tonnes of non-processed outgoing materials received, 41,866 tonnes (64% of the outgoing materials) was sent to the Waste Management Twin Creeks Landfill in Lambton County, 15,932 tonnes (24.5%) was sent to then Energy-from-Waste (EFW) facility in Detroit, Michigan and 4,302 tonnes (7%) was sent to the Smith Creek Landfill in Michigan for disposal. About 4,176 tonnes (6%) of non-processed materials is marketable consisting of other recyclable materials such as shingles, clean wood, drywall, concrete and rubble. • Of the 50,686 tonnes of marketable processed material transferred off the site from the WRIC facility. 30,855 tonnes (61%) was paper-based goods such as cardboard and newsprint, 7,920 tonnes (16%) was organics, 3,672 tonnes (4%) was plastics and the remaining 8,240 tonnes (16%) was other recyclable materials such as aluminum, steel cans, glass, tires and metal. • 64% of the outbound waste/materials from the Transfer Station were shipped off-site to the Waste Management Twin Creeks Landfill in Lambton County.
52(e) An annual summary of the analytical results for the groundwater and surface water monitoring program including an interpretation of the results and any remedial/mitigative action undertaken,	• Section 8 discusses groundwater quality. Groundwater monitoring results indicate road salt effects at some up-gradient groundwater monitoring locations (5-96, 8-96, 18b-14, 19b-08, 20b-08, 23b-12). These are related to off-site winter road salting of the adjacent major roadways. Road salt effects are detected in some on-site downgradient groundwater monitors (6b-96, 7-96, 11b-11,13b-01, 15b-01, 17b-08, 19b-08). Monitors 5-96, 6b-96,15b-08 17b-08, 19b-08 and 23b-12 exceeded ODWS for sodium and/or chloride in 2015 as a result of road salt effects. There were no apparent leachate impacts observed in the groundwater at the site boundary. • The nitrate ODWS has historically been exceeded at 7-96 but was within ODWS in 2015. Historically, elevated nitrate concentrations were prevalent across the site at all locations prior to development of the site. Elevated nitrates are most likely a result of surrounding and historic land use in the area and are not a result of site operations. • Exceedances of the iron ODWS, first noted in 2011, were also noted in 2015. The elevated iron concentrations at 18a-14 and 18b-14 may be due to the residual effects of drilling mud used during installation of these monitors. The cause of the increase in iron concentrations is unknown. These iron exceedances will be further investigated in future monitoring events, although they are not considered to be related to site operations. Aside from the sodium, chloride and iron exceedances discussed above, there were no other exceedances of the Ontario Drinking Water Standards in 2015 for the groundwater monitors sampled for the WRIC monitoring program. • As the shallow outwash water quality is not affected by site operations, no effects to the deeper bedrock groundwater would be expected. No leachate effects were detected in the bedrock monitors sampled in 2015. • Section 8.5 discusses organic groundwater results. The organic sampling organic groundwater sample was inadvertently missed in 2015. There are no sources of VOCs on the WRIC property as waste is handled within the covered buildings, truck boxes are covered when outside (preventing contact between the waste and precipitation) and no waste processing occurs on-site. • Section 8.7 discusses the Guideline B-7 assessment for monitor nest 22-11, located along the western property boundary The nitrate and chloride B-7 limits were exceeded during the spring monitoring event at 22b-11 in the overburden. This minor exceedance is considered related to the current surrounding land use in the area as similar concentrations are noted at some upgradient and background location. The iron concentrations at 22a-11 also exceeded Guideline B7 limits during both monitoring events. As previously discussed, iron concentrations at some of the monitor locations were unusually high during the December 2011 monitoring event. These elevated concentrations decreased at 22a-11 during 2012 but have been variable since then. The elevated iron concentrations occurred in both upgradient and downgradient monitors and therefore, do not appear to be related to site operations.

A. Amended Provisional C of A (Waste Disposal Site)

C of A Annual Report Requirement (Condition N)	Report Reference and Summary
	• Section 8.8 discusses surface water quality results. Monthly monitoring of the stormwater management pond in the northwest corner of the site was conducted, with samples collected at the discharge at the north end of the pond (TP1 (out)) on 10 occasions in 2015. SWM pond samples exceeded the PWQO for zinc, iron, total phosphorus and phenols during one or more 2015 sampling events. The elevated total phosphorus is a result of surrounding land use and not a result of operations at the site. Elevated zinc, total phosphorus and iron concentrations appear to be related to external factors since background surface water have also exceeded PWQO for these parameters. Metals are a common contaminant from roadway runoff. Elevated phosphorus is typical in rural and urbanized areas. No organics were detected in the stormwater management pond during 2015. • Of the 11 sets of samples collected in 2015 at EPTS-01 (the existing on-site surface water pond, East Pond), the PWQO for zinc was exceeded during all the 2015 monitoring events. Zinc has consistently exceeded PWQO in the past at this location. Phenols, total phosphorus and iron have exceeded PWQO in the past but were within PWQO in 2015. All the leachate indicator parameters concentrations were within background overburden ranges. Surface water organic sampling in June 2015 showed a low chloroform and o-cresol concentration at the background surface water station, EPTS-01. Low chloroform levels have historically occasionally been detected at this location. There have been no previous detections of o-cresol at EPTS-1. • The SW 1 (Stormwater Detention Area 2) was only sampled in April 2015 when the water level in the detention pond was above the trigger level of 0.46 m. The April sample at the WRIC showed elevated concentrations of boron and alkalinity compared to background surface water quality at the East Pond, although generally similar. 2015 SW 1 parameter concentrations are within the range of historic concentrations at this location. The Provincial Water Quality Objectives (PWQO) were exceeded for zinc. Zinc has historically routinely exceeded PWQO at this location, which is also observed at the East Pond. No discharge was required from Detention Pond 2 in 2015. No other samples at SW1 were collected in 2015 as the pond was frozen/snow covered or dry during the remaining months of the year. • As previously discussed, the design and operation of the WRIC and compost facility minimizes the potential for leachate generation from site activities.
52(f) An annual summary of any deficiencies, items of non-compliance or process aberrations that occurred and remedial/mitigative action taken to correct them.	• Section 11 of the report briefly discusses site compliance. As reported by the City, there were no deficiencies, items of non-compliance, or process aberrations in 2015.
52(g) A summary to any changes to the Engineer's Report and/or the Design and Operations Report that have been approved by the Director since the last annual report;	• As stated in Section 11, there have been no changes to the Engineer's Report or to the Design and Operations Report since the last annual report. There were no changes to the WRIC Environmental Emergency Plan in 2015.
52(h) A summary of any changes to the Design and Operations Report Design and the WRIC Environmental Emergency Plan that were made in accordance with Condition 68(1) of this Certificate;	• As stated in Section 11, there have been no changes to the Engineer's Report since the last annual report. The Design and Operations Report has been updated to include the new Public Drop Off. There were no changes to the WRIC Environmental Emergency Contingency Plan in 2015.
52(i) A summary of any changes to the Design and Operations Report that have been approved by the Director since the last annual report;	• As stated in Section 11, there have been no changes to the Engineer's Report since the last annual report. The Design and Operations Report has been updated to include the new Public Drop Off. There were no changes to the WRIC Environmental Emergency Contingency Plan in 2015.
52(j) Update on activities of the PLC.	• Section 9 summarizes the 2015 PLC activities, as provided by the City.

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1. Introduction and Background

In June 2000, Guelph's City Council made the decision to seek future solid waste disposal capacity through an agreement with a landfill owner outside of the city's corporate boundaries. Since the potential disposal site was to be distant from Guelph, the City needed a Transfer Station to facilitate waste bulking from small collection vehicles into larger transport vehicles. The City constructed the Solid Waste Transfer Station adjacent to the existing Waste Resource Innovation Centre (WRIC), formerly the Wet-Dry Recycling Centre. The WRIC was designed as a composting and multi-material recovery operation for the County of Wellington and the City of Guelph. The 29.54 ha site is located at 110 Dunlop Drive in the southeast part of Guelph. Figure 1 shows the location and layout of the Transfer Station and WRIC.

The Transfer Station has been designed to manage up to 299 tonnes/day of waste, calculated on a weekly average (six days), including municipal, industrial, commercial, and institutional wastes. The Transfer Station began receiving waste on October 14, 2003.

The City carries out a number of waste management operations at the WRIC. These operations include processing of recyclables from the City's "dry" waste stream, transfer of non-compostable materials and non-recyclable waste residues to disposal off-site, a public waste drop-off area, and a municipal hazardous special waste (MHSW) depot. The City's current composting operations have been active since 2012. The site is licensed to handle up to 1,000 tonnes of residual waste transported for disposal per day. Both the Transfer Station and WRIC facility operate under a combined Ministry of the Environment Amended Provisional Certificate of Approval C of A/ECA) No. A170128, dated February 10, 2011.

Amended Provisional C of A/ECA #A170128, Notice No. 1, dated September 22, 2011, amended Condition 58(1) with respect to the composting operation to add item 58(1)(c) on cross-contamination prevention and to add supporting reference documents to Schedule A. Amended Provisional C of A/ECA, Notice No. 2, dated November 2, 2012, provided additions to Condition 54(1) regarding the service area, approved waste types, rates and storage. Amended Provisional C of A/ECA, Notice No. 3, dated January 24, 2013, was an amendment to condition 29(4) of the C of A/ECA that provided the Public Liaison Committee to serve as a forum for their mandate for the whole site and not just for the composting site. Notice No. 3 also expanded the site service area to include New York and Michigan State. Amendment to ECA #A170128, Notice No. 4, dated January 9, 2015, provided minor changes to the ECA (i.e., amended the pre-amble of the ECA and a few of the definitions, etc.) and removed the references to the groundwater and surface water monitoring program from the waste disposal site ECA #A170128 and transferred them to the Municipal and Private Sewage Works ECA #9496-9NFKJ9, issued January 7, 2015. These amendments are included in Appendix E.

A new Public Drop Off (PDO) facility was added to the site in 2015. An application for an amendment was submitted to the MOECC in support of the change that included an updated Design and Operations Report.

As part of the requirements to develop and design the WRIC, a hydrogeological assessment was conducted in 1991[1]. Further groundwater sampling at the proposed site was completed in 1992, 1994 and 1995 prior to the construction of the site[2].

1. *Jagger Hims Limited; Hydrogeological Assessment, Proposed Wet/Dry Facility, Guelph, Ontario; Report prepared for the City of Guelph, October 1991.*
2. *Jagger Hims Limited; Groundwater Monitoring Program; Guelph Wet/Dry Recycling Facility; Draft Report completed for the City of Guelph, September 1995.*

Notes:

- Site Boundary and Fence Based on drawing "MW-1 Monitor Well Locations" Revision B dated Jan 13/09, from Lonsdale Consulting Engineers Inc.
- Google Earth Pro Aerial Photo, Imagery Date: 9/27/2013.

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Transfer Station / WRIC
City of Guelph
Annual Monitoring Program
Groundwater Monitor Location Map

Legend

- Approximate Site Boundary
- Fence
- Monitoring Well
- Surface Water Location

PROJECT NUMBER **60487592**

DATE **February 2016**

FIGURE **1**

A SIZE 8.5" x 11" (215.9mm x 279.4mm)
PLOT: 2/29/2016 10:11:56 AM
BY:----
FILE NAME: 60487592-01-FIG01.DWG

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The main conclusions of these reports were:

a) Groundwater flow in the shallow subsurface is towards the northeast to the Correctional Centre pond and Clythe Creek.

b) Background groundwater quality in the area is considered hard with calcium, magnesium, and alkalinity the dominant ions. The concentrations of the other major ions (i.e., sodium, potassium, sulphate and chloride) were found for the most part to be low. The exception to this was the 1995 sample collected from monitor 5-91, which exhibited higher than background concentrations of sodium and chloride. The source of the sodium and chloride was considered unknown at that time. The only other parameter of concern was nitrate. This was found at consistently elevated levels at monitors 1a-91, 1b-91, 2b-91 and 3-91, from 1991 until locations 1a-91, 1b-91 and 3-91 were destroyed due to construction activities.

1.1 Annual Reporting Requirements

Section N, Condition 52 of the Amended Provisional Certificate of Approval (Waste Disposal Site) states that:

Composting Site

52(a) the information required by Condition 63(8) of the Certificate dealing with the Composting Site;

63(8) By March 31st following the end of each operating year, the Owner shall prepare and submit to the District Manager, an Annual Report summarizing the operation of the Composting Site covering the previous calendar year. This Annual Report shall include, as a minimum, the following information:

63(8)(a) A monthly mass balance of the Organic Waste received, processed and transferred from this composting site, including waste type, quantity, sources and/or disposal destinations.

63(8)(b) An annual summary mass balance of the organic waste, the wood waste, the waste wood and the amendment material, received, processed and transferred from this composting site, including waste type, quantity, sources, and/or disposal destination.

63(8)(c) An annual summary of any deficiencies, items of non-compliance or process aberrations that occurred at this composting site and any remedial/mitigative action taken to correct them.

63(8)(d) A descriptive summary of any spills, incidents or other emergency situations which have occurred at this composting site, any remedial measures taken and the measures taken to prevent future occurrences.

63(8)(e) A summary describing any rejected waste including quantity, waste type, reasons for rejection and origin of the rejected waste.

63(8)(f) The quantity, by weight and volume of compost and residues produced and the quantity of compost and residues removed from the facility.

63(8)(g) Any environmental and operational problems, that could negatively impact the environment, encountered during the operation of the composting site or identified during the facility inspections and any mitigative actions taken.

63(8)(h) Any changes to the WRIC Environmental Emergency Plan, the Operations Manual or the Closure Plan that have been approved by the Director since the last Annual report.

63(8)(i) Any recommendations to minimize environmental impacts from the operation of the composting site and to improve the composting site operations and monitoring programs in this regard.

63(8)(j) A summary of any complaints received and the responses made, as required by the C of A (Air/Noise) for the composting site.

63(8)(k) A description of the compost distribution/markets.

63(8)(l) Conclusions from the advanced pathogen testing as the results relate to the pasteurization temperature monitoring.

63(8)(m) A condition-by-condition analysis of compliance with all Conditions of this Certificate.

Transfer/WRIC Site

The City shall submit an annual report on the operation of the Site for the previous calendar year to the District Manager by March 31st of each year. This report will include the information required as follows:

52(b) A monthly summary of the waste and/or recyclable materials received at the Site, including quantity, source and Ontario Regulation 347 waste classes.

52(c) A monthly summary of the waste and/or recyclable materials processed at the Site, including quantity and Ontario Regulation 347 waste classes.

52(d) A monthly summary of the waste and/or recyclable materials transferred at the off-Site, including quantity, destination and Ontario Regulation 347 waste classes.

52(e) An annual summary of the analytical results for the groundwater and surface water monitoring program including an interpretation of the results and any remedial/mitigative action undertaken.

52(f) An annual summary of any deficiencies, items of non-compliance or process aberrations that occurred and remedial and mitigative measures taken to correct them.

52(g) A summary of any changes to the Engineer's Report and/or Design and Operations Report that have been approved by the Director since the last annual report.

52(h) A summary of any changes to the Design and Operations Report Design and the WRIC Environmental Emergency Plan that were made in accordance with the information specified for a waste processing site as described in the most recent version of the Ministry publication "Guide for Applying for Approval of a Waste Disposal Site".

52(i) A summary of any changes to the Design and Operations Report that have been approved by the Director since the last annual report.

52(j) An update on the activities of the PLC.

The current C of A/ECAs for the site are included in Appendix E.

2. Composting Facility

The original compost facility was shut down in 2006. The City commissioned a new compost facility design, which was completed by the summer of 2011. The composting facility is fully enclosed with all processing and finished product remaining indoors. This facility currently processes only City of Guelph and Region of Waterloo organic material.

2.1 Material Received, Processed and Transferred

As per Section N, Condition 63(8) (a) and (b), Table 1 presents a summary of the waste volumes received, processed and transferred from the site. 19,584 tonnes of material was received by the composting facility. Of the materials received, mixed organic materials constituted 19,084 tonnes (97%), brush constituted 424 tonnes (2%) and paper fiber sludge and amendment/mulch made up the remaining 77 tonnes. During 2015, the site accepted organic material mainly from the City of Guelph (52%) and Region of Waterloo (48%). Amendment material was received in the form of wood chips from other sources (Speedside Construction Ltd. and Accent Tree Services).

Table 1: 2015 Monthly Summary of Incoming and Outgoing Material, Composting Facility

Incoming Material	Jan Tonnes	Feb Tonnes	March Tonnes	Apr Tonnes	May Tonnes	June Tonnes	July Tonnes	Aug Tonnes	Sept Tonnes	Oct Tonnes	Nov Tonnes	Dec Tonnes	Yearly Total
Mixed Organics	1,504.07	1,172.45	1,467.27	1,585.86	1,517.73	1,612.97	1,729.51	1,552.42	1,737.83	1,718.23	1,969.01	1,516.19	19,083.54
Paper Fiber Sludge	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.25	8.16	0.00	15.41
Brush	16.84	0.00	0.00	0.00	0.00	0.00	28.85	53.57	56.21	120.12	64.42	84.13	424.14
Ammendment/Mulch	0.00	0.00	0.00	0.00	0.00	0.00	19.52	0.00	0.00	18.07	5.40	18.30	61.29
Total Month	1,520.91	1,172.45	1,467.27	1,585.86	1,517.73	1,612.97	1,777.88	1,605.99	1,794.04	1,863.67	2,046.99	1,618.62	19,584.38

Outgoing Mixed Waste	Jan Tonnes	Feb Tonnes	March Tonnes	Apr Tonnes	May Tonnes	June Tonnes	July Tonnes	Aug Tonnes	Sept Tonnes	Oct Tonnes	Nov Tonnes	Dec Tonnes	Yearly Total
Finished Compost	241.31	250.47	272.64	271.18	191.48	210.50	353.85	423.37	571.97	543.47	629.68	459.69	4,419.61
Overs	0.00	68.72	64.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	133.34
Screening Waste	14.26	19.04	21.43	14.10	18.28	18.69	28.00	16.97	26.37	15.06	50.41	21.44	264.05
Residual Compost Waste	37.18	54.52	42.70	25.85	23.99	36.96	17.15	30.92	65.56	53.02	53.91	20.76	462.52
Organic Rejected Material	0.00	0.00	0.00	0.00	3.48	3.09	0.00	2.22	3.37	2.28	0.00	0.00	14.44
Total Month	292.75	392.75	401.39	311.13	233.75	266.15	399.00	471.26	663.90	611.55	734.00	501.89	5,293.96

A total of 4,420 tonnes finished compost was removed from the facility in 2015 (83% of the outgoing organics). All the finished compost was shipped to a farmer in Atwood, Ontario, northwest of Guelph. A total of 874 tonnes of screening, residual compost, Overs and organic rejected material from the composting process were shipped to the Transfer Station and then the Waste Management Twin Creeks Landfill in Sarnia, Ontario or to various other locations.

2.2 Deficiencies / Non-Compliance and Environmental / Operational Issues

No spills occurred in 2015 at the composting site.

There were 14 tonnes of rejected material from the organics facility due to some contamination of the materials with recycled/ blue bag material. These were removed to the transfer facility for final disposal. The occasional curbside

recyclables collection bag (blue bag) is included in the organics deliveries, which are separated and removed by the staff at the facility.

There were minor issues with the operation of the biofilter at the composting facility. An action plan was developed and submitted to the Ministry to address the issues. The facility operators continue to assess the operation of the biofilter and further recommendations will be brought forward in 2016.

There were no changes to the WRIC Environmental Emergency Plan or the Closure Plan since the last annual report. The compost facility operated in 2015 without any major incidents.

2.3 Public Complaints

There were 31 odour investigations from 39 complainants in 2015 received by staff at the Waste Resource Innovation Centre. All complaints were investigated by site management staff. Of the 39 complaints received, ten (10) were confirmed to have originated from the WRIC site. Each time a complaint was received, the complainant was contacted and a letter advising the complainant of the investigation findings was hand delivered.

The MOECC visited the site on the July 8, 2015. As a result of the site visit, the MOECC made recommendations for site housekeeping for storage of material, which, at this time, was believed to be the possible source of odours.

As a result of the confirmed July odour complaints, the City e-mailed the PLC on July 24, 2015 to explain what actions had been/were implemented to address the odours. The quarterly biofilter report indicated some operational parameters have changed from the last report that required investigation and remedial action. Wellington Organix recommended an odour control action plan. Highlights of the action plan included:

- Review of daily equipment measures/readings to attempt to identify possible causes and remedy;
- Turn the biofilter media in all three cells, one cell at a time;
- Rinse biofilter media with a water wash, one cell at a time; and
- Bring additional brush/fresh amendment into the facility for processing/production.

2.4 Enhanced Pathogen Testing and Operations Summary

Samples taken from the maturation hall of the compost stream indicate that all compost that has been shipped off of the site has passed the conditions for a Class A[3] compost under the CCME[4] Guidelines and the conditions within the ECA.

To reduce the health risks of pathogenic organisms, organic waste must attain a temperature of 55°C for a period of three days (72-hours) using in-vessel composting methods. The compost material goes through a series of tunnels to get to its finished state. There are seven tunnels at the facility. When material is in a tunnel the temperature in each of those tunnels is measured every five minutes and the logs are stored within a supervisory control and data acquisition (SCADA) system. The operator provides a weekly report which contains a snap shot of the tunnel temperatures. The Operator also takes readings of the curing piles that are maturing in the maturation building. The spreadsheet for the weekly readings of the compost temperatures and all the weekly reports for the snapshots of tunnel temperatures are available upon request. Temperature monitoring logs of the tunnels at the composting facility show that pasteurisation at 55°C was maintained for 72 hours.

3. *Category A = Unrestricted use. Compost that can be used in any application (i.e., agricultural, residential gardens, horticultural operations, nursery industry, other businesses.*
4. *CCME = Canadian Council of Ministers of the Environment, 2005: Guidelines for Compost Quality, PN 1340.*

2.5 Site Operation Recommendations

There were no confirmed deficiencies/non-compliance or environmental/operational issues related to the compost facility in 2015, other than those related to the biofilter, discussed in Section 2.2. The facility is operating as designed.

2.6 Compliance with the Conditions of the Certificate of Approval

Section N, 52(a) refers to reporting requirements associated with the Composting site. Section 63 (8)(m) requires:

> *A condition-by-condition analysis of compliance with all Conditions of this Certificate.*

The City provided the following statement with respect to this condition:

> *"A condition by condition analysis of compliance of all conditions of this Certificate of Approval was done and the City is not aware of any non-compliance issues for 2015.*
>
> *The Deputy CAO of Infrastructure, Development and Enterprise Services and the General Manager of Solid Waste Resources continue to put a very high priority on compliance with applicable laws. Staff training continues to be provided both in-house and by external providers, and included inspections, reporting, due diligence, environmental regulations, competent person, contingency plans, emergency procedures, certificate of approval conditions, spills, TDGA, laboratory packing and other relevant topics."*

3. Municipal Hazardous and Special Waste (MHSW) Operations

3.1 MHSW Waste Screening Procedures and Acceptance Criteria

The information presented in this section was reported by the City of Guelph. Municipal hazardous special waste materials can only be received at the City of Guelph Depot in accordance with the conditions specified on amended ECA #A170128.

Purpose

This procedure is designed to assist the employees at the Municipal Hazardous Special Waste (MHSW) Depot in the screening of waste that is brought to the depot and to prevent the acceptance of items not permitted by ECA #A170128. Adherence to these conditions is mandatory in order to ensure the operating permit is not revoked as a result of non-compliance issues.

Scope

These procedures are for employees at the Municipal Hazardous Special Waste (MHSW) Depot and their Supervisor. The Depot is restricted to accepting only spent municipal and household consumer commodity goods that are widely available to the general public in quantities and concentrations typically found at conventional retail outlets.

Definitions

Municipal Hazardous Special Waste Depot .... A collection centre which accepts municipal and household hazardous waste from residents, which consist of but not limited to, paint, waste oil, thinners, household cleansers, etc., with a capacity of less than fifteen (15) tonnes.

Industrial/Commercial/Institutional Waste ..... Waste from businesses, medical centres, etc. Such waste is not accepted at the MHSW.

PCBs ..... Polychlorinated biphenyls. The import, manufacturing and re-sale of materials containing PCB's was banned in Canada in 1977, but legislation allowed the continued use of previously acquired products until the end of their functional life.

Residential Waste ..... Waste generated by an individual or a family at the place where the individual or the family lives.

TDG ..... Transportation of Dangerous Goods. This is a set of rules to follow regarding the transportation of dangerous substances, including how the materials are to be contained and labelled.

WHMIS ..... The Workplace Hazardous Materials Information System (WHMIS) is Canada's national hazard communication standard. The key elements of the system are cautionary labelling of containers of WHMIS "controlled products", the provision of material safety data sheets (MSDSs) and worker education and training programs.

Conditions

1. The Depot is restricted to accepting MHSW waste from residents within the City of Guelph or County of Wellington only. This information shall be documented on the Waste Ticket Form prior to acceptance of the MHSW materials and must include all contact information necessary to validate residency status.
2. Spent consumer commodity goods that are widely available to the general public in quantities and concentrations typically found at conventional retails outlets, examples include:
   - Canadian Tire products
   - Home Depot products.
3. No industrial, commercial or institutional hazardous waste shall be received at this facility. Waste materials originating from these sources are items that would not be readily available to the general public nor would be considered consumer commodity. Examples include:
   - Laboratory reagents from the local University
   - Large pesticide containers typically sold to farmers
   - Chemical agents in containers greater than 20 L in capacity.
4. The following are not acceptable under any circumstance:
   - Radioactive wastes
   - Explosives and ammunition
   - Pathological wastes (sharps however, are permitted if they are placed in a rigid plastic container, soaked in bleach overnight, drained, and labelled)
   - Unknown wastes
   - Polychlorinated biphenyls (PCBs).
5. Any unacceptable materials inadvertently received at the MHSW or other areas on the WRIC site, must be handled and disposed of in accordance with applicable legislation. The MHSW Co-ordinator is to be contacted immediately upon discovery for processing and handling of these unacceptable materials.

Additional Information

1. All waste received shall be clearly identified either by the labels of the original consumer packaging or if no labels are present, by the resident dropping the material off. The materials must be in a clear container and the contents identifiable by the MHSW attendant. Materials identified by the homeowner will be labelled by City of Guelph staff prior to acceptance and laboratory packing.
2. Only propane in containers typically available to the public is acceptable [Small 1 kg tanks up to barbeque size containers (20 kg)].
3. The City of Guelph MHSW depot reserves the right to reject any waste materials which if received could jeopardize the operational permits held by the site.

Procedures

1. Always wear the appropriate PPE (personal protective equipment) to handle the waste items.
2. All waste containers brought to the Depot shall be sealed prior to acceptance and must be surrendered by the resident. Unacceptable activities include:
   - Decanting gasoline for the purpose of returning jerry-cans to the homeowner
   - Decanting pesticides from small portable pumps.

3. Hazardous waste material characteristic ranking will determine the order in which waste is handled. Many items will have the properties of two or more hazards and items with more than one hazard must be placed in the highest hazards characteristic class. Use the following in order of highest to lowest precedence of hazard:

    1. Radioactive
    2. Poisonous gases
    3. Flammable gases
    4. Non-flammable gases
    5. Biohazardous materials
    6. Poisonous liquid
    7. Pyrophoric materials
    8. Self-reactive
    9. Flammable liquids
    10. Flammable solids
    11. Combustible materials
    12. Miscellaneous hazardous materials.

4. Refused items shall be recorded in the Waste Rejection section of the MHSW Waste Ticket Form with reasons for the refusal documented. Offer the resident a list of Alternate Disposal Options. (See MHSW Operations Manual).

5. Abandoned wastes will be recorded on an Unacceptable Waste Log. (See MHSW Operations Manual).

6. Items of concern (extremely dangerous, toxic, explosive, biohazardous, infectious, or radioactive materials) shall be brought to the attention of the Supervisor of Governance and Compliance.

7. The resident will be contacted within three days in order to trace the whereabouts of any items of concern and to ensure that the material was properly disposed of. If required, the Ministry of Environment and Climate Change, City of Guelph Police Department, Fire Department or the Community Emergency Management Co-ordinator may also need to be notified.

8. Wastes containing PCB's or suspect PCB materials are not acceptable at the City of Guelph MHSW depot, however should such material be suspected or identified after drop-off or in the case of illegal dumping, the following steps shall be taken:

    1. The PCB or suspect PCB waste materials shall be set aside in a secure area, along with the ticket identifying the resident that brought these materials to the depot if it was not illegally dumped.

    2. The material must be sampled and set for analysis to an accredited laboratory to determine the PCB concentration.

    3. Analytical results over 50 ppm confirm the waste to be PCBs.

    4. Upon confirmation of the presence of PCB waste, The City of Guelph shall obtain Directors Instructions from the Ministry of the Environment after which arrangements shall be made for removal and disposal.

Training

All MHSW employees must be trained in WHMIS, TDG, Spills Response, Competent Person, and First Aid to perform these procedures.

Applicable Legislation and References

- OHSA Regulation 860 Workplace Hazardous Material Information System.
- O. Reg. 347 *General Waste Management Transportation of Dangerous Goods Act*, 2002.

4. Waste Transfer Station Operations

4.1 Facility Inspection and Routine Maintenance

The following information was reported by the City of Guelph. The facility is inspected on an ongoing basis by site employees. Corrective maintenance is carried out as required. There were no environmental or operational problems reported during 2015.

A log of all security and grounds inspection noting the condition of the fences, litter, birds, vermin and vectors and any off-site discharges is recorded daily. Routine maintenance is conducted at the site that includes litter pick-up, dust control, rodent control and clean-up of external roads within 1 km of the facility. The compactor is cleaned and inspected weekly when in use. Inspection of the inside floor drains, oil and grit separator, etc., are conducted weekly. The floor drain in the loading ramp is pumped and cleaned every three weeks. Maintenance was conducted on the holding tanks, floor drains and oil and grit separator once per month. The overhead doors are oiled every three weeks. All preventative maintenance performed on equipment are filed under the equipment number (hard copy) as well as recorded electronically in the Synergen program to indicate that the required maintenance has been completed.

A log book recording the weekly inspection of the detention ponds, ditches and facility inspections is kept on-site. Weekly inspections were recorded in 2015.

4.2 Contaminant Sources

4.2.1 Site Design and Operations

To determine if the site is having an impact on the ground and surface water in the area, it is important to examine what are the potential sources of impact. The site has been designed to minimize the possible sources of impacts and limit the risk of their emission to the environment, as discussed below.

Waste is dumped from incoming collection vehicles onto an indoor tipping floor located within the transfer building. The transfer building is a steel framed, metal clad building with a reinforced, surface-hardened slab-on-grade floor. The tipping floor is curbed such that liquid discharges onto the floor cannot readily flow off of the floor to the building exterior. It is drained by floor drains and routed through an oil-water separator, with the provision to divert flows to holding tanks prior to reaching the pumping station through the sanitary sewer. Spill cleanup materials (e.g., sorbents) are kept on hand and any liquid spills on the tipping floor are cleaned up immediately. Washing of spilled materials into the floor drain system is avoided to the greatest degree possible. In the event of any potential for leachate or liquid discharge from the building, the shut-off valve for the stormwater management pond will be closed to prevent any off-site discharge.

No waste processing is undertaken in the Transfer Station, with the exception of removal of recyclable material that arrives in incoming wastes (i.e., metal, wood, cardboard). Truck boxes (both incoming waste and transfers out) are tarped when outside of the transfer building to prevent odour and dust emissions as well as to prevent contact between the waste and precipitation that could potentially produce impacted runoff.

The Transfer Station building and the scale house are serviced with a connection to the City sanitary sewer. Domestic sewage from the washrooms in the transfer building and the scale house are discharged directly to the

sewage pumping station. The stormwater management pond has a valved connection to the pumping station, which will permit any stormwater that becomes impacted to be discharged to the sanitary sewer system. The site is graded such that all runoff drains to the stormwater management pond. As all waste handling occurs within the Transfer Station building, runoff from the site will be initially considered to be unimpacted.

Ditches are located on both sides of the driveway to collect road runoff and to convey upstream runoff to the pond. A culvert conveys flow from the ditch on the west side of the driveway to the ditch on the east side and ultimately to the pond. MOECC approved dust suppressant and road salt for the internal paved areas may be used occasionally.

A new Public Drop Off (PDO) facility was added to the site in 2015. An application for an amendment was submitted to the MOECC in support of the change that included an updated Design and Operations Report. There have been no changes to the Engineer's Report since the last annual report.

5. Incoming and Outgoing Waste and/or Recyclables

5.1 Summary of Incoming Materials

As per Section N, Condition 52(b) of the amended C of A, Table 4 is a monthly summary of the incoming materials received at the site during 2015, based on data recorded by City staff.

As shown on Table 4, 136,226 tonnes of material was received by the site. The compost facility received 19,584 tonnes of organics (14% of the materials received in 2015). Recyclables and mixed dry materials constituted 64,523 tonnes (47%)[5] of the total materials received at the site. This included about 59,610 tonnes of paper products[6] and 3 tonnes of plastics[7]. There were 7,935 tonnes[8] (5%) brush, leaves, yard waste and mixed organics received. Non-recyclable materials (mixed solid waste organic rejected materials) constituted 43,574 tonnes (29%) of the total materials received at the site in 2015. 154 tonnes of clean wood was accepted at the Transfer Station.

The on-site Municipal Hazardous Special Waste (MHSW) depot serves residents of the City of Guelph and the County of Wellington. The depot accepted 22,073 drop offs of materials during 2015. A monthly summary of the 2015 drop off numbers are shown on the table below.

Public	Drop Offs
January	962
February	694
March	1,135
April	2,059
May	2,383
June	2,305
July	2,617
August	2,187
September	2,199
October	2,263
November	1,829
December	1,440
Totals	**22.073**

5. *Table 2 paper incoming (59,610 tonnes)+ plastic incoming (3 tonnes)+ other recyclable incoming to the Transfer Station and the WRIC (4,910 tonnes) = 64,523 tonnes*
6. *Table 2 incoming single stream - loose (624 + 47,866 tonnes) + OCC loose (13 + 2,358 tonnes) + mixed papers (10 + 894 tonnes) + commingle (2 + 7,578 tonnes) + OCC baled (123 tonnes) + single stream bagged (25 tonnes) + single stream baled (39 tonnes) = 59,610 tonnes*
7. *Table 2 incoming PET #1 (2.5 tonnes) + HDPE#2 (0.8 tonnes) = 3.3 tonnes*
8. *Table 2 incoming mixed organics (0.7 tonnes) + yard waste (12 + 3,801 tonnes) + leaves (2,226 tonnes) + brush (2 + 1892 tonnes) + yard waste (12 + 3,801 tonnes) = 7,935 tonnes*

Table 2: 2015 Monthly Summary of Incoming Material

Transfer Station Incoming Material

Incoming Material	Jan Tonnes	Feb Tonnes	March Tonnes	Apr Tonnes	May Tonnes	June Tonnes	July Tonnes	Aug Tonnes	Sept Tonnes	Oct Tonnes	Nov Tonnes	Dec Tonnes	Yearly Total
Mixed Solid Waste	2,916.85	2,154.60	2,771.57	3,870.24	4,417.97	4,217.06	4,291.45	4,035.12	3,877.17	3,971.36	3,832.77	3,203.08	43,559.23
MRF Glass Residue	738.59	382.65	605.62	658.62	692.95	885.12	998.92	752.80	757.52	973.74	827.98	864.18	9,138.69
MRF Residue	683.57	492.64	636.61	699.23	772.04	971.94	579.89	467.65	495.30	558.62	416.29	448.51	7,222.29
Shingles	23.63	14.00	59.32	212.75	338.19	327.51	354.36	294.89	392.22	371.92	264.10	96.06	2,748.95
Drywall	24.54	8.33	89.39	103.39	60.74	67.62	30.37	41.94	67.03	59.73	45.71	28.85	627.64
Single Stream - Loose	0.00	0.00	0.00	0.00	0.00	0.00	88.90	143.23	68.79	229.61	0.00	93.83	624.36
C & D	25.04	31.80	35.03	103.48	121.18	46.03	54.89	50.70	43.53	44.37	32.61	7.44	596.10
Residual Compost Waste	37.18	54.52	42.70	25.85	23.99	36.96	17.15	30.92	65.56	53.02	53.91	20.76	462.52
Rubble/Brick/Toilets	14.17	8.32	4.62	19.78	48.16	39.99	106.79	41.51	45.65	25.50	22.75	11.59	388.83
Screening Waste	14.26	19.04	21.43	14.10	18.28	18.69	28.00	16.97	26.37	15.06	50.41	21.44	264.05
Clean Wood	8.50	5.78	5.54	12.10	11.96	12.77	10.06	20.46	7.59	10.17	25.74	22.92	153.59
Medical Waste	0.00	1.20	2.03	0.00	4.84	5.07	1.96	1.01	1.23	3.27	2.88	1.37	24.86
Organic Rejected Material	0.00	0.00	0.00	0.00	3.48	3.09	0.00	2.22	3.37	2.28	0.00	0.00	14.44
Occ - Loose	0.45	0.00	0.00	1.36	0.00	0.00	7.86	3.25	0.00	0.00	0.00	0.00	12.92
Yardwaste	7.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.47	0.00	12.49
Mixed Papers	0.00	0.00	0.00	1.58	0.00	0.00	0.43	0.00	0.00	1.91	6.22	0.00	10.14
Clean Fill	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.33	3.33
Brush	0.00	0.00	0.00	0.10	0.00	0.00	0.50	0.00	0.10	0.00	0.00	1.33	2.03
Commingle	0.00	0.00	0.00	0.00	0.00	0.00	1.62	0.00	0.00	0.00	0.00	0.00	1.62
Bulky Item Program	0.00	0.00	0.00	0.00	0.19	0.00	0.58	0.00	0.00	0.00	0.00	0.00	0.77
Mixed Organics	0.00	0.00	0.00	0.00	0.00	0.00	0.74	0.00	0.00	0.00	0.00	0.00	0.74
Overs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Month	4,493.80	3,172.88	4,273.86	5,722.58	6,513.97	6,631.85	6,574.46	5,902.67	5,851.43	6,320.56	5,586.84	4,824.69	65,869.59

WRIC (MRF Recycling /PDO Facility) Incoming Material

Incoming Material	Jan Tonnes	Feb Tonnes	March Tonnes	Apr Tonnes	May Tonnes	June Tonnes	July Tonnes	Aug Tonnes	Sept Tonnes	Oct Tonnes	Nov Tonnes	Dec Tonnes	Yearly Total
Aluminum - Loose	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Brush	63.70	61.00	45.67	172.13	312.46	413.39	338.35	196.94	103.17	102.52	51.95	31.16	1,892.44
Clothing	0.89	0.43	0.67	0.73	0.99	0.79	0.71	1.12	0.75	0.93	0.74	0.19	8.94
Commingle	13.40	17.75	16.83	768.41	748.42	899.82	927.88	840.92	856.63	796.87	824.31	836.47	7,547.72
Electronics	14.16	9.13	20.33	24.29	19.34	20.75	22.63	27.84	19.29	14.94	19.18	14.41	226.29
Empty Oil Containers	0.37	0.11	0.17	0.30	0.41	0.36	1.82	1.26	0.97	0.47	0.37	0.35	6.96
HDPE #2	0.10	0.12	0.09	0.13	0.00	0.24	0.00	0.00	0.00	0.00	0.11	0.00	0.79
Leaves	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2,226.29	0.00	2,226.29
Mixed Papers	56.81	54.18	63.48	83.21	82.13	86.05	69.03	59.05	72.07	90.43	84.48	93.54	894.46
Mixed Plastics	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 2: 2015 Monthly Summary of Incoming Material (continued)

WRIC (MRF Recycling /PDO Facility) Incoming Material

Incoming Material	Jan Tonnes	Feb Tonnes	March Tonnes	Apr Tonnes	May Tonnes	June Tonnes	July Tonnes	Aug Tonnes	Sept Tonnes	Oct Tonnes	Nov Tonnes	Dec Tonnes	Yearly Total
OCC - Baled	0.21	0.00	12.62	0.00	0.00	20.42	13.89	28.40	0.00	3.73	41.05	3.04	123.36
OCC - Loose	248.41	166.57	205.80	195.02	192.10	215.19	205.53	195.38	156.42	200.74	191.88	185.28	2,358.32
ONP#6 Baled	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ONP#6 Loose	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ONP#8 Bales	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ONP#8 Loose	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
OWP/Fine - loose	0.00	6.06	8.91	4.52	0.00	0.00	0.00	0.00	0.00	5.23	55.29	25.85	105.86
PET #1	0.00	0.00	2.37	0.00	0.00	0.00	0.17	0.00	0.00	0.00	0.00	0.00	2.54
Scrap Metal	29.65	33.13	0.00	64.72	89.45	36.32	159.86	60.69	99.57	70.47	51.67	11.35	706.88
Single Stream Bagged	7.53	4.90	0.00	1.28	0.00	0.00	10.39	0.37	0.00	0.00	0.83	0.00	25.30
Single Stream Baled	0.00	0.00	16.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	22.94	39.39
Single Stream Loose	3,302.51	2,438.60	3,466.38	4,047.32	4,015.80	4,541.40	4,341.83	3,545.49	4,468.59	4,466.40	4,315.66	4,916.51	47,866.49
Steel Cans - Baled	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tires	1.25	0.00	1.53	4.87	6.01	4.36	3.89	5.78	3.29	3.69	3.55	3.10	41.32
Yardwaste	23.44	0.00	0.00	358.66	745.67	502.94	289.16	239.47	201.39	563.90	777.38	98.84	3,800.85
Total Month	3,762.43	2,791.98	3,861.30	5,725.59	6,212.78	6,742.03	6,385.14	5,202.71	5,982.14	6,320.32	8,644.74	6,243.04	67,874.20

Organics Compost Facility Incoming Material

Incoming Material	Jan Tonnes	Feb Tonnes	March Tonnes	Apr Tonnes	May Tonnes	June Tonnes	July Tonnes	Aug Tonnes	Sept Tonnes	Oct Tonnes	Nov Tonnes	Dec Tonnes	Yearly Total
Mixed Organics	1,504.07	1,172.45	1,467.27	1,585.86	1,517.73	1,612.97	1,729.51	1,552.42	1,737.83	1,718.23	1,969.01	1,516.19	19,083.54
Paper Fiber Sludge	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.25	8.16	0.00	15.41
Brush	16.84	0.00	0.00	0.00	0.00	0.00	28.85	53.57	56.21	120.12	64.42	84.13	424.14
Ammendment/Mulch	0.00	0.00	0.00	0.00	0.00	0.00	19.52	0.00	0.00	18.07	5.40	18.30	61.29
Total Month	1,520.91	1,172.45	1,467.27	1,585.86	1,517.73	1,612.97	1,777.88	1,605.99	1,794.04	1,863.67	2,046.99	1,618.62	19,584.38

Notes: All volumes in tonnes

MRF = Materials Recovery Facility

PDO = Public Drop Off

Single Stream = all recyclable products mixed together (bottles, cans, paper, cardboard, etc.)

OCC = Old Corrugated Cardboard

OWP = Office Waste Paper (also known as Fine Paper)

Overs or residual compost waste= a type of residue created during the composting process

Overall Site Total = (Transfer Station Annual Tonnage + WRIC Annual Tonnage + Compost Facility Annual Tonnage) - (Transfer Station Residue from MRF and Organics)

Facility Totals	153,328.18
Residue from MRF and Organic Plant	17,101.99
Overall Site Total	136,226.19

Incoming MHSW is sent to hazardous waste haulers for disposal or recycling. The City's Paint Plus Re-Use Program was conducted between April 21 and October 10, 2015. A monthly summary of the amounts of MHSW (separated by waste class) received at the site for the Paint Plus Re-Use Program for 2015 are tabulated below.

Material/Month	April	May	June	July	August	September	October	Total
Paints and Coatings Non-aerosol; #145 (L)	231	965	797	451	336	159	72.5	3011.5
Paints and Coatings Aerosol; # 331 (kg)	15	14	27	13.76	37	7	10	123.76
Solvents # 213 (L)	5	41	19	16.4	13	2	30	126.4
Antifreeze (L)	0	17	20	0	0	0	0	37
Propane Cylinders (kg)	2	0	2	1	0	0	0	5
Cleaners/Detergents #148 (L)	12	37	34	41.35	16	3	7	150.35
Car Products #213 (L)	4	24	9	10.3	10	1	2	60.3
Non-Paint Aerosols #331 (kg)	1	1	1	1	1	2	0	7
Motor Oil (L)	6	15	11	15	7	4	0	58
Plaster/Cement/Grout (kg)	2	10	3	24	1	0	2	42
Client Count	**33**	**162**	**170**	**117**	**62**	**26**	**22**	**592**

A total of about 257,161 L and 38,495 kg of municipal and household special wastes[9] were received in 2015. In addition, 978 20-lb. propane tanks, 8,800 1-lb. propane cylinders, 13,639 (39,695 ft.) fluorescent tubes and 615 fire extinguishers were received in 2015. All materials accepted at the MHSW depot are re-used, recycled or shipped off-site for disposal.

As shown on Table 4, the source of the bulk of the materials received was primarily mixed solid waste of domestic origin. Recyclables accepted by the WRIC originated mainly from the United States (54%) and the City of Guelph (26%). Materials accepted at the Transfer Station were mainly from the City of Guelph, of which 62% was mixed solid waste. The Transfer Station can accept waste from anywhere in Ontario, New York and Michigan States as long as it is within the acceptable daily tonnage limit.

There were no rejected and no suspects received during 2015.

5.2 Summary of Wastes/Recyclables Processed and Outgoing

Materials that are accepted by the site are either processed (composted), diverted to be re-used or sent to the waste Transfer Station for disposal. Section N, Condition 52(c) requires monthly reporting of processed materials from the site, which are presented on Table 5. Of the 120,319 tonnes of outgoing material, 46,899 tonnes (39%)[10] is processed on-site through the Material Recovery facility (MRF) and 4,420 tonnes (9%) of finished compost was produced. 133 tonnes went from the organic compost plant to residual compost waste. The remaining 80,906 tonnes (67%) is shipped off-site to other destinations. In 2015, the MHSW facility received and diverted a total of about 257,161 L and 38,495 kg of municipal and household special wastes, in addition 978 20 lb. propane tanks, 8,800 1-lb. propane cylinders, 13,639 (39,695 ft.) fluorescent tubes and 615 fire extinguishers.

9. Paints, flammables, aerosols, acids, bases, pesticides, oxidizers, batteries (alkaline, car, household), pharmaceuticals, motor oil, cooking oil, glycol, sharps, peroxide, mercury, compressed gas, oxygen (welding), expanding foam

10. Total of 67,047 tonnes outgoing from the WRIC – 7,222 tonnes residue from processing – 9,139 tonnes glass residue from processing – 3,787 tonnes mixed solid waste (baled) shipped to Twin Creeks Landfill = 46,899 tonnes.

Table 3: 2015 Monthly Summary of Outgoing Materials

Transfer Station Outgoing Materials

Outgoing Mixed Waste	Jan Tonnes	Feb Tonnes	March Tonnes	Apr Tonnes	May Tonnes	June Tonnes	July Tonnes	Aug Tonnes	Sept Tonnes	Oct Tonnes	Nov Tonnes	Dec Tonnes	Yearly Total
Mixed Solid Waste	4,171.03	2,962.61	3,995.02	5,152.18	6,052.38	5,839.92	6,447.31	5,343.22	5,275.20	5,665.75	5,381.07	4,618.38	60,904.07
C & D	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Shingles	0.00	0.00	0.00	53.07	134.19	584.25	585.08	205.70	269.51	388.21	374.17	178.89	2,773.07
Clean Wood	28.16	0.00	9.32	12.47	0.00	22.70	23.88	26.84	10.98	0.00	32.56	10.95	177.86
Drywall	0.00	40.57	79.71	128.54	17.20	94.61	60.06	20.07	92.24	55.81	67.12	47.00	702.93
Concrete, Rubble	0.00	0.00	33.40	0.00	48.63	103.60	24.49	180.08	23.19	49.38	30.94	28.51	522.22
Total Month	4,199.19	3,003.18	4,117.45	5,346.26	6,252.40	6,645.08	7,140.82	5,775.91	5,671.12	6,159.15	5,885.86	4,883.73	65,080.15

MRF Recycling & PDO Facility Outgoing Materials

Outgoing Mixed Waste	Jan Tonnes	Feb Tonnes	March Tonnes	Apr Tonnes	May Tonnes	June Tonnes	July Tonnes	Aug Tonnes	Sept Tonnes	Oct Tonnes	Nov Tonnes	Dec Tonnes	Yearly Total
Aluminum Baled	0.00	18.46	0.00	32.52	38.13	35.69	57.61	35.27	35.55	54.74	32.42	47.81	388.20
Batteries	0.00	0.82	0.00	1.88	1.83	1.61	2.04	2.14	1.02	3.34	0.95	1.38	17.01
Brush	63.70	61.00	45.67	172.13	312.46	413.39	338.35	196.94	103.17	102.52	51.95	31.16	1,892.44
Clothing	0.89	0.43	0.67	0.73	0.99	0.79	0.71	1.12	0.75	0.93	0.74	0.19	8.94
Electronics	14.16	9.13	20.33	24.29	19.34	20.75	22.63	27.84	19.29	14.94	19.18	14.41	226.29
Empty Oil Containers	0.37	0.11	0.17	0.30	0.41	0.36	1.82	1.26	0.97	0.47	0.37	0.35	6.96
Glass Residue(from process)	738.59	382.65	605.62	658.62	692.95	885.12	998.92	752.80	757.52	973.74	827.98	864.18	9,138.69
HDPE#2 - BALED	75.71	69.41	53.72	75.60	79.71	118.91	93.75	93.65	110.78	94.50	76.36	122.35	1,064.45
Leaves	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2,226.29	0.00	2,226.29
Mixed Glass	0.00	0.00	0.00	37.36	66.21	16.59	39.11	35.63	99.99	0.00	85.97	17.78	398.64
Mixed Plastics Baled	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mixed Recyclables	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mixed Solid Waste (Baled)	31.82	0.00	79.07	30.60	0.00	60.99	779.49	428.96	587.76	664.67	551.00	572.99	3,787.35
OCC Baled	731.32	481.09	537.50	668.87	636.96	761.95	747.59	625.86	559.03	633.50	666.11	721.33	7,771.11
ONP #6 Baled	423.45	305.30	358.67	462.90	486.34	492.72	504.89	501.83	638.15	548.70	467.08	463.26	5,653.29
ONP #8 Baled	1,302.85	742.62	1,188.30	1,590.16	1,487.65	1,471.42	1,568.85	1,191.14	1,281.21	1,723.61	1,854.85	1,890.92	17,293.58
ONP#7 Baled	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
OWP/Fine Paper	20.91	0.00	15.44	0.00	17.86	0.00	0.00	0.00	0.00	0.00	41.92	40.71	136.84
PET #1	128.09	112.18	135.76	197.60	219.10	221.80	336.71	272.44	271.68	273.63	227.17	205.61	2,601.77
PLASTIC FILM - BALED	0.00	0.00	0.00	5.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.69
Polycoat/Tetra Pak	0.00	0.00	0.00	19.51	0.00	20.82	0.00	0.00	20.30	0.00	20.57	0.00	81.20
Residue (from processing)	683.57	492.64	636.61	699.23	772.04	971.94	579.89	467.65	495.30	558.62	416.29	448.51	7,222.29
Scrap Metal	29.65	33.13		64.72	89.45	36.32	159.86	60.69	99.57	70.47	51.67	11.35	706.88
Single Stream Baled	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Single Stream Loose	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Steel Cans Baled	147.14	96.97	119.37	144.69	234.18	138.36	282.69	160.69	208.72	214.97	253.15	187.91	2,188.84
Tires	1.25	0.00	1.53	4.87	6.01	4.36	3.89	5.78	3.29	3.69	3.55	3.10	41.32
Tubs and Lids	37.39	19.32	15.23	40.41	18.27	38.74	38.49	38.75	37.28	52.77	36.52	15.05	388.22
Yard Waste	23.44	0.00	0.00	358.66	745.67	502.94	289.16	239.47	201.39	563.90	777.38	98.84	3,800.85
Total Month	4454.3	2825.26	3813.66	5291.34	5925.56	6215.568	6846.447	5139.905	5532.72	6553.71	8689.47	5759.19	67047.13

Table 3: 2015 Monthly Summary of Outgoing Materials *(continued)*

Organic Compost Plant Outgoing Materials

Outgoing Mixed Waste	Jan Tonnes	Feb Tonnes	March Tonnes	Apr Tonnes	May Tonnes	June Tonnes	July Tonnes	Aug Tonnes	Sept Tonnes	Oct Tonnes	Nov Tonnes	Dec Tonnes	Yearly Total
Finished Compost	241.31	250.47	272.64	271.18	191.48	210.50	353.85	423.37	571.97	543.47	629.68	459.69	4,419.61
Overs	0.00	68.72	64.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	133.34
Screening Waste	14.26	19.04	21.43	14.10	18.28	18.69	28.00	16.97	26.37	15.06	50.41	21.44	264.05
Residual Compost Waste	37.18	54.52	42.70	25.85	23.99	36.96	17.15	30.92	65.56	53.02	53.91	20.76	462.52
Organic Rejected Material	0.00	0.00	0.00	0.00	3.48	3.09	0.00	2.22	3.37	2.28	0.00	0.00	14.44
Total Month	292.75	392.75	401.39	311.13	233.75	266.15	399.00	471.26	663.90	611.55	734.00	501.89	5,293.96

Facility Totals	137,421
MRF & Organic Residue to Site Transfer Station	17,102
Overall Site Total	120,319

In past years we have provided calculations on the tonnages of incoming and outgoing materials. It was noted that since 2010, there has consistently been more incoming materials compared to outgoing materials. Since the tonnage left on site was added to the tonnage in the following year, this resulted in the tonnage left on site to increase every year. As this did not appear to be representative of actual conditions on the site, the methodology used for the reconciliation of the incoming and outgoing materials was reviewed with the City. The City stated that there was recently an issue identified with the outbound scales. The weigh scale foundations were "floating" causing a misalignment. The scale service company suggested that the scale was weighing lighter on the outbound materials than the inbound materials. It was also discussed that the materials received at the organics compost facility is much heavier due to moisture retention compared to when it leaves the site in a processed, dry and degraded state. In light of this, it was decided that the materials from the compost facility would be excluded from the reconciliation calculations since there was no accurate method to estimate the of percentage moisture loss/decay to account for a smaller outbound tonnage. The compost facility became operational in 2012. As this was the case, the reconciliations were re-calculated from 2012. Tonnages will not be equal as some mass is lost through evaporation and processing. Table 6 is reconciliation of the incoming and outgoing materials and materials processed from the site since 2012.

Table 4: Summary of Incoming, Outgoing and Processed Quantities

		Inbound Tonnage	Outbound Tonnage	Difference Between Inbound and Outbound Tonnage	Difference not including Compost Facility Tonnage	Plus Carry Over from Previous Year not including Compost Facility Tonnage
2012	Transfer Station	56,576	55,773	803		
	MRF Recycling/PDO Facility	39,201	38,671	530		
	Compost Facility	17,338	3,671	13,667		
	2012 Overall Site Total	**105,915**	**90,915**	**15,000**	**1,333**	**1,333 tonnes**
2013	Transfer Station	52,444	51,745	699		
	MRF Recycling/PDO Facility	32,104	30,506	1,598		
	Compost Facility	19,124	4,007	15,117		
	2013 Overall Site Total	**97,414**	**80,024**	**17,390**	**2,297**	**3,630 tonnes**
2014	Transfer Station	58,936	58,588	348		
	MRF Recycling/PDO Facility	49,907	49,386	521		
	Compost Facility	19,321	4,569	14,752		
	2014 Overall Site Total	**116,449**	**100,829**	**15,620**	**869**	**4,499 tonnes**
2015	Transfer Station	65,870	65,080	789		
	MRF Recycling/PDO Facility	67,874	67,047	827		
	Compost Facility	19,584	5,294	14,290		
	2015 Overall Site Total	**136,226**	**120,319**	**15,907**	**1,617**	**6,116 tonnes**

There is a difference of 6,116 tonnes between incoming and outgoing wastes/materials calculated for 2015, excluding the compost facility. This can largely be attributed to several factors:

- stored recyclable material not yet processed
- baled recyclable product awaiting shipment
- construction and demolition material including shingles, drywall, clean wood and rubble awaiting shipment.

In addition, in 2015, some single stream materials in the Transfer Station was stored on site that was destined for the MRF. This material was weighed as inbound into the Transfer Station. When some of the material was returned to the MRF, it was discovered that this material wasn't weighed with the MRF so this tonnage was estimated. The reconciliation volumes will be re-visited in the 2016 report.

Table 5 also shows a monthly summary of the outgoing materials shipped off site during 2015 as per Section N, Condition 52(d) of the amended C of A/ECA. Of the 65,080 tonnes of non-processed outgoing materials, 41,866 tonnes (64% of the outgoing materials) was sent to the Waste Management Twin Creeks Landfill in Lambton County, 15,932 tonnes (24.5%) was sent to then Energy-from-Waste (EFW) facility in Detroit, Michigan and 4,302 tonnes (7%) was sent to the Smith Creek Landfill in Michigan for disposal. Other facilities received less than 5% of the materials. About 4,176 tonnes (6%) of non-processed materials is marketable consisting of other recyclable materials such as shingles, clean wood, drywall, concrete and rubble.

In 2015, 50,686 tonnes of marketable processed material was transferred off the site from the WRIC facility. 30,855 tonnes (61%) was paper-based goods such as cardboard and newsprint, 7,920 tonnes (16%) was organics, 3,672 tonnes (4%) was plastics and the remaining 8,240 tonnes (16%) was other recyclable materials such as aluminum, steel cans, glass, tires and metal. As reflected in the volumes above, the majority of the marketable materials sold were paper products.

The WRIC achieved a 100% diversion rate for organic (yard, leaf and brush) and a 49% rate[11] of diversion for the remaining materials accepted at the site in 2015.

Most of the MHSW materials were shipped to Photech Environmental, St. Catharines (the waste removal contractor for 2015) for disposal or re-use.

Outgoing municipal and household hazardous waste materials were manifested to Photech and disposed of by the companies identified below for recycling and re-use.

Waste Types	List of Intended Receivers
Paints	• Photech Environmental Solutions Inc.
Oil Filters	• Safety Kleen, Breslau, ON
Bulk Oil/Antifreeze	• Safety Kleen, Breslau, ON
Pesticides	• Clean Harbours, Thorold, ON
Pharmaceuticals	• Phase Separation Solutions
Oxidizers/Acids/Bases	• Stablex Canada Inc., Quebec
Pathological Wastes/Syringes	• Stericycle, Toronto, ON
Car Batteries	• Benmet Steel & Metal
Fluorescent Tubes/Lamps	• Aevitas
Household Batteries/Mercury	• Raw Materials Corp.
Propane Tanks	• Simcoe Energy & Technical Services
Aerosols	• Peintures Recuperees Du Quebec
Organics/Flammables	• Newalta Industrial Services Inc., ON

Destinations/buyers for dry recyclable processed materials include:

Material Type	Destinations/Major Buyers
Mixed Solid Waste	EFW Niagara, EFW Detroit, Twin Creeks Landfill (Ont), Smith Creek Landfill (Michigan)
Bagged Yard Waste	All Treat Farms, Gro-Bark, Try Recycling
Brush	All Treat Farms, Scmidt Lumber, Waste Management (Etobicoke), Toronto
Loose Leaves	Budget Environmental
Construction/Demolition	Budget Environmental, Greenstep
Tires	CRM Tires
PET Bottles (#1 plastics)	ReMM, Canadian Plastics, Canada Fibers

11. Diversion rate (excluding yard waste) = Incoming for Transfer Station and WRIC (128,292 tonnes) – Outgoing MSW from Transfer Station (65,080 tonnes)/Incoming (128,292 tonnes) x 100 = 49.3%.

Material Type	Destinations/Major Buyers
HDPE (#2 plastics)	Entropex, Canadian Plastics
Mixed Plastics(#4,5,7)	Entropex, Canadian Plastics, ReMM
Aluminum Cans	Triple M Metals, Ram Iron and Metals
Corrugated Cardboard	ReMM, Continental Grading, Canada Fibers
Newsprint	Continental Paper Grading, Canada Fibres, ReMM
Steel Cans	Triple M Metals
Polycoat: Tetra Pak and Milk Cartons	Continental Paper Grading
Mixed Glass	Nexcycle
Scrap Metal/White Goods	Triple M Metals
Electronics	Electro Shed/Waxman Industrial
Used Clothing	Canadian Diabetes Society
Shingles	Try Recycling
Clean Wood (lumber)	Budget Environmental Disposal Ltd., Greenstep Recycling
Drywall	Greenstep, New West Gypsum
Concrete/Brick/Rubble/Toilets	Martin Deter
Finished Compost	farmer, Atwood Ontario

6. Ground and Surface Water Monitoring Program

6.1 Groundwater Monitoring Program

Groundwater levels are measured at all monitoring locations on a quarterly basis each year. During 2015, groundwater level measurements were conducted on; April 29, June 16, September 24 and December 1. As per Condition 5 of the ECA #9496-9NFKJ9, groundwater sampling was conducted on a semi-annual basis in spring and fall in 2015; in June (dry period, late spring) and in December (wet period, late fall). Each of the 2015 sampling events included analyses for leachate indicator parameters, general chemistry and organics[12]. Tables 2 and 3 below summarize the groundwater monitoring program and analytical parameters, respectively.

Table 5: Groundwater Monitoring Program

Location	April	June	September	December
13a-01	•	S	•	S
13b-01	•	S	•	S
14a-01	•	S	•	S
14b-01	•	S	•	S
15a-01	•	S	•	S
15-b-01	•	S	•	S
16a-08	•	S	•	S
16b-08	•	S	•	S
17a-08	•	S	•	S
17b-08	•	S	•	S
18a-14*	•	S	•	S

Location	April	June	September	December
18b-14	•		•	
19a-08	•	S	•	S
19b-08	•		•	S
20a-08	•	S	•	S
20b-08	•	S	•	S
21-08	•	S	•	S
22a-11	•	S	•	S
22b-11	•	S	•	S
23a-12	•	S	•	S
23b-12	•	S	•	S

*Notes: • = Water Levels Only / S = Sampling and Water Levels / * = BH18-08 was replaced in 2014 therefore was re-named 18-14*

Table 6: Analytical Parameter List

Leachate Indicator Parameters	• Biological Oxygen Demand (BOD) • Chemical Oxygen Demand (COD) • Total Kjeldahl Nitrogen (TKN) • Ammonia as Nitrogen (NH3-N) • Total Phosphorus (Total P) • Total Suspended Solids (TSS) for surface water and leachate only • Total Sulphate (SO4) • Phenols	• Chloride (Cl) • Sodium (Na) • Calcium (Ca) • Boron (B) • Total Iron (Fe) • Phosphorus (P) • Zinc (Zn) • Nitrate (NO3) and Nitrite (NO2)
General Parameters	• pH • Conductivity • Alkalinity	• Magnesium (Mg) • Potassium (K)
Field Parameters	• pH • Conductivity	• Temperature
Organics	• EPA 624,625 (ATG 16+17+18 & ATG 19+20)	

12. Organic groundwater analysis was inadvertently missed in 2015 but will take place in 2016.

The organic compound parameter list for the ATG MISA Groups are as follows:

Misa Group 16	Misa Group 19	
1,1,2,2-Tetrachloroethane	Acenaphthene	2-Methylnaphthalene
1,1,2-Trichloroethane	5-Nitroacenaphthene	Naphthalene
1,1-Dichloroethane	Acenaphthylene	Perylene
1,1-Dichloroethylene	Anthracene	Phenanthrene
1,2-Dichlorobenzene	Benzo(a)anthracene	Pyrene
1,2-Dichloroethane	Benzo(a)Pyrene	Benzyl Butyl Phthalate
1,2-Dichloropropane	Benzo(b)Fluoranthene	bis(2-ethylhexyl)Phthalate
1,3-Dichlorobenzene	Benzo(g,h,i)perylene	Di-N-butylPhthalate
1,4-Dichlorobenzene	Benzo(k)Fluoranthene	Di-N-octylPhthalate
Bromodichloromethane	Biphenyl	4-Bromophenyl phenyl Ether
Bromoform	Camphene	4-Chlorophenyl Phenyl Ether
Bromomethane	1-Chloronaphthalene	bis(2-chloroisopropyl)Ether
Carbon Tetrachloride	2-Chloronaphthalene	bis(2-Chloroethyl)Ether
Chlorobenzene	Chrysene	Diphenyl ether
Chloroform	Dibenzo(a,h)Anthracene	2,4-Dinitrotoluene
Chloromethane	Fluoranthene	2,6-Dinitrotoluene
Cis-1,3-Dichloropropylene	Fluorene	bis(2-chloroethoxy)Methane
Dibromochloromethane	Indeno(1,2,3-cd)Pyrene	Diphenylamine
1,2-Dibromoethane	Indole	N-Nitrosodiphenylamine
Methylene Chloride	1-Methylnaphthalene	N-Nitrosodi-N-propylamine
Tetrachloroethylene		
trans-1,2-Dichloroethylene		
Trans-1,3-Dichloropropylene		
Trichloroethylene		
Trichlorofluoromethane		
Vinyl chloride		
Misa Group 17	**Misa Group 20**	
Benzene	2,3,4,5-Tetrachlorophenol	2,6-Dichlorophenol
Ethylbenzene	2,3,4,6-Tetrachlorophenol	4,6-Dinitro-o-Cresol
Styrene	2,3,5,6-Tetrachlorophenol	2-Chlorophenol
Toluene	2,3,4-Trichlorophenol	4-Chloro-3-methylphenol
o-Xylene	2,3,5-Trichlorophenol	4-Nitrophenol
m-Xylene and p-Xylene	2,4,5-Trichlorophenol	m-,p-Cresol
Misa Group 18	2,4,6-Trichlorophenol	o-Cresol
Acrolein	2,4-Dimethylphenol	Pentachlorophenol
Acrylonitrile	2,4-Dinitrophenol	Phenol
	2,4-Dichlorophenol	

Groundwater monitoring was conducted at all locations in June and December 2015. The results of the groundwater monitoring are discussed in Sections 8.4 to 8.7.

6.2 Surface Water Monitoring Program

The surface water monitoring program for the site is outlined in the ECA in Conditions 5 (2) (parameter list) and Condition 5 (3) of ECA #9496-9NFKJ9, for the final off-site surface water station (stormwater Management pond - TP1-Out) and in the Follow-up Response to Ministry of the Environment Comments on the Surface Water Monitoring Program and Proposed Action Plan, dated December 3, 2013 (Appendix E) for the Wet/Dry property. These monitoring programs are discussed below.

As requested by the MOECC, a revised surface monitoring program was recommended for the WRIC in December 2013. A summary of the response to the MOECC, including the revised monitoring are provided in Section 8.9. On March 6, 2014, the City met with the MOECC to discuss the Public Drop off facility (PDO) application. It was agreed that sampling at the WRIC Detention Pond 1 (SW 2 and SW 3) would be discontinued. Detention Pond 2 (SW1) would only be sampled once the levels in the pond reached 0.46 m above the pond invert and that the SWM pond (TP1-out) would continue to be sampled monthly. During 2015, monthly monitoring of surface water runoff into Detention Pond 2 (SW 1) was completed. In April, the pond level was measured above the trigger and a sample was collected on April 10 at SW1, however, no discharge occurred. The pond was frozen/snow covered by the end of each month in January, February and March and the pond was dry from May to December 2015. The results of the surface water monitoring are discussed in Section 8.8.

Surface water sampling is undertaken on a monthly basis in the stormwater management pond (SWM) for the parameters (excluding organics) shown in Table 6. Organic sampling of the SWM and East pond surface water stations was conducted on June 30, 2015. During each month, sampling will be undertaken unless stagnant conditions occur (no discharge). Measurements of discharge, surface water runoff events and overall conditions of the detention ponds (e.g., dry, or stagnant water) will be documented on a weekly basis throughout each month. One surface water station in the SWM pond was monitored by the City staff in 2015; TP1 (out), located at the discharge at the north end of the pond. 2015 monthly inorganic monitoring was conducted TP1-out from March to December (ten events). As per condition 5 (3), TP1-out surface water sampling is also to include at least three wet events per year (as defined by 15 mm of rain in the previous 24 hours) of which two must occur within May to September for TSS. This sampling was completed under the monthly monitoring in April, June and September 2015.

The existing surface water pond (“East Pond” in Figure 1) was sampled in January and March to December 2015 (for inorganic parameters shown on Table 6). The East Pond setting is similar to the other on-site ponds (influenced by road salting) though it is within a different catchment area. As suggested by the MOECC, surface water quality from the samples collected from the in the East Pond (designated EPTS-01) can be considered as background surface water quality as it is upstream of both facilities[13] and will be used as comparison to the on-site surface water features.

A ditch located between the stormwater management pond and the East Pond is designed to receive pond overflow and direct it in a northwesterly direction beneath Dunlop Drive.

13. Memorandum from Lynnette Latulippe (MOECC) to Bill Shields (City of Guelph), Re: Annual Monitoring Report – 2009 Guelph Wet-Dry Recycling Centre and Waste Transfer Station, dated February 7, 2011.

7. Leachate Quality

7.1 Leachate Indicators

To determine the potential leachate quality that may be generated from the site, the leachate quality from the City of Guelph closed Eastview Road Landfill was examined. Prior to closure in 2003, this landfill accepted a similar mix of waste as the Transfer Station. Groundwater monitoring has been routinely conducted on this site since 1991. Leachate quality is measured by a series of groundwater monitors in the waste and in the outwash layer beneath the waste. In general, the leachate quality is characterized by elevated concentrations of chloride, boron, phenols (critical leachate parameters), sodium, potassium, magnesium, iron, manganese, ammonia and alkalinity (leachate indicator parameters). Though monitoring continues at the site, leachate quality up to 2009 was only considered since leachate strength is expected to decrease over time with closure of the landfill. Table 7 provides a summary of the historic leachate concentrations (1997 to 2009) for the leachate monitors.

Table 7: Summary of Leachate Quality from the Waste Monitors, Eastview Landfill

Parameters		Avg.	Min.	Max.
General	• pH	7.68	7.09	8.63
	• Conductivity (μS)	14,364	3,880	21,500
	• Alkalinity (mg/L)	6,195	2,900	9,050
	• Hardness (mg/L)	2,161	1,010	2,900
Critical Indicators	• Chloride (mg/L)	1,841	101	2,660
	• Boron (mg/L)	22.8	6.22	47
	• Phenol (μg/L)	100	0.72	830
Leachate Indicators	• Calcium (mg/L)	96	33	221
	• Sodium (mg/L)	1,468	424	2,300
	• Magnesium (mg/L)	468	144	661
	• Potassium (mg/L)	794	149	1,410
	• Iron (mg/L)	11	1.1	41.4
	• Manganese (mg/L)	0.10	0.027	0.688
	• Ammonia (mg/L)	583	0.05	1,200

With regard to the site, downgradient water quality is compared to background water quality for the critical leachate indicator parameters, as identified above, to determine potential impacts from site operations.

The site operation is not expected to generate any significant quantities of leachate because all waste handling operations are conducted in an indoor environment within the transfer building. The Design and Operations plan incorporates a number of features to protect the groundwater and surface water resources. This includes features such as a completely contained waste tipping floor and collection system and operating procedures that ensure that waste is handled indoors in a closed environment and is not stored on-site for any length of time. Nevertheless, it is still appropriate to examine water quality at the site for indicators of leachate affects to confirm that all of the safeguards are functioning.

7.2 Petroleum Indicators

The site operations do not involve the use, storage or handling of significant quantities of potential contaminants, other than machine fuel/lubricants. If these are handled with normal, reasonable precaution (according to the regulations) then the risk of groundwater contamination is very low. Established procedures for spills response and contingency are in place. BTEX analysis results are examined to determine if there is any indication of hydrocarbon contamination. Downgradient organic water quality is discussed in Section 8.5.

8. Groundwater, Leachate and Surface Water

A ground and surface water monitoring program is conducted on the sites as outlined in Section 3.

8.1 Groundwater Elevation and Flow Directions

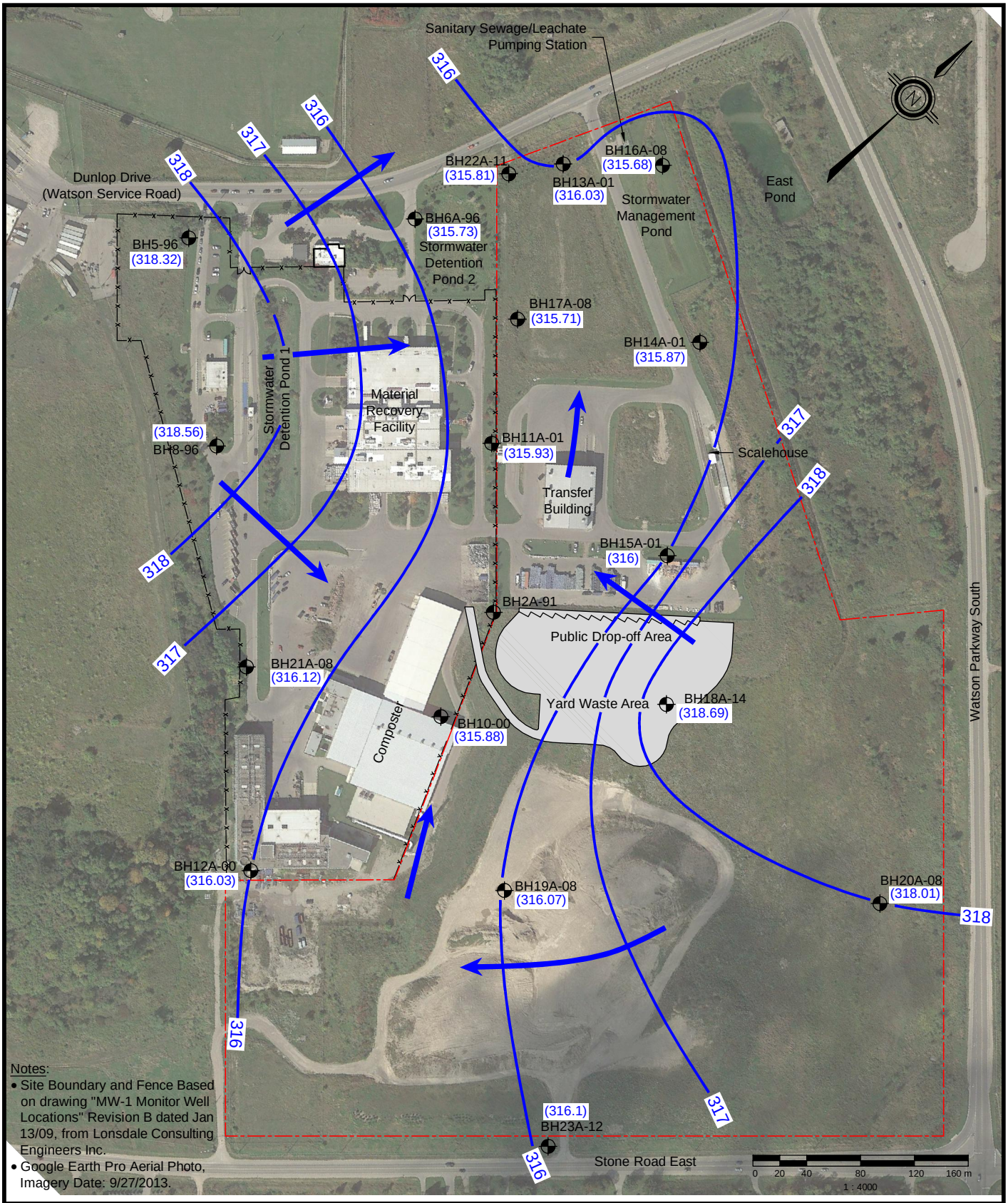
The ECA requires collection of water levels four times per year. Groundwater levels were collected in April, June, September and December during 2015. Groundwater elevations were measured at 18 locations that included a total of 32 monitors. The monitors are outlined below with the geological unit they are measuring. Groundwater elevations are appended. Hydrographs for each location are presented in Appendix A.

Monitor	Geological Unit	Groundwater Zone
2a-91	Sandy Silt Till	Not Used
2b-91[4]	Sandy Outwash	Water Table
5-96	Dolostone Bedrock	Water Table/Bedrock
6a-96	Dolostone Bedrock	Bedrock
6b-96	Sandy Outwash	Water Table
7-96	Sandy Outwash	Water Table
8-96	Dolostone Bedrock	Water Table/Bedrock
9-96	Sandy Outwash	Water Table
10-00[1]	Dolostone Bedrock	Bedrock
11a-01[1]	Dolostone Bedrock	Bedrock
11b-00[1]	Gravelly Outwash	Water Table
12a-00[2]	Dolostone Bedrock	Bedrock
12b-00	Gravelly Outwash	Water Table
13a-01[3]	Dolostone Bedrock	Bedrock
13b-01[3]	Gravelly Outwash	Water Table
14a-01[3]	Dolostone Bedrock	Bedrock
14b-01[3]	Gravelly Outwash	Water Table

Monitor	Geological Unit	Groundwater Zone
15a-01[3]	Dolostone Bedrock	Bedrock
15b-01[3]	Gravelly Outwash	Water Table
16a-08[3]	Dolostone Bedrock	Bedrock
16b-08[3]	Gravelly Outwash	Water Table
17a-08[3]	Dolostone Bedrock	Bedrock
17b-08[3]	Gravelly Outwash	Water Table
18a-08/18a-14[3]	Dolostone Bedrock	Bedrock
18b-08/18b-14[3]	Gravelly Outwash	Water Table
19a-08[3]	Dolostone Bedrock	Bedrock
19b-08[3]	Gravelly Outwash	Water Table
20a-08[3]	Dolostone Bedrock	Bedrock
20b-08[3]	Gravelly Outwash	Water Table
21-08	Dolostone Bedrock	Water Table/Bedrock
22a-11 [3]	Dolostone Bedrock	Bedrock
22b-11 [3]	Gravelly Outwash	Water Table
23a-12	Gravelly Outwash	Water Table
23b-12	Dolostone Bedrock	Bedrock

Notes: *(1) Locations recommended by MOECC.*
(2) Replaces 3-97.
(3) Locations in Transfer Station Area.
(4) Decommissioned in September 2014 due to the construction of the Public Drop Off Area, as agreed with the MOECC.

The bedrock groundwater flow is discussed first as the understanding of the geology controlling this flow is important to the shallow water table flow. In general, the groundwater flow is similar to previous years (Figure 2). Groundwater flow is generally from southwest to northeast (bedrock high) and northeast to southwest (from Watson Road) coming into the site from both directions. It is expected that flow would ultimately merge and be directed northerly based on the assessment of the bedrock surface topography, which suggests that the bedrock is deepening to the north. This is important as previous hydrogeological assessments in the area suggest that the bedrock low observed in this area is a former paleo river valley (incised bedrock low) that trends to the north. Therefore, it would be expected that the groundwater flow would follow this feature. The 2008 monitoring nests (bedrock and overburden) were placed to the east of the facility (BH18-08, BH19-08 and BH20-08) to confirm the geology and groundwater flow in this area. Southeast of the Transfer Station, the bedrock elevation is highest at BH20-08, sloping to the northwest towards the paleo river valley. A more detailed assessment of the geology in the



Notes:
- Site Boundary and Fence Based on drawing "MW-1 Monitor Well Locations" Revision B dated Jan 13/09, from Lonsdale Consulting Engineers Inc.
- Google Earth Pro Aerial Photo, Imagery Date: 9/27/2013.

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AECOM

Transfer Station / WRIC
City of Guelph
Annual Monitoring Program
Bedrock Groundwater Flow (June 2015)

Legend
- Approximate Site Boundary
- Fence
- Monitoring Well
- (166.45) Bedrock Groundwater Elevation
- 170 Bedrock Groundwater Contour

PROJECT NUMBER **60487592**
DATE **February 2016**
FIGURE **2**

A SIZE 8.5" x 11" (215.9mm x 279.4mm)
PLOT: 2/29/2016 10:16:34 AM
BY:----
FILE NAME: 60487592-01-FIG02.DWG

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area incorporating the 2008 borehole data was provided in the 2009 Annual report (AECOM, 2010), which confirms that there is a pronounced incised bedrock low that trends through the site to the north. The addition of the BH23-12 location on Stone Road, also suggest that the flow in the incised bedrock low is generally to the north.

In general, the shallow groundwater flow beneath the site is similar to previous years (Figure 3) though flows have been refined and confirmed based on the groundwater elevation information from the monitors installed in 2008 and the updated geological model assessment in 2009. Shallow groundwater flow in the sandy outwash is expected to follow the bedrock topography and be similar to the bedrock groundwater flow. Overall, the shallow flow is similar, directed into the site from the bedrock high on the southwest area of the site and from along Watson Road. It is also expected that flow would ultimately merge and be directed northerly within the alignment of the incised bedrock low. The 2008 drilling also identified a bedrock high (similar to the high to the west) southeast of the site in the vicinity of 20a-08, between which the bedrock trends. The shallow water table elevation is generally similar to BH19b-08 to apparently slightly lower (BH19b-08 was 315.99 mASL, whereas BH23b-12 was 316.02 mASL in June 2015) in the southern area of the site. The slight difference is most likely related to the actual positioning in the bedrock low as the new location intercepted the bedrock at a deeper elevation than at BH19 indicating that BH19 is most likely higher up on the edge of the bedrock low. Though this is the case, the overall trend of the bedrock low is to the northwest.

In their review of the 2006 Annual Monitoring report, the MOECC commented that though water levels are collected four times per year, only one data set was used to plot the groundwater contour map. It should be noted that for our assessment of groundwater flow conditions, each set of water level data are plotted and reviewed. However, for reporting purposes, only one set of data are presented as flow contours from season to season (and from year to year) as flows have been quite similar. Should significant differences between the seasonal flow conditions be noted, they would be identified and discussed.

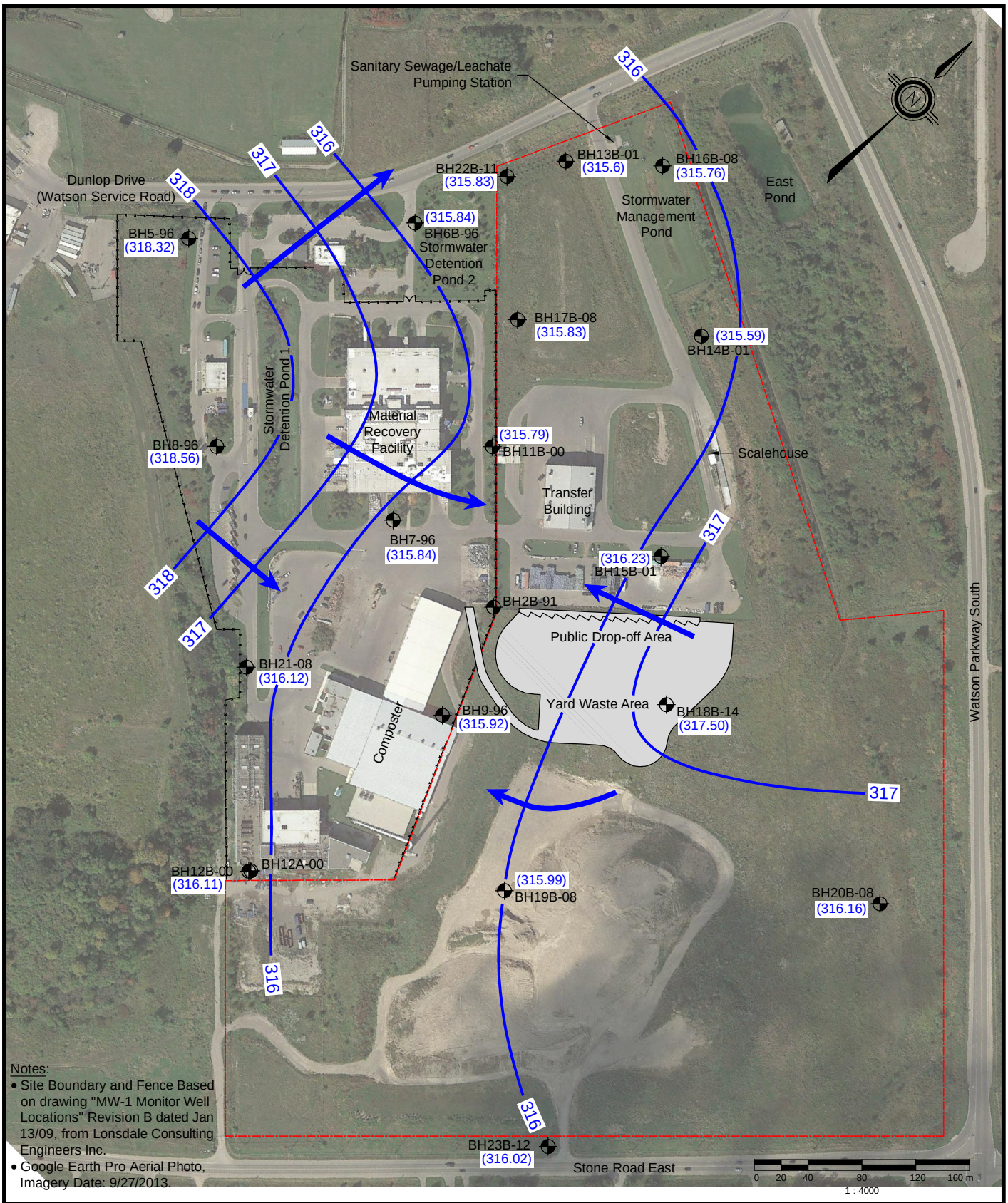
8.2 Groundwater Monitoring

8.2.1 Transfer Station Area

The original monitoring program for the site included three overburden monitors (in outwash materials) 13b-01, 14b-01 and 15b-01 and three bedrock monitors 13a-01, 14a-01 and 15a-01. The MOECC completed a review of the 2004 and 2005 Annual Monitoring reports for the Eastview Landfill and the Transfer Station. The MOECC recommended installation of additional monitoring locations to better address the geological setting with respect to the groundwater flow. Based on the MOECC review comments, six monitoring nest locations (BH16-08 to BH21-08) were completed in 2008, at the locations shown on Figures 1 to 3. These monitors consist of overburden outwash (16b-08, 17b-08, 18b-08, 19b-08, 20b-08) and bedrock monitors (16a-08, 17a-08, 18a-08, 19a-08, 20a-08). These monitors were incorporated into the routine monitoring program in 2008. Based on the confirmation of groundwater flow at the site, the MOECC recommended that a new monitoring location be established at the northerly boundary to serve as a Guideline B7 (RUP) boundary compliance point. This location was completed in 2011 and consists of a deep bedrock and shallow overburden outwash monitor (22a-11 and 22b-11). A further location along Stone Road was completed in the summer of 2012, as recommended to the MOECC, to better assess the potential effects, if any, from the soils that had been stored on site. This location also consists of a deep bedrock and shallow overburden outwash monitor (23a-12 and 23b-12).

8.2.2 WRIC

Baseline groundwater monitoring was conducted from 1991 to 1995, prior to construction at the WRIC site (monitor locations 1a-91, 1b-91, 2a-91, 2b-91, 3-91 and 5-91). Monitoring of the groundwater at the WRIC Facility commenced in April 1996 at the remaining monitoring locations that were not destroyed during construction (Figure 1). In late 1996, replacements for the monitors that were destroyed were completed and added to the program. The present monitoring program, initiated in 1999 after MOECC approval, is twice per year (June and December).



Notes:

- Site Boundary and Fence Based on drawing "MW-1 Monitor Well Locations" Revision B dated Jan 13/09, from Lonsdale Consulting Engineers Inc.
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Transfer Station / WRIC
City of Guelph
Annual Monitoring Program
Shallow Groundwater Flow (JUNE 2015)

Legend

- Approximate Site Boundary
- Fence
- Monitoring Well
- (317.67) Shallow Groundwater Elevation
- 317 Shallow Groundwater Contour

PROJECT NUMBER **60487592**

DATE **February 2016**

FIGURE **3**

A SIZE 8.5" x 11" (215.9mm x 279.4mm)
PLOT: 2/29/2016 10:20:02 AM
BY:----
FILE NAME: 60487592-01-FIG03.DWG

\\catrt3fs001\prod\AecomPrjs\60487592\900-Work\910-CAD\25-SKETCHES\X\01-2015 AMR\60487592-01-Fig03.dwg Layout:Fig 03 Plotted: Feb 29, 2016 @ 10:20am by jiangr

The City commenced construction of the new Public Drop off (PDO) area in the late summer of 2014 (Figures 1 to 3). Monitoring nests BH18-08a/b (within the pad area) and BH2-91a/b (on the berm between the Wet/Dry and transfer properties) were found to be within the construction area. The MOECC was contacted to discuss the decommissioning and need for replacement of these monitoring nests. It was decided that monitoring nest 18-08 would be decommissioned and re-located just to the south of the PDO pad, between the pad and the new pond.

As for BH2-91, this location was the only one with a deep monitor in the till. Water quality has generally remained similar since about 1991 in the deep till and shallow groundwater (when sampled as it generally has very little water). A slight change (around 2011) in quality did occur in the deep monitor at the time of construction of the compost facility, which may suggest that the monitor was compromised. This was an old monitor installation (1991) and probably only had a surface seal and seal above sand pack. Although this was the case, based on the overall long term historical water quality and the difficulty in sampling the shallow well, it was recommended that this location was to be decommissioned and not replaced. The MOECC hydrogeologist, confirmed through e-mail correspondence on September 8, 2014 that he was in agreement with the re-location of monitoring nest 18 as well as the elimination of BH2a/b-91 from the current monitoring program.

Monitoring nest BH2a/b-91 and 18-08 (consisting of bedrock monitor 18a-08 and water table monitor 18b-08) were decommissioned in September 2014 as per O. Reg. 903 to accommodate expansion of the Public Drop off (PDO) pad. A new monitoring nest (18a-14 and 18b-14) was installed by the City in September 2014 with a mud-rotary drill rig and screened to the same depth/within the same formations as 18a-08 and 18b-08. These new monitors were located about 15 m northeast of the former 18-08 location, just off the PDO pad and were incorporated into the monitoring program for the site.

8.2.3 Groundwater Quality

Groundwater sampling was conducted for the site in June and December 2015. Groundwater quality results are appended.

8.2.3.1 Background Outwash Water Quality

Background outwash groundwater quality was historically measured at locations 14 and 15 on the adjacent eastern property. Location 15 is now considered a downgradient location due to the construction of the compost pad and PDO area to the south. Groundwater flow is directed towards the site from these areas. Monitors BH18b-14, BH19b-08 and BH20b-08, located southeast of the Transfer Station and 16b-08, located north of the Transfer Station are also representative of background outwash conditions based on the groundwater flow patterns in this area. Water quality for the indicator parameters are summarized in the table below.

Monitor		Alkalinity (ppm)	Chloride (ppm)	Sodium (ppm)	Calcium (ppm)	Magnesium (ppm)	Potassium (ppm)
14b-01	Historical Range	267 – 438	22.3 – 280	0.1 – 170	0.2 – 280	0.05 – 80	0.2 – 2.6
	2015 Average	360	133	78.5	135	29.5	1.8
16b-08	2008-2014 Range	318 – 597	10 – 260	23 – 150	89 – 170	27 – 51	1.1 – 3.1
	2015 Average	480	91.5	79	135	40	2.1
18b-08	2008-2014 Range*	260 - 424	8 - 19	6.2 - 270	29 - 65	12 - 26	0.73 – 5.5
18b-14	2015 Average	200	41.5	21.5	61	26.5	2.3
19b-08	2008-2014 Range	289 – 700	7 – 60	110 – 480	23 – 98	10 – 31	4.5 – 12
	2015 Average	655	41.5	290	65	20.5	11
20b-08	2008-2014 Range	235 – 310	7 – 170	3.5 – 58	78 – 110	25 – 32	1.1 – 3.3
	2015 Average	290	31.5	12	97	31.5	1.7
23b-12	2012-2014 Range	320 - 400	140 - 190	79 - 140	96 - 380	29 - 150	2.6 – 5.4
	2015 Average	340	240	160	120	32.5	3.2

Note: Historical Ranges include all data up to and including 2014, except where specified.
**Only three historic samples were collected from monitor 18b-08: March 2008, June 2011 and May 2014*

Monitors 18b-08/14, 19b-08, 20b-08 and 23b-12 have chemistry similar to monitors 14b-01, located northeast of the WRIC though a few parameters at 19b-08 were notably higher than the other overburden background monitors. Monitor 19b-08 showed elevated concentrations of alkalinity, potassium and sodium. Sulphate concentrations at 19b-08, which were previously elevated prior to 2013, remained elevated in 2015 compared to the other overburden background monitors. The 2015 results from 18b-14 were generally similar to May 2014 with the following exceptions. The December 2015 18b-14 sample showed elevated COD (130 mg/L), total phosphorus (14 mg/L) and iron (320 mg/L) compared to historic results. Both 2015 chloride concentrations (40 mg/L and 43 mg/L) were also elevated. This monitor has now only been sampled four times due to persistent dry conditions. The cause of these elevated concentrations may be related to the installation of the new monitor and the use of drilling mud during the installation. Alkalinity appears to be showing an increasing trend over time at 19b-08. Since 19b-08 and 18b-14 are upgradient of the site, the elevated concentrations are not a result of site activities. Monitor 18b-14 is now located at the eastern edge of the recently completed PDO and yard waste area. Concentrations at most of the background monitors were generally similar to previous years with some parameters at a few locations slightly higher or lower than historic ranges. Since most of these monitors have a fairly limited dataset, some variability in parameter concentrations is expected.

Elevated iron at 14b-01, 16b-08, 19b-08 and 20b-08 were noted since December 2011 but decreased in 2013 with the iron concentrations at these monitors below the laboratory detection limits in December 2013. However, the 2015 iron at 14b-01, 19b-08 and 20b-08 again showed elevated concentrations (averages of 22 mg/L, 3.4 mg/L and 4.1 mg/L, respectively). The cause of the increase in iron concentrations is unknown. As these elevated concentrations were apparent in the background monitors, it is concluded that they are not a result of site operations.

The 2015 parameter concentrations at monitor 14b-01 were within the historic range of concentrations at this monitor for both sampling events. Previously elevated concentrations of magnesium, TKN, chloride, calcium, phosphorus and zinc that were noted in 2014 have returned to concentrations similar to historic concentrations in 2015. COD concentrations at 14b-01 were showing a decreasing trend since peaking in 2004-2003 but have been variable in recent years. The COD concentrations have fluctuated between less than 4 mg/L to 46 mg/L since 2012. Monitor 14b-01 has shown elevated sodium and chloride concentrations, most likely related to road salting along Watson Parkway. The average 2015 indicator parameter concentrations at monitor 14b-01 were generally lower than the average 2014 concentrations.

Monitor 16b-08 is located near the northwest corner of the of the Transfer Station area by the stormwater management pond. Indicator parameter concentrations are within the range of concentrations for the other background overburden monitors though they tend to be at the high end of the range. The 2015 parameter concentrations at monitor 16b-08 are within their historic ranges. This location appears to exhibit a seasonal increase in road salt effects (based on chloride and sodium) in the spring.

8.2.3.2 Background Bedrock Water Quality

Background bedrock groundwater quality is measured at locations 5-96 (northwest) and 8-96 (west) on the bedrock high along the western portion of the WRIC site from where groundwater flows into the immediate area of the WRIC. As well, groundwater quality in the bedrock below the site was measured at location 6a-96, 14a-01, 16a-08, 18a-08/18a-14, 19a-08 and 20a-08, as well as the upgradient monitor 23a-12. Background bedrock groundwater quality is typically hard with more elevated concentrations of the major ions, most noticeably alkalinity and calcium. These types of concentrations are associated with dolostone, which is made up of calcium and magnesium carbonate. The average concentrations of these parameters observed in 2015, along with the historical ranges at these locations are provided below.

Also, provided in this table are the 2015 averages from the downgradient bedrock WRIC site monitors (10-00, 11a-00) and Solid Waste Transfer Station area bedrock monitors (13a-01, 15a-01, 17a-08, 22a-11).

	Monitor		Alkalinity (ppm)	Chloride (ppm)	Sodium (ppm)	Calcium (ppm)	Magnesium (ppm)	Potassium (ppm)
Background	5-96	Historical Range[1]	278 – 380	112 – 474	71.9 – 263	83.7 – 134	16 – 40	3.9 – 6
		2015 Average	285	645[2]	435[2]	103	22.5	4.1
	8-96	Historical Range	264 – 356	37.2 – 332	17.6 – 171	87 – 123	30 – 43.4	1.73 – 3.1
		2015 Average	290	140	78.5	94	33.5	2.4
	14a-01	Historical Range	215 – 263	4.8 – 28	9.1 – 29	63.5 – 86	22.4 – 29	1 – 2
		2015 Average	245	23	23	77.5	27.5	1.2
	16a-08	2008-2014 Range	230 – 251	28 – 39	2.1 – 42	76 – 88	26 – 30	1.7 – 3.6
		2015 Average	230	32	3	84.5	28.5	1.9
	18a-08	2008-2014 Range	233 – 258	16 – 57	4 – 89	65 – 100	27 – 34	1 – 3
		2015 Average	245	17.5	6.9	84	28	1.7
	19a-08	2008-2014 Range	234 – 250	27 – 72	12 – 47	94 – 110	33 – 37	1.2 – 1.9
		2015 Average	240	67	30.5	100	35	1.55
	20a-08	2008-2014 Range	236 – 262	15 – 37	3.9 – 56	72 – 88	26 – 31	1 – 1.8
		2015 Average	245	18	4.4	84.5	29	1.25
	21-08	2008-2014 Range	260 – 290	4 – 54	6.9 – 34	71 – 87	23 – 32	0.8 – 1.2
		2015 Average	280	14	13.5	79	26.5	0.98
	23a-12	2012-2014 Range	230 - 250	24 – 31	11 - 15	85 - 97	28 - 34	0.95 – 1.3
		2015 Average	230	24.5	12	87	31	1.2
Downgradient	6a-96	Historical Range	206 – 420	140 – 345	70 – 176	89 – 158	23 – 42	2 – 16.4
		2015 Average	280	225[2]	140[2]	104	26	2.75
	10-00	Historical Range	236 – 267	17 – 44.9	7.7 – 14	79 - 95.1	27 – 32	1 – 2
		2015 Average	235	34	13	93	31	1.25
	11a-00	Historical Range	225 – 263	4 – 24	4.3 - 25.9	62 - 83.2	23 – 28	1 – 3
		2015 Average	230	23.5	5.8	72.5	26	1.8
	13a-01	Historical Range	240 – 272	83.9 – 111	38 – 49	90 – 112	31 – 38.8	2 – 2.9
		2015 Average	240	97	45	99	35	2.7
	15a-01	Historical Range	240 – 271	42 – 68	7.7 – 25	88 – 140	29 – 41	1 – 2
		2015 Average	250	67	27	110	36	1.4
	17a-08	2008-2013 Range	225 – 248	27 – 45	10 – 67	64 – 94	26 – 32	1.4 – 2.2
		2015 Average	225	45.5	14	87.5	30.5	1.6
	22a-11	2011-2014 Range	212 - 260	47 - 130	15 – 78	93 - 110	20 - 35	1.3 – 2.3
		2015 Average	235	49.5	16.5	94.5	32.5	1.5

Note: 1. Historical Ranges only include data from 1997 up to 2003 due to continued increasing chloride and sodium values after 2003.
2. Road salt impact.
Historical Ranges include all data up to and including 2014 except where specified.

Generally, the average 2015 indicator parameter concentrations fall within the historical ranges at the background locations, with the following exceptions.

The 2015 average concentrations of sodium and chloride at monitor 5-96 continue to show significant road salt impacts. The sodium and chloride concentrations at 5-96 have shown a significant increase in recent years from less than 140 mg/L and 300 mg/L pre-2003, respectively, to about 645 mg/L and 435 mg/L in 2015. The effects are found to generally be seasonal with the dry weather (June) sampling period usually showing higher sodium and chloride concentrations as compared to the wet weather sampling periods. As well, there have been historical road salt effects observed at location 6a-96 and 8-96. Sodium and chloride at monitor 5-96 are above the ODWS. Sodium and chloride are elevated (but within ODWS) at monitor 6a-96. The elevated sodium and chloride concentrations at monitors 5-96 and 6a-96 are due to road salt impacts.

Monitor 12a-00 is located at the southern corner of the WRIC property. Calcium is showing gradual decreasing concentration trend. The calcium concentrations averaged 107 mg/L from 2001 to 2007, decreasing to an average of 88 mg/L from 2008 to 2012 and are currently at an average of 82.5 in 2015. Magnesium concentrations have also slightly decreased from an average of 39.5 mg/L from 2001 to 2007 to current stable concentrations of about 32 mg/L. Potassium concentrations peaked in 2007 at 23 mg/L and have now declined to an average of 7.7 mg/L in 2015. Similarly, alkalinity peaked in 2006 at a concentration of 423 mg/L and has declined to an average of 338 mg/L between 2007 and 2009 to its 2015 average of 305 mg/L. These declines in concentration are not related to site operations since this location is upgradient.

Both the June and December 2015 sodium concentrations of 27 mg/L at 15a-01 was slightly higher than the historic maximum concentration of 25 mg/L, which occurred in December 2014. Sodium at this location has shown a subtle increasing trend from about 10 mg/L prior to 2004 to an average 2014 concentration of 24.5 mg/L and 2015 concentration of 27 mg/L in 2015. This concentration remains relatively low and is well within the ODWS.

Examination of the calcium and chloride concentrations over time at 17a-08 shows a subtle increasing trend. The December 2015 chloride concentration of 46 mg/L is slightly higher than the previous maximum concentration of 45 mg/L. An elevated iron concentration was noted in December 2013 at 2.1 mg/L. Though iron concentrations of 0.13 mg/L and 0.07 mg/L were measured during the two subsequent events, the December 2014 iron concentration was elevated above ODWS at 1.4 mg/L and continued to be elevated above ODWS in 2015 at concentrations of 0.91 mg/L and 0.62 mg/L.

Unusually high iron concentrations in the December 2011 samples were noted at monitors 2b-91, 5-96, 6b-96, 11b-00, 12a-00, 13b-01, 14b-01, 15b-01, 16a-08, 16b-08, 17a-08, 17b-08, 18a-08, 19a-08 and 21a-08. These elevated iron results occurred across the site in both upgradient and downgradient and overburden and bedrock monitors. Elevated iron concentrations continued in 2012 except at 5-96 and 12a-00 which showed 2012 iron concentrations similar to historic. Iron concentrations in the remaining monitors decreased to below the laboratory detection limits by December 2013 except for 16a-08, 17a-08, 18a-08 and 19a-08. The iron concentrations at these four monitors remain slightly elevated though at lower concentrations than December 2011, except at 17a-08 where concentrations are similar to December 2011. Iron concentrations were above the ODWS in June 2013 at 2b-91, 11b-00, 13b-01, 14b-01, 15b-01, 17a-08, 17b-08, 18a-08, 19a-08 and 21a-08 and in June and December at 16a-08. Iron concentrations were above ODWS in 2014 during the May event at 2a-91, 2b-91, 13a-01, 14b-01, 18a-08, 18b-08, 19b-08, 20b-08, the December monitoring event at 17a-08, 17b-08, 22b-11 and both 2014 monitoring events at 10-00, 12b-00, 15a-01. City sampling staff were asked if there have been any changes to sampling protocols, equipment or site conditions in 2011. No changes occurred so it is unknown as to the cause of the increase in iron concentrations. In 2015, iron concentrations were above ODWS in June at 11b-00 and 21a-08, December at 9-96, 10-00 and 17b-08 and during both monitoring events at 12b-00, 13a-01, 14a-01, 14b-01, 15a-01, 15b-01, 17a-08, 18a-14, 18b-14, 19a-08, 19b-08, 20a-08, 20b-08, 22a-11 and 23b-12. At a few of these locations, the 2015 iron concentrations were more than 10 mg/L (14b-01, 18a-14, 18b-14, 23b-12). The elevated iron concentrations at 18a-14 and 18b-14 may be due to the residual effects of drilling mud used during installation of these monitors. As elevated concentrations are apparent in the background monitors, it is concluded that they are not a result of site operations.

When the water quality from the monitors located along the eastern boundary of the WRIC (10-00, 11a-00) and in the Transfer Station area (13a-01, 14a-01, 15a-01, 16a-08, 17a-08) are compared to the historical monitors to the west, there is a difference in bedrock water quality observed. With the exception of alkalinity, the concentrations of the major ions are generally lower indicating a less mineralized water. This difference in water quality is attributed to the bedrock units they are completed in. As stated earlier, there is a bedrock high to the west of the site. This high is dominated by the dolostone units of the Guelph Formation. The bedrock topography dips steeply from this high, across the WRIC site, towards a deeply incised bedrock valley low. This valley cuts into the underlying Gasport Formation (formerly the Amabel). Monitors are installed in this formation or at the contact of this formation at the eastern boundary of the WRIC facility. Overall, water quality from this lower formation is found to be less mineralized, which is confirmed by sampling of these monitors. Phenols were detected in December 2015 at a concentration of 1.6 μg/L at 11a-00. Historically, phenols were detected in December 2014 (1.3 μg/L) and June 2003 (9 μg/L) though they are usually less than the laboratory method detection limit.

Monitor 22a-11 is located downgradient in the bedrock low and constructed as a piezometer in the bedrock (total depth of 24.4 m below ground surface, 293 mASL). The nine samples collected at the site shows indicator parameter concentrations generally within the range of other downgradient bedrock monitors. Chloride and sodium concentrations are slightly elevated suggesting possible road salt impacts, as observed further up-gradient.

Monitor 23a-12 is located upgradient of the site and is representative of background conditions. Indicator parameter concentrations are within the range of other background groundwater monitors.

8.3 Downgradient Groundwater Quality

8.3.1 Shallow Outwash Groundwater Quality

Monitors along the eastern property boundary of the WRIC and within the paleo-valley in this same area are downgradient of site operations based on shallow groundwater flows (Figure 3). The table below compares downgradient water quality at monitors 2b-01, 6b-96, 7-96, 11b-00, 13b-01, 15b-01, 17b-08 and 22b-11 to the Ontario Drinking Water Standards (ODWS), leachate quality (from the Closed Eastview Road Landfill) and background outwash water quality from monitors BH14b-01, 16b-08, 18b-14, 19b-08 and 20b-08.

	Monitor		Critical Leachate Indicators				Other Leachate Indicators			
			Boron (mg/L)	*Phenols (µg/L)*	*Alkalinity (mg/L)*	*Chloride (mg/L)*	*Sodium (mg/L)*	*Calcium (mg/L)*	*Magnesium (mg/L)*	*Potassium (mg/L)*
Leachate		ODWS	5.0		30 – 500	250	200			
		Historical Range (1997-2009)	6.22 – 47	0.72 – 830	2,900 – 9,050	101 – 2,660	424 – 2,300	33 – 221	144 – 661	149 – 1,410
		Average (1997-2009)	22.8	100	6,195	1,841	1,468	96	468	794
Downgradient	**6b-96**	Historical Range	0.02 – 0.078	< 0.72 – 11	246 – 412	90.3 – 815	53.1 – 467	85.9 – 217	20.5 – 47	5.36 – 18
		2015 Average	0.037	< 1	305	210	155	101.5	22.5	7.2
	9-96	Historical Range	0.01 – 0.063	< 0.72 – 4	85 – 348	5 – 83.7	1.48 – 34	29 – 100	6.9 – 34	0.3 – 10
		2015 Average	0.035	< 1	117	8.5	14.5	36.5	9.4	11.8
	7-96	Historical Range	0.03 – 0.102	< 0.72 – 12	224 – 378	54.3 – 397	28.7 – 212	95.1 – 226	26 – 52.7	8.5 – 27
		2015 Average	0.033	< 1	295	135	74	103.5	27.5	8.4
	11b-00	Historical Range	0.04 – 1.9	< 1 – 7	185 – 330	54 – 290	26.8 – 220	44 – 103	12 – 28.4	1 – 2.2
		2015 Average	0.225	< 1	240	195	125	102	26.5	1.75
	13b-01	Historical Range	0.01 – 0.1	< 1 – 12	287 – 506	7 – 200	4.8 – 88	84.7 – 160	27 – 45	1 – 2.5
		2015 Average	0.024	< 1	375	74	37.5	135	27	1.85
	15b-01	Historical Range	< 0.01 – 0.08	< 1 – 10	200 – 544	4 – 270	2 – 130	73.4 – 210	18.7 – 53	0.89 – 2
		2015 Average	0.051	< 1	270	169	96	150	25.5	3.9
	17b-08	2008-2014 Range	0.015 – 0.026	< 1	304 – 357	220 – 620	160 – 330	100 – 190	27 – 48	1.8 – 3.1
		2015 Average	0.019	< 1.3	305	250	150	104	28.5	1.75
	22b-11	Range 2011-2014	0.014 – 0.031	< 1	230 - 340	46 - 150	13 - 93	84 - 110	19 - 32	1.3 - 1.9
		2015 Average	0.027	< 1	280	122.5	67	110	24.5	1.75
	14b-01	Historical Range	< 0.01 – 0.05	< 1 – 13	267 – 438	22.3 – 280	0.1 – 170	0.2 – 280	0.05 – 80	0.2 – 2.6
		2015 Average	0.021	< 1	360	133	78.5	135	29.5	1.75
Background	**16b-08**	2008-2014 Range	< 0.01 – 0.047	< 1 - < 5	318 – 597	10 – 260	23 – 150	89 – 170	27 – 51	1.1 – 3.1
		2015 Average	0.032	< 1	480	91.5	79	135	40	2.05
	18b-08	2008-2014 Range[(1)]	< 0.01 – 0.10	< 1	260 - 424	8 - 19	6.2 - 270	29 - 65	12 - 26	0.73 – 5.5
	18b-14	2015 Average	0.021	<1	200	41.5	21.5	61	26.5	2.3
	19b-08	2008-2014 Range	0.066 – 0.27	< 1	289 – 700	7 – 60	110 – 480	23 – 98	10 – 31	4.5 – 12
		2015 Average	0.150	< 1	655	41.5	290	65	20.5	11
	20b-08	2008-2014 Range	< 0.01 – 0.018	< 1 – 8.9	235 – 310	7 – 170	3.5 – 58	78 – 110	25 – 32	1.1 – 3.3
		2015 Average	0.013	< 1	290	31.5	12	97	31.5	1.65

Note: Historical Ranges includes all data up to and including 2014, except where specified.
ODWS = Ontario Drinking Water Standards
(1) Only two historic samples have been collected from 18b-01; March 2008, June 2011 and May 2014.

Background monitor 18b-14 was installed in September 2014 to replace 18b-08. 18b-08 was only sampled on three occasions. The December 2015 chloride and magnesium concentrations were higher than historic maximum concentrations and the June alkalinity is lower than historic minimum concentrations at this location. Such variations in parameter concentrations are expected as additional data at this location is collected due to natural variability.

Outwash at monitors 6b-96 (northeast corner) and 7-96 (central) as well as at the historical monitor 3-97 (southwest corner), which was destroyed during the construction of the SUBBOR pilot facility and replaced with monitor 12b-00, are upgradient of the site. These locations are along the flow path that trends from the southwest to the northeast and receives groundwater inputs from the bedrock high to the west. This water quality is typified by concentrations of the major ions that are elevated above the background outwash but for the most part lower than the bedrock concentrations. This is anticipated as the more ionized water from the bedrock to the west would mix with the less ionized waters in the overburden. The June 2015 potassium concentration at 7-96 of 7.8 mg/L is slightly lower than the previous minimum concentration of 8.5 mg/L. There has been a gradual decreasing trend in potassium concentrations at 7-96 since peaking at 27 mg/L in 2002 such that the average 2015 concentration is 8.4 mg/L. Magnesium concentrations at 7-96 have also decreased since peaking in 2003 at 52.7 mg/L to its current 2015 average concentration of 27.5 mg/L.

Monitor 6b-96 usually shows lower concentrations of chloride and sodium than observed in the background bedrock at monitor 5-96. These sodium and chloride concentrations tend to show a seasonal trend, usually highest in the early spring, suggesting they are attributed to road salting of the surrounding area. Monitor 5-96 has been showing increasing chloride concentrations over time from about 200 mg/L up to 2002 to about 750 mg/L in recent years', likely in response to long-term road salting in the area. Monitor 12b-00 shows lower sodium and chloride concentrations (average concentrations of 19.5 mg/L and 28.5 mg/L, respectively, in 2015) compared to 6b-96 and 7-96, likely due to the absence of road salt sources upgradient of this location. It was however noted that chloride concentrations at 12b-00 were low between 2007 and 2013, generally less than 10 mg/L but have increased in 2015 to an average of 28.5 mg/L.

As shown on the above table, indicator parameter concentrations observed in the background and downgradient outwash monitors on the site are considerably lower than typical leachate concentrations from the closed Eastview Road Landfill. Sodium and chloride concentrations at 11b-00 have shown a subtle increasing trend over the years' at this location though 2015 concentrations are lower than 2014 concentrations and within ODWS. The sodium and potassium concentrations at 11b-00 are lower than the historic minimum concentrations at this location and are within to lower than the historic range of concentrations of the background WRIC bedrock monitors 5-96 and 6a-96, which have been affected by road salt. The December 2015 magnesium concentration of 30 mg/L is slightly higher than the historic maximum concentration at this location of 28.4 mg/L. The June 2015 phenol sample at 17b-08 showed a concentration just above the laboratory method detection limit at 1.6 μg/L. Phenols have not historically been detected at this location however, the subsequent December 2015 sample showed no phenol detection. 17b-08 has shown a variable chloride concentrations over time but is generally showing a downward trend with an average concentration of 382 mg/L from 2008 to 2012 to an average concentration of 260 mg/L in recent years. Other leachate indicator parameter concentrations are within background outwash ranges for the Transfer Station indicating no impacts.

Monitor 9-96 showed a June potassium concentration higher than its historic maximum concentration. The 9-96 potassium concentrations were generally less than 1 mg/L up to 2005. From 2006 to 2011, the potassium concentrations were stable, averaging 1.2 mg/L. Potassium concentrations at 9-96 started to increase from a 2012-2013 average of 4.5 to a 2014-2015 average of 10.4 mg/L. However, alkalinity, magnesium and calcium concentrations have decreased and stabilized in recent years. Alkalinity concentrations from 1997 to 2008 averaged 242 mg/L and peaked in 2009 at a concentration of 348 mg/L. Since 2012, alkalinity concentrations have stabilized and are lower than pre-2009 concentrations, less than 150 mg/L. Magnesium and calcium concentrations at 9-96 showed similar concentration patterns as potassium. Magnesium and calcium both showed gradual concentration increases peaking in 2009 and then decreasing to concentrations lower than pre-2009 from 2012 to 2015 with both showing stable concentrations since 2012. This location is downgradient and adjacent to the compost facility. The compost facility became operational in 2012, around the same time that the above concentration changes occurred. All compost operations are fully enclosed so these changes are not due to site operations.

Though nitrate concentrations at monitor 7-96 historically have regularly exceeded the ODWS prior to 2013, they were within ODWS in recent years' with 2015 concentrations of 4.5 mg/L and 3.9 mg/L. Elevated nitrate has occurred historically, including prior to the start-up of the WRIC facility and is most likely a result of past land use historically and to current surrounding land use currently. There were no exceedances of ODWS for the shallow groundwater monitors in 2015 for the parameters tested, except for chloride at 15b-01 and 17b-08, sodium at 19b-08 and iron (previously discussed).

At 13b-01, both sodium and chloride have shown increasing trends since 2004, peaking in 2008 and slowly declining since then. These elevated concentrations are likely due to road salt effects as this monitor is located adjacent to the access road to the Transfer Station and Dunlop Road. Since indicator parameter concentrations at monitor 13b-01 remain within background concentrations, it has been concluded that there are no leachate impacts.

Potassium, sulphate, sodium, chloride at 15b-01 spiked in concentration in December 2015. Historic maximum concentrations for these three parameters were 63 mg/L, 110 mg/L and 270 mg/L, respectively, compared to the December 2015 concentrations of 190 mg/L, 170 mg/L and 320 mg/L. City monitoring staff noted that there was a lot of construction in the vicinity of 15-01 with a trench excavated very close to the monitors such that access to this location was difficult. The construction in the area may have affected the December 2015 water quality. City staff will be re-sampling this location in March 2016 to determine if the December results are anomalous. Total phosphorus at 15b-01 peaked at a concentration of 1.2 mg/L in December 2011. Prior to 2011, total phosphorus concentrations were low or close to the laboratory method detection limit of 0.02 mg/L. Since 2011, concentrations have been higher than the pre-2011 concentrations and are currently at a 2015 average of 0.0845 mg/L. Sodium and chloride showed a noticeable increasing trend from about 2007 to 2010 peaking at an average of 108 mg/L and 195 mg/L, respectively from about an average concentrations of 11 mg/L and 29 mg/L in 2007. Sodium and chloride began to decrease in 2011 from these highs though, as previously discussed, sodium and chloride concentrations peaked in December 2015. This monitor also showed a subtle increasing trend in alkalinity, peaking in 2008 at about 496 mg/L and gradually decreasing to an average concentration of 270 mg/L in 2015. Alkalinity concentrations over the past three years appear to have stabilized. These increases are likely related to the construction of the paved pad immediately southeast, as discussed below. This monitor had previously been considered an upgradient background location due to its location east of the WRIC and south of the Transfer Station. However, in the mid-2000s, a large paved pad was constructed southeast of this monitor location. The pad was sloped such that surface water runoff is captured by a catch basin located near the middle of the pad and directed to the storm sewer. This pad was originally intended for storage of leaf compost but was being used to store construction and demolition material (roofing shingles, clean wood, drywall, rubble). The overall change in water quality at this location may be due to a combination of road runoff impacts from the Transfer Station access road to the northwest, a reduction of infiltration (and therefore, dilution) with the installation of the paved pad as well as the road salt from the south, as observed in the background monitors.

Monitor 22b-11, completed in November 2011, is representative of downgradient overburden conditions based on its location along the western site boundary. Elevated sodium and chloride concentrations appear to reflect minor road salt effects due to its location immediately adjacent to Dunlop Drive. Of the indicator parameters, the June 2015 calcium concentration is slightly higher than the historic maximum concentration at this location, likely due to natural variability.

We conclude from this assessment, there have been no leachate impacts to the shallow groundwater in the vicinity of the site as a result of site operations in 2015.

8.3.2 Downgradient Bedrock Groundwater Quality

The interpreted bedrock groundwater flow directions (Figure 2) indicate that monitors 6a-96, 10-00, 11a-01, 13a-01, 15a-01, 17a-08 and 22a-11 are downgradient of the active site area, within or on the edge of the paleo-valley trending through the site.

The bedrock groundwater quality was compared to Ontario Drinking Water Standards (ODWS), as applicable. Sodium and chloride exceed ODWS at background bedrock monitor 5-96 due to road salt effects. There are no other exceedances of ODWS in 2015 for the bedrock groundwater monitors for the parameters tested (except for iron, previously discussed).

As the shallow outwash water quality is not affected by site operations, no effects to the deeper bedrock groundwater would be expected nor observed.

8.4 Groundwater Organics Results

Groundwater monitors are to be analyzed for organics during the spring monitoring event at monitoring locations 2, 6, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 22 and 23 and monitors 5-96, 7-96, 8-96, 9-96, 10-00 and 21a-08. The organic groundwater sample was inadvertently missed in 2015 but will be completed in 2016.

Historically, there have been occasional low level detections of organics at both upgradient and downgradient monitors. Because the detection limits for organic compounds are very low, it is not unusual to have sporadic low level organic detections at sites where organic samples are frequently collected. The presence of persistent organics at one location combined with elevated indicator parameter concentrations and/or increasing trend in parameter concentrations would trigger more intense scrutiny of water quality results. This has not been the case for the organic detections at this site.

8.5 General Groundwater Quality Discussion

Overall, the groundwater chemistry during 2015 was similar to previous years.

In 2007, nitrate and nitrite analysis was re-instated into the routine monitoring program for both the sites as per the MOECC's recommendations. Historically, nitrates were included in the monitoring program but were removed since elevated nitrate concentrations were prevalent across the site at all locations prior to development of the site. Shallow background monitors 1b-91, 6b-96 and 7-96 historically have shown elevated nitrate concentrations in the early 1990s (up to 32 mg/L at 1b-91) and late 1990s (up to 53.5 mg/L at 7-96) indicating that the elevated nitrates were present prior to the commencement of facility operations due to historical land use. Concentrations of nitrate have decreased since this time and are generally at much lower levels reflecting current surrounding land use in the area. There were no exceedances of the nitrate ODWS in 2015.

Monitors 5-96, 6b-96, 15b-08, 17b-08, 19b-08 and 23b-12 exceeded ODWS for sodium and/or chloride in 2015 as a result of road salt effects. 15b-08 also exceeded the chloride ODWS in December 2015, which may be related to PDO area construction. 15b-08 will be re-sampled in March 2016 to determine if higher parameter concentrations at this monitor are anomalous. In 2015, some elevated iron concentrations were detected at some of the monitors. In the past, exceedances of the iron ODWS occurred at many of the monitoring locations during December 2011 and persisted throughout 2012, though at lower concentrations with many of the monitors with iron concentrations below the laboratory detection limits by December 2013. These elevated iron concentrations will continue to be evaluated further in future monitoring events. There were no other exceedances of the Ontario Drinking Water Standards in 2015.

The organic groundwater sampling was inadvertently missed in 2015 but will be completed in 2016.

In conclusion, there were no observable effects attributed to the WRIC operations on the groundwater quality beneath the site. No effects were observed at the site boundaries. Road salt effects continue to be observed at monitoring locations both upgradient of the site and on-site.

8.6 Guideline B-7 Assessment

MOE Guideline B-7 (formerly Policy 15-08 referred to as the Reasonable Use Policy) applies the reasonable use approach to groundwater quality management at waste management sites. Guideline B-7 describes acceptable levels of contaminants in the groundwater at site boundaries, based on the Ontario Drinking Water Standards (ODWS) and natural background conditions. In addition, it is used to determine whether any remedial action is warranted. The Guideline B7 limits were calculated using the formula outlined in the MOECC's Procedure B-7-1 (MOEE 1994a and 1994b).

The basic methodology to assess groundwater quality in relation to Guideline B7 limits (reasonable use guidelines), is to compare the shallow and bedrock downgradient groundwater quality to the calculated maximum concentrations. The leachate indicator parameters used in the assessment are either health related or aesthetic parameters specified in the ODWS. Based on the MOECC reasonable use approach from Guideline B-7, the maximum concentrations (**Cm**) allowed at the site boundaries are calculated from the drinking water quality criteria (**Cr)** and background concentrations (**Cb**) based on the formula provided in Procedure B-7-1. Guideline B7 allows for some incremental impact to occur on the neighbouring property, relative to background. Input for a given chemical parameter includes the background concentration, the Ontario Drinking Water Standards (MOE, 2003), and a safety factor that was established by the MOECC based on human health and aesthetic considerations.

As part of the MOECC review on the 2009 Annual Monitoring report, it was recommended that Guideline B-7 be applied to this site as the geological model and groundwater flow have been confirmed, which is generally northeasterly. Monitor 22a-11 (bedrock) and 22b-11 (overburden) were installed at the downgradient northwestern property boundary adjacent to Dunlop Drive to be utilized for an impact assessment with respect to the requirements of Guideline B-7[14]. As recommended by the MOECC reviewer[15], the number of monitors considered for calculation of the median background concentrations was expanded to include the more recent monitors. The median historic concentrations from background overburden monitors 12b-00, 14b-01, 16b-08, 18b-08, 19b-08, 20b-08 and 23b-12 and from background bedrock monitors 5-96, 8-86, 14a-01, 16a-08, 18a-08, 19a-08, 20a-08 and 23a- 12 were used to calculate the maximum concentration levels presented in Tables 8 and 9, respectively.

$$C_m = C_b + F \times (C_{ODWS} - C_b)$$

where, C_m is the maximum concentration,
C_b is the median background concentration,
C_{ODWS} is the maximum concentration (dependant on water use),
F is a constant – 0.5 mg/L for aesthetic parameters, 0.25 mg/L for health related parameters.

14. Memorandum from Lynnette Latulippe (MOECC) to Bill Shields (City of Guelph), Re: Annual Monitoring Report – 2009 Guelph Wet-Dry Recycling Centre and Waste Transfer Station Groundwater Review, dated February 7, 2011.

15. Memorandum from Abdul Quyum (MOECC) to Kevin Noll (MOECC), Re: Annual Monitoring Report – 2012 Guelph Wet-Dry Recycling Centre and Waste Transfer Station, Guelph, Ontario, dated April 25, 2013.

Table 8: Guideline B-7 Calculated Maximum Parameter Concentrations – Overburden

Parameter	Cb	F	CODWS	Cm
Nitrate (mg/L)	0.925	0.25	10	3.19
Boron (mg/L)	0.022	0.25	5	1.27
Sodium (mg/L)	71	0.5	200	136
Chloride (mg/L)	73	0.5	250	162
Sulphate (mg/L)	47.5	0.5	500	274
Iron (mg/L)	0.115	0.5	0.3	0.21

Note that monitors 5-96, 8-86, 14b-01 and 19b-08 show elevated sodium and chloride concentrations due to road salt impacts, however, these conditions are representative of the background conditions of these areas.

Table 9: Guideline B-7 Calculated Maximum Parameter Concentrations – Bedrock

Parameter	Cb	F	CODWS	Cm
Nitrate (mg/L)	0.305	0.25	10	2.73
Boron (mg/L)	0.02	0.25	5	1.27
Sodium (mg/L)	28	0.5	200	114
Chloride (mg/L)	47	0.5	250	149
Sulphate (mg/L)	49	0.5	500	275
Iron (mg/L)	0.03	0.5	0.3	0.17

Maximum allowable concentrations (C_m) are compared to the 2015 groundwater quality results from location 22-11 in Table 10.

Table 10: Summary of 2015 MOECC Guideline B-7 (Reasonable Use) Calculations at the Northwest Boundary

Parameters in mg/L		Overburden			Bedrock		
		Cm	Monitor 22b-11		Cm	Monitor 22a-11	
			Jun 2015	Dec 2015		Jun 2015	Dec 2015
Health Related Parameters	Nitrate	3.19	***3.93***	0.32	2.73	< 0.1	< 0.1
	Boron	1.27	0.026	0.024	1.27	0.023	0.022
Aesthetic Parameters	Sodium	136	93	41	114	16	17
	Chloride	162	***170***	75	149	49	50
	Sulphate	274	20	45	275	87	86
	Iron	0.21	0.05	0.20	0.17	***0.70***	***0.72***

Bold, italicized concentrations in Table 10 exceed Guideline B-7 limits. The nitrate and chloride B-7 limits were exceeded during the spring monitoring event at 22b-11 in the overburden. Historically, elevated nitrate concentrations were prevalent across the site at all locations prior to development of the site. Although concentrations have decreased from the historical levels, they still remain elevated, albeit at much lower levels in the area due to current surrounding land use. This demonstrated at, background monitors (19B, 23B) and immediately upgradient monitors (6B and 7), which had concentrations that were still elevated and slightly higher than the spring result at 22B indicating that the exceedance is not related to site operations. The chloride concentrations at 22b-11 show seasonal patterns with more elevated concentrations in the spring compared to the fall concentrations. This is a common pattern observed at many other monitor locations. The iron concentrations at 22a-11 also exceeded Guideline B7 limits during both monitoring events. As previously discussed, iron

concentrations at some of the monitor locations were unusually high during the December 2011 monitoring event. These elevated concentrations decreased at 22a-11 during 2012 but have been variable since then. The elevated iron concentrations occurred in both upgradient and downgradient monitors and therefore, do not appear to be related to site operations. Only nine samples have been collected from 22-11 since it was drilled in 2011 therefore, continued sampling of this location will build a larger dataset for comparison purposes.

Strictly speaking, Guideline B-7 is in place to assess groundwater impacts leaving the site for protection of downgradient users. There are no downgradient well users as the surrounding area is municipally serviced.

8.7 Surface Water Monitoring

8.7.1 Transfer Station Area

In 2015, monthly inorganic surface water sampling of the stormwater management pond (SWM) for the parameters shown on Table 6 occurred when water was present. The SWM pond was routinely checked during 2015. When water was present, samples were collected at the discharge at the north end of the pond (TP1 (out) on Figure 1) on a monthly basis. Monitoring of the culvert on the west side of the pond (TP1 on Figure 1) was discontinued in March 2014, as approved by the MOECC. TP1 (out) was sampled from March to December in 2015 (ten events).

City field staff make note of discharge conditions at the surface water stations at the time of sample collection. Below is a summary of the discharge conditions observed at TP1(out).

Month	Discharge Events	Conditions	Sampling Date
January	No Discharge	Ice covered	**January 21, 2015 – No Sample**
February	No Discharge	Ice covered	**February 2015 - No Sample**
March	No Discharge	Clear water	**March 17, 2015**
April	No Discharge	15 mm rain event - Clear water	**April 10, 2015**
May	No Discharge	Clear water	**May 20, 2015**
June	No Discharge	15 mm rain event – organic material on water surface	**June 30, 2015**
July	No Discharge	15 mm rain event – organic material on water surface	**July 14, 2015**
August	No Discharge	Clear water	**August 27, 2015**
September	No Discharge	15 mm rain event – Clear water	**September 4, 2015**
October	No Discharge	Clear water	**October 22, 2015**
November	No Discharge	Clear water	**November 25, 2015**
December	No Discharge	Clear water	**December 15, 2015**

In the MOECC review comments of the 2013 annual report, the MOECC acknowledged that sampling the SWM pond when it is not flowing does not provide useful information. AECOM advised field staff to continue to monitor surface water levels monthly to note conditions but only collect samples during discharging conditions. City staff continued to collect the monthly samples at TP1(out) during 2015 though no discharge occurred.

As now required under the currently amended ECA, surface water samples are to be collected under rain event of greater than 15 mm three times per year, for TSS, of which two must be between May and September. Full samples including TSS where collected in April, Jun and September along with an additional sample collected in July. Although these samples were collected it was recorded that now discharge was occurring at the time.

The existing on-site surface water pond (“East Pond” on Figure 1) is also included in the monitoring program. Water quality from the East Pond is considered representative of background surface water quality as it does not receive any inputs from the facilities. It was recommended in the 2011 annual monitoring report that the monitoring

frequency of the East Pond be increased to monthly to coincide with those occasions when samples are collected from the on-site SWM ponds. If no samples are collected from the any of the SWM pond locations, no sample from the East Pond for that month is required. East Pond surface water samples (designated EPTS-01) were collected in January and March to December. The 2015 surface water results for the leachate indicator parameters are tabulated below, and the testing results are presented in Appendix C.

Surface water results were compared to Provincial Water Quality Objectives (PWQO), background surface water quality (EPTS-01) and background overburden water quality. At EPTS-01, the PWQO for zinc was exceeded during all 11 monitoring events in 2015. Zinc has consistently exceeded PWQO in the past at this location. Phenols (2.4 μg/L), total phosphorus (0.072 mg/L) and iron (0.45 mg/L) exceeded PWQO in April 2015. All three parameters have occasionally exceeded PWQO. All the leachate indicator parameter concentrations were within background overburden ranges.

Location	Date	Critical Leachate Indicators			Other Leachate Indicators				
		Boron (ppm)	Phenols (ppm)	Chloride (ppm)	Alkalinity (ppm)	Sodium (ppm)	Calcium (ppm)	Magnesium (ppm)	Potassium (ppm)
PWQO/		0.2	0.001	-	-	-	-	-	-
Background Overburden[(1)]		0.005 – 0.063	< 0.001 – 0.006	2 – 362	85 – 438	0.1 – 170	0.2 – 280	0.05 – 80	0.2 – 10
Background Overburden[(2)]		<0.01 – 0.59	< 0.001-0.0089	5 – 620	235 – 700	3.5 – 480	23 – 190	10 – 51	1.1 – 12
TP1 (out)	17-Mar-15	0.014	0.0065	200	96	130	32	4.4	3.3
	10-April-15	0.019	0.0016	180	180	120	67	11	3.1
	20-May-15	0.018	< 0.001	260	210	160	72	13	5
	30-June-15	0.026	< 0.001	88	200	68	52	7.6	1.8
	14-July-15	0.032	< 0.001	39	130	34	39	5.3	2.2
	27-Aug-15	0.034	< 0.001	45	150	40	49	6.2	3.4
	4-Sept-15	0.033	< 0.001	45	150	37	47	5.5	3.6
	22-Oct-15	0.028	< 0.001	19	100	15	37	5.4	3.9
	25-Nov-15	0.026	< 0.001	76	160	52	64	8.9	9.1
	15-Dec-15	0.096	0.019	120	140	83	87	10	8.1
	Historic Range	< 0.01 – 0.11	< 0.001 – 0.007	5 - 1300	50 - 390	5 - 820	16 - 160	0.8 - 29	1.5 - 45
EPTS-01	21-Jan-15	0.017	< 0.001	120	290	43	95	23	1.5
	17-Mar-15	0.019	< 0.001	46	270	27	94	24	1.7
	10-April-15	0.010	0.0024	92	73	68	22	3.5	1.6
	20-May-15	0.015	< 0.001	59	260	32	86	24	1.3
	30-June-15	0.018	< 0.001	59	270	34	79	23	1.2
	14-July-15	0.016	< 0.001	49	250	30	75	21	1.2
	27-Aug-15	0.025	< 0.001	48	270	31	83	24	1.4
	4-Sept-15	0.019	< 0.001	48	260	28	75	22	1.5
	22-Oct-15	0.016	< 0.001	43	270	25	85	24	1.5
	25-Nov-15	0.016	< 0.001	60	270	35	93	25	1.7
	15-Dec-15	0.014	< 0.001	66	270	34	95	25	1.8
	Historic Range	<0.01 – 0.19	<0.001 – 0.002	26 – 190	169 – 334	13 – 120	68 – 160	19 – 27	1 – 2

Note: (1) Range of background overburden water quality from 1997 to 2014 for monitors 2b-91, 9-96 and 14b-01.
(2) Range of background overburden water quality from 2008-2014 for monitors 12b-00, 16b-08, 18b-08, 19b-08, 20b-08 and 23b-12

For the SWM pond samples at TP1(out), the PWQO was exceeded for total phosphorus for all ten of the 2015 events, iron and phenol for three events each and zinc for one event. The PWQO for total phosphorus, iron, phenols and zinc have routinely to occasionally been exceeded at this location in the past. The elevated total phosphorus is a result of former surrounding land use and not a result of operations at the site. Elevated zinc, total phosphorus and iron concentrations appear to be related to external factors since background surface water have also exceeded PWQO for these parameters. Metals are a common contaminant from roadway runoff. Elevated

phosphorus is typical in rural and urbanized areas. The 2015 concentrations are within the range of historic background overburden quality, except for December 2015 phenol concentration of 0.019 mg/L which is elevated compared to the maximum observed background overburden concentration of 0.0089 mg/L and higher than the historic maximum of 0.007 mg/L previously observed at this location. 2015 indicator parameter concentrations are within the range of background surface water concentrations at EPTS-01. Comparing the water quality at TP1(out) to EPTS-01 per sampling event, TP1(out) concentrations exceed background EPTS-01 concentrations for potassium during all ten 2015 sampling events, boron and sodium (nine events), chloride (six events), phenols (three events) and one event each for alkalinity, calcium and magnesium. Of note is the EPTS-01 April 2015 results, which showed elevated phenols and sodium but lower concentrations of alkalinity, calcium and magnesium compared to other samples collected in 2015. The cause of this water quality difference may be related to 37.6 mm of sustained spring runoff entering the pond from precipitation over the preceding two days and the day of sampling. Baseline water quality information collected prior to building the WRIC had historically shown elevated total phosphorus concentrations and occasional elevated phenols, sodium, magnesium and potassium concentrations. Therefore, the elevated parameter results are due to the effects of former land use and not a result of operations at the site. Elevated parameter concentrations are not attributed to the site operations as site handling and maintenance practices would deter potential surface water influences

2015 parameter concentrations at TP1(out) were within the range of historic concentrations, except for phenols and sulphate in December 2015. The December 2015 sulphate concentration at TP1(out) was 120 mg/L, compared to the previous maximum concentration of 48 mg/L. Several parameters (COD, potassium, total, phosphorus, boron, zinc) during the December event were elevated and at the high end of the historic concentration range. The cause may be related to sediment in the sample as TSS, iron, sulphate and to a lesser degree total phosphorous were noted to be more highly elevated. The SWM Pond also shows elevated sodium and chloride concentrations suggesting road salt influences from the adjacent access road.

