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DURING CONSTRUCTION ANNUAL REPORT YEAR 2

DURHAM YORK ENERGY CENTRE - SURFACE WATER MONITORING PROGRAM

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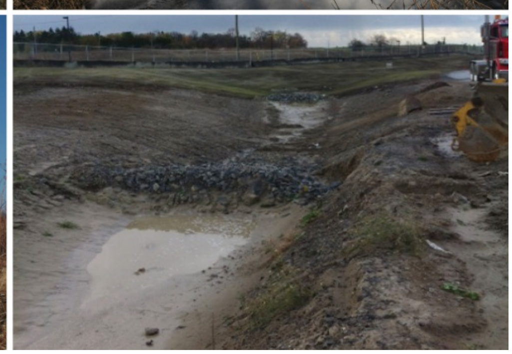

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REPORT

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1.0 INTRODUCTION

Golder Associates Ltd. ("Golder Associates") has been retained by Covanta Durham York Renewable Energy Limited Partnership ("Covanta") to oversee the Surface Water Monitoring Program for the Durham York Energy Centre (the "Facility") during construction. This Surface Water Monitoring Program involves erosion and sediment control ("E&SC") monitoring, along with a surface water quality sampling program, and spill response support as needed.

This Surface Water Monitoring Program - During Construction Year 2 Report is in general accordance with the Ontario Ministry of the Environment ("MOE") Technical Guidance Document on Monitoring and Reporting for Waste Disposal Sites (2010). This Year 2 report highlights the continued Surface Water Monitoring Program - During Construction efforts from May 2013 to April 2014.

The Year 1 Surface Water Monitoring Program - During Construction Report, dated April 30, 2013, was prepared by Golder Associates, reviewed by the MOE, with acceptance confirmed during a conference call meeting with the Regional Municipalities of Durham and York on September 17, 2013.

During this conference call discussion with the MOE, a refinement for the Surface Water Monitoring Program in Year 2 focusing on monthly *in situ* turbidity measurements at the established surface water sampling stations, with optional additional Total Suspended solids sampling, was also discussed. These monthly surface water in situ measurements and periodic sampling efforts were implemented in Year 2, and along with continued weekly Environmental Monitor and Inspector ("EMI") E&SC Site inspections and spill records, response and reporting (where needed), are all presented in this report.

1.1 Location

The Facility is located at 72 Osborne Road in Clarington, Ontario (the Waste Disposal Site "WDS" or "Site"), is approximately 12 ha and is currently under construction. The Site is bounded by the Canadian National Railway ("CNR") line to the south, industrial development to the north, agricultural land to the west (owned by the Regional Municipality of Durham), and Osborne Road to the east (Figure 1).

1.2 Ownership and Key Personnel

The Facility and Site is owned by the Regional Municipalities of Durham and York, and is operated by Covanta. The key contact information for the Site owner(s), the Site operator and the Competent Environmental Practitioner ("CEP") for both groundwater and surface water overseeing the environmental monitoring programs during construction is provided in Appendix B.

Covanta is overseeing both the construction and operation phases of the Facility. Functional testing (i.e., when waste is first delivered) is scheduled to be begin by approximately July, 2014. Courtice Power Partnership ("CPP") is the general contractor comprised of a joint venture between Kenaidan Contracting Ltd. and Barton Malow Canada Inc., hired by Covanta. CPP are delivering the various construction administration efforts for the Facility and the overall Site. CPP have also identified qualified staff to prepare the weekly EMI E&SC Site inspections, to be presented to the Golder Surface Water CEP for review and follow-up as required (e.g., confirmation that any identified E&SC deficiencies have been addressed, Site visit, prescription of mitigation measures, MOE contact).

1.3 Description and Development of the WDS

Durham and York Regions partnered in 2005 to undertake an environmental study to investigate alternative methods to manage their future residential waste. The goal of the study was to seek local solutions to responsibly manage residual municipal solid waste not captured by the Regions recycling and diversion programs.

Extensive public consultation was undertaken throughout the process to reach the preferred alternative of the mass burn incinerator at the Site, selected as the most environmentally sustainable disposal option for residual municipal solid waste in the Regions.

The Facility will be capable of processing 140,000 tonnes per year of post-diversion residual waste, while recovering metals and energy from waste ("EFW"). The waste arriving at the Facility will have minimal recyclables content, due to the various province-leading curbside and waste management facility diversion programs offered by the Regions; in addition, any residual metals will be removed from the ash for recycling.

The EFW process also includes production of high-pressure steam, which is fed through a turbine generator that produces electricity. The EFW Facility is projected to produce up to 15 MW of renewable energy, enough to power approximately 10,000 homes (Stantec, 2009).

1.4 Monitoring and Reporting Program Objectives and Requirements

This Surface Water Monitoring Program is in Accordance with Condition 20 of the Site's Environmental Assessment ("EA") Notice of Approval issued by the Ontario Ministry of the Environment ("MOE") (Appendix A). Specifically, Condition 20.1 required the preparation of the Durham-York Energy Centre Groundwater and Surface Water Monitoring Plan for the Regional Municipalities of Durham and York ("the Plan") (Stantec, 2011).

This report provides a summary of the surface water monitoring program activities, including the EMI weekly E&SC inspection efforts, periodic surface water quality sampling performed by Golder, along with any reportable spill incidents and associated responses for the first year of during construction monitoring, since the program was initiated on May 28, 2012.

The Owners ("Regional Municipalities of Durham and York") and Covanta have been meeting with the MOE approximately every two months on-Site to review the status of construction and perform a Site walk.

Covanta, the CPP EMI and the Golder Surface Water CEP circulate weekly EMI reports highlighting E&SC inspections, as well as summaries of the periodic surface water quality sampling observations, in accordance with the Surface Water Monitoring Plan. Covanta then relays these EMI reviews to the Owners, including a summary of any deficiencies and corrective measures, surface water sampling events, and/or any reportable spills on-Site.

1.5 Assumptions and Limitations

The following assumptions and limitations for the Surface Water Monitoring Program are outlined below:

- The EMI provides complete and accurate weekly E&SC Site observations, deficiency reporting, and follow-up as documented via electronic information exchanges and phone conversations.
- There are many factors that can affect the results produced by an *in-situ* surface water monitoring program. The monitoring equipment used along with the monitoring design set-up, the sampling procedures and Site

specific environmental factors may all play a role in affecting observed results. Golder staff followed the sampling methods and laboratory chain-of-custody protocol procedures prescribed in Section 3.0.

- Spill reporting has been provided for all notable incidents on Site and clean-up measures for any reportable spills have been implemented in a timely manner and as outlined in follow-up incident reports provided to the Surface Water CEP.

2.0 PHYSICAL SETTING

2.1 Geology and Hydrogeology

The Site and surrounding study area is situated within the Iroquois Plan Region, generally underlain by a dense Newmarket Till with low permeability and limited infiltration potential. The Newmarket Till layer is estimated to be between 25 to 30 m in depth ((Genivar and Jacques Whitford, 2007); (CLOCA, 2008); (DFO, et al., 2000)). A thin layer of intertill sediments of approximately 5 m (including both Thorncliffe and Scarborough formations) lies beneath the Newmarket Till layer (DFO, et al., 2000). Below the overburden layers described above lies the Whitby shale bedrock (DFO, 2005).

The groundwater flow through the Site generally follows the surrounding Site topography, from the northeast to the southwest towards Lake Ontario (Jacques Whitford Ltd., 2009). This groundwater baseflow pattern travels laterally and discharges to local surface water features (e.g., receiving swale, Tooley Creek and ultimately Lake Ontario). A substantial region of recharge and discharge is known within the Iroquois Beach/Shoreline Area (DFO, et al., 2000).

2.2 Surface Water Features

Before construction, the general northeast to southwest slope of the Site was approximately 1.9 %, based on a detailed Site topographic survey in 2005 (The Regional Municipality of Durham, 2005). The overall, post development slope of the Site will be approximately the same (1.9%). The Site re-grading efforts are now directing Site runoff towards two Stormwater Management ("SWM") Ponds (East and West), located at the southeastern and southwestern quadrants of the Site (Figure 1). During construction, Site runoff is still generally conveyed from northeast to southwest, via overland flow or through two constructed swales that direct runoff towards the two SWM Ponds along the southern perimeter.

These SWM ponds are currently operational for construction, with final grading and landscaping already complete. Final outfall channel work will be completed, once the on-going Region of Durham conveyance channel construction immediately south of the Site, north of the CNR line is completed.

The stormwater discharges from these SWM ponds are controlled by float-pumps in the aft bay of both ponds, to keep water levels at approximately 1 m below the invert of the temporary polyvinyl chloride ("PVC") pipe outlets. This practice minimizes the potential for major storm events to discharge from the ponds, uncontrolled during the construction period.

For both the East and West SWM Pond, the controlled discharge is directed through a 300 mm diameter, PVC pipe. Both SWM Pond pipe outlets direct discharge to one outfall location immediately south of the West SWM Pond, beyond the property fence. During the construction phase, if significant rainfall-runoff events (e.g., greater than 25 mm of total rainfall) result in the SWM ponds reaching the inlet (upstream end) of the PVC pipes, controlled discharge will gravity drain through the outlet pipes to the outfall location.

During the conveyance channel construction work, which commenced in September 2013, the ponds were pumped as needed to conveyance swales downstream or around the conveyance channel construction activities. Actual discharge points and time frames were coordinated directly with the contractor executing the work to occur when turbidity levels in the ponds appeared to be low based on visual inspection, and to avoid any disruption to on-going work.

