-FINAL-

2012-2013 ANNUAL REPORT OF ACTIVITIES
UPPER TRINITY SOUTH (NEW HARBOUR)
WASTE DISPOSAL SITE

Submitted To:

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EXECUTIVE SUMMARY

AMEC Environment & Infrastructure, a division of AMEC Americas Limited (AMEC), was retained by the Newfoundland and Labrador Department of Environment and Conservation (ENVC) in November 2012 to provide Environmental Consulting Services for the Upper Trinity South Waste Disposal Site located east of the community of New Harbour, Newfoundland and Labrador (NL).

SITE DESCRIPTION

The Site is located south of Route 73 on the New Harbour Barrens and has operated as a domestic waste disposal facility from the early 1970s until November 2009. In the past the facility has accepted domestic waste from the communities of Blaketown, Dildo, Green's Harbour, Hopeall, Markland, New Harbour, Old Shop, South Dildo, Bay Roberts and Cupids. The facility is an unlined waste disposal facility; however, potential impacts from leachate generated at the Site are now being managed by an interception ditch and leachate collection pond constructed at the Site in 2007. Until recent years, open burning was a common practice carried out at the Site to reduce waste volumes and control vermin. The surrounding area consists of vacant, undeveloped land that is comprised mostly of bogs/wetland and forested areas with several ponds and streams located upgradient and downgradient of the facility.

Further details concerning Site history is described in detail in Section 1.1.

SCOPE OF WORK

As outlined in the ENVC Request for Proposals (RFP) dated September 2012, AMEC completed the following scope of work:

- Complete inspection of monitoring wells and the leachate control system;
- Complete inspection of the geomembrane (in fenced ENVC storage yard);
- Complete one groundwater and surface water monitoring event, including one background sampling event (groundwater);
- Compare all groundwater and surface water data results that exists for the Site, and provide meaningful interpretation of the results; and
- Prepare draft and final annual reports of activities.

FINDINGS OF THE MONITORING PROGRAM

Groundwater Quality

- Concentrations of BTEX and modified TPH in groundwater during the current and previous sampling events did not exceed 2012 Atlantic PIRI Tier I Risk Based Corrective Action (RBCA) Risk Based Screening Levels (RBSLs) or Ontario Ministry of the Environment (MOE) Site Condition Standards (SCSs). BTEX and TPH are not considered to be

contaminants of potential concern (COPCs) in groundwater at the Site. AMEC recommends that BTEX/TPH be removed from any future groundwater monitoring events carried out at the Site.

- Concentrations of metals detected in groundwater during the current (November 2012) sampling event did not exceed the MOE SCSs. Concentrations of four metal parameters (i.e. copper, lead, cobalt and mercury) detected in groundwater during the previous sampling events exceeded the MOE SCSs. It is also noted that concentrations of metals in background monitoring well (MW-08) did not exceed the MOE SCSs. Due to historical metal exceedences reported in groundwater, AMEC recommends that all monitoring wells, be sampled and analyzed for metals during any future groundwater monitoring events carried out at the Site.
- Concentrations of polycyclic aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs), dioxins and furans and general water chemistry parameters in groundwater during the current and previous sampling events were either non-detect or detected at levels below the MOE SCSs. These parameters are not considered to be COPCs in groundwater at this Site at this time. AMEC recommends that these parameters be removed from any future groundwater monitoring events carried out at the Site.
- PCBs have not been detected in groundwater samples collected at the Site during the current and previous sampling events. This parameter is not considered to be COPCs in groundwater at this Site at this time. However, given that there is PCB impacted soil present at the Site, AMEC recommends that all monitoring wells, with the exception of monitoring wells MW-07 and MW-08 (i.e. located upgradient of the PCB Disposal Area), be analyzed for PCBs during any future groundwater monitoring events carried out at the Site.

Surface Water Quality

- Concentrations of metals (i.e. cadmium and iron) and nitrite (nitrite as N) detected in one surface water sample (SW-POND) collected from the leachate collection pond exceeded the Canadian Council of Ministers of the Environment (CCME) – Freshwater Aquatic life (FAL) guidelines. AMEC recommends both surface water sampling locations (SW-POND and STREAM) be analyzed for metals during any future monitoring events carried out at the Site.
- pH levels in surface water at the Site were similar during all sampling events, with the exception of the January 2010 sampling event when pH levels detected in surface water sample STREAM was outside the range of the CCME-FAL guideline 6.5-9. The concentrations of nitrite (i.e. Nitrite as N) detected in surface water has fluctuated over time (increasing or decreasing during all sampling events). There is no trend identified. AMEC recommends that surface water samples be collected from the leachate collection pond and the downgradient stream for the analyses of general water chemistry during any future surface water monitoring events carried out at the Site.
- PCBs were not detected in the surface water samples collected from the leachate collection pond and downgradient stream. However, given that there is PCB impacted soil present at the Site, AMEC recommends both surface water sampling locations (SW-POND and STREAM) be analyzed for PCBs during any future monitoring events carried out at the Site.

- Concentrations of BTEX/TPH, PAHs and VOCs detected in all surface water samples collected at the Site were either non-detect or detected at levels below the applicable CCME-FAL guidelines. These parameters are not considered to be COPCs in surface water at this Site at this time. AMEC recommends that these parameters be removed from any future groundwater monitoring events carried out at the Site.
- Concentrations of dioxins and furans (3.01 pg / L and 4.31 pg / L) were detected in surface water samples collected from the leachate collection pond and downgradient stream. Given the above, dioxins and furans are not considered to be COPCs in surface water at this Site at this time. Therefore, AMEC recommends that dioxins and furans be removed from any future surface water monitoring events carried out at the Site.

FINDINGS OF THE LEACHATE CONTROL SYSTEM INSPECTION

- The leachate control system, consisting of surface water drainage ditches and a leachate collection pond, was observed to be in good condition with no blockages or eroded areas noted.
- The rip rap was observed to be in good condition and there was no evidence of exposed liner.

FINDINGS OF THE GEOMEMBRANE INSPECTION

- The linear low-density polyethylene (LLDPE) rolls appeared to be in good condition with no evidence of material degradation. The polyethylene tarps covering the rolls appeared in good condition, no tears or areas of exposure were noted during the inspection. Wear of the sand bags which covered the polyethylene tarps was noted and it is suggested the sand bags be replaced in the Spring 2013.

RECOMMENDATIONS

AMEC recommends that the following further actions be carried out at the Site:

- Complete site closure activities in accordance with the Department of Environment and Conservation Guidance Documents “Guidelines for the Closure of Non-Containment Municipal Solid Waste Landfill Sites” GD-PPD-062 and “Environmental Standards for Municipal Solid Waste Landfill Sites” GD-PPD-049.1.
- Develop and implement an environmental monitoring plan to continue to monitor groundwater and surface water at the Site. Groundwater should be monitored for metals and PCBs and surface water should be monitored for metals, PCBs and general water chemistry.
- Replace the locks on the monitoring wells and carry out the necessary repairs to monitoring well MW-5 (replace riser, replace bentonite and re-install and secure the protective casing).
- Conduct a Human Health Ecological Risk Assessment (HHERA) to determine whether or not the levels of PCBs in various media at the Site pose any risk to human and ecological receptors.

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APPENDICES

1.0 INTRODUCTION

AMEC Environment & Infrastructure, a division of AMEC Americas Limited (AMEC), was retained by the Newfoundland and Labrador Department of Environment and Conservation (ENVC) in November 2012 to provide Environmental Consulting Services for the Upper Trinity South Waste Disposal Site located east of the community of New Harbour, Newfoundland and Labrador (NL). As per the Terms of Reference (TOR) issued by ENVC in September 2012, the objectives included:

- Complete inspection of monitoring wells and the leachate control system;
- Complete inspection of the geomembrane (in fenced ENVC storage yard);
- Complete one groundwater and surface water monitoring event, including one background sampling event (groundwater);
- Compare all groundwater and surface water data results that exists for the Site, and provide meaningful interpretation of the results; and
- Prepare draft and final annual reports of activities.

1.1 SITE DESCRIPTION AND HISTORY

The Site is located south of Route 73 on the New Harbour Barrens and has operated as a domestic waste disposal facility since the early 1970s (refer to Figure 1, Appendix A). As of November 2009, the facility is no longer operational. In the past the facility has accepted domestic waste from the communities of Blaketown, Dildo, Green's Harbour, Hopeall, Markland, New Harbour, Old Shop, South Dildo, Bay Roberts and Cupids. The facility is an unlined waste disposal facility; however, potential impacts from leachate generated at the Site are now being managed by an interception ditch and leachate collection pond constructed at the Site in 2007. Until recent years, open burning was a common practice carried out at the Site to reduce waste volumes and control vermin. The surrounding area consists of vacant, undeveloped land that is comprised mostly of bogs/wetland and forested areas with several ponds and streams located upgradient and downgradient of the facility (refer to Figure 1, Appendix A).

1.2 SUMMARY OF PREVIOUS WORK COMPLETED AT THE SITE

Investigations were completed at the site from 2002 to 2012, which included test pitting and soil sampling programs, a soil remediation program, groundwater monitoring well installations, several groundwater, sediment and surface water monitoring events and fish sampling. The previous work completed at the Site has been summarized in the following subsections.

1.2.1 Previous PCB in Soil Investigations/Remediation Programs

1.2.1.1 1992 – 1995

During the period of 1992 through 1995, ENVC undertook a PCB remediation program at a nearby scrap yard, located in the community of Makinsons, NL. During this program, PCB-impacted scrap metal and transformer casings were transported to the Site and buried on-Site. Previous soil sampling programs carried out at the Site revealed concentrations of PCBs in soil at the Site that exceeded the Canadian Council of Ministers of the Environment (CCME) Canadian Soil Quality Guideline (CSQG) of 33 mg/kg for PCBs in soil at a commercial site.

1.2.1.2 SGE Acres 2003 (February)

Waste Disposal Site

SGE Acres (SGE) conducted a test pitting program along the perimeter of the waste disposal site in August 2002. Six test pits TP-1 to TP-6 were excavated and one soil sample collected from each test pit was analyzed or PCBs. PCBs were not detected (<0.05 mg/kg) in any of the six soil samples analyzed.

PCB Disposal Area

SGE conducted a test pitting program within in the area of the buried transformers in August 2002. Two soil samples (Trans #1 and Trans #2) were collected from soil adjacent to the transformer casing and we analyzed for PCBs. PCBs were detected in both of the soil samples analyzed at concentrations of 1.4 mg/kg and 5.7 mg/kg, below the CCME-CSQG of 33 mg/kg. The locations of the sample samples were not provided in the report.

1.2.1.3 SGE Acres 2003 (May)

SGE conducted a test pitting program in the area of the buried transformers in March 2003. A ‘T-shaped’ trench was excavated within the PCB Disposal Area of the Site and five subsurface soil samples (TP-1, TP-2, TP-3, TP-5 and TP-6) were collected from the bottom trench (on bedrock) and analyzed for PCBs.

PCBs were detected in one soil sample at a concentration of 52 mg/kg (TP-3), above the CCME-CSQG of 33 mg/kg for PCBs in soil at a commercial site. PCBs were not detected (<1 mg/kg) in the other four soil samples analyzed.

1.2.1.4 AMEC 2006

AMEC conducted a test pitting program in the area of the buried transformers in November 2005. Five test pits (TP-1 to TP-5) were excavated and 15 soil samples were collected from the test pits and analyzed for PCBs.

PCBs were detected in all soil samples analyzed and the concentrations ranged from 0.036 mg/kg to 21.1 mg/kg, below the CCME-CSQG of 33 mg/kg for PCBs in soil at a

commercial site.

1.2.1.5 AMEC 2007

AMEC conducted a test pitting program in the area of the buried transformers in November 2006. Two test pits (TP-6 and TP-7) were excavated and 10 soil samples were collected from the test pits and analyzed for PCBs.

One soil sample was reported as having a PCB concentration of 66.7 mg/kg (TP-6 SA-4), above the CCME-CSQG of 33 mg/kg for PCBs in soil at a commercial site. Soil sample TP-6 SA-4 was collected from a depth interval of 2-3 meters below the ground surface (mbgs). Concentrations of PCBs detected in the remaining nine soil samples analyzed ranged from 0.052 to 30.1 mg/kg.

1.2.1.6 AMEC 2008 - 2009

In 2008, AMEC prepared an invitation to tender (ITT) for a PCB remediation program at the Site. The ITT specification included the excavation and removal of PCB-impacted material consisting of soil and debris (scrap metal and solid municipal waste) from the area of buried transformer casings at the Site for storage, treatment, and final disposal at an approved disposal/treatment facility.

The 2008 PCB remediation program was carried out in two phases (i.e., Phase I and Phase II). Phase I was carried out on September 9 and 10, 2008 in accordance with the original ITT specification and involved the removal of PCB-impacted material from two locations (i.e., Locations A and B). Phase II was carried out on October 25, 2009 and involved the removal of additional PCB-impacted material from Location A. In total, 120.25 tonnes of PCB-impacted material were removed Locations A and B of the Site by Edward Collins Contracting Limited and transported to the Universal Environmental Services Inc. (UESI) soil treatment facility located in Sunnyside, NL.

Phase I – PCB Remediation Program

As part of the Phase I PCB remediation program, a total of 43.57 tonnes of PCB-impacted material was removed from Locations A and B and delivered to an approved PCB-impacted soil and debris disposal and treatment facility operated by UESI in Sunnyside, NL. PCB concentrations for all of the confirmatory and stockpile soil samples associated with Location A exceeded the applicable CCME-CSQG of 33 mg/kg. Based on the confirmatory soil sample results, ENVC requested to have an additional 75 to 80 tonnes of PCB-impacted material removed from Location A for disposal and treatment at the Sunnyside facility (i.e., Phase II). PCB concentrations for all of the confirmatory and stockpile soil samples associated with Location B were below the applicable CCME-CSQG of 33 mg/kg. Location B was backfilled with non PCB-impacted material from the adjacent stockpile and surrounding overburden.

Phase II – PCB Remediation Program

As part of the Phase II PCB remediation program, an additional 76.78 tonnes of PCB-impacted material was removed from Location A. Numerous transformer casings and scrap metal were observed within the remediation excavation area. Confirmatory soil samples collected from the northeast floor section and east and south walls of the remediation excavation at Location A contained PCB concentrations above the CCME-CSQG of 33 mg/kg. PCB concentrations for overburden samples collected adjacent to Location A were below the CCME-CSQG of 33 mg/kg.

At the request of ENVC, Location A was partially backfilled with PCB-impacted material including material that was initially excavated and stockpiled from Location A during the Phase I remediation program. The excavation was lined with 6 mil polyethylene sheeting to mark the boundary of the excavation extents, for future excavation and removal of the material. The PCB-impacted material was placed on top of the polyethylene sheeting then covered by a layer of polyethylene sheeting and oriented stand boards (OSBs). Surrounding overburden was then placed on top of the polyethylene sheeting and OSBs and the excavation was backfilled to match surrounding grade. The purpose of placing a layer of polyethylene sheeting and OSBs between the PCB-impacted material and overburden material was to mark the boundary and restrict contact between PCB-impacted material and overburden material.

Supplemental Soil Sampling Program - Trenching

A supplementary PCB soil sampling program was carried out on January 12 and 13, 2009. The program included the excavation of five trenches (Trench 1 to Trench 5) adjacent to Location A and the collection of representative soil samples from each of the trenches. A total of 44 soil samples were submitted to an accredited laboratory for PCB analysis. Soil samples collected from trenches located southeast and south of the former remediation excavation Location A (Trench 2 and Trench 3) contained PCB concentrations that exceeded the CCME-CSQG of 33 mg/kg. Numerous transformer casings and scrap metal were also observed in some of the trenches.

1.2.1.7 AMEC 2010

AMEC prepared an ITT for the excavation and removal of 120 tonnes of PCB-impacted material (i.e. soil and debris) from an area of buried transformer casings at Location A of the Site for treatment and final disposal at an approved disposal/treatment facility. The PCB-impacted material to be excavated and removed from the Site, as part of the remedial program, included the material that was initially excavated and stockpiled from Location A during the Phase I of the previous PCB soil remediation program (AMEC 2008) and re-positioned within the remediation excavation at Location A.

AMEC provided support to ENVC for the duration of the PCB-impacted material removal program to ensure that work was being conducted in accordance with the Contract Documents and to provide the necessary on-Site inspection and monitoring to ensure compliance. AMEC

provided an environmental technician to supervise the on-Site work. AMEC identified the boundaries of the remediation excavation for the Contractor prior to the start of excavating the material. The material was excavated and loaded into the trucks (B-Trains) using an excavator. AMEC/ENVC collected manifests for the PCB-impacted material being transported off-Site to the soil treatment facility located in Quebec for decontamination and destruction. In total, 136 tonnes of PCB-impacted material was excavated and removed. AMEC confirmed that the PCB-impacted material area was completely removed as per the boundaries identified in the Contract Document's boundaries.

1.2.2 Groundwater and Stream Monitoring Programs

Six (6) groundwater and stream monitoring programs have seen carried out at the Site by AMEC and SNC Lavalin Inc. (SNC) during the period of February 2007 to December 2011. Findings of the monitoring programs are summarized in the following subsections (1.2.3.1 to 1.2.3.7).

1.2.2.1 AMEC 2007

Laboratory analytical results for groundwater samples collected at the Site by AMEC during the February 2007 Groundwater Monitoring Program (GMP) (AMEC 2007) indicated that on-Site groundwater was impacted with metals and polycyclic aromatic hydrocarbons (PAH) (i.e. naphthalene) at concentrations above the Canadian Council of Ministers of the Environment (CCME) Canadian Water Quality Guidelines (CWQGs) for the Protection of Freshwater Aquatic Life (FAL) (updated 2007).

It was noted in the report that the analytical results were from one set of groundwater samples collected only a few weeks after the monitoring wells were installed and before the final construction of the leachate collection pond and surface water drainage ditches. The leachate collection pond and surface water drainage ditches would not have had opportunity to demonstrate any positive impact on groundwater outside the perimeter of the landfill.

AMEC recommended that a longer term sampling regime would provide better information on the success of the leachate control measures implemented at the Site.

1.2.2.2 AMEC 2008

Laboratory analytical results for groundwater and surface water samples collected at the Site by AMEC during the November 2007 Groundwater and Surface Water Monitoring Program (GSMP) (AMEC 2008) indicated that on-Site groundwater was impacted with toluene, metals and dioxins and furans and surface water within the leachate collection pond was impacted with metals and nitrite.

A comparison of the February 2007 and November 2007 groundwater analytical data revealed that concentrations of metals, PAHs and nitrite had decreased; concentrations of volatile

organic compounds (VOCs), benzene, ethylbenzene, xylenes, TPH, pH had generally remained the same; and concentrations of toluene and dioxins and furans had increased since the February 2007 sampling event.

AMEC recommended that additional groundwater and surface water monitoring events be carried out to further monitor groundwater and surface water quality at the Site.

1.2.2.3 AMEC 2009 (February)

Laboratory analytical results for groundwater and surface water samples collected at the Site by AMEC during the May 2008 GSMP (AMEC 2009a) indicated that on-Site groundwater was impacted with toluene, metals and dioxins and furans and surface water within the leachate collection pond and downgradient stream was impacted with metals and nitrite.

A comparison of the February 2007, November 2007 and May 2008 groundwater analytical data revealed that the concentrations of metals (with a few exceptions) and PAHs had decreased; concentrations of PCBs, VOCs (with the exception of toluene), benzene, ethylbenzene, xylenes, TPH, pH had generally remained the same; and concentrations of toluene, mercury, and dioxins and furans had increased over time.

A comparison of the November 2007 and May 2008 surface water analytical data revealed that metal concentrations had decreased in the leachate collection pond and increased in the downgradient stream; concentrations of nitrite had increased in both the leachate collection pond and downgradient stream; and concentrations of PCBs, VOCs, BTEX, modified TPH, dioxins and furans and pH had generally remained the same in the leachate collection pond and the downgradient stream (i.e. below the applicable criteria) over time.

AMEC recommended that additional groundwater and surface water monitoring events be carried out to further monitor groundwater and surface water quality at the Site.