Although discharge was not occurring, TSS during the 15 mm rain events was generally below 3 mg/L.

Organic samples were collected from the TP1(out) and EPTS-01 surface water locations in June 2015. The background station EPTS-1 showed chloroform at concentration of 0.44 μg/L. Chloroform was previously detected at this location in June 2004 (0.9 μg/L), April and June 2007 (0.3 μg/L and 0.6 μg/L), June 2008 (1.9 μg/L), June 2009 (0.8 μg/L), June 2010 (0.6 μg/L), June 2011 (0.3 μg/L) and April and June 2013 (0.14 μg/L and 0.9 μg/L) and April 2014 (0.26 μg/L). There is no PWQO for chloroform. EPTS-1 also showed o-cresol at a concentration of 0.51 μg/L, just above the 0.5 mg/L laboratory method detection limit. This concentration is within the o-cresol interim PWQO of 1 μg/L. There have been no previous detections of o-cresol at EPTS-1. As these detections are at the background surface water station, they are not related to site operations. There were no organic detected at TP1 (out) in 2015.

8.7.2 WRIC

Monitoring of surface water at the WRIC commenced in March 1996. As required in the former C of A/ECA, this monitoring was to be on a monthly basis for a short parameter list and on a quarterly basis for the full leachate parameter list (updated in 1999), as outlined in Section 3. There were two surface water sampling stations at the site, designated as SW 1 located at the off-site discharge point in Stormwater Detention Area 2 and SW 2 located in the Stormwater Detention Area 1 (Figure 1). Surface water runoff from the site is directed to a series of on-site stormwater catch basins. Excess water from Stormwater Detention Area 1 flows to Stormwater Detention Area 2 where it would ultimately discharge via a pond outlet structure in the northwest portion of the pond to the York-Watson Stormwater Detention Area.

On March 6, 2014, the City met with the MOECC to discuss the Public Drop Off facility (PDO) application and observed the stormwater ponds on WRIC. It was agreed that sampling at the WRIC Detention Pond (SW 2 and SW 3) would be discontinued. Detention Pond 2 (SW 1) would only be sampled once the levels in the pond

reached 0.46 m above the pond invert and that the SWM pond (TP1(out)) would continue to be sampled monthly though TP1 could be discontinued. These changes to the surface water monitoring were confirmed by the MOECC though e-mail on March 17, 2014. As a result, sampling was discontinued at SW 2 and SW 3 in March 2014.

Surface water monitoring of the staff gauge in Detention Pond 2 is still undertaken on a monthly basis at SW 1 only, and if water levels exceed the target of 0.46 m sampling is completed to assess the water quality in the pond should discharge be required. Detailed recordings on discharge and overall conditions (such as dry or stagnant water) are undertaken.

SW 1 was monitored monthly however, the pond was snow covered between January and March and was dry between May and December. SW1 was sampled in April 2015 during a rain event when the water level in the detention pond was recorded above the trigger.

East Pond water quality will serve as background surface water for comparison purposes. There is no baseline surface water analysis (prior to site operations), so any impacts due to runoff from the WRIC would be difficult to determine at the discharge point SW 1, due to the potential for other sources of non-facility impacts. These sources include runoff from the surrounding lands and road systems.

Below is a discussion of the surface water monitoring at station SW 1 during 2015. Samples were collected from Detention Pond 2 (SW 1) on April 10, 2015 only as the pond was frozen/ice covered from January to March and then dry for the remainder of the year. The table below briefly outlines the surface water monitoring events for the past year at SW1.

Month	Discharge Events	Conditions	Sampling Date
January	No Discharge	Ice covered	**January 21, 2015 – No Sample**
February	No Discharge	Ice covered	**February 2015 - No Sample**
March	No Discharge	Ice covered	**March 17, 2015 - No Sample**
April	No Discharge	1.2 m level - clear water, 15 mm rain event	**April 10, 2015**
May	No Discharge	Dry	**May 20, 2015 – No Sample**
June	No Discharge	Dry	**June 30, 2015 – No Sample**
July	No Discharge	Dry	**July 14, 2015 No Sample**
August	No Discharge	Dry	**August 27, 2015 – No Sample**
September	No Discharge	Dry	**September 4, 2015 – No Sample**
October	No Discharge	Dry	**October 22, 2015 – No Sample**
November	No Discharge	Dry	**November 25, 2015 – No Sample**
December	No Discharge	Dry	**December 15, 2015 - No Sample**

A comparison of the April 2015 samples collected at SW 1 (Stormwater Detention Area 2), to the site indicator parameters, showed elevated boron and alkalinity compared to background surface water quality at the East Pond (EPTS-01). Alkalinity, magnesium, sulphate and calcium concentrations are generally much lower at SW1 compared to the East Pond. The April 2015 SW 1 parameter concentrations are within the range of historic concentrations at this location, though magnesium, alkalinity, calcium and zinc are at the high end of the concentration range. The Provincial Water Quality Objectives (PWQO) was exceeded for zinc. Zinc has occasionally exceeded PWQO in the past at this location. The zinc PWQO is consistently exceeded at the background surface water station. Occasionally elevated parameter concentrations at SW1 are a result of road salt effected runoff from the adjacent internal roadways and/or occasional stagnant water conditions in the pond.

The MOECC surface water specialist provided comments on the 2013 annual report[16]. One of the comments was with respect to recent exceedances of the phenol PWQO at the detention pond locations. The MOECC surface

16. Memorandum from Krista Chomicki (MOECC) to Kevin Noll (MOECC), Re: 2013 Guelph Waste Resource Centre – City of Guelph, dated April 8, 2014.

water reviewer commented that since AECOM note that any water collected in the detention ponds quickly infiltrates into the groundwater, the MOECC Geoscientist should assess phenol concentrations in the subsurface. Since the number of exceedances is increasing, the source of the phenols should be evaluated, and if there is a source, monitoring and treatment are recommended. AECOM responded[17] that we would respond to comments that may be provided by the MOECC Geoscientist with regard to this item though no comments were forthcoming from the MOECC hydrogeologist with respect to this item[18]. Related to this item, in the body of the memorandum, the surface water reviewer notes that she disagrees with AECOM's interpretation that aside from some irregular occurrences of parameters above PWQOs, there does not appear to be a problem with surface water quality results resulting from the facility and uses phenols as an example where the majority of the samples in the detention ponds were above the PWQO and the number of exceedances was greater than other years. While it is true that the number of exceedances of phenols in the detention ponds is more than in previous years, they are still low. In 2015, no phenols were detected at SW1 and TP1(out) had fewer detections than previous years' with no detections in seven of the ten sampling events. It should be noted that the operational practices of the site (indoor composting and waste handling, no on-site waste processing, etc.) deter surface water influences from site operation as acknowledged by the surface water reviewer within the body of the memorandum.

8.8 Adequacy of Program and Proposed Changes

In conclusion, there were no observable effects attributed to the WRIC on the groundwater quality beneath the site. Monitors 5 96, 6b-96, 15b-08, 17b-08, 19b-08 and 23b-12 exceeded ODWS for sodium and/or chloride in 2015 as a result of road salt effects.

The organic groundwater sampling was inadvertently missed in 2015 but will be completed in 2016. Historic detections of occasional low levels of VOC throughout the site in both upgradient and downgradient monitors have been observed. Occasional VOC detections are not considered to be a result of site operations and are most likely related to surrounding land use.

The MOECC recommended installation of a well nest along the downgradient property boundary to be utilized for impact assessment with respect to the requirements of Guideline B-7[19]. Monitoring nest 22-11 with a bedrock and overburden monitor was installed in November 2011 and the Guideline B-7 analysis was completed. The nitrate and chloride B-7 limits were exceeded during the spring monitoring event at 22b-11 in the overburden. The nitrate exceedance is considered related to current surrounding land use as similar to slight higher concentrations are observed at locations further upgradient as well as in the background. The chloride concentrations at 22b-11 show seasonal patterns with more elevated concentrations in the spring compared to the fall concentrations. This is a common pattern observed at many other monitor locations. The iron concentrations at 22a-11 also exceeded Guideline B7 limits during both monitoring events. As previously discussed, iron concentrations at some of the monitor locations were unusually high during the December 2011 monitoring event. These elevated concentrations decreased at 22a-11 during 2012 but have been variable since then. The elevated iron concentrations occurred in both upgradient and downgradient monitors and therefore, do not appear to be related to site operations. Only nine samples have been collected from 22-11 since it was drilled in 2011 therefore, continued sampling of this location will build a larger dataset for comparison purposes.

In previous monitoring reports, we had recommended discontinuation of the organic sampling from the groundwater monitoring program for all historical locations. In the MOECC review of the 2009 Annual Monitoring report (Groundwater Review), the reviewer did not support the discontinuation of the organic groundwater sampling program

17. AECOM Letter to Bill Shields (City of Guelph); Re: Response to MOE Surface Water Review Comments. 2013 Annual Report – Solid Waste Transfer Station & Wet-Dry Recycling Centre, C of A/ECA (Waste Disposal Site) No. A170128, dated May 30, 2014.

18. Memorandum from Abdul Quyum (MOECC) to Kevin Noll (MOECC), Re: Annual Monitoring Report – 2013, Guelph Wet-Dry Recycling Centre and Waste Transfer Station, Guelph Ontario, dated April 23, 2014.

19. Memorandum from Lynnette Latulippe (MOECC) to Bill Shields (City of Guelph), Re: Annual Monitoring Report – 2009 Guelph Wet-Dry Recycling Centre and Waste Transfer Station Groundwater Review, dated February 7, 2011.

since an impact assessment with respect to the requirements of Guideline B-7 had not yet been completed. This Guideline B-7 assessment was completed (discussed above) and found that there were no impacts at the western downgradient site boundary as a result of site operations therefore, we request removal of the organic sampling from the groundwater monitoring program. Further, increased sampling for organics (twice per year) in 2012, 2013 and 2014, as a result of the dirt stock pile and addition of location 23-12, was completed by the City to better assess any potential contributions from the stock pile. These data indicated that sporadic hits of organics occur across the site (upgradient and downgradient), which are not related to any on-site activity and were most likely related to surrounding land use. At of the end of 2013, all contaminated soils along with the majority of the stock pile have been removed from the site. Groundwater organic sampling was completed in May in 2014. The groundwater reviewer did not comment on removal of organics from the groundwater program in his review of the 2014 annual monitoring report. We continue to recommend the discontinuation of the organic groundwater sampling program as historical data has consistently shown that low concentrations of organics not related to the site.

The East Pond setting is similar to the other on-site ponds (influenced by road salting and within similar overburden soils) though it is within a different catchment area. The East Pond will be used as a background surface water station for water quality from the on-site surface water features. Monthly surface water samples were collected from the East Pond in 2015 (where possible). As agreed by the MOECC, the Detention Pond 2 (SW 1) would only be sampled once the levels in the pond reached 0.46 m above the pond invert and the SWM pond (TP1(out)) continued to be sampled monthly during non-stagnant conditions (no discharge). SW 1 was monitored monthly however, the pond was dry for most of the year. If no samples are collected from the SWM pond location (TP1(out)), no sample from the East Pond for that month is required.

The 2015 surface water monitoring program shows that there have been no leachate effects to the SWM pond as a result of site operations. The 2015 SWM Pond results from TP1(out) showed all indicator parameter concentrations exceeded background surface water concentrations at EPTS-01 on one or more occasions. Parameter concentrations at TP1(out) were within historic concentrations for this location (except for December phenols and sulphate) and within background overburden concentrations. Elevated concentrations are not attributed to the site as site handling and maintenance practices would deter potential surface water impacts. Elevated sodium and chloride concentrations suggest road salt influences from the adjacent access road. Surface water organic sampling in June 2015 showed a low o-cresol and chloroform concentrations at the background surface water station, EPTS-01. There were no organics detected at TP1(out) in 2015. Historically, only low levels of a few organics have occasionally been detected in the surface water samples. As previously discussed, the site design and operations minimizes the potential for leachate generation from site activities.

As per the surface water monitoring program, SW 1 (detention pond 2) was monitored monthly however, the pond was snow covered between January and March and was dry between May and December. SW1 was sampled in April 2015 during a rain event when the water level in the detention pond was recorded above the trigger. The water quality was found to be similar to lower than at East Pond (background). The PWQO was exceeded for zinc which was also observed in the East Pond and is considered natural to the area. No discharge was required from the detention pond in 2015.

9. Public Liaison (PLC) Activities

The following is a summary of the PLC activities in 2015, as provided by the City.

The City ensured that meetings were held on a quarterly basis. The PLC has been informed and provided an opportunity to comment on all ECA amendments that were submitted to the Ministry in 2015.

10. WRIC Contingency Plans

The City has detailed contingency plans in place for the site prepared by the Environmental Services Department, Solid Waste Resources. The 2008 Emergency and Contingency Plan and the 2006 Contingency Plan documents (WRIC Contingency Programs, WRIC Business Continuity Plan, WRIC Emergency Plan, WRIC Fire Safety Plan) were reviewed by AECOM.

The pertinent items identified by the ECA are summarized below.

10.1 Spills

The WRIC has a Spills Handling and Reporting procedure in place. This procedure applies to all areas, employees and contractors at the WRIC. The procedure defines spills: minor, major, moderate and hazardous materials. The Spills procedure then outlines how to clean up a minor spill and who must be notified in the case of moderate or major spills.

In the event of a minor spill, the plan indicates that appropriate personal protective equipment should be worn and absorbents used to soak up the spill. Absorbed material should be transported to the Transfer Station for disposal.

The plan also covers procedures to follow in the event of a moderate or major spill. The City of Guelph Operations Department, the Environmental Protection Officer at the Wastewater Treatment Plant and the MOECC Spills Action Centre must be notified, also in the event of a major spill, the Fire Department, Police, Operations Department, or City of Guelph Emergency Operations Control Group may need to be notified. The plan indicates that all necessary steps should be taken to eliminate possible ignition sources and prevent the spill from leaving the area or entering a watercourse. The plan notes that an Employee Incident Report must be completed once the cleanup is underway. Finally, the plan provides sources of additional information and applicable legislation and references.

A Spill Contingency and Pollution Prevention Plan has also been developed for the site.

10.2 Fire or Similar Emergency

The WRIC has comprehensive plans in place in case of fire or similar emergency documented in the WRIC Fire Safety Plan and the WRIC Emergency Plan. The Fire Safety Plan includes site mapping, floor plans for each of the on-site buildings (including locations of fire alarms and extinguishers), procedures to be followed in the event of a fire/emergency, staff responsibilities and contacts in the event of a fire/emergency, procedures for fire drills, prevention and monitoring equipment maintenance.

The Emergency Plan includes many of the elements incorporated into the Fire Safety Plan plus emergency communications procedures, locations of emergency supplies, emergency equipment information and procedures related to specific emergency situations. The original Fire Safety Plan was reviewed and approved by the City Fire Department.

10.3 Composting Facilities

The Organic Waste Processing Facility has been operating since September 2011. There is a 2012 contingency plan that now includes the waste processing facility, approved in late 2011.

10.4 Power or Equipment Failure

Procedures related to power failure are discussed in the Emergency and Contingency Plan and the WRIC Emergency Plan. In the event of a minor power outage, a portable generator is available at the closed Eastview Road Landfill site. There is currently no contract for a company to supply the WRIC with a generator in the event of a major power outage. However, arrangements are in place for an outside power generation unit for the WRIC Administration Building if it is being used as an Operations Control Centre. If electricity is unavailable for more than a 24-hour period, the WRIC would be required to re-direct waste materials. Emergency procedures have also been assessed for on-site facilities should the power failure be accompanied by flood or freezing conditions.

Procedures as a result of loss of on-site facilities are addressed in the Emergency and Contingency Plan as well as the WRIC Business Continuity Plan. Recommended procedures associated with the loss of each of the facilities are documented. Ultimately, management will assess the course of action to restore the facilities and re-gain normal operations. A new generator has been installed at the Organic Waste Processing Facility.

10.5 Odour

Twice daily odour monitoring is conducted by qualified Solid Waste Resources (SWR) staff. Odour complaints from the public are investigated through the SWR Environmental Complaint Investigation Procedure in compliance with Condition 46 of the ECA. Control measures may include closing doors, cleaning up standing water and/or spills, other housekeeping measures, making changes to the processes or removal of the odour source to the landfill. If the odour persists, a portion of the operation or the entire site may be closed until the issue is resolved.

In response to the odour survey report completed by the MOECC in 2012, the City prepared an action plan to address the potential for off-site odours. In addition, supplementary measures were introduced for odour control as described previously in Section 2.3.

10.6 Aircraft Hazards/Bird Control

The Guelph Air Park is located within three km of the site. The most obvious aircraft hazard, as it relates to the operation of the WRIC, is the nuisance bird population. Daily monitoring of the number of birds occurs as part of the site inspections. A maximum number of birds on-site was determined in the bird hazard evaluation referred to in the ECA. Continual housekeeping measures, such as litter pick up around the site, at the yard waste pile and compost area, occur at the site to deter the attraction of birds and vermin. Should nuisance birds become an issue at the site, trained birds-of-prey or other mitigative measures will be considered. If necessary, the site operations may cease until the issue is resolved.

Dust, steam, smoke or any airborne vapour may pose an aircraft hazard due to decreased visibility. Operations are conducted in a manner to minimize emissions.

10.7 Un-Authorized Waste

Non-compliant materials are rejected at the scale house prior to entering the site. If un-authorized, hazardous or inappropriate waste is inadvertently accepted, the material will be loaded back on the vehicle (if it has not left the site) or the material will be placed in the appropriate bin for removal by a licensed hauler to an appropriate disposal site. The waste will be transported off-site as soon as arrangements can be made with a certified disposal company. If possible, the vehicle that brought the non-compliant materials will be charged for the disposal fee.

10.8 Groundwater/Surface Water Contamination

The site and operational procedures are designed such that there will be minimal impacts on the environment. In the event of a surface water impact, the on-site SWM detention ponds have valves that can stop off-site flow. A Spills Contingency Plan (discussed in Section 10.1) is in place to handle spills. Dry and wet waste received and handled at the site is conducted in indoor covered areas with impermeable floor surfaces and materials stored outside are covered such that impacted runoff is not generated.

Nevertheless, should water quality results suggest that there are impacts to the ground or surface water, the monitor locations/surface water stations will be re-sampled within a reasonable period of time to confirm results. As well, the area immediately adjacent and upgradient of the impacted location will be inspected for possible contaminant sources. Equipment and floor drains may also be inspected to determine if repairs are required. These repairs will be completed immediately. Should the repairs be such that normal operation is not possible, this portion of the operation will be shut down until maintenance is complete. If the contamination is a result of failure in the infrastructure that cannot be repaired under normal maintenance procedures, a remedial plan will be developed to prevent further impacts.

10.9 Quality/Fungal Contamination

If issues arise regarding air quality or fungal contamination, the appropriate qualified professional will be contracted to investigate the cause and recommend remedial measures. Remedial measures may include a change/alteration of operations or suspension of operations in the affected area(s).

All staff receive and are trained on the procedures contained within the WRIC Emergency Plan and WRIC Fire Safety Plan. The WRIC Business Continuity Plan is for use only by City Management staff due to personal information within the document. Contingency Plans are available at the WRIC for review by the Ministry.

11. Summary of Site Operational Changes and Compliance

As reported by the City, there were no deficiencies, items of non-compliance, or process aberrations in 2015. There have been no changes to the Engineer's Report[20] since the last annual report. The Design and Operations Report[21] has been updated to include the new Public Drop Off. There were no changes to the WRIC Environmental Emergency Contingency Plan in 2015.

20. Engineer's Report for the City of Guelph Waste Recycling Innovation Centre prepared by Golder Associates dated July 20, 2010.

21. The Design and Operations Report for the City of Guelph Material Recovery Facility prepared by Golder Associates, dated January 12, 2010. The Design and Operations Report for the City of Guelph Waste Transfer Station prepared by Golder Associates, dated January 12, 2010. The Design and Operations Report for the City of Guelph WRIC Public Drop Off and Municipal Hazardous and Special Waste Facilities prepared by Golder Associates, dated January 12, 2010.

12. Conclusions

The site operations at the WRIC do not appear to have any negative impacts on the ground and surface water quality in the vicinity of the site.

The following conclusions are provided based on the findings of the 2015 program:

Composting Site

a) The total tonnage of organic waste received at the composting site in 2015 was 19,584 tonnes.

b) A total tonnage of 4,420 tonnes of finished compost was produced and shipped to a farmer in Atwood, Ontario, northwest of Guelph in 2015. A total of 874 tonnes of screening and residual compost waste from the composting process were shipped to the Transfer Station and then Waste Management Twin Creeks Landfill in Sarnia, Ontario or to various other locations.

c) The total tonnage of wood waste ("clean wood") and amendment/mulch material received at the site in 2015 was about 154 tonnes and 61 tonnes, respectively. Wood waste was received mostly from the City of Guelph. Amendment material was received from the City of Guelph, Speedside Construction Limited and Accent Tree Services.

d) There were 31 odour incidents from 39 complainants received by staff at the Waste Resource Innovation Centre in 2015. All complaints were investigated by site management staff. As a result of odour complaints, the MOECC visited the site and provided recommendations for site housekeeping for storage of material, which, at this time, was believed to be the source of odours. In addition, the City directed the plant operator to investigate possible causes of the odours and a control action plan was implemented.

e) Compost samples indicate that all compost that has been shipped off of the site has passed the conditions for a Class A compost under the CCME Guidelines and the conditions within the ECA. Temperature monitoring logs of the tunnels at the composting facility show that pasteurisation at 55 degrees C was maintained for 72 hours, as required.

f) There were minor issues with the operation of the biofilter at the composting facility. An action plan was developed and submitted to the Ministry to address the issues. The facility operators continue to assess the operation of the biofilter and further recommendations will be brought forward in 2016. The compost facility operated in 2015 without any major incidents.

g) There were no confirmed deficiencies/non-compliance or environmental/operational issues related to the compost facility in 2015, other than those related to the biofilter. The facility is operating as designed.

Operations

a) The total tonnage of waste accepted by the site in 2015 was 136,226 tonnes. By the end of 2015, 120,319 tonnes were shipped off-site with 67,047 tonnes of outgoing materials from the Material Recovery facility (MRF).

b) Of the 65,080 tonnes of non-processed outgoing materials received at the Transfer Station in 2015, 41,866 tonnes (64% of the outgoing materials) was sent to the Waste Management Twin Creeks Landfill in Lambton County, 15,932 tonnes (24.5%) was sent to then Energy-from-Waste (EFW) facility in Detroit, Michigan and 4,302 tonnes (7%) was sent to the Smith Creek Landfill in Michigan for disposal. Other facilities

received less than 5% of the materials. About 4,176 tonnes (6%) of non-processed materials is marketable consisting of other recyclable materials such as shingles, clean wood, drywall, concrete and rubble.

c) In 2015, 50,686 tonnes of marketable processed material was transferred off the site from the WRIC facility. 30,855 tonnes (61%) was paper-based goods such as cardboard and newsprint, 7,920 tonnes (16%) was organics, 3,672 tonnes (4%) was plastics and the remaining 8,240 tonnes (16%) was other recyclable materials such as aluminum, steel cans, glass, tires and metal. As reflected in the volumes above, the majority of the marketable materials sold were paper products.

d) The Emergency and Contingency Plan for the site were reviewed and the items pertinent to the ECA are summarized in this document.

e) No remedial or mitigative actions were required at the site in 2015 based on findings from the monitoring program.

Groundwater Elevations and Flows

a) Shallow groundwater flow beneath the majority of the site is in a northeasterly direction. To the west of the site, groundwater flows out of a bedrock high into the outwash beneath the site before being directed to the northeast.

b) The bedrock groundwater flow pattern is similar to the overlying shallow groundwater system. Groundwater flow is from west to east and east to west coming into the site area from both directions and ultimately to the north following the former paleo river valley (incised bedrock low) that trends to the north.

Leachate

a) Historically, WRIC Monitoring results from SW3 was used the characterize compost leachate inputs. SW3 receives mostly runoff from the former compost pad. SW 3 is no longer representative of direct compost leachate and sampling of this station was discontinued in March 2014, as agreed with the MOECC. In the past SW3 (or CL-1 leachate), showed elevated concentrations of conductivity, potassium, BOD, COD, TKN, ammonia, total phosphorus, chloride, sodium and iron. SW 3 parameter concentrations were generally much lower than pre-2007 concentrations in the absence of compost runoff. This water was ultimately directed to the sanitary sewer.

Groundwater

a) Groundwater monitoring results indicate road salt effects at some up-gradient groundwater monitoring locations (5-96, 8-96, 18b-14, 19b-08, 20b-08, 23b-12). These are related to off-site winter road salting of the adjacent major roadways. Road salt effects are detected in some on-site downgradient groundwater monitors (6b-96, 7-96, 11b-00, 13b-01, 15b-01, 17b-08, 19b-08). Monitors 5-96, 6b-96, 15b-08, 17b-08, 19b-08 and 23b-12 exceeded ODWS for sodium and/or chloride in 2015 as a result of road salt effects. There were no apparent leachate impacts observed in the groundwater at the site boundary.

b) There were no exceedances of the nitrate ODWS in 2015. Historically, elevated nitrate concentrations were prevalent across the site at all locations prior to development of the site. Nitrate concentrations have decreased over the years from the historical highs observed prior to the commencements the WRIC but are still found to be elevated. These current elevated nitrates are most likely a result of surrounding and historic land use in the area.

c) Exceedances of the iron ODWS occurred at many of the monitoring locations during the December 2011 and were also noted in 2015. The elevated iron concentrations at 18a-14 and 18b-14 may be due to the residual effects of drilling mud used during installation of these monitors. The cause of the overall increase in iron

concentrations is unknown. These elevated iron concentrations will continue to be investigated further in future monitoring events. Aside from the sodium, chloride and iron exceedances discussed above, there were no other exceedances of the Ontario Drinking Water Standards in 2015 for the groundwater monitors sampled for the site monitoring programs.

d) The organic sampling organic groundwater sample was inadvertently missed in 2015 but will be completed in 2016. There are no sources of VOCs on the WRIC property as waste is handled within the covered buildings, truck boxes are covered when outside (preventing contact between the waste and precipitation) and no waste processing occurs on-site.

e) A Guideline B-7 assessment for the overburden and the bedrock was completed for monitoring nest 22-11, located along the western property boundary. The nitrate and chloride B-7 limits were exceeded during the spring monitoring event at 22b-11 in the overburden. This minor exceedance is considered related to the current surrounding land use in the area as similar concentration are noted at some upgradient and background location. The iron concentrations at 22a-11 also exceeded Guideline B7 limits during both monitoring events. As previously discussed, iron concentrations at some of the monitor locations were unusually high during the December 2011 monitoring event. These elevated concentrations decreased at 22a-11 during 2012 but have been variable since then. The elevated iron concentrations occurred in both upgradient and downgradient monitors and therefore, do not appear to be related to site operations.

f) No observable effects were detected in the shallow outwash water quality related to site operations. Similarly, no effects related to site operation were observed in the bedrock. Further, no effects related to site operations was observed at the downgradient site boundary.

Surface Water Monitoring

a) Of the 11 sets of samples collected in 2015 at EPTS-01 (the existing background on-site surface water pond, East Pond), the PWQO for zinc, phenols, total phosphorus and iron was exceeded during one or more of the 2015 monitoring events. Zinc has consistently exceeded PWQO in the past at this location. Phenols, total phosphorus and iron have exceeded PWQO in the past. All the leachate indicator parameters concentrations were within background overburden ranges. Surface water organic sampling in June 2015 showed a low chloroform and o-cresol concentration at the background surface water station, EPTS-01. Low chloroform levels have historically occasionally been detected at this location. There have been no previous detections of o-cresol at EPTS-1.

b) Monthly monitoring of the stormwater management pond in the northwest corner of the site was conducted, with samples collected at the discharge at the north end of the pond (TP1 (out)) on 10 occasions in 2015. SWM pond samples exceeded the PWQO for zinc, iron, total phosphorus and phenols during one or more 2015 sampling events. The elevated total phosphorus is a result of surrounding land use and not a result of operations at the site. Elevated zinc, total phosphorus and iron concentrations appear to be related to external factors since background surface water have also exceeded PWQO for these parameters. Metals are a common contaminant from roadway runoff. Elevated phosphorus is typical in rural and urbanized areas. No organics were detected in the stormwater management pond during 2015.

c) The SW 1 (Stormwater Detention Area 2) was only sampled in April 2015 when the water levels in the detention pond went above the trigger level of 0.46 m. The April sample at the WRIC showed elevated concentrations of boron and alkalinity compared to background surface water quality at the East Pond, although generally similar. 2015 SW 1 parameter concentrations are within the range of historic concentrations at this location. The Provincial Water Quality Objectives (PWQO) were exceeded for zinc. Zinc has historically routinely exceeded PWQO at this location, which is also observed at the East Pond. No discharge was required from Detention Pond 2 in 2015.

13. Recommendations

The following recommendations are provided for consideration:

a) Records pertaining to details of the incoming and outgoing waste/materials, environmental and operational problems should continue to be kept up to date for the WRIC.

b) The approved ground and surface water monitoring program should be continued for the site during 2016. The monitoring program for both the sites is outlined in Section XX and summarized on Table 11.

c) All samples should be analyzed for the parameters listed in the table below.

Monitoring Parameter List

Leachate Indicator		
Parameters	• Biological Oxygen Demand (BOD) • Chemical Oxygen Demand (COD) • Total Kjeldahl Nitrogen (TKN) • Ammonia as Nitrogen (NH3-N) • Total Phosphorus (Total P) • Total Suspended Solids (TSS) for surface water and leachate. • Total Sulphate (SO4) • Phenols	• Nitrate (NO3) and Nitrite (NO2) • Chloride (Cl) • Sodium (Na) • Calcium (Ca) • Boron (B) • Total Iron (Fe) • Phosphorus (P) • Zinc (Zn)
General Parameters	• pH • Conductivity • Alkalinity	• Magnesium (Mg) • Potassium (K)
Organics	• EPA 624,625 (ATG 16+17+18 & ATG 19+20)	

Discontinuation of the organic groundwater sampling program is recommended as historical data has consistently shown that low concentrations of organics are not related to the site.

d) The East Pond will continue to be used as a background surface water station for water quality from the on-site surface water features. To effectively compare surface water samples, monthly samples should continue to be collected on the same day. If no samples are collected from the any of the SWM pond locations, no sample from the East Pond for that month is required.

Table 11: Monitoring Program Summary

City of Guelph WRIC
Groundwater Monitoring Locations and Sampling Frequency

Formation	Monitor Locations		Sampling Frequency	Water Levels *
Sandy Silt Till	7-96		Semi Annually - Inorganics (June, December) Annually - Organics (June)	Semi Annually (June, December)
Sandy Outwash	6b-96	9-96	Semi Annually - Inorganics (June, December) Annually - Organics (June)	Semi Annually (June, December)
Gravelly Outwash	11b-00	12b-00	Semi Annually - Inorganics (June, December) Annually - Organics (June)	Semi Annually (June, December)
Dolostone Bedrock	5-96	10-00	Semi Annually - Inorganics (June, December) Annually - Organics (June)	Semi Annually (June, December)
	6a-96	11a-00		
	8-96	12a-00		

Surface Water Monitoring Stations and Sampling Frequency

Monitor Locations	Sampling Frequency	SW Level Sampling
SW1 - Downstream outflow of Detention Pond 2 (East of Admin)	Monthly - Inorganics, if pond levels exceed the target level of 0.46 m.	Monthly - Discharge

** C of A requirements for Wet-Dry is semi-annual. Recommend quarterly water levels collected to compare to Waste Transfer Station locations, which have quarterly requirements.*

City of Guelph Transfer Station
Groundwater Monitoring Locations and Sampling Frequency

Formation	Monitor Locations		Sampling Program
Gravelly Outwash	13b-01	18b-14	Semi Annually - Inorganics (June, December) Annually - Organics (June)
	14b-01	19b-08	
	15b-01	20b-08	
	16b-08	22b-11	
	17b-08	23b-12	
Dolostone Bedrock	13a-01	19a-08	Semi Annually - Inorganics (June, December) Annually - Organics (June)
	14a-01	20a-08	
	15a-01	21a-08	
	16a-08	22a-11	
	17a-08	23a-12	
	18a-14	EPTS-01	

Groundwater Levels

Formation	Monitor Locations		Sampling Program
Gravelly	13b-01	18b-14	Quarterly (June, December)
	14b-01	19b-08	
	15b-01	20b-08	
	16b-08	22b-11	
	17b-08	23b-12	
Dolostone	13a-01	18a-14	Quarterly (June, December)
	14a-01	19a-08	
	15a-01	20a-08	
	16a-08	21a-08	
	17a-08	22a-11	
	23a-12		

Surface Water Monitoring Stations and Sampling Frequency

Monitor Locations	Sampling Program
TP1 (out)	Monthly*** - Inorganics Annually*** - Organics
East Pond (EPTS-01)	Monthly*** - Inorganics Annually*** - Organics

**** After a rain event, if no rain or stagnent conditions persit No sampling required monitoring period*

14. References

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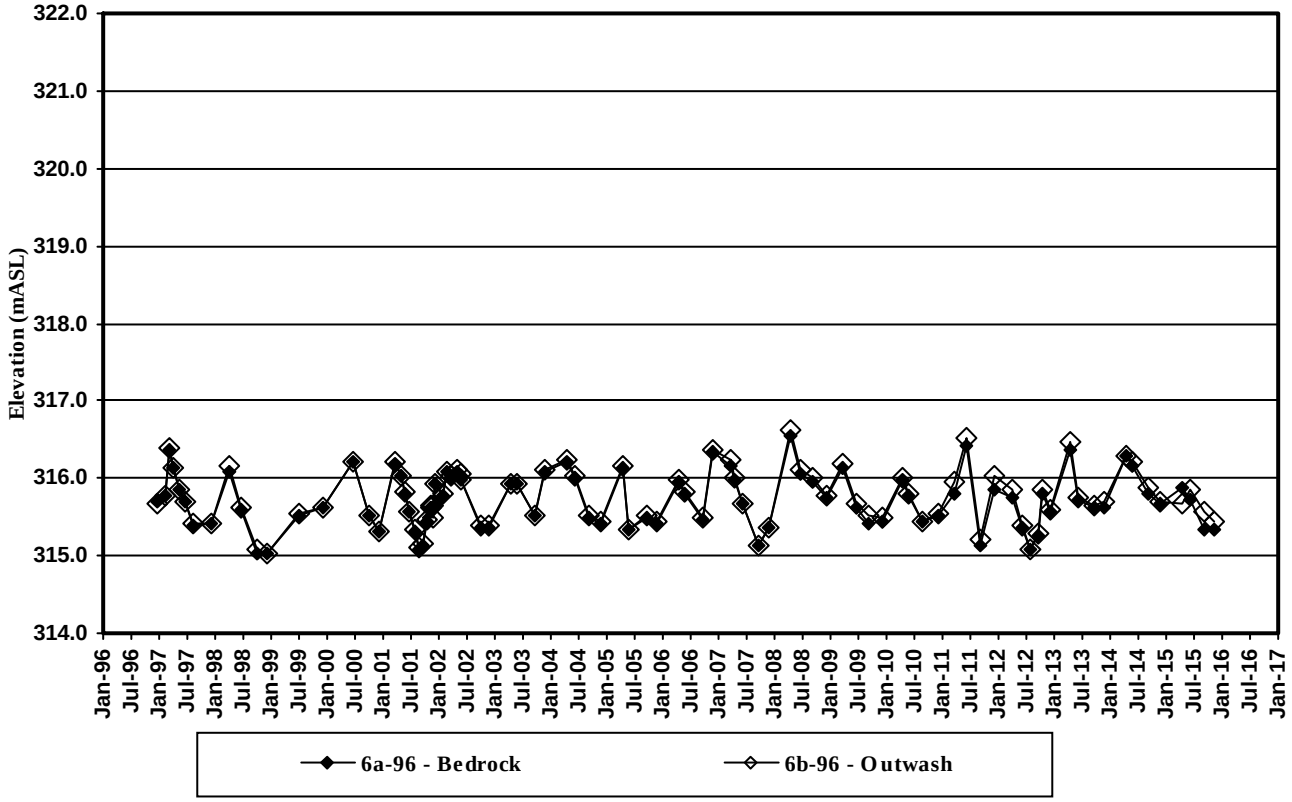
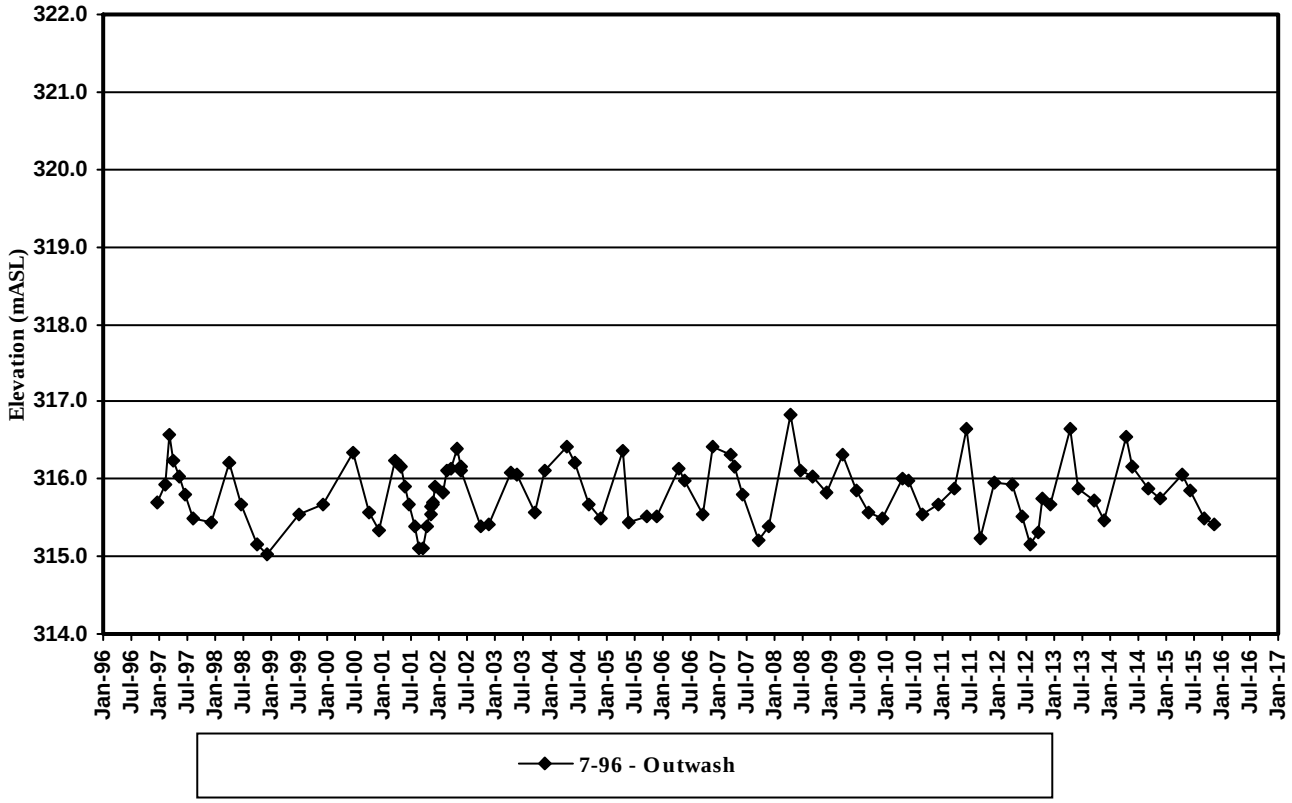
Guideline B-7 “Incorporation of the Reasonable Use Concept into More Groundwater Management Activities”, MOEE, 1994.

Appendix A

Groundwater Elevations and Hydrographs





AECOM

Guelph WRIC & Waste Transfer Station

Hydrographs

FIGURE

A - 1

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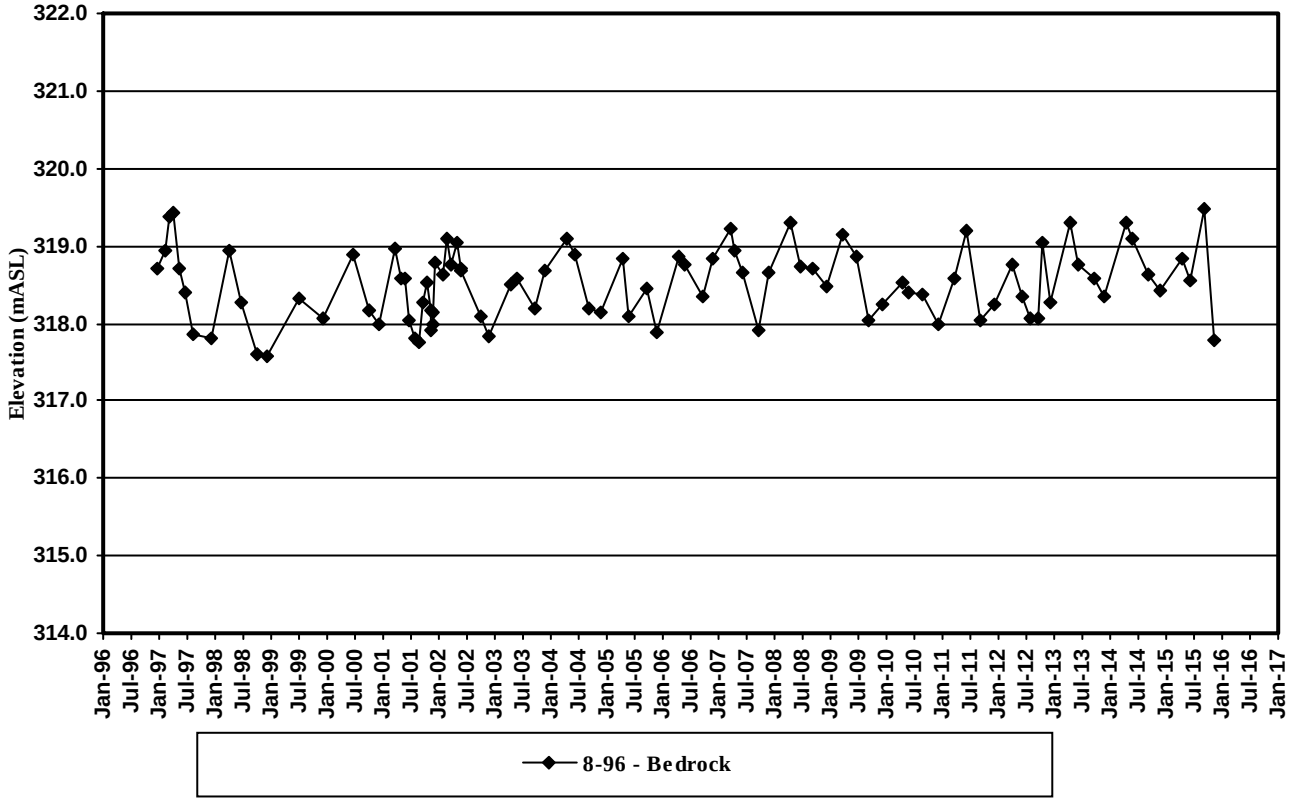
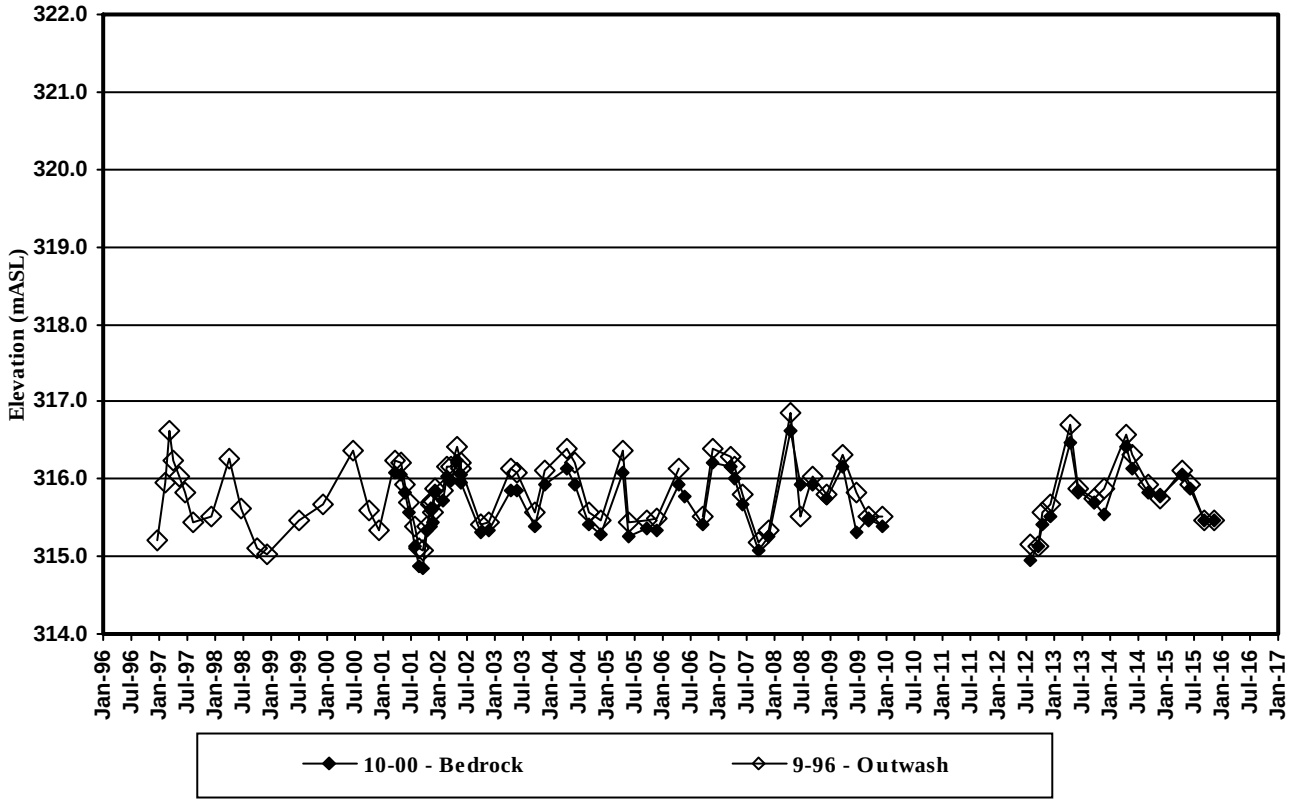
9 Rpt Hydrographs





AECOM

Guelph WRIC & Waste Transfer Station

Hydrographs

FIGURE

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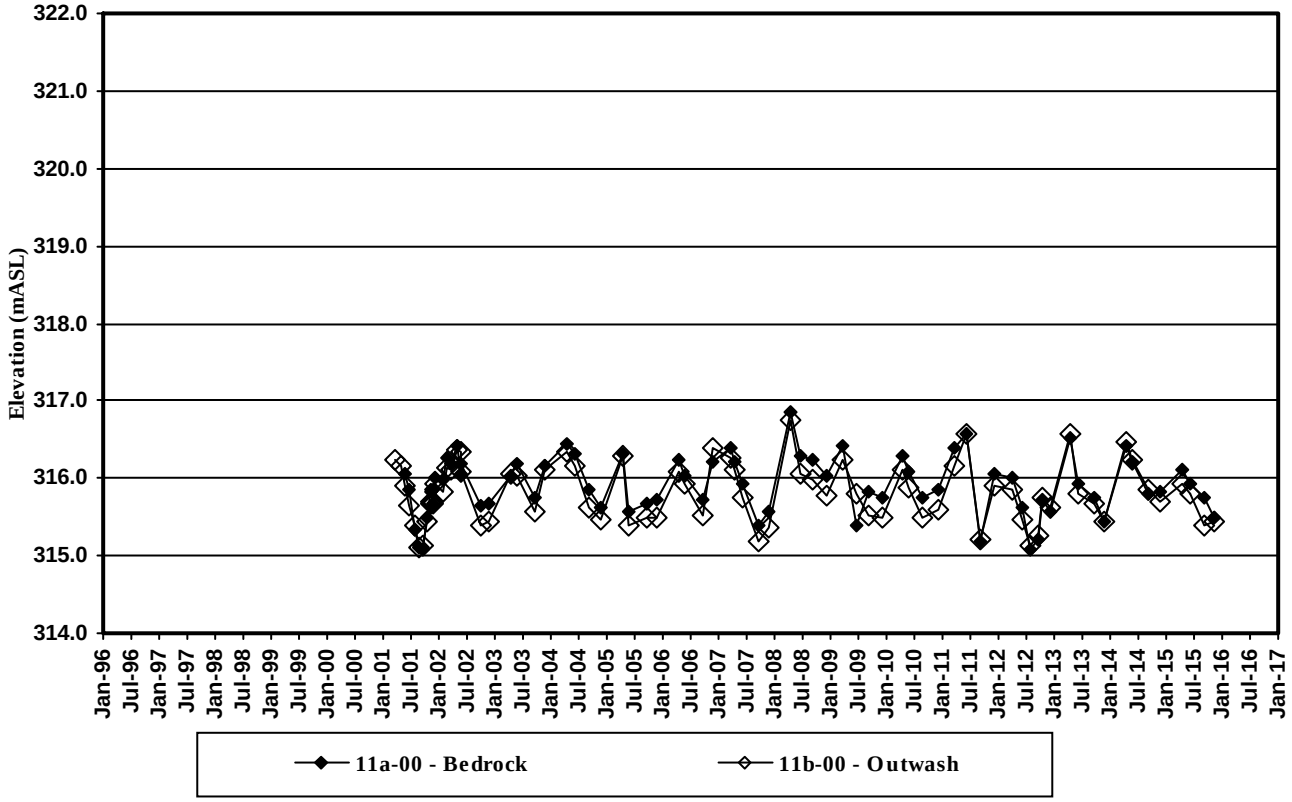
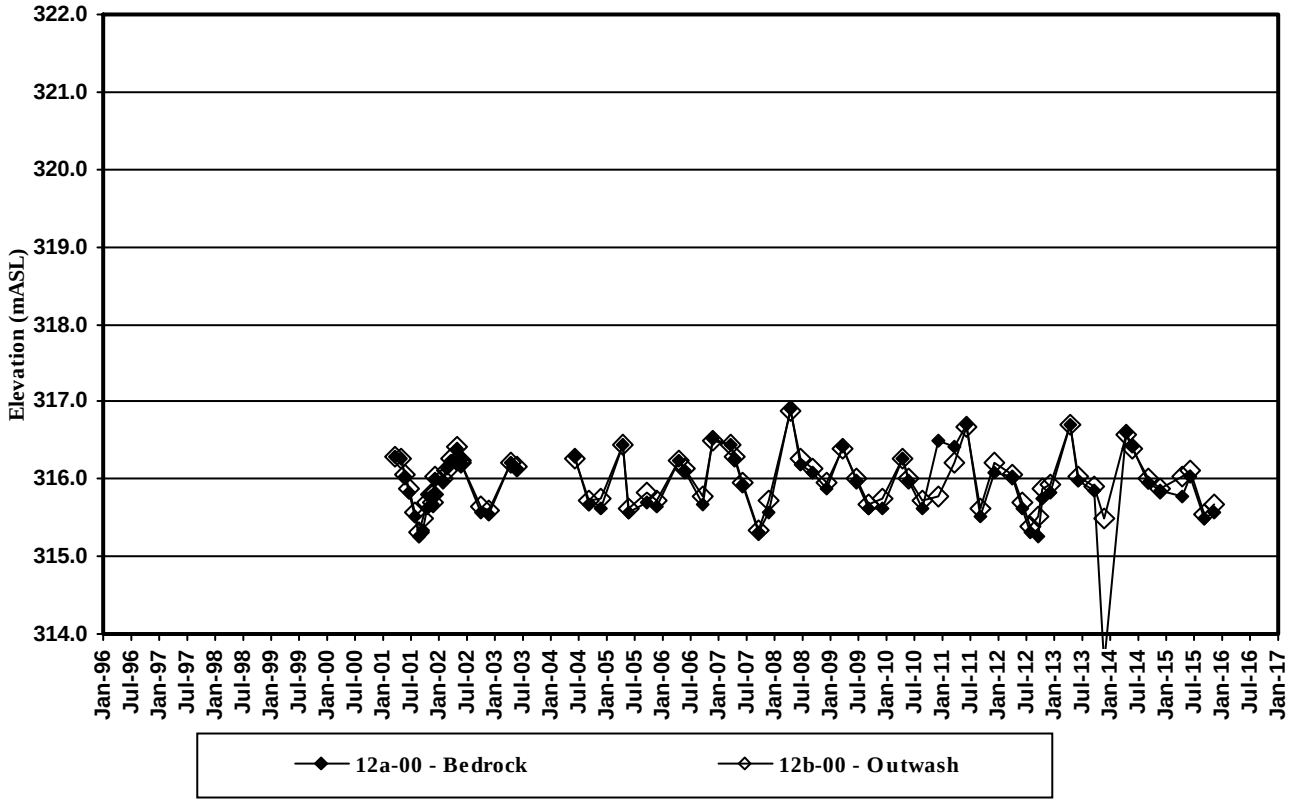
9 Rpt Hydrographs





AECOM

Guelph WRIC & Waste Transfer Station

Hydrographs

FIGURE

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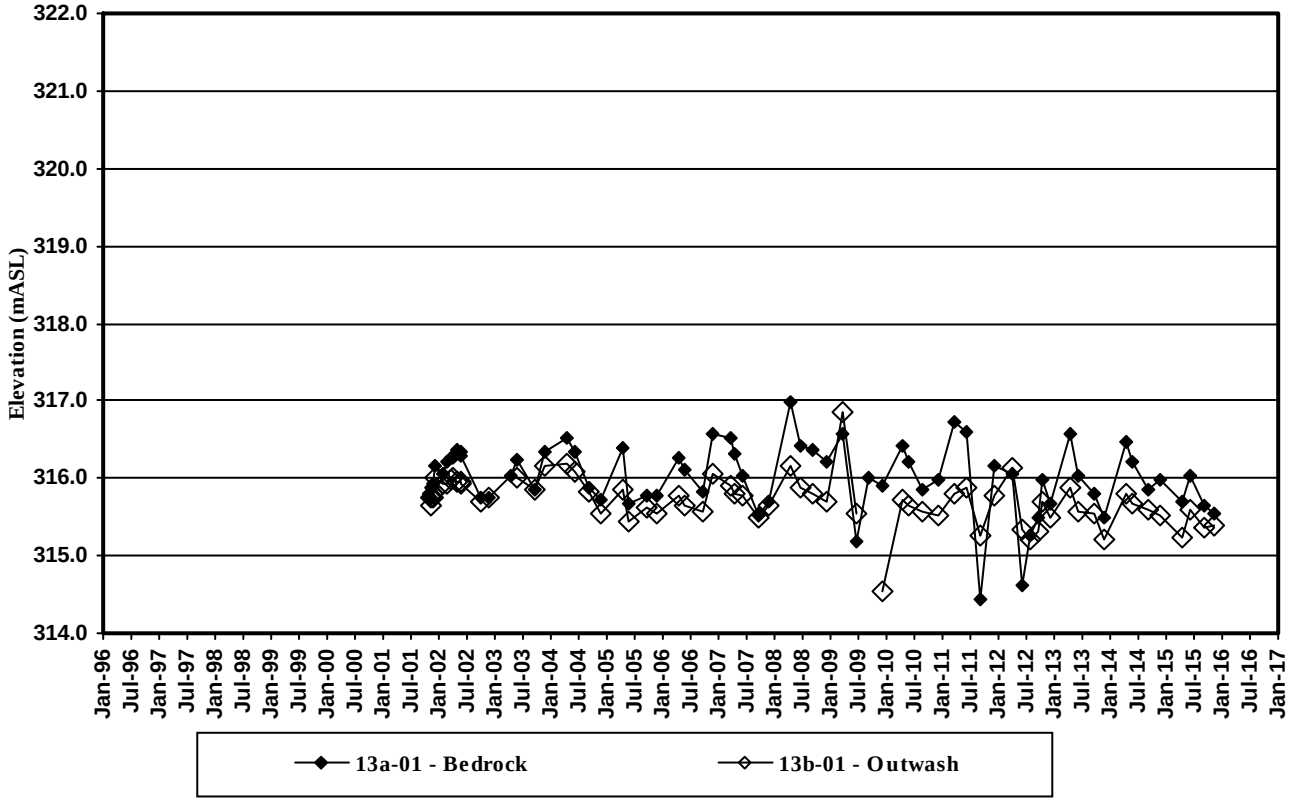
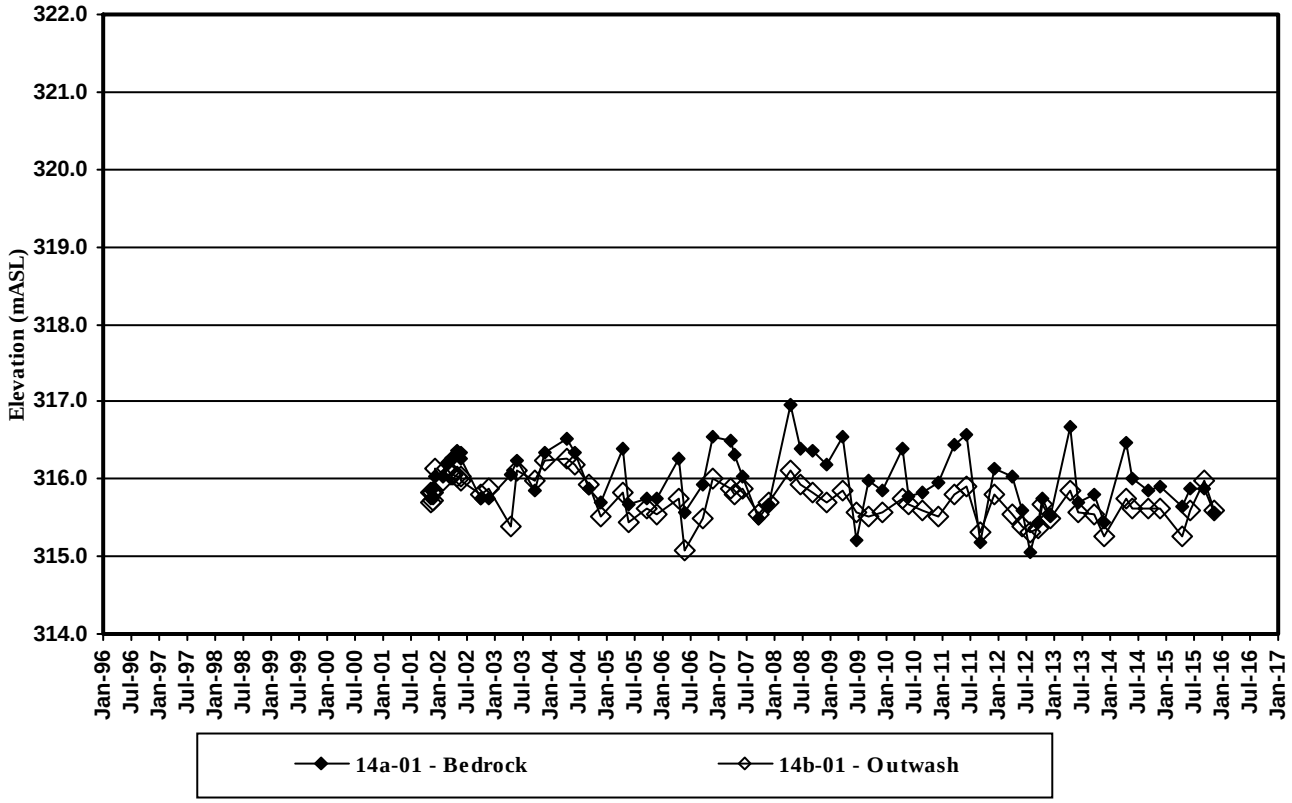
9 Rpt Hydrographs





AECOM

Guelph WRIC & Waste Transfer Station

Hydrographs

FIGURE

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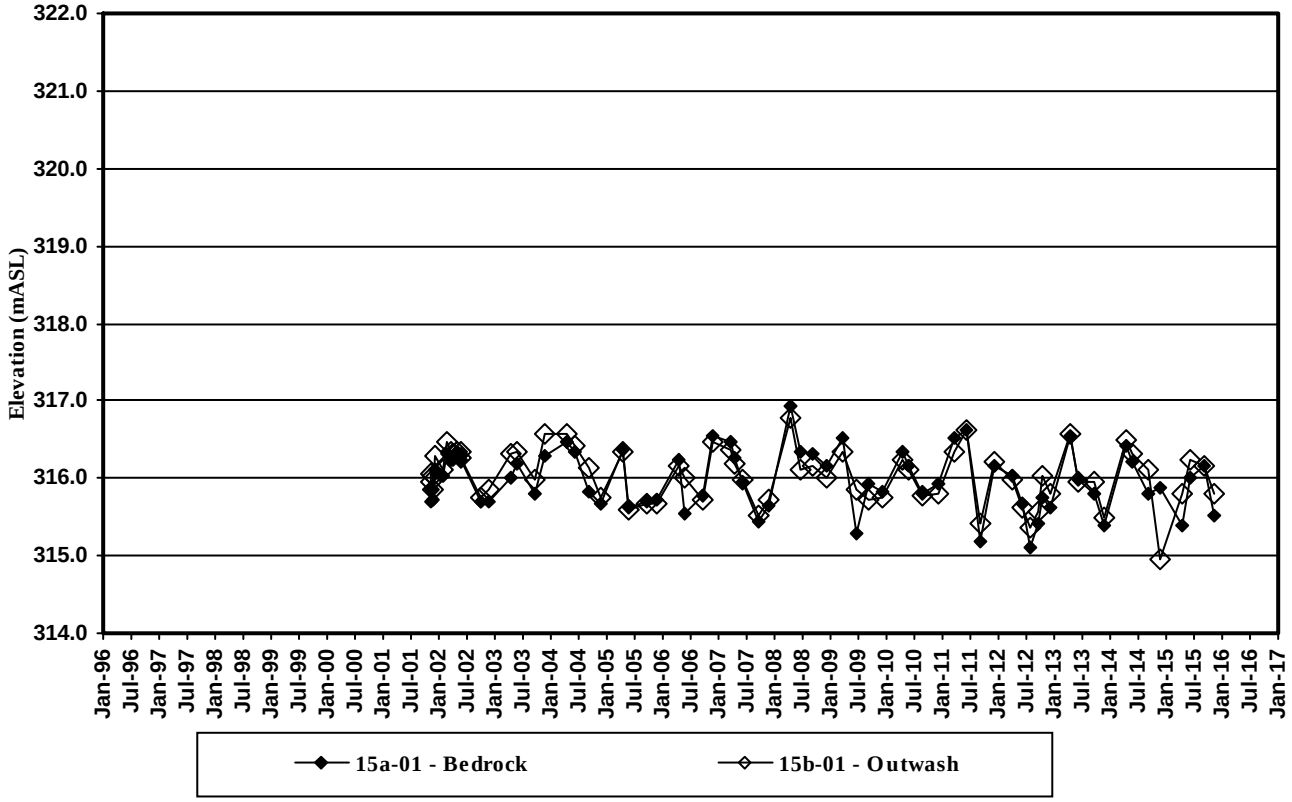
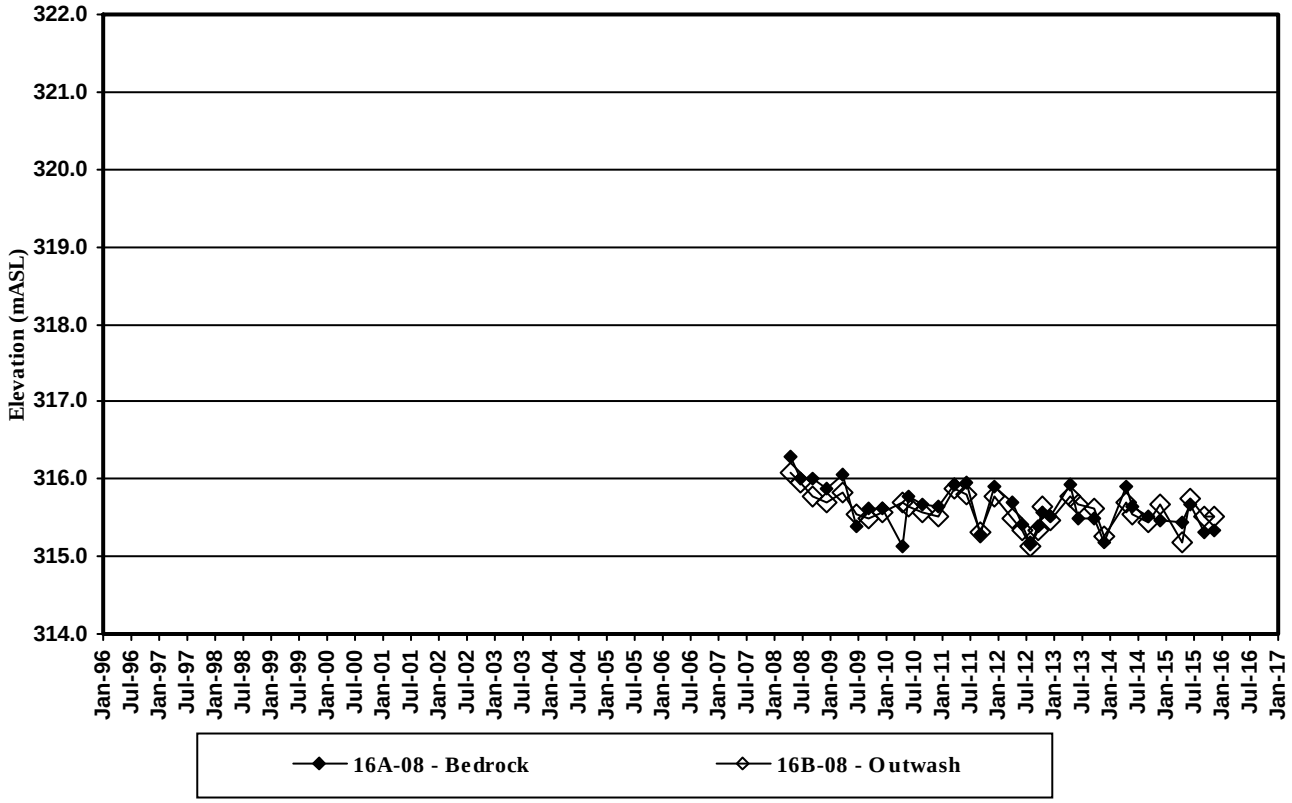
9 Rpt Hydrographs





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Guelph WRIC & Waste Transfer Station

Hydrographs

FIGURE

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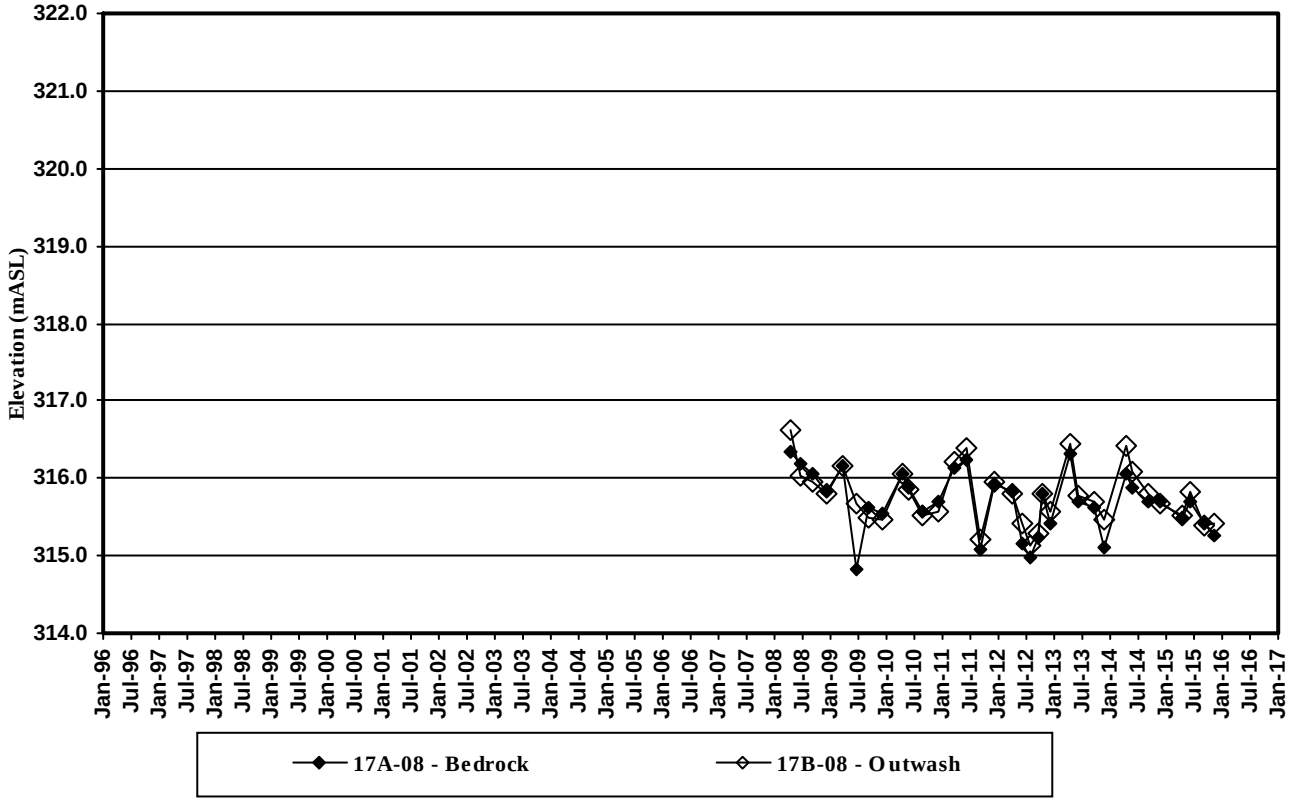
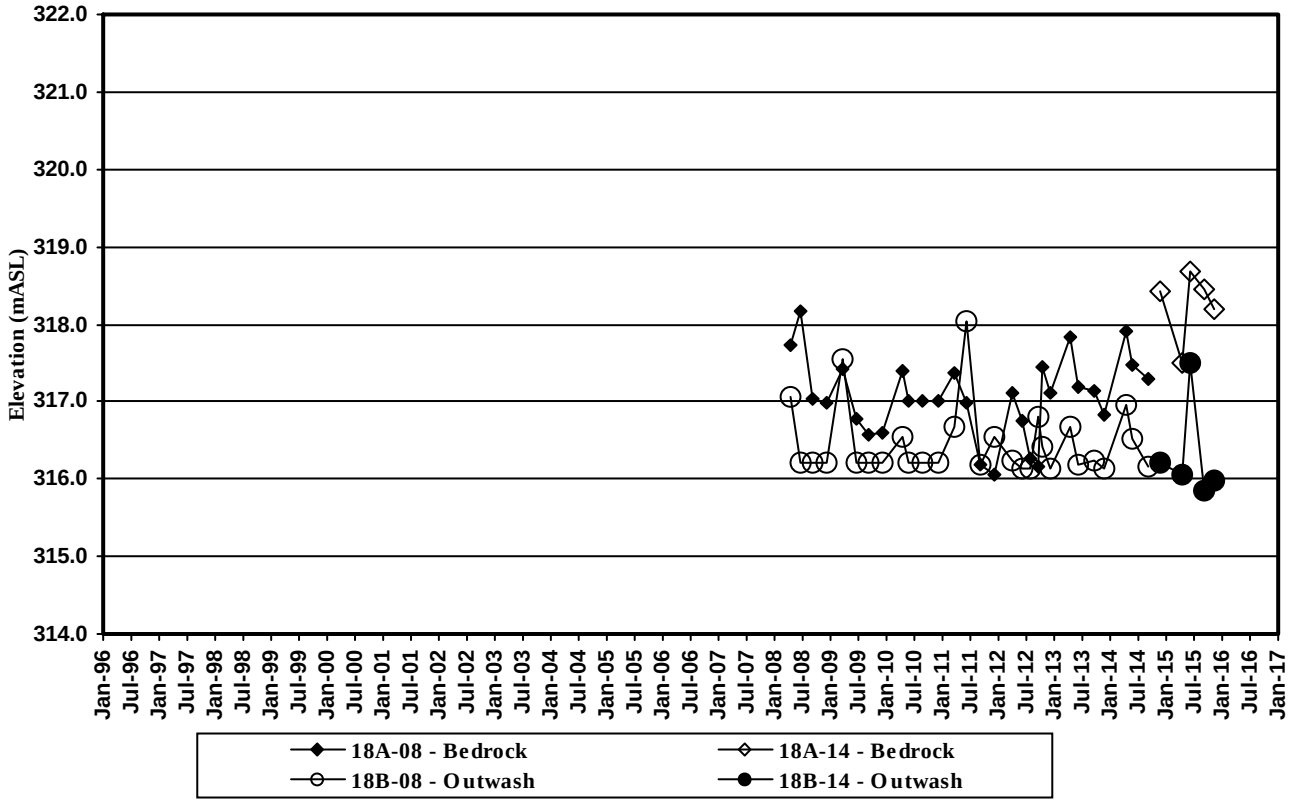
9 Rpt Hydrographs





AECOM

Guelph WRIC & Waste Transfer Station

Hydrographs

FIGURE

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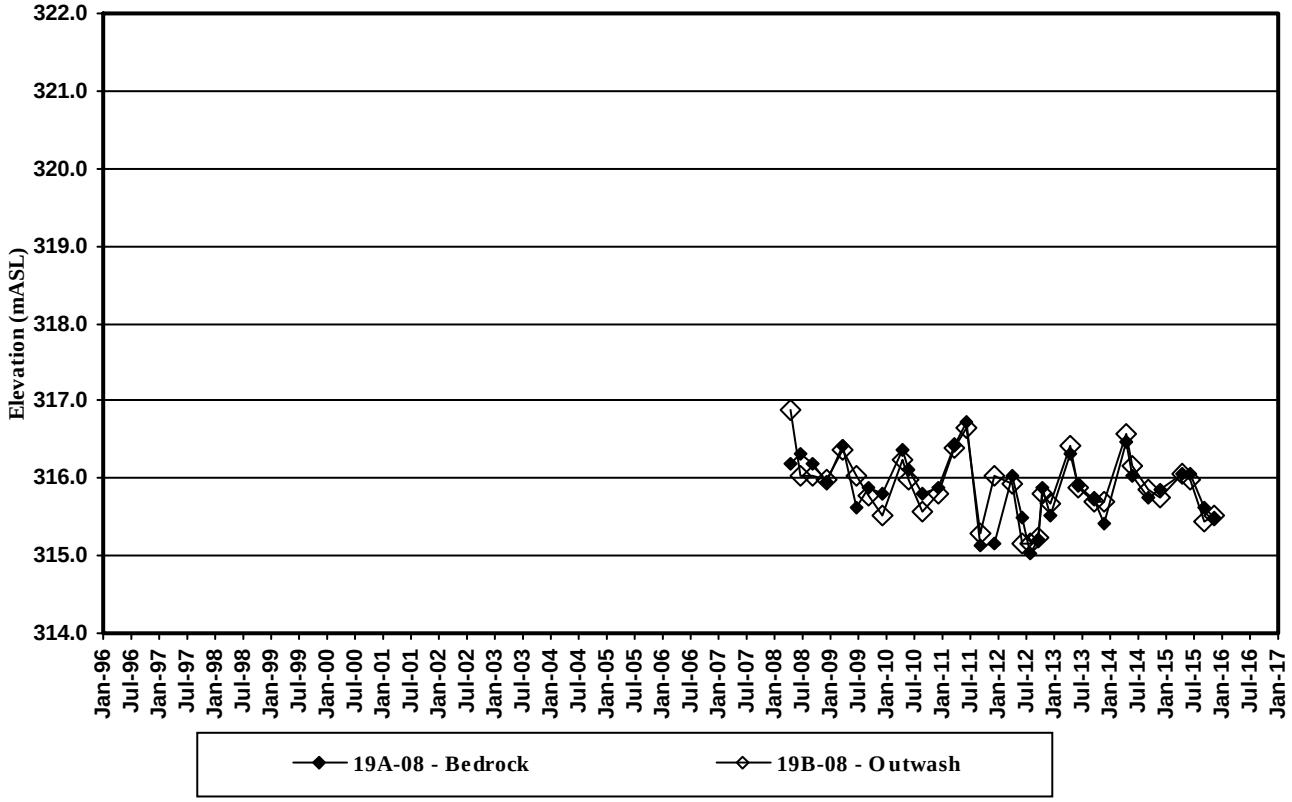
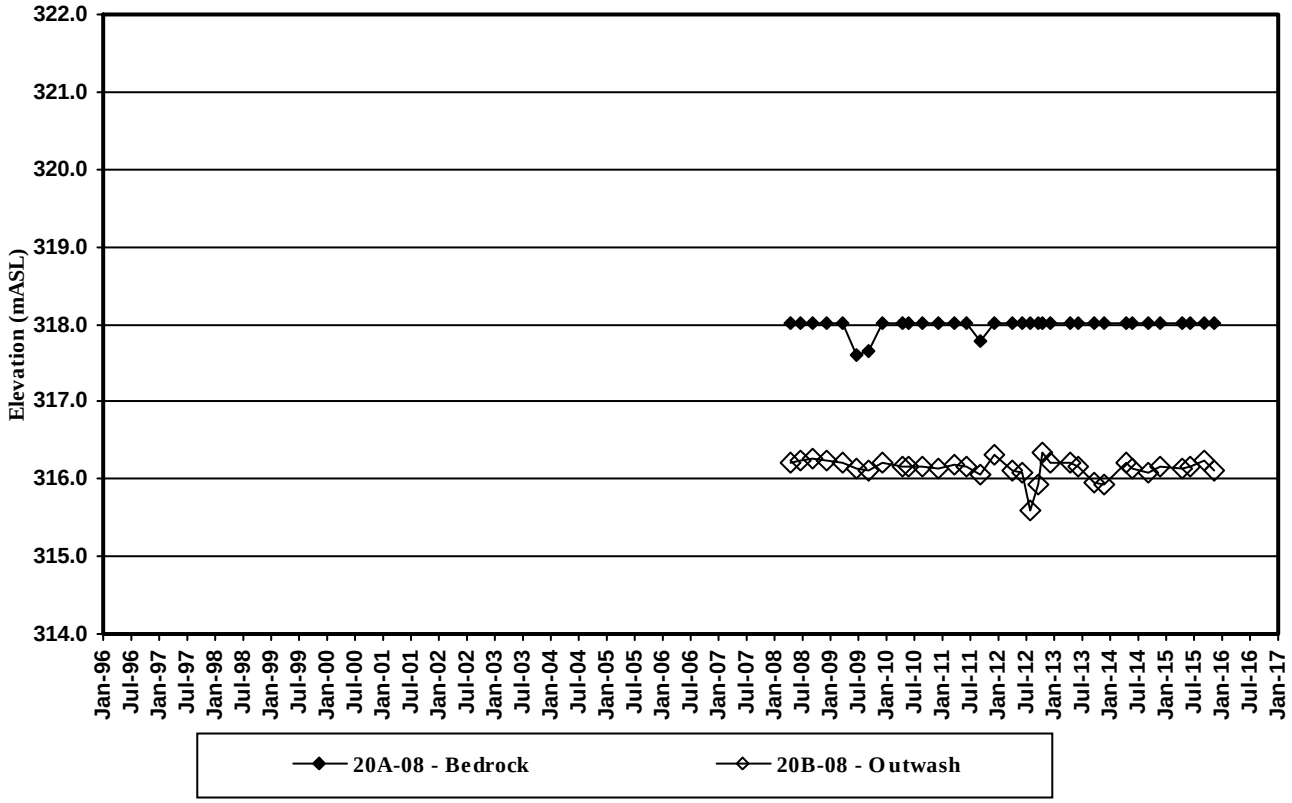
9 Rpt Hydrographs





AECOM

Guelph WRIC & Waste Transfer Station

Hydrographs

FIGURE

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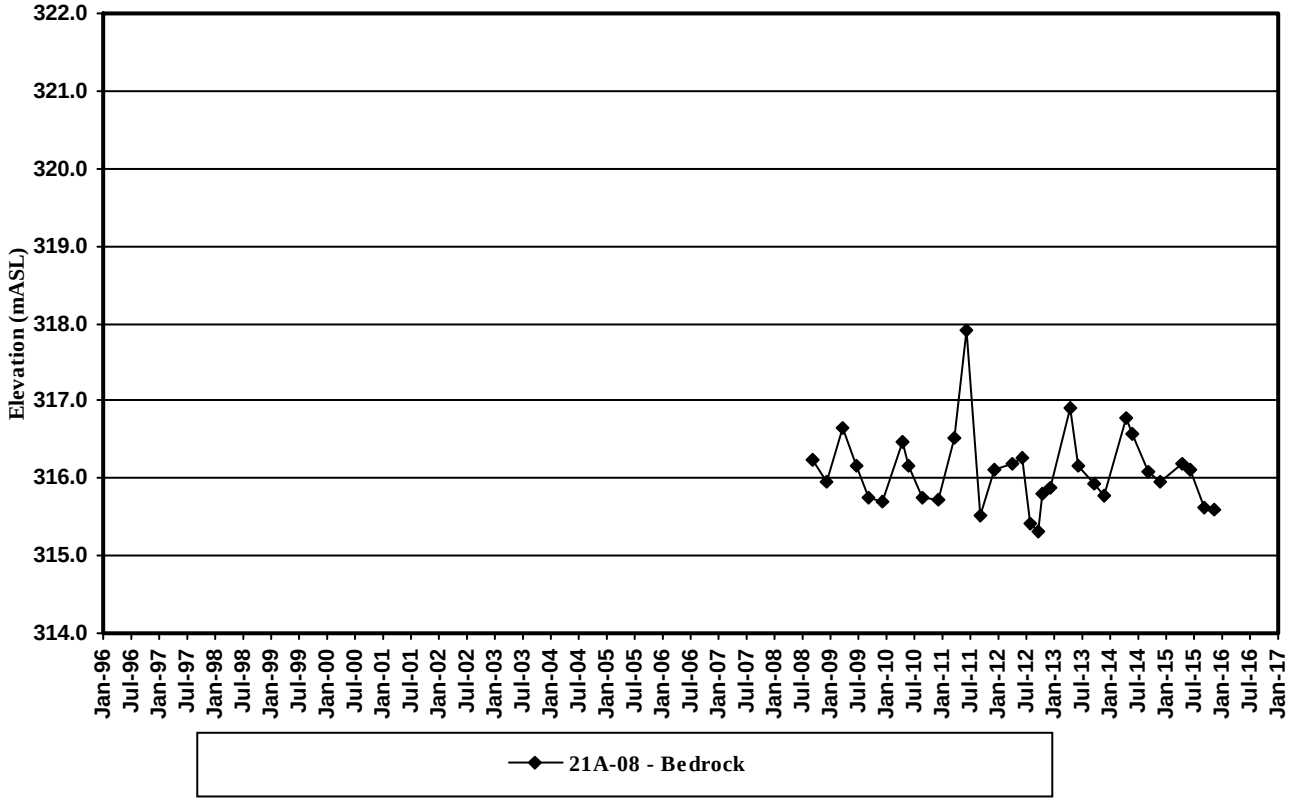
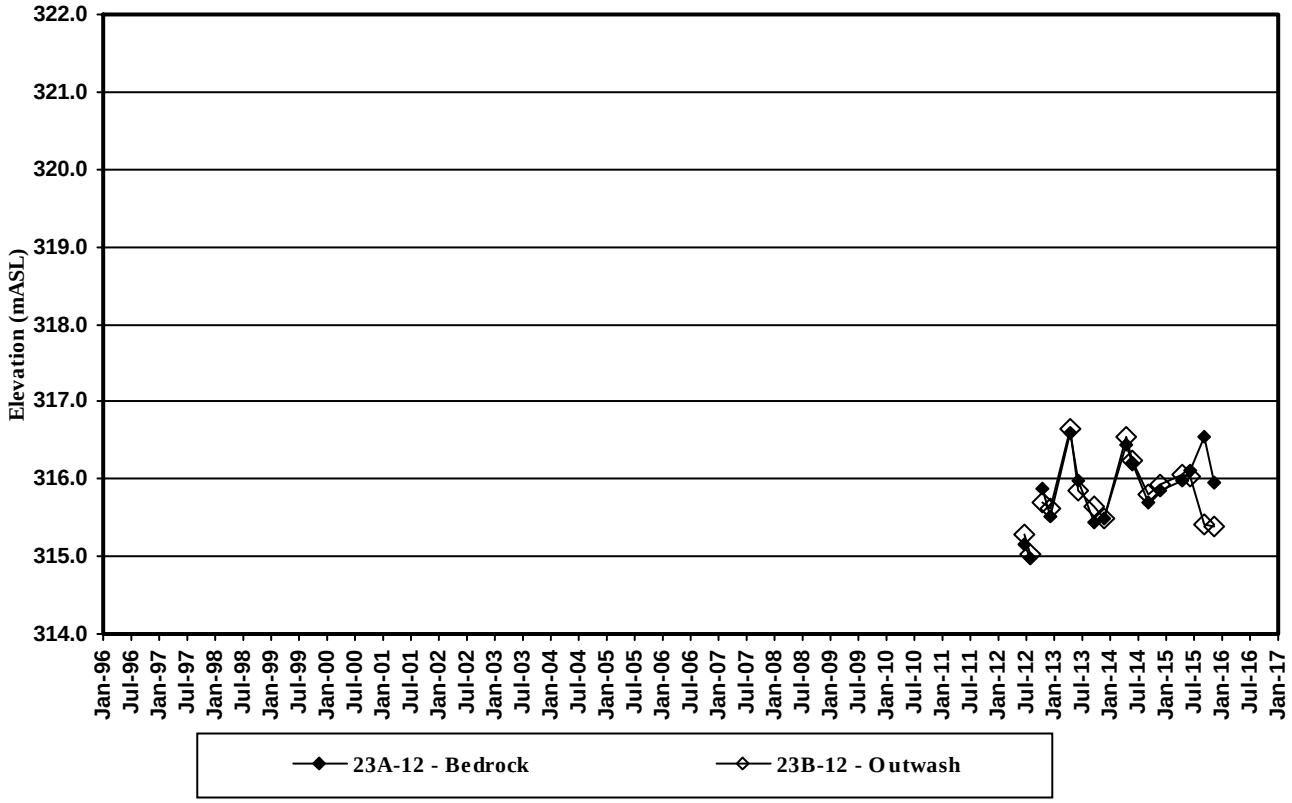
9 Rpt Hydrographs





AECOM

Guelph WRIC & Waste Transfer Station

Hydrographs

FIGURE

A - 8

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9 Rpt Hydrographs

Routine Groundwater Elevations at the WRIC/Waste Transfer Station

AECOM

Date	2a-91	2b-91	5-96	6a-96	6b-96	7-96	8-96	9-96	10-00	11a-00	11b-00	12a-00	12b-00	13a-01	13b-01	14a-01	14b-01
4-Apr-1991	316.00	316.02															
14-Apr-1991	315.88	315.89															
12-May-1991	315.67	315.59															
17-May-1991	315.60	315.58															
17-May-1994	316.32	316.34															
5-May-1995	315.96	316.00															
13-Apr-1996	316.22	316.20															
13-Jun-1996	316.41	316.34															
21-Aug-1996	315.81	315.75															
9-Sep-1996	315.59	315.55															
11-Dec-1996		315.62															
20-Dec-1996			319.53	315.70	315.67	315.70	318.72	315.20									
11-Feb-1997	315.31		319.48	315.77	315.78	315.92	318.95	315.96									
3-Mar-1997	315.26		320.34	316.37	316.38	316.57	319.37	316.62									
27-Mar-1997	315.58	316.27	320.68	316.13	316.13	316.24	319.42	316.24									
6-May-1997	315.38	316.08	319.39	315.86	315.86	316.02	318.72	316.04									
23-Jun-1997	315.20	315.87	318.47	315.69	315.70	315.81	318.40	315.83									
8-Aug-1997	314.86	315.50	317.62	315.39	315.41	315.49	317.85	315.45									
9-Dec-1997	314.82	315.55	318.32	315.41	315.41	315.44	317.81	315.52									
31-Mar-1998	315.62	316.28	319.90	316.08	316.15	316.22	318.94	316.26									
24-Jun-1998	315.07	315.74	318.67	315.60	315.61	315.68	318.26	315.61									
29-Sep-1998	314.47	Dry	317.34	315.03	315.08	315.15	317.59	315.11									
3-Dec-1998	314.40	Dry	318.24	315.03	315.04	315.02	317.57	315.03									
29-Jun-1999	314.91	Dry	320.03	315.51	315.55	315.54	318.33	315.46									
9-Dec-1999	315.04	315.60	318.99	315.62	315.63	315.67	318.07	315.68									
21-Jun-2000	315.69	316.40	320.17	316.21	316.21	316.34	318.89	316.36									
28-Sep-2000	314.95	315.62	318.08	315.51	315.51	315.56	318.16	315.59									
6-Dec-2000	314.52	315.43	318.29	315.32	315.32	315.34	317.98	315.35									
22-Mar-2001	316.23	316.25	320.11	316.19	316.20	316.23	318.97	316.23	316.09		316.23	316.30	316.30				
26-Apr-2001	316.19	316.19	318.53	316.02	316.04	316.17	318.59	316.20	316.07		316.15	316.26	316.26				
28-May-2001	315.91	315.91	319.57	315.80	315.83	315.90	318.57	315.92	315.83	316.06	315.90	316.03	316.07				
27-Jun-2001	315.68	315.68	318.01	315.56	315.58	315.66	318.04	315.69	315.56	315.85	315.65	315.82	315.88				
31-Jul-2001	315.39	NR	317.62	315.32	315.34	315.38	317.80	315.39	315.14	315.34	315.38	315.53	315.58				
30-Aug-2001	315.11	NR	317.87	315.09	315.10	315.10	317.76	315.11	314.87	315.11	315.11	315.26	315.31				
28-Sep-2001	315.11	NR	319.68	315.14	315.16	315.11	318.26	315.09	314.85	315.08	315.13	315.35	315.48				
19-Oct-2001	315.40	NR	320.35	315.45	315.46	315.40	318.54	315.38	315.35	315.50	315.43	315.61	315.71				
8-Nov-2001	315.66	NR	319.03	315.62	315.63	315.65	318.17	315.66	315.61	315.85	315.66			315.74	315.64	315.74	315.71
16-Nov-2001	315.56	315.71	318.31	315.63	315.65	315.55	317.90	315.71	315.59	315.82	315.69	315.78	315.80	315.89	315.76	315.86	315.83
21-Nov-2001	315.57	315.56	318.30	315.61	315.48	315.68	317.99	315.56	315.45	315.66	315.68	315.79	315.80	315.89	315.75	315.88	315.82
27-Nov-2001	315.71	315.71	318.88	315.63	315.65	315.70	318.14	315.72	315.61	315.84	315.70	315.67	315.70	315.92	315.79	315.76	315.72
4-Dec-2001	315.90	315.89	320.97	315.92	315.93	315.90	318.78	315.89	315.85	316.00	315.92	316.00	316.02	316.17	316.00	316.03	316.14
28-Jan-2002	315.85	315.84	318.94	315.77	315.79	315.83	318.63	315.85	315.72	315.98	315.83	315.97	316.00	316.07	315.93	316.04	315.99
28-Feb-2002	316.14	316.14	320.56	316.08	316.09	316.12	319.09	316.15	316.04	316.27	316.13	316.14	316.11	316.22	315.92	316.21	316.13
28-Mar-2002	316.16	316.16	319.02	316.00	316.02	316.14	318.76	316.17	315.99	316.19	316.12	316.25	316.26	316.27	315.97	316.27	316.05

Routine Groundwater Elevations at the WRIC/Waste Transfer Station

AECOM

Date	2a-91	2b-91	5-96	6a-96	6b-96	7-96	8-96	9-96	10-00	11a-00	11b-00	12a-00	12b-00	13a-01	13b-01	14a-01	14b-01
10-Apr-2002														316.27	316.00	316.26	316.05
29-Apr-2002	316.40	316.41	320.48	316.08	316.11	316.39	319.05	316.41	316.24	316.43	316.37	316.39	316.43	316.36	315.96	316.37	316.04
28-May-2002	316.18	316.18	318.46	316.03	316.05	316.16	318.70	316.20	316.05	316.07	316.33	316.25	316.25	316.35	315.96	316.35	316.03
4-Jun-2002	316.11	316.12	318.57	315.98	315.99	316.10	318.69	316.13	315.95	316.19	316.09	316.20	316.21	316.28	315.93	316.26	315.99
30-Sep-2002	315.41	315.40	318.85	315.36	315.38	315.40	318.10	315.41	315.30	315.64	315.40	315.56	315.64	315.75	315.70	315.74	315.81
3-Dec-2002	315.44	315.43	317.96	315.37	315.39	315.41	317.84	315.44	315.34	315.67	315.43	315.54	315.59	315.76	315.75	315.76	315.87
25-Apr-2003	316.10	316.11	318.90	315.92	315.94	316.09	318.49	316.13	315.85	316.04	316.07	316.20	316.21	316.03	N/A	316.05	315.39
2-Jun-2003	316.06	316.05	319.15	315.92	315.94	316.05	318.57	316.08	315.86	316.18	316.03	316.14	316.15	316.23	316.01	316.24	316.11
30-Sep-2003	315.57	315.57	319.18	315.52	315.53	315.56	318.20	315.56	315.38	315.74	315.57	N/A	N/A	315.85	315.85	315.84	315.97
1-Dec-2003	316.12	316.11	320.70	316.09	316.11	316.11	318.67	316.11	315.93	316.15	316.12	N/A	N/A	316.34	316.16	316.33	316.25
27-Apr-2004	316.38	316.38	319.88	316.20	316.23	316.42	319.10	316.39	316.14	316.45	316.34	N/A	N/A	316.52	316.19	316.51	316.27
8-Jun-2004	316.16	316.20	318.53	316.00	316.02	316.20	318.88	316.20	315.93	316.32	316.15	316.28	316.27	316.33	316.08	316.34	316.18
14-Sep-2004	N/A	N/A	318.50	315.49	315.51	315.66	318.19	315.57	315.42	315.85	315.63	315.67	315.72	315.88	315.82	315.89	315.94
30-Nov-2004	315.46	315.47	318.97	315.42	315.44	315.50	318.14	315.47	315.29	315.61	315.46	315.63	315.74	315.72	315.54	315.70	315.52
18-Apr-2005	316.33	316.35	318.85	316.14	316.16	316.36	318.83	316.37	316.08	316.32	316.29	316.44	316.44	316.40	315.85	316.38	315.82
1-Jun-2005	N/A	315.28	318.11	315.34	315.35	315.44	318.08	315.43	315.26	315.57	315.39	315.56	315.63	315.67	315.44	315.66	315.44
30-Sep-2005	315.48	315.47	320.58	315.48	315.51	315.52	318.45	315.46	315.36	315.66	315.50	315.69	315.83	315.77	315.63	315.74	315.62
28-Nov-2005	315.44	315.48	318.45	315.42	315.44	315.52	317.88	315.49	315.34	315.72	315.49	315.65	315.73	315.77	315.54	315.74	315.54
20-Apr-2006	316.12	316.12	319.06	315.96	315.98	316.14	318.87	316.13	315.93	316.23	316.08	316.23	316.24	316.27	315.77	316.26	315.75
1-Jun-2006	315.98	315.96	318.51	315.81	315.82	315.99	318.76	N/A	315.77	316.02	315.93	316.11	316.13	316.11	315.64	315.58	315.09
27-Sep-2006	315.53	315.52	319.32	315.47	315.49	315.55	318.35	315.53	315.41	315.72	315.51	315.68	315.78	315.83	315.58	315.94	315.48
4-Dec-2006	316.39	316.38	320.16	316.35	316.37	316.43	318.84	316.40	316.20	316.20	316.38	316.52	316.49	316.58	316.06	316.55	316.01
30-Mar-2007	316.28	316.28	320.23	316.17	316.25	316.32	319.22	316.30	316.15	316.40	316.26	316.44	316.44	316.52	315.90	316.49	315.87
26-Apr-2007	316.14	316.15	319.03	315.98	316.01	316.17	318.95	316.16	316.00	316.22	316.10	316.27	316.28	316.32	315.80	316.31	315.80
14-Jun-2007	315.77	315.79	318.11	315.66	315.67	315.81	318.66	315.81	315.68	315.93	315.75	315.92	315.95	316.03	315.78	316.02	315.88
27-Sep-2007	315.18	Dry	318.11	315.12	315.14	315.21	317.90	315.18	315.08	315.39	315.18	315.30	315.33	315.51	315.49	315.49	315.55
5-Dec-2007	315.36	Dry	320.31	315.36	315.37	315.40	318.65	315.35	315.26	315.58	315.37	315.57	315.72	315.69	315.65	315.68	315.70
25-Apr-2008	316.84	316.84	319.02	316.54	316.63	316.82	319.31	316.86	316.62	316.86	316.76	316.91	316.87	316.98	316.16	316.96	316.12
25-Jun-2008	316.05	316.04	320.44	316.05	316.10	316.10	318.74	315.53	315.94	316.28	316.07	316.19	316.27	316.41	315.89	316.38	315.92
18-Sep-2008	316.03	315.98	319.68	315.95	316.01	316.03	318.72	316.03	315.94	316.24	315.98	316.09	316.13	316.37	315.81	316.36	315.82
9-Dec-2008	315.83	315.78	318.91	315.75	315.77	315.82	318.47	315.80	315.76	316.04	315.78	315.89	315.96	316.22	315.70	316.19	315.70
2-Apr-2009	316.29	316.29	319.06	316.14	316.18	316.31	319.14	316.31	316.16	316.43	316.24	316.41	316.40	316.56	316.86	316.55	315.84
24-Jun-2009	315.83	315.83	318.36	315.63	315.66	315.85	318.85	315.83	315.31	315.38	315.79	315.98	316.01	315.18	315.54	315.22	315.56
10-Sep-2009	315.53	315.52	317.84	315.42	315.52	315.56	318.05	315.53	315.50	315.82	315.51	315.62	315.67	316.00	damaged	315.98	315.51
15-Dec-2009	315.45	315.48	319.73	315.44	315.49	315.50	318.25	315.51	315.40	315.76	315.48	315.63	315.75	315.91	314.55	315.86	315.57
22-Apr-2010	316.17	316.16	318.71	315.98	316.01	316.00	318.54	N/A	N/A	316.30	316.11	316.27	316.26	316.41	315.73	316.38	315.76
1-Jun-2010	315.91	315.91	317.59	315.78	315.80	315.97	318.40	N/A	N/A	316.08	315.88	315.97	316.01	316.21	315.65	315.77	315.67
1-Sep-2010	315.49	315.50	320.13	315.44	315.44	315.54	318.37	N/A	N/A	315.74	315.50	315.61	315.73	315.86	315.56	315.83	315.60
16-Dec-2010	315.62	315.61	318.17	315.53	315.55	315.66	318.00	N/A	N/A	315.85	315.59	316.50	315.77	315.98	315.53	315.95	315.53
5-Apr-2011	316.11	315.95	318.48	315.79	315.96	315.89	318.58	N/A	N/A	316.38	316.16	316.42	316.21	316.72	315.80	316.45	315.81
14-Jun-2011	316.57	316.58	318.54	316.42	316.51	316.65	319.19	N/A	N/A	316.58	316.58	316.69	316.67	316.61	315.89	316.56	315.91
16-Sep-2011	315.20		317.67	315.14	315.22	315.24	318.03	N/A	N/A	315.18	315.20	315.51	315.61	314.45	315.26	315.18	315.31
13-Dec-2011	315.93	315.93	319.36	315.84	316.02	315.95	318.24	N/A	N/A	316.07	315.90	316.09	316.22	316.17	315.77	316.14	315.80
12-Apr-2012	315.90	315.90	318.07	315.76	315.84	315.92	318.75	N/A	N/A	316.00	315.86	316.04	316.06	316.06	316.13	316.04	315.54

Routine Groundwater Elevations at the WRIC/Waste Transfer Station

AECOM

Date	2a-91	2b-91	5-96	6a-96	6b-96	7-96	8-96	9-96	10-00	11a-00	11b-00	12a-00	12b-00	13a-01	13b-01	14a-01	14b-01
18-Jun-2012	315.77	315.49	318.03	315.36	315.38	315.52	318.34	N/A	N/A	315.61	315.47	315.63	315.70	314.61	315.35	315.60	315.40
5-Jul-2012																	
7-Aug-2012	315.33	dry	318.50	315.08	315.09	315.15	318.07	315.17	314.94	315.07	315.13	315.30	315.39	315.26	315.22	315.06	315.31
27-Sep-2012	315.08	Dry	318.54	315.25	315.29	315.30	318.07	315.13	315.13	315.20	315.27	315.25	315.52	315.48	315.32	315.44	315.36
2-Nov-2012	315.53	315.53	320.85	315.80	315.85	315.76	319.04	315.57	315.41	315.72	315.75	315.76	315.87	315.98	315.69	315.75	315.68
17-Dec-2012	315.60	315.61	319.63	315.56	315.60	315.68	318.28	315.68	315.51	315.57	315.61	315.82	315.92	315.67	315.50	315.52	315.49
26-Apr-2013	316.63	316.63	319.76	316.36	316.46	316.64	319.29	316.69	316.47	316.51	316.57	316.69	316.70	316.56	315.88	316.67	315.85
17-Jun-2013	315.87	315.84	318.42	315.73	315.74	315.87	318.75	315.89	315.85	315.94	315.81	315.99	316.02	316.04	315.56	315.71	315.56
25-Sep-2013	315.71	315.72	318.86	315.63	315.64	315.72	318.59	315.74	315.69	315.75	315.67	315.85	315.91	315.81	315.54	315.80	315.55
1-Dec-2013	315.67	315.56	317.71	315.63	315.70	315.46	318.34	315.87	315.55	315.43	315.43	313.62	315.49	315.48	315.22	315.44	315.27
24-Apr-2014	315.71	315.67	318.95	316.29	316.30	316.54	319.31	316.57	316.42	316.42	316.46	316.61	316.58	316.47	315.79	316.47	315.75
1-Jun-2014	316.16	316.15	318.66	316.16	316.20	316.17	319.09	316.31	316.14	316.21	316.25	316.42	316.40	316.20	315.66	316.00	315.61
16-Sep-2014	315.79	315.62	319.14	315.80	315.87	315.88	318.64	315.92	315.82	315.81	315.84	315.96	316.00	315.84	315.59	315.84	315.61
1-Dec-2014			318.90	315.67	315.71	315.75	318.42	315.76	315.78	315.82	315.69	315.85	315.87	315.98	315.52	315.91	315.63
29-Apr-2015	removed	removed	318.53	315.89	315.67	316.07	318.84	316.11	316.05	316.11	315.93	315.78	316.03	315.71	315.24	315.64	315.27
16-Jun-2015	removed	removed	318.32	315.73	315.84	315.84	318.56	315.92	315.88	315.93	315.79	316.03	316.11	316.03	315.60	315.87	315.59
24-Sep-2015	removed	removed	317.71	315.33	315.57	315.49	319.47	315.46	315.46	315.74	315.39	315.48	315.55	315.65	315.36	315.88	315.98
1-Dec-2015	Removed	removed	317.82	315.35	315.44	315.42	317.79	315.46	315.46	315.49	315.43	315.57	315.66	315.55	315.39	315.57	315.59

Routine Groundwater Elevations at the WRIC/Waste Transfer Station

AECOM

Date	15a-01	15b-01	16a-08	16b-08	17a-08	17b-08	18a-08 /18a-14	18b-08 /18b-14	19a-08	19b-08	20a-08	20b-08	21a-08	22a-11	22b-11	23a-12	23b-12
4-Apr-1991																	
14-Apr-1991																	
12-May-1991																	
17-May-1991																	
17-May-1994																	
5-May-1995																	
13-Apr-1996																	
13-Jun-1996																	
21-Aug-1996																	
9-Sep-1996																	
11-Dec-1996																	
20-Dec-1996																	
11-Feb-1997																	
3-Mar-1997																	
27-Mar-1997																	
6-May-1997																	
23-Jun-1997																	
8-Aug-1997																	
9-Dec-1997																	
31-Mar-1998																	
24-Jun-1998																	
29-Sep-1998																	
3-Dec-1998																	
29-Jun-1999																	
9-Dec-1999																	
21-Jun-2000																	
28-Sep-2000																	
6-Dec-2000																	
22-Mar-2001																	
26-Apr-2001																	
28-May-2001																	
27-Jun-2001																	
31-Jul-2001																	
30-Aug-2001																	
28-Sep-2001																	
19-Oct-2001																	
8-Nov-2001	315.70	315.95															
16-Nov-2001	315.84	316.06															
21-Nov-2001	315.84	316.02															
27-Nov-2001	315.72	315.86															
4-Dec-2001	316.11	316.30															
28-Jan-2002	316.02	316.10															
28-Feb-2002	316.32	316.47															
28-Mar-2002	316.23	316.34															

Notes Location 18 was decommisioned and off set in September 2014 to facilitate construction of the PDO Area.

Routine Groundwater Elevations at the WRIC/Waste Transfer Station

AECOM

Date	15a-01	15b-01	16a-08	16b-08	17a-08	17b-08	18a-08 /18a-14	18b-08 /18b-14	19a-08	19b-08	20a-08	20b-08	21a-08	22a-11	22b-11	23a-12	23b-12
10-Apr-2002	316.24	316.31															
29-Apr-2002	316.33	316.35															
28-May-2002	316.30	316.34															
4-Jun-2002	316.24	316.27															
30-Sep-2002	315.69	315.75															
3-Dec-2002	315.71	315.86															
25-Apr-2003	316.01	316.31															
2-Jun-2003	316.19	316.35															
30-Sep-2003	315.80	315.99															
1-Dec-2003	316.29	316.56															
27-Apr-2004	316.48	316.56															
8-Jun-2004	316.33	316.43															
14-Sep-2004	315.83	316.13															
30-Nov-2004	315.67	315.74															
18-Apr-2005	316.36	316.34															
1-Jun-2005	315.62	315.59															
30-Sep-2005	315.70	315.66															
28-Nov-2005	315.72	315.66															
20-Apr-2006	316.23	316.17															
1-Jun-2006	315.54	316.00															
27-Sep-2006	315.77	315.72															
4-Dec-2006	316.54	316.48															
30-Mar-2007	316.48	316.37															
26-Apr-2007	316.27	316.19															
14-Jun-2007	315.96	315.99															
27-Sep-2007	315.45	315.52															
5-Dec-2007	315.65	315.72															
25-Apr-2008	316.92	316.77	316.30	316.09	316.33	316.62	317.72	317.07	316.19	316.89	318.01	316.22					
25-Jun-2008	316.35	316.12	316.00	315.95	316.18	316.02	318.17	316.21	316.31	316.03	318.01	316.23					
18-Sep-2008	316.31	316.16	316.01	315.78	316.05	315.95	317.03	316.22	316.18	316.02	318.01	316.27	316.23				
9-Dec-2008	316.16	316.00	315.88	315.69	315.83	315.79	316.98	316.21	315.95	315.98	318.01	316.25	315.96				
2-Apr-2009	316.51	316.34	316.05	315.82	316.15	316.17	317.42	317.56	316.43	316.36	318.01	316.20	316.64				
24-Jun-2009	315.28	315.86	315.40	315.55	314.82	315.67	316.79	316.21	315.62	316.03	317.59	316.14	316.17				
10-Sep-2009	315.92	315.73	315.63	315.50	315.62	315.49	316.57	316.21	315.88	315.78	317.64	316.10	315.75				
15-Dec-2009	315.83	315.76	315.61	315.56	315.54	315.46	316.59	316.20	315.80	315.53	318.01	316.22	315.70				
22-Apr-2010	316.35	316.23	315.13	315.71	316.05	316.07	317.40	316.54	316.36	316.24	318.01	316.16	316.48				
1-Jun-2010	316.15	316.10	315.77	315.65	315.88	315.84	317.00	316.22	316.11	315.98	318.01	316.15	316.15				
1-Sep-2010	315.80	315.77	315.66	315.56	315.57	315.51	317.00	316.20	315.79	315.56	318.01	316.17	315.75				
16-Dec-2010	315.92	315.81	315.64	315.51	315.69	315.58	317.02	316.22	315.87	315.81	318.01	316.14	315.73				
5-Apr-2011	316.53	316.34	315.93	315.88	316.14	316.20	317.37	316.67	316.42	316.40	318.01	316.18	316.52				
14-Jun-2011	316.63	316.63	315.96	315.81	316.25	316.40	316.99	318.05	316.73	316.66	318.01	316.16	317.91				
16-Sep-2011	315.19	315.42	315.29	315.32	315.09	315.22	316.19	316.19	315.13	315.28	317.77	316.07	315.52				
13-Dec-2011	316.17	316.22	315.90	315.77	315.93	315.96	316.06	316.55	315.15	316.03	318.01	316.31	316.12	316.64	315.95		
12-Apr-2012	316.02	315.98	315.70	315.50	315.83	315.81	317.12	316.25	316.02	315.94	318.01	316.12	316.19	315.77	315.73		

Notes Location 18 was decommisioned and off set in September 2014 to facilitate construction of the PDO Area.

Routine Groundwater Elevations at the WRIC/Waste Transfer Station

AECOM

Date	15a-01	15b-01	16a-08	16b-08	17a-08	17b-08	18a-08 /18a-14	18b-08 /18b-14	19a-08	19b-08	20a-08	20b-08	21a-08	22a-11	22b-11	23a-12	23b-12
18-Jun-2012	315.68	315.63	315.41	315.35	315.15	315.42	316.75	<316.13	315.50	<315.16	318.01	316.08	316.27	315.29	315.39		
5-Jul-2012																315.15	315.29
7-Aug-2012	315.10	315.37	315.16	315.12	314.99	315.13	316.27	<316.13	315.02	<315.16	318.01	315.60	315.41	314.99	315.16	314.97	315.04
27-Sep-2012	315.42	315.56	315.39	315.34	315.23	315.29	316.15	316.81	315.20	315.24	318.01	315.94	315.31	315.31	315.28	NA	NA
2-Nov-2012	315.75	316.03	315.58	315.65	315.81	315.81	317.44	316.41	315.88	315.80	318.01	316.35	315.81	315.81	315.81	315.89	315.70
17-Dec-2012	315.61	315.81	315.51	315.47	315.41	315.58	317.10	316.14	315.52	315.68	318.01	316.22	315.88	315.62	315.49	315.53	315.63
26-Apr-2013	316.54	316.58	315.94	315.78	316.32	316.44	317.84	316.68	316.32	316.41	318.01	316.22	316.90	316.34	316.28	316.60	316.65
17-Jun-2013	315.99	315.95	315.49	315.66	315.69	315.77	317.18	316.19	315.91	315.88	318.01	316.17	316.17	315.81	315.76	315.99	315.85
25-Sep-2013	315.79	315.95	315.49	315.63	315.61	315.69	317.15	316.24	315.73	315.70	318.01	315.96	315.94	315.68	315.65	315.45	315.65
1-Dec-2013	315.38	315.50	315.18	315.26	315.11	315.47	316.83	<316.13	315.41	315.69	318.01	315.94	315.77	315.41	315.30	315.49	315.50
24-Apr-2014	316.43	316.50	315.90	315.71	316.05	316.42	317.90	316.97	316.47	316.57	318.01	316.20	316.78	316.27	316.19	316.45	316.54
1-Jun-2014	316.22	316.31	315.65	315.54	315.89	316.08	317.47	316.53	316.04	316.15	318.01	316.13	316.56	316.11	315.97	316.20	316.25
16-Sep-2014	315.80	316.12	315.52	315.44	315.71	315.81	317.28	316.16	315.74	315.85	318.01	316.09	316.08	315.81	315.72	315.69	315.79
1-Dec-2014	315.88	314.95	315.46	315.67	315.70	315.68	318.42	316.22	315.86	315.74	318.01	316.16	315.96	315.65	315.66	315.85	315.94
29-Apr-2015	315.38	315.79	315.43	315.18	315.48	315.51	317.51	316.05	316.05	316.06	318.01	316.13	316.19	315.71	315.89	315.97	316.05
16-Jun-2015	316.00	316.23	315.68	315.76	315.71	315.83	318.69	317.50	316.07	315.99	318.01	316.16	316.12	315.81	315.83	316.10	316.02
24-Sep-2015	316.17	316.16	315.31	315.51	315.42	315.40	318.46	315.85	315.61	315.45	318.01	316.23	315.61	315.54	315.57	316.55	315.41
1-Dec-2015	315.52	315.80	315.35	315.52	315.27	315.42	318.20	315.98	315.50	315.51	318.01	316.10	315.60	315.37	315.32	315.96	315.38

Notes Location 18 was decommisioned and off set in September 2014 to facilitate construction of the PDO Area.

AECOM

Appendix B

Groundwater Chemistry and Time-Concentration Plots – Routine and Organics

Routine Groundwater Quality - General Analysis -Guelph WRIC & Waste Transfer Station

AECOM

	Date	Lab	pH	Cond-uctivity	Alk mg/L	Mg mg/L	K mg/L	BOD mg/L	COD mg/L	TKN mg/L	NH3-N mg/L	Total-P mg/L	SO4 mg/L	Phenol ug/L	Cl mg/L	Na mg/L	Ca mg/L	Fe mg/L	B mg/L	P mg/L	Zn mg/L	NO2 mg/L	NO3 mg/L
Monitor	11/7/1991	EPL	7.2	609	297	32	8.1						25.6		10.5	2.9	96.7	<0.005	0.03	<0.09	<0.005	<0.03	17.7
1a-91	3/4/1992	EPL	7.09	647	300	31.8	7.9						26.2		9.23	3.14	94.7	0.026	0.03	1.13	0.017	<0.03	17.9
Lower Til	3/7/1992	EPL	7.63	721	234	35.5	8.1						27.3		14.1	2.72	89.1	<0.005	<0.01	<0.06	<0.005	<0.03	27.5
	5/17/1994	EPL	7.76	703	242	31.6	5.5					< 0.05	28.7		12.6	2.41	97.6	0.101	0.02	<0.06	0.024	<0.03	22.6
	5/5/1995	MDS	7.6	689	250	32.5	5.2					< 0.05	31.7		17.3	2.67	102	0.012	0.02	<0.06	<0.005	<0.03	21.3
Monitor	11/7/1991	EPL	7.3	753	280	40	15						37.4		23.9	3.5	111	0.074	0.05	<0.09	<0.005	<0.03	33.1
1b-91	3/4/1992	EPL	7.31	733	227	34.9	13.6						34.1		10.5	2.95	97.2	0.265	0.05	0.7	0.022	<0.03	32.3
Outwash	3/7/1992	EPL	7.64	740	224	34.1	14.6						33.6		20.7	3.01	97.8	0.022	0.04	<0.06	0.01	<0.03	27.2
	3/17/1994	EPL	7.74	521	225	23	11.4					< 0.05	15.6		5.45	2.01	67.7	0.064	0.03	<0.06	0.009	<0.03	8.76
	5/5/1995	MDS	7.85	398	138	16.4	7.4					< 0.05	19.7		26.9	10.9	46.1	0.033	0.03	<0.06	<0.005	<0.03	5.01

Routine Groundwater Quality - General Analysis -Guelph WRIC & Waste Transfer Station

AECOM

	Date	Lab	pH	Cond-uctivity	Alk mg/L	Mg mg/L	K mg/L	BOD mg/L	COD mg/L	TKN mg/L	NH3-N mg/L	Total-P mg/L	SO4 mg/L	Phenol ug/L	Cl mg/L	Na mg/L	Ca mg/L	Fe mg/L	B mg/L	P mg/L	Zn mg/L	NO2 mg/L	NO3 mg/L
Monitor	11/7/1991	EPL	7.78	434	215	28	2.8						17.1		24.5	32	35	0.11	0.06	<0.09	<0.005	<0.03	0.98
2a-91	3/4/1992	EPL	7.61	494	229	28.7	3.6						20		21.3	34.7	36.9	0.313	0.07	1.14	0.009	0.37	1.67
Lower Til	3/7/1992	EPL	7.88	479	209	28.3	1.4						16.2		15.2	30.6	36.6	0.018	0.06	<0.06	<0.005	0.16	1.99
	5/17/1994	EPL	7.99	462	236	24.3	0.9					< 0.05	10.5		10.5	39.6	30.4	0.204	0.07	<0.06	<0.005	<0.03	0.08
	5/5/1995	MDS	8.02	437	210	20.9	1					< 0.05	11.7		8.92	45.5	28	0.054	0.07	<0.06	<0.005	<0.03	0.47
	4/13/1996	ENT	8.31	424	220	29	1.82				0.45		19.8	< 0.5	8.1	30	49.3	0.23	0.093		0.01	<0.06	<0.05
	6/13/1996	ENT	8.27	331	234	26.5	2.61				0.159		18.9	< 0.5	7.5	32	43.3	<0.01	0.11		<0.01	<0.06	0.4
	8/21/1996	ENT	7.7	454	237	26.9	2.1				0.22		19.9	1	7.5	33.3	43.9	<0.01	0.11		<0.01	<0.06	1.27
	9/18/1996	ENT	8.11	363	226	31.4	1.9				0.03		18	< 0.5	6.4	31.4	41.1	<0.01	0.146		<0.01	<0.06	1.08
	2/11/1997	WBL	7.9			23.8	1.7	< 0.34	8	0.17	0.021	< 0.011	48.4	< 0.72	119	27.1	45.6	0.796	0.057	0.048	0.028		
	3/26/1997	WBL	8.18	514	235	27.7	2.29	< 0.34	17	0.16	0.089	< 0.011	25.2	< 0.72	5.8	26.2	51	0.672	0.07	<0.028	0.021		
	6/25/1997	WBL	8.24	471	226	21.8	1.43	1.89	< 7	0.33	0.26	< 0.011	18.8	< 0.72	5.33	24	36.5	0.069	0.066	<0.028	0.016		
	10/1/1997	WBL	8.1	441	227	22.6	1.63	0.66	14	0.33	0.176	< 0.011	16.3	< 0.72	5.13	26.9	38.6	0.477	0.055	<0.028	0.017		
	12/11/1997	WBL	8.12	450	225	22.2	1.92	< 0.34	33	0.34	0.108	< 0.011	16.7	< 0.72	4.97	29.5	38.6	1.28	0.055	<0.028	0.042		0.22
	3/31/1998	WBL	8.05	455	227	21.3	1.77	1.03			0.212		16.3	< 0.72	6.47	24.2	44.8	1.14	0.055	<0.011	0.022		0.58
	6/24/1998	WBL	8.06	463	230	21.2	1.39	0.9			0.177		17	< 0.72	4.92	26.7	42	0.176	0.103	<0.006	0.01		0.8
	10/2/1998	CAN	8	500	240	25	< 1	2	< 5	0.17	< 0.1	0.08	19	< 1	4.8	31	41	0.6	0.05		0.02		0.71
	12/3/1998	CAN	7.9	490	240	23	< 1	< 2	< 5	0.2	< 0.1	0.12	17	< 2	4.9	30	36	<0.05	0.05		<0.01		0.4
	6/29/1999	Barr	8.45	440	220	24.2	2	1.5	9	0.33	0.24	0.025	15.8		5.9	28.7	38	0.39	0.05	<0.1	0.017		
	12/9/1999	Barr	8.04	454	221	23.2	1.4	0.7	14	0.46	0.23	0.009	15	< 1	< 5	32.3	34.5	0.02	0.07	<0.1	<0.005		
	6/21/2000	Philip	7.88	441	231	21.6	1.2	1	< 5	0.46	0.31	0.005	15.3	< 1	5.1	25.6	35.8	<0.03	0.042	<0.05	<0.005		
	12/7/2000	Philip	8.15	388	236	22.6	1.1	1.1	10	0.47	0.25	0.011	17.8	< 1	5.2	27.8	35.7	0.21	0.094		0.11		
	6/27/2001	Philip	7.9	456	236	23	1	1.9	< 5	0.34	0.22	0.018	22.4	< 1	4.8	29.4	38.2	0.06	0.13	<0.1	0.135		
	12/3/2001	Philip	8.19	457	241	20.3	1.6	1	< 5	0.23	0.07	0.028	18.1	< 1	4.2	30.4	33.3	0.03	0.07	<0.1	0.038		
	6/4/2002	Philip	8.44	443	266	23.4	1	0.6	8	0.66	0.13	0.016	15.2	< 1	3.6	25.7	39.6	<0.01	0.06	<0.1	0.007		
	12/3/2002	Philip	8.27	466	230	24.4	2	< 0.5	17	0.94	0.07	0.01	14.7	< 1	3.3	27.1	42.3	0.01	0.05	<0.1	<0.005		
	6/2/2003	Philip	8.14	460	220	23.7	1	< 0.5	9	0.67	0.17	< 0.001	15.7	20	4.6	25.8	40.4	<0.01	0.06		<0.005		
	12/1/2003	Philip	8.21	415	225	24.5	1.1	1	6	0.25	< 0.03	0.015	20.1	< 1	4.4	24.6	40.8	0.03	0.06	<0.1	<0.005		
	6/9/2004	Philip	8.11	459	234	22	< 1	0.7	6	0.36	0.07	0.01	20.9	1	5.2	36.8	36.6	<0.01	0.06		0.03	<0.2	0.7
	11/30/2004	Philip	8.04	452	241	23.5	1	< 0.5	5	0.23	0.03	0.005	15.5	< 1	4.3	27.5	38.4	<0.01	0.05		<0.005		
	8/3/2005	N/A																					
	11/28/2005	Maxx	8.24	433	233	25		< 2	14	0.8	0.14	< 0.02	15	< 1	4	32	4	<0.05	0.061	<0.05	0.005		
	6/1/2006	MAX	8.2	510	254	27	1.4	< 2	6	0.8	0.24	< 0.02	15	< 1	7	28	48	<0.02	0.061	<0.05	<0.005		
	12/4/2006	MAX	8.2	511	256	26	1.3	< 2	< 4	0.5	0.23	< 0.02	18	< 1	6	30	43	<0.02	0.061	<0.05	<0.005		
	3/30/2007	MAX	8.3	477	241	22	1.2	< 2	4	0.4	0.21	< 0.02	16	< 1	6	32	39	<0.02	0.063	<0.05	<0.005		
	6/14/2007	MAX	8.3	501	249	28	1.4	2	5	0.3	0.16	0.04	19	< 1	6	37	42	<0.02	0.071	<0.05	<0.005		
	12/5/2007	MAX	8.3	448	229	23	1.3	< 2	8	0.2	0.12	< 0.02	13	< 1	4	24	40	<0.02	0.05	<0.1	<0.005	<0.01	0.1
	6/25/2008	MAX	8.4	446	226	23	1.4		13	0.5	0.25	< 0.02	13	< 1	5	33	38	<0.02	0.059	<0.1	<0.005	<0.01	0.1
	12/9/2008	MAX	8.1	460	236	21	1.1	< 2	4	0.3	0.09	0.03	16	< 1	3	29	39	<0.02	0.064	<0.1	<0.005	<0.01	<0.1
	6/25/2009	MAX	8.1	486	244	27	1.4	< 2	6	0.5	0.25	< 0.02	16	< 1	4	31	44	<0.02	0.067	<0.1	<0.005	<0.01	0.8
	12/16/2009	MAX	8.2	439	227	24	1.3	< 2	4	0.4	0.2	< 0.02	10	< 1	3	22	42	<0.02	0.055	<0.1	<0.005	<0.01	<0.1
	6/29/2010	MAX	8.1	456	226	23	1.2	< 2	11	0.6	0.29	< 0.02	12	< 1	4	25	40	<0.02	0.064	<0.1	<0.005	<0.01	0.4
	12/22/2010	MAX	8.07	452	238	26	1.2	< 2	< 4	0.2	< 0.05	< 0.02	7	< 1	4	22	45	<0.02	0.05	<0.1	0.013	<0.01	0.1
	6/16/2011	MAX	8.11	493	246	26	1.4	< 2	13	0.5	0.3	< 0.02	15	< 1	3	27	47	0.02	0.057	<0.1	<0.005	0.03	0.9
	12/15/2011	MAX	8.11	552	271	28	1.4	< 2	< 4	0.9	0.09	0.17	22	< 1	4	29	52	2	0.062	<0.1	0.06	0.06	0.4
	6/18/2012	MAX	8.13	520	260	27	1.3	< 2	10	0.26	< 0.05	0.05	22	< 1	3	25	49	2.3	0.053	<0.1	0.011	<0.01	0.18
	12/17/2012	MAX	7.98	640	330	35	1.5	< 2	< 4	0.45	0.066	0.086	31	< 1	4	32	62	2.8	0.054	<0.1	0.011	<0.01	0.52
	6/18/2013	MAX	8.18	620	300	31	1.5	< 2	4.9	0.25	0.052	0.12	29	< 1	3	33	61	2.3	0.061	<0.1	0.007	<0.01	0.14
	12/5/2013	MAX	7.97	700	340	38	1.6	< 2	18	3	0.1	0.86	34	< 1	5	32	73	<0.02	0.059	<0.1	<0.005	<0.01	0.74

Routine Groundwater Quality - General Analysis -Guelph WRIC & Waste Transfer Station

AECOM

	Date	Lab	pH	Cond-uctivity	Alk mg/L	Mg mg/L	K mg/L	BOD mg/L	COD mg/L	TKN mg/L	NH3-N mg/L	Total-P mg/L	SO4 mg/L	Phenol ug/L	Cl mg/L	Na mg/L	Ca mg/L	Fe mg/L	B mg/L	P mg/L	Zn mg/L	NO2 mg/L	NO3 mg/L
	5/26/2014	MAX	7.91	710	350	38	1.5	< 2	19	<2	< 0.05	0.94	36	< 1	5	30	72	27	0.053	<0.1	0.014	<0.01	0.9
	12/2/2014	Remo																					
Monitor	3/7/1992	EPL	8	499	154	26.3	0.4						28.1		18.1	3.56	63.8	<0.005	<0.01	<0.06	<0.005	<0.03	13.3
2b-91	5/17/1994	EPL	7.9	587	208	31.4	2					< 0.05	34		8.69	9.44	63.9	0.054	0.01	<0.06	<0.005	<0.03	<0.03
Outwash	5/5/1995	MDS	7.95	530	179	28.3	0.6					< 0.05	25.5		8.59	3.69	68.9	0.019	<0.01	<0.06	<0.005		17.2
	4/13/1996	ENT	7.91	425	169	26.8	0.908				0.01		30.3	< 0.5	11.6	4.1	67.9	<0.01	0.42		<0.01	<0.06	<0.05
	6/13/1996	ENT	8.34	337	177	25.1	0.8				0.016		28.2	0.1	7.5	3.9	60.3	<0.01	0.052		<0.01	<0.06	11
	8/21/1996	ENT	8.16	373	167	22.8	1.14				0.06		26.2	1	6.7	3.63	59.6	<0.01	0.05		<0.01	<0.06	11.2
	9/18/1996	ENT	7.93	377	216	22.9	0.9				< 0.01		26	< 0.5	6.5	2.9	60.2	<0.01	0.067		<0.01	<0.06	11.5
	12/11/1996	ENT	8.19	459	208	21.1	1.1				0.04		26.7	< 0.5	7.2	4.6	51	<0.01	0.017		0.01	<0.06	11.4
	3/27/1997	WBL	8.14	543	180	26.8	0.69	< 0.34	18	0.24	< 0.01	0.014	25.8	< 0.72	10.5	2.4	71.9	0.088	0.028	<0.028	0.013		
	3/31/1998	WBL	7.92	556	183	25.8	0.78	1.03			< 0.019		23.2	1.34	16.2	3.88	74.8	0.111	<0.016	0.024	0.012		15.7
	6/24/1998	Dry																					
	10/2/1998	Dry																					
	12/3/1998	Dry																					
	12/9/1999	Barr	7.77	463	166	23.9	< 1	0.9	14	0.4	0.43	0.005	27	< 1	17	3.6	53.2	<0.01	<0.01	<0.1	0.016		
	6/21/2000	Philip	7.89	401	184	24.5	0.7	< 0.5	< 5	0.23	< 0.03	< 0.002	25.5	< 1	8.1	4	58.2	<0.03	<0.005	<0.05	<0.005		
	12/7/2000	INS																					
	6/27/2001	INV																					
	12/3/2001	INV																					
	6/4/2002	Philip	8.22	362	176	21.8	< 1	1.1	15	1.01	< 0.03	0.006	19.1	< 1	5.5	1.8	52.2	<0.01	0.01	<0.1	0.015		
	12/3/2002	INS																					
	6/2/2003	Philip	8	444	182	23.1	< 1	1.4	14	0.74	< 0.03	< 0.001	15	6	4.8	2.2	54.4	<0.01	<0.01		0.019		
	12/1/2003	Philip	8.16	501	190	25	< 1	< 0.5	10	0.51	< 0.03	0.004	23	< 1	8.4	2.9	61.4	<0.01	0.01	<0.1	0.008		
	6/8/2004	Philip	7.83	550	256	31.2	< 1	< 0.5	7	0.49	< 0.03	0.002	21.3	< 1	8.4	2.1	90	0.04	0.01		0.179	<0.2	9.2
	11/30/2004	INS																					
	8/3/2005	INS																					
	11/28/2005	INS																					
	6/1/2006	INS																					
	12/4/2006	INS																					
	3/30/2007	MAX	8.1	764	362	39	0.84	< 2	5	0.3	0.06	< 0.02	15	< 1	10	2.5	78	<0.02	0.022	<0.05	<0.005		
	6/14/2007	INS																					
	12/5/2007	INS																					
	6/25/2008	MAX	8.3	494	228	26	0.79		< 4	0.3	0.05	< 0.02	10	< 1	4	2.6	64	<0.02	0.02	<0.1	0.016	<0.01	0.7
	12/9/2008	INS																					
	6/25/2009	MAX	8	514	270	27	0.78	< 2	< 4	0.3	< 0.05	< 0.02	9	< 1	3	5.2	71	<0.02	0.02	<0.1	0.023	<0.01	0.7
	12/16/2009	INS																					
	6/29/2010	MAX	8	558	286	26	0.75	< 2	7	0.2	< 0.05	< 0.02	9	< 1	3	5.2	75	<0.02	0.018	<0.1	0.022	<0.01	1.2
	12/22/2010	INS																					
	6/16/2011	MAX	7.99	530	278	27	0.7	< 2	12	0.2	< 0.05	< 0.02	8	< 1	3	3.4	78	<0.02	0.016	<0.1	0.02	<0.01	0.4
	12/15/2011	MAX	8.05	537	283	27	0.95	< 2	9	0.5	< 0.05	0.24	8	< 1	4	4.9	80	4.3	0.02	<0.1	0.04	<0.01	0.6
	6/18/2012	INSV																					
	12/17/2012	MAX	7.76	540	290	28	0.99	< 2	10	<0.1	< 0.05	0.19	6	< 1	3	3.8	87	6.7	0.011	<0.1	0.031	<0.01	0.46
	6/19/2013	MAX	7.97	460	230	20	0.65	< 2	22	0.6	< 0.05	0.28	7	< 1	2	2.4	61	12	0.017	<0.1	0.019	<0.01	0.41
	12/5/2013	MAX	7.92	500	270	26	0.94	< 2	31	2.9	< 0.05	0.34	5	< 1	2	2.4	81	<0.02	0.021	<0.1	0.026	<0.01	0.38
	5/26/2014	MAX	7.9	450	240	22	0.67	< 2	8.3	0.21	< 0.05	0.14	6	< 1	2	2.5	68	5.9	0.017	<0.1	0.03	<0.01	0.4
	12/2/2014	Remo																					

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AECOM

	Date	Lab	pH	Cond-uctivity	Alk mg/L	Mg mg/L	K mg/L	BOD mg/L	COD mg/L	TKN mg/L	NH3-N mg/L	Total-P mg/L	SO4 mg/L	Phenol ug/L	Cl mg/L	Na mg/L	Ca mg/L	Fe mg/L	B mg/L	P mg/L	Zn mg/L	NO2 mg/L	NO3 mg/L
Monitor	11/7/1991	EPL	7.2	711	278	42	1						31.7		22.6	3.2	104	0.12	0.02	<0.09	0.3	<0.03	27
3-91	3/4/1992	EPL	7.49	740	308	39.9	2						33.4		15.7	3.37	96.9	0.44	0.02	0.68	0.22	<0.03	22.4
Bedrock	5/17/1994	EPL	7.92	802	327	40.2	2.7					< 0.05	34.2		32.1	13.2	98.5	0.013	0.02	<0.06	0.299	<0.03	10.1
	5/5/1995	MDS	7.47	687	300	37.2	< 0.4					< 0.05	32.5		20.8	7.75	96.5	0.018	0.01	<0.06	0.425	<0.03	9.27
	8/21/1996	ENT	7.75	950	363	45.2	13.4				1.09		39	1.5	8	44.1	116	<0.01	0.12		0.46	<0.06	14.5
	9/18/1996	ENT	7.53	720	323	39.9	7.1				0.45		30.8	< 0.5	40.1	18.1	105	0.03	0.112		0.28	<0.06	9.31
	12/11/1996	ENT	8.09	918	363	32.9	1.86				0.08		35.9	< 0.5	49	17.4	85.6	<0.01	0.06		0.74	<0.06	18.3
Monitor	12/11/1997	WBL				464	29.4		79	2.08	0.037	2.07		< 0.72		98.5	905	54.9	0.05	3.3	6.86		
3-97	3/31/1998	WBL	7.72	1270	343	30.5	6.52	1.15			< 0.019		58.6	< 0.72	165	99.3	126	0.12	0.041	0.065	0.055		3.7
Outwash	6/24/1998	WBL	7.56	939	364	27	4.98	1.17			< 0.019		27.8	< 0.72	71.6	44.9	112	0.475	0.072	<0.006	0.134		2.42
	10/2/1998	Dry																					
	12/3/1998	Dry																					
Monitor	11/7/1991	EPL	7.54	589	290	35	1.8						54.2		15.8	12	88	<0.005	0.02	<0.09	0.048	<0.03	1.8
5-91	3/7/1992	EPL	7.51	658	282	34.7	1.1						41.4		12.3	14.8	85.3	<0.005	0.01	<0.06	0.29	0.12	6.35
edrock/Outv	5/17/1994	EPL	7.64	547	282	31.9	1					< 0.05	15.6		8.68	4.67	68.5	0.084	0.01	<0.06	0.92	<0.03	0.86
	5/5/1995	MDS	7.37	1210	234	60.2	< 0.4					< 0.05	53		210	51.1	136	<0.005	0.02	<0.06	0.229	<0.03	12