This Site outfall disperses flow through a grassy, overland flow route leading to the receiving swale south of the Site, and immediately north of the CNR (i.e., the CNR ditch). This swale directs surface water flow from east to west towards Tooley Creek. The upstream end of this swale within the study area conveys flow through a 600 mm diameter corrugated steel pipe (“CSP”) culvert under Osborne Road. From this culvert crossing, the swale continues west another 600 m to Courtice Road. Surface water flow from the swale is conveyed under Courtice Road via a 1250 mm diameter CSP, and discharges into Tooley Creek approximately 400 m downstream and west of the Courtice Road crossing. The swale within the Study Area has a varying bank full width between 1 to 2 m (Jacques Whitford Ltd., 2009).

Tooley Creek flows generally north to south and crosses the CNR immediately downstream of the Site receiving swale. Downstream from the CNR crossing, Tooley Creek meanders for approximately 1 km before discharging into Lake Ontario at the Tooley Creek Coastal Marsh. In this reach, the average channel width is approximately 5 m with steep well-incised banks and minimal riparian buffer lands. There are no road crossings of the creek south of the CNR.

The Tooley Creek Watershed is fully contained within the Municipality of Clarington and has an area of 1040 ha. The headwaters originate in the Maple Grove Wetland Complex north of Highway 2. The definable stream length of this creek is 26 km (AECOM Canada Ltd., 2009).

3.0 DESCRIPTION OF MONITORING PROGRAM

The following Section outlines the Surface Water Monitoring program for the Site and greater study area. This program for Year 2 during construction is in general accordance with Sections 3.3 and 3.4 of the Plan (Stantec, 2011).

The MOE provided comments on both the Year 1 during construction Groundwater and Surface Water Monitoring Program reports for the Site, in a response letter dated May 24, 2014 (Appendix A-2). A follow-up conference call was coordinated with the Regions, Covanta and Golder on September 17, 2013, to review the comments and discuss any modifications to the Surface Water program required. The Regions follow-up letter dated October 18, 2013 (Appendix A-2), summarized the key points discussed during this conference call. A few modifications to the Year 2 Surface Water Monitoring Program for the Site, summarized below, were accepted by the MOE and Regions as per the correspondence.

- In Year 2, the Golder surface water field crew began taking in situ turbidity measurements using a turbidity meter at all stations for the monthly sampling efforts, with TSS sampling to be performed on an ‘as needed basis’, when there was any concern that *in situ* turbidity measurements were indicating TSS concentrations above 25 mg/L.
- Due to the Region trunk sewer construction activity start-up in September 2013, the SW1 and SW2 stations that were directly affected (within the zone of construction) were moved on September 30, 2013

More detail on the Year 2 Surface Water Monitoring program and modifications is provided below.

3.1 Surface Water Monitoring Locations

The on and off-Site surface water sampling stations (SW1 to SW4, E-SWMP-IN, E-SWMP-OUT, W-SWMP-IN, and W-SWMP-OUT) are shown on Figure 1. Changes to locations SW1 and SW2 on/after September 30, 2013, due to construction are shown on Figure 2. Each station is described in more detail below, with conditions during sampling events shown in Appendix C.

SW1

Sampling Location SW1 was established on June 5, 2013 within the CNR ditch ("receiving swale") on the north side of the CNR line immediately downstream of 100 Osborne Road driveway leading to the WPCP (Figure 1). This flat bottom ditch is approximately 1 m in width at this location. A pool that is slightly deeper than the downstream swale is located at the outlet of the 100 Osborne Road driveway culvert. Dense wetland grasses span the width of the channel.

SW1 was moved on September 30, 2013 approximately 15 m to the East; to the upstream inlet end of the culvert crossing 100 Osborne Rd driveway (Figure 2). The sampling location was moved because of sewer trunk construction on the outlet downstream side of the culvert

SW2

Sampling Location SW2 was originally established within the ditch on the north side of the CNR line approximately 50 m east of Courtice Road (Figure 1). This location is accessed via agricultural land to the north. At this location the ditch is approximately 2 m in width with well treed banks providing good shade across the channel. The channel bed contains much less vegetation than at SW1, but exhibits minor channel obstructions from woodland debris.

SW2 was moved approximately 190 m to the west (Figure 2), at a suitable location west of the Courtice Road crossing and further downstream in the receiving swale before the Region trunk sewer construction efforts started in early October 2013.

SW3

Sampling Location SW3 is on Tooley Creek, approximately 50m north of the CNR crossing and upstream of the receiving swale confluence with Tooley Creek. The sampling location is surrounded by grassland. The channel bed consists of exposed loamy soil with grasses along the banks. The banks are steeper than 2:1 and are prone to erosion, particularly along the outside bends of channel meanders. The bankfull depth at this location is approximately 1.5 m.

SW4

Sampling Location SW4 is on Tooley Creek, approximately 50 m south of the CNR crossing and downstream of the receiving swale confluence with Tooley Creek. The sampling location is surrounded by grassland. The channel bed consists of exposed loamy soil with some cobbles. Immediately downstream of the sampling location, a meander in the creek has resulted in significant erosion on the western bank. There is minimal vegetation within the channel. The bankfull depth at this location is approximately 1.5 m.

SWM Pond Inlets

Sampling locations E-SWMP-IN and W-SWMP-IN are in close proximity to the eastern and western SWM pond inlet headwalls, respectively. Samples are taken from the centre-line of the inflow path at both stations. During the construction-phase of Site development, the ponds were excavated into on-Site fill material.

SWM Pond Outlets

Prior to the Region trunk sewer construction efforts that started in October 2013, the east and west SWM ponds discharged to a rip-rap splash pad located close to the southwest Site boundary. The outlet pad was located in a low-lying grassed area.

The E-SWMP currently outlets to a rip-rap splash pad located in the large trunk sewer construction trench that currently runs south of the new road entering the Covanta facility from the southwest. The E-SWMP outfall piping outlets to a new receiving swale north of the CNR, as shown on Figure 2. The W-SWMP currently discharges from a temporary outlet pipe to the conveyance channel south of the Site, within the approximate location of the final W-SWMP outfall channel discharge location, as shown on Figure 2. Both SWMP outfalls are expected to be on-line (i.e., valves open) by late April, 2014.

During the construction-stage, pond discharge is primarily a result of controlled pumping after a runoff event. However, during significant rainfall-runoff events to date, gravity discharge from the outlet of the western and eastern SWM ponds have occurred on occasion (e.g., Year 1 - September 6, 2012 and November 1, 2012; Year 2 - March 31, 2014). The SWM pond outlets are accessed by walking west along the southern perimeter fence from the 100 Osborne Road driveway. Pre October 2013, samples were taken at the combined W-SWMP and E-SWMP PVC pipes outfall location (Photographs 36 and 46, Appendix C). Post October 2013 samples were taken at temporary re-located outlets after the Region sanitary trunk sewer construction works began (Photographs 62 and 63, Appendix C).

3.2 Monitoring Frequency

Erosion and Sediment Control Monitoring Inspections

The weekly E&SC monitoring inspections performed by the qualified CPP EMI designated for the Site, are presented in a report template designed by Golder (Appendix D). These EMI reports outline key observations and notable deficiencies to address. Observations made during surface water sampling efforts by Golder are also included on Page 2 of these reports, when appropriate.

After the CPP EMI completes the form, it is then reviewed and signed-off by the Covanta Site construction manager or designate. It is then e-mailed to the Golder Surface Water CEP, along with Site photographs taken during the inspection for the final review. The Site photographs are of key on and off-Site vantage points outlined in the Site photographic record established during the initiation of the program in late May/early June, 2012 (Appendix B), along with any notable additional photographs taken at the time of the specific inspection during the Year 2 monitoring period. Each EMI E&SC report is signed-off by the Golder CEP after confirmation is received that any outstanding deficiencies have been addressed.

The photographic record also provides comparative upstream and downstream viewpoints of both the receiving swale (CNR ditch) and Tooley Creek, taken during the surface water quality sampling efforts performed by Golder.

Surface Water Quality Measurements and Sampling

Surface water quality *in situ* measurements and sampling efforts have occurred at strategic locations upstream and downstream of the SWM Ponds on Site, the receiving swale, and Tooley Creek (Figure 1).

Three inter-event ('dry-period'), surface water measurements and sampling efforts were performed during the Year 2 monitoring period. An inter-event occurs when there is no rainfall-runoff flow increase in the receiving swale and Tooley Creek. It should also be noted that some of these sampling efforts occurred when there were trace amounts of total daily rainfall observed at the nearby Courtice Water Pollution Control Plant ("WPCP"), approximately 5 km west of the Site. Depending on the water level conditions in the SWM ponds, on some occasions a controlled discharge may still have occurred during these sampling efforts.

Some monthly *in situ* measurement and sampling efforts also observed rainfall-runoff events, where no controlled discharge occurred. This situation would occur when SWMPs had ample quantity control capacity and/or water quality conditions in the SWMPs were not suitable for discharge, due to higher levels of turbidity visible from recent rainfall-runoff discharging to the SWMPs.

Rainfall-runoff events were also targeted during the Year 2 surface water quality monitoring efforts. However, based on the continued controlled discharge operation for the SWM Ponds during construction, there were no occasions during rainfall-runoff sampling events where a gravity discharge was observed by Golder.