1.2.2.4 AMEC 2009 (March)

Laboratory analytical results for groundwater and surface water samples collected at the Site by AMEC during the May 2009 GSMP (AMEC 2009b) indicated that on-Site groundwater was impacted with toluene and metals, surface water within the leachate collection pond was impacted with metals and nitrite and surface water within the downgradient stream was impacted with metals. PCBs were detected at low levels in surface water within the surface water drainage ditch located downgradient of the PCB Disposal Area of the Site.

A comparison of the February 2007, November 2007, May 2008 and January 2009 groundwater analytical data revealed that the concentrations of metals (with a few exceptions) and PAHs had decreased; and concentrations of PCBs, VOCs (with the exception of toluene), benzene, ethylbenzene, xylenes, TPH, pH and mercury had generally remained the same. The maximum Total Toxic Equivalent (TTE) concentrations of dioxins and furans reported for two of the seven

groundwater samples (MW-04 and MW-05) collected at the Site during the November 2007 and May 2008 sampling events exceeded the Ontario Ministry of the Environment (MOE) Site Condition Standards (SCS), since then the concentrations of dioxins and furans has decreased over time.

A comparison of the November 2007, May 2008 and March 2009 surface water analytical data revealed that metal concentrations (with the exception of copper) had decreased in the leachate collection pond and in the downgradient stream while the concentrations of nitrite had decreased in both the leachate collection pond and downgradient stream, however the concentrations of nitrite remained above the applicable criteria. The concentrations of PCBs, VOCs, BTEX, modified TPH, dioxins and furans and pH had generally remained the same in the leachate collection pond and the downgradient stream (i.e. below the applicable criteria) over time.

To further characterize the environmental condition of the Site AMEC recommended the following further actions:

- Conduct additional groundwater and surface water monitoring events to further monitor groundwater and surface water quality at the Site.
- Collect sediment samples from the leachate collection pond, surface water drainage ditch and the downgradient stream for metals, dioxins and furans and PCB analyses.
- Conduct a test pitting program along the perimeter of the landfill, in the vicinity of the existing monitoring wells, to assess the levels of PCBs in surface and subsurface soil at that area of the Site.
- Obtain the services of a survey contractor to survey the “top of casing” and “ground surface” elevations for the existing monitoring wells to further evaluate the direction of groundwater flow throughout the Site.
- Repair or re-install monitoring well MW-05.
- Conduct a background assessment of metals in groundwater, surface water and sediment in the general area of the Site to assess whether or not the metals impacted media identified at the Site are attributed to metals leaching from the landfill or from the natural surficial and bedrock geology of the area. This assessment would consist of a literature review (i.e. aerial photograph, surficial geology mapping, bedrock geology mapping, land use maps, land ownership maps, etc.) and groundwater, surface water and sediment sampling.

1.2.2.5 SNC 2010

Laboratory analytical results for groundwater and surface water samples collected at the Site by SNC during September 2009 and January 2010 (SNC 2010) indicated that Site groundwater was impacted with toluene, metals, nitrates and nitrites and pH levels were outside of the CCME-FAL guideline range of 6.5 - 9.0 (which is typical for pH in NL). Surface water within the leachate collection pond was impacted with metals and nitrite and surface water within the

downgradient stream was impacted with metals, nitrite and pH levels outside of the CCME-FAL guideline range of 6.5 - 9.0. There are no CCME-FAL or MOE guidelines available for dioxins and furans in surface water therefore samples were assessed based on presence/absence only. The TTE of dioxins and furans in the stream and pond samples analyzed were between 1.77 pg/L and 2.63 pg/L.

A comparison of the February 2007, November 2007, May 2008, January 2009, October 2009, January 2010 groundwater analytical data revealed that the concentrations of metals had either decreased or shown no consistent trends over time. Concentrations of nitrates, nitrites and pH levels had generally remained the same (exceeding the CCME-FAL guidelines). Concentrations of PCBs, PAHs, VOCs (with the exception of toluene), benzene, ethylbenzene, xylenes and TPH had generally remained the same (below the applicable guidelines). The maximum TTE concentrations of dioxins and furans reported for two of the seven groundwater samples (MW-04 and MW-05) collected at the Site during the November 2007 and May 2008 sampling events exceeded the MOE SCS, since then the concentrations of dioxins and furans have decreased over time (no exceedences).

A comparison of the November 2007, May 2008, January 2009, September 2009, January 2010 surface water analytical data revealed that metal and nitrite concentrations had fluctuated (exceeded CCME-FAL guidelines) and therefore, shown no consistent trends over time in the leachate collection pond and in the downgradient stream. The pH levels in the downgradient stream were usually within the CCME-FAL guideline range of 6.5 - 9.0, however it was detected at a low level in January 2010. The concentrations of PCBs, PAHs, VOCs, BTEX, modified TPH, and dioxins and furans had generally remained the same in the leachate collection pond and the downgradient stream (i.e. below the applicable criteria) over time.

As recommended by AMEC (AMEC 2010) SNC conducted a background sampling program of sediment, groundwater and surface water and a sediment sampling program at the Site in March 2010. A monitoring well (MW-08) was installed northeast (upgradient) of the Site to be used as a background well.

Background Sampling Program

Results of the background groundwater sampling program revealed that the groundwater sample collected from background monitoring well MW-08 (installed north of the Site by SNC) contained concentrations of aluminum (626 µg/L), cadmium (0.018 µg/L), copper (8.8 µg/L), iron (411 µg/L) and lead (1.2 µg/L) that exceeded the CCME-FAL guidelines. The pH (5.42) measured in sample MW-08 was outside of the CCME-FAL guideline range of 6.5 to 9.0.

Results of the background surface water samples (BACK-SW-1 and BACK-SW-2) revealed that concentrations of aluminum (150 µg/L) and iron (540 µg/L) in the background sample collected from a pond located northeast of the Site (BACK-SW-2) and aluminum (130 µg/L) and chromium (20 µg/L) in the background sample collected from a pond located northwest (BACK-SW-1) of the Site exceeded the applicable CCME-FAL guidelines. The pH (5.45 and 4.92) measured in both samples was outside of the CCME-FAL range of 6.5 to 9.0.

Results of the background sediment samples (BACKPOND-SED1 and BACKPOND-SED-2) revealed that the concentration of arsenic (9 mg/kg) in the background sample collected from a pond located northwest (BACKPOND-SED1) of the Site exceeded the CCME-ISQGs and toluene (0.04 mg/kg) was detected in the background sample collected from a pond located northeast (BACKPOND-SED-2) of the Site.

Surface Water Sampling, On-Site

A comparison of the February 2007, November 2007, May 2008, January 2009, September 2009, January 2010 surface water analytical data revealed that metal and nitrite concentrations had fluctuated (exceeding CCME-FAL guidelines) and therefore, shown no consistent trends over time in the leachate collection pond and in the downgradient stream. The pH levels in the downgradient stream were usually within the CCME-FAL range of 6.5 - 9.0, however it was detected at a low level in January 2010. The concentrations of PCBs, PAHs, VOCs, BTEX, modified TPH, and dioxins and furans had generally remained the same in the leachate collection pond and the downgradient stream (i.e. below the applicable criteria) over time.

Sediment Sampling, On-Site

Results of the sediment samples collected on Site (POND-SED, STREAM-SED and DITCH-SED) revealed that toluene (0.06 mg/kg) and total xylene (0.25 mg/kg) were detected in sediment, and that the concentration of mercury (0.2 mg/kg) exceeded the CCME - Interim Sediment Quality Guidelines (ISQGs) and Probable Effect Levels (PELs) in the sediment sample collected from the stream located directly downgradient of the waste disposal site (STREAM-SED). Concentrations of modified TPH (27 mg/kg) were detected in the sediment sample collected from the surface water drainage ditch located west of the PCB Remediation Area (DITCH-SED). There are no guidelines available for dioxins and furans in sediment however the results for the sediment samples collected on Site ranged from 0.815 to 2.01 pg/L.

1.2.2.6 AMEC 2011

During the period of September 2010 to March 2011, AMEC collected groundwater samples from six monitoring wells on-site and one background groundwater monitoring well, as well as surface water samples and background surface water samples. Two surface water samples were obtained from the leachate collection pond and the stream located directly down-gradient of the landfill facility, and two background surface water samples were collected from two ponds in the surrounding area. Three sediment samples were also collected during this time; one from the leachate collection pond, one from the stream located directly down-gradient of the landfill facility, and one from an interception ditch (west of the PCB disposal area). Two background sediment samples were also collected from two ponds in the surrounding area.

Groundwater Sampling, On-Site

Concentrations of BTEX detected in groundwater during all seven sampling events did not exceed ten times (10 x) the Canadian Council of Ministers of the Environment Fresh Water

Aquatic Life (CCME-FAL) guidelines, 2003 Atlantic PIRI Tier I Risk Based Corrective Action (RBCA) Risk Based Screening Levels (RBSLs) or the MOE SCSs. Concentrations of modified TPH detected in groundwater during all seven sampling events did not exceed the applicable or 2003 Atlantic PIRI Tier I RBCA RBSLs. BTEX and TPH are not considered to be contaminants of potential concern (COPCs) in groundwater at the Site. AMEC recommended that BTEX/TPH be removed from any future groundwater monitoring events carried out at the Site.

Concentrations of metals (i.e. arsenic, aluminum, cadmium, chromium, copper, iron and zinc) detected in groundwater during the current and previous sampling events at the Site exceeded the 10 x CCME-FAL guidelines. Concentrations of copper, lead and mercury detected in groundwater at the Site during previous sampling events also exceeded the exceeded the MOE SCSs.

A comparison of on-Site and background metals data revealed that background levels in metals in groundwater in the general area of the Site were elevated; however, it is possible that the landfill is contributing to the levels of metals in on-Site groundwater. Therefore, metals were considered to be COPCs in groundwater at the Site at that time. AMEC recommended that all monitoring wells (including the background monitoring well MW-08) be sampled for the analyses of metals during any future groundwater monitoring events carried out at the Site.

Concentration of VOCs detected in all groundwater samples collected at the Site during all sampling events did not exceed the applicable MOE SCSs. The majority of VOC parameters in groundwater were not detected in groundwater samples collected at the Site during all sampling events. VOCs were not considered to be COPCs in groundwater at the Site. AMEC recommended that VOCs be removed from any future groundwater monitoring events carried out at the Site.

Concentrations of PAHs, dioxins and furans and general water chemistry parameters (with the exception of pH in MW-07) in groundwater were either non-detect or detected at levels below 10 x the CCME-FAL guidelines and MOE SCSs. These parameters were not considered to be COPCs in groundwater at this Site at that time. AMEC recommended that these parameters be removed from any future groundwater monitoring events carried out at the Site.

PCBs were not detected in groundwater samples collected at the Site during all sampling events. Given that soil remediation programs have been carried out at the Site, AMEC recommended that all monitoring wells, with the exception of monitoring wells MW-07 and MW-08 (i.e. located upgradient of the PCB Remediation Area), be analyzed for PCBs during any future groundwater monitoring events carried out at the Site.

<u>Surface Water Sampling, On-Site</u>

Concentrations of metals (i.e. aluminum, cadmium and copper) and nitrite (nitrite as N) detected in surface water samples collected from the leachate collection pond and downgradient stream exceeded the CCME-FAL guidelines.

A comparison of on-Site and the background metals data revealed that background levels in metals in surface water in the general area of the Site were elevated; however, it is possible that the landfill is contributing to the levels of cadmium and copper in on-Site surface water and surface water in a stream located directly downgradient of the waste disposal site. AMEC recommended that surface water samples be collected from the leachate collection pond, surface water drainage ditches and the downgradient stream for the analyses of metals and general water chemistry (i.e. for use in the selection of CCME-FAL guidelines for aluminum, copper, lead and nickel) during any future surface water monitoring events carried out at the Site.

PCBs were not detected in the surface water samples collected from the leachate collection pond and downgradient stream, but were detected at low levels in the surface water drainage ditch located downgradient of the PCB Remediation Area. AMEC recommends that surface water samples be collected from the leachate collection pond, surface water drainage ditches and the downgradient stream for the analyses of PCBs during any future surface water monitoring events carried out at the Site.

Concentrations of BTEX/TPH, PAHs and VOCs detected in all surface water samples collected at the Site were either non-detect or detected at levels below the applicable criteria. These parameters are not considered to be COPCs in surface water at this Site at this time. AMEC recommends that these parameters be removed from any future groundwater monitoring events carried out at the Site.

Concentrations of the Total Toxic Equivalent (TTE) of the dioxins and furans (194 pg / L and 210 pg / L) were detected in surface water samples collected from the leachate collection pond and downgradient stream. Given that dioxins and furans are generated from a variety of sources, AMEC recommends that background surface water samples from nearby streams and ponds be analyzed for dioxins and furans during any future surface water monitoring events to assess whether or not the dioxins and furans are likely sourced from the Site, or possibly from other external sources.

Sediment Quality, On-Site

Concentrations of BTEX/TPH, metals, PCBs, PAHs and VOCs detected in the sediment sample collected from the leachate collection pond were either non-detect or detected at levels below the applicable CCME - Interim Sediment Quality Guidelines (ISQGs) or Probable Effects Level (PELs).

Concentrations of modified TPH in sediment samples collected from the downgradient stream and surface water drainage ditch were detected; however, the laboratory reported that the petroleum hydrocarbons detected in sediment at the Site and background sample location do not represent petroleum products. These values are likely a result of organic interference from vegetation present within the samples. Therefore, petroleum hydrocarbons are not considered to be a concern in sediment at the Site.

Concentrations of metals (i.e. arsenic, copper, lead, mercury and zinc) detected in sediment samples collected from the downgradient stream and surface water drainage ditch exceeded the CCME-ISQGs and/or PELs.

A comparison of on-Site and background metals data revealed that background levels in metals in sediment in the general area of the Site are elevated; however, it is possible that the landfill is contributing to the levels of metals in on-Site sediment collected from a stream located directly downgradient of the waste disposal site.

Concentrations of PAHs (chrysene and fluoranthene) and detected in the sediment sample collected from the surface water drainage ditch exceeded the CCME-ISQGs. Concentrations of PAHs in all the remaining sediment samples analyzed were either non-detect or were detected at levels below the applicable CCME-ISQGs, concentrations of PAHs in all sediment samples analyzed were detected at levels below the applicable CCME-PELs.

Concentrations of VOCs in sediment samples collected from the downgradient stream and surface water drainage ditch were either non-detect or detected at levels below the applicable criteria.

Concentrations of the TTE of the dioxins and furans (1.67 pg/g to 11.8 pg/g) were detected in sediment samples collected from the leachate collection pond and downgradient stream. Given that dioxins and furans are generated from a variety of sources, AMEC recommended that background sediment samples from nearby streams and ponds be analyzed for dioxins and furans during any future sediment monitoring events to assess whether or not the dioxins and furans are likely sourced from the Site, or possibly from other external sources.

The concentration of PCBs detected in sediment sample DITCH-SED exceeded the CCME-ISQG and CCME-PEL for PCBs in freshwater sediment. PCBs were non-detect and therefore below the CCME-ISQG and CCME-PEL in the remaining sediment samples analyzed.

Recommendations

AMEC recommended that the following further actions be carried out at the Site:

- Complete site closure activities in accordance with the Department of Environment and Conservation Guidance Documents “Guidelines for the Closure of Non-Containment Municipal Solid Waste Landfill Sites” GD-PPD-062 and “Environmental Standards for Municipal Solid Waste Landfill Sites” GD-PPD-049.1.
- Develop and implement an environmental monitoring plan to continue to monitor groundwater, surface water and sediment quality at the Site.
- Conduct a test pitting program at the Site to delineate the boundaries of the buried transformers area. Select soil samples should be collected and analyzed for PCBs.
- Conduct a Human Health Preliminary Quantitative Risk Assessment (PQRA) and Screening

Level Ecological Risk Assessment (SLERA) to determine whether or not the levels of PCBs in various media at the Site pose any risk to human and ecological receptors.

1.2.2.7 SNC 2012

On December 14, 2011, the sampling program was completed at the Site, which included groundwater sampling from the seven monitoring wells on site and a background monitoring well offsite, as well as surface water sampling from the leachate pond and down-gradient stream.

Groundwater Results

Although concentrations of metals in groundwater did not exceed the MOE SCSs as part of the 2012 sampling event, concentrations of cobalt, copper, lead and mercury detected in groundwater exceeded the MOE SCSs during previous sampling events at the Site.

A comparison of on-Site and background metals groundwater data revealed that on-site metals concentrations in the landfill area of the Site were considered to be elevated compared to background metal concentrations. SNC recommended that all monitoring wells (including the background monitoring well MW-08) be sampled for the analyses of metals (including mercury) during any future groundwater monitoring events carried out at the Site.

PCBs have not been detected in groundwater samples collected at the Site during any sampling events. Given that PCB soil remediation programs have been carried out at the Site, SNC recommended that all monitoring wells, with the exception of monitoring wells MW-07 and MW-08 (i.e. located upgradient of the PCB Remediation Area), continue to be analyzed for PCBs during any future groundwater monitoring events carried out at the Site.

Surface Water Results

Previous and current concentrations of metals (i.e. aluminum, cadmium chromium, copper and iron) and nitrite (nitrite as N) detected in surface water samples collected from the leachate collection pond and/or the downgradient stream exceeded the CCME-FAL guidelines. Concentrations of metals (i.e. aluminum, cadmium, copper and iron) and nitrite (nitrite as N) detected in surface water samples collected from the leachate collection pond and/or the downgradient stream exceeded the CCME-FAL guidelines.
A comparison of on-Site and the background metals data revealed that background levels in metals in surface water in the general area of the Site were elevated; however, it is possible that the landfill is contributing to the levels of cadmium and copper in on-Site surface water and surface water in a stream located directly downgradient of the waste disposal site. SNC recommended that surface water samples be collected from the leachate collection pond, ditches and the downgradient stream for the analyses of metals (including mercury) and general water chemistry (i.e. for use in the selection of CCME-FAL guidelines for aluminum, copper, lead and nickel) during any future surface water monitoring events carried out at the Site.

PCBs were not detected in the surface water samples collected from the leachate collection pond and downgradient stream. SNC recommended that surface water samples continue to be collected from the leachate collection pond, clean water ditches and the downgradient stream for the analyses of PCBs during any future surface water monitoring events carried out at the Site.

Concentrations of the TTE of the dioxins and furans (197 pg / L and 191 pg / L) were detected in surface water samples collected from the leachate collection pond and downgradient stream. Given that dioxins and furans are generated from a variety of sources, SNC recommends that background surface water samples from nearby streams and ponds be analyzed for dioxins and furans during future surface water monitoring events to further assess trends associated with these chemicals of concern.

A Site visit was conducted by SNC personnel on December 12, 2011 to inspect the leachate control system. On December 14, 2011 a visit to a secure compound in Foxtrap, NL was completed to evaluate the condition of the stored linear low-density polyethylene (LLDPE) geomembrane. It was determined that the geomembrane should be acceptable for future use.

Based on the findings of the 2011 – 2012 program carried out by SNC between December 2011 and March 2012, the following recommendations for further actions at the Site included:

- Continue with site closure activities in accordance with the Department of Environment and Conservation Guidance Documents “Guidelines for the Closure of Non-Containment Municipal Solid Waste Landfill Sites” GD-PPD-062 and “Environmental Standards for Municipal Solid Waste Landfill Sites” GD-PPD-049.1.
- Develop and implement an environmental monitoring plan to continue to monitor groundwater and surface water at the Site.
- Replace all monitoring well locks as part of the next groundwater sampling event.
- Replace all sand bags replaced to prevent uplift of the tarp covering the rolls of geomembrane material.

1.2.3 Geomembrane Storage

Eighteen rolls of geomembrane liner were previously purchased for future use at the Site at the request of the Department of Environment and Conservation (ENVC) as part of proposed Site closure activities. The liner was delivered to an ENVC storage compound located on Incinerator Road near Foxtrap, NL on March 25, 2008. Prior to the delivery of the liner to the storage compound, AMEC arranged snow and ice removal at the compound and construction of a level gravel pad to ensure proper drainage. The rolls of geomembrane liner were placed over 2” x 6” wood boards, and 4’ x 8’ sheets of oriented strand board. Polyethylene tarps were placed over the geomembrane rolls and sand bags were placed on the top and around the sides of the tarps to hold them in place. SNC and AMEC have completed annual inspections of the geomembrane since 2009 and each inspection determined that the liner should be acceptable for further use.