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	Date	Lab	pH	Cond-uctivity	Alk mg/L	Mg mg/L	K mg/L	BOD mg/L	COD mg/L	TKN mg/L	NH3-N mg/L	Total-P mg/L	SO4 mg/L	Phenol ug/L	Cl mg/L	Na mg/L	Ca mg/L	Fe mg/L	B mg/L	P mg/L	Zn mg/L	NO2 mg/L	NO3 mg/L
Monitor	2/11/1997	WBL	7.32			34.8	4.83	< 0.34	< 7	0.24	0.021	0.012	32.7	< 0.72	6.53	54.6	125	0.013	0.041	<0.028	1.07		
5-96	3/27/1997	WBL	7.45	1390	312	35	5.16	< 0.34		0.19	0.051	< 0.011	39.5	< 0.72	219	88.8	130	0.013	0.034	<0.028	1.92		
Bedrock	6/25/1997	WBL	7.58	1460	326	33.5	5.1	< 0.34	< 7	0.35	0.044	< 0.011	41.6	< 0.72	251	100	104	0.017	0.029	<0.028	1.62		
	10/1/1997	WBL	7.26	1290	345	37.1	5.57	< 0.34	13	0.29	< 0.01	< 0.011	43.4	< 0.72	190	102	116	0.017	0.032	<0.028	1.78		
	12/11/1997	WBL	7.34	1240	358	35.9	5.85	< 0.34	25	0.24	0.018	< 0.011	43.3	< 0.72	173	96.3	115	0.016	0.023	<0.028	1.7		2.26
	3/31/1998	WBL	7.18	1180	352	30.6	5.14	< 0.34			0.058		41.5	< 0.72	142	75.3	128	0.017	0.028	<0.011	1.52		1.95
	6/24/1998	WBL	7.38	1240	346	31.4	5.27	1.32			0.062		38.6	< 0.72	172	84.2	107	0.028	0.053	<0.006	2.1		1.75
	10/2/1998	CAN	7.3	1300	370	32	5.3	3	6	0.25	< 0.1	0.03	42	< 1	160	91	100	<0.05	<0.05		1.9		0.53
	12/3/1998	CAN	7.3	1200	380	30	5.6	< 2	< 5	0.13	< 0.1	0.11	39	< 2	130	88	94	<0.05	<0.05		1.5		0.54
	6/29/1999	Barr	8.01	1216	333	34.4	6	1.3	10	0.23	0.06	0.004	41.7		236	105	105	<0.01	<0.01	<0.1	2.12		
	12/9/1999	Barr	7.32	1136	355	30.2	4.8	0.6	14	0.42	0.32	0.058	33	< 1	124	100	90.5	<0.01	0.02	<0.1	1.61		
	6/21/2000	Philip	7.27	1056	330	29.2	5	0.6	10	0.46	< 0.03	< 0.002	35.8	< 1	165	95.3	100	<0.03	0.009	<0.05	1.42		
	12/7/2000	Philip	7.52	910	360	27.2	4.5	0.7	11	0.45	0.04	< 0.002	31.5	< 1	112	71.9	83.9	<0.03	0.022		1.66		
	6/27/2001	Philip	7.55	1376	321	33.2	5	0.8	< 5	0.22	< 0.03	0.01	38	< 1	275	137	111	<0.01	0.06	<0.1	1.81		
	12/3/2001	Philip	7.68	1054	343	27.4	3.9	1	6	0.32	< 0.03	0.003	33	< 1	136	93.2	89.9	<0.01	0.05	<0.1	1.88		
	6/4/2002	Philip	8.38	1360	290	31.1	5	0.9	9	0.39	< 0.03	0.005	32.6	< 1	290	139	106	<0.01	0.02	<0.1	1.92		
	12/3/2002	Philip	7.9	1116	316	25.9	5	< 0.5	10	0.37	< 0.03	0.013	30.4	< 1	177	118	86.1	<0.01	0.02	<0.1	1.56		
	6/2/2003	Philip	7.52	2132	278	38.4	6	< 0.5	10	0.39	0.03	< 0.001	43.2	6	474	263	134	<0.01	0.02		2.35		
	12/1/2003	Philip	7.89	1345	299	24.2	4.3	0.9	10	0.36	< 0.03	< 0.002	35.8	< 1	284	178	83.7	<0.01	0.02	<0.1	1.65		
	6/8/2004	Philip	7.46	2148	275	33.2	4.6	< 0.5	13	0.48	< 0.03	0.006	47.8	< 1	631	295	130	0.06	0.02		2.43	<0.2	1
	11/30/2004	Philip	7.69	1707	321	20.8	4	< 0.5	19	0.64	0.04	0.003	41.3	< 1	425	272	79	<0.01	0.02		1.44		
	8/3/2005	Maxx	7.97	3500	283	40	7.7	< 2	27	1.2	< 0.05	< 0.02	47	< 1	952	710	160	<0.5	<0.1	<0.5	2.9		
	11/28/2005	Maxx	8.1	2780	333	25		< 2	17	0.5	< 0.05	< 0.02	49	< 1	661	53	97	<0.05	0.023	<0.05	1.6		
	6/1/2006	MAX	8	3480	302	31	5.9	< 2	15	0.6	0.07	< 0.02	41	< 1	908	590	120	<0.02	0.021	<0.05	2.1		
	12/4/2006	MAX	7.9	2190	341	19	4.6	< 2	6	0.3	0.09	< 0.02	41	< 1	470	390	73	<0.02	0.02	<0.05	1.4		
	3/30/2007	MAX	8	2610	297	22	4.6	< 2	11	0.4	0.12	< 0.02	38	< 1	630	410	97	<0.02	0.018	<0.05	1.5		
	6/14/2007	MAX	8.1	2900	284	29	5.3	< 2	12	0.3	0.1	< 0.02	40	< 1	700	490	110	<0.02	0.018	<0.05	2.2		
	12/5/2007	MAX	8.1	2460	307	23	5.4	< 2	24	0.2	0.06	< 0.02	39	< 1	580	420	94	<0.02	0.017	<0.1	1.7	0.01	0.2
	6/25/2008	MAX	8.1	3810	270	30	5.5		29	0.4	< 0.05	< 0.02	44	< 1	970	610	140	<0.02	<0.01	<0.1	2.2	<0.01	0.5
	12/9/2008	MAX	8	2530	319	16	4.2	< 2	12	0.3	< 0.05	< 0.02	39	< 1	570	390	76	<0.02	0.03	<0.1	1.5	<0.01	0.3
	6/25/2009	MAX	7.8	3030	288	27	5	< 2	12	0.3	< 0.05	< 0.02	42	< 1	740	490	110	<0.02	0.019	<0.1	2.3	0.01	0.4
	12/16/2009	MAX	7.7	2190	307	19	4.5	14	22	2	1.4	0.09	33	12	480	390	76	0.05	0.02	0.12	0.14	<0.01	0.2
	6/24/2010	MAX	7.9	2560	263	24	4.4	< 2	4	0.5	< 0.05	< 0.02	32	< 1	610	390	100	<0.02	0.019	<0.1	1.4	<0.01	0.7
	12/17/2010	MAX	7.9	1940	296	18	4	< 2	10	0.2	< 0.05	< 0.02	28	< 1	390	330	79	<0.02	0.027	<0.1	0.97	<0.01	0.4
	6/15/2011	MAX	7.82	2580	277	26	4.2	< 2	16	0.2	< 0.05	< 0.02	31	< 1	630	390	120	<0.02	0.02	<0.1	2	<0.01	0.5
	12/13/2011	MAX	7.96	1980	304	19	4	< 2	14	0.4	0.07	0.07	28	3	400	330	80	0.21	0.013	<0.1	1.1	<0.01	0.2
	6/18/2012	MAX	7.85	3100	250	27	4.2	< 2	12	0.36	< 0.05	< 0.02	31	1.3	780	420	130	0.07	0.025	<0.1	1.7	<0.01	0.19
	12/10/2012	MAX	7.71	1900	290	19	3.8	< 2	7.6	0.67	< 0.05	< 0.02	28	< 1	380	320	83	0.03	0.015	<0.1	1.6	<0.01	0.46
	6/20/2013	MAX	8.24	3900	250	26	4.1	< 2	6.1	0.26	< 0.05	< -1	38	< 1	1100	380	120	0.26	0.013	<0.1	2.1	<0.01	0.26
	12/3/2013	MAX	7.8	2400	300	19	4.1	< 2	6.4	0.31	< 0.05	< 0.02	30	< 1	590	440	88	<0.02	0.019	<0.1	1.5	<0.01	0.57
	5/23/2014	MAX	7.8	2600	280	21	3.8	< 2	6.6	0.26	< 0.05	< 0.04	34	< 1	650	440	110	<0.02	0.013	<0.1	1.8	<0.01	0.64
	12/3/2014	MAX	7.98	2800	290	23	4.3	< 2	8.4	0.14	< 0.05	< 0.02	35	< 1	680	460	100	<0.02	0.02	<0.1	1.8	<0.01	0.75
	6/22/2015	MAX	7.68	2900	290	23	4.2	< 2	22	0.18	< 0.05	0.02	36	< 1	730	460	110	0.03	0.017	<0.1	1.7	<0.01	0.53
	12/7/2015	MAX	7.84	2500	280	22	4	< 2	< 4	0.16	< 0.05	< 0.02	31	< 1	560	410	96	0.04	0.011	<0.1	1.8	<0.01	0.73

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AECOM

	Date	Lab	pH	Cond-uctivity	Alk mg/L	Mg mg/L	K mg/L	BOD mg/L	COD mg/L	TKN mg/L	NH3-N mg/L	Total-P mg/L	SO4 mg/L	Phenol ug/L	Cl mg/L	Na mg/L	Ca mg/L	Fe mg/L	B mg/L	P mg/L	Zn mg/L	NO2 mg/L	NO3 mg/L
Monitor	2/11/1997	WBL	7.55			26.4	3.58	0.87	17	0.25	< 0.01	< 0.011	32.4	< 0.72	16.3	68.8	111	0.036	0.038	<0.028	0.037		
6a-96	3/26/1997	WBL	7.76	1430	237	35.4	4.36	< 0.34		<0.07	< 0.01	< 0.011	32.7	< 0.72	312	83.9	130	0.033	0.022	<0.028	0.051		
Bedrock	6/25/1997	WBL	7.76	1640	238	30	4.74	0.36	< 7	<0.07	< 0.01	< 0.011	33.4	< 0.72	312	136	104	0.026	0.028	<0.028	0.049		
	10/1/1997	WBL	7.26	1690	420	37.1	16.4	1.44	10	0.23	< 0.01	< 0.011	43.1	< 0.72	216	134	158	0.021	0.056	0.035	0.154		
	12/11/1997	WBL	7.63	1700	261	33	5.53	< 0.34	15	0.22	< 0.01	< 0.011	38.3	< 0.72	333	176	116	0.016	0.021	<0.028	0.03		14.8
	3/31/1998	WBL	7.56	1290	246	29.1	4.87	< 0.34			< 0.019		32.9	< 0.72	199	70	133	0.02	0.021	<0.011	0.029		16.7
	6/24/1998	WBL	7.61	1480	239	31.5	4.76	0.66			< 0.019		31	< 0.72	270	122	121	0.041	0.024	<0.006	0.049		13
	10/2/1998	CAN	7.6	1500	260	33	4.8	2	8	0.24	< 0.1	0.02	33	< 1	250	130	110	<0.05	<0.05		0.04		16
	12/3/1998	CAN	7.5	1600	250	33	5	< 2	< 5	0.11	< 0.1	0.12	30	< 2	280	120	110	<0.05	<0.05		0.07		12
	6/29/1999	Barr	8.19	1210	252	33.5	5	0.9	10	0.24	0.03	0.003	32.3		261	111	112	<0.01	<0.01	<0.1	0.043		
	12/9/1999	Barr	7.61	1344	260	31.1	4.3	0.7	11	0.14	0.02	0.006	30	< 1	208	129	101	<0.01	0.02	<0.1	0.07		
	6/21/2000	Philip	7.52	1157	292	32	4	1.2	8	0.36	< 0.03	< 0.002	33.7	< 1	202	99.8	114	<0.03	<0.005	<0.05	0.039		
	12/7/2000	Philip	7.74	1116	288	28.3	3.5	0.5	9	0.35	< 0.03	< 0.002	32.4	< 1	194	97.3	94.6	<0.03	0.014		0.034		
	6/27/2001	Philip	7.73	1165	290	31.1	3	1.7	5	0.13	< 0.03	0.004	40	< 1	192	96	110	<0.01	0.06	<0.1	0.25		
	12/3/2001	Philip	7.91	1232	286	30.7	2.7	< 0.5	< 5	0.12	< 0.03	0.005	36.4	< 1	206	104	106	<0.01	0.05	<0.1	0.099		
	6/4/2002	Philip	8.14	1051	278	30	3	0.7	6	0.44	< 0.03	0.005	33.8	< 1	158	78.9	107	<0.01	0.02	<0.1	0.033		
	12/3/2002	Philip	7.85	1143	271	29.3	4	< 0.5	8	0.41	< 0.03	0.012	33.9	< 1	179	99.2	106	<0.01	0.01	<0.1	0.039		
	6/2/2003	Philip	7.58	1191	277	32.1	3	< 0.5	7	0.4	< 0.03	< 0.001	46.8	6	171	83.1	116	<0.01	0.01		0.035		
	12/1/2003	Philip	8.09	1098	277	31.1	2	0.8	10	0.29	< 0.03	0.004	39	< 1	167	79.4	111	<0.01	0.02	<0.1	0.035		
	6/9/2004	Philip	7.77	1029	248	28.3	2.9	< 0.5	< 5	0.18	< 0.03	0.004	34.8	< 1	164	74.5	125	0.08	0.01		0.404	<0.2	16.1
	11/30/2004	Philip	7.78	1463	253	37	3	< 0.5	8	0.24	0.05	0.004	38.3	< 1	345	115	137	<0.01	0.02		0.034		
	8/3/2005	Maxx	8.02	1350	235	38	2.8	< 2	5	0.3	< 0.05	< 0.02	34	< 1	233	130	130	<0.05	0.012	0.07	0.029		
	11/28/2005	Maxx	8.08	1510	252	40		< 2	8	0.9	< 0.05	< 0.02	42	< 1	256	140	140	<0.05	0.016	<0.05	0.036		
	6/1/2006	MAX	8.1	1510	264	35	2.7	< 2	7	0.3	< 0.05	0.04	39	1	228	130	120	<0.02	0.018	<0.05	0.036		
	12/4/2006	MAX	7.9	1620	273	42	3.2	< 2	6	<0.1	0.09	0.02	56	< 1	210	140	150	<0.02	0.019	<0.05	0.042		
	3/30/2007	MAX	8.1	1530	270	34	3.1	< 2	5	0.3	0.15	< 0.02	55	< 1	180	110	130	<0.02	0.021	<0.05	<0.005		
	6/14/2007	MAX	8.2	1330	206	38	3.4	< 2	5	<0.1	0.1	< 0.02	56	< 1	190	130	130	<0.02	0.025	<0.05	0.035		
	12/5/2007	MAX	8	1610	267	38	3.3	< 2	17	0.3	< 0.05	< 0.02	46	< 1	230	140	140	<0.02	0.015	<0.1	0.037	<0.2	34
	6/25/2008	MAX	8.2	1660	257	32	3.1		< 4	0.4	0.09	< 0.02	42	< 1	280	160	120	0.04	0.021	<0.1	0.036	<0.1	26
	12/9/2008	MAX	8	1740	268	38	3.6	< 2	9	<0.1	0.09	< 0.02	54	< 1	260	150	140	<0.02	0.02	<0.1	0.042	<0.01	37
	6/25/2009	MAX	7.9	1700	273	39	4.4	< 2	5	0.1	< 0.05	< 0.02	50	< 1	240	160	150	<0.02	0.03	<0.1	0.039	<0.01	46
	12/15/2009	MAX	7.8	1520	280	33	3.9	< 2	4	0.2	< 0.05	0.04	41	< 1	220	140	120	<0.02	0.03	<0.1	0.039	<0.01	22
	6/23/2010	MAX	8	1340	277	28	3.4	< 2	< 4	0.4	< 0.05	< 0.02	37	< 1	200	130	110	<0.02	0.027	<0.1	0.029	<0.01	12
	12/20/2010	MAX	7.86	1340	279	28	2.9	< 2	5	0.2	< 0.05	< 0.02	33	< 1	210	130	110	0.06	0.021	<0.1	0.035	<0.01	6.8
	6/14/2011	MAX	7.94	1300	276	28	3	< 2	8	0.3	< 0.05	< 0.02	35	< 1	190	140	100	<0.02	0.028	<0.1	0.031	<0.01	8.4
	12/13/2011	MAX	8.01	1220	269	26	3	< 2	5	0.2	< 0.05	0.04	34	< 1	160	120	98	<0.02	0.016	<0.1	0.038	<0.01	7.5
	6/18/2012	MAX	7.91	1100	280	23	2.8	< 2	9.2	0.39	< 0.05	< 0.02	35	1.1	140	100	89	<0.02	0.021	<0.1	0.027	<0.01	5.9
	12/10/2012	MAX	7.91	1200	290	26	2.9	< 2	< 4	0.45	< 0.05	< 0.02	34	< 1	160	120	100	<0.02	0.019	<0.1	0.03	<0.01	4.9
	6/17/2013	MAX	8	1100	280	23	2.5	< 2	4	0.21	< 0.05	< 1	34	< 1	150	100	89	<0.02	0.024	<0.1	0.025	<0.01	4.8
	12/2/2013	MAX	7.84	1200	290	27	3.2	< 2	7.1	0.35	< 0.05	< 0.02	39	< 1	160	110	100	<0.02	0.024	<0.1	0.029	<0.01	5.2
	5/21/2014	MAX	7.88	1200	290	26	3.6	< 2	< 4	0.18	< 0.05	< 0.04	38	< 1	160	110	110	<0.02	0.024	<0.1	0.031	<0.01	5.31
	12/2/2014	MAX	7.93	1300	280	25	3.7	< 2	< 4	0.33	< 0.05	< 0.02	34	< 1	180	120	100	0.03	0.029	<0.1	0.029	<0.01	4.55
	6/16/2015	MAX	7.79	1400	290	28	2.9	< 2	4.5	0.55	< 0.05	0.02	35	< 1	230	140	110	0.05	0.029	<0.1	0.035	<0.01	3.7
	12/2/2015	MAX	7.86	1400	270	24	2.6	< 2	6.9	0.38	0.1	0.021	37	< 1	220	140	98	0.15	0.026	<0.1	0.03	<0.01	2.8

Routine Groundwater Quality - General Analysis -Guelph WRIC & Waste Transfer Station

AECOM

	Date	Lab	pH	Cond-uctivity	Alk mg/L	Mg mg/L	K mg/L	BOD mg/L	COD mg/L	TKN mg/L	NH3-N mg/L	Total-P mg/L	SO4 mg/L	Phenol ug/L	Cl mg/L	Na mg/L	Ca mg/L	Fe mg/L	B mg/L	P mg/L	Zn mg/L	NO2 mg/L	NO3 mg/L
Monitor	2/11/1997	WBL	7.39			42.2	15.3	0.42	22	0.18	0.055	< 0.011	44.3	< 0.72	621	322	167	0.038	0.045	<0.028	0.073		
6b-96	3/26/1997	WBL	7.73	3260	260	35.2	16.3	< 0.34		0.09	< 0.01	< 0.011	44.1	< 0.72	815	467	146	0.073	0.062	<0.028	0.1		
Outwash	6/25/1997	WBL	7.58	2210	323	34.8	15	0.51	< 7	<0.07	< 0.01	< 0.011	45	< 0.72	440	198	125	0.033	0.047	<0.028	0.139		
	10/1/1997	WBL	7.65	1740	246	36.2	5.36	4.19	56	<0.07	< 0.01	< 0.011	35.8	< 0.72	341	164	128	0.019	0.02	0.035	0.041		
	12/11/1997	WBL	7.33	1200	333	30.6	13.1	0.75	17	0.17	< 0.01	< 0.011	39.7	< 0.72	128	80.5	120	0.145	0.046	<0.028	0.09		14
	3/31/1998	WBL	7.43	2770	270	28.8	12.6	< 0.34			< 0.019		50.9	< 0.72	649	289	168	0.113	0.029	<0.011	0.083		17.3
	6/24/1998	WBL	7.34	1860	308	35.5	15.4	0.48			0.047		43	< 0.72	279	159	163	0.017	0.078	<0.006	0.151		43.5
	10/2/1998	CAN	7.3	1500	410	45	15	< 2	< 5	0.34	< 0.1	< 0.02	40	< 1	150	92	160	<0.05	0.05		0.14		37
	12/3/1998	CAN	7.3	1300	390	35	12	< 2	< 5	<0.1	< 0.1	0.11	35	< 2	120	75	120	<0.05	<0.05		0.1		15
	6/29/1999	Barr	8.01	1550	327	34.3	11	1.9	11	0.29	< 0.02	0.003	44.4		338	189	125	0.01	0.03	<0.1	0.098		
	12/9/1999	Barr	7.32	1378	332	32.1	10.5	0.6	17	0.54	0.05	0.002	38	< 1	155	122	121	<0.01	0.04	<0.1	0.108		
	6/21/2000	Philip	7.36	1639	306	31	18	< 0.5	13	3.16	2.84	< 0.002	48.8	< 1	313	182	130	<0.03	0.03	<0.05	0.099		
	12/7/2000	Philip	7.48	1137	352	32.9	10.2	2.5	11	0.44	0.09	< 0.002	43.7	< 1	163	78.3	113	<0.03	0.04		0.104		
	6/27/2001	Philip	7.59	1580	339	30.2	10	1.9	< 5	0.28	< 0.03	0.005	43	< 1	265	188	114	<0.01	0.07	<0.1	0.258		
	12/3/2001	Philip	7.79	1531	379	28.6	8.9	< 0.5	11	0.42	< 0.03	0.008	56.7	< 1	252	161	116	<0.01	0.06	<0.1	0.141		
	6/4/2002	Philip	8.2	1769	317	32.7	10	0.6	12	0.59	< 0.03	0.015	46.1	< 1	390	223	129	0.01	0.04	<0.1	0.177		
	12/3/2002	Philip	7.85	974	310	25.8	9	< 0.5	14	0.77	< 0.03	0.009	34.7	< 1	97	77.2	95	<0.01	0.03	<0.1	0.063		
	6/2/2003	Philip	7.69	1538	270	25.8	7	0.7	10	0.37	0.1	< 0.001	41.9	11	350	225	101	<0.01	0.03		0.068		
	12/1/2003	Philip	7.96	1407	309	22.5	6.9	0.8	5	0.42	< 0.03	0.004	38.6	< 1	278	179	107	0.03	0.03	<0.1	0.242		
	6/9/2004	Philip	7.54	1871	314	40.4	10.2	< 0.5	8	0.3	< 0.03	0.003	65.2	< 1	412	214	217	0.21	0.04		1.31	<0.2	40.3
	11/30/2004	Philip	7.76	791	290	20.5	6	< 0.5	13	0.6	< 0.03	0.004	23.4	< 1	90.3	53.1	85.9	<0.01	0.02		0.054		
	8/3/2005	Maxx	7.86	1920	347	39	13	< 2	13	0.7	< 0.05	< 0.02	49	< 1	297	210	160	<0.05	0.045	<0.05	0.11		
	11/28/2005	Maxx	8.19	1190	348	26		< 2	11	0.2	< 0.05	< 0.02	35	< 1	120	110	110	<0.05	0.039	<0.05	0.067		
	6/1/2006	MAX	8	2060	342	35	11	< 2	8	0.5	< 0.05	0.08	44	< 1	340	250	140	<0.02	0.045	<0.05	0.088		
	12/4/2006	MAX	8.1	1420	412	24	8.6	< 2	7	0.6	0.09	< 0.02	44	< 1	170	180	99	<0.02	0.04	<0.05	0.066		
	3/30/2007	MAX	7.9	2440	356	31	9.2	8	12	0.8	0.11	< 0.02	54	< 1	460	280	120	<0.02	0.034	<0.05	<0.005		
	6/14/2007	MAX	8	1820	344	36	11	< 2	9	0.3	0.09	< 0.02	55	< 1	240	230	140	<0.02	0.05	<0.05	0.09		
	12/5/2007	MAX	8.1	1450	282	29	11	< 2	17	0.4	< 0.05	< 0.02	44	< 1	240	130	120	<0.02	0.041	<0.1	0.068	<0.01	8.3
	6/25/2008	MAX	8.1	2480	308	47	14		15	0.6	0.13	< 0.02	63	< 1	420	280	190	<0.02	0.047	<0.1	0.12	<0.1	76
	12/9/2008	MAX	8	1840	309	33	12	< 2	11	0.4	0.12	0.05	51	< 1	280	190	130	<0.02	0.034	<0.1	0.085	0.01	33
	6/25/2009	MAX	7.9	2030	320	30	11	< 2	6	0.3	< 0.05	< 0.02	46	< 1	370	280	120	<0.02	0.049	<0.1	0.08	<0.01	23
	12/15/2009	MAX	7.8	1380	307	30	11	< 2	< 4	0.6	0.19	0.03	45	< 1	170	130	120	<0.02	0.04	<0.1	0.068	<0.01	22
	6/23/2010	MAX	8	1300	302	22	8.1	< 2	< 4	0.5	< 0.05	< 0.02	36	< 1	190	140	90	<0.02	0.035	<0.1	0.064	<0.01	12
	12/20/2010	MAX	7.82	1080	283	22	8.3	< 2	6	0.3	< 0.05	< 0.02	33	< 1	130	94	96	<0.02	0.027	<0.1	0.059	<0.01	11
	6/14/2011	MAX	7.91	1650	313	22	7.7	< 2	16	0.4	< 0.05	< 0.02	36	< 1	270	240	93	<0.02	0.036	0.11	0.057	<0.01	6.1
	12/13/2011	MAX	8.01	1380	326	24	9.1	< 2	13	0.8	< 0.05	0.12	38	< 1	180	160	95	2	0.024	<0.1	0.067	<0.01	5.3
	6/18/2012	MAX	7.9	1500	350	22	7.6	< 2	10	0.38	< 0.05	0.027	39	< 1	230	190	95	0.12	0.029	<0.1	0.063	<0.01	5.6
	12/10/2012	MAX	7.84	1200	310	21	7.6	< 2	16	1.1	< 0.05	0.12	22	1.2	160	130	94	2.4	0.023	<0.1	0.06	<0.01	2.9
	6/17/2013	MAX	7.88	1900	330	26	8.7	< 2	4.6	0.81	0.4	0.044	73	< 1	330	230	110	0.1	0.036	<0.1	0.078	0.018	6.8
	12/2/2013	MAX	7.79	1400	310	23	7.4	2	22	0.86	0.15	0.026	44	< 1	220	170	110	<0.02	0.03	<0.1	0.073	0.048	5.3
	5/21/2014	MAX	7.88	2100	330	23	6.2	< 2	9.7	0.38	< 0.05	0.052	41	< 1	410	310	110	<0.02	0.027	<0.1	0.081	<0.01	7.18
	12/2/2014	MAX	7.78	1900	330	28	8.4	2	14	1.4	0.063	0.059	40	< 1	350	210	130	0.21	0.042	<0.1	0.086	0.013	5.69
	6/16/2015	MAX	7.75	1600	320	23	7	< 2	5.4	0.67	< 0.05	0.025	39	< 1	280	210	110	0.26	0.039	<0.1	0.076	<0.01	4.28
	12/2/2015	MAX	7.81	1200	290	22	7.3	< 2	8.5	0.33	< 0.05	0.048	36	< 1	140	100	93	0.18	0.035	<0.1	0.065	<0.01	3.48

Routine Groundwater Quality - General Analysis -Guelph WRIC & Waste Transfer Station

AECOM

	Date	Lab	pH	Cond-uctivity	Alk mg/L	Mg mg/L	K mg/L	BOD mg/L	COD mg/L	TKN mg/L	NH3-N mg/L	Total-P mg/L	SO4 mg/L	Phenol ug/L	Cl mg/L	Na mg/L	Ca mg/L	Fe mg/L	B mg/L	P mg/L	Zn mg/L	NO2 mg/L	NO3 mg/L
Monitor	2/11/1997	WBL	7.7			26.2	12.6	< 0.34	24	<0.07	< 0.01	< 0.011	35.2	2.48	132	63.5	90.1	0.053	0.048	<0.028	0.05		
7-96	3/26/1997	WBL	7.7	1180	256	32.5	14	< 0.34		<0.07	< 0.01	< 0.011	35.5	< 0.72	131	80.6	104	0.071	0.074	<0.028	0.084		
Outwash	6/25/1997	WBL	7.8	992	250	29.6	9.65	0.69	< 7	0.08	< 0.01	< 0.011	35.2	< 0.72	66.4	33.7	95.1	0.03	0.039	<0.028	0.11		
	10/1/1997	WBL	7.57	902	251	33.2	10.2	1.44	< 7	0.1	< 0.01	< 0.011	35.7	< 0.72	54.3	28.7	110	0.039	0.056	<0.028	0.082		24.6
	12/11/1997	WBL	7.52	906	248	31.8	10.1	< 0.34	< 7	0.25	< 0.01	< 0.011	36.3	< 0.72	62.1	30	105	0.168	0.055	<0.028	0.084		23
	3/31/1998	WBL	7.55	1120	224	32.4	9.06	< 0.34			< 0.019		43	< 0.72	92.4	36.8	127	0.092	0.038	<0.011	0.088		43.1
	6/24/1998	WBL	7.77	1200	226	34.9	9.49	0.78			< 0.019		41.3	< 0.72	89.8	38.8	141	0.058	0.056	<0.006	0.115		53.5
	10/2/1998	CAN	7.4	1100	280	38	11	3	10	0.27	< 0.1	< 0.02	46	< 1	74	35	130	<0.05	<0.05		0.12		41
	12/3/1998	CAN	7.5	1200	310	39	11	< 2	< 5	0.36	< 0.1	0.1	41	< 2	72	32	130	<0.05	<0.05		0.13		37
	6/29/1999	Barr	8.15	1325	248	41	12	2.2	10	0.21	< 0.02	0.003	58.4		282	110	132	<0.01	0.03	<0.1	0.122		
	12/9/1999	Barr	7.39	1478	293	45.4	14.1	0.8	13	0.2	< 0.02	< 0.002	41	< 1	231	91.1	135	<0.01	0.05	0.1	0.153		
	6/21/2000	Philip	7.44	1775	255	48.8	13.9	0.6	12	0.54	< 0.03	< 0.002	80.9	< 1	397	172	157	<0.03	0.035	<0.05	0.144		
	12/7/2000	Philip	7.5	1430	321	41	13.2	16	12	0.3	0.05	< 0.002	75.8	< 1	227	118	135	<0.03	0.102		0.297		
	6/27/2001	Philip	7.72	1768	293	44.4	13	1.7	6	0.34	< 0.03	0.006	105	< 1	307	176	144	<0.01	0.09	<0.1	0.246		
	12/3/2001	Philip	7.73	1259	365	36.2	11.8	< 0.5	7	0.41	< 0.03	0.004	48.7	< 1	162	87.8	124	<0.01	0.05	<0.1	0.151		
	6/4/2002	Philip	8.04	1863	328	46.1	20	< 0.5	11	0.77	0.42	0.006	110	< 1	378	201	146	<0.01	0.07	<0.1	0.182		
	12/3/2002	Philip	7.92	1681	350	44.9	27	< 0.5	16	1.03	1.11	0.012	70.9	< 1	244	145	152	<0.01	0.07	<0.1	0.173		
	6/2/2003	Philip	7.52	2122	298	52.7	23	< 0.5	11	0.99	0.41	0.002	131	12	380	212	167	<0.01	0.06		0.199		
	12/1/2003	Philip	8	1206	303	36.9	16.3	1.3	12	0.41	< 0.03	0.003	61.1	< 1	178	86.6	118	<0.01	0.05	<0.1	0.147		
	6/8/2004	Philip	7.48	1995	336	51.6	22	0.8	13	0.57	< 0.03	0.002	129	< 1	370	196	226	0.19	0.07		0.859	<0.2	55.4
	11/30/2004	Philip	7.71	1705	368	40.5	20	< 0.5	15	0.75	0.12	0.003	107	< 1	296	158	150	<0.01	0.07		0.202		
	8/3/2005	Maxx	7.95	1800	325	51	19	< 2	22	1.5	0.12	< 0.02	86	< 1	190	140	180	<0.05	0.086	0.067	0.23		
	11/28/2005	Maxx	8.07	2140	378	52		< 2	10	1	< 0.05	< 0.02	112	< 1	258	180	200	<0.05	0.093	<0.05	0.27		
	6/1/2006	MAX	8	1910	306	44	16	< 2	12	0.7	< 0.05	0.04	113	< 1	186	120	170	<0.02	0.099	<0.05	0.24		
	12/4/2006	MAX	7.9	1610	315	40	17	< 2	7	0.7	0.09	< 0.02	83	1	150	100	170	<0.02	0.092	<0.05	0.22		
	3/30/2007	MAX	8.1	1650	276	45	16	< 2	12	<0.1	0.08	< 0.02	65	< 1	160	100	180	<0.02	0.06	<0.05	0.23		
	6/14/2007	MAX	8	1370	278	39	15	< 2	8	0.1	0.09	< 0.02	70	< 1	140	110	140	<0.02	0.058	<0.05	0.18		
	12/5/2007	MAX	8	1310	289	36	15	< 2	20	0.5	0.06	< 0.02	57	< 1	100	72	150	<0.02	0.048	<0.1	0.2	<0.2	44
	6/25/2008	MAX	8.1	1810	284	37	14		9	0.6	0.06	< 0.02	83	< 1	240	150	140	<0.02	0.065	<0.1	0.21	<0.1	54
	12/9/2008	MAX	7.9	1470	289	35	14	< 2	8	0.6	< 0.05	< 0.02	58	< 1	170	110	130	<0.02	0.062	<0.1	0.19	0.02	41
	6/25/2009	MAX	7.8	1400	318	33	11	< 2	< 4	0.6	< 0.05	< 0.02	56	< 1	190	130	120	<0.02	0.042	<0.1	0.17	<0.01	21
	12/15/2009	MAX	7.8	1130	298	28	12	< 2	5	0.4	< 0.05	0.03	40	< 1	120	89	100	<0.02	0.052	<0.1	0.15	<0.01	15
	6/24/2010	MAX	8	1380	331	36	12	< 2	4	0.5	< 0.05	< 0.02	51	< 1	180	100	130	<0.02	0.039	<0.1	0.19	<0.01	21
	12/17/2010	MAX	7.73	1030	278	29	11	< 2	12	0.3	< 0.05	< 0.02	41	< 1	84	73	110	<0.02	0.05	<0.1	0.17	<0.01	23
	6/14/2011	MAX	7.85	1740	316	36	11	< 2	16	0.6	< 0.05	< 0.02	60	< 1	270	190	130	<0.02	0.039	<0.1	0.16	<0.01	18
	12/14/2011	MAX	8.02	1190	333	30	11	< 2	5	0.4	< 0.05	0.05	46	< 1	110	93	110	0.81	0.036	<0.1	0.22	<0.01	16
	6/18/2012	MAX	7.88	1200	310	28	9.5	< 2	15	0.66	< 0.05	0.034	44	1	120	91	100	1.7	0.034	<0.1	0.17	<0.01	12
	12/10/2012	MAX	7.88	1100	330	28	11	< 2	7.7	0.54	< 0.05	< 0.02	46	< 1	110	86	110	0.08	0.04	<0.1	0.2	<0.01	8.6
	6/19/2013	MAX	8.12	1100	300	26	8.5	< 2	4.8	0.28	< 0.05	< 0.02	41	< 1	130	80	100	0.74	0.037	<0.1	0.19	<0.01	6.8
	12/3/2013	MAX	7.73	1000	320	27	11	< 2	11	0.52	0.064	< 0.02	34	< 1	110	73	100	<0.02	0.047	<0.1	0.11	<0.01	5.3
	5/26/2014	MAX	7.74	1400	300	30	9.7	< 2	18	0.48	< 0.05	< 0.04	42	< 1	190	120	110	<0.02	0.037	<0.1	0.17	<0.01	5.87
	12/3/2014	MAX	7.88	1100	290	28	10	< 2	< 4	0.4	< 0.05	< 0.02	37	< 1	140	81	110	<0.02	0.047	<0.1	0.2	<0.01	4.93
	6/22/2015	MAX	7.76	1000	290	26	7.8	< 2	21	0.65	< 0.05	< 0.02	36	< 1	130	70	97	0.22	0.035	<0.1	0.16	<0.01	4.54
	12/7/2015	MAX	7.73	1100	300	29	9	< 2	< 4	0.4	< 0.05	0.024	35	< 1	140	78	110	0.22	0.031	<0.1	0.17	<0.01	3.88

Routine Groundwater Quality - General Analysis -Guelph WRIC & Waste Transfer Station

AECOM

	Date	Lab	pH	Cond-uctivity	Alk mg/L	Mg mg/L	K mg/L	BOD mg/L	COD mg/L	TKN mg/L	NH3-N mg/L	Total-P mg/L	SO4 mg/L	Phenol ug/L	Cl mg/L	Na mg/L	Ca mg/L	Fe mg/L	B mg/L	P mg/L	Zn mg/L	NO2 mg/L	NO3 mg/L
Monitor	2/11/1997	WBL	7.78			39.9	2.08	< 0.34	28	0.21	< 0.01	0.034	73.5	< 0.72	33	19.3	94.9	0.054	0.051	<0.028	0.024		
8-96	3/27/1997	WBL	7.77	864	302	36.9	1.73	< 0.34	46	0.3	< 0.01	< 0.011	53.9	< 0.72	49.8	18.8	107	0.011	0.032	<0.028	0.673		
Bedrock	6/25/1997	WBL	7.84	882	308	33.6	1.77	< 0.34	< 7	<0.07	0.018	< 0.011	60.8	< 0.72	40.9	17.6	92	0.017	0.052	<0.028	0.543		
	10/1/1997	WBL	7.45	838	321	37.1	1.9	0.51	51	0.2	< 0.01	< 0.011	66.2	< 0.72	37.2	19.3	111	0.021	0.021	<0.028	0.502		
	12/11/1997	WBL	7.61	880	297	37.7	1.99	< 0.34	< 7	0.34	< 0.01	< 0.011	75.2	< 0.72	55.4	21	105	0.063	0.025	<0.028	0.69		5.16
	3/31/1998	WBL	7.41	997	288	33.4	2.05	1.72			< 0.019		65.6	< 0.72	102	32.9	116	0.013	0.022	<0.011	0.535		3.94
	6/24/1998	WBL	7.5	890	309	32.1	1.78	0.75			< 0.019		59.6	< 0.72	58.4	30.1	107	0.057	<0.016	<0.006	0.632		5.23
	10/2/1998	CAN	7.4	890	320	38	2.2	< 2	< 5	0.3	< 0.1	< 0.02	73	< 1	57	31	110	<0.05	<0.05		0.84		4.8
	12/3/1998	CAN	7.4	910	310	36	2.2	< 2	< 5	0.48	< 0.1	0.12	72	< 2	60	28	99	<0.05	<0.05		0.83		2.6
	6/29/1999	Barr	8.23	976	282	40.1	3	1.7	12	0.19	< 0.02	0.003	68.2		146	67.7	109	<0.01	<0.01	<0.1	0.751		
	12/9/1999	Barr	7.46	1358	287	43.4	2.8	0.9	9	0.49	0.03	0.004	64	< 1	207	103	114	<0.01	0.01	<0.1	0.896		
	6/21/2000	Philip	7.43	1212	264	38.9	2.4	< 0.5	6	0.25	< 0.03	< 0.002	64.4	< 1	233	107	111	<0.03	<0.005	<0.05	0.89		
	12/7/2000	Philip	7.6	942	320	34.6	2	1.3	13	0.25	0.04	< 0.002	63.7	< 1	125	59.2	94.6	<0.03	0.059		1.01		
	6/27/2001	Philip	7.76	1019	317	36.3	2	1.6	< 5	0.27	0.03	0.037	63	< 1	139	76.1	105	0.02	0.05	<0.1	1.11		
	12/3/2001	Philip	7.66	1329	356	36	2.3	1.1	< 5	0.2	< 0.03	0.005	50	< 1	225	93.9	103	<0.01	0.05	<0.1	1.02		
	6/4/2002	Philip	8.43	1024	302	35.1	3	< 0.5	12	0.75	< 0.03	0.008	56.5	< 1	138	74.1	102	<0.01	0.01	<0.1	0.867		
	12/3/2002	Philip	7.97	1002	309	35.8	3	< 0.5	6	0.31	< 0.03	0.004	59.4	< 1	118	65.5	101	<0.01	0.01	<0.1	0.871		
	6/2/2003	Philip	7.47	1622	276	39.9	3	< 0.5	7	0.41	< 0.03	< 0.001	55.1	9	332	171	116	<0.01	0.01		1.08		
	12/1/2003	Philip	7.85	1262	285	35.6	3.1	1	9	0.4	< 0.03	0.003	53.8	< 1	254	124	104	<0.01	0.02	<0.1	1.05		
	6/8/2004	Philip	7.6	1036	292	35.3	1.8	< 0.5	6	0.2	< 0.03	0.003	58.4	< 1	159	80.6	123	0.11	0.01		1.43	<0.2	3.9
	11/30/2004	Philip	7.8	981	309	33.4	3	< 0.5	17	0.7	< 0.03	0.006	58.4	< 1	121	66.2	96.3	<0.01	<0.01		0.919		
	8/3/2005	Maxx	8.15	888	298	36	2.5	< 2	22	1.2	< 0.05	< 0.02	47	< 1	98	71	92	<0.05	0.019	0.069	0.7		
	11/28/2005	Maxx	8.05	997	320	37		< 2	6	0.6	< 0.05	< 0.02	54	< 1	99	66	110	<0.05	0.015	<0.05	1		
	6/1/2006	MAX	8.1	1040	314	32	2.3	< 2	11	0.5	< 0.05	< 0.02	50	< 1	129	67	87	<0.02	0.013	<0.05	0.94		
	12/4/2006	MAX	8.1	976	327	35	2.8	< 2	< 4	0.4	< 0.05	< 0.02	50	< 1	99	62	99	<0.02	0.014	<0.05	1.1		
	3/30/2007	MAX	8.2	1030	308	36	2.6	< 2	5	0.4	0.08	< 0.02	55	< 1	120	71	100	<0.02	0.02	<0.05	1.1		
	6/14/2007	MAX	8.1	1010	303	40	2.7	< 2	5	0.5	0.11	< 0.02	54	< 1	110	79	100	<0.02	0.015	<0.05	1.1		
	12/5/2007	MAX	8	1130	306	37	2.8	< 2	12	0.2	< 0.05	< 0.02	62	< 1	150	68	110	<0.02	0.011	<0.1	1.2	<0.01	1.9
	6/25/2008	MAX	8.1	1050	291	37	2.8		15	0.5	0.12	< 0.02	52	< 1	130	81	100	<0.02	<0.01	<0.1	1.2	<0.01	1.2
	12/9/2008	MAX	8	997	310	33	2.5	< 2	4	0.3	< 0.05	< 0.02	56	< 1	110	59	91	<0.02	0.012	<0.1	1.1	<0.01	1
	6/25/2009	MAX	7.8	943	298	32	2.3	< 2	4	0.3	< 0.05	< 0.02	54	< 1	97	61	90	<0.02	0.013	<0.1	1	<0.01	1.1
	12/16/2009	MAX	7.7	1010	312	35	2.5	< 2	8	0.3	< 0.05	0.02	46	< 1	110	62	97	<0.02	0.015	<0.1	1.1	<0.01	1.1
	6/24/2010	MAX	8	960	292	33	2.3	< 2	< 4	0.4	< 0.05	< 0.02	50	< 1	110	63	93	<0.02	0.013	<0.1	0.97	<0.01	1.1
	12/22/2010	MAX	7.73	953	304	35	2.6	< 2	< 4	0.3	< 0.05	< 0.02	43	< 1	95	64	97	<0.02	0.014	<0.1	1.1	<0.01	0.8
	6/15/2011	MAX	7.9	1030	282	33	2.5	< 2	14	0.3	< 0.05	< 0.02	56	< 1	140	79	91	<0.02	0.015	<0.1	1.1	<0.01	0.6
	12/14/2011	MAX	7.99	1000	296	32	2.7	< 2	< 4	0.3	< 0.05	0.02	38	< 1	110	73	91	<0.02	<0.01	<0.1	1.4	<0.01	0.5
	6/18/2012	MAX	7.9	960	290	31	2.2	< 2	10	0.43	< 0.05	< 0.02	44	< 1	100	62	89	0.21	<0.01	<0.1	0.76	<0.01	0.33
	12/10/2012	MAX	7.77	920	300	32	2.4	< 2	7	0.57	< 0.05	< 0.02	47	< 1	88	59	92	0.08	<0.01	<0.1	0.99	<0.01	0.44
	6/20/2013	MAX	8.37	960	290	33	2.4	< 2	5.8	0.34	< 0.05	< 0.02	44	< 1	100	66	97	0.14	0.016	<0.1	0.92	<0.01	0.28
	12/3/2013	MAX	7.74	910	300	32	2.5	< 2	6.1	0.24	< 0.05	< 0.02	38	< 1	93	60	87	<0.02	0.016	<0.1	1.1	<0.01	0.31
	5/26/2014	MAX	7.83	900	290	32	2.2	< 2	< 4	0.16	< 0.05	< 0.04	39	< 1	92	57	90	<0.02	0.013	<0.1	0.97	<0.01	0.37
	12/3/2014	MAX	7.99	900	290	30	2.4	< 2	< 4	0.19	0.051	< 0.02	39	< 1	93	59	87	<0.02	0.021	<0.1	0.94	<0.01	0.4
	6/22/2015	MAX	7.76	1100	300	33	2.3	< 2	9	0.16	< 0.05	< 0.02	39	< 1	140	76	93	0.06	0.015	<0.1	0.97	<0.01	0.35
	12/7/2015	MAX	7.87	1100	280	34	2.4	< 2	< 4	0.14	< 0.05	< 0.02	37	< 1	140	81	95	0.03	<0.01	<0.1	1	<0.01	0.39

Routine Groundwater Quality - General Analysis -Guelph WRIC & Waste Transfer Station

AECOM

	Date	Lab	pH	Cond-uctivity	Alk mg/L	Mg mg/L	K mg/L	BOD mg/L	COD mg/L	TKN mg/L	NH3-N mg/L	Total-P mg/L	SO4 mg/L	Phenol ug/L	Cl mg/L	Na mg/L	Ca mg/L	Fe mg/L	B mg/L	P mg/L	Zn mg/L	NO2 mg/L	NO3 mg/L
Monitor	2/11/1997	WBL	7.81			16.4	0.99	0.69	7	0.19	< 0.01	< 0.011	17.6	2.23	7.17	4.37	61.6	0.124	0.021	<0.028	0.008		
9-96	3/26/1997	WBL	8.04	474	186	18.7	0.86	< 0.34	14	0.24	< 0.01	< 0.011	23.4	< 0.72	6.34	7.96	68.6	0.074	0.036	<0.028	0.027		
Outwash	6/25/1997	WBL	8.01	582	205	20.7	0.95	< 0.34	< 7	<0.07	< 0.01	< 0.011	26.7	< 0.72	6.93	7.38	71	0.031	0.031	<0.028	0.018		
	10/1/1997	WBL	7.92	490	179	21.7	0.84	1.2	13	0.1	< 0.01	< 0.011	22.4	< 0.72	9.82	1.68	74.5	0.026	0.018	0.029	0.008		11.4
	12/11/1997	WBL	7.85	488	171	21.8	0.67	< 0.34	< 7	0.22	< 0.01	< 0.011	20.4	< 0.72	13.6	1.48	70.3	0.031	<0.016	0.04	0.005		8.67
	3/31/1998	WBL	8.38	557	195	25.9	0.7	< 0.34			0.019		26.7	< 0.72	13.1	2.2	71.7	0.011	0.03	<0.011	0.005		13
	6/24/1998	WBL	7.79	536	193	21.6	0.78	1.38			< 0.019		26	< 0.72	12.5	2.83	76.2	0.027	0.047	<0.006	0.007		11.6
	10/2/1998	CAN	7.7	610	210	29	< 1	< 2	< 5	0.4	< 0.1	< 0.02	29	< 1	19	2	85	<0.05	<0.05		<0.01		14
	12/3/1998	CAN	7.6	590	230	24	< 1	< 2	< 5	0.31	< 0.1	0.17	23	< 2	11	2.5	79	<0.05	<0.05		0.01		9.9
	6/29/1999	Barr	8.31	528	220	19.6	1	1.2	10	0.21	< 0.02	0.004	24.6		23.3	8.2	79.7	<0.01	0.01	<0.1	<0.005		
	12/9/1999	Barr	7.65	649	251	20.2	< 1	< 0.5	6	0.16	0.06	0.004	17	< 1	31	14.6	93.2	0.01	0.03	<0.1	0.024		
	6/21/2000	Philip	7.71	414	234	14.7	0.8	< 0.5	5	0.28	< 0.03	< 0.002	12.2	< 1	12	8.9	77.4	<0.03	0.013	<0.05	<0.005		
	12/7/2000	Philip	7.91	408	249	15	0.3	1.1	5	0.13	0.04	< 0.002	13.7	< 1	13.5	8.7	69.3	<0.03	0.063		0.169		
	6/27/2001	Philip	7.9	570	248	18.3	< 1	1.7	< 5	0.14	< 0.03	0.004	25	< 1	20	14.2	86	<0.01	0.06	<0.1	0.208		
	12/3/2001	Philip	7.93	482	223	15.3	1.3	0.9	< 5	0.39	< 0.03	0.008	10.8	< 1	15.7	20.2	72	0.03	0.03	<0.1	0.182		
	6/4/2002	Philip	8.08	517	236	16.1	1	< 0.5	5	0.43	< 0.03	0.005	17.1	< 1	21.7	16.7	79.2	0.01	0.05	<0.1	<0.005		
	12/3/2002	Philip	8.08	595	232	20.8	1	< 0.5	5	0.3	< 0.03	0.012	15.8	< 1	33.5	10.9	84.5	<0.01	0.03	<0.1	0.011		
	6/2/2003	Philip	7.76	666	229	20.6	< 1	< 0.5	7	0.45	0.03	< 0.001	11	4	64.1	20.7	90.2	<0.01	0.04		0.011		
	12/1/2003	Philip	8.03	701	236	21.6	< 1	< 0.5	12	0.5	< 0.03	< 0.002	13.4	< 1	83.7	29.2	87	<0.01	0.03	<0.1	0.018		
	6/8/2004	Philip	7.81	591	235	20.1	< 1	0.6	6	0.28	< 0.03	0.002	28.8	< 1	39.7	18.4	89.5	<0.01	0.05		0.072	<0.2	6.4
	11/30/2004	Philip	7.78	671	274	19.9	1	< 0.5	9	0.34	< 0.03	0.003	27.8	< 1	41.2	28.6	87.9	<0.01	0.02		<0.005		
	8/3/2005	Maxx	8.08	584	259	22	1	< 2	13	0.8	< 0.05	< 0.02	24	< 1	9	11	87	<0.05	0.03	0.073	<0.005		
	11/28/2005	Maxx	8.17	714	295	18		< 2	10	0.6	< 0.05	< 0.02	21	< 1	38	34	100	<0.05	0.043	<0.05	0.006		
	6/1/2006	N/A																					
	12/4/2006	MAX	8.1	686	291	22	1.2	< 2	< 4	0.3	0.07	< 0.02	20	< 1	34	27	86	<0.02	0.036	<0.05	0.005		
	3/30/2007	MAX	8.2	691	296	22	1.1	< 2	< 4	0.4	0.06	< 0.02	27	< 1	23	15	81	<0.02	0.039	<0.05	<0.005		
	6/14/2007	MAX	8.1	703	322	30	1.3	< 2	4	0.4	0.09	< 0.02	22	< 1	17	18	100	<0.02	0.045	<0.05	<0.005		
	12/5/2007	MAX	8.1	653	305	26	1	< 2	12	0.3	< 0.05	< 0.02	27	< 1	6	6.7	97	<0.02	0.03	<0.1	<0.005	<0.01	5.3
	6/25/2008	MAX	8.3	738	246	31	1.5		6	0.6	< 0.05	< 0.02	26	< 1	23	14	95	<0.02	0.035	<0.1	0.011	<0.01	6.6
	12/9/2008	MAX	8	700	317	30	1.1	< 2	8	0.5	< 0.05	< 0.02	27	< 1	18	9.7	93	<0.02	0.032	<0.1	0.008	<0.01	5.6
	6/25/2009	MAX	7.9	690	317	29	1.3	< 2	4	0.4	< 0.05	< 0.02	22	< 1	15	13	99	<0.02	0.037	<0.1	0.005	<0.01	5
	12/16/2009	MAX	8	691	348	34	1.2	< 2	8	0.3	< 0.05	< 0.02	23	< 1	5	9.6	100	<0.02	0.037	<0.1	0.006	<0.01	3.9
	6/24/2010	N/A																					
	12/22/2010	N/A																					
	6/15/2011	N/A																					
	12/14/2011	N/A																					
	6/18/2012	NA																					
	7/19/2012	MAX	7.96	290	85	7.5	2.2	< 2	8.6	1.5	0.1	< 0.02	14	< 1	14	19	30	0.39	0.017	<0.1	<0.005	<0.01	6.2
	12/10/2012	MAX	7.48	290	100	6.9	3.9	< 2	< 4	1	< 0.05	< 0.02	19	< 1	13	17	29	0.34	0.012	<0.1	<0.005	<0.01	6.3
	6/18/2013	MAX	7.89	390	130	11	4.1	< 2	8.1	0.16	< 0.05	< 0.02	19	< 1	18	21	41	0.22	0.019	<0.1	<0.005	<0.01	8.3
	12/2/2013	MAX	8.02	450	140	13	6.8	< 2	13	0.3	< 0.05	< 0.02	33	< 1	16	21	44	<0.02	0.02	<0.1	0.034	<0.01	9.2
	5/21/2014	MAX	8.12	490	150	14	8	< 2	< 4	0.35	< 0.05	< 0.02	31	< 1	26	28	50	<0.02	0.021	<0.1	<0.005	<0.01	8.08
	12/2/2014	MAX	8.02	430	150	12	10	< 2	< 4	0.26	< 0.05	< 0.02	31	< 1	9	20	43	0.05	0.039	<0.1	<0.005	<0.01	5.28
	6/16/2015	MAX	8.28	270	84	4.8	17	< 2	8.8	<1	< 0.05	< 0.02	26	< 1	7	13	26	0.14	0.025	<0.1	<0.005	<0.01	3.85
	12/1/2015	MAX	7.96	430	150	14	6.5	< 2	11	<0.1	< 0.05	0.037	33	< 1	9.9	16	47	2.4	0.044	<0.1	0.0088	<0.01	4.56

Routine Groundwater Quality - General Analysis -Guelph WRIC & Waste Transfer Station

AECOM

	Date	Lab	pH	Cond-uctivity	Alk mg/L	Mg mg/L	K mg/L	BOD mg/L	COD mg/L	TKN mg/L	NH3-N mg/L	Total-P mg/L	SO4 mg/L	Phenol ug/L	Cl mg/L	Na mg/L	Ca mg/L	Fe mg/L	B mg/L	P mg/L	Zn mg/L	NO2 mg/L	NO3 mg/L
Monitor	6/27/2001	Philip	7.84	662	259	31.5	< 1	< 0.5	< 5	0.14	0.07	0.009	103	< 1	22	9.9	93.7	0.02	0.02	<0.1	0.016		
10-00	12/3/2001	Philip	8.01	666	267	30.7	< 1	0.8	< 5	0.19	0.04	0.01	85.8	< 1	25.8	12	95.1	0.04	0.02	<0.1	0.061		
Bedrock	6/4/2002	Philip	8.23	595	239	28.2	2	< 0.5	< 5	0.19	0.04	0.013	76	< 1	21.5	9.2	84.4	0.02	0.02	<0.1	<0.005		
	12/3/2002	Philip	8	660	255	29.5	1	< 0.5	7	0.42	0.06	0.013	76.8	< 1	26.9	11.3	87.7	0.03	0.01	<0.1	<0.005		
	6/2/2003	Philip	7.78	659	242	29.1	< 1	< 0.5	< 5	0.17	0.05	< 0.001	25.2	11	44.9	10	87	0.03	0.01		<0.005		
	12/1/2003	Philip	8.09	626	236	28.2	1.1	0.8	< 5	0.21	< 0.03	0.009	78.5	< 1	27.6	10.2	85.2	0.04	0.02	<0.1	0.015		
	6/9/2004	Philip	7.78	600	238	28.2	< 1	< 0.5	< 5	0.13	0.08	0.005	82.4	< 1	27.8	9.7	91	0.07	0.02		0.13	<0.2	<0.2
	11/30/2004	Philip	7.89	626	245	27.7	2	< 0.5	< 5	0.13	0.03	0.005	77.7	< 1	28.1	10.4	83.5	0.04	0.02		<0.005		
	8/3/2005	Maxx	8.18	599	240	31	1.2	< 2	< 4	0.3	< 0.05	< 0.02	67	< 1	20	10	86	<0.05	0.011	<0.05	<0.005		
	11/28/2005	Maxx	8.07	616	251	31		< 2	5	0.2	< 0.05	< 0.02	71	< 1	23	10	90	<0.05	0.016	<0.05	<0.005		
	6/1/2006	MAX	8.1	646	254	30	1.1	< 2	< 4	1	0.09	< 0.02	77	< 1	20	9.1	88	0.03	0.014	<0.05	<0.005		
	12/4/2006	MAX	8.2	651	257	28	1	< 2	4	0.3	0.11	< 0.02	82	< 1	17	8.6	83	0.02	0.014	<0.05	<0.005		
	3/30/2007	MAX	8.2	648	249	27	1.1	< 2	< 4	0.5	0.12	< 0.02	75	< 1	19	7.7	79	0.02	0.014	<0.05	<0.005		
	6/14/2007	MAX	8.1	656	246	29	1.1	< 2	5	0.2	0.15	< 0.02	81	< 1	21	8.9	84	0.03	0.015	<0.05	<0.005		
	12/5/2007	MAX	8.2	652	239	28	1.1	< 2	11	0.2	0.07	< 0.02	81	< 1	21	8.8	86	<0.02	<0.01	<0.1	<0.005	<0.01	<0.1
	6/25/2008	MAX	8.2	654	237	28	1.1		11	0.3	0.11	< 0.02	82	< 1	23	9.5	86	<0.02	<0.01	<0.1	<0.005	<0.01	<0.1
	12/9/2008	MAX	8.1	679	238	29	1.1	< 2	< 4	0.2	0.07	< 0.02	91	< 1	27	11	85	0.03	0.018	<0.1	<0.005	<0.01	<0.1
	6/25/2009	MAX	8	631	240	29	1.1	< 2	< 4	0.3	< 0.05	< 0.02	80	< 1	17	8.8	87	0.03	0.016	<0.1	<0.005	<0.01	<0.1
	12/16/2009	MAX	8	685	239	32	1.2	< 2	< 4	0.2	0.06	0.02	84	< 1	28	14	94	0.04	0.019	<0.1	<0.005	<0.01	<0.1
	6/24/2010	N/A																					
	12/22/2010	N/A																					
	6/15/2011	N/A																					
	12/14/2011	N/A																					
	6/18/2012	NA																					
	7/19/2012	MAX	7.88	650	240	30	1.1	< 2	11	0.97	0.11	0.24	68	< 1	22	9.1	87	3.1	0.015	<0.1	<0.005	<0.01	<0.1
	12/10/2012	MAX	7.93	670	240	30	1.1	< 2	< 4	0.54	0.077	0.23	74	< 1	25	9.3	91	6.6	<0.01	<0.1	<0.005	<0.01	<0.1
	6/18/2013	MAX	8.04	710	240	29	1.2	< 2	5.1	0.24	0.054	0.03	82	< 1	32	12	95	0.81	0.017	<0.1	<0.005	<0.01	<0.1
	12/2/2013	MAX	8	690	250	31	1.1	< 2	7	0.2	0.053	0.041	80	< 1	30	11	92	0.04	0.014	<0.1	<0.005	<0.01	<0.1
	5/21/2014	MAX	8	700	240	29	1.1	< 2	< 4	0.29	< 0.05	< 0.02	81	< 1	30	10	94	0.81	0.013	<0.1	<0.005	<0.01	<0.1
	12/2/2014	MAX	7.94	740	240	30	1.2	< 2	< 4	0.19	0.094	0.03	90	< 1	37	14	92	0.63	0.025	<0.1	<0.005	<0.01	<0.1
	6/16/2015	MAX	7.86	720	240	31	1.3	< 2	< 4	0.12	0.053	0.026	92	< 1	36	14	95	0.22	0.022	<0.1	<0.005	<0.01	<0.1
	12/1/2015	MAX	7.97	710	230	31	1.2	< 2	10	0.16	< 0.05	0.087	84	< 1	32	12	91	1.8	0.019	<0.1	<0.005	<0.01	<0.1

Routine Groundwater Quality - General Analysis -Guelph WRIC & Waste Transfer Station

AECOM

	Date	Lab	pH	Cond-uctivity	Alk mg/L	Mg mg/L	K mg/L	BOD mg/L	COD mg/L	TKN mg/L	NH3-N mg/L	Total-P mg/L	SO4 mg/L	Phenol ug/L	Cl mg/L	Na mg/L	Ca mg/L	Fe mg/L	B mg/L	P mg/L	Zn mg/L	NO2 mg/L	NO3 mg/L
Monitor	6/27/2001	Philip	8.13	528	263	25.3	2	2.9	< 5	0.28	0.13	0.03	46.8	< 1	7.1	25.9	68.7	0.34	0.1	<0.1	0.138		
11a-00	12/3/2001	Philip	7.99	512	262	24.9	2	1.2	< 5	0.32	0.12	0.007	34.9	< 1	5.1	12	83.2	0.04	0.04	<0.1	0.254		
Bedrock	6/4/2002	Philip	8.13	454	241	23.7	2	0.9	< 5	0.41	0.13	0.01	26.7	< 1	5	6	64.4	0.04	0.03	<0.1	<0.005		
	12/3/2002	Philip	8.12	500	253	24.3	3	< 0.5	< 5	0.33	0.12	0.009	25.9	< 1	4	6.1	67	<0.01	0.03	<0.1	0.011		
	6/2/2003	Philip	7.71	515	231	24.7	2	< 0.5	< 5	0.38	0.11	< 0.001	31.8	9	6.3	5.8	67.5	<0.01	0.03		<0.005		
	12/1/2003	Philip	8.02	507	233	23.6	1.6	1	9	0.52	< 0.03	0.004	35.9	< 1	7	5.6	64.8	0.02	0.04	<0.1	<0.005		
	6/8/2004	Philip	7.81	478	236	24.2	1	< 0.5	6	0.26	0.1	0.003	33.4	< 1	6.9	5.4	80.3	0.05	0.03		0.185	<0.2	<0.2
	11/30/2004	Philip	7.96	494	241	23.8	1	< 0.5	10	0.53	0.13	0.007	29.4	< 1	6.7	5.1	66	<0.01	0.02		<0.005		
	8/3/2005	Maxx	8.13	471	238	25	1.9	< 2	8	0.6	0.06	< 0.02	20	< 1	5	5.5	62	0.066	0.038	0.079	<0.005		
	11/28/2005	Maxx	8.2	470	248	26		< 2	10	0.4	0.14	< 0.02	26	< 1	7	5.2	70	<0.05	0.036	<0.05	<0.005		
	6/1/2006	MAX	8.1	520	250	26	2	< 2	< 4	0.4	0.16	< 0.02	25	< 1	8	5.2	72	<0.02	0.034	<0.05	<0.005		
	12/4/2006	MAX	8.1	532	252	25	1.8	< 2	< 4	0.3	0.12	< 0.02	38	< 1	10	5.3	70	<0.02	0.035	<0.05	<0.005		
	3/30/2007	MAX	8.3	523	244	23	1.8	< 2	< 4	0.4	0.26	< 0.02	29	< 1	11	4.3	64	<0.02	0.033	<0.05	<0.005		
	6/14/2007	MAX	8.3	539	242	27	1.8	< 2	< 4	0.4	0.24	< 0.02	32	< 1	12	5.2	77	<0.02	0.033	<0.05	0.015		
	12/5/2007	MAX	8.2	534	236	25	1.9	< 2	11	0.2	0.12	< 0.02	33	< 1	12	6	69	<0.02	0.031	<0.1	<0.005	<0.01	<0.1
	6/25/2008	MAX	8.2	534	231	27	2.3		16	0.6	0.21	< 0.02	30	< 1	15	6.5	73	<0.02	0.026	<0.1	<0.005	<0.01	<0.1
	12/9/2008	MAX	8.1	526	237	23	1.7	< 2	< 4	0.3	0.1	< 0.02	34	< 1	12	4.9	65	<0.02	0.035	<0.1	<0.005	<0.01	0.1
	6/25/2009	MAX	8	559	232	27	1.8	< 2	11	0.2	< 0.05	< 0.02	44	< 1	16	5.2	74	<0.02	0.035	<0.1	<0.005	<0.01	0.1
	12/15/2009	MAX	8	539	233	25	1.8	< 2	5	0.1	< 0.05	0.03	34	< 1	14	5.2	69	<0.02	0.038	<0.1	<0.005	<0.01	0.2
	6/28/2010	MAX	8.1	546	225	25	1.8	< 2	5	0.2	< 0.05	0.03	39	< 1	18	4.8	69	<0.02	0.036	<0.1	<0.005	<0.01	0.1
	12/22/2010	MAX	7.85	575	227	28	1.9	< 2	< 4	0.3	0.24	< 0.02	38	< 1	22	5.4	75	<0.02	0.032	<0.1	<0.005	<0.01	<0.1
	6/15/2011	MAX	7.97	568	228	27	1.8	< 2	10	0.2	0.1	< 0.02	51	< 1	24	5.3	75	0.25	0.033	<0.1	<0.005	<0.01	<0.1
	12/14/2011	MAX	8.12	588	230	27	1.8	< 2	< 4	0.3	0.1	0.03	35	< 1	24	5.4	75	0.21	0.025	<0.1	0.011	0.05	<0.1
	6/19/2012	MAX	8.09	590	230	27	1.8	< 2	8.1	0.39	0.073	0.025	39	< 1	24	5.2	74	0.56	0.031	<0.1	0.04	<0.01	<0.1
	12/11/2012	MAX	7.85	580	240	25	1.7	< 2	< 4	<0.1	0.058	< 0.02	40	< 1	22	5.2	75	0.17	0.034	<0.1	<0.005	<0.01	0.11
	6/21/2013	MAX	8.2	570	230	26	1.9	< 2	< 4	0.31	0.13	< 0.02	39	< 1	21	5.6	74	0.3	0.033	<0.1	0.01	<0.01	<0.1
	12/4/2013	MAX	7.8	580	230	26	1.7	< 2	7.9	0.34	0.12	< 0.02	37	< 1	24	5.8	71	<0.02	0.031	<0.1	<0.005	0.014	<0.1
	5/21/2014	MAX	7.98	570	230	27	1.7	< 2	< 4	0.54	< 0.05	< 0.02	38	< 1	24	5.9	75	0.04	0.034	<0.1	<0.005	<0.01	<0.1
	12/3/2014	MAX	8.05	580	230	27	1.9	< 2	< 4	0.21	0.19	< 0.02	38	1.3	24	5.9	74	0.16	0.037	<0.1	0.0065	<0.01	<0.1
	6/22/2015	MAX	7.83	580	240	26	1.8	< 2	8.3	0.13	< 0.05	0.021	38	< 1	24	5.7	71	0.19	0.033	<0.1	<0.005	0.015	<0.1
	12/2/2015	MAX	7.88	590	220	26	1.8	< 2	5.2	0.22	0.12	0.025	35	1.6	23	5.8	74	0.23	0.04	<0.1	0.0063	0.035	<0.1

Routine Groundwater Quality - General Analysis -Guelph WRIC & Waste Transfer Station

AECOM

	Date	Lab	pH	Cond-uctivity	Alk mg/L	Mg mg/L	K mg/L	BOD mg/L	COD mg/L	TKN mg/L	NH3-N mg/L	Total-P mg/L	SO4 mg/L	Phenol ug/L	Cl mg/L	Na mg/L	Ca mg/L	Fe mg/L	B mg/L	P mg/L	Zn mg/L	NO2 mg/L	NO3 mg/L
Monitor	6/27/2001	Philip	7.99	798	264	25.6	2	7.2	5	0.22	< 0.03	0.017	55	< 1	54	54.1	83.1	0.03	0.07	<0.1	0.113		
11b-00	12/3/2001	Philip	7.98	1081	266	28.4	2.2	1.4	6	0.28	< 0.03	0.023	50.4	< 1	155	92.8	100	<0.01	0.04	<0.1	0.013		
Outwash	6/4/2002	Philip	8.02	751	252	24.7	1	0.9	6	0.39	< 0.03	0.005	35	< 1	69.3	40.3	91.4	<0.01	0.09	<0.1	0.015		
	12/3/2002	Philip	8	813	250	28.2	2	< 0.5	6	0.37	< 0.03	0.022	42.2	< 1	68.9	26.8	103	<0.01	0.15	<0.1	0.063		
	6/2/2003	Philip	7.72	873	226	28.1	2	0.6	5	0.37	0.04	< 0.001	48.5	7	70.6	37.2	101	<0.01	0.41		0.029		
	12/1/2003	Philip	8.1	629	185	13.1	1.1	< 0.5	12	0.51	< 0.03	0.005	43	< 1	58.8	58.9	51.6	0.02	0.58	<0.1	0.012		
	6/8/2004	Philip	7.9	887	192	18.3	< 1	0.7	23	0.97	0.03	0.007	37.7	< 1	165	93.4	79.2	0.02	1.09		0.129	<0.2	4.7
	11/30/2004	Philip	8	781	212	15.1	1	< 0.5	7	0.26	< 0.03	0.002	29.4	< 1	118	83.2	60.6	<0.01	0.57		0.011		
	8/3/2005	Maxx	8.04	919	235	21	1.6	< 2	8	0.8	< 0.05	< 0.02	37	< 1	139	88	84	<0.05	1.2	<0.05	0.028		
	11/28/2005	Maxx	8.12	1210	235	21		< 2	< 4	0.7	< 0.05	< 0.02	37	< 1	192	150	91	<0.05	0.6	<0.05	0.02		
	6/1/2006	MAX	8.1	961	268	18	1.4	< 2	8	0.6	< 0.05	0.05	40	< 1	129	120	69	<0.02	0.8	<0.05	0.02		
	12/4/2006	MAX	8.2	899	279	14	1.2	< 2	< 4	0.5	< 0.05	< 0.02	48	< 1	92	110	53	<0.02	1.9	<0.05	0.012		
	3/30/2007	MAX	8.3	780	274	12	1	< 2	7	0.4	0.09	< 0.02	34	< 1	61	95	44	<0.02	1.5	<0.05	<0.005		
	6/14/2007	MAX	8.2	756	264	15	1.3	< 2	7	0.4	0.08	< 0.02	36	< 1	54	96	60	<0.02	1.8	<0.05	0.016		
	12/5/2007	MAX	8.2	755	259	16	1.5	< 2	12	0.3	< 0.05	5.2	27	< 1	66	77	65	<0.02	0.58	<0.1	0.013	<0.01	3.4
	6/25/2008	MAX	8.2	1100	250	19	1.4		6	0.5	0.08	< 0.02	25	< 1	180	110	81	<0.02	0.39	<0.1	0.018	<0.01	5.5
	12/9/2008	MAX	8.1	939	264	16	1.4	< 2	5	0.4	< 0.05	0.03	27	< 1	110	110	63	<0.02	0.9	<0.1	0.019	<0.01	4.4
	6/25/2009	MAX	8	1130	253	18	1.4	< 2	< 4	0.3	< 0.05	< 0.02	25	< 1	190	140	74	<0.02	0.85	<0.1	0.018	<0.01	3.8
	12/15/2009	MAX	8	890	250	17	1.5	< 2	< 4	0.2	< 0.05	0.03	19	< 1	110	89	71	<0.02	0.44	<0.1	0.016	<0.01	3.5
	6/28/2010	MAX	8	966	243	17	1.5	< 2	6	0.3	< 0.05	< 0.02	35	< 1	140	95	75	<0.02	0.24	<0.1	0.017	<0.01	3.3
	12/17/2010	MAX	7.96	966	255	18	1.5	< 2	< 4	0.2	< 0.05	< 0.02	38	< 1	130	110	75	<0.02	0.57	<0.1	0.017	<0.01	3.3
	6/14/2011	MAX	8.01	1140	224	16	1.9	< 2	17	0.5	< 0.05	< 0.02	30	< 1	190	140	73	<0.02	0.58	<0.1	0.014	<0.01	3
	12/14/2011	MAX	8.16	975	238	15	1.4	< 2	< 4	1	< 0.05	0.19	25	< 1	140	110	64	1.9	0.49	<0.1	0.02	<0.01	2.7
	6/18/2012	MAX	8.04	970	230	16	1.5	< 2	9.8	0.45	0.055	0.024	23	1	140	100	71	1.6	0.21	<0.1	0.034	<0.01	2.1
	12/11/2012	MAX	7.87	1000	250	18	1.6	< 2	< 4	0.26	< 0.05	0.045	23	< 1	140	100	84	2	0.19	<0.1	0.02	<0.01	3
	6/19/2013	MAX	7.9	1300	250	18	1.6	< 2	4.9	0.43	< 0.05	0.067	28	< 1	220	130	87	1.8	0.15	<0.1	0.022	<0.01	3
	12/4/2013	MAX	7.97	1100	330	27	1.8	< 2	10	0.48	< 0.05	0.19	23	< 1	140	150	91	<0.02	0.27	<0.1	0.11	<0.01	2.8
	5/21/2014	MAX	7.96	1600	270	23	1.8	< 2	< 4	0.29	< 0.05	< 0.02	27	< 1	290	220	100	<0.02	0.1	<0.1	0.073	<0.01	3.13
	12/3/2014	MAX	8.07	1000	270	22	1.9	< 2	< 4	0.17	< 0.05	0.03	17	< 1	140	130	85	<0.02	0.16	<0.1	0.058	<0.01	2.15
	6/22/2015	MAX	7.81	1300	230	23	1.6	< 2	8.7	0.39	< 0.05	0.061	20	< 1	240	130	94	2.7	0.27	<0.1	0.023	<0.01	1.94
	12/2/2015	MAX	8.01	1100	250	30	1.9	< 2	4	0.41	< 0.05	0.044	28	< 1	150	120	110	0.07	0.18	<0.1	0.09	<0.01	3.73

Routine Groundwater Quality - General Analysis -Guelph WRIC & Waste Transfer Station

AECOM

	Date	Lab	pH	Cond-uctivity	Alk mg/L	Mg mg/L	K mg/L	BOD mg/L	COD mg/L	TKN mg/L	NH3-N mg/L	Total-P mg/L	SO4 mg/L	Phenol ug/L	Cl mg/L	Na mg/L	Ca mg/L	Fe mg/L	B mg/L	P mg/L	Zn mg/L	NO2 mg/L	NO3 mg/L
Monitor	6/27/2001	Philip	7.5	888	390	43.6	14	1.2	7	0.92	0.45	0.006	96.2	< 1	82.8	22.6	109	<0.01	0.07	<0.1	1.44		
12a-00	12/3/2001	Philip	7.77	920	389	44.7	10.1	1.2	16	0.75	0.19	0.008	50.6	< 1	24.7	19.7	110	<0.01	0.06	<0.1	1.17		
Bedrock	6/4/2002	Philip	8.33	889	346	40.5	15	0.6	10	1.34	0.64	0.007	44.5	< 1	44.3	20.6	123	0.04	0.02	<0.1	1.51		
	12/3/2002	Philip	7.78	4365	372	41.2	15	< 0.5	24	4.22	4.23	0.012	55.7	< 1	1200	763	109	<0.1	<0.1	<1	0.958		
	6/2/2003	Philip	7.37	915	350	40.4	18	< 0.5	11	1.04	0.41	0.002	46.3	10	55.5	36.2	103	<0.01	0.02		1.17		
	12/1/2003	No A																					
	6/8/2004	Philip	7.53	845	319	37	13.9	< 0.5	10	0.89	0.47	0.009	45.5	< 1	45.3	23	106	<0.01	0.02		1.15	<0.2	22.5
	11/30/2004	Philip	7.57	823	321	37.7	13	< 0.5	13	0.67	0.13	0.002	50.5	< 1	38.5	16.4	98.4	<0.01	0.02		1		
	8/3/2005	Maxx	7.93	891	370	44	16	< 2	9	0.6	0.17	< 0.02	40	< 1	42	27	110	<0.05	0.028	0.084	1.1		
	11/28/2005	Maxx	7.88	791	331	40		< 2	54	2.5	0.16	< 0.02	54	< 1	30	20	100	<0.05	0.024	<0.05	0.97		
	6/1/2006	MAX	7.9	858	338	39	16	< 2	13	1.2	0.24	< 0.02	40	< 1	34	25	110	<0.02	0.02	<0.05	1.1		
	12/4/2006	MAX	7.8	1020	423	41	22	< 2	8	1.2	0.56	< 0.02	49	< 1	41	34	110	<0.02	0.024	<0.05	1.2		
	3/30/2007	MAX	8.1	938	376	33	23	< 2	5	1.1	0.47	< 0.02	40	< 1	35	26	110	<0.02	0.022	<0.05	1.3		
	6/14/2007	MAX	8	947	353	37	17	< 2	8	3.5	0.24	< 0.02	45	< 1	40	29	100	<0.02	0.019	<0.05	1.1		
	12/5/2007	MAX	8	796	343	34	11	< 2	12	0.4	0.1	0.03	39	< 1	34	17	94	<0.02	0.027	<0.1	0.92	<0.01	1.4
	6/25/2008	MAX	8	796	343	32	13		6	0.6	0.07	< 0.02	36	< 1	23	18	93	<0.02	0.02	<0.1	0.99	<0.01	8.9
	12/9/2008	MAX	7.9	816	343	30	12	< 2	9	0.5	0.06	< 0.02	40	< 1	27	18	96	<0.02	0.032	<0.1	0.92	0.02	5.9
	6/25/2009	MAX	7.7	707	298	30	13	< 2	4	0.5	0.05	< 0.02	38	< 1	13	15	83	<0.02	0.05	<0.1	0.81	0.01	8
	12/16/2009	MAX	7.6	742	312	37	10	< 2	10	0.3	< 0.05	< 0.02	39	< 1	31	13	93	<0.02	0.019	<0.1	0.81	0.03	1.4
	6/24/2010	MAX	7.9	699	304	30	14	< 2	7	0.6	< 0.05	< 0.02	35	< 1	11	15	86	<0.02	0.02	<0.1	0.84	0.02	5.5
	12/20/2010	MAX	7.75	658	304	32	8.7	< 2	7	0.4	< 0.05	< 0.02	34	< 1	9	6.5	87	<0.02	0.02	<0.1	0.77	0.02	1.7
	6/15/2011	MAX	7.82	603	283	26	12	< 2	12	0.3	< 0.05	< 0.02	26	< 1	5	8.4	77	<0.02	0.016	<0.1	0.74	<0.01	3
	12/15/2011	MAX	8.01	701	318	33	11	< 2	< 4	0.8	< 0.05	0.06	32	< 1	13	11	92	0.55	0.011	<0.1	0.82	<0.01	2.3
	6/18/2012	MAX	7.8	680	300	30	9.5	< 2	10	0.5	< 0.05	< 0.02	32	< 1	18	9.4	82	0.05	0.02	<0.1	0.77	<0.01	1.9
	12/10/2012	MAX	7.62	710	310	33	6.2	< 2	< 4	0.62	< 0.05	< 0.02	31	< 1	25	11	90	<0.02	0.016	<0.1	0.74	0.016	1.3
	6/18/2013	MAX	7.87	630	290	28	11	< 2	7.3	0.19	< 0.05	< 0.02	29	< 1	6	7.4	84	<0.02	0.016	<0.1	0.76	<0.01	2.2
	12/2/2013	MAX	7.77	660	320	31	12	< 2	< 4	0.27	< 0.05	< 0.02	28	< 1	8	7.4	89	<0.02	0.02	<0.1	0.78	<0.01	1.5
	5/20/2014	MAX	7.63	590	290	26	11	< 2	< 4	0.12	< 0.05	< 0.02	25	< 1	4	5.4	78	<0.02	0.016	<0.1	0.82	<0.01	1.29
	12/2/2014	MAX	7.64	670	310	30	8.7	< 2	< 4	0.15	< 0.05	< 0.02	26	< 1	14	6.8	87	<0.02	0.025	<0.1	0.71	0.019	1.04
	6/17/2015	MAX	7.69	710	310	30	9	< 2	5.8	0.24	< 0.05	< 0.02	28	< 1	28	9.7	79	0.02	0.015	<0.1	0.73	<0.01	1.33
	12/1/2015	MAX	7.75	690	300	34	6.4	< 2	8.6	0.16	< 0.05	< 0.02	33	< 1	18	7.5	86	0.09	0.02	<0.1	0.72	<0.01	0.59

Routine Groundwater Quality - General Analysis -Guelph WRIC & Waste Transfer Station

AECOM

	Date	Lab	pH	Cond-uctivity	Alk mg/L	Mg mg/L	K mg/L	BOD mg/L	COD mg/L	TKN mg/L	NH3-N mg/L	Total-P mg/L	SO4 mg/L	Phenol ug/L	Cl mg/L	Na mg/L	Ca mg/L	Fe mg/L	B mg/L	P mg/L	Zn mg/L	NO2 mg/L	NO3 mg/L
Monitor	6/27/2001	Philip	7.77	760	354	27.2	4	0.9	11	0.45	0.13	0.026	48.9	< 1	40	25.2	106	0.62	0.1	<0.1	0.372		
12b-00	12/3/2001	Philip	7.83	435	204	12.8	3.5	1.2	12	0.26	< 0.03	0.042	21.3	< 1	11.7	12.3	54.8	0.02	0.07	<0.1	0.209		
Outwash	6/4/2002	Philip	8.51	1144	353	25.6	11	2.9	48	10.8	9.3	0.053	30.1	< 1	169	94.7	97	0.01	0.09	<0.1	0.352		
	12/3/2002	Philip	7.76	1187	420	37.2	5	1.2	32	1.41	0.71	0.239	35.4	< 1	135	112	110	16.7	0.05	0.3	0.006		
	6/2/2003	Philip	7.38	1108	398	33.7	3	92	88	1.33	0.57	0.004	4.5	157	117	66	118	22.7	0.11		0.017		
	12/1/2003	No A																					
	6/8/2004	Philip	7.56	710	339	24.9	4.1	2.1	29	1.94	1.46	0.151	20.1	< 1	51	33.8	118	11	0.09		0.342	<0.2	0.2
	11/30/2004	Philip	7.62	687	341	24.4	4	< 0.5	24	1.03	0.43	0.046	32.3	< 1	22.7	16.4	96.7	3.25	0.08		0.079		
	8/3/2005	Maxx	7.78	610	306	21	4.2	< 3	27	2.4	1.07	0.1	20	1	14	16	90	7.1	0.092	0.17	0.026		
	11/28/2005	Maxx	7.93	647	345	26		< 2	14	1	0.35	< 0.02	28	< 1	13	13	100	2.1	0.068	<0.05	0.32		
	6/1/2006	MAX	8.1	584	292	19	2.5	< 2	8	1	0.49	0.02	24	< 1	10	12	72	1.7	0.05	0.053	0.15		
	12/4/2006	MAX	7.9	648	328	22	3.2	< 2	5	0.8	0.43	< 0.02	26	< 1	11	14	92	0.78	0.065	<0.05	0.21		
	3/30/2007	MAX	8.1	526	257	15	2.2	< 2	8	0.7	0.39	< 0.02	18	< 1	8	10	76	1.1	0.039	<0.05	0.22		
	6/14/2007	MAX	8	685	337	22	3	< 2	16	0.6	0.44	< 0.02	30	< 1	11	13	93	4.5	0.049	<0.05	0.22		
	12/5/2007	MAX	7.9	657	305	22	2.8	< 2	11	0.3	< 0.05	0.02	27	< 1	7	8.4	95	<0.02	0.035	<0.1	0.58	<0.01	4.5
	6/25/2008	MAX	8.2	482	235	16	2.7		5	0.6	0.16	< 0.02	22	< 1	5	8.9	70	<0.02	0.067	<0.1	0.61	<0.01	0.2
	12/9/2008	MAX	7.9	707	356	25	4	< 2	9	0.5	< 0.05	< 0.02	27	< 1	6	13	100	<0.02	0.058	<0.1	0.74	<0.01	1.4
	6/25/2009	MAX	7.7	587	297	20	3	< 2	< 4	0.4	0.12	0.03	21	< 1	4	9.3	87	<0.02	0.053	<0.1	0.61	<0.01	0.4
	12/16/2009	MAX	7.5	764	383	31	4.7	< 2	5	0.5	< 0.05	< 0.02	25	< 1	4	9	120	<0.02	0.037	<0.1	0.65	<0.01	3.6
	6/24/2010	MAX	7.9	532	263	18	2.8	< 2	11	0.5	0.07	< 0.02	13	< 1	8	9.5	80	<0.02	0.051	<0.1	0.54	<0.01	<0.1
	12/17/2010	MAX	7.68	712	353	30	3.9	< 2	9	0.4	< 0.05	< 0.02	20	< 1	7	7.7	100	<0.02	0.057	<0.1	0.47	<0.01	2.1
	6/15/2011	MAX	7.84	516	260	18	2.6	< 2	14	0.3	0.09	0.02	16	< 1	5	7.1	77	<0.02	0.044	<0.1	0.35	<0.01	0.1
	12/15/2011	MAX	8.01	749	354	29	3.9	< 2	14	0.7	< 0.05	0.88	32	< 1	8	9.6	110	6.1	0.035	<0.1	0.18	<0.01	2.4
	6/18/2012	MAX	7.73	710	340	26	3.5	< 2	21	0.96	< 0.05	0.28	29	< 1	6	7.5	100	16	0.039	<0.1	0.7	<0.01	2.4
	12/10/2012	MAX	7.64	780	380	30	4.2	< 2	6.9	1.2	< 0.05	0.6	33	< 1	9	11	120	13	0.035	<0.1	0.3	<0.01	3.2
	6/18/2013	MAX	7.86	510	250	17	2.6	< 2	11	0.51	< 0.05	0.32	16	< 1	6	6.5	76	8	0.04	<0.1	0.61	<0.01	0.14
	12/2/2013	MAX	7.59	590	290	23	3.4	< 2	7.5	0.55	< 0.05	0.17	21	< 1	5	6.6	92	5.4	0.044	<0.1	0.55	<0.01	0.95
	5/20/2014	MAX	7.64	530	250	18	2.5	< 2	< 4	0.31	< 0.05	0.12	18	< 1	11	8.4	77	2.5	0.035	<0.1	0.52	<0.01	<0.1
	12/2/2014	MAX	7.57	740	320	26	3.7	< 2	6.8	0.27	< 0.05	0.098	19	< 1	30	13	100	4.1	0.045	<0.1	0.48	<0.01	1.9
	6/17/2015	MAX	7.69	670	300	24	2.8	< 2	7.6	0.3	< 0.05	0.15	26	< 1	26	13	87	4.7	0.032	<0.1	0.34	<0.01	1.01
	12/1/2015	MAX	7.57	810	350	29	3.9	< 2	11	0.2	< 0.05	0.14	23	< 1	31	26	100	4.3	0.029	<0.1	0.18	<0.01	2.56

Routine Groundwater Quality - General Analysis -Guelph WRIC & Waste Transfer Station

AECOM

	Date	Lab	pH	Cond-uctivity	Alk mg/L	Mg mg/L	K mg/L	BOD mg/L	COD mg/L	TKN mg/L	NH3-N mg/L	Total-P mg/L	SO4 mg/L	Phenol ug/L	Cl mg/L	Na mg/L	Ca mg/L	Fe mg/L	B mg/L	P mg/L	Zn mg/L	NO2 mg/L	NO3 mg/L
Monitor	12/3/2001	Philip	7.95	913	272	38.8	2.9	0.8	< 5	0.21	0.09	0.008	105	< 1	83.9	39.9	106	0.77	0.04	<0.1	0.111		
13a-01	6/4/2002	Philip	8.08	851	259	35	2	< 0.5	< 5	0.24	0.1	0.005	107	< 1	85.5	38	97.7	0.96	0.04	<0.1	<0.005		
Bedrock	12/3/2002	Philip	7.99	902	262	35.6	2	< 0.5	< 5	0.24	0.1	0.008	104	< 1	85.3	40.3	99.8	0.81	0.03	<0.1	<0.005		
	6/2/2003	Philip	7.77	921	248	35.2	2	< 0.5	< 5	0.23	0.11	< 0.001	111	9	88.5	41	100	0.45	0.03		0.022		
	12/1/2003	Philip	8.15	853	250	34.5	2.3	< 0.5	6	0.25	< 0.03	0.004	110	< 1	97.1	39	109	0.74	0.05	<0.1	0.193		
	6/9/2004	Philip	7.81	854	254	34.3	2.1	< 0.5	< 5	0.19	0.14	0.007	119	< 1	97.1	39.7	112	0.64	0.04		0.117	<0.2	<0.2
	11/30/2004	Philip	7.96	897	254	33.9	2	< 0.5	6	0.25	0.1	0.006	115	< 1	101	40.8	98.8	0.65	0.04		<0.005		
	8/3/2005	Maxx	8.02	889	252	36	2.5	< 2	4	0.5	0.19	< 0.02	107	< 1	93	44	100	0.58	0.043	<0.05	<0.005		
	11/28/2005	Maxx	8	884	263	37		< 2	< 4	0.2	0.12	< 0.02	101	< 1	87	44	110	0.59	0.041	<0.05	<0.005		
	6/1/2006	MAX	8.1	929	266	33	2.2	< 2	5	0.5	0.17	< 0.02	106	< 1	111	40	94	0.43	0.045	<0.05	<0.005		
	12/4/2006	MAX	8	967	268	35	2.5	< 2	< 4	0.3	0.18	< 0.02	111	< 1	100	43	100	0.5	0.044	<0.05	<0.005		
	3/30/2007	MAX	8.1	958	260	32	2.4	< 2	5	0.3	0.21	< 0.02	103	< 1	94	39	90	0.5	0.042	<0.05	<0.005		
	6/14/2007	MAX	8.2	967	258	34	2.5	< 2	4	0.4	0.21	< 0.02	110	< 1	97	44	100	0.43	0.043	<0.05	<0.005		
	12/5/2007	MAX	8.1	939	251	34	2.4	< 2	8	0.2	0.17	< 0.02	103	< 1	97	42	98	0.42	0.038	<0.1	<0.005	<0.01	<0.1
	6/25/2008	MAX	8.2	967	247	37	2.6		11	0.5	0.19	< 0.02	120	< 1	100	49	100	0.3	0.043	<0.1	<0.005	<0.01	<0.1
	12/9/2008	MAX	8	965	251	34	2.5	< 2	< 4	0.3	0.14	< 0.02	124	< 1	95	45	97	0.32	0.043	<0.1	<0.005	<0.01	<0.1
	6/25/2009	MAX	7.9	969	248	34	2.6	< 2	< 4	0.2	0.13	< 0.02	120	< 1	96	44	100	0.54	0.047	<0.1	<0.005	<0.01	<0.1
	12/16/2009	MAX	7.8	955	248	35	2.7	< 2	7	0.3	0.12	0.03	110	< 1	95	45	100	0.37	0.047	<0.1	<0.005	<0.01	<0.1
	6/28/2010	MAX	7.9	953	244	32	2.5	< 2	9	0.4	0.1	0.02	120	< 1	92	40	95	0.4	0.049	<0.1	<0.005	<0.01	<0.1
	12/20/2010	MAX	7.76	952	243	34	2.6	< 2	6	0.3	0.13	< 0.02	100	< 1	95	43	100	0.2	0.048	<0.1	<0.005	<0.01	<0.1
	6/16/2011	MAX	7.95	936	241	36	2.7	< 2	13	0.2	0.14	< 0.02	120	< 1	95	44	100	0.39	0.043	<0.1	<0.005	<0.01	<0.1
	12/13/2011	MAX	8.02	980	245	37	2.7	< 2	< 4	0.2	0.08	0.04	110	< 1	93	44	100	0.44	0.043	<0.1	<0.005	<0.01	<0.1
	6/20/2012	MAX	7.86	970	250	35	2.6	< 2	8.2	0.46	0.079	0.032	110	< 1	93	44	100	0.42	0.046	<0.1	<0.005	<0.01	<0.1
	12/11/2012	MAX	7.85	960	250	31	2.6	< 2	< 4	0.47	0.15	< 0.02	110	< 1	91	40	100	0.37	0.048	<0.1	<0.005	<0.01	<0.1
	6/17/2013	MAX	7.71	960	260	32	2.3	< 2	< 4	0.72	0.16	< 0.02	110	< 1	95	42	94	0.42	0.048	<0.1	<0.005	<0.01	<0.1
	12/9/2013	MAX	7.89	980	240	35	2.5	< 2	< 4	0.24	0.15	< 1	110	< 1	97	44	100	0.35	0.041	<0.1	<0.005	<0.01	<0.1
	5/22/2014	MAX	7.86	950	240	32	2.5	< 2	< 4	0.28	0.093	< 0.04	110	< 1	97	45	110	0.31	0.045	<0.1	<0.005	<0.01	<0.1
	12/3/2014	MAX	7.99	930	250	36	2.7	< 2	< 4	0.2	0.16	< 0.02	110	< 1	99	45	100	0.3	0.053	<0.1	<0.005	<0.01	<0.1
	6/18/2015	MAX	7.93	960	240	35	2.7	< 2	4.1	0.23	0.15	< 0.02	110	< 1	99	45	100	0.45	0.048	<0.1	<0.005	<0.01	<0.1
	12/4/2015	MAX	8	960	240	35	2.6	< 2	4.9	0.14	0.14	< 0.02	100	< 1	95	45	98	0.34	0.041	<0.1	<0.005	<0.01	<0.1

Routine Groundwater Quality - General Analysis -Guelph WRIC & Waste Transfer Station

AECOM

	Date	Lab	pH	Cond-uctivity	Alk mg/L	Mg mg/L	K mg/L	BOD mg/L	COD mg/L	TKN mg/L	NH3-N mg/L	Total-P mg/L	SO4 mg/L	Phenol ug/L	Cl mg/L	Na mg/L	Ca mg/L	Fe mg/L	B mg/L	P mg/L	Zn mg/L	NO2 mg/L	NO3 mg/L
Monitor	12/3/2001	Philip	7.93	655	296	29.7	2.2	1.4	< 5	0.23	< 0.03	0.223	50.4	< 1	14.9	4.8	84.7	0.01	0.02	<0.1	0.024		
13b-01	6/4/2002	Philip	8.17	576	299	30.4	2	0.7	11	0.75	< 0.03	0.006	38	< 1	7	5	88	<0.01	0.08	<0.1	0.08		
Outwash	12/3/2002	Philip	7.93	683	300	31.6	2	< 0.5	< 5	0.18	< 0.03	0.213	50.4	< 1	17.4	7.2	92.8	0.01	0.01	<0.1	0.022		
	6/2/2003	Philip	7.65	699	287	33.6	1	0.7	9	0.56	< 0.03	< 0.001	53.8	12	23.3	4.9	97.2	<0.01	0.01		0.042		
	12/1/2003	Philip	7.8	665	375	35.8	1.4	0.8	5	0.2	< 0.03	0.036	29.4	< 1	11.9	7.5	103	0.05	0.1	<0.1	0.06		
	6/9/2004	Philip	7.72	610	291	30.4	< 1	< 0.5	7	0.48	< 0.03	0.004	44.8	< 1	16.7	5.7	105	0.05	0.02		0.252	<0.2	4.6
	11/30/2004	Philip	7.71	810	369	35.4	2	< 0.5	20	0.91	< 0.03	0.002	29.8	< 1	51.8	19.9	110	<0.01	0.04		0.055		
	8/3/2005	Maxx	7.98	800	345	38	2	< 2	19	1.1	< 0.05	< 0.02	25	< 1	55	12	110	0.15	0.014	<0.05	0.061		
	11/28/2005	Maxx	8.06	846	506	45		< 2	7	0.5	< 0.05	< 0.02	17	< 1	11	14	140	<0.05	0.063	<0.05	0.09		
	6/1/2006	MAX	8	1090	403	41	1.7	< 2	12	0.7	< 0.05	< 0.02	21	< 1	132	30	120	<0.02	0.019	<0.05	0.072		
	12/4/2006	MAX	7.9	1070	471	41	2	< 2	< 4	0.4	0.08	< 0.02	26	< 1	65	32	140	<0.02	0.035	<0.05	0.089		
	3/30/2007	MAX	8.1	977	419	38	1.9	< 2	< 4	0.4	0.08	< 0.02	22	< 1	65	40	130	<0.02	0.032	<0.05	0.072		
	6/14/2007	MAX	8.1	971	383	35	2	< 2	5	0.4	0.09	< 0.02	24	< 1	79	38	130	<0.02	0.029	<0.05	0.07		
	12/5/2007	MAX	8	1260	363	36	2	< 2	14	0.2	< 0.05	< 0.02	49	< 1	160	88	120	<0.02	0.021	<0.1	0.07	<0.01	3.3
	6/25/2008	MAX	8.1	1340	309	45	2.4		4	0.5	< 0.05	< 0.02	29	< 1	200	49	160	<0.02	0.017	<0.1	0.093	<0.01	6
	12/9/2008	MAX	8	1180	348	28	2.5	< 2	< 4	0.3	< 0.05	< 0.02	35	< 1	160	83	120	<0.02	0.033	<0.1	0.07	<0.01	2.6
	6/25/2009	MAX	7.7	1190	355	31	2.2	< 2	< 4	0.3	< 0.05	< 0.02	24	< 1	160	78	130	<0.02	0.029	<0.1	0.092	0.02	4.1
	12/16/2009	MAX	7.9	1030	338	29	2.4	< 2	9	0.5	0.29	0.03	28	< 1	120	73	110	2.5	0.028	<0.1	0.018	<0.01	2.7
	6/28/2010	MAX	7.9	1050	402	30	2	< 2	7	0.3	< 0.05	0.02	28	< 1	83	50	130	<0.02	0.031	<0.1	0.095	0.02	2.4
	12/20/2010	MAX	7.71	1120	357	31	2.2	< 2	< 4	0.2	< 0.05	< 0.02	36	< 1	130	59	140	<0.02	0.026	<0.1	0.089	<0.01	2.1
	6/16/2011	MAX	7.76	1040	423	30	2	< 2	11	0.3	< 0.05	< 0.02	24	< 1	77	50	140	<0.02	0.026	<0.1	0.12	0.03	2.2
	12/13/2011	MAX	7.86	987	407	30	2.1	< 2	14	1.1	< 0.05	0.32	21	< 1	62	39	130	20	0.027	<0.1	0.13	<0.01	2
	6/20/2012	MAX	7.69	1100	440	30	2.1	< 2	13	0.53	< 0.05	0.043	28	< 1	68	44	140	1.4	0.029	<0.1	0.12	0.017	2.3
	12/11/2012	MAX	7.74	1000	410	28	2.1	< 2	< 4	1.4	< 0.05	< 0.04	33	< 1	66	37	140	1.2	0.029	<0.1	0.11	0.011	3
	6/17/2013	MAX	7.78	1100	420	30	1.8	< 2	30	1.4	0.096	0.35	30	< 1	89	38	140	11	0.032	<0.1	0.15	0.1	3.5
	12/9/2013	MAX	7.69	1100	440	27	2	< 2	< 4	0.31	< 0.05	0.027	24	< 1	83	49	140	<0.02	0.025	<0.1	0.13	0.034	2.4
	5/22/2014	MAX	7.68	1100	440	28	1.9	< 2	< 4	0.47	< 0.05	< 0.04	31	< 1	66	52	150	<0.02	0.029	<0.1	0.23	0.019	2.82
	12/3/2014	MAX	7.88	1100	410	28	2.1	< 2	< 4	0.22	< 0.05	< 0.02	22	< 1	95	53	150	<0.02	0.036	<0.1	0.2	0.029	2.08
	6/18/2015	MAX	7.95	870	410	26	1.8	< 2	< 4	0.23	< 0.05	< 0.02	20	< 1	38	35	130	0.19	0.027	<0.1	0.13	0.024	1.14
	12/4/2015	MAX	7.81	1100	340	28	1.9	< 2	4.3	0.11	< 0.05	< 0.02	41	< 1	110	40	140	0.26	0.02	<0.1	0.076	<0.01	0.48

Routine Groundwater Quality - General Analysis -Guelph WRIC & Waste Transfer Station

AECOM

	Date	Lab	pH	Cond-uctivity	Alk mg/L	Mg mg/L	K mg/L	BOD mg/L	COD mg/L	TKN mg/L	NH3-N mg/L	Total-P mg/L	SO4 mg/L	Phenol ug/L	Cl mg/L	Na mg/L	Ca mg/L	Fe mg/L	B mg/L	P mg/L	Zn mg/L	NO2 mg/L	NO3 mg/L
Monitor	12/4/2001	Philip	7.95	674	263	27.9	< 1	2	10	0.23	< 0.03	0.011	64.8	< 1	26.6	27.4	84	0.25	0.04	<0.1	0.128		
14a-01	6/4/2002	Philip	8.44	556	240	22.4	2	1.4	8	0.5	< 0.03	0.006	56.1	< 1	10.7	24.9	63.5	<0.01	0.04	<0.1	0.007		
Bedrock	12/3/2002	Philip	8.01	519	240	23.7	< 1	< 0.5	< 5	0.25	< 0.03	0.006	38.8	< 1	4.8	11.5	65.3	<0.01	0.01	<0.1	0.007		
	6/2/2003	Philip	7.82	489	215	23.3	1	1.1	15	0.13	0.03	< 0.001	49.7	29	7	20	64.6	0.13	0.02		0.006		
	12/1/2003	Philip	8.18	542	232	23.7	< 1	0.7	7	0.24	< 0.03	0.003	53.1	< 1	12	18.2	72.9	0.05	0.03	<0.1	0.083		
	6/9/2004	Philip	8.04	527	234	25.7	< 1	< 0.5	19	0.86	0.03	0.004	61.2	< 1	14.2	19.6	69.3	0.01	0.02		<0.005	<0.2	<0.2
	11/30/2004	Philip	7.92	527	236	24.4	1	< 0.5	< 5	0.06	< 0.03	< 0.002	48.6	< 1	12.8	9.1	68.1	0.03	<0.01		<0.005		
	8/3/2005	Maxx	8.22	533	234	26	1.1	< 2	15	1.1	< 0.05	< 0.02	51	< 1	11	19	67	<0.05	0.031	0.069	<0.005		
	11/28/2005	Maxx	8.18	529	242	29		< 2	9	0.4	< 0.05	< 0.02	42	< 1	15	14	78	0.16	0.018	<0.05	<0.005		
	6/1/2006	MAX	8.2	605	253	28	1.1	< 2	9	0.4	< 0.05	< 0.02	52	< 1	15	16	77	0.14	0.022	<0.05	<0.005		
	12/4/2006	MAX	8.2	597	253	26	1	< 2	< 4	0.2	0.08	< 0.02	61	< 1	13	14	74	0.11	0.017	<0.05	<0.005		
	3/30/2007	MAX	8.2	599	249	24	0.99	< 2	< 4	0.2	0.06	< 0.02	61	< 1	13	13	72	<0.02	0.018	<0.05	<0.005		
	6/14/2007	MAX	8.1	601	243	29	1.1	< 2	< 4	0.2	0.1	< 0.02	63	< 1	14	12	80	<0.02	0.015	<0.05	0.01		
	12/5/2007	MAX	8.2	603	241	27	1.2	< 2	12	0.1	< 0.05	< 0.02	62	< 1	12	16	77	<0.02	0.013	<0.1	<0.005	<0.01	<0.1
	6/25/2008	MAX	8.2	590	236	29	1.1		7	0.3	< 0.05	< 0.02	58	< 1	15	11	80	<0.02	<0.01	<0.1	<0.005	<0.01	<0.1
	12/9/2008	MAX	8	606	239	26	1.1	< 2	< 4	0.2	< 0.05	0.04	67	< 1	17	14	72	<0.02	0.016	<0.1	<0.005	<0.01	<0.1
	6/25/2009	MAX	8	635	237	29	1.2	< 2	< 4	0.2	< 0.05	< 0.02	71	< 1	21	16	86	0.06	0.022	<0.1	<0.005	<0.01	<0.1
	12/16/2009	MAX	7.9	629	242	29	1.2	< 2	< 4	0.1	< 0.05	< 0.02	64	< 1	20	17	79	0.03	0.017	<0.1	<0.005	<0.01	<0.1
	6/29/2010	MAX	8.1	599	231	26	0.98	< 2	6	0.2	< 0.05	0.02	64	< 1	19	10	75	<0.02	0.016	<0.1	<0.005	<0.01	<0.1
	12/20/2010	MAX	7.92	672	252	27	1.2	< 2	< 4	0.2	< 0.05	< 0.02	65	< 1	23	19	77	<0.02	0.017	<0.1	<0.005	<0.01	<0.1
	6/15/2011	MAX	7.96	666	239	28	1.2	< 2	14	0.1	< 0.05	< 0.02	73	< 1	28	16	83	0.11	0.023	<0.1	<0.005	<0.01	<0.1
	12/14/2011	MAX	8.13	652	240	28	1.2	< 2	< 4	0.2	< 0.05	< 0.02	65	< 1	23	17	81	0.14	0.015	<0.1	0.014	<0.01	<0.1
	6/19/2012	MAX	8.06	620	240	27	1.1	< 2	7.6	0.15	< 0.05	0.022	57	< 1	20	14	76	0.09	0.019	<0.1	0.018	<0.01	<0.1
	12/17/2012	MAX	7.72	620	240	28	1.1	< 2	7	0.31	< 0.05	< 0.02	62	< 1	20	18	81	0.16	0.012	<0.1	0.0061	<0.01	<0.1
	6/18/2013	MAX	8.05	620	240	25	1.3	< 2	< 4	0.22	< 0.05	0.025	63	< 1	20	29	74	0.29	0.024	<0.1	<0.005	<0.01	<0.1
	12/4/2013	MAX	7.94	650	250	27	1.2	< 2	11	0.31	< 0.05	0.041	63	< 1	24	22	76	0.02	0.023	<0.1	0.008	<0.01	<0.1
	5/26/2014	MAX	8.02	630	240	25	1	< 2	< 4	0.27	< 0.05	< 0.02	62	< 1	22	18	80		0.019		<0.005	<0.01	<0.1
	12/4/2014	MAX	7.96	620	230	26	1.2	< 2	4.5	<0.1	< 0.05	< 0.02	56	< 1	21	15	78	0.02	0.019	<0.1	<0.005	<0.01	<0.1
	6/22/2015	MAX	7.79	640	250	26	1.2	< 2	9	<0.1	< 0.05	0.022	63	< 1	23	21	75	1.3	0.024	<0.1	<0.005	<0.01	<0.1
	12/30/2015	MAX	7.8	640	240	29	1.2	< 2	< 4	<0.1	< 0.05	< 0.02	63	< 1	23	25	80	1.3	0.024	<0.1	0.006	<0.01	<0.1

Routine Groundwater Quality - General Analysis -Guelph WRIC & Waste Transfer Station

AECOM

	Date	Lab	pH	Cond-uctivity	Alk mg/L	Mg mg/L	K mg/L	BOD mg/L	COD mg/L	TKN mg/L	NH3-N mg/L	Total-P mg/L	SO4 mg/L	Phenol ug/L	Cl mg/L	Na mg/L	Ca mg/L	Fe mg/L	B mg/L	P mg/L	Zn mg/L	NO2 mg/L	NO3 mg/L
Monitor	12/4/2001	Philip	7.94	716	336	30.3	< 1	1.3	12	0.3	< 0.03	0.009	62.9	< 1	22.3	8.2	114	0.15	0.05	<0.1	0.269		
14b-01	6/4/2002	Philip	8.41	776	279	30.2	2	1	21	0.34	0.06	1.11	89.4	< 1	58.4	20.9	100	<0.01	0.02	<0.1	0.195		
Outwash	12/3/2002	Philip	8.07	680	277	29.7	2	0.7	12	0.68	< 0.03	0.005	58.1	< 1	24.1	7.7	95.4	0.01	<0.01	<0.1	0.081		
	6/2/2003	Philip	7.59	845	270	26.2	2	0.8	18	0.62	0.04	< 0.001	33.7	13	85.8	32.7	104	0.37	0.02		0.121		
	12/1/2003	Philip	7.84	895	342	30.1	< 1	< 0.5	27	0.9	0.22	0.005	29.6	< 1	101	40.4	112	0.73	0.02	<0.1	0.245		
	6/9/2004	Philip	7.55	771	327	27.9	1.2	< 0.5	20	0.7	0.14	0.002	39.2	2	70.6	33.8	129	0.8	0.01		0.505	<0.2	<0.2
	11/30/2004	Philip	7.65	878	364	31.3	< 1	< 0.5	34	1.37	0.15	0.004	30.6	< 1	91.4	34.2	123	1.22	0.02		0.369		
	8/3/2005	Maxx	7.93	818	267	29	2.3	< 2	20	1.3	0.06	< 0.02	83	< 1	73	31	110	0.91	0.013	0.059	0.11		
	11/28/2005	Maxx	8.09	1070	305	38		6	12	0.6	0.09	< 0.02	77	< 1	143	49	140	1.3	0.02	<0.05	0.12		
	6/1/2006	MAX	8	1100	361	36	2	< 2	11	0.5	0.06	0.03	59	< 1	129	60	120	0.29	0.021	<0.05	0.26		
	12/4/2006	MAX	8	1120	438	37	2	< 2	9	0.9	0.09	< 0.02	64	< 1	92	67	130	0.15	0.025	<0.05	0.33		
	3/30/2007	MAX	8.1	901	347	32	1.7	< 2	15	0.3	0.07	< 0.02	46	< 1	67	49	110	0.03	0.023	<0.05	0.42		
	6/14/2007	MAX	8.1	909	295	36	2	< 2	8	0.2	0.09	< 0.02	87	< 1	75	39	110	0.13	0.026	<0.05	0.18		
	12/5/2007	MAX	8.1	1040	294	35	1.9	< 2	13	0.3	< 0.05	< 0.02	88	< 1	120	42	120	<0.02	0.012	<0.1	0.35	<0.01	<0.1
	6/25/2008	MAX	8	1270	326	35	2.6		6	0.3	< 0.05	< 0.02	84	< 1	180	100	120	<0.02	0.016	<0.1	0.4	<0.01	0.4
	12/9/2008	MAX	8	1310	423	33	2.2	< 2	4	0.3	< 0.05	< 0.02	58	< 1	150	110	120	0.02	0.022	<0.1	0.41	<0.01	0.1
	6/25/2009	MAX	7.8	1670	357	33	2.6	< 2	< 4	0.2	< 0.05	0.02	52	< 1	280	170	130	<0.02	0.025	<0.1	0.87	<0.01	0.2
	12/15/2009	MAX	7.7	1670	398	32	2.2	< 2	4	0.3	< 0.05	0.03	42	< 1	260	170	130	<0.02	0.016	<0.1	0.7	<0.01	<0.1
	6/29/2010	MAX	8	1230	365	27	2.3	< 2	9	0.4	< 0.05	< 0.02	47	< 1	150	120	110	<0.02	0.027	<0.1	0.79	<0.01	0.3
	12/20/2010	MAX	7.76	1240	420	< 0.05	< 0.2	< 2	7	0.3	< 0.05	< 0.02	38	< 1	130	< 0.1	< 0.2	<0.02	<0.01	<0.1	<0.005	<0.01	4
	6/14/2011	MAX	7.74	1170	370	30	2.2	< 2	8	0.4	< 0.05	< 0.02	35	< 1	130	94	120	<0.02	0.022	<0.1	1.4	<0.01	3.5
	12/14/2011	MAX	8.05	977	386	24	1.9	< 2	15	3	< 0.05	1	32	< 1	63	88	93	61	0.018	<0.1	0.72	<0.01	1.2
	6/19/2012	MAX	7.82	1200	340	32	2.3	< 2	9.7	0.84	< 0.05	0.65	37	< 1	150	82	130	39	0.02	<0.1	1.4	<0.01	<0.1
	12/17/2012	MAX	7.48	1100	410	30	2	< 2	46	2.9	0.073	1.5	35	< 1	92	91	130	27	0.015	<0.1	0.94	<0.01	0.4
	6/18/2013	MAX	7.81	1600	380	40	2.6	< 2	< 4	0.33	< 0.05	0.089	43	< 1	250	120	180	3.2	0.022	<0.1	1.7	<0.01	1.6
	12/4/2013	MAX	7.68	1100	430	37	1.9	< 2	8.1	0.84	< 0.05	0.11	29	< 1	81	78	140	<0.02	0.025	0.11	1.2	<0.01	0.95
	5/26/2014	MAX	7.56	1600	320	36	1.9	< 2	36	11	< 0.05	1.1	36	< 1	270	120	160	34	0.018	<0.1	1.1	<0.01	2.67
	12/4/2014	MAX	7.77	1000	420	80	2.5	< 2	10	0.71	< 0.05	0.43	22	< 1	73	83	280	<0.02	0.037	0.45	2	<0.01	0.37
	6/22/2015	MAX	7.64	1300	340	32	2	< 2	37	1.2	< 0.05	1.1	37	< 1	180	86	150	34	0.023	<0.1	0.98	<0.01	1.48
	12/30/2015	MAX	7.58	1000	380	27	1.5	< 2	5.9	0.31	< 0.05	0.26	33	< 1	86	71	120	10	0.019	<0.1	0.52	<0.01	0.6

Routine Groundwater Quality - General Analysis -Guelph WRIC & Waste Transfer Station

AECOM

	Date	Lab	pH	Cond-uctivity	Alk mg/L	Mg mg/L	K mg/L	BOD mg/L	COD mg/L	TKN mg/L	NH3-N mg/L	Total-P mg/L	SO4 mg/L	Phenol ug/L	Cl mg/L	Na mg/L	Ca mg/L	Fe mg/L	B mg/L	P mg/L	Zn mg/L	NO2 mg/L	NO3 mg/L
Monitor	12/4/2001	Philip	7.95	754	259	35.1	< 1	0.6	< 5	0.16	< 0.03	0.006	92.4	< 1	48.3	7.7	104	0.27	<0.01	<0.1	<0.005		
15a-01	6/4/2002	Philip	8.13	718	254	34.9	1	< 0.5	< 5	0.15	< 0.03	0.086	94.1	< 1	52.8	8.3	103	0.4	<0.01	<0.1	<0.005		
Bedrock	12/3/2002	Philip	8.06	794	260	35.7	2	< 0.5	8	0.49	0.03	0.011	92.3	< 1	57.6	10.6	106	0.47	<0.01	<0.1	<0.005		
	6/2/2003	Philip	7.87	789	246	36	1	< 0.5	6	0.15	< 0.03	< 0.001	99	15	56.2	12.2	107	0.5	<0.01		<0.005		
	12/1/2003	Philip	8.17	754	245	32.5	< 1	< 0.5	7	0.19	< 0.03	0.007	101	< 1	60.7	11.5	103	0.5	<0.01	<0.1	0.072		
	6/9/2004	Philip	7.85	734	258	34.9	< 1	< 0.5	6	0.16	< 0.03	0.004	105	< 1	62.4	13	129	0.55	0.01		0.335	<0.2	<0.2
	11/30/2004	Philip	7.97	754	257	33.7	1	< 0.5	< 5	0.16	< 0.03	0.005	105	< 1	61.5	13.7	101	0.52	<0.01		<0.005		
	8/3/2005	Maxx	8.14	737	254	35	1.1	< 2	5	0.4	< 0.05	< 0.02	91	< 1	49	15	100	0.55	<0.01	<0.05	<0.005		
	11/28/2005	Maxx	8.22	736	262	37		< 2	6	0.4	< 0.05	< 0.02	88	< 1	47	16	110	0.58	<0.01	<0.05	<0.005		
	6/1/2006	MAX	8.1	790	268	33	1	< 2	10	0.4	< 0.05	< 0.02	74	1	59	15	92	0.46	0.011	<0.05	<0.005		
	12/4/2006	MAX	8	811	271	35	1.1	< 2	< 4	0.3	0.18	< 0.02	79	< 1	55	17	100	0.55	0.011	<0.05	<0.005		
	3/30/2007	MAX	8.1	808	263	29	1	< 2	< 4	0.3	0.1	< 0.02	92	< 1	54	15	88	0.56	0.01	<0.05	<0.005		
	6/14/2007	MAX	8.1	799	258	36	1.3	< 2	< 4	0.4	0.11	< 0.02	95	< 1	51	18	110	0.4	0.011	<0.05	<0.005		
	12/5/2007	MAX	8.2	799	255	35	1.2	< 2	13	0.2	0.09	< 0.02	100	< 1	51	19	110	0.47	0.012	<0.1	<0.005	<0.01	<0.1
	6/25/2008	MAX	8.3	783	249	33	1.4		10	0.4	< 0.05	< 0.02	104	< 1	45	19	100	0.07	<0.01	<0.1	0.042	<0.01	<0.1
	12/9/2008	MAX	8	786	252	32	1.2	< 2	< 4	0.3	0.07	< 0.02	116	< 1	42	19	96	0.45	0.013	<0.1	<0.005	<0.01	<0.1
	6/25/2009	MAX	8	783	249	34	1.2	< 2	4	0.2	< 0.05	< 0.02	110	< 1	43	20	96	0.57	0.034	<0.1	<0.005	<0.01	<0.1
	12/16/2009	MAX	8	802	251	32	1.2	2	< 4	0.2	< 0.05	< 0.02	110	< 1	48	19	100	0.62	0.015	<0.1	<0.005	<0.01	<0.1
	6/28/2010	MAX	8.1	818	245	34	1.2	< 2	6	0.3	< 0.05	0.02	110	< 1	47	19	100	0.64	0.021	<0.1	<0.005	<0.01	<0.1
	12/22/2010	MAX	7.85	844	251	37	1.3	< 2	< 4	0.2	< 0.05	< 0.02	110	< 1	56	21	110	0.64	0.016	<0.1	<0.005	<0.01	<0.1
	6/14/2011	MAX	7.92	824	243	35	1.3	< 2	7	0.3	< 0.05	0.02	100	< 1	56	19	110	0.71	0.017	<0.1	<0.005	<0.01	<0.1
	12/15/2011	MAX	8.02	857	247	39	1.4	< 2	< 4	0.2	0.05	< 0.02	100	< 1	61	24	120	0.19	0.012	<0.1	<0.005	<0.01	<0.1
	6/18/2012	MAX	7.94	860	250	34	1.2	< 2	12	0.2	< 0.05	< 0.02	98	< 1	62	21	100	0.78	0.013	<0.1	<0.005	<0.01	<0.1
	12/11/2012	MAX	7.87	860	250	34	1.3	< 2	< 4	0.59	0.057	< 0.02	110	< 1	63	22	110	0.66	0.02	<0.1	<0.005	<0.01	<0.1
	6/19/2013	MAX	8.17	860	260	30	1.2	< 2	9.9	0.17	0.064	< 0.02	110	< 1	63	20	98	0.74	0.025	<0.1	<0.005	<0.01	<0.1
	12/3/2013	MAX	7.83	850	250	31	1.1	< 2	< 4	0.28	< 0.05	< 0.02	94	< 1	67	21	92	0.74	0.025	<0.1	0.006	<0.01	<0.1
	5/21/2014	MAX	7.9	870	250	34	1.3	< 2	< 4	<0.1	< 0.05	< 0.02	110	< 1	66	24	110	0.73	0.018	<0.1	<0.005	<0.01	<0.1
	12/4/2014	MAX	7.94	840	250	41	1.7	< 2	< 4	0.15	0.082	0.13	96	< 1	68	25	140	0.75	0.028	0.17	0.077	<0.01	<0.1
	6/19/2015	MAX	8.02	840	260	36	1.4	< 2	< 4	0.14	< 0.05	< 0.02	100	< 1	68	27	110	1	0.022	<0.1	<0.005	<0.01	<0.1
	12/8/2015	MAX	7.93	870	240	36	1.3	< 2	< 4	0.14	< 0.05	0.025	110	< 1	66	27	110	1.2	0.014	<0.1	<0.005	<0.01	<0.1

Routine Groundwater Quality - General Analysis -Guelph WRIC & Waste Transfer Station

AECOM

	Date	Lab	pH	Cond-uctivity	Alk mg/L	Mg mg/L	K mg/L	BOD mg/L	COD mg/L	TKN mg/L	NH3-N mg/L	Total-P mg/L	SO4 mg/L	Phenol ug/L	Cl mg/L	Na mg/L	Ca mg/L	Fe mg/L	B mg/L	P mg/L	Zn mg/L	NO2 mg/L	NO3 mg/L
Monitor 15b-01 Outwash	12/4/2001	Philip	8.16	646	252	27	< 1	4.4	13	0.27	< 0.03	0.014	26.2	< 1	24.4	6.2	77.7	<0.01	0.08	<0.1	0.143		
	6/4/2002	Philip	8.1	475	215	21.1	1	0.9	11	0.79	< 0.03	0.008	13.8	< 1	6.9	2	73.4	<0.01	<0.01	<0.1	0.007		
	12/3/2002	Philip	7.95	723	200	29.4	2	0.9	12	0.75	< 0.03	0.012	14.3	< 1	9.1	2	103	<0.01	0.01	<0.1	0.009		
	6/2/2003	Philip	7.95	534	214	22.4	< 1	1.4	12	0.66	< 0.03	0.002	37.1	10	5.2	5	77.2	<0.01	0.01		0.009		
	12/1/2003	Philip	8.08	661	291	27.5	1.1	< 0.5	25	0.74	< 0.03	0.003	40.5	< 1	7.9	10.7	95	<0.01	0.04	<0.1	0.01		
	6/9/2004	Philip	7.94	478	204	18.7	< 1	< 0.5	11	0.45	< 0.03	0.002	24.2	< 1	24.8	4	74	0.01	<0.01		0.047	<0.2	4.1
	11/30/2004	Philip	7.99	558	240	21.8	< 1	< 0.5	12	0.58	< 0.03	0.002	22.4	< 1	27.9	3.3	83	<0.01	0.01		0.008		
	8/3/2005	Maxx	8.06	668	335	30	0.98	< 2	18	1.4	< 0.05	< 0.02	16	< 1	10	4.6	120	0.097	<0.01	<0.05	0.03		
	11/28/2005	Maxx	7.97	1150	533	53		< 2	9	0.8	< 0.05	< 0.02	26	< 1	56	10	190	<0.05	0.039	<0.05	0.045		
	6/1/2006	MAX	8	853	462	32	0.97	< 2	11	0.7	< 0.05	0.02	15	< 1	8	12	120	<0.02	0.025	<0.05	0.026		
	12/4/2006	MAX	7.8	949	490	36	1.2	< 2	7	0.4	< 0.05	< 0.02	24	< 1	4	16	150	0.29	0.045	<0.05	0.034		
	3/30/2007	MAX	8.1	955	484	38	0.92	< 2	< 4	0.4	0.09	< 0.02	28	< 1	13	9.2	150	<0.02	0.026	<0.05	0.008		
	6/14/2007	MAX	8.1	996	478	38	1	< 2	7	0.3	0.1	< 0.02	25	< 1	35	8.7	160	<0.02	0.023	<0.05	0.041		
	12/5/2007	MAX	8	1130	481	42	1.3	< 2	17	0.4	< 0.05	< 0.02	28	< 1	38	15	180	<0.02	0.042	<0.1	0.049	<0.1	15
	6/25/2008	MAX	8.1	1330	449	31	1.3		4	0.4	< 0.05	< 0.02	23	< 1	130	94	150	<0.02	0.016	<0.1	0.036	<0.1	13
	12/9/2008	MAX	8	1100	544	25	1.2	< 2	6	0.4	< 0.05	< 0.02	18	< 1	21	90	120	<0.02	0.038	<0.1	0.037	<0.01	8.6
	6/25/2009	MAX	7.7	1160	423	37	1.1	< 2	6	0.4	< 0.05	< 0.02	27	< 1	110	45	170	<0.02	0.023	<0.1	0.043	<0.01	5.7
	12/16/2009	MAX	7.8	1070	540	24	1.2	< 2	< 4	0.3	< 0.05	< 0.02	16	< 1	15	98	120	<0.02	0.034	<0.1	0.039	<0.01	10
	6/25/2010	MAX	7.8	1720	393	43	1.4	< 2	8	0.4	< 0.05	0.02	25	< 1	270	85	210	<0.02	0.026	<0.1	0.053	<0.01	9.7
	12/17/2010	MAX	7.6	1380	521	30	1.4	< 2	6	0.3	< 0.05	< 0.02	17	< 1	120	130	150	<0.02	0.041	<0.1	0.045	<0.01	4.6
	6/14/2011	MAX	7.73	1150	402	26	1.1	< 2	13	0.4	< 0.05	< 0.02	23	< 1	110	93	130	<0.02	0.024	0.11	0.032	<0.01	5.8
	12/15/2011	MAX	7.84	1130	465	30	1.4	< 2	19	1.2	< 0.05	1.2	36	< 1	49	110	140	6.7	0.023	<0.1	0.055	<0.01	8.8
	6/18/2012	MAX	7.68	1200	440	33	1	< 2	15	1	< 0.05	0.34	38	< 1	74	57	150	25	0.014	<0.1	0.052	<0.01	13
	12/11/2012	MAX	7.66	1000	410	32	1.1	< 2	< 4	0.22	0.11	< 0.1	63	< 1	36	38	170	<0.02	0.025	<0.1	0.23	<0.01	8.5
	6/19/2013	MAX	7.5	1100	340	26	0.89	< 2	4.1	0.35	0.061	0.12	63	< 1	78	40	140	6.5	0.017	<0.1	0.036	<0.01	7.8
	12/3/2013	MAX	7.52	910	410	32	1.1	< 2	< 4	1.3	< 0.05	0.075	34	< 1	30	26	140	<0.02	0.024	<0.1	0.039	<0.01	3.5
	5/21/2014	MAX	7.7	880	360	39	1.4	< 2	< 4	0.1	< 0.05	0.049	32	< 1	35	21	150	<0.02	0.017	<0.1	0.24	<0.01	4.65
	12/4/2014	MAX	7.8	940	390	37	1.5	< 2	< 4	0.18	< 0.05	0.074	46	< 1	39	24	170	<0.02	0.034	<0.1	0.24	<0.01	5.23
	6/19/2015	MAX	7.89	820	360	28	0.91	< 2	< 4	<0.5	< 0.05	0.073	61	< 1	18	22	130	3.6	0.023	<0.1	0.037	<0.01	5.85
	12/8/2015	MAX	7.77	1800	180	23	6.8	< 2	19	0.41	< 0.05	0.096	190	< 1	320	170	170	2.4	0.078	<0.1	0.035	<0.01	<0.1
Monitor 16A-08 Bedrock	3/26/2008	MAX	8	691	251	29	3.6	< 2	4	0.4	0.16	< 0.02	70	< 1	36	42	76	<0.02	0.039	<0.1	0.053	0.02	<0.1
	6/25/2008	MAX	8.3	596	238	28	2.7		7	0.5	0.19	< 0.02	46	< 1	28	6.2	82	<0.02	0.022	<0.1	0.04	<0.01	<0.1
	12/9/2008	MAX	8.1	605	239	26	2	< 2	< 4	0.3	0.06	< 0.02	39	< 1	29	2.5	77	<0.02	0.025	<0.1	0.039	<0.01	<0.1
	6/25/2009	MAX	8	645	239	29	2	< 2	< 4	0.3	0.05	< 0.02	47	< 1	39	4	88	<0.02	0.029	<0.1	0.043	<0.01	<0.1
	12/16/2009	MAX	8.1	636	240	29	2	< 2	7	0.2	0.07	0.03	42	< 1	36	3.6	87	<0.02	0.027	<0.1	0.043	<0.01	<0.1
	6/28/2010	MAX	7.9	634	236	27	1.8	< 2	4	0.2	< 0.05	0.02	53	< 1	31	2.1	83	<0.02	0.029	<0.1	0.035	<0.01	<0.1
	12/20/2010	MAX	7.94	630	236	29	1.9	< 2	< 4	0.2	0.05	< 0.02	41	< 1	33	2.2	88	0.04	0.027	<0.1	0.025	0.01	<0.1
	6/16/2011	MAX	7.99	620	232	29	2	< 2	18	0.4	0.06	< 0.02	58	< 1	34	2.2	88	0.06	0.025	<0.1	0.021	<0.01	<0.1
	12/13/2011	MAX	8.08	653	239	30	2	< 2	< 4	0.3	< 0.05	< 0.02	43	< 1	35	3.5	87	0.63	0.021	<0.1	0.037	<0.01	<0.1
	6/20/2012	MAX	8.03	640	230	27	1.9	< 2	10	0.19	< 0.05	0.033	39	< 1	33	2.7	84	0.48	0.025	<0.1	0.032	<0.01	<0.1
	12/12/2012	MAX	8.02	620	250	27	1.8	< 2	< 4	0.27	0.091	< 0.02	43	< 1	32	2.5	86	0.3	0.027	<0.1	0.029	<0.01	<0.1
	6/17/2013	MAX	8.07	620	230	27	1.7	< 2	< 4	0.26	0.064	< 0.02	40	< 1	31	2.3	79	0.37	0.028	<0.1	0.026	<0.01	<0.1
	12/9/2013	MAX	8.02	630	240	27	1.8	< 2	< 4	0.23	0.052	< 0.02	37	< 1	32	2.2	83	0.38	0.022	<0.1	0.023	<0.01	<0.1
	5/26/2014	MAX	7.9	620	230	28	1.8	< 2	< 4	<0.1	< 0.05	< 0.04	43	< 1	32	2.2	86	0.19	0.028	<0.1	0.031	<0.01	<0.1
	12/3/2014	MAX	8.03	620	240	29	2	< 2	< 4	0.12	0.084	< 0.02	40	< 1	32	2.1	87	0.07	0.032	<0.1	0.028	<0.01	<0.1
	6/18/2015	MAX	8.11	600	230	28	1.9	< 2	< 4	0.15	0.1	< 0.02	44	< 1	32	3.7	84	0.15	0.034	<0.1	0.028	<0.01	<0.1
	12/4/2015	MAX	8.06	630	230	29	1.9	< 2	4.6	0.13	< 0.05	< 0.02	39	< 1	32	2.3	85	0.18	0.022	<0.1	0.021	0.01	<0.1

Routine Groundwater Quality - General Analysis -Guelph WRIC & Waste Transfer Station

AECOM

	Date	Lab	pH	Cond-uctivity	Alk mg/L	Mg mg/L	K mg/L	BOD mg/L	COD mg/L	TKN mg/L	NH3-N mg/L	Total-P mg/L	SO4 mg/L	Phenol ug/L	Cl mg/L	Na mg/L	Ca mg/L	Fe mg/L	B mg/L	P mg/L	Zn mg/L	NO2 mg/L	NO3 mg/L
Monitor	3/26/2008	MAX	8	1130	477	42	1.5	< 2	15	0.9	0.09	< 0.02	105	< 1	38	60	130	<0.02	0.027	<0.1	0.16	0.12	3.3
16B-08	6/25/2008	MAX	8.2	1170	318	43	2.4		14	0.3	< 0.05	< 0.02	68	< 1	160	42	130	<0.02	<0.01	<0.1	1.1	<0.01	<0.1
Outwash	12/9/2008	MAX	7.8	1290	597	51	2.1	< 2	17	0.8	< 0.05	< 0.02	50	< 1	53	39	170	<0.02	0.028	<0.1	0.72	<0.01	2.9
	6/25/2009	MAX	7.8	1640	382	46	3.1	< 2	9	0.4	< 0.05	< 0.02	58	< 1	260	150	150	<0.02	0.022	<0.1	1.8	<0.01	<0.1
	12/15/2009	MAX	7.6	1350	555	48	2.1	< 2	19	0.5	< 0.05	0.03	48	< 1	96	71	160	0.03	0.033	<0.1	1.1	<0.01	<0.1
	6/23/2010	MAX	7.9	1470	373	41	2.8	< 2	9	0.4	< 0.05	0.02	79	< 1	210	120	130	<0.02	0.022	<0.1	1.3	<0.01	<0.1
	12/20/2010	MAX	7.55	1240	586	49	1.6	< 2	22	0.8	< 0.05	< 0.02	49	< 1	39	46	170	<0.02	0.029	<0.1	0.75	0.03	1.8
	6/16/2011	MAX	7.78	1340	383	37	2.6	< 2	20	0.4	< 0.05	< 0.02	63	< 1	170	130	120	0.09	0.021	<0.1	1.3	0.02	0.9
	12/13/2011	MAX	7.73	1190	518	50	1.3	< 2	17	1.1	< 0.05	0.13	71	< 1	23	38	160	1.3	0.033	<0.1	0.49	0.03	10
	6/20/2012	MAX	7.78	1200	360	27	2.1	< 2	14	0.45	< 0.05	< 0.02	38	< 1	120	120	89	0.18	0.021	<0.1	0.55	<0.01	<0.1
	12/12/2012	MAX	7.75	1100	560	45	1.1	< 2	16	0.74	< 0.05	< 0.02	55	< 5	10	23	170	0.14	0.034	<0.1	0.53	0.013	5
	6/17/2013	MAX	7.89	1200	370	30	2.1	< 2	7.3	0.35	< 0.05	< 0.02	41	< 1	130	110	97	0.1	0.021	<0.1	0.92	<0.01	<0.1
	12/9/2013	MAX	7.58	1200	570	47	1.5	< 2	6.6	0.78	< 0.05	< 0.02	43	< 1	38	43	160	<0.02	0.031	<0.1	0.72	<0.01	0.49
	5/26/2014	MAX	7.69	1200	360	29	2.3	< 2	7.1	0.2	< 0.05	< 0.02	35	< 1	140	120	99	0.1	0.025	<0.1	1	<0.01	<0.1
	12/3/2014	MAX	7.68	1100	570	47	1.3	< 2	17	0.64	0.053	< 0.02	39	< 1	13	25	160	<0.02	0.047	<0.1	0.62	<0.01	2.61
	6/18/2015	MAX	7.84	1300	430	35	2.5	< 2	9.7	0.23	< 0.05	< 0.02	39	< 1	150	120	120	0.07	0.032	<0.1	1.1	<0.01	<0.1
	12/4/2015	MAX	7.48	1100	530	45	1.6	< 2	17	0.4	< 0.05	< 0.02	36	< 1	33	38	150	0.08	0.032	<0.1	0.7	<0.01	<0.1
Monitor	3/26/2008	MAX	8.2	721	248	28	2.1	< 2	7	0.6	0.21	< 0.02	96	< 1	29	67	64	<0.02	0.039	<0.1	0.007	<0.01	0.3
17A-08	6/25/2008	MAX	8.3	643	233	30	2.2		< 4	0.5	0.29	< 0.02	63	< 1	36	16	80	0.05	0.022	<0.1	<0.005	<0.01	<0.1
Bedrock	12/9/2008	MAX	8.1	609	237	26	1.4	< 2	< 4	0.4	0.1	< 0.02	51	< 1	27	15	69	0.02	0.028	<0.1	<0.005	<0.01	<0.1
	6/25/2009	MAX	8	608	230	28	1.6	< 2	< 4	0.4	0.18	< 0.02	51	< 1	29	10	77	0.13	0.028	<0.1	<0.005	<0.01	<0.1
	12/16/2009	MAX	7.9	615	232	29	1.6	< 2	4	0.2	0.08	< 0.02	48	< 1	30	11	79	0.1	0.027	<0.1	<0.005	<0.01	0.2
	6/23/2010	MAX	8.1	645	229	30	1.6	< 2	< 4	0.5	0.13	< 0.02	59	< 1	34	12	79	0.11	0.027	<0.1	<0.005	<0.01	<0.1
	12/20/2010	MAX	7.92	650	228	29	1.6	< 2	5	0.3	0.19	< 0.02	51	< 1	36	11	81	0.03	0.027	<0.1	<0.005	0.04	<0.1
	6/16/2011	MAX	8.02	647	225	29	1.6	< 2	11	0.3	0.17	< 0.02	57	< 1	38	12	83	0.05	0.024	<0.1	<0.005	<0.01	<0.1
	12/15/2011	MAX	8.21	682	229	29	1.6	< 2	< 4	1	0.08	0.05	56	< 1	39	12	83	0.65	0.025	<0.1	0.014	0.05	0.1
	6/20/2012	MAX	8.04	680	230	30	1.6	< 2	10	0.37	0.073	0.03	55	< 1	38	12	84	0.86	0.027	<0.1	<0.005	<0.01	<0.1
	12/10/2012	MAX	7.85	680	230	28	1.6	< 2	< 4	0.41	0.12	< 0.02	66	< 1	39	12	85	0.8	0.029	<0.1	<0.005	<0.01	<0.1
	6/17/2013	MAX	8.06	690	230	29	1.5	< 2	< 4	0.41	0.14	0.075	61	< 1	41	13	78	2.1	0.026	<0.1	<0.005	<0.01	<0.1
	12/4/2013	MAX	7.84	710	240	32	1.9	< 2	6.1	0.46	0.12	0.08	62	< 1	45	14	87	0.13	0.028	<0.1	0.024	0.042	0.12
	5/22/2014	MAX	8.05	700	230	32	1.9	< 2	< 4	0.74	0.13	0.1	67	< 1	45	14	94	0.07	0.03	<0.1	0.022	0.021	<0.1
	12/2/2014	MAX	7.96	710	230	30	1.7	< 2	< 4	0.3	0.18	0.047	63	< 1	45	13	85	1.4	0.033	<0.1	0.0066	0.013	<0.1
	6/17/2015	MAX	7.97	710	230	31	1.6	< 2	< 4	0.2	0.093	0.032	68	< 1	45	14	85	0.91	0.026	<0.1	0.0052	0.044	<0.1
	12/3/2015	MAX	7.7	730	220	30	1.6	< 2	< 4	0.21	0.07	0.022	69	< 1	46	14	90	0.62	0.029	<0.1	<0.005	0.011	<0.1