Controlled discharges from the SWM Pond(s) for a rainfall-runoff event of approximately 5 mm or greater were sampled on five occasions in Year 2. Considering the variability of rainfall events, every effort was made to be on-Site during the discharge periods. These discharge periods typically occurred shortly after larger rainfall events, controlled via float pumps located in the aft bays of the SWM Ponds. These discharges were controlled to minimize any turbidity and/or Total Suspended Solids ("TSS") discharge to the receiving swale, while at the same time maintaining a lower water level in the ponds. The controlled discharges were timed to provide sufficient storage in both ponds, and after settling had occurred, to minimize any uncontrolled discharges with higher TSS loadings to the receiving swale (CNR ditch) or current construction trench.

During these sampling efforts, comparative upstream and downstream viewpoints of both the receiving swale and Tooley Creek were also taken for inclusion in the Site photographic record.

3.3 Field and Laboratory Parameters and Analysis

Four (4), 500 mL sampling bottles were filled at each location with surface water grabs. Two (2) of the sampling bottles from each location were submitted to the laboratory for TSS and Turbidity analyses. The bottles submitted were labeled with the appropriate analysis identified, the date and time of sampling, sampling grab location and Golder project number. The additional two (2) bottles from each sampling location were kept as duplicates and were stored off-Site at the local Golder-Whitby office in coolers on ice (see Section 3.8).

In situ measurements for turbidity, pH, temperature, and conductivity were also taken by Golder staff at each surface water monitoring station when conditions were suitable. The instrument used for these measurements was calibrated before each use, to ensure accurate results were obtained.

3.4 Certificate of Approval Requirements

Performing the E&SC and Surface Water Sampling program (as laid out here-in) is required for the Site, as stipulated by both Condition 20 of the EA Approval and Section 7, Part 14 (a) to (c) of the Multi-Media Certificate of Approval ('C of A') No. 7306-8FDKNX, dated June 28, 2011.

3.5 Monitoring Procedures and Methods

Surface Water sampling occurred via grab samples from established consistent sampling locations that were considered representative of 'well-mixed' surface water conditions. Typically, these grabs were taken in the centre-line zone of the receiving swale or creek, or the centre of the inlet or outlet location for the SWM Ponds. Whenever possible these samples were grabbed from depths slightly below the surface of the water (Burton and Pitt, 2002).

When collecting samples, care was taken not to disturb the substrate at the sampling station in order to avoid any increase in TSS or Turbidity measurements while sampling efforts occur. When depths were too shallow, every effort was taken for a 'well-mixed' sample, while avoiding any disturbance (e.g., shallow sampling scoops using control bottle).

3.6 Standard Operating Procedures

A standard surface water sampling protocol was developed for Golder field staff (Appendix E-1). The standard operating procedure for the E&SC monitoring was communicated to Covanta and CPP via the EMI template.

A Health and Safety Environmental Plan ("HaESP") was developed by Golder, respecting on-Site arrival and departure reporting to both the CPP Health and Safety Officer and the Covanta Site Construction Manager or designate.

Field personnel were required to obtain fall protection training for sampling at the SWM ponds to ensure appropriate health and safety procedures were followed on-Site when sampling these areas.

3.7 Record Keeping and Field Notes

Golder maintained records, including field notes, analytical results, measurements, and logs in electronic format and hardcopy. Golder developed both the EMI report and surface water sampling field form that was filled out for each monitoring station during the sampling effort (Appendix D and Appendix E-3, respectively).

An e-mail circulation to the project construction group involved with the Surface Water Monitoring Program (Covanta, CPP, and Golder) was also provided with the final EMI report signed-off by the Golder Surface Water CEP, after confirmation was received that all notable deficiencies had been addressed.

A Site Photographic Record illustrating weekly observations from the E&SC monitoring and periodic surface water sampling efforts is also summarized with selected events (Appendix C).

3.8 Sampling Grabs and In Situ Measurements

A grab sample is defined as a sample collected during a very short time period at a single location. As mentioned above, Surface Water sampling occurred via a grab sample from established consistent sampling locations that are considered representative of 'well-mixed' surface water conditions at the sampling station.

Field personnel were required to obtain fall protection training for sampling at the SWM ponds to ensure appropriate health and safety procedures were followed on-Site when sampling these areas.

Sampling grabs were made either by direct sampling or by sampling pole using latex gloves and standard sampling procedures. Direct sampling grabs were carried out at sampling stations where there was slow flowing water with a very narrow stream where the centre of the stream could be accessed safely by arm extension from the stream bank without disturbing the sediment. The sampling pole was used to access the SWM ponds and all other monitoring stations.

When taking direct sampling grabs, the sample bottle was held near its base and plunged below the surface, ensuring that sediment was not disturbed. The sample bottle was filled to the top and the lid was then placed securely on the bottle. When using the sampling pole, the sample container was securely attached to the holder with clamps. The container lid was removed and the sampling pole was extended slowly to the sampling point. The same procedure used for the direct sampling grab was then used. Care was used to avoid any debris floating in the stream entering the sample bottles.

Four (4), 500 mL sampling bottles were filled at each location with surface water grabs. Two (2) of the sampling bottles from each location were submitted to the laboratory (Maxxam Analytics) for TSS and Turbidity analyses. The bottles submitted were labeled with the appropriate analysis identified, the date and time of sampling, sampling grab location and Golder project number. An additional two (2) bottles acted as duplicates and were stored off-Site at the local Golder-Whitby office until lab results were received and reviewed. If there was any question or concern regarding the initial laboratory results, the duplicate samples would then be submitted to the laboratory for additional analysis. The duplicate samples will be discarded at the end of every season once all reviews are complete.

In situ measurements for turbidity, pH, temperature and conductivity were also taken by Golder staff when on-Site. The instrument used for these measurements was calibrated before each use, to ensure accurate results are obtained (See Section 4.1).

3.9 Quality Assurance and Sampling Analysis

Grab samples were packaged in ice and sent to the laboratory for analysis immediately after the sampling event. Approximately two (2) to three (3) bags of ice were required to fill the cooler box provided with the bottles. Ice bags entirely surrounded the sample bottles by being placed on the bottom of the cooler below the sample bottles, as well as between, on all sides and above the sample bottles. If the temperature of the bottles is above 10 ˚C when it is received at the laboratory, the analysis results are less reliable and this will be noted in the laboratory results.

Golder followed the chain-of-custody protocol from the laboratory, and provided a copy of the grab sample set exchange with the laboratory to Covanta for their records.

When analytical results were completed, they were forwarded via e-mail to the Golder Surface Water CEP.

An additional two (2) bottles, acting as duplicates, were stored off-Site at the local Golder-Whitby office until lab results are received and reviewed.

4.0 MONITORING RESULTS

The Surface Water Program monitoring results for Year 2 construction, are summarized in this section.

4.1 Data Quality Evaluation

The EMI E&SC weekly monitoring reports were validated through photographs sent during the review and sign-off of each report, supported by phone and e-mail conversations between Covanta, CPP and Golder. In addition, the periodic unannounced visits to the Site by the Surface Water CEP on August 28 and November 13, 2013, and March 26, 2014 confirmed the accuracy of E&SC Site conditions presented in the weekly reports, and provided an opportunity to offer any additional recommendations, if needed.

The field and periodic laboratory data collected for eleven (11) surface water measurements and periodic sampling events during Year 2 construction monitoring have followed the Surface Water Monitoring Program protocols outlined in Section 3.0. The standard operating procedures for sampling at the Site and greater study area (Appendix E-1) were followed and laboratory results verified through certificates of analyses (Appendix E-2) provided by the laboratory (Maxxam Analytics). Maxxam Analytics are accredited by the Standards Council of Canada and the Canadian Association for Laboratory Accreditation, and is recognized as a certified laboratory by the MOE.

In situ water quality parameter measurements were also recorded using Hana probes and a Lamotte 2020we turbidity meter. Before field visits, the Hana probes were calibrated in the office using calibration buffer set solutions for pH and conductivity. The turbidity meter was calibrated using a series of polymeric based turbidity standard sample vials (in nephelometric turbidity units, (“NTUs”)) that are factory tested and certified to provide a consistent level of transparency.

4.2 E&SC Monitoring Results

A summary of notable deficiencies, general comments and corrective measures taken on-Site by the EMI CPP and Covanta for the Year 2 monitoring period, with input where needed from the Golder Surface Water CEP, is provided in Table 1 below. Selected photographs from the weekly E&SC inspections are also provided in Appendix C.