2.0 GROUNDWATER AND STREAM MONITORING PROGRAM

2.1 SCOPE OF WORK

The scope of work for the 2012 GSMP included the following assessment activities:

- Collecting groundwater samples from seven existing monitoring wells (MW-01 to MW-07) and analyzing the samples for BTEX/TPH, dissolved metals, PAHs, VOCs, PCBs, dioxins and furans and general water chemistry.
- Collecting groundwater samples from one background monitoring well (MW-08) and analyzing the samples for BTEX/TPH, dissolved metals, PAHs, VOCs, PCBs, dioxins and furans and general water chemistry.
- Collecting one surface water sample from the leachate collection pond (SW-POND) and one surface water sample (STREAM) from a stream located directly downgradient of the landfill facility and analyzing the samples for petroleum hydrocarbons (BTEX/TPH), total metals, PAHs, VOCs, PCBs, dioxins and furans and general water chemistry.
- Comparing all groundwater and surface water data that exists for the Site, and provide meaningful interpretation of the results.
- Preparing a report outlining the methodologies, findings, conclusions and recommendations of the monitoring program.

Groundwater and surface water sample locations are presented on Figures 2 and 3, Appendix A. The groundwater and stream sampling program was carried out at the Site during the period of November 28 to 30, 2012. It is noted that groundwater samples were not collected from monitoring well MW-02 because the monitoring well was dry (insufficient water to collect an adequate sample for laboratory analyses) and from monitoring well MW-05 (because the well was damaged) broken off below ground level and no longer functioning.

2.2 METHODOLOGY

2.2.1 Groundwater Sampling

Groundwater samples were collected from six (MW-01, MW-03, MW-04, MW-06, MW-07 and MW-08) of the eight existing monitoring wells from November 28 to 30, 2012 using dedicated WaTerra™ tubing and foot valves. Prior to sampling, the monitoring wells were purged by removing three well volumes of groundwater from each well. During the third purge event, the pH, temperature and specific conductivity of the groundwater being removed from the wells were recorded. Field pH, temperature and specific conductance data for the current and previous sampling events are provided in Appendix B. Prior to purging the wells, the field water quality meters were calibrated according to the manufacturer's instructions. These calibrations were re-checked periodically during the sampling program to ensure that no significant drifting of the instrument calibration had occurred. Descriptions of the groundwater samples collected at the Site are presented in Table 2-1.

Table 2-1: Groundwater Sample Descriptions

Sample IDs	Location	Description
MW-01	West of the Waste Disposal Site.	Cloudy, orange color, no sheen, no odour.
MW-03	Downgradient of the leachate collection pond.	Cloudy, brown, no sheen, no odour.
MW-04	Southeast of the Waste Disposal Site.	Clear, no sheen, slight sulphur odour.
MW-06	South of the Waste Disposal Site.	Cloudy, dark grey, no sheen, no odour.
MW-07	Northeast and upgradient of the Waste Disposal Site.	Cloudy, brown, no sheen, no odour.
MW-08*	Northeast and upgradient of the Waste Disposal Site.	Cloudy, brown, no sheen, no odour.

Note: * denotes background groundwater sample (off-Site).

Prior to purging and sampling, all existing monitoring wells present at the Site, not including MW-02 and MW-05, were gauged using a Heron^{TM} oil/water interface meter to determine static groundwater depth and the presence/absence of free phase petroleum hydrocarbon products. Gauging was conducted by lowering the clean probe down the monitoring wells until a tone was obtained indicating a liquid had been contacted. The probe was then immediately raised until the tone ceased and then by very slowly lowering the probe, the depths at which the tone for a non-aqueous liquid and/or water were first sounded were then carefully noted to the nearest millimetre (mm). Groundwater depths for the current and previous sampling events are presented in Appendix C. Free phase petroleum hydrocarbon product was not detected in any of the monitoring wells present at the Site during the current and previous monitoring programs.

The groundwater samples collected for the analyses of dissolved metals were filtered in the field using disposable 45 micron inline filters. Groundwater samples collected for BTEX/TPH, PAHs, VOCs, PCBs and dioxins and furans were not filtered. The groundwater samples were placed in laboratory supplied bottles and vials (with preservatives as necessary), maintained in cool storage with ice and transported to the laboratory for select chemical analyses. Groundwater sample locations are presented on Figures 2 and 3, Appendix A.

2.2.2 Surface Water Sampling Program

On November 28, 2012, one surface water sample (SW-POND) was collected from the leachate collection pond and one surface water sample (STREAM) was collected from a stream located directly downgradient of the landfill facility. Field data for pH, temperature and conductivity for the surface water samples are presented in Table B-2, Appendix B and descriptions of the surface samples are presented in Table 2-2.

Table 2-2: Surface Water Sample Descriptions

Sample IDs	Location	Description
SW-POND	Leachate Collection Pond	Clear, no sediment, no sheen, no odour.
STREAM	Downgradient Stream	Clear, no sediment, no sheen, no odour.

Surface water samples were collected along the shoreline of the pond by positioning the laboratory supplied sampling bottles into the water column at an approximate depth of 0 to 0.15 m below the water's surface (i.e., at mid-stream), depending on allowable water depth, until the bottle was filled. To avoid sample biasing, caution was exercised so as not to disturb and entrain any bottom sediment in the samples. Samples were maintained in cool storage with ice and transported to the laboratory for select chemical analyses. Surface water sample locations are presented on Figures 2 and 3, Appendix A.

2.2.3 Laboratory Analytical Program

All groundwater and surface water samples collected at the Site were stored in ice chilled coolers, and remained in the custody of the sampler until they were delivered, along with the accompanying chain of custody forms, directly to analytical laboratory. The Maxxam Analytics Inc. (Maxxam) laboratories located in St. John's, NL and Bedford, Nova Scotia were used to conduct the analyses for the project. These laboratories met the requirements of ISO/IEC (International Organization for Standardization/International Electrotechnical Commission) Guide 25 (General Requirements for the Competence of Calibration and Testing Laboratories), and are accredited members of the Canadian Association for Laboratory Accreditation Inc. (CALA). The analyses outlined in Table 2-3 were requested and performed on the groundwater, surface water and sediment samples collected at the Site during the current monitoring program.

Table 2-3: Laboratory Analytical Program

Media	Sample IDs	Analyses
Groundwater	MW-01, MW-03, MW-04, MW-06 & MW-07	BTEX/TPH, metals (dissolved), PAHs, VOCs, PCBs, Dioxins and Furans and General Chemistry
	MW-08	BTEX/TPH, metals (dissolved), PAHs, VOCs, PCBs, Dioxins and Furans and General Chemistry
	DUP-01	BTEX/TPH, metals (dissolved), PAHs, VOCs, PCBs, Dioxins and Furans and General Chemistry
Surface Water	SW-POND & STREAM	BTEX/TPH, metals (total), PAHs, VOCs, PCBs, Dioxins and Furans and General Chemistry

Notes: DUP-01 is a blind field duplicate of groundwater sample MW-08

Analytical results are summarized in Appendix D and the Laboratory Certificates of Analyses are provided in Appendix E. Sample locations are illustrated on Figures 2 and 3, Appendix A.

2.2.4 Quality Assurance/Quality Control Program

One blind field duplicate sample (DUP-01) was collected at the Site on November 30, 2012 and submitted to the laboratory for the analyses of BTEX/TPH, dissolved metals, PAHs, VOCs, PCBs, dioxins and furans and general water chemistry. Laboratory blank and replicate samples were also analyzed with the samples as part of the laboratory's internal Quality Assurance/Quality Control (QA/QC) protocols to assess the reliability of the analyses. The QA/QC program is discussed in further detail in Section 2.6 and the results are reported on the Laboratory Certificates of Analyses included in Appendix E.

In order to minimize cross contamination during sampling, a field QA/QC program was followed, which included the following measures:

- Disposable nitrile gloves were worn during all sampling (i.e. new pair of gloves for each sample).
- Dedicated WaTerra^{TM} tubing was used for each monitoring well to sample groundwater in order to ensure that samples were unaffected by cross-contamination from previous samples.
- The interface probe, water chemistry probes, and sampling equipment (i.e., stainless steel spade) were thoroughly cleaned with biodegradable soap (i.e. Simple Green^{TM}) and rinsed with distilled water between monitoring wells to prevent cross contamination between samples.
- Samples were stored in a cooler with ice to keep then cool (i.e. ~ 4^{o}C) during shipment to the laboratory.

The Maxxam laboratory has extensive QA/QC programs in place to ensure that reliable results are consistently obtained. Specific laboratory QA/QC measures include:

- Chain of Custody and sample integrity inspection.
- Strict documentation control and files.
- Trained personnel prepare and analyze samples according to Standard Operating Procedures (SOPs).
- All analytical methods are based on accepted (i.e. MOE, USEPA, ASTM) procedures and are fully validated prior to use.
- Precision is monitored by performing replicate analysis of samples within each batch.
- Accuracy is verified by analyzing spiked samples and reference materials within each batch.
- Instrument calibration integrity is ensured by analyzing calibration check standards within each run sequence.
- Matrix effects in organic analyses are assessed with surrogate fortification of each sample.
- Extensive use is made of reference material for routine procedure evaluation.

- Highest available purity analytical standards.
- Predefined analytical sequences ensure all results are traceable to calibration and QC data.
- Hard copy reports displaying all of the required data are generated for each instrument.
- Analytical results are determined only from instrument responses that fall within the calibration range.
- Acceptable QA/QC performance must be demonstrated prior to data authorization (data are subject to three levels of QA/QC review: chemist, supervisor and manager).
- On-going method and instrument performance records are maintained for all analyses.
- Records containing all pertinent data are securely archived for three years.
- A full-time Quality Assurance Scientist evaluates the QA/QC program on an on-going basis.

2.2.5 Site Classification and Guidelines

The Site is considered to be a commercial property based on past site use activities (i.e. waste disposal site). Site soils are considered to be coarse-grained and groundwater resources are not used for human consumption and therefore considered to be non-potable.

2.2.5.1 Groundwater

Analytical chemistry data for groundwater samples collected at the Site during the current monitoring program were assessed and evaluated using the following federal and provincial regulatory guidelines:

- Analytical data for BTEX and modified TPH in groundwater were compared against the 2012 Atlantic Partners in RBCA Implementation (PIRI) Tier I Risk Based Corrective Action (RBCA) Risk Based Screening Levels (RBSLs) for petroleum hydrocarbons in groundwater at a commercial site with coarse-grained soil and non-potable groundwater. It is noted that these guidelines are human health-based.
- The analytical results for BTEX, metals, PAHs, VOCs, PCBs and dioxins and furans in groundwater were compared to the Ontario Ministry of Environment (MOE) Site Condition Standards (SCSs) for Use Under Part XV.1 of the Environmental Protection Act (2011) for a full depth generic site in a non-potable groundwater condition. It is noted that these guidelines account for the concentration dilution that occurs when groundwater discharges into surface water.
- Dioxins and furans consist of many similar chemical forms or congeners. Toxic Equivalency Factors (TEF) are used to convert these different congeners to a single congener based on a relative toxicity estimate. TEF Equivalents are a universal way of summarizing the total toxicity of the individual dioxin and furan components based on the toxicity of the individual chemicals compared to the primary congener used for comparative purposes. The analytical results for dioxins and furans in groundwater were compared to the MOE SCS for Use

Under Part XV.1 of the Environmental Protection Act (2011) for a full depth generic site in a non-potable groundwater condition. The SCS is represented as a total of the TEF equivalents or the Total Toxic Equivalents (TTE). The MOE SCS for dioxin and furan in groundwater is currently set at 14,000 pg/L (MOE, 2011). The SCS is protective of drinking water pathways and for the protection of ecological receptors exposed to the total of TEF Equivalents for chronic periods.

2.2.5.2 Surface Water

The analytical chemical data for benzene, toluene, ethylbenzene, metals, PAHs, VOCs, and general water chemistry in surface water were compared against the CCME-CWQGs for the protection of FAL (CCME Online, 2012). There are no CCME-FAL guidelines available for xylenes, modified TPH, PCBs and dioxins and furans in water.

2.3 LABORATORY ANALYTICAL RESULTS

The results of the laboratory analyses for the groundwater and surface water samples collected at the Site during the current and previous monitoring programs are summarized in Tables D-1 to D-14, Appendix D. The analytical results were compared to the guidelines and criteria referenced in Section 2.2.5 of this report. Copies of the Laboratory Certificates of Analyses for the current monitoring program are provided in Appendix E.

2.3.1 Groundwater Results

2.3.1.1 Petroleum Hydrocarbons in Groundwater

Six groundwater samples (MW-01, MW-03, MW-04 and MW-06 to MW-08), plus one blind field duplicate sample (DUP-01), collected at the Site from November 28 to 30, 2012 were analyzed for BTEX/TPH. The analytical results were compared to the 2012 Atlantic PIRI Tier I RBCA RBSLs and the 2011 MOE Full Depth Generic SCSs. The laboratory analytical results for petroleum hydrocarbons in groundwater are presented in Table D-1, Appendix D.

Benzene, ethylbenzene and xylene were not detected in any of the groundwater samples analyzed and therefore did not exceed the applicable assessment criteria.

The concentration of toluene detected in groundwater sample MW-07 was 0.002 µg/L; well below the 2012 Atlantic PIRI Tier I RBCA RBSL of 20,000 µg/L and the MOE SCS of 1,800 µg/L. Toluene was not detected in the remainder of the groundwater samples analyzed.

Modified TPH was not detected (<100 µg/L) in any of the groundwater samples analyzed and therefore did not exceed the 2012 Atlantic PIRI Tier I RBCA RBSL of 20,000 µg/L.

Based on the above, no petroleum hydrocarbon impacts were detected in groundwater at the Site during the current monitoring program.

2.3.1.2 Dissolved Metals in Groundwater

Six groundwater samples (MW-01, MW-03, MW-04 and MW-06 to MW-08), plus one blind field duplicate sample (DUP-01), collected at the Site from November 28 to 30, 2012 were analyzed for dissolved metals. The analytical results were compared to the 2011 MOE Full Depth Generic SCSs. The laboratory analytical results for dissolved metals in groundwater are presented in Table D-2, Appendix D.

Concentrations of dissolved metals in all groundwater samples analyzed were non-detect or detected at concentrations below the MOE SCSs.

2.3.1.3 PAHs in Groundwater

Six groundwater samples (MW-01, MW-03, MW-04 and MW-06 to MW-08), plus one blind field duplicate sample (DUP-1), collected at the Site from November 28 to 30, 2012 were analyzed for PAHs. The analytical results were compared to the 2011 MOE Full Depth Generic SCSs. The laboratory analytical results for PAHs in groundwater are presented in Table D-3, Appendix D.

Concentrations of PAHs in all groundwater samples analyzed were non-detect and therefore were below the MOE SCSs.

2.3.1.4 VOCs in Groundwater

Six groundwater samples (MW-01, MW-03, MW-04 and MW-06 to MW-08), plus one blind field duplicate sample (DUP-1), collected at the Site from November 28 to 30, 2012 were analyzed for VOCs. The analytical results were compared to the 2011 MOE Full Depth Generic SCSs. The laboratory analytical results for VOCs in groundwater are presented in Table D-4, Appendix D.

Concentrations of VOCs in all groundwater samples analyzed were non-detect and therefore were below the MOE SCSs. It is noted that the laboratories reported detection limits (RDL) for T1,2-dichloroethylene, 1,1-dichloroethane, C1,2-dichloroethylene, carbon tetrachloride and ethylene dibromide, was detected above the MOE SCS, and therefore no comparison could be made.

2.3.1.5 PCBs in Groundwater

Six groundwater samples (MW-01, MW-03, MW-04 and MW-06 to MW-08), plus one blind field duplicate sample (DUP-1), collected at the Site from November 28 to 30, 2012 were analyzed for PCBs. The analytical results were compared to the applicable 2011 MOE Full Depth Generic SCS of 7.8 µg/L. The laboratory analytical results for PCBs in groundwater are presented in Table D-5, Appendix D.

PCBs were not detected (<0.05 µg/L and <0.06 µg/L) in any of the groundwater samples analyzed and therefore did not exceed the applicable 2011 MOE Full Depth Generic SCS of 7.8 µg/L.

2.3.1.6 Dioxins and Furans in Groundwater

Six groundwater samples (MW-01, MW-03, MW-04 and MW-06 to MW-08), plus one blind field duplicate sample (DUP-1), collected at the Site from November 28 to 30, 2012 were analyzed for dioxins and furans. The analytical results were compared to the applicable 2011 MOE Full Depth Generic SCS of 14,000 pg/L. The laboratory analytical results for dioxins and furans in groundwater are presented in Table D-6, Appendix D.

The TTE of all dioxins and furans (2.37 pg/L to 3.32 pg/L) in all groundwater samples analyzed during the current monitoring event did not exceed the applicable MOE SCS of 14,000 pg/L.

2.3.1.7 General Water Chemistry in Groundwater

Six groundwater samples (MW-01, MW-03, MW-04 and MW-06 to MW-08), plus one blind field duplicate sample (DUP-1), collected at the Site from November 28 to 30, 2012 were analyzed for general water chemistry. There are no 2011 MOE SCSs for general water chemistry. The laboratory analytical results for general water chemistry in groundwater are presented in Table D-7, Appendix D.

2.3.2 Surface Water Results

2.3.2.1 Petroleum Hydrocarbons in Surface Water

One surface water sample (SW-POND) collected from the leachate collection pond and one surface water sample (STREAM) collected from a stream located directly downgradient of the waste disposal site were collected on November 28, 2012 and analyzed for BTEX/TPH. The analytical results were compared to the applicable CCME-FAL guidelines. There are no CCME-FAL guidelines available for xylenes and TPH in water; therefore these parameters were assessed based on presence/absence. The laboratory analytical results for petroleum hydrocarbons in surface water are presented in Table D-8, Appendix D.

BTEX/TPH was not detected in any of the surface water samples analyzed.

The concentrations of benzene (<1.0 µg/L), toluene (<1.0 µg/L) and ethylbenzene (<1.0 µg/L) in surface water did not exceed the applicable CCME-FAL guidelines.

2.3.2.2 Total Metals in Surface Water

One surface water sample (SW-POND) collected from the leachate collection pond and one surface water sample (STREAM) collected from a stream located directly downgradient of the

waste disposal site were collected on November 28, 2012 and analyzed for total metals. The analytical results were compared to the applicable CCME-FAL guidelines. The laboratory analytical results for total metals in surface water are presented in Table D-9, Appendix D.

The following total metal parameters exceeded the applicable CCME-FAL guidelines for metals in surface water:

SW-POND

- Cadmium (0.028 µg/L) exceeded the CCME-FAL guideline of 0.017 µg/L.
- Iron (405 µg/L) exceeded the CCME-FAL guideline of 300 µg/L.

2.3.2.3 PAHs in Surface Water

One surface water sample (SW-POND) collected from the leachate collection pond and one surface water sample (STREAM) collected from a stream located directly downgradient of the waste disposal site were collected on November 28, 2012 and analyzed for PAHs. The analytical results were compared to the applicable CCME-FAL guidelines. The laboratory analytical results for PAHs in surface water are presented in Table D-10, Appendix D.

PAHs were not detected in any of the surface water samples analyzed and therefore did not exceed the applicable CCME-FAL guidelines.

2.3.2.4 VOCs in Surface Water

One surface water sample (SW-POND) collected from the leachate collection pond and one surface water sample (STREAM) collected from a stream located directly downgradient of the waste disposal site were collected on November 28, 2012 and analyzed for VOCs. The analytical results were compared to the applicable CCME-FAL guidelines. The laboratory analytical results for VOCs in surface water are presented in Table D-11, Appendix D.

VOCs were not detected any of the surface water samples analyzed and therefore did not exceed the applicable CCME-FAL guidelines.

2.3.2.5 PCBs in Surface Water

One surface water sample (SW-POND) collected from the leachate collection pond and one surface water sample (STREAM) collected from a stream located directly downgradient of the waste disposal site were collected on November 28, 2012 and analyzed for PCBs. There is no CCME-FAL guideline available for PCBs in water; therefore this parameter was assessed based on presence/absence. The laboratory analytical results for PCBs in surface water are presented in Table D-12, Appendix D.