Routine Groundwater Quality - General Analysis -Guelph WRIC & Waste Transfer Station

AECOM

	Date	Lab	pH	Cond-uctivity	Alk mg/L	Mg mg/L	K mg/L	BOD mg/L	COD mg/L	TKN mg/L	NH3-N mg/L	Total-P mg/L	SO4 mg/L	Phenol ug/L	Cl mg/L	Na mg/L	Ca mg/L	Fe mg/L	B mg/L	P mg/L	Zn mg/L	NO2 mg/L	NO3 mg/L
Monitor	3/26/2008	MAX	8	2080	357	41	2.4	< 2	5	0.4	< 0.05	< 0.02	75	< 1	400	240	150	<0.02	0.025	<0.1	0.25	0.02	3.6
17B-08	6/25/2008	MAX	8.3	2380	313	46	2.8		11	0.3	< 0.05	< 0.02	68	< 1	500	290	160	<0.02	0.015	<0.1	0.29	<0.01	4.2
Outwash	12/9/2008	MAX	8	1580	319	32	2.5	< 2	4	0.3	< 0.05	< 0.02	56	< 1	260	170	110	<0.02	0.018	<0.1	0.14	<0.01	5.1
	6/25/2009	MAX	7.8	2730	304	48	3.1	< 2	8	0.2	< 0.05	< 0.02	66	< 1	620	330	190	<0.02	0.018	<0.1	0.33	<0.01	4.9
	12/16/2009	MAX	7.7	1730	321	36	2.3	< 2	6	0.2	< 0.05	0.04	39	< 1	300	180	140	<0.02	0.021	<0.1	0.16	<0.01	4.5
	6/23/2010	MAX	8	1850	304	34	2.8	< 2	6	0.4	< 0.05	0.02	74	< 1	330	180	140	<0.02	0.022	<0.1	0.081	<0.01	4
	12/20/2010	MAX	7.82	1640	320	29	2.2	< 2	4	0.2	< 0.05	< 0.02	45	< 1	270	170	120	<0.02	0.023	<0.1	0.13	<0.01	5
	6/16/2011	MAX	7.77	2020	321	34	2.4	< 2	12	0.2	< 0.05	< 0.02	64	< 1	410	250	130	<0.02	0.019	<0.1	0.25	<0.01	4.1
	12/15/2011	MAX	8.07	1510	325	28	2.1	< 2	10	0.9	< 0.05	0.34	38	< 1	230	160	110	12	0.021	<0.1	0.15	<0.01	3.5
	6/20/2012	MAX	7.8	2100	330	35	2.3	< 2	11	0.55	< 0.05	0.062	41	< 1	400	230	140	2.7	0.022	<0.1	0.26	<0.01	4.4
	12/10/2012	MAX	7.7	2400	330	36	2.9	< 2	< 4	0.19	< 0.05	< 0.04	59	< 1	480	260	170	1.2	0.026	<0.1	0.22	<0.01	3
	6/17/2013	MAX	7.91	1900	330	31	1.9	< 2	< 4	0.5	< 0.05	< 0.02	47	< 1	350	220	120	1.3	0.02	<0.1	0.24	<0.01	2.7
	12/4/2013	MAX	7.82	1600	330	27	2	< 2	6.5	0.43	< 0.05	0.032	40	< 1	270	200	100	<0.02	0.02	<0.1	0.24	<0.01	3.1
	5/22/2014	MAX	7.85	1400	320	27	1.8	< 2	< 4	0.2	< 0.05	< 0.02	38	< 1	220	170	100	<0.02	0.022	<0.1	0.24	<0.01	2.78
	12/2/2014	MAX	7.92	1400	320	27	1.9	< 2	4.6	0.17	0.056	0.025	36	< 1	220	160	100	1.1	0.026	<0.1	0.19	<0.01	2.55
	6/17/2015	MAX	7.81	1800	300	33	1.9	< 2	4.4	0.33	< 0.05	0.022	37	1.6	350	190	120	<0.02	0.017	<0.1	0.27	<0.01	0.34
	12/3/2015	MAX	7.93	1200	310	24	1.6	< 2	< 4	0.19	< 0.05	0.038	35	< 1	150	110	88	1.6	0.021	<0.1	0.14	<0.01	1.7
Monitor	3/26/2008	MAX	8.1	803	258	27	1.5	< 2	23	0.9	0.09	< 0.02	130	< 1	18	89	65	88	0.029	<0.1	0.022	0.12	5.7
18A-08	6/25/2008	MAX	8.3	632	243	28	3		12	0.3	< 0.05	< 0.02	36	< 1	19	20	81	<0.02	<0.01	<0.1	0.25	<0.01	7.3
Bedrock	12/9/2008	MAX	8.1	613	247	27	1.1	< 2	< 4	0.5	0.16	< 0.02	35	< 1	16	6.1	76	<0.02	<0.01	<0.1	0.12	<0.01	6.7
	6/25/2009	MAX	7.9	605	242	29	1.2	< 2	< 4	0.2	< 0.05	< 0.02	34	< 1	16	5	85	<0.02	0.012	<0.1	0.32	<0.01	6.9
	12/15/2009	MAX	7.9	628	246	28	1.3	< 2	< 4	0.2	< 0.05	0.04	36	< 1	16	4.5	82	<0.02	0.01	<0.1	0.35	<0.01	8
	6/30/2010	MAX	8	625	241	29	1.2	< 2	18	0.3	< 0.05	0.03	38	< 1	18	4.6	82	<0.02	0.01	<0.1	0.33	0.02	6.5
	12/22/2010	MAX	7.85	628	241	31	1.2	< 2	< 4	<0.1	< 0.05	< 0.02	37	< 1	18	4.6	88	<0.02	<0.01	<0.1	0.36	<0.01	6.8
	6/16/2011	MAX	7.81	840	233	34	1.5	< 2	13	0.2	< 0.05	< 0.02	130	< 1	57	24	100	0.21	0.024	<0.1	0.009	<0.01	<0.1
	12/16/2011	MAX	7.91	621	251	27	1.2	< 2	32	2	0.33	1	36	2	16	4	78	20	<0.01	<0.1	0.22	0.02	5.3
	6/22/2012	MAX	7.82	610	240	28	1.3	< 2	55	2.8	< 0.05	0.17	38	< 1	16	4.1	82	3.3	<0.01	<0.1	0.36	0.038	4.8
	12/17/2012	MAX	7.59	610	250	30	1.2	< 2	< 4	<0.1	< 0.05	0.082	38	< 1	16	4.5	91	2	<0.01	<0.1	0.41	<0.01	5.1
	6/20/2013	MAX	8.32	610	240	28	1.2	< 2	22	1.1	0.079	1.4	39	< 1	16	4.2	87	33	<0.01	<0.1	0.36	0.035	4.7
	12/9/2013	MAX	7.81	620	240	28	1.1	< 2	6.1	0.66	0.17	0.11	37	< 1	16	4.3	81	0.05	<0.01	<0.1	0.37	<0.01	5
	5/27/2014	MAX	7.74	600	240	27	1	< 2	< 4	0.28	< 0.05	0.083	40	< 1	16	4.4	82	2.7	<0.01	<0.1	0.36	<0.01	4.86
Monitor	12/5/2014	N/A																					
18A-14	6/16/2015	MAX	7.93	620	250	27	1.8	< 2	29	0.75	< 0.05	0.38	45	< 1	18	9.1	84	12	0.014	<0.1	0.16	<0.01	4.68
Bedrock	12/8/2015	MAX	7.83	610	240	29	1.6	< 2	14	<1	< 0.05	0.39	35	< 1	17	4.7	84	13	<0.01	<0.1	0.26	0.026	4.42
Monitor	3/26/2008	MAX	8.2	1020	284	12	2.1	< 2	53	1	0.12	0.02	223	< 1	8	270	29	150	0.07	<0.1	0.021	0.05	1.6
18B-08	6/25/2008	INS																					
Outwash	12/9/2008	INS																					
	6/25/2009	INS																					
	12/15/2009	INS																					
	6/30/2010	INS																					
	12/22/2010	INS																					
	6/16/2011	MAX	8.03	1080	424	18	5.5	< 2	14	0.4	< 0.05	0.03	120	< 1	19	190	60	<0.02	0.1	<0.1	<0.005	<0.01	4.4
	12/16/2011	INS																					
	6/22/2012	Dry																					
	12/17/2012	INS																					
	6/20/2013	INSV																					
	12/9/2013	Dry																					
	5/27/2014	MAX	7.97	520	260	26	0.73	< 2	18	2.1	< 0.05	0.43	10	< 1	9	6.2	65	10	<0.01	<0.1	0.018	<0.01	0.32

Routine Groundwater Quality - General Analysis -Guelph WRIC & Waste Transfer Station

AECOM

	Date	Lab	pH	Cond-uctivity	Alk mg/L	Mg mg/L	K mg/L	BOD mg/L	COD mg/L	TKN mg/L	NH3-N mg/L	Total-P mg/L	SO4 mg/L	Phenol ug/L	Cl mg/L	Na mg/L	Ca mg/L	Fe mg/L	B mg/L	P mg/L	Zn mg/L	NO2 mg/L	NO3 mg/L
Monitor	12/5/2014	N/A																					
18B-14	6/16/2015	MAX	8.17	540	190	25	2.4	< 2	8.1	<1	< 0.05	0.94	19	< 1	40	24	53	37	0.029	<0.1	0.0074	<0.01	1.09
Outwash	12/8/2015	MAX	7.99	610	210	28	2.2	< 2	130	0.68	< 0.05	14	21	< 1	43	19	69	320	0.012	<0.1	0.0067	<0.01	4.2
Monitor	3/26/2008	MAX	8.1	844	245	37	1.4	< 2	13	0.3	0.1	0.03	143	< 1	45	47	94	0.02	0.03	<0.1	<0.005	0.02	<0.1
19A-08	6/25/2008	MAX	8.2	841	240	37	1.3		4	0.3	0.05	< 0.02	134	< 1	50	33	100	0.04	0.022	<0.1	<0.005	<0.01	<0.1
Bedrock	12/9/2008	MAX	8.1	811	242	33	1.2	< 2	< 4	0.2	< 0.05	< 0.02	129	< 1	46	19	96	0.17	0.022	<0.1	<0.005	<0.01	<0.1
	6/25/2009	MAX	7.9	768	236	35	1.2	< 2	2	0.2	< 0.05	< 0.02	140	< 1	27	12	100	0.17	0.026	<0.1	<0.005	<0.01	<0.1
	12/15/2009	MAX	7.9	834	244	35	1.4	< 2	5	0.2	< 0.05	0.02	120	< 1	48	21	100	0.21	0.029	<0.1	<0.005	<0.01	<0.1
	6/30/2010	MAX	7.8	788	234	33	1.2	< 2	6	0.2	< 0.05	0.03	130	< 1	37	16	100	0.2	0.023	<0.1	<0.005	<0.01	<0.1
	12/22/2010	MAX	7.87	825	236	36	1.3	< 2	< 4	0.1	< 0.05	< 0.02	120	< 1	43	21	110	0.21	0.027	<0.1	<0.005	<0.01	<0.1
	6/15/2011	MAX	7.95	838	235	35	1.4	< 2	17	0.2	< 0.05	< 0.02	130	< 1	60	25	100	0.24	0.033	<0.1	<0.005	<0.01	<0.1
	12/16/2011	MAX	7.95	898	246	34	1.5	< 2	38	0.8	0.09	0.7	120	< 1	70	29	100	29	0.031	<0.1	0.067	<0.01	<0.1
	6/22/2012	MAX	7.87	880	240	35	1.4	< 2	< 4	0.49	< 0.05	0.055	110	< 1	65	28	110	2.4	0.028	<0.1	<0.005	<0.01	<0.1
	12/17/2012	MAX	7.74	890	250	35	1.5	< 2	8.5	0.61	0.074	0.031	120	< 1	68	32	110	0.53	0.025	<0.1	0.012	<0.01	<0.1
	6/20/2013	MAX	8.13	860	240	34	1.5	< 2	< 4	0.18	0.071	< 0.02	120	< 1	63	27	110	0.77	0.036	<0.1	<0.005	<0.01	<0.1
	12/9/2013	MAX	8.02	900	240	35	1.5	< 2	< 4	0.22	0.07	< 0.02	110	< 1	72	32	110	0.27	0.026	<0.1	<0.005	<0.01	<0.1
	5/27/2014	MAX	7.91	890	240	34	1.4	< 2	< 4	0.2	< 0.05	< 0.04	120	< 1	70	31	100	0.28	0.032	<0.1	<0.005	<0.01	<0.1
	12/4/2014	MAX	7.82	840	240	36	1.9	< 2	< 4	<0.1	0.1	0.054	110	< 1	72	31	110	0.26	0.035	<0.1	0.016	<0.01	<0.1
	6/18/2015	MAX	7.98	860	250	35	1.6	< 2	9.6	0.16	0.16	0.13	110	< 1	68	31	100	4.7	0.036	<0.1	<0.005	0.014	<0.1
	12/2/2015	MAX	7.94	880	230	35	1.5	< 2	5	0.12	< 0.05	0.024	120	< 1	66	30	100	0.63	0.032	<0.1	<0.005	<0.01	<0.1
Monitor	3/26/2008	MAX	8.1	1560	289	14	4.5	< 2	51	1.7	0.53	0.03	454	< 1	38	350	35	130	0.14	<0.1	0.02	<0.1	1
19B-08	6/25/2008	MAX	8.3	2070	314	10	7.8		38	1.8	1	< 0.02	576	< 1	60	480	23	<0.02	0.2	<0.1	<0.005	0.26	2.5
Outwash	12/9/2008	MAX	8.2	2290	485	13	8.6	< 2	13	1.1	0.44	< 0.02	596	< 1	56	470	36	<0.02	0.27	<0.1	<0.005	0.06	8.8
	6/25/2009	MAX	8.2	2010	499	10	8.1	< 2	9	1.1	0.54	< 0.02	420	< 1	40	470	28	<0.02	0.23	<0.1	<0.005	0.12	10
	12/15/2009	INS																					
	6/30/2010	INS																					
	12/22/2010	INS																					
	6/15/2011	MAX	8.07	1220	485	15	6.4	< 2	16	0.4	< 0.05	0.03	150	< 1	16	250	44	1.7	0.15	<0.1	0.005	<0.01	5.4
	12/16/2011	MAX	7.93	1670	666	25	7.3	< 2	25	0.8	< 0.05	0.57	180	< 1	18	160	85	15	0.1	<0.1	0.006	<0.01	5.6
	6/22/2012	Dry																					
	12/17/2012	MAX	7.72	1300	620	18	11	< 2	17	0.75	< 0.05	0.69	77	< 1	7	260	57	11	0.14	<0.1	0.007	<0.01	2.8
	6/20/2013	INSV																					
	12/9/2013	MAX	8.02	1400	650	14	10	< 2	< 4	0.3	< 0.05	0.14	77	< 1	16	220	45	0.02	0.14	<0.1	<0.005	<0.01	3.8
	5/27/2014	MAX	7.71	1100	470	31	6.7	< 2	5.8	1.1	< 0.05	0.43	63	< 1	29	110	98	5.9	0.066	<0.1	0.023	<0.01	5.78
	12/4/2014	MAX	7.87	1600	700	26	12	< 2	5.4	0.38	< 0.05	0.15	98	< 1	26	300	75	<0.02	0.17	0.14	0.026	0.01	4.94
	6/18/2015	MAX	8.03	1500	620	22	11	< 2	< 4	0.27	0.16	0.09	110	< 1	42	250	71	2.6	0.13	<0.1	0.026	0.017	4.61
	12/2/2015	MAX	7.23	1700	690	19	11	< 2	15	0.13	< 0.05	0.13	150	< 1	41	330	59	4.2	0.17	<0.1	0.014	<0.01	3.85

Routine Groundwater Quality - General Analysis -Guelph WRIC & Waste Transfer Station

AECOM

	Date	Lab	pH	Cond-uctivity	Alk mg/L	Mg mg/L	K mg/L	BOD mg/L	COD mg/L	TKN mg/L	NH3-N mg/L	Total-P mg/L	SO4 mg/L	Phenol ug/L	Cl mg/L	Na mg/L	Ca mg/L	Fe mg/L	B mg/L	P mg/L	Zn mg/L	NO2 mg/L	NO3 mg/L
Monitor	3/26/2008	MAX	8.1	732	262	30	1.8	< 2	15	0.8	0.07	< 0.02	107	< 1	19	56	72	53	0.025	<0.1	0.012	0.13	2
20A-08	6/25/2008	MAX	8.3	597	242	28	1.2		11	0.4	< 0.05	< 0.02	53	< 1	16	4.9	83	<0.02	<0.01	<0.1	0.032	0.07	2.5
Bedrock	12/9/2008	MAX	8.1	633	251	26	1.1	< 2	4	0.3	< 0.05	< 0.02	55	< 1	17	9.2	84	<0.02	0.02	<0.1	0.068	0.05	4.1
	6/25/2009	MAX	7.9	602	242	28	1.2	< 2	< 4	0.3	< 0.05	< 0.02	49	< 1	16	5.9	83	<0.02	0.011	<0.1	0.089	0.09	2.4
	12/15/2009	MAX	7.9	622	247	29	1.3	< 2	< 4	0.2	< 0.05	0.03	47	< 1	16	4.9	84	<0.02	0.012	<0.1	0.11	0.04	3.8
	6/29/2010	MAX	8	794	236	27	1.2	< 2	10	0.4	< 0.05	< 0.02	130	< 1	37	5.3	80	0.19	<0.01	<0.1	0.096	<0.01	<0.1
	12/22/2010	MAX	7.79	630	242	31	1.2	< 2	< 4	0.4	< 0.05	< 0.02	50	< 1	18	4.7	88	<0.02	<0.01	<0.1	0.12	0.06	2.9
	6/15/2011	MAX	7.94	604	239	26	1	< 2	15	0.2	< 0.05	< 0.02	48	< 1	17	4.9	80	<0.02	<0.01	<0.1	0.11	0.08	3.1
	12/16/2011	MAX	8.04	629	244	27	1.2	< 2	51	1	< 0.05	1	49	< 1	18	5.4	81	15	<0.01	<0.1	0.074	0.02	3.1
	6/22/2012	MAX	7.95	620	240	27	1.2	< 2	9.7	0.67	< 0.05	0.21	43	< 1	17	4	82	4.1	<0.01	<0.1	0.14	<0.01	3.4
	12/17/2012	MAX	7.63	620	250	30	1.3	< 2	< 4	0.17	< 0.05	< 0.02	48	< 1	17	4.5	87	2.6	<0.01	<0.1	0.13	0.012	3.3
	6/20/2013	MAX	8.38	610	240	28	1.1	< 2	6.2	0.24	< 0.05	< 0.02	44	< 1	15	3.9	86	0.81	<0.01	<0.1	0.13	0.029	2.5
	12/9/2013	MAX	7.92	630	250	26	1	< 2	< 4	0.32	< 0.05	0.029	43	< 1	17	5.7	78	0.33	<0.01	<0.1	0.11	0.038	3.6
	5/27/2014	MAX	7.87	610	240	28	1.1	< 2	< 4	0.22	< 0.05	< 0.02	45	< 1	17	3.9	84	<0.02	<0.01	<0.1	0.16	0.045	2.81
	12/4/2014	MAX	7.89	620	240	29	1.2	< 2	< 4	<0.1	< 0.05	< 0.02	44	< 1	17	4.2	85	<0.02	<0.01	<0.1	0.13	0.03	3.11
	6/18/2015	MAX	8.03	600	250	29	1.2	< 2	< 4	0.27	< 0.05	< 0.02	43	< 1	17	4.1	85	0.41	0.01	<0.1	0.12	0.036	3.09
	12/2/2015	MAX	7.42	630	240	29	1.3	< 2	4.4	<0.1	< 0.05	< 0.02	46	< 1	19	4.7	84	1.7	0.013	<0.1	0.13	0.012	3.49
Monitor	3/26/2008	MAX	8	572	244	30	1.2	< 2	10	0.5	< 0.05	< 0.02	52	< 1	11	3.5	82	73	<0.01	<0.1	0.09	<0.01	1.2
20B-08	6/25/2008	MAX	8.2	933	235	26	3.3		20	0.6	< 0.05	< 0.02	78	< 1	110	57	99	<0.02	0.013	<0.1	0.63	<0.01	<0.1
Outwash	12/9/2008	MAX	8	694	266	25	1.3	< 2	7	0.3	< 0.05	< 0.02	73	< 1	25	16	84	<0.02	0.018	<0.1	0.16	<0.01	<0.1
	6/25/2009	MAX	7.7	822	254	26	1.9	< 2	10	0.3	< 0.05	< 0.02	49	< 1	88	45	95	<0.02	0.014	<0.1	0.37	<0.01	<0.1
	12/15/2009	MAX	7.9	628	271	27	1.5	< 2	< 4	0.2	< 0.05	< 0.02	56	< 1	8	9.6	85	<0.02	0.012	<0.1	0.18	<0.01	<0.1
	6/29/2010	MAX	7.8	1080	256	29	1.9	< 2	14	0.4	< 0.05	0.02	44	< 1	170	58	110	<0.02	0.013	<0.1	0.64	<0.01	<0.1
	12/22/2010	MAX	7.87	631	272	31	1.5	< 2	< 4	0.2	< 0.05	< 0.02	49	< 1	12	5.9	93	<0.02	<0.01	<0.1	0.14	<0.01	0.3
	6/15/2011	MAX	7.9	614	296	28	1.3	< 2	13	0.3	< 0.05	< 0.02	29	< 1	7	3.6	89	<0.02	0.016	<0.1	0.13	<0.01	<0.1
	12/16/2011	MAX	7.94	590	272	25	1.1	< 2	14	0.8	< 0.05	0.27	32	< 1	10	4.3	78	7.1	<0.01	<0.1	0.098	<0.01	<0.1
	6/22/2012	MAX	7.8	790	270	27	1.8	3	93	1.3	0.19	0.4	44	8.9	67	30	93	7.7	<0.01	<0.1	0.28	<0.01	<0.1
	12/17/2012	MAX	7.65	670	280	32	1.5	< 2	13	0.3	< 0.05	0.072	44	< 1	24	11	97	2.5	<0.01	<0.1	0.11	<0.01	0.14
	6/20/2013	MAX	8.25	910	260	28	1.5	< 2	16	0.5	< 0.05	0.089	49	< 1	100	50	100	3.1	0.013	<0.1	0.43	<0.01	<0.1
	12/9/2013	MAX	7.88	790	280	28	1.4	< 2	< 4	0.34	< 0.05	0.021	43	< 1	59	23	91	<0.02	<0.01	<0.1	0.23	<0.01	<0.1
	5/27/2014	MAX	7.82	700	290	31	1.4	< 2	7.5	0.28	< 0.05	< 0.02	44	< 1	29	8.8	95	1.2	0.01	<0.1	0.1	<0.01	<0.1
	12/4/2014	MAX	7.86	700	310	32	1.6	< 2	5.8	0.2	< 0.05	0.032	36	< 1	25	11	100	0.04	0.013	<0.1	0.16	<0.01	<0.1
	6/18/2015	MAX	7.89	730	300	31	1.7	< 2	9.7	0.12	< 0.05	0.097	49	< 1	30	13	97	3.7	0.014	<0.1	0.083	<0.01	0.1
	12/2/2015	MAX	7.46	740	280	32	1.6	< 2	25	0.16	< 0.05	0.13	52	< 1	33	11	97	4.5	0.012	<0.1	0.092	<0.01	<0.1

Routine Groundwater Quality - General Analysis -Guelph WRIC & Waste Transfer Station

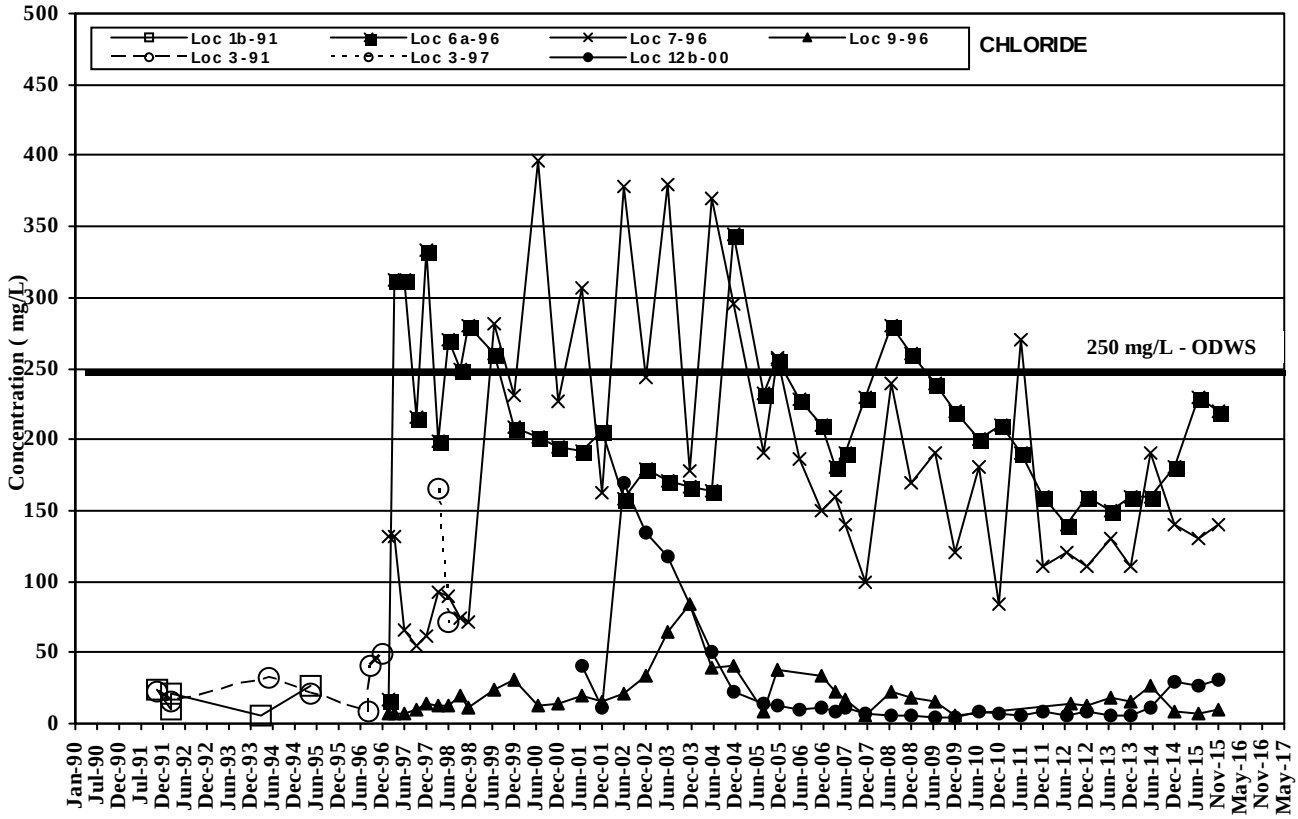
AECOM

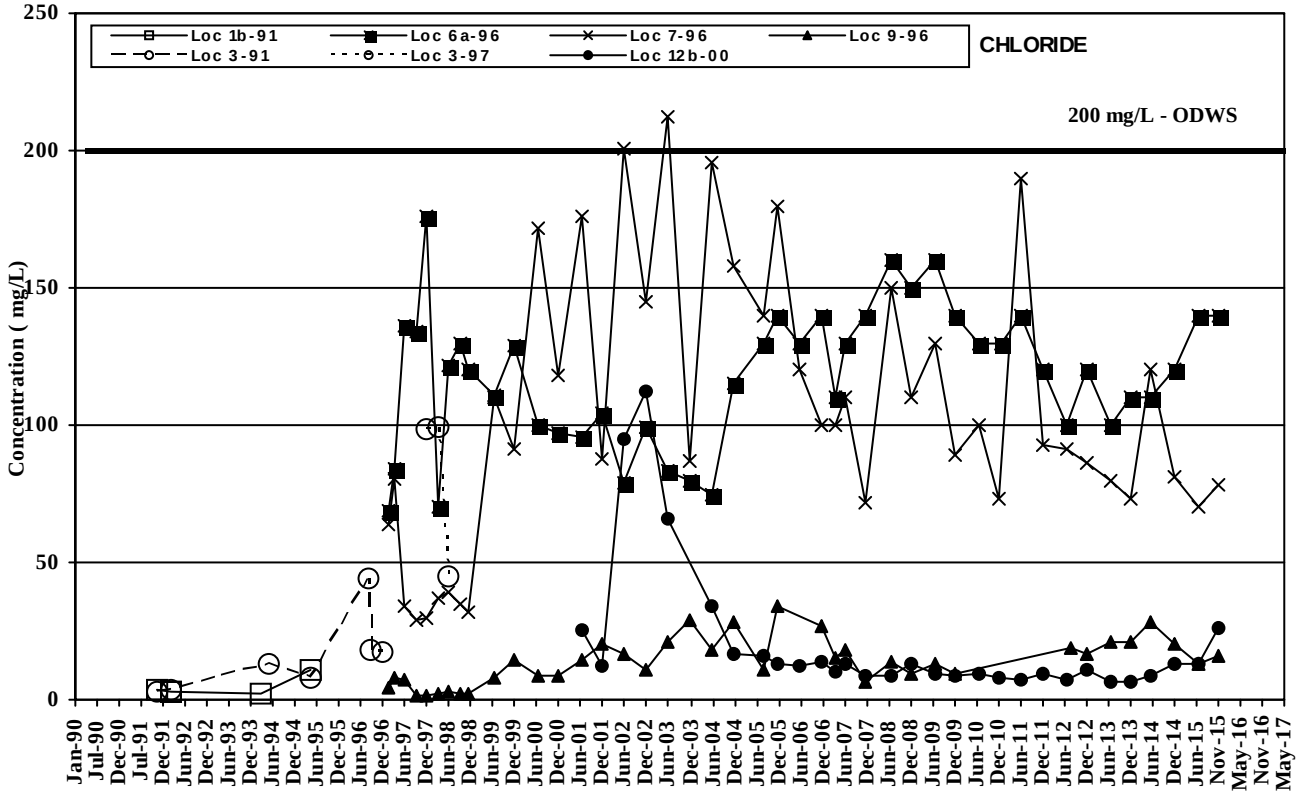
	Date	Lab	pH	Cond-uctivity	Alk mg/L	Mg mg/L	K mg/L	BOD mg/L	COD mg/L	TKN mg/L	NH3-N mg/L	Total-P mg/L	SO4 mg/L	Phenol ug/L	Cl mg/L	Na mg/L	Ca mg/L	Fe mg/L	B mg/L	P mg/L	Zn mg/L	NO2 mg/L	NO3 mg/L
Monitor	6/25/2008	MAX																					
21A-08	6/25/2008	MAX																					
Bedrock	6/25/2008	N/A																					
	6/25/2008	N/A																					
	12/9/2008	MAX	8.1	820	284	32	1.2	< 2	8	0.5	< 0.05	< 0.02	49	< 1	54	34	86	<0.02	0.013	<0.1	0.22	0.02	6.2
	6/25/2009	MAX	7.8	583	261	26	0.89	< 2	6	0.3	< 0.05	< 0.02	30	< 1	5	13	78	<0.02	0.015	<0.1	0.26	<0.01	4.8
	12/15/2009	MAX	7.8	776	277	29	1.1	< 2	4	0.3	< 0.05	0.02	39	< 1	47	33	86	0.05	0.018	<0.1	0.32	<0.01	6.3
	6/25/2010	MAX	8	589	262	25	0.87	< 2	4	0.4	< 0.05	< 0.02	26	< 1	8	13	75	<0.02	0.012	<0.1	0.29	<0.01	4.3
	12/22/2010	MAX	7.79	660	278	29	1.1	< 2	< 4	0.3	< 0.05	< 0.02	32	< 1	18	19	87	<0.02	0.01	<0.1	0.29	<0.01	5.1
	6/14/2011	MAX	7.85	557	263	26	0.86	< 2	15	0.5	< 0.05	< 0.02	21	< 1	4	7.5	79	<0.02	0.02	<0.1	0.36	<0.01	3.1
	12/14/2011	MAX	8.07	619	278	26	1	< 2	15	2	< 0.05	0.14	27	< 1	10	14	79	0.83	<0.01	<0.1	0.31	<0.01	3.5
	6/18/2012	MAX	7.93	570	260	24	0.88	< 2	12	0.26	< 0.05	< 0.02	24	< 1	6	9.8	73	0.44	<0.01	<0.1	0.31	<0.01	2.9
	12/10/2012	MAX	7.81	650	290	28	1.1	< 2	< 4	0.34	< 0.05	< 0.02	28	< 1	19	18	84	0.07	0.011	<0.1	0.36	<0.01	3.1
	6/19/2013	MAX	8.23	560	270	23	0.8	< 2	6.1	0.41	< 0.05	0.032	19	< 1	4	6.9	71	0.97	0.014	<0.1	0.31	<0.01	1.9
	12/3/2013	MAX	7.76	570	280	27	1.1	< 2	5.5	0.54	0.25	0.039	20	14	6	10	80	<0.02	0.016	<0.1	0.27	<0.01	2.1
	5/20/2014	MAX	7.85	580	280	25	0.82	< 2	5.6	0.15	< 0.05	< 0.02	23	< 1	8	8.9	80	0.29	0.012	<0.1	0.35	<0.01	2.32
	12/3/2014	MAX	7.94	630	280	27	1	< 2	< 4	0.34	< 0.05	< 0.02	21	< 1	22	20	80	<0.02	0.017	<0.1	0.38	<0.01	1.88
	6/22/2015	MAX	7.74	580	280	25	0.96	< 2	7.1	0.35	< 0.05	< 0.02	20	< 1	12	11	77	0.42	0.015	<0.1	0.34	<0.01	1.57
	12/7/2015	MAX	7.86	620	280	28	1	< 2	< 4	0.25	< 0.05	< 0.02	24	< 1	16	16	81	0.11	<0.01	<0.1	0.35	<0.01	1.77
Monitor	12/19/2011	MAX	7.88	769	212	35	1.6	< 2	< 4	0.9	< 0.05	0.14	89	< 1	56	16	110	1.3	0.015	0.16	0.015	<0.01	<0.1
22A-11	6/19/2012	MAX	7.96	990	260	20	1.5	< 2	10	<0.1	0.1	< 0.02	25	< 1	130	78	94	0.19	0.024	<0.1	0.015	<0.01	4
Bedrock	12/11/2012	MAX	7.82	780	240	31	1.4	< 2	< 4	0.11	< 0.05	0.029	93	< 1	49	16	100	0.89	0.023	<0.1	<0.005	<0.01	<0.1
	6/17/2013	MAX	8.22	780	230	31	1.3	< 2	< 4	0.26	0.062	0.055	88	< 1	49	16	88	1.2	0.02	<0.1	0.006	<0.01	<0.1
	12/4/2013	MAX	7.86	770	240	33	2.3	< 2	7.1	0.35	0.14	0.11	85	< 1	55	17	93	1.2	0.025	0.18	0.01	0.023	0.12
	5/21/2014	MAX	7.95	760	230	32	1.6	< 2	< 4	0.35	0.058	0.21	88	< 1	48	15	99	0.28	0.022	0.22	0.025	0.033	<0.1
	12/2/2014	MAX	7.97	770	240	32	1.5	< 2	< 4	0.25	0.15	0.32	85	< 1	47	15	97	2.1	0.025	<0.1	<0.005	0.021	<0.1
	6/16/2015	MAX	8.01	760	240	33	1.5	< 2	5.1	0.12	< 0.05	0.081	87	< 1	49	16	99	0.7	0.023	<0.1	<0.005	0.01	<0.1
	12/3/2015	MAX	7.66	780	230	32	1.5	< 2	< 4	0.14	< 0.05	0.035	86	< 1	50	17	90	0.72	0.022	<0.1	0.0052	<0.01	<0.1
Monitor	12/19/2011	MAX	7.83	817	299	24	1.6	< 2	< 4	0.3	< 0.05	0.03	25	< 1	57	43	110	0.21	0.014	<0.1	0.021	<0.01	3.7
22B-11	6/19/2012	MAX	7.97	770	230	32	1.3	< 2	9.8	0.43	< 0.05	0.04	83	< 1	46	13	96	1.4	0.019	<0.1	<0.005	<0.01	<0.1
Outwash	12/11/2012	MAX	7.82	870	340	22	1.5	< 2	< 4	0.46	< 0.05	< 0.02	26	< 1	59	48	110	0.28	0.024	<0.1	0.012	<0.01	3.5
	6/17/2013	MAX	7.89	1100	240	22	1.7	< 2	< 4	0.69	< 0.05	< 0.02	28	< 1	150	93	100	0.23	0.028	<0.1	0.013	<0.01	3.9
	12/4/2013	MAX	7.85	910	300	19	1.6	< 2	7.5	0.44	< 0.05	< 0.02	23	< 1	98	83	84	<0.02	0.025	<0.1	0.021	<0.01	3
	5/21/2014	MAX	7.83	1100	270	22	1.8	< 2	21	0.5	< 0.05	< 0.02	28	< 1	140	84	100	<0.02	0.022	<0.1	0.017	0.014	4.13
	12/2/2014	MAX	7.9	950	340	22	1.9	< 2	< 4	0.21	0.082	< 0.02	21	< 1	96	70	110	0.05	0.031	<0.1	0.015	0.02	2.94
	6/16/2015	MAX	7.95	1200	280	26	2	< 2	< 4	0.66	< 0.05	< 0.02	20	< 1	170	93	120	0.05	0.026	<0.1	0.018	<0.01	3.93
	12/3/2015	MAX	7.64	870	280	23	1.5	< 2	< 4	0.12	< 0.05	< 0.02	45	< 1	75	41	100	0.2	0.024	<0.1	0.014	<0.01	0.32
Monitor	7/5/2012	MAX	7.8	700	230	28	0.95	< 2	4.8	<0.1	< 0.05	< 0.02	100	< 1	24	11	85	0.49	0.026	<0.1	<0.005	<0.01	<0.1
23A-12	12/17/2012	MAX	7.71	720	250			< 2	< 4	0.29	< 0.05	< 0.02	95	< 1	30			0.13				<0.01	<0.1
Bedrock	12/18/2012	MAX	7.68	720	250	34	1.3	< 2	< 4	0.3	0.063	0.035	93	< 1	30	15	97	0.13	0.014	<0.1	<0.005	<0.01	<0.1
	6/18/2013	MAX	7.99	710	230	32	1.2	< 2	< 4	0.23	0.052	< 0.02	100	< 1	25	12	96	0.15	0.024	<0.1	<0.005	<0.01	<0.1
	12/5/2013	MAX	7.86	720	240	34	1.3	< 2	9.4	0.28	< 0.05	< 0.02	90	< 1	30	14	96	0.12	0.024	<0.1	<0.005	<0.01	<0.1
	5/22/2014	MAX	7.91	710	240	31	1.2	< 2	< 4	0.39	< 0.05	< 0.02	92		31	14	93	0.13	0.024	<0.1	0.012	<0.01	<0.1
	12/4/2014	MAX	7.9	700	230	33	1.3	< 2	< 4	<0.1	0.066	< 0.02	96	< 1	24	12	95	0.14	0.024	<0.1	<0.005	<0.01	<0.1
	6/17/2015	MAX	7.89	700	230	30	1.2	< 2	< 4	0.1	< 0.05	< 0.02	110	< 1	25	12	84	0.17	0.02	<0.1	<0.005	<0.01	<0.1
	12/4/2015	MAX	7.95	710	230	32	1.2	< 2	< 4	<0.1	< 0.05	< 0.02	100	< 1	24	12	90	0.14	0.019	<0.1	<0.005	<0.01	<0.1

Routine Groundwater Quality - General Analysis -Guelph WRIC & Waste Transfer Station

AECOM

	Date	Lab	pH	Cond-uctivity	Alk mg/L	Mg mg/L	K mg/L	BOD mg/L	COD mg/L	TKN mg/L	NH3-N mg/L	Total-P mg/L	SO4 mg/L	Phenol ug/L	Cl mg/L	Na mg/L	Ca mg/L	Fe mg/L	B mg/L	P mg/L	Zn mg/L	NO2 mg/L	NO3 mg/L
Monitor	7/5/2012	MAX	7.83	1200	320	35	4.6	< 2	74	<1	0.075	5.6	35	< 1	150	79	96	120	0.094	<0.1	0.039	0.054	3.7
23B-12	7/19/2012	MAX	7.75	1400	330	40	5	< 2	12	0.75	0.088	0.6	29	< 1	190	120	120	27	0.061	<0.1	0.18	0.011	3.5
Outwash	12/18/2012	MAX	7.65	1300	380	35	4.2	< 2	23	<0.5	0.074	1.2	36	< 1	140	120	130	26	0.59	<0.1	0.22	<0.01	4.8
	6/18/2013	MAX	7.91	1100	320	29	3	< 2	< 4	0.4	< 0.05	0.23	26	< 1	150	83	120	9.9	0.49	<0.1	0.16	<0.01	3.3
	12/5/2013	MAX	7.71	1100	400	33	3.4	< 2	12	1.7	< 0.05	0.41	28	< 1	110	98	130	0.03	0.39	<0.1	0.2	<0.01	3.4
	5/22/2014	MAX	7.72	1200	360	78	2.6	< 2	< 4	0.55	< 0.05	0.24	34	< 1	140	84	240	<0.02	0.71	0.23	0.88	<0.01	3.31
	12/4/2014	MAX	7.82	1400	380	150	5.4	< 2	5	<0.5	< 0.05	0.48	33	< 1	180	140	380	<0.02	0.19	0.52	1.6	0.02	4.59
	6/17/2015	MAX	7.74	1400	320	31	2.7	< 2	4.3	0.75	< 0.05	0.33	29	< 1	210	120	110	15	0.46	<0.1	0.25	<0.01	4.68
	12/4/2015	MAX	7.74	1700	360	34	3.6	< 2	17	0.96	< 0.05	0.51	34	< 1	270	200	130	19	0.12	<0.1	0.35	0.02	4.17





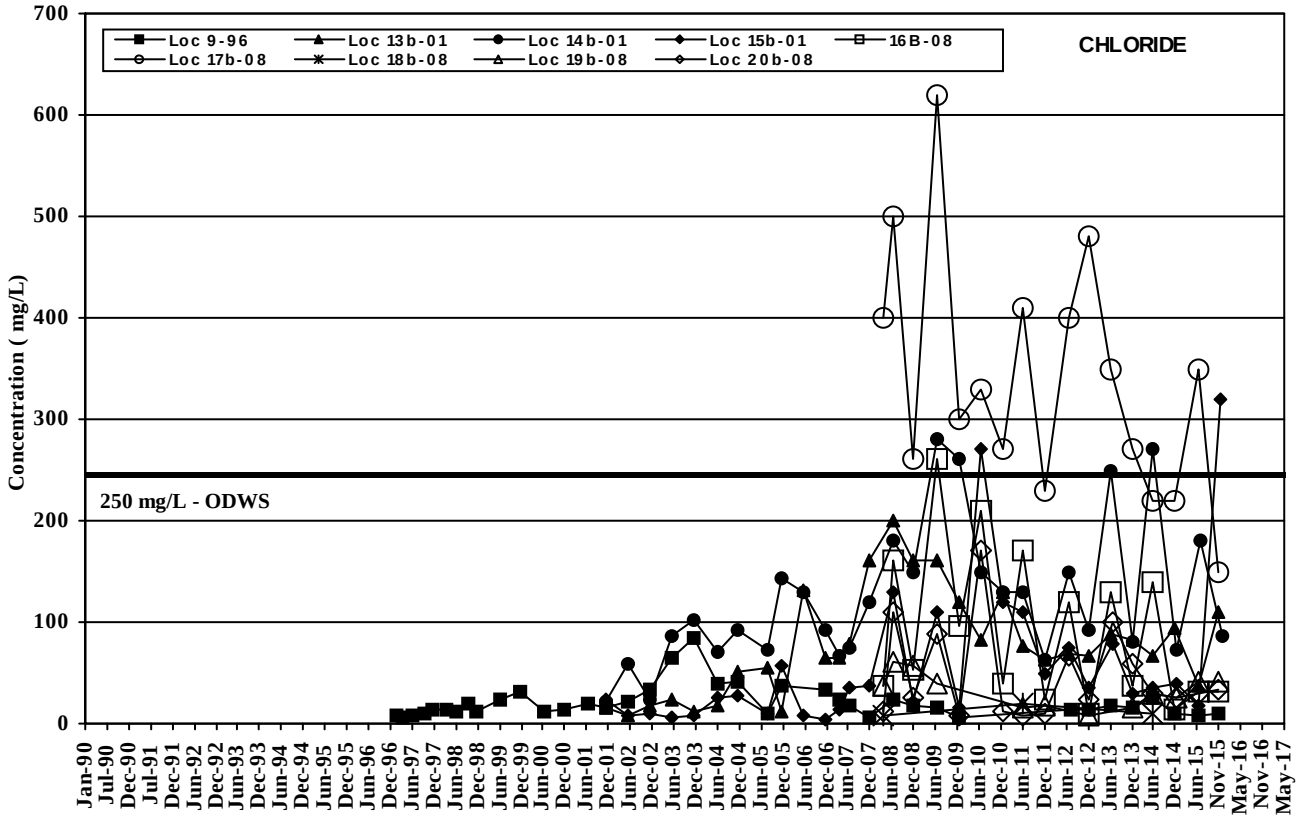
AECOM

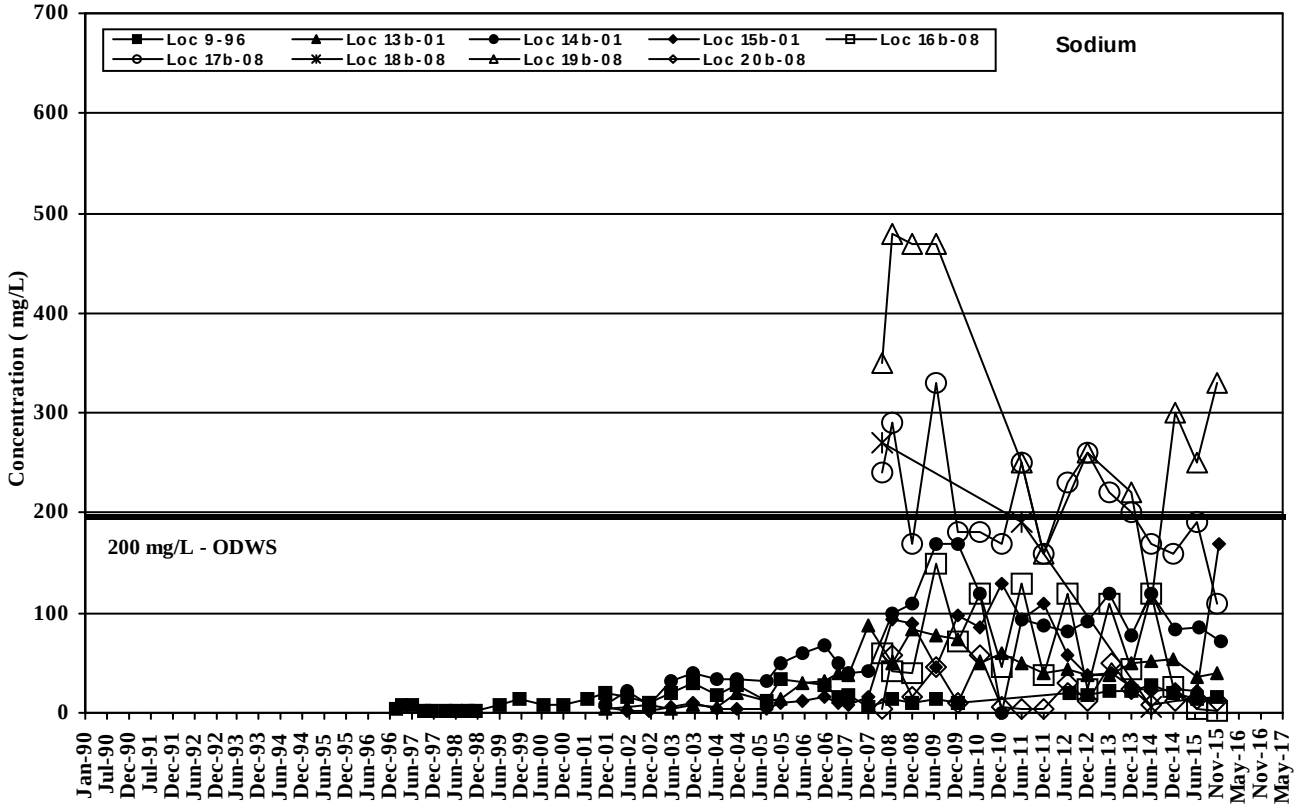
Guelph WRIC & Waste Transfer Station

Ground Water Chemistry Trends
Overburden Locations on Wet/Dry Facility

FIGURE
B1

60487592
12 Cl-NA Location WestOB





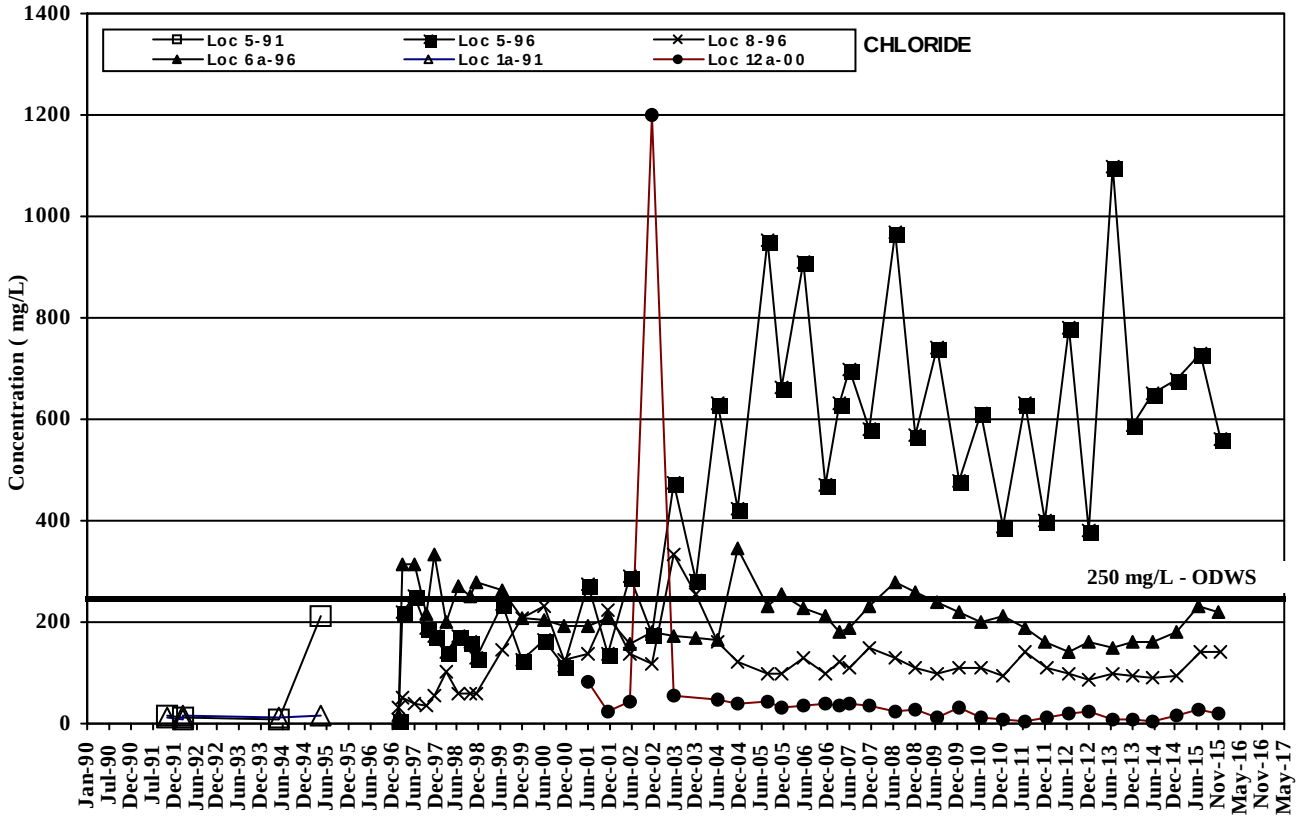
AECOM

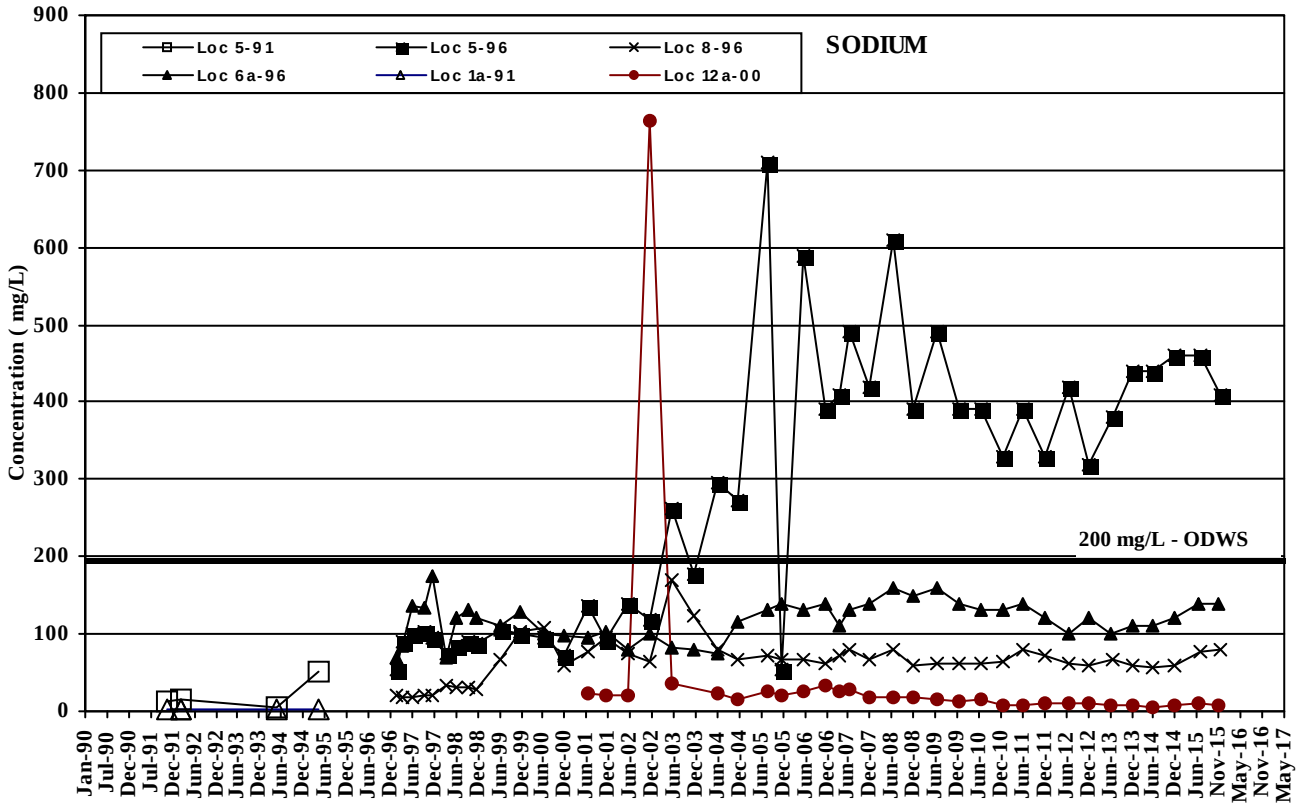
Guelph WRIC & Waste Transfer Station

Ground Water Chemistry Trends
Overburden Locations East of Wet/Dry or Transfer Station Property

FIGURE
B2

60487592
12 Cl-NA Location EastOB





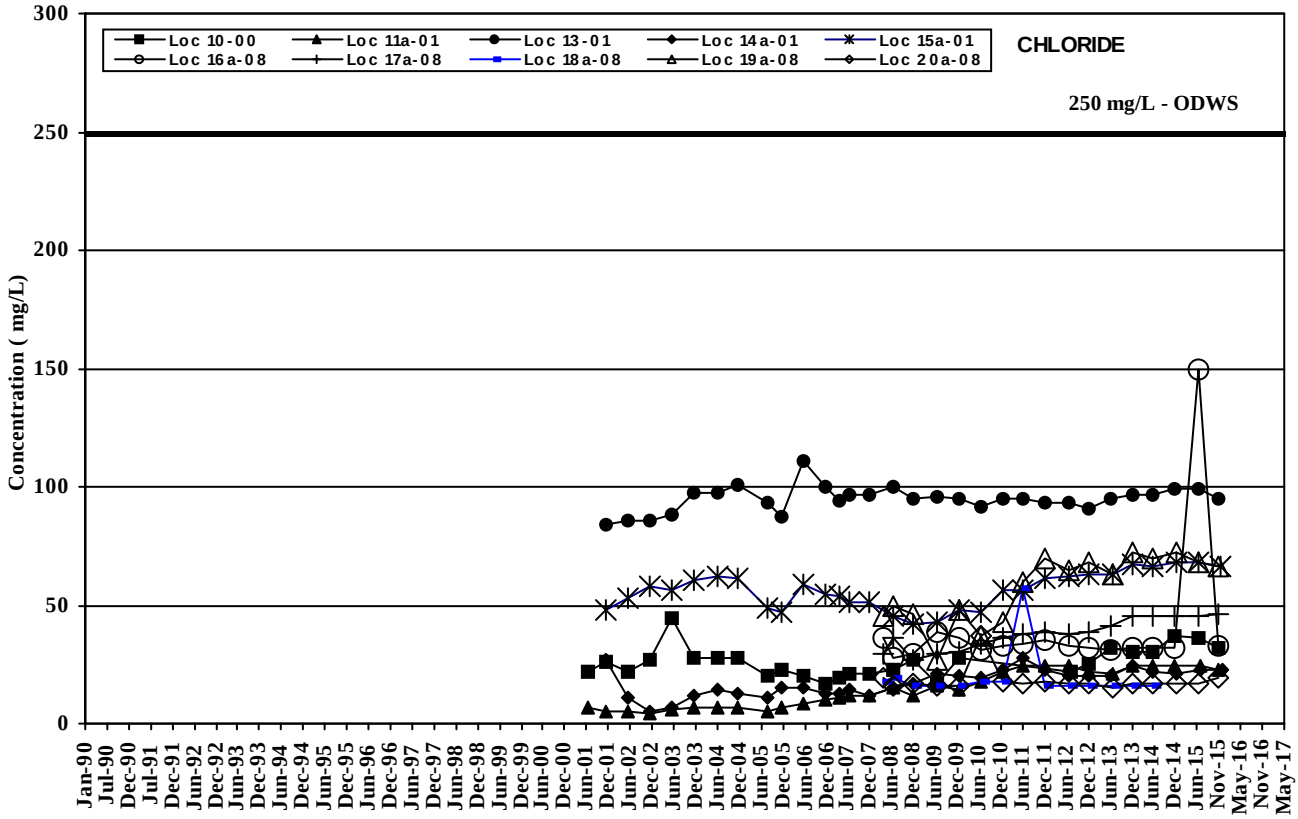
AECOM

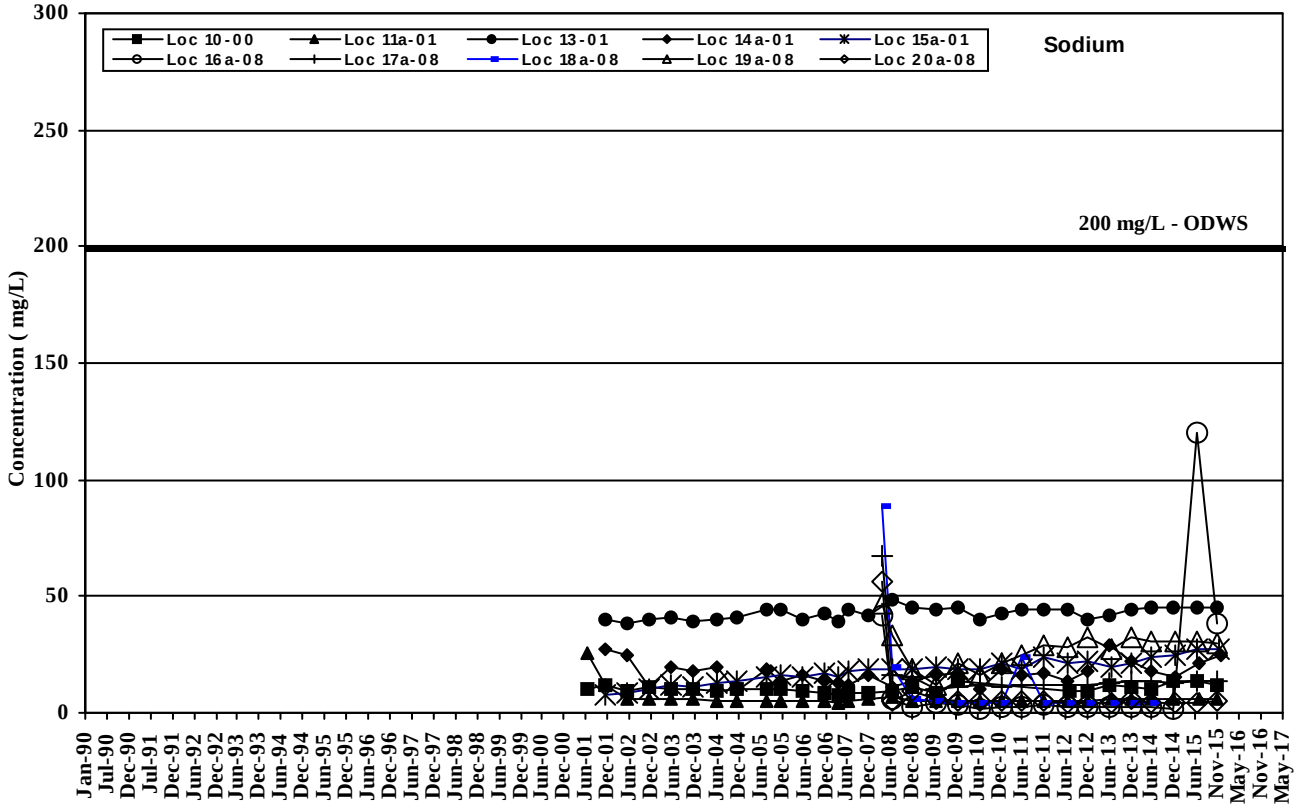
Guelph WRIC & Waste Transfer Station

Ground Water Chemistry Trends
Bedrock Locations West or on Wet/Dry Facility

FIGURE
B3

60487592
12 Cl-NA Location WestBed





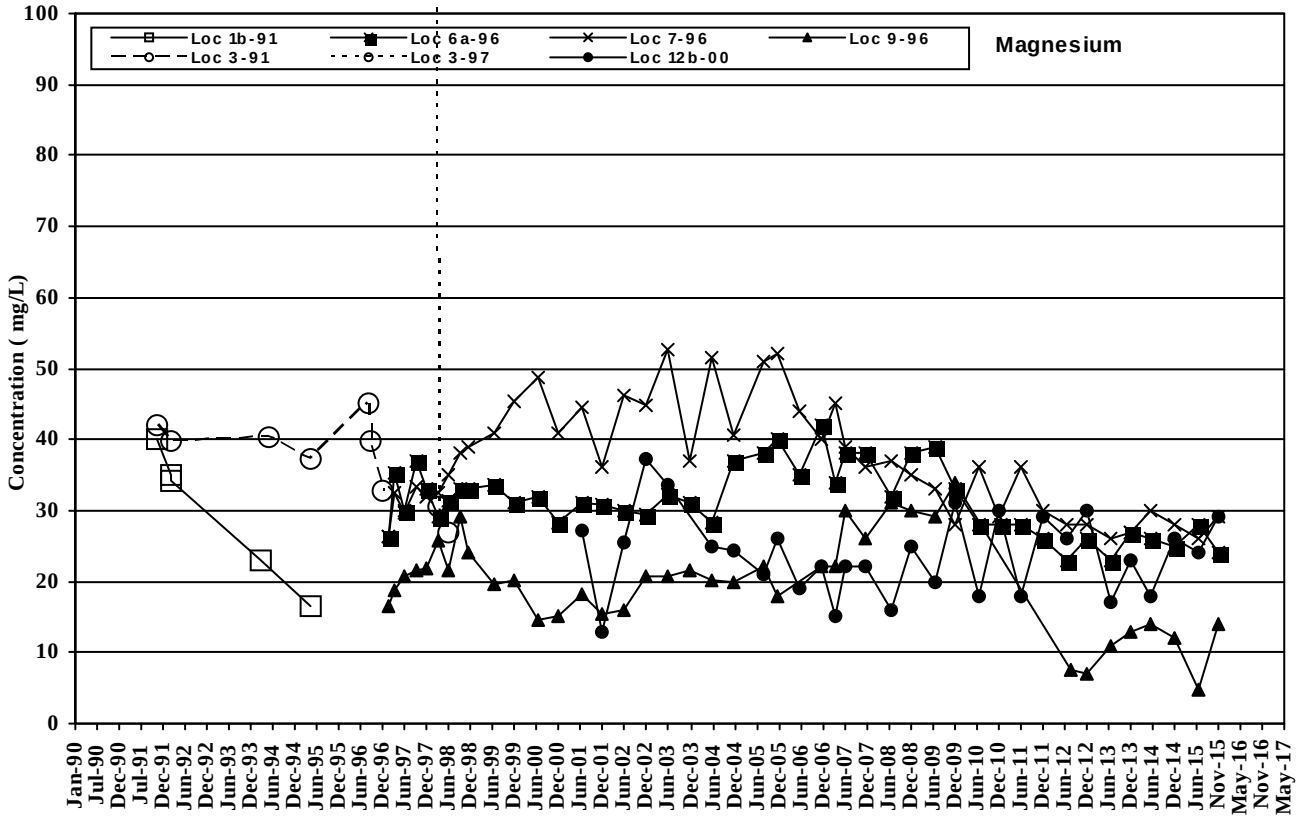
AECOM

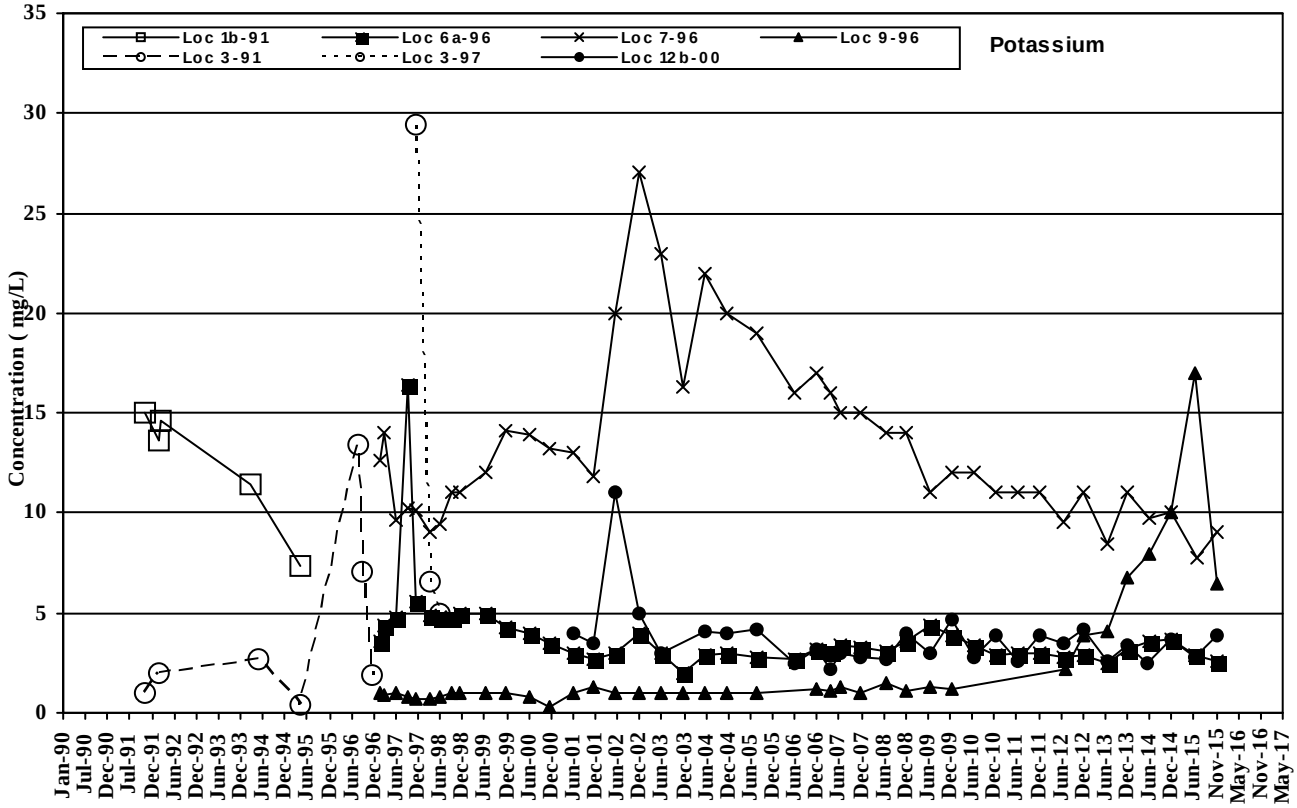
Guelph WRIC & Waste Transfer Station

Ground Water Chemistry Trends
Bedrock Locations East of Wet/Dry or on Transfer Station Property

FIGURE
B4

60487592
12 Cl-NA Location EastBed





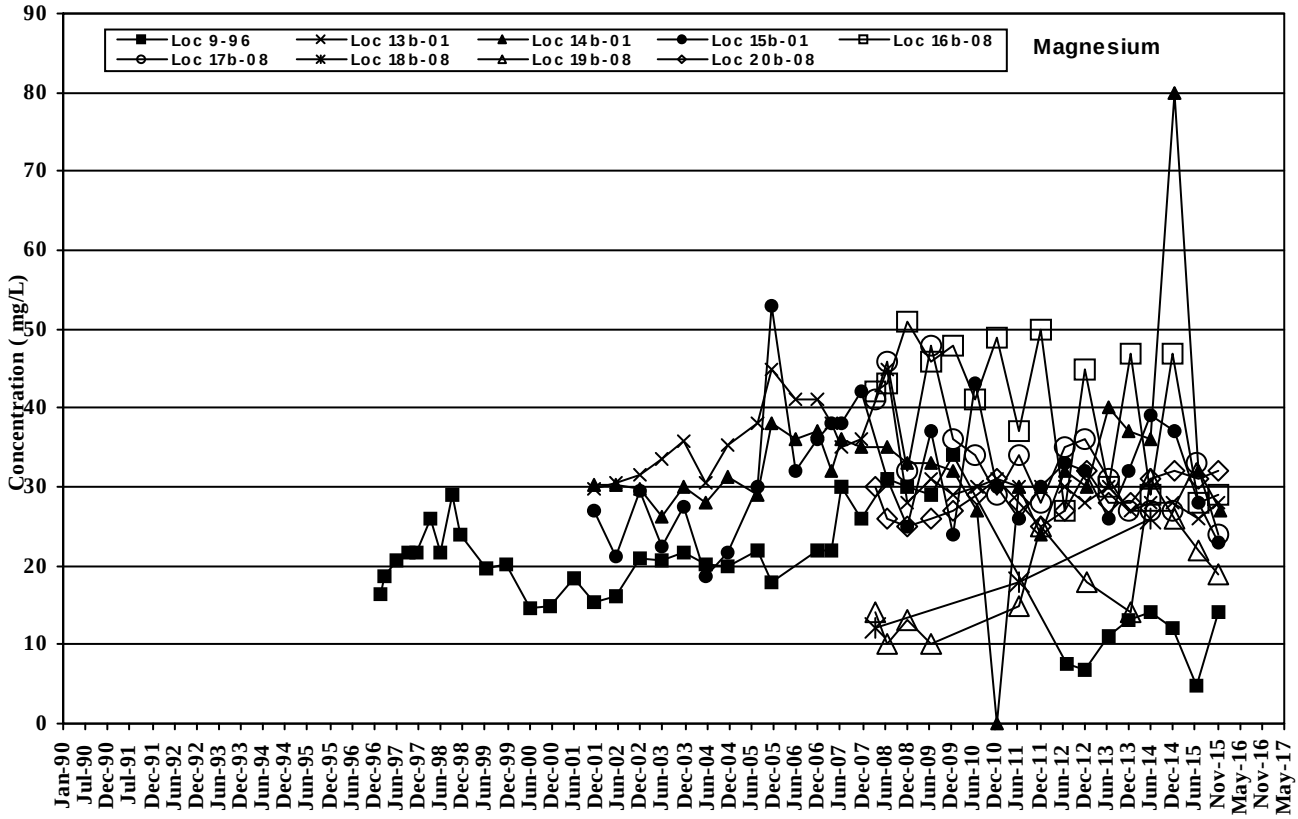
AECOM

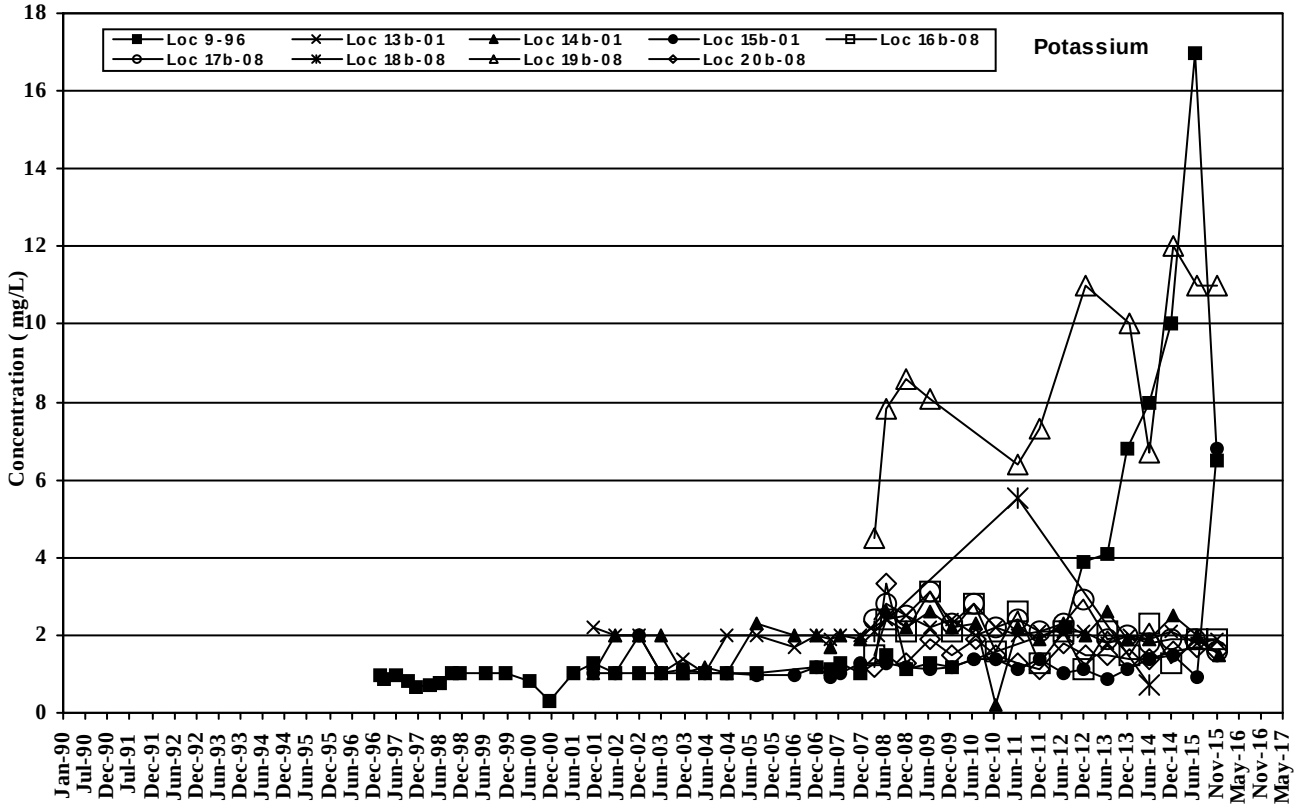
Guelph WRIC & Waste Transfer Station

Ground Water Chemistry Trends
Overburden Locations on Wet/Dry Facility

FIGURE
B5

60487592
12 Mg-K Location WestOB





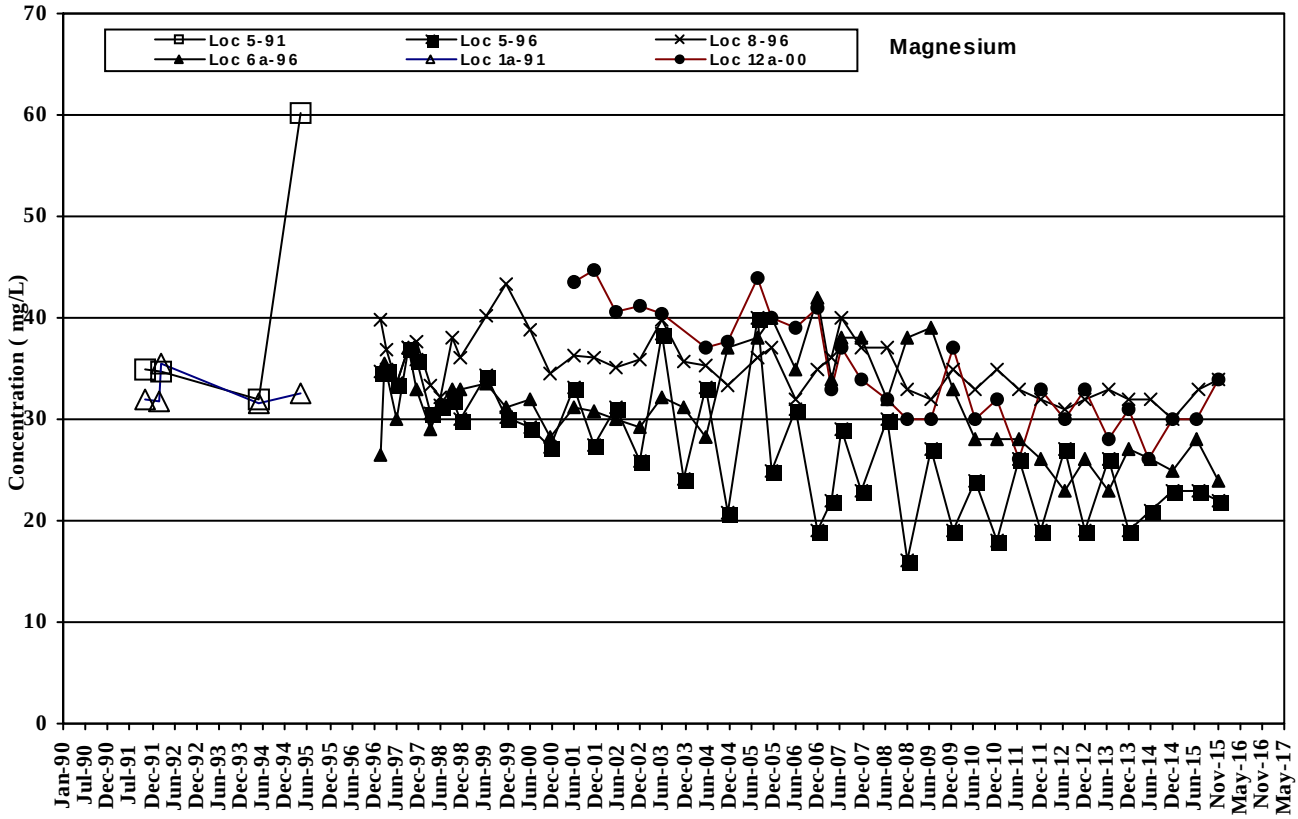
AECOM

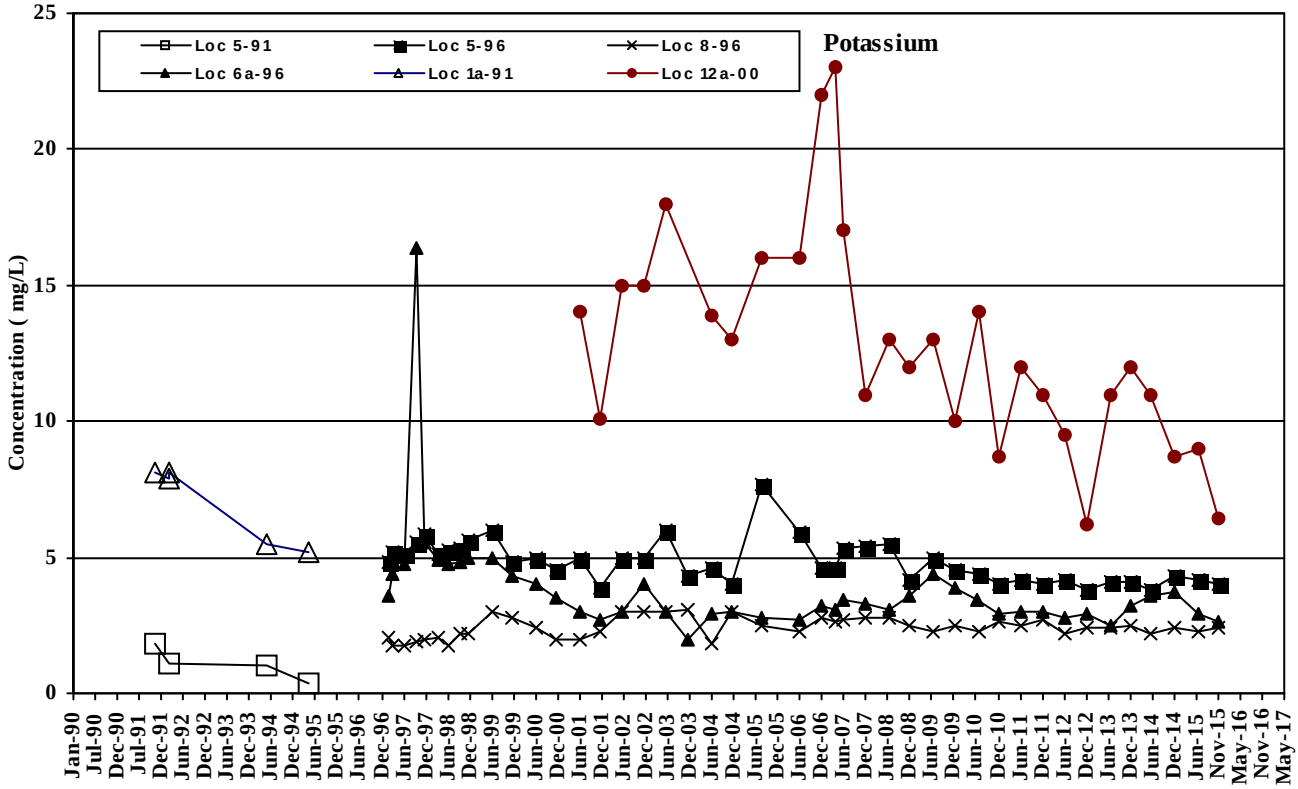
Guelph WRIC & Waste Transfer Station

Ground Water Chemistry Trends
Overburden Locations East of Wet/Dry or Transfer Station Property

FIGURE
B6

60487592
12 Mg-K Location EastOB





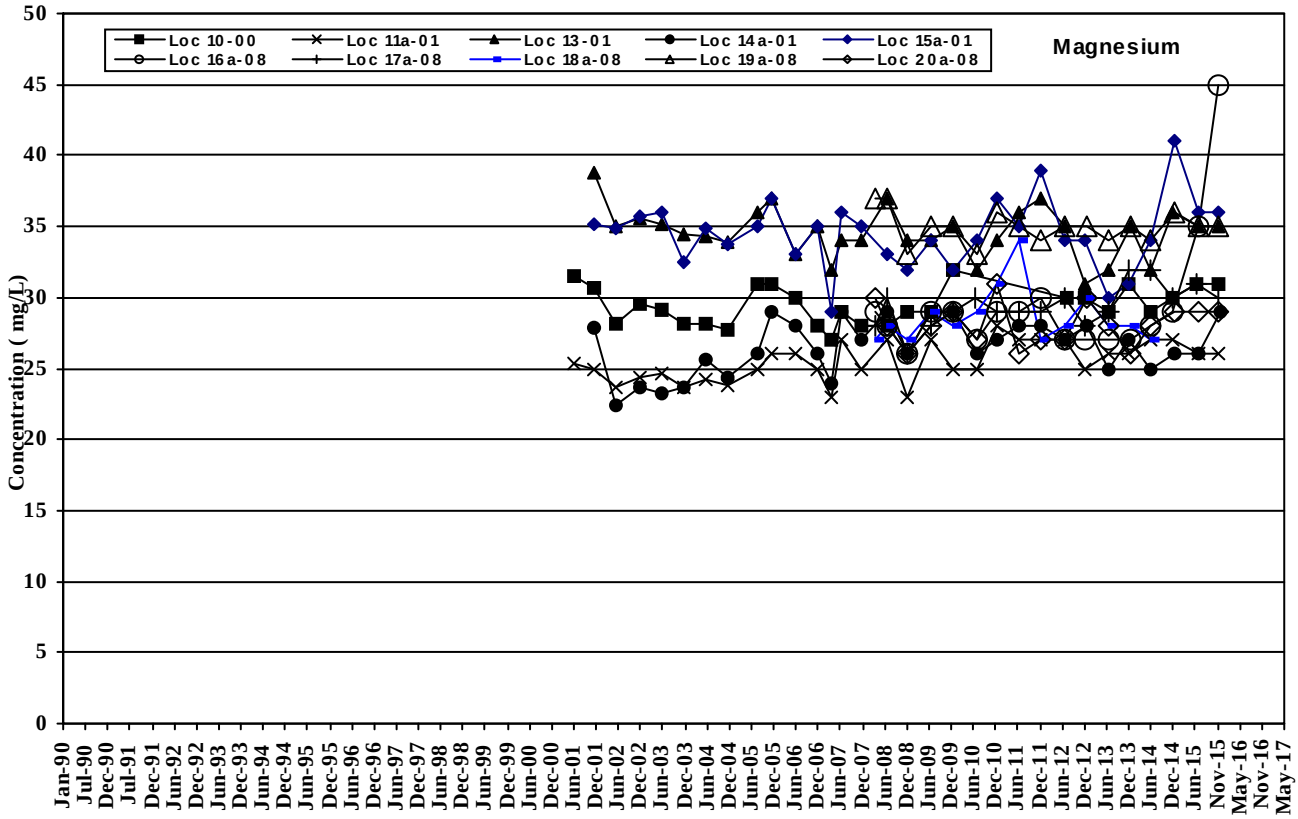
AECOM

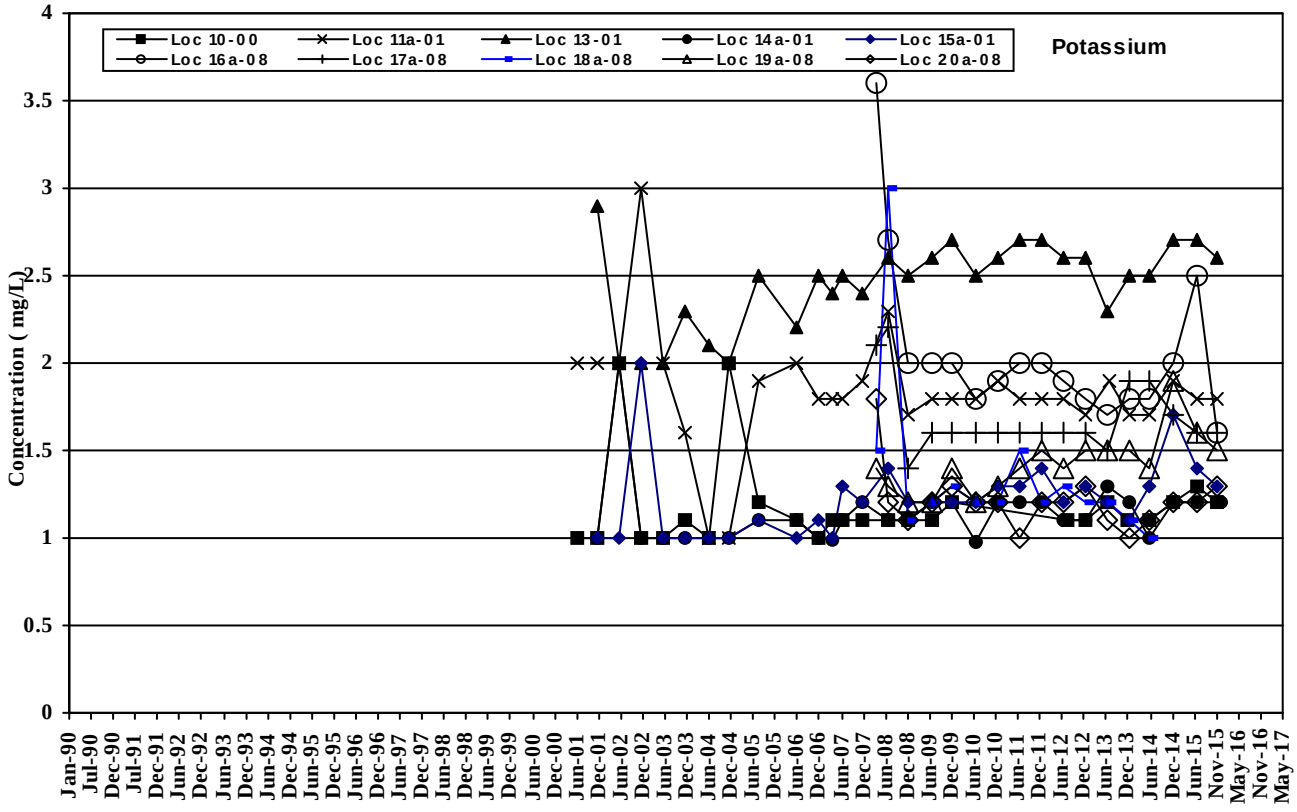
Guelph WRIC & Waste Transfer Station

Ground Water Chemistry Trends
Bedrock Locations West or on Wet/Dry Facility

FIGURE
B7

60487592
12 Mg-K Location WestBed





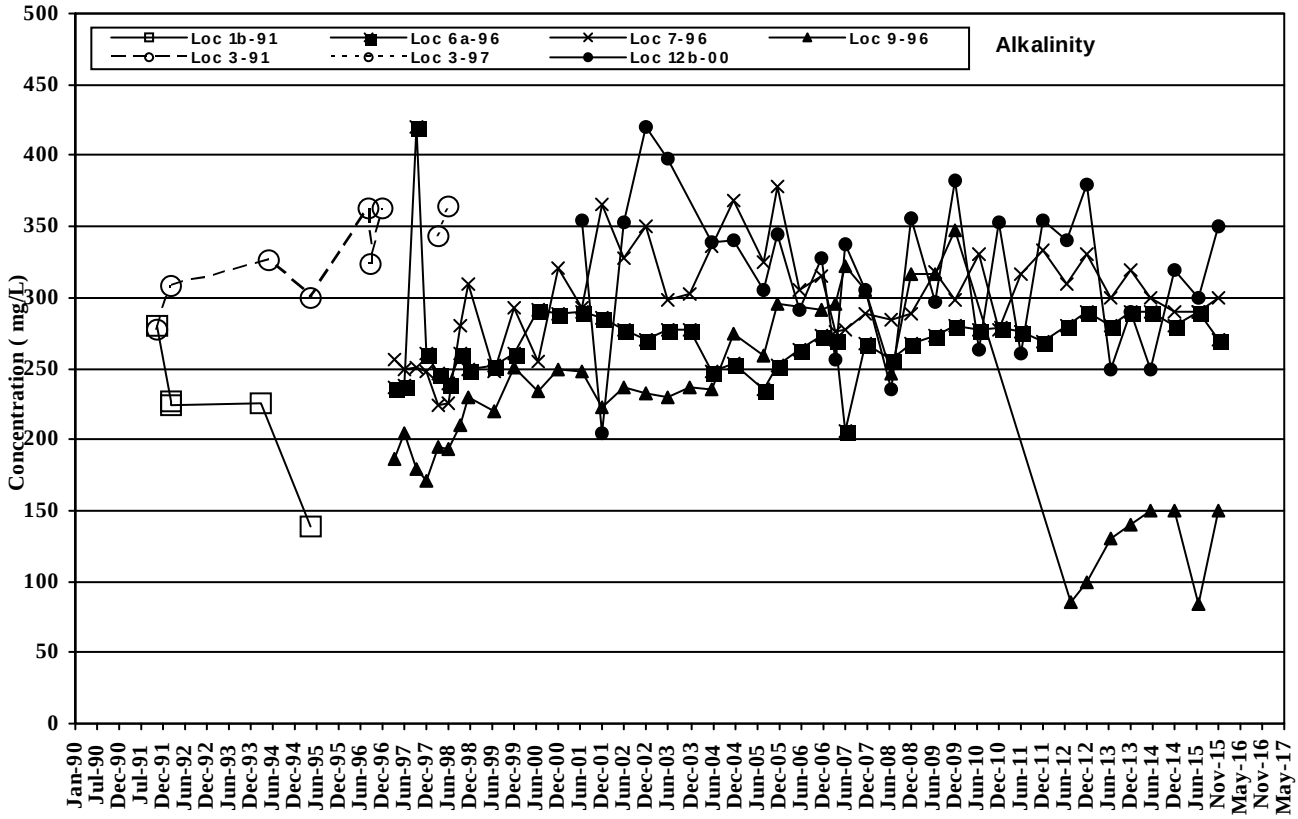
AECOM

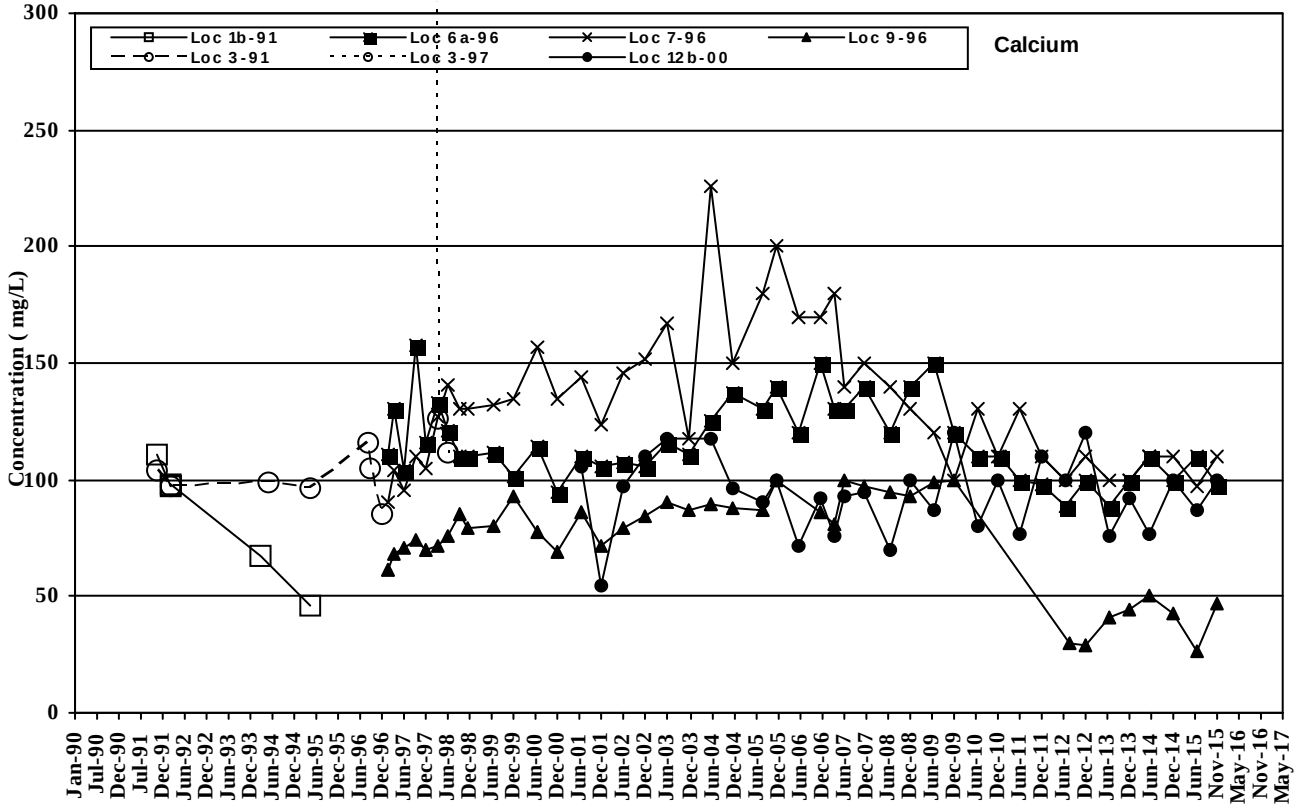
Guelph WRIC & Waste Transfer Station

Ground Water Chemistry Trends
Bedrock Locations East of Wet/Dry or on Transfer Station Property

FIGURE
B8

60487592
12 Mg-K Location EastBed





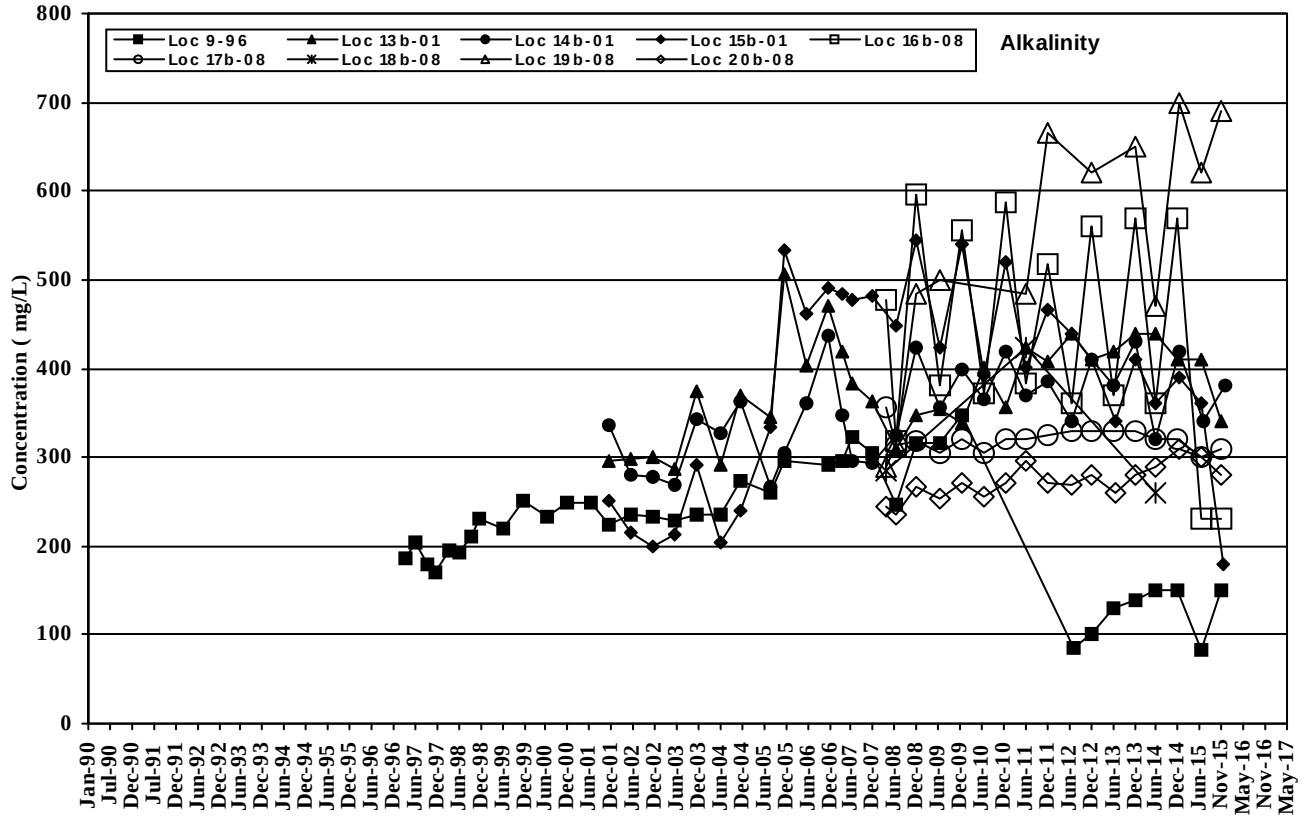
AECOM

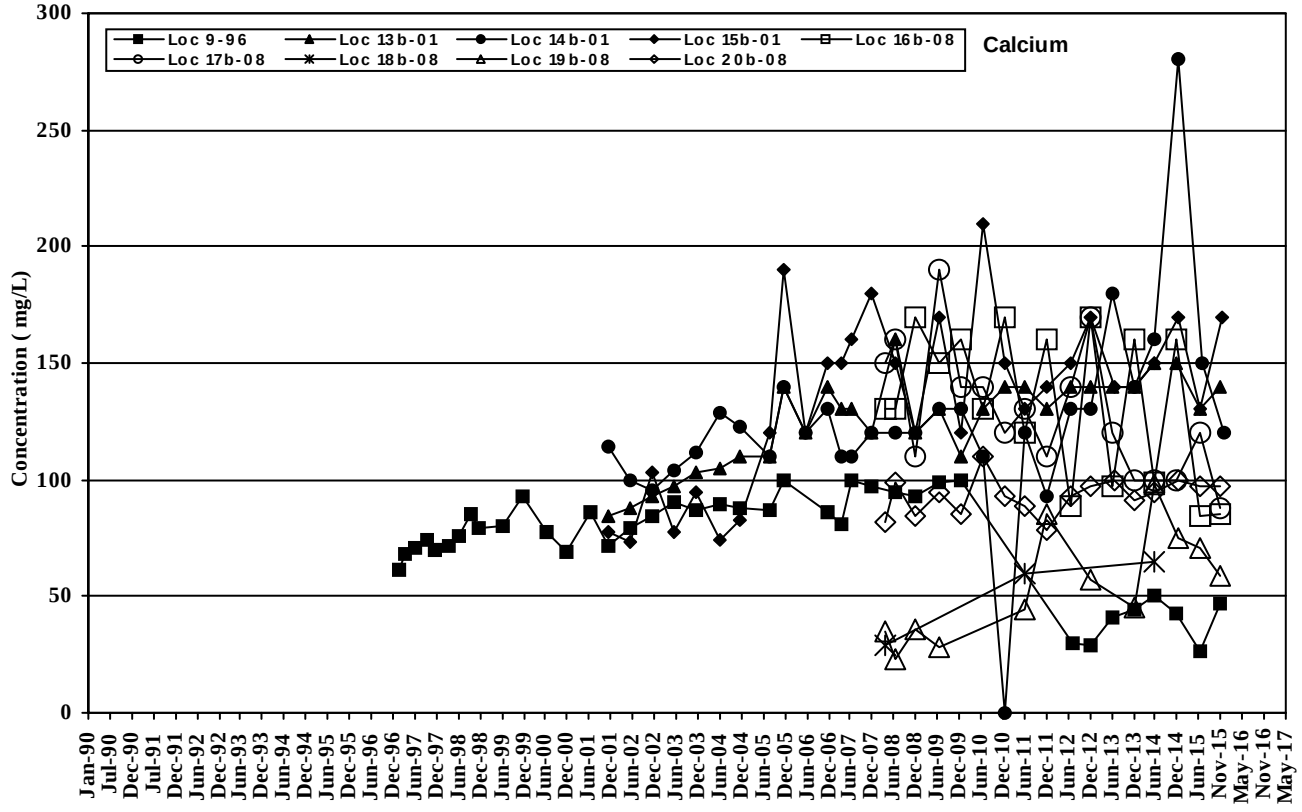
Guelph WRIC & Waste Transfer Station

Ground Water Chemistry Trends
Overburden Locations on Wet/Dry Facility

FIGURE
B9

60487592
12 Alk-Ca Location WestOB





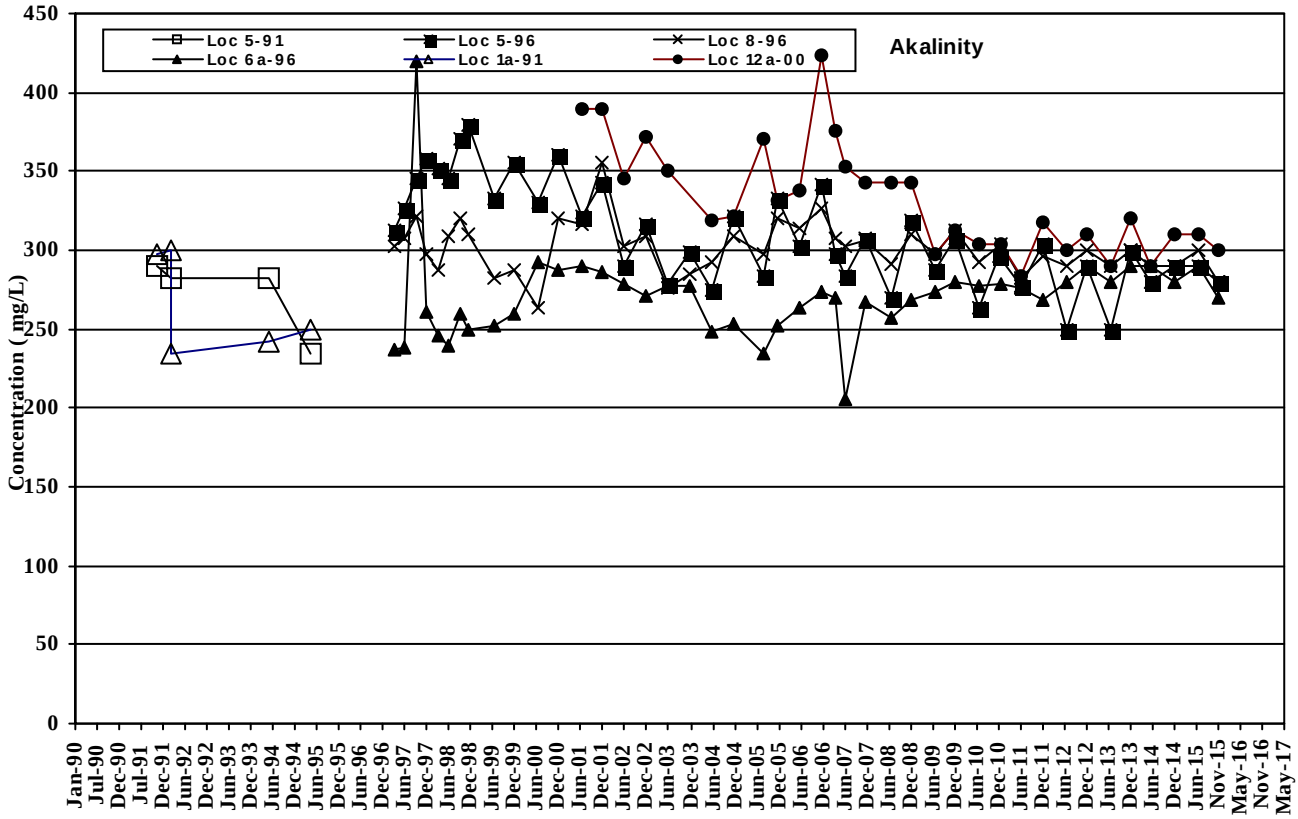
AECOM

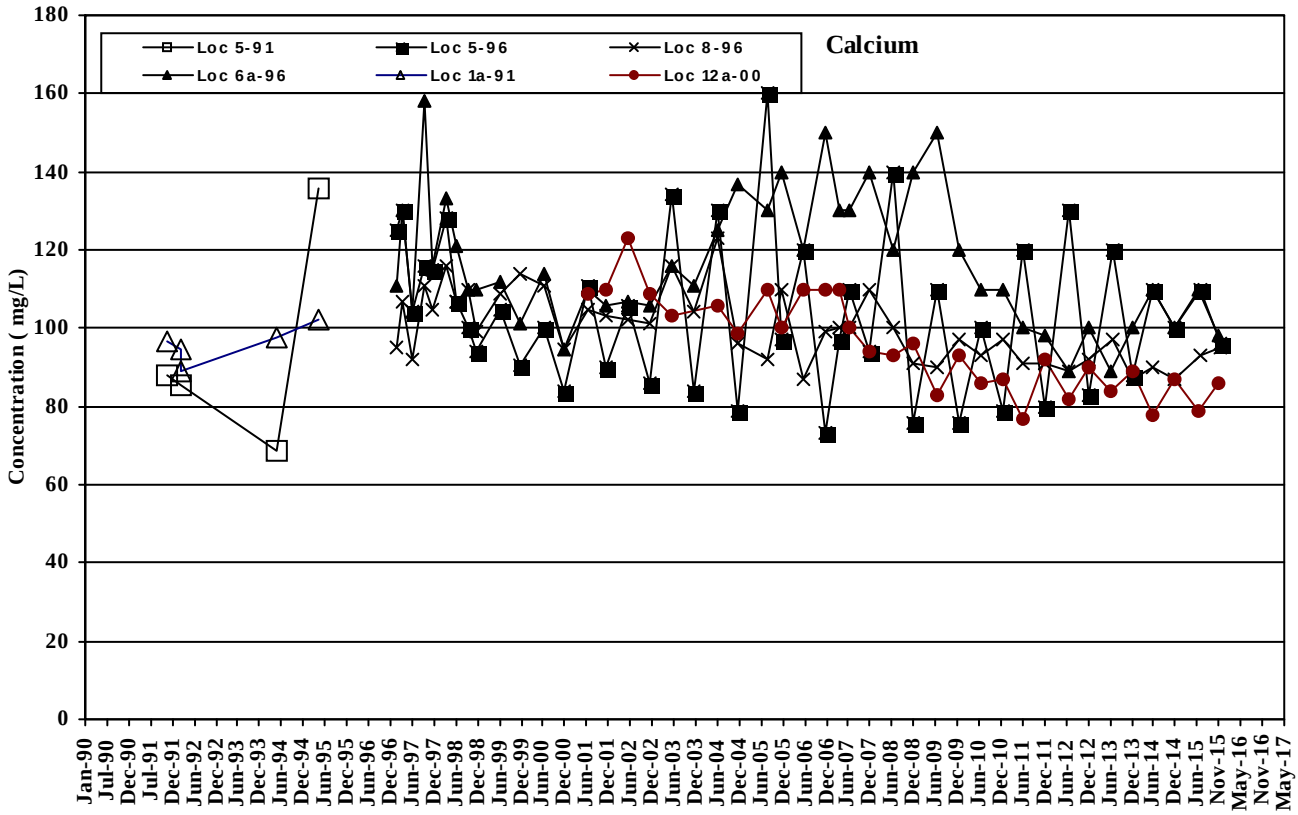
Guelph WRIC & Waste Transfer Station

Ground Water Chemistry Trends
Overburden Locations East of Wet/Dry or Transfer Station Property

FIGURE
B10

60487592
12 Alk-Ca Location EastOB





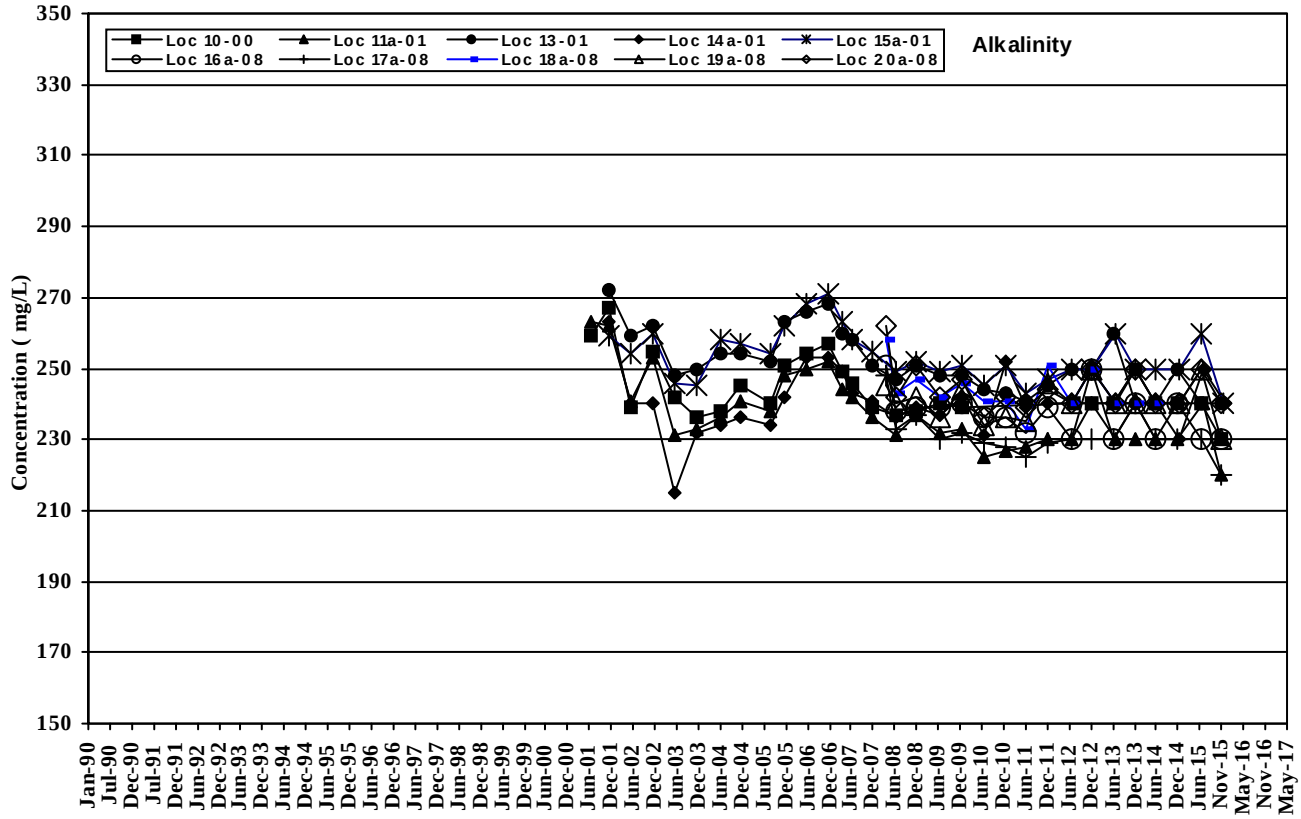
AECOM

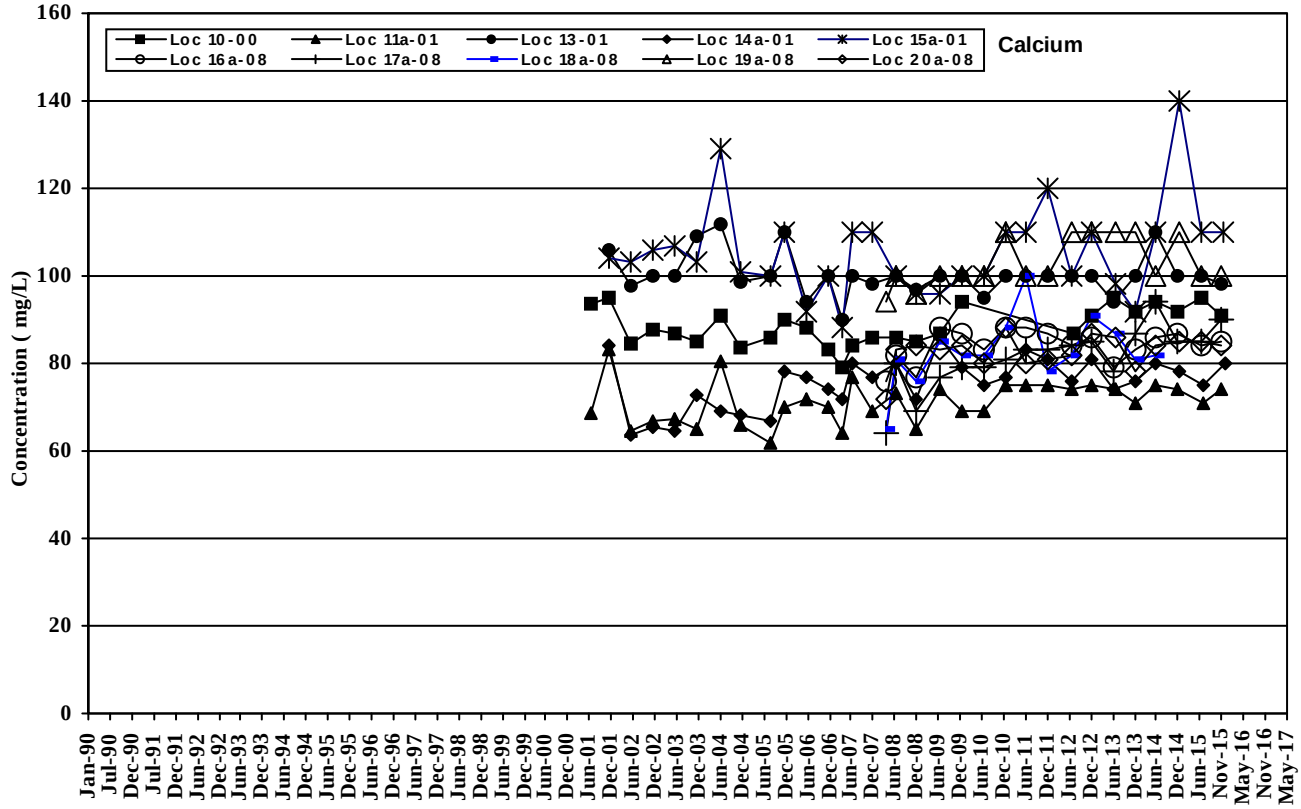
Guelph WRIC & Waste Transfer Station

Ground Water Chemistry Trends
Bedrock Locations West or on Wet/Dry Facility

FIGURE
B11

60487592
12 Alk-Ca Location WestBed





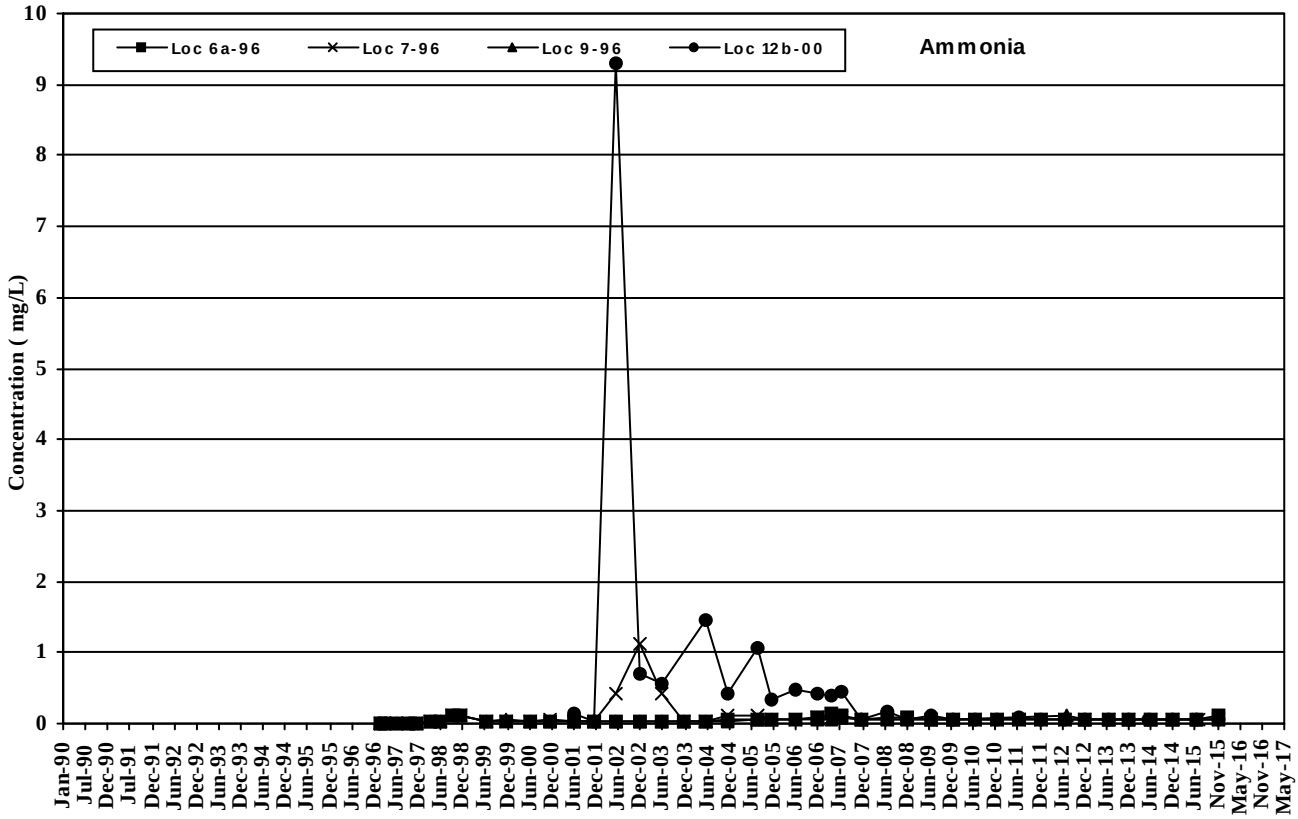
AECOM

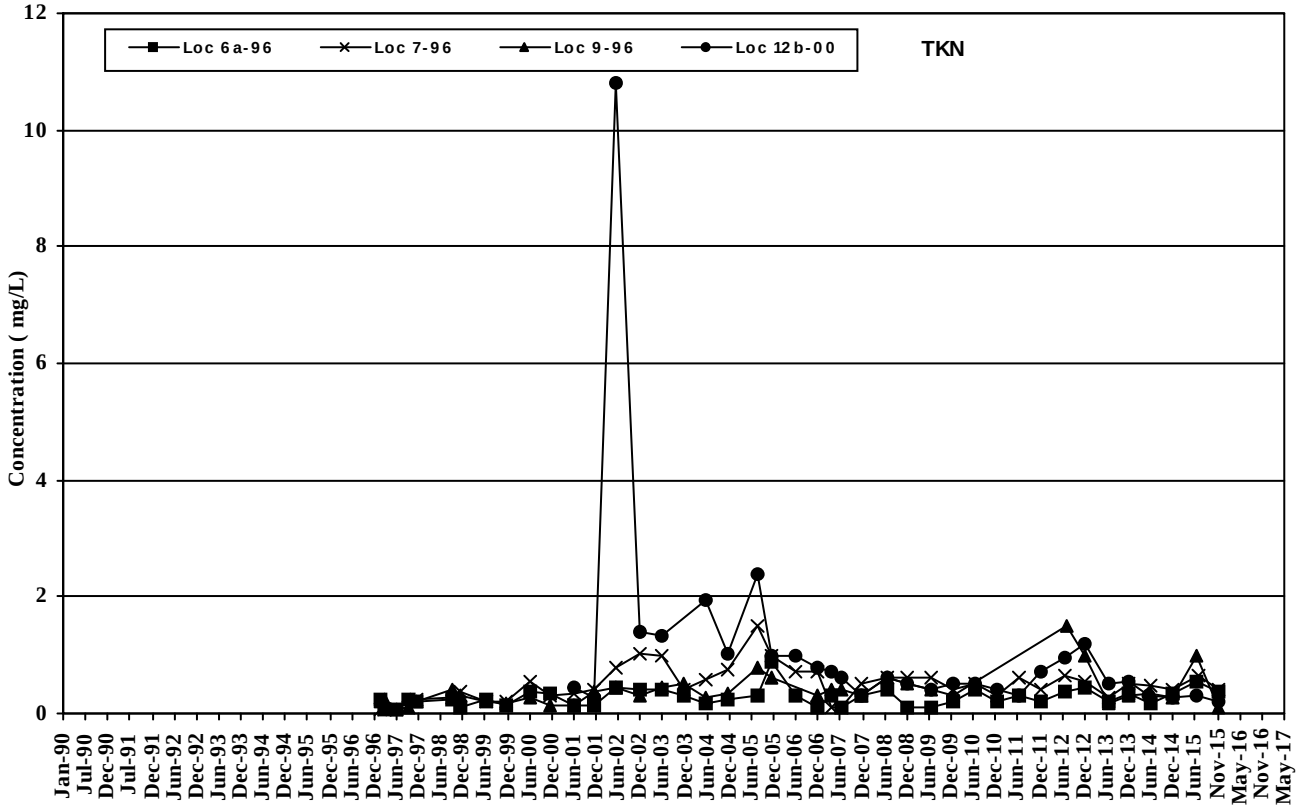
Guelph WRIC & Waste Transfer Station

Ground Water Chemistry Trends
Bedrock Locations East of Wet/Dry or on Transfer Station Property

FIGURE
B12

60487592
12 Alk-Ca Location EastBed





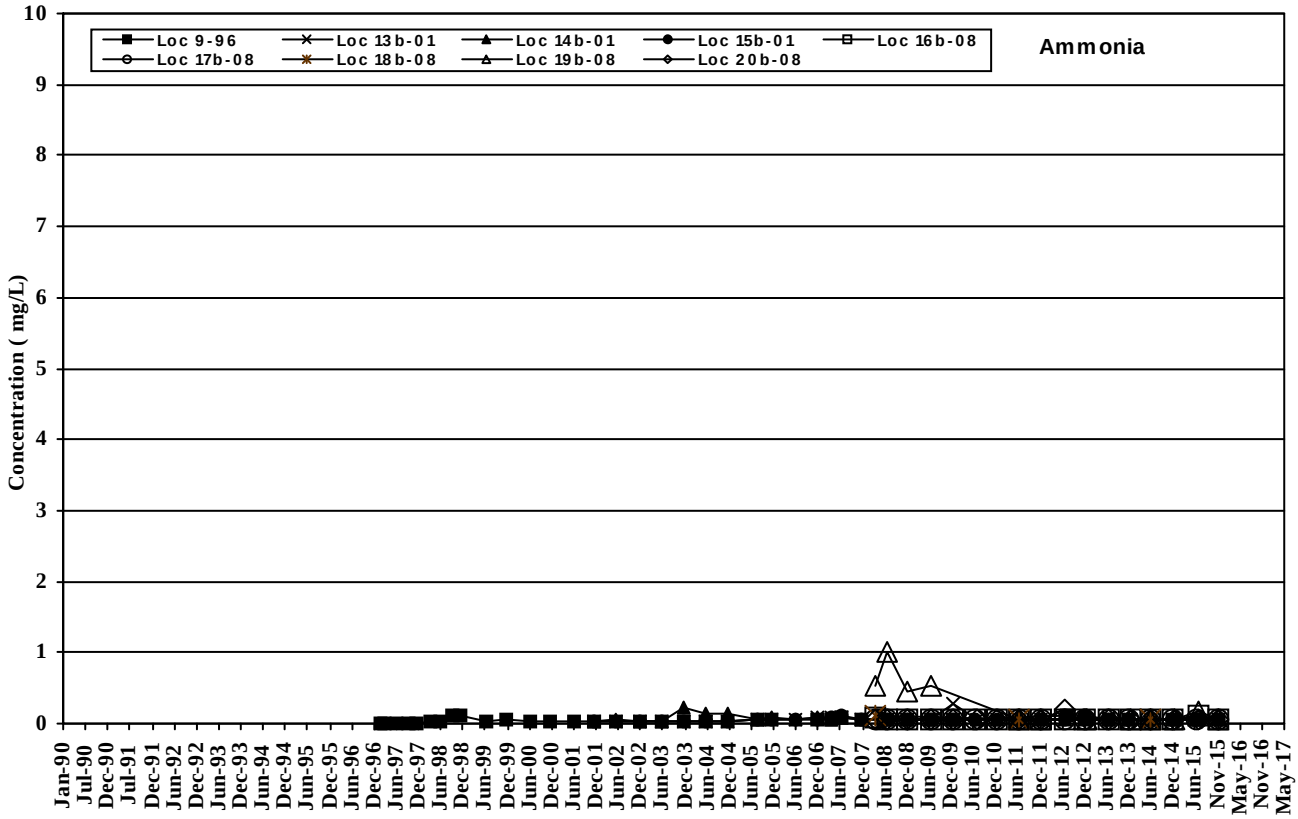
AECOM

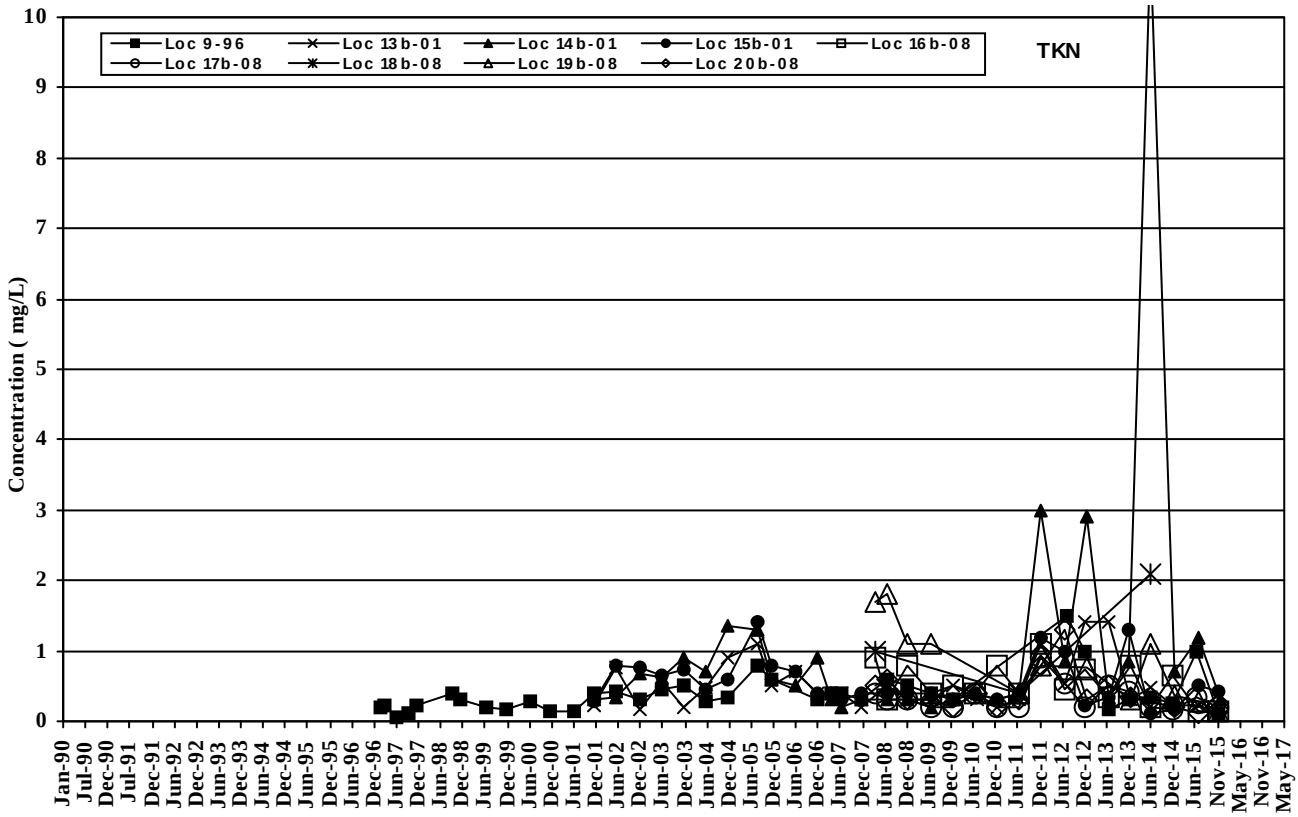
Guelph WRIC & Waste Transfer Station

Ground Water Chemistry Trends
Overburden Locations on Wet/Dry Facility

FIGURE
B13

60487592
12 NH3-TKN Location WestOB





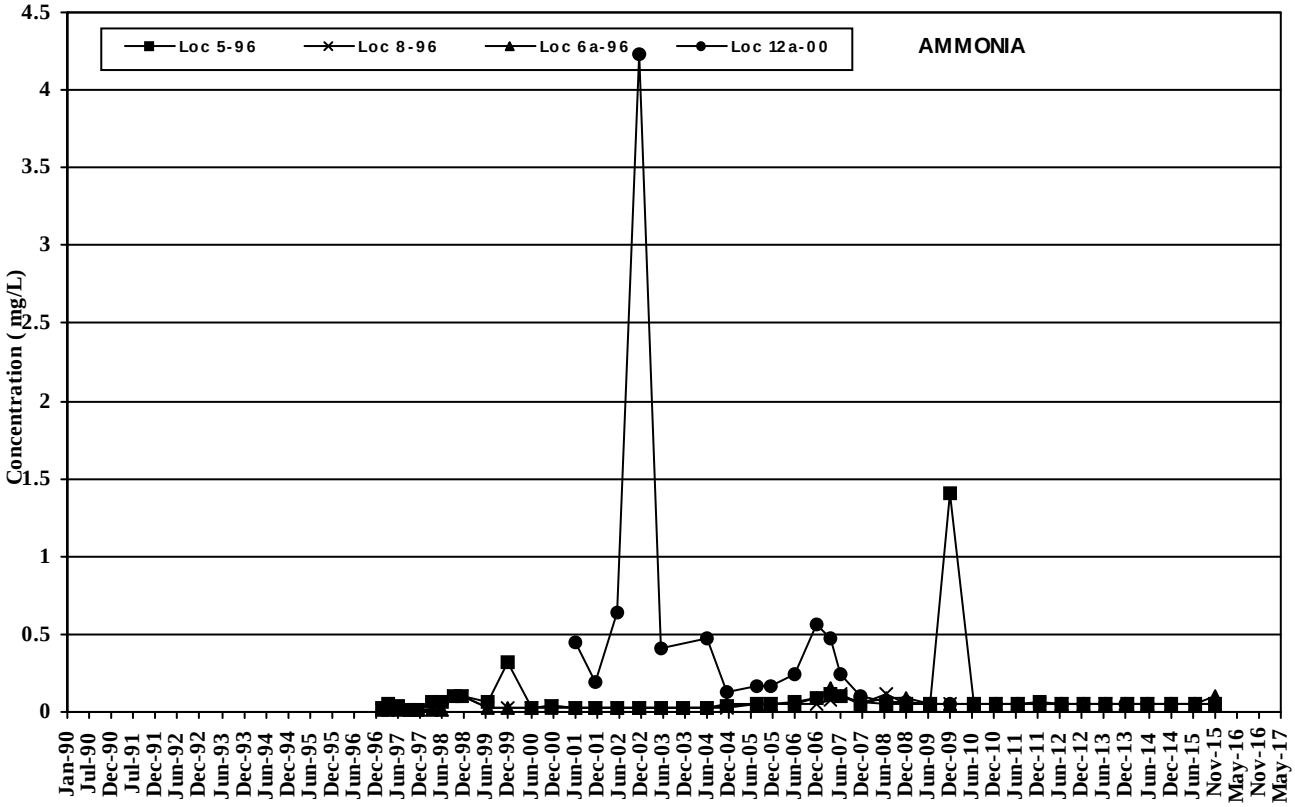
AECOM

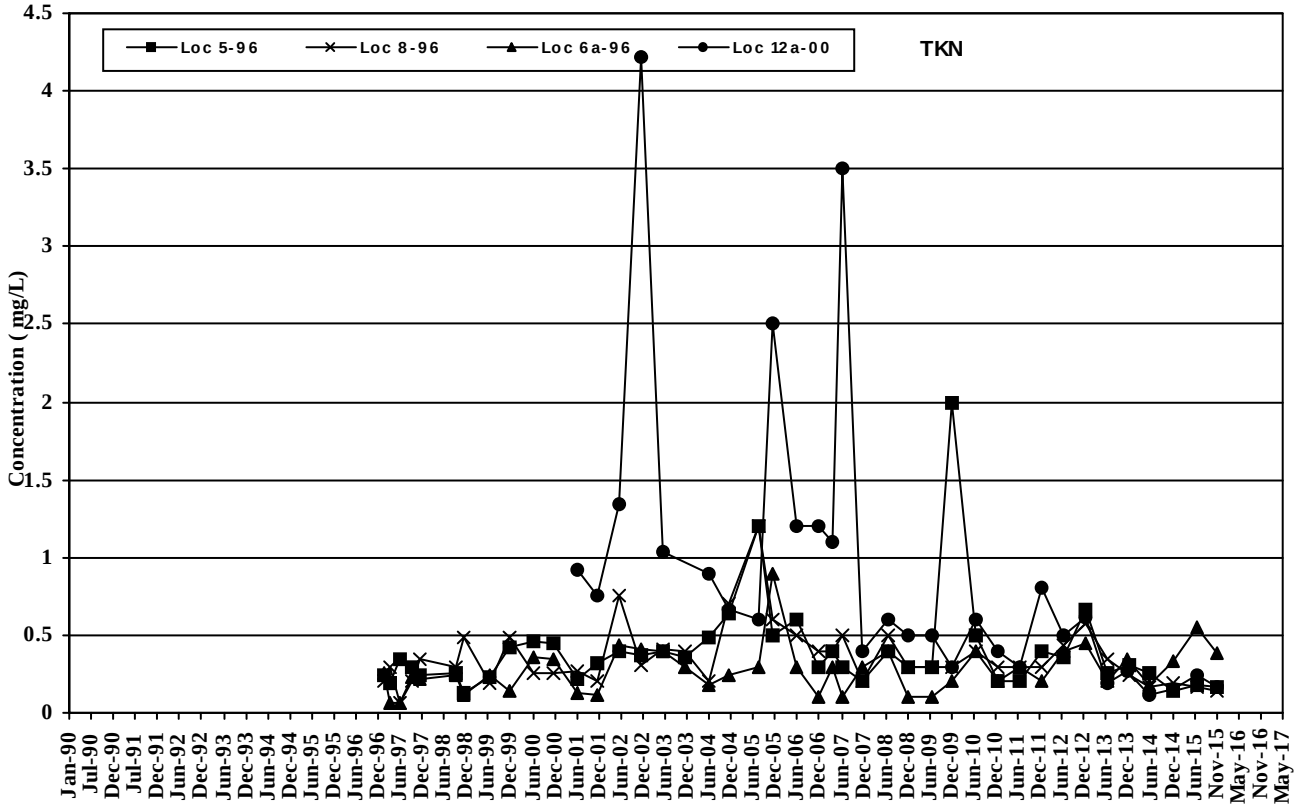
Guelph WRIC & Waste Transfer Station

Ground Water Chemistry Trends Overburden Locations East of Wet/Dry or Transfer Station Property