Table 1: Summary of Site E&SC Deficiency List, General Comments and Corrective Measures

E&SC Measure	Deficiency Highlights	General Comments	Corrective Measures Implemented / Recommended
Perimeter Silt Fencing	■ Silt fencing experienced several minor tears on all sides, and additional tie downs/reinstatements (typically after high winds) were also needed (mostly, along western perimeter). ■ Silt fencing temporarily removed in southeast corner around East SWM Pond area before new fencing installation occurs. ■ Observed fence breaches.	■ Weekly EMI inspections along with Daily perimeter Site walks ensured silt fence deficiencies were addressed quickly. ■ Some visible sediment transport build-up along southern silt fence.	■ Increase height to meet required, minimum height of 0.6 m, as per Ontario Provincial Standard Drawing (OPSD) No. 219.130. ■ Tie down improvements and repairs (e.g., patched tears) made to silt fencing, where needed. ■ Provided temporary sediment control fencing at down grade off-Site area before landscaping and new fencing installation was implemented in May, 2013. ■ New Silt fencing along southern perimeter was established by September 17, 2013. ■ Sediment build-up was periodically removed and re-distributed on-Site.
Controlled Discharge	■ NA	■ Provided effective sediment control via pumping to discharge cleaner surface water from SWM Ponds periodically during construction, while maintaining storage capacity to minimize the frequency of gravity drain discharges to the receiving swale. ■ See Section 4.3 and 5.2 for more details on the effectiveness of this Sediment Control measure for the Site during construction.	■ NA

Table 1: Summary of Site E&SC Deficiency List and Corrective Measures

E&SC Measure	Deficiency Highlights	General Comments	Corrective Measures Implemented/Recommended
Vehicular Entrances to the Site	■ Mud mats clogging, general dirt build-up from construction transport activity on-Site.	■ Entrances mats appeared relatively clean during Surface Water CEP Site inspections.	■ Sweeping at the vehicle entrances via mechanical broom, as required per CPP general practice. ■ One truck wheel wash stations on-Site near southern Site entrance (Gate 2). ■ Harder access road surfaces installed in Year 1 of construction to reduce potential of sediment transport from trucking activities. ■ Periodic sweeping of Osbourne Road also occurred (e.g., May 9, 2013).
Interceptor Swales (including Rock Check Dams)	■ NA	■ These drainage paths to the East and West Ponds did not experience excess sediment accumulation at upstream ends of rock check dams. ■ Sediment clean-out in the rock-check dam areas would be prescribed based on visual and *in situ* measurements (if the depth of sediment is greater than ½ the height of the control from the toe to the spillway in any of these features).	■ Rock check Dam repairs occurred on Early October, 2013 (Western Side). ■ Rock check dam cleanouts occurred on July 26, 2013. ■ Stabilized/Vegetated Southwest side in November, 2013.
Final Stage(s) of Construction: Site Vegetation and SWMP Cleanouts	■ NA	■ The E-SWMP was cleaned out in August 2013. ■ The W-SWMP was cleaned out in September 2013. ■ The south side of the Site was seeded on October 21, 2013 and the west side of the Site was seeded on November 4, 2013.	■ SWMPs cleanout ■ Landscaping (plantings).

The E&SC deficiencies noted throughout the Year 2 monitoring period were addressed by the CPP EMI, Covanta and the Golder Surface Water CEP on an as needed basis. For more details on all of the EMI reports and deficiency and corrective measures, see Appendix D.

4.3 Surface Water Sampling Results

Surface water *in situ* measurements (for turbidity, pH and temperature), with occasional TSS and Turbidity sampling was conducted on eleven (11) occasions during the period from May 2013 to April, 2014. These sampling events consisted of three (3) inter-event sets of samples, (5) rainfall-runoff-controlled discharge, and (3) rainfall-runoff with no discharge sets. During the monthly visits, the field staff would determine whether or not additional sampling beyond the *in situ* measurements for gage based on visual measurements turbidity meter results. A summary of the sampling events is provided in Table 2 below.

Table 2: Surface Water Sampling Event Summary - Year 2 Construction

Date (Type of event) [1.]	Season	Total Rainfall [2.]	Site Conditions and Observations
May 31, 2013 (Controlled discharge)	Spring	1.8 mm	▪ Antecedent rainfall: May 28/13(22.2 mm); May 29/13(3.8 mm). ▪ Short-duration controlled discharge from E SWM Pond, controlled discharge from W SWM Pond.
June 25, 2013 (Rainfall-runoff, Controlled discharge)	Summer	8 mm	▪ Antecedent rainfall: June 22/13 (8.4 mm), June 24/13 (2.1 mm). ▪ Controlled discharges from both SWM Ponds.
July 22, 2013 (Controlled discharge)	Summer	0 mm	▪ Antecedent rainfall: July 19/13 (28.0 mm). ▪ Controlled discharges from both SWM Ponds.
August 28, 2013 [3.] (Inter-event)	Summer	0 mm	▪ Antecedent rainfall: August 25/13 (27.0 mm); August 27/13 (0.6 mm). ▪ No SWM Pond discharge.
September 30, 2013 (Inter-event)	Fall	0 mm	▪ No antecedent rainfall. ▪ East and West SWM Ponds not discharging/still had sufficient storage capacity.
October 7, 2013 (Rainfall-runoff, no discharge)	Fall	2 mm	▪ Antecedent rainfall: October 3/13 (6.8 mm); October 4/13 (2.0 mm); October 5/13 (2.0 mm); October 6/13 (18.2 mm). ▪ No SWM Pond discharge.
November 22, 2013 (Controlled discharge)	Fall	1.6 mm	▪ Antecedent rainfall: November 21/13 (4.8 mm). ▪ Controlled discharges from both SWM Ponds.
December 20, 2013 (Rainfall-runoff, no discharge)	Winter	16 mm	▪ No antecedent rainfall. ▪ No SWM Pond discharge.
January 13, 2014 (Rainfall-runoff, no discharge)	Winter	0.6 mm	▪ Antecedent rainfall: January 10/14 (10 mm); January 11/14 (5.6 mm). ▪ No SWM Pond discharge.
February 28, 2014 (Inter-event)	Winter	0.0 mm	▪ No antecedent rainfall, frozen conditions. ▪ No SWM Pond discharge.
March 31, 2014 (Controlled Discharge)	Spring	0.0 mm	▪ Antecedent rainfall: May 27/14 (4.8 mm); May 28/14 (4.0 mm). ▪ Controlled discharge from W SWM Pond only.

Notes:
1. Inter-event (dry), controlled discharge (due to recent rainfall-runoff), rainfall-runoff-discharge (gravity drain), or freshet ('spring melt') sampling event conditions.
2. Rainfall totals observed at the Oshawa, Water Pollution Control Plan ("WPCP"), Environment Canada Climate ID No. 6155878.
3. A site visit and sampling efforts were attempted on this date, following the significant rainfall of approximately 27 mm on August 25, 2013. However, SWMP levels were still low and there were receiving swale access issues, due to construction.

The surface water sampling efforts for all events involved *in situ* measurements and grab samples taken at Stations SW-1, SW-2, SW-3 and SW-4 shown on Figures 1 and 2. During controlled discharge and/or rainfall-runoff-gravity discharge sampling events, samples were also taken from the East and West SWM Pond stations, when visual and/or *in situ* turbidity measurements identified a potential issue, and submitted to Maxxam Analytics for TSS and turbidity analyses. Results from these laboratory analyses are provided in Appendix E-2, the *in situ* measurements for turbidity, temperature, pH, conductivity, and qualitative observations recorded during sampling are provided in Appendix E-3. Sampling results are summarized in Tables 3 to 8 below, and compared to the Provincial Water Quality Objectives ("PWQOs") (MOE, 1994) and Canadian Water Quality Guidelines ("CWQGs") (CCME, 2013).

Table 3: *In Situ* Turbidity Measurements

Date [1.] **(Type of event)**	**PWQO** (NTU)	**CWQG** (NTU)	**Stations**							
			SW-1 (NTU)	**SW-2** (NTU)	**SW-3** (NTU)	**SW-4** (NTU)	**E-SWMP-IN** (NTU)	**W-SWMP-IN** (NTU)	**E-SWMP-OUT** (NTU)	**W-SWMP-OUT** (NTU)
May 31, 2013 (Controlled Discharge)	Surface water concentrations will change the natural Secchi disk reading by more than 10% [2.]	See Note [2.] for CWQG narrative for Turbidity.	22.5	15.8	4.67	5.15	36.5	40	NA	1000 [5.]
June 25, 2013 (Rainfall-runoff, Controlled Discharge)			101	13.9	66.1	**84.8**	21.9	41.3	20.9	186
July 22, 2013 (Controlled discharge)			9.10	15.37	5.92	4.67	26.64	310	180	52.4
August 28, 2013 (Inter-event)			NA	NA	NA	NA	NA	235	NA	NA
September 30, 2013 (Inter-event)			24.6	NA	12.91	9.20	ND	ND	ND	ND
October 7, 2013 (Rainfall-runoff, no discharge)			23	43.49	26.95	25.37	39.56	86.67	39.96	55.44
November 22, 2013 (Controlled discharge)			51.1	23.0	5.53	14.4	196	25.3	80	25.6
December 20, 2013 (Inter-event)			76.7	NA	13.6	12.2	ND	ND	2.85	NA
January 13, 2014 (Rainfall-runoff, no discharge)			7.63	27.8	4.76	4.48	ND	ND	NA	NA
February 28, 2014 (Inter-event)			10	NA	NA	NA	NA	NA	NA	NA
March 31, 2014 (Controlled Discharge)			15.9	555	374	335	NA	NA	NA	110

Notes:

1. Inter-event (dry) or rainfall-runoff sampling event indication is provided below the date.
2. The CWQQs for TSS are the following:
   i. clear flow
   Maximum increase of 8 NTUs from background levels for a short-term exposure (e.g., 24-h period). Maximum average increase of 2 NTUs from background levels for a longer term exposure (e.g., 30-d period).
   ii. high flow or turbid waters
   Maximum increase of 8 NTUs from background levels at any one time when background levels are between 8 and 80 NTUs. Should not increase more than 10% of background levels when background is > 80 NTUs (CCME, 2013).
3. Where 'NA' is indicated, sample was not measured to do Health &Safety / access issues during construction.
4. Where 'ND' is indicated, SWM Pond station was not sampled or provided in this table, since there was no discharge from the SWM feature during the sampling effort.
5. Turbidity meter instrument measurement likely out of range.