PCBs were not detected (<0.05 µg/L) in any of the surface water samples analyzed.

2.3.2.6 Dioxins and Furans in Surface Water

One surface water sample (SW-POND) collected from the leachate collection pond and one surface water sample (STREAM) collected from a stream located directly downgradient of the waste disposal site were collected on November 28, 2012 and analyzed for dioxins and furans. There is no CCME-FAL guideline available for dioxins and furans in water; therefore dioxins and furans were assessed based on presence/absence. The laboratory analytical results for dioxins and furans in surface water are presented in Table D-13, Appendix D.

The TTE of all dioxins and furans were detected in surface water samples SW-POND and STREAM at concentrations of 3.01 pg/L and 4.31 pg/L, respectively.

2.3.2.7 General Water Chemistry in Surface Water

One surface water sample (SW-POND) collected from the leachate collection pond and one surface water sample (STREAM) collected from a stream located directly downgradient of the waste disposal site were collected on November 28, 2012 and analyzed for general water chemistry. The analytical results were compared to the applicable CCME-FAL guidelines. The laboratory analytical results for general water chemistry in surface water are presented in Table D-14, Appendix D.

The concentration of nitrite (i.e. Nitrite as N) detected in surface water sample SW-POND (68 µg/L) exceeded the CCME-FAL guideline of 60 µg/L.

The remaining general water chemistry parameters in both of the surface water samples analyzed were reported at levels within or below the applicable CCME-FAL guidelines.

2.4 COMPARISON OF PREVIOUS AND CURRENT DATA

2.4.1 Groundwater

This section provides a general comparison of the current (November 2012) and previous (January 2010, October 2009, January 2009, May 2008, February 2007 and November 2007, December 2010 and December 2011) groundwater laboratory analytical results available for the Site, as well as recommendations for any future groundwater and surface monitoring events carried out at the Site. The analytical results are presented, in a side-by-side fashion, in Tables D-1 to D-7, Appendix D.

BTEX

- Concentrations of BTEX detected in groundwater during all sampling events did not exceed the 2012 Atlantic PIRI Tier I RBCA RBSLs or MOE SCSs.
- Concentrations of toluene were detected in groundwater at monitoring well MW-04 (470 µg/L) during the January 2009 sampling event and in groundwater at monitoring well MW-06

(30 µg/L) during the October 2009 sampling event but did not exceed the 2012 Atlantic PIRI Tier I RBCA RBSLs or MOE SCSs. Concentrations of toluene were non-detect <1.0/<0.2 µg/L in all groundwater samples during the current November 2012 sampling event indicating a decrease in toluene concentrations at monitoring wells MW-04 and MW-06.

Given the above, plus the fact that BTEX has not been detected in any surface water samples collected at the Site, BTEX parameters are not considered to be contaminants of concern in groundwater at the Site at this time. Therefore, AMEC recommends that BTEX be removed from any future groundwater monitoring events carried out at the Site.

Modified TPH

- Concentrations of modified TPH detected in groundwater during all seven sampling events did not exceed the 2012 Atlantic RBCA RBSL of 20,000 µg/L.
- Modified TPH was not detected in groundwater during the February 2007, November 2007 and May 2008 sampling events. Modified TPH was only detected in groundwater at the location of monitoring well MW-07, at a concentration of 200 µg/L (lube oil), during the January 2009 sampling event, 100x less than the 2012 Atlantic RBCA RBSL. It is noted that monitoring well MW-07 is located upgradient of the landfill.

Given the above, TPH is not considered to be a contaminant of concern in groundwater at this Site at this time. Therefore, AMEC recommends that modified TPH be removed from any future groundwater monitoring events carried out at the Site.

Metals

- Concentrations of copper and lead detected in on-Site during the February 2007 sampling event exceeded the MOE SCSs. A concentration of cobalt was also detected in groundwater sample MW-01 during the February 2007 sampling event and exceeded the MOE SCSs. The concentration of mercury detected at monitoring well MW-03 during the January 2009 and January 2010 sampling events, and MW-05 during the May 2008 and January 2009 sampling event, both located directly downgradient of the landfill, exceeded the MOE SCSs.
- Concentrations of all metals detected in groundwater during the December 2012 sampling event did not exceed the MOE SCSs.

Given the above, metals are not considered to be contaminants of potential concern in groundwater at the Site at this time. However, due to historical metal exceedences reported in groundwater, AMEC recommends that all monitoring wells be sampled and analyzed for metals during any future groundwater monitoring events carried out at the Site.

PAHs

- Concentrations of PAHs in groundwater during the current and previous sampling events were either non-detect or reported at levels below the MOE SCSs.

Given the above, PAHs are not considered to be contaminants of potential concern in groundwater at the Site. Therefore, AMEC recommends that PAHs be removed from any future groundwater monitoring events carried out at the Site.

VOCs

- Concentration of VOCs detected in all groundwater samples collected at the Site during all sampling events did not exceed the applicable MOE SCSs.
- The majority of VOC parameters in groundwater were not detected in the groundwater samples collected at the Site during all sampling events.

Given the above, VOCs are not considered to be contaminant of potential concern in groundwater at the Site. Therefore, AMEC recommends that VOCs be removed from any future groundwater monitoring events carried out at the Site.

PCBs

- PCBs were not detected in any of the groundwater samples collected at the Site during all sampling events.

Given the above, plus the fact that the concentrations of PCBs in all surface water samples collected at the Site did not exceed the MOE SCSs, PCBs are not considered to be contaminant of potential concern in groundwater at the Site. However, given that there is PCB impacted soil present at the Site, AMEC recommends that all monitoring wells, with the exception of monitoring wells MW-07 and MW-08 (i.e. located upgradient of the PCB Disposal Area), be analyzed for PCBs during any future groundwater monitoring events carried out at the Site.

Dioxins and Furans

- Dioxin and furan analysis was conducted on two groundwater samples (MW-03 and MW-05) during the February 2007 sampling event, seven groundwater samples (MW-01 to MW-07) during the November 2007 and May 2008 sampling events, six groundwater samples (MW-01 and MW-03 to MW-07) during the January 2009 and December 2010 sampling events, seven groundwater samples (MW-01 to MW-07) during the October 2009 and January 2010 sampling events and six groundwater samples (MW-01, MW-03, MW-04 and MW-06 to MW-08) during the November 2012 sampling event.
- The maximum total toxic equivalency (TTE) concentrations of dioxins and furans reported for the groundwater samples collected at the Site during all sampling events did not exceed the applicable MOE SCS.

Given the above, dioxins and furans are not considered to be contaminants of potential concern in groundwater at the Site at this time. Therefore, AMEC recommends that dioxins and furans be removed from any future groundwater monitoring events carried out at the Site.

2.4.2 Surface Water

This section provides a comparison of the current (November 2012) and previous (May 2008, November 2007, January 2009, September 2009, January 2010, November 2010 and December 2011) surface water laboratory analytical results available for the Site (i.e. leachate collection pond and the downgradient stream). No surface water samples were collected at the Site during the February 2007 sampling event. The analytical results are presented in Tables D-8 to D-14, Appendix D.

BTEX/Modified TPH

- BTEX and modified TPH were not detected in any of the surface water samples collected at the Site during all sampling events.

Given the above, BTEX and TPH are not considered to be contaminants of potential concern in surface water at the Site at this time. Therefore, AMEC recommends that BTEX and TPH be removed from any future surface water monitoring events carried out at the Site.

Metals

- Concentrations of metals (i.e. aluminum, cadmium, copper and iron) detected in surface water samples collected at the Site during all sampling events have been reported at levels above the CCME-FAL guidelines.

AMEC recommends both surface water sampling locations (SW-POND and STREAM) be analyzed for metals during any future monitoring events carried out at the Site.

PAHs

- Concentrations of PAHs detected in surface water samples collected from the leachate collection pond and the downgradient stream during all sampling events were either non-detect or detected at levels below the applicable CCME-FAL guidelines.

Given the above, PAHs are not considered to be contaminants of potential concern in surface water at the Site at this time. Therefore, AMEC recommends that PAHs be removed from any future surface water monitoring events carried out at the Site.

VOCs

- Concentrations of VOCs detected in surface water samples collected from the leachate collection pond and the downgradient stream during all sampling events were either non-detect or detected at levels below the applicable criteria.

Given the above, VOCs are not considered to be contaminants of potential concern in surface water at this Site at this time. Therefore, AMEC recommends that VOCs be removed from any future surface water monitoring events carried out at the Site.

PCBs

- PCBs were not detected or were detected below the CCME-FAL guidelines in both of the surface water samples collected from the leachate collection pond (SW-POND) or the downgradient stream (STREAM) during all the sampling events.

Given the above, PCBs are not considered to be contaminant of potential concern in surface water at the Site. However, given that there is PCB impacted soil present at the Site, AMEC recommends both surface water sampling locations (SW-POND and STREAM) be analyzed for PCBs during any future monitoring events carried out at the Site.

Dioxins and Furans

- Dioxins and furans were detected in surface water during all eight sampling events. There are currently no 2011 MOE SCSs for dioxins and furans in surface water.

Dioxins and furans are not considered to be contaminants of potential concern in surface water at this Site at this time. Therefore, AMEC recommends that dioxins and furans be removed from any future surface water monitoring events carried out at the Site.

General Chemistry

- pH levels in surface water at the Site were similar during all sampling events, with the exception of the January 2010 sampling event when pH levels detected in surface water sample STREAM was outside the range of the CCME-FAL guideline 6.5-9.
- The concentrations of nitrite (i.e. Nitrite as N) detected in surface water has fluctuated over time (increasing or decreasing during all sampling events). There is no trend identified.

AMEC recommends that surface water samples be collected from the leachate collection pond and the downgradient stream for the analyses of general water chemistry during any future surface water monitoring events carried out at the Site.

2.5 QUALITY CONTROL (QC) REVIEW

One blind field duplicate groundwater sample (DUP-01, a blind field duplicate of groundwater sample MW-08) was submitted to the laboratory for duplicate analyses. The laboratory QA/QC results are reported on the copies of the Laboratory Certificates of Analyses included in Appendix E. To assess the quality of both the sampling and laboratory analytical program, a review of the QA/QC results was completed. Details regarding the QC assessment of surrogate recoveries, laboratory blank and blind field duplicate samples are presented in this section.

2.5.1 Surrogate Recoveries

Surrogate recoveries have been reviewed to evaluate the effectiveness and accuracy of the method on a sample-specific basis. It is noted that the acceptable range for surrogate

recoveries for all organic parameters (i.e. BTEX/TPH, PAHs, VOCs, PCBs and dioxins and furans) in water is 60% to 140%. A summary of the reported surrogate recovery data for each media and parameter is provided in Table 2-4.

For groundwater samples analyzed during the current monitoring program, percent surrogate recoveries were reported below the acceptable range of 60% to 140% for PCBs (DECA: 22-91%). For ground water samples analyzed during the current investigation, all percent surrogate recoveries were reported within their acceptable ranges.

Table 2-4: Surrogate Recovery Summary

Media	Parameter	Surrogate Recovery		
Groundwater	BTEX/TPH	Iso-BE: 87-110%	n-D: 88-118%	Iso-BV: 82-94%
	VOCs	4-B: 92-101%	D4: 101-106%	TD8: 97-101%
	PAHs	D10: 80-81%	D14: 76%	D8: 78%
	PCBs	DECA: 22-91%		
	Dioxins and Furans	HeptaCDD: 82-101%	HeptaCDF: 81-106%	HexaCDD: 80-98%
		HexaCDF: 71-88%	PentaCDD: 65-80%	PentaCDF: 54-72%
		TetraCDD: 55-79%	TetraCDF: 56-81%	OCDD: 82-96%
Surface Water	BTEX/TPH	Iso-BE: 94-96%	n-D: 97%	Iso-BV: 85-89%
	VOCs	4-B: 98-101%	D4: 100-105%	TD8: 100-101%
	PAHs	D10: 65-89%	D14: 31-82%	D8: 69-83%
	PCBs	DECA: 70-81%		
	Dioxins and Furans	HeptaCDD: 79-85%	HeptaCDF: 72-73%	HexaCDD: 87-88%
		HexaCDF: 71-72%	PentaCDD: 83-85%	PentaCDF: 69-72%
		TetraCDD: 64-73%	TetraCDF: 57-63%	OCDD: 101-102%

Notes:
Surrogate recoveries identified as follows:

Iso-BE = Isobutylbenzene – extractable
Iso-BV = Isobutylbenzene – volatile
D4 = D4-1,2-Dichloroeathane
D10 = D10-Anthracene
D8 = D8-Acenaphthylene
HeptaCDD = C13-1234678 HeptaCDD
HexaCDD = C13-123678 HexaCDD
PentaCDD = C13-12378 PentaCDD
TetraCDD = C13-2378 TetraCDD
OCDD = C13-OCDD

n-D = n-Dotriacontane
4-B = 4-Bromofluorobenzene
TD8 = Toulene-d8
D14 = D14-Terphenyl
DECA = Decachlorobiphenyl
HeptaCDF = C13-1234678 HeptaCDF
HexaCDF = C13-123678 HexaCDF
PentaCDF = C13-12378 PentaCDF
TetraCDF = C13-2378 TetraCDF

According to Robert Whalen of Maxxam, surrogates can be affected by many different variables. Surrogates are single compounds added to the sample to check method recoveries. When matrix interferences are encountered (i.e. sediment), it most often results in a low surrogate recovery. The sediment provides a surface for these compounds to adhere to, and hence, are lost and not recovered. Sediment may also affect the concentration of parameters in the sample, but there is no way of knowing this for sure and for this reason it is never recommended to correct the sample concentrations for low surrogate recoveries. The low recoveries on the surrogates are for single compounds, and the parameters tested for this project are made up of hundreds of different compounds, so it is difficult to confirm bias high versus bias low results.

2.5.2 Laboratory Blank Samples

Laboratory blank water samples, referred to as “Method Blanks and Lab Blanks” on the laboratory certificates of analyses presented in Appendix E, were analyzed for BTEX/TPH, metals, PAHs, VOCs, PCBs, general water chemistry (with the exception of pH) and dioxins and furans. The purpose of the laboratory blank samples were to assess the quality of the laboratory results with respect to the presence/ absence of instrument cross contamination at the laboratory.

Analysis of the laboratory blank samples for BTEX/TPH, metals, PAHs, VOCs, PCBs and general water chemistry (with the exception of pH) indicated non-detectable concentrations, and therefore, no evidence of cross contamination at the laboratory for these parameters was identified during the laboratory analytical program.

Analysis of the laboratory blank sample for dioxins and furans reported detectable concentrations in two parameters. According to Michelle Hill of Maxxam, the laboratory blank samples for dioxins and furans are measured in parts per trillion (i.e. pg/L) or lower; therefore, it is expected at these low levels, some parameters will be detected. However, in this particular case, if you multiply each of detected parameters by their respective TEFs, the overall contribution to the total dioxin and furan concentration is relatively insignificant. Therefore, the dioxin and furan data is considered to be representative of Site conditions.

2.5.3 Blind Field Duplicates

The analytical data for the blind field duplicate groundwater sample was compared as relative percent differences (RPDs), which are given by the absolute difference in two results times 100 divided by the arithmetic mean of the two results:

$$RPD = \frac{(\text{Original Concentration} - \text{Duplicate Concentration}) * 100}{(\text{Original Concentration} + \text{Duplicate Concentration}) / 2}$$

These evaluations are only applicable when both results are at least three times the reporting limit. For water samples, RPDs of 50% or less are considered to be acceptable proof of equivalency.

The BTEX/TPH data for the field duplicate groundwater DUP-01 and its original sample MW-08 revealed identical results, RPD of 0%.

The metals data for the field duplicate groundwater sample DUP-01 and its original sample MW-08 revealed a maximum RPD of 14.91% for potassium, within the 50% proof of equivalency.

The PAH data for the field duplicate groundwater sample DUP-01 and its original sample MW-08 revealed identical results, RPD of 0%.

The dioxins and furans data for the field duplicate groundwater sample DUP-01 and its original sample MW-08 a maximum RPD of 63.16% for Octa CDD, outside of the 50% proof of equivalency. This may be a result of sediment in the groundwater samples.

The general chemistry data for the field duplicate groundwater sample DUP-01 and its original sample MW-08 a maximum RPD of 79.48% for turbidity, outside of the 50% proof of equivalency. This may be a result of sediment in the groundwater samples.

The VOC data for the field duplicate groundwater sample DUP-01 and its original sample MW-08 revealed identical results, RPD of 0%.

2.5.4 Laboratory Duplicate Samples

The metals data for the laboratory replicate groundwater sample MW-08 Lab-Dup and its original sample MW-08 revealed a maximum RPD of 8.69% for arsenic, within the 50% proof of equivalency.

The BTEX/TPH data for the laboratory replicate surface water sample SW-POND Lab-Dup and its original sample SW-POND revealed identical results, RPD of 0%.

The total organic carbon data for the laboratory replicate surface water sample STREAM Lab-Dup and its original sample STREAM revealed an RPD of 3.24%, within the 50% proof of equivalency.

2.5.5 Summary of QC Review

Overall, based on the QA/QC review, the analytical results are considered representative of the Site conditions in the immediate vicinity of the sample locations.

3.0 INSPECTION OF THE LEACHATE CONTROL SYSTEM AND GEOMEMBRANE

The scope of work for this task included:

- Completing an inspection of the leachate control system to ensure that the system is not blocked with garbage from the waste disposal facility and inspecting the rip rap to ensure the liner is covered.
- Completing an inspection of the geomembrane that is being stored inside a ENVC fenced storage yard in Conception Bay South, NL, to ensure that the integrity of the material is not being jeopardized by weather, site conditions, or human/animal influences.

3.1 LEACHATE CONTROL SYSTEM

In June 2006, AMEC submitted a design for a leachate control system to the ENVC. Aspects of the design were chosen based on their ability to be constructed while the landfill continued to operate, and the level of environmental protection considered necessary at that time. Specific measures implemented at the Site to control leachate included a leachate collection pond in a low lying area to the south of the waste disposal site and three surface water drainage ditches to intercept surface water before it could enter the waste site and direct it to natural collection areas away from the waste.

In November 2012, AMEC conducted an inspection of the leachate collection pond, rip rap around the perimeter of the leachate collection pond and the surface water drainage ditches located along the perimeter of the waste disposal Site and offer the following conclusions:

- The leachate control system, consisting of surface water drainage ditches and a leachate collection pond, was observed to be in good condition with no blockages or eroded areas noted.
- The rip rap was observed to be in good condition.

3.2 GEOMEMBRANE STORAGE

Eighteen (18) rolls of linear low-density polyethylene (LLDPE) geomembrane were previously purchased for future use on Site at the request of ENVC on March 25, 2008. The LLDPE rolls were in storage at an ENVC compound located on Incinerator Road near Foxtrap, NL. The rolls of geomembrane were stored in two separate areas of the compound. The rolls were placed over 2" x 6" wood boards in a single layer with 4' x 8' sheets of strand board over top. Polyethylene tarps covered LLDPE rolls and sand bags were placed over the tarps and around the sides.

AMEC conducted a site visit to inspect the LLDPE geomembrane on January 8, 2013. Select photographs of the geomembrane taken during the inspection are presented in Appendix F (Photos 1 to 3). Snow and ice around the tarp was removed to inspect the geomembrane. The LLDPE rolls appeared to be in good condition with no evidence of material degradation. The polyethylene tarps covering the rolls appeared in good condition, no tears or areas of exposure were noted during the inspection. Wear of the sand bags which covered the polyethylene tarps was noted and it is suggested by AMEC that the sand bags be replaced in the Spring of 2013.

4.0 CONCLUSIONS

4.1 MONITORING PROGRAM

4.1.1 Groundwater

- Concentrations of BTEX detected in groundwater during all sampling events did not exceed 2012 Atlantic PIRI Tier I RBCA RBSLs or MOE SCSs. Concentrations of modified TPH detected in groundwater during all sampling events did not exceed the 2012 Atlantic PIRI Tier I RBCA RBSLs. BTEX and TPH are not considered to be contaminants of potential concern (COPCs) in groundwater at the Site. AMEC recommends that BTEX/TPH be removed from any future groundwater monitoring events carried out at the Site.
- Concentrations of metals (i.e. copper, lead, cobalt and mercury) detected in groundwater during the previous sampling events exceeded the MOE SCSs. Concentrations of metals detected in groundwater during the current (November 2012) sampling event did not exceed the MOE SCSs. It is also noted that concentrations of metals in background monitoring well (MW-08) did not exceed the MOE SCSs. Due to historical metal exceedences reported in

groundwater, AMEC recommends that all monitoring wells, be sampled and analyzed for metals during any future groundwater monitoring events carried out at the Site.