FIGURE
B14

60487592
12 NH3-TKN Location EasttOB





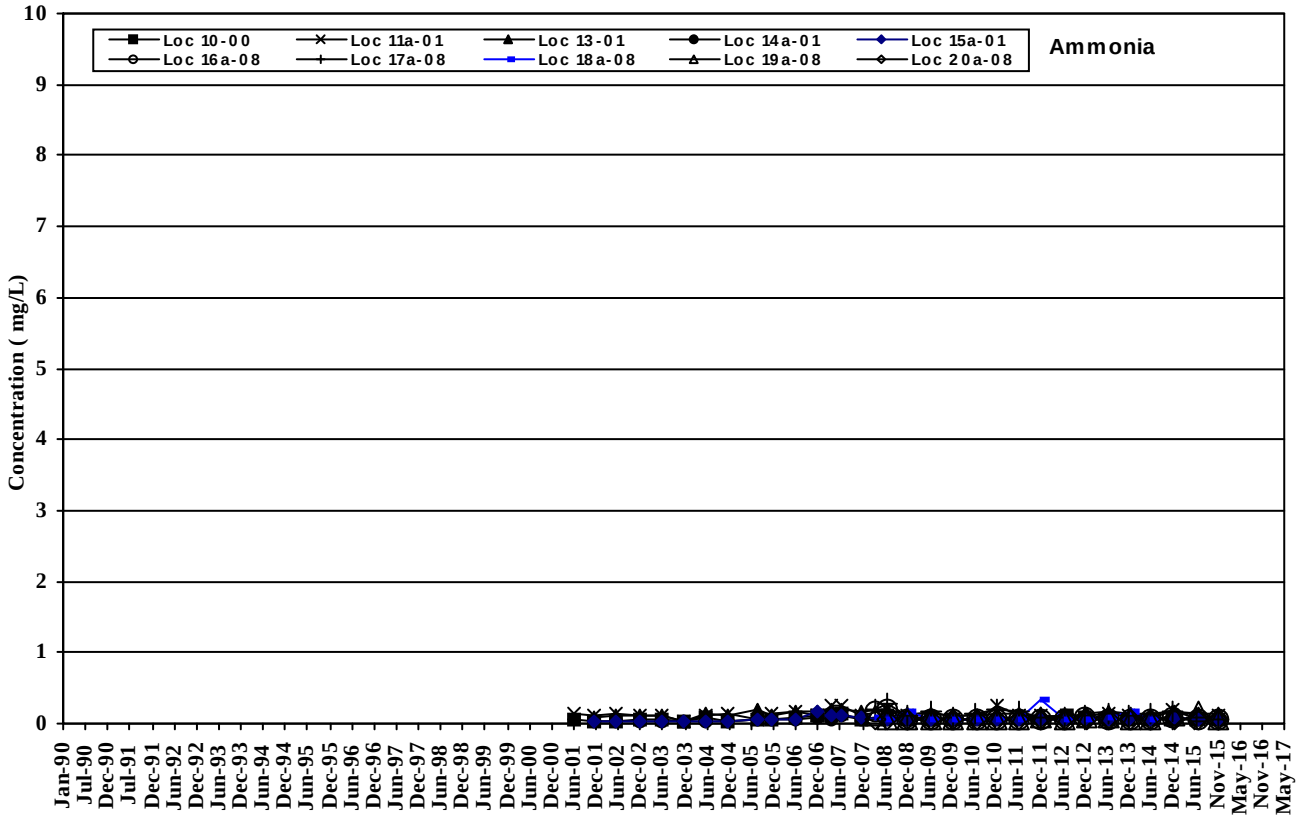
AECOM

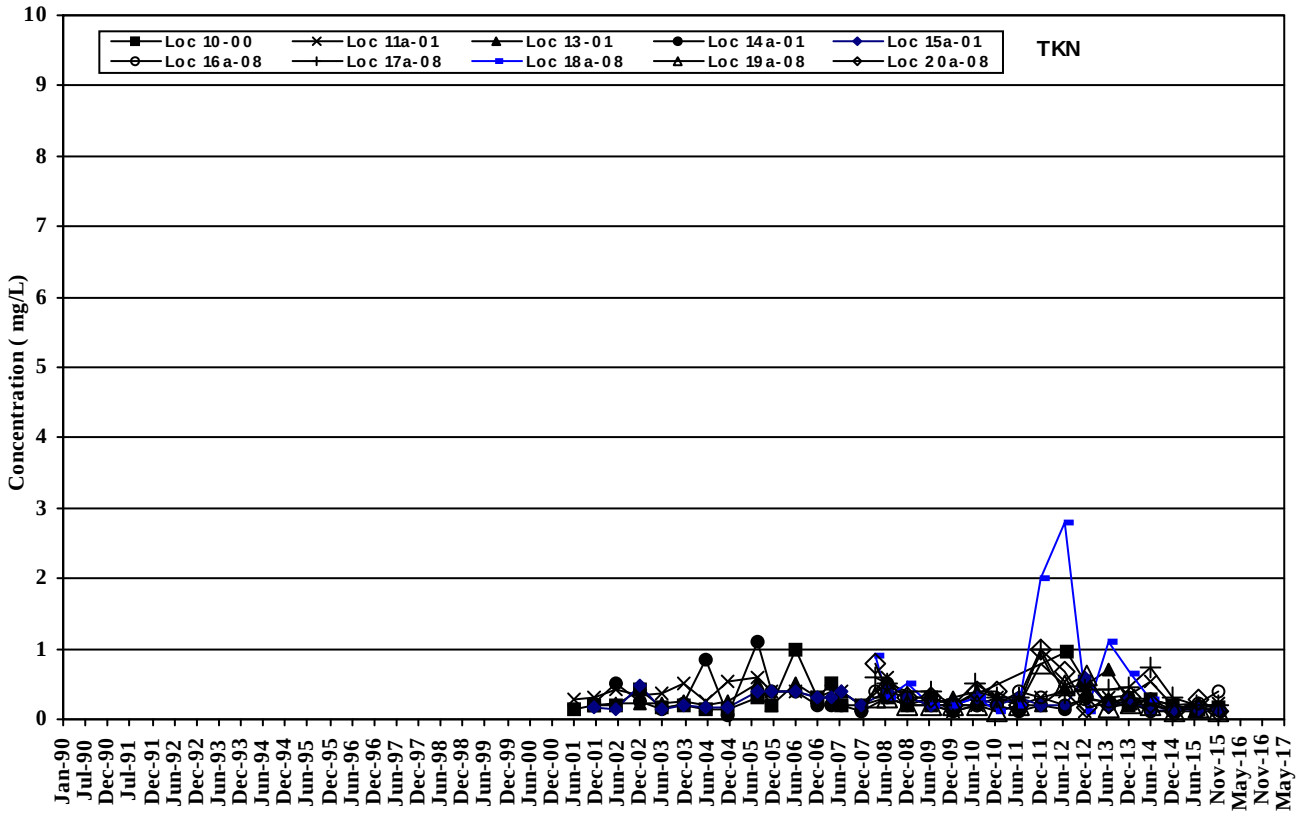
Guelph WRIC & Waste Transfer Station

Ground Water Chemistry Trends
Bedrock Locations West or on Wet/Dry Facility

FIGURE
B15

60487592
12 NH3-TKN Location WestBed





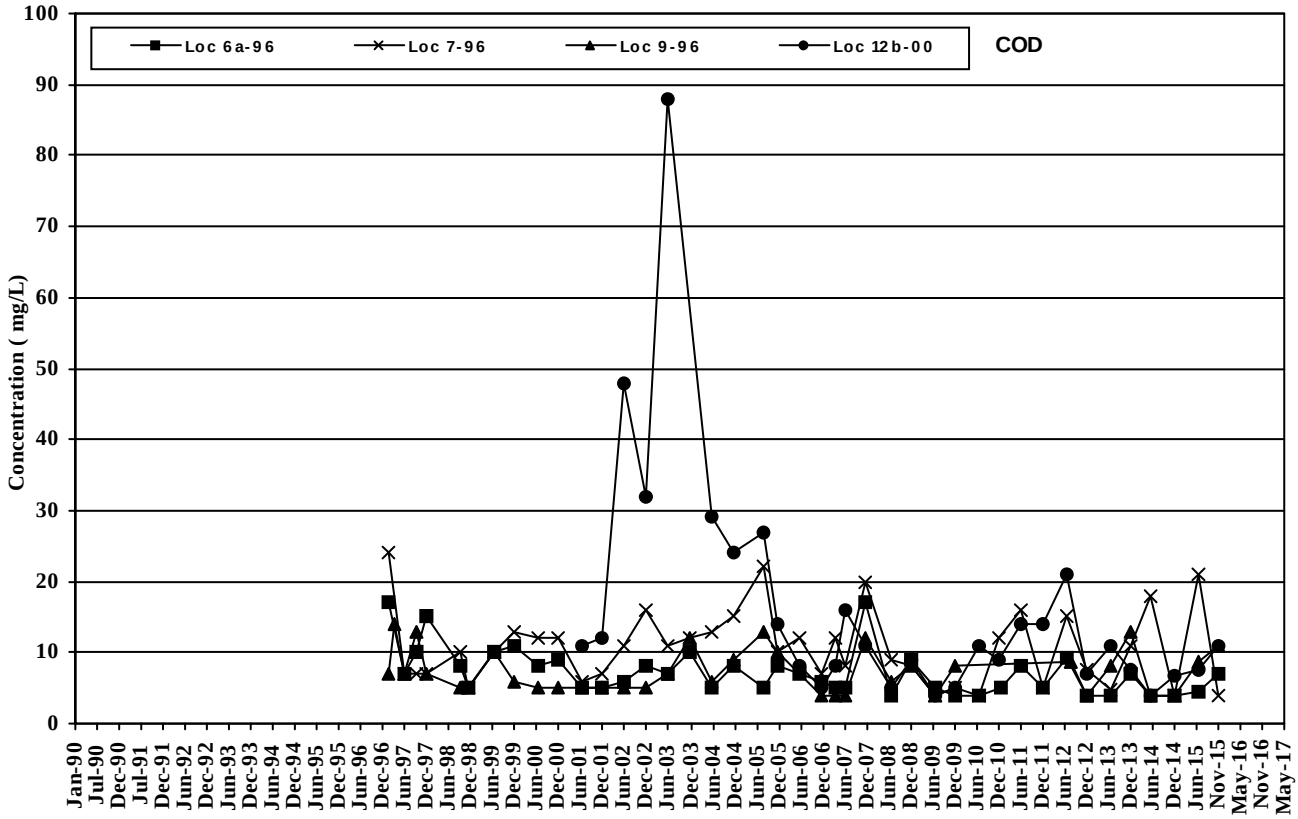
AECOM

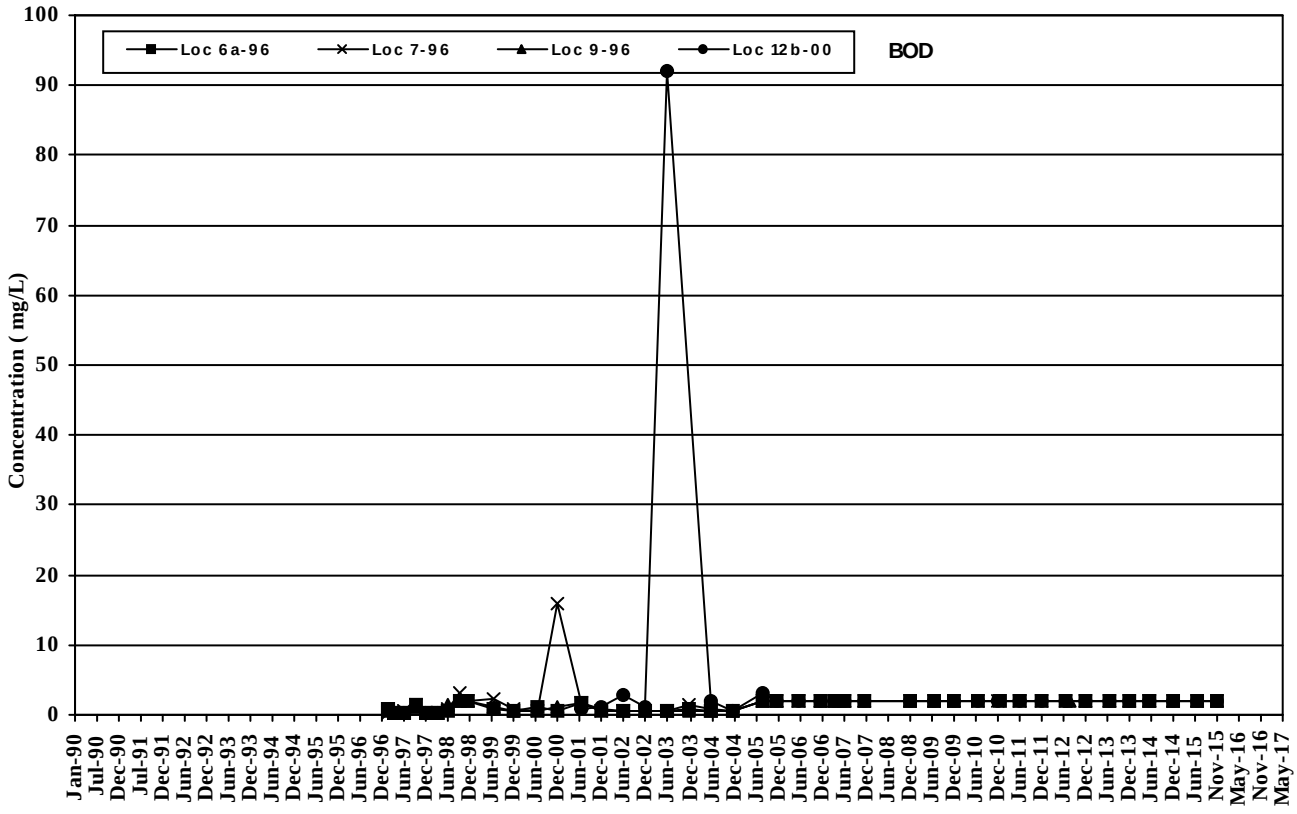
Guelph WRIC & Waste Transfer Station

Ground Water Chemistry Trends
Bedrock Locations East of Wet/Dry or on Transfer Station Property

FIGURE
B16

60487592
12 NH3-TKN Location EasttBed





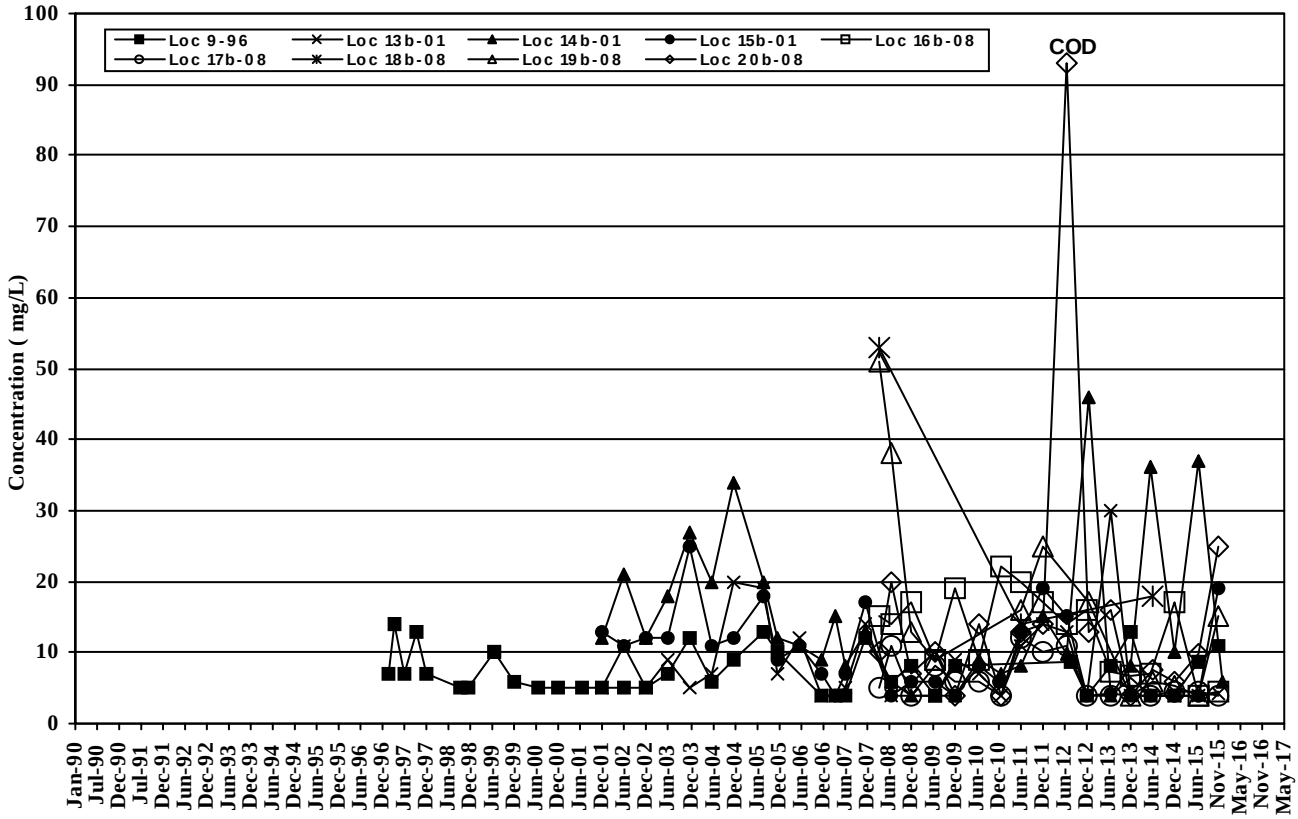
AECOM

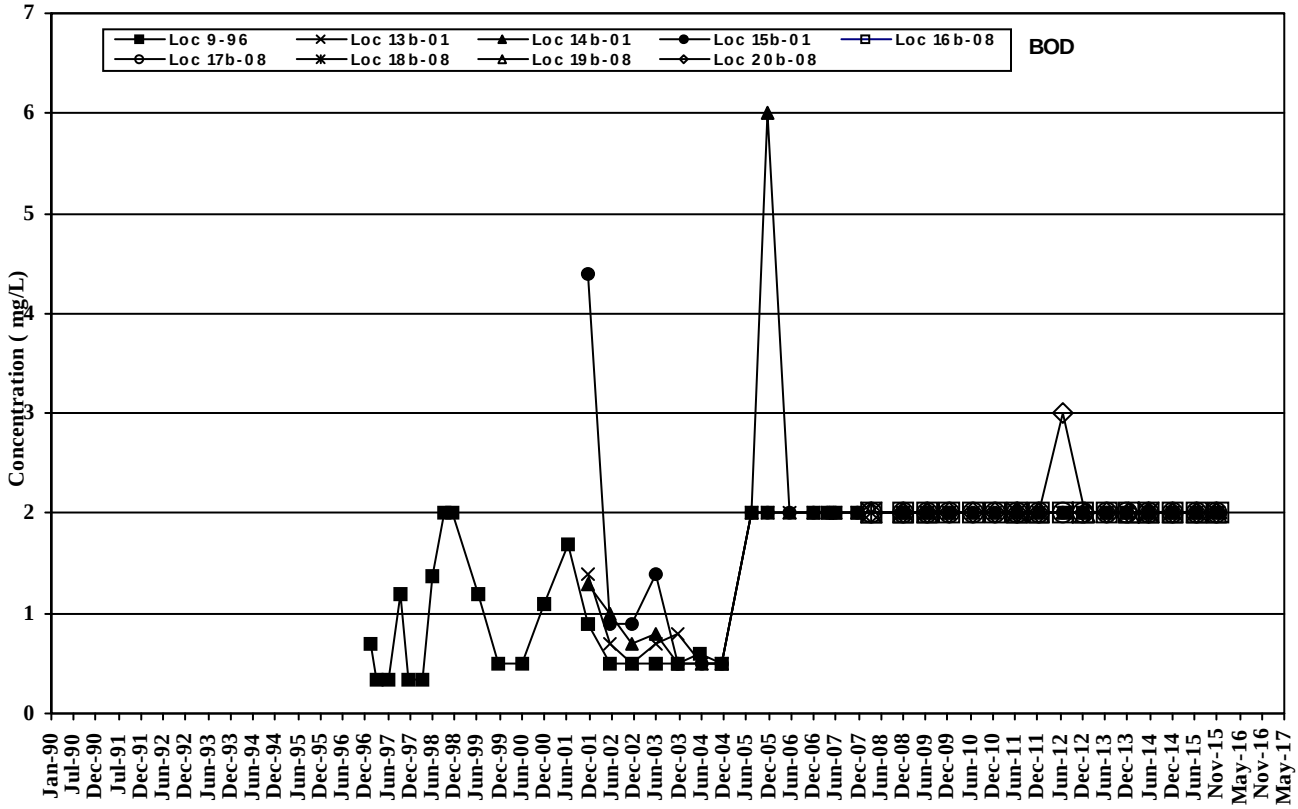
Guelph WRIC & Waste Transfer Station

Ground Water Chemistry Trends
Overburden Locations on Wet/Dry Facility

FIGURE
B17

60487592
12 COD-BOD Location WestOB





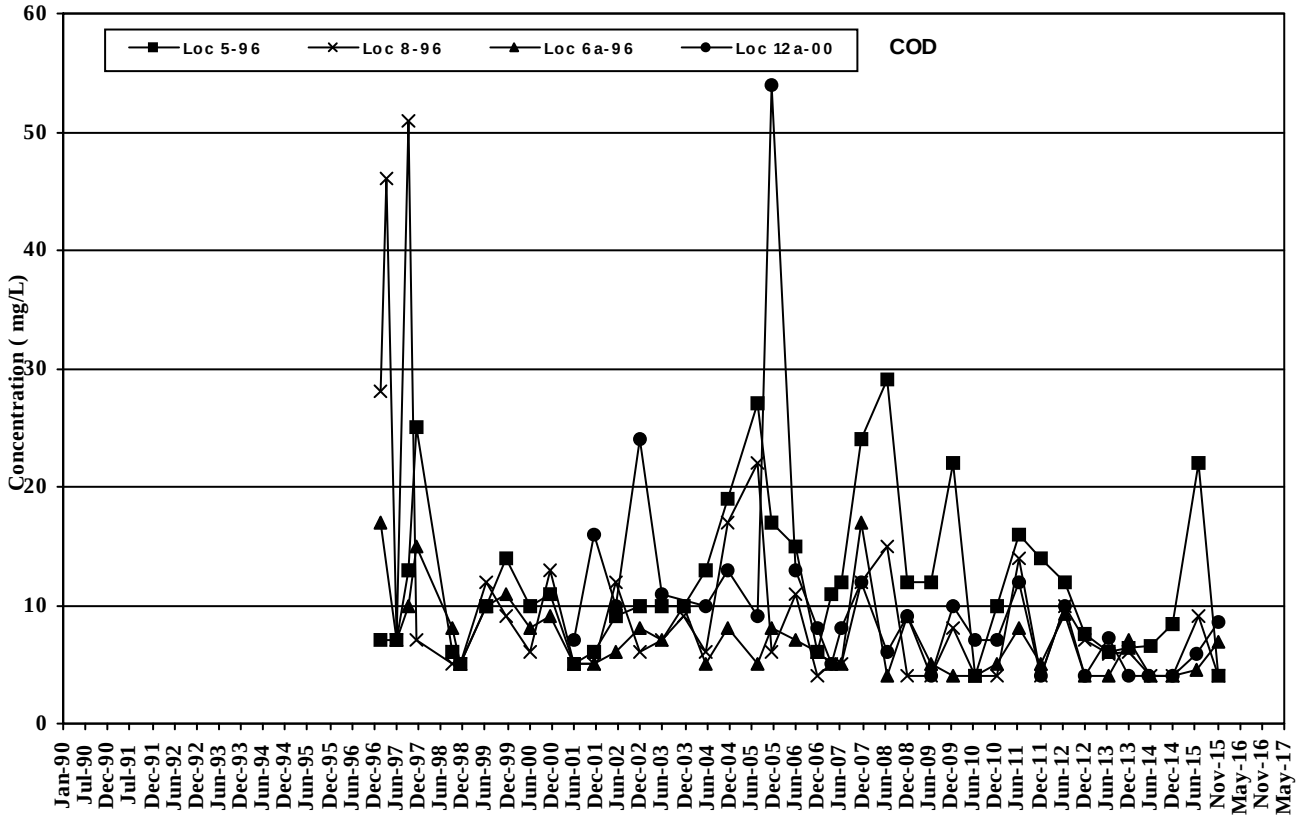
AECOM

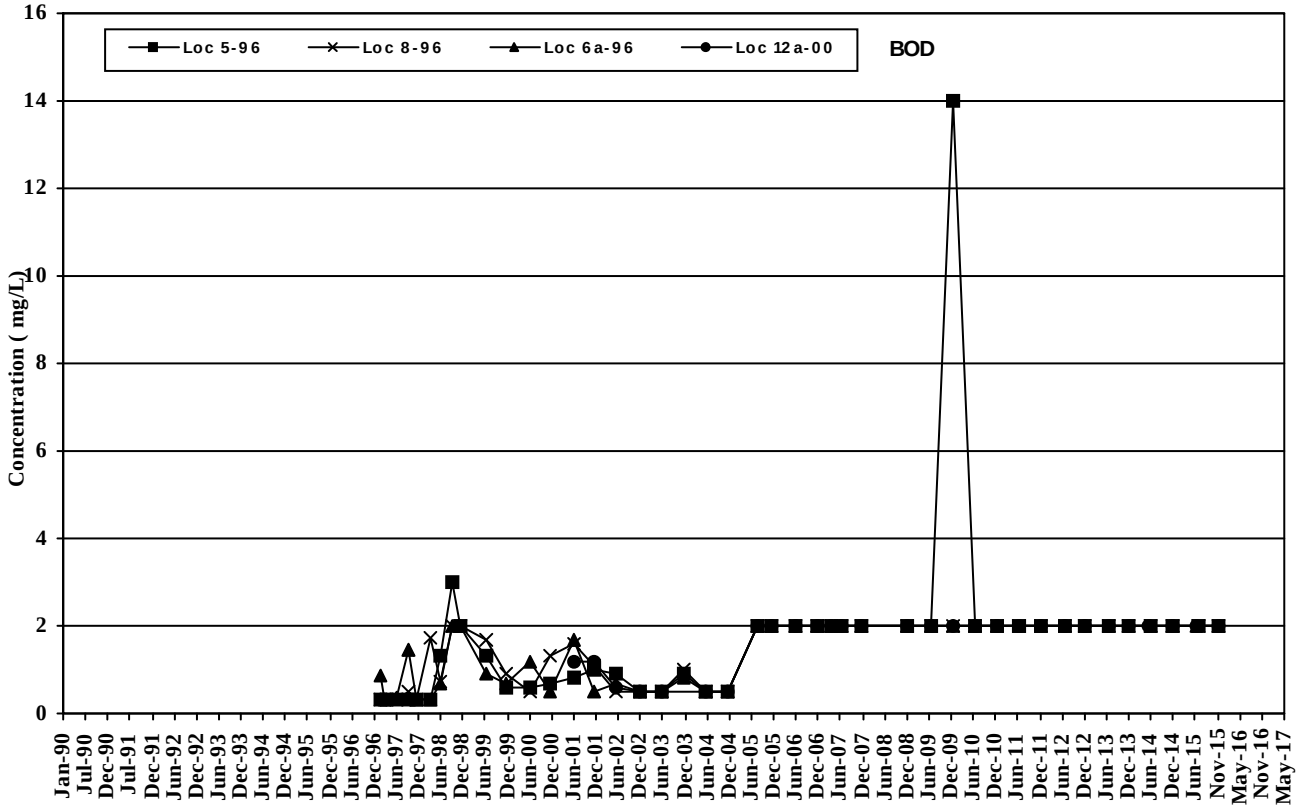
Guelph WRIC & Waste Transfer Station

Ground Water Chemistry Trends
Overburden Locations East of Wet/Dry or Transfer Station Property

FIGURE
B18

60487592
12 COD-BOD Location EastOB





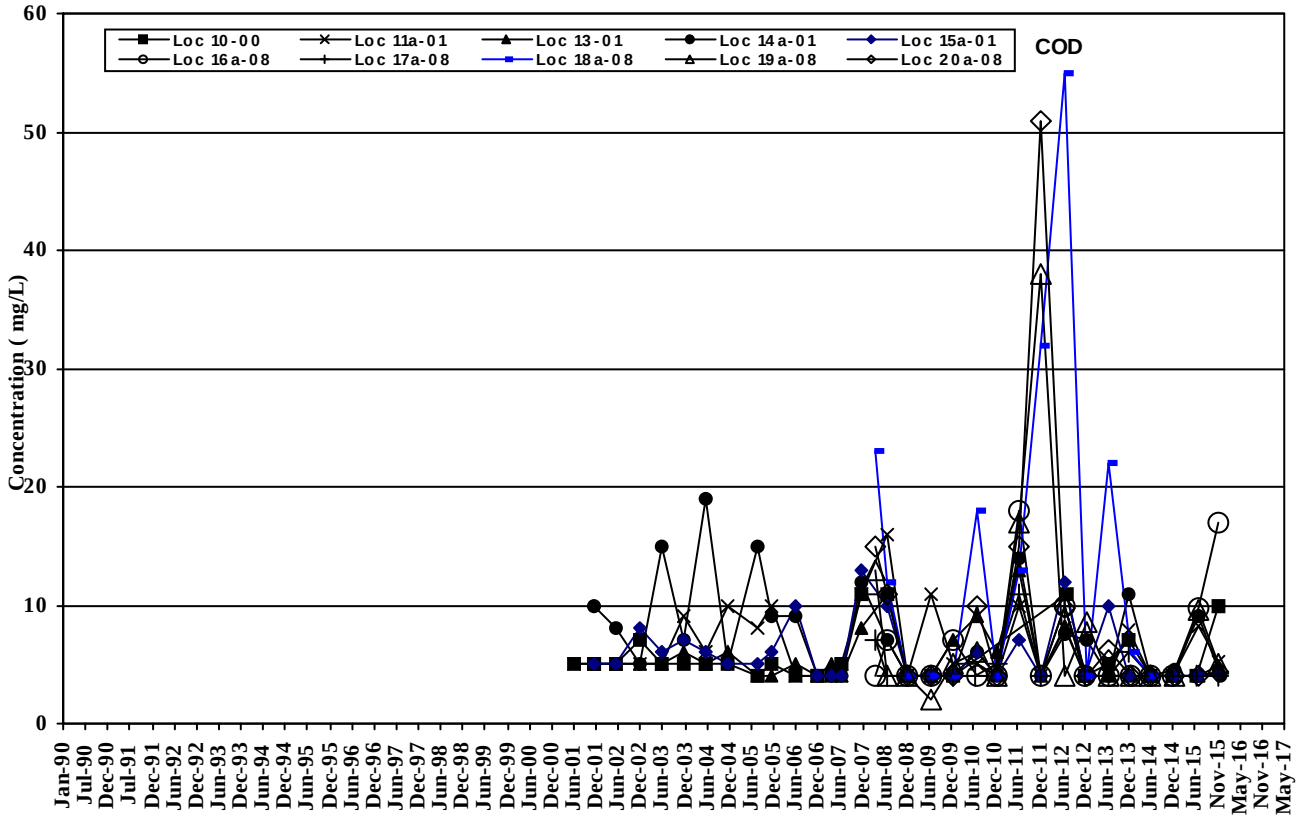
AECOM

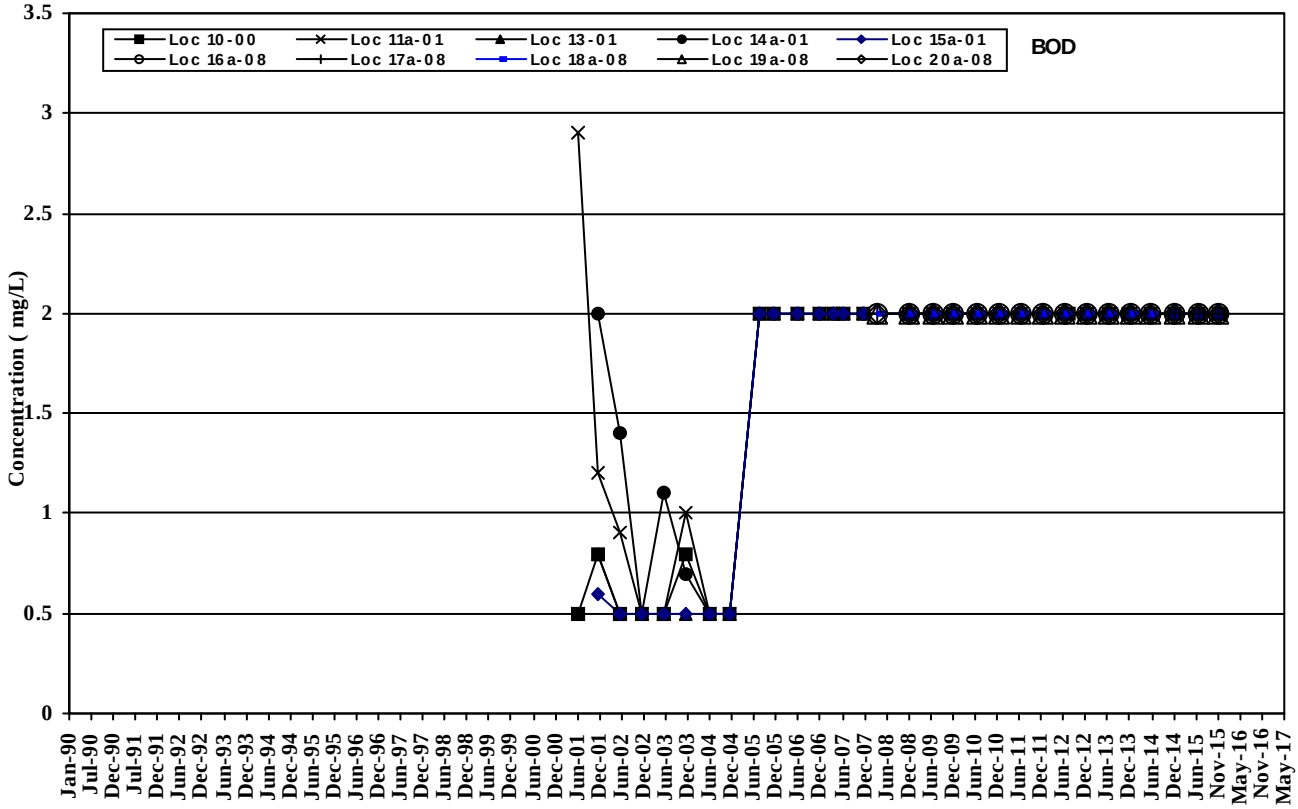
Guelph WRIC & Waste Transfer Station

Ground Water Chemistry Trends
Bedrock Locations West or on Wet/Dry Facility

FIGURE
B19

60487592
12 COD-BOD Location WestBed





AECOM

Guelph WRIC & Waste Transfer Station

Ground Water Chemistry Trends
Bedrock Locations East of Wet/Dry or on Transfer Station Property

FIGURE
B20

60487592
12 COD-BOD Location EastBed

AECOM

Appendix C

Surface Water Chemistry – Routine and Organics

Routine Surface Water Quality - General Analysis -Guelph WRIC & Waste Transfer Station

AECOM

Date	Lab	pH	Cond-uctivity	Alk mg/L	Mg mg/L	K mg/L	BOD mg/L	COD mg/L	TKN mg/L	NH3-N mg/L	Total-P mg/L	TSS mg/L	SO4 mg/L	Phenol ug/L	Cl mg/L	Na mg/L	Ca mg/L	Fe mg/L	B mg/L	P mg/L	Zn mg/L
SW 1		6.5 - 8.5									0.03			1.0				0.30	0.20		0.02
4/13/1996	ENT	7.6	310	60						392		123		< 0.5	59.4				0.02		
5/29/1996	ENT	7.8			4.74	5.32	< 10	22	1	0.04	0.22	21	14.1	7	42.2	29.8	32.4	0.51	0.06	0.2	0.08
7/3/1996	ENT						13		2.4	0.19	0.08	73		1							
8/22/1996	ENT	7.82			0.46	13.1	< 10	< 10	0.56	0.27	0.23	10	7.4	< 0.5	19.7	20.5	38.6	0.25	0.3	0.18	<0.0004
9/18/1996	ENT						< 10		2	0.13	0.07	6		< 0.5							
10/16/1996	ENT						< 10		2	0.13	0.01	1		< 1							
11/20/1996	ENT						< 10		3	0.08	0.15	7		15							
12/11/1996	ENT	7.94			6.84	9.6	< 10	93	1.34	0.08	0.18	4	12.6	1	272	155	41.7	0.59	0.02	0.15	0.02
4/8/1997	WBL	8.64	2840	118	8.09	18.3	9.24	170	2.73	< 0.01	0.206	19	18	< 0.72	732	434	49.7	1.05	<0.016	<0.028	0.034
5/6/1997	WBL	8.29	1450	81	4.47	9.81	5.7	134	1.37	0.067	0.174	39	13.2	1.15	423	236	27.3	1.73	0.023	0.16	0.071
6/26/1997	WBL	9.23	826	111	3.86	11.1	4.11	57	1.35	< 0.01	0.124	5	14.3	< 0.72	164	114	26.3	0.743	0.062	0.128	0.017
7/31/1997	WBL	9.53	1460	123	4.79	13.1	2.82	88	3.51	0.119	0.234	4	15	0.99	394	245	24.2	0.873	0.054	0.234	0.015
9/11/1997	WBL	8.73	527	94.1	4.47	12.3	2.17	71	1.48	0.017	0.072	< 6	14.7	< 0.72	89.6	76	25.4	0.56	0.095	0.099	0.02
11/26/1997	WBL	7.6	960				3.12		1.72	0.084	0.139	542		< 0.72							
12/9/1997	WBL	7.79	970	132	7.02	12.5	1.94	59	1.6	0.014	0.095	3	13.9	< 0.72	198	140	45.7	0.381	0.023	0.081	0.014
1/8/1998	WBL	7.65	545				6.3		1	0.2	0.31	357		7							
2/28/1998	Froze																				
3/31/1998	WBL	8.32	1480	121	3.48	6.75	2.53		1.52	0.023	0.107	5	12.7	< 0.72	443	250	35.5	0.542	0.051	0.107	0.007
4/30/1998	Dry																				
5/12/1998	WBL	7.55	1420				8.52		4.02	0.795	0.3	840		0.72							
6/24/1998	WBL	9.52	597	112	4.14	9.73	5.58		2.73	0.058	0.245	< 2	10.9	< 0.72	109	72.8	27.7	0.644	0.064	0.245	0.02
7/31/1998	Dry																				
8/31/1998	Dry																				
9/30/1998	Dry																				
10/31/1998	Dry																				
11/30/1998	Dry																				
12/31/1998	Dry																				
1/31/1999	Froze																				
2/28/1999	Froze																				
3/31/1999	Barr	8.01	1624	142	7.49	13	6.7	68	3.6	0.37	0.27	21	33	< 2	441	298	52.7	0.5	0.05	0.4	0.026
4/30/1999	Dry																				
5/31/1999	Dry																				
6/29/1999	Barr	7.91	307	77	2.9	9	6.4	51	1.72	0.84	0.057	12	15		41.9	34.3	20.6	0.12		0.4	0.019
7/31/1999	Dry																				
8/31/1999	Dry																				
9/30/1999	Dry																				
10/31/1999	Dry																				
11/30/1999	Dry																				
12/14/1999	Barr	8.01	716	168	16.7	18	19.4	49	2.77	1.05	0.11	40	46.9	< 1	57.4	42.5	65.5	0.01	0.04	0.2	0.018
1/30/2000	Froze																				
2/28/2000	Froze																				
3/31/2000	Philip	7.37	2380	123	10.2	15	9.1	87	3.31	0.07	0.224	17	21	< 1	634	370	59.7	0.62	0.03		0.031
4/27/2000	Philip	7.13	2595	140	29.8	43	16.5	117	115	104	0.423	23	35.8	1	123	85.7	146	0.36	0.06	0.5	0.041
5/23/2000	Philip	7.46	1930	142	25.9	53	3.2	137	66.3	68.2	0.47	13	35.3	< 1	96.5	70.2	120	0.42	0.09	0.6	0.073
6/30/2000	Philip	7.33	88	241	3.7	10	27	60	1.92	0.19	0.286	5	6.6	< 1	23.6	19	24.9	0.36		0.4	0.031

Routine Surface Water Quality - General Analysis -Guelph WRIC & Waste Transfer Station

AECOM

Date	Lab	pH	Cond-uctivity	Alk mg/L	Mg mg/L	K mg/L	BOD mg/L	COD mg/L	TKN mg/L	NH3-N mg/L	Total-P mg/L	TSS mg/L	SO4 mg/L	Phenol ug/L	Cl mg/L	Na mg/L	Ca mg/L	Fe mg/L	B mg/L	P mg/L	Zn mg/L
SW 1		6.5 - 8.5									0.03			1.0				0.30	0.20		0.02
7/30/2000	Dry																				
8/29/2000	Dry																				
9/28/2000	Philip	7.81	374	97	4.32	12.4	12.8	57	2.5	0.08	0.194	128	15.5	< 1	51.8	40.1	30.5	0.16	0.029	0.23	0.035
10/30/2000	Dry																				
11/28/2000	Philip	7.63	778	90	7.41	16.8	6	57	2.54	0.08	0.5	29	24.4	< 1	193	109	73.7	0.96	0.022	0.7	0.112
12/7/2000	Froze																				
1/31/2001	Froze																				
2/28/2001	Froze																				
3/31/2001	Froze																				
4/24/2001	Philip	7.9	747	175	6.13	11	2.2	65	3.16	0.17	0.12	6	9.8	2	140	122	34.4	0.83		0.4	0.024
5/28/2001	Philip	7.29	333	119	3.93	9	8.3	77	2.4	0.11	0.288	10	13.2	< 1	39.4	46	49.4	0.58	0.03	0.4	0.048
6/30/2001	Dry																				
7/25/2001	Philip	7.3	322	105	4.82	15	8.1	143	5.3	0.3	0.765	21	21.7	< 1	30.3	29.7	56.9	0.96	0.06	1	0.103
8/31/2001	Dry																				
9/27/2001	Philip	7.5	383	128	5.48	15	3	57	1.64	0.07	0.318	2	19	< 1	33.8	31.7	30.5	0.09	0.03	0.3	0.019
10/18/2001	Philip	7.84	304	125	4.94	9	3.4	50	2.94	< 0.03	0.294	7	4.3	< 1	19.3	24.8	31.7	0.91	0.04	0.4	0.042
11/30/2001	Philip	7.48	104	39	1.72	4	1.3	24	0.87	0.03	0.3	11	1.5	< 1	4.5	6.8	9.38	0.54	<0.01	0.2	0.031
12/4/2001	Philip	7.57	153	61	3.04	6.3	3.1	26	0.68	< 0.03	0.128	1	2.7	< 1	6.5	8.8	19.2	0.31	0.01	0.4	0.043
1/31/2002	Froze																				
2/28/2002	Froze																				
3/29/2002	Froze																				
4/29/2002	Philip	7.52	398	77	2.9	5	5.6	58	1.88	0.06	0.456	11	7.3	< 1	69.3	57.4	30.8	0.57	0.02	0.5	0.361
5/31/2002	Dry																				
6/5/2002	Philip	7.8	228	55	2.46	4	5.2	75	2.19	0.14	0.438	16	5.6	< 1	28.9	26.4	18.1	0.87	0.02	0.6	0.099
7/31/2002	Dry																				
8/30/2002	Dry																				
9/27/2002	Dry																				
10/31/2002	Dry																				
11/29/2002	Dry																				
12/20/2002	Dry																				
1/31/2003	Froze																				
2/28/2003	Froze																				
3/29/2003	Froze																				
4/30/2003	Dry																				
5/31/2003	Dry																				
6/5/2003	Philip	6.99	240	68	2.89	4	6.1	51	6	0.16	0.934	118	6.1	< 1	26.1						
7/31/2003	N/A																				
8/30/2003	N/A																				
9/27/2003	Dry																				
10/31/2003	Dry																				
11/29/2003	Dry																				
12/1/2003	Philip	7.21	256	52	3.16	4	4.2	24	0.63	< 0.03	0.146	12	6	< 1	49.7	28.9	18.8	0.54	<0.01	0.3	0.07
1/31/2006	Dry																				
2/28/2006	Dry																				
3/9/2006	MAX	7.5	245	25	2.2	2	4	22	1.3	0.29	0.17	24	5	2	53	37	8.9	1.8	<0.02	0.2	0.09

Routine Surface Water Quality - General Analysis -Guelph WRIC & Waste Transfer Station

AECOM

Date	Lab	pH	Cond-uctivity	Alk mg/L	Mg mg/L	K mg/L	BOD mg/L	COD mg/L	TKN mg/L	NH3-N mg/L	Total-P mg/L	TSS mg/L	SO4 mg/L	Phenol ug/L	Cl mg/L	Na mg/L	Ca mg/L	Fe mg/L	B mg/L	P mg/L	Zn mg/L
SW 1		6.5 - 8.5									0.03			1.0				0.30	0.20		0.02
4/30/2006	Dry																				
5/16/2006	MAX	7.6	346	126	4.8	7.6	3	43	1.6	0.16	0.21	3	4	< 1	36	43	31	0.43	0.018		0.023
6/30/2006	Dry																				
7/31/2006	Dry																				
8/31/2006	Dry																				
9/13/2006	N/A																				
10/31/2006	Dry																				
11/30/2006	Dry																				
12/31/2006	Dry																				
1/31/2007	Snow																				
2/28/2007	Snow																				
3/14/2007	MAX	7.3	238	22	2.4	5.3	3	25	1.3	0.53	0.26	4	7	< 1	49	33	8.7	0.16	<0.01		0.021
3/29/2007	MAX	7.8	686	101	6.7	4.4	3	31	1.5	0.08	0.19	10	13	1	140	120	34	0.93	0.021		0.043
4/30/2007	Dry																				
5/31/2007	Dry																				
6/30/2007	Dry																				
7/31/2007	Dry																				
8/31/2007	Dry																				
9/28/2007	Dry																				
10/31/2007	Dry																				
11/21/2007	MAX	7.9	239	69	4.4	8	3	33	1.3	0.09	0.41	8	10	< 1	24	24	15	0.56	0.011		0.035
12/31/2007	Snow																				
1/8/2008	MAX	7.5	731	83	5.7	5.4	2	31	1.4	0.06	0.22	3	13	< 1	170	160	35	1.5	0.022		0.09
2/28/2008	Snow																				
3/31/2008	Snow																				
4/10/2008	MAX	8.3	2260	225	20	9.5	< 2	22	0.9	< 0.05	0.06	2	29	< 1	520	350	100	0.2	0.02		0.03
5/31/2008	Dry																				
6/24/2008	MAX	7.6	121	39	2.3	2.6	5	33	2.5	0.9	0.28	24	4	< 1	9	11	11	0.99	0.011		0.067
7/24/2008	MAX	7.6	98	47	2.1	2.6	5	22	0.6	< 0.05	0.19	5	< 1	< 1	3	2.7	14	0.2	0.01		0.023
8/11/2008	MAX	7.3	157	61	2.2	2.2	3	19	0.8	0.15	0.19	4	2	< 1	10	11	16	0.2	0.02		0.017
9/28/2008	Dry																				
10/31/2008	Dry																				
11/30/2008	Dry																				
12/31/2008	Snow																				
1/30/2009	Snow																				
2/12/2009	MAX	7.3	374	36	1.7	2.4	< 2	14	0.6	< 0.05	0.19	7	7	< 1	85	60	12	0.5	<0.01		0.035
3/11/2009	MAX	6.4	253	47	1.7	2.6	3	19	0.7	< 0.05	0.13	< 10	9	< 1	43	36	12	0.3	<0.01		0.028
4/28/2009	MAX	7	374	80	2.7	2.2	< 2	33	0.1	< 0.05	0.11	10	6	1	58	50	23	0.4	0.02		0.04
5/27/2009	MAX	7.4	472	88	4	7.6	7	67	3.1	0.63	1.3	9	20	< 1	74	80	22	0.3	0.03		0.032
6/30/2009	Dry																				
7/31/2009	Dry																				
8/31/2009	Dry																				
9/30/2009	Dry																				
10/30/2009	Dry																				
11/30/2009	Dry																				

Routine Surface Water Quality - General Analysis -Guelph WRIC & Waste Transfer Station

AECOM

Date	Lab	pH	Cond-uctivity	Alk mg/L	Mg mg/L	K mg/L	BOD mg/L	COD mg/L	TKN mg/L	NH3-N mg/L	Total-P mg/L	TSS mg/L	SO4 mg/L	Phenol ug/L	Cl mg/L	Na mg/L	Ca mg/L	Fe mg/L	B mg/L	P mg/L	Zn mg/L
SW 1		6.5 - 8.5									0.03			1.0				0.30	0.20		0.02
12/30/2009	Dry																				
1/29/2010	Snow																				
2/26/2010	Snow																				
3/18/2010	MAX	7.7	268	91	4	3.2	3	23	0.8	< 0.05	0.13	2	5	< 1	27	21	28	<0.1	<0.01		0.015
4/30/2010	Dry																				
5/31/2010	Dry																				
6/30/2010	Dry																				
7/30/2010	Dry																				
8/31/2010	Dry																				
9/30/2010	Dry																				
10/29/2010	Dry																				
12/2/2010	MAX	7.68	187	82	3.9	2.4	< 2	31	0.9	< 0.05	0.29	49	2	1	7	7	23	0.2	<0.01		0.025
12/31/2010	Dry																				
1/28/2011	Froze																				
2/28/2011	Froze																				
3/31/2011	Snow/																				
4/8/2011	MAX	7.93	1060	178	9.3	2.6	< 2	32	0.8	< 0.05	0.07	2	4	< 1	200	140	63	<0.1	<0.01		0.013
6/3/2011	MAX	8.1	463	209	9.1	2.3	< 2	44	1.2	0.13	0.15	7	< 1	< 1	22	26	71	0.8	0.02		0.012
6/22/2011	MAX	7.8	593	270	9.8	1.3	6	53	2.1	< 0.05	0.38	30	< 1	< 1	30	33	88	2.8	0.02		0.007
7/29/2011	Dry																				
8/31/2011	Dry																				
9/30/2011	Dry																				
10/20/2011	MAX	7.54	67	29	1.7	2.1	< 2	10	0.4	< 0.05	0.25	3	< 1	4	3	2.9	7.5	0.1	<0.01		0.01
11/29/2011	MAX	7.19	70	29	1.6	2.6	< 2	10	0.3	< 0.05	0.18	6	< 1	< 1	3	2.4	8.5	0.2	<0.01		0.016
12/15/2011	MAX	7.77	200	67	4.7	3.4	< 2	26	0.8	0.33	0.26	4	6	2	16	10	25	0.13	<0.01		0.014
1/31/2012	Dry																				
2/29/2012	Dry																				
3/29/2012	Dry																				
4/30/2012	Dry																				
5/31/2012	Dry																				
6/29/2012	Dry																				
7/31/2012	Dry																				
8/31/2012	Dry																				
9/28/2012	Dry																				
10/31/2012	Dry																				
11/30/2012	Dry																				
12/21/2012	Dry																				
1/30/2013	MAX	6.7	990	23	1.9	3.8	3	25	1.4	0.23	0.2	7	12		230	150	9.4	0.23	<0.01		0.023
2/28/2013	Dry																				
3/29/2013	Dry																				
4/18/2013	MAX	7.73	1500	74	7.6	5.3	< 2	37	0.9	0.12	0.021	2	8	3.3	390	280	51	<0.1	<0.01		0.023
5/31/2013	Dry																				
6/28/2013	Dry																				
7/31/2013	Dry																				
8/7/2013	MAX	6.51	540	100	8.6	66	170	360	7.5	0.76	5.5	49	17	2.6	63	15	42	0.61	0.033		0.1

Routine Surface Water Quality - General Analysis -Guelph WRIC & Waste Transfer Station

AECOM

Date	Lab	pH	Cond-uctivity	Alk mg/L	Mg mg/L	K mg/L	BOD mg/L	COD mg/L	TKN mg/L	NH3-N mg/L	Total-P mg/L	TSS mg/L	SO4 mg/L	Phenol ug/L	Cl mg/L	Na mg/L	Ca mg/L	Fe mg/L	B mg/L	P mg/L	Zn mg/L
SW 1		6.5 - 8.5									0.03			1.0				0.30	0.20		0.02
9/30/2013	Dry																				
10/31/2013	MAX	7.27	110	44	2.3	2.3	< 2	21	0.55	< 0.05	0.18	2	4	1.9	3	3.6	15	0.22	0.012		0.022
11/29/2013	Dry																				
12/31/2013	Dry																				
1/14/2014	MAX	7.49	2200	69	10	2.6	7	42	1.7	0.07	0.11	110	20	< 1	570	410	74	1	0.01		0.07
1/31/2014	Ice C																				
2/28/2014	Snow																				
3/28/2014	Ice C																				
4/30/2014	Belo																				
5/30/2014	Dry																				
6/30/2014	Dry																				
7/31/2014	Dry																				
8/29/2014	Dry																				
9/30/2014	Dry																				
10/31/2014	Dry																				
11/28/2014	Belo																				
12/31/2014	Dry																				
1/31/2015	Snow																				
2/28/2015	Snow																				
3/28/2015	Snow																				
4/10/2015	MAX	7.96	700	260	24	1.4	< 2	< 4	0.29	0.077	< 0.02	< 1	12	< 1	59	32	85	<0.1	0.015		0.098
5/30/2015	Dry																				
6/30/2015	Dry																				
7/31/2015	Dry																				
8/29/2015	Dry																				
9/30/2015	Dry																				
10/31/2015	Dry																				
11/28/2015	Dry																				
12/31/2015	Dry																				

Routine Surface Water Quality - General Analysis -Guelph WRIC & Waste Transfer Station

AECOM

Date	Lab	pH	Cond-uctivity	Alk mg/L	Mg mg/L	K mg/L	BOD mg/L	COD mg/L	TKN mg/L	NH3-N mg/L	Total-P mg/L	TSS mg/L	SO4 mg/L	Phenol ug/L	Cl mg/L	Na mg/L	Ca mg/L	Fe mg/L	B mg/L	P mg/L	Zn mg/L
EPTS-01		6.5 - 8.5									0.03			1.0				0.30	0.20		0.02
6/9/2004	Philip	8	583	236	20.8	< 1	1.3	7	0.27	0.07	0.003		19.4	< 1	52.3	24.9	93.5	0.09	0.02		0.427
6/9/2004	N/A					<								<							
6/9/2004	N/A																				
6/9/2004	Philip	8	583	236	20.8	1	1.3	7	0.27	0.07	0.003		19.4	1	52.3	24.9	93.5	0.09	0.02		0.427
11/30/2004	Philip	8.11	665	244	22.4	2	< 0.5	8	0.18	< 0.03	0.003		21.3	< 1	60.3	23.6	83.4	<0.01	0.01		0.082
8/3/2005	N/A																				
11/28/2005	Maxx	8.18	620	231	24		< 2	< 4	0.4	0.1	< 0.02		18	< 1	51	26	84	<0.05	0.015	<0.05	0.077
6/1/2006	N/A																				
12/4/2006	MAX																				
3/30/2007	MAX	8.3	621	242	24	1.3	< 2	4	0.6	0.11	< 0.02		14	< 1	44	24	82	<0.02	0.015	<0.05	0.099
6/14/2007	MAX	8.3	592	243	22	1.3	< 2	10	0.9	0.13	< 0.02		16	< 1	35	18	76	<0.02	0.014	<0.05	0.17
8/16/2007	MAX	8.2	558	235	24	1.5	< 2	12	0.6	0.19	< 0.02		16	< 1	27	15	75	<0.02	0.014	<0.05	0.045
12/5/2007	MAX	8.2	650	232	27	1.7	< 2	6	0.4	0.18	< 0.02		26	< 1	51	22	96	0.06	0.016	<0.1	0.1
5/2/2008	MAX	8.3	610	213	19	1.1	< 2	< 4	0.6	0.05	0.02		17	< 1	51	30	68	<0.02	<0.01	<0.1	0.068
6/25/2008	MAX	8.1	593	217	20	1.3		11	0.7	0.12	< 0.02		15	< 1	45	26		<0.02	<0.01	<0.1	0.052
9/11/2008	MAX	8.2	574	228	20	1.4	< 2	11	0.6	< 0.05	< 0.02		16	< 1		21	75	<0.02	0.013	<0.1	0.067
12/9/2008	MAX	8	787	262	20	1.6	< 2	< 4	0.3	< 0.05	< 0.02		19	< 1	80	47	80	<0.02	0.017	<0.1	0.13
5/1/2009	MAX	7.8	582	231	21	1.3	< 2	< 4	0.5	< 0.05	< 0.02		13	< 1	44	22	75	<0.02	0.013	<0.1	0.065
6/25/2009	MAX	8.1	557	228	21	1.4	< 2	< 4	0.5	< 0.05	< 0.02		12	< 1	31	18	73	<0.02	0.017	<0.1	0.056
8/31/2009	MAX	7.8	1420	334	20	1.7	< 2	140	1.5	0.13	0.12		110	< 1	190	120	160	1	0.19	0.11	0.013
12/15/2009	MAX	7.8	451	169	20	1.2	< 2	9	0.4	0.06	0.02		11	< 1	26	13	70	<0.02	0.011	<0.1	0.15
6/24/2010	MAX	8	618	235	21	1.3	< 2	< 4	0.6	0.07	0.02		15	1	40	24	73	<0.06	0.012	<0.1	0.053
12/17/2010	MAX	7.98	725	266	24	1.5	< 2	8	0.3	< 0.05	< 0.02		16	< 1	54	28	88	<0.02	0.023	<0.1	0.096
6/15/2011	MAX	8.07	617	238	19	1.6	< 2	17	0.5	< 0.05	< 0.02		12	< 1	45	35	70	<0.02	0.02	<0.1	0.073
12/19/2011	MAX	7.99	770	256	27	1.8	< 2	5	0.4	< 0.05	0.03		30	2	64	45	96	0.04	<0.01	<0.1	0.29
1/31/2012	NA																				
2/29/2012	NA																				
3/29/2012	NA																				
4/17/2012	MAX	8.08	670	250	23	1.4	< 2	13	0.55	< 0.05	0.025	1	14	< 1	45	31	86	<0.1	0.016		0.08
5/31/2012	NA																				
6/22/2012	MAX	8.05	620	230	21	1.3	< 2	13	0.64	< 0.05	< 0.02	3	14	< 1	38	22	74	<0.1	0.016		0.055
7/26/2012	MAX	8.19	590	230	22	1.4	3	12	0.66	0.1	< 0.02	1	14	< 1	34	18	73	<0.1	0.015		0.039
8/31/2012	NA																				
9/20/2012	MAX	8.02	690	250	25	1.5	< 2	9.5	0.75	0.12	< 0.02	1	15	< 1	47	29	84	<0.1	0.017		0.057
10/24/2012	MAX	8.09	700	250	24	1.6	< 2	15	0.5	0.2	< 0.02	2	16	< 1	49	30	87	<0.1	0.018		0.085
11/30/2012	NA																				
12/18/2012	MAX	7.88	740	270	25	1.7	< 2	7.6	0.3	0.062	< 0.02	2	18	< 1	58	37	94	<0.1	<0.01		0.11
1/30/2013	MAX	7.91	620	220	20	1.4	< 2	9.1	0.54	< 0.05	< 0.02	2	16	< 1	44	32	76	<0.1	0.012		0.2
2/28/2013	NA																				
3/29/2013	NA																				
4/18/2013	MAX	8.1	650	210	19	1.2	< 2	18	0.64	< 0.05	< 0.02	< 1	13	< 1	64	50	73	<0.1	0.011		0.072
5/28/2013	MAX	8.16	580	220	22	1.4	< 2	8.9	0.42	0.12	< 0.02	2	13	< 1	35	26	79	<0.1	<0.01		0.06
6/21/2013	MAX	8.43	600	230	20	1.4	< 2	8.5	0.58	< 0.05	< 0.02		14	< 1	35	25	74	<0.02	0.013	<0.1	0.051
6/27/2013	MAX	8.03	630	240	22	1.4	< 2	10	0.43	0.11	< 0.02	3	13	< 1	39	27	78	<0.1	0.016		0.066
7/25/2013	MAX	8.17	600	240	21	1.5	< 2	6.3	0.39	0.067	< 0.02	2	12	< 1	32	23	77	<0.1	0.017		0.059

Routine Surface Water Quality - General Analysis -Guelph WRIC & Waste Transfer Station

AECOM

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EPTS-01		6.5 - 8.5									0.03			1.0				0.30	0.20		0.02
8/7/2013	MAX	8.2	560	220	20	1.5	< 2	5.7	0.52	0.074	< 0.02	1	12	< 1	30	20	75	<0.1	0.017		0.058
9/24/2013	MAX	8.15	640	260	20	1.5	< 2	10	0.93	0.12	< 0.02	2	14	< 1	37	23	74	<0.1	0.021		0.067
10/31/2013	MAX	8.13	620	260	20	1.4	< 2	< 4	0.27	< 0.05	< 0.02	< 1	12	< 1	32	19	79	<0.1	0.015		0.083
11/19/2013	MAX	8.05	650	270	23	1.7	< 2	8	0.5	0.086	< 0.02	< 1	13	< 1	34	23	85	<0.1	0.02		0.086
12/5/2013	MAX	7.87	660	270	22	1.5	< 2	< 4	0.32	0.1	< 0.02	< 1	14	< 1	36	21	80	<0.1	0.012		0.099
1/14/2014	MAX	7.98	720	250	24	1.7	< 2	4.6	0.24	< 0.05	< 0.02	< 1	14	< 1	61	37	93	<0.1	0.015		0.11
2/20/2014	MAX	8.03	680	260	24	1.6	< 2	< 4	0.46	0.13	< 0.04	2	14	< 1	41	32	91	<0.1	0.017		0.1
3/27/2014	MAX	8.17	695	250	25	1.5	< 2	6.2	0.43	< 0.05	< 0.04	< 1	12	< 1	58	25	92	<0.1	0.021		0.091
4/23/2014	MAX	7.93	710	240	22	1.4	< 2	< 4	0.4	< 0.05	< 0.04	< 1	11	< 1	71	39	84	<0.1	<0.01		0.1
5/27/2014	MAX	7.92	660	250	21	1.3	< 2	< 4	0.53	< 0.05	< 0.02	1	11	< 1	45	27	78	<0.1	0.013		0.068
6/25/2014	MAX	8.14	610	250	22	1.4	< 2	< 4	0.63	0.06	< 0.02	2	12	< 1	37	25	80	<0.1	0.021		0.069
7/29/2014	MAX	8.05	620	250	21	1.4	< 2	9.1	0.68	0.13	< 0.02	10	12	< 1	38	22	76	<0.1	0.015		0.061
8/21/2014	MAX	8.11	650	260	26	1.6	< 2	7.2	0.75	< 0.05	< 0.02	1	13	< 1	41	29	92	<0.1	0.013		0.072
9/23/2014	MAX	8.08	700	260	23	1.6	< 2	< 4	0.64	0.055	0.021	< 1	13	< 1	44	30	83	<0.1	0.017		0.063
10/23/2014	MAX	8.06	670	270	23	1.6	< 2	7.6	0.39	0.075	0.024	< 1	12	< 1	36	23	90	<0.1	0.025		0.077
11/26/2014	MAX	8.12	700	280	25	1.8	< 2	< 4	0.48	0.14	< 0.02	1	13	< 1	43	28	95	<0.1	0.018		0.1
12/18/2014	MAX	8.08	680	270	25	1.7	< 2	< 4	0.21	< 0.05	< 0.02	< 1	13	< 1	36	22	93	<0.1	0.018		0.094
1/21/2015	MAX	7.96	990	290	23	1.5	< 2	< 4	0.24	< 0.05	< 0.02	< 1	17	< 1	120	43	95	<0.1	0.017		0.12
2/28/2015	Snow																				
3/17/2015	MAX	7.94	680	270	24	1.7	< 2	9.3	0.72	0.17	0.028	2	14	< 1	46	27	94	<0.1	0.019		0.093
4/10/2015	MAX	7.19	470	73	3.5	1.6	< 2	24	0.72	0.067	0.072	10	7	2.4	92	68	22	0.45	0.01		0.029
5/20/2015	MAX	7.93	700	260	24	1.3	< 2	9.1	0.66	0.094	< 0.02	2	12	< 1	59	32	86	<0.1	0.015		0.067
6/30/2015	MAX	8.03	710	270	23	1.2	< 2	< 4	< 1	0.073	< 0.02	3	13	< 1	59	34	79	<0.1	0.018		0.063
7/14/2015	MAX	8	660	250	21	1.2	< 2	6.3	0.48	< 0.05	< 0.02	2	13	< 1	49	30	75	<0.1	0.016		0.051
8/27/2015	MAX	8.08	710	270	24	1.4	< 2	< 4	0.35	0.051	< 0.02	2	14	< 1	48	31	83	<0.1	0.025		0.068
9/4/2015	MAX	7.97	680	260	22	1.5	< 2	17	0.76	0.053	0.024	15	14	< 1	48	28	75	<0.1	0.019		0.067
10/22/2015	MAX	8.19	690	270	24	1.5	< 2	5.2	0.52	0.064	< 0.02	2	14	< 1	43	25	85	<0.1	0.016		0.071
11/25/2015	MAX	8	750	270	25	1.7	< 2	6	0.56	0.051	< 0.02	3	15	< 1	60	35	93	<0.1	0.016		0.096
12/15/2015	MAX	7.87	780	270	25	1.8	< 2	8.4	0.52	0.14	0.024	9	15	< 1	66	34	95	<0.1	0.014		0.15

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AECOM

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TP1-Out		6.5 - 8.5									0.03			1.0				0.30	0.20		0.02
1/31/2006	Dry																				
2/28/2006	Dry																				
3/9/2006	MAX	7.6	1390	69	3.9	6	10	52	2.4	0.66	0.29	25	27	1	332	220	37	0.92	<0.02	0.4	0.07
4/30/2006	Dry																				
5/16/2006	MAX	7.8	222	85	3.4	2.7	< 2	31	1.2	0.07	0.13	3	6	< 1	15	23	23	0.47	0.018		0.019
6/30/2006	Dry																				
7/31/2006	Dry																				
8/31/2006	Dry																				
9/13/2006	MAX	7.6	135	50	2.2	3.8	4	17	0.9	0.06	0.28	1	8	< 1	5	5.4	16	<0.05	0.032		0.021
10/31/2006	Dry																				
11/30/2006	Dry																				
12/31/2006	Dry																				
1/31/2007	Snow																				
2/28/2007	Snow																				
3/14/2007	MAX	7.6	972	70	4	5.7	4	28	1.7	0.66	0.3	3	11	< 1	220	180	26	0.2	0.018		0.028
3/29/2007	MAX	8.2	951	170	9.8	5.8	4	38	2.1	< 0.05	0.12	4	23	2	180	170	61	0.48	0.052		0.021
4/30/2007	Dry																				
5/31/2007	Dry																				
6/30/2007	Dry																				
7/31/2007	Dry																				
8/31/2007	Dry																				
9/12/2007	MAX	7.7	659	107	0.8	45	14	140	3	0.13	0.75	15	48	4	100	53	48	7.2	0.1		0.023
10/2/2007	MAX	7.9	695	229	9.6	24	7	120	4	0.19	0.26	10	24	2	73	47	72	0.96	0.08		0.022
11/21/2007	MAX	7.8	191	55	3.1	4.1	5	5	1	0.1	0.22	19	15	< 1	14	15	22	0.77	0.022		0.045
12/31/2007	Snow																				
1/8/2008	MAX	7.7	867	107	4	2.9	2	22	1.5	< 0.05	0.12	9	24	< 1	190	150	32	0.43	0.013		0.037
2/28/2008	Snow																				
3/31/2008	Snow																				
4/10/2008	MAX	8.2	535	126	4.3	2.3	< 2	36	1.1	< 0.05	0.14	3	6	1	84	76	32	0.7	0.02		0.011
5/22/2008	MAX	8.1	584	155	5.9	2.5	3	41	1.5	< 0.05	0.12	17	14	< 1	80	80	41	0.7	0.04		0.008
6/24/2008	MAX	7.8	245	87	2.9	1.7	4	37	1.5	0.24	0.23	6	4	1	19	20	22	0.69	0.028		0.019
7/24/2008	MAX	8	333	128	4.8	5.8	4	43	1.3	0.11	0.15	5	< 1	< 1	27	24	35	1.2	0.03		0.006
8/11/2008	MAX	7.5	323	118	4.7	2.1	2	24	0.6	0.4	0.059	3	2	< 1	24	24	32	0.5	0.02		0.007
9/17/2008	MAX	7.9	427	165	7.1	5.2	< 2	26	1.2	< 0.05	0.091	4	8	< 1	33	40	54	0.5	0.03		0.014
10/16/2008	MAX	7.9	389	130	3.9	4.7	< 2	63	1.1	0.28	0.11	< 1	34	2	23	23	52	<0.1	0.04		0.007
11/26/2008	MAX	8.1	4740	243	16	4.2	< 2	36	0.8	0.06	0.056	2	34	< 1	1300	820	160	0.2	0.03		0.055
12/31/2008	Snow																				
1/30/2009	Snow																				
2/12/2009	MAX	7.6	772	86	5.2	2.2	< 2	21	0.7	< 0.05	0.11	11	9	< 1	180	110	33	1	<0.01		0.046
3/11/2009	MAX	6.7	526	95	4.5	2.9	3	27	1	< 0.05	0.13	10	13	< 1	99	78	29	1	0.01		0.045
4/28/2009	MAX	6.7	404	64	3	1.8	8	53	1.6	0.24	0.25	32	21	2	72	57	22	1.5	0.02		0.062
5/27/2009	MAX	7	282	52	2.9	4.6	13	71	2.6	0.35	0.5	48	33	4	32	34	21	1.6	0.06		0.08
6/17/2009	MAX	7	462	133	4.2	6.2	6	53	1.6	0.25	0.13	4	42	< 1	37	42	47	0.6	0.11		0.011
7/23/2009	MAX	7.1	214	62	3.3	3.4	6	68	2.7	< 0.05	0.5	32	19	< 1	11	16	24	1.2	0.05		0.076
8/28/2009	Dry																				

Routine Surface Water Quality - General Analysis -Guelph WRIC & Waste Transfer Station

AECOM

Date	Lab	pH	Cond-uctivity	Alk mg/L	Mg mg/L	K mg/L	BOD mg/L	COD mg/L	TKN mg/L	NH3-N mg/L	Total-P mg/L	TSS mg/L	SO4 mg/L	Phenol ug/L	Cl mg/L	Na mg/L	Ca mg/L	Fe mg/L	B mg/L	P mg/L	Zn mg/L
TP1-Out		6.5 - 8.5									0.03			1.0				0.30	0.20		0.02
9/29/2009	MAX	7.3	228	78	2.7	3.2	3	28	1	0.05	0.19	6	20	< 1	14	15	26	0.1	0.02		0.015
10/29/2009	MAX	7.8	586	161	6.7	7.7	< 2	35	1.1	0.08	0.14	8	28	< 1	65	48	59	0.3	0.03		0.034
11/19/2009	MAX	8	627	190	7.7	7.4	< 2	27	1	0.14	0.11	1	18	< 1	70	55	69	0.2	0.03		0.014
12/9/2009	MAX	7.9	531	167	6.9	4	< 2	21	0.8	0.11	0.06	2	14	< 1	55	48	53	0.2	0.01		0.009
1/29/2010	Snow																				
2/26/2010	Snow																				
3/18/2010	MAX	7.9	723	224	12	6.4	4	34	1.8	0.15	0.16	7	5	< 1	92	73	64	0.8	0.01		0.019
4/7/2010	MAX	7.7	599	140	6.5	5.1	6	58	1.8	< 0.05	0.29	9	32	< 1	88	72	53	1.4	0.03		0.02
5/31/2010	Dry																				
6/22/2010	N/A																				
7/30/2010	MAX	7.8	365	135	4.6	3.1	3	42	1.5	0.57	0.17	9	20	< 1	20	19	48	0.7	0.04		0.007
8/31/2010	MAX	8.2	379	140	4.1	4.5	3	25	1	0.08	0.13	< 1	20	< 1	21	23	52	<0.1	0.04		<0.005
9/30/2010	MAX	7.9	443	146	6.4	6.8	< 2	45	1.4	0.19	0.18	< 10	14	< 1	38	32	47	0.5	0.02		0.008
11/5/2010	MAX	8.17	569	188	8.1	5.9	< 2	41	1.6	0.43	0.15	7	15	< 1	51	51	63	0.7	0.02		0.031
12/2/2010	MAX	8	544	177	7.9	3	< 2	22	0.6	< 0.05	0.05	3	16	< 1	49	57	50	0.4	0.01		0.019
12/31/2010	Froze																				
1/28/2011	Froze																				
2/28/2011	Froze																				
3/31/2011	Snow/																				
4/8/2011	MAX	7.97	996	195	10	3.6	< 2	33	1.1	< 0.05	0.1	5	21	< 1	190	130	67	0.4	0.02		0.016
6/3/2011	MAX	7.65	1030	390	29	7.4	< 2	26	1.7	0.52	0.2	9	36	3	66	63	140	1.4	0.04		0.071
6/22/2011	MAX	8.06	343	150	5.5	1.5	< 2	39	1.4	0.23	0.13	< 10	< 1	< 1	16	21	45	0.6	0.03		<0.005
7/29/2011	Dry																				
8/25/2011	MAX	7.48	394	98	5.3	14	3	49	2.3	0.09	0.3	5	40	< 1	33	22	41	<0.1	0.03		0.015
9/27/2011	MAX	7.96	316	109	5.9	6.9	< 2	42	1.5	0.15	0.24	2	27	7	15	14	39	0.2	0.04		0.013
10/20/2011	MAX	7.95	225	87	3.6	1.9	< 2	17	0.5	< 0.05	0.09	6	8	3	13	14	26	0.2	<0.01		0.013
11/29/2011	MAX	7.37	137	50	2.5	1.7	5	35	0.9	< 0.05	0.25	28	10	3	5	7.4	19	1	<0.01		0.059
12/15/2011	MAX	7.78	423	70	2.4	1.6	3	25	0.6	< 0.05	0.14	5	10	3	75	56	28	0.33	0.014		0.067
1/31/2012	Dry																				
2/29/2012	Dry																				
3/29/2012	MAX	8	920	170	8.8	3.7	2	41	0.91	0.085	0.15	6	6	< 1	170	130	60	1.1	0.02		0.013
4/17/2012	MAX	8.1	970	180	8	4.2	< 2	40	1.9	0.09	0.1	5	7	< 1	170	130	65	1.2	0.018		0.0082
5/31/2012	Dry																				
6/22/2012	MAX	8.04	400	140	4.5	3.8	< 2	43	1	0.16	0.11	4	16	< 1	26	32	48	0.67	0.057		0.0086
7/26/2012	MAX	8.26	410	140	3.3	5.4	2	27	1.4	0.14	0.079	2	17	< 1	28	36	46	<0.1	0.052		0.0089
8/31/2012	Dry																				
9/20/2012	MAX	7.67	400	140	6.7	3	< 2	35	1.1	< 0.05	0.075	2	11	3.1	32	26	47	0.29	0.024		<0.005
10/24/2012	MAX	7.68	490	180	9	2.8	< 2	30	0.64	0.15	0.035	4	12	< 1	38	36	58	0.23	0.019		0.0083
11/30/2012	Dry																				
12/18/2012	MAX	7.23	740	160	6.9	2	3	21	0.94	< 0.05	0.043	3	23	< 1	120	87	54	<0.1	0.011		0.025
1/30/2013	MAX	7.05	1600	61	4.8	2.6	7	57	1.8	0.13	0.28	58	17	< 1	400	300	34	1.7	0.013		0.11
2/28/2013	Dry																				
3/29/2013	Dry																				
4/18/2013	MAX	7.85	1100	94	4.5	1.8	3	31	0.87	0.055	0.056	5	16	2.3	240	190	36	0.49	0.024		0.015
5/28/2013	MAX	8.26	1000	150	6	3.9	4	59	2.7	0.1	0.82	49	19	< 1	180	150	57	8.5	0.019		0.015

Routine Surface Water Quality - General Analysis -Guelph WRIC & Waste Transfer Station

AECOM

Date	Lab	pH	Cond-uctivity	Alk mg/L	Mg mg/L	K mg/L	BOD mg/L	COD mg/L	TKN mg/L	NH3-N mg/L	Total-P mg/L	TSS mg/L	SO4 mg/L	Phenol ug/L	Cl mg/L	Na mg/L	Ca mg/L	Fe mg/L	B mg/L	P mg/L	Zn mg/L
TP1-Out		6.5 - 8.5									0.03			1.0				0.30	0.20		0.02
6/27/2013	MAX	8.02	370	120	4	1.9	< 2	20	0.71	0.093	< 0.02	2	10	< 1	30	31	42	0.31	0.032		<0.005
7/25/2013	MAX	7.96	230	82	3.4	3	< 2	18	0.82	0.17	0.075	1	11	< 1	14	12	33	0.26	0.037		<0.005
8/7/2013	MAX	7.68	470	140	7.2	12	14	55	1.9	0.055	0.39	11	< 1	1	58	32	46	1.2	0.028		0.011
9/24/2013	MAX	7.95	510	180	8.8	3.1	< 2	32	1.2	0.094	0.077	2	9	< 1	43	35	54	0.16	0.024		0.007
10/31/2013	MAX	7.32	150	52	2.2	2.4	3	17	0.72	< 0.05	0.19	5	8	2.3	10	8.8	17	0.26	0.017		0.025
11/19/2013	MAX	7.82	440	160	8.9	3.9	< 2	25	0.67	< 0.05	0.038	2	15	< 1	30	28	52	0.12	0.022		0.011
12/5/2013	MAX	7.81	380	130	6.5	2.9	< 2	15	0.71	0.28	0.049	2	18	2.7	30	25	44	0.66	0.012		0.01
1/14/2014	MAX	7.78	1400	120	8.6	2.8	< 2	15	1.1	< 0.05	0.022	9	14	< 1	310	230	59	0.33	<0.01		0.015
2/28/2014	Snow																				
3/28/2014	Snow																				
4/23/2014	MAX	7.93	1500	230	15	3.8	< 2	29	0.94	< 0.05	< 0.02	2	5	< 1	300	170	99	0.39	0.012		0.0054
5/27/2014	MAX	7.99	770	160	7.9	2.2	4	33	1.5	0.14	0.076	6	19	2	130	95	54	0.83	0.043		<0.005
6/25/2014	MAX	7.46	260	56	3.3	9.1	5	47	1.6	0.28	0.71	8	24	1.9	30	25	19	0.22	0.052		0.015
7/29/2014	MAX	7.77	270	88	4	2.8	2	30	1.2	0.071	0.089	3	7	< 1	25	22	26	0.12	0.022		0.014
8/21/2014	MAX	7.73	210	72	3.3	2.5	2	26	0.57	0.088	0.091	1	17	1.1	13	11	25	0.14	0.028		0.012
9/23/2014	MAX	7.88	370	120	6.4	2.1	< 2	27	0.63	0.066	0.05	1	6	2.1	33	27	40	0.16	0.022		0.0074
10/23/2014	MAX	7.9	570	180	8	3.9	< 2	31	0.72	0.067	0.072	3	17	1.8	61	45	61	0.39	0.036		0.0058
11/26/2014	MAX	8.05	870	200	10	2.9	< 2	25	0.89	< 0.05	0.074	15	10	4.5	140	100	61	0.71	0.015		0.024
12/18/2014	MAX	7.92	570	170	8.9	2.7	< 2	24	0.73	< 0.05	0.052	4	< 1	3.5	74	58	57	0.55	0.013		0.008
1/31/2015	Ice C																				
2/28/2015	Ice C																				
3/17/2015	MAX	7.67	890	96	4.4	3.3	3	26	0.73	0.06	0.062	5	8	6.5	200	130	32	0.27	0.014		0.016
4/10/2015	MAX	7.76	1000	180	11	3.1	< 2	20	0.88	< 0.05	0.07	3	8	1.6	180	120	67	0.28	0.019		0.0085
5/20/2015	MAX	8.16	1200	210	13	5	< 2	30	0.92	< 0.05	0.033	3	2	< 1	260	160	72	0.29	0.018		<0.005
6/30/2015	MAX	7.8	660	200	7.6	1.8	7	34	1.1	0.089	0.073	3	1	< 1	88	68	52	0.26	0.026		0.0061
7/14/2015	MAX	7.72	420	130	5.3	2.2	< 2	23	0.86	0.1	0.056	1	25	< 1	39	34	39	0.25	0.032		<0.005
8/27/2015	MAX	7.96	480	150	6.2	3.4	4	23	0.87	0.2	0.072	2	12	< 1	45	40	49	0.49	0.034		<0.005
9/4/2015	MAX	8	470	150	5.5	3.6	< 2	26	0.82	0.094	0.058	< 1	12	< 1	45	37	47	0.37	0.033		<0.005
10/22/2015	MAX	8.06	310	100	5.4	3.9	< 2	21	0.45	< 0.05	0.048	1	26	< 1	19	15	37	0.16	0.028		0.0052
11/25/2015	MAX	7.73	650	160	8.9	9.1	< 2	34	0.61	< 0.05	0.15	3	42	< 1	76	52	64	0.27	0.026		0.012
12/15/2015	MAX	7.53	930	140	10	8.1	8	66	1.4	< 0.05	0.25	35	120	19	120	83	87	2.1	0.096		0.072

Surface Water ORGANIC ANALYSIS (ATG MISA Groups 19 and 20) - Guelph WRIC/Waste Transfer Station - 2015

AECOM

Parameter	EPTS-01 30-Jun-2015	TP1-Out 30-Jun-2015
MISA Group 19		
Acenaphthene:	< 0.2	< 0.2
5-Nitroacenaphthene:	< 1	< 1
Acenaphthylene:	< 0.2	< 0.2
Anthracene:	< 0.2	< 0.2
Benzo(a)anthracene:	< 0.2	< 0.2
Benzo(a)Pyrene:	< 0.2	< 0.2
Benzo(b)Fluoranthene:	< 0.2	< 0.2
Benzo(g,h,i)perylene:	< 0.2	< 0.2
Benzo(k)Fluoranthene:	< 0.2	< 0.2
Biphenyl:	< 0.5	< 0.5
Camphene:	< 1	< 1
1-Chloronaphthalene:	< 1	< 1
2-Chloronaphthalene:	< 0.5	< 0.5
Chrysene:	< 0.2	< 0.2
Dibenzo(a,h)Anthracene:	< 0.2	< 0.2
Fluoranthene:	< 0.2	< 0.2
Fluorene:	< 0.2	< 0.2
Indeno(1,2,3-cd)Pyrene:	< 0.2	< 0.2
Indole:	< 1	< 1
1-Methylnaphthalene:	< 0.2	< 0.2
2-Methylnaphthalene:	< 0.2	< 0.2
Naphthalene:	< 0.2	< 0.2
Perylene:	< 0.2	< 0.2
Phenanthrene:	< 0.2	< 0.2
Pyrene:	< 0.2	< 0.2
Benzyl Butyl Phthalate:	< 0.5	< 0.5
bis(2-ethylhexyl)Phthalate	< 2	< 2
Di-N-butylPhthalate:	< 2	< 2
Di-N-octylPhthalate:	< 0.8	< 0.8
4-Bromophenyl phenyl Ethe	< 0.3	< 0.3
4-Chlorophenyl Phenyl Eth	< 0.5	< 0.5
bis(2-chloroisopropyl)Ether	< 0.5	< 0.5
bis(2-Chloroethyl)Ether:	< 0.5	< 0.5
Diphenyl ether:	< 0.3	< 0.3
2,4-Dinitrotoluene:	< 0.5	< 0.5
2,6-Dinitrotoluene:	< 0.5	< 0.5
bis(2-chloroethoxy)Methan	< 0.5	< 0.5
Nitrosodiphenylamine /Diphenylamine:	< 1	< 1
N-Nitrosodi-N-propylamine:	< 0.5	< 0.5
MISA Group 20		
2,3,4,5-Tetrachlorophenol		
2,3,4,6-Tetrachlorophenol		
2,3,5,6-Tetrachlorophenol		
2,3,4-Trichlorophenol:	< 0.5	< 0.5
2,3,5-Trichlorophenol:	< 0.5	< 0.5
2,4,5-Trichlorophenol:	< 0.5	< 0.5
2,4,6-Trichlorophenol:	< 0.5	< 0.5
2,4-Dinitrophenol:	< 2	< 2
2,4-Dimethylphenol:	< 0.5	< 0.5
2,4-Dichlorophenol:	< 0.3	< 0.3
2,6-Dichlorophenol:	< 0.5	< 0.5
4,6-Dinitro-o-Cresol:		
2-Chlorophenol:	< 0.3	< 0.3
4-Chloro-3-methylphenol	< 0.5	< 0.5
4-Nitrophenol:	< 1.4	< 1.4
o-Cresol:	0.51	< 0.5
m-,p-Cresol:	< 0.5	< 0.5
Pentachlorophenol:	< 1	< 1
Phenol:	< 0.5	< 0.5

Surface Water ORGANIC ANALYSIS - ATG MISA Groups 16, 17 and 18 -Guelph WRIC/Waste Transfer Station - 2015

AECOM

Parameter	EPTS-01 30-Jun-2015	TP1-Out 30-Jun-2015
MISA Group 16		
1,1,1,2-Tetrachloroethane:	< 0.2	< 0.2
1,1,1-Trichloroethane:	< 0.1	< 0.1
1,1,2,2-Tetrachloroethane:	< 0.2	< 0.2
1,1,2-Trichloroethane:	< 0.2	< 0.2
1,1-Dichloroethane:	< 0.1	< 0.1
1,1-Dichloroethylene:	< 0.1	< 0.1
1,2-Dichlorobenzene:	< 0.2	< 0.2
1,2-Dibromoethane:*	< 0.2	< 0.2
1,2-Dichloroethane:	< 0.2	< 0.2
1,2-Dichloropropane:	< 0.1	< 0.1
1,3-Dichlorobenzene:	< 0.2	< 0.2
1,4-Dichlorobenzene:	< 0.2	< 0.2
Bromodichloromethane:	< 0.1	< 0.1
Bromoform:	< 0.2	< 0.2
Bromomethane:	< 0.5	< 0.5
Carbon Tetrachloride:	< 0.1	< 0.1
Chlorobenzene:	< 0.1	< 0.1
Chloroform:	0.44	< 0.1
Chloromethane:	< 0.5	< 0.5
Cis-1,2-Dichloroethylene:	< 0.1	< 0.1
Cis-1,3-Dichloropropylene:	< 0.2	< 0.2
Dibromochloromethane:	< 0.2	< 0.2
Methylene Chloride:	< 0.5	< 0.5
Tetrachloroethylene:	< 0.1	< 0.1
trans-1,2-Dichloroethylene:	< 0.1	< 0.1
Trans-1,3-Dichloropropylene:	< 0.2	< 0.2
Trichloroethylene:	< 0.1	< 0.1
Trichlorofluoromethane:	< 0.2	< 0.2
Vinyl chloride:	< 0.2	< 0.2
MISA Group 17		
Benzene:	< 0.1	< 0.1
Ethylbenzene:	< 0.1	< 0.1
Styrene:	< 0.2	< 0.2
Toluene:	< 0.2	< 0.2
o-Xylene:	< 0.1	< 0.1
m-Xylene and p-Xylene:	< 0.1	< 0.1
MISA Group 18		
Acrolein:	< 10	< 10
Acrylonitrile:	< 5	< 5

AECOM

Appendix D

2015 Laboratory Reports
(CD in report pocket)

Your Project #: Wet/Dry Ground Water
Site Location: WET/DRY JUNE
Your C.O.C. #: 517057-01-01

Attention:Andrew Shouldice

City of Guelph
Eastview Landfill
186 Eastview Road
Guelph, ON
CANADA N1E 1Z6

Report Date: 2015/06/24
Report #: R3487755
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B5B7102
Received: 2015/06/17, 16:54

Sample Matrix: Water
Samples Received: 8

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Alkalinity	4	N/A	2015/06/18	CAM SOP-00448	SM 22 2320 B m
Alkalinity	4	N/A	2015/06/19	CAM SOP-00448	SM 22 2320 B m
Biochemical Oxygen Demand (BOD)	8	N/A	2015/06/23	CAM SOP-00427	SM 22 5210B m
Chloride by Automated Colourimetry	8	N/A	2015/06/19	CAM SOP-00463	EPA 325.2 m
Chemical Oxygen Demand	8	N/A	2015/06/24	CAM SOP-00416	SM 22 5220 D m
Conductivity	4	N/A	2015/06/18	CAM SOP-00414	SM 22 2510 m
Conductivity	4	N/A	2015/06/19	CAM SOP-00414	SM 22 2510 m
Dissolved Metals by ICPMS	8	N/A	2015/06/24	CAM SOP-00447	EPA 6020A m
Total Metals Analysis by ICP	8	2015/06/19	2015/06/19	CAM SOP-00408	EPA 6010C m
Total Ammonia-N	8	N/A	2015/06/22	CAM SOP-00441	EPA GS I-2522-90 m
Nitrate (NO3) and Nitrite (NO2) in Water (1)	8	N/A	2015/06/19	CAM SOP-00440	SM 22 4500-NO3I/NO2B
pH	4	N/A	2015/06/18	CAM SOP-00413	SM 4500H+ B m
pH	4	N/A	2015/06/19	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	8	N/A	2015/06/24	CAM SOP-00444	OMOE E3179 m
Sulphate by Automated Colourimetry	8	N/A	2015/06/19	CAM SOP-00464	EPA 375.4 m
Total Kjeldahl Nitrogen in Water	8	2015/06/19	2015/06/19	CAM SOP-00938	OMOE E3516 m
Total Phosphorus (Colourimetric)	8	2015/06/23	2015/06/24	CAM SOP-00407	SM 4500 P B H m

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

Encryption Key

James Aspin
25 Jun 2015 11:39:27 -04:00

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
James Aspin, Senior Project Manager
Email: JAspin@maxxam.ca
Phone# (905)817-5771

==========

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Maxxam Job #: B5B7102
Report Date: 2015/06/24

City of Guelph
Client Project #: Wet/Dry Ground Water
Site Location: WET/DRY JUNE

RESULTS OF ANALYSES OF WATER

Maxxam ID		ALU842	ALU842		ALU843		ALU844		
Sampling Date		2015/06/16	2015/06/16		2015/06/16		2015/06/16		
COC Number		517057-01-01	517057-01-01		517057-01-01		517057-01-01		
	Units	**9**	**9 Lab-Dup**	**RDL**	**10**	**RDL**	**6A**	**RDL**	**QC Batch**
Inorganics									
Total Ammonia-N	mg/L	ND		0.050	0.053	0.050	ND	0.050	4073628
Total BOD	mg/L	ND		2.0	ND	2.0	ND	2.0	4071101
Total Chemical Oxygen Demand (COD)	mg/L	8.8	8.0	4.0	ND	4.0	4.5	4.0	4075784
Conductivity	umho/cm	270		1.0	720	1.0	1400	1.0	4071829
Total Kjeldahl Nitrogen (TKN)	mg/L	ND (1)	0.57	0.50	0.12	0.10	0.55	0.10	4073630
pH	pH	8.28		N/A	7.86	N/A	7.79	N/A	4071828
Phenols-4AAP	mg/L	ND		0.0010	ND	0.0010	ND	0.0010	4071714
Total Phosphorus	mg/L	ND		0.020	0.026	0.020	0.020	0.020	4077292
Dissolved Sulphate (SO4)	mg/L	26		1	92	1	35	1	4072874
Alkalinity (Total as CaCO3)	mg/L	84		1.0	240	1.0	290	1.0	4071825
Dissolved Chloride (Cl)	mg/L	7		1	36	1	230	3	4072868
Nitrite (N)	mg/L	ND		0.010	ND	0.010	ND	0.010	4072542
Nitrate (N)	mg/L	3.85		0.10	ND	0.10	3.70	0.10	4072542
Nitrate + Nitrite	mg/L	3.85		0.10	ND	0.10	3.70	0.10	4072542

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not detected
N/A = Not Applicable
(1) Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.

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Maxxam Job #: B5B7102
Report Date: 2015/06/24

City of Guelph
Client Project #: Wet/Dry Ground Water
Site Location: WET/DRY JUNE

RESULTS OF ANALYSES OF WATER

Maxxam ID		ALU844	ALU845	ALU845			ALU846		
Sampling Date		2015/06/16	2015/06/16	2015/06/16			2015/06/16		
COC Number		517057-01-01	517057-01-01	517057-01-01			517057-01-01		
	Units	**6A Lab-Dup**	**6B**	**6B Lab-Dup**	**RDL**	**QC Batch**	**22A**	**RDL**	**QC Batch**
Inorganics									
Total Ammonia-N	mg/L		ND		0.050	4073628	ND	0.050	4073628
Total BOD	mg/L		ND		2.0	4071101	ND	2.0	4071101
Total Chemical Oxygen Demand (COD)	mg/L		5.4		4.0	4075784	5.1	4.0	4075784
Conductivity	umho/cm		1600		1.0	4071829	760	1.0	4072468
Total Kjeldahl Nitrogen (TKN)	mg/L		0.67		0.10	4073630	0.12	0.10	4073630
pH	pH		7.75		N/A	4071828	8.01	N/A	4072470
Phenols-4AAP	mg/L		ND	ND	0.0010	4071714	ND	0.0010	4071714
Total Phosphorus	mg/L		0.025		0.020	4077292	0.081	0.020	4077292
Dissolved Sulphate (SO4)	mg/L		39		1	4072874	87	1	4072534
Alkalinity (Total as CaCO3)	mg/L		320		1.0	4071825	240	1.0	4072466
Dissolved Chloride (Cl)	mg/L		280		3	4072868	49	1	4072528
Nitrite (N)	mg/L	ND	ND		0.010	4072542	0.010	0.010	4072542
Nitrate (N)	mg/L	3.68	4.28		0.10	4072542	ND	0.10	4072542
Nitrate + Nitrite	mg/L	3.68	4.28		0.10	4072542	ND	0.10	4072542

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not detected
N/A = Not Applicable

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Maxxam Job #: B5B7102
Report Date: 2015/06/24

City of Guelph
Client Project #: Wet/Dry Ground Water
Site Location: WET/DRY JUNE

RESULTS OF ANALYSES OF WATER

Maxxam ID		ALU847			ALU848		ALU849		
Sampling Date		2015/06/16			2015/06/16		2015/06/16		
COC Number		517057-01-01			517057-01-01		517057-01-01		
	Units	**22B**	**RDL**	**QC Batch**	**18A**	**RDL**	**18B**	**RDL**	**QC Batch**
Inorganics									
Total Ammonia-N	mg/L	ND	0.050	4073628	ND	0.050	ND	0.050	4073628
Total BOD	mg/L	ND	2.0	4071101	ND	2.0	ND	2.0	4071101
Total Chemical Oxygen Demand (COD)	mg/L	ND	4.0	4075784	29	4.0	8.1	4.0	4075784
Conductivity	umho/cm	1200	1.0	4072468	620	1.0	540	1.0	4072468
Total Kjeldahl Nitrogen (TKN)	mg/L	0.66	0.10	4073630	0.75	0.50	ND (1)	0.50	4073630
pH	pH	7.95	N/A	4072470	7.93	N/A	8.17	N/A	4072470
Phenols-4AAP	mg/L	ND	0.0010	4071714	ND	0.0010	ND	0.0010	4071714
Total Phosphorus	mg/L	ND	0.020	4077292	0.38	0.10	0.94	0.20	4077292
Dissolved Sulphate (SO4)	mg/L	20	1	4072534	45	1	19	1	4072874
Alkalinity (Total as CaCO3)	mg/L	280	1.0	4072466	250	1.0	190	1.0	4072466
Dissolved Chloride (Cl)	mg/L	170	2	4072528	18	1	40	1	4072868
Nitrite (N)	mg/L	ND	0.010	4072542	ND	0.010	ND	0.010	4072542
Nitrate (N)	mg/L	3.93	0.10	4072542	4.68	0.10	1.09	0.10	4072542
Nitrate + Nitrite	mg/L	3.93	0.10	4072542	4.68	0.10	1.09	0.10	4072542

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected
N/A = Not Applicable
(1) Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.

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Maxxam Job #: B5B7102
Report Date: 2015/06/24

City of Guelph
Client Project #: Wet/Dry Ground Water
Site Location: WET/DRY JUNE

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		ALU842	ALU843	ALU844	ALU845	ALU846	ALU847		
Sampling Date		2015/06/16	2015/06/16	2015/06/16	2015/06/16	2015/06/16	2015/06/16		
COC Number		517057-01-01	517057-01-01	517057-01-01	517057-01-01	517057-01-01	517057-01-01		
	Units	**9**	**10**	**6A**	**6B**	**22A**	**22B**	**RDL**	**QC Batch**
Metals									
Total Iron (Fe)	mg/L	0.14	0.22	0.05	0.26	0.70	0.05	0.02	4073664
Dissolved Boron (B)	ug/L	25	22	29	39	23	26	10	4077216
Dissolved Calcium (Ca)	ug/L	26000	95000	110000	110000	99000	120000	200	4077216
Dissolved Magnesium (Mg)	ug/L	4800	31000	28000	23000	33000	26000	50	4077216
Dissolved Phosphorus (P)	ug/L	ND	ND	ND	ND	ND	ND	100	4077216
Dissolved Potassium (K)	ug/L	17000	1300	2900	7000	1500	2000	200	4077216
Dissolved Sodium (Na)	ug/L	13000	14000	140000	210000	16000	93000	100	4077216
Dissolved Zinc (Zn)	ug/L	ND	ND	35	76	ND	18	5.0	4077216

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected

Maxxam ID		ALU848	ALU849		
Sampling Date		2015/06/16	2015/06/16		
COC Number		517057-01-01	517057-01-01		
	Units	**18A**	**18B**	**RDL**	**QC Batch**
Metals					
Total Iron (Fe)	mg/L	12	37	0.02	4073664
Dissolved Boron (B)	ug/L	14	29	10	4077216
Dissolved Calcium (Ca)	ug/L	84000	53000	200	4077216
Dissolved Magnesium (Mg)	ug/L	27000	25000	50	4077216
Dissolved Phosphorus (P)	ug/L	ND	ND	100	4077216
Dissolved Potassium (K)	ug/L	1800	2400	200	4077216
Dissolved Sodium (Na)	ug/L	9100	24000	100	4077216
Dissolved Zinc (Zn)	ug/L	160	7.4	5.0	4077216

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected

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Maxxam Job #: B5B7102
Report Date: 2015/06/24

City of Guelph
Client Project #: Wet/Dry Ground Water
Site Location: WET/DRY JUNE

GENERAL COMMENTS

Results relate only to the items tested.

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Maxxam Job #: B5B7102
Report Date: 2015/06/24

QUALITY ASSURANCE REPORT

City of Guelph
Client Project #: Wet/Dry Ground Water
Site Location: WET/DRY JUNE

			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits	% Recovery	QC Limits
4071101	Total BOD	2015/06/23					ND, RDL=2.0	mg/L	NC	25	100	85 - 115
4071714	Phenols-4AAP	2015/06/24	89	80 - 120	95	85 - 115	ND, RDL=0.0010	mg/L	NC	20		
4071825	Alkalinity (Total as CaCO3)	2015/06/18			97	85 - 115	ND, RDL=1.0	mg/L	1.6	25		
4071828	pH	2015/06/18			101	98 - 103			0.23	N/A		
4071829	Conductivity	2015/06/18			101	85 - 115	ND, RDL=1.0	umho/cm	0.37	25		
4072466	Alkalinity (Total as CaCO3)	2015/06/19			95	85 - 115	ND, RDL=1.0	mg/L	1.6	25		
4072468	Conductivity	2015/06/19			102	85 - 115	ND, RDL=1.0	umho/cm	0.19	25		
4072470	pH	2015/06/19			101	98 - 103			0.13	N/A		
4072528	Dissolved Chloride (Cl)	2015/06/19	NC	80 - 120	104	80 - 120	ND,RDL=1	mg/L	0.064	20		
4072534	Dissolved Sulphate (SO4)	2015/06/19	NC	75 - 125	104	80 - 120	ND,RDL=1	mg/L	0.96	20		
4072542	Nitrate (N)	2015/06/19	NC	80 - 120	105	80 - 120	ND, RDL=0.10	mg/L	0.52	25		
4072542	Nitrite (N)	2015/06/19	107	80 - 120	98	80 - 120	ND, RDL=0.010	mg/L	NC	25		
4072868	Dissolved Chloride (Cl)	2015/06/19	110	80 - 120	102	80 - 120	ND,RDL=1	mg/L				
4072874	Dissolved Sulphate (SO4)	2015/06/19	NC	75 - 125	105	80 - 120	ND,RDL=1	mg/L				
4073628	Total Ammonia-N	2015/06/22	101	80 - 120	101	85 - 115	ND, RDL=0.050	mg/L	NC	20		
4073630	Total Kjeldahl Nitrogen (TKN)	2015/06/19	99	80 - 120	99	80 - 120	ND, RDL=0.10	mg/L	NC	20	100	80 - 120
4073664	Total Iron (Fe)	2015/06/22	103	80 - 120	94	80 - 120	ND, RDL=0.02	mg/L	7.0	25		
4075784	Total Chemical Oxygen Demand (COD)	2015/06/24	101	75 - 125	100	75 - 125	ND, RDL=4.0	mg/L	NC	25		
4077216	Dissolved Boron (B)	2015/06/24	107	80 - 120	106	80 - 120	ND, RDL=10	ug/L	NC	20		
4077216	Dissolved Calcium (Ca)	2015/06/24	NC	80 - 120	100	80 - 120	ND, RDL=200	ug/L				
4077216	Dissolved Magnesium (Mg)	2015/06/24	102	80 - 120	101	80 - 120	ND, RDL=50	ug/L				
4077216	Dissolved Phosphorus (P)	2015/06/24	NC	80 - 120	109	80 - 120	ND, RDL=100	ug/L				
4077216	Dissolved Potassium (K)	2015/06/24	105	80 - 120	102	80 - 120	ND, RDL=200	ug/L				
4077216	Dissolved Sodium (Na)	2015/06/24	NC	80 - 120	101	80 - 120	ND, RDL=100	ug/L	1.2	20		
4077216	Dissolved Zinc (Zn)	2015/06/24	100	80 - 120	100	80 - 120	ND, RDL=5.0	ug/L	NC	20		

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Maxxam Job #: B5B7102
Report Date: 2015/06/24

QUALITY ASSURANCE REPORT(CONT'D)

City of Guelph
Client Project #: Wet/Dry Ground Water
Site Location: WET/DRY JUNE

			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits	% Recovery	QC Limits
4077292	Total Phosphorus	2015/06/24	103	80 - 120	102	80 - 120	ND, RDL=0.020	mg/L	1.7	20	102	80 - 120

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

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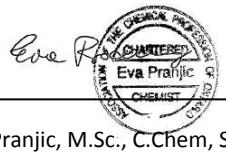
Maxxam Job #: B5B7102
Report Date: 2015/06/24

City of Guelph
Client Project #: Wet/Dry Ground Water
Site Location: WET/DRY JUNE

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Ewa Pranjic, M.Sc., C.Chem, Scientific Specialist

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Your Project #: Wet/Dry Ground Water
Site Location: WET/DRY "JUNE"
Your C.O.C. #: 517057-02-01

Attention:Amy Spence

City of Guelph
Soild Waste RIC (Wet/Dry)
110 Dunlop Drive
Guelph, ON
CANADA N1H 6H8

Report Date: 2015/06/25
Report #: R3493798
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B5B8340
Received: 2015/06/18, 16:55

Sample Matrix: Water
Samples Received: 7

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Alkalinity	7	N/A	2015/06/19	CAM SOP-00448	SM 22 2320 B m
Biochemical Oxygen Demand (BOD)	7	N/A	2015/06/24	CAM SOP-00427	SM 22 5210B m
Chloride by Automated Colourimetry	7	N/A	2015/06/22	CAM SOP-00463	EPA 325.2 m
Chemical Oxygen Demand	6	N/A	2015/06/23	CAM SOP-00416	SM 22 5220 D m
Chemical Oxygen Demand	1	N/A	2015/06/24	CAM SOP-00416	SM 22 5220 D m
Conductivity	7	N/A	2015/06/19	CAM SOP-00414	SM 22 2510 m
Dissolved Metals by ICPMS	7	N/A	2015/06/25	CAM SOP-00447	EPA 6020A m
Total Metals Analysis by ICP	7	2015/06/23	2015/06/23	CAM SOP-00408	EPA 6010C m
Total Ammonia-N	7	N/A	2015/06/23	CAM SOP-00441	EPA GS I-2522-90 m
Nitrate (NO3) and Nitrite (NO2) in Water (1)	7	N/A	2015/06/22	CAM SOP-00440	SM 22 4500-NO3I/NO2B
pH	7	N/A	2015/06/19	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	7	N/A	2015/06/23	CAM SOP-00444	OMOE E3179 m
Sulphate by Automated Colourimetry	7	N/A	2015/06/22	CAM SOP-00464	EPA 375.4 m
Total Kjeldahl Nitrogen in Water	7	2015/06/19	2015/06/23	CAM SOP-00938	OMOE E3516 m
Total Phosphorus (Colourimetric)	7	2015/06/24	2015/06/25	CAM SOP-00407	SM 4500 P B H m

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

Encryption Key

James Aspin
25 Jun 2015 16:10:17 -04:00

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
James Aspin, Senior Project Manager
Email: JAspin@maxxam.ca
Phone# (905)817-5771

==========

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Maxxam Job #: B5B8340
Report Date: 2015/06/25

City of Guelph
Client Project #: Wet/Dry Ground Water
Site Location: WET/DRY "JUNE"

RESULTS OF ANALYSES OF WATER

Maxxam ID		AMA567	AMA567			AMA568		
Sampling Date		2015/06/17	2015/06/17			2015/06/17		
COC Number		517057-02-01	517057-02-01			517057-02-01		
	Units	**12A**	**12A Lab-Dup**	**RDL**	**QC Batch**	**12B**	**RDL**	**QC Batch**
Inorganics								
Total Ammonia-N	mg/L	ND		0.050	4076448	ND	0.050	4076448
Total BOD	mg/L	ND	ND	2.0	4073468	ND	2.0	4073468
Total Chemical Oxygen Demand (COD)	mg/L	5.8		4.0	4075793	7.6	4.0	4075793
Conductivity	umho/cm	710		1.0	4073725	670	1.0	4073725
Total Kjeldahl Nitrogen (TKN)	mg/L	0.24		0.10	4074278	0.30	0.20	4074278
pH	pH	7.69		N/A	4073730	7.69	N/A	4073730
Phenols-4AAP	mg/L	ND		0.0010	4073851	ND	0.0010	4073851
Total Phosphorus	mg/L	ND		0.020	4078776	0.15	0.10	4078776
Dissolved Sulphate (SO4)	mg/L	28		1	4074365	26	1	4074654
Alkalinity (Total as CaCO3)	mg/L	310		1.0	4073723	300	1.0	4073723
Dissolved Chloride (Cl)	mg/L	28		1	4074361	26	1	4074643
Nitrite (N)	mg/L	ND		0.010	4073689	ND	0.010	4073689
Nitrate (N)	mg/L	1.33		0.10	4073689	1.01	0.10	4073689
Nitrate + Nitrite	mg/L	1.33		0.10	4073689	1.01	0.10	4073689

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not detected
N/A = Not Applicable

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Maxxam Job #: B5B8340
Report Date: 2015/06/25

City of Guelph
Client Project #: Wet/Dry Ground Water
Site Location: WET/DRY "JUNE"

RESULTS OF ANALYSES OF WATER

Maxxam ID		AMA569	AMA569			AMA570		
Sampling Date		2015/06/17	2015/06/17			2015/06/17		
COC Number		517057-02-01	517057-02-01			517057-02-01		
	Units	**17A**	**17A Lab-Dup**	**RDL**	**QC Batch**	**17B**	**RDL**	**QC Batch**
Inorganics								
Total Ammonia-N	mg/L	0.093	0.086	0.050	4076448	ND	0.050	4076448
Total BOD	mg/L	ND		2.0	4073468	ND	2.0	4073468
Total Chemical Oxygen Demand (COD)	mg/L	ND		4.0	4075784	4.4	4.0	4075793
Conductivity	umho/cm	710		1.0	4073725	1800	1.0	4073725
Total Kjeldahl Nitrogen (TKN)	mg/L	0.20		0.10	4074278	0.33	0.10	4074278
pH	pH	7.97		N/A	4073730	7.81	N/A	4073730
Phenols-4AAP	mg/L	ND		0.0010	4073851	0.0016	0.0010	4073446
Total Phosphorus	mg/L	0.032		0.020	4078776	0.022	0.020	4078776
Dissolved Sulphate (SO4)	mg/L	68		1	4074365	37	1	4074654
Alkalinity (Total as CaCO3)	mg/L	230		1.0	4073723	300	1.0	4073723
Dissolved Chloride (Cl)	mg/L	45		1	4074361	350	4	4074643
Nitrite (N)	mg/L	0.044		0.010	4073689	ND	0.010	4073689
Nitrate (N)	mg/L	ND		0.10	4073689	0.34	0.10	4073689
Nitrate + Nitrite	mg/L	ND		0.10	4073689	0.34	0.10	4073689

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not detected
N/A = Not Applicable

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Maxxam Job #: B5B8340
Report Date: 2015/06/25

City of Guelph
Client Project #: Wet/Dry Ground Water
Site Location: WET/DRY "JUNE"

RESULTS OF ANALYSES OF WATER

Maxxam ID		AMA571		AMA572			AMA573		
Sampling Date		2015/06/17		2015/06/17			2015/06/17		
COC Number		517057-02-01		517057-02-01			517057-02-01		
	Units	**23A**	**RDL**	**23B**	**RDL**	**QC Batch**	**25**	**RDL**	**QC Batch**
Inorganics									
Total Ammonia-N	mg/L	ND	0.050	ND	0.050	4076448	ND	0.050	4076448
Total BOD	mg/L	ND	2.0	ND	2.0	4073468	ND	2.0	4073468
Total Chemical Oxygen Demand (COD)	mg/L	ND	4.0	4.3	4.0	4075793	ND	4.0	4075793
Conductivity	umho/cm	700	1.0	1400	1.0	4073725	690	1.0	4073725
Total Kjeldahl Nitrogen (TKN)	mg/L	0.10	0.10	0.75	0.20	4074278	0.10	0.10	4074278
pH	pH	7.89	N/A	7.74	N/A	4073730	7.92	N/A	4073730
Phenols-4AAP	mg/L	ND	0.0010	ND	0.0010	4073446	ND	0.0010	4073446
Total Phosphorus	mg/L	ND	0.020	0.33	0.10	4078776	ND	0.020	4078776
Dissolved Sulphate (SO4)	mg/L	110	1	29	1	4074365	100	1	4074654
Alkalinity (Total as CaCO3)	mg/L	230	1.0	320	1.0	4073723	230	1.0	4073723
Dissolved Chloride (Cl)	mg/L	25	1	210	2	4074361	25	1	4074643
Nitrite (N)	mg/L	ND	0.010	ND	0.010	4073689	ND	0.010	4073689
Nitrate (N)	mg/L	ND	0.10	4.68	0.10	4073689	ND	0.10	4073689
Nitrate + Nitrite	mg/L	ND	0.10	4.68	0.10	4073689	ND	0.10	4073689

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected
N/A = Not Applicable

Maxxam ID		AMA573		
Sampling Date		2015/06/17		
COC Number		517057-02-01		
	Units	**25 Lab-Dup**	**RDL**	**QC Batch**
Inorganics				
Total Chemical Oxygen Demand (COD)	mg/L	ND	4.0	4075793

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not detected

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Maxxam Job #: B5B8340
Report Date: 2015/06/25

City of Guelph
Client Project #: Wet/Dry Ground Water
Site Location: WET/DRY "JUNE"

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		AMA567	AMA567	AMA568	AMA569	AMA570	AMA571		
Sampling Date		2015/06/17	2015/06/17	2015/06/17	2015/06/17	2015/06/17	2015/06/17		
COC Number		517057-02-01	517057-02-01	517057-02-01	517057-02-01	517057-02-01	517057-02-01		
	Units	**12A**	**12A Lab-Dup**	**12B**	**17A**	**17B**	**23A**	**RDL**	**QC Batch**
Metals									
Total Iron (Fe)	mg/L	0.02	ND	4.7	0.91	ND	0.17	0.02	4077201
Dissolved Boron (B)	ug/L	15		32	26	17	20	10	4078930
Dissolved Calcium (Ca)	ug/L	79000		87000	85000	120000	84000	200	4078930
Dissolved Magnesium (Mg)	ug/L	30000		24000	31000	33000	30000	50	4078930
Dissolved Phosphorus (P)	ug/L	ND		ND	ND	ND	ND	100	4078930
Dissolved Potassium (K)	ug/L	9000		2800	1600	1900	1200	200	4078930
Dissolved Sodium (Na)	ug/L	9700		13000	14000	190000	12000	100	4078930
Dissolved Zinc (Zn)	ug/L	730		340	5.2	270	ND	5.0	4078930

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not detected

Maxxam ID		AMA572	AMA573		
Sampling Date		2015/06/17	2015/06/17		
COC Number		517057-02-01	517057-02-01		
	Units	**23B**	**25**	**RDL**	**QC Batch**
Metals					
Total Iron (Fe)	mg/L	15	0.20	0.02	4077201
Dissolved Boron (B)	ug/L	460	25	10	4078930
Dissolved Calcium (Ca)	ug/L	110000	85000	200	4078930
Dissolved Magnesium (Mg)	ug/L	31000	30000	50	4078930
Dissolved Phosphorus (P)	ug/L	ND	ND	100	4078930
Dissolved Potassium (K)	ug/L	2700	1200	200	4078930
Dissolved Sodium (Na)	ug/L	120000	12000	100	4078930
Dissolved Zinc (Zn)	ug/L	250	ND	5.0	4078930

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected

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Maxxam Job #: B5B8340
Report Date: 2015/06/25

City of Guelph
Client Project #: Wet/Dry Ground Water
Site Location: WET/DRY "JUNE"

GENERAL COMMENTS

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

City of Guelph
Client Project #: Wet/Dry Ground Water
Site Location: WET/DRY "JUNE"

			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits	% Recovery	QC Limits
4073446	Phenols-4AAP	2015/06/23	96	80 - 120	97	85 - 115	ND, RDL=0.0010	mg/L	NC	20		
4073468	Total BOD	2015/06/24					ND, RDL=2.0	mg/L	NC	25	113	85 - 115
4073689	Nitrate (N)	2015/06/22	106	80 - 120	105	80 - 120	ND, RDL=0.10	mg/L	NC	25		
4073689	Nitrite (N)	2015/06/22	102	80 - 120	101	80 - 120	ND, RDL=0.010	mg/L	NC	25		
4073723	Alkalinity (Total as CaCO3)	2015/06/19			100	85 - 115	ND, RDL=1.0	mg/L	0.48	25		
4073725	Conductivity	2015/06/19			102	85 - 115	ND, RDL=1.0	umho/cm	0	25		
4073730	pH	2015/06/19			101	98 - 103			0.29	N/A		
4073851	Phenols-4AAP	2015/06/23	100	80 - 120	97	85 - 115	ND, RDL=0.0010	mg/L	NC	20		
4074278	Total Kjeldahl Nitrogen (TKN)	2015/06/23	98	80 - 120	97	80 - 120	ND, RDL=0.10	mg/L	NC	20	95	80 - 120
4074361	Dissolved Chloride (Cl)	2015/06/22	110	80 - 120	102	80 - 120	ND,RDL=1	mg/L	NC	20		
4074365	Dissolved Sulphate (SO4)	2015/06/22	109	75 - 125	103	80 - 120	ND,RDL=1	mg/L	4.7	20		
4074643	Dissolved Chloride (Cl)	2015/06/22	108	80 - 120	101	80 - 120	ND,RDL=1	mg/L	NC	20		
4074654	Dissolved Sulphate (SO4)	2015/06/22	107	75 - 125	103	80 - 120	ND,RDL=1	mg/L	NC	20		
4075784	Total Chemical Oxygen Demand (COD)	2015/06/24	101	75 - 125	100	75 - 125	ND, RDL=4.0	mg/L	NC	25		
4075793	Total Chemical Oxygen Demand (COD)	2015/06/23	100	75 - 125	101	75 - 125	ND, RDL=4.0	mg/L	NC	25		
4076448	Total Ammonia-N	2015/06/23	95	80 - 120	99	85 - 115	ND, RDL=0.050	mg/L	NC	20		
4077201	Total Iron (Fe)	2015/06/23	93	80 - 120	94	80 - 120	ND, RDL=0.02	mg/L	NC	25		
4078776	Total Phosphorus	2015/06/25	103	80 - 120	102	80 - 120	ND, RDL=0.020	mg/L	0.67	20	107	80 - 120
4078930	Dissolved Boron (B)	2015/06/25	92	80 - 120	99	80 - 120	ND, RDL=10	ug/L	1.9	20		
4078930	Dissolved Calcium (Ca)	2015/06/25	NC	80 - 120	98	80 - 120	ND, RDL=200	ug/L				
4078930	Dissolved Magnesium (Mg)	2015/06/25	NC	80 - 120	99	80 - 120	ND, RDL=50	ug/L				
4078930	Dissolved Phosphorus (P)	2015/06/25	NC	80 - 120	101	80 - 120	ND, RDL=100	ug/L				
4078930	Dissolved Potassium (K)	2015/06/25	92	80 - 120	99	80 - 120	ND, RDL=200	ug/L				
4078930	Dissolved Sodium (Na)	2015/06/25	NC	80 - 120	99	80 - 120	ND, RDL=100	ug/L	1.5	20		

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Maxxam Job #: B5B8340
Report Date: 2015/06/25

QUALITY ASSURANCE REPORT(CONT'D)

City of Guelph
Client Project #: Wet/Dry Ground Water
Site Location: WET/DRY "JUNE"

			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits	% Recovery	QC Limits
4078930	Dissolved Zinc (Zn)	2015/06/25	93	80 - 120	101	80 - 120	ND, RDL=5.0	ug/L	NC	20		

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

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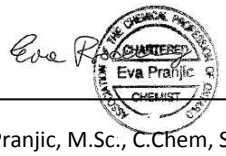
Maxxam Job #: B5B8340
Report Date: 2015/06/25

City of Guelph
Client Project #: Wet/Dry Ground Water
Site Location: WET/DRY "JUNE"

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Ewa Pranjic, M.Sc., C.Chem, Scientific Specialist

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Your Project #: WET/DRY GROUND WATER JUNE
Your C.O.C. #: 517057-03-01

Attention:Amy Spence

City of Guelph
Soild Waste RIC (Wet/Dry)
110 Dunlop Drive
Guelph, ON
CANADA N1H 6H8

Report Date: 2015/06/29
Report #: R3510931
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B5B9266
Received: 2015/06/19, 16:50

Sample Matrix: Water
Samples Received: 10

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Alkalinity	2	N/A	2015/06/22	CAM SOP-00448	SM 22 2320 B m
Alkalinity	8	N/A	2015/06/24	CAM SOP-00448	SM 22 2320 B m
Biochemical Oxygen Demand (BOD)	10	N/A	2015/06/27	CAM SOP-00427	SM 22 5210B m
Chloride by Automated Colourimetry	2	N/A	2015/06/22	CAM SOP-00463	EPA 325.2 m
Chloride by Automated Colourimetry	8	N/A	2015/06/23	CAM SOP-00463	EPA 325.2 m
Chemical Oxygen Demand	10	N/A	2015/06/26	CAM SOP-00416	SM 22 5220 D m
Conductivity	2	N/A	2015/06/22	CAM SOP-00414	SM 22 2510 m
Conductivity	8	N/A	2015/06/24	CAM SOP-00414	SM 22 2510 m
Dissolved Metals by ICPMS	10	N/A	2015/06/26	CAM SOP-00447	EPA 6020A m
Total Metals Analysis by ICP	10	2015/06/24	2015/06/24	CAM SOP-00408	EPA 6010C m
Total Ammonia-N	9	N/A	2015/06/23	CAM SOP-00441	EPA GS I-2522-90 m
Total Ammonia-N	1	N/A	2015/06/26	CAM SOP-00441	EPA GS I-2522-90 m
Nitrate (NO3) and Nitrite (NO2) in Water (1)	8	N/A	2015/06/23	CAM SOP-00440	SM 22 4500-NO3I/NO2B
Nitrate (NO3) and Nitrite (NO2) in Water (1)	2	N/A	2015/06/24	CAM SOP-00440	SM 22 4500-NO3I/NO2B
pH	2	N/A	2015/06/22	CAM SOP-00413	SM 4500H+ B m
pH	8	N/A	2015/06/24	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	10	N/A	2015/06/25	CAM SOP-00444	OMOE E3179 m
Sulphate by Automated Colourimetry	2	N/A	2015/06/22	CAM SOP-00464	EPA 375.4 m
Sulphate by Automated Colourimetry	8	N/A	2015/06/23	CAM SOP-00464	EPA 375.4 m
Total Kjeldahl Nitrogen in Water	10	2015/06/23	2015/06/24	CAM SOP-00938	OMOE E3516 m
Total Phosphorus (Colourimetric)	10	2015/06/24	2015/06/25	CAM SOP-00407	SM 4500 P B H m

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

Your Project #: WET/DRY GROUND WATER JUNE
Your C.O.C. #: 517057-03-01

Attention:Amy Spence

City of Guelph
Soild Waste RIC (Wet/Dry)
110 Dunlop Drive
Guelph, ON
CANADA N1H 6H8

Report Date: 2015/06/29
Report #: R3510931
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B5B9266
Received: 2015/06/19, 16:50

Encryption Key

Hina Ahmed
29 Jun 2015 12:53:36 -04:00

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
James Aspin, Senior Project Manager
Email: JAspin@maxxam.ca
Phone# (905)817-5771

==========

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Maxxam Job #: B5B9266
Report Date: 2015/06/29

City of Guelph
Client Project #: WET/DRY GROUND WATER JUNE

RESULTS OF ANALYSES OF WATER

Maxxam ID		AMF160			AMF161	AMF161		
Sampling Date		2015/06/18			2015/06/18	2015/06/18		
COC Number		517057-03-01			517057-03-01	517057-03-01		
	Units	**19A**	**RDL**	**QC Batch**	**16A**	**16A Lab-Dup**	**RDL**	**QC Batch**
Inorganics								
Total Ammonia-N	mg/L	0.16	0.050	4077282	ND	ND	0.050	4081065
Total BOD	mg/L	ND	2.0	4075870	ND		2.0	4075870
Total Chemical Oxygen Demand (COD)	mg/L	9.6	4.0	4077732	9.7	10	4.0	4077732
Conductivity	umho/cm	860	1.0	4076291	1300		1.0	4076291
Total Kjeldahl Nitrogen (TKN)	mg/L	0.16	0.10	4077801	0.23	0.21	0.10	4077801
pH	pH	7.98	N/A	4076294	7.84		N/A	4076294
Phenols-4AAP	mg/L	ND	0.0010	4075218	ND		0.0010	4075218
Total Phosphorus	mg/L	0.13	0.040	4079567	ND		0.020	4079567
Dissolved Sulphate (SO4)	mg/L	110	1	4076845	39		1	4076279
Alkalinity (Total as CaCO3)	mg/L	250	1.0	4076284	430		1.0	4076284
Dissolved Chloride (Cl)	mg/L	68	1	4076843	150		2	4076276
Nitrite (N)	mg/L	0.014	0.010	4076274	ND		0.010	4076268
Nitrate (N)	mg/L	ND	0.10	4076274	ND		0.10	4076268
Nitrate + Nitrite	mg/L	ND	0.10	4076274	ND		0.10	4076268

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not detected
N/A = Not Applicable

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Maxxam Job #: B5B9266
Report Date: 2015/06/29

City of Guelph
Client Project #: WET/DRY GROUND WATER JUNE

RESULTS OF ANALYSES OF WATER

Maxxam ID		AMF162		AMF163	AMF164		
Sampling Date		2015/06/18		2015/06/18	2015/06/18		
COC Number		517057-03-01		517057-03-01	517057-03-01		
	Units	**19B**	**RDL**	**16B**	**20A**	**RDL**	**QC Batch**
Inorganics							
Total Ammonia-N	mg/L	0.16	0.050	0.10	ND	0.050	4077282
Total BOD	mg/L	ND	2.0	ND	ND	2.0	4075870
Total Chemical Oxygen Demand (COD)	mg/L	ND	4.0	ND	ND	4.0	4077732
Conductivity	umho/cm	1500	1.0	600	600	1.0	4076291
Total Kjeldahl Nitrogen (TKN)	mg/L	0.27	0.10	0.15	0.27	0.10	4077801
pH	pH	8.03	N/A	8.11	8.03	N/A	4076294
Phenols-4AAP	mg/L	ND	0.0010	ND	ND	0.0010	4075218
Total Phosphorus	mg/L	0.090	0.040	ND	ND	0.020	4079567
Dissolved Sulphate (SO4)	mg/L	110	1	44	43	1	4076279
Alkalinity (Total as CaCO3)	mg/L	620	1.0	230	250	1.0	4076284
Dissolved Chloride (Cl)	mg/L	42	1	32	17	1	4076276
Nitrite (N)	mg/L	0.017	0.010	ND	0.036	0.010	4076268
Nitrate (N)	mg/L	4.61	0.10	ND	3.09	0.10	4076268
Nitrate + Nitrite	mg/L	4.63	0.10	ND	3.13	0.10	4076268

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected
N/A = Not Applicable

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Maxxam Job #: B5B9266
Report Date: 2015/06/29

City of Guelph
Client Project #: WET/DRY GROUND WATER JUNE

RESULTS OF ANALYSES OF WATER

Maxxam ID		AMF165		AMF166		AMF167	AMF168		
Sampling Date		2015/06/18		2015/06/18		2015/06/18	2015/06/19		
COC Number		517057-03-01		517057-03-01		517057-03-01	517057-03-01		
	Units	**20B**	**RDL**	**13A**	**QC Batch**	**13B**	**15A**	**RDL**	**QC Batch**
Inorganics									
Total Ammonia-N	mg/L	ND	0.050	0.15	4077282	ND	ND	0.050	4077282
Total BOD	mg/L	ND	2.0	ND	4075870	ND	ND	2.0	4075870
Total Chemical Oxygen Demand (COD)	mg/L	9.7	4.0	4.1	4077732	ND	ND	4.0	4077732
Conductivity	umho/cm	730	1.0	960	4075139	870	840	1.0	4076291
Total Kjeldahl Nitrogen (TKN)	mg/L	0.12	0.10	0.23	4077801	0.23	0.14	0.10	4077801
pH	pH	7.89	N/A	7.93	4075140	7.95	8.02	N/A	4076294
Phenols-4AAP	mg/L	ND	0.0010	ND	4075218	ND	ND	0.0010	4075218
Total Phosphorus	mg/L	0.097	0.040	ND	4079567	ND	ND	0.020	4079567
Dissolved Sulphate (SO4)	mg/L	49	1	110	4075144	20	100	1	4076279
Alkalinity (Total as CaCO3)	mg/L	300	1.0	240	4075138	410	260	1.0	4076284
Dissolved Chloride (Cl)	mg/L	30	1	99	4075143	38	68	1	4076276
Nitrite (N)	mg/L	ND	0.010	ND	4076054	0.024	ND	0.010	4076268
Nitrate (N)	mg/L	0.10	0.10	ND	4076054	1.14	ND	0.10	4076268
Nitrate + Nitrite	mg/L	0.10	0.10	ND	4076054	1.17	ND	0.10	4076268

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected
N/A = Not Applicable

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Maxxam Job #: B5B9266
Report Date: 2015/06/29

City of Guelph
Client Project #: WET/DRY GROUND WATER JUNE

RESULTS OF ANALYSES OF WATER

Maxxam ID		AMF168		AMF169	AMF169		
Sampling Date		2015/06/19		2015/06/19	2015/06/19		
COC Number		517057-03-01		517057-03-01	517057-03-01		
	Units	**15A Lab-Dup**	**RDL**	**15B**	**15B Lab-Dup**	**RDL**	**QC Batch**
Inorganics							
Total Ammonia-N	mg/L		0.050	ND		0.050	4077282
Total BOD	mg/L		2.0	ND		2.0	4075870
Total Chemical Oxygen Demand (COD)	mg/L		4.0	ND		4.0	4077732
Conductivity	umho/cm		1.0	820		1.0	4076291
Total Kjeldahl Nitrogen (TKN)	mg/L		0.10	ND		0.50	4077801
pH	pH		N/A	7.89		N/A	4076294
Phenols-4AAP	mg/L		0.0010	ND		0.0010	4075218
Total Phosphorus	mg/L	ND	0.020	0.073		0.040	4079567
Dissolved Sulphate (SO4)	mg/L		1	61		1	4076279
Alkalinity (Total as CaCO3)	mg/L		1.0	360		1.0	4076284
Dissolved Chloride (Cl)	mg/L		1	18		1	4076276
Nitrite (N)	mg/L		0.010	ND	ND	0.010	4076268
Nitrate (N)	mg/L		0.10	5.85	5.74	0.10	4076268
Nitrate + Nitrite	mg/L		0.10	5.85	5.74	0.10	4076268

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not detected

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Maxxam Job #: B5B9266
Report Date: 2015/06/29

City of Guelph
Client Project #: WET/DRY GROUND WATER JUNE

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		AMF160	AMF160	AMF161	AMF162	AMF163	AMF164		
Sampling Date		2015/06/18	2015/06/18	2015/06/18	2015/06/18	2015/06/18	2015/06/18		
COC Number		517057-03-01	517057-03-01	517057-03-01	517057-03-01	517057-03-01	517057-03-01		
	Units	**19A**	**19A Lab-Dup**	**16A**	**19B**	**16B**	**20A**	**RDL**	**QC Batch**
Metals									
Total Iron (Fe)	mg/L	4.7	4.6	0.07	2.6	0.15	0.41	0.02	4079028
Dissolved Boron (B)	ug/L	36	36	32	130	34	10	10	4081803
Dissolved Calcium (Ca)	ug/L	100000	110000	120000	71000	84000	85000	200	4081803
Dissolved Magnesium (Mg)	ug/L	35000	35000	35000	22000	28000	29000	50	4081803
Dissolved Phosphorus (P)	ug/L	ND	ND	ND	ND	ND	ND	100	4081803
Dissolved Potassium (K)	ug/L	1600	1600	2500	11000	1900	1200	200	4081803
Dissolved Sodium (Na)	ug/L	31000	32000	120000	250000	3700	4100	100	4081803
Dissolved Zinc (Zn)	ug/L	ND	ND	1100	26	28	120	5.0	4081803

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not detected

Maxxam ID		AMF165		AMF166		AMF167	AMF168	AMF169		
Sampling Date		2015/06/18		2015/06/18		2015/06/18	2015/06/19	2015/06/19		
COC Number		517057-03-01		517057-03-01		517057-03-01	517057-03-01	517057-03-01		
	Units	**20B**	**RDL**	**13A**	**RDL**	**13B**	**15A**	**15B**	**RDL**	**QC Batch**
Metals										
Total Iron (Fe)	mg/L	3.7	0.02	0.45	0.02	0.19	1.0	3.6	0.02	4079028
Dissolved Boron (B)	ug/L	14	10	48	10	27	22	23	10	4081803
Dissolved Calcium (Ca)	ug/L	97000	200	100000	400	130000	110000	130000	200	4081803
Dissolved Magnesium (Mg)	ug/L	31000	50	35000	50	26000	36000	28000	50	4081803
Dissolved Phosphorus (P)	ug/L	ND	100	ND	100	ND	ND	ND	100	4081803
Dissolved Potassium (K)	ug/L	1700	200	2700	200	1800	1400	910	200	4081803
Dissolved Sodium (Na)	ug/L	13000	100	45000	100	35000	27000	22000	100	4081803
Dissolved Zinc (Zn)	ug/L	83	5.0	ND	5.0	130	ND	37	5.0	4081803

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected

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Maxxam Job #: B5B9266
Report Date: 2015/06/29

City of Guelph
Client Project #: WET/DRY GROUND WATER JUNE

GENERAL COMMENTS

Results relate only to the items tested.