Table 4: Turbidity Sampling Results

Date (Type of event) [1.]	PWQO (NTU)	CWQG (NTU)	RDL [4.] (NTU)	Stations							
				SW-1 (NTU)	SW-2 (NTU)	SW-3 (NTU)	SW-4 (NTU)	E-SWMP-IN (NTU)	W-SWMP-IN (NTU)	E-SWMP-OUT (NTU)	W-SWMP-OUT (NTU)
May 31, 2013 (Controlled Discharge)	Surface water concentrations will change the natural Secchi disk reading by more than 10% [2.]	See Note [2.] for CWQG narrative for Turbidity.	0.2	10	9	2.5	2.9	20	130	NA	460
June 25, 2013 (Rainfall-runoff, Controlled Discharge)			0.2	28	7.7	17	20	8.2	19	9.3	52
July 22, 2013 (Controlled discharge)			0.2	9.0	16	5.4	5.2	33	450	280	390
August 28, 2013 (Inter-event)			0.2	NA	NA	NA	NA	NA	NA	NA	NA
September 30, 2013 (Inter-event)			0.2	NA	NA	NA	NA	NA	NA	ND	ND
October 7, 2013 (Rainfall-runoff, no discharge)			0.2	24	24	25	29	28	130	32	47
November 22, 2013 (Controlled discharge)			0.2	29	18	5.1	16	89	36	110	35
December 20, 2013 (Inter-event)			0.2	ND	ND	ND	ND	ND	ND	ND	ND
January 13, 2014 (Rainfall-runoff, no discharge)			0.2	NA	10	NA	NA	ND	ND	ND	ND
February 28, 2014 (Inter-event)			NA	NA	NA	NA	NA	NA	NA	NA	NA
March 31, 2014 (Controlled Discharge)			0.2	9.8	220	87	100	NA	NA	NA	66

Notes:

1. Inter-event (dry), controlled discharge (due to recent rainfall-runoff), rainfall-runoff-discharge (gravity drain), or freshet ('spring melt') sampling event conditions.
2. The CWQQs for TSS are the following:
   i. clear flow
   Maximum increase of 8 NTUs from background levels for a short-term exposure (e.g., 24-h period). Maximum average increase of 2 NTUs from background levels for a longer term exposure (e.g., 30-d period).
   ii. high flow or turbid waters
   Maximum increase of 8 NTUs from background levels at any one time when background levels are between 8 and 80 NTUs. Should not increase more than 10% of background levels when background is > 80 NTUs (CCME, 2013).
3. RDL - Reported Detection Limit.
4. Where 'NA' is indicated, sample was not measured to do Health &Safety / access issues during construction.
5. Where 'ND' is indicated, SWM Pond station was not sampled or provided in this table, since there was no discharge from the SWM feature during the sampling effort.
6. Exceedances of limits are in bold, with further discussion in Section 5.2, where applicable.

Table 5: Total Suspended Solids Sampling Results

Date (Type of event) [1.]	TSS Limit [2], CWQG [3] (mg/L)	RDL[3] (mg/L)	Stations							
			SW-1 (mg/L)	**SW-2** (mg/L)	**SW-3** (mg/L)	**SW-4** (mg/L)	**E-SWMP-IN** (mg/L)	**W-SWMP-IN** (mg/L)	**E-SWMP-OUT** (mg/L)	**W-SWMP-OUT** (mg/L)
May 31, 2013 (Controlled Discharge)	25	10	<10	10	<10	<10	<10	17	NA	**92**
June 25, 2013 (Rainfall-runoff, Controlled discharge)		10	**81**	10	**28**	**44**	<10	12	<10	**87**
July 22, 2013 (Controlled discharge)		10	8	5	3	2	18	**49**	**240**	**130**
August 28, 2013 (Inter-event)		10	NA	NA	NA	NA	NA	NA	NA	NA
September 30, 2013 (Inter-event)		10	NA	NA	NA	NA	ND	ND	ND	ND
October 7, 2013 (Rainfall-runoff, no discharge)		10	**40**	**49**	**31**	22	**31**	**81**	**69**	**150**
November 22, 2013 (Controlled discharge)		10	**28**	**28**	7	18	**430**	**45**	**300**	**30**
December 20, 2013 (Inter-event)		10	ND	ND	ND	ND	ND	ND	ND	ND
January 13, 2014 (Rainfall-runoff, no discharge)		10	NA	**26**	NA	NA	ND	ND	ND	ND
February 28, 2014 (Inter-event)		10	NA	NA	NA	NA	NA	NA	NA	NA
March 31, 2014 (Controlled Discharge)		10	10	**330**	**540**	**590**	NA	NA	NA	**36**

Notes:

1. Inter-event (dry), controlled discharge (due to recent rainfall-runoff), rainfall-runoff-discharge (gravity drain), or freshet (‘spring melt’) sampling event conditions.
2. There is no PWQO and {Interim PWQO} for TSS. A suitable TSS limit for various sewage (including SWM) discharges, and receiving water is accepted to be 25 mg/L (MOE, 1994b).
3. The CWQQs for TSS are the following:
   i. clear flow - Maximum increase of 25 mg/L from background levels for any short-term exposure (e.g., 24-h period). Maximum average increase of 5 mg/L from background levels for longer term exposures (e.g., inputs lasting between 24 h and 30 d).
   ii. high flow - Maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L. Should not increase more than 10% of background levels when background is ≥ 250 mg/L (CCME, 2013).
4. RDL - Reported Detection Limit.
5. Where ‘NA’ is entered, sample was not measured to do Health &Safety / access issues during construction.
6. Where ‘ND’ is entered, SWM Pond station was not sampled or provided in this table, since there was no discharge from the SWM feature during the sampling effort.
7. Exceedances of limits are in bold, with further discussion in Section 5.2, where applicable.

Table 6: *In Situ* pH Measurements

Date (Type of event) [1.]	PWQO	CWQG	Stations							
			SW-1	SW-2	SW-3	SW-4	E-SWMP-IN	W-SWMP-IN	E-SWMP-OUT	W-SWMP-OUT
May 31, 2013 (Controlled Discharge)	6.5 to 8.5	6.5 to 9	8.07	8.07	8.26	8.16	8.13	**8.62**	NA	8.58
June 25, 2013 (Rainfall-runoff Controlled Discharge)			6.96	7.01	7.53	7.33	**6.46**	6.58	7.07	7.20
July 22, 2013 (Controlled discharge)			7.25	7.80	7.38	7.57	**8.58**	8.03	7.45	7.58
August 28, 2013 (Inter-event)			NA	NA	NA	NA	NA	**8.79**	NA	NA
September 30, 2013 (Inter-event)			**6.38**	NA	6.63	6.68	ND	ND	ND	ND
October 7, 2013 (Rainfall-runoff, no discharge)			7.83	7.87	7.92	7.83	8.08	8.40	8.25	8.26
November 22, 2013 (Controlled discharge)			8.49	8.26	8.35	8.32	**8.57**	9.41	**9.30**	**9.35**
December 20, 2013 (Inter-event)			7.96	NA	8.14	7.96	ND	ND	8.33	NA
January 13, 2014 (Rainfall-runoff, no discharge)			8.13	7.98	8.17	8.25	ND	ND	NA	NA
February 28, 2014 (Inter-event)			NA	NA	NA	NA	NA	NA	NA	NA
March 31, 2014 (Controlled Discharge)			8.83	8.22	8.24	8.28	NA	NA	NA	8.90

Notes:

1. Inter-event (dry) or rainfall-runoff sampling event indication is provided below the date.
2. Where ‘NA’ is indicated, sample was not measured to do Health &Safety / access issues during construction.
3. Where ‘ND’ is indicated, SWM Pond station was not sampled or provided in this table, since there was no discharge from the SWM feature during the sampling effort.
4. Sampling results out of the PWQO and CWQG acceptable limits are in bold, with further discussion in Section 5.2, where applicable.

Table 7: *In Situ* Temperature Measurements

Date (Type of event) [1.]	PWQO	CWQG	Stations							
			SW-1 (°C)	SW-2 (°C)	SW-3 (°C)	SW-4 (°C)	E-SWMP-IN (°C)	W-SWMP-IN (°C)	E-SWMP-OUT (°C)	W-SWMP-OUT (°C)
May 31, 2013 (Controlled Discharge)	Note[2.]	Note[3.]	20.1	17.4	18.9	17.7	22.7	22.3	NA	14.9
June 25, 2013 (Rainfall-runoff, Controlled Discharge)			21.0	18.6	19.1	19.0	23.4	23.8	23.3	21.6
July 22, 2013 (Controlled discharge)			23.5	21.4	22.3	21.6	25.2	24.4	24.9	24.9
August 28, 2013 (Inter-event)			NA	NA	NA	NA	NA	24.3	NA	NA
September 30, 2013 (Inter-event)			22.4	NA	20.5	26.5	ND	ND	ND	ND
October 7, 2013 (Rainfall-runoff, no discharge)			15.2	14.1	14.2	14.8	16.3	15.5	16.0	15.9
November 22, 2013 (Controlled discharge)			5.9	5.8	5.6	5.6	7.8	3.5	4.4	3.8
December 20, 2013 (Inter-event)			0.0	NA	0.0	0.9	ND	ND	3.9	NA
January 13, 2014 (Rainfall-runoff, no discharge)			1.4	0.3	0.5	0.3	ND	ND	NA	NA
February 28, 2014 (Inter-event)			NA	NA	NA	NA	NA	NA	NA	NA
March 31, 2014 (Controlled Discharge)			6.7	2.3	2.1	1.7	NA	NA	NA	2.2

Notes:

1. Inter-event (dry) or rainfall-runoff sampling event indication is provided below the date.
2. PWQO for Temperature (generally) states: The natural thermal regime of any body of water shall not be altered so as to impair the quality of the natural environment. In particular, the diversity, distribution and abundance of plant and animal life shall not be significantly changed (MOE, 1994).
3. CWQG for Temperature:
   i.Thermal Stratification: Thermal additions to receiving waters should be such that thermal stratification and subsequent turnover dates are not altered from those existing prior to the addition of heat from artificial origins
   ii. Maximum Weekly Average Temperature: Thermal additions to receiving waters should be such that the maximum weekly average temperature is not exceeded
   iii. Short-term Exposure to Extreme Temperature: Thermal additions to receiving waters should be such that the short-term exposures to maximum temperatures are not exceeded. Exposures should not be so lengthy or frequent as to adversely affect the important species (CCME, 2013).
4. Where 'NA' is indicated, sample was not measured to do Health &Safety / access issues during construction.
5. Where 'ND' is indicated, SWM Pond station was not sampled or provided in this table, since there was no discharge from the SWM feature during the sampling effort.
6. Exceedances of limits are in bold, with further discussion in Section 5.2, where applicable.