- Concentrations of PAHs, VOCs, dioxins and furans and general water chemistry parameters in groundwater were either non-detect or detected at levels below the MOE SCSs. These parameters are not considered to be COPCs in groundwater at this Site at this time. AMEC recommends that these parameters be removed from any future groundwater monitoring events carried out at the Site.
- PCBs have not been detected in groundwater samples collected at the Site during all sampling events. This parameter is not considered to be COPCs in groundwater at this Site at this time. However, given that there is PCB impacted soil present at the Site, AMEC recommends that all monitoring wells, with the exception of monitoring wells MW-07 and MW-08 (i.e. located upgradient of the PCB Disposal Area), be analyzed for PCBs during any future groundwater monitoring events carried out at the Site.

4.1.2 Surface Water

- Concentrations of metals (i.e. cadmium and iron) and nitrite (nitrite as N) detected in one surface water sample (SW-POND) collected from the leachate collection pond exceeded the CCME-FAL guidelines. AMEC recommends both surface water sampling locations (SW-POND and STREAM) be analyzed for metals during any future monitoring events carried out at the Site.
- pH levels in surface water at the Site were similar during all sampling events, with the exception of the January 2010 sampling event when pH levels detected in surface water sample STREAM was outside the range of the CCME-FAL guideline 6.5-9. The concentrations of nitrite (i.e. Nitrite as N) detected in surface water has fluctuated over time (increasing or decreasing during all sampling events). There is no trend identified. AMEC recommends that surface water samples be collected from the leachate collection pond and the downgradient stream for the analyses of general water chemistry during any future surface water monitoring events carried out at the Site.
- PCBs were not detected in the surface water samples collected from the leachate collection pond and downgradient stream. However, given that there is PCB impacted soil present at the Site, AMEC recommends both surface water sampling locations (SW-POND and STREAM) be analyzed for PCBs during any future monitoring events carried out at the Site.
- Concentrations of BTEX/TPH, PAHs and VOCs detected in all surface water samples collected at the Site were either non-detect or detected at levels below the applicable CCME-FAL guidelines. These parameters are not considered to be COPCs in surface water at this Site at this time. AMEC recommends that these parameters be removed from any future groundwater monitoring events carried out at the Site.
- Concentrations of the TTE of the dioxins and furans (3.01 pg / L and 4.31 pg / L) were detected in surface water samples collected from the leachate collection pond and downgradient stream. Given the above, dioxins and furans are not considered to be COPCs

in surface water at this Site at this time. Therefore, AMEC recommends that dioxins and furans be removed from any future surface water monitoring events carried out at the Site.

4.2 LEACHATE CONTROL SYSTEM

- The leachate control system, consisting of surface water drainage ditches and a leachate collection pond, was observed to be in good condition with no blockages or eroded areas noted.
- The rip rap was observed to be in good condition and there was no evidence of exposed liner.

4.3 GEOMEMBRANE STORAGE

- The LLDPE rolls appeared to be in good condition with no evidence of material degradation. The polyethylene tarps covering the rolls appeared in good condition, no tears or areas of exposure were noted during the inspection. Wear of the sand bags which covered the polyethylene tarps was noted and it is suggested the sand bags be replaced in the Spring 2013.

5.0 RECOMMENDATIONS

AMEC recommends that the following further actions be carried out at the Site:

- Complete site closure activities in accordance with the Department of Environment and Conservation Guidance Documents “Guidelines for the Closure of Non-Containment Municipal Solid Waste Landfill Sites” GD-PPD-062 and “Environmental Standards for Municipal Solid Waste Landfill Sites” GD-PPD-049.1.
- Develop and implement an environmental monitoring plan to continue to monitor groundwater and surface water at the Site. Groundwater should be monitored for metals and PCBs and surface water should be monitored for metals, PCBs and general water chemistry.
- Replace the locks on the monitoring wells and carry out the necessary repairs to monitoring well MW-5 (replace riser, replace bentonite and re-install and secure the protective casing).
- Conduct a Human Health Ecological Risk Assessment (HHERA) to determine whether or not the levels of PCBs in various media at the Site pose any risk to human and ecological receptors.

6.0 CLOSURE

This report has been prepared for the exclusive use of NLDOEC. The project was conducted using standard assessment practices and in accordance with verbal and written requests from the client. No further warranty, expressed or implied, is made. The conclusions presented herein are based solely upon the scope of services and time and budgetary limitations described in our contract. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. AMEC Environment & Infrastructure accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report. The limitations of this report are attached in Appendix G.

Yours truly,
AMEC Environment & Infrastructure

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APPENDIX A

Figures

SITE

NOTE:

1. ALL DIMENSIONS ARE IN METERS.
2. DO NOT SCALE FROM DRAWING.
3. THIS DRAWING IS INTENDED TO SHOW RELATIVE LOCATIONS AND CONFIGURATION OF THE STUDY AREA IN SUPPORT OF THE CONCEPTUAL CLOSURE PLAN OF THE SITE.
4. ALL LOCATIONS, DIMENSIONS, AND ORIENTATIONS ARE APPROXIMATE.
5. THIS DRAWING SHOULD NOT BE USED FOR PURPOSES OTHER THAN THOSE OUTLINED ABOVE.
6. THIS DRAWING CONTAINS INTELLECTUAL PROPERTY OF NEWFOUNDLAND AND LABRADOR DEPARTMENT OF ENVIRONMENT AND CONSERVATION AND MAY NOT BE REPRODUCED OR COPIED WITHOUT THEIR WRITTEN CONSENT.

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SCALE: 0 500 m

PROJECT: 2012-2013 ANNUAL REPORT OF ACTIVITIES
UPPER TRINITY SOUTH (NEW HARBOUR) WASTE DISPOSAL SITE

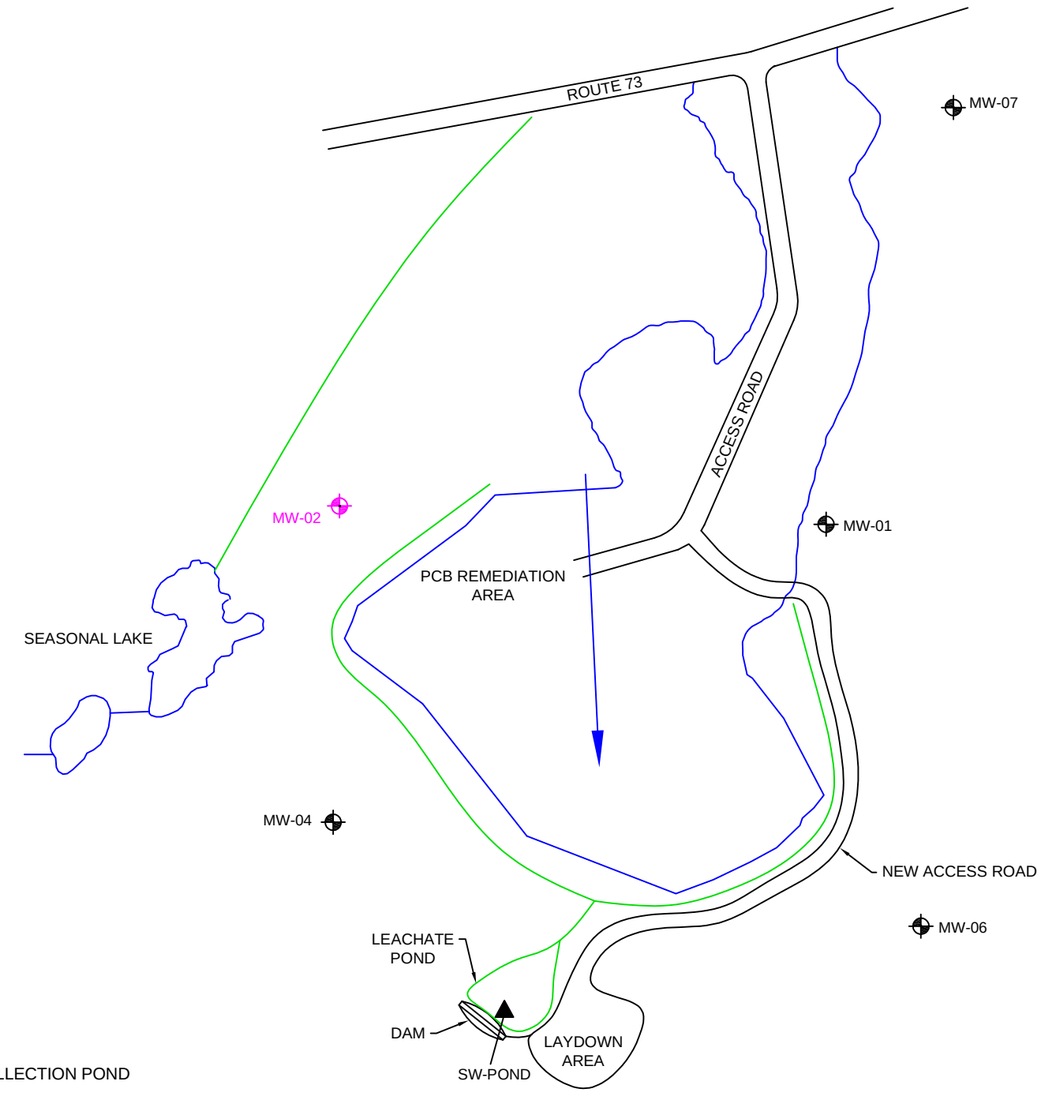
TITLE: SITE LOCATION PLAN

DATE: March 2013

PROJECT No.: TF1212735

REV. No.:

FIGURE No.: 1



LEGEND:

- SURFACE WATER DRAINAGE DITCHES AND LEACHATE COLLECTION POND
- DUMP BOUNDARY
- MONITORING WELL LOCATION (AMEC)
- DRY OR DAMAGED MONITORING WELL LOCATION
- SURFACE WATER SAMPLE LOCATION
- ASSUMED GROUNDWATER FLOW DIRECTION

NOTE:

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2. DO NOT SCALE FROM DRAWING.
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5. THIS DRAWING SHOULD NOT BE USED FOR PURPOSES OTHER THAN THOSE OUTLINED ABOVE.
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Government of Newfoundland and Labrador
Department of Environment Conservation

AMEC Environment & Infrastructure
133 Crosbie Road
St. John's, NL
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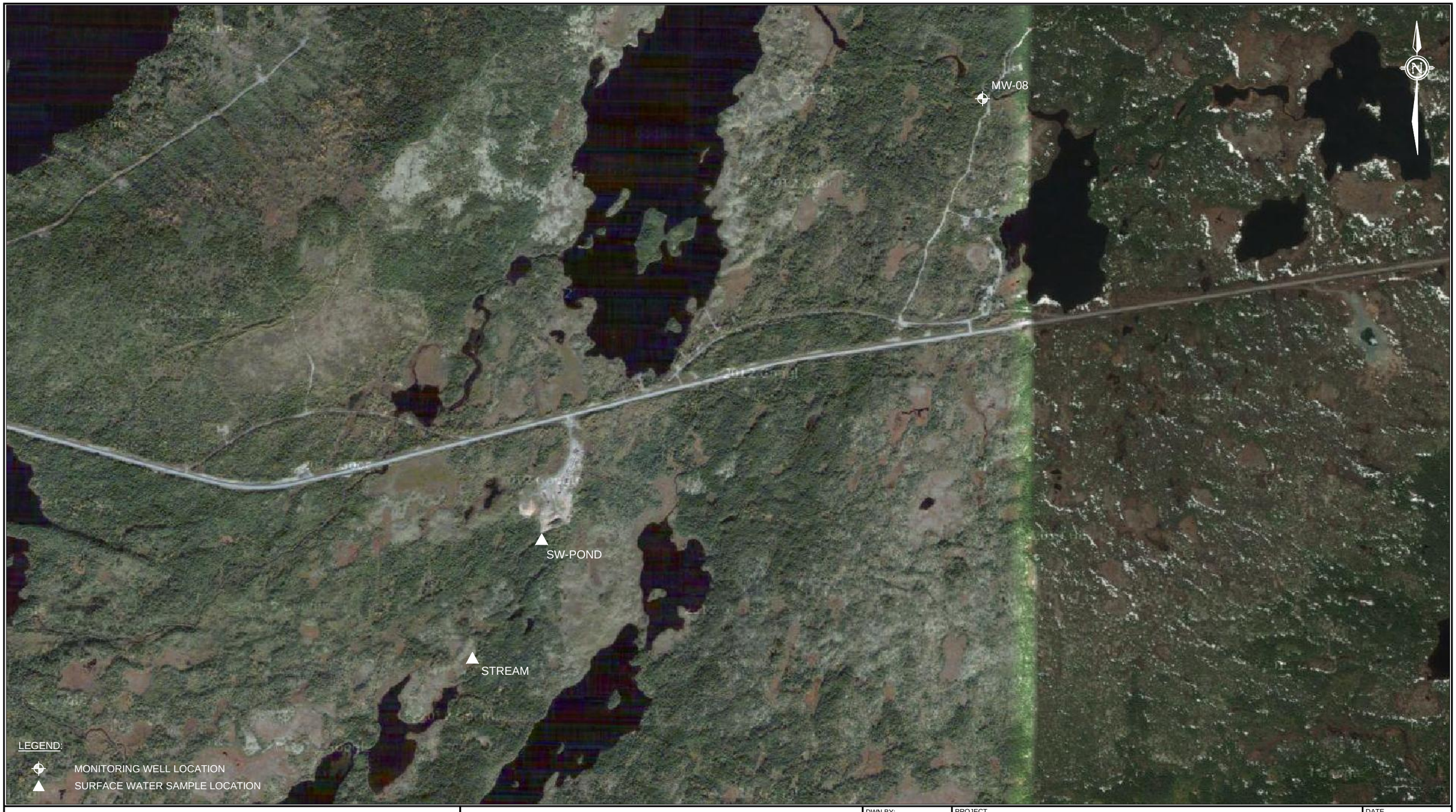
709-722-7023

DWN BY: H. Ryan
CHK'D BY: G. Warren
SCALE: NTS

PROJECT: 2012-2013 ANNUAL REPORT OF ACTIVITIES
UPPER TRINITY SOUTH (NEW HARBOUR) WASTE DISPOSAL SITE

TITLE: ON SITE SAMPLE LOCATIONS

DATE: March 2013
PROJECT No.: TF1212735
REV. No.:
FIGURE No.: 2



NOTE:

1. ALL DIMENSIONS ARE IN METERS.
2. DO NOT SCALE FROM DRAWING.
3. THIS DRAWING IS INTENDED TO SHOW RELATIVE LOCATIONS AND CONFIGURATION OF THE STUDY AREA IN SUPPORT OF THE CONCEPTUAL CLOSURE PLAN OF THE SITE.
4. ALL LOCATIONS, DIMENSIONS, AND ORIENTATIONS ARE APPROXIMATE.
5. THIS DRAWING SHOULD NOT BE USED FOR PURPOSES OTHER THAN THOSE OUTLINED ABOVE.
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7. THIS DRAWING WAS PRODUCED FROM A GOOGLE MAPS IMAGE.

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DWN BY: H. Ryan

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SCALE: NTS

PROJECT: 2012-2013 ANNUAL REPORT OF ACTIVITIES
UPPER TRINITY SOUTH (NEW HARBOUR) WASTE DISPOSAL SITE

TITLE: SURFACE WATER AND BACKGROUND MONITORING WELL LOCATIONS

DATE: March 2013

PROJECT No.: TF1212735

REV. No.:

FIGURE No.: 3

APPENDIX B

Field Parameter Data

Table B-1:Summary of Field Parameter Data for Groundwater

Feb-07

Monitoring Well ID	Sample Date (d-m-yy)	Temperature (°C)	Electrical Conductivity (µS/cm)	pH (unit)
MW-01	7-Feb-07	3.0	140	6.12
MW-02	7-Feb-07	2.0	374	5.60
MW-03	7-Feb-07	2.4	3	6.70
MW-04	7-Feb-07	0.1	490	6.80
MW-05	7-Feb-07	2.9	163	6.04
MW-06	7-Feb-07	0.3	1100	5.40
MW-07	7-Feb-07	1.0	139	5.40

Nov-07

Monitoring Well ID	Sample Date (d-m-yy)	Temperature (°C)	Electrical Conductivity (µS/cm)	pH (unit)
MW-01	15-Nov-07	9.1	31	6.31
MW-02	15-Nov-07	9.3	37	6.74
MW-03	15-Nov-07	8.7	781	6.77
MW-04	15-Nov-07	9.1	754	6.89
MW-05	15-Nov-07	8.9	49	6.56
MW-06	15-Nov-07	8.8	457	6.37
MW-07	15-Nov-07	8.3	58	5.18

May-08

Monitoring Well ID	Sample Date (d-m-yy)	Temperature (°C)	Electrical Conductivity (µS/cm)	pH (unit)
MW-01	29-May-08	11.0	37	5.74
MW-02	29-May-08	11.1	46	6.81
MW-03	29-May-08	9.4	171	5.75
MW-04	29-May-08	13.4	452	6.57
MW-05	29-May-08	13.1	26	5.36
MW-06	29-May-08	12.9	338	6.00
MW-07	29-May-08	12.1	25	5.11

Jan-09

Monitoring Well ID	Sample Date (d-m-yy)	Temperature (°C)	Electrical Conductivity (µS/cm)	pH (unit)
MW-01	7-Jan-09	2.7	81	6.59
MW-03	7-Jan-09	3.9	1140	6.48
MW-04	7-Jan-09	3.4	2070	6.65
MW-05	7-Jan-09	1.3	45	6.09
MW-06	7-Jan-09	0.9	130	6.42
MW-07	7-Jan-09	2.2	59	4.98

Mar-09

Monitoring Well ID	Sample Date (d-m-yy)	Temperature (°C)	Electrical Conductivity (µS/cm)	pH (unit)
MW-01	23-Mar-09	3.5	40	6.15
MW-03	23-Mar-09	4.5	734	6.05
MW-04	23-Mar-09	3.8	731	6.37
MW-07	23-Mar-09	3.8	47	4.55

Table B-1:Summary of Field Parameter Data for Groundwater (Continued)

Oct-09

Monitoring Well ID	Sample Date (d-m-yy)	Temperature (°C)	Electrical Conductivity (µS/cm)	pH (unit)	DO(%)	TDS (g/L)
MW-01	8-Oct-09	11.9	41	6.27	16.4	0.027
MW-02	8-Oct-09	13.1	40	6.43	136.7	0.025
MW-03	8-Oct-09	10.5	518	7.22	2	0.337
MW-04	8-Oct-09	9.8	805	7.30	3.1	0.524
MW-05	8-Oct-09	9.1	53	6.61	12	0.034
MW-06	8-Oct-09	11.3	9	7.04	5.6	0.588
MW-07	8-Oct-09	11.1	61	5.72	5.3	0.039

Dec-10

Monitoring Well ID	Sample Date (d-m-yy)	Temperature (°C)	Electrical Conductivity (µS/cm)	pH (unit)	DO(%)
MW-01	2-Dec-10	6.5	46	6.64	20.9
MW-03	2-Dec-10	6.5	123	6.60	25.5
MW-04	2-Dec-10	7.5	348	6.47	12.0
MW-05	2-Dec-10	7.8	276	6.14	13.2
MW-06	2-Dec-10	6.5	385	6.77	13
MW-07	2-Dec-10	7.5	75	5.95	12.5

Dec-11

Monitoring Well ID	Sample Date (d-m-yy)	Temperature (°C)	Electrical Conductivity (µS/cm)	pH (unit)	DO(%)	TDS (g/L)
MW-01	14-Dec-11	4.4	42	5.88	374	0.27
MW-02	14-Dec-11	2.4	64	7.15	264	0.00
MW-03	14-Dec-11	4.6	300	6.93	321	0.19
MW-04	14-Dec-11	5.2	434	6.68	255	0.59
MW-05	14-Dec-11	4.0	46	6.34	361	0.03
MW-06	14-Dec-11	3.1	254	6.98	98	0.17
MW-07	14-Dec-11	4.4	52	5.59	315	0.03
MW-08	14-Dec-11	5.3	44	5.74	280	0.28