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Maxxam Job #: B5B9266
Report Date: 2015/06/29

QUALITY ASSURANCE REPORT

City of Guelph
Client Project #: WET/DRY GROUND WATER JUNE

			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits	% Recovery	QC Limits
4075138	Alkalinity (Total as CaCO3)	2015/06/23			94	85 - 115	ND, RDL=1.0	mg/L	0.30	25		
4075139	Conductivity	2015/06/23			103	85 - 115	ND, RDL=1.0	umho/cm	0.093	25		
4075140	pH	2015/06/22			101	98 - 103			0.85	N/A		
4075143	Dissolved Chloride (Cl)	2015/06/22	NC	80 - 120	102	80 - 120	ND,RDL=1	mg/L	1.3	20		
4075144	Dissolved Sulphate (SO4)	2015/06/22	NC	75 - 125	100	80 - 120	ND,RDL=1	mg/L	NC	20		
4075218	Phenols-4AAP	2015/06/25	96	80 - 120	99	85 - 115	ND, RDL=0.0010	mg/L	NC	20		
4075870	Total BOD	2015/06/27					ND, RDL=2.0	mg/L	NC	25	95	85 - 115
4076054	Nitrate (N)	2015/06/24	NC	80 - 120	92	80 - 120	ND, RDL=0.10	mg/L	1.9	25		
4076054	Nitrite (N)	2015/06/24	105	80 - 120	104	80 - 120	ND, RDL=0.010	mg/L	NC	25		
4076268	Nitrate (N)	2015/06/23	NC	80 - 120	97	80 - 120	ND, RDL=0.10	mg/L	2.0	25		
4076268	Nitrite (N)	2015/06/23	96	80 - 120	95	80 - 120	ND, RDL=0.010	mg/L	NC	25		
4076274	Nitrate (N)	2015/06/23	NC	80 - 120	99	80 - 120	ND, RDL=0.10	mg/L	0.34	25		
4076274	Nitrite (N)	2015/06/23	92	80 - 120	95	80 - 120	ND, RDL=0.010	mg/L	NC	25		
4076276	Dissolved Chloride (Cl)	2015/06/23	NC	80 - 120	102	80 - 120	ND,RDL=1	mg/L	0.69	20		
4076279	Dissolved Sulphate (SO4)	2015/06/23	NC	75 - 125	105	80 - 120	ND,RDL=1	mg/L	0.45	20		
4076284	Alkalinity (Total as CaCO3)	2015/06/24			97	85 - 115	ND, RDL=1.0	mg/L	0.14	25		
4076291	Conductivity	2015/06/24			101	85 - 115	ND, RDL=1.0	umho/cm	0.055	25		
4076294	pH	2015/06/24			102	98 - 103			0.097	N/A		
4076843	Dissolved Chloride (Cl)	2015/06/23	NC	80 - 120	101	80 - 120	ND,RDL=1	mg/L	0.48	20		
4076845	Dissolved Sulphate (SO4)	2015/06/23	NC	75 - 125	104	80 - 120	ND,RDL=1	mg/L	1.2	20		
4077282	Total Ammonia-N	2015/06/23	103	80 - 120	100	85 - 115	ND, RDL=0.050	mg/L	NC	20		
4077732	Total Chemical Oxygen Demand (COD)	2015/06/26	100	75 - 125	99	75 - 125	ND, RDL=4.0	mg/L	NC	25		
4077801	Total Kjeldahl Nitrogen (TKN)	2015/06/24	98	80 - 120	97	80 - 120	ND, RDL=0.10	mg/L	NC	20	99	80 - 120
4079028	Total Iron (Fe)	2015/06/24	NC	80 - 120	99	80 - 120	ND, RDL=0.02	mg/L	2.0	25		
4079567	Total Phosphorus	2015/06/25	102	80 - 120	102	80 - 120	ND, RDL=0.020	mg/L	NC	20	107	80 - 120

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QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits	% Recovery	QC Limits
4081065	Total Ammonia-N	2015/06/26	102	80 - 120	103	85 - 115	ND, RDL=0.050	mg/L	NC	20		
4081803	Dissolved Boron (B)	2015/06/26	106	80 - 120	102	80 - 120	ND, RDL=10	ug/L	NC	20		
4081803	Dissolved Calcium (Ca)	2015/06/26	NC	80 - 120	104	80 - 120	ND, RDL=200	ug/L	2.7	20		
4081803	Dissolved Magnesium (Mg)	2015/06/26	NC	80 - 120	107	80 - 120	ND, RDL=50	ug/L	2.3	20		
4081803	Dissolved Phosphorus (P)	2015/06/26	105	80 - 120	108	80 - 120	ND, RDL=100	ug/L	NC	20		
4081803	Dissolved Potassium (K)	2015/06/26	105	80 - 120	105	80 - 120	ND, RDL=200	ug/L	2.8	20		
4081803	Dissolved Sodium (Na)	2015/06/26	NC	80 - 120	105	80 - 120	ND, RDL=100	ug/L	3.2	20		
4081803	Dissolved Zinc (Zn)	2015/06/26	99	80 - 120	99	80 - 120	ND, RDL=5.0	ug/L	NC	20		

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

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Maxxam Job #: B5B9266
Report Date: 2015/06/29

City of Guelph
Client Project #: WET/DRY GROUND WATER JUNE

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Cristina Carriere

Cristina Carriere, Scientific Services

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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Your Project #: Wet/Dry Ground Water
Site Location: WET/DRY "JUNE"
Your C.O.C. #: 518545-02-01

Attention:Andrew Shouldice

City of Guelph
Eastview Landfill
186 Eastview Road
Guelph, ON
CANADA N1E 1Z6

Report Date: 2015/06/30
Report #: R3522307
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B5C1632
Received: 2015/06/23, 16:56

Sample Matrix: Water
Samples Received: 8

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Alkalinity	1	N/A	2015/06/25	CAM SOP-00448	SM 22 2320 B m
Alkalinity	7	N/A	2015/06/26	CAM SOP-00448	SM 22 2320 B m
Biochemical Oxygen Demand (BOD)	8	N/A	2015/06/29	CAM SOP-00427	SM 22 5210B m
Chloride by Automated Colourimetry	8	N/A	2015/06/25	CAM SOP-00463	EPA 325.2 m
Chemical Oxygen Demand	8	N/A	2015/06/29	CAM SOP-00416	SM 22 5220 D m
Conductivity	1	N/A	2015/06/25	CAM SOP-00414	SM 22 2510 m
Conductivity	7	N/A	2015/06/26	CAM SOP-00414	SM 22 2510 m
Dissolved Metals by ICPMS	6	N/A	2015/06/29	CAM SOP-00447	EPA 6020A m
Dissolved Metals by ICPMS	2	N/A	2015/06/30	CAM SOP-00447	EPA 6020A m
Total Metals Analysis by ICP	8	2015/06/30	2015/06/30	CAM SOP-00408	EPA 6010C m
Total Ammonia-N	7	N/A	2015/06/26	CAM SOP-00441	EPA GS I-2522-90 m
Total Ammonia-N	1	N/A	2015/06/29	CAM SOP-00441	EPA GS I-2522-90 m
Nitrate (NO3) and Nitrite (NO2) in Water (1)	8	N/A	2015/06/26	CAM SOP-00440	SM 22 4500-NO3I/NO2B
pH	1	N/A	2015/06/25	CAM SOP-00413	SM 4500H+ B m
pH	7	N/A	2015/06/26	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	8	N/A	2015/06/26	CAM SOP-00444	OMOE E3179 m
Sulphate by Automated Colourimetry	8	N/A	2015/06/25	CAM SOP-00464	EPA 375.4 m
Total Kjeldahl Nitrogen in Water	8	2015/06/25	2015/06/29	CAM SOP-00938	OMOE E3516 m
Total Phosphorus (Colourimetric)	8	2015/06/26	2015/06/29	CAM SOP-00407	SM 4500 P B H m

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

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Your Project #: Wet/Dry Ground Water
Site Location: WET/DRY "JUNE"
Your C.O.C. #: 518545-02-01

Attention:Andrew Shouldice

City of Guelph
Eastview Landfill
186 Eastview Road
Guelph, ON
CANADA N1E 1Z6

Report Date: 2015/06/30
Report #: R3522307
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B5C1632
Received: 2015/06/23, 16:56

Encryption Key

Hina Ahmed
30 Jun 2015 17:57:22 -04:00

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
James Aspin, Senior Project Manager
Email: JAspin@maxxam.ca
Phone# (905)817-5771

==========

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Maxxam Job #: B5C1632
Report Date: 2015/06/30

City of Guelph
Client Project #: Wet/Dry Ground Water
Site Location: WET/DRY "JUNE"

RESULTS OF ANALYSES OF WATER

Maxxam ID		AMR599			AMR600	AMR600		
Sampling Date		2015/06/22			2015/06/22	2015/06/22		
COC Number		518545-02-01			518545-02-01	518545-02-01		
	Units	**11A**	**RDL**	**QC Batch**	**11B**	**11B Lab-Dup**	**RDL**	**QC Batch**
Inorganics								
Total Ammonia-N	mg/L	ND	0.050	4081834	ND		0.050	4081360
Total BOD	mg/L	ND	2.0	4078958	ND		2.0	4078958
Total Chemical Oxygen Demand (COD)	mg/L	8.3	4.0	4081219	8.7		4.0	4081219
Conductivity	umho/cm	580	1.0	4080312	1300		1.0	4080312
Total Kjeldahl Nitrogen (TKN)	mg/L	0.13	0.10	4081185	0.39		0.10	4081185
pH	pH	7.83	N/A	4080315	7.81		N/A	4080315
Phenols-4AAP	mg/L	ND	0.0010	4079959	ND		0.0010	4079959
Total Phosphorus	mg/L	0.021	0.020	4083001	0.061		0.020	4083001
Dissolved Sulphate (SO4)	mg/L	38	1	4080076	20	19	1	4080076
Alkalinity (Total as CaCO3)	mg/L	240	1.0	4080311	230		1.0	4080311
Dissolved Chloride (Cl)	mg/L	24	1	4080063	240	240	3	4080063
Nitrite (N)	mg/L	0.015	0.010	4080042	ND		0.010	4080042
Nitrate (N)	mg/L	ND	0.10	4080042	1.94		0.10	4080042
Nitrate + Nitrite	mg/L	ND	0.10	4080042	1.94		0.10	4080042

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not detected
N/A = Not Applicable

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Maxxam Job #: B5C1632
Report Date: 2015/06/30

City of Guelph
Client Project #: Wet/Dry Ground Water
Site Location: WET/DRY "JUNE"

RESULTS OF ANALYSES OF WATER

Maxxam ID		AMR601	AMR601		AMR602		AMR603		
Sampling Date		2015/06/22	2015/06/22		2015/06/22		2015/06/22		
COC Number		518545-02-01	518545-02-01		518545-02-01		518545-02-01		
	Units	**14A**	**14A Lab-Dup**	**RDL**	**14B**	**RDL**	**7**	**RDL**	**QC Batch**
Inorganics									
Total Ammonia-N	mg/L	ND		0.050	ND	0.050	ND	0.050	4081360
Total BOD	mg/L	ND		2.0	ND	2.0	ND	2.0	4078958
Total Chemical Oxygen Demand (COD)	mg/L	9.0		4.0	37	4.0	21	4.0	4081219
Conductivity	umho/cm	640		1.0	1300	1.0	1000	1.0	4080312
Total Kjeldahl Nitrogen (TKN)	mg/L	ND		0.10	1.2	0.50	0.65	0.20	4081185
pH	pH	7.79		N/A	7.64	N/A	7.76	N/A	4080315
Phenols-4AAP	mg/L	ND		0.0010	ND	0.0010	ND	0.0010	4079959
Total Phosphorus	mg/L	0.022		0.020	1.1	0.40	ND	0.020	4083001
Dissolved Sulphate (SO4)	mg/L	63		1	37	1	36	1	4080076
Alkalinity (Total as CaCO3)	mg/L	250		1.0	340	1.0	290	1.0	4080311
Dissolved Chloride (Cl)	mg/L	23		1	180	2	130	1	4080063
Nitrite (N)	mg/L	ND	ND	0.010	ND	0.010	ND	0.010	4080042
Nitrate (N)	mg/L	ND	ND	0.10	1.48	0.10	4.54	0.10	4080042
Nitrate + Nitrite	mg/L	ND	ND	0.10	1.48	0.10	4.54	0.10	4080042

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not detected
N/A = Not Applicable

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Maxxam Job #: B5C1632
Report Date: 2015/06/30

City of Guelph
Client Project #: Wet/Dry Ground Water
Site Location: WET/DRY "JUNE"

RESULTS OF ANALYSES OF WATER

Maxxam ID		AMR604		AMR605	AMR605		
Sampling Date		2015/06/22		2015/06/22	2015/06/22		
COC Number		518545-02-01		518545-02-01	518545-02-01		
	Units	**5**	**RDL**	**8**	**8 Lab-Dup**	**RDL**	**QC Batch**
Inorganics							
Total Ammonia-N	mg/L	ND	0.050	ND		0.050	4081360
Total BOD	mg/L	ND	2.0	ND		2.0	4078958
Total Chemical Oxygen Demand (COD)	mg/L	22	4.0	9.0		4.0	4081219
Conductivity	umho/cm	2900	1.0	1100		1.0	4080312
Total Kjeldahl Nitrogen (TKN)	mg/L	0.18	0.10	0.16		0.10	4081185
pH	pH	7.68	N/A	7.76		N/A	4080315
Phenols-4AAP	mg/L	ND	0.0010	ND		0.0010	4079959
Total Phosphorus	mg/L	0.020	0.020	ND	ND	0.020	4083001
Dissolved Sulphate (SO4)	mg/L	36	1	39		1	4080076
Alkalinity (Total as CaCO3)	mg/L	290	1.0	300		1.0	4080311
Dissolved Chloride (Cl)	mg/L	730	10	140		2	4080063
Nitrite (N)	mg/L	ND	0.010	ND		0.010	4080042
Nitrate (N)	mg/L	0.53	0.10	0.35		0.10	4080042
Nitrate + Nitrite	mg/L	0.53	0.10	0.35		0.10	4080042

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not detected
N/A = Not Applicable

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Maxxam Job #: B5C1632
Report Date: 2015/06/30

City of Guelph
Client Project #: Wet/Dry Ground Water
Site Location: WET/DRY "JUNE"

RESULTS OF ANALYSES OF WATER

Maxxam ID		AMR606		
Sampling Date		2015/06/22		
COC Number		518545-02-01		
	Units	**21A**	**RDL**	**QC Batch**
Inorganics				
Total Ammonia-N	mg/L	ND	0.050	4081360
Total BOD	mg/L	ND	2.0	4078958
Total Chemical Oxygen Demand (COD)	mg/L	7.1	4.0	4081219
Conductivity	umho/cm	580	1.0	4080010
Total Kjeldahl Nitrogen (TKN)	mg/L	0.35	0.10	4081185
pH	pH	7.74	N/A	4080011
Phenols-4AAP	mg/L	ND	0.0010	4079959
Total Phosphorus	mg/L	ND	0.020	4083001
Dissolved Sulphate (SO4)	mg/L	20	1	4080076
Alkalinity (Total as CaCO3)	mg/L	280	1.0	4080009
Dissolved Chloride (Cl)	mg/L	12	1	4080063
Nitrite (N)	mg/L	ND	0.010	4080042
Nitrate (N)	mg/L	1.57	0.10	4080042
Nitrate + Nitrite	mg/L	1.57	0.10	4080042

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected
N/A = Not Applicable

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Maxxam Job #: B5C1632
Report Date: 2015/06/30

City of Guelph
Client Project #: Wet/Dry Ground Water
Site Location: WET/DRY "JUNE"

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		AMR599	AMR599	AMR600	AMR601	AMR602		
Sampling Date		2015/06/22	2015/06/22	2015/06/22	2015/06/22	2015/06/22		
COC Number		518545-02-01	518545-02-01	518545-02-01	518545-02-01	518545-02-01		
	Units	**11A**	**11A Lab-Dup**	**11B**	**14A**	**14B**	**RDL**	**QC Batch**
Metals								
Total Iron (Fe)	mg/L	0.19	0.20	2.7	1.3	34	0.02	4086643
Dissolved Boron (B)	ug/L	33		270	24	23	10	4085301
Dissolved Calcium (Ca)	ug/L	71000		94000	75000	150000	200	4085301
Dissolved Magnesium (Mg)	ug/L	26000		23000	26000	32000	50	4085301
Dissolved Phosphorus (P)	ug/L	ND		ND	ND	ND	100	4085301
Dissolved Potassium (K)	ug/L	1800		1600	1200	2000	200	4085301
Dissolved Sodium (Na)	ug/L	5700		130000	21000	86000	100	4085301
Dissolved Zinc (Zn)	ug/L	ND		23	ND	980	5.0	4085301

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not detected

Maxxam ID		AMR603		AMR604		AMR605		AMR606		
Sampling Date		2015/06/22		2015/06/22		2015/06/22		2015/06/22		
COC Number		518545-02-01		518545-02-01		518545-02-01		518545-02-01		
	Units	**7**	**QC Batch**	**5**	**QC Batch**	**8**	**QC Batch**	**21A**	**RDL**	**QC Batch**
Metals										
Total Iron (Fe)	mg/L	0.22	4086643	0.03	4086643	0.06	4086643	0.42	0.02	4086643
Dissolved Boron (B)	ug/L	35	4086746	17	4085301	15	4086746	15	10	4085301
Dissolved Calcium (Ca)	ug/L	97000	4086746	110000	4085301	93000	4086746	77000	200	4085301
Dissolved Magnesium (Mg)	ug/L	26000	4086746	23000	4085301	33000	4086746	25000	50	4085301
Dissolved Phosphorus (P)	ug/L	ND	4086746	ND	4085301	ND	4086746	ND	100	4085301
Dissolved Potassium (K)	ug/L	7800	4086746	4200	4085301	2300	4086746	960	200	4085301
Dissolved Sodium (Na)	ug/L	70000	4086746	460000	4085301	76000	4086746	11000	100	4085301
Dissolved Zinc (Zn)	ug/L	160	4086746	1700	4085301	970	4086746	340	5.0	4085301

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected

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Maxxam Job #: B5C1632
Report Date: 2015/06/30

City of Guelph
Client Project #: Wet/Dry Ground Water
Site Location: WET/DRY "JUNE"

GENERAL COMMENTS

Results relate only to the items tested.

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Maxxam Job #: B5C1632
Report Date: 2015/06/30

QUALITY ASSURANCE REPORT

City of Guelph
Client Project #: Wet/Dry Ground Water
Site Location: WET/DRY "JUNE"

			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits	% Recovery	QC Limits
4078958	Total BOD	2015/06/29					ND, RDL=2.0	mg/L	NC	25	105	85 - 115
4079959	Phenols-4AAP	2015/06/26	115	80 - 120	99	85 - 115	ND, RDL=0.0010	mg/L	1.1	20		
4080009	Alkalinity (Total as CaCO3)	2015/06/25			98	85 - 115	ND, RDL=1.0	mg/L	0.051	25		
4080010	Conductivity	2015/06/25			100	85 - 115	ND, RDL=1.0	umho/cm	0.24	25		
4080011	pH	2015/06/25			102	98 - 103			0.16	N/A		
4080042	Nitrate (N)	2015/06/26	96	80 - 120	98	80 - 120	ND, RDL=0.10	mg/L	NC	25		
4080042	Nitrite (N)	2015/06/26	102	80 - 120	102	80 - 120	ND, RDL=0.010	mg/L	NC	25		
4080063	Dissolved Chloride (Cl)	2015/06/25	NC	80 - 120	102	80 - 120	ND,RDL=1	mg/L	1.6	20		
4080076	Dissolved Sulphate (SO4)	2015/06/25	NC	75 - 125	102	80 - 120	ND,RDL=1	mg/L	5.6	20		
4080311	Alkalinity (Total as CaCO3)	2015/06/26			100	85 - 115	ND, RDL=1.0	mg/L	3.0	25		
4080312	Conductivity	2015/06/26			100	85 - 115	ND, RDL=1.0	umho/cm	0.31	25		
4080315	pH	2015/06/26			101	98 - 103			2.0	N/A		
4081185	Total Kjeldahl Nitrogen (TKN)	2015/06/29	103	80 - 120	102	80 - 120	ND, RDL=0.10	mg/L	NC	20	103	80 - 120
4081219	Total Chemical Oxygen Demand (COD)	2015/06/29	103	75 - 125	101	75 - 125	ND, RDL=4.0	mg/L	NC	25		
4081360	Total Ammonia-N	2015/06/26	100	80 - 120	104	85 - 115	ND, RDL=0.050	mg/L	NC	20		
4081834	Total Ammonia-N	2015/06/29	96	80 - 120	102	85 - 115	ND, RDL=0.050	mg/L	NC	20		
4083001	Total Phosphorus	2015/06/29	100	80 - 120	103	80 - 120	ND, RDL=0.020	mg/L	NC	20	98	80 - 120
4085301	Dissolved Boron (B)	2015/06/29	100	80 - 120	99	80 - 120	ND, RDL=10	ug/L	0.81	20		
4085301	Dissolved Calcium (Ca)	2015/06/29	NC	80 - 120	101	80 - 120	ND, RDL=200	ug/L				
4085301	Dissolved Magnesium (Mg)	2015/06/29	NC	80 - 120	100	80 - 120	ND, RDL=50	ug/L				
4085301	Dissolved Phosphorus (P)	2015/06/29	106	80 - 120	102	80 - 120	ND, RDL=100	ug/L				
4085301	Dissolved Potassium (K)	2015/06/29	101	80 - 120	99	80 - 120	ND, RDL=200	ug/L				
4085301	Dissolved Sodium (Na)	2015/06/29	NC	80 - 120	101	80 - 120	ND, RDL=100	ug/L	3.4	20		
4085301	Dissolved Zinc (Zn)	2015/06/29	99	80 - 120	98	80 - 120	ND, RDL=5.0	ug/L	NC	20		
4086643	Total Iron (Fe)	2015/06/30	94	80 - 120	97	80 - 120	ND, RDL=0.02	mg/L	5.4	25		
4086746	Dissolved Boron (B)	2015/06/30	101	80 - 120	100	80 - 120	ND, RDL=10	ug/L	NC	20		

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Maxxam Job #: B5C1632
Report Date: 2015/06/30

QUALITY ASSURANCE REPORT(CONT'D)

City of Guelph
Client Project #: Wet/Dry Ground Water
Site Location: WET/DRY "JUNE"

			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits	% Recovery	QC Limits
4086746	Dissolved Calcium (Ca)	2015/06/30	NC	80 - 120	96	80 - 120	ND, RDL=200	ug/L	2.2	20		
4086746	Dissolved Magnesium (Mg)	2015/06/30	NC	80 - 120	99	80 - 120	ND, RDL=50	ug/L	1.4	20		
4086746	Dissolved Phosphorus (P)	2015/06/30	105	80 - 120	103	80 - 120	ND, RDL=100	ug/L	NC	20		
4086746	Dissolved Potassium (K)	2015/06/30	99	80 - 120	99	80 - 120	ND, RDL=200	ug/L	2.1	20		
4086746	Dissolved Sodium (Na)	2015/06/30	NC	80 - 120	100	80 - 120	ND, RDL=100	ug/L	0.34	20		
4086746	Dissolved Zinc (Zn)	2015/06/30	96	80 - 120	97	80 - 120	ND, RDL=5.0	ug/L	NC	20		

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

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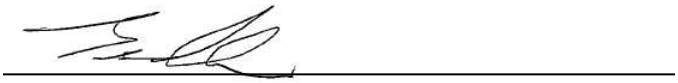
Maxxam Job #: B5C1632
Report Date: 2015/06/30

City of Guelph
Client Project #: Wet/Dry Ground Water
Site Location: WET/DRY "JUNE"

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Brad Newman, Scientific Specialist

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Your P.O. #: 720.8121.3516
Your Project #: Wet/Dry - Surface Water
Site#: 110 DUNLOP
Site Location: 110 DUNLOP
Your C.O.C. #: 400396-05-01

Attention:Amy Spence

City of Guelph
Soild Waste RIC (Wet/Dry)
110 Dunlop Drive
Guelph, ON
CANADA N1H 6H8

Report Date: 2015/07/10
Report #: R3569011
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B5C7276
Received: 2015/06/30, 16:45

Sample Matrix: Water
Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
ABN Compounds in Water by GC/MS	2	2015/07/07	2015/07/08	CAM SOP-00301	EPA 8270 m
Alkalinity	2	N/A	2015/07/04	CAM SOP-00448	SM 22 2320 B m
Biochemical Oxygen Demand (BOD)	2	N/A	2015/07/07	CAM SOP-00427	SM 22 5210B m
Chloride by Automated Colourimetry	2	N/A	2015/07/06	CAM SOP-00463	EPA 325.2 m
Chemical Oxygen Demand	2	N/A	2015/07/06	CAM SOP-00416	SM 22 5220 D m
Conductivity	2	N/A	2015/07/04	CAM SOP-00414	SM 22 2510 m
Total Metals Analysis by ICPMS	2	N/A	2015/07/08	CAM SOP-00447	EPA 6020A m
Total Ammonia-N	2	N/A	2015/07/06	CAM SOP-00441	EPA GS I-2522-90 m
Nitrate (NO3) and Nitrite (NO2) in Water (1)	2	N/A	2015/07/08	CAM SOP-00440	SM 22 4500-NO3I/NO2B
pH	2	N/A	2015/07/04	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	2	N/A	2015/07/03	CAM SOP-00444	OMOE E3179 m
Sulphate by Automated Colourimetry	2	N/A	2015/07/06	CAM SOP-00464	EPA 375.4 m
Total Kjeldahl Nitrogen in Water	2	2015/07/03	2015/07/08	CAM SOP-00938	OMOE E3516 m
Total Phosphorus (Colourimetric)	2	2015/07/06	2015/07/07	CAM SOP-00407	SM 4500 P B H m
Low Level Total Suspended Solids	2	N/A	2015/07/04	CAM SOP-00428	SM 22 2540D m
Volatile Organic Compounds in Water	2	N/A	2015/07/06	CAM SOP-00226	EPA 8260C m
Non-Routine Volatile Organic Compounds	2	N/A	2015/07/06	CAM SOP-00226	EPA 8260 m

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

Encryption Key

James Aspin
13 Jul 2015 11:53:14 -04:00

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
James Aspin, Senior Project Manager
Email: JAspin@maxxam.ca
Phone# (905)817-5771

==========

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Maxxam Job #: B5C7276
Report Date: 2015/07/10

City of Guelph
Client Project #: Wet/Dry - Surface Water
Site Location: 110 DUNLOP
Your P.O. #: 720.8121.3516

RESULTS OF ANALYSES OF WATER

Maxxam ID		ANU469	ANU469			ANU470		
Sampling Date		2015/06/30	2015/06/30			2015/06/30		
COC Number		400396-05-01	400396-05-01			400396-05-01		
	Units	**EPTSO1**	**EPTSO1 Lab-Dup**	**RDL**	**QC Batch**	**TP1-OUT**	**RDL**	**QC Batch**
Inorganics								
Total Ammonia-N	mg/L	0.073		0.050	4090951	0.089	0.050	4090951
Total BOD	mg/L	ND	ND	2.0	4088855	7.0	2.0	4088855
Total Chemical Oxygen Demand (COD)	mg/L	ND		4.0	4091314	34	4.0	4091314
Conductivity	umho/cm	710		1.0	4091115	660	1.0	4091115
Total Kjeldahl Nitrogen (TKN)	mg/L	ND (1)		0.50	4091051	1.1	1.0	4091051
pH	pH	8.03		N/A	4091116	7.80	N/A	4091116
Phenols-4AAP	mg/L	ND		0.0010	4089598	ND	0.0010	4089598
Total Phosphorus	mg/L	ND		0.020	4093274	0.073	0.020	4093274
Total Suspended Solids	mg/L	3	3	1	4090976	3	1	4091005
Dissolved Sulphate (SO4)	mg/L	13		1	4091150	1	1	4091150
Alkalinity (Total as CaCO3)	mg/L	270		1.0	4091113	200	1.0	4091113
Dissolved Chloride (Cl)	mg/L	59		1	4091140	88	1	4091140
Nitrite (N)	mg/L	0.043		0.010	4090760	ND	0.010	4090760
Nitrate (N)	mg/L	2.77		0.10	4090760	ND	0.10	4090760
Nitrate + Nitrite	mg/L	2.81		0.10	4090760	ND	0.10	4090760

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not detected
N/A = Not Applicable
(1) Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.

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Maxxam Job #: B5C7276
Report Date: 2015/07/10

City of Guelph
Client Project #: Wet/Dry - Surface Water
Site Location: 110 DUNLOP
Your P.O. #: 720.8121.3516

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		ANU469	ANU470		
Sampling Date		2015/06/30	2015/06/30		
COC Number		400396-05-01	400396-05-01		
	Units	**EPTSO1**	**TP1-OUT**	**RDL**	**QC Batch**
Metals					
Total Boron (B)	mg/L	0.018	0.026	0.010	4094414
Total Calcium (Ca)	mg/L	79	52	0.20	4094414
Total Iron (Fe)	mg/L	ND	0.26	0.10	4094414
Total Magnesium (Mg)	mg/L	23	7.6	0.050	4094414
Total Potassium (K)	mg/L	1.2	1.8	0.20	4094414
Total Sodium (Na)	mg/L	34	68	0.10	4094414
Total Zinc (Zn)	mg/L	0.063	0.0061	0.0050	4094414

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected

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Maxxam Job #: B5C7276
Report Date: 2015/07/10

City of Guelph
Client Project #: Wet/Dry - Surface Water
Site Location: 110 DUNLOP
Your P.O. #: 720.8121.3516

SEMI-VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		ANU469	ANU470		
Sampling Date		2015/06/30	2015/06/30		
COC Number		400396-05-01	400396-05-01		
	Units	**EPTSO1**	**TP1-OUT**	**RDL**	**QC Batch**
Semivolatile Organics					
Acenaphthene	ug/L	ND	ND	0.20	4094403
Acenaphthylene	ug/L	ND	ND	0.20	4094403
Anthracene	ug/L	ND	ND	0.20	4094403
Benzo(a)anthracene	ug/L	ND	ND	0.20	4094403
Benzo(a)pyrene	ug/L	ND	ND	0.20	4094403
Benzo(b/j)fluoranthene	ug/L	ND	ND	0.20	4094403
Benzo(g,h,i)perylene	ug/L	ND	ND	0.20	4094403
Benzo(k)fluoranthene	ug/L	ND	ND	0.20	4094403
1-Chloronaphthalene	ug/L	ND	ND	1.0	4094403
2-Chloronaphthalene	ug/L	ND	ND	0.50	4094403
Chrysene	ug/L	ND	ND	0.20	4094403
Dibenz(a,h)anthracene	ug/L	ND	ND	0.20	4094403
Fluoranthene	ug/L	ND	ND	0.20	4094403
Fluorene	ug/L	ND	ND	0.20	4094403
Indeno(1,2,3-cd)pyrene	ug/L	ND	ND	0.20	4094403
1-Methylnaphthalene	ug/L	ND	ND	0.20	4094403
2-Methylnaphthalene	ug/L	ND	ND	0.20	4094403
Naphthalene	ug/L	ND	ND	0.20	4094403
5-Nitroacenaphthene	ug/L	ND	ND	1.0	4094403
Perylene	ug/L	ND	ND	0.20	4094403
Phenanthrene	ug/L	ND	ND	0.20	4094403
Pyrene	ug/L	ND	ND	0.20	4094403
2-Chlorophenol	ug/L	ND	ND	0.30	4094403
4-Chloro-3-Methylphenol	ug/L	ND	ND	0.50	4094403
m/p-Cresol	ug/L	ND	ND	0.50	4094403
o-Cresol	ug/L	0.51	ND	0.50	4094403
2,4-Dichlorophenol	ug/L	ND	ND	0.30	4094403
2,6-Dichlorophenol	ug/L	ND	ND	0.50	4094403
2,4-Dimethylphenol	ug/L	ND	ND	0.50	4094403
2,4-Dinitrophenol	ug/L	ND	ND	2.0	4094403
4,6-Dinitro-2-methylphenol	ug/L	ND	ND	2.0	4094403
4-Nitrophenol	ug/L	ND	ND	1.4	4094403
Pentachlorophenol	ug/L	ND	ND	1.0	4094403

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected

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Maxxam Job #: B5C7276
Report Date: 2015/07/10

City of Guelph
Client Project #: Wet/Dry - Surface Water
Site Location: 110 DUNLOP
Your P.O. #: 720.8121.3516

SEMI-VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		ANU469	ANU470		
Sampling Date		2015/06/30	2015/06/30		
COC Number		400396-05-01	400396-05-01		
	Units	**EPTSO1**	**TP1-OUT**	**RDL**	**QC Batch**
Phenol	ug/L	ND	ND	0.50	4094403
2,3,4-Trichlorophenol	ug/L	ND	ND	0.50	4094403
2,3,5-Trichlorophenol	ug/L	ND	ND	0.50	4094403
2,4,5-Trichlorophenol	ug/L	ND	ND	0.50	4094403
2,4,6-Trichlorophenol	ug/L	ND	ND	0.50	4094403
Benzyl butyl phthalate	ug/L	ND	ND	0.50	4094403
Biphenyl	ug/L	ND	ND	0.50	4094403
Bis(2-chloroethyl)ether	ug/L	ND	ND	0.50	4094403
Bis(2-chloroethoxy)methane	ug/L	ND	ND	0.50	4094403
Bis(2-chloroisopropyl)ether	ug/L	ND	ND	0.50	4094403
Bis(2-ethylhexyl)phthalate	ug/L	ND	ND	2.0	4094403
4-Bromophenyl phenyl ether	ug/L	ND	ND	0.30	4094403
Camphene	ug/L	ND	ND	1.0	4094403
4-Chlorophenyl phenyl ether	ug/L	ND	ND	0.50	4094403
Di-N-butyl phthalate	ug/L	ND	ND	2.0	4094403
Di-N-octyl phthalate	ug/L	ND	ND	0.80	4094403
2,4-Dinitrotoluene	ug/L	ND	ND	0.50	4094403
2,6-Dinitrotoluene	ug/L	ND	ND	0.50	4094403
Diphenyl Ether	ug/L	ND	ND	0.30	4094403
Indole	ug/L	ND	ND	1.0	4094403
Nitrosodiphenylamine/Diphenylamine	ug/L	ND	ND	1.0	4094403
N-Nitroso-di-n-propylamine	ug/L	ND	ND	0.50	4094403
Surrogate Recovery (%)					
2,4,6-Tribromophenol	%	85	80		4094403
2-Fluorobiphenyl	%	56	46		4094403
2-Fluorophenol	%	44	41		4094403
D14-Terphenyl	%	92	92		4094403
D5-Nitrobenzene	%	67	62		4094403
D5-Phenol	%	31	28		4094403

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected

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Maxxam Job #: B5C7276
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City of Guelph
Client Project #: Wet/Dry - Surface Water
Site Location: 110 DUNLOP
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VOLATILE ORGANICS BY GC/MS (WATER)

Maxxam ID		ANU469	ANU470	ANU470		
Sampling Date		2015/06/30	2015/06/30	2015/06/30		
COC Number		400396-05-01	400396-05-01	400396-05-01		
	Units	**EPTSO1**	**TP1-OUT**	**TP1-OUT Lab-Dup**	**RDL**	**QC Batch**
Volatile Organics						
Acetone (2-Propanone)	ug/L	ND	ND	ND	10	4091154
Benzene	ug/L	ND	ND	ND	0.10	4091154
Bromodichloromethane	ug/L	ND	ND	ND	0.10	4091154
Acrolein	ug/L	ND	ND	ND	10	4092149
Bromoform	ug/L	ND	ND	ND	0.20	4091154
Bromomethane	ug/L	ND	ND	ND	0.50	4091154
Carbon Tetrachloride	ug/L	ND	ND	ND	0.10	4091154
Chlorobenzene	ug/L	ND	ND	ND	0.10	4091154
Chloroform	ug/L	0.44	ND	ND	0.10	4091154
Dibromochloromethane	ug/L	ND	ND	ND	0.20	4091154
Acrylonitrile	ug/L	ND	ND	ND	5.0	4092149
1,2-Dichlorobenzene	ug/L	ND	ND	ND	0.20	4091154
1,3-Dichlorobenzene	ug/L	ND	ND	ND	0.20	4091154
1,4-Dichlorobenzene	ug/L	ND	ND	ND	0.20	4091154
1,1-Dichloroethane	ug/L	ND	ND	ND	0.10	4091154
1,2-Dichloroethane	ug/L	ND	ND	ND	0.20	4091154
1,1-Dichloroethylene	ug/L	ND	ND	ND	0.10	4091154
cis-1,2-Dichloroethylene	ug/L	ND	ND	ND	0.10	4091154
trans-1,2-Dichloroethylene	ug/L	ND	ND	ND	0.10	4091154
1,2-Dichloropropane	ug/L	ND	ND	ND	0.10	4091154
cis-1,3-Dichloropropene	ug/L	ND	ND	ND	0.20	4091154
trans-1,3-Dichloropropene	ug/L	ND	ND	ND	0.20	4091154
Ethylbenzene	ug/L	ND	ND	ND	0.10	4091154
Ethylene Dibromide	ug/L	ND	ND	ND	0.20	4091154
Methylene Chloride(Dichloromethane)	ug/L	ND	ND	ND	0.50	4091154
Methyl Isobutyl Ketone	ug/L	ND	ND	ND	5.0	4091154
Methyl Ethyl Ketone (2-Butanone)	ug/L	ND	ND	ND	5.0	4091154
Methyl t-butyl ether (MTBE)	ug/L	ND	ND	ND	0.20	4091154
Styrene	ug/L	ND	ND	ND	0.20	4091154
1,1,1,2-Tetrachloroethane	ug/L	ND	ND	ND	0.20	4091154
1,1,2,2-Tetrachloroethane	ug/L	ND	ND	ND	0.20	4091154
Tetrachloroethylene	ug/L	ND	ND	ND	0.10	4091154
Toluene	ug/L	ND	ND	ND	0.20	4091154

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not detected

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City of Guelph
Client Project #: Wet/Dry - Surface Water
Site Location: 110 DUNLOP
Your P.O. #: 720.8121.3516

VOLATILE ORGANICS BY GC/MS (WATER)

Maxxam ID		ANU469	ANU470	ANU470		
Sampling Date		2015/06/30	2015/06/30	2015/06/30		
COC Number		400396-05-01	400396-05-01	400396-05-01		
	Units	**EPTSO1**	**TP1-OUT**	**TP1-OUT Lab-Dup**	**RDL**	**QC Batch**
1,1,1-Trichloroethane	ug/L	ND	ND	ND	0.10	4091154
1,1,2-Trichloroethane	ug/L	ND	ND	ND	0.20	4091154
Trichloroethylene	ug/L	ND	ND	ND	0.10	4091154
Vinyl Chloride	ug/L	ND	ND	ND	0.20	4091154
p+m-Xylene	ug/L	ND	ND	ND	0.10	4091154
o-Xylene	ug/L	ND	ND	ND	0.10	4091154
Total Xylenes	ug/L	ND	ND	ND	0.10	4091154
Chloromethane	ug/L	ND	ND	ND	0.50	4091154
Trichlorofluoromethane (FREON 11)	ug/L	ND	ND	ND	0.20	4091154
Surrogate Recovery (%)						
4-Bromofluorobenzene	%	102	100	100		4091154
D4-1,2-Dichloroethane	%	105	102	103		4091154
D8-Toluene	%	95	96	96		4091154

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not detected

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City of Guelph
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GENERAL COMMENTS

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

City of Guelph
Client Project #: Wet/Dry - Surface Water
Site Location: 110 DUNLOP
Your P.O. #: 720.8121.3516

			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits	% Recovery	QC Limits
4091154	4-Bromofluorobenzene	2015/07/06	103	70 - 130	101	70 - 130	100	%				
4091154	D4-1,2-Dichloroethane	2015/07/06	103	70 - 130	101	70 - 130	103	%				
4091154	D8-Toluene	2015/07/06	95	70 - 130	96	70 - 130	97	%				
4094403	2,4,6-Tribromophenol	2015/07/07	90	10 - 130	91	10 - 130	54	%				
4094403	2-Fluorobiphenyl	2015/07/07	63	30 - 130	69	30 - 130	31	%				
4094403	2-Fluorophenol	2015/07/07	41	10 - 130	51	10 - 130	22	%				
4094403	D14-Terphenyl	2015/07/07	92	30 - 130	92	30 - 130	91	%				
4094403	D5-Nitrobenzene	2015/07/07	67	30 - 130	84	30 - 130	36	%				
4094403	D5-Phenol	2015/07/07	29	10 - 130	33	10 - 130	14	%				
4088855	Total BOD	2015/07/07					ND, RDL=2.0	mg/L	NC	25	103	85 - 115
4089598	Phenols-4AAP	2015/07/03	88	80 - 120	100	85 - 115	ND, RDL=0.0010	mg/L	NC	20		
4090760	Nitrate (N)	2015/07/08	NC	80 - 120	107	80 - 120	ND, RDL=0.10	mg/L	0.20	25		
4090760	Nitrite (N)	2015/07/08	101	80 - 120	95	80 - 120	ND, RDL=0.010	mg/L	NC	25		
4090951	Total Ammonia-N	2015/07/06	102	80 - 120	101	85 - 115	ND, RDL=0.050	mg/L	NC	20		
4090976	Total Suspended Solids	2015/07/04					ND,RDL=1	mg/L	NC	25	97	85 - 115
4091005	Total Suspended Solids	2015/07/04					ND,RDL=1	mg/L	4.0	25	98	85 - 115
4091051	Total Kjeldahl Nitrogen (TKN)	2015/07/08	NC	80 - 120	100	80 - 120	ND, RDL=0.10	mg/L	2.9	20	98	80 - 120
4091113	Alkalinity (Total as CaCO3)	2015/07/04			97	85 - 115	ND, RDL=1.0	mg/L	0.12	25		
4091115	Conductivity	2015/07/04			103	85 - 115	ND, RDL=1.0	umho/cm	0	25		
4091116	pH	2015/07/04			101	98 - 103			0.41	N/A		
4091140	Dissolved Chloride (Cl)	2015/07/06	103	80 - 120	102	80 - 120	ND,RDL=1	mg/L	1.4	20		
4091150	Dissolved Sulphate (SO4)	2015/07/06	NC	75 - 125	100	80 - 120	ND,RDL=1	mg/L	2.2	20		
4091154	1,1,1,2-Tetrachloroethane	2015/07/06	100	70 - 130	98	70 - 130	ND, RDL=0.20	ug/L	NC	30		
4091154	1,1,1-Trichloroethane	2015/07/06	101	70 - 130	101	70 - 130	ND, RDL=0.10	ug/L	NC	30		
4091154	1,1,2,2-Tetrachloroethane	2015/07/06	105	70 - 130	101	70 - 130	ND, RDL=0.20	ug/L	NC	30		
4091154	1,1,2-Trichloroethane	2015/07/06	97	70 - 130	95	70 - 130	ND, RDL=0.20	ug/L	NC	30		
4091154	1,1-Dichloroethane	2015/07/06	94	70 - 130	93	70 - 130	ND, RDL=0.10	ug/L	NC	30		
4091154	1,1-Dichloroethylene	2015/07/06	103	70 - 130	102	70 - 130	ND, RDL=0.10	ug/L	NC	30		

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QUALITY ASSURANCE REPORT(CONT'D)

City of Guelph
Client Project #: Wet/Dry - Surface Water
Site Location: 110 DUNLOP
Your P.O. #: 720.8121.3516

			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits	% Recovery	QC Limits
4091154	1,2-Dichlorobenzene	2015/07/06	96	70 - 130	95	70 - 130	ND, RDL=0.20	ug/L	NC	30		
4091154	1,2-Dichloroethane	2015/07/06	100	70 - 130	99	70 - 130	ND, RDL=0.20	ug/L	NC	30		
4091154	1,2-Dichloropropane	2015/07/06	98	70 - 130	97	70 - 130	ND, RDL=0.10	ug/L	NC	30		
4091154	1,3-Dichlorobenzene	2015/07/06	89	70 - 130	88	70 - 130	ND, RDL=0.20	ug/L	NC	30		
4091154	1,4-Dichlorobenzene	2015/07/06	95	70 - 130	94	70 - 130	ND, RDL=0.20	ug/L	NC	30		
4091154	Acetone (2-Propanone)	2015/07/06	102	60 - 140	96	60 - 140	ND, RDL=10	ug/L	NC	30		
4091154	Benzene	2015/07/06	101	70 - 130	100	70 - 130	ND, RDL=0.10	ug/L	NC	30		
4091154	Bromodichloromethane	2015/07/06	111	70 - 130	107	70 - 130	ND, RDL=0.10	ug/L	NC	30		
4091154	Bromoform	2015/07/06	102	70 - 130	99	70 - 130	ND, RDL=0.20	ug/L	NC	30		
4091154	Bromomethane	2015/07/06	104	60 - 140	103	60 - 140	ND, RDL=0.50	ug/L	NC	30		
4091154	Carbon Tetrachloride	2015/07/06	103	70 - 130	102	70 - 130	ND, RDL=0.10	ug/L	NC	30		
4091154	Chlorobenzene	2015/07/06	105	70 - 130	104	70 - 130	ND, RDL=0.10	ug/L	NC	30		
4091154	Chloroform	2015/07/06	102	70 - 130	101	70 - 130	ND, RDL=0.10	ug/L	NC	30		
4091154	Chloromethane	2015/07/06	82	60 - 140	83	60 - 140	ND, RDL=0.50	ug/L	NC	30		
4091154	cis-1,2-Dichloroethylene	2015/07/06	107	70 - 130	105	70 - 130	ND, RDL=0.10	ug/L	NC	30		
4091154	cis-1,3-Dichloropropene	2015/07/06	104	70 - 130	102	70 - 130	ND, RDL=0.20	ug/L	NC	30		
4091154	Dibromochloromethane	2015/07/06	104	70 - 130	100	70 - 130	ND, RDL=0.20	ug/L	NC	30		
4091154	Ethylbenzene	2015/07/06	95	70 - 130	95	70 - 130	ND, RDL=0.10	ug/L	NC	30		
4091154	Ethylene Dibromide	2015/07/06	96	70 - 130	93	70 - 130	ND, RDL=0.20	ug/L	NC	30		
4091154	Methyl Ethyl Ketone (2-Butanone)	2015/07/06	108	60 - 140	103	60 - 140	ND, RDL=5.0	ug/L	NC	30		
4091154	Methyl Isobutyl Ketone	2015/07/06	112	70 - 130	106	70 - 130	ND, RDL=5.0	ug/L	NC	30		
4091154	Methyl t-butyl ether (MTBE)	2015/07/06	110	70 - 130	106	70 - 130	ND, RDL=0.20	ug/L	NC	30		
4091154	Methylene Chloride(Dichloromethane)	2015/07/06	110	70 - 130	107	70 - 130	ND, RDL=0.50	ug/L	NC	30		
4091154	o-Xylene	2015/07/06	92	70 - 130	91	70 - 130	ND, RDL=0.10	ug/L	NC	30		
4091154	p+m-Xylene	2015/07/06	83	70 - 130	83	70 - 130	ND, RDL=0.10	ug/L	NC	30		
4091154	Styrene	2015/07/06	98	70 - 130	98	70 - 130	ND, RDL=0.20	ug/L	NC	30		
4091154	Tetrachloroethylene	2015/07/06	91	70 - 130	91	70 - 130	ND, RDL=0.10	ug/L	NC	30		
4091154	Toluene	2015/07/06	91	70 - 130	90	70 - 130	ND, RDL=0.20	ug/L	NC	30		
4091154	Total Xylenes	2015/07/06					ND, RDL=0.10	ug/L	NC	30		
4091154	trans-1,2-Dichloroethylene	2015/07/06	99	70 - 130	100	70 - 130	ND, RDL=0.10	ug/L	NC	30		
4091154	trans-1,3-Dichloropropene	2015/07/06	104	70 - 130	103	70 - 130	ND, RDL=0.20	ug/L	NC	30		

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QUALITY ASSURANCE REPORT(CONT'D)

City of Guelph
Client Project #: Wet/Dry - Surface Water
Site Location: 110 DUNLOP
Your P.O. #: 720.8121.3516

			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits	% Recovery	QC Limits
4091154	Trichloroethylene	2015/07/06	99	70 - 130	98	70 - 130	ND, RDL=0.10	ug/L	NC	30		
4091154	Trichlorofluoromethane (FREON 11)	2015/07/06	101	70 - 130	100	70 - 130	ND, RDL=0.20	ug/L	NC	30		
4091154	Vinyl Chloride	2015/07/06	94	70 - 130	95	70 - 130	ND, RDL=0.20	ug/L	NC	30		
4091314	Total Chemical Oxygen Demand (COD)	2015/07/06	NC	75 - 125	101	75 - 125	ND, RDL=4.0	mg/L	0.29	25		
4092149	Acrolein	2015/07/06	96	60 - 140	93	60 - 140	ND, RDL=10	ug/L	NC	30		
4092149	Acrylonitrile	2015/07/06	101	60 - 140	99	60 - 140	ND, RDL=5.0	ug/L	NC	30		
4093274	Total Phosphorus	2015/07/07	100	80 - 120	102	80 - 120	ND, RDL=0.020	mg/L	NC	20	99	80 - 120
4094403	1-Chloronaphthalene	2015/07/07	63	30 - 130	72	30 - 130	ND, RDL=1.0	ug/L				
4094403	1-Methylnaphthalene	2015/07/07	66	30 - 130	76	30 - 130	ND, RDL=0.20	ug/L				
4094403	2,3,4-Trichlorophenol	2015/07/07	82	10 - 130	84	10 - 130	ND, RDL=0.50	ug/L				
4094403	2,3,5-Trichlorophenol	2015/07/07	97	10 - 130	100	10 - 130	ND, RDL=0.50	ug/L				
4094403	2,4,5-Trichlorophenol	2015/07/07	82	10 - 130	87	10 - 130	ND, RDL=0.50	ug/L				
4094403	2,4,6-Trichlorophenol	2015/07/07	77	10 - 130	84	10 - 130	ND, RDL=0.50	ug/L				
4094403	2,4-Dichlorophenol	2015/07/07	63	10 - 130	81	10 - 130	ND, RDL=0.30	ug/L				
4094403	2,4-Dimethylphenol	2015/07/07	47	10 - 130	80	10 - 130	ND, RDL=0.50	ug/L				
4094403	2,4-Dinitrophenol	2015/07/07	91	10 - 130	76	10 - 130	ND, RDL=2.0	ug/L				
4094403	2,4-Dinitrotoluene	2015/07/07	81	30 - 130	82	30 - 130	ND, RDL=0.50	ug/L				
4094403	2,6-Dichlorophenol	2015/07/07	62	10 - 130	72	10 - 130	ND, RDL=0.50	ug/L				
4094403	2,6-Dinitrotoluene	2015/07/07	76	30 - 130	77	30 - 130	ND, RDL=0.50	ug/L				
4094403	2-Chloronaphthalene	2015/07/07	69	30 - 130	76	30 - 130	ND, RDL=0.50	ug/L				
4094403	2-Chlorophenol	2015/07/07	66	10 - 130	82	10 - 130	ND, RDL=0.30	ug/L				
4094403	2-Methylnaphthalene	2015/07/07	61	30 - 130	70	30 - 130	ND, RDL=0.20	ug/L				
4094403	4,6-Dinitro-2-methylphenol	2015/07/07	101	10 - 130	97	10 - 130	ND, RDL=2.0	ug/L				
4094403	4-Bromophenyl phenyl ether	2015/07/07	88	30 - 130	84	30 - 130	ND, RDL=0.30	ug/L				
4094403	4-Chloro-3-Methylphenol	2015/07/07	82	10 - 130	85	10 - 130	ND, RDL=0.50	ug/L				
4094403	4-Chlorophenyl phenyl ether	2015/07/07	76	30 - 130	78	30 - 130	ND, RDL=0.50	ug/L				
4094403	4-Nitrophenol	2015/07/07	49	10 - 130	49	10 - 130	ND, RDL=1.4	ug/L				
4094403	5-Nitroacenaphthene	2015/07/07	91	30 - 130	88	30 - 130	ND, RDL=1.0	ug/L				
4094403	Acenaphthene	2015/07/07	75	30 - 130	80	30 - 130	ND, RDL=0.20	ug/L				
4094403	Acenaphthylene	2015/07/07	71	30 - 130	72	30 - 130	ND, RDL=0.20	ug/L				

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Maxxam Job #: B5C7276
Report Date: 2015/07/10

QUALITY ASSURANCE REPORT(CONT'D)

City of Guelph
Client Project #: Wet/Dry - Surface Water
Site Location: 110 DUNLOP
Your P.O. #: 720.8121.3516

			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits	% Recovery	QC Limits
4094403	Anthracene	2015/07/07	84	30 - 130	82	30 - 130	ND, RDL=0.20	ug/L				
4094403	Benzo(a)anthracene	2015/07/07	97	30 - 130	95	30 - 130	ND, RDL=0.20	ug/L				
4094403	Benzo(a)pyrene	2015/07/07	92	30 - 130	91	30 - 130	ND, RDL=0.20	ug/L				
4094403	Benzo(b/j)fluoranthene	2015/07/07	89	30 - 130	87	30 - 130	ND, RDL=0.20	ug/L				
4094403	Benzo(g,h,i)perylene	2015/07/07	98	30 - 130	101	30 - 130	ND, RDL=0.20	ug/L				
4094403	Benzo(k)fluoranthene	2015/07/07	93	30 - 130	97	30 - 130	ND, RDL=0.20	ug/L				
4094403	Benzyl butyl phthalate	2015/07/07	95	30 - 130	92	30 - 130	ND, RDL=0.50	ug/L				
4094403	Biphenyl	2015/07/07	70	30 - 130	77	30 - 130	ND, RDL=0.50	ug/L				
4094403	Bis(2-chloroethoxy)methane	2015/07/07	67	30 - 130	82	30 - 130	ND, RDL=0.50	ug/L				
4094403	Bis(2-chloroethyl)ether	2015/07/07	69	30 - 130	85	30 - 130	ND, RDL=0.50	ug/L				
4094403	Bis(2-chloroisopropyl)ether	2015/07/07	59	30 - 130	73	30 - 130	ND, RDL=0.50	ug/L				
4094403	Bis(2-ethylhexyl)phthalate	2015/07/08	97	30 - 130	94	30 - 130	ND, RDL=2.0	ug/L	NC	40		
4094403	Camphene	2015/07/07	39	30 - 130	51	30 - 130	ND, RDL=1.0	ug/L				
4094403	Chrysene	2015/07/07	93	30 - 130	93	30 - 130	ND, RDL=0.20	ug/L				
4094403	Dibenz(a,h)anthracene	2015/07/07	95	30 - 130	96	30 - 130	ND, RDL=0.20	ug/L				
4094403	Di-N-butyl phthalate	2015/07/08	98	30 - 130	94	30 - 130	ND, RDL=2.0	ug/L	NC	40		
4094403	Di-N-octyl phthalate	2015/07/07	101	30 - 130	99	30 - 130	ND, RDL=0.80	ug/L				
4094403	Diphenyl Ether	2015/07/07	73	30 - 130	81	30 - 130	ND, RDL=0.30	ug/L				
4094403	Fluoranthene	2015/07/07	90	30 - 130	86	30 - 130	ND, RDL=0.20	ug/L				
4094403	Fluorene	2015/07/07	82	30 - 130	81	30 - 130	ND, RDL=0.20	ug/L				
4094403	Indeno(1,2,3-cd)pyrene	2015/07/07	95	30 - 130	94	30 - 130	ND, RDL=0.20	ug/L				
4094403	Indole	2015/07/07	27 (1)	30 - 130	41	30 - 130	ND, RDL=1.0	ug/L				
4094403	m/p-Cresol	2015/07/07	56	10 - 130	68	10 - 130	ND, RDL=0.50	ug/L				
4094403	Naphthalene	2015/07/07	59	30 - 130	70	30 - 130	ND, RDL=0.20	ug/L				
4094403	Nitrosodiphenylamine/Diphenylamine	2015/07/07	87	30 - 130	87	30 - 130	ND, RDL=1.0	ug/L				
4094403	N-Nitroso-di-n-propylamine	2015/07/07	78	30 - 130	91	30 - 130	ND, RDL=0.50	ug/L				
4094403	o-Cresol	2015/07/07	58	10 - 130	75	10 - 130	ND, RDL=0.50	ug/L				
4094403	Pentachlorophenol	2015/07/07	69	10 - 130	87	10 - 130	ND, RDL=1.0	ug/L				
4094403	Perylene	2015/07/07	97	30 - 130	96	30 - 130	ND, RDL=0.20	ug/L				
4094403	Phenanthrene	2015/07/07	86	30 - 130	83	30 - 130	ND, RDL=0.20	ug/L				
4094403	Phenol	2015/07/07	27	10 - 130	40	10 - 130	ND, RDL=0.50	ug/L				

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Maxxam Job #: B5C7276
Report Date: 2015/07/10

QUALITY ASSURANCE REPORT(CONT'D)

City of Guelph
Client Project #: Wet/Dry - Surface Water
Site Location: 110 DUNLOP
Your P.O. #: 720.8121.3516

			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits	% Recovery	QC Limits
4094403	Pyrene	2015/07/07	89	30 - 130	86	30 - 130	ND, RDL=0.20	ug/L				
4094414	Total Boron (B)	2015/07/08	100	80 - 120	103	80 - 120	ND, RDL=0.010	mg/L				
4094414	Total Calcium (Ca)	2015/07/08	NC	80 - 120	99	80 - 120	ND, RDL=0.20	mg/L				
4094414	Total Iron (Fe)	2015/07/08	104	80 - 120	104	80 - 120	ND, RDL=0.10	mg/L				
4094414	Total Magnesium (Mg)	2015/07/08	99	80 - 120	104	80 - 120	ND, RDL=0.050	mg/L				
4094414	Total Potassium (K)	2015/07/08	103	80 - 120	104	80 - 120	ND, RDL=0.20	mg/L				
4094414	Total Sodium (Na)	2015/07/08	102	80 - 120	106	80 - 120	ND, RDL=0.10	mg/L				
4094414	Total Zinc (Zn)	2015/07/08	104	80 - 120	104	80 - 120	ND, RDL=0.0050	mg/L				

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

(1) Surrogate recovery was below the lower control limit due to matrix interference. This may represent a low bias in some results.

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Maxxam Job #: B5C7276
Report Date: 2015/07/10

City of Guelph
Client Project #: Wet/Dry - Surface Water
Site Location: 110 DUNLOP
Your P.O. #: 720.8121.3516

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Brad Newman, Scientific Specialist

Ewa Pranjic, M.Sc., C.Chem, Scientific Specialist

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Your Project #: Wet/Dry - Surface Water
Site Location: WET/DRY - 15MM RAIN EVENT
Your C.O.C. #: 400396-06-01

Attention:Amy Spence

City of Guelph
Soild Waste RIC (Wet/Dry)
110 Dunlop Drive
Guelph, ON
CANADA N1H 6H8

Report Date: 2015/07/22
Report #: R3587679
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B5D7381
Received: 2015/07/14, 16:35

Sample Matrix: Water
Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Alkalinity	2	N/A	2015/07/16	CAM SOP-00448	SM 22 2320 B m
Biochemical Oxygen Demand (BOD)	2	N/A	2015/07/20	CAM SOP-00427	SM 22 5210B m
Chloride by Automated Colourimetry	2	N/A	2015/07/16	CAM SOP-00463	EPA 325.2 m
Chemical Oxygen Demand	2	N/A	2015/07/20	CAM SOP-00416	SM 22 5220 D m
Conductivity	2	N/A	2015/07/16	CAM SOP-00414	SM 22 2510 m
Total Metals Analysis by ICPMS	2	N/A	2015/07/21	CAM SOP-00447	EPA 6020A m
Total Ammonia-N	2	N/A	2015/07/17	CAM SOP-00441	EPA GS I-2522-90 m
Nitrate (NO3) and Nitrite (NO2) in Water (1)	2	N/A	2015/07/16	CAM SOP-00440	SM 22 4500-NO3I/NO2B
pH	2	N/A	2015/07/16	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	2	N/A	2015/07/17	CAM SOP-00444	OMOE E3179 m
Sulphate by Automated Colourimetry	2	N/A	2015/07/16	CAM SOP-00464	EPA 375.4 m
Total Kjeldahl Nitrogen in Water	2	2015/07/16	2015/07/16	CAM SOP-00938	OMOE E3516 m
Total Phosphorus (Colourimetric)	2	2015/07/20	2015/07/20	CAM SOP-00407	SM 4500 P B H m
Low Level Total Suspended Solids	2	N/A	2015/07/16	CAM SOP-00428	SM 22 2540D m

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

Encryption Key

James Aspin
22 Jul 2015 12:13:17 -04:00

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
James Aspin, Senior Project Manager
Email: JAspin@maxxam.ca
Phone# (905)817-5771

==========

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Maxxam Job #: B5D7381
Report Date: 2015/07/22

City of Guelph
Client Project #: Wet/Dry - Surface Water
Site Location: WET/DRY - 15MM RAIN EVENT

RESULTS OF ANALYSES OF WATER

Maxxam ID		APU263	APU263	APU264	APU264		
Sampling Date		2015/07/14	2015/07/14	2015/07/14	2015/07/14		
COC Number		400396-06-01	400396-06-01	400396-06-01	400396-06-01		
	Units	**TP1-OUT**	**TP1-OUT Lab-Dup**	**EPTSO1**	**EPTSO1 Lab-Dup**	**RDL**	**QC Batch**
Inorganics							
Total Ammonia-N	mg/L	0.10		ND		0.050	4107793
Total BOD	mg/L	ND		ND		2.0	4105384
Total Chemical Oxygen Demand (COD)	mg/L	23		6.3		4.0	4108450
Conductivity	umho/cm	420		660		1.0	4106816
Total Kjeldahl Nitrogen (TKN)	mg/L	0.86		0.48		0.10	4107522
pH	pH	7.72		8.00		N/A	4106817
Phenols-4AAP	mg/L	ND		ND		0.0010	4109339
Total Phosphorus	mg/L	0.056		ND		0.020	4111643
Total Suspended Solids	mg/L	1		2	2	1	4107437
Dissolved Sulphate (SO4)	mg/L	25	25	13		1	4106845
Alkalinity (Total as CaCO3)	mg/L	130		250		1.0	4106815
Dissolved Chloride (Cl)	mg/L	39	39	49		1	4106842
Nitrite (N)	mg/L	0.022		0.033		0.010	4106886
Nitrate (N)	mg/L	0.18		2.54		0.10	4106886
Nitrate + Nitrite	mg/L	0.21		2.58		0.10	4106886

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not detected

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Maxxam Job #: B5D7381
Report Date: 2015/07/22

City of Guelph
Client Project #: Wet/Dry - Surface Water
Site Location: WET/DRY - 15MM RAIN EVENT

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		APU263	APU264	APU264		
Sampling Date		2015/07/14	2015/07/14	2015/07/14		
COC Number		400396-06-01	400396-06-01	400396-06-01		
	Units	**TP1-OUT**	**EPTSO1**	**EPTSO1 Lab-Dup**	**RDL**	**QC Batch**
Metals						
Total Boron (B)	mg/L	0.032	0.016	0.016	0.010	4113868
Total Calcium (Ca)	mg/L	39	75	75	0.20	4113868
Total Iron (Fe)	mg/L	0.25	ND	ND	0.10	4113868
Total Magnesium (Mg)	mg/L	5.3	21	21	0.050	4113868
Total Potassium (K)	mg/L	2.2	1.2	1.1	0.20	4113868
Total Sodium (Na)	mg/L	34	30	30	0.10	4113868
Total Zinc (Zn)	mg/L	ND	0.051	0.051	0.0050	4113868

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not detected

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B5D7381
Report Date: 2015/07/22

City of Guelph
Client Project #: Wet/Dry - Surface Water
Site Location: WET/DRY - 15MM RAIN EVENT

GENERAL COMMENTS

Results relate only to the items tested.

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B5D7381
Report Date: 2015/07/22

QUALITY ASSURANCE REPORT

City of Guelph
Client Project #: Wet/Dry - Surface Water
Site Location: WET/DRY - 15MM RAIN EVENT

			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits	% Recovery	QC Limits
4105384	Total BOD	2015/07/20					ND, RDL=2.0	mg/L	NC	25	103	85 - 115
4106815	Alkalinity (Total as CaCO3)	2015/07/16			97	85 - 115	ND, RDL=1.0	mg/L	0.14	25		
4106816	Conductivity	2015/07/16			102	85 - 115	ND, RDL=1.0	umho/cm	1.3	25		
4106817	pH	2015/07/16			102	98 - 103			0.29	N/A		
4106842	Dissolved Chloride (Cl)	2015/07/16	NC	80 - 120	103	80 - 120	ND,RDL=1	mg/L	0.15	20		
4106845	Dissolved Sulphate (SO4)	2015/07/16	NC	75 - 125	104	80 - 120	ND,RDL=1	mg/L	0.13	20		
4106886	Nitrate (N)	2015/07/16	103	80 - 120	100	80 - 120	ND, RDL=0.10	mg/L	NC	25		
4106886	Nitrite (N)	2015/07/16	100	80 - 120	99	80 - 120	ND, RDL=0.010	mg/L	NC	25		
4107437	Total Suspended Solids	2015/07/16					ND,RDL=1	mg/L	NC	25	96	85 - 115
4107522	Total Kjeldahl Nitrogen (TKN)	2015/07/16	103	80 - 120	101	80 - 120	ND, RDL=0.10	mg/L	NC (1)	20	99	80 - 120
4107793	Total Ammonia-N	2015/07/17	NC	80 - 120	99	85 - 115	ND, RDL=0.050	mg/L	0.80	20		
4108450	Total Chemical Oxygen Demand (COD)	2015/07/20	99	75 - 125	101	75 - 125	ND, RDL=4.0	mg/L	NC	25		
4109339	Phenols-4AAP	2015/07/17	97	80 - 120	102	85 - 115	ND, RDL=0.0010	mg/L	NC	20		
4111643	Total Phosphorus	2015/07/20	99	80 - 120	97	80 - 120	ND, RDL=0.020	mg/L	3.5	20	97	80 - 120
4113868	Total Boron (B)	2015/07/21	98	80 - 120	97	80 - 120	ND, RDL=0.010	mg/L	NC	20		
4113868	Total Calcium (Ca)	2015/07/21	NC	80 - 120	100	80 - 120	ND, RDL=0.20	mg/L	0.51	20		
4113868	Total Iron (Fe)	2015/07/21	100	80 - 120	98	80 - 120	ND, RDL=0.10	mg/L	NC	20		
4113868	Total Magnesium (Mg)	2015/07/21	NC	80 - 120	96	80 - 120	ND, RDL=0.050	mg/L	2.3	20		
4113868	Total Potassium (K)	2015/07/21	98	80 - 120	96	80 - 120	ND, RDL=0.20	mg/L	3.5	20		
4113868	Total Sodium (Na)	2015/07/21	NC	80 - 120	97	80 - 120	ND, RDL=0.10	mg/L	1.6	20		

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Maxxam Job #: B5D7381
Report Date: 2015/07/22

QUALITY ASSURANCE REPORT(CONT'D)

City of Guelph
Client Project #: Wet/Dry - Surface Water
Site Location: WET/DRY - 15MM RAIN EVENT

			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits	% Recovery	QC Limits
4113868	Total Zinc (Zn)	2015/07/21	100	80 - 120	98	80 - 120	ND, RDL=0.0050	mg/L	0.30	20		

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

(1) Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.

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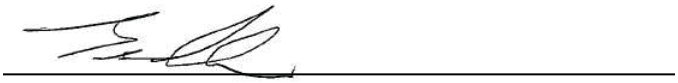
Maxxam Job #: B5D7381
Report Date: 2015/07/22

City of Guelph
Client Project #: Wet/Dry - Surface Water
Site Location: WET/DRY - 15MM RAIN EVENT

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Brad Newman, Scientific Specialist

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Your Project #: Wet/Dry - Surface Water
Site Location: WET/DRY
Your C.O.C. #: 400396-07-01

Attention:Amy Spence

City of Guelph
Soild Waste RIC (Wet/Dry)
110 Dunlop Drive
Guelph, ON
CANADA N1H 6H8

Report Date: 2015/09/08
Report #: R3655233
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B5H3910
Received: 2015/08/28, 16:55

Sample Matrix: Water
Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Alkalinity	2	N/A	2015/09/01	CAM SOP-00448	SM 22 2320 B m
Biochemical Oxygen Demand (BOD)	2	N/A	2015/09/03	CAM SOP-00427	SM 22 5210B m
Chloride by Automated Colourimetry	2	N/A	2015/08/31	CAM SOP-00463	EPA 325.2 m
Chemical Oxygen Demand	2	N/A	2015/09/01	CAM SOP-00416	SM 22 5220 D m
Conductivity	2	N/A	2015/09/01	CAM SOP-00414	SM 22 2510 m
Total Metals Analysis by ICPMS	2	N/A	2015/09/03	CAM SOP-00447	EPA 6020A m
Total Ammonia-N	2	N/A	2015/09/08	CAM SOP-00441	EPA GS I-2522-90 m
Nitrate (NO3) and Nitrite (NO2) in Water (1)	2	N/A	2015/09/01	CAM SOP-00440	SM 22 4500-NO3I/NO2B
pH	2	N/A	2015/09/01	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	2	N/A	2015/09/01	CAM SOP-00444	OMOE E3179 m
Sulphate by Automated Colourimetry	2	N/A	2015/08/31	CAM SOP-00464	EPA 375.4 m
Total Kjeldahl Nitrogen in Water	2	2015/08/31	2015/09/02	CAM SOP-00938	OMOE E3516 m
Total Phosphorus (Colourimetric)	2	2015/09/04	2015/09/04	CAM SOP-00407	SM 4500 P B H m
Low Level Total Suspended Solids	2	N/A	2015/09/03	CAM SOP-00428	SM 22 2540D m

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

Encryption Key

James Aspin
09 Sep 2015 08:36:04 -04:00

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
James Aspin, Senior Project Manager
Email: JAspin@maxxam.ca
Phone# (905)817-5771

==========

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Maxxam Job #: B5H3910
Report Date: 2015/09/08

City of Guelph
Client Project #: Wet/Dry - Surface Water
Site Location: WET/DRY
Sampler Initials: AS

RESULTS OF ANALYSES OF WATER

Maxxam ID		AWU661	AWU661			AWU662			
Sampling Date		2015/08/27	2015/08/27			2015/08/27			
COC Number		400396-07-01	400396-07-01			400396-07-01			
	UNITS	**EPTS01**	**EPTS01 Lab-Dup**	**RDL**	**MDL**	**TP1-OUT**	**RDL**	**MDL**	**QC Batch**
Inorganics									
Total Ammonia-N	mg/L	0.051	ND	0.050	N/A	0.20	0.050	N/A	4171986
Total BOD	mg/L	ND		2.0	0.40	4.0	2.0	0.40	4170263
Total Chemical Oxygen Demand (COD)	mg/L	ND	ND	4.0	N/A	23	4.0	N/A	4171167
Conductivity	umho/cm	710		1.0	0.20	480	1.0	0.20	4170610
Total Kjeldahl Nitrogen (TKN)	mg/L	0.35	0.37	0.20	0.10	0.87	0.10	0.050	4171445
pH	pH	8.08		N/A	N/A	7.96	N/A	N/A	4170613
Phenols-4AAP	mg/L	ND		0.0010	0.00020	ND	0.0010	0.00020	4172110
Total Phosphorus	mg/L	ND		0.020	N/A	0.072	0.020	N/A	4178033
Total Suspended Solids	mg/L	2		1	N/A	2	1	N/A	4172732
Dissolved Sulphate (SO4)	mg/L	14		1.0	0.10	12	1.0	0.10	4170605
Alkalinity (Total as CaCO3)	mg/L	270		1.0	0.20	150	1.0	0.20	4170606
Dissolved Chloride (Cl)	mg/L	48		1.0	0.30	45	1.0	0.30	4170599
Nitrite (N)	mg/L	0.068		0.010	0.0020	0.023	0.010	0.0020	4170469
Nitrate (N)	mg/L	2.74		0.10	0.010	0.98	0.10	0.010	4170469
Nitrate + Nitrite	mg/L	2.80		0.10	0.010	1.01	0.10	0.010	4170469

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not detected
N/A = Not Applicable

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Maxxam Job #: B5H3910
Report Date: 2015/09/08

City of Guelph
Client Project #: Wet/Dry - Surface Water
Site Location: WET/DRY
Sampler Initials: AS

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		AWU661	AWU662			
Sampling Date		2015/08/27	2015/08/27			
COC Number		400396-07-01	400396-07-01			
	UNITS	**EPTS01**	**TP1-OUT**	**RDL**	**MDL**	**QC Batch**
Metals						
Total Boron (B)	mg/L	0.025	0.034	0.010	0.00030	4176380
Total Calcium (Ca)	mg/L	83	49	0.20	0.050	4176380
Total Iron (Fe)	mg/L	ND	0.49	0.10	0.010	4176380
Total Magnesium (Mg)	mg/L	24	6.2	0.050	0.020	4176380
Total Potassium (K)	mg/L	1.4	3.4	0.20	0.050	4176380
Total Sodium (Na)	mg/L	31	40	0.10	0.050	4176380
Total Zinc (Zn)	mg/L	0.068	ND	0.0050	0.0030	4176380

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected

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Maxxam Job #: B5H3910
Report Date: 2015/09/08

City of Guelph
Client Project #: Wet/Dry - Surface Water
Site Location: WET/DRY
Sampler Initials: AS

GENERAL COMMENTS

Results relate only to the items tested.

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B5H3910
Report Date: 2015/09/08

QUALITY ASSURANCE REPORT

City of Guelph
Client Project #: Wet/Dry - Surface Water
Site Location: WET/DRY
Sampler Initials: AS

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
4170263	Total BOD	2015/09/03					ND, RDL=2.0	mg/L	NC	25	104	85 - 115
4170469	Nitrate (N)	2015/09/01	104	80 - 120	105	80 - 120	ND, RDL=0.10	mg/L	NC	25		
4170469	Nitrite (N)	2015/09/01	102	80 - 120	104	80 - 120	ND, RDL=0.010	mg/L	NC	25		
4170599	Dissolved Chloride (Cl)	2015/08/31	NC	80 - 120	103	80 - 120	ND, RDL=1.0	mg/L	0.23	20		
4170605	Dissolved Sulphate (SO4)	2015/08/31	NC	75 - 125	101	80 - 120	ND, RDL=1.0	mg/L	0.27	20		
4170606	Alkalinity (Total as CaCO3)	2015/09/01			98	85 - 115	ND, RDL=1.0	mg/L	0.33	25		
4170610	Conductivity	2015/09/01			101	85 - 115	ND, RDL=1.0	umho/cm	0	25		
4170613	pH	2015/09/01			101	98 - 103			0.43	N/A		
4171167	Total Chemical Oxygen Demand (COD)	2015/09/01	98	75 - 125	100	75 - 125	ND, RDL=4.0	mg/L	NC	25		
4171445	Total Kjeldahl Nitrogen (TKN)	2015/09/02	100	80 - 120	100	80 - 120	ND, RDL=0.10	mg/L	NC	20	96	80 - 120
4171986	Total Ammonia-N	2015/09/08	97	80 - 120	99	85 - 115	ND, RDL=0.050	mg/L	NC	20		
4172110	Phenols-4AAP	2015/09/01	99	80 - 120	100	85 - 115	ND, RDL=0.0010	mg/L	NC	20		
4172732	Total Suspended Solids	2015/09/03					ND,RDL=1	mg/L	NC	25	100	85 - 115
4176380	Total Boron (B)	2015/09/03	94	80 - 120	102	80 - 120	ND, RDL=0.010	mg/L				
4176380	Total Calcium (Ca)	2015/09/03	NC	80 - 120	99	80 - 120	ND, RDL=0.20	mg/L				
4176380	Total Iron (Fe)	2015/09/03	95	80 - 120	100	80 - 120	ND, RDL=0.10	mg/L				
4176380	Total Magnesium (Mg)	2015/09/03	NC	80 - 120	101	80 - 120	ND, RDL=0.050	mg/L				
4176380	Total Potassium (K)	2015/09/03	NC	80 - 120	101	80 - 120	ND, RDL=0.20	mg/L				
4176380	Total Sodium (Na)	2015/09/03	NC	80 - 120	103	80 - 120	ND, RDL=0.10	mg/L				
4176380	Total Zinc (Zn)	2015/09/03	95	80 - 120	102	80 - 120	ND, RDL=0.0050	mg/L	NC	20		

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Maxxam Job #: B5H3910
Report Date: 2015/09/08

QUALITY ASSURANCE REPORT(CONT'D)

City of Guelph
Client Project #: Wet/Dry - Surface Water
Site Location: WET/DRY
Sampler Initials: AS

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
4178033	Total Phosphorus	2015/09/04	104	80 - 120	101	80 - 120	ND, RDL=0.020	mg/L	1.9	20	100	80 - 120

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

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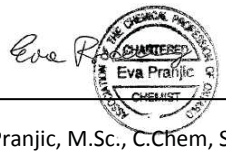
Maxxam Job #: B5H3910
Report Date: 2015/09/08

City of Guelph
Client Project #: Wet/Dry - Surface Water
Site Location: WET/DRY
Sampler Initials: AS

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Ewa Pranjic, M.Sc., C.Chem, Scientific Specialist

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Your Project #: WET / DRY SURFACE WATER 15 MM
Site Location: WET/DRY
Your C.O.C. #: 527868-01-01

Attention:Amy Spence

City of Guelph
Soild Waste RIC (Wet/Dry)
110 Dunlop Drive
Guelph, ON
CANADA N1H 6H8

Report Date: 2015/09/15
Report #: R3662288
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B5H9983
Received: 2015/09/04, 16:20

Sample Matrix: Water
Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Alkalinity	2	N/A	2015/09/09	CAM SOP-00448	SM 22 2320 B m
Biochemical Oxygen Demand (BOD)	2	N/A	2015/09/10	CAM SOP-00427	SM 22 5210B m
Chloride by Automated Colourimetry	2	N/A	2015/09/10	CAM SOP-00463	EPA 325.2 m
Chemical Oxygen Demand	2	N/A	2015/09/10	CAM SOP-00416	SM 22 5220 D m
Conductivity	2	N/A	2015/09/09	CAM SOP-00414	SM 22 2510 m
Total Metals Analysis by ICPMS	2	N/A	2015/09/11	CAM SOP-00447	EPA 6020A m
Total Ammonia-N	2	N/A	2015/09/15	CAM SOP-00441	EPA GS I-2522-90 m
Nitrate (NO3) and Nitrite (NO2) in Water (1)	1	N/A	2015/09/09	CAM SOP-00440	SM 22 4500-NO3I/NO2B
Nitrate (NO3) and Nitrite (NO2) in Water (1)	1	N/A	2015/09/10	CAM SOP-00440	SM 22 4500-NO3I/NO2B
pH	2	N/A	2015/09/09	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	2	N/A	2015/09/10	CAM SOP-00444	OMOE E3179 m
Sulphate by Automated Colourimetry	2	N/A	2015/09/10	CAM SOP-00464	EPA 375.4 m
Total Kjeldahl Nitrogen in Water	2	2015/09/09	2015/09/09	CAM SOP-00938	OMOE E3516 m
Total Phosphorus (Colourimetric)	2	2015/09/11	2015/09/11	CAM SOP-00407	SM 4500 P B H m
Low Level Total Suspended Solids	2	N/A	2015/09/10	CAM SOP-00428	SM 22 2540D m

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

Encryption Key

James Aspin
15 Sep 2015 17:36:06 -04:00

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
James Aspin, Senior Project Manager
Email: JAspin@maxxam.ca
Phone# (905)817-5771

==========

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Maxxam Job #: B5H9983
Report Date: 2015/09/15

City of Guelph
Client Project #: WET / DRY SURFACE WATER 15 MM
Site Location: WET/DRY

RESULTS OF ANALYSES OF WATER

Maxxam ID		AYA127	AYA127		AYA128			
Sampling Date		2015/09/04	2015/09/04		2015/09/04			
COC Number		527868-01-01	527868-01-01		527868-01-01			
	UNITS	**TP1-OUT**	**TP1-OUT Lab-Dup**	**QC Batch**	**EPT S10**	**RDL**	**MDL**	**QC Batch**
Inorganics								
Total Ammonia-N	mg/L	0.094		4182420	0.053	0.050	N/A	4182420
Total BOD	mg/L	ND		4179841	ND	2.0	0.40	4179841
Total Chemical Oxygen Demand (COD)	mg/L	26		4182439	17	4.0	N/A	4182439
Conductivity	umho/cm	470		4182173	680	1.0	0.20	4182173
Total Kjeldahl Nitrogen (TKN)	mg/L	0.82		4182636	0.76	0.10	0.050	4182636
pH	pH	8.00		4182174	7.97	N/A	N/A	4182174
Phenols-4AAP	mg/L	ND		4183583	ND	0.0010	0.00020	4183583
Total Phosphorus	mg/L	0.058		4185661	0.024	0.020	N/A	4185661
Total Suspended Solids	mg/L	ND	ND	4182248	15	1	N/A	4182248
Dissolved Sulphate (SO4)	mg/L	12		4182712	14	1.0	0.10	4182712
Alkalinity (Total as CaCO3)	mg/L	150		4182159	260	1.0	0.20	4182159
Dissolved Chloride (Cl)	mg/L	45		4182708	48	1.0	0.30	4182708
Nitrite (N)	mg/L	0.011		4182648	0.068	0.010	0.0020	4181293
Nitrate (N)	mg/L	1.12		4182648	2.74	0.10	0.010	4181293
Nitrate + Nitrite	mg/L	1.13		4182648	2.80	0.10	0.010	4181293

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable
ND = Not detected

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Maxxam Job #: B5H9983
Report Date: 2015/09/15

City of Guelph
Client Project #: WET / DRY SURFACE WATER 15 MM
Site Location: WET/DRY

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		AYA127	AYA128			
Sampling Date		2015/09/04	2015/09/04			
COC Number		527868-01-01	527868-01-01			
	UNITS	**TP1-OUT**	**EPT S10**	**RDL**	**MDL**	**QC Batch**
Metals						
Total Boron (B)	mg/L	0.033	0.019	0.010	0.00030	4185989
Total Calcium (Ca)	mg/L	47	75	0.20	0.050	4185989
Total Iron (Fe)	mg/L	0.37	ND	0.10	0.010	4185989
Total Magnesium (Mg)	mg/L	5.5	22	0.050	0.020	4185989
Total Potassium (K)	mg/L	3.6	1.5	0.20	0.050	4185989
Total Sodium (Na)	mg/L	37	28	0.10	0.050	4185989
Total Zinc (Zn)	mg/L	ND	0.067	0.0050	0.0030	4185989

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B5H9983
Report Date: 2015/09/15

City of Guelph
Client Project #: WET / DRY SURFACE WATER 15 MM
Site Location: WET/DRY

GENERAL COMMENTS

Results relate only to the items tested.

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B5H9983
Report Date: 2015/09/15

QUALITY ASSURANCE REPORT

City of Guelph
Client Project #: WET / DRY SURFACE WATER 15 MM
Site Location: WET/DRY

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
4179841	Total BOD	2015/09/10					ND, RDL=2.0	mg/L	15	25	107	85 - 115
4181293	Nitrate (N)	2015/09/09	NC	80 - 120	101	80 - 120	ND, RDL=0.10	mg/L	1.1	25		
4181293	Nitrite (N)	2015/09/09	107	80 - 120	106	80 - 120	ND, RDL=0.010	mg/L	NC	25		
4182159	Alkalinity (Total as CaCO3)	2015/09/09			98	85 - 115	ND, RDL=1.0	mg/L	0.88	25		
4182173	Conductivity	2015/09/09			101	85 - 115	ND, RDL=1.0	umho/cm	0.081	25		
4182174	pH	2015/09/09			101	98 - 103			0.30	N/A		
4182248	Total Suspended Solids	2015/09/10					ND,RDL=1	mg/L	NC	25	97	85 - 115
4182420	Total Ammonia-N	2015/09/15	98	80 - 120	101	85 - 115	ND, RDL=0.050	mg/L	0.11	20		
4182439	Total Chemical Oxygen Demand (COD)	2015/09/10	98	75 - 125	100	75 - 125	ND, RDL=4.0	mg/L	1.4	25		
4182636	Total Kjeldahl Nitrogen (TKN)	2015/09/09	NC	80 - 120	102	80 - 120	ND, RDL=0.10	mg/L	0.20	20	100	80 - 120
4182648	Nitrate (N)	2015/09/10	102	80 - 120	100	80 - 120	ND, RDL=0.10	mg/L	NC	25		
4182648	Nitrite (N)	2015/09/10	105	80 - 120	106	80 - 120	ND, RDL=0.010	mg/L	NC	25		
4182708	Dissolved Chloride (Cl)	2015/09/10	103	80 - 120	101	80 - 120	ND, RDL=1.0	mg/L	2.8	20		
4182712	Dissolved Sulphate (SO4)	2015/09/10	NC	75 - 125	104	80 - 120	ND, RDL=1.0	mg/L	1.2	20		
4183583	Phenols-4AAP	2015/09/10	98	80 - 120	104	85 - 115	ND, RDL=0.0010	mg/L	NC	20		
4185661	Total Phosphorus	2015/09/11	101	80 - 120	99	80 - 120	ND, RDL=0.020	mg/L	1.9	20	100	80 - 120
4185989	Total Boron (B)	2015/09/11	98	80 - 120	99	80 - 120	ND, RDL=0.010	mg/L	1.1	20		
4185989	Total Calcium (Ca)	2015/09/11	NC	80 - 120	98	80 - 120	ND, RDL=0.20	mg/L	2.0	20		
4185989	Total Iron (Fe)	2015/09/11	98	80 - 120	98	80 - 120	ND, RDL=0.10	mg/L				
4185989	Total Magnesium (Mg)	2015/09/11	99	80 - 120	98	80 - 120	ND, RDL=0.050	mg/L	3.6	20		
4185989	Total Potassium (K)	2015/09/11	NC	80 - 120	98	80 - 120	ND, RDL=0.20	mg/L	3.8	20		
4185989	Total Sodium (Na)	2015/09/11	NC	80 - 120	97	80 - 120	ND, RDL=0.10	mg/L	2.8	20		

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Maxxam Job #: B5H9983
Report Date: 2015/09/15

QUALITY ASSURANCE REPORT(CONT'D)

City of Guelph
Client Project #: WET / DRY SURFACE WATER 15 MM
Site Location: WET/DRY

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
4185989	Total Zinc (Zn)	2015/09/11	98	80 - 120	97	80 - 120	ND, RDL=0.0050	mg/L	NC	20		

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

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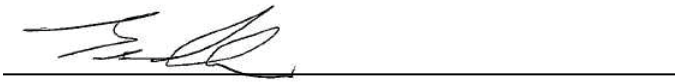
Maxxam Job #: B5H9983
Report Date: 2015/09/15

City of Guelph
Client Project #: WET / DRY SURFACE WATER 15 MM
Site Location: WET/DRY

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Brad Newman, Scientific Specialist

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Maxxam
A Bureau Veritas Group Company

Your Project #: WET/DRY SW
Site Location: WET/DRY
Your C.O.C. #: 509374-01-01

Attention:Amy Spence

City of Guelph
Soild Waste RIC (Wet/Dry)
110 Dunlop Drive
Guelph, ON
CANADA N1H 6H8

Report Date: 2015/11/04
Report #: R3749929
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B5L7213
Received: 2015/10/23, 16:15

Sample Matrix: Water
Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Alkalinity	2	N/A	2015/10/28	CAM SOP-00448	SM 22 2320 B m
Biochemical Oxygen Demand (BOD)	2	N/A	2015/10/31	CAM SOP-00427	SM 22 5210B m
Chloride by Automated Colourimetry	2	N/A	2015/10/27	CAM SOP-00463	EPA 325.2 m
Chemical Oxygen Demand	2	N/A	2015/10/31	CAM SOP-00416	SM 22 5220 D m
Conductivity	2	N/A	2015/10/28	CAM SOP-00414	SM 22 2510 m
Total Metals Analysis by ICPMS	2	N/A	2015/10/30	CAM SOP-00447	EPA 6020A m
Total Ammonia-N	2	N/A	2015/10/31	CAM SOP-00441	EPA GS I-2522-90 m
Nitrate (NO3) and Nitrite (NO2) in Water (1)	2	N/A	2015/10/30	CAM SOP-00440	SM 22 4500-NO3I/NO2B
pH	2	N/A	2015/10/28	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	2	N/A	2015/10/27	CAM SOP-00444	OMOE E3179 m
Sulphate by Automated Colourimetry	2	N/A	2015/10/27	CAM SOP-00464	EPA 375.4 m
Total Kjeldahl Nitrogen in Water	2	2015/10/30	2015/11/04	CAM SOP-00938	OMOE E3516 m
Total Phosphorus (Colourimetric)	2	2015/10/30	2015/10/30	CAM SOP-00407	SM 4500 P B H m
Low Level Total Suspended Solids	2	N/A	2015/10/30	CAM SOP-00428	SM 22 2540D m

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

Encryption Key

James Aspin
04 Nov 2015 17:58:27 -05:00

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
James Aspin, Senior Project Manager
Email: JAspin@maxxam.ca
Phone# (905)817-5771

==========

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Maxxam Job #: B5L7213
Report Date: 2015/11/04

City of Guelph
Client Project #: WET/DRY SW
Site Location: WET/DRY

RESULTS OF ANALYSES OF WATER

Maxxam ID		BFJ921	BFJ922	BFJ922			
Sampling Date		2015/10/22	2015/10/22	2015/10/22			
COC Number		509374-01-01	509374-01-01	509374-01-01			
	UNITS	**TP1-OUT**	**EPTS01**	**EPTS01 Lab-Dup**	**RDL**	**MDL**	**QC Batch**
Inorganics							
Total Ammonia-N	mg/L	ND	0.064		0.050	N/A	4252664
Total BOD	mg/L	ND	ND		2.0	0.40	4245136
Total Chemical Oxygen Demand (COD)	mg/L	21	5.2		4.0	N/A	4252646
Conductivity	umho/cm	310	690		1.0	0.20	4245302
Total Kjeldahl Nitrogen (TKN)	mg/L	0.45	0.52		0.10	0.050	4252156
pH	pH	8.06	8.19		N/A	N/A	4245303
Phenols-4AAP	mg/L	ND	ND		0.0010	0.00020	4244209
Total Phosphorus	mg/L	0.048	ND	ND	0.020	N/A	4251870
Total Suspended Solids	mg/L	1	2		1	N/A	4244262
Dissolved Sulphate (SO4)	mg/L	26	14		1.0	0.10	4245368
Alkalinity (Total as CaCO3)	mg/L	100	270		1.0	0.20	4245299
Dissolved Chloride (Cl)	mg/L	19	43		1.0	0.30	4245363
Nitrite (N)	mg/L	ND	0.093		0.010	0.0020	4245373
Nitrate (N)	mg/L	ND	3.20		0.10	0.010	4245373
Nitrate + Nitrite (N)	mg/L	ND	3.29		0.10	0.010	4245373

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not detected
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B5L7213
Report Date: 2015/11/04

City of Guelph
Client Project #: WET/DRY SW
Site Location: WET/DRY

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		BFJ921	BFJ922			
Sampling Date		2015/10/22	2015/10/22			
COC Number		509374-01-01	509374-01-01			
	UNITS	**TP1-OUT**	**EPTS01**	**RDL**	**MDL**	**QC Batch**
Metals						
Total Boron (B)	mg/L	0.028	0.016	0.010	0.00030	4250548
Total Calcium (Ca)	mg/L	37	85	0.20	0.050	4250548
Total Iron (Fe)	mg/L	0.16	ND	0.10	0.010	4250548
Total Magnesium (Mg)	mg/L	5.4	24	0.050	0.020	4250548
Total Potassium (K)	mg/L	3.9	1.5	0.20	0.050	4250548
Total Sodium (Na)	mg/L	15	25	0.10	0.050	4250548
Total Zinc (Zn)	mg/L	0.0052	0.071	0.0050	0.0030	4250548

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected

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Maxxam Job #: B5L7213
Report Date: 2015/11/04

City of Guelph
Client Project #: WET/DRY SW
Site Location: WET/DRY

GENERAL COMMENTS

Results relate only to the items tested.

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B5L7213
Report Date: 2015/11/04

QUALITY ASSURANCE REPORT

City of Guelph
Client Project #: WET/DRY SW
Site Location: WET/DRY

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
4244209	Phenols-4AAP	2015/10/27	95	80 - 120	98	85 - 115	ND, RDL=0.0010	mg/L	NC	20		
4244262	Total Suspended Solids	2015/10/30					ND,RDL=1	mg/L	NC	25	100	85 - 115
4245136	Total BOD	2015/10/31					ND, RDL=2.0	mg/L	NC	25	92	85 - 115
4245299	Alkalinity (Total as CaCO3)	2015/10/28			96	85 - 115	ND, RDL=1.0	mg/L	0.15	25		
4245302	Conductivity	2015/10/28			101	85 - 115	ND, RDL=1.0	umho/cm	0.12	25		
4245303	pH	2015/10/28			102	98 - 103			0.048	N/A		
4245363	Dissolved Chloride (Cl)	2015/10/27	106	80 - 120	102	80 - 120	ND, RDL=1.0	mg/L	NC	20		
4245368	Dissolved Sulphate (SO4)	2015/10/27	108	75 - 125	103	80 - 120	ND, RDL=1.0	mg/L	NC	20		
4245373	Nitrate (N)	2015/10/30	102	80 - 120	101	80 - 120	ND, RDL=0.10	mg/L	NC	25		
4245373	Nitrite (N)	2015/10/30	106	80 - 120	99	80 - 120	ND, RDL=0.010	mg/L	NC	25		
4250548	Total Boron (B)	2015/10/30	107	80 - 120	102	80 - 120	ND, RDL=0.010	mg/L	3.0	20		
4250548	Total Calcium (Ca)	2015/10/30	NC	80 - 120	99	80 - 120	ND, RDL=0.20	mg/L	0.29	20		
4250548	Total Iron (Fe)	2015/10/30	101	80 - 120	102	80 - 120	ND, RDL=0.10	mg/L	NC	20		
4250548	Total Magnesium (Mg)	2015/10/30	NC	80 - 120	106	80 - 120	ND, RDL=0.050	mg/L	1.6	20		
4250548	Total Potassium (K)	2015/10/30	NC	80 - 120	101	80 - 120	ND, RDL=0.20	mg/L	2.0	20		
4250548	Total Sodium (Na)	2015/10/30	97	80 - 120	103	80 - 120	ND, RDL=0.10	mg/L	2.0	20		
4250548	Total Zinc (Zn)	2015/10/30	101	80 - 120	105	80 - 120	ND, RDL=0.0050	mg/L	NC	20		
4251870	Total Phosphorus	2015/10/30	101	80 - 120	100	80 - 120	ND, RDL=0.020	mg/L	NC	20	102	80 - 120
4252156	Total Kjeldahl Nitrogen (TKN)	2015/11/04	104	80 - 120	103	80 - 120	ND, RDL=0.10	mg/L	NC	20	104	80 - 120
4252646	Total Chemical Oxygen Demand (COD)	2015/10/31	100	75 - 125	100	75 - 125	ND, RDL=4.0	mg/L	NC	25		

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Maxxam Job #: B5L7213
Report Date: 2015/11/04

QUALITY ASSURANCE REPORT(CONT'D)

City of Guelph
Client Project #: WET/DRY SW
Site Location: WET/DRY

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
4252664	Total Ammonia-N	2015/10/31	95	80 - 120	96	85 - 115	ND, RDL=0.050	mg/L	NC	20		

N/A = Not Applicable

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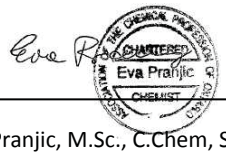
Maxxam Job #: B5L7213
Report Date: 2015/11/04

City of Guelph
Client Project #: WET/DRY SW
Site Location: WET/DRY

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Ewa Pranjic, M.Sc., C.Chem, Scientific Specialist

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Your Project #: WET/DRY SW
Site Location: WET/DRY SW
Your C.O.C. #: 464125-01-01

Attention:Amy Spence

City of Guelph
Soild Waste RIC (Wet/Dry)
110 Dunlop Drive
Guelph, ON
CANADA N1H 6H8

Report Date: 2015/12/04
Report #: R3793754
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B5O3592
Received: 2015/11/26, 16:15

Sample Matrix: Water
Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Alkalinity	2	N/A	2015/11/28	CAM SOP-00448	SM 22 2320 B m
Biochemical Oxygen Demand (BOD)	2	N/A	2015/12/02	CAM SOP-00427	SM 22 5210B m
Chloride by Automated Colourimetry	2	N/A	2015/11/30	CAM SOP-00463	EPA 325.2 m
Chemical Oxygen Demand	2	N/A	2015/12/03	CAM SOP-00416	SM 22 5220 D m
Conductivity	2	N/A	2015/11/28	CAM SOP-00414	SM 22 2510 m
Total Metals Analysis by ICPMS	2	N/A	2015/12/04	CAM SOP-00447	EPA 6020A m
Total Ammonia-N	2	N/A	2015/12/03	CAM SOP-00441	EPA GS I-2522-90 m
Nitrate (NO3) and Nitrite (NO2) in Water (1)	2	N/A	2015/12/02	CAM SOP-00440	SM 22 4500-NO3I/NO2B
pH	2	N/A	2015/11/28	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	2	N/A	2015/12/01	CAM SOP-00444	OMOE E3179 m
Sulphate by Automated Colourimetry	2	N/A	2015/11/30	CAM SOP-00464	EPA 375.4 m
Total Kjeldahl Nitrogen in Water	2	2015/12/02	2015/12/02	CAM SOP-00938	OMOE E3516 m
Total Phosphorus (Colourimetric)	2	2015/12/03	2015/12/03	CAM SOP-00407	SM 4500 P B H m
Low Level Total Suspended Solids	2	N/A	2015/11/27	CAM SOP-00428	SM 22 2540D m

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

Encryption Key

James Aspin
04 Dec 2015 16:17:15 -05:00

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
James Aspin, Senior Project Manager
Email: JAspin@maxxam.ca
Phone# (905)817-5771

==========

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Maxxam Job #: B5O3592
Report Date: 2015/12/04

City of Guelph
Client Project #: WET/DRY SW
Site Location: WET/DRY SW

RESULTS OF ANALYSES OF WATER

Maxxam ID		BKR257		BKR258	BKR258			
Sampling Date		2015/11/25		2015/11/25	2015/11/25			
COC Number		464125-01-01		464125-01-01	464125-01-01			
	UNITS	**TP1-OUT**	**QC Batch**	**EPTS01**	**EPTS01 Lab-Dup**	**RDL**	**MDL**	**QC Batch**
Inorganics								
Total Ammonia-N	mg/L	ND	4295714	0.051	ND	0.050	N/A	4295714
Total BOD	mg/L	ND	4289765	ND		2.0	0.40	4289765
Total Chemical Oxygen Demand (COD)	mg/L	34	4295459	6.0		4.0	N/A	4295459
Conductivity	umho/cm	650	4291281	750		1.0	0.20	4291281
Total Kjeldahl Nitrogen (TKN)	mg/L	0.61	4295464	0.56		0.10	0.050	4295464
pH	pH	7.73	4291282	8.00		N/A	N/A	4291282
Phenols-4AAP	mg/L	ND	4291168	ND		0.0010	0.00020	4291168
Total Phosphorus	mg/L	0.15	4297146	ND		0.020	N/A	4297146
Total Suspended Solids	mg/L	3	4290262	3	3	1	N/A	4290262
Dissolved Sulphate (SO4)	mg/L	42	4291295	15		1.0	0.10	4291347
Alkalinity (Total as CaCO3)	mg/L	160	4291280	270		1.0	0.20	4291280
Dissolved Chloride (Cl)	mg/L	76	4291286	60		1.0	0.30	4291346
Nitrite (N)	mg/L	0.035	4291296	0.028		0.010	0.0020	4291302
Nitrate (N)	mg/L	ND	4291296	3.64		0.10	0.010	4291302
Nitrate + Nitrite (N)	mg/L	ND	4291296	3.67		0.10	0.010	4291302

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not detected
N/A = Not Applicable

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Maxxam Job #: B5O3592
Report Date: 2015/12/04

City of Guelph
Client Project #: WET/DRY SW
Site Location: WET/DRY SW

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		BKR257	BKR258			
Sampling Date		2015/11/25	2015/11/25			
COC Number		464125-01-01	464125-01-01			
	UNITS	**TP1-OUT**	**EPTS01**	**RDL**	**MDL**	**QC Batch**
Metals						
Total Boron (B)	mg/L	0.026	0.016	0.010	0.00030	4297967
Total Calcium (Ca)	mg/L	64	93	0.20	0.050	4297967
Total Iron (Fe)	mg/L	0.27	ND	0.10	0.010	4297967
Total Magnesium (Mg)	mg/L	8.9	25	0.050	0.020	4297967
Total Potassium (K)	mg/L	9.1	1.7	0.20	0.050	4297967
Total Sodium (Na)	mg/L	52	35	0.10	0.050	4297967
Total Zinc (Zn)	mg/L	0.012	0.096	0.0050	0.0030	4297967

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B5O3592
Report Date: 2015/12/04

City of Guelph
Client Project #: WET/DRY SW
Site Location: WET/DRY SW

GENERAL COMMENTS

Results relate only to the items tested.

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B5O3592
Report Date: 2015/12/04

QUALITY ASSURANCE REPORT

City of Guelph
Client Project #: WET/DRY SW
Site Location: WET/DRY SW

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
4289765	Total BOD	2015/12/02					ND, RDL=2.0	mg/L	NC	25	97	85 - 115
4290262	Total Suspended Solids	2015/11/27					ND,RDL=1	mg/L	NC	25	95	85 - 115
4291168	Phenols-4AAP	2015/12/01	96	80 - 120	97	85 - 115	ND, RDL=0.0010	mg/L	NC	20		
4291280	Alkalinity (Total as CaCO3)	2015/11/28			94	85 - 115	ND, RDL=1.0	mg/L	1.2	25		
4291281	Conductivity	2015/11/28			101	85 - 115	ND, RDL=1.0	umho/cm	0.34	25		
4291282	pH	2015/11/28			101	98 - 103			0.64	N/A		
4291286	Dissolved Chloride (Cl)	2015/11/30	98	80 - 120	103	80 - 120	ND, RDL=1.0	mg/L	NC	20		
4291295	Dissolved Sulphate (SO4)	2015/11/30	97	75 - 125	101	80 - 120	ND, RDL=1.0	mg/L	NC	20		
4291296	Nitrate (N)	2015/12/02	84	80 - 120	104	80 - 120	ND, RDL=0.10	mg/L	NC	25		
4291296	Nitrite (N)	2015/12/02	NC	80 - 120	102	80 - 120	ND, RDL=0.010	mg/L	2.5	25		
4291302	Nitrate (N)	2015/12/02	NC	80 - 120	104	80 - 120	ND, RDL=0.10	mg/L	0.11	25		
4291302	Nitrite (N)	2015/12/02	109	80 - 120	101	80 - 120	ND, RDL=0.010	mg/L				
4291346	Dissolved Chloride (Cl)	2015/11/30	NC	80 - 120	104	80 - 120	ND, RDL=1.0	mg/L	4.0	20		
4291347	Dissolved Sulphate (SO4)	2015/11/30	NC	75 - 125	102	80 - 120	ND, RDL=1.0	mg/L	0.21	20		
4295459	Total Chemical Oxygen Demand (COD)	2015/12/03	95	75 - 125	103	75 - 125	ND, RDL=4.0	mg/L	3.5	25		
4295464	Total Kjeldahl Nitrogen (TKN)	2015/12/02	101	80 - 120	97	80 - 120	ND, RDL=0.10	mg/L	NC	20	99	80 - 120
4295714	Total Ammonia-N	2015/12/03	100	80 - 120	100	85 - 115	ND, RDL=0.050	mg/L	NC	20		
4297146	Total Phosphorus	2015/12/03	105	80 - 120	102	80 - 120	ND, RDL=0.020	mg/L	4.8	20	105	80 - 120
4297967	Total Boron (B)	2015/12/04	107	80 - 120	104	80 - 120	ND, RDL=0.010	mg/L				
4297967	Total Calcium (Ca)	2015/12/04	NC	80 - 120	101	80 - 120	ND, RDL=0.20	mg/L	2.1	20		
4297967	Total Iron (Fe)	2015/12/04	105	80 - 120	102	80 - 120	ND, RDL=0.10	mg/L	3.2	20		
4297967	Total Magnesium (Mg)	2015/12/04	NC	80 - 120	102	80 - 120	ND, RDL=0.050	mg/L	1.5	20		
4297967	Total Potassium (K)	2015/12/04	103	80 - 120	102	80 - 120	ND, RDL=0.20	mg/L	2.1	20		
4297967	Total Sodium (Na)	2015/12/04	NC	80 - 120	103	80 - 120	ND, RDL=0.10	mg/L	2.3	20		

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Maxxam Job #: B5O3592
Report Date: 2015/12/04

QUALITY ASSURANCE REPORT(CONT'D)

City of Guelph
Client Project #: WET/DRY SW
Site Location: WET/DRY SW

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
4297967	Total Zinc (Zn)	2015/12/04	104	80 - 120	103	80 - 120	ND, RDL=0.0050	mg/L				

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

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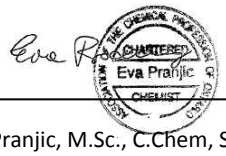
Maxxam Job #: B5O3592
Report Date: 2015/12/04

City of Guelph
Client Project #: WET/DRY SW
Site Location: WET/DRY SW

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Ewa Pranjic, M.Sc., C.Chem, Scientific Specialist

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Maxxam
A Bureau Veritas Group Company

Your P.O. #: 720.8121.3516
Your Project #: WET/DRY GROUND WATER/FALL GW
Your C.O.C. #: 540602-01-01

Attention:Andrew Shouldice

City of Guelph
Eastview Landfill
186 Eastview Road
Guelph, ON
CANADA N1E 1Z6

Report Date: 2015/12/10
Report #: R3801813
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B5O8091
Received: 2015/12/02, 15:55

Sample Matrix: Water
Samples Received: 8

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Alkalinity	5	N/A	2015/12/05	CAM SOP-00448	SM 22 2320 B m
Alkalinity	3	N/A	2015/12/06	CAM SOP-00448	SM 22 2320 B m
Biochemical Oxygen Demand (BOD)	8	N/A	2015/12/09	CAM SOP-00427	SM 22 5210B m
Chloride by Automated Colourimetry	8	N/A	2015/12/07	CAM SOP-00463	EPA 325.2 m
Chemical Oxygen Demand	8	N/A	2015/12/10	CAM SOP-00416	SM 22 5220 D m
Conductivity	5	N/A	2015/12/05	CAM SOP-00414	SM 22 2510 m
Conductivity	3	N/A	2015/12/06	CAM SOP-00414	SM 22 2510 m
Dissolved Metals by ICPMS	8	N/A	2015/12/07	CAM SOP-00447	EPA 6020A m
Total Metals Analysis by ICP	8	2015/12/09	2015/12/09	CAM SOP-00408	EPA 6010C m
Total Ammonia-N	8	N/A	2015/12/07	CAM SOP-00441	EPA GS I-2522-90 m
Nitrate (NO3) and Nitrite (NO2) in Water (1)	5	N/A	2015/12/06	CAM SOP-00440	SM 22 4500-NO3I/NO2B
Nitrate (NO3) and Nitrite (NO2) in Water (1)	3	N/A	2015/12/08	CAM SOP-00440	SM 22 4500-NO3I/NO2B
pH	5	N/A	2015/12/05	CAM SOP-00413	SM 4500H+ B m
pH	3	N/A	2015/12/07	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	8	N/A	2015/12/08	CAM SOP-00444	OMOE E3179 m
Sulphate by Automated Colourimetry	8	N/A	2015/12/07	CAM SOP-00464	EPA 375.4 m
Total Kjeldahl Nitrogen in Water	8	2015/12/04	2015/12/07	CAM SOP-00938	OMOE E3516 m
Total Phosphorus (Colourimetric)	7	2015/12/09	2015/12/09	CAM SOP-00407	SM 4500 P B H m
Total Phosphorus (Colourimetric)	1	2015/12/09	2015/12/10	CAM SOP-00407	SM 4500 P B H m

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

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Your P.O. #: 720.8121.3516
Your Project #: WET/DRY GROUND WATER/FALL GW
Your C.O.C. #: 540602-01-01

Attention:Andrew Shouldice

City of Guelph
Eastview Landfill
186 Eastview Road
Guelph, ON
CANADA N1E 1Z6

Report Date: 2015/12/10
Report #: R3801813
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B5O8091
Received: 2015/12/02, 15:55

Encryption Key

James Aspin
11 Dec 2015 08:53:19 -05:00

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
James Aspin, Senior Project Manager
Email: JAspin@maxxam.ca
Phone# (905)817-5771

==========

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Maxxam Job #: B5O8091
Report Date: 2015/12/10

City of Guelph
Client Project #: WET/DRY GROUND WATER/FALL GW
Your P.O. #: 720.8121.3516

RESULTS OF ANALYSES OF WATER

Maxxam ID		BLN348	BLN348		BLN349	BLN349		
Sampling Date		2015/12/01	2015/12/01		2015/12/01	2015/12/01		
COC Number		540602-01-01	540602-01-01		540602-01-01	540602-01-01		
	UNITS	**12A**	**12A Lab-Dup**	**RDL**	**12B**	**12B Lab-Dup**	**RDL**	**QC Batch**
Inorganics								
Total Ammonia-N	mg/L	ND		0.050	ND		0.050	4299560
Total BOD	mg/L	ND	ND	2.0	ND		2.0	4299302
Total Chemical Oxygen Demand (COD)	mg/L	8.6		4.0	11	11	4.0	4302154
Conductivity	umho/cm	690		1.0	810		1.0	4300972
Total Kjeldahl Nitrogen (TKN)	mg/L	0.16		0.10	0.20		0.20	4299579
pH	pH	7.75		N/A	7.57		N/A	4300974
Phenols-4AAP	mg/L	ND		0.0010	ND		0.0010	4301684
Total Phosphorus	mg/L	ND		0.020	0.14		0.020	4304894
Dissolved Sulphate (SO4)	mg/L	33		1.0	23		1.0	4300412
Alkalinity (Total as CaCO3)	mg/L	300		1.0	350		1.0	4300967
Dissolved Chloride (Cl)	mg/L	18		1.0	31		1.0	4300408
Nitrite (N)	mg/L	ND		0.010	ND		0.010	4300423
Nitrate (N)	mg/L	0.59		0.10	2.56		0.10	4300423
Nitrate + Nitrite (N)	mg/L	0.59		0.10	2.56		0.10	4300423

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not detected

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Maxxam Job #: B5O8091
Report Date: 2015/12/10

City of Guelph
Client Project #: WET/DRY GROUND WATER/FALL GW
Your P.O. #: 720.8121.3516

RESULTS OF ANALYSES OF WATER

Maxxam ID		BLN350	BLN350		BLN351		BLN352		
Sampling Date		2015/12/01	2015/12/01		2015/12/01		2015/12/02		
COC Number		540602-01-01	540602-01-01		540602-01-01		540602-01-01		
	UNITS	**9**	**9 Lab-Dup**	**QC Batch**	**10**	**QC Batch**	**19A**	**RDL**	**QC Batch**
Inorganics									
Total Ammonia-N	mg/L	ND		4299560	ND	4299560	ND	0.050	4299560
Total BOD	mg/L	ND		4299302	ND	4299302	ND	2.0	4299302
Total Chemical Oxygen Demand (COD)	mg/L	11		4302154	10	4302154	5.0	4.0	4302154
Conductivity	umho/cm	430		4300972	710	4300972	880	1.0	4300972
Total Kjeldahl Nitrogen (TKN)	mg/L	ND		4299579	0.16	4299579	0.12	0.10	4299579
pH	pH	7.96		4300974	7.97	4300974	7.94	N/A	4300974
Phenols-4AAP	mg/L	ND		4301684	ND	4301684	ND	0.0010	4301684
Total Phosphorus	mg/L	0.037		4304894	0.087	4304894	0.024	0.020	4304894
Dissolved Sulphate (SO4)	mg/L	33	32	4300885	84	4300412	120	1.0	4300885
Alkalinity (Total as CaCO3)	mg/L	150		4300967	230	4300967	230	1.0	4300967
Dissolved Chloride (Cl)	mg/L	9.9	9.8	4300884	32	4300408	66	1.0	4300884
Nitrite (N)	mg/L	ND		4300158	ND	4300423	ND	0.010	4300158
Nitrate (N)	mg/L	4.56		4300158	ND	4300423	ND	0.10	4300158
Nitrate + Nitrite (N)	mg/L	4.56		4300158	ND	4300423	ND	0.10	4300158

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not detected
N/A = Not Applicable

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Maxxam Job #: B5O8091
Report Date: 2015/12/10

City of Guelph
Client Project #: WET/DRY GROUND WATER/FALL GW
Your P.O. #: 720.8121.3516

RESULTS OF ANALYSES OF WATER

Maxxam ID		BLN352		BLN353		BLN354		
Sampling Date		2015/12/02		2015/12/02		2015/12/02		
COC Number		540602-01-01		540602-01-01		540602-01-01		
	UNITS	**19A Lab-Dup**	**QC Batch**	**19B**	**QC Batch**	**20A**	**RDL**	**QC Batch**
Inorganics								
Total Ammonia-N	mg/L		4299560	ND	4299560	ND	0.050	4299560
Total BOD	mg/L		4299302	ND	4299302	ND	2.0	4299302
Total Chemical Oxygen Demand (COD)	mg/L		4302154	15	4302154	4.4	4.0	4302154
Conductivity	umho/cm		4300972	1700	4300971	630	1.0	4300971
Total Kjeldahl Nitrogen (TKN)	mg/L		4299579	0.13	4299579	ND	0.10	4299579
pH	pH		4300974	7.23	4300977	7.42	N/A	4300977
Phenols-4AAP	mg/L		4301684	ND	4301686	ND	0.0010	4301684
Total Phosphorus	mg/L	0.024	4304894	0.13	4304894	ND	0.020	4305310
Dissolved Sulphate (SO4)	mg/L		4300885	150	4300885	46	1.0	4300885
Alkalinity (Total as CaCO3)	mg/L		4300967	690	4300964	240	1.0	4300964
Dissolved Chloride (Cl)	mg/L		4300884	41	4300884	19	1.0	4300884
Nitrite (N)	mg/L		4300158	ND	4300872	0.012	0.010	4300872
Nitrate (N)	mg/L		4300158	3.85	4300872	3.49	0.10	4300872
Nitrate + Nitrite (N)	mg/L		4300158	3.85	4300872	3.50	0.10	4300872

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not detected
N/A = Not Applicable

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Maxxam Job #: B5O8091
Report Date: 2015/12/10

City of Guelph
Client Project #: WET/DRY GROUND WATER/FALL GW
Your P.O. #: 720.8121.3516

RESULTS OF ANALYSES OF WATER

Maxxam ID		BLN355		
Sampling Date		2015/12/02		
COC Number		540602-01-01		
	UNITS	**20B**	**RDL**	**QC Batch**
Inorganics				
Total Ammonia-N	mg/L	ND	0.050	4299560
Total BOD	mg/L	ND	2.0	4299302
Total Chemical Oxygen Demand (COD)	mg/L	25	4.0	4302154
Conductivity	umho/cm	740	1.0	4300971
Total Kjeldahl Nitrogen (TKN)	mg/L	0.16	0.10	4299579
pH	pH	7.46	N/A	4300977
Phenols-4AAP	mg/L	ND	0.0010	4301684
Total Phosphorus	mg/L	0.13	0.020	4304894
Dissolved Sulphate (SO4)	mg/L	52	1.0	4300885
Alkalinity (Total as CaCO3)	mg/L	280	1.0	4300964
Dissolved Chloride (Cl)	mg/L	33	1.0	4300884
Nitrite (N)	mg/L	ND	0.010	4300872
Nitrate (N)	mg/L	ND	0.10	4300872
Nitrate + Nitrite (N)	mg/L	ND	0.10	4300872

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected
N/A = Not Applicable

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Maxxam Job #: B5O8091
Report Date: 2015/12/10

City of Guelph
Client Project #: WET/DRY GROUND WATER/FALL GW
Your P.O. #: 720.8121.3516

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		BLN348	BLN348	BLN349	BLN349	BLN350	BLN351		
Sampling Date		2015/12/01	2015/12/01	2015/12/01	2015/12/01	2015/12/01	2015/12/01		
COC Number		540602-01-01	540602-01-01	540602-01-01	540602-01-01	540602-01-01	540602-01-01		
	UNITS	**12A**	**12A Lab-Dup**	**12B**	**12B Lab-Dup**	**9**	**10**	**RDL**	**QC Batch**
Metals									
Total Iron (Fe)	mg/L	0.09	0.10	4.3		2.4	1.8	0.02	4305114
Dissolved Boron (B)	ug/L	20		29	32	44	19	10	4301732
Dissolved Calcium (Ca)	ug/L	86000		100000	100000	47000	91000	200	4301732
Dissolved Magnesium (Mg)	ug/L	34000		29000	30000	14000	31000	50	4301732
Dissolved Phosphorus (P)	ug/L	ND		ND	ND	ND	ND	100	4301732
Dissolved Potassium (K)	ug/L	6400		3900	3900	6500	1200	200	4301732
Dissolved Sodium (Na)	ug/L	7500		26000	26000	16000	12000	100	4301732
Dissolved Zinc (Zn)	ug/L	720		180	180	8.8	ND	5.0	4301732

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not detected

Maxxam ID		BLN352	BLN353	BLN354	BLN355		
Sampling Date		2015/12/02	2015/12/02	2015/12/02	2015/12/02		
COC Number		540602-01-01	540602-01-01	540602-01-01	540602-01-01		
	UNITS	**19A**	**19B**	**20A**	**20B**	**RDL**	**QC Batch**
Metals							
Total Iron (Fe)	mg/L	0.63	4.2	1.7	4.5	0.02	4305114
Dissolved Boron (B)	ug/L	32	170	13	12	10	4301732
Dissolved Calcium (Ca)	ug/L	100000	59000	84000	97000	200	4301732
Dissolved Magnesium (Mg)	ug/L	35000	19000	29000	32000	50	4301732
Dissolved Phosphorus (P)	ug/L	ND	ND	ND	ND	100	4301732
Dissolved Potassium (K)	ug/L	1500	11000	1300	1600	200	4301732
Dissolved Sodium (Na)	ug/L	30000	330000	4700	11000	100	4301732
Dissolved Zinc (Zn)	ug/L	ND	14	130	92	5.0	4301732

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected

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GENERAL COMMENTS

Results relate only to the items tested.

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Maxxam Job #: B5O8091
Report Date: 2015/12/10

QUALITY ASSURANCE REPORT

City of Guelph
Client Project #: WET/DRY GROUND WATER/FALL GW
Your P.O. #: 720.8121.3516

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
4299302	Total BOD	2015/12/09					ND, RDL=2.0	mg/L	NC	25	104	85 - 115
4299560	Total Ammonia-N	2015/12/07	100	80 - 120	98	85 - 115	ND, RDL=0.050	mg/L	NC	20		
4299579	Total Kjeldahl Nitrogen (TKN)	2015/12/07	98	80 - 120	97	N/A	ND, RDL=0.10	mg/L	NC	20	97	80 - 120
4300158	Nitrate (N)	2015/12/06	97	80 - 120	103	80 - 120	ND, RDL=0.10	mg/L	NC	25		
4300158	Nitrite (N)	2015/12/06	109	80 - 120	105	80 - 120	ND, RDL=0.010	mg/L				
4300408	Dissolved Chloride (Cl)	2015/12/07	109	80 - 120	101	80 - 120	ND, RDL=1.0	mg/L	NC	20		
4300412	Dissolved Sulphate (SO4)	2015/12/07	111	75 - 125	101	80 - 120	ND, RDL=1.0	mg/L	3.9	20		
4300423	Nitrate (N)	2015/12/06	100	80 - 120	102	80 - 120	ND, RDL=0.10	mg/L	1.3	25		
4300423	Nitrite (N)	2015/12/06	107	80 - 120	107	80 - 120	ND, RDL=0.010	mg/L				
4300872	Nitrate (N)	2015/12/08	102	80 - 120	101	80 - 120	ND, RDL=0.10	mg/L	NC	25		
4300872	Nitrite (N)	2015/12/08	105	80 - 120	102	80 - 120	ND, RDL=0.010	mg/L	NC	25		
4300884	Dissolved Chloride (Cl)	2015/12/07	111	80 - 120	105	80 - 120	ND, RDL=1.0	mg/L	1.5	20		
4300885	Dissolved Sulphate (SO4)	2015/12/07	NC	75 - 125	100	80 - 120	ND, RDL=1.0	mg/L	0.99	20		
4300964	Alkalinity (Total as CaCO3)	2015/12/06			92	85 - 115	ND, RDL=1.0	mg/L	0.99	25		
4300967	Alkalinity (Total as CaCO3)	2015/12/05			94	85 - 115	ND, RDL=1.0	mg/L	0.99	25		
4300971	Conductivity	2015/12/06			101	85 - 115	ND, RDL=1.0	umho/cm	0.45	25		
4300972	Conductivity	2015/12/05			101	85 - 115	ND, RDL=1.0	umho/cm	0.22	25		
4300974	pH	2015/12/05			101	98 - 103			0.087	N/A		
4300977	pH	2015/12/07			101	98 - 103			0.58	N/A		
4301684	Phenols-4AAP	2015/12/08	112	80 - 120	98	85 - 115	ND, RDL=0.0010	mg/L	NC	20		
4301686	Phenols-4AAP	2015/12/08	100	80 - 120	97	85 - 115	ND, RDL=0.0010	mg/L	NC	20		
4301732	Dissolved Boron (B)	2015/12/07	102	80 - 120	100	80 - 120	ND, RDL=10	ug/L	NC	20		
4301732	Dissolved Calcium (Ca)	2015/12/07	NC	80 - 120	99	80 - 120	ND, RDL=200	ug/L	3.1	20		
4301732	Dissolved Magnesium (Mg)	2015/12/07	NC	80 - 120	100	80 - 120	ND, RDL=50	ug/L	1.0	20		

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Maxxam Job #: B5O8091
Report Date: 2015/12/10

QUALITY ASSURANCE REPORT(CONT'D)

City of Guelph
Client Project #: WET/DRY GROUND WATER/FALL GW
Your P.O. #: 720.8121.3516

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
4301732	Dissolved Phosphorus (P)	2015/12/07	99	80 - 120	96	80 - 120	ND, RDL=100	ug/L	NC	20		
4301732	Dissolved Potassium (K)	2015/12/07	99	80 - 120	99	80 - 120	ND, RDL=200	ug/L	1.1	20		
4301732	Dissolved Sodium (Na)	2015/12/07	NC	80 - 120	100	80 - 120	ND, RDL=100	ug/L	0.75	20		
4301732	Dissolved Zinc (Zn)	2015/12/07	94	80 - 120	96	80 - 120	ND, RDL=5.0	ug/L	0.28	20		
4302154	Total Chemical Oxygen Demand (COD)	2015/12/10	105	75 - 125	103	75 - 125	ND, RDL=4.0	mg/L	NC	25		
4304894	Total Phosphorus	2015/12/09	105	80 - 120	104	80 - 120	ND, RDL=0.020	mg/L	NC	20	110	80 - 120
4305114	Total Iron (Fe)	2015/12/09	98	80 - 120	101	80 - 120	ND, RDL=0.02	mg/L	NC	25		
4305310	Total Phosphorus	2015/12/10	103	80 - 120	102	80 - 120	ND, RDL=0.020	mg/L	1.4	20	102	80 - 120

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

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Maxxam Job #: B5O8091
Report Date: 2015/12/10

City of Guelph
Client Project #: WET/DRY GROUND WATER/FALL GW
Your P.O. #: 720.8121.3516

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Cristina Carriere

Cristina Carriere, Scientific Services

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Maxxam
A Bureau Veritas Group Company

Your Project #: Wet/Dry Ground Water
Site#: FALL GW
Your C.O.C. #: 540602-02-01

Attention:Amy Spence

City of Guelph
Soild Waste RIC (Wet/Dry)
110 Dunlop Drive
Guelph, ON
CANADA N1H 6H8

Report Date: 2015/12/15
Report #: R3806665
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B5O9100
Received: 2015/12/03, 16:15

Sample Matrix: Water
Samples Received: 8

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Alkalinity	4	N/A	2015/12/05	CAM SOP-00448	SM 22 2320 B m
Alkalinity	3	N/A	2015/12/06	CAM SOP-00448	SM 22 2320 B m
Alkalinity	1	N/A	2015/12/07	CAM SOP-00448	SM 22 2320 B m
Biochemical Oxygen Demand (BOD)	8	N/A	2015/12/10	CAM SOP-00427	SM 22 5210B m
Chloride by Automated Colourimetry	7	N/A	2015/12/07	CAM SOP-00463	EPA 325.2 m
Chloride by Automated Colourimetry	1	N/A	2015/12/08	CAM SOP-00463	EPA 325.2 m
Chemical Oxygen Demand	3	N/A	2015/12/09	CAM SOP-00416	SM 22 5220 D m
Chemical Oxygen Demand	5	N/A	2015/12/11	CAM SOP-00416	SM 22 5220 D m
Conductivity	4	N/A	2015/12/05	CAM SOP-00414	SM 22 2510 m
Conductivity	3	N/A	2015/12/06	CAM SOP-00414	SM 22 2510 m
Conductivity	1	N/A	2015/12/07	CAM SOP-00414	SM 22 2510 m
Dissolved Metals by ICPMS	7	N/A	2015/12/09	CAM SOP-00447	EPA 6020A m
Dissolved Metals by ICPMS	1	N/A	2015/12/14	CAM SOP-00447	EPA 6020A m
Total Metals Analysis by ICP	8	2015/12/10	2015/12/10	CAM SOP-00408	EPA 6010C m
Total Ammonia-N	8	N/A	2015/12/10	CAM SOP-00441	EPA GS I-2522-90 m
Nitrate (NO3) and Nitrite (NO2) in Water (1)	7	N/A	2015/12/07	CAM SOP-00440	SM 22 4500-NO3I/NO2B
Nitrate (NO3) and Nitrite (NO2) in Water (1)	1	N/A	2015/12/09	CAM SOP-00440	SM 22 4500-NO3I/NO2B
pH	4	N/A	2015/12/05	CAM SOP-00413	SM 4500H+ B m
pH	4	N/A	2015/12/07	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	7	N/A	2015/12/07	CAM SOP-00444	OMOE E3179 m
Phenols (4AAP)	1	N/A	2015/12/08	CAM SOP-00444	OMOE E3179 m
Sulphate by Automated Colourimetry	7	N/A	2015/12/07	CAM SOP-00464	EPA 375.4 m
Sulphate by Automated Colourimetry	1	N/A	2015/12/08	CAM SOP-00464	EPA 375.4 m
Total Kjeldahl Nitrogen in Water	3	2015/12/09	2015/12/09	CAM SOP-00938	OMOE E3516 m
Total Kjeldahl Nitrogen in Water	5	2015/12/10	2015/12/10	CAM SOP-00938	OMOE E3516 m
Total Phosphorus (Colourimetric)	8	2015/12/10	2015/12/11	CAM SOP-00407	SM 4500 P B H m

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

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Your Project #: Wet/Dry Ground Water
Site#: FALL GW
Your C.O.C. #: 540602-02-01

Attention:Amy Spence

City of Guelph
Soild Waste RIC (Wet/Dry)
110 Dunlop Drive
Guelph, ON
CANADA N1H 6H8

Report Date: 2015/12/15
Report #: R3806665
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B5O9100
Received: 2015/12/03, 16:15

Encryption Key

James Aspin
15 Dec 2015 08:42:20 -05:00

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
James Aspin, Senior Project Manager
Email: JAspin@maxxam.ca
Phone# (905)817-5771

==========

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Maxxam Job #: B5O9100
Report Date: 2015/12/15

City of Guelph
Client Project #: Wet/Dry Ground Water

RESULTS OF ANALYSES OF WATER

Maxxam ID		BLS321			BLS322		
Sampling Date		2015/12/02			2015/12/02		
COC Number		540602-02-01			540602-02-01		
	UNITS	**11A**	**RDL**	**QC Batch**	**11B**	**RDL**	**QC Batch**
Inorganics							
Total Ammonia-N	mg/L	0.12	0.050	4306941	ND	0.050	4306941
Total BOD	mg/L	ND	2.0	4300892	ND	2.0	4300892
Total Chemical Oxygen Demand (COD)	mg/L	5.2	4.0	4306953	4.0	4.0	4306953
Conductivity	umho/cm	590	1.0	4302448	1100	1.0	4300972
Total Kjeldahl Nitrogen (TKN)	mg/L	0.22	0.10	4306963	0.41	0.10	4306963
pH	pH	7.88	N/A	4302446	8.01	N/A	4300974
Phenols-4AAP	mg/L	0.0016	0.0010	4301682	ND	0.0010	4301682
Total Phosphorus	mg/L	0.025	0.020	4307121	0.044	0.020	4307121
Dissolved Sulphate (SO4)	mg/L	35	1.0	4302598	28	1.0	4301180
Alkalinity (Total as CaCO3)	mg/L	220	1.0	4302423	250	1.0	4300967
Dissolved Chloride (Cl)	mg/L	23	1.0	4302596	150	2.0	4301179
Nitrite (N)	mg/L	0.035	0.010	4302276	ND	0.010	4301015
Nitrate (N)	mg/L	ND	0.10	4302276	3.73	0.10	4301015
Nitrate + Nitrite (N)	mg/L	ND	0.10	4302276	3.73	0.10	4301015

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected
N/A = Not Applicable

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Maxxam Job #: B5O9100
Report Date: 2015/12/15

City of Guelph
Client Project #: Wet/Dry Ground Water

RESULTS OF ANALYSES OF WATER

Maxxam ID		BLS323			BLS324		
Sampling Date		2015/12/02			2015/12/02		
COC Number		540602-02-01			540602-02-01		
	UNITS	**6A**	**RDL**	**QC Batch**	**6B**	**RDL**	**QC Batch**
Inorganics							
Total Ammonia-N	mg/L	0.10	0.050	4306941	ND	0.050	4306941
Total BOD	mg/L	ND	2.0	4300892	ND	2.0	4300892
Total Chemical Oxygen Demand (COD)	mg/L	6.9	4.0	4306953	8.5	4.0	4306953
Conductivity	umho/cm	1400	1.0	4300972	1200	1.0	4300972
Total Kjeldahl Nitrogen (TKN)	mg/L	0.38	0.10	4306963	0.33	0.10	4306963
pH	pH	7.86	N/A	4300974	7.81	N/A	4300974
Phenols-4AAP	mg/L	ND	0.0010	4301682	ND	0.0010	4301684
Total Phosphorus	mg/L	0.021	0.020	4307121	0.048	0.020	4307121
Dissolved Sulphate (SO4)	mg/L	37	1.0	4301180	36	1.0	4301180
Alkalinity (Total as CaCO3)	mg/L	270	1.0	4300967	290	1.0	4300967
Dissolved Chloride (Cl)	mg/L	220	3.0	4301179	140	2.0	4301179
Nitrite (N)	mg/L	ND	0.010	4300986	ND	0.010	4300986
Nitrate (N)	mg/L	2.80	0.10	4300986	3.48	0.10	4300986
Nitrate + Nitrite (N)	mg/L	2.80	0.10	4300986	3.48	0.10	4300986

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected
N/A = Not Applicable

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Maxxam Job #: B5O9100
Report Date: 2015/12/15

City of Guelph
Client Project #: Wet/Dry Ground Water

RESULTS OF ANALYSES OF WATER

Maxxam ID		BLS325	BLS326	BLS326		BLS327		
Sampling Date		2015/12/03	2015/12/03	2015/12/03		2015/12/03		
COC Number		540602-02-01	540602-02-01	540602-02-01		540602-02-01		
	UNITS	**22A**	**22B**	**22B Lab-Dup**	**QC Batch**	**17A**	**RDL**	**QC Batch**
Inorganics								
Total Ammonia-N	mg/L	ND	ND		4305027	0.070	0.050	4306941
Total BOD	mg/L	ND	ND		4300892	ND	2.0	4300892
Total Chemical Oxygen Demand (COD)	mg/L	ND	ND		4305040	ND	4.0	4306953
Conductivity	umho/cm	780	870		4300971	730	1.0	4300971
Total Kjeldahl Nitrogen (TKN)	mg/L	0.14	0.12		4305178	0.21	0.10	4306963
pH	pH	7.66	7.64		4300977	7.70	N/A	4300977
Phenols-4AAP	mg/L	ND	ND		4301682	ND	0.0010	4301682
Total Phosphorus	mg/L	0.035	ND	ND	4307121	0.022	0.020	4307121
Dissolved Sulphate (SO4)	mg/L	86	45		4300885	69	1.0	4300885
Alkalinity (Total as CaCO3)	mg/L	230	280		4300964	220	1.0	4300964
Dissolved Chloride (Cl)	mg/L	50	75		4300884	46	1.0	4300884
Nitrite (N)	mg/L	ND	ND		4300897	0.011	0.010	4300897
Nitrate (N)	mg/L	ND	0.32		4300897	ND	0.10	4300897
Nitrate + Nitrite (N)	mg/L	ND	0.32		4300897	ND	0.10	4300897

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not detected
N/A = Not Applicable

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Maxxam Job #: B5O9100
Report Date: 2015/12/15

City of Guelph
Client Project #: Wet/Dry Ground Water

RESULTS OF ANALYSES OF WATER

Maxxam ID		BLS328		
Sampling Date		2015/12/03		
COC Number		540602-02-01		
	UNITS	**17B**	**RDL**	**QC Batch**
Inorganics				
Total Ammonia-N	mg/L	ND	0.050	4305027
Total BOD	mg/L	ND	2.0	4300892
Total Chemical Oxygen Demand (COD)	mg/L	ND	4.0	4305040
Conductivity	umho/cm	1200	1.0	4300972
Total Kjeldahl Nitrogen (TKN)	mg/L	0.19	0.10	4305178
pH	pH	7.93	N/A	4300974
Phenols-4AAP	mg/L	ND	0.0010	4301682
Total Phosphorus	mg/L	0.038	0.020	4307121
Dissolved Sulphate (SO4)	mg/L	35	1.0	4301180
Alkalinity (Total as CaCO3)	mg/L	310	1.0	4300967
Dissolved Chloride (Cl)	mg/L	150	2.0	4301179
Nitrite (N)	mg/L	ND	0.010	4301015
Nitrate (N)	mg/L	1.70	0.10	4301015
Nitrate + Nitrite (N)	mg/L	1.70	0.10	4301015

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected
N/A = Not Applicable

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Maxxam Job #: B5O9100
Report Date: 2015/12/15

City of Guelph
Client Project #: Wet/Dry Ground Water

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		BLS321		BLS322	BLS322		BLS323	BLS324		
Sampling Date		2015/12/02		2015/12/02	2015/12/02		2015/12/02	2015/12/02		
COC Number		540602-02-01		540602-02-01	540602-02-01		540602-02-01	540602-02-01		
	UNITS	**11A**	**QC Batch**	**11B**	**11B Lab-Dup**	**QC Batch**	**6A**	**6B**	**RDL**	**QC Batch**
Metals										
Total Iron (Fe)	mg/L	0.23	4307728	0.07	ND	4307728	0.15	0.18	0.02	4307728
Dissolved Boron (B)	ug/L	40	4306036	180		4309984	26	35	10	4306036
Dissolved Calcium (Ca)	ug/L	74000	4306036	110000		4309984	98000	93000	200	4306036
Dissolved Magnesium (Mg)	ug/L	26000	4306036	30000		4309984	24000	22000	50	4306036
Dissolved Phosphorus (P)	ug/L	ND	4306036	ND		4309984	ND	ND	100	4306036
Dissolved Potassium (K)	ug/L	1800	4306036	1900		4309984	2600	7300	200	4306036
Dissolved Sodium (Na)	ug/L	5800	4306036	120000		4309984	140000	100000	100	4306036
Dissolved Zinc (Zn)	ug/L	6.3	4306036	90		4309984	30	65	5.0	4306036

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not detected

Maxxam ID		BLS325	BLS326	BLS327	BLS328		
Sampling Date		2015/12/03	2015/12/03	2015/12/03	2015/12/03		
COC Number		540602-02-01	540602-02-01	540602-02-01	540602-02-01		
	UNITS	**22A**	**22B**	**17A**	**17B**	**RDL**	**QC Batch**
Metals							
Total Iron (Fe)	mg/L	0.72	0.20	0.62	1.6	0.02	4307728
Dissolved Boron (B)	ug/L	22	24	29	21	10	4306036
Dissolved Calcium (Ca)	ug/L	90000	100000	90000	88000	200	4306036
Dissolved Magnesium (Mg)	ug/L	32000	23000	30000	24000	50	4306036
Dissolved Phosphorus (P)	ug/L	ND	ND	ND	ND	100	4306036
Dissolved Potassium (K)	ug/L	1500	1500	1600	1600	200	4306036
Dissolved Sodium (Na)	ug/L	17000	41000	14000	110000	100	4306036
Dissolved Zinc (Zn)	ug/L	5.2	14	ND	140	5.0	4306036

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected

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GENERAL COMMENTS

Results relate only to the items tested.