Table 8: *In Situ* Conductivity Measurements

Date [1.] (Type of event)	PWQO, CWQG[2]	Stations							
		SW-1 (µS/cm)	SW-2 (µS/cm)	SW-3 (µS/cm)	SW-4 (µS/cm)	E-SWMP-IN (µS/cm)	W-SWMP-IN (µS/cm)	E-SWMP-OUT [4.] (µS/cm)	W-SWMP-OUT [4.] (µS/cm)
May 31, 2013 (Controlled Discharge)	N/A	610	700	920	860	1080	320	NA	280
June 25, 2013 (Rainfall-runoff, Controlled Discharge)		630	740	860	820	940	410	840	400
July 22, 2013 (Controlled discharge)		670	590	1270	1080	750	280	420	290
August 28, 2013 (Inter-event)		NA	NA	NA	NA	NA	318	NA	NA
September 30, 2013 (Inter-event)		>20	NA	>20	>20	ND	ND	ND	ND
October 7, 2013 (Rainfall-runoff, no discharge)		520	860	960	850	2150	1140	1080	1020
November 22, 2013 (Controlled discharge)		449	577	930	834	943	551	598	548
December 20, 2013 (Inter-event)		3999 [5.]	NA	3999 [5.]	3999 [5.]	ND	ND	2756	NA
January 13, 2014 (Rainfall-runoff, no discharge)		3999 [5.]	3160	1116	1440	ND	ND	NA	NA
February 28, 2014 (Inter-event)		NA	NA	NA	NA	NA	NA	NA	NA
March 31, 2014 (Controlled Discharge)		1635	1065	505	552	NA	NA	NA	615

Notes:

1. Inter-event (dry) or rainfall-runoff sampling event indication is provided below the date.
2. There are no PWQO and CWQG limits for conductivity. However, higher values are often related to higher concentrations of finer suspended metals in surface water. More discussion provided in Section 5.2.
3. Where 'NA' is indicated, sample was not measured to do Health &Safety / access issues during construction.
4. Where 'ND' is indicated, SWM Pond station was not sampled or provided in this table, since there was no discharge from the SWM feature during the sampling effort.
5. Exceeding range of Hana probe, most likely due to freezing conditions / stagnant water.

4.4 Spill Response

The CPP EMI and Covanta handled any of the spills on-Site, while reporting these issues to the Golder Surface Water CEP after they were contained, cleaned up, and any appropriate communication to the MOE occurred. The Owners were also notified of the incidents that warranted a call to the MOE Spills Action Centre, and the follow-up response activities.

Table 9 below summarizes the spills and follow-ups with the MOE Spills Action Centre. Appropriate Site actions were taken to contain and remove the spill from the Site and/or within the building envelope.

Table 9: Site Spills – Year 1 Construction

Date (Type of event)	Description	Amount	Call-in to MOE Spill Response Action Centre
June 24, 2013	Excavator – Hydraulic oil leak - Site	2L	No
June 28, 2013 [1.]	Transformer Drop, Insulation oil spill - Site	< 4L	Yes
July 9, 2013	Boom Lift, Hydraulic oil leak – Site	1 L	No
July 19, 2013	Man Lift, Hydraulic oil leak - Site	3 L	No
September 4, 2013	Man Lift, Blown head gasket - Residue Building	2 L	No
October 17, 2013	Boom Lift, Hydraulic oil leak – Site	2 L	No

Notes:
1. Surface water sampling and Site follow-up inspections performed on June 28, July 2, and July 10, 2013.

More details on the June 28 2013 spill, containment, clean-up, removal, continued monitoring and assessment are discussed in Section 5.3. All of the Spill investigation forms and details are provided in Appendix F.

5.0 ASSESSMENT, INTERPRETATION AND DISCUSSION

5.1 E&SC Measures, Deficiencies and Contingency Measures

The following summarizes the E&SC measures, deficiencies and contingency measures that were implemented, based on the weekly CPP EMI findings, Surface Water CEP review and any follow-up efforts required (Appendix D).

Perimeter Silt Fencing

Throughout the monitoring period, tears and wind damage to the perimeter silt fencing throughout the Site were identified, reinstated and promptly repaired, as needed.

The daily Site walks performed by both Covanta and CPP adequately supports catching these deficiencies quickly, in concert with the weekly (at minimum) CPP EMI reporting efforts.

Preservation of Natural Vegetation

There were no concerns noted with the preservation of natural vegetation on-Site during the course of the Year 2 monitoring period (e.g., mature pine tree near Stock Pile and Gate 2 Entrance).

Vehicular Entrances to the Site

The sweeping of Gates 1 and 2 has been typically practiced by CPP as needed, as part of their standard Site maintenance practices. A wheel washing station at the Gate 2 Entrance, along with the hard access road surfaces established on Site minimize any potential for sediment transport off-Site.

Stock Piles

The on-Site stockpiles that were no longer active have been stabilized with vegetation. Some of the active stockpiles were also used on-Site for final grading or removed from Site. One topsoil stockpile remains for future use. The excess topsoil stockpiles will be removed from the Site, once the Half Load Restrictions are lifted. There were no concerns with sediment transport from these piles, nor were any issues with the active piles on-Site observed during the Year 2 construction monitoring.

Interceptor Swale Rock Check Dam Repairs, Clean-outs, Stabilized and Vegetated

The interceptor swale rock check dams were repaired on one occasion during the Year 2 monitoring period. Clean-outs of the western and eastern interceptor swales also occurred periodically, on an as needed basis (as summarized in Table 1, Section 4.2). For more details on the locations of the rock check dam clean-out locations, see the EMI reports in Appendix D.

The CPP EMI, along with the Golder Surface Water CEP, prescribed repairs and clean-outs based on visual inspections. Clean-outs are prescribed when the sediment accumulation is greater than one-half of the height, from the pool invert to spillway crest of the rock check dams.

Controlled Discharges from SWM Ponds

The controlled discharges were performed to maintain storage capacity in both SWM Ponds during the construction period. During Year 2 of construction, CPP timed these discharges to ensure settling had occurred in the SWM Ponds to minimize any TSS loading discharges to the outfall channel. CPP has used a benchmark of approximately 1 m below invert of the PVC outlet pipe in each Pond to determine when pumping should begin. Prior to pumping, SWM pond surface water conditions are also confirmed via visual inspection to be at low turbidity levels (i.e., confirm settling has occurred).

Final Stages of Construction

For the final stages of Site construction, the landscaping plantings serve to provide the final cover for stabilization, thus providing the ultimate key E&SC measure for the Site.

The south side of the Site was seeded on October 21, 2013 and the west side of the Site on November 4, 2013. The north and east areas are scheduled for this final stabilization effort by the fall of 2014. These continued plantings will be monitored by Covanta, with any deficiencies addressed.

SWMP cleanouts are also an important periodic E&SC measure, and required during the final stage of construction to ensure quantity control capacity and functionality (e.g., TSS removal efficiency) is maintained before SWMP certification. The E-SWMP was cleaned out in August 2013 and the W-SWMP was cleaned out in September 2013.

5.2 Surface Water Sampling Results

5.2.1 Turbidity

The Turbidity in situ measurement results in Table 3 and sampling results summarized in Table 4, Section 4.3 are discussed in more detail in this section.

The *in situ* Turbidity measurements in comparison to the lab concentration results are generally comparable and follow the same trends, with higher results typically observed via the *in situ* measurements. This turbidity results discussion will focus on the *in situ* measurements.

Similar to Year 1 results, there is no indication that the East and West SWM Pond discharges are having any adverse effects on turbidity levels in the receiving swale and further downstream in Tooley Creek. Although the October 7, 2013 *in situ* measurements indicate a significant increase in turbidity from SW1 to SW2, with measurements of 23 NTU to approximately 43 NTU, the SWMPs were not discharging during this measurement period. The stations further downstream on Tooley Creek observed a slight decrease in turbidity, with measurements at 37 and 25 NTU at the upstream SW3 and downstream SW4 stations, respectively.