Nov-12

Monitoring Well ID	Sample Date (d-m-yy)	Temperature (°C)	Electrical Conductivity (µS/cm)	pH (unit)	DO(%)
MW-01	28-Nov-12	4.9	88	4.62	34.23
MW-02	28-Nov-12	Dry			
MW-03	28-Nov-12	2.0	217	7.25	93.5
MW-04	28-Nov-12	7.1	860	6.70	31.1
MW-05	28-Nov-12	Damaged			
MW-06	28-Nov-12	5.2	342	6.03	50.3
MW-07	29-Nov-12	4.3	178	4.00	13.8
MW-08	30-Nov-12	2.3	83	5.16	35.5

APPENDIX C

Groundwater Depth Data

Table C-1: Depth to Groundwater

Feb-07

Well ID	Date (d-m-yy)	Depth of Well (mbtoc)	Depth to Water (mbtoc)	Depth to Free Product (masl)	Free Product Thickness (m)
MW-01	7-Feb-07	3.020	1.225	-	-
MW-02	7-Feb-07	3.890	2.250	-	-
MW-03	7-Feb-07	3.630	0.780	-	-
MW-04	7-Feb-07	3.430	1.060	-	-
MW-05	7-Feb-07	2.330	1.430	-	-
MW-06	7-Feb-07	3.425	1.078	-	-
MW-07	7-Feb-07	3.580	3.225	-	-

Nov-07

Well ID	Date (d-m-yy)	Depth of Well (mbtoc)	Depth to Water (mbtoc)	Depth to Free Product (masl)	Free Product Thickness (m)
MW-01	15-Nov-07	3.074	1.115	-	-
MW-02	15-Nov-07	3.822	3.025	-	-
MW-03	15-Nov-07	3.575	0.891	-	-
MW-04	15-Nov-07	3.690	1.087	-	-
MW-05	15-Nov-07	2.160	1.560	-	-
MW-06	15-Nov-07	3.417	1.055	-	-
MW-07	15-Nov-07	3.508	3.025	-	-

May-08

Well ID	Date (d-m-yy)	Depth of Well (mbtoc)	Depth to Water (mbtoc)	Depth to Free Product (masl)	Free Product Thickness (m)
MW-01	29-May-08	3.117	1.105	-	-
MW-02	29-May-08	3.505	3.913	-	-
MW-03	29-May-08	3.635	0.855	-	-
MW-04	29-May-08	3.757	1.025	-	-
MW-05	29-May-08	2.190	1.530	-	-
MW-06	29-May-08	3.462	1.041	-	-
MW-07	29-May-08	3.613	1.260	-	-

Jan-09

Well ID	Date (d-m-yy)	Depth of Well (mbtoc)	Depth to Water (mbtoc)	Depth to Free Product (masl)	Free Product Thickness (m)
MW-01	7-Jan-09	3.080	1.106	-	-
MW-02	7-Jan-09	3.830	3.910	-	-
MW-03	7-Jan-09	3.660	1.118	-	-
MW-04	7-Jan-09	3.680	0.930	-	-
MW-05	7-Jan-09	2.200	1.560	-	-
MW-06	7-Jan-09	3.375	1.550	-	-
MW-07	7-Jan-09	3.580	1.380	-	-

Notes:
masl: meters above sea level
mbtoc: meters below top of casing
Insufficient groundwater to collect a sample from monitoring well MW-02 (Jan-09)
-: denotes no free product detected

Table C-1: Depth to Groundwater (Continued)

Mar-09

Well ID	Date (d-m-yy)	Depth of Well (mbtoc)	Depth to Water (mbtoc)	Depth to Free Product (masl)	Free Product Thickness (m)
MW-01	23-Mar-09	3.078	1.125	-	-
MW-03	23-Mar-09	3.625	1.030	-	-
MW-04	23-Mar-09	3.680	1.150	-	-
MW-07	23-Mar-09	3.600	1.385	-	-

Oct-09

Well ID	Date (d-m-yy)	Depth of Well (mbtoc)	Depth to Water (mbtoc)	Depth to Free Product (masl)	Free Product Thickness (m)
MW-01	8-Oct-09	3.070	1.050	-	-
MW-02	8-Oct-09	3.920	3.850	-	-
MW-03	8-Oct-09	3.650	1.090	-	-
MW-04	8-Oct-09	3.730	0.930	-	-
MW-05	8-Oct-09	4.500	0.910	-	-
MW-06	8-Oct-09	3.480	1.040	-	-
MW-07	8-Oct-09	3.550	1.240	-	-

Jan-10

Well ID	Date (d-m-yy)	Depth of Well (mbtoc)	Depth to Water (mbtoc)	Depth to Free Product (masl)	Free Product Thickness (m)
MW-01	1-Jan-10	3.100	1.080	-	-
MW-02	1-Jan-10	3.880	3.440	-	-
MW-03	1-Jan-10	3.650	3.660	-	-
MW-04	1-Jan-10	3.610	0.850	-	-
MW-05	1-Jan-10	3.790	1.040	-	-
MW-06	1-Jan-10	3.390	1.050	-	-
MW-07	1-Jan-10	3.440	1.300	-	-

Dec-10

Well ID	Date (d-m-yy)	Depth of Well (mbtoc)	Depth to Water (mbtoc)	Depth to Free Product (masl)	Free Product Thickness (m)
MW-01	7-Jan-07	3.040	1.180	-	-
MW-02	7-Jan-07	3.905	3.798	-	-
MW-03	7-Jan-07	3.691	1.082	-	-
MW-04	7-Jan-07	3.590	1.130	-	-
MW-05	7-Jan-07	4.540	1.165	-	-
MW-06	7-Jan-07	3.390	1.075	-	-
MW-07	7-Jan-07	3.600	1.310	-	-

Notes:
masl: meters above sea level
mbtoc: meters below top of casing
Insufficient groundwater to collect a sample from monitoring well MW-02 (Jan-09, Mar-09, Dec-10)
-: denotes no free product detected

Table C-1: Depth to Groundwater (Continued)

Dec-11

Well ID	Date (d-m-yy)	Depth of Well (mbtoc)	Depth to Water (mbtoc)	Depth to Free Product (masl)	Free Product Thickness (m)
MW-01	14-Dec-11	3.410	1.110	-	-
MW-02	14-Dec-11	3.930	3.680	-	-
MW-03	14-Dec-11	3.620	1.130	-	-
MW-04	14-Dec-11	3.610	1.000	-	-
MW-05	14-Dec-11	4.530	0.910	-	-
MW-06	14-Dec-11	3.420	1.500	-	-
MW-07	14-Dec-11	3.560	1.280	-	-
MW-08	14-Dec-11	5.620	1.370	-	-

Nov-12

Well ID	Date (d-m-yy)	Depth of Well (mbtoc)	Depth to Water (mbtoc)	Depth to Free Product (masl)	Free Product Thickness (m)
MW-01	28-Nov-12	3.011	2.331	-	-
MW-03	28-Nov-12	3.610	2.615	-	-
MW-04	28-Nov-12	3.571	1.220	-	-
MW-05	28-Nov-12	Broken - parameters not obtained			
MW-06	28-Nov-12	Damaged			
MW-07	29-Nov-12	3.521	1.282	-	-
MW-08	30-Nov-12	5.592	1.291	-	-

Notes:
masl: meters above sea level
mbtoc: meters below top of casing
Insufficient groundwater to collect a sample from monitoring well MW-02 (Dec-11, and Nov-12)
-: denotes no free product detected

APPENDIX D

Laboratory Data Tables

TABLE D-1: BTEX/TPH Concentrations in Groundwater (2007-2012)

				DATA															GUIDELINES			
Sample ID				MW-01										MW-02					2012 ATLANTIC PIRI - TIER I RBCA RBSL*			2011 MOE
Sampling Date				Feb. 2007	Nov. 2007	May 2008	Jan 2009	Oct. 2009	Jan. 2010	Jan. 2010 MW-01-D	Dec. 2010	Nov. 2012	Feb. 2007	Nov. 2007	May 2008	Oct. 2009	Dec. 2010	GASOLINE	DIESEL/#2	#6 OIL	Standards (1) (Table 3) (2)
	MDL (µg/L)																					
Parameter	2007 - 2008	2009	2012	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
Benzene	0.2	1.0	1.0	<0.2	<0.2	<0.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.2	<0.2	<0.2	<1.0	<1.0	**20,000**	**20,000**	**20,000**	**44**
Toluene	0.2	1.0	1.0	<0.2	<0.2	<0.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.2	<0.2	<0.2	<1.0	<1.0	**20,000**	**20,000**	**20,000**	**1,800**
Ethylbenzene	0.2	1.0	1.0	<0.2	<0.2	<0.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.2	<0.2	<0.2	<1.0	<1.0	**20,000**	**20,000**	**20,000**	**2,300**
Total Xylene	0.6	2.0	2.0	<0.6	<0.6	<0.6	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<0.6	<0.6	<0.6	<2.0	<2.0	**20,000**	**20,000**	**20,000**	**4,200**
TPH (C_6-C_{10})	50	10	10	<50	<50	<50	<10	<10	<10	<10	<10	<10	<50	<50	<50	<10	<10	**-**	**-**	**-**	-
TPH (>C_{10}-C_{21})	50	50	-	<50	<50	<50	<50	<50	<50	<50	<50	-	<50	<50	BB	<50	<50	**-**	**-**	**-**	**-**
TPH (>C_{10}-C_{16})	-	-	50	-	-	-	-	-	-	-	-	<50	-	-	-	-	-				
TPH (>C_{16}-C_{21})	-	-	50	-	-	-	-	-	-	-	-	<50	-	-	-	-	-				
TPH (>C_{21}-<C_{32})	50	100	100	<50	<50	<50	<100	<100	<100	<100	<100	<100	<50	<50	BB	<100	<100	**-**	**-**	**-**	**-**
Modified TPH (C_6-C_{32})	150	100	100	<150	<150	<150	<100	<100	<100	<100	<100	<100	<150	<150	BB	<100	<100	**20,000**	**20,000**	**20,000**	**-**
Hydrocarbon Identification				-	-	-	-	A	A	B	-	A	-	-	-	A	A				

Notes:

MDL: Method detection limit
<X: not detected above MDL
PIRI: Partnership in RBCA Implementation
RBCA: Risk Based Corrective Action
RBSL: Risk Based Screening Level
MOE: Ontario Ministry of Environment
Bold and underlined data exceeds the recommended 2012 Atlantic PIRI RBCA RBSLs
Blue shaded data exceeds the recommeded MOE SCSs
-: Value not established
BB: Broken Bottle
*: Tier I RBCA criteria for gasoline, diesel/#2 and #6 oil in coarse grained soils at commercial sites where groundwater is non-potable
(1) - MOE Standards = Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011.
(2) - Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition & Coarse Grain Soils
A) TEH sample contained Sediment
B) Isobutylbenzene/n-Dotriacontane recovery(ies) not within acceptance limits due to sediment interference

TABLE D-1: BTEX/TPH Concentrations in Groundwater (2007-2012) - Continued

				DATA																GUIDELINES			
Sample ID				MW-03								MW-04								2012 ATLANTIC PIRI - TIER I RBCA RBSL*			2011 MOE
Sampling Date	MDL (µg/L)			Feb. 2007	Nov. 2007	May 2008	Jan 2009	Oct. 2009	Jan. 2010	Dec. 2010	Nov. 2012	Feb. 2007	Nov. 2007	May 2008	Jan 2009	Oct. 2009	Jan. 2010	Dec. 2010	Nov. 2012	GASOLINE	DIESEL/#2	#6 OIL	Standards (1) (Table 3) (2)
Parameter	2007 - 2008	2009	2012	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
Benzene	0.2	1.0	1.0	<0.2	<0.2	<0.2	<1.0	<1.0	<1.0	<1.0	<1.0	<0.2	<0.2	<0.2	<10	<1.0	<1.0	<1.0	<1.0	**20,000**	**20,000**	**20,000**	**44**
Toluene	0.2	1.0	1.0	0.5	4.3	14.4	<1.0	6	<1.0	<1.0	<1.0	<0.2	<0.2	<0.2	470	<1.0	<1.0	<1.0	<1.0	**20,000**	**20,000**	**20,000**	**1,800**
Ethylbenzene	0.2	1.0	1.0	<0.2	<0.2	<0.2	<1.0	<1.0	<1.0	<1.0	<1.0	<0.2	<0.2	<0.2	<10	<1.0	<1.0	<1.0	<1.0	**20,000**	**20,000**	**20,000**	**2,300**
Total Xylene	0.6	2.0	2.0	<0.6	<0.6	<0.6	<2.0	<2.0	<2.0	<2.0	<2.0	<0.6	<0.6	<0.6	<20	<2.0	<2.0	<2.0	<2.0	**20,000**	**20,000**	**20,000**	**4,200**
TPH (C_6-C_{10})	50	10	10	<50	<50	<50	<10	<10	<10	<10	<10	<50	<50	<50	<10	<10	<10	<10	<10	**-**	**-**	**-**	-
TPH (>C_{10}-C_{21})	50	50	-	<50	<50	<50	<50	80	<50	<50	-	<50	<50	<50	70	50	<50	<50	-	**-**	**-**	**-**	**-**
TPH (>C_{10}-C_{16})	-	-	50	-	-	-	-	-	-	-	<50	-	-	-	-	-	-	-	<50				
TPH (>C_{16}-C_{21})	-	-	50	-	-	-	-	-	-	-	<50	-	-	-	-	-	-	-	<50				
TPH (>C_{21}-<C_{32})	50	100	100	<50	<50	<50	<100	<100	<100	<100	<100	<50	<50	<50	<100	<100	<100	<100	<100	**-**	**-**	**-**	**-**
Modified TPH (C_6-C_{32})	150	100	100	<150	<150	<150	<100	<100	<100	<100	<100	<150	<150	<150	<100	<100	<100	<100	<100	**20,000**	**20,000**	**20,000**	**-**
Hydrocarbon Identification				-	-	-	-	C	B	-	E	-	-	-	-	D	A	-	A				

amec

Notes:

MDL: Method detection limit
<X: not detected above MDL
PIRI: Partnership in RBCA Implementation
RBCA: Risk Based Corrective Action
RBSL: Risk Based Screening Level
MOE: Ontario Ministry of Environment
Bold and underlined data exceeds the recommended 2012 Atlantic PIRI RBCA RBSLs
Blue shaded data exceeds the recommeded MOE SCSs
-: Value not established
BB: Broken Bottle
*: Tier I RBCA criteria for gasoline, diesel/#2 and #6 oil in coarse grained soils at commercial sites where groundwater is non-potable
(1) - MOE Standards = Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011
(2) - Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition & Coarse Grain Soils
A) TEH sample contained Sediment
B) Isobutylbenzene/n-Dotriacontane recovery(ies) not within acceptance limits due to sediment interference
C) No resemblance to petroleum products in fuel oil range. Isobutylbenzene/n-Dotriacontane recovery(ies) not within acceptance limits due to sediment interference
D) No resemblance to petroleum products in fuel oil range. TEH sample contained sediment
E) TEH sample decanted due to sediment

TABLE D-1: BTEX/TPH Concentrations in Groundwater (2007-2012) - Continued

				DATA															GUIDELINES			
Sample ID				MW-05							MW-06								2012 ATLANTIC PIRI - TIER I RBCA RBSL*			2011 MOE
Sampling Date				Feb. 2007	Nov. 2007	May 2008	Jan 2009	Oct. 2009	Jan. 2010	Dec. 2010	Nov. 2007	May 2008	Jan 2009	Oct. 2009	Jan. 2010	Dec. 2010	Dec. 2010 DUP-1	Nov. 2012	GASOLINE	DIESEL/#2	#6 OIL	Standards (1) (Table 3) (2)
	MDL (µg/L)																					
Parameter	2007 - 2008	2009	2012	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
Benzene	0.2	1.0	1.0	<0.2	<0.2	<0.2	<1.0	<1.0	<1.0	<1.0	<0.2	<0.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**20,000**	**20,000**	**20,000**	**44**
Toluene	0.2	1.0	1.0	<0.2	<0.2	<0.2	<1.0	<1.0	<1.0	<1.0	<0.2	1.6	<1.0	30	<1.0	<1.0	<1.0	<1.0	**20,000**	**20,000**	**20,000**	**1,800**
Ethylbenzene	0.2	1.0	1.0	<0.2	<0.2	<0.2	<1.0	<1.0	<1.0	<1.0	<0.2	<0.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**20,000**	**20,000**	**20,000**	**2,300**
Total Xylene	0.6	2.0	2.0	<0.6	<0.6	<0.6	<2.0	<2.0	<2.0	<2.0	<0.6	<0.6	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	**20,000**	**20,000**	**20,000**	**4,200**
TPH (C_6-C_{10})	50	10	10	<50	<50	<51	<10	<10	<10	<10	<50	<50	<10	<10	<10	<10	<10	<10	-	-	-	-
TPH (>C_{10}-C_{21})	50	50	-	<50	<50	BB	<50	<50	<50	<50	<50	<50	<50	50	<50	<50	<50	-	-	-	-	-
TPH (>C_{10}-C_{16})	-	-	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50				
TPH (>C_{16}-C_{21})	-	-	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<50				
TPH (>C_{21}-<C_{32})	50	100	100	<50	<50	BB	<100	<100	<100	<100	<50	<50	<100	<100	<100	<100	<100	<100	-	-	-	-
Modified TPH (C_6-C_{32})	150	100	100	<150	<150	BB	<100	<100	<100	<100	<150	<150	<100	<100	<100	<100	<100	<100	**20,000**	**20,000**	**20,000**	-
Hydrocarbon Identification				-	-	-	-	A	A	-	-	-	-	D	E	-	-	F				

Notes:

MDL: Method detection limit
<X: not detected above MDL
PIRI: Partnership in RBCA Implementation
RBCA: Risk Based Corrective Action
RBSL: Risk Based Screening Level
MOE: Ontario Ministry of Environment
Bold and underlined data exceeds the recommended 2012 Atlantic PIRI RBCA RBSLs
Blue shaded data exceeds the recommeded MOE SCSs
-: Value not established
a: higher MDL due to sample dilution.
*: Tier I RBCA criteria for gasoline, diesel/#2 and #6 oil in coarse grained soils at commercial sites where groundwater is non-potable
DUP-1 (Dec. 2010) is a blind field duplicate of groundwater sample MW-06
(1) - MOE Standards = Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15,2011
(2) - Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition & Coarse Grain Soils
A) TEH sample contained Sediment.
B) Isobutylbenzene/n-Dotriacontane recovery(ies) not within acceptance limits due to sediment interference
C) No resemblance to petroleum products in fuel oil range. Isobutylbenzene/n-Dotriacontane recovery(ies) not within acceptance limits due to sediment interference
D) No resemblance to petroleum products in fuel oil range. TEH sample contained sediment
E) Isobutylbenzene/n-Dotriacontane recovery(ies) not within acceptance limits due to matrix/co-extractive interference. Isobutylbenzene/n-Dotriacontane recovery(ies) not within acceptance limits due to sediment interference
F) TEH sample decanted due to sediment