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Maxxam Job #: B5O9100
Report Date: 2015/12/15

QUALITY ASSURANCE REPORT

City of Guelph
Client Project #: Wet/Dry Ground Water

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
4300884	Dissolved Chloride (Cl)	2015/12/07	111	80 - 120	105	80 - 120	ND, RDL=1.0	mg/L	1.5	20		
4300885	Dissolved Sulphate (SO4)	2015/12/07	NC	75 - 125	100	80 - 120	ND, RDL=1.0	mg/L	0.99	20		
4300892	Total BOD	2015/12/10					ND, RDL=2.0	mg/L	NC	25	94	85 - 115
4300897	Nitrate (N)	2015/12/07	100	80 - 120	100	80 - 120	ND, RDL=0.10	mg/L	NC	25		
4300897	Nitrite (N)	2015/12/07	109	80 - 120	103	80 - 120	ND, RDL=0.010	mg/L	NC	25		
4300964	Alkalinity (Total as CaCO3)	2015/12/06			92	85 - 115	ND, RDL=1.0	mg/L	0.99	25		
4300967	Alkalinity (Total as CaCO3)	2015/12/05			94	85 - 115	ND, RDL=1.0	mg/L	0.99	25		
4300971	Conductivity	2015/12/06			101	85 - 115	ND, RDL=1.0	umho/cm	0.45	25		
4300972	Conductivity	2015/12/05			101	85 - 115	ND, RDL=1.0	umho/cm	0.22	25		
4300974	pH	2015/12/05			101	98 - 103			0.087	N/A		
4300977	pH	2015/12/07			101	98 - 103			0.58	N/A		
4300986	Nitrate (N)	2015/12/07	97	80 - 120	97	80 - 120	ND, RDL=0.10	mg/L	1.0	25		
4300986	Nitrite (N)	2015/12/07	106	80 - 120	102	80 - 120	ND, RDL=0.010	mg/L	NC	25		
4301015	Nitrate (N)	2015/12/07	NC	80 - 120	98	80 - 120	ND, RDL=0.10	mg/L	0.21	25		
4301015	Nitrite (N)	2015/12/07	113	80 - 120	103	80 - 120	ND, RDL=0.010	mg/L	NC	25		
4301179	Dissolved Chloride (Cl)	2015/12/07	NC	80 - 120	105	80 - 120	ND, RDL=1.0	mg/L	1.6	20		
4301180	Dissolved Sulphate (SO4)	2015/12/07	NC	75 - 125	99	80 - 120	ND, RDL=1.0	mg/L	0.47	20		
4301682	Phenols-4AAP	2015/12/07	93	80 - 120	97	85 - 115	ND, RDL=0.0010	mg/L	NC	20		
4301684	Phenols-4AAP	2015/12/08	112	80 - 120	98	85 - 115	ND, RDL=0.0010	mg/L	NC	20		
4302276	Nitrate (N)	2015/12/09	96	80 - 120	101	80 - 120	ND, RDL=0.10	mg/L	NC	25		
4302276	Nitrite (N)	2015/12/09	104	80 - 120	104	80 - 120	ND, RDL=0.010	mg/L	NC	25		
4302423	Alkalinity (Total as CaCO3)	2015/12/07			94	85 - 115	ND, RDL=1.0	mg/L	0.95	25		
4302446	pH	2015/12/07			101	98 - 103			0.13	N/A		
4302448	Conductivity	2015/12/07			101	85 - 115	ND, RDL=1.0	umho/cm	0	25		

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QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
4302596	Dissolved Chloride (Cl)	2015/12/08	NC	80 - 120	103	80 - 120	ND, RDL=1.0	mg/L	2.1	20		
4302598	Dissolved Sulphate (SO4)	2015/12/08	NC	75 - 125	102	80 - 120	ND, RDL=1.0	mg/L	0.24	20		
4305027	Total Ammonia-N	2015/12/10	100	80 - 120	99	85 - 115	ND, RDL=0.050	mg/L	NC	20		
4305040	Total Chemical Oxygen Demand (COD)	2015/12/09	101	75 - 125	103	75 - 125	ND, RDL=4.0	mg/L	0.28	25		
4305178	Total Kjeldahl Nitrogen (TKN)	2015/12/09	98	80 - 120	98	80 - 120	ND, RDL=0.10	mg/L	NC	20	100	80 - 120
4306036	Dissolved Boron (B)	2015/12/09	NC	80 - 120	101	80 - 120	ND, RDL=10	ug/L	0.24	20		
4306036	Dissolved Calcium (Ca)	2015/12/09	NC	80 - 120	100	80 - 120	ND, RDL=200	ug/L	1.2	20		
4306036	Dissolved Magnesium (Mg)	2015/12/09	NC	80 - 120	98	80 - 120	ND, RDL=50	ug/L	1.3	20		
4306036	Dissolved Phosphorus (P)	2015/12/09	112	80 - 120	97	80 - 120	ND, RDL=100	ug/L				
4306036	Dissolved Potassium (K)	2015/12/09	106	80 - 120	101	80 - 120	ND, RDL=200	ug/L	0.63	20		
4306036	Dissolved Sodium (Na)	2015/12/09	NC	80 - 120	97	80 - 120	ND, RDL=100	ug/L	0.39	20		
4306036	Dissolved Zinc (Zn)	2015/12/09	101	80 - 120	98	80 - 120	ND, RDL=5.0	ug/L	NC	20		
4306941	Total Ammonia-N	2015/12/10	98	80 - 120	98	85 - 115	ND, RDL=0.050	mg/L	NC	20		
4306953	Total Chemical Oxygen Demand (COD)	2015/12/11	81	75 - 125	103	75 - 125	ND, RDL=4.0	mg/L	2.0	25		
4306963	Total Kjeldahl Nitrogen (TKN)	2015/12/10	105	80 - 120	97	80 - 120	ND, RDL=0.10	mg/L	NC	20	100	80 - 120
4307121	Total Phosphorus	2015/12/11	103	80 - 120	101	80 - 120	ND, RDL=0.020	mg/L	NC	20	103	80 - 120
4307728	Total Iron (Fe)	2015/12/10	84	80 - 120	102	80 - 120	ND, RDL=0.02	mg/L	NC	25		
4309984	Dissolved Boron (B)	2015/12/14	105	80 - 120	103	80 - 120	ND, RDL=10	ug/L	NC	20		
4309984	Dissolved Calcium (Ca)	2015/12/14	NC	80 - 120	104	80 - 120	ND, RDL=200	ug/L	0.54	20		
4309984	Dissolved Magnesium (Mg)	2015/12/14	NC	80 - 120	107	80 - 120	ND, RDL=50	ug/L	0.75	20		
4309984	Dissolved Phosphorus (P)	2015/12/14	111	80 - 120	104	80 - 120	ND, RDL=100	ug/L	NC	20		
4309984	Dissolved Potassium (K)	2015/12/14	104	80 - 120	105	80 - 120	ND, RDL=200	ug/L	0.32	20		
4309984	Dissolved Sodium (Na)	2015/12/14	NC	80 - 120	108	80 - 120	ND, RDL=100	ug/L	1.1	20		

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Maxxam Job #: B5O9100
Report Date: 2015/12/15

QUALITY ASSURANCE REPORT(CONT'D)

City of Guelph
Client Project #: Wet/Dry Ground Water

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
4309984	Dissolved Zinc (Zn)	2015/12/14	100	80 - 120	101	80 - 120	ND, RDL=5.0	ug/L	2.1	20		

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

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Maxxam Job #: B5O9100
Report Date: 2015/12/15

City of Guelph
Client Project #: Wet/Dry Ground Water

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Brad Newman, Scientific Specialist

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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Maxxam
A Bureau Veritas Group Company

Your Project #: WET/DRY GW / FALL GW
Site Location: FALL GW
Your C.O.C. #: 538581-08-01

Attention:Andrew Shouldice

City of Guelph
Eastview Landfill
186 Eastview Road
Guelph, ON
CANADA N1E 1Z6

Report Date: 2015/12/14
Report #: R3805940
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B5P0318
Received: 2015/12/04, 16:10

Sample Matrix: Water
Samples Received: 6

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Alkalinity	6	N/A	2015/12/07	CAM SOP-00448	SM 22 2320 B m
Biochemical Oxygen Demand (BOD)	6	N/A	2015/12/12	CAM SOP-00427	SM 22 5210B m
Chloride by Automated Colourimetry	6	N/A	2015/12/08	CAM SOP-00463	EPA 325.2 m
Chemical Oxygen Demand	6	N/A	2015/12/11	CAM SOP-00416	SM 22 5220 D m
Conductivity	6	N/A	2015/12/07	CAM SOP-00414	SM 22 2510 m
Dissolved Metals by ICPMS	6	N/A	2015/12/11	CAM SOP-00447	EPA 6020A m
Total Metals Analysis by ICP	6	2015/12/11	2015/12/11	CAM SOP-00408	EPA 6010C m
Total Ammonia-N	6	N/A	2015/12/14	CAM SOP-00441	EPA GS I-2522-90 m
Nitrate (NO3) and Nitrite (NO2) in Water (1)	6	N/A	2015/12/09	CAM SOP-00440	SM 22 4500-NO3I/NO2B
pH	6	N/A	2015/12/07	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	6	N/A	2015/12/08	CAM SOP-00444	OMOE E3179 m
Sulphate by Automated Colourimetry	6	N/A	2015/12/08	CAM SOP-00464	EPA 375.4 m
Total Kjeldahl Nitrogen in Water	6	2015/12/11	2015/12/11	CAM SOP-00938	OMOE E3516 m
Total Phosphorus (Colourimetric)	6	2015/12/11	2015/12/14	CAM SOP-00407	SM 4500 P B H m

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

Encryption Key

James Aspin
14 Dec 2015 18:01:13 -05:00

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
James Aspin, Senior Project Manager
Email: JAspin@maxxam.ca
Phone# (905)817-5771

==========

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Maxxam Job #: B5P0318
Report Date: 2015/12/14

City of Guelph
Client Project #: WET/DRY GW / FALL GW
Site Location: FALL GW

RESULTS OF ANALYSES OF WATER

Maxxam ID		BLY447			BLY448		
Sampling Date		2015/12/04			2015/12/04		
COC Number		538581-08-01			538581-08-01		
	UNITS	**23A**	**RDL**	**QC Batch**	**23B**	**RDL**	**QC Batch**
Inorganics							
Total Ammonia-N	mg/L	ND	0.050	4309287	ND	0.050	4309287
Total BOD	mg/L	ND	2.0	4301934	ND	2.0	4301934
Total Chemical Oxygen Demand (COD)	mg/L	ND	4.0	4309208	17	4.0	4309208
Conductivity	umho/cm	710	1.0	4302448	1700	1.0	4302448
Total Kjeldahl Nitrogen (TKN)	mg/L	ND	0.10	4309274	0.96	0.10	4309274
pH	pH	7.95	N/A	4302446	7.74	N/A	4302446
Phenols-4AAP	mg/L	ND	0.0010	4301720	ND	0.0010	4301720
Total Phosphorus	mg/L	ND	0.020	4309261	0.51	0.10	4309261
Dissolved Sulphate (SO4)	mg/L	100	1.0	4302661	34	1.0	4302598
Alkalinity (Total as CaCO3)	mg/L	230	1.0	4302423	360	1.0	4302423
Dissolved Chloride (Cl)	mg/L	24	1.0	4302659	270	4.0	4302596
Nitrite (N)	mg/L	ND	0.010	4302278	0.020	0.010	4302278
Nitrate (N)	mg/L	ND	0.10	4302278	4.17	0.10	4302278
Nitrate + Nitrite (N)	mg/L	ND	0.10	4302278	4.19	0.10	4302278

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected
N/A = Not Applicable

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Maxxam Job #: B5P0318
Report Date: 2015/12/14

City of Guelph
Client Project #: WET/DRY GW / FALL GW
Site Location: FALL GW

RESULTS OF ANALYSES OF WATER

Maxxam ID		BLY449		BLY450	BLY450		BLY451		
Sampling Date		2015/12/04		2015/12/04	2015/12/04		2015/12/04		
COC Number		538581-08-01		538581-08-01	538581-08-01		538581-08-01		
	UNITS	**16A**	**QC Batch**	**16B**	**16B Lab-Dup**	**QC Batch**	**13A**	**RDL**	**QC Batch**
Inorganics									
Total Ammonia-N	mg/L	ND	4309287	ND		4309287	0.14	0.050	4309287
Total BOD	mg/L	ND	4301934	ND	ND	4301934	ND	2.0	4301934
Total Chemical Oxygen Demand (COD)	mg/L	17	4309208	4.6		4309208	4.9	4.0	4309208
Conductivity	umho/cm	1100	4302448	630		4302448	960	1.0	4302448
Total Kjeldahl Nitrogen (TKN)	mg/L	0.40	4309274	0.13	0.14	4309246	0.14	0.10	4309274
pH	pH	7.48	4302446	8.06		4302446	8.00	N/A	4302446
Phenols-4AAP	mg/L	ND	4301720	ND		4301720	ND	0.0010	4301720
Total Phosphorus	mg/L	ND	4309261	ND		4309261	ND	0.020	4309261
Dissolved Sulphate (SO4)	mg/L	36	4302661	39		4302598	100	1.0	4302598
Alkalinity (Total as CaCO3)	mg/L	530	4302423	230		4302423	240	1.0	4302423
Dissolved Chloride (Cl)	mg/L	33	4302659	32		4302596	95	1.0	4302596
Nitrite (N)	mg/L	ND	4302278	0.010		4302278	ND	0.010	4302278
Nitrate (N)	mg/L	ND	4302278	ND		4302278	ND	0.10	4302278
Nitrate + Nitrite (N)	mg/L	ND	4302278	ND		4302278	ND	0.10	4302278

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not detected
N/A = Not Applicable

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Maxxam Job #: B5P0318
Report Date: 2015/12/14

City of Guelph
Client Project #: WET/DRY GW / FALL GW
Site Location: FALL GW

RESULTS OF ANALYSES OF WATER

Maxxam ID		BLY451		BLY452		
Sampling Date		2015/12/04		2015/12/04		
COC Number		538581-08-01		538581-08-01		
	UNITS	**13A Lab-Dup**	**QC Batch**	**13B**	**RDL**	**QC Batch**
Inorganics						
Total Ammonia-N	mg/L	0.13	4309287	ND	0.050	4309287
Total BOD	mg/L		4301934	ND	2.0	4301934
Total Chemical Oxygen Demand (COD)	mg/L		4309208	4.3	4.0	4309208
Conductivity	umho/cm		4302448	1100	1.0	4302448
Total Kjeldahl Nitrogen (TKN)	mg/L	0.16	4309274	0.11	0.10	4309274
pH	pH		4302446	7.81	N/A	4302446
Phenols-4AAP	mg/L		4301720	ND	0.0010	4302956
Total Phosphorus	mg/L		4309261	ND	0.020	4309261
Dissolved Sulphate (SO4)	mg/L		4302598	41	1.0	4302598
Alkalinity (Total as CaCO3)	mg/L		4302423	340	1.0	4302423
Dissolved Chloride (Cl)	mg/L		4302596	110	1.0	4302596
Nitrite (N)	mg/L		4302278	ND	0.010	4302278
Nitrate (N)	mg/L		4302278	0.48	0.10	4302278
Nitrate + Nitrite (N)	mg/L		4302278	0.48	0.10	4302278

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not detected
N/A = Not Applicable

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Maxxam Job #: B5P0318
Report Date: 2015/12/14

City of Guelph
Client Project #: WET/DRY GW / FALL GW
Site Location: FALL GW

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		BLY447	BLY447	BLY448	BLY449	BLY450		BLY451		
Sampling Date		2015/12/04	2015/12/04	2015/12/04	2015/12/04	2015/12/04		2015/12/04		
COC Number		538581-08-01	538581-08-01	538581-08-01	538581-08-01	538581-08-01		538581-08-01		
	UNITS	**23A**	**23A Lab-Dup**	**23B**	**16A**	**16B**	**RDL**	**13A**	**RDL**	**QC Batch**
Metals										
Total Iron (Fe)	mg/L	0.14	0.13	19	0.08	0.18	0.02	0.34	0.02	4309023
Dissolved Boron (B)	ug/L	19		120	32	22	10	41	10	4307436
Dissolved Calcium (Ca)	ug/L	90000		130000	150000	85000	200	98000	400	4307436
Dissolved Magnesium (Mg)	ug/L	32000		34000	45000	29000	50	35000	50	4307436
Dissolved Phosphorus (P)	ug/L	ND		ND	ND	ND	100	ND	100	4307436
Dissolved Potassium (K)	ug/L	1200		3600	1600	1900	200	2600	200	4307436
Dissolved Sodium (Na)	ug/L	12000		200000	38000	2300	100	45000	100	4307436
Dissolved Zinc (Zn)	ug/L	ND		350	700	21	5.0	ND	5.0	4307436

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not detected

Maxxam ID		BLY451		BLY452		
Sampling Date		2015/12/04		2015/12/04		
COC Number		538581-08-01		538581-08-01		
	UNITS	**13A Lab-Dup**	**RDL**	**13B**	**RDL**	**QC Batch**
Metals						
Total Iron (Fe)	mg/L		0.02	0.26	0.02	4309023
Dissolved Boron (B)	ug/L	43	10	20	10	4307436
Dissolved Calcium (Ca)	ug/L	99000	400	140000	200	4307436
Dissolved Magnesium (Mg)	ug/L	35000	50	28000	50	4307436
Dissolved Phosphorus (P)	ug/L	ND	100	ND	100	4307436
Dissolved Potassium (K)	ug/L	2700	200	1900	200	4307436
Dissolved Sodium (Na)	ug/L	46000	100	40000	100	4307436
Dissolved Zinc (Zn)	ug/L	ND	5.0	76	5.0	4307436

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not detected

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Maxxam Job #: B5P0318
Report Date: 2015/12/14

City of Guelph
Client Project #: WET/DRY GW / FALL GW
Site Location: FALL GW

GENERAL COMMENTS

Results relate only to the items tested.

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Maxxam Job #: B5P0318
Report Date: 2015/12/14

QUALITY ASSURANCE REPORT

City of Guelph
Client Project #: WET/DRY GW / FALL GW
Site Location: FALL GW

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
4301720	Phenols-4AAP	2015/12/08	99	80 - 120	97	85 - 115	ND, RDL=0.0010	mg/L	NC	20		
4301934	Total BOD	2015/12/12					ND, RDL=2.0	mg/L	NC	25	112	85 - 115
4302278	Nitrate (N)	2015/12/09	98	80 - 120	102	80 - 120	ND, RDL=0.10	mg/L	NC	25		
4302278	Nitrite (N)	2015/12/09	103	80 - 120	104	80 - 120	ND, RDL=0.010	mg/L	NC	25		
4302423	Alkalinity (Total as CaCO3)	2015/12/07			94	85 - 115	ND, RDL=1.0	mg/L	0.95	25		
4302446	pH	2015/12/07			101	98 - 103			0.13	N/A		
4302448	Conductivity	2015/12/07			101	85 - 115	ND, RDL=1.0	umho/cm	0	25		
4302596	Dissolved Chloride (Cl)	2015/12/08	NC	80 - 120	103	80 - 120	ND, RDL=1.0	mg/L	2.1	20		
4302598	Dissolved Sulphate (SO4)	2015/12/08	NC	75 - 125	102	80 - 120	ND, RDL=1.0	mg/L	0.24	20		
4302659	Dissolved Chloride (Cl)	2015/12/08	NC	80 - 120	104	80 - 120	ND, RDL=1.0	mg/L	0.44	20		
4302661	Dissolved Sulphate (SO4)	2015/12/08	NC	75 - 125	101	80 - 120	ND, RDL=1.0	mg/L	0.46	20		
4302956	Phenols-4AAP	2015/12/08	96	80 - 120	101	85 - 115	ND, RDL=0.0010	mg/L	NC	20		
4307436	Dissolved Boron (B)	2015/12/11	109	80 - 120	100	80 - 120	ND, RDL=10	ug/L	NC	20		
4307436	Dissolved Calcium (Ca)	2015/12/11	NC	80 - 120	102	80 - 120	ND, RDL=200	ug/L	0.76	20		
4307436	Dissolved Magnesium (Mg)	2015/12/11	NC	80 - 120	105	80 - 120	ND, RDL=50	ug/L	0.82	20		
4307436	Dissolved Phosphorus (P)	2015/12/11	112	80 - 120	106	80 - 120	ND, RDL=100	ug/L	NC	20		
4307436	Dissolved Potassium (K)	2015/12/11	107	80 - 120	102	80 - 120	ND, RDL=200	ug/L	0.82	20		
4307436	Dissolved Sodium (Na)	2015/12/11	NC	80 - 120	106	80 - 120	ND, RDL=100	ug/L	1.3	20		
4307436	Dissolved Zinc (Zn)	2015/12/11	106	80 - 120	100	80 - 120	ND, RDL=5.0	ug/L	NC	20		
4309023	Total Iron (Fe)	2015/12/11	94	80 - 120	95	80 - 120	ND, RDL=0.02	mg/L	4.4	25		
4309208	Total Chemical Oxygen Demand (COD)	2015/12/11	104	75 - 125	102	75 - 125	ND, RDL=4.0	mg/L	6.8	25		
4309246	Total Kjeldahl Nitrogen (TKN)	2015/12/11	101	80 - 120	101	80 - 120	ND, RDL=0.10	mg/L	NC	20	101	80 - 120
4309261	Total Phosphorus	2015/12/14	103	80 - 120	102	80 - 120	ND, RDL=0.020	mg/L	1.5	20	103	80 - 120
4309274	Total Kjeldahl Nitrogen (TKN)	2015/12/11	102	80 - 120	95	80 - 120	ND, RDL=0.10	mg/L	NC	20	97	80 - 120

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Maxxam Job #: B5P0318
Report Date: 2015/12/14

QUALITY ASSURANCE REPORT(CONT'D)

City of Guelph
Client Project #: WET/DRY GW / FALL GW
Site Location: FALL GW

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
4309287	Total Ammonia-N	2015/12/14	100	80 - 120	102	85 - 115	ND, RDL=0.050	mg/L	NC	20		

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

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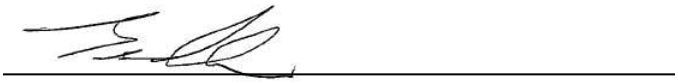
Maxxam Job #: B5P0318
Report Date: 2015/12/14

City of Guelph
Client Project #: WET/DRY GW / FALL GW
Site Location: FALL GW

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Brad Newman, Scientific Specialist

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Maxxam
A Bureau Veritas Group Company

Your Project #: GW WET/DRY / FALL GW
Your C.O.C. #: 484840-07-01

Attention:Andrew Shouldice

City of Guelph
Eastview Landfill
186 Eastview Road
Guelph, ON
CANADA N1E 1Z6

Report Date: 2015/12/16
Report #: R3809386
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B5P2692
Received: 2015/12/08, 16:11

Sample Matrix: Water
Samples Received: 8

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Alkalinity	8	N/A	2015/12/09	CAM SOP-00448	SM 22 2320 B m
Biochemical Oxygen Demand (BOD)	8	N/A	2015/12/14	CAM SOP-00427	SM 22 5210B m
Chloride by Automated Colourimetry	8	N/A	2015/12/10	CAM SOP-00463	EPA 325.2 m
Chemical Oxygen Demand	8	N/A	2015/12/14	CAM SOP-00416	SM 22 5220 D m
Conductivity	8	N/A	2015/12/09	CAM SOP-00414	SM 22 2510 m
Dissolved Metals by ICPMS	8	N/A	2015/12/14	CAM SOP-00447	EPA 6020A m
Total Metals Analysis by ICP	8	2015/12/14	2015/12/14	CAM SOP-00408	EPA 6010C m
Total Ammonia-N	8	N/A	2015/12/15	CAM SOP-00441	EPA GS I-2522-90 m
Nitrate (NO3) and Nitrite (NO2) in Water (1)	4	N/A	2015/12/10	CAM SOP-00440	SM 22 4500-NO3I/NO2B
Nitrate (NO3) and Nitrite (NO2) in Water (1)	4	N/A	2015/12/11	CAM SOP-00440	SM 22 4500-NO3I/NO2B
pH	8	N/A	2015/12/09	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	8	N/A	2015/12/10	CAM SOP-00444	OMOE E3179 m
Sulphate by Automated Colourimetry	8	N/A	2015/12/10	CAM SOP-00464	EPA 375.4 m
Total Kjeldahl Nitrogen in Water	7	2015/12/11	2015/12/14	CAM SOP-00938	OMOE E3516 m
Total Kjeldahl Nitrogen in Water	1	2015/12/15	2015/12/16	CAM SOP-00938	OMOE E3516 m
Total Phosphorus (Colourimetric)	8	2015/12/15	2015/12/15	CAM SOP-00407	SM 4500 P B H m

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

Encryption Key

James Aspin
16 Dec 2015 18:10:32 -04:59

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
James Aspin, Senior Project Manager
Email: JAspin@maxxam.ca
Phone# (905)817-5771

==========

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Maxxam Job #: B5P2692
Report Date: 2015/12/16

City of Guelph
Client Project #: GW WET/DRY / FALL GW

RESULTS OF ANALYSES OF WATER

Maxxam ID		BMK304		BMK305	BMK306		BMK307		
Sampling Date		2015/12/07		2015/12/07	2015/12/07		2015/12/07		
COC Number		484840-07-01		484840-07-01	484840-07-01		484840-07-01		
	UNITS	**7**	**QC Batch**	**8**	**21A**	**RDL**	**5**	**RDL**	**QC Batch**
Inorganics									
Total Ammonia-N	mg/L	ND	4312066	ND	ND	0.050	ND	0.050	4312066
Total BOD	mg/L	ND	4304882	ND	ND	2.0	ND	2.0	4304882
Total Chemical Oxygen Demand (COD)	mg/L	ND	4310077	ND	ND	4.0	ND	4.0	4310077
Conductivity	umho/cm	1100	4305414	1100	620	1.0	2500	1.0	4305414
Total Kjeldahl Nitrogen (TKN)	mg/L	0.40	4309638	0.14	0.25	0.10	0.16	0.10	4309638
pH	pH	7.73	4305413	7.87	7.86	N/A	7.84	N/A	4305413
Phenols-4AAP	mg/L	ND	4306296	ND	ND	0.0010	ND	0.0010	4306296
Total Phosphorus	mg/L	0.024	4313384	ND	ND	0.020	ND	0.020	4313384
Dissolved Sulphate (SO4)	mg/L	35	4305486	37	24	1.0	31	1.0	4305486
Alkalinity (Total as CaCO3)	mg/L	300	4305410	280	280	1.0	280	1.0	4305410
Dissolved Chloride (Cl)	mg/L	140	4305489	140	16	1.0	560	6.0	4305489
Nitrite (N)	mg/L	ND	4306466	ND	ND	0.010	ND	0.010	4305565
Nitrate (N)	mg/L	3.88	4306466	0.39	1.77	0.10	0.73	0.10	4305565
Nitrate + Nitrite (N)	mg/L	3.88	4306466	0.39	1.77	0.10	0.73	0.10	4305565

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected
N/A = Not Applicable

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Maxxam Job #: B5P2692
Report Date: 2015/12/16

City of Guelph
Client Project #: GW WET/DRY / FALL GW

RESULTS OF ANALYSES OF WATER

Maxxam ID		BMK307			BMK308	BMK308		
Sampling Date		2015/12/07			2015/12/08	2015/12/08		
COC Number		484840-07-01			484840-07-01	484840-07-01		
	UNITS	**5 Lab-Dup**	**RDL**	**QC Batch**	**15A**	**15A Lab-Dup**	**RDL**	**QC Batch**
Inorganics								
Total Ammonia-N	mg/L		0.050	4312066	ND		0.050	4312066
Total BOD	mg/L		2.0	4304882	ND		2.0	4304882
Total Chemical Oxygen Demand (COD)	mg/L		4.0	4310077	ND	ND	4.0	4310077
Conductivity	umho/cm		1.0	4305414	870		1.0	4305424
Total Kjeldahl Nitrogen (TKN)	mg/L		0.10	4309638	0.14		0.10	4314274
pH	pH		N/A	4305413	7.93		N/A	4305416
Phenols-4AAP	mg/L		0.0010	4306296	ND		0.0010	4306296
Total Phosphorus	mg/L	ND	0.020	4313384	0.025		0.020	4313384
Dissolved Sulphate (SO4)	mg/L		1.0	4305486	110		1.0	4305486
Alkalinity (Total as CaCO3)	mg/L		1.0	4305410	240		1.0	4305423
Dissolved Chloride (Cl)	mg/L		6.0	4305489	66		1.0	4305489
Nitrite (N)	mg/L		0.010	4305565	ND		0.010	4306466
Nitrate (N)	mg/L		0.10	4305565	ND		0.10	4306466
Nitrate + Nitrite (N)	mg/L		0.10	4305565	ND		0.10	4306466

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not detected

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Maxxam Job #: B5P2692
Report Date: 2015/12/16

City of Guelph
Client Project #: GW WET/DRY / FALL GW

RESULTS OF ANALYSES OF WATER

Maxxam ID		BMK309		BMK310			BMK311		
Sampling Date		2015/12/08		2015/12/08			2015/12/08		
COC Number		484840-07-01		484840-07-01			484840-07-01		
	UNITS	**15B**	**RDL**	**18A**	**RDL**	**QC Batch**	**18B**	**RDL**	**QC Batch**
Inorganics									
Total Ammonia-N	mg/L	ND	0.050	ND	0.050	4312066	ND	0.050	4312066
Total BOD	mg/L	ND	2.0	ND	2.0	4304882	ND	2.0	4304882
Total Chemical Oxygen Demand (COD)	mg/L	19	4.0	14	4.0	4310077	130	8.0	4310077
Conductivity	umho/cm	1800	1.0	610	1.0	4305414	610	1.0	4305414
Total Kjeldahl Nitrogen (TKN)	mg/L	0.41	0.10	ND (1)	0.50	4309638	0.68	0.50	4309638
pH	pH	7.77	N/A	7.83	N/A	4305413	7.99	N/A	4305413
Phenols-4AAP	mg/L	ND	0.0010	ND	0.0010	4306296	ND	0.0010	4306296
Total Phosphorus	mg/L	0.096	0.020	0.39	0.040	4313384	14	1.0	4313384
Dissolved Sulphate (SO4)	mg/L	190	1.0	35	1.0	4305486	21	1.0	4305486
Alkalinity (Total as CaCO3)	mg/L	180	1.0	240	1.0	4305410	210	1.0	4305410
Dissolved Chloride (Cl)	mg/L	320	4.0	17	1.0	4305489	43	1.0	4305489
Nitrite (N)	mg/L	ND	0.010	0.026	0.010	4306466	ND	0.010	4305565
Nitrate (N)	mg/L	ND	0.10	4.42	0.10	4306466	4.20	0.10	4305565
Nitrate + Nitrite (N)	mg/L	ND	0.10	4.45	0.10	4306466	4.20	0.10	4305565

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected
N/A = Not Applicable
(1) Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.

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Maxxam Job #: B5P2692
Report Date: 2015/12/16

City of Guelph
Client Project #: GW WET/DRY / FALL GW

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		BMK304	BMK304	BMK305	BMK306	BMK307	BMK308		
Sampling Date		2015/12/07	2015/12/07	2015/12/07	2015/12/07	2015/12/07	2015/12/08		
COC Number		484840-07-01	484840-07-01	484840-07-01	484840-07-01	484840-07-01	484840-07-01		
	UNITS	**7**	**7 Lab-Dup**	**8**	**21A**	**5**	**15A**	**RDL**	**QC Batch**
Metals									
Total Iron (Fe)	mg/L	0.22	0.25	0.03	0.11	0.04	1.2	0.02	4312158
Dissolved Boron (B)	ug/L	31	34	ND	ND	11	14	10	4309984
Dissolved Calcium (Ca)	ug/L	110000	110000	95000	81000	96000	110000	200	4309984
Dissolved Magnesium (Mg)	ug/L	29000	29000	34000	28000	22000	36000	50	4309984
Dissolved Phosphorus (P)	ug/L	ND	ND	ND	ND	ND	ND	100	4309984
Dissolved Potassium (K)	ug/L	9000	9000	2400	1000	4000	1300	200	4309984
Dissolved Sodium (Na)	ug/L	78000	78000	81000	16000	410000	27000	100	4309984
Dissolved Zinc (Zn)	ug/L	170	160	1000	350	1800	ND	5.0	4309984

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not detected

Maxxam ID		BMK309	BMK310		BMK311		
Sampling Date		2015/12/08	2015/12/08		2015/12/08		
COC Number		484840-07-01	484840-07-01		484840-07-01		
	UNITS	**15B**	**18A**	**RDL**	**18B**	**RDL**	**QC Batch**
Metals							
Total Iron (Fe)	mg/L	2.4	13	0.02	320	0.2	4312158
Dissolved Boron (B)	ug/L	78	ND	10	12	10	4309984
Dissolved Calcium (Ca)	ug/L	170000	84000	200	69000	200	4309984
Dissolved Magnesium (Mg)	ug/L	23000	29000	50	28000	50	4309984
Dissolved Phosphorus (P)	ug/L	ND	ND	100	ND	100	4309984
Dissolved Potassium (K)	ug/L	6800	1600	200	2200	200	4309984
Dissolved Sodium (Na)	ug/L	170000	4700	100	19000	100	4309984
Dissolved Zinc (Zn)	ug/L	35	260	5.0	6.7	5.0	4309984

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected

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GENERAL COMMENTS

Sample BMK311-01 : Metals: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.

Results relate only to the items tested.

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Maxxam Job #: B5P2692
Report Date: 2015/12/16

QUALITY ASSURANCE REPORT

City of Guelph
Client Project #: GW WET/DRY / FALL GW

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
4304882	Total BOD	2015/12/14					ND, RDL=2.0	mg/L	NC	25	104	85 - 115
4305410	Alkalinity (Total as CaCO3)	2015/12/09			93	85 - 115	ND, RDL=1.0	mg/L	0.47	25		
4305413	pH	2015/12/09			102	98 - 103			0.54	N/A		
4305414	Conductivity	2015/12/09			101	85 - 115	ND, RDL=1.0	umho/cm	0.22	25		
4305416	pH	2015/12/09			102	98 - 103			0.11	N/A		
4305423	Alkalinity (Total as CaCO3)	2015/12/09			92	85 - 115	ND, RDL=1.0	mg/L	0.49	25		
4305424	Conductivity	2015/12/09			101	85 - 115	ND, RDL=1.0	umho/cm	0	25		
4305486	Dissolved Sulphate (SO4)	2015/12/10	99	75 - 125	100	80 - 120	ND, RDL=1.0	mg/L	6.8	20		
4305489	Dissolved Chloride (Cl)	2015/12/10	NC	80 - 120	103	80 - 120	ND, RDL=1.0	mg/L	0.16	20		
4305565	Nitrate (N)	2015/12/10	NC	80 - 120	104	80 - 120	ND, RDL=0.10	mg/L	0.33	25		
4305565	Nitrite (N)	2015/12/10	108	80 - 120	107	80 - 120	ND, RDL=0.010	mg/L	NC	25		
4306296	Phenols-4AAP	2015/12/10	97	80 - 120	97	85 - 115	ND, RDL=0.0010	mg/L	NC	20		
4306466	Nitrate (N)	2015/12/11	101	80 - 120	102	80 - 120	ND, RDL=0.10	mg/L	NC	25		
4306466	Nitrite (N)	2015/12/11	105	80 - 120	101	80 - 120	ND, RDL=0.010	mg/L	NC	25		
4309638	Total Kjeldahl Nitrogen (TKN)	2015/12/14	101	80 - 120	100	80 - 120	ND, RDL=0.10	mg/L	NC	20	98	80 - 120
4309984	Dissolved Boron (B)	2015/12/14	105	80 - 120	103	80 - 120	ND, RDL=10	ug/L	NC	20		
4309984	Dissolved Calcium (Ca)	2015/12/14	NC	80 - 120	104	80 - 120	ND, RDL=200	ug/L	0.54	20		
4309984	Dissolved Magnesium (Mg)	2015/12/14	NC	80 - 120	107	80 - 120	ND, RDL=50	ug/L	0.75	20		
4309984	Dissolved Phosphorus (P)	2015/12/14	111	80 - 120	104	80 - 120	ND, RDL=100	ug/L	NC	20		
4309984	Dissolved Potassium (K)	2015/12/14	104	80 - 120	105	80 - 120	ND, RDL=200	ug/L	0.32	20		
4309984	Dissolved Sodium (Na)	2015/12/14	NC	80 - 120	108	80 - 120	ND, RDL=100	ug/L	1.1	20		
4309984	Dissolved Zinc (Zn)	2015/12/14	100	80 - 120	101	80 - 120	ND, RDL=5.0	ug/L	2.1	20		
4310077	Total Chemical Oxygen Demand (COD)	2015/12/14	105	75 - 125	103	75 - 125	ND, RDL=4.0	mg/L	NC	25		
4312066	Total Ammonia-N	2015/12/15	NC	80 - 120	97	85 - 115	ND, RDL=0.050	mg/L	1.9	20		
4312158	Total Iron (Fe)	2015/12/14	103	80 - 120	103	80 - 120	ND, RDL=0.02	mg/L	14	25		
4313384	Total Phosphorus	2015/12/15	104	80 - 120	103	80 - 120	ND, RDL=0.020	mg/L	NC	20	104	80 - 120

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QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
4314274	Total Kjeldahl Nitrogen (TKN)	2015/12/16	96	80 - 120	97	80 - 120	ND, RDL=0.10	mg/L	NC	20	94	80 - 120

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

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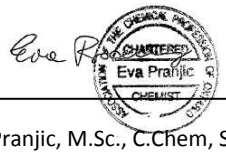
Maxxam Job #: B5P2692
Report Date: 2015/12/16

City of Guelph
Client Project #: GW WET/DRY / FALL GW

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Ewa Pranjic, M.Sc., C.Chem, Scientific Specialist

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Maxxam
A Bureau Veritas Group Company

Your Project #: WET/DRY SW
Site#: WET/DRY
Site Location: WET/DRY SW
Your C.O.C. #: 00570761

Attention:Amy Spence

City of Guelph
Soild Waste RIC (Wet/Dry)
110 Dunlop Drive
Guelph, ON
CANADA N1H 6H8

Report Date: 2015/12/23
Report #: R3825740
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B5P9419
Received: 2015/12/16, 16:00

Sample Matrix: Water
Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Alkalinity	2	N/A	2015/12/18	CAM SOP-00448	SM 22 2320 B m
Biochemical Oxygen Demand (BOD)	2	N/A	2015/12/22	CAM SOP-00427	SM 22 5210B m
Chloride by Automated Colourimetry	2	N/A	2015/12/21	CAM SOP-00463	EPA 325.2 m
Chemical Oxygen Demand	2	N/A	2015/12/22	CAM SOP-00416	SM 22 5220 D m
Conductivity	2	N/A	2015/12/18	CAM SOP-00414	SM 22 2510 m
Total Metals Analysis by ICPMS	2	N/A	2015/12/23	CAM SOP-00447	EPA 6020A m
Total Ammonia-N	2	N/A	2015/12/21	CAM SOP-00441	EPA GS I-2522-90 m
Nitrate (NO3) and Nitrite (NO2) in Water (1)	2	N/A	2015/12/18	CAM SOP-00440	SM 22 4500-NO3I/NO2B
pH	2	N/A	2015/12/18	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	2	N/A	2015/12/18	CAM SOP-00444	OMOE E3179 m
Sulphate by Automated Colourimetry	2	N/A	2015/12/21	CAM SOP-00464	EPA 375.4 m
Total Kjeldahl Nitrogen in Water	2	2015/12/22	2015/12/22	CAM SOP-00938	OMOE E3516 m
Total Phosphorus (Colourimetric)	2	2015/12/22	2015/12/22	CAM SOP-00407	SM 4500 P B H m
Low Level Total Suspended Solids	2	N/A	2015/12/21	CAM SOP-00428	SM 22 2540D m

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

Encryption Key

Hina Ahmed
23 Dec 2015 17:01:29 -05:00

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
James Aspin, Senior Project Manager
Email: JAspin@maxxam.ca
Phone# (905)817-5771

==========

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Maxxam Job #: B5P9419
Report Date: 2015/12/23

City of Guelph
Client Project #: WET/DRY SW
Site Location: WET/DRY SW

RESULTS OF ANALYSES OF WATER

Maxxam ID		BNR722		BNR723	BNR723		
Sampling Date		2015/12/15		2015/12/15	2015/12/15		
COC Number		00570761		00570761	00570761		
	UNITS	**TP1 - OUT**	**RDL**	**EPTS 01**	**EPTS 01 Lab-Dup**	**RDL**	**QC Batch**
Inorganics							
Total Ammonia-N	mg/L	ND	0.050	0.14		0.050	4322186
Total BOD	mg/L	8.0	2.0	ND		2.0	4317758
Total Chemical Oxygen Demand (COD)	mg/L	66	4.0	8.4		4.0	4323300
Conductivity	umho/cm	930	1.0	780		1.0	4320101
Total Kjeldahl Nitrogen (TKN)	mg/L	1.4	0.50	0.52		0.10	4323297
pH	pH	7.53	N/A	7.87		N/A	4320094
Phenols-4AAP	mg/L	0.019	0.0050	ND		0.0010	4319577
Total Phosphorus	mg/L	0.25	0.10	0.024	0.023	0.020	4323803
Total Suspended Solids	mg/L	35	2	9		1	4320214
Dissolved Sulphate (SO4)	mg/L	120	1.0	15		1.0	4319642
Alkalinity (Total as CaCO3)	mg/L	140	1.0	270		1.0	4320100
Dissolved Chloride (Cl)	mg/L	120	1.0	66		1.0	4319638
Nitrite (N)	mg/L	ND	0.010	0.075		0.010	4318960
Nitrate (N)	mg/L	ND	0.10	3.24		0.10	4318960
Nitrate + Nitrite (N)	mg/L	ND	0.10	3.31		0.10	4318960

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not detected
N/A = Not Applicable

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Maxxam Job #: B5P9419
Report Date: 2015/12/23

City of Guelph
Client Project #: WET/DRY SW
Site Location: WET/DRY SW

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		BNR722	BNR723		
Sampling Date		2015/12/15	2015/12/15		
COC Number		00570761	00570761		
	UNITS	**TP1 - OUT**	**EPTS 01**	**RDL**	**QC Batch**
Metals					
Total Boron (B)	mg/L	0.096	0.014	0.010	4325355
Total Calcium (Ca)	mg/L	87	95	0.20	4325355
Total Iron (Fe)	mg/L	2.1	ND	0.10	4325355
Total Magnesium (Mg)	mg/L	10	25	0.050	4325355
Total Potassium (K)	mg/L	8.1	1.8	0.20	4325355
Total Sodium (Na)	mg/L	83	34	0.10	4325355
Total Zinc (Zn)	mg/L	0.072	0.15	0.0050	4325355

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected

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Maxxam Job #: B5P9419
Report Date: 2015/12/23

City of Guelph
Client Project #: WET/DRY SW
Site Location: WET/DRY SW

GENERAL COMMENTS

Results relate only to the items tested.

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Maxxam Job #: B5P9419
Report Date: 2015/12/23

QUALITY ASSURANCE REPORT

City of Guelph
Client Project #: WET/DRY SW
Site Location: WET/DRY SW

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
4317758	Total BOD	2015/12/22					ND, RDL=2.0	mg/L	NC	25	103	85 - 115
4318960	Nitrate (N)	2015/12/18	94	80 - 120	97	80 - 120	ND, RDL=0.10	mg/L	NC	25		
4318960	Nitrite (N)	2015/12/18	98	80 - 120	102	80 - 120	ND, RDL=0.010	mg/L	NC	25		
4319577	Phenols-4AAP	2015/12/18	99	80 - 120	98	85 - 115	ND, RDL=0.0010	mg/L	NC	20		
4319638	Dissolved Chloride (Cl)	2015/12/21	NC	80 - 120	103	80 - 120	ND, RDL=1.0	mg/L	3.1	20		
4319642	Dissolved Sulphate (SO4)	2015/12/21	NC	75 - 125	100	80 - 120	ND, RDL=1.0	mg/L	4.2	20		
4320094	pH	2015/12/18			101	98 - 103			0.36	N/A		
4320100	Alkalinity (Total as CaCO3)	2015/12/18			95	85 - 115	ND, RDL=1.0	mg/L	0.049	25		
4320101	Conductivity	2015/12/18			101	85 - 115	ND, RDL=1.0	umho/cm	0.33	25		
4320214	Total Suspended Solids	2015/12/21					ND,RDL=1	mg/L	13	25	96	85 - 115
4322186	Total Ammonia-N	2015/12/21	100	80 - 120	94	85 - 115	ND, RDL=0.050	mg/L	NC	20		
4323297	Total Kjeldahl Nitrogen (TKN)	2015/12/22	93	80 - 120	97	80 - 120	ND, RDL=0.10	mg/L	NC	20	100	80 - 120
4323300	Total Chemical Oxygen Demand (COD)	2015/12/22	110	75 - 125	105	75 - 125	ND, RDL=4.0	mg/L	NC	25		
4323803	Total Phosphorus	2015/12/22	100	80 - 120	102	80 - 120	ND, RDL=0.020	mg/L	NC	20	101	80 - 120
4325355	Total Boron (B)	2015/12/23	96	80 - 120	96	80 - 120	ND, RDL=0.010	mg/L				
4325355	Total Calcium (Ca)	2015/12/23	98	80 - 120	101	80 - 120	ND, RDL=0.20	mg/L				
4325355	Total Iron (Fe)	2015/12/23	103	80 - 120	103	80 - 120	ND, RDL=0.10	mg/L				
4325355	Total Magnesium (Mg)	2015/12/23	102	80 - 120	106	80 - 120	ND, RDL=0.050	mg/L				
4325355	Total Potassium (K)	2015/12/23	100	80 - 120	98	80 - 120	ND, RDL=0.20	mg/L				
4325355	Total Sodium (Na)	2015/12/23	101	80 - 120	102	80 - 120	ND, RDL=0.10	mg/L				

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Maxxam Job #: B5P9419
Report Date: 2015/12/23

QUALITY ASSURANCE REPORT(CONT'D)

City of Guelph
Client Project #: WET/DRY SW
Site Location: WET/DRY SW

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
4325355	Total Zinc (Zn)	2015/12/23	102	80 - 120	103	80 - 120	ND, RDL=0.0050	mg/L				

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

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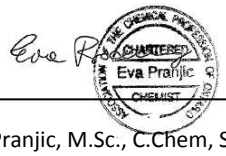
Maxxam Job #: B5P9419
Report Date: 2015/12/23

City of Guelph
Client Project #: WET/DRY SW
Site Location: WET/DRY SW

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Ewa Pranjic, M.Sc., C.Chem, Scientific Specialist

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Maxxam
A Bureau Veritas Group Company

Your Project #: WET/DRY GW
Your C.O.C. #: 484840-08-01

Attention:Andrew Shouldice

City of Guelph
Eastview Landfill
186 Eastview Road
Guelph, ON
CANADA N1E 1Z6

Report Date: 2016/01/07
Report #: R3842268
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B5Q6717
Received: 2015/12/30, 15:38

Sample Matrix: Water
Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Alkalinity	2	N/A	2015/12/31	CAM SOP-00448	SM 22 2320 B m
Biochemical Oxygen Demand (BOD)	2	N/A	2016/01/07	CAM SOP-00427	SM 22 5210B m
Chloride by Automated Colourimetry	2	N/A	2016/01/05	CAM SOP-00463	EPA 325.2 m
Chemical Oxygen Demand	2	N/A	2016/01/06	CAM SOP-00416	SM 22 5220 D m
Conductivity	2	N/A	2015/12/31	CAM SOP-00414	SM 22 2510 m
Dissolved Metals by ICPMS	2	N/A	2016/01/05	CAM SOP-00447	EPA 6020A m
Total Metals Analysis by ICP	2	2016/01/05	2016/01/05	CAM SOP-00408	EPA 6010C m
Total Ammonia-N	2	N/A	2016/01/06	CAM SOP-00441	EPA GS I-2522-90 m
Nitrate (NO3) and Nitrite (NO2) in Water (1)	2	N/A	2016/01/04	CAM SOP-00440	SM 22 4500-NO3I/NO2B
pH	2	N/A	2015/12/31	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	2	N/A	2016/01/04	CAM SOP-00444	OMOE E3179 m
Sulphate by Automated Colourimetry	2	N/A	2016/01/05	CAM SOP-00464	EPA 375.4 m
Total Kjeldahl Nitrogen in Water	2	2016/01/04	2016/01/05	CAM SOP-00938	OMOE E3516 m
Total Phosphorus (Colourimetric)	2	2016/01/06	2016/01/06	CAM SOP-00407	SM 4500 P B H m

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

Encryption Key

James Aspin
Senior Project Manager
07 Jan 2016 12:51:06 -05:00

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
James Aspin, Senior Project Manager
Email: JAspin@maxxam.ca
Phone# (905)817-5771

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Maxxam Job #: B5Q6717
Report Date: 2016/01/07

City of Guelph
Client Project #: WET/DRY GW
Sampler Initials: AS

RESULTS OF ANALYSES OF WATER

Maxxam ID		BPC847	BPC847	BPC848		
Sampling Date		2015/12/30	2015/12/30	2015/12/30		
COC Number		484840-08-01	484840-08-01	484840-08-01		
	UNITS	**14A**	**14A Lab-Dup**	**14B**	**RDL**	**QC Batch**
Inorganics						
Total Ammonia-N	mg/L	ND		ND	0.050	4334109
Total BOD	mg/L	ND	ND	ND	2.0	4332440
Total Chemical Oxygen Demand (COD)	mg/L	ND	ND	5.9	4.0	4334423
Conductivity	umho/cm	640		1000	1.0	4331688
Total Kjeldahl Nitrogen (TKN)	mg/L	ND		0.31	0.10	4332939
pH	pH	7.80		7.58	N/A	4331696
Phenols-4AAP	mg/L	ND		ND	0.0010	4331682
Total Phosphorus	mg/L	ND		0.26	0.020	4334960
Dissolved Sulphate (SO4)	mg/L	63		33	1.0	4332362
Alkalinity (Total as CaCO3)	mg/L	240		380	1.0	4331686
Dissolved Chloride (Cl)	mg/L	23		86	1.0	4332361
Nitrite (N)	mg/L	ND		ND	0.010	4331680
Nitrate (N)	mg/L	ND		0.60	0.10	4331680
Nitrate + Nitrite (N)	mg/L	ND		0.60	0.10	4331680

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not detected
N/A = Not Applicable

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Maxxam Job #: B5Q6717
Report Date: 2016/01/07

City of Guelph
Client Project #: WET/DRY GW
Sampler Initials: AS

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		BPC847	BPC848		
Sampling Date		2015/12/30	2015/12/30		
COC Number		484840-08-01	484840-08-01		
	UNITS	**14A**	**14B**	**RDL**	**QC Batch**
Metals					
Total Iron (Fe)	mg/L	1.3	10	0.02	4333603
Dissolved Boron (B)	ug/L	24	19	10	4333778
Dissolved Calcium (Ca)	ug/L	80000	120000	200	4333778
Dissolved Magnesium (Mg)	ug/L	29000	27000	50	4333778
Dissolved Phosphorus (P)	ug/L	ND	ND	100	4333778
Dissolved Potassium (K)	ug/L	1200	1500	200	4333778
Dissolved Sodium (Na)	ug/L	25000	71000	100	4333778
Dissolved Zinc (Zn)	ug/L	6.0	520	5.0	4333778

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected

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Maxxam Job #: B5Q6717
Report Date: 2016/01/07

City of Guelph
Client Project #: WET/DRY GW
Sampler Initials: AS

GENERAL COMMENTS

Results relate only to the items tested.

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B5Q6717
Report Date: 2016/01/07

QUALITY ASSURANCE REPORT

City of Guelph
Client Project #: WET/DRY GW
Sampler Initials: AS

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
4331680	Nitrate (N)	2016/01/04	NC	80 - 120	101	80 - 120	ND, RDL=0.10	mg/L	1.5	25		
4331680	Nitrite (N)	2016/01/04	105	80 - 120	107	80 - 120	ND, RDL=0.010	mg/L	NC	25		
4331682	Phenols-4AAP	2016/01/04	101	80 - 120	96	85 - 115	ND, RDL=0.0010	mg/L	NC	20		
4331686	Alkalinity (Total as CaCO3)	2015/12/31			95	85 - 115	ND, RDL=1.0	mg/L	0.017	25		
4331688	Conductivity	2015/12/31			100	85 - 115	ND, RDL=1.0	umho/cm	0.16	25		
4331696	pH	2015/12/31			101	98 - 103			0.15	N/A		
4332361	Dissolved Chloride (Cl)	2016/01/05	NC	80 - 120	104	80 - 120	ND, RDL=1.0	mg/L	0.61	20		
4332362	Dissolved Sulphate (SO4)	2016/01/05	NC	75 - 125	99	80 - 120	ND, RDL=1.0	mg/L	0.46	20		
4332440	Total BOD	2016/01/07					ND, RDL=2.0	mg/L	NC	25	104	85 - 115
4332939	Total Kjeldahl Nitrogen (TKN)	2016/01/05	98	80 - 120	95	80 - 120	ND, RDL=0.10	mg/L	NC	20	96	80 - 120
4333603	Total Iron (Fe)	2016/01/05	NC	80 - 120	102	80 - 120	ND, RDL=0.02	mg/L				
4333778	Dissolved Boron (B)	2016/01/05	NC	80 - 120	103	80 - 120	ND, RDL=10	ug/L	6.0	20		
4333778	Dissolved Calcium (Ca)	2016/01/05	NC	80 - 120	106	80 - 120	ND, RDL=200	ug/L				
4333778	Dissolved Magnesium (Mg)	2016/01/05	NC	80 - 120	109	80 - 120	ND, RDL=50	ug/L				
4333778	Dissolved Phosphorus (P)	2016/01/05	117	80 - 120	112	80 - 120	ND, RDL=100	ug/L				
4333778	Dissolved Potassium (K)	2016/01/05	110	80 - 120	104	80 - 120	ND, RDL=200	ug/L				
4333778	Dissolved Sodium (Na)	2016/01/05	NC	80 - 120	111	80 - 120	ND, RDL=100	ug/L	5.0	20		
4333778	Dissolved Zinc (Zn)	2016/01/05	108	80 - 120	102	80 - 120	ND, RDL=5.0	ug/L	NC	20		
4334109	Total Ammonia-N	2016/01/06	97	80 - 120	101	85 - 115	ND, RDL=0.050	mg/L	NC	20		
4334423	Total Chemical Oxygen Demand (COD)	2016/01/06	104	75 - 125	100	75 - 125	ND, RDL=4.0	mg/L	NC	25		

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Maxxam Job #: B5Q6717
Report Date: 2016/01/07

QUALITY ASSURANCE REPORT(CONT'D)

City of Guelph
Client Project #: WET/DRY GW
Sampler Initials: AS

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
4334960	Total Phosphorus	2016/01/06	101	80 - 120	99	80 - 120	ND, RDL=0.020	mg/L	NC	20	100	80 - 120

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

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Maxxam Job #: B5Q6717
Report Date: 2016/01/07

City of Guelph
Client Project #: WET/DRY GW
Sampler Initials: AS

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Cristina Carriere

Cristina Carriere, Scientific Services

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Your Project #: WET/DRY-SURFACE WATER
Site Location: JANUARY 2015 SW
Your C.O.C. #: C#381534-05-01

Attention: Amy Spence
City of Guelph
Soild Waste RIC (Wet/Dry)
110 Dunlop Drive
Guelph, ON
CANADA N1H 6H8

Report Date: 2015/01/30
Report #: R3317262
Version: 1

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B512752
Received: 2015/01/22, 16:30

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
Alkalinity	1	N/A	2015/01/26	CAM SOP-00448	SM 22 2320 B m
Biochemical Oxygen Demand (BOD)	1	N/A	2015/01/28	CAM SOP-00427	SM 22 5210B m
Chloride by Automated Colourimetry	1	N/A	2015/01/26	CAM SOP-00463	EPA 325.2 m
Chemical Oxygen Demand	1	N/A	2015/01/27	CAM SOP-00416	SM 22 5220 D m
Conductivity	1	N/A	2015/01/26	CAM SOP-00414	SM 22 2510 m
Total Metals Analysis by ICPMS	1	N/A	2015/01/28	CAM SOP-00447	EPA 6020 m
Total Ammonia-N	1	N/A	2015/01/29	CAM SOP-00441	EPA GS I-2522-90 m
pH	1	N/A	2015/01/26	CAM SOP-00413	SM 4500H+ B
Phenols (4AAP)	1	N/A	2015/01/27	CAM SOP-00444	OMOE E3179 m
Sulphate by Automated Colourimetry	1	N/A	2015/01/26	CAM SOP-00464	EPA 375.4 m
Total Kjeldahl Nitrogen in Water	1	2015/01/28	2015/01/29	CAM SOP-00454	EPA 351.2 m
Total Phosphorus (Colourimetric)	1	2015/01/28	2015/01/29	CAM SOP-00407	SM 4500 P B F m
Low Level Total Suspended Solids	1	N/A	2015/01/25	CAM SOP-00428	SM 22 2540D m

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
* Results relate only to the items tested.

Encryption Key

James Aspin
30 Jan 2015 14:23:02 -05:00

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

James Aspin, Senior Project Manager
Email: JAspin@maxxam.ca
Phone# (905) 817-5771

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Total cover pages: 1

Maxxam Job #: B512752
Report Date: 2015/01/30

City of Guelph
Client Project #: WET/DRY-SURFACE WATER
Site Location: JANUARY 2015 SW

RESULTS OF ANALYSES OF WATER

Maxxam ID		ZG4694	ZG4694		
Sampling Date		2015/01/21	2015/01/21		
	Units	**EPT S01**	**EPT S01 Lab-Dup**	**RDL**	**QC Batch**
Inorganics					
Total Ammonia-N	mg/L	ND		0.050	3899164
Total BOD	mg/L	ND	ND	2.0	3895919
Total Chemical Oxygen Demand (COD)	mg/L	ND		4.0	3898515
Conductivity	umho/cm	990	980	1.0	3897434
Total Kjeldahl Nitrogen (TKN)	mg/L	0.24		0.10	3900602
pH	pH	7.96	7.96		3897433
Phenols-4AAP	mg/L	ND		0.0010	3897357
Total Phosphorus	mg/L	ND		0.020	3900604
Total Suspended Solids	mg/L	ND	ND	1	3897648
Dissolved Sulphate (SO4)	mg/L	17		1	3897626
Alkalinity (Total as CaCO3)	mg/L	290	290	1.0	3897431
Dissolved Chloride (Cl)	mg/L	120		1	3897625

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		ZG4694		
Sampling Date		2015/01/21		
	Units	**EPT S01**	**RDL**	**QC Batch**
Metals				
Total Boron (B)	mg/L	0.017	0.010	3899492
Total Calcium (Ca)	mg/L	95	0.20	3899492
Total Iron (Fe)	mg/L	ND	0.10	3899492
Total Magnesium (Mg)	mg/L	23	0.050	3899492
Total Potassium (K)	mg/L	1.5	0.20	3899492
Total Sodium (Na)	mg/L	43	0.10	3899492
Total Zinc (Zn)	mg/L	0.12	0.0050	3899492

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B512752
Report Date: 2015/01/30

City of Guelph
Client Project #: WET/DRY-SURFACE WATER
Site Location: JANUARY 2015 SW

QUALITY ASSURANCE REPORT

			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits	% Recovery	QC Limits
3895919	Total BOD	2015/01/28					ND, RDL=2.0	mg/L	NC	25	108	85 - 115
3897357	Phenols-4AAP	2015/01/27	97	80 - 120	97	85 - 115	ND, RDL=0.0010	mg/L	NC	20		
3897431	Alkalinity (Total as CaCO3)	2015/01/26			94	85 - 115	ND, RDL=1.0	mg/L	0.003	25		
3897433	pH	2015/01/26			102	98 - 103			0.03	N/A		
3897434	Conductivity	2015/01/26			99	85 - 115	ND, RDL=1.0	umho/cm	0.2	25		
3897625	Dissolved Chloride (Cl)	2015/01/26	NC	80 - 120	104	80 - 120	ND, RDL=1	mg/L	3.4	20		
3897626	Dissolved Sulphate (SO4)	2015/01/26	NC	75 - 125	102	80 - 120	ND, RDL=1	mg/L	0.8	20		
3897648	Total Suspended Solids	2015/01/25					ND, RDL=1	mg/L	NC	25	98	85 - 115
3898515	Total Chemical Oxygen Demand (COD)	2015/01/27	100	75 - 125	101	75 - 125	ND, RDL=4.0	mg/L	3.6	25		
3899164	Total Ammonia-N	2015/01/29	101	80 - 120	101	85 - 115	ND, RDL=0.050	mg/L	NC	20		
3899492	Total Boron (B)	2015/01/29	106	80 - 120	100	80 - 120	ND, RDL=0.010	mg/L	12.3	20		
3899492	Total Calcium (Ca)	2015/01/29	NC	80 - 120	100	80 - 120	ND, RDL=0.20	mg/L				
3899492	Total Iron (Fe)	2015/01/29	99	80 - 120	96	80 - 120	0.11, RDL=0.10	mg/L	NC	20		
3899492	Total Magnesium (Mg)	2015/01/29	NC	80 - 120	97	80 - 120	ND, RDL=0.050	mg/L				
3899492	Total Potassium (K)	2015/01/29	NC	80 - 120	100	80 - 120	ND, RDL=0.20	mg/L				
3899492	Total Sodium (Na)	2015/01/29	NC	80 - 120	97	80 - 120	ND, RDL=0.10	mg/L				
3899492	Total Zinc (Zn)	2015/01/29	103	80 - 120	96	80 - 120	ND, RDL=0.0050	mg/L	3.8	20		
3900602	Total Kjeldahl Nitrogen (TKN)	2015/01/29	NC	80 - 120	94	80 - 120	ND, RDL=0.10	mg/L	4.3	20	97	80 - 120
3900604	Total Phosphorus	2015/01/29	100	80 - 120	98	80 - 120	ND, RDL=0.020	mg/L	3.1	20	102	80 - 120

N/A = Not Applicable
RDL = Reportable Detection Limit
RPD = Relative Percent Difference
Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.
Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.
QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.
Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.
NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).
NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

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Validation Signature Page

Maxxam Job #: B512752

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Cristina Carriere, Scientific Services

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BOD

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6740 Campobello Road, Mississauga, Ontario Canada L5N 2L8 Tel:(905) 817-5700 Toll-free:800-563-6266 Fax:(905) 817-5779 www.maxxam.ca

CHAIN OF CUSTODY RECORD

INVOICE INFORMATION:		REPORT INFORMATION (if differs from invoice):		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#12237 City of Guelph	Company Name:	#9497 City of Guelph	Quotation #:	B11416	MAXXAM JOB #:	BOTTLE ORDER #: 381534
Contact Name:	Amy Spence (Wet/Dry)	Contact Name:	Amy Spence	P.O. #:			
Address:	186 Eastview Rd Guelph ON N1E 1Z6	Address:	110 Dunlop Drive Guelph ON N1H 6H8	Project #:	Wet/Dry - Surface Water		
Phone:	(519)837-5633 Fax: (519)823-0910	Phone:	(519)362-1164 Fax:	Project Name:	JANUARY 2015 SW WET/DRY	CHAIN OF CUSTODY #: C#381534-05-01	PROJECT MANAGER: Kassandra Roussy
Email:	amy.spence@guelph.ca	Email:	amy.spence@guelph.ca, Terry.LaChapelle@aeco	Site #:			
				Sampled By:	RICK SPEER		

Regulation 153 (2011): ☐ Table 1 ☐ Table 2 ☐ Table 3 ☐ Table ___ ☐ Res/Park ☐ Ind/Comm ☐ Agri/Other ☐ Medium/Fine ☐ Coarse ☐ For RSC

Other Regulations: ☐ CCME ☐ Reg. 558 ☐ MISA ☐ PWQO ☐ Other ___ ☐ Sanitary Sewer Bylaw ☐ Storm Sewer Bylaw Municipality ___

SPECIAL INSTRUCTIONS

Include Criteria on Certificate of Analysis (Y/N)? ___

Note: For MOE regulated drinking water samples - please use the Drinking Water Chain of Custody Form

SAMPLES MUST BE KEPT COOL (< 10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

TURNAROUND TIME (TAT) REQUIRED:

PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS

Regular (Standard) TAT: ☒
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: ___ Time Required: ___ ☐
Rush Confirmation Number: ___ *(call lab for #)*

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water ? (Y/N)	Metals Field Filtered ? (Y/N)	ANALYSIS REQUESTED (Please be specific): WET-DRY SURFACE WATER	# of Bottles	Comments
1		EPT S01	JAN 21 2015	PM	SW	N	N	X	7	22-Jan-15 16:30 James Aspin B512752 M_P ENV-677
2										
3										
4										
5										
6										
7										
8										
9										
10										

*RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time:	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time:	# Jars Used and Not Submitted	Laboratory Use Only: Time Sensitive	Temperature (°C) on Receipt	Custody Seal Present	Yes	No
RICK SPEER	15/01/21	PM	RACHEL DEVLIN	2015/01/22	16:30						

IF CHAIN OF CUSTODY RECORD IS INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

Your Project #: Wet / Dry Surface Water
Site Location: WET/DRY SW
Your C.O.C. #: 499891-01-01

Attention:Amy Spence

City of Guelph
Soild Waste RIC (Wet/Dry)
110 Dunlop Drive
Guelph, ON
CANADA N1H 6H8

Report Date: 2015/03/26
Report #: R3373332
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B547872
Received: 2015/03/18, 16:40

Sample Matrix: Water
Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Alkalinity	2	N/A	2015/03/20	CAM SOP-00448	SM 22 2320 B m
Biochemical Oxygen Demand (BOD)	2	N/A	2015/03/25	CAM SOP-00427	SM 22 5210B m
Chloride by Automated Colourimetry	2	N/A	2015/03/20	CAM SOP-00463	EPA 325.2 m
Chemical Oxygen Demand	2	N/A	2015/03/24	CAM SOP-00416	SM 22 5220 D m
Conductivity	2	N/A	2015/03/20	CAM SOP-00414	SM 22 2510 m
Total Metals Analysis by ICPMS	2	N/A	2015/03/25	CAM SOP-00447	EPA 6020 m
Total Ammonia-N	2	N/A	2015/03/26	CAM SOP-00441	EPA GS I-2522-90 m
Nitrate (NO3) and Nitrite (NO2) in Water (1)	1	N/A	2015/03/20	CAM SOP-00440	SM 22 4500-NO3I/NO2B
Nitrate (NO3) and Nitrite (NO2) in Water (1)	1	N/A	2015/03/23	CAM SOP-00440	SM 22 4500-NO3I/NO2B
pH	2	N/A	2015/03/20	CAM SOP-00413	SM 4500H+ B
Phenols (4AAP)	2	N/A	2015/03/20	CAM SOP-00444	OMOE E3179 m
Sulphate by Automated Colourimetry	2	N/A	2015/03/20	CAM SOP-00464	EPA 375.4 m
Total Kjeldahl Nitrogen in Water	2	2015/03/25	2015/03/25	CAM SOP-00454	EPA 351.2 m
Total Phosphorus (Colourimetric)	2	2015/03/25	2015/03/25	CAM SOP-00407	SM 4500 P B F m
Low Level Total Suspended Solids	2	N/A	2015/03/19	CAM SOP-00428	SM 22 2540D m

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

Encryption Key

James Aspin
26 Mar 2015 16:08:19 -04:00

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
James Aspin, Senior Project Manager
Email: JAspin@maxxam.ca
Phone# (905)817-5771

==========

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Maxxam Job #: B547872
Report Date: 2015/03/26

City of Guelph
Client Project #: Wet / Dry Surface Water
Site Location: WET/DRY SW
Sampler Initials: AS

RESULTS OF ANALYSES OF WATER

Maxxam ID		ZX6426	ZX6426			ZX6427	ZX6427		
Sampling Date		2015/03/17	2015/03/17			2015/03/17	2015/03/17		
COC Number		499891-01-01	499891-01-01			499891-01-01	499891-01-01		
	Units	**TP1-OUT**	**TP1-OUT Lab-Dup**	**RDL**	**QC Batch**	**EPTS01**	**EPTS01 Lab-Dup**	**RDL**	**QC Batch**
Inorganics									
Total Ammonia-N	mg/L	0.060		0.050	3958012	0.17		0.050	3958012
Total BOD	mg/L	3.0	ND	2.0	3954818	ND		2.0	3954818
Total Chemical Oxygen Demand (COD)	mg/L	26		4.0	3958022	9.3	11	4.0	3957402
Conductivity	umho/cm	890		1.0	3954481	680		1.0	3954481
Total Kjeldahl Nitrogen (TKN)	mg/L	0.73		0.10	3959665	0.72		0.10	3959665
pH	pH	7.67		N/A	3954480	7.94		N/A	3954480
Phenols-4AAP	mg/L	0.0065		0.0010	3954222	ND		0.0010	3954222
Total Phosphorus	mg/L	0.062		0.020	3959420	0.028		0.020	3959420
Total Suspended Solids	mg/L	5		1	3954534	2		1	3954534
Dissolved Sulphate (SO4)	mg/L	8		1	3954474	14		1	3954474
Alkalinity (Total as CaCO3)	mg/L	96		1.0	3954477	270		1.0	3954477
Dissolved Chloride (Cl)	mg/L	200		2	3954471	46		1	3954471
Nitrite (N)	mg/L	ND		0.010	3954975	0.044		0.010	3954394
Nitrate (N)	mg/L	ND		0.10	3954975	3.14		0.10	3954394
Nitrate + Nitrite	mg/L	ND		0.10	3954975	3.18		0.10	3954394

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not detected

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Maxxam Job #: B547872
Report Date: 2015/03/26

City of Guelph
Client Project #: Wet / Dry Surface Water
Site Location: WET/DRY SW
Sampler Initials: AS

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		ZX6426	ZX6426	ZX6427		
Sampling Date		2015/03/17	2015/03/17	2015/03/17		
COC Number		499891-01-01	499891-01-01	499891-01-01		
	Units	**TP1-OUT**	**TP1-OUT Lab-Dup**	**EPTS01**	**RDL**	**QC Batch**
Metals						
Total Boron (B)	mg/L	0.014	0.015	0.019	0.010	3959598
Total Calcium (Ca)	mg/L	32	32	94	0.20	3959598
Total Iron (Fe)	mg/L	0.27	0.27	ND	0.10	3959598
Total Magnesium (Mg)	mg/L	4.4	4.4	24	0.050	3959598
Total Potassium (K)	mg/L	3.3	3.3	1.7	0.20	3959598
Total Sodium (Na)	mg/L	130	130	27	0.10	3959598
Total Zinc (Zn)	mg/L	0.016	0.016	0.093	0.0050	3959598

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not detected

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B547872
Report Date: 2015/03/26

City of Guelph
Client Project #: Wet / Dry Surface Water
Site Location: WET/DRY SW
Sampler Initials: AS

GENERAL COMMENTS

Results relate only to the items tested.

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B547872
Report Date: 2015/03/26

QUALITY ASSURANCE REPORT

City of Guelph
Client Project #: Wet / Dry Surface Water
Site Location: WET/DRY SW
Sampler Initials: AS

			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits	% Recovery	QC Limits
3954222	Phenols-4AAP	2015/03/20	102	80 - 120	101	85 - 115	ND, RDL=0.0010	mg/L	NC	20		
3954394	Nitrate (N)	2015/03/20	102	80 - 120	103	80 - 120	ND, RDL=0.10	mg/L	NC	25		
3954394	Nitrite (N)	2015/03/20	95	80 - 120	97	80 - 120	ND, RDL=0.010	mg/L	NC	25		
3954471	Dissolved Chloride (Cl)	2015/03/20	NC	80 - 120	103	80 - 120	ND,RDL=1	mg/L	0.46	20		
3954474	Dissolved Sulphate (SO4)	2015/03/20	NC	75 - 125	103	80 - 120	ND,RDL=1	mg/L	0.52	20		
3954477	Alkalinity (Total as CaCO3)	2015/03/20			94	85 - 115	ND, RDL=1.0	mg/L	4.0	25		
3954480	pH	2015/03/20			102	98 - 103			0.054	N/A		
3954481	Conductivity	2015/03/20			101	85 - 115	ND, RDL=1.0	umho/cm	0.49	25		
3954534	Total Suspended Solids	2015/03/19					ND,RDL=1	mg/L	NC	25	100	85 - 115
3954818	Total BOD	2015/03/25					ND, RDL=2.0	mg/L	NC	25	110	85 - 115
3954975	Nitrate (N)	2015/03/23	98	80 - 120	96	80 - 120	ND, RDL=0.10	mg/L	3.5	25		
3954975	Nitrite (N)	2015/03/23	100	80 - 120	97	80 - 120	ND, RDL=0.010	mg/L	NC	25		
3957402	Total Chemical Oxygen Demand (COD)	2015/03/24	99	75 - 125	101	75 - 125	ND, RDL=4.0	mg/L	NC	25		
3958012	Total Ammonia-N	2015/03/26	97	80 - 120	97	85 - 115	ND, RDL=0.050	mg/L	NC	20		
3958022	Total Chemical Oxygen Demand (COD)	2015/03/24	96	75 - 125	98	75 - 125	ND, RDL=4.0	mg/L	3.1	25		
3959420	Total Phosphorus	2015/03/25	98	80 - 120	99	80 - 120	ND, RDL=0.020	mg/L	0.89	20	102	80 - 120
3959598	Total Boron (B)	2015/03/25	103	80 - 120	100	80 - 120	ND, RDL=0.010	mg/L	NC	20		
3959598	Total Calcium (Ca)	2015/03/25	NC	80 - 120	102	80 - 120	ND, RDL=0.20	mg/L	0.026	20		
3959598	Total Iron (Fe)	2015/03/25	101	80 - 120	98	80 - 120	ND, RDL=0.10	mg/L	NC	20		
3959598	Total Magnesium (Mg)	2015/03/25	102	80 - 120	99	80 - 120	ND, RDL=0.050	mg/L	0.082	20		
3959598	Total Potassium (K)	2015/03/25	103	80 - 120	101	80 - 120	ND, RDL=0.20	mg/L	1.5	20		
3959598	Total Sodium (Na)	2015/03/25	NC	80 - 120	97	80 - 120	ND, RDL=0.10	mg/L	1.0	20		
3959598	Total Zinc (Zn)	2015/03/25	100	80 - 120	97	80 - 120	0.0052, RDL=0.0050	mg/L	NC	20		

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Maxxam Job #: B547872
Report Date: 2015/03/26

QUALITY ASSURANCE REPORT(CONT'D)

City of Guelph
Client Project #: Wet / Dry Surface Water
Site Location: WET/DRY SW
Sampler Initials: AS

			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits	% Recovery	QC Limits
3959665	Total Kjeldahl Nitrogen (TKN)	2015/03/25	81	80 - 120	98	80 - 120	0.10, RDL=0.10	mg/L	6.5	20	92	80 - 120

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

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Maxxam Job #: B547872
Report Date: 2015/03/26

City of Guelph
Client Project #: Wet / Dry Surface Water
Site Location: WET/DRY SW
Sampler Initials: AS

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Cristina Carriere

Cristina Carriere, Scientific Services

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Maxxam
A Bureau Veritas Group Company

Success Through Science®

Your Project #: WET/DRY - SW/15 M
Site Location: WET/DRY RAINEVENT
Your C.O.C. #: 400396-03-01

Attention:Amy Spence

City of Guelph
Soild Waste RIC (Wet/Dry)
110 Dunlop Drive
Guelph, ON
CANADA N1H 6H8

Report Date: 2015/04/17
Report #: R3393450
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B563716
Received: 2015/04/10, 17:20

Sample Matrix: Water
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Alkalinity	2	N/A	2015/04/13	CAM SOP-00448	SM 22 2320 B m
Alkalinity	1	N/A	2015/04/14	CAM SOP-00448	SM 22 2320 B m
Biochemical Oxygen Demand (BOD)	3	N/A	2015/04/16	CAM SOP-00427	SM 22 5210B m
Chloride by Automated Colourimetry	3	N/A	2015/04/14	CAM SOP-00463	EPA 325.2 m
Chemical Oxygen Demand	3	N/A	2015/04/14	CAM SOP-00416	SM 22 5220 D m
Conductivity	2	N/A	2015/04/13	CAM SOP-00414	SM 22 2510 m
Conductivity	1	N/A	2015/04/14	CAM SOP-00414	SM 22 2510 m
Total Metals Analysis by ICPMS	3	N/A	2015/04/16	CAM SOP-00447	EPA 6020A m
Total Ammonia-N	3	N/A	2015/04/16	CAM SOP-00441	EPA GS I-2522-90 m
pH	2	N/A	2015/04/13	CAM SOP-00413	SM 4500H+ B m
pH	1	N/A	2015/04/14	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	3	N/A	2015/04/14	CAM SOP-00444	OMOE E3179 m
Sulphate by Automated Colourimetry	3	N/A	2015/04/14	CAM SOP-00464	EPA 375.4 m
Total Kjeldahl Nitrogen in Water	3	2015/04/16	2015/04/16	CAM SOP-00454	EPA 351.2 m
Total Phosphorus (Colourimetric)	3	2015/04/16	2015/04/17	CAM SOP-00407	SM 4500 P B H m
Low Level Total Suspended Solids	3	N/A	2015/04/13	CAM SOP-00428	SM 22 2540D m

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Encryption Key

James Aspin
20 Apr 2015 09:25:55 -04:00

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
James Aspin, Senior Project Manager
Email: JAspin@maxxam.ca
Phone# (905)817-5771

==========

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Maxxam Job #: B563716
Report Date: 2015/04/17

City of Guelph
Client Project #: WET/DRY - SW/15 M
Site Location: WET/DRY RAINEVENT

RESULTS OF ANALYSES OF WATER

Maxxam ID		ABZ191	ABZ191			ABZ192	ABZ192		
Sampling Date		2015/04/10	2015/04/10			2015/04/10	2015/04/10		
COC Number		400396-03-01	400396-03-01			400396-03-01	400396-03-01		
	Units	**TPI-OUT**	**TPI-OUT Lab-Dup**	**RDL**	**QC Batch**	**EPTSOI**	**EPTSOI Lab-Dup**	**RDL**	**QC Batch**
Inorganics									
Total Ammonia-N	mg/L	ND		0.050	3981526	0.067		0.050	3981526
Total BOD	mg/L	ND	ND	2.0	3979013	ND		2.0	3979013
Total Chemical Oxygen Demand (COD)	mg/L	20		4.0	3980453	24		4.0	3980453
Conductivity	umho/cm	1000		1.0	3980879	470		1.0	3980073
Total Kjeldahl Nitrogen (TKN)	mg/L	0.88		0.10	3984774	0.72		0.10	3984774
pH	pH	7.76		N/A	3980880	7.19		N/A	3980072
Phenols-4AAP	mg/L	0.0016		0.0010	3980318	0.0024		0.0010	3980318
Total Phosphorus	mg/L	0.070		0.020	3985171	0.072		0.020	3985171
Total Suspended Solids	mg/L	3		1	3979416	10		1	3979416
Dissolved Sulphate (SO4)	mg/L	8		1	3980401	7	7	1	3980401
Alkalinity (Total as CaCO3)	mg/L	180		1.0	3980876	73		1.0	3980070
Dissolved Chloride (Cl)	mg/L	180		2	3980392	92	93	1	3980392

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not detected

Maxxam ID		ABZ193	ABZ193		
Sampling Date		2015/04/10	2015/04/10		
COC Number		400396-03-01	400396-03-01		
	Units	**P2SW1**	**P2SW1 Lab-Dup**	**RDL**	**QC Batch**
Inorganics					
Total Ammonia-N	mg/L	0.077		0.050	3981526
Total BOD	mg/L	ND		2.0	3979013
Total Chemical Oxygen Demand (COD)	mg/L	ND		4.0	3980453
Conductivity	umho/cm	700		1.0	3980073
Total Kjeldahl Nitrogen (TKN)	mg/L	0.29	0.39	0.10	3984774
pH	pH	7.96		N/A	3980072
Phenols-4AAP	mg/L	ND		0.0010	3980318
Total Phosphorus	mg/L	ND	ND	0.020	3985171
Total Suspended Solids	mg/L	ND	ND	1	3979416
Dissolved Sulphate (SO4)	mg/L	12		1	3980401
Alkalinity (Total as CaCO3)	mg/L	260		1.0	3980070
Dissolved Chloride (Cl)	mg/L	59		1	3980392

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not detected

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Maxxam Job #: B563716
Report Date: 2015/04/17

City of Guelph
Client Project #: WET/DRY - SW/15 M
Site Location: WET/DRY RAINEVENT

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		ABZ191	ABZ192	ABZ193		
Sampling Date		2015/04/10	2015/04/10	2015/04/10		
COC Number		400396-03-01	400396-03-01	400396-03-01		
	Units	**TPI-OUT**	**EPTSOI**	**P2SW1**	**RDL**	**QC Batch**
Metals						
Total Boron (B)	mg/L	0.019	0.010	0.015	0.010	3984465
Total Calcium (Ca)	mg/L	67	22	85	0.20	3984465
Total Iron (Fe)	mg/L	0.28	0.45	ND	0.10	3984465
Total Magnesium (Mg)	mg/L	11	3.5	24	0.050	3984465
Total Potassium (K)	mg/L	3.1	1.6	1.4	0.20	3984465
Total Sodium (Na)	mg/L	120	68	32	0.10	3984465
Total Zinc (Zn)	mg/L	0.0085	0.029	0.098	0.0050	3984465

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected

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Maxxam Job #: B563716
Report Date: 2015/04/17

City of Guelph
Client Project #: WET/DRY - SW/15 M
Site Location: WET/DRY RAINEVENT

GENERAL COMMENTS

Results relate only to the items tested.

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B563716
Report Date: 2015/04/17

QUALITY ASSURANCE REPORT

City of Guelph
Client Project #: WET/DRY - SW/15 M
Site Location: WET/DRY RAINEVENT

			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits	% Recovery	QC Limits
3979013	Total BOD	2015/04/16					ND, RDL=2.0	mg/L	NC	25	104	85 - 115
3979416	Total Suspended Solids	2015/04/13					ND,RDL=1	mg/L	NC	25	98	85 - 115
3980070	Alkalinity (Total as CaCO3)	2015/04/13			93	85 - 115	ND, RDL=1.0	mg/L	2.1	25		
3980072	pH	2015/04/13			102	98 - 103			0.36	N/A		
3980073	Conductivity	2015/04/13			102	85 - 115	ND, RDL=1.0	umho/cm	0.27	25		
3980318	Phenols-4AAP	2015/04/14	NC	80 - 120	100	85 - 115	ND, RDL=0.0010	mg/L	0.11	20		
3980392	Dissolved Chloride (Cl)	2015/04/14	NC	80 - 120	103	80 - 120	ND,RDL=1	mg/L	1.2	20		
3980401	Dissolved Sulphate (SO4)	2015/04/14	113	75 - 125	103	80 - 120	ND,RDL=1	mg/L	2.8	20		
3980453	Total Chemical Oxygen Demand (COD)	2015/04/14	NC	75 - 125	101	75 - 125	ND, RDL=4.0	mg/L	1.1	25		
3980876	Alkalinity (Total as CaCO3)	2015/04/14			91	85 - 115	ND, RDL=1.0	mg/L	0.028	25		
3980879	Conductivity	2015/04/14			101	85 - 115	ND, RDL=1.0	umho/cm	0.21	25		
3980880	pH	2015/04/14			101	98 - 103			0.52	N/A		
3981526	Total Ammonia-N	2015/04/16	93	80 - 120	96	85 - 115	ND, RDL=0.050	mg/L	NC	20		
3984465	Total Boron (B)	2015/04/16	95	80 - 120	98	80 - 120	ND, RDL=0.010	mg/L				
3984465	Total Calcium (Ca)	2015/04/16	NC	80 - 120	95	80 - 120	ND, RDL=0.20	mg/L				
3984465	Total Iron (Fe)	2015/04/16	95	80 - 120	95	80 - 120	ND, RDL=0.10	mg/L	NC	20		
3984465	Total Magnesium (Mg)	2015/04/16	95	80 - 120	96	80 - 120	ND, RDL=0.050	mg/L				
3984465	Total Potassium (K)	2015/04/16	96	80 - 120	94	80 - 120	ND, RDL=0.20	mg/L				
3984465	Total Sodium (Na)	2015/04/16	NC	80 - 120	98	80 - 120	ND, RDL=0.10	mg/L				
3984465	Total Zinc (Zn)	2015/04/16	94	80 - 120	97	80 - 120	ND, RDL=0.0050	mg/L	NC	20		
3984774	Total Kjeldahl Nitrogen (TKN)	2015/04/16	99	80 - 120	96	80 - 120	ND, RDL=0.10	mg/L	NC	20	98	80 - 120

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Maxxam Job #: B563716
Report Date: 2015/04/17

QUALITY ASSURANCE REPORT(CONT'D)

City of Guelph
Client Project #: WET/DRY - SW/15 M
Site Location: WET/DRY RAINEVENT

			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits	% Recovery	QC Limits
3985171	Total Phosphorus	2015/04/17	99	80 - 120	103	80 - 120	ND, RDL=0.020	mg/L	NC	20	102	80 - 120

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

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Maxxam Job #: B563716
Report Date: 2015/04/17

City of Guelph
Client Project #: WET/DRY - SW/15 M
Site Location: WET/DRY RAINEVENT

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Cristina Carriere

Cristina Carriere, Scientific Services

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Your Project #: Wet/Dry - Surface Water
Site Location: 110 DUNLOP/ WET/DRY -SW
Your C.O.C. #: 400396-04-01

Attention:Amy Spence

City of Guelph
Soild Waste RIC (Wet/Dry)
110 Dunlop Drive
Guelph, ON
CANADA N1H 6H8

Report Date: 2015/06/01
Report #: R3449530
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B595106
Received: 2015/05/21, 16:45

Sample Matrix: Water
Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Alkalinity	2	N/A	2015/05/23	CAM SOP-00448	SM 22 2320 B m
Biochemical Oxygen Demand (BOD)	2	N/A	2015/05/29	CAM SOP-00427	SM 22 5210B m
Chloride by Automated Colourimetry	2	N/A	2015/05/25	CAM SOP-00463	EPA 325.2 m
Chemical Oxygen Demand	2	N/A	2015/05/29	CAM SOP-00416	SM 22 5220 D m
Conductivity	2	N/A	2015/05/23	CAM SOP-00414	SM 22 2510 m
Total Metals Analysis by ICPMS	2	N/A	2015/05/28	CAM SOP-00447	EPA 6020A m
Total Ammonia-N	2	N/A	2015/05/28	CAM SOP-00441	EPA GS I-2522-90 m
Nitrate (NO3) and Nitrite (NO2) in Water (1)	1	N/A	2015/05/25	CAM SOP-00440	SM 22 4500-NO3I/NO2B
Nitrate (NO3) and Nitrite (NO2) in Water (1)	1	N/A	2015/05/26	CAM SOP-00440	SM 22 4500-NO3I/NO2B
pH	2	N/A	2015/05/23	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	2	N/A	2015/05/26	CAM SOP-00444	OMOE E3179 m
Sulphate by Automated Colourimetry	2	N/A	2015/05/25	CAM SOP-00464	EPA 375.4 m
Total Kjeldahl Nitrogen in Water	2	2015/05/25	2015/05/29	CAM SOP-00938	OMOE E3516 m
Total Phosphorus (Colourimetric)	2	2015/05/26	2015/05/26	CAM SOP-00407	SM 4500 P B H m
Low Level Total Suspended Solids	2	N/A	2015/05/23	CAM SOP-00428	SM 22 2540D m

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

Encryption Key

James Aspin
02 Jun 2015 09:25:55 -04:00

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
James Aspin, Senior Project Manager
Email: JAspin@maxxam.ca
Phone# (905)817-5771

==========

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Maxxam Job #: B595106
Report Date: 2015/06/01

City of Guelph
Client Project #: Wet/Dry - Surface Water
Site Location: 110 DUNLOP/ WET/DRY -SW

RESULTS OF ANALYSES OF WATER

Maxxam ID		AHS991			AHS992	AHS992		
Sampling Date		2015/05/20			2015/05/20	2015/05/20		
COC Number		400396-04-01			400396-04-01	400396-04-01		
	Units	**TPI-OUT**	**RDL**	**QC Batch**	**EPTS01**	**EPTS01 Lab-Dup**	**RDL**	**QC Batch**
Inorganics								
Total Ammonia-N	mg/L	ND	0.050	4035769	0.094		0.050	4035769
Total BOD	mg/L	ND	2.0	4035159	ND		2.0	4035159
Total Chemical Oxygen Demand (COD)	mg/L	30	4.0	4035910	9.1		4.0	4035910
Conductivity	umho/cm	1200	1.0	4034984	700		1.0	4034984
Total Kjeldahl Nitrogen (TKN)	mg/L	0.92	0.10	4035862	0.66		0.10	4035862
pH	pH	8.16	N/A	4034983	7.93		N/A	4034983
Phenols-4AAP	mg/L	ND	0.0010	4033355	ND		0.0010	4033355
Total Phosphorus	mg/L	0.033	0.020	4037226	ND		0.020	4037226
Total Suspended Solids	mg/L	3	1	4034046	2	1	1	4034046
Dissolved Sulphate (SO4)	mg/L	2	1	4034265	12		1	4034265
Alkalinity (Total as CaCO3)	mg/L	210	1.0	4034981	260		1.0	4034981
Dissolved Chloride (Cl)	mg/L	260	3	4034255	59		1	4034255
Nitrite (N)	mg/L	ND	0.010	4034169	0.034		0.010	4033986
Nitrate (N)	mg/L	ND	0.10	4034169	2.51		0.10	4033986
Nitrate + Nitrite	mg/L	ND	0.10	4034169	2.54		0.10	4033986

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not detected
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B595106
Report Date: 2015/06/01

City of Guelph
Client Project #: Wet/Dry - Surface Water
Site Location: 110 DUNLOP/ WET/DRY -SW

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		AHS991	AHS992		
Sampling Date		2015/05/20	2015/05/20		
COC Number		400396-04-01	400396-04-01		
	Units	**TPI-OUT**	**EPTS01**	**RDL**	**QC Batch**
Metals					
Total Boron (B)	mg/L	0.018	0.015	0.010	4040625
Total Calcium (Ca)	mg/L	72	86	0.20	4040625
Total Iron (Fe)	mg/L	0.29	ND	0.10	4040625
Total Magnesium (Mg)	mg/L	13	24	0.050	4040625
Total Potassium (K)	mg/L	5.0	1.3	0.20	4040625
Total Sodium (Na)	mg/L	160	32	0.10	4040625
Total Zinc (Zn)	mg/L	ND	0.067	0.0050	4040625

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected

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Maxxam Job #: B595106
Report Date: 2015/06/01

City of Guelph
Client Project #: Wet/Dry - Surface Water
Site Location: 110 DUNLOP/ WET/DRY -SW

GENERAL COMMENTS

Results relate only to the items tested.

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Maxxam Job #: B595106
Report Date: 2015/06/01

QUALITY ASSURANCE REPORT

City of Guelph
Client Project #: Wet/Dry - Surface Water
Site Location: 110 DUNLOP/ WET/DRY -SW

			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits	% Recovery	QC Limits
4033355	Phenols-4AAP	2015/05/26	88	80 - 120	94	85 - 115	ND, RDL=0.0010	mg/L	NC	20		
4033986	Nitrate (N)	2015/05/25	NC	80 - 120	99	80 - 120	ND, RDL=0.10	mg/L	0	25		
4033986	Nitrite (N)	2015/05/25	103	80 - 120	99	80 - 120	ND, RDL=0.010	mg/L	NC	25		
4034046	Total Suspended Solids	2015/05/23					ND,RDL=1	mg/L	NC	25	100	85 - 115
4034169	Nitrate (N)	2015/05/26	100	80 - 120	101	80 - 120	ND, RDL=0.10	mg/L	NC	25		
4034169	Nitrite (N)	2015/05/26	101	80 - 120	99	80 - 120	ND, RDL=0.010	mg/L	NC	25		
4034255	Dissolved Chloride (Cl)	2015/05/25	NC	80 - 120	103	80 - 120	ND,RDL=1	mg/L	3.3	20		
4034265	Dissolved Sulphate (SO4)	2015/05/25	NC	75 - 125	102	80 - 120	ND,RDL=1	mg/L	0.28	20		
4034981	Alkalinity (Total as CaCO3)	2015/05/23			94	85 - 115	ND, RDL=1.0	mg/L	0.96	25		
4034983	pH	2015/05/23			101	98 - 103			0.28	N/A		
4034984	Conductivity	2015/05/23			100	85 - 115	ND, RDL=1.0	umho/cm	1.9	25		
4035159	Total BOD	2015/05/29					ND, RDL=2.0	mg/L	NC	25	97	85 - 115
4035769	Total Ammonia-N	2015/05/28	96	80 - 120	96	85 - 115	ND, RDL=0.050	mg/L	NC	20		
4035862	Total Kjeldahl Nitrogen (TKN)	2015/05/29	105	80 - 120	105	80 - 120	ND, RDL=0.10	mg/L	NC	20	103	80 - 120
4035910	Total Chemical Oxygen Demand (COD)	2015/05/29	96	75 - 125	102	75 - 125	ND, RDL=4.0	mg/L	8.6	25		
4037226	Total Phosphorus	2015/05/26	101	80 - 120	99	80 - 120	ND, RDL=0.020	mg/L	1.8	20	100	80 - 120
4040625	Total Boron (B)	2015/05/28	101	80 - 120	103	80 - 120	ND, RDL=0.010	mg/L	NC	20		
4040625	Total Calcium (Ca)	2015/05/28	101	80 - 120	103	80 - 120	ND, RDL=0.20	mg/L	0.016	20		
4040625	Total Iron (Fe)	2015/05/28	104	80 - 120	105	80 - 120	ND, RDL=0.10	mg/L	NC	20		
4040625	Total Magnesium (Mg)	2015/05/28	103	80 - 120	103	80 - 120	ND, RDL=0.050	mg/L	6.8	20		
4040625	Total Potassium (K)	2015/05/28	103	80 - 120	104	80 - 120	ND, RDL=0.20	mg/L	NC	20		
4040625	Total Sodium (Na)	2015/05/28	100	80 - 120	102	80 - 120	ND, RDL=0.10	mg/L	0.51	20		

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Maxxam Job #: B595106
Report Date: 2015/06/01

QUALITY ASSURANCE REPORT(CONT'D)

City of Guelph
Client Project #: Wet/Dry - Surface Water
Site Location: 110 DUNLOP/ WET/DRY -SW

			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits	% Recovery	QC Limits
4040625	Total Zinc (Zn)	2015/05/28	105	80 - 120	106	80 - 120	ND, RDL=0.0050	mg/L	NC	20		

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

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Maxxam Job #: B595106
Report Date: 2015/06/01

City of Guelph
Client Project #: Wet/Dry - Surface Water
Site Location: 110 DUNLOP/ WET/DRY -SW

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Cristina Carriere

Cristina Carriere, Scientific Services

Eva Pranjic

Ewa Pranjic, M.Sc., C.Chem, Scientific Specialist

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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Appendix E

Certificate of Approval – WRIC and Transfer Station

CONTENT COPY OF ORIGINAL

Ontario

Ministry of the Environment
Ministère de l'Environnement

AMENDED PROVISIONAL CERTIFICATE OF APPROVAL
WASTE DISPOSAL SITE
NUMBER A170128
Issue Date: February 10, 2011

The Corporation of the City of Guelph
1 Carden St
Guelph, Ontario
N1H 3A1

Site Location: 110 Dunlop Drive
Guelph City, County of Wellington
N1H 6N1

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

the establishment and operation of a Waste Disposal Site (Transfer and Processing) consisting of a 29.54 hectare of property for the purposes of composting, multi-material recovery, and waste transfer to serve the municipalities and businesses of the Province of Ontario and *Municipal Hazardous and Special Waste Transfer Station* serving the County of Wellington and City of Guelph,

to be used for:

a) the use and operation of an Organic Waste Processing Facility composting of the following categories of waste *(Note: Use of the site for additional categories of wastes requires a new application and amendments to the Provisional Certificate of Approval);* organic non-hazardous waste from residential, industrial, commercial and institutional sources limited to a maximum Site indoor storage capacity of 8,500 tonnes;

b) the use and operation of a *Material Recovery Facility* for processing, transfer and temporary storage of the following categories of waste *(Note: Use of the Site for additional categories of wastes requires a new application and amendments to the Provisional Certificate of Approval);* municipal waste including food and beverage cans, cardboard, glass, newspaper, plastic, waste electrical and electronic equipment and other such materials as would be collected by means of the source separated *dry waste* collection system limited to a maximum indoor storage capacity of 3850 tonnes and having an outdoor storage area for recyclable waste and *leaf and yard waste* that is located to the west of the Organic Waste Processing Facility;

c) the use and operation of a Municipal Hazardous and Special Waste facility for the transfer and temporary storage of the following categories of waste *(Note: Use of the Site for additional categories of wastes requires a new application and amendments to the Provisional Certificate of Approval); Municipal Hazardous and Special Waste* limited to the following waste classes; 112, 121, 145, 146, 148, 212, 213, 221, 242, 251, 252, 261, 263, 269, 312, and 331 as outlined in the New Ontario Waste Classes January 1986 limited to a maximum Site storage capacity of 15 tonnes; and

d) the use and operation of a Waste Disposal Site (Transfer) for non-hazardous solid industrial waste *(Note: Use of the Site for additional categories of wastes requires a new application and amendments to the Provisional Certificate of Approval);* from industrial, commercial and institutional sources, commercial waste and domestic waste, with an indoor storage maximum capacity of 795 tonnes and outdoor storage areas for *leaf and yard waste* and for recyclable waste.

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) "**Air Pollution Control Equipment**" means the air pollution control equipment to abate emissions to the atmosphere

originating from the *Processing Building;*

(c) "**Amendment Materials**" means the materials derived from plants or animals, including materials consisting of other compounds of carbon, all readily biodegradable, and limited to materials listed in Condition 54.(2) of this Certificate;

(d) "**birds**" means pigeons, gulls, terns, crows, hawks, ducks, geese or any other birds that create a hazard to aircraft;

(e) "**brush**" means tree limbs, natural Christmas trees or other woody materials;

(f) "**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;

(g) "**Certificate of Approval (Air/Noise)**" means the Certificate of Approval issued under section 9 of the *EPA* for this Composting Site;

(h) "**City**" means the Corporation of the City of Guelph;

(i) "**Clean Wood**" means wood that is not painted wood, treated w*ood or laminated wood. Clean Wood does not include wood waste or waste wood;*

(j) **"Competent Person**" **or "Competent People"** means a person or people who 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 Report;
iv. the terms, conditions and operating requirements of the *Certificate;*
v. the applicable Fire Code and how it applies to proper storage and handling of waste that may be reactive, oxidizing, explosive or flammable;
vi. the *WRIC Environmental Emergency Plan,* including exit locations and evacuation routing, and location of relevant equipment available for emergency situations;
vii. procedures for recording and responding to public complaints;
viii. record keeping procedures as outlined in Conditions 51 and 63 of this *Certificate;*
ix. occupational health and safety concerns pertaining to the wastes to be processed;
x. specific written procedures for the control of nuisance conditions;
xi. operation and management of the *Site,* in accordance with the specific job requirements of each individual operator;
xii. procedures for the identification and refusal of unacceptable wastes;
xiii. proper handling of waste, and
xiv. proper procedures for the storage of waste and proper maintenance of the *Site;*

(k) "**Compost**" means the material produced by an aerobic Composting of the Organic Waste and which has been tested to show compliance with the Compost quality criteria listed in Schedule B of this *Certificate* and can be used as a soil additive or for other similar uses. Compost is not considered a waste;

(l) "**Composting**" means an aerobic biological process, conducted under controlled engineered conditions designed to decompose and stabilize organic matter; simple exposure of organic matter under non-engineered conditions resulting in uncontrolled decay is not considered Composting;

(m) "**Composting Residual Waste**" means waste resulting from the Organic Waste processing activities at the *Composting Site* and the waste that cannot be Composted and that is destined for final disposal;

(n) "**Composting Site**" means the Organic Waste Composting Site, which is a part of the waste disposal site located at 110 Dunlop Drive in the City of Guelph, approved in this *Certificate* and as described and referred to in Items #32 to #47 of the attached Schedule"A";

CONTENT COPY OF ORIGINAL

(o) **"Current Design and Operations Report"** or **"Current Design and Operations Reports"** means the Design and Operations Report or the Design and Operations Reports that is/are referenced in Items 49, 50, and/or 51 of Schedule "A" of this *Certificate* or the most recent Design and Operations Report that the Owner has submitted to the Ministry in accordance with Condition 68(4) of this *Certificate*;

(p) "**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*;

(q) "**District Manager**" means the District Manager of the of the Guelph District Office of the Ministry;

(r) "**District Office**" means the local office of the Ministry in which the Site is geographically located;

(s) **"dry waste"** means those waste materials not identified in the wet and household hazardous waste streams;

(t) "**Engineer's Report**" means a report prepared under the direction of and signed by an Independent Professional Engineer that sets out the *Operating Envelope;*

(u) **"Finished Compost"** means the Organic Waste that has been Composted and fully cured and is considered ready for sampling and testing for compliance with the *Compost* quality criteria. Finished Compost is considered a waste until testing for the *Compost* quality criteria is completed and compliance with the criteria is demonstrated;

(v) **"Immature Compost"** means the Organic Waste which has been Composted in the aerate *Composting* tunnels and screened within the confines of the *Processing Building*. Composted Organic Waste is considered an Immature Compost until it has been fully cured and is ready for compliance testing for *Compost* quality criteria. Immature Compost is considered a waste;

(w) **"incident"** means an abnormal event which causes a spill, emission, emergency situation or other occurrences which may have an adverse effect on the environment, cause a nuisance or endanger public health and safety;

(x) "**Independent Professional Engineer**" means a Professional Engineer licensed to Practice in the Province of Ontario and who is not an employee of the Owner;

(y) "**Infrastructure**" means the structural elements that are used at the waste disposal site approved by this *Certificate* including buildings, structures, grounds and utilities;

(z) "**leaf and yard waste**" means waste consisting of leaves, grass clippings and other plant materials but not tree limbs or other woody materials;

(aa) **"Material Recovery Facility"** or **"MRF"** means the facility where *dry waste* is received, processed and stored, and includes the material recovery building and an outside storage area;

(bb) **"Ministry"** means the Ontario Ministry of the Environment and includes all officials, employees or other persons acting on its behalf;

(cc) "**Modifications**" means a change to the waste disposal site identified in the Engineer's Report and approved by this *Certificate* including changes to how the *Site* is used, operated, altered or enlarged;

(dd) **"Municipality"** means The Corporation of the City of Guelph, and includes its officers, employees, agents and contractors;

(ee) ***"Municipal Hazardous and Special Waste"*** **and the acronym** ***"MHSW"*** means hazardous waste or special waste generated by households located in the geographic boundaries of the City of Guelph and County of Wellington that fall within waste numbers 112, 121, 145, 146, 148, 212, 213, 221, 242, 251, 252, 261, 263, 269, 312, and 331 as outlined in the New Ontario Waste Classes, January 1996. as defined in Ontario Regulation 347; and also includes wet cell batteries and small dry cell batteries, household cleaners and detergents, aerosols, waxes and polishes, fluorescent tubes and energy efficient light bulbs and mercury switches and thermostats;

(ff) "**Municipal Hazardous and Special Waste Transfer Station**" or **"MHSW Waste Transfer Station"** means the location where the *MHSW* waste is received, bulked, packed, stored and transferred to recyclers and/or to final disposal;

(gg) "***NMA***" means *Nutrient Management Act*, 2002, S.O. 2002, c. 4, as amended from time to time;

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

(ii) "**Ontario Regulation 362**" means Ontario Regulation 362 - R.R.O. 1990, Waste Management PCBs, or as amended, made under the *Act*;

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

(kk) "**Operating Envelope**" means the limits on the pre-approved *Modifications* that the *Owner* may make to the *Site* without further amendment to the *Certificate*;

(ll) "**Organic Waste**" means solid non-hazardous waste derived from plants or animals, including wastes consisting of other compounds of carbon, all readily biodegradable, and limited to wastes listed in Condition 54 of this *Certificate*;

(mm) "**Owner**" means any person that is responsible for the establishment and operation of the *Site* being approved by this *Certificate*, and includes The Corporation of the City of Guelph**,** its successors and assigns;

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

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

(pp) "**PCB**", " **PCB waste"** and "**PCBs"** means any monochlorinated or polychlorinated biphenyl or any mixture of them or mixture that contains one or more of them;

(qq) "**Processing Building**" means the building at the *Composting Site* where the *Organic Waste* is received, pre-processed, Composted, screened and cured;

(rr) "**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 *EPA* or Section 17 of the *PA* or Section 4 of the *NMA* or Section 8 of *SDWA;*

(ss) "**Public Liaison Committee**" and **"ToR PLC"** and ***PLC"*** :means the committee referred to in Conditions 29, and 30 that is established to monitor the construction and operation of any activity at the *Site;*

(tt) "**putrescible waste**" means solid waste that contains organic matter capable of being decomposed by microorganisms;

(uu) "**Rejected Waste**" means the load of incoming waste received at the *Composting Site* and deemed by *Owner* to contain waste that does not meet the incoming *Organic Waste* quality criteria set out in this *Certificate* or that cannot be Composted;

(vv) "**residual waste**" means waste resulting from the operations at the *Site* and directed for disposal;

(ww) **"residual waste (Processing Building)"** means waste resulting from the Organic Waste processing activities at the *Composting Site* and the waste that cannot be Composted and that is destined for final disposal;

(xx) "**Re-Start-up**" means resumption of the *Organic Waste* processing activities at the *Composting Site* following suspension of operations or a long duration power failure at the *Composting Site*;

(yy) **"small generators"** means small sources of waste of unknown origin that the City manages as a result of improper or illegal disposal of waste within the City of Guelph and is/are less than 500 kg of solid, non-hazardous waste per load or/and a combined total of less than 100 litres per month of hazardous wastes listed in Ontario Regulation 347 Schedule 1 or Schedule 2B and characteristic waste, or/and less than 1 kg per month of hazardous waste listed in Ontario Regulation 347 Schedule 2A, or/and less than 500 litres per month or 6000 litres per year of liquid industrial waste. Where the small generators generate both hazardous and liquid industrial waste, the sum total of the two shall not exceed 6000 litres per year;

(zz) "***SDWA***" means *Safe Drinking Water Act*, 2002, S.O. 2002, c. 32, as amended from time to time;

(aaa) "**Site**" means the 29.54 hectare Waste Disposal Site (Processing and Transfer) for the purposes of receipt, storage, processing and transfer of waste by *Composting*, waste transfer,and multi-material recovery, to serve the municipalities and businesses of the Province of Ontario and *Municipal Hazardous and Special Transfer Waste Station*, serving the County of Wellington and City of Guelph located on Lot 4 and 5 Concession 1, Division C, Guelph, Ontario as shown on Reference Plan 61R-5574;

(bbb) "**Start-up Date**" means the date on which the *Organic Waste* is first received at the *Composting Site*;

(ccc) "**Trained Personnel**" means an employee who in addition to being a *Competent Person* is trained in accordance with the requirements of Condition 60 and knowledgeable through instruction and/or practice;

(ddd) **"Waste Transfer Station"** means the part of the *Site* that is used to receive, process and transfer non-hazardous solid waste including municipal, industrial, commercial and institutional wastes, *leaf and yard waste* and source separated recyclables;

(eee) "**waste wood**" means waste that is a wood or a wood product that has been treated with adhesives or preservatives or painted and includes manufactured wood such as medium density fibreboard;

(fff) "**wet waste**" means organic waste material consisting of food scraps and other non-hazardous waste with similar characteristics collected as part of the *Municipality's* residential curbside collection program;

(ggg) "**wood waste"** means waste that is wood or a wood product that is not contaminated with chromated copper arsenate, ammoniacal copper arsenic pentachlorophenol, creosote or other wood preservative, is not part of an upholstered article, does not have an affixed or adhered rigid surface and from which hardware or fittings have been removed;

(hhh) **"WRIC"** means the City of Guelph Waste Resource Innovation Centre located at 80/110

Dunlop Drive, Guelph; and

(iii) **"WRIC Environmental Emergency Plan"** means the plan that is required by Condition 45 for the Waste Resource Innovation centre facility located at 80/110 Dunlop Drive, Guelph.

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

TERMS AND CONDITIONS

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

(1) relieve any person of any obligation to comply with any provision of any applicable statute, regulation or other legal requirement including, but not limited to:

(a) obtaining *Site* plan approval from the local municipal authority;
(b) obtaining all necessary building permits from the local municipal authority Building Services Division;
(c) obtaining approval from the Chief Fire Prevention Officer, local municipal authority: or

(2) limit in any way the authority of the Ministry to require certain steps be taken or to require the *Owner* and Operator to furnish any further information related to compliance with this *Certificate*.

A. INTERPRETATION

2. The requirements of this *Certificate* are severable. If any requirement of this *Certificate*, or application of any requirement of this *Certificate*, to any circumstances is held invalid, the application of such requirement to other circumstances and the remainder of this *Certificate* shall not be affected thereby.

3. 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. 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.

5. 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.

B. CHANGE IN OWNERSHIP

6. (a) The *City* shall notify the *Director*, in writing, of any of the following changes within, thirty (30) days of the change occurring;
(i) change of *Owner/*operator of the *Site* or both;
(ii) change of address of the *City*'s office or address of the new owner; and
(iii) any changes in the legal name of the *Certificate* holder, or any change of business name or style where applicable;

(b) Notification shall include a copy of the most current "Initial Notice" or "Notice of Change" filed under the Corporations Information Act, R.S.O. 1990, as amended from time to time, or if that act is not applicable, a copy of the most recent registration under the Business Names Act, R.S.O. 1990, as amended from time to time; and

(c) In the event of any change in ownership of the *Site*, the *Owner* shall notify in writing the succeeding owner of the existence of this *Certificate*, and a copy of such notice shall be forwarded to the *Director*.

C) RECORDS and *MINISTRY* ACCESS

7. (a) The *City* shall make all records, diagrams and reports, available upon request for inspection by a Provincial Officer;

and

(b) The *City* shall maintain, at all times, up-to-date *Site* plans, plant drawings, operation plans, contingency plans, emergency measures and any other similar type information at the facility for as long as the facility is operational and shall retain this information for five (5) years following closure of the facility.

8. The *Municipality* shall allow *Ministry* personnel, or a *Ministry* authorized representative(s), upon presentation of credentials, to carry out any and all inspections authorized by Section 156, 157 or 158 of the *Act*, Section 15, 16, 17 of the Ontario Water Resources Act, R.S.O. 1990, or Section 19, 20 of the Pesticides Act, R.S.O. 1990, as amended from time to time, of any place to which this *Certificate* relates; and, without restricting the generality of the foregoing to:

(i) enter upon any premises where the records required by the Conditions of this *Certificate* are kept;

(ii) have access to and copy, at any reasonable time, any records required by the Conditions of this *Certificate*;

(iii) inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations required by the Conditions of this *Certificate*; and

(iv) sample and monitor at reasonable times for the purposes of assuring compliance with the Conditions of this *Certificate*.

9. (a) The *Municipality* shall, forthwith upon request of the *Director, District Manager,* or Provincial Officer (as defined in the *Act*), furnish any information requested by such persons with respect to compliance with this *Certificate*, including but not limited to, any records required to be kept under this *Certificate*; and

(b) In the event the *Municipality* provides the *Ministry* with information, records, documentation or notification in accordance with this *Certificate* (for the purposes of this Condition referred to as "Information");

(i) the receipt of Information by the *Ministry;*

(ii) the acceptance by the *Ministry* of the Information completeness or accuracy; or

(iii) the failure of the *Ministry* to prosecute the *Municipality,* or require the *Municipality* to take any action under this *Certificate* or any statute or regulation in relation to the Information;

shall not be construed as an approval, excuse or justification by the *Ministry* of any act or omission of the *Municipality* relating to the Information, amounting to non-compliance with this *Certificate* or any statute or regulation.

10. 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 Privacy Protection Act, R.S.O. 1990, C.F-31.

11. All records and monitoring data required by the Conditions of this *Certificate* must be kept on the *Site* for a minimum period of at least five (5) years.

D. *SITE* OPERATIONS

General

12. a) Except as otherwise provided by these Terms and Conditions, this *Site* shall be designed, developed, used, maintained and operated in accordance with the Applications for Provisional Certificate of Approval for a Waste Disposal Site dated October 22, 2009 and January 11, 2010 and signed by Bill Shields, Supervisor of Governance and Compliance, City of Guelph and associated plans and specifications, and the other supporting documentation listed in the attached Schedule "A" of this *Certificate;* and

b) Within ninety (90) days from the first receipt of *Organic Waste* at the *Composting Site*, a set of as-built drawings showing the *Composting Site*, as constructed, shall be prepared and kept at the *Composting Site*.

13. Only vehicles operating under the City's current Waste Management System Certificate of Approval No. A170150 are

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permitted to bring waste to this *Site*during Sunday operating hours.

14. (i) The *Site* shall be operated and maintained in an environmentally safe manner which ensures the health and safety of all persons and minimizes visual impacts, surface water ponding, dust, odours, vectors, litter, vibration, noise and hazard to aircraft; and

(ii) If at any time problems such as dust, odours, vectors, litter, vibration, noise, hazard to aircraft or other nuisances are generated at the *Site*, resulting in complaints received by this *Ministry* and validated by a Provincial Officer, then the *City* shall upon request of the *Ministry*, take appropriate remedial action immediately. Appropriate measures may include temporary stoppage of all operations until the problem has been rectified and measures have been undertaken to prevent future occurrence.

Receiving Waste

15. a) *Residual waste,* transported from the *Site,* shall not exceed an average of one thousand (1000) tonnes per day averaged over a calendar year. If the *residual waste* approaches an average of one thousand (1000) tonnes per day, the *City* shall take measures immediately to reduce the receipt of the waste that causes the *residual waste* to approach the average of one thousand (1000) tonnes per day. *Residual waste* shall be disposed of at a waste disposal site approved by the *Ministry* to accept such waste;

b) The maximum amount of *residual waste* that may be transported from the *Site* is 1200 tonnes per day; and

c) In the event that *residual waste* and/or processed waste cannot be transferred from the *Site*, the *Owner* shall cease accepting any additional waste at the *Site.*

16. All in-coming and outgoing wastes to and from the *Site* shall be screened and inspected by *Competent Person* or *Trained Personnel* as detailed in the *Current Design and Operations Reports*, prior to being received, transferred and shipped to ensure wastes are being managed and disposed of in accordance with the *Act* and *O. Reg. 347*.

Waste Storage

17. Waste shall be stored at the *Site* in accordance with the *Current Design and Operations Reports* and at a minimum the *Owner* shall ensure that:

(1) i) all activities related to unloading waste, in-process waste and *residual waste* shall be conducted indoors at all times; and
ii) Condition 17. (1) i) does not apply to materials destined for recycling markets; and
iii) Condition 17.(1)(i) does not apply to materials received at the Public Drop-Off area.

(2) all *putrescible waste* shall be removed from the tipping floor of the *Waste Transfer Station* and the *MRF* at the end of each operating day and the tipping floor cleaned as necessary. Any *putrescible waste* that is not removed from the *Site* at the end of the operating day shall be stored indoors in a tarped or enclosed container;

(3) all containers used for the outside storage of non-putrescible processed waste that is destined for recycling markets shall be maintained in a leakproof condition and shall be tarped or enclosed unless material is being added or removed;

(4) The following are the maximum storage amounts that area allowed at the *Site*:
(a) *Waste Transfer Station* - 795 tonnes inside the *Waste Transfer Station* building;
(b) *MRF*- 3850 tonnes inside *MRF* building;
(c) Organic Waste Processing Facility- 8,500 tonnes inside building;
(d) Outdoor storage of the following:
i) *leaf and yard waste*- 4000 tonnes;
ii) a maximum of 3050 tonnes of non-putrescible recyclable wastes stored in dedicated bunkers or covered bins on an asphalt paved pad of approximate area of 6100 square metres pads located to the south of the transfer station and an asphalt paved pad of approximate area 2,100 square metres to the west of the Organic Processing Facility for the storage of such

recyclable materials as waste electronics, tires, scrap metal, corrugated cardboard and reusable materials;
iii) outdoor storage for a maximum of twelve (12) hours of two loaded transfer trailers from *Waste Transfer Station;*
iv) outdoor storage of *waste wood, wood waste* and *Amendment Materials* that are referred to in Condition 54 (9) of this *Certificate* in amounts that are needed for the processing of *Organic Waste* at the *Organic Waste Processing Facility;*
v) Any outdoor storage of recyclable waste shall not create a nuisance or hazard;
(e) wastes that are in bins in the Public Drop-Off area that is identified in Appendix A-1 of the Design and Operations Report that is identified in item 51 of Schedule "A"; and
(f) *MHSW Waste Transfer Station*-15 tonnes;

(5) The maximum storage times are as follows:

(a) *Waste Transfer Station* - i) *Organic Waste*- except as provided in (in building) Condition 17 (5) (a) ii), 24-hours storage time at the *Waste Transfer Station* until the *Start-up Date;*
ii) due to exceptional circumstances or an emergency, the *Owner* may request to the *District Manager* that maximum 24-hour storage allowed by Condition 17 (5)(a) i) be extended to up to 72-hours and the *District Manager* has the authority to grant written concurrence to such a request;

iii) after the *Start-up Date, Organic Waste, Residual Waste* and/or *rejected waste* may be stored at the *Waste Transfer Station* in accordance with Condition 56 (2)(h), 56(3)(c), and/or 56(4)(b);
iv) after the *Start-up Date,* due to exceptional circumstances or an emergency that results in the cessation of further processing at the *Composting Site,* on a one time basis for each such cessation of further processing, the *Owner* may remove the unprocessed organic waste from the *Composting Site* and transfer it in a covered container, on a priority basis, to the *Waste Transfer Station* and have it removed from the *Waste Transfer Station* on the same day that the transfer of unprocessed Organic Waste occurred on;

v) all other waste - 72-hours;

vi) due to exceptional circumstances or an emergency, the *Owner* may request to the *District Manager* that maximum 72-hour storage allowed by Condition 17 (5)(a) v) be extended to up to seven (7) days and the *District Manager* has the authority to grant written concurrence to such a request; and
vii) notwithstanding Conditions 17 i), ii), iii), iv), v) and vi), if the *District Manager* determines that the storage of odorous waste at the *Waste Transfer Station* is causing significant odour issues, the odorous waste at the *Waste Transfer Station* shall be immediately removed from the *Site;*

(b) *MRF* i) 5 days for generation of *residual waste* from date of (in building) generation; and

ii) 120 days for all other waste;

(c) Organic Waste i) as outlined in Condition 54 (8)(a)

Processing Facility of this *Certificate, Organic Waste* shall

be incorporated into active *Composting* process within 36-hours of receipt;
ii) as outlined in condition 54 (8)(e) of this *Certificate, residual waste (Processing Building)*
-maximum of 14 days storage time from generation date;

(d) Outdoor storage of waste - i) 12 hours for a maximum of two loaded and

transfer trailers from the *Waste Transfer Station;* and
ii) seven (7) days storage time for all other waste stored outside;

(e) Outdoor storage of materials referred to in Conditions 54 (9) and 17 (4)d.(iv) -
the reasonable amount of time required for operational needs at the *Organic Waste Processing Facility* for the outdoor storage of *waste wood, wood waste* and
*Amendment Materials;*and

(f) *MHSW* - 90 days storage time; and

(6) No storage or transfer areas, other than those approved under this *Certificate* shall be used for waste storage or transferring.

Dirt, Dust and Airborne Emissions
18. (a) The *City* shall ensure that dust and/or other material that may become a contaminant, generated by activities on the *Site*, is minimized in a manner that ensures there are no off-*Site* impacts of such emissions. The *City* shall implement control measures as outlined in the approved Operation and Management Plan to comply with this Condition;

(b) The *City* shall ensure that vehicles entering the *Site* do not drag into the *Site*, dirt and/or other material that may become a contaminant or a nuisance. The *City* shall ensure that vehicles leaving the *Site* do not drag out of the buildings or off the *Site* waste, dirt and/or other material that may become a contaminant or a nuisance; and

(c) All parking areas, on-*Site* roads that are used for transportation of wastes, recyclable material and/or processed material including *Compost,* and storage areas shall be paved and shall be cleaned as necessary to prevent dust and litter from blowing off the *Site*.

Litter
19. (a) Litter shall be picked up daily from the *Site* and from roads and ditches within one (1) kilometer of the *Site*;

(b) All collected and stored litter shall be in closed or covered containers;

(c) Litter collected through the litter control program shall be transferred off-*Site* or processed within four (4) days of collection; and

(d) The *City* shall undertake all reasonable measures at the *Site* to ensure that there is no unauthorized dumping of waste on the *Site*.

Rodents and Vermin
20. (a) The *City* shall implement the approved litter control to minimize and control the occurrence of vectors, rodents and vermin; and

(b) If necessary, the *City* shall retain the services of a pest management company to monitor and controls vectors, rodents and vermin.

Odour
21. a) The Odour Monitoring Program that is required by Condition 58 (13) of this *Certificate* also shall be designed to detect and identify any odours originating from the operation of the *Waste Transfer Station* and the *MRF;*

b) *Organic Waste* received at the public drop-off bins shall remain covered at all times other than loading and shall be emptied indoors daily; and

c) If *putrescible waste* is received at the *Material Recovery Facility,* it shall remain covered at all times other than during loading and unloading.

Noise
22. (a) All off-road equipment used at the *Site* shall be operated in such a manner that sound levels from such equipment do not exceed 85 decibels at 15 metres measurement distance;

(b) All off-road equipment shall be operated and maintained in accordance with the procedures specified in Publication NPC-115 of the *Ministry's* Model Municipal Noise Control By-law;

(c) All stationary equipment shall be operated and maintained in accordance with the procedures specified in Publication NPC-105 of the *Ministry's* Model Municipal Noise Control By-law; and

(d) Notwithstanding Conditions 22, (a), (b) and (c), if at any time noise and vibration nuisances are generated at the *Site*, resulting in complaints received by this *Ministry* and validated by a Provincial Officer, the *City* shall take remedial action immediately.

Hazard to Aircraft

23. (a) The *City* shall ensure that the activities related to the operation of the *Site* do not create a hazard to aircraft;

(b) The *City* shall ensure that there is no net increase in bird populations at the *Site* above the baseline levels established by the baseline study that has been conducted by the *Owner;*

(c) If the population of *birds* in the vicinity of the facility increases above the baseline levels, the *City* shall immediately undertake additional bird deterrent measures, to bring the bird population in accordance with baseline levels;

(d) The *City* shall ensure that the number of thermals created by the *Site* is kept to the minimum and that the number of *birds* soaring in these thermals shall not exceed ten (10) at any given time;

(e) The *City* shall ensure that the amount of dust, steam, smoke or other airborne vapour discharged from the facility is kept to the minimum and shall not restrict visibility on or near the Guelph Air Park;

(f) The *City* shall continue to implement a bird control management plan, as required, to ensure the *Site* is not an attraction to *birds*. The bird control management plan shall include but not be limited to additional bird deterrent measures in addition to the measure outlined in Item 6 of Schedule "A"; and

(g) Upon receipt of a written notification that Transport Canada or such other governmental agency of equivalent jurisdiction over airport operations has served notice or a similar written warning to shut down or curtail airport operations at the Guelph Air Park due to hazard to aircraft as a result of *birds* in the vicinity of the airport, which may or may not be a direct result of the *Site* operations, the *City* shall undertake the following measures immediately:
(i) cease acceptance of all waste at the *Site*, except *MHSW*, unless in the opinion of the *District Manager*, the reason for the hazard to aircraft as a result of *birds* is known, and is not a direct or indirect result of *Site* operations;
(ii) if the reason for the hazard to aircraft as a result of *birds* is known and is a direct or indirect result of *Site* operations, take all reasonable measures to investigate the problem, institute remedial/mitigative measures immediately, devise a long-term action plan to avoid any such future occurrences at the airport and submit a comprehensive report of such plans to the *Director*, and the appropriate agency that has served the notification to shutdown or curtail airport operations;
(iii) if the reason for the hazard to aircraft as a result of *birds* is not known, the *City* shall undertake a comprehensive study, acceptable to the *Director* and the agency that served notification to shutdown or curtail operations to determine if such hazard to aircraft was a direct or indirect result of the *Site* operations and to propose measures to prevent any similar or related occurrences that may create a hazard to aircraft;
(iv) the *City* shall submit the reports required by Condition 23 (g) (ii) and (iii) to the *Director* for approval and to the agency that served notification to shutdown or curtail airport operations. Upon the *Director's* approval, the *City* shall implement remedial/mitigative/contingency measures, as required;
(v) The *City* shall not accept any waste at the *Site* unless a qualified professional consultant has submitted a report stating that the hazard to aircraft as a result of *birds* has been resolved, or is not the direct or indirect result of *Site* operations, and the *Director* has authorized that the *Site* can again begin to accept waste;
(vi) notwithstanding Condition 23 (g) (ii), (iii), (iv) and (v), the *City* may continue to process any waste materials inside the *Organic Waste Processing Facility* and the *Material Recovery Facility* that were present at the *Site* prior to the *City* ceasing to accept waste at the *Site* pursuant to Condition 23 (g) (i). The *City* shall continue to ensure that all *Site* activities do not create a hazard to aircraft safety;
(vii) During the period of shutdown the *City* shall implement its contingency plan for disposal of waste at approved alternative location(s); and
(viii) Condition 23(g) (i) to (vii) does not relieve the *City* from implementing all necessary contingency/mitigative measures

to ensure that *Site* activities do not create a hazard to aircraft.

Traffic

24. The *City* shall make adjustments to traffic flow patterns, including but not limited to the use of traffic lights as required, to minimize any adverse traffic impacts resulting from the facility traffic patterns.

Operating Hours

25. (a) All control measures at the *Site,* including but not limited to, dust, odours, vectors, litter, noise and hazard to aircraft shall take place 24-hours a day, seven (7) days a week;

Composting Site

(b) The allowed hours of operation of the *Composting Site* operation are covered by Condition 56 (1);

***MHSW Transfer Station, MRF,* and Public Drop-off area**

(c) Waste and recyclable materials destined for the *MHSW,* the *MRF,* and/or the Public Drop-off area may be received at the *Site* only from 7:00a.m. to 11:00p.m. from Monday to Friday, and from 8:00a.m. to 4:00p.m. on Saturday;

(d) Waste and/or recyclable materials may be transferred from the *Site* only during the following hours:
(i) Monday to Friday 7:00a.m. to 6:00 p.m; and
(ii) Saturday 8:00 a.m. to 4:00 p.m.;

(e) Outdoor processing of waste and/or recyclables associated with the *MHSW Transfer Station,*the *MRF* and/or the Public Drop-off area may occur only in the following hours:

(i) Monday to Friday 7:00 a.m. to 11:00 p.m.; and
(ii) Saturday 8:00 a.m. to 4:00 p.m.;

(f) Indoor processing at the *MRF* and/or the *MHSW* may take place from Monday 12:00 a.m. to Saturday 11:59 p.m. In extraordinary circumstances, indoor processing may take place beyond these hours to eliminate any backlog of material requiring processing;

(g) Due to exceptional circumstances or an emergency, the *Owner* may request to the *District Manager* that the hours of operation of the *MHSW Transfer Station,* the *MRF* and/or the Public Drop-off area be extended and the *District Manager* has the authority to grant written concurrence to such a request;

Waste Transfer Station

(h) Subject to Condition 13, waste destined for the Waste Transfer Station may be received at the *Site* only from Monday to Sunday from 7:00a.m. to 7:00p.m.;

(i) Notwithstanding the hours of operation for waste receipt at the *Waste Transfer Station* referenced in Condition 25 (g), the *Site's* activities and movement of waste within the *Site*related to the *Waste Transfer Station,* including outgoing shipments, may occur only during the hours of 7:00a.m. to 11:00p.m Monday to Saturday; and

(j) Due to exceptional circumstances or an emergency, the *Owner* may request to the *District Manager* that the hours of operation of the *Waste Transfer Station* be extended and the *District Manager* has the authority to grant written concurrence to such a request.

Competent People* and *Trained Personnel

26. a) The *Municipality* shall ensure through proper training programs and personnel records that all personnel directly involved with activities relating to the operation, maintenance and inspection of the *Site* are *Competent People* and that all personnel directly involved with the activities of the *Organic Waste Processing Facility* are *Trained Personnel* and that they are given refresher training on the components of a *Competent Person* or *Trained Personnel* as applicable, at least once every three years; and

b) The *Municipality* shall keep a record that is in electronic or written format that is easily accessible for inspection by a *Provincial Officer* of all employees who are *Competent People* and *Trained Personnel.*

27. The *Municipality* shall ensure that *Competent People* or *Trained Personnel* are available at all times during the hours of operation of this *Site*. No loading, unloading, or sorting of recyclables or any waste material shall occur unless a *Competent Person* or *Trained Personnel* supervises the loading, unloading, or sorting operation.

28. All in-coming and outgoing wastes shall be screened and inspected by *Competent People* or *Trained Personnel* as detailed in the *Current Design and Operations Reports*, prior to being received, transferred and shipped to ensure wastes are being managed and disposed of in accordance with the Act and *O. Reg. 347*.

Public Liaison Committee

29. (1) The *Owner* shall invite the following groups to provide input and/or comments into preparation of the Terms of Reference for the *Public Liaison Committee (ToR PLC):*

(a) home owners within 2,000 metres of the *Composting Site*;
(b) any interested non-governmental organization (NGOs); and
(c) any interested person(s) or group(s);

(2) (a) The *Owner* shall consider all input and/or comments submitted by the groups listed above during preparation of the *ToR PLC*; and

(b) A minimum of ninety (90) days prior to the receipt of the *Organic Waste* at the *Composting Site*, the *Owner* shall prepare and submit to the *District Manager* the *ToR PLC*, including documentation demonstrating consideration of all public input and/or comments received, for written concurrence of the *District Manager;*

(3) The *ToR PLC* shall be amended from time to time according to appropriate amending procedures identified within the content of the *ToR PLC*. Any amendment to the *ToR PLC* must be agreed to by the *District Manager* prior to its implementation;

(4) Within sixty (60) days from the *District Manager`s* concurrence to the *ToR PLC,* the *Owner* shall take all reasonable steps to establish a *Public Liaison Committee (PLC)* which shall serve as a forum for dissemination, consultation, review and exchange of information regarding the operation of the *Composting Site*, including environmental monitoring, maintenance, complaint resolution, and new approvals or amendments to existing approvals related to the operation of this *Composting Site*;

(5) The *Owner* shall invite representation from the following groups to participate on the *PLC*:

(a) home owners within 2,000 metres of the *Composting Site;*
(b) any interested NGOs; and
(c) any interested person(s) or group(s);

(6) The number of representatives from each group shall be as specified in the *ToR PLC* approved by the *District Manager;*

(7) No later than ninety (90) days from the *District Manager`s* concurrence to the *ToR PLC,* the *Owner* shall submit to the *District Manager* a written report that details steps to be taken by the *Owner* to establish, maintain and participate in a *PLC*. This report shall include the identification of each of the representatives that have been invited to participate in the *PLC*;

(8) A copy of the Annual Report that is required by Conditions 52 shall be provided to the *Public Liaison Committee* at the first scheduled meeting following March 31st; and

(9) The *City* shall allow reasonable access to the *Site* for any member of the *Public Liaison Committee;*

30. The *City* shall make available to the *Public Liaison Committee,* all records and reports required by this *Certificate* for the purposes of monitoring the ongoing operations of the *Site.*

E. STORMWATER AND WASTEWATER MANAGEMENT:

31. The *Municipality* shall manage all discharges from this *Site* including stormwater run-off, including the stormwater

collected and contained in the Stormwater Collection Ponds, in accordance with Municipal and Private Sewage Works Certificate of Approval number 5015-856HHG and appropriate Municipal, Provincial and or Federal Legislation, Regulations and By-laws.

F. MONITORING PROGRAM

Groundwater Monitoring

32. Groundwater shall be sampled on a semi-annual basis (spring and fall).

33. The analyses of samples collected in accordance with Condition 32 shall seek to identify chloride, nitrate and a suite of compounds characteristic of waste at the *Site*. Sampling frequency and parameters for analysis may be adjusted upon the approval of the *District Manager,* as groundwater information become available.

34. All monitoring wells which form part of any 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*.

Surface Water Monitoring

35. (a) The *City* shall annually review and update the existing surface water sampling program, designed to detect and quantify any impacts originating from the *Site*;

(b) A surface water sampling program shall be implemented to ensure early detection of contaminants in the event that such contaminants escape the *Site*. Surface water shall be sampled monthly for the following conventional parameters: biochemical oxygen demand (BOD), suspended solids (SS), ammonia, nitrogen, Total Kjeldahl Nitrogen (TKN), total phosphorus and phenolics. For all other parameters, surface water shall be sampled on a semi-annual basis (spring and fall). The analysis shall seek to identify chloride, nitrate and a suite of organic and inorganic compounds characteristic of waste generated at the *Site;*

(c) Sampling frequency and parameter for analysis may be adjusted upon the approval of the *District Manager,* as surface water information become available;

(d) Surface water shall be sampled at the discharge location of the final surface water detention pond;

(e) The *City* shall ensure that all stormwater which comes in contact with waste material is treated or discharged into the sanitary sewer; and

(f) The *City* shall annually review and update the detailed maintenance schedules for the infiltration trenches and stormwater detention ponds.

Reporting on monitoring.

36. The *Municipality* shall include the results from the approved program covering the previous calendar year, with the interpretation of the monitoring results prepared by a qualified hydrogeologist, engineer or scientist in the Annual Report referenced in Condition 52. Following a review of the analytical results or, of any of the reports required by this Condition, the *District Manager* or, the *Director* may alter the frequencies and locations of sampling and parameters for analysis required by this Condition if he/she considers it necessary for proper assessment of the quality of the groundwater or, if he/she is requested to do so by the *Municipality* and considers it acceptable by the evidence of information in support of the request.