The latest in situ measurements on March 31, 2014 show a significant increase in turbidity in the receiving swale from SW1 to SW2, with measurements from 15.9 NTU to 555 NTU, respectively. However, the measurements further downstream in Tooley Creek are similar at both the upstream SW3 station and downstream SW4 stations, at 374 NTU and 335 NTU, respectively.

Tooley Creek turbidity results for all of the other measurement events are typically comparable and appear to be unaffected by the SWM Pond discharges. However, both the June 25, 2013 and November 22, 2013 events show increase in turbidity at the downstream Tooley Creek stations: from 66 NTU at SW3 to 85 NTU at SW4 on June 25, 2013 and from 6 NTU at SW3 to 14 NTU at SW4 on November 22, 2013. The June 25, 2013 controlled discharge measurements indicate the CWQG limit was exceeded (i.e., an increase greater than 8 NTU during high flow/turbid waters - see Table 4, Note 3). However, the second observed increase in turbidity was approximately 8 NTU on November 22, 2013; and any increases have not been observed since. Also, when considering both of these events further upstream, the SW1 compared to the SW2 stations, consistently show a decrease in turbidity: from 101 NTU at SW1 to 14 NTU at SW2 on June 25, 2013; and from 51 NTU to 23 NTU on November 22, 2013. These turbidity decreases demonstrate that the controlled discharge did not lead to any increase in turbidity measured in Tooley Creek, since the SW2 station is directly downstream of the SWMPs outlet location(s) within the receiving swale.

Similar to Year 1 results, these observed increases in turbidity between the upstream and downstream stations on Tooley Creek could be related to a variety of background factors unrelated to the controlled discharge during this rainfall-runoff period (e.g., bank erosion and deposition, re-suspension of sediment in Tooley Creek and/or receiving swale). These results also do not factor in the relative flow and loading scenarios at both stations, along with discharge and loadings from the SWMPs on-Site, and receiving swale discharge to Tooley Creek.

5.2.2 Total Suspended Solids

The TSS sampling results summarized in Table 5, Section 4.3 is discussed in more detail in this section.

A TSS concentration of 25 mg/L or lower for any discharge or background surface water concentration from most municipal or private sewage works and receiving water concentrations is typically considered an acceptable limit for fish habitat (MOE, 1994b). The CWQG for TSS considers an increase of 25 mg/L in low or higher flow receiving water conditions as the acceptable limit.

During the June 25, 2013 sampling efforts and late Spring rainfall-runoff period, the (SW3) upstream and (SW4) downstream Tooley Creek stations observed higher TSS values (28 mg/L and 44 mg/L, respectively). However, the surface water sampling results at the SW2 station directly downstream of the Site observed a TSS value of 10 mg/L during this sampling period, indicating the higher TSS values observed in Tooley Creek on June 25, 2013 are more likely related to TSS build-up and wash-off conditions from other off-Site sources, resulting in higher receiving stream loadings observed at SW4 during these melt conditions. There was a higher TSS loading concentration of 87 mg/L observed at the W-SWMP-OUT station during this sampling event, but this increased TSS concentration sampled from the W-SWMP outlet was not reflected in the SW2 result (TSS equal to 10 mg/L) directly downstream.

The October 7, 2013 rainfall-runoff event *in situ* measurement and sampling efforts also observed higher TSS concentrations within the receiving swale at SW1 and SW2 of 40 mg/L and 49 mg/L, along with the upstream Tooley Creek SW3 station of 31 mg/L. However, the downstream Tooley Creek station sampling effort resulted in a lower TSS concentration of 22 mg/L. The SWMPs were not discharging during this event, and therefore any increase and decrease of TSS loadings were the result of off-Site sources.

The November 22, 2013 controlled discharge event during a trace rainfall event (1.6 mm) also observed TSS values of 28 mg/L at both the SW1 and SW2 stations. Although the E-SWMP-OUT observed TSS concentration of 300 mg/L was significantly higher during this time, any effects within the receiving swale at SW2, and further downstream in Tooley Creek (with SW3 and SW4 TSS concentrations of 7 mg/L and 18 mg/L, respectively) were not observed.

Similar to the in situ turbidity measurements on March 31, 2014, sampling results for TSS are showing a significant increase from SW1 to SW2 (10 mg/L to 330 mg/L). However, the TSS measurements are relatively consistent and higher in Tooley Creek downstream, at 540 mg/L at SW3 and 590 mg/L at SW4.

Other than these sampling events noted above, the TSS sampling occasions performed were below 25 mg/L for all of the in-stream stations (SW1, SW2, SW3 and SW4).

5.2.3 *In Situ* Measurements

The *in situ* measurements of pH, temperature and conductivity are summarized in Tables 6, 7 and 8, respectively (Section 4.3). The *in situ* measurements field forms are provided in Appendix E-3.

5.2.3.1 pH

The *in situ* surface water sampling measurements for pH demonstrate the receiving swale (CN Rail ditch) and Tooley Creek pH levels fall within the PWQO and CWQG ranges from 6.5 to 8.5 and 6.5 to 9, respectively, with the exception of a pH level of 6.38 at SW-1 on September 30, 2013. There are also some pH levels out of the acceptable PWQO and CWQG ranges measured in the East and West SWM Ponds inlets and outlets periodically, mainly showing slightly more basic pH levels out of the PWQO range at both inlet and outlet sampling locations, (e.g., 8.62 and 8.58 at W-SWMP-IN and W-SWMP-OUT, respectively, on May 31, 2013; and 8.57, 9,30 and 9.35 at E-SWMP-IN, E-SWMP-OUT and W-SWMP-OUT, respectively, on November 22, 2013). One slightly more acidic measurement of 6.46 was observed at E-SWMP-IN on June 25, 2013. In any case, there is no evidence the SWM Pond discharges have any adverse effects on pH levels in the receiving swale and Tooley Creek.

5.2.3.2 Temperature

The observed *in situ* temperature measurements during the Year 2 monitoring period were very comparable within the receiving swale (CN Rail ditch) and Tooley Creek, and appear to be unaffected by the SWM pond discharges for all of the *in situ* measurement events observed. Therefore, there have been no concerns with any higher temperatures observed in the receiving stream and Tooley Creek that would exceed any of the acceptable limits for PWQO or CWQG outlined in Table 7.

5.2.3.3 Conductivity

The conductivity *in situ* measurements observed in the receiving swale (CN Rail ditch) and Tooley Creek during Year 2 of this Surface Water Program typically showed very comparable results at their respective upstream and downstream sampling locations suggesting that any affect attributable to the SWM pond discharges was small.

The conductivity measurements in Tooley Creek were consistently higher than those measured in the receiving swale. The greatest differential increase in conductivity in Tooley Creek observed during the Year 2 monitoring at both the SW3 and SW4 stations, was on July 22, 2013, where the SW3 and SW4 stations measured conductivity of 1270 µS/cm and 1080 µS/cm, respectively, whereas 670 µS/cm was measured at SW1 and 590 µS/cm at SW2. This higher conductivity at both of the Tooley Creek stations may be from local groundwater baseflow input to Tooley Creek further upstream.

There are no PWQO or CWQG limits for conductivity. However, any significant increases are often considered indicators for groundwater influence and/or increases in finer suspended metal loadings in receiving water. The conductivity measurements observed in Year 2 do not present any cause for major concerns at this time. However, consistent observed increases during future sampling will continue to be monitored, with consideration for additional E&SC measures at the Site outfall, if deemed appropriate.

5.3 Spill Response

On June 28 2013, a new transformer was dropped during delivery and unloading shortly before 2:30 pm, resulting in approximately 4 L of insulating synthetic mineral oil spilled in the loading/unloading area. Absorbent pads and socks were used in the spill area approximately 25 m east of the main DYEC building, to contain the spill on the asphalt surface. Since this spill occurred during a rainfall-runoff period, some of this synthetic oil drained into the stormwater sewer, conveying it to the East Stormwater Management Pond (E-SWMP). Here it was promptly contained within and upstream portion of the E-SWMP Inlet via containment booms spanning beyond the entire inlet opening. E-SWMP was not discharging during the initial incident, nor did it following the incident and before the follow-up clean-out and sampling efforts were complete.

The following recommendations were implemented/acted upon by CPP and the Site Environmental Monitoring Team, directed by Covanta in accordance with Golder's recommendations.

- The E-SWMP Inlet should be visually inspected daily to confirm whether or not the sheen is still present. To back up this observation and for comparative purposes to the initial sampling effort post the spill incident, two sampling grabs for total oil & grease/mineral synthetic should be taken: i. within the boom area; and ii. outside of the boom.
- If any sheen is still present at the E-SWMP Inlet, the vacuum truck contractor should come back to the site and skim off all of the excess sheen at the inlet of the E-SWMP, as well as inspect access manholes / catch-basins within the storm sewer system leading to the E-SWMP and downstream of the CB that received some of the mineral oil before it was bermed/contained to remove any excess oil in the sumps of these nodal points within the drainage system.
- During the follow-up site visits, the rest of the sampling stations W-SWMP, SWMP W&E-OUT and SW1 to SW4 should be visited to confirm that no mineral oil synthetic is visually observed at the downstream stations.
- Oil absorbent pads were also added by CPP (and subcontractors) within the containment boom area of the E-SWMP inlet, as another clean-up/remedial measure.

The two identified sampling locations at the E-SWMP inlet were sampled for Total Oil & Grease Mineral Synthetic analysis on three occasions following the incident: 1.During the initial spill response on June 28, 2013; 2. Follow-up sampling on July 2, 2013; and 3. Follow-up sampling on July 10, 2013.