TABLE D-1: BTEX/TPH Concentrations in Groundwater (2007-2012) - Continued

Sample ID				DATA													GUIDELINES			
Sampling Date				MW-07									MW-08				2012 ATLANTIC PIRI - TIER I RBCA RBSL*			2011 MOE Standards (1) (Table 3) (2)
	MDL (µg/L)			Feb. 2007	Nov. 2007	May 2008	Jan 2009	Jan 2009 DUP-1	Oct. 2009	Jan. 2010	Jan. 2010 MW-07-D	Dec. 2010	Nov. 2012	Mar. 2010	Dec. 2010	Nov. 2012	Nov. 2012 DUP-01	GASOLINE	DIESEL/#2	#6 OIL	
Parameter	2007 - 2008	2009	2012	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
Benzene	0.2	1.0	1.0	<0.2	<0.2	<0.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**20,000**	**20,000**	**20,000**	**44**
Toluene	0.2	1.0	1.0	<0.2	<0.2	2.0	5	5	3	3	3	<5**	0.002	<1.0	<1.0	<1.0	<1.0	**20,000**	**20,000**	**20,000**	**1,800**
Ethylbenzene	0.2	1.0	1.0	<0.2	<0.2	<0.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**20,000**	**20,000**	**20,000**	**2,300**
Total Xylene	0.6	2.0	2.0	<0.6	<0.6	<0.6	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	**20,000**	**20,000**	**20,000**	**4,200**
TPH (C_6-C_{10})	50	10	10	<50	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	**-**	**-**	**-**	-
TPH (>C_{10}-C_{21})	50	50	-	<50	<50	<50	<50	<50	<50	<50	<50	<50	-	<50	<50	-	-	**-**	**-**	**-**	**-**
TPH (>C_{10}-C_{16})	-	-	50	-	-	-	-	-	-	-	-	-	<50	-	-	<50	<50				
TPH (>C_{16}-C_{21})	-	-	50	-	-	-	-	-	-	-	-	-	<50	-	-	<50	<50				
TPH (>C_{21}-<C_{32})	50	100	100	<50	<50	<50	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	**-**	**-**	**-**	**-**
Modified TPH (C_6-C_{32})	150	100	100	<150	<150	<150	200	200	<100	<100	<100	<100	<100	<100	<100	<100	<100	**20,000**	**20,000**	**20,000**	**-**
Hydrocarbon Identification				-	-	-	Lube Oil	Lube Oil	B	F	A	-	F	F	-	A	A				

Notes:

MDL: Method detection limit
<X: not detected above MDL
PIRI: Partnership in RBCA Implementation
RBCA: Risk Based Corrective Action
RBSL: Risk Based Screening Level
MOE: Ontario Ministry of Environment
Bold and underlined data exceeds the recommended 2012 Atlantic PIRI RBCA RBSLs
Blue shaded data exceeds the recommeded MOE SCSs
-: Value not established
*: Tier I RBCA criteria for gasoline, diesel/#2 and #6 oil in coarse grained soils at commercial sites where groundwater is non-potable
** Elevated method detection limit for toluene due to matrix interference. Method detection limit does not exceed the applicable guidelines.
(1) - MOE Standards = Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011
(2) - Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition & Coarse Grain Soils
DUP-1 (Jan. 2009) is a blind field duplicate of groundwater sample MW-07
MW-07-D (Jan. 2010) is a blind field duplicate of groundwater sample MW-07
DUP-01 (Nov. 2012) is a blind field duplicate of groundwater sample MW-08
A) TEH sample contained Sediment
B) Isobutylbenzene/n-Dotriacontane recovery(ies) not within acceptance limits due to sediment interference
C) No resemblance to petroleum products in fuel oil range. Isobutylbenzene/n-Dotriacontane recovery(ies) not within acceptance limits due to sediment interference
D) No resemblance to petroleum products in fuel oil range. TEH sample contained sediment
E) Isobutylbenzene/n-Dotriacontane recovery(ies) not within acceptance limits due to matrix/co-extractive interference. Isobutylbenzene/n-Dotriacontane recovery(ies) not within acceptance limits due to sediment interference
F) TEH sample decanted due to sediment

TABLE D-2: Metal Concentrations in Groundwater (2007-2012)

Sample ID								DATA															GUIDELINES
								MW-01									MW-02						
Sampling Date								Feb. 2007	Nov. 2007	May 2008	Jan 2009	Oct. 2009	Jan. 2010	Dec. 2010	Dec. 2011	Nov. 2012	Feb 2007	Nov. 2007	May 2008	Oct. 2009	Jan. 2010	Dec. 2011	**2011 MOE Standards (1)**
pH								6.04	7.30	5.96	6.23	6.15	6.05	6.25	5.88	6.81	5.62	6.05	5.94	6.1	5.59	7.15	
$CaCO_3$ (µg/L)								268,000	7,880	9,080	8,370	19,000	7,000	8,000	-	8,800	11,500	5,220	5,220	7,000	5,000	-	**(Table 3) (2)**
				MDL (µg/L)																			
Parameter	Feb. 2007	Nov. 2007 / May 2008	Jan 2009	Oct. 2009 / Jan. 2010	Dec. 2010	Dec. 2011	Nov. 2012	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
Aluminum	1	5	5	5.0	5.0	5.0	5.0	558,000	3,530	75	72.5	176	109	250	234	130	3,540	70	34	56.9	45.6	432	**-**
Antimony	1	1	2	2.0	1.0	1.0	1.0	<1	<1	<1	<2	<2	<2	<1	<1	<1	<1	<1	<1	<2	<2	<1	**20,000**
Arsenic	1	1	2	2.0	1.0	1.0	1.0	77	<1	4	<2	<2	<2	<1	<1	<1	<1	<1	<1	<2	<2	<1	**1,900**
Barium	0.5	0.5	5	5.0	1.0	1.0	1.0	870	15.1	2.1	<5	<5	<5	2	1.7	3.2	17.6	2.7	3.0	<5	<5	4.7	**29,000**
Beryllium	0.1	0.1	2	2.0	1.0	1.0	1.0	36.9	0.2	<0.1	<2	<2	<2	<1	<1	<1	0.5	<0.1	<0.1	<2	<2	<1	**67**
Bismuth	0.5	0.5	2	2.0	2.0	2.0	2.0	<0.5	<0.5	<0.5	<2	<2	<2	<2	<2	<2	<0.5	<0.5	<0.5	<2	<2	<2	**-**
Boron	-	-	-	5	5.0	5.0	50	-	-	-	-	5.6	<5	<5	<50	<50	-	-	-	<5	<5	<50	**45,000**
Cadmium	0.1	0.015	0.017	0.017	0.02**	0.02**	0.017	1.792	0.380	0.058	0.021	0.020	0.026	0.020	<0.017	<0.017	0.158	1.010	0.057	0.039	<0.017	0.056	**2.7**
Calcium	50	500	-	100	100	100	100	81,600	2,070	2,400	-	5,200	2,000	2,200	2,040	2,530	2,670	1,350	1,330	1,700	1,300	1,910	**-**
Chromium	1	1	1	1.0	1.0	1.0	1.0	82	2	<1	<1	<1	<1	<1	<1	<1	10.8	<1	<1	<1	<1	<1	**810**
Cobalt	1	1	0.4	0.40	0.40	0.40	0.40	79.85	2	<1	<0.4	<4	<0.4	<0.4	0.4	0.95	7	<1	<1	0.86	1.04	0.53	**66**
Copper	1	1	2	2.0	2.0	2.0	2.0	1250	12	2	5	18.5	3.1	3	<2	<2	29	1	4	8.3	<2	7.1	**87**
Iron	1	1	50	50	50.0	50.0	50	75,000	2,180	246	140	107	<50	290	167	968	4,170	64	59	<50	<50	245	**-**
Lead	2	1	0.5	0.50	0.50	0.50	0.50	192.7	4	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	6	<1	<1	<0.5	<0.5	0.62	**25**
Magnesium	50	20	-	100	100	100	100	15,500	642	745	-	1,400	600	500	611	602	1,150	449	479	600	500	258	**-**
Manganese	1	1	2	2.0	2.0	2.0	2.0	2,120	58	31	34	20.5	9.7	17	15.9	83.3	150	13	19	8.3	33.4	4.5	**-**
Mercury	0.01	0.02	0.01	0.013		-	-	<0.02	<0.02	0.13	0.08	0.030	0.11	-	-	-	<0.01	<0.02	0.03	-	0.015	-	**0.29**
Molybdenum	5	5	2	2.0	2.0	2.0	2.0	16	<5	<5	<2	<2	<2	<2	<2	<2	<5	<5	<5	<2	<2	<2	**9,200**
Nickel	1	5	2	2.0	2.0	2.0	2.0	43	<5	<5	<2	<2	<2	<2	<2	<2	5	<5	<5	<2	<2	<2	**490**
Phosphorus	2	5	-	100.00	100.00	100	100	32,200	127	<5	-	<100	200	140	-	<100	336	<5	<5	<100	200	-	**-**
Potassium	50	20	-	100.00	100.00	100	100	9,180	595	212	-	2,100	200	150	166	275	546	239	148	400	200	238	**-**
Selenium	1	1	1	1.0	1.0	1.0	1.0	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	**63.0**
Silver	1	0.1	0.1	0.10	0.10	0.10	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	**1.5**
Sodium	50	500	-	100	100	100	100	11,800	4,090	4,750	-	12,000	3,700	4,300	4,140	5,810	12,100	4,510	5,210	5,100	5,200	5,020	**-**
Strontium	-	-	-	5.0	2.0	2.0	2.0	-	-	-	-	13.4	6.9	7	6.9	12.3	-	-	-	6	6	5	**-**
Thallium	-	-	-	0.10	0.10	0.10	0.10	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	<0.1	<0.1	<0.1	**510**
Tin	-	-	-	2.0	2.0	2.0	2.0	-	-	-	-	<2	<2	<2	<2	<2	-	-	-	<2	<2	<2	**-**
Titanium	-	-	-	2.0	2.0	2.0	2.0	-	-	-	-	6.4	4.8	6	6.8	3.0	-	-	-	<2	<2	24	**-**
Uranium	-	-	-	0.10	0.10	0.10	0.10	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	<0.1	<0.1	<0.1	**420**
Vanadium	2	5	2	2.0	2.0	2.0	2.0	108	<5	<5	<2	<2	<2	<2	<2	<2	3	<5	<5	<2	<2	<2	**250**
Zinc	1	1	5	5.0	5.0	5.0	5.0	825	12	5	6	37.3	8.4	6	5.5	5.2	22	4	6	21.1	<5	19.5	**1,100**

Notes

MDL: Method Detection Limit

<X: Below MDL

MOE: Ontario Ministry of Environment

Bold faced guidelines reflect those most applicable to current land use designation

-: Value not established

Shaded Data exceeds the MOE Standards

(1) - MOE Standards = Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011

(2) - Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition & Coarse Grain Soils

Dup-1 is a blind field duplicate of groundwater sample MW-03 (Nov 2008)

**Method Detection Limit exceeds the guidelines

TABLE D-2: Metal Concentrations in Groundwater (2007-2012)

								DATA																GUIDELINES
Sample ID								MW-03		Dup-1	MW-03								MW-04									2011 MOE
Sampling Date								Feb 2007	Nov. 2007	Nov. 2007	May 2008	Jan 2009	Oct. 2009	Jan. 2010	Dec. 2010	Dec. 2011	Nov. 2012	Feb 2007	Nov. 2007	July 2008	Jan 2009	Oct. 2009	Jan. 2010	Dec. 2010	Dec. 2011	Nov. 2012	Standards (1)
pH								6.66	6.60	6.61	5.96	6.95	6.94	6.57	7.27	6.93	7.11	6.01	6.53	6.69	6.84	6.80	6.75	7.45	6.68	7.08	
$CaCO_3$ (µg/L)								56,000	38,400	38,401	17,400	70,700	51,000	48,000	24,000	-	3,400	118	65,900	50,700	37,700	69,000	31,000	22,000	-	52,000	(Table 3) (2)
Parameter	Feb. 2007	Nov. 2007 / May 2008	Jan 2009	Oct. 2009 / Jan. 2010	Dec. 2010	Dec. 2011	Nov. 2012	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(ug/L)	(ug/L)	(µg/L)
Aluminum	1	5	5	5.0	5.0	5.0	5.0	5,450	129	145	45	146	120	87.9	190	163	78.4	275,000	1,580	41	105	197	131	60	84.1	1610	-
Antimony	1	1	2	2.0	1.0	1.0	1.0	<1	<1	<1	<1	<2	<2	<2	<1	<1.0	<1.0	<1	<1	<1	<2	<2	<2	<1	<1.0	<1.0	**20,000**
Arsenic	1	1	2	2.0	1.0	1.0	1.0	3	1	1	<1	6	<2	7.8	4	7.4	6.6	15	2	13	8	11.1	3.1	2	2	3.2	**1,900**
Barium	0.5	0.5	5	5.0	1.0	1.0	1.0	64.8	25.5	25.0	7.7	12	29.3	13.4	6	9.8	10.2	356.0	14.7	34.8	92	20.4	25.8	12	14.9	51.1	**29,000**
Beryllium	0.1	0.1	2	2.0	1.0	1.0	1.0	1.6	<0.1	0.2	0.3	<2	<2	<2	<1	<1.0	<1.0	40.5	0.3	<0.1	<2	<2	<2	<1	<1.0	<1.0	**67**
Bismuth	0.5	0.5	2	2.0	2.0	2.0	2.0	<0.5	<0.5	<0.5	<0.5	<2	<2	<2	<2	<2.0	<2.0	<0.5	<0.5	0.8	<2	<2	<2	<2	<2.0	<2.0	-
Boron	-	-	-	5	5.0	5.0	50	-	-	-	-	-	29.2	22.9	11	<50	<50	-	-	-	-	22.4	37.1	22	<50	<50	**45,000**
Cadmium	0.1	0.015	0.017	0.017	0.02**	0.02**	0.017	0.109	0.067	0.221	0.102	<0.017	0.049	0.018	<0.02**	0.063	<0.017	1.013	0.059	0.166	<0.017	<0.017	<0.017	<0.02**	<0.017	0.101	**2.7**
Calcium	50	500	-	100	100	100	100	15,800	11,300	10,500	5,060	-	15,000	13,000	7,000	8,780	10,800	34,600	17,500	32,500	-	19,000	9,400	6,700	8,710	15,700	-
Chromium	1	1	1	1.0	1.0	1.0	1.0	7.0	<1	<1	<1	<1	1.7	<1	<1	<1.0	<1.0	37.0	1	1	<1	1.1	<1	<1	<1.0	2.9	**810**
Cobalt	1	1	0.4	0.40	0.40	0.40	0.40	12	5	5	9	6	1.98	5.49	4.6	4.75	3.63	100	4	14	8.38	7.21	2.87	1.9	2.42	11.1	**66**
Copper	1	1	2	2.0	2.0	2.0	2.0	3	4	4	4	<2	5.0	<2	<2	3.5	<2.0	137	6	<1	2	2.6	<2	<2	<2.0	5.3	**87**
Iron	1	1	50	50	50.0	50.0	50	6,680	2,410	2230	312	1,400	4,390	1,590	1,500	1,030	9,570	64,100	1,170	2,430	7,600	2,030	2,020	1,100	1,950	6,530	-
Lead	2	1	0.5	0.50	0.50	0.50	0.50	19	4	4	<1	<0.5	1.11	<0.5	<0.5	<0.50	<0.50	63	2	3	0.8	<0.5	1.14	0.6	0.68	2.44	**25**
Magnesium	50	20	-	100	100	100	100	4,000	2,470	2,410	1,140	-	3,200	3,600	1,600	2,160	1,610	7,680	5,380	10,100	-	5,000	1,900	1,200	1,740	3,160	-
Manganese	1	1	2	2.0	2.0	2.0	2.0	2,040	1,010	964	171	3,800	721	3,930	1,900	2,090	1,570	8,950	2,370	6,740	2,500	4,510	925	370	549	1,300	-
Mercury	0.01	0.02	0.01	0.013		-	-	0.02	<0.02	<0.02	0.04	0.68	0.037	0.46	-	-	-	<0.01	<0.02	0.02	0.01	0.18	0.083	-	-	-	**0.29**
Molybdenum	5	5	2	2.0	2.0	2.0	2.0	<5	<5	<5	<5	<2	<2	<2	<2	<2.0	<2.0	8	<5	<5	<2	2.4	<2	<2	<2.0	<2.0	**9,200**
Nickel	1	5	2	2.0	2.0	2.0	2.0	5	<5	<5	<5	<2	<2	<2	<2	6	<2.0	22	<5	<5	3	<2	<2	<2	<2.0	3.3	**490**
Phosphorus	2	5	-	100.00	100.00	100	100	1,090	312	199	20	-	200	<100	110	-	<100	11,100	93	28	-	<100	100	130	-	335	-
Potassium	50	20	-	100.00	100.00	100	100	6,560	3,630	3,540	633	-	4,800	2,400	1,100	1,350	1,730	4,810	3,150	4,440	-	3,600	2,900	1,500	2,130	2,900	-
Selenium	1	1	1	1.0	1.0	1.0	1.0	<1	<1	<1	<1	<1	<1	<1	<1	<1.0	<1.0	<1	<1	<1	<1	<1	<1	<1	<1.0	<1.0	**63.0**
Silver	1	0.1	0.1	0.10	0.10	0.10	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	<0.10	0.1	<0.1	0.7	<0.1	<0.1	<0.1	<0.1	<0.10	<0.10	**1.5**
Sodium	50	500	-	100	100	100	100	189,000	102,000	103,000	24,500	-	96,000	73,000	32,000	32,300	37,000	60,700	91,200	149,000	-	88,000	77,000	40,000	41,900	43,500	-
Strontium	-	-	-	5.0	2.0	2.0	2.0	-	-	-	-	-	56.2	38.0	21	22.9	50.5	-	-	-	-	51.9	34	24	29	89.7	-
Thallium	-	-	-	0.10	0.10	0.10	0.10	-	-	-	-	-	<0.1	<0.1	<0.1	<0.10	<0.10	-	-	-	-	<0.1	<0.1	<0.1	<0.10	<0.10	**510**
Tin	-	-	-	2.0	2.0	2.0	2.0	-	-	-	-	-	<2	<2	<2	<2.0	<2.0	-	-	-	-	<2	<2	<2	<2.0	<2.0	-
Titanium	-	-	-	2.0	2.0	2.0	2.0	-	-	-	-	-	11.9	2.9	4	7.4	2.5	-	-	-	-	10.2	30.6	6	8.6	56.0	-
Uranium	-	-	-	0.10	0.10	0.10	0.10	-	-	-	-	-	<0.1	0.11	<0.1	<0.10	<0.10	-	-	-	-	<0.1	<0.1	<0.1	<0.10	0.19	**420**
Vanadium	2	5	2	2.0	2.0	2.0	2.0	9	<5	<5	<5	<2	2.4	<2	<2	<2.0	<2.0	43	<5	5	4	<2	3	<2	<2.0	3.6	**250**
Zinc	1	1	5	5.0	5.0	5.0	5.0	41	6	5	30	<5	58.2	7.4	9	18.3	<5.0	212	4	8	6	16.2	<5	7	7.7	19.3	**1,100**

Notes
MDL: Method Detection Limit
<X: Below MDL
MOE: Ontario Ministry of Environment
-: Value not established
Shaded Data exceeds the MOE Standards
(1) - MOE Standards = Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011
(2) - Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition & Coarse Grain Soils
Dup-1 is a blind field duplicate of groundwater sample MW-03 (Nov 2007)
**Method Detection Limit exceeds the guidelines