G. *SITE* SECURITY

37. (a) The *City* shall ensure that a *Competent Person* is available at all times during the hours of operation at this *Site*. No loading or unloading of waste, *Compost* and/or recyclable material, including the public drop-off bins, shall occur unless a *Competent Person* supervises the loading or unloading operation. No public drop-off shall be allowed beyond the normal

operating hours of the facility. No processing shall occur unless a *Competent Person* supervises the processing;

(b) Not less than once each calendar year, the *City* shall ensure that a fire inspection is carried out to determine if adequate fire prevention and protection measures are in place for the facility;

(c) The *City* shall ensure that the *Site* is adequately lit at all times;

(d) The *City* shall ensure that the existing signs posted on the *Site*, which identify the name of the facility and an emergency and/or *incident* reporting telephone number, continue to be adequately maintained;

(e) The *City* shall ensure that the existing 1.6 metre high fence with lockable gates is adequately maintained in order to continue to preserve the security of the *Site*; and

(f) The *City* shall ensure that the *Site* is secured beyond the normal operating hours of the facility to prevent unauthorized entry.

H. *WASTE TRANSFER STATION*

38. a) Except as noted in Condition 38 b) and c) of this *Certificate*, the *Waste Transfer Station* may accept non-hazardous solid industrial waste from industrial, commercial and institutional sources, commercial waste and domestic waste;

b) asbestos waste may not be accepted at the *Waste Transfer Station;* and

c) *Organic Waste* may only be accepted at the *Waste Transfer Station* in accordance with Condition 17.(5)(a).

39. a) Except as noted in Condition 17.(5)(a) ii), iii), iv) and vi) in accordance with Condition 17.(5)(a)i), the maximum storage time at the *Waste Transfer Station* building for allowed *Organic Waste* is 24-hours; and

b) The maximum storage capacity in the building at the *Waste Transfer Station* is 795 tonnes in the *Waste Transfer Station* building.

I. *MATERIAL RECOVERY FACILITY*

40. (a) The *City* shall ensure that only municipal waste recyclable material, generated within the Province of Ontario is received at this *Site;*

(b) The maximum storage capacity at the *MRF* is 3,850 tonnes;

(c) All materials to be processed at the *Material Recovery Facility* shall be unloaded and processed indoors except commingled recyclables which may also, as required, be unloaded into the outdoor storage bunker assigned to this material, or in the *Organic Waste Processing Facility* when not in use for *Composting*;

(d) The *City* shall ensure all storage containers are maintained in good condition;

(e) The *City* shall limit any outside storage to processed or source-separated non-putrescible dry materials, dropped off by either commercial or residential vehicles, including but not necessarily limited to tires, rubble, electronic waste, source separated roofing shingles, mattresses, textiles, white goods, construction and demolition wastes, commingled recyclables, *wood waste, waste wood*, glass, scrap metal, and drywall;

(f) The *Owner* may apply to the *District Manager* for the outdoor storage in concrete bunkers or in storage containers of additional non-hazardous solid waste(s) that is/are not provided for in Condition 40 (e) and the *District Manager* may provide written concurrence to the *Owner* for the storage of non-hazardous solid waste(s) that is/are not provided for in Condition 40 (e);

(g) Outside storage shall be on an asphalt pad, or equivalent impermeable surface, within designated concrete bunkers, or in closed storage containers in a manner and in amounts which does not create a nuisance or hazard;

(h) The *City* shall implement litter controls including, but not limited to, covering waste with netting and limiting the receipt

or movement of materials on windy days. Litter pick-up shall occur daily and after the movement of waste either into the *Material Recovery Facility* for processing or after loading vehicles for off-*Site* transfer at a minimum;

(i) The outdoor storage of any wastes that may attract *birds,* vectors, rodents and/or vermin is prohibited;

(j) The *City* shall ensure that the addition, removal and processing of all wastes and/or recyclable material occurs only in the presence of a *Competent Person;*

(k) The *Material Recovery Facility* doors for vehicular traffic shall normally be kept closed and shall only be opened for entry or departure of vehicles if there is an attraction to *birds;*

(l) All *dry waste* shall be processed and shipped off-*Site* within 120 days of receipt; and

(m) *Residual waste* not suitable for further processing at the *Site* shall be moved off-*Site* within five (5) days of generation.

J. *MUNICIPAL HAZARDOUS AND SPECIAL WASTE TRANSFER STATION*

41. In this section, "processed waste" means wastes that have been bulked together in a common container or packaged for disposal.

42. (a) The operation of this *MHSW Transfer Station* is limited to the collection and transfer of waste classes 112, 121, 145, 146, 148, 212, 213, 221, 242, 251, 252, 261, 263, 269, 312, and 331 and also includes wet cell batteries and small dry cell batteries, household cleaners and detergents, aerosols, waxes and polishes, fluorescent tubes and energy efficient light bulbs, mercury switches and thermostats; as outlined in the New Ontario Waste Classes, January 1996, and waste allowed by Condition 43(b); and

(b) The maximum amount of *MHSW* and waste allowed by Condition 43(b) that may be stored at the *Site* is 15 tonnes.

43. (a) The *City* shall ensure that only *MHSW* generated by residents living within the City of Guelph and the County of Wellington is received. No industrial, commercial and/or institutional hazardous waste shall be received at this facility;

(b) Subject to the limitations outlined in Condition 42 of this Certificate, the City of Guelph may accept for collection and transfer at the *MHSW Transfer Station, MHSW* or other waste acquired by the City from *small generators*as a result of the management of incidents of improper or illegal dumping in the City of Guelph, none of which shall exceed the quantities outlined in the definition of *small generators* that is defined in the definitions section of this Certificate;

(c) The *City* shall ensure that a *Competent Person* is on duty at all times during the operation of the *MHSW Transfer Station* to provide proper supervision of activities;

(d) The *City* shall ensure that adequate fire fighting equipment is available at the *MHSW Transfer Station* location at all times and that on-*Site* staff are trained in the use of such equipment;

(e) The *City* shall ensure that the local police and fire departments are informed of the operation at the *MHSW Transfer Station* at all times and are kept up-to-date on the types and quantities of waste that the facility handles;

(f) Not less than once per calendar year, the *City* shall ensure that a fire and explosion prevention inspection is carried out by a qualified person who is either a representative from the City of Guelph Fire Department, a Professional Engineer or who has specialized training in fire and explosion hazards;

(g) The *City* shall ensure that the management and disposal of waste at the *MHSW Transfer Station* is done in accordance with Ontario Regulation 347;

(h) i) The *MHSW Transfer Station* shall be inspected by a *Competent Person*

on each operating day basis to ensure the proper storage and handling of *MHSW* waste and that the integrity of waste containers is intact;

ii) A daily record of the inspections required by Condition 43(g)i shall be maintained by the *Owner;*

iii) At a minimum, the record shall indicate the date and time of the inspection, the name of the *Competent Person* who did the inspection, a description of any unusual observations, such as spills, made during the inspection, description of any action taken to correct an *incident* that was identified and any recommendations for preventing a recurrence of a similar *incident;* and

iv) the records required by Condition 43(g)ii shall be made readily available for an inspection by a *Provincial Officer;*

(i) No MHSW waste shall be stored on-*Site* longer than ninety (90) days from the date it was received;

(j) All storage of waste shall be in accordance with the *Ministry's* "Guidelines for Environmental Protection Measures at Chemical and Waste Storage Facilities," May 2007, and its amendments;

(k) The *City* shall have a *Competent Person* annually review and update the existing waste screening measures for all incoming waste, to ensure only wastes approved by this *Certificate* are received at this facility;

(l) Any updated report on the waste screening measures shall be submitted to the *District Manager;* and

(m) The *City* shall ensure that no *PCB waste* are accepted at the *Site*. Oil and oil-based paints which have been manufactured prior to 1972, paints and thinners having an oily appearance, rubber based paints (concrete paints/stains), adhesives, urethane elastomers manufactured prior to 1977, pesticides manufactured prior to 1977, any of these materials whose manufacturing date cannot be determined and any container having contained these materials may contain *PCBs.* The *City* shall undertake a waste screening procedure for *PCBs* that includes, but is not limited to the following:
(i) The *City* shall ensure that an approved *PCB* storage site is available to take and store any confirmed *PCB waste* that is inadvertently received at the *Site*;
(ii) The *City* shall ensure a waste tracking system is established to property identify the source of any confirmed *PCB waste;*
(iii) Any *PCB* suspect material shall be segregated and shall not be mixed or bulked. All *PCB* suspect material shall be sampled and analyzed for *PCB* content. Each individual suspect container or a representative proportional composite of not more than ten (10) individual suspect containers shall be sampled and analyzed;
(iv) Any material that may be mixed or bulked shall be sampled and analyzed for *PCB* content. Each individual bulk container or drum shall be sampled and analyzed; and
(v) Any material that has measure levels greater than fifty (50) parts per million is considered to be *PCB waste* as defined in *Ontario Regulation 362*. *PCB waste* shall be removed from the *Site* to an approved *PCB* storage site in accordance with written instructions from a *Director* as defined in *Ontario Regulation 362*, or a Waste Management System Certificate of Approval which specifies the manner in which *PCB waste* may be stored, handled, collected, transported or disposed of.

44. The *City* may offer materials in Ontario Waste Classes 145 (paint), 331 (aerosols), 213 (car products) and 148 (cleaning products) to the public.

K. *WRIC ENVIRONMENTAL EMERGENCY PLAN*

45. (a) Within thirty (30) days of commencing the receipt of Organic Waste at the *Composting Site,* the *Owner* shall update its "Solid Waste Resources Emergency and Contingency Plan" that is contained in the *Owner's* Design and Operations Reports that are referenced by Items 49, 50 and 51 of Schedule "A" by submitting to the *District Manager* a *WRIC Environmental Emergency Plan* for the entire *Site.* The *WRIC Environmental Emergency Plan* for the entire *Site* shall be prepared in consultation with the local Municipality and the City of Guelph Fire Department;

(b) The *WRIC Environmental Emergency Plan* shall identify measures for the preparation for, the prevention of, the response to and the recovery from environmental emergencies at the *Site* including but not limited to:

(i) a spill, process upset, emission of odours, fire, explosion or any other emergency situation, and disruption at the *Site* such as power failure and/or equipment failure;
(ii) specific clean-up methods for wastes expected to be generated from an emergency situation;
(iii) fire and explosion prevention planning and fire protection systems;
(iv) a list of equipment and clean-up materials available for dealing with the projected emergency situation;
(v) measures to be taken to prevent incompatible chemicals at the *MHSW* Transfer Station from coming into contact;

(vi) Environmental Emergency Planning measures for the *Composting Site* that are required by Condition 61 of this Certificate;
(vii) measure to be undertaken in the event hazard to aircraft problems develop or there is a net increase in *birds* at the *Site*;
(viii) measures to be undertaken in the event any unauthorized non-hazardous or hazardous waste or unidentifiable waste appears at the *Site*;
(ix) measures to be undertaken in the event of groundwater and/or surface water contamination;
(x) notification protocol with names and telephone numbers of persons to be contacted, including persons responsible for the *Site*, the *Ministry's District Office* and Spills Action Centre, the local Fire Department, the local Municipality, the local Medical Officer of Health, and the Ministry of Labour, and the names and telephone numbers of waste management companies available for emergency response; and
(xi) a complaints procedure that has a minimum the information that is outlined in Condition 46;

(c) No waste shall be received at the *Composting Site* for storage or processing until the *District Manager* provides a written concurrence for the emergency response and contingency planning measures for the issues in the *WRIC Environmental Emergency Plan* that deals with the *Composting Site;*

(d) The city shall keep up-to-date copies of its *WRIC Environmental Emergency Plan* at central locations at the *Composting Site*, the *Waste Transfer Station,* the *MRF* and the *MHSW Waste Transfer Station;*

(e) The *WRIC Environmental Emergency Plan* shall be reviewed on an annual basis and updated, if necessary by the *Owner.* Any revised version of the *WRIC Environmental Emergency Plan* shall be submitted within fifteen (15) days of the revision for comments and concurrence to the local Municipality, the Fire Department and to the *District Manager;* and

(f) After five (5) years from the date of issue of this *Certificate,* the *Owner* may apply in writing to the *District Manager* for agreement of the removal of the requirement in Condition 45(e) that requires *District Manager* concurrence. Also, the *District Manager* may provide written notice to the *Owner* that they are exempted from the noted provision in Condition 45(e).

Complaints Procedure

46. If at any time, the *Municipality* receives complaints regarding the operation of the *Site*, the *Municipality* shall respond to these complaints according to the following procedure:

(a) The *Municipality* shall record each complaint on a formal complaint form entered in a sequentially numbered log book. The information recorded shall include the nature of the complaint, circumstances of the complaint including weather conditions, the name, address and the telephone number of the complainant and the time and date of the complaint;

(b) The *Municipality,* 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 *Municipality* shall immediately orally notify the *Ministry* of the complaint, followed with the submission of a written report within one (1) week, of the complaint detailing what actions, if any, were taken to identify and remediate the cause of the complaint and what remedial action, if any, would be taken.

47. The *Municipality* shall take immediate measures to clean-up all spills, related discharges and process upsets of wastes which result from the operation of the *Site*. All spills and upsets shall be immediately reported to the *Ministry's* Spills Action Centre at (416) 325-3000 or 1-800-268-6060 and shall be recorded in a written log or an electronic file format, referred to in Condition 51 of this *Certificate*, as to the nature of the spill or upset, and the action taken for clean-up, correction and prevention of future occurrences.

L. INSPECTION

48. The ***Municipality*** shall have a *Competent Person* or *Trained Personnel* conduct regular daily and weekly inspections of the equipment and facilities as outlined in the Design and Operations Reports of this *Certificate* and as is required by Condition 57 of the *Certificate* to ensure that all equipment and facilities at the *Site* are maintained in good working order at all times. Any deficiencies detected during these regular inspections must be promptly corrected. A written record must be maintained at the *Site*, which includes the following:

(a) name and signature of *Trained Personnel* conducting the inspection;

(b) date and time of the inspection;

(c) list of equipment inspected and all deficiencies observed;

(d) a detailed description of the maintenance activity;

(e) date and time of maintenance activity; and

(f) recommendations for remedial action and actions undertaken.

49. The *Municipality,* in addition to inspections and documentation requirements carried out in Condition 48, shall conduct on each operating day, a physical inspection of the following areas to ensure the *Site* is secure or operating properly and that no off-*Site* impacts such as vermin, vectors, odour, noise, dust, litter, or other possible contaminants resulting from the operation of the Facility:

(a) Oil/water separator;
(b) holding tanks and associated containment areas;
(c) drainage swales, culverts and catch basins and stormwater management pond; and
(d) security fence, barriers and property line.

50. The *City* shall remedy any malfunction and/or deficiency which these inspections reveal.

M. RECORD KEEPING

51. (a) The *City* shall maintain written records of daily *Site* inspections at the *Site*. This record shall be in the form of a *Site* Inspection daily log(s) and shall include as a minimum:
(i) the requirement outlined in Condition 63 of the *Certificate;*
(ii) date and time of inspection;
(iii) name, title and signature of a *Competent Person* or *Trained Personnel* supervising the inspection;
(iv) a listing of all equipment, fencing, gates etc inspected and any deficiencies observed;
(v) any maintenance conducted as a result of these inspections;
(vi) recommendations for remedial action and date remedial action, if necessary, was completed;
(vii) indication whether odours are detectable;
(viii) indication of any litter collected;
(ix) indication of any *incidents;* and
(x) indication of *birds;*

(b) The *City* shall maintain daily written records of the waste and/or recyclable material received and processed at the *Waste Transfer Station,* the *Material Recovery Facility,* the *Municipal Hazardous and Special Waste Facility* and *the Organic Waste and Composting Site.* This record shall include as a minimum:
(i) date, quantity and source of waste and/or recyclable material received;

(ii) date and quantity of waste and/or recyclable material processed;
(iii) date, quantity and the destination of material transferred off-*Site*; and
(iv) date, quantity and destination of any *rejected waste* from the *Organic Processing Facility;*

(c) The log for the *Organic Waste* and *Composting Site* shall be in accordance with Condition 63;

(d) analytical results, when required of all in-coming and outgoing wastes and materials; and

(e) results of inspections and reports required under Conditions 48, 49 and 50, including the name and signature of the person conducting the inspection and completing the report.

N. ANNUAL REPORT

52. The *City* shall submit an annual report on the operation of the *Site* for the previous calendar year to the *District Manager* by March 31st of each year. This report will include the information required as follows:

(a) the information required by Condition 63 (8) of the *Certificate* dealing with the *Composting Site;*

(b) a monthly summary of the waste and/or recyclable materials received at the *Site*, including quantity, source and *Ontario Regulation 347* waste classes;
(c) a monthly summary of the wastes and/or recyclable materials processed at the *Site* including quantity and *Ontario Regulation 347* waste classes;
(d) a monthly summary of the waste and/or recyclable materials transferred off-*Site* including quantity, destination and *Ontario Regulation 347* waste classes;
(e) an annual summary of the analytical results for the groundwater, and surface water monitoring program including an interpretation of the results and any remedial/mitigative action undertaken;

(f) an annual summary of any deficiencies, items of non-compliance or process aberrations that occurred and remedial/mitigative action taken to correct them;
(g) a summary of any changes to the *Engineer's Report* and/or the Design and Operations Report that have been approved by the *Director* since the last annual report;
(h) a summary of any changes to the Design and Operations Report Design and the WRIC Environmental Emergency Plan that were made in accordance with Condition 68(1) of this *Certificate*;
(i) a summary of any changes to the Design and Operations Report that have been approved by the *Director* since the last annual report;
(j) update on activities of the *PLC*; and
(k) all measurement units shall be reported in consistent metric units.

O. CLOSURE PLAN:

53. (a) The *Municipality* shall submit, for approval by the *Director,* a written Closure Plan for the *Site* four (4) months prior to the closure of the *Site*. This plan must include as a minimum, a description of the work that will be done to facilitate closure of the *Site* and a schedule for completion of that work;

(b) The closure plan shall include the requirement of Condition 65 of this *Certificate*; and

(c) Within ten (10) days after closure of the *Site*, the *Municipality* shall notify the *Director* in writing that the *Site* has been closed in accordance with the approved Closure Plan.

P. *ORGANIC WASTE* AND *COMPOSTING SITE*

54. **Service Area, Approved Waste Types, Rates & Storage**
(1) The *Composting Site* may only accept solid non-hazardous residential, commercial, institutional or industrial *Organic Waste* from the Provinces of Ontario, limited to the following *Organic Waste*:

(a) Source-Separated *Organic Waste* limited to the following:

(i) food wastes: fruit, vegetable and general table scraps, meat and fish/shellfish products, dairy products, eggs and egg shells, herbs, nuts and seeds, sugar and spices, confectionery products, sauces, bones, pet food, bread, grains, rice, pasta, flour, coffee grounds and tea bags;
(ii) solidified cooking oils and cooked or raw grease and fats from residential sources only;
(iii) paper fibres: soiled paper towels, tissues, paper plates, coffee filters, soiled paper food packaging items such as boxboard, cardboard, newspaper, and other paper fibre packaging materials;
(iv) fresh flowers, houseplants and their soil, hair, pet fur, feathers and sawdust, wood shavings;
(v) ashes from residential sources only;
(vi) pet waste that is not collected or encased in a bag; and
(vii) pet litter box or bedding wastes, including the intermingled pet waste;

(b) *Organic Waste* from the industrial, commercial and institutional sources that produce or collect food wastes;

(c) *Leaf and Yard Waste;* and

(d) *Compost* overs as described in the supporting documentation listed in the attached Schedule "A".

(2) The *Composting Site* may accept the following *Amendment Materials*:

(a) straw and hay; and
(b) *brush*, *Clean Wood* and Clean Wood products.

(3) The *Composting Site* may accept the *wood waste* and the *waste wood*, as defined in this *Certificate*, for processing to undertake size reduction on the paved outdoor pad referred to as the Amendment, Recyclables, and Leaf and Yard Staging Area, described in documentation listed in the attached Schedule "A", for the purpose of subsequent transfer from the *Composting Site*.

(4) (a) The *Owner* shall not accept at the *Composting Site* any cooked or raw grease and fats from industrial, commercial and institutional sources;

(b) The *Owner* shall not accept at the *Composting Site* animal carcasses, used sanitary products and human body waste;

(c) The *Owner* shall not receive pet waste from commercial, institutional or industrial sources;

(d) The *Owner* shall not accept at the *Composting Site* any *Organic Waste* that is collected through a waste collection program that allows use of bags, except the waste that is generated in and collected by the City of Guelph and in accordance with Table 1 entitled "Proposed Phase-out of Plastic Bag Usage in Organics Collection" included in Item #40 of the attached Schedule "A";

(e) The *Owner* shall ensure that the *Organic Waste* collected in bags in accordance with restrictions specified above, is given priority in the processing and transfer to the *Composting* tunnels;

(f) The *Owner* shall ensure that the *Organic Waste* collected in bags in accordance with restrictions specified above, is transported directly from the collection route to the *Composting Site,* without any intermediate transfer step; and

(g) The *Owner* shall not accept at the *Composting Site* any waste that is classified as hazardous waste or liquid industrial waste in accordance with *O. Reg. 347*.

(5) The *Owner* is only approved to receive *Organic Waste* in quantities that are not to exceed:

(a) a maximum of 450 tonnes on a daily basis; and

(b) a maximum of 60,000 tonnes per year.

(6) The *Owner* is approved to store a maximum of 8,500 tonnes of waste at the *Composting Site* at any one time.

(7) All waste and *Amendment Materials* storage at the *Composting Site* is subject to the following limitations:

> (a) all unprocessed *Organic Waste* and the *Immature Compost* in various stages of curing and the *Finished Compost* shall be stored within the confines of the *Processing Building;*
>
> (b) the *leaf and yard waste,* the *waste wood*, the *wood waste* and the *Amendment Materials* may be stored outdoors on the paved pad referred to as the Amendment, Recyclables, and Leaf and Yard Staging Area, described in documentation listed in the attached Schedule "A";
>
> (c) all *Compost* shall be stored within the confines of the *Processing Building;*
>
> (d) all solid *residual waste (Processing Building)* shall be stored within the confines of the *Processing Building;* and
>
> (e) all solid *putrescible waste* generated through activities not relating to the handling and processing of *Organic Waste* (ie. office, lunch room, etc.) may be stored within the confines of the *Processing Building* and it shall be removed from the *Composting Site* as required in accordance with *O. Reg* 347 and the *EPA*.

(8) *Organic Waste* storage duration at the *Composting Site* is limited to the following:

> (a) The *Owner* shall ensure that the *Organic Waste,* excluding the *leaf and yard waste,* received at the *Composting Site* is incorporated into active *Composting* process no later than thirty six (36) hours from the time of its receipt;
>
> (b) The *Owner* shall ensure that the *Organic Waste* collected in bags in accordance with restrictions specified in this *Certificate*, is given priority in the processing and transfer to the *Composting* tunnels;
>
> (c) The *Owner* shall ensure that the *leaf and yard waste* storage duration shall not exceed seven (7) calendar days from the time of its receipt;
>
> (d) Notwithstanding provisions of Conditions 54.(8)(a) and (c), above, the *Owner* shall transfer all *Organic Waste* processed in the *Processing Building* into the *Composting* tunnels at the end of the operating day each Friday; and
>
> (e) The *Owner* shall not store the *residual waste (Processing Building),*at the Site in excess of fourteen (14) days from the date of its generation, or as directed by the *District Manager*.

(9) (a) The *Owner* shall ensure that all outside storage of the *leaf and yard waste,* the *wood waste,* the *waste wood* and the *Amendment Materials* is undertaken in a manner that does not cause an adverse effect or a hazard to the environment or any person; and

> (b) If in the opinion of the *District Manager*, the outside storage of the *leaf and yard waste,* the *wood waste,* the *waste wood* and the *Amendment Materials* results in odour complaint(s), the *Owner,* in consultation with the *District Manager* shall undertake appropriate steps, including reducing waste storage duration or the storage method, so that odour complaint(s) are eliminated.

(10) No outside waste storage of material from or for the Organic Waste Processing Facility other than the *leaf and yard waste,* the *waste wood,* the *wood waste* and the *Amendment Materials,* is approved under this Certificate."

(11) The *Owner* shall ensure that all *wood waste* and *waste wood* that has undergone size reduction at the Amendment, Recyclables, and Leaf and Yard Staging Area is segregated from the shredded *leaf and yard waste* and the *Amendment Materials* to prevent contamination of *Organic Waste* and *Amendment Materials* intended for the Composing Process.

(12) In the event that *Organic Waste* cannot be processed at the *Composting Site* in accordance with the requirements of this *Certificate*, the *Owner* shall cease accepting additional *Organic Waste* and shall remove all unprocessed *Organic Waste*

from the *Composting Site* in accordance with the procedures outlined in the *WRIC Environmental Emergency Plan*.

(13) All waste removed from the *Composting Site* shall be transferred to a waste disposal site for which a Provisional Certificate of Approval has been issued by the *Ministry* and the site is approved to receive this type and quantity of waste.

55. ***Composting Site*** **Security**
(1) The *Owner* shall ensure that all unloading and loading of waste and all *Organic Waste* processing activities at the *Composting Site* are at all times undertaken by *Trained Personnel.*

(2) The *Owner* shall ensure that the *Composting Site* is operated in a safe and secure manner, and that all waste is properly handled, packaged or contained and stored so as not to pose any threat to the general public and the *Composting Site* personnel.

56. ***Composting Site*** **Operations**

(1) The *Composting Site* is approved to operate within the following operating hours, subject to limitations of the local municipal by-laws:

Receipt and Removal of Waste from the Composting Site
(a) The *Owner* may only receive *Organic Waste* at the *Composting Site* and ship waste from the *Composting Site* between the hours of 7:00 a.m. and 6:00 p.m. Monday through Friday and between the hours of 8:00 a.m. and 4:00 p.m on Saturday;

Shipment of Compost from the Composting Site
(b) The *Owner* may only ship *Compost* from the *Composting Site* between the hours of 7:00 a.m. and 6:00 p.m. Monday through Friday and between the hours of 8:00 a.m. and 4:00 p.m on Saturday;

Processing Within the Processing Building
(c) The *Owner* may process the *Organic Waste* within the confines of the *Processing Building* twenty four (24) hours per day, seven (7) days per week;

Emergency Receipt of Waste
(d) The *Owner* may receive the *Organic Waste* at the *Composting Site* outside of the operating hours specified in sub-condition (a), above, on an emergency basis only;

(e) Within twenty four (24) hours from the emergency receipt of the *Organic Waste,* the *Owner* shall notify, in writing, the *District Manager* during regular business hours or verbally the Spills Action Centre, that the *Organic Waste* was received outside of the approved hours; and

(f) If in the opinion of the *District Manager,* the emergency receipt of the *Organic Waste* results in complaints, following the written notification from the *District Manager,* the *Owner* shall not receive the *Organic Waste* outside of the approved hours, until such time as the deficiencies causing complaints are rectified to the District Manager's satisfaction.

(2) **Incoming Waste/*Amendment Materials* receipt:**

(a) The *Owner* shall ensure that all unloading of the incoming *Organic Waste* at the *Composting Site*, takes place entirely within the confines of the *Processing Building;*

(b) Notwithstanding provisions of Condition 56.(2)(a), the *Owner* may unload the *leaf and yard waste,* the *wood waste,* the *waste wood* and the *Amendment Materials* outdoors on the paved pad referred to as the Amendment, Recyclables, and Leaf and Yard Staging Area, described in documentation listed in the attached Schedule "A";

(c) The *Owner* shall ensure that all loads of the incoming *Organic Waste,* excluding the *leaf and yard waste,* are accompanied by documentation containing the results of the required waste characterization as required by Condition 58.(2) or the identification of a pre-approved generator of waste as required by Conditions 58.(3)(b)

and 58.(3)(c);

(d) *Trained Personnel* shall inspect the required documentation prior to acceptance of the incoming *Organic Waste* at the *Composting Site;*

(e) The *Organic Waste* that has not been characterized in accordance with this *Certificate* or that is not accompanied by the required documentation shall not be accepted at the *Composting Site;*

(f) *Trained Personnel* shall visually inspect all incoming *Organic Waste* to ensure that only approved waste type is accepted at the *Composting Site;*

(g) The *Owner* shall only accept the incoming *Organic Waste* that is delivered in vehicles that have been approved by the *Ministry,* as required; and

(h) In the event that *Organic Waste* cannot be processed at the *Processing Building,* the portion of *Organic Waste* originating from the geographical area of the City of Guelph may be accepted at the *Waste Transfer Station* and may be stored for a maximum of 24-hours.

(3) ***Rejected Waste (Organic Composting Facility)*** **handling:**

(a) In the event that *Rejected Waste* is inadvertently accepted at the *Composting Site*, the *Owner* shall ensure that all *Rejected Waste:*

(i) is stored in a way that ensures that no adverse effects result from such storage;
(ii) is segregated from all other *Organic Waste;*
(iii) is handled and removed from the *Composting Site* in accordance with *O.Reg. 347* and the *EPA; and*
(iv) is removed from the *Composting Site* within three (3) days of its receipt or as acceptable to the *District Manager;*

(b) In the event that *Rejected Waste* is inadvertently accepted at the *Composting Site*, a record shall be made in the daily log book or in an electronic file of the reason why the waste was rejected and of the origin of the waste, if known; and

(c) i) *Rejected Waste* may be transferred to the *Waste Transfer Station* in a covered container; and

ii) In the event that *Rejected Waste* is transferred to the *Waste Transfer Station,*it shall be handled on a priority basis and removed from the *Waste Transfer Station* on the same day that the transfer of *Rejected* Waste occurred on.

(4) ***residual waste (Processing Building)*** **handling:**

(a) Subject to Condition 56 (4) (b), the *Owner* shall ensure that storage of all solid *residual waste (Processing Building)* resulting from processing of the *Organic Waste* at the *Composting Site* is undertaken within the confines of the *Processing Building;*

(b) i) *residual waste (Processing Building)*may be transferred to the *Waste Transfer Station* in a covered container; and

ii) In the event that *residual waste (Processing Building)* is transferred to the *Waste Transfer Station,* it shall be handled on a priority basis and removed from the *Waste Transfer Station* on the same day that the transfer of *residual waste (Processing Building)* occurred on.

(5) **Waste Processing:**

(a) The *Owner* shall ensure that all *Organic Waste* preprocessing, other than the activities approved under

Condition 56.(5)(c)(i), all *Organic Waste Composting*, all *Immature Compost* screening and curing and all *Finished Compost* screening are undertaken within the confines of the *Processing Building;*

(b) The *Owner* shall segregate the *Immature Compost* at various stages of curing until all *Compost* quality criteria specified in this *Certificate* are tested for and met; and

(c) (i) *Brush*, *Clean Wood* and clean wood products, *wood waste* and *waste wood* may undergo size reduction by shredding, grinding and/or chipping using *Ministry* approved equipment on the outdoor paved pad referred to as the Amendment, Recyclables, and Leaf and Yard Staging Area, described in documentation listed in the attached Schedule "A"; and

(ii) The *Owner* shall take precautions to ensure that size reduction activities do not cause a nuisance or impact including by limiting the hours of operation and/or refraining from carrying out size reduction during days with unfavourable meteorological conditions.

(6) **Odour Control:**

(a) The *Owner* shall maintain a negative air pressure atmosphere within the *Processing Building,* as compared to the ambient atmospheric pressure, at all times;

(b) The *Owner* shall ensure that the outside loading bay doors into the *Processing Building* are kept fully closed at all times except to permit the entry or exit of maintenance and waste and *Compost* transportation vehicles;

(c) The *Owner* shall ensure that the outside loading bay doors of the Receiving Area of the *Processing Building* are equipped with the air curtains, as described in the documentation of the attached Schedule "A", and that these air curtains are installed and maintained in accordance with the recommendations of the equipment manufacturer;

(d) The *Owner* shall ensure that, at all times, the air from the *Processing Building* is exhausted through an appropriate *Air Pollution Control Equipment* approved by the *Ministry* in the *Certificate of Approval (Air/Noise);*

(e) If in the opinion of the *District Manager,* the fugitive air emissions originating from the *Processing Building* result in odour complaint(s), the *Owner* shall implement modifications to the *Processing Building* as proposed in the *WRIC Environmental Emergency Plan,* within the time frame acceptable to the *District Manager;*

(f) The *Owner* shall ensure that no equipment handling *Organic Waste* or their storage containers are kept outside, unless they have been washed to prevent odours; and

(g) (i) Prior to the receipt of *Organic Waste* at the *Composting Site*, the *Owner* shall undertake an appropriate test to confirm the integrity of the *Processing Building* containment;

(ii) This test shall be undertaken in accordance with the test protocol prepared in the consultation with and approved by the *District Manager;* and

(iii) This test shall be repeated as directed or agreed by the *District Manager.*

57. **Equipment and *Composting Site* Inspections & Maintenance**

(1) Prior to receipt of any *Organic Waste* at the *Composting Site*, the *Owner* shall prepare a comprehensive written inspection program which includes inspections of all aspects of the *Composting Site's* operations including the following:

(a) *Processing Building* including all outside bay doors, the *Air Pollution Control Equipment* and the presence of rust on metal surfaces within the confines of the *Processing Building;*

(b) on-*Site* roads for presence of leaks and drips from the waste delivery trucks;
(c) presence of excessive fugitive dust emissions from the on-*Site* roads;
(d) on and off-*Site* litter; and
(e) presence of vector and vermin.

(2) The inspections are to be undertaken daily by *Trained Personnel* in accordance with the inspection program to ensure that all equipment and facilities at the *Composting Site* are maintained in good working order at all times and that no negative impacts are occurring as a result of the *Organic Waste* management operations at the *Composting Site.* Any deficiencies detected during these regular inspections must be corrected as soon as reasonable.

(3) The *Owner* shall develop and implement a preventative maintenance program for all equipment associated with the processing and managing of *Organic Waste* at the *Composting Site* and with control of odour and dust emissions. The preventative maintenance program shall be maintained up-to-date and shall be available for inspection by a *Provincial Officer* upon request.

58. **Quality Criteria, Testing & Monitoring**

(1) **Cross-Contamination Prevention**

(a) The *Owner* shall ensure that the incoming *Organic Waste* is kept separate and does not come in contact with the *Immature Compost* / the *Finished Compost* and the *Compost* except where the *Immature Compost* / the *Finished Compost* and the *Compost* are being fed back into the *Composting* process; and

(b) The *Owner* may use the equipment utilized in processing of the incoming *Organic Waste* to process the *Immature Compost* / the *Finished Compost* and the *Compost* provided that the equipment has been cleaned, in accordance with the procedures described in documents listed in the attached Schedule "A", to prevent the *Immature Compost* / the *Finished Compost* and the *Compost* from being contaminated by the incoming *Organic Waste.*

(2) **Quality Control Monitoring of the *Organic Waste* at the generator site:**

(a) Prior to being accepted at the *Composting Site* for the first time, the incoming *Organic Waste* from a new source/stream shall be characterized in accordance with the *Ministry's* regulatory requirements for sampling and testing to ensure that the incoming *Organic Waste* complies with the quality criteria specified in this *Certificate*. The incoming *Organic Waste* may be considered a pre-approved waste source/stream once the incoming *Organic Waste* meets the required quality criteria and has been classified as such by the *Owner;* and

(b) The incoming *Organic Waste* shall be re-characterized following any process changes, operational issues or other factors that may affect the quality of the incoming *Organic Waste* from the pre-approved source/stream.

(3) **Quality Control Monitoring of the *Organic Waste* at the *Composting Site*:**

(a) The *Owner* shall not accept for *Composting* any individual *Organic Waste* source or an additive necessary for *Composting* that exceeds the following quality parameters set out in "Schedule B" of this *Certificate:*

(i) trace elements; and
(ii) organic chemicals;

(b) (i) Notwithstanding requirements from Condition 58.(2), the *Owner* shall conduct quality control monitoring of the incoming *Organic Waste* from each source/stream, except the *leaf and yard waste;* and

(ii) The *Owner* sample and analyze the incoming *Organic Waste* weekly; and

(c) (i) For the incoming *Organic Waste* from a particular source/stream with consistent quality as demonstrated through a minimum of four (4) analytical events spaced over a minimum of four (4) weeks, the *Owner* may reduce the sampling frequency to once every two (2) months; and

(ii) A minimum of seven (7) business days prior to the change in the *Organic Waste* sampling frequency, as permitted by Condition 58.(3)(b)(ii), the *Owner* shall submit a written notification of the proposed change to the *District Manager*.

Compost Quality Criteria

(4) The *Finished Compost* is considered to be *Compost* when it meets the following *Compost* quality criteria:

(a) *Compost* quality criteria set out in Schedule "B" of this *Certificate*; and

(b) curing duration of a minimum of twenty one (21) days and compliance with one (1) of the following three (3) maturity criteria:

(i) the respiration rate is less than, or equal to, 400 milligrams of oxygen per kilogram of volatile solids (or organic matter) per hour; or

(ii) the carbon dioxide evolution rate is less than, or equal to, 4 milligrams of carbon in the form of carbon dioxide per gram of organic matter per day; or

(iii) the temperature rise of the *Compost* above ambient temperature is less than $8^{O}C$.

Quality Control Monitoring of _Finished Compost_

(5) As a minimum, the *Owner* shall conduct quality control monitoring of the *Finished Compost* as follows:

(a) a composite sample, consisting of a minimum of ten (10) representative grab samples, shall be collected for every 500 tonnes of the *Finished Compost* produced during the first four (4) months of operation;

(b) following the first four (4) months of operation, a composite sample, consisting of a minimum of ten (10) representative grab samples, shall be collected every two (2) months representing all *Compost* generated within the preceding sixty (60) days or every 5,000 tonnes of the *Finished Compost,* whichever comes first;

(c) if non-compliance with the *Compost* quality criteria has taken place during three (3) consecutive sampling events, the *Owner* shall sample and test the *Finished Compost* in accordance with Condition 58.(5)(a) until compliance with the *Compost* criteria is demonstrated again; and

(d) all composite samples shall be analyzed for the parameters listed in Schedule "B".

Enhanced Pathogen Testing

(6) (a) As a minimum, the *Owner* shall conduct an enhanced pathogen quality control monitoring of the *Finished Compost* as follows:

(i) a composite sample, consisting of a minimum of ten (10) representative grab samples, shall be collected and tested for every 500 tonnes of the *Finished Compost;* and

(b) Prior to any change in the pathogen testing program, the *Owner* shall submit a minimum of one (1) year of the testing data that demonstrates compliance with the pathogens *Compost* quality criteria to the *District Manager*. This testing data shall be cross-referenced with the pasteurization temperature monitoring data required to be collected in Condition 58.(10).

Sampling And Testing Methods

(7) All sampling and testing required in this *Certificate* for the purpose of verifying compliance with the *Compost* quality criteria from Condition 58.(4) shall be undertaken in compliance with the document entitled “National Standard of Canada CAN/BNQ 0413-200/2005 Organic Soil Conditioners – Composts”, dated 2005, as amended.

Non-compliance with Compost Quality Criteria

(8) (a) The *Finished Compost* is classified as waste until sampling/testing required by this *Certificate* demonstrates that all *Compost* quality criteria specified in this *Certificate* are met;

(b) (i) The *Finished Compost* that does not meet the pathogen criteria from Schedule "B" and/or non-biodegradable matter criteria from Condition 58.(4) shall be moved back to the aerobic *Composting* tunnels for re-processing;

(ii) Should the *Finished Compost* consistently exceed the pathogen criteria set out in Schedule "B", as demonstrated by three (3) sampling/testing events, the *Owner,* in consultation with the *District Manager*, shall implement appropriate modifications to the *Composting* process to ensure consistent destruction of pathogens;

(iii) The *Finished Compost* that does not meet the maturation criteria from Condition 58.(4) shall be re-tested and shall not be removed from the Maturation Area of the *Processing Building* until the maturation criteria are met;

(iv) The *Finished Compost* that does not meet the trace elements and/or organic chemicals criteria from Schedule "B" shall be kept segregated from all other waste and from the *Compost* and shall be handled as waste; and

(v) The *Finished Compost* that continues to be classified as waste shall be handled and be disposed of in accordance with *O. Reg. 347* and the *EPA*.

Process Monitoring
(9) The *Owner* shall ensure that the following process parameters are monitored:

(a) temperature of the *Composting Organic Waste* in the *Composting* tunnels, as proposed in documentation in the attached Schedule "A";
(b) temperature of the headspace air in the *Composting* tunnels, as proposed in documentation in the attached Schedule "A";
(c) inlet air temperature;
(d) outlet air temperature;
(e) relative humidity in the *Composting* tunnels;
(f) air flow into the tunnels;
(g) oxygen content in the air; and
(h) temperature of the *Immature Compost* in the curing piles.

Compliance With *Composting* Process Operating Parameters
(10) (a) The *Owner* shall ensure that the *Organic Waste Composting* in the *Composting* tunnels, is maintained at a minimum pasteurization temperature of 55^{O}C for a minimum of seventy two (72) hours, in accordance with the documentation listed in attached Schedule "A", to ensure complete inactivation of pathogens in the *Composting Organic Waste;*

(b) As a minimum, two (2) temperature probes shall monitor the required pasteurization temperature within the *Composting Organic Waste* and three (3) temperature probes shall monitor the headspace air temperature of each *Composting* tunnel;

(c) The pasteurization temperature measurements within the *Composting Organic Waste* must be taken one (1) metre inside the *Composting* stockpile mass; and

(d) Should temperature monitoring show that the required pasteurization temperature has not been achieved, the *Composting* process must be continued until the above requirement has been met.

Temperature Monitoring Within the Curing Stockpiles
(11) As a minimum, the *Owner* shall monitor the temperature of the *Immature Compost* within the curing stockpiles weekly. The measurements shall be taken one (1) metre inside the curing stockpile mass and at points sufficient to provide a temperature profile of the *Immature Compost*.

(12) The *Owner* shall not start the curing process duration countdown until the temperature monitoring required by Condition 58.(11), above, demonstrates that the temperature of the *Immature Compost* in the Maturation Area does not exceed 50 ^{O}C.

Odour Monitoring Program
(13) A minimum of ninety (90) days prior to any *Organic Waste* being received at the *Composting Site,* the *Owner* shall prepare and submit to the *District Manager* an Odour Monitoring Program. The Odour Monitoring Program shall be designed to detect and identify any odours originating from the operation of the *Composting Site* which may cause nuisance impacts. The Odour Monitoring Program shall include a description of the equipment and inspection protocol to ensure that negative pressure is maintained at all times throughout the *Processing Building.* The Odour Monitoring Program shall be implemented after written concurrence from the *District Manager* has been received. In the future, should it be necessary to modify the approved Odour Monitoring Program written authorization of the *District Manager* is required.

59. **Nuisance Impact Control & Housekeeping**

(1) The *Owner* shall ensure that all vehicles that have delivered *Organic Waste* to the *Composting Site* are not leaking or dripping waste when leaving the *Composting Site*.

(2) The *Owner* shall ensure that the exterior of all trucks delivering *Organic Waste* to the *Composting Site* is cleaned prior to leaving the *Composting Site,* as needed, to prevent odours. Truck washing shall occur only in the dedicated wash down area of the *Processing Building***.**

(3) Should the *Owner* become aware that the truck(s) delivering waste to the *Composting Site* have leaked waste or wastewater on the municipal roadways, the *Owner* shall immediately submit a written and/or verbal notification to the owner of the leaking vehicle(s).

(4) The *Owner* shall:

(a) take all practical steps to prevent the escape of litter from the *Composting Site;*
(b) pick up litter around the *Composting Site* on a daily basis, or more frequently if necessary; and
(c) if necessary, erect litter fences around the areas causing a litter problem.

(5) Prior to the receipt of any *Organic Waste* at the *Composting Site,* the *Owner* shall:

(a) implement necessary housekeeping procedures to eliminate sources of attraction for vermin and vectors; and
(b) hire a qualified, licensed pest control professional to design and implement a pest control plan for the *Composting Site.* The pest control plan shall remain in place, and be updated from time to time as necessary, until the *Composting Site* has been closed and this *Certificate* has been revoked.

(6) The *Owner* shall ensure that all *Composting Site* roads and operations / yard areas are regularly swept / washed to prevent dust impacts from the *Composting Site*.

(7) The *Owner* shall store all *Compost* within the confines of the *Processing Building.*

(8) The *Owner* shall regularly clean and disinfect, if necessary, all equipment and storage areas that are used to handle and process waste at the *Composting Site*.

60. **Operations Manual & Staff Training**

(1) The *Owner* shall prepare an Operations Manual for use by the *Composting Site* personnel. The Operations Manual shall contain the following:

(a) outline the responsibilities of the *Composting Site* personnel;
(b) personnel training protocols;

(c) waste receiving and screening procedures;
(d) unloading, handling and storage procedures;
(e) waste processing and process monitoring procedures;
(f) sampling and testing procedures;
(g) *Composting Site* inspections and recording procedures;
(h) the emergency response procedures; and
(i) procedure for handling complaints as described in the *Certificate of Approval (Air/Noise)* for this *Composting Site.*

(2) A copy of this Operations Manual shall be kept at the *Composting Site,* must be accessible to personnel at all times and must be updated, as required.

(3) (a) All employees of the *Composting Site* shall be trained with respect to the following, as it is relevant to the employee's position:

(i) terms, conditions and operating requirements of this *Certificate*;
(ii) operation and management of the *Site,* or area(s) within the *Composting Site,* as per the specific job requirements of each individual employee, and which may include procedures for receiving, screening and identifying waste, refusal, handling, processing and temporarily storing wastes;
(iii) an outline of the responsibilities of the *Composting Site* employees including roles and responsibilities during emergency situations;
(iv) the *WRIC Environmental Emergency Plan*, including exit locations and evacuation routing, and location of relevant equipment available for emergency situations;
(v) environmental, and occupational health and safety concerns pertaining to the wastes to be handled;
(vi) emergency first-aid information;
(vii) relevant waste management legislation and regulations, including the *EPA* and *O. Reg. 347*;
(viii) recording procedures as required by this *Certificate*;
(ix) equipment and *Composting Site* inspection procedures, as required by this *Certificate*;
(x) nuisance impact control & housekeeping procedures, as required by this *Certificate*; and
(xi) procedures for recording and responding to public complaints as required by the *Certificate of Approval (Air/Noise)* for this *Composting Site.*

(4) The *Owner* shall ensure that all employees are trained in the requirements of this *Certificate* relevant to the employee's position:

(a) upon commencing employment at the *Composting Site* in a particular position;
(b) whenever items listed in Condition 60.(1) are changed; or
(c) during the planned three (3)-year refresher training.

61. ***Environmental Emergency Plan (Composting Facility)***

(1) The emergency response and contingency planning measures for the *Composting Site* that are required by Condition 45(a)(vi) shall include, as a minimum, the following information:

(a) procedures and actions to be taken should the incoming *Organic Waste* not meet the quality criteria specified by this *Certificate*;
(b) procedures and actions to be taken should the composted *Organic Waste* fail to meet the compost quality criteria specified by the *Certificate*;
(c) procedures and actions to be taken should the occurrence of the complaints require the *Owner* to suspend the waste processing activities at the *Composting Site;*
(d) modifications to the *Processing Building* and the implementation schedule should the fugitive odour emissions originating from the *Processing Building* result in odour complaints;
(e) procedures and actions to be taken should a long term power failure at the *Composting Site* or a suspension of waste processing activities require a phased *Re-Start-up* of operations; and
(f) procedures to be taken should it be necessary for the *Owner* to remove the unprocessed *Organic Waste* from the *Composting Site.*

(2) The emergency response and contingency planning measures for the *Composting Site* that are required by Condition 45(a)(vi) shall be prepared in consultation with the *District Manager,* the local Municipality and the Guelph Fire Department.

(3) As is required by Condition 45(c) of this Certificate, no waste shall be received at the *Composting Site* for storage or processing until the *District Manager* provides a written concurrence to the Plan.

62. **Emergency Response and Reporting**

(1) The *Owner* shall immediately take all necessary measures, as outlined in the applicable *WRIC Environmental Emergency Plan*, to handle the emergency situations occurring at the *Composting Site* and/or *Re-Start-up* of operations.

(2) The *Owner* shall ensure that the equipment and materials outlined in the applicable *WRIC Environmental Emergency Plan* are immediately available at the *Composting Site* at all times and are in a good state of repair and fully operational.

(3) The *Owner* shall ensure that all *Composting Site* personnel are fully trained in the use of the equipment and materials outlined in the applicable *WRIC Environmental Emergency Plan*, and in the procedures to be employed in the event of an emergency.

(4) All Spills, as defined in the *EPA*, shall be immediately reported to the ***Ministry's*** **Spills Action Centre at 1-800-268-6060** and shall be recorded in the log book as to the nature and cause of the spill, and the action taken for clean-up, correction and prevention of similar future occurrences.

(5) Should a Spill, as defined in the *EPA,* occur at the *Composting Site,* in addition to fulfilling the requirements from the *EPA,* the *Owner* shall submit to the *District Manager,* a written report within three (3) calendar days outlining the nature of the Spill, remedial measure taken and the measures taken to prevent future occurrences at the *Composting Site.*

63. **Records Keeping**

Daily Activities

(1) The *Owner* shall maintain an on-*Site* written or digital record of activities undertaken at the *Composting Site.* All measurements shall be recorded in consistent metric units of measurement. The record shall include, as a minimum, the following information:

(a) date, quantity, source and type of the *Organic Waste,* (including any analytical data), received at the *Composting Site;*
(b) date, quantity, type and the destination of the *Compost,* transferred from the *Composting Site;*
(c) date, quantity, type and the destination of the *residual waste,* transferred from the *Composting Site* for final disposal;
(d) date, quantity, type and the destination of the *Rejected Waste,* transferred from the *Composting Site;*
(e) pre-Composting and post-Composting processing activities undertaken at the *Composting Site;*
(f) tunnel loading / unloading activities and number of *Composting* tunnels actively undergoing *Composting*;
(g) amount of the *Immature Compost* transferred from the *Composting* tunnels to the curing area;
(h) housecleaning activities, including litter collection, floor and equipment washing;
(i) loss of negative pressure within the *Processing Building* and the activities undertaken to restore the required negative pressure; and
(j) results of the hydrogen sulphide and ammonia monitoring required by the *Certificate of Approval (Air/Noise)* for this *Composting Site.*

Monitoring Records

(2) (a) The *Owner* shall establish and maintain a written or digital record of all monitoring activities at the *Composting Site* as required by this *Certificate* and the *Certificate of Approval (Air/Noise)* for this *Composting Site;* and

(b) The *Owner* shall establish and maintain a tracking system that tracks the pasteurization temperature measurements from the *Composting* tunnels and the testing results from the enhanced pathogen testing required by this *Certificate*. This tracking system shall include, as a minimum, the following information:

(i) identification of the *Composting* tunnel used for the purpose of the *Organic Waste* pasteurization;
(ii) the in-waste and the headspace temperature during the *Composting Organic Waste* pasteurization cycle, as required by this *Certificate*; and
(iii) the results of the pathogen testing, as required by this *Certificate*.

Emergency Situations
(3) The *Owner* shall maintain an on-*Site* written or digital record of the emergency situations. The record shall include, as a minimum, the following:

(a) the type of an emergency situation;
(b) description of how the emergency situation was handled;
(c) the type and amount of material spilled, if applicable;
(d) a description of how the spilled material was cleaned up and stored, if generated; and
(e) the location and time of final disposal, if applicable.

Inspections
(4) The *Owner* shall maintain an on-*Site* written or digital record of inspections as required by this *Certificate*. The record shall include, as a minimum, the following:

(a) the name and signature of the *Trained Personnel* that conducted the inspection;
(b) the date and time of the inspection;
(c) the list of any deficiencies discovered;
(d) the recommendations for remedial action; and
(e) the date, time and description of actions taken.

Training
(5) The *Owner* shall maintain an on-*Site* written or digital record of training as required by this *Certificate*. The record shall include, as a minimum, the following:

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

Sampling & Testing Records
(6) The *Owner* shall establish and maintain a written or digital record of all sampling and testing activities at the *Composting Site.* This record shall include, as a minimum, the following information:

(a) waste sampled, sample collection locations and volume collected;
(b) day and time of collection;
(c) sample handling procedures;
(d) parameters tested for and the resulting concentrations;
(e) name of the laboratory facility conducting the testing; and
(f) conclusions drawn with respect to the results of the testing.

Complaints Response Records
(7) The *Owner* shall establish and maintain a written or digital record of complaints received and the responses made as required by the *Certificate of Approval (Air/Noise)* for this *Composting Site.*

Annual Report
(8) By March 31st following the end of each operating year, the *Owner* shall prepare and submit to the *District Manager,* an Annual Report summarizing the operation of the *Composting Site* covering the previous calendar year. This Annual Report shall include, as a minimum, the following information:

(a) a monthly mass balance of the *Organic Waste* received, processed and transferred from this *Composting Site,* including waste type, quantity, sources and/or disposal destinations;
(b) an annual summary mass balance of the *Organic Waste,* the *wood waste,* the *waste wood* and the Amendment Material received, processed and transferred from this *Composting Site,* including waste type, quantity, sources and/or disposal destination;
(c) an annual summary of any deficiencies, items of non-compliance or process aberrations that occurred at this *Composting Site* and any remedial / mitigative action taken to correct them;
(d) a descriptive summary of any spills, *incidents* or other emergency situations which have occurred at this *Composting Site,* any remedial measures taken, and the measures taken to prevent future occurrences;
(e) a summary describing any *Rejected Waste* including quantity, waste type, reasons for rejection and origin of the *Rejected Waste;*
(f) the quantity, by weight and volume of *Compost* and residues produced and the quantity of *Compost* and residues removed from the facility;
(g) any environmental and operational problems, that could negatively impact the environment, encountered during the operation of the *Composting Site* or identified during the facility inspections and any mitigative actions taken;
(h) any changes to the *WRIC Environmental Emergency Plan*, the Operations Manual or the Closure Plan that have been approved by the *Director* since the last Annual Report;
(i) any recommendations to minimize environmental impacts from the operation of the *Composting Site* and to improve *Composting Site* operations and monitoring programs in this regard;
(j) a summary of any complaints received and the responses made, as required by the *Certificate of Approval (Air/Noise)* for the *Composting Site;*
(k) a description of the *Compost* distribution/markets;
(l) conclusions from the enhanced pathogen testing as the results relate to the pasteurization temperature monitoring; and
(m) a condition-by-condition analysis of compliance with all Conditions of this *Certificate*.

64. **Wastewater Management**
(1) The *Owner* shall ensure that all wastewater generated within the *Processing Building* is:

(a) contained within the *Processing Building* and the storage tanks approved by this *Certificate*;
(b) collected in the sufficiently designed wastewater storage facilities; and
(c) either utilized in the process or discharged to the sanitary sewer or disposed of at a *Ministry* approved site.

(2) The *Owner* shall regularly empty, clean and disinfect if necessary, all sumps or wastewater storage/holding areas that are used to contain and collect the wastewater generated within the *Processing Building.*

(3) The *Owner* shall ensure that only uncontaminated water is used to irrigate the *Composting Organic Waste* after the *Composting Organic Waste* has completed the pasteurization phase of the *Composting* Process.

(4) The *Owner* shall ensure that the impermeable membrane under the *Processing Building* is installed in accordance with the manufacturer specifications to ensure its integrity and effectiveness as a wastewater leak barrier.

65. **Closure Plan**

(1) (a) The *Owner* shall submit, for approval by the *Director,* a written Closure Plan for the *Composting Site* at least six (6) months prior to closure of the *Composting Site.* This plan shall include, as a minimum, a description of the work that will be done to facilitate closure of the *Composting Site* and a schedule for completion of the required work; and

(b) Within ten (10) days after closure of the *Composting Site,* the *Owner* shall notify the *Director,* in writing, that the *Composting Site* is closed and that the *Composting Site* Closure Plan has been implemented.

66. ***Ministry's*** **Supplementary Requirements**

Unless otherwise specified by the conditions of this *Certificate*, the *Owner* shall comply with the requirements of the *Ministry's* document entitled "Interim Guidelines for the Production and Use of Aerobic Compost in Ontario", dated November 2004, as amended.

67. **Q. LIMITED OPERATIONAL FLEXIBILITY – Design, Operation and Management**

(1) The *Owner* may make *Modifications* to the *Material Recovery Facility* (*MRF*), and the *Waste Transfer Station* and the Design and Operations Reports for the *Material Recovery Facility* and the *Waste Transfer Station* in accordance with this *Certificate* and the pre-approved changes of the *Operating Envelope* as described in the *Engineer's Report* that is identified in Item 52 of Schedule "A".

(2) For greater certainty, the follow are *Modifications* that would be allowed at the *MRF* or the Transfer Station:

1) The following *Modifications* to the *infrastructure;* i) replacement of truck doors;
ii) the installation of a coverall building to house a maximum of 1000 tonnes of recyclable wastes; iii) movement or *Modifications* to the staging area for recyclable materials; iv) additional outdoor storage of recyclable materials in staging area on an asphalt
pad;
v) landscaping changes; vi) on-*Site* roadway changes; vii) relocation of scales;
viii) Installation of additional parking stalls and/or rearrangement of parking
areas; ix) Installation or *Modifications* to lighting; x) Construction of a facility for the collection and distribution of reusable items
xi) installation or *Modifications* to signage;
xii) changes to improve the working environment for the employees within the *MRF* or Transfer Station such as installation or improvements to heating units, air conditioning units, air handling units, odour control systems or dust control systems as long as such changes would occur within the building and would not adversely effect the surroundings environment and would not require an application for a Section 9 Certificate of Approval; and

2) The ability to make *Modifications* to the *Site's* processing operations and equipment to improve the efficiency and effectiveness of the operation of the Waste Transfer Site or the Municipal Recycling Facility such as:

i) *Modifications* or repairs to the building and its facilities including walls, floors, pits, roof, doors, plumbing, and electrical;
ii) The installation or replacement of recycling or transfer plant equipment such as balers, conveyors, separation equipment, and compactors;
iii) Addition or replacement of mobile equipment for use of the *Waste Transfer Station* or the Municipal Recycling Facility; and
iv) relocation and modification of maintenance and waste processing operations inside the building used for the *Waste Transfer Station* or the Municipal Recycling Facility.

(3) For greater certainty, the following *Modifications* to the *Site* are not permitted as part of the *Operating Envelope:*

i) Any changes to the *MHSW;*
ii) Any changes to the *Organic Waste* Processing Facility;
iii) *Modifications* to the type of waste accepted at the *Site*;
iv) *Modifications* to the storage capacity of the *Waste Transfer Station* or the Municipal Recycling Facility;
v) extending the *Site* onto adjacent lands;
vi) changing the function of the approved operations of the *MRF* and the *Waste Transfer Station*;
vii) accepting hazardous waste, liquid industrial waste, or municipal or industrial sewage;
viii) changes to the *Site* not identified in the *Engineer's Report;* or
ix) changes to the *Site* that have requirements under the Environmental Assessment Act.

(4) The *Owner* shall provide a written notification to the *District Manager* and *Director* at least fifteen (15) days prior to

making *Modifications* to the *Site* in accordance with 67(1) At a minimum the notification shall include the following:

(1) a description of the change to the operations of the *Site* including an assessment of the anticipated environmental effects of the *Modifications;*

(2) updated versions of, or amendments to, all relevant technical documents required by this *Certificate* that are affected by the Modification including but not necessarily limited to an updated *Site* Plan drawing, Design and Operations Report, the Emergency Response, Spill Reporting and Contingency Plan and the Closure Plan including a document control record that tracks all changes that were made to the documents; and

(3) a statement signed by the *Owner* and an *Independent Professional Engineer* declaring that the *Modifications* made to the *Site* are done so in accordance with the *Operating Envelope,* are consistent with industry's best management practices and are not likely to result in an adverse effect.

(5) Notwithstanding Condition 67(4), if the *Modifications* made to the *Site* require an amendment to the *WRIC Environmental Emergency Plan*, the *Owner* shall obtain the authorization of the local fire services authority prior to instituting the *Modifications.* A copy of the approved plan must be forwarded to the *District Manager* within fifteen (15) days of such approval.

68. **Design and Operations Report**

(1) The Design and Operations Reports shall be retained at the *Site*; kept up to date; and be available for inspection by *Ministry* staff. The Design and Operations Report shall contain at a minimum the information specified for a waste processing site as described in the most recent version of the *Ministry* publication "Guide for Applying for Approval of Waste Disposal Site".

(2) The *Owner* may amend the *Current Design and Operations Reports* for the *MRF* and the *Waste Transfer Station* in accordance with Condition 67(1) of this *Certificate*.

(3) Changes to the Design and Operations Reports, with the exception of changes made under Condition 67(1), shall be submitted to the *Director* for approval.

(4) If the *Owner* has made *Modifications* to the *Site* in accordance with Condition 67(1), the *Owner* shall ensure that the *Site* is built, operated and maintained in accordance with the *current Design and Operations Report*.

(5) The *Owner* shall maintain a document control record at the *Site* that tracks all changes that are made to the Design and Operations Report.

(6) The *Owner* may accept any solid Municipal Waste at the *Site* if the *Owner* has received written notification from a *Ministry* employee appointed for the purposes of Section 31 of the EPA, including the *Director* and *District Manager,* advising the *Owner* that the waste may be received to alleviate an emergency described in Section 31 of the EPA.

SCHEDULE "A"

This Schedule "A" forms part of this Certificate.

1. Applications for a Certificate of Approval for a Waste Disposal Site (Processing & Transfer) dated August 27, 1991, September 10, 1993, and January 2, 2007 and supporting documentation submitted therewith.

2. Applications for Certificate of Approval for a Waste Disposal Site (Processing & Transfer) submitted on April 4, 2008, February 24, 2009, October 22, 2009 and January 12, 2010 by Bill Shields, Supervisor, Governance & Compliance, City of Guelph Solid Waste Resources Division, including the Report, dated October 2009 and prepared by Golder Associates Ltd.and all other supporting documentation.

3. Applications for a Provisional Certificate of Approval for a Waste Disposal Site dated January 30, 2002 and February 1, 2005 signed by Cathy Smith, Manager, Solid Waste Resources Division, Corporation of the City of Guelph and other

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supporting documentation.

4. Application for a Provisional Certificate of Approval for a Waste Disposal Site signed by Janet Laird, Director of Environmental Services, City of Guelph, dated February 17, 2006.

5. Plume Visibility Study, Wet/Dry Processing Facility, Guelph, Ontario dated November 20, 1991.

6. Evaluation of Potential Birds Hazards to Aircraft Safety Associated with the City of Guelph's Proposed Wet/Dry Recycling Facility Adjacent to the Guelph Air Park, dated March 5, 1992.

7. Letter from Mr. Dean Wyman, Manager, Solid Waste Resources Division, City of Guelph, to EAAB, dated June 12, 2006 requesting amendments to Certificate of Approval No. 9241-5DTRD9 and providing the rationale for the proposed amendments.

8. Letter to E. Gill, Ministry of Environment from K.J. Bull, City of Guelph, dated December 18, 1992 and additional information submitted therewith including the document "City of Guelph Hazardous Waste Facility Operation Manual" dated December 1992.

9. Letter and supporting documentation dated April 4, 1994, to Mr. H. M. Wong, Ontario Ministry of Environment and Energy from Mr. Richard Cave, R. Cave and Associates Ltd.

10. Letter date March 31, 1995 to the Ministry of Environment and Energy, Cambridge *District Office* from R.D. Funnell, P.Eng., City Engineer, re: Wet-Dry Recycling Centre - Annual Report.

11. Letter dated May 16, 1995 to Dave Ross, Ministry of Environment and Energy, from R.D. Funnell, P.Eng., City Engineer, RE: City of Guelph's Application to Amend Provisional Certificate of Approval No. A170128 for Waste Disposal Site (Processing) with the attached Application for an Approval of Waste Disposal Site dated May 17, 1995.

12. Letter dated December 30, 1996, to Mr. H. Wong, Ministry of Environment and Energy, West Central Region from R.D. Funnell, P.Eng., Director of Works, RE: Amendments to Certificate of Approval (Waste Disposal) No. A170128 for the City of Guelph's Wet-Dry Recycling Centre, including application dated December 31, 1996 and supporting documentation.

13. Letter dated July 14, 1997 to Mr. Hardy Wong, Director, West Central Region from Jutta Siebel, Wet-Dry Residential Coordinator, RE: City of Guelph's Wet-Dry Recycling Centre Certificate of Approval No. A170128.

14. Letter and application from Janet Laird, Manager of Solid Waste Services, City of Guelph to G. Carpentier, MOE dated April 3, 1998 re: Amendment to Certificate of Approval A170128.

15. Letter from Jutta Siebel, Wet-Dry Residential Coordinator, City of Guelph to G. Carpentier, dated May 4, 1998 re: Public Consultation and Analytical Data.

16. The covering letter from Ms. J. Laird, Manager of Solid Waste Services, City of Guelph to Mr. G. Carpentier, MOE, dated May 27, 1998 with attachments:

(a) Application for approval of a waste disposal site.
(b) Public consultation process for amendments to Certificate of Approval No. A170128.

17. The covering letter from Ms. J. Laird, to Mr. G. Carpentier, dated June 19, 1998 with attachments:

(a) Waste acceptance policy at the wet-dry recycling centre;
(b) Section 2.9 "Penalties for Improper Disposal" from the "A Guide for Solid Waste Disposal at Eastview Sanitary Landfill Site and the Wet-Dry Recycling Centre";
(c) Contingency plan for "odourous" wet/organic waste received at the wet-dry recycling centre.

18. Letter and application from Janet Laird, Manager of Solid Waste Services, City of Guelph, to G. Carpentier, MOE, dated October 26, 1998, re: Amendment to Provisional Certificate of Approval A170128.

19. Facsimile from Jutta Siebel, Wet-Dry Residential Coordinator, City of Guelph, to Stephen Rouleau, MOE, dated January 13, 1999, re: Copper and Mercury Levels in Compost.

20. Facsimile from Jutta Siebel, Wet-Dry Residential Coordinator, City of Guelph, to Stephen Rouleau, MOE, dated January 15, 1999 re: Copper and Mercury Levels in *leaf and yard waste.*

21. Letter and application from Janet Laird, Manager of Solid Waste Services, City of Guelph, to Adam Ciulini, MOE, dated February 12, 1999, re: Rationale for Amendment.

22. Memorandum from Adam Ciulini, MOE, to A. Dominski, MOE, dated April 12, 1999, re: Waste Management Policy Branch's Support of the Amendment.

23. Letter and application from Janet Laird, Manager of Solid Waste Services, City of Guelph to G. Carpentier, MOE, dated August 19, 1999, re: Amendment to Certificate of Approval No. A170128.

24. Document entitled City of Guelph - Request for Amendments to Provisional Certificate of Approval No. A170128, prepared for City of Guelph, prepared by Gartner Lee Limited, dated February 2006 except for Section 2.4, 2.6, 3.4 and 3.5 which are not approved by the Director.

25. Letter from Dean Wyman, Manager, Solid Waste Resources Division, City of Guelph, to EAAB, dated June 12, 2006 re: changes to and clarification of document submitted in support of the application for amendments.

26. Email from Dean Wyman, Manager, Solid Waste Resources Division, City of Guelph, to Veronica Pochmursky, EAAB, sent September 6, 2006, re: City of Guelph's procedures for *Clean Wood* and contaminated wood and final destination of contaminated or combined wood.

27. Letter Dated February 8, 2007 from Bill Shields, Supervisor, Governance and Compliance, City of Guelph to T. Gebrezghi, MOE, amendment of Section (C) of Page 1 of the CofA;

28. Letter dated March 14, 2007 from Khaled Mamun, P. Eng., EAAB to Jennifer Turnbull, City of Guelph, requesting for additional information;

29. Fax dated March 28, 2007 from Dean Wyman, Manager, Solid Waste Resources Division, City of Guelph to Khaled Mamun, P. Eng., MOE, submission of the additional information.

30. Fax dated April 11, 2007 from Dean Wyman, Solid Waste Resources Division, City of Guelph to Khaled Mamun, P. Eng., MOE, re: addition of Waste Class 121.

31. Document "City of Guelph Household Hazardous Waste Depot Request for Amendment to Certificate of Approval A170128", dated April 2008, including all appendixes.

32. E-mail dated February 2, 2010 (4:44 p.m.) from Amy Burke, Golder Associates Ltd., to Margaret Wojcik, Ontario Ministry of the Environment, including an attachment entitled "08-1112-0126 LET 2010'02'02 MOE Response.pdf" to provide additional information on the proposal.

33. E-mail dated February 17, 2010 (11:12 a.m.) from Ravi Mahabir, Golder Associates Ltd., to Bijal Shah and Margaret Wojcik, Ontario Ministry of the Environment, including an attachment entitled "0811120126 City of Guelph OWPF Response to MOE 17Feb10.pdf" to provide additional information on the proposal.

34. E-mail dated March 1, 2010 (7:46 a.m.) from Amy Burke, Golder Associates Ltd., to Margaret Wojcik, Ontario Ministry of the Environment, including an attachment entitled "08-1112-0126 MEM 2010'02'25.pdf" to provide additional information on the proposed air curtains.

35. E-mail dated March 30, 2010 (4:56 p.m.) from Ravi Mahabir, Golder Associates Ltd., to Margaret Wojcik, Ontario Ministry of the Environment, including an attachment entitled "0811120126 City of Guelph OWPF Response to MOE 30Mar,2010.pdf" to provide additional information on the proposal.

36. E-mail dated April 8, 2010 (2:23 p.m.) from Ravi Mahabir, Golder Associates Ltd., to Margaret Wojcik, Ontario Ministry of the Environment, including an attachment entitled "0811120126 City of Guelph OWPF Response to MOE 8Apr10.pdf" to provide additional information on the proposal.

37. E-mail dated April 9, 2010 (8:27 a.m.) from Ravi Mahabir, Golder Associates Ltd., to Margaret Wojcik, Ontario Ministry of the Environment, including an attachment entitled "Revised Flowchart April 9,2010.pdf" to provide a correction to the previously submitted information.

38. E-mail dated April 09, 2010 (11:08 a.m.) from Ravi Mahabir, Golder Associates Ltd., to Margaret Wojcik, Ontario Ministry of the Environment, including an attachment entitled "08375-801-W02-1a.pdf" to provide additional information on the proposal.

39. E-mail dated April 28, 2010 (1:06 p.m.) from Ravi Mahabir, Golder Associates Ltd., to Margaret Wojcik, Ontario Ministry of the Environment, including an attachment entitled "0811120126 City of Guelph OWPF Responses to MOE 28Apr10.pdf" to provide additional information on the proposal.

40. E-mail dated May 05, 2010 (9:24 a.m.) from Ravi Mahabir, Golder Associates Ltd., to Margaret Wojcik, Ontario Ministry of the Environment, including an attachment entitled "0811120126 City of Guelph OWPF Responses to MOE 4May,2010 FSC.pdf" to provide additional information on the proposal including the schedule for phasing out the use of plastic bags to collect the *Organic Waste* in the City of Guelph, the approach to temperature monitoring of material within *Composting* tunnels.

41. E-mail dated May 7, 2010 (2:36 p.m.) from Ravi Mahabir, Golder Associates Ltd., to Margaret Wojcik, Ontario Ministry of the Environment, to clarify the proposal with respect to mixing of the *Composting* waste.

42. E-mail dated May 7, 2010 (3:52 p.m.) from Ravi Mahabir, Golder Associates Ltd., to Margaret Wojcik, Ontario Ministry of the Environment, to confirm that the acid spray system will be installed and operational at the start-up of the *Composting Site.*

43. E-mail dated May 11, 2010 (2:49 p.m.) from Ravi Mahabir, Golder Associates Ltd., to Margaret Wojcik, Ontario Ministry of the Environment, including an attachment entitled "compost temperatures.pdf" to provide data on compost temperature from two different monitoring methods.

44. E-mail dated May 26, 2010 (2:30 p.m.) from Ravi Mahabir, Golder Associates Ltd., to Margaret Wojcik, Ontario Ministry of the Environment, including an attachment entitled "0811120126 Draft CofA Review - Supporting Information RSM May 25,2010.pdf" providing additional clarification on the types of wastes to be received at the *Composting Site.*

45. E-mail dated June 2, 2010 (10:41 a.m.) from Amy Burke, Golder Associates Ltd., to Margaret Wojcik, Ontario Ministry of the Environment, providing additional clarification on the types of amendment and other wastes to be received at the *Composting Site,* the equipment decontamination procedure and the proposed pasteurization temperature monitoring.

46. E-mail dated June 18, 2010 (8:08 a.m.) from Bill Shields, Corporation of the City of Guelph, to Margaret Wojcik, Ontario Ministry of the Environment, including attachments entitled "Fig1_GuelphWRIC_Screening.pdf, Fig2_GuelphWRIC_Screening.pdf, Fig1_GuelphWRIC_Screening Option 3 (2010-05-04).pdf" describing the visual screening features and the landscaping completed at the Site.

47. E-mail dated June 25, 2010 (12:38 p.m.) from Amy Burke, Golder Associates Ltd., to Margaret Wojcik, Ontario Ministry of the Environment, including attachments entitled "0811120126 Draft CofA Review - Additional Comments 2010'06'25.pdf" and "0811120126 Draft CofA Review - Addition Comments 2010'06'23 Site_Layout_v2.pdf" showing the location of the outdoor paved pad referred to as the Amendment, Recyclables, and Leaf and Yard Waste Staging Area and describing handling of wastes at the said outdoor pad.

48. Letter from Mr. Dean Wyman, Manager, Solid Waste Resources Division, City of Guelph, to EAAB, dated June 12, 2006 requesting amendments to Certificate of Approval No. 9241-5DTRD9 and providing the rationale for the proposed amendments.

49. The Design and Operations Report for the City of Guelph *Material Recovery Facility* prepared by Golder Associates, dated January 12, 2010.

50. The Design and Operations Report for the City of Guelph *Waste Transfer Station* prepared by Golder Associates, dated January 12, 2010.

51. The Design and Operations Report for the City of Guelph WRIC Public Drop Off and *Municipal Hazardous and Special Waste* Facilities prepared by Golder Associates, dated January 12, 2010 and supplemental information provided by e-mail from Pamela Russell, P.Eng. of Golder Associates, to Jim Chisholm, P.Eng., Senior Review Engineer of the Ministry.

52. Engineers Report for the City of Guelph Waste Recycling Innovation Centre prepared by Golder Associates dated July 20, 2010 and provided by e-mail from Pamela Russell, P.Eng. of Golder Associates, to Jim Chisholm, P.Eng., Senior Review Engineer of the Ministry.

53. e-mail of July 20, 2010 from Pamela Russell of Golder Associate, to Jim Chisholm, Senior Review Engineer, Ministry of Environment along with attachments.

54. e-mail of Nov. 2, 2010 from Amy Burke of Golder Associates to Jim Chisholm, Senior Review Engineer, Ministry of Environment.

SCHEDULE "B"

This Schedule "B" forms part of this Certificate of Approval.

Compost Quality Criteria

Parameter		**Concentration**
Trace Elements (mg/kg dry weight)[1]	arsenic	13
	cadmium	3
	chromium	210
	cobalt	34
	copper	100
	lead	150
	mercury	0.8
	molybdenum	5
	nickel	62
	selenium	2
	zinc	500
Organic chemicals (mg/kg dry weight)[1]	*PCBs*[2]	0.5
Pathogens	fecal coliforms	<1000 MPN/g of total solids calculated on a dry weight basis[3]
	salmonellae	<3 MPN/4g total solids calculated on a dry weight basis[3]
Non-biodegradable matter[4] % dry weight	plastic	1
	other	2

Note 1 – means milligrams per kilogram

Note 2 - means polychlorinated biphenols
Note 3 - means “Most Probable Number”
Note 4 - will not fit through a size 8 mesh

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

1. The reason for Conditions 1 to 5 inclusive and Conditions 10 and 11 is to clarify the legal rights and obligations of this Certificate.

2. The reason for Condition 6 is to ensure that the Site is operated under the corporate, limited or applicant's own name which appears on the application and supporting information submitted with the application and not under any name which the Director has not been asked to consider.

3. The reason for Conditions 7, 8 and 9 is to ensure that Ministry personnel, when acting in the course of their duties, will be given unobstructed access to the information and records related to the Site which are required by this Certificate, and to enable the Ministry to be assured of the City's compliance with the terms and conditions stated in this Certificate.

4. The reason for Conditions 16, 17, 18, 19, 20, 21, 22, and 24, is to minimize and/or prevent nuisance or adverse environmental affects from occurring. The use and operation of the Site without these conditions may create a nuisance or result in a hazard to the health and safety of any person or the environment.

5. The reason for Condition 23 is to ensure that there is no adverse impact on aircraft safety in the area and no net increase in the bird population in the area, as a result of the use and operation of this Site.

6. The reason for Conditions 12(a), 12(b), 13 and 14 is to ensure that the Site is operated in accordance with the application and supporting documentation for this Certificate and not in any manner which the Director has not been asked to consider. The operation of the Site without these conditions would not be in the public interest and may result in unacceptable environmental impacts. The imposition and compliance with these conditions will further ensure that the facility is operated and monitored in accordance with established procedures and practices for this type of facility.

7. The reason for Condition 15 is to outline the maximum amount of residual waste that can be taken from the Site in one day. Any amount above an average o 1000 tonnes per day requires an Environmental Assessment.

8. The reason for Condition 25 is to ensure that the Site will not be operated at hours during which such operation could cause material discomfort to any person.

9. The reason for Condition 26, 27, 28 is to have personnel that have the sufficient skills, knowledge and experience to do the work that is necessary at the Site.

10. The reason for Condition 29 and 30 is to require the Owner to establish a forum and provide reasonable access to the Site for the exchange of information and public dialogue on activities carried out at the Composting Site and other parts of the Site. Open communication with the public and local authorities is important in helping to maintain high standards for the operation of the Composting Site and other parts of the Site and protection of the natural environment. The use and operation of the Site without this condition would not be in the public interest.

11. The reason for Condition 31 is to protect the environment from an adverse effect as a result of activities at the Site.

12. The reason for Conditions 32, 33, 34, 35, and 36 is to minimize the risk of environmentally unacceptable discharges of a contaminant into the environment. Compliance with the monitoring programs outlined in these conditions will enable the City to allow for an early detection system for any unacceptable discharges of contaminants and allow for the implementation of a contingency plan.

13. The reason for Condition 37 is to minimize the risk of vandalism and to ensure that the Site is only operated in the presence of competent people to ensure the waste is properly managed.

14. The reason for Conditions 38, 39, 40, 41, 42, 43, and 44 to ensure the Site is operated in accordance with the application and this Certificate and not in any manner which the Director has not been asked to consider. Operation of the Site without these conditions would not be in the public interest.

15. The reason for Condition 45 is to ensure the City has an up-to-date Environmental Emergency Plan for the Site for the prompt control, abatement, mitigation and clean-up of emergency incidents, accidental discharge of contaminants, potential environmental or nuisance related impacts.

16. The reason for Condition 46 is to ensure that the City has a robust Complaints Procedure

17. The reason for Condition 47 is to make sure that the City takes immediate measures to responds to a spill and process upset and informs the Ministry immediately of such spills or upset.

18. The reason for conditions 48, 49, 50, 51, and 52 is so that the City have a robust inspection program at the site and that the inspections are properly recorded and an annual summary of activities at the site are sent to the ministry.

19. The reason for Condition 53 is to ensure the orderly shut down of the composting facility or other parts of the site.

20. Condition 54. is included to specify the approved Organic Waste receipt rate, the approved Organic Waste types and the service area from which the Organic Waste may be accepted at the Composting Site based on the Owner's application and supporting documentation.

21. Condition 55. is included to ensure that the Composting Site is sufficiently secured, supervised and operated by properly Trained Personnel and to ensure controlled access and integrity of the Composting Site by preventing unauthorized access when the Composting Site is closed and no Composting Site personnel is on duty.

22. Condition 56.(1) is included to specify the hours of operation for the Composting Site to ensure that the hours of the Composting Site's operation do not result in an adverse effect or a hazard to the natural environment or any person.

23. Condition 56.(2) is included to ensure that only the approved waste types are accepted and processed at the Composting Site.

24. Condition 56.(3) is included to specify the requirements for handling of the Rejected Waste that was inadvertently received at the Composting Site.

25. Conditions 56.(4) and (5) are included to ensure that waste and amendment materials handling and storage are undertaken in done in a way which does not result in an adverse effect or a hazard to the environment or any person.

26. Condition 56.(6) is included to specify odour control measures to minimize a potential for odour emissions from the Composting Site.
27. Condition 57. is included to require the Composting Site to be maintained and inspected thoroughly and on a regular basis to ensure that the operations at the Composting Site are undertaken in a manner which does not result in an adverse effect or a hazard to the health and safety of the environment or any person.

28. Condition 58. is included to require the Owner to characterize all waste received at the Composting Site and shipped off the Composting Site to ensure that only waste approved by this Certificate is handled at the Composting Site and that all waste transferred off the Composting Site is handled in accordance with the Ministry's requirements. Condition 38. is also included to require the Owner to monitor the Composting process parameters.

29. Condition 59. is included to ensure that the Composting Site is operated and maintained in an environmentally acceptable manner which does not result in a negative impact on the natural environment or any person.

30. Condition 60. is included to ensure that personnel employed at the Composting Site are fully aware and properly trained on the requirements and restrictions related to Composting Site operations under this Certificate.

31. Condition 61. is included to ensure that the Owner is prepared and properly equipped to take action in the event of an emergency situation.

CONTENT COPY OF ORIGINAL

32. Conditions 62. also is included to require further spill notification to the Ministry, in addition to the requirements already listed in Part X of the EPA.

33. Condition 63. is included to ensure that detailed records of Composting Site activities, inspections, monitoring and upsets are recorded and maintained for inspection and information purposes.

34. Condition 64. is included to ensure that the wastewater generated at the Composting Site is handled in accordance with the Ministry's requirements and in a manner which does not result in a negative impact on the natural environment or any person.

35. Condition 65. is included to ensure that final closure of the Composting Site is completed in accordance with Ministry's standards.

36. Condition 66. is included to require the Owner to design, operate, maintain and monitor the waste management activities at the Composting Site in compliance with the Ministry's supplementary requirements as they become published and amended from time to time.

37. The reason for Conditions 67 and 68 is to ensure that the Site is operated 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.

This Provisional Certificate of Approval revokes and replaces Certificate(s) of Approval No. A170128 and 9241-5DTRD9 issued on September 29, 2006 and April 24, 2003 respectively.

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 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) 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.

CONTENT COPY OF ORIGINAL

DATED AT TORONTO this 10th day of February, 2011

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

JC/
c: District Manager, MOE Guelph
Pamela Russell, Golder Associates Ltd.

Ontario

Ministry of the Environment
Ministère de l'Environnement

AMENDMENT TO PROVISIONAL CERTIFICATE OF APPROVAL
WASTE DISPOSAL SITE
NUMBER A170128
Notice No. 1
Issue Date: September 22, 2011

RECEIVED
OCT 0 3 2011
CITY CLERK'S OFFICE

The Corporation of the City of Guelph
1 Carden St
Guelph, Ontario
N1H 3A1

Site Location: 110 Dunlop Drive
Division 'C', RP 61R-5574
Lot 4 and 5, Concession 1
Guelph City, County of Wellington
N1H 6N1

You are hereby notified that I have amended Provisional Certificate of Approval No. A170128 issued on February 10, 2011 for the use and operation of a 29.54 hectare Waste Disposal Site (Transfer/Processing) *, as follows:*

1. The following Condition 58.(1) is amended to read as follows:

58. **Quality Criteria, Testing & Monitoring**

(1) **Cross-Contamination Prevention:**

(a) The *Owner* shall ensure that the incoming *Organic Waste* is kept separate and does not come in contact with the *Immature Compost* / the *Finished Compost* and the *Compost* except where the *Immature Compost* / the *Finished Compost* and the *Compost* are being fed back into the *Composting* process.

(b) The *Owner* may use the equipment utilized in processing of the incoming *Organic Waste* to process the *Immature Compost* / the *Finished Compost* and the *Compost* provided that the equipment has been cleaned, in accordance with the procedures described in documents listed in the attached Schedule "A", to prevent the *Immature Compost* / the *Finished*

Compost and the *Compost* from being contaminated by the incoming *Organic Waste.*

(c) The *Owner* may use the equipment utilized in screening of the *Immature* Compost to screen the *Compost* provided that the screening equipment has been adequately cleaned prior to its use to screen the Compost and in accordance with the procedures described in documents listed in the attached Schedule "A", to prevent the *Compost* from being contaminated by the *Immature Compost.*

2. The following documents are added to Schedule "A":

55. The application for the Certificate of Approval for a Waste Disposal Site, dated September 8, 2011 and signed by Bill Shields, Corporation of the City of Guelph, including the following attachments:

(a) E-mail dated September 2, 2011 (11:17 a.m.) from Ravi Mahabir, Dillon Consulting Limited, to Tesfaye Gebrezghi, Ontario Ministry of the Environment, describing the considered proposal and including the following attachments:

(i) 104328 Letter to MOE on Facility Refinements Aug22,2011 RSM.pdf;
(ii) Guelph screen Layout.pdf

(b) E-mail dated September 8, 2011 (8:57 a.m.) from Ravi Mahabir, Dillon Consulting Limited, to Margaret Wojcik, Ontario Ministry of the Environment, describing the further technical details of the proposal and the cross contamination prevention procedures and including the following attachments:

(i) 104328 Letter to MOE on Facility Refinements Sep2,2011 RSM signed.pdf;

(ii) 104328 Letter to MOE on OWPF Screening Plant Operations Sep8,2011 RSM.pdf

The reason for this amendment to the Certificate of Approval is as follows:

to replace the previously approved two separate screening plants with a single double-deck screening plant to allow for increased working space within the Maturation Hall.

This Notice shall constitute part of the approval issued under Provisional Certificate of Approval No. A170128 dated February 10, 2011, as amended.

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 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) 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 22nd day of September, 2011

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

MW/
c: District Manager, MOE Guelph
Ravi Mahabir, P. Eng., Dillon Consulting Limited

Ontario

Ministry of the Environment
Ministère de l'Environnement

AMENDMENT TO ENVIRONMENTAL COMPLIANCE APPROVAL
NUMBER A170128
Notice No. 2
Issue Date: November 2, 2012

The Corporation of the City of Guelph
1 Carden St
Guelph, Ontario
N1H 3A1

Site Location: 110 Dunlop Drive
110 Dunlop Dr
Guelph City, County of Wellington
N1H 6N1

You are hereby notified that I have amended Approval No. A170128 issued on February 10, 2011 and amended on September 22, 2011 for the use and operation of a 29.54 hectare Waste Disposal Site (Transfer/Processing), as follows: , as follows:

The following sub-conditions in Condition 54 are hereby amended as follows:

54. **Service Area, Approved Waste Types, Rates & Storage**

(1.1) The *Composting Site* may only accept solid non-hazardous residential, commercial, institutional or industrial *Organic Waste* from the Provinces of Ontario, limited to the following *Organic Waste* :

(a) Source-Separated *Organic Waste* limited to the following:
- (i) food wastes: fruit, vegetable and general table scraps, meat and fish/shellfish products, dairy products, eggs and egg shells, herbs, nuts and seeds, sugar and spices, confectionery products, sauces, bones, pet food, bread, grains, rice, pasta, flour, coffee grounds and tea bags;
- (ii) solidified cooking oils and cooked or raw grease and fats from residential sources only;
- (iii) paper fibres: soiled paper towels, tissues, paper plates, coffee filters, soiled paper food packaging items such as boxboard, cardboard, newspaper, and other paper fibre packaging materials;
- (iv) fresh flowers, houseplants and their soil, hair, pet fur, feathers and sawdust, wood shavings;
- (v) ashes from residential sources only;

(vi) pet waste that is not collected or encased in a bag; and
(vii) pet litter box or bedding wastes, including the intermingled pet waste;

(b) *Organic Waste* from the industrial, commercial and institutional sources that produce or collect food wastes;

(c) *Leaf and Yard Waste;* and

(d) *Compost* overs as described in the supporting documentation listed in the attached Schedule "A".

(1.2) (a) A minimum of eight (8) months prior to accepting *Organic Waste* from any new source at the *Site* , the *Owner* shall provide written notice to the *District Manager* of its intent to commence acceptance of the new waste .

(b) The *Owner* shall submit to the *District Manager* the following information regarding the new waste source in writing at least six (6) weeks prior to receiving the new waste identified in Condition 54 (1.2)(a):

(i) the name and location of the generator,
(ii) the date the *Owner* proposes to commence accepting the waste at the *Site* ,
(iii) description of the constituent components of the waste being accepted,
(iv) confirmation whether inclusion of the waste component referenced above in Condition 54 (1.2)(a) is characterized as incidental or inadvertent,
(v) information related to the handling and storage of the waste prior to its delivery to the *Site* , and
(vi) all operational plans the *Owner* proposes for integrating the processing of waste from the new source into the waste stream currently being processed at the Site.

(4) (d) i. The *Owner* shall not accept at the *Composting Site* any *Organic Waste* that is collected through a waste collection program that allows use of bags, except the waste that is generated in and collected by the City of Guelph and in accordance with Table 1 entitled "Proposed Phase-out of Plastic Bag Usage in Organics Collection" included in Item #40 of the attached Schedule "A";

ii. Notwithstanding Condition 54 (4)(d) (i) above, the *Owner* is allowed to accept *Organic Waste* that has been placed in a biodegradable certified compostable bag.

iii. The *Owner* shall ensure that any *Organic Waste* accepted at the *Site* that is

generated outside of the *City* that is collected through a waste collection program will only be collected in biodegradable certified compostable bags in accordance with Item 56 in Schedule "A".

The following Item is hereby added to Schedule "A":

56. Environmental Compliance Approval Application submitted by the City of Guelph requesting amendment to Condition No. 54 (4)(d). The application was signed and dated by Bill Shields, Supervisor of Goverance and Compliance on October 3, 2012. The supporting documentation for the application include the following:

    a. ECA Amendment Outline prepared by Golder Associates which consists of a letter dated October 2, 2012 addressed to Mr. Bill Shields, City of Guelph from Ms Amy Burke and Mr. Michael Cant, Golder Associates (Project No. 12-1188-0007);
    b. Public Liaison Committee Comments and Responses prepared by the City of Guelph which includes:

        i. Memorandum dated February 10, 2010 entitled "Addendum to ESDM Report for City of Guelph OWPF Responses to Request Information/Clarification from MOE" addressed to Bijal Shah, Ministry of the Environment from Ravi Mahabir and Sean Capstick, Golder Associates; and
        ii. Memorandum dated May 4, 2010 entitled "Summary of Key Items Discussed at April 29 Meeting with MOE" addressed to Tes Gebrezghi, Bijal Shah and Margaret Wojcik, Ministry of the Environment from Ravi Mahabir and Sean Capstick, Golder Associates; and

    c. ECA Amendment Support Letter provided by Wellington Organix Inc. which consists of a letter dated August 29, 2012 addressed to Mr. David Gordon, City of Guelph from Mr. Mark Jared, Wellington Organix.

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

1. *The reason for the amendment to Condition 54 (1.1) and (1.2) is to ensure the City notifies the Ministry should the City start to accept waste from other clients.*

2. *The reason for the amendment to Condition 54 (4)(d) is to permit the City of Guelph to accept incoming waste in certified biogradeable compostable bags as the City has shown that operational changes have addressed odour issues at the Site and the restriction on waste being accepted in plastic bags is longer required.*

This Notice shall constitute part of the approval issued under Approval No. A170128 dated February 10, 2011

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) 314-4506 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 2nd day of November, 2012

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

DG/
c: District Manager, MOE Guelph

Amy Burke, Golder Associates Ltd.

CONTENT COPY OF ORIGINAL

Ontario

Ministry of the Environment
Ministère de l'Environnement

AMENDMENT TO ENVIRONMENTAL COMPLIANCE APPROVAL
NUMBER A170128
Notice No. 3
Issue Date: January 24, 2013

The Corporation of the City of Guelph
1 Carden St
Guelph, Ontario
N1H 3A1

Site Location: 110 Dunlop
110 Dunlop Dr , Guelph Organic Waste Composting Facility,
Guelph City, County of Wellington
N1H 6N1

You are hereby notified that I have amended Approval No. A170128 issued on February 10, 2011 and amended on September 22, 2011 and November 2, 2012 forthe establishment and operation of a Waste Disposal Site (Transfer and Processing) consisting of a 29.54 hectare of property for the purposes of composting, multi-material recovery, and waste transfer to serve the municipalities and businesses of the Province of Ontario, the State of New York, the State of Michigan and Municipal Hazardous and Special Waste Transfer Station serving the County of Wellington and City of Guelph,

to be used for:

a) the use and operation of an Organic Waste Processing Facility composting of the following categories of waste (Note: Use of the site for additional categories of wastes requires a new application and amendments to the Provisional Certificate of Approval); organic non-hazardous waste from residential, industrial, commercial and institutional sources limited to a maximum Site indoor storage capacity of 8,500 tonnes;

b) the use and operation of a Material Recovery Facility for processing, transfer and temporary storage of the following categories of waste (Note: Use of the Site for additional categories of wastes requires a new application and amendments to the Provisional Certificate of Approval); municipal waste including food and beverage cans, cardboard, glass, newspaper, plastic, waste electrical and electronic equipment and other such materials as would be collected by means of the source separated dry waste collection system limited to a maximum indoor storage capacity of 3850 tonnes and having an outdoor storage area for recyclable waste and leaf and yard waste that is located to the west of the Organic Waste Processing Facility;

c) the use and operation of a Municipal Hazardous and Special Waste facility for the transfer and temporary storage of the following categories of waste (Note: Use of the Site for additional categories of wastes requires a new application and amendments to the Provisional Certificate of Approval); Municipal Hazardous and Special Waste limited to the following waste classes; 112, 121, 145, 146, 148, 212, 213, 221, 242, 251, 252, 261, 263, 269, 312, and 331 as outlined in the <u>New Ontario Waste Classes</u> January 1986 limited to a maximum Site storage capacity of 15 tonnes; and

d) the use and operation of a Waste Disposal Site (Transfer) for non-hazardous solid industrial waste (Note: Use of the Site for additional categories of wastes requires a new application and amendments to the Provisional Certificate of Approval);from industrial, commercial and institutional sources, commercial waste and domestic waste, with an indoor storage maximum capacity of 795 tonnes and outdoor storage areas for leaf and yard waste and for recyclable waste.

, as follows:

The following Definition is hereby amended as follows:

CONTENT COPY OF ORIGINAL

(aaa) "**Site**" means the 29.54 hectare Waste Disposal Site (Processing and Transfer) for the purposes of receipt, storage, processing and transfer of waste by *Composting*, waste transfer,and multi-material recovery, to serve the municipalities and businesses of the Province of Ontario, the State of New York, the State of Michigam and *Municipal Hazardous and Special Transfer Waste Station*, serving the County of Wellington and City of Guelph located on Lot 4 and 5 Concession 1, Division C, Guelph, Ontario as shown on Reference Plan 61R-5574;

The following Condition is hereby revoked:

56. (6) **Odour Control:**

(a) The *Owner* shall maintain a negative air pressure atmosphere within the *Processing Building,* as compared to the ambient atmospheric pressure, at all times;

The following Conditions are hereby amended as follows:

Public Liaison Committee

29. (1) The *Owner* shall invite the following groups to provide input and/or comments into preparation of the Terms of Reference for the *Public Liaison Committee (ToR PLC):*

(a) home owners within 2,000 metres of the *Site*;
(b) any interested non-governmental organization (NGOs); and
(c) any interested person(s) or group(s);

(2) (a) The *Owner* shall consider all input and/or comments submitted by the groups listed above during preparation of the *ToR PLC*; and

(b) A minimum of ninety (90) days prior to the receipt of the *Waste* at the *Site*, the *Owner* shall prepare and submit to the *District Manager* the *ToR PLC*, including documentation demonstrating consideration of all public input and/or comments received, for written concurrence of the *District Manager;*

(3) The *ToR PLC* shall be amended from time to time according to appropriate amending procedures identified within the content of the *ToR PLC*. Any amendment to the *ToR PLC* must be agreed to by the *District Manager* prior to its implementation;

(4) Within sixty (60) days from the *District Manager`s* concurrence to the *ToR PLC,* the *Owner* shall take all reasonable steps to establish a *Public Liaison Committee (PLC)* which shall serve as a forum for dissemination, consultation, review and exchange of information regarding the operation of the *Site*, including environmental monitoring, maintenance, complaint resolution, and new approvals or amendments to existing approvals related to the operation of this *Site*;

(5) The *Owner* shall invite representation from the following groups to participate on the *PLC*:

(a) home owners within 2,000 metres of the *Site;*
(b) any interested NGOs; and
(c) any interested person(s) or group(s);

(6) The number of representatives from each group shall be as specified in the *ToR PLC* approved by the *District Manager;*

(7) No later than ninety (90) days from the *District Manager`s* concurrence to the *ToR PLC,* the *Owner* shall submit to the *District Manager* a written report that details steps to be taken by the *Owner* to establish, maintain and participate in a *PLC*. This report shall include the identification of each of the representatives that have been invited to participate in the *PLC*;

(8) A copy of the Annual Report that is required by Conditions 52 shall be provided to the *Public Liaison Committee* at the first scheduled meeting following March 31st; and

(9) The *City* shall allow reasonable access to the *Site* for any member of the *Public Liaison Committee;*

40. (a) The *City* shall ensure that only municipal waste recyclable material, generated within the Province of Ontario, the State of New York and the State of Michigan is received at this *Site;*

54. (1.2) (a) A minimum of **six (6)** months prior to accepting *Organic Waste* from any new source at the *Site*, the *Owner* shall provide written notice to the *District Manager* of its intent to commence acceptance of the new waste .

The following Item is hereby added to Schedule "A":

57. Environmental Compliance Approval Application requesting that Condition 40 (a) relating to the service area be amended. The application was signed by Mr. Bill Shields, Supervisor of Governance and Compliance, City of Guelph and dated August 2, 2012.

58. Letter dated November 2, 2012 addressed to Mr. Dale Gable, Ministry of the Environment from Mr. Bill Shields, Supervisor of Governance and Compliance, City of Guelph requesting Condition 56 (6)(a) be revoked.

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

1. The reason for the revocation of Condition 56 (6)(a) is the requirement to maintain negative air pressure is addressed with the ECA related to the air. This condition is a duplicate requirement.

2. The reason for the amendment to Condition 29 is to ensure the PLC is an exchange of information for the entire Site and not limited to the Composting Site.

3. The reason for the amendment to Condition No. 40 is to approve the service area expansion to include the State of New York as applied for by the City. This is to ensure the facility and equipment can operate at its peak efficiency.

4. The reason for the amendment to Condition 54 (1.2)(a) which corrects an administrative error in the last notice.

This Notice shall constitute part of the approval issued under Approval No. A170128 dated February 10, 2011

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.

CONTENT COPY OF ORIGINAL

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) 314-4506 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 24th day of January, 2013

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

DG/
c: District Manager, MOE Guelph
Amy Burke, Golder Associates Ltd.

GOLDER ASSOCIATES
JAN 31 2013
RECEIVED - WHITBY

Ontario

Ministry of the Environment
Ministère de l'Environnement

AMENDMENT TO ENVIRONMENTAL COMPLIANCE APPROVAL
NUMBER A170128
Notice No. 3
Issue Date: January 24, 2013

The Corporation of the City of Guelph
1 Carden St
Guelph, Ontario
N1H 3A1

Site Location: 110 Dunlop
110 Dunlop Dr , Guelph Organic Waste Composting Facility,
Guelph City, County of Wellington
N1H 6N1

You are hereby notified that I have amended Approval No. A170128 issued on February 10, 2011 and amended on September 22, 2011 and November 2, 2012 for the establishment and operation of a Waste Disposal Site (Transfer and Processing) consisting of a 29.54 hectare of property for the purposes of composting, multi-material recovery, and waste transfer to serve the municipalities and businesses of the Province of Ontario, the State of New York, the State of Michigan and Municipal Hazardous and Special Waste Transfer Station serving the County of Wellington and City of Guelph,

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c) *the use and operation of a Municipal Hazardous and Special Waste facility for the transfer and temporary storage of the following categories of waste (Note: Use of the Site for additional categories of wastes requires a new application and amendments to the Provisional Certificate of Approval); Municipal Hazardous and Special Waste limited to the following waste classes; 112, 121, 145, 146, 148, 212, 213, 221, 242, 251, 252, 261, 263, 269, 312, and 331 as outlined in the New Ontario Waste Classes January 1986 limited to a maximum Site storage capacity of 15 tonnes; and*

d) *the use and operation of a Waste Disposal Site (Transfer) for non-hazardous solid industrial waste (Note: Use of the Site for additional categories of wastes requires a new application and amendments to the Provisional Certificate of Approval);from industrial, commercial and institutional sources, commercial waste and domestic waste, with an indoor storage maximum capacity of 795 tonnes and outdoor storage areas for leaf and yard waste and for recyclable waste.*

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(aaa) "**Site**" means the 29.54 hectare Waste Disposal Site (Processing and Transfer) for the purposes of receipt, storage, processing and transfer of waste by *Composting* , waste transfer,and multi-material recovery, to serve the municipalities and businesses of the Province of Ontario, the State of New York, the State of Michigam and *Municipal Hazardous and Special Transfer Waste Station* , serving the County of Wellington and City of Guelph located on Lot 4 and 5 Concession 1, Division C, Guelph, Ontario as shown on Reference Plan 61R-5574;

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(a) home owners within 2,000 metres of the *Site* ;
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(c) any interested person(s) or group(s);

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(b) A minimum of ninety (90) days prior to the receipt of the *Waste* at the *Site* , the *Owner* shall prepare and submit to the *District Manager* the *ToR PLC* , including documentation demonstrating consideration of all public input and/or comments received, for written concurrence of the *District Manager;*

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(c) any interested person(s) or group(s);

(6) The number of representatives from each group shall be as specified in the *ToR PLC* approved by the *District Manager;*

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(8) A copy of the Annual Report that is required by Conditions 52 shall be provided to the *Public Liaison Committee* at the first scheduled meeting following March 31st; and

(9) The *City* shall allow reasonable access to the *Site* for any member of the *Public Liaison Committee;*

40. (a) The *City* shall ensure that only municipal waste recyclable material, generated within the Province of Ontario, the State of New York and the State of Michigan is received at this *Site;*

54. (1.2) (a) A minimum of **six (6)** months prior to accepting *Organic Waste* from any new source at the *Site* , the *Owner* shall provide written notice to the *District Manager* of its intent to commence acceptance of the new waste .

The following Item is hereby added to Schedule "A":

57. Environmental Compliance Approval Application requesting that Condition 40 (a) relating to the service area be amended. The application was signed by Mr. Bill Shields, Supervisor of Governance and Compliance, City of Guelph and dated August 2, 2012.

58. Letter dated November 2, 2012 addressed to Mr. Dale Gable, Ministry of the Environment from Mr. Bill Shields, Supervisor of Governance and Compliance, City of Guelph requesting Condition 56 (6)(a) be revoked.

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

1. *The reason for the revocation of Condition 56 (6)(a) is the requirement to maintain negative air pressure is addressed with the ECA related to the air. This condition is a duplicate requirement.*

2. *The reason for the amendment to Condition 29 is to ensure the PLC is an exchange of information for the entire Site and not limited to the Composting Site.*

3. *The reason for the amendment to Condition No. 40 is to approve the service area expansion to include the State of New York as applied for by the City. This is to ensure the facility and equipment can operate at its peak efficiency.*

4. *The reason for the amendment to Condition 54 (1.2)(a) which corrects an administrative error in the last notice.*

This Notice shall constitute part of the approval issued under Approval No. A170128 dated February 10, 2011

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) 314-4506 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 24th day of January, 2013

THIS NOTICE WAS MAILED
ON Jan. 29, 2013
9 C
(Signed)

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

DG/
c: District Manager, MOE Guelph
Amy Burke, Golder Associates Ltd. ✓

Ontario

Ministry of the Environment
Ministère de l'Environnement

AMENDED ENVIRONMENTAL COMPLIANCE APPROVAL

NUMBER 9496-9NFKJ9
Issue Date: January 7, 2015

The Corporation of the City of Guelph
1 Carden Street
Guelph, Ontario
N1H 3A1

Site Location: Guelph Waste Resource Innovation Centre (WRIC)
110 Dunlop Drive
City of Guelph, County of Wellington

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:

an amendment to the wastewater infrastructure Works serving the 29.54 hectare Waste Resource Innovation Centre (WRIC) site, consisting of a Solid Waste Transfer Station, a Material Recovery Facility, an Organic Waste Processing Facility, a Municipal Hazardous and Special Waste Depot and a Public Drop-Off (PDO) Area, located at 110 Dunlop Drive on Part of Lot 5, Concession 1, Division C, in the City of Guelph, for the conveyance of sanitary sewage to the existing municipal sanitary sewer system, and for the collection, treatment and disposal of stormwater run-off from the WRIC site, providing Enhanced Level water quality control and erosion protection, and attenuating post-development peak flows to pre-development levels for the 5-year and 100-year storm events, to consolidate previous approvals for the site, to add new storm sewers and stormwater management facilities for the Public Drop-Off (PDO) Area at the eastern portion of the site, and to modify the stormwater facilities at the Solid Waste Transfer Station, consisting of the following:

Proposed Works:

Public Drop-Off (PDO) Area

storm sewers: - installation of a new stormwater conveyance system serving the Public Drop-Off (PDO) Area, discharging to an oil and grit separator (Oil/Grit1), identified below;

oil and grit separator (Oil/Grit1 - catchment area 1.35 hectares): - one (1) oil and grit separator (Wilkinson Watergate Model WG400, or Approved Equivalent), having a sediment storage capacity of 1.4 m^3, an oil storage capacity of 7.2 m^3, and a total storage volume of 14.7 m^3, and a maximum treatment flow rate of 393 L/s, discharging via a 525 mm diameter outlet pipe to a bioretention and infiltration facility, identified below;

bioretention and infiltration facility (catchment area 2.73 ha): - establishment of a bioretention filter and infiltration basin (Cell 1) and a second infiltration basin (Cell 2) located to the south-east of the Public Drop-Off (PDO) Area, having a minimum detention storage volume of approximately 586 m^3 for the 100-year storm event, with an emergency spillway discharging via an existing ditch within a stormwater easement along the east side of the site to Dunlop Drive, and ultimately to the Eramosa River and the Grand River;

Solid Waste Transfer Station (TS) Area

storm sewers: - diversion of the existing storm sewer collection system located south-east of the Solid Waste Transfer Station (TS) from the spill collection and treatment system for the Solid Waste Transfer Station (TS) to an oil and grit separator (Oil/Grit2), identified below;

oil and grit separator (Oil/Grit2 - catchment area 1.09 hectares): - one (1) oil and grit separator (Wilkinson Watergate Model WG400, or Approved Equivalent), having a sediment storage capacity of 1.4 m^3, an oil storage capacity of 7.2 m^3, and a total storage volume of 14.7 m^3, and a maximum treatment flow rate of 393 L/s, discharging via a 375 mm diameter outlet pipe to the existing a stormwater management pond serving the Solid Waste Transfer Station, identified below;

stormwater management pond (catchment area 5.51 ha): - modification of the drainage area to the existing stormwater management dry pond serving the Solid Waste Transfer Station, with a total storage volume of 2,899 m^3 at a depth of 1.97 m with a maximum release rate of 628 L/s achieved during a 100-year design storm due to flow restriction by a staged outlet control structure consisting of three orifices having 0.25 m, 0.30 m and 0.50 m diameters;

Previous Works:

Solid Waste Transfer Station

a stormwater and spill collection and treatment system for the Solid Waste Transfer Station serving a concrete apron and a concrete fuel tank base at the petroleum fuelling facility, including:
- a series of catchbasins, manholes and underground storm sewers, discharging to an oil/water separator;
- one (1) coalescing oil/water separator, having a holding capacity of 2,700 L and designed for a maximum flow rate of 260 L/min, discharging to a pump chamber;
- a pump chamber (manhole) equipped with a pump with a rated capacity of 5 L/sec at a total dynamic head of 3.3 m, discharging via an existing swale to a stormwater management pond, identified below;

a stormwater management pond (catchment area 5.85 ha) for the Solid Waste Transfer Station discharging to an existing ditch on Dunlop Drive located to the north-east of the Solid Waste Transfer Station, including:
- a network of vegetated ditches and swales constructed on the site to collect and convey the 100-year design storm run-off to the stormwater management pond via two 525 mm diameter culverts under the driveway;
- one (1) stormwater management dry pond with a total storage volume of 2,899 m^3 at a depth of 1.97 m with a maximum release rate of 628 L/s achieved during a 100-year design storm due to flow restriction by a staged outlet control structure consisting of three orifices having 0.25 m, 0.30 m and 0.50 m diameters;
- one (1) shut-off valve at the outlet control structure to allow diversion of any contaminated stormwater to a

sanitary sewage-leachate pumping station (SLPS), identified below;

sanitary sewage-leachate pumping station (SLPS) servicing the Solid Waste Transfer Station consisting of one (1) 3.5 m square by 5.6 m deep concrete wet well with duplex submersible sewage pumps each rated at 14 L/s at 13 m total dynamic head under normal operating condition and 22 L/s at 12 m total dynamic head under a stormwater management pond full/by-pass condition, a 300 mm diameter sanitary sewer inlet, a 200 mm diameter by-pass pipe from/to the adjacent stormwater management pond, identified above, discharging via a 150 mm diameter forcemain along Dunlop Drive to an existing municipal sanitary sewer on Watson Parkway;

Other Operations

redirection of the overflow outlet from the Municipal Hazardous and Special Waste Depot underground spill tank to the lined portion of the compost pad storage pond (CPSP) using a buried sewer pipe equipped with a flat gate and rip-rap protection;

Sanitary and Storm Sewers

sanitary sewers and sewer connections with diameters of 100 mm, 150 mm, and 200 mm;

storm sewers with diameters of 300 mm, 600 mm, and 900 mm;

small sanitary sewage pumping station, located in the north-east sector of the site, consisting of one (1) 1.2 m diameter sewage pumping station (SPS), complete with one (1) 4.8 m deep wet well, two (2) grinder pumps, each rated at 7.6 L/s at a total dynamic head of 16 m, and one (1) 100 mm diameter forcemain from the SPS to sanitary sewer manhole (MH 1) on Dunlop Drive connected to the existing municipal sanitary sewer system;

Stormwater Management Facilities

a stormwater management facility servicing the Waste Resource Innovation Centre, designed as a stormwater detention wet pond (SDP), having a permanent pool volume of 705 m^3 for quality control and outlet control devices for quantity control, including:
- a perimeter drainage swale around the site;
- subsurface infiltration trenches to accommodate roof-top run-off;
- grass-lined drainage ditches;
- two (2) double-inlet catch basins located within the grassed ditch to capture and direct surface stormwater run-off from around the perimeter of the outdoor compost curing pad (OCCP) to a 300 mm diameter storm sewer leading to stormwater detention pond 1 (SDP1);
- one (1) lined compost pad storage pond (CPSP) with a temporary storage capacity of 100 m^3 for run-off from the 1.56 ha outdoor compost curing pad (OCCP) having a total storage capacity of 540 m^3;
- one (1) 600 mm diameter inlet storm sewer connecting the compost pad storage pond (CPSP) and manhole (MH 5) at the outdoor compost curing pad (OCCP);
- an outlet from the compost pad storage pond (CPSP) to the sanitary sewer system via a 200 mm diameter sewer leading to manhole (MH A2), with a 50 mm diameter orifice plate at the pipe inlet, for conveyance of the run-off from the outdoor compost curing pad (OCCP) to the sewage pumping station (SPS) at a maximum controlled rate of 7 L/s for the 100-year storm event;

- a separation berm between the compost pad storage pond (CPSP) and stormwater detention pond 1 (SDP1), including a ditch inlet catch basin with invert at 0.45 m above the bottom of the compost pad storage pond (CPSP), to convey excess flow to stormwater detention pond 1 (SDP1) during the 2-year storm event or greater with corresponding compost pad storage pond (CPSP) volumes of greater than 100 m^3 via a 900 mm diameter pipe from the ditch inlet catchbasin and over the separation berm;
- an impermeable liner along the base and slopes of the compost pad storage pond (CPSP);

a stormwater detention wet pond (SDP1, catchment area 5.71 ha) having a permanent pool volume of approximately 630 m^3 at a depth of 0.6 m and a total storage volume of 2,090 m^3, including the permanent pool volume, including:
- seven (7) stormwater inlet locations around the pond perimeter for direct conveyance of run-off from a total drainage area of up to 5.71 ha into the pond, in addition to the 900 mm diameter overflow line from the compost pad storage pond (CPSP) ditch inlet catch basin to a rip rap protected area;
- a small, impermeable berm constructed around the pond outlet structure to ensure the minimum required permanent pool storage volume for quality control;
- an outlet structure for discharge of effluent to stormwater detention pond 2 (SDP2) via a 900 mm diameter sewer equipped at the inlet with a headwall and an adjustable steel gate with a 200 mm diameter orifice for quantity control;

a stormwater detention wet pond (SDP2, catchment area 2.87 ha) having a permanent pool volume of approximately 75 m^3 and a total storage volume of 1,870 m^3, including the permanent pool volume, designed for controlled outflow rates of 0.12 m^3/s for the 5-year storm event and 0.18 m^3/s for the 100-year storm event, including:
- four (4) stormwater inlet locations around the pond perimeter for direct conveyance of run-off from a total drainage area of 2.87 ha into the pond, in addition to the 900 mm diameter inlet sewer from stormwater detention pond 1 (SDP1);
- a small, impermeable berm constructed around the pond outlet structure to ensure the minimum required permanent pool storage volume for quality control;
- an outlet structure for discharge of effluent to the Dunlop Drive roadside ditch via a 900 mm diameter CSP sewer equipped at the inlet with a headwall and an adjustable steel gate with a 400 mm diameter orifice for quantity control;

including erosion/sedimentation control measures during construction and all other controls, electrical equipment, instrumentation, piping, valves and appurtenances essential for the proper operation of the aforementioned Works;

all in accordance with the submitted supporting documents listed in Schedule "A" forming part of this Approval.

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

"Approval" means this entire document including the application and any supporting documents listed in any schedules in this Approval;

"Approved Equivalent" means a substituted product that meets the required quality and performance standards of a named product and has been approved for substitution in writing by the Director.

"Director" means a person appointed by the Minister pursuant to section 5 of the Environmental Protection Act for the purposes of Part II.1 of the Environmental Protection Act;

"Ministry" means the ministry of the government of Ontario responsible for the Environmental Protection Act and the Ontario Water Resources Act and includes all officials, employees or other persons acting on its behalf;

"Owner" means The Corporation of the City of Guelph and includes their successors and assignees;

"Previous Works" means those portions of the sewage Works previously approved under an Approval;

"Water Supervisor" means the Water Supervisor of the Guelph office of the Ministry;

"Works" means the sewage works described in the Owner's application(s) and this Approval.

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. GENERAL PROVISIONS

(1) The Owner shall ensure that any person authorized to carry out work on or operate any aspect of the Works is notified of this Approval and the Conditions herein and shall take all reasonable measures to ensure any such person complies with the same.

(2) Except as otherwise provided by these Conditions, the Owner shall design, build, install, operate and maintain the Works in accordance with the description given in this Approval, and the application for approval of the Works.

(3) Where there is a conflict between a provision of any submitted document referred to in this Approval and the Conditions of this Approval, the Conditions in this Approval shall take precedence, and where there is a conflict between the listed submitted documents, the document bearing the most recent date shall prevail.

(4) Where there is a conflict between the listed submitted documents, and the application, the application shall take precedence unless it is clear that the purpose of the document was to amend the application.

(5) The Conditions of this Approval are severable. If any Condition of this Approval, or the application of any requirement of this Approval to any circumstance, is held invalid or unenforceable, the application of such Condition to other circumstances and the remainder of this Approval shall not be affected thereby.

(6) The issuance of, and compliance with the Conditions of this Approval does not:

(a) relieve any person of any obligation to comply with any provision of any applicable statute, regulation or other legal requirement, including, but not limited to, the obligation to obtain approval from the local conservation authority necessary to construct or operate the sewage Works; or

(b) limit in any way the authority of the Ministry to require certain steps be taken to require the Owner to furnish any further information related to compliance with this Approval.

(7) This Approval includes the collection, treatment and disposal of stormwater run-off from the 29.54 hectare Waste Resource Innovation Centre (WRIC) in the City of Guelph, to provide Enhanced Level water quality control and erosion protection, discharging via existing ditches to the Eramosa River. Any changes within the drainage areas that might increase the required storage volumes or increase the flows to or from the stormwater management facilities or any structural/physical changes to the stormwater management facilities, including the inlets and outlets will require an amendment to this Approval.

2. EXPIRY OF APPROVAL

This Approval will cease to apply to those parts of the proposed Works which have not been constructed within **five (5) years** of the date of this Approval.

3. CHANGE OF OWNER

(1) The Owner shall notify the Water Supervisor and the Director, in writing, of any of the following changes within **thirty (30) days** of the change occurring:

(a) change of Owner;

(b) change of address of the Owner;

(c) change of 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. B17 shall be included in the notification to the Water Supervisor;

(d) change of name of the corporation where the Owner is or at any time becomes a corporation, and a copy of the most current information filed under the Corporations Information Act, R.S.O. 1990, c. C39 shall be included in the notification to the Water Supervisor.

4. OPERATION AND MAINTENANCE

(1) The Owner shall ensure that the design minimum liquid retention volume(s) is maintained in the wet ponds at all times.

(2) The Owner shall conduct a monthly visual inspection of the oil/water separators and the effluent from the pumping manhole during discharge of treated water for any visual oil sheen.

(3) The Owner shall inspect the Works at least once a year and, if necessary, clean and maintain the Works to prevent the excessive build-up of sediments, debris, and/or vegetation, maintain the inlet and outlet structures, and address any signs of slope erosion.

(4) The Owner shall maintain a logbook to record the results of these inspections and any cleaning and maintenance operations undertaken, and shall keep the logbook at the Corporate Office for inspection by the Ministry. The logbook shall include the following:

(a) the name of the Works; and

(b) the date and results of each inspection, maintenance and cleaning, including an estimate of the quantity of any materials removed.

5. MONITORING AND REPORTING

(1) The Owner shall implement a ground water and surface water sampling program to ensure early detection of
contaminants in the event that such contaminants escape the Waste Resource Innovation Centre (WRIC) site, as follows:

(2) Ground Water and Surface Water shall be sampled and analysed for the following parameter suite:

Parameters (sampled semi-annually in the spring and fall)	Biological Oxygen Demand (BOD)	Chloride (Cl)
	Chemical Oxygen Demand (COD)	Sodium (Na)
	Total Kjeldahl Nitrogen (KTN)	Calcium (Ca)
	Ammonia as Nitrogen (NH3-N)	Boron (B)
	Total Phosphorus (Total P)	Total Iron (Fe)
	Total Sulphate (SO4)	Phosphorus (P)
	Phenols	Zinc (Zn)
	Nitrate (NO3) and Nitrite (NO2)	
General Parameters (semi-annually)	pH	Magnesium (Mg)
	Conductivity	Potassium (K)
	Alkalinity	
Organics (sampled annually)	EPA 624,625 (ATG 16+17+18) & ATG (19+20)	
Field Parameters	pH, Conductivity, Temperature	

(3) The surface water monitoring shall include obtaining grab samples at the discharge locations of the final surface water off the Waste Resource Innovation Centre (WRIC) site, for at least three (3) wet events per year (a wet event is defined as a minimum of 15 mm of rain in the previous 24 hours), and tested for Total Suspended Solids (mg/L), and the results recorded. Two (2) of the events must occur within the May to September time period.

(4) The Owner shall **annually** review and update the ground water and surface water sampling programs, designed to detect and quantify any impacts originating from the Waste Resource Innovation Centre (WRIC) site.

(5) Sampling frequency and parameters for analysis may be adjusted upon the written approval of the Water Supervisor, from time to time, as ground water and surface water information becomes available.

(6) All ground water monitoring wells which form part of any monitoring program shall be protected from damage. Any ground water monitoring wells that are damaged shall be repaired or replaced forthwith or properly abandoned in accordance with Ontario Regulation 903.

(7) The Owner shall **annually** review and update, if required, the detailed maintenance schedules for the stormwater management facilities on the Waste Resource Innovation Centre (WRIC) site.

(8) The Owner shall submit to the Water Supervisor, **every year**, a copy of the test results as per Condition 5, Subsection (2) and Subsection (3), above.

(9) The Owner shall submit to the Water Supervisor, an **annual report** on the ground water and surface water sampling and monitoring program described herein, and shall include an interpretation of the results prepared by a qualified hydrogeologist, engineer or scientist, and shall identify any remedial/mitigative action taken.

6. SPILL CONTINGENCY AND POLLUTION PREVENTION PLAN

(1) Upon commencement of operation of the Works, the Owner shall implement a Spill Contingency and Pollution Prevention Plan that outlines procedures as to how to mitigate the impacts of a spill within the area serviced by the Works and/or prevent pollution incidents. The said plan shall include as a minimum, but not limited to:

(a) the name, job title and location (address) of the Owner, person in charge, management or control of the Waste Resource Innovation Centre (WRIC) at 110 Dunlop Drive;

(b) the name, job title and 24-hour telephone number of the person(s) responsible for activating the Spill Contingency and Pollution Prevention Plan;

(c) a site plan drawn to scale showing the facility, nearby buildings, streets, catchbasins & manholes, drainage patterns (including direction(s) of flow in storm sewers) and any features which need to be taken into account in terms of potential impacts on access and response (including physical obstructions and location of response and clean-up equipment);

(d) steps to be taken to report, contain, clean up and dispose of contaminants following a spill;

(e) a listing of telephone numbers for: local clean-up companies who may be called upon to assist in responding to spills; local emergency responders including health institution(s); and MOE Spills Action Centre 1-800-268-6060;

(f) Materials Safety Data Sheets (MSDS) for each and every hazardous material which may be transported or stored within the area serviced by the Works;

(g) the means (internal corporate procedures) by which the Spill Contingency and Pollution Prevention Plan is activated;

(h) a description of the spill response and pollution prevention training provided to employees assigned to work in the area serviced by the Works, the date(s) on which the training was provided and to whom;

(i) an inventory of response and clean-up equipment available to implement the Spill Contingency and Pollution Prevention Plan, location and date of maintenance/replacement if warranted, including testing and calibration of the equipment; and

(j) the date on which the Spill Contingency and Pollution Prevention Plan was prepared and subsequently, amended.

(2) The Spill Contingency and Pollution Prevention Plan shall be kept in a conspicuous place near the reception area on site.

(3) The Spill Contingency and Pollution Prevention Plan will be amended from time to time as needed by changes in the operation of the facility or to reflect updates in the Municipal By-Laws, or improved Best Management Practices by the Owner.

7. TEMPORARY EROSION AND SEDIMENT CONTROL

(1) The Owner shall install and maintain temporary sediment and erosion control measures during construction and conduct inspections once every **two (2) weeks** and after each significant storm event (a significant storm event is defined as a minimum of 25 mm of rain in any 24 hours period). The inspections and maintenance of the temporary sediment and erosion control measures shall continue until they are no longer required and at which time they shall be removed and all disturbed areas reinstated properly.

(2) The Owner shall maintain records of inspections and maintenance which shall be made available for inspection by the Ministry, upon request. The record shall include the name of the inspector, date of inspection, and the remedial measures, if any, undertaken to maintain the temporary sediment and erosion control measures.

8. RECORD KEEPING

The Owner shall retain for a minimum of **five (5) years** from the date of their creation, all records and information related to or resulting from the operation and maintenance activities required by this Approval.

Schedule "A"

1. Application for Approval of Industrial Sewage Works, dated October 18, 2002, and associated documents, submitted by The Corporation of the City of Guelph;

2. Application for Approval of Municipal and Private Sewage Works, dated August 16, 2007, and received on August 20, 2007, submitted by The Corporation of the City of Guelph;

3. Storm & Sanitary Drainage Assessment Report for the City of Guelph Waste Resource Innovation Centre, dated August, 2007, prepared by Gartner Lee Limited;

4. Letters with attachments from Glenn Farmer of Gartner Lee Limited to the Ministry, dated October 5, 2007 and November 26, 2007;

5. E-mail with attachments from Glenn Farmer of Gartner Lee Limited to the Ministry, dated April 1, 2008;

6. E-mail from the Ministry to Glenn Farmer of Gartner Lee Limited, dated April 21, 2008;

7. Stormwater Management Report and final plans and specifications, dated 1992, prepared by R. Cave and Associates Engineering Ltd., Consulting Engineers;

8. Application for Approval of Municipal and Private Sewage Works, along with supporting information, dated April 13, 2010 and received on April 14, 2010, submitted by the The Corporation of the City of Guelph;

9. E-mail along with supporting information from Glenn Farmer of AECOM to the Ministry, dated May 14, 2010;

10. Application for Approval of Sewage Works, dated August 25, 2011 and submitted by The Corporation of the City of Guelph;

11. Design Brief and engineering drawings and specifications, dated August 9, 2011, provided by Vida Stripinis & Associates Limited;

12. Application for Approval of Municipal and Private Sewage Works, dated March 25, 2014, and received on April 15, 2014, submitted by the The Corporation of the City of Guelph;

13. Pipe Data Form and Storm Sewer Design Sheet, dated February 2014, prepared by Sco-Terra Consulting Group Limited;

14. Design Level Stormwater Management Plan, dated April 2014, prepared by Sco-Terra Consulting Group Limited;

15. Set of Engineering Drawings (22 drawings), dated April 14, 2014, prepared by Sco-Terra Consulting Group Limited;

16. E-mail and letter from Richard Pellerin of Sco-Terra Consulting Group Limited to the Ministry, dated September 24, 2014; and

17. E-mails from Richard Pellerin of Sco-Terra Consulting Group Limited to the Ministry, dated November 25, 2014, December 18, 2014, and January 7, 2015.

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

1. Condition 1 is imposed to ensure that the Works are built and operated in the manner in which they were described for review and upon which approval was granted. This Condition is also included to emphasize the precedence of Conditions in the Approval and the practice that the Approval is based on the most current document, if several conflicting documents are submitted for review.

2. Condition 2 is included to ensure that, when the Works are constructed, the Works will meet the standards that apply at the time of construction to ensure the ongoing protection of the environment.

3. Condition 3 is included to ensure that the Ministry records are kept accurate and current with respect to approved Works and to ensure that any subsequent Owner of the Works is made aware of the Approval and continues to operate the Works in compliance with it.

4. Condition 4 is included to require that the Works be properly operated and maintained such that the environment is protected.

5. Condition 5 is included to enable the Owner to evaluate and demonstrate the performance of the Works on a continual basis, so that the Works are properly operated and maintained at a level which is consistent with the design objectives specified in the Approval and that the Works do not cause any impairment to the receiving watercourse.

6. Condition 6 is included to ensure that the Ministry is immediately informed of the occurrence of an emergency or otherwise abnormal situation so that appropriate steps are taken to address the immediate concerns regarding the protection of public health and minimizing environmental damage and to be able to devise an overall abatement strategy to prevent long term degradation and the re-occurrence of the situation.

7. Condition 7 is included as installation, regular inspection and maintenance of the temporary sediment and erosion control measures is required to mitigate the impact on the downstream receiving watercourse during construction, until they are no longer required.

8. Condition 8 is included to require that all records are retained for a sufficient time period to adequately evaluate the long-term operation and maintenance of the Works.

Upon issuance of the environmental compliance approval, I hereby revoke Approval No(s). 5015-856HHF, and 5320-8NXK2Y issued on June 16, 2010 and December 8, 2011 respectively.

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) 314-4506 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 7th day of January, 2015

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

DC/

c: DWMD Supervisor, MOE Guelph office
Richard Pellerin, P. Eng, Sco-Terra Consulting Group Limited

AMENDMENT TO ENVIRONMENTAL COMPLIANCE APPROVAL
NUMBER A170128
Notice No. 4
Issue Date: January 9, 2015

The Corporation of the City of Guelph
1 Carden St
Guelph, Ontario
N1H 3A1

Site Location: Guelph Waste Resource Innovation Centre (WRIC)
110 Dunlop Dr
Guelph City, County of Wellington
N1H 6N1

You are hereby notified that I have amended Approval No. A170128 issued on February 10, 2011 forthe use and operation of a 29.54 hectare Waste Disposal Site (Transfer/Processing), as follows:

1. Paragraphs c) and d) of the pre-amble have been amended to read as follows:

   c) the use and operation of a Municipal Hazardous and Special Waste facility for the transfer and temporary storage of the following categories of waste *(Note: Use of the Site for additional categories of wastes requires a new application and amendments to the Provisional Certificate of Approval); Municipal Hazardous and Special Waste* limited to the following waste classes; 112, 121, 145, 146, 147, 148, 212, 213, 221, 242, 251, 252, 261, 263, 269, 312, and 331 as described in the Ministry of the Environment's document entitled *"Ontario Waste Classes"*, dated February 2013, as amended, limited to a maximum Site storage capacity of 15 tonnes; and

   d) the use and operation of a Waste Disposal Site (Transfer) for solid non-hazardous waste from industrial, commercial and institutional sources, commercial waste and domestic waste, with an indoor storage maximum capacity of 795 tonnes and outdoor storage areas for leaf and yard waste and for recyclable waste.

2. The following definitions have been amended to read as follows:

   (g) "**Environmental Compliance Approval (Air/Noise)**" means the **Environmental Compliance Approval** issued for the Site for the activities mentioned in subsection 9 (1) of the *EPA* for the Composting Site;

(ee) **"Municipal Hazardous and Special Waste"and "MHSW**" mean hazardous waste or special waste generated by households located within geographic boundaries of the City of Guelph and the County of Wellington that fall within waste numbers 112, 121, 145, 146, 147, 148, 212, 213, 221, 242, 251, 252, 261, 263, 269, 312, and 331 as set out in the Ministry of the Environment's document entitled "Ontario Waste Classes", dated February 2013, as amended, and as defined in *Regulation 347,*and also include wet cell batteries and small dry cell batteries, household cleaners and detergents, aerosols, waxes and polishes, fluorescent tubes and energy efficient light bulbs and mercury switches and thermostats;

3. The following definitions have been added:

(jjj) "**Public Drop-off area**" means the East Public Drop-Off and the West Public Drop-Off areas set out in the supporting documentation included in the attached Schedule "A";

(kkk) "**Environmental Compliance Approval (Municipal and Private Sewage Works)**" means the Environmental Compliance Approval issued for the Site for the activities mentioned in subsection 53 of the *OWRA;*

4. The following conditions have been amended to read as follows:

	Waste Storage
17.(4)(e)	wastes that are in bins in the Public Drop-Off area; and
	Complaints Procedure
46.(c)	The *Municipality* shall immediately orally notify the *Ministry* of the complaint, followed with the submission of a written report within three (3) days, of the complaint detailing what actions, if any, were taken to identify and remediate the cause of the complaint and what remedial action, if any, would be taken.
	Annual Report
52.(e)	an annual summary of the analytical results from the groundwater monitoring program and from surface water monitoring required in Environmental Compliance Approval (Municipal and Private Sewage Works), including an interpretation of the results and any remedial/mitigative action undertaken;
	Organic Waste and Composting Site
54.(1.2)(b)(iv)	confirmation whether inclusion of the *Organic Waste* in a biodegradable certified compostable bag is characterized as incidental/inadvertent or a result of collection through a waste collection program that allows the use of the said compostable bags;

5. Conditions 32, 33, 34, 35 and 36 are deleted.

6. The following documents have been added to Schedule "A":

57. Environmental Compliance Approval Application dated April 2, 2013, signed by Bill Shields, The Corporation of the City of Guelph, including the attached supporting documentation.

58. E-mail dated March 17, 2014 (9:31 a.m.) from Bill Shields, The Corporation of the City of Guelph, to Margaret Wojcik, Ontario Ministry of the Environment and Climate Change, with the description of the amended access to the West PDO and including the description of the wastes received at this location.

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

to approve an additional Public Drop-Off location, a new brush and leaf and yard waste storage areas, the new waste class to be accepted at Municipal Hazardous and Special Waste facility and to correct an administrative ambiguity in Condition 54.(1.2)(b)(iv). Conditions 32 through 35 are deleted since the groundwater and the surface water monitoring is required in the Environmental Compliance Approval (Municipal and Private Sewage Works) issued for the Site.

This Notice shall constitute part of the approval issued under Approval No. A170128 dated February 10, 2011, as amended.

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

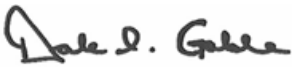
AND

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 9th day of January, 2015



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

MW/
c: District Manager, MOE Guelph
Chris Visser, Golder Associates Ltd.

AECOM
105 Commerce Valley Drive West, Floor 7 905 886 7022 tel
Markham, ON, Canada L3T 7W3 905 886 9494 fax
www.aecom.com

December 3, 2013

Mr. Bill Shields
Supervisor of Governance & Compliance
Solid Waste Resources
Environmental Services Department
City of Guelph
59 Carden Street
Guelph, ON N1H 3A1

Dear Mr. Shields:

Project No: 60266226-03

Regarding: Follow Up Response to Ministry of the Environment Comments on the Surface Water Monitoring Program and Proposed Action Plan– City of Guelph

We have reviewed the comments received from the Ministry of the Environment (MOE) via email on October 31, 2013 with regard to our further response to the surface water comments from MOE review of the 2012 Annual Report dated October 8, 2013.

Based on the follow-up comments the MOE has agreed to the monitoring of Stormwater Detention Pond 2 (SD2) during and after precipitation events with water quality sampling only if discharge is required. The MOE has also requested that if this monitoring is to proceed that documentation regarding the operations of the pond should be provided in order to address, capacity, freeboard and the trigger level at which the pond will be discharged.

Discussion

A detailed assessment of the storm water ponds is contained in the "Storm & Sanitary Drainage Assessment Report for the City of Guelph Waste Resource Innovation Centre, dated August 2007 (GLL70-176). The physical characteristics of Pond SD2, as outlined in Table 3.5 of the drainage assessment report, are provided in the table below.

Depth / Stage (m)	Storage Volume (m3)	Pond Outflow 400 mmϕ. (m^3/s)[1]	Pond Outflow 900 mm ϕCSP (m^3/s)[1]	Comments
0	75	0000	0.000	Pond invert
0.2	470	0.149	0.293	400 mm orifice set at + 0.15 m above invert
0.45	870	0.224	0.535	
1.0	1870	0.334	1.254	Maximum pond depth

Notes: 1-units were incorrectly stated as L/s in the report (GLL70-176) as values in report are correctly report in m^3/s.

Based on the detailed site assessment, it was determined that the Pond SD2 outlet could accommodate the peak flow generated by a 100 year storm (i.e., predicted outflow is 1.2 m^3/s versus 1.33 m^3/s pre development levels). However, it was concluded through modelling, that due to the modification to the system, which included the blockage of the outlet at SD2, that there could be surface flooding in the low lying areas for storm events in excess of a 5 year storm. Although this has not been observed at the site to-date, it is recommended that the trigger water level in the pond be set based on the theoretical calculation for a 5 year storm, in order to be conservative. Therefore, the trigger water level is to be set at 0.46 m as per the theoretical volume calculated in Pond SD2 of 890 m^3 from a 5 year storm (Table 3.6 in the drainage assessment report).

Based on the above information, the following surface water monitoring program is recommended:

- Assess Storm Water Detention Pond 2 on a monthly basis/ and or during periods of rain/storm events (where practical);
- Install a staff gauge at the point of discharge from Pond SD2 to record observed levels;
- When a target level of 0.46 m above pond invert is reached, discharge would be required;
- Water quality sampling should be completed, prior to any discharge, to insure all applicable Provincial Water Quality Objectives (PWQO) and Canadian Water Quality Guidelines (CWQG) are met.
- If applicable guidelines are met off site discharge should be completed until below the outlet invert. Upon reaching this level, the outlet should then be closed.

Further to the above, the storm water management pond (TP) on the transfer station property will continue on the monthly frequency, under non stagnant conditions, based on current proposed upgrades to the transfer station facility. As part of this, sampling of the background station EPTS-01 should also continue on a monthly basis.

We trust that this meets your requirement at this time. Should you need further information or clarifications please do not hesitate to contact me at (905) 747-7482.

Sincerely,
AECOM Canada Ltd.

Terry La Chapelle, B.Sc., P.Geo.
Senior Geologist, Project Manager

TLC:mm .
cc: Kevin Noll, MOE
Glenn Farmer, AECOM

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