The results from all three sampling efforts are summarized in Table 10 below.

Table 10: Total Oil & Grease Mineral/Synthetic Spill Response Sampling Analysis Summary

Date (Type of event)	Total Oil & Grease Mineral/Synthetic		RDL [1.]
	E-SWMP Inlet (Inside) mg/L	E-SWMP Inlet (Outside) mg/L	
June 28, 2013	15	< 0.5	< 0.5
July 2, 2013	< 0.5	< 0.5	< 0.5
July 10, 2013	< 0.5	< 0.5	< 0.5

Notes:

1. Reportable Detection Limit.
2. Surface water sampling analyses performed by Maxxam Analytics.

There was no reason to believe the synthetic mineral oil spill was discharged to the receiving swale, since the water level in the pond remained well below the invert of the outlet pipe. However, during this initial period following the incident, the entire monitoring area was also inspected on both July 2, 2013 and July 10, 2013, confirming that there was no residual mineral oil synthetic observed in the receiving swale and further downstream in Tooley Creek.

After the Golder spill response team was satisfied that the residual synthetic mineral oil was adequately removed (i.e., no clear visual signs of any residual synthetic mineral oil within the E-SWMP inlet containment boom, sampling results came back non-detect at the locations both inside and outside of the sampling booms for both follow-up sampling efforts on July 2 and 10, 2013), the following close-out measures were recommended.

- Remove the boom and absorbent pads at the E-SWMP-IN location, and skim away any residual oil observed visually in this location; and
- Set up boom at E & W - SWMP - OUTLET sampling location (pool), for continued monthly monitoring for any residual mineral oil discharging from E-SWMP.

5.4 Adequacy of the Monitoring Program

The Surface Water Monitoring Program for the Year 2 construction period for the Site is considered to be adequate and in general accordance with the Plan.

5.5 Assessment of the Need for Implementation of Contingency Measures

Based on the Year 2 Surface Water Monitoring Program results, there is no need for the implementation of any further contingency measures at this time. However, it is recommended that continued E&SC measures are properly and effectively implemented during the final SWMP outlet channel construction to the Region trunk sewer trench and ultimate receiving swale reconstruction.

6.0 CONCLUSIONS

The E&SC deficiencies noted throughout the monitoring period were appropriately addressed by the Covanta and the CPP EMI. Covanta, the CPP EMI, and the Golder Surface Water CEP carried out the weekly inspections, review and sign-off, to ensure deficiencies were promptly addressed.

Surface water quality *in situ* measurements and sampling results taken throughout the monitoring program indicate that there are no significant concerns with any Site influence on surface water conditions in the receiving swale (CN Rail ditch) and further downstream in Tooley Creek. These monitoring results are also providing baseline surface water quality data for comparative purposes, as the Surface Water Monitoring Program continues into the Operation Phase, currently scheduled to start in July, 2014.

Considering there were continued construction activities observed upstream of the Site, together with the Region sanitary trunk sewer construction along the northern side of the CNR immediately south and west of the Site, as well as rural agricultural influence on runoff loading, the higher TSS, turbidity and conductivity loadings observed at downstream stations in the receiving swale and Tooley Creek on June 25, 2013,November 22, 2013, and March 31, 2013 are most likely associated with these off Site, upstream influences. These potential influences were not specifically identified or characterized by this monitoring program.

The mineral oil spill from the transformer drop on June 28, 2013 was effectively contained during the initial response by CPP and Covanta. The surface water sampling performed as part of the spill response, in concert with the fact the E-SWMP water level was below the outlet invert preventing any discharge during the spill response period, supports the conclusion that the spill response included the appropriate clean-up measures. The spill response was appropriately communicated to and accepted by the MOE Spill Response Centre.

7.0 RECOMMENDATIONS

It is recommended that the E&SC Inspections and the Surface Water Sampling program continue until construction activities throughout the Site are complete, currently scheduled through to the fall of 2014, with some overlap with the Operations Phase, scheduled to start on July 1, 2014. These continued efforts should include the weekly EMI report circulation, review and sign-off by Covanta, the CPP EMI and the Golder Surface Water CEP once all deficiencies are confirmed to be appropriately addressed.

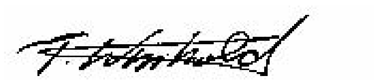
Surface water quality *in situ* measurements and sampling results should be collected as per the program outlined in Section 3.0, and will be promptly analyzed by the Golder Surface Water CEP. Any potential issues or concerns rising from these results and relating to Site discharges should be immediately brought to the attention of Covanta and the CPP EMI and promptly addressed with appropriate mitigation measures.

Since the Regional Municipality of Durham conveyance channel servicing construction will continue during the April to August, 2014 period, it is also recommended that Covanta, the CPP EMI and Golder Surface Water CEP continue to monitor any impacts or modifications made to the receiving swale, and make any appropriate modifications to the Surface Water Monitoring stations or sampling frequencies.

It is also recommended that the Owners, Covanta, the CPP EMI, along with the Golder Surface Water CEP and the WSP (formerly Genivar) Groundwater CEP continue appropriate, responsive communication. This practice will ensure that an appropriate spill response occurs, including both surface water and groundwater sampling, when warranted. This continued coordination effort will also allow the MOE to provide their input upfront on the level of spill response required, based on each particular incident, noting that minor equipment failure spills are often observed during a major construction project.

Report Signature Page

GOLDER ASSOCIATES LTD.



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9.0 GLOSSARY OF TERMS AND ABBREVIATIONS

CEP	Competent Environmental Practitioner
CNR	Canadian National Railway
CofA	Certificate of Approval
CPP	Courtice Power Partners
CSP	corrugated steel pipe
CWQG	Canadian Water Quality Guideline
DFO	Department of Fisheries and Oceans
DYEC	Durham York Energy Centre
EA	Environmental Assessment
ECA	Environmental Compliance Approval
EFW	Energy from Waste
E&SC	erosion and sediment control
EMI	Environmental Monitor and Inspector
HaESP	Health and Safety Environmental Plan
mg/L	Milligrams per litre
MNR	Ontario Ministry of Natural Resources
MOE	Ontario Ministry of the Environment
MW	Mega Watts
NTU	Nephelometric Turbidity Units
OPSD	Ontario Provincial Standard Drawing
PVC	polyvinyl chloride
PWQO	Provincial Water Quality Objective
RDL	Reported Detection Limit
SW	Surface Water
SWM	Stormwater management
TSS	Total Suspended Solids
µS/cm	Micro Siemens per centimetre
WDS	Waste Disposal Site
WPCP	Water Pollution Control Plant

FIGURES

LEGEND

- Surface Water Sampling Locations
- Major Contour (25 m)
- Minor Contour (5 m)
- Expressway
- Highway
- Major Road
- Local Road
- Railway
- Swale
- Interceptor Swale
- Utility Line
- Watercourse
- Waterbody
- Catchment Divide
- Approximate Site Boundary

REFERENCE

Base Data - MNR NRVIS, obtained 2004, CANMAP v2006.4
Imagery: Firstbase Solutions. Flown 2010; Bing Maps © 2009 Microsoft Corporation and its data suppliers
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Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 17N

200 100 0 200 400
SCALE 1:9,000 METERS

PROJECT
DURHAM-YORK ENERGY CENTRE
SURFACE WATER AND EROSION AND SEDIMENT CONTROL MONITORING

TITLE
SURFACE WATER SAMPLING LOCATIONS

Golder Associates
Mississauga, Ontario

PROJECT NO. 12-1151-0155 (4000)			SCALE AS SHOWN	REV. 0.0
DESIGN	PRM	25 Aug. 2010		
GIS	PRM	25 Apr. 2013		
CHECK	JSA	25 Apr. 2013	FIGURE: 1	
REVIEW	TW	25 Apr. 2013		

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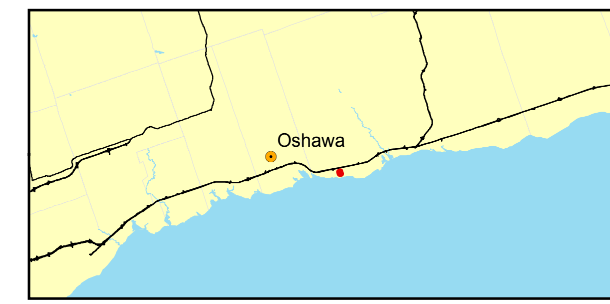
LEGEND

- Surface Water Sampling Locations (Moved on September 30, 2013)
- Surface Water Sampling Locations (Established June 5, 2012)
- Major Contour (25 m)
- Minor Contour (5 m)
- Expressway
- Highway
- Major Road
- Local Road
- Railway
- Swale
- Interceptor Swale
- Utility Line
- Watercourse
- Waterbody
- Catchment Divide
- Approximate Site Boundary



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200 100 0 200 400
SCALE 1:9,000 METERS

PROJECT
DURHAM-YORK ENERGY CENTRE
SURFACE WATER AND EROSION AND SEDIMENT CONTROL MONITORING

TITLE
UPDATED SURFACE WATER SAMPLING LOCATIONS

Golder Associates
Mississauga, Ontario

PROJECT NO. 12-1151-0155 (4000)			SCALE AS SHOWN	REV. 0.0
DESIGN	PRM	25 Aug. 2010		
GIS	PRM	25 Apr. 2013		
CHECK	JSA	25 Apr. 2013	**FIGURE: 2**	
REVIEW	TW	25 Apr. 2013		

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