TABLE D-2: Metal Concentrations in Groundwater (2007-2012) - Continued

								DATA																GUIDELINES
Sample ID								MW-05								MW-06						DUP-1	MW-06		**2011 MOE**
Sampling Date								Feb. 2007	Nov. 2007	May 2008	Jan 2009	Oct. 2009	Jan. 2010	Dec. 2010	Dec. 2011	Feb 2007	Nov. 2007	May 2008	Jan 2009	Oct. 2009	Jan. 2010*	Dec. 2010	Dec. 2010	Dec. 2011	Nov. 2012	**Standards (1)**
pH								6.09	6.10	6.30	6.09	6.18	5.92	6.70	6.34	6.13	6.11	6.31	6.42	6.36	6.82	7.10	7.02	6.98	6.96	
$CaCO_3$ (µg/L)				MDL (µg/L)				50,100	8,350	5,330	6,840	14,000	9,000	10,000	-	177,000	101,000	87,900	94,450	260,000	510,000	88,000	91,000	-	47,000	**(Table 3) (2)**
Parameter	Feb. 2007	Nov. 2007 / May 2008	Jan 2009	Oct. 2009 / Jan. 2010	Dec. 2010	Dec. 2011	Nov. 2012	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
Aluminum	1	5	5	5.0	5.0	5.0	5.0	57,100	7,880	288	209	168	95.7	200	133	8,540	485	179	44.1	112	<50	160	180	176	247	-
Antimony	1	1	2	2.0	1.0	1.0	1.0	<1	<1	<1	<2	<2	<2	<1	<1.0	<1	<1	<1	<2	<2	<20	<1	<1	<1.0	<1.0	**20,000**
Arsenic	1	1	2	2.0	1.0	1.0	1.0	17	1	<1	<2	<2	<2	<1	<1.0	3	<1	<1	<2	<2	<20	2	2	1.7	2.9	**1,900**
Barium	0.5	0.5	5	5.0	1.0	1.0	1.0	114.0	23.4	1.4	<5	<5	<5	2	4	55.9	9.6	6.9	16	26.4	<50	8	8	4.6	7.4	**29,000**
Beryllium	0.1	0.1	2	2.0	1.0	1.0	1.0	20.8	0.2	<0.1	<2	<2	<2	<1	<1.0	0.7	<0.1	<0.1	<2	<2	<20	<1	<1	<1.0	<1.0	**67**
Bismuth	0.5	0.5	2	2.0	2.0	2.0	2.0	<0.5	<0.5	<0.5	<2	<2	<2	<2	<2.0	<0.5	<0.5	<0.5	<2	<2	<20	<2	<2	<2.0	<2.0	**-**
Boron	-	-	-	5	5.0	5.0	50	-	-	-	-	<5	<5	<5	<50	-	-	-	-	468	693	170	180	142	96	**45,000**
Cadmium	0.1	0.015	0.017	0.017	0.02**	0.02**	0.017	0.627	0.192	0.059	0.020	0.067	<0.017	<0.02**	0.061	0.364	0.122	0.082	0.051	0.038	<0.17	<0.02**	<0.02**	<0.017	<0.017	**2.7**
Calcium	50	500	-	100	100	100	100	14,300	2,330	1,310	-	3,700	2,300	2,800	3,740	52,000	30,900	26,600	-	79,000	150,000	28,000	28,000	22,400	14,800	**-**
Chromium	1	1	1	1.0	1.0	1.0	1.0	15.0	5.0	<1	<1	<1	<1	<1	<1.0	14.6	<1	<1	<1	<1	<10	<1	<1	<1.0	<1.0	**810**
Cobalt	1	1	0.4	0.40	0.40	0.40	0.40	27	4	<1	1.06	0.63	<0.4	<0.4	0.48	12	6	4	3.68	6.35	<4	4.2	4	2.93	2.58	**66**
Copper	1	1	2	2.0	2.0	2.0	2.0	237	39	7	7	16.0	2.8	3	9.2	42	5	7	7	5.5	<20	2	2	2.7	<2.0	**87**
Iron	1	1	50	50	50.0	50.0	50	12,390	2,940	124	120	105	<50	79	65	10,276	513	178	<50	637	<500	3,100	3,200	2,870	8,380	**-**
Lead	2	1	0.5	0.50	0.50	0.50	0.50	57	11	<1	0.5	<0.5	<0.5	<0.5	<0.50	26	<1	<1	<0.5	<0.5	<5	<0.5	<0.5	<0.50	1.19	**25**
Magnesium	50	20	-	100	100	100	100	3,490	616	502	-	1,300	800	790	825	11,400	5,840	5,210	-	15,000	30,000	4,600	4,800	3,920	2,400	**-**
Manganese	1	1	2	2.0	2.0	2.0	2.0	487	77	15	35	26.3	11.8	20	10.7	1,830	905	520	890	1,060	889	380	400	355	480	**-**
Mercury	0.01	0.02	0.01	0.13		-	-	<0.01	0.06	1.44	0.85	0.013	0.078	-	-	<0.01	<0.02	0.04	<0.01	0.11	0.047	-	-	-	-	**0.29**
Molybdenum	5	5	2	2.0	2.0	2.0	2.0	3	<5	<5	<2	13.6	<2	<2	<2.0	<5	<5	<5	<2	<2	<20	<2	<2	<2.0	<2.0	**9,200**
Nickel	1	5	2	2.0	2.0	2.0	2.0	20	<5	<5	<2	<2	<2	<2	<2.0	6	<5	<5	<2	2.3	<20	<2	<2	<2.0	2.5	**490**
Phosphorus	2	5	-	100.0	100.00	100	100	3,550	373	6	-	<100	100	<100	-	1,340	60	30	-	100	<100	<100	180	-	182	**-**
Potassium	50	20	-	100.00	100.00	100	100	1,530	405	446	-	900	100	210	524	20,100	9,220	10,200	-	22,000	33,000	9,000	9,000	5,180	3,540	**-**
Selenium	1	1	1	1.0	1.0	1.0	1.0	<1	<1	<1	<1	<1	<1	<1	<1.0	<1	<1	<1	<1	<1	<10	<1	<1	<1.0	<1.0	**63.0**
Silver	1	0.1	0.1	0.10	0.10	0.10	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.10	<0.10	**1.5**
Sodium	50	500	-	100	100	100	100	6,800	10,200	4,030	-	8,200	4,900	5,400	5,200	53,400	27,600	21,800	-	56,000	72,000	20,000	20,000	11,800	10,000	**-**
Strontium	-	-	-	5.0	2.0	2.0	2.0	-	-	-	-	10.2	7.8	8	8.1	-	-	-	-	228	392	70	71	56	51.9	**-**
Thallium	-	-	-	0.10	0.10	0.10	0.10	-	-	-	-	<0.1	<0.1	<0.1	<0.10	-	-	-	-	<0.1	<1	<0.1	<0.1	<0.10	<0.10	**510**
Tin	-	-	-	2.0	2.0	2.0	2.0	-	-	-	-	<2	<2	<2	<2.0	-	-	-	-	<2	<20	<2	<2	<2.0	<2.0	**-**
Titanium	-	-	-	2.0	2.0	2.0	2.0	-	-	-	-	3.3	<2	4	2	-	-	-	-	7.0	<20	6	6	5.6	7.8	**-**
Uranium	-	-	-	0.10	0.10	0.10	0.10	-	-	-	-	<0.1	<0.1	<0.1	0.1	-	-	-	-	<0.1	<1	<0.1	<0.1	<0.10	<0.10	**420**
Vanadium	2	5	2	2.0	2.0	2.0	2.0	19	6	<5	<2	<2	<2	<2	<2.0	10	<5	<5	<2	<2	<20	<2	<2	<2.0	<2.0	**250**
Zinc	1	1	5	5.0	5.0	5.0	5.0	163	25	6	10	20.2	5.2	12	28	52	10	14	8	46.5	<50	15	14	8.9	6.1	**1,100**

Notes

MDL: Method Detection Limit
<X: Below MDL
MOE: Ontario Ministry of Environment
-: Value not established
Shaded Data exceeds the MOE Standards
*RDL increased by a factor of 10 for this sample
(1) - MOE Standards = Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011
(2) - Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition & Coarse Grain Soils
DUP-1 (Dec. 2010) is a blind field duplicate of groundwater sample MW-06
**Method Detection Limit exceeds the guidelines

TABLE D-2: Metal Concentrations in Groundwater (2007-2012) - Continued

								DATA															GUIDELINES
Sample ID									MW-07		DUP-1		DUP-1		MW-07			DUP (MW-09)	MW-07		MW-08				DUP-01	**2011 MOE**
Sampling Date								Feb. 2007	Nov. 2007	May 2008	May 2008	Jan 2009	Jan 2009	Oct. 2009	Jan. 2010	Dec. 2010	Dec. 2011	Dec. 2011	Nov. 2012	Mar. 2010	Dec. 2010	Dec. 2011	Nov. 2012	Nov. 2012	**Standards (1)**
pH								4.92	5.01	5.20	5.45	4.65	4.47	4.71	4.86	6.05	5.59	5.59	5.74	5.42	5.21	5.74	5.15	5.16	
$CaCO_3$ (µg/L)								13,200	5,890	3,990	3,870	5,740	5,500	6,000	3,000	7,000	-	-	6,900	3,000	4,000	-	3,800	3,900	**(Table 3) (2)**
	MDL (µg/L)																								
Parameter	Feb. 2007	Nov. 2007 / May 2008	Jan 2009	Oct. 2009 / Mar. 2010	Dec. 2010	Dec. 2011	Nov. 2012	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
Aluminum	1	5	5	5.0	5.0	5.0	5.0	4,527	1,740	982	1,170	830	822	2,460	1,100	2,900	1,760	1,860	4,320	626	640	1,210	1,160	1,190	-
Antimony	1	1	2	2.0	1.0	1.0	1.0	<1	<1	<1	<1	<2	<2	<2	<2	<1	<1.0	<1.0	<1.0	<2	<1	<1.0	<1.0	<1.0	**20,000**
Arsenic	1	1	2	2.0	1.0	1.0	1.0	2	<1	2	1	<2	<2	<2	<2	1	<1.0	<1.0	2.5	<2	<1	<1.0	1.1	1.1	**1,900**
Barium	0.5	0.5	5	5.0	1.0	1.0	1.0	18.7	4.8	2.4	2.8	<5	<5	<5	<5	5	3.5	3.4	9.1	<5	6	7.2	7.0	7.1	**29,000**
Beryllium	0.1	0.1	2	2.0	1.0	1.0	1.0	0.4	0.1	<0.1	<0.1	<2	<2	<2	<2	<1	<1.0	<1.0	<1.0	<2	<1	<1.0	<1.0	<1.0	**67**
Bismuth	0.5	0.5	2	2.0	2.0	2.0	2.0	<0.5	<0.5	<0.5	<0.5	<2	<2	<2	<2	<2	<2.0	<2.0	<2.0	<2	<2	<2.0	<2.0	<2.0	-
Boron	-	-	-	5	5.0	5.0	50	-	-	-	-	-	-	<10	<5	<5	<50	<50	<50	6	<5	<50	<50	<50	**45,000**
Cadmium	0.1	0.015	0.017	0.017	0.02**	0.02**	0.017	0.122	0.024	0.118	0.103	0.020	0.019	0.032	<0.017	0.03	<0.017	<0.017	0.068	0.018	0.02	0.022	0.043	0.040	**2.7**
Calcium	50	500	-	100	100	100	100	3,690	1,040	791	758	-	-	1,200	500	2,000	1,130	1,080	2,040	800	810	840	729	711	-
Chromium	1	1	1	1.0	1.0	1.0	1.0	4.0	1	<1	1	<1	<1	2.4	<1	2	1.4	1.3	4.5	<1	<1	<1.0	<1.0	<1.0	**810**
Cobalt	1	1	0.4	0.40	0.40	0.40	0.40	4	2	<1	1	0.93	0.93	0.87	0.48	0.7	0.64	0.60	1.28	0.58	1.1	0.61	0.57	0.63	**66**
Copper	1	1	2	2.0	2.0	2.0	2.0	14	5	3	3	<2	3	4.0	<2	2	2.9	2.7	7.1	8.8	7	15.4	13.1	12.9	**87**
Iron	1	1	50	50	50.0	50.0	50	2,910	1,130	2,120	2,490	1,200	1,200	1,820	1,280	2,300	1,990	1,980	4,680	411	590	513	399	415	-
Lead	2	1	0.5	0.50	0.50	0.50	0.50	3	1	<1	1	<0.5	<0.5	2.26	0.63	1.9	1.64	1.66	5.02	1.2	<0.5	0.6	<0.50	0.52	**25**
Magnesium	50	20	-	100	100	100	100	962	837	490	354	-	-	700	500	450	312	323	430	34.7	560	546	484	518	-
Manganese	1	1	2	2.0	2.0	2.0	2.0	67	19	38	45	23	22	28.9	18.7	36	30.3	29.2	78.2	200	41	30.9	24.8	27.7	-
Mercury	0.01	0.02	0.01	0.13	-	-	-	<0.01	<0.02	0.13	0.09	0.07	0.08	0.13	0.043	-	-	-		<0.013	-	-	-	-	**0.29**
Molybdenum	5	5	2	2.0	2.0	2.0	2.0	<5	<5	<5	<5	<2	<2	<2	<2	<2	<2.0	<2.0	<2.0	<2	<2	<2.0	<2.0	<2.0	**9,200**
Nickel	1	5	2	2.0	2.0	2.0	2.0	7	<5	<5	<5	<2	<2	<2	<2	<2	<2.0	<2.0	3.5	2.7	6	5	5.3	5.5	**490**
Phosphorus	2	5	-	100.00	100.00	100	100	383	104	55	66	-	-	100	100	<1,000*	-	-	146	<100	<100	-	<100	<100	-
Potassium	50	20	-	100.00	100.00	100	100	463	221	170	290	-	-	300	<100	<1,000*	180	190	320	500	310	334	242	281	-
Selenium	1	1	1	1.0	1.0	1.0	1.0	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1.0	<1.0	<1.0	<1	<1	<1.0	<1.0	<1.0	**63.0**
Silver	1	0.1	0.1	0.10	0.10	0.10	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	<0.10	<0.10	<0.1	<0.1	0.2	<0.10	<0.10	**1.5**
Sodium	50	500	-	100	100	100	100	4,220	4,680	3,830	3,950	-	-	9,200	5,800	9,300*	8,270	8,090	21,700	5,400	4,400	4,340	5,000	5,210	-
Strontium	-	-	-	5.0	2.0	2.0	2.0	-	-	-	-	-	-	9.1	<5	13	7.6	7.8	12.5	<5	8	7.1	7.9	8.4	-
Thallium	-	-	-	0.10	0.10	0.10	0.10	-	-	-	-	-	-	<0.1	<0.1	<0.10	<0.10	<0.10	<0.10	<0.1	<0.1	<0.10	<0.10	<0.10	**510**
Tin	-	-	-	2.0	2.0	2.0	2.0	-	-	-	-	-	-	<2	<2	<2	<2.0	<2.0	<2.0	<2	<2	<2.0	<2.0	<2.0	-
Titanium	-	-	-	2.0	2.0	2.0	2.0	-	-	-	-	-	-	54.8	19.1	49	40.4	40.6	120	7.8	8	18.2	18.2	15.9	-
Uranium	-	-	-	0.10	0.10	0.10	0.10	-	-	-	-	-	-	0.14	<0.1	0.2	0.17	0.18	0.82	0.1	<0.1	0.1	<0.10	<0.10	**420**
Vanadium	2	5	2	2.0	2.0	2.0	2.0	6	<5	<5	<5	<2	<2	2.6	<2	<2	<2.0	<2.0	6.9	<2	<2	<2.0	<2.0	<2.0	**250**
Zinc	1	1	5	5.0	5.0	5.0	5.0	15	9	8	19	11	15	24	8.6	17	8.3	10.8	26.6	16.5	30	20.2	28.2	28.6	**1,100**

Notes

MDL: Method Detection Limit
<X: Below MDL
MOE: Ontario Ministry of Environment
-: Value not established
Shaded Data exceeds the MOE Standards
(1) - MOE Standards = Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011
(2) - Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition & Coarse Grain Soils
DUP-1 (May 2008, Jan. 2009) is a blind field duplicate of groundwater sample MW-07
DUP (MW-09) (Dec. 2011) is a blind field duplicate of groundwater sample MW-07
DUP-01 (Nov. 2012) is a blind field duplicate of groundwater sample MW-08
*Method Detection Limit elevated
**Method Detection Limit exceeds the guidelines

TABLE D-3: PAH Concentrations in Groundwater (2007-2012)

					DATA															GUIDELINES
Sample ID					MW-01									MW-02						
Sampling Date					Feb. 2007	Nov. 2007	May 2008	Jan. 2009	Oct. 2009*	Jan. 2010	Jan. 2010 MW-01-D	Dec. 2010	Nov. 2012	Feb. 2007	Nov. 2007	May 2008	Oct. 2009	Jan. 2010	**2011 MOE SCS [1] (Table 3) [2]**
	MDL (µg/L)																			
Parameter	2007-2008	2009	Oct. 2009 / Dec. 2010	Nov. 2012	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	**(µg/L)**
1-Methylnaphthalene	0.03	0.05	0.05	0.05	NA	-	<0.03	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	NA	-	<0.03	<0.05	<0.05	**1,800**
2-Methylnaphthalene	0.03	0.05	0.05	0.05	NA	-	<0.03	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	NA	-	<0.03	<0.05	<0.05	**1,800**
Acenaphthene	0.04	0.01	0.01	0.01	NA	<0.04	<0.04	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	NA	<0.04	<0.04	<0.01	<0.01	**600**
Acenaphthylene	0.03	0.01	0.01	0.01	NA	<0.03	<0.03	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	NA	<0.03	<0.03	<0.01	<0.01	**1.8**
Acridine	-	-	0.05	0.05	-	-	-	-	<0.1	<0.05	<0.05	<0.05	<0.05	-	-	-	<0.05	<0.05	**-**
Anthracene	0.01	0.01	0.01	0.01	NA	<0.01	<0.01	<0.01	<0.02**	<0.01	<0.01	<0.01	<0.01	NA	<0.01	<0.01	<0.01	<0.01	**2.4**
Benzo(a)anthracene	0.01	0.01	0.01	0.01	NA	<0.01	<0.01	<0.01	<0.02**	<0.01	<0.01	<0.01	<0.01	NA	<0.01	<0.01	<0.01	<0.01	**4.7**
Benzo(a)pyrene	0.005	0.01	0.01	0.01	NA	<0.005	<0.005	<0.01	<0.02**	<0.01	<0.01	<0.01	<0.01	NA	<0.005	<0.005	<0.01	<0.01	**0.81**
Benzo(b)fluoranthene	0.05	0.01	0.01	0.01	NA	<0.05	<0.05	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	NA	<0.05	<0.05	<0.01	<0.01	**0.75**
Benzo(g,h,i)perylene	0.03	0.01	0.01	0.01	NA	<0.03	<0.03	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	NA	<0.03	<0.03	<0.01	<0.01	**0.2**
Benzo(k)fluoranthene	0.05	0.01	0.01	0.01	NA	<0.05	<0.05	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	NA	<0.05	<0.05	<0.01	<0.01	**0.4**
Chrysene	0.04	0.01	0.01	0.01	NA	<0.04	<0.04	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	NA	<0.04	<0.04	<0.01	<0.01	**1**
Dibenzo(a,h)anthracene	0.05	0.01	0.01	0.01	NA	<0.05	<0.05	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	NA	<0.05	<0.05	<0.01	<0.01	**0.52**
Fluoranthene	0.03	0.01	0.01	0.01	NA	<0.03	<0.03	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	NA	<0.03	<0.03	<0.01	<0.01	**130**
Fluorene	0.03	0.01	0.01	0.01	NA	<0.03	<0.03	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	NA	<0.03	<0.03	<0.01	<0.01	**400**
Indeno(1,2,3-cd)pyrene	0.05	0.01	0.01	0.01	NA	<0.05	<0.05	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	NA	<0.05	<0.05	<0.01	<0.01	**0.2**
Naphthalene	0.03	0.2	0.2	0.20	NA	<0.03	<0.03	<0.2	<0.5	<0.2	<0.2	<0.2	<0.2	NA	<0.03	<0.03	<0.2	<0.2	**1,400**
Perylene	-	-	0.01	0.01	-	-	-	-	0.03	<0.01	<0.01	<0.01	<0.01	-	-	-	<0.01	<0.01	**-**
Phenanthrene	0.04	0.01	0.01	0.01	NA	<0.04	<0.04	0.03	<0.02	<0.01	<0.01	<0.01	<0.01	NA	<0.04	<0.04	<0.01	<0.01	**580**
Pyrene	0.01	0.01	0.01	0.01	NA	<0.01	<0.01	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	NA	<0.01	<0.01	<0.01	<0.01	**68**
Quinoline	-	-	0.05	0.05	-	-	-	-	<0.1	<0.05	<0.05	<0.05	<0.05	-	-	-	<0.05	<0.05	-

Notes

MDL: Method Detection Limit
<X: Below MDL
MOE: Ontario Ministry of Environment
SCS: Site Condition Standard
-: Value not established or Parameter not analyzed
NA: Sample not analyzed for PAHs
Shaded Data exceeds the MOE Standards
MW-01-D (Jan. 2010) is a blind field duplicate of groundwater sample MW-01
(1) - MOE Standards = Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act,April 15, 2011
(2) - Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition & Coarse Grain Soils
*Elevated Method Detection Limit due to insuficient sample
**Method Detection Limit exceeds the guidelines

TABLE D-3: PAH Concentrations in Groundwater (2007-2012) - Continued

				DATA																GUIDELINES
Sample ID				MW-03									MW-04							**2011 MOE**
Sampling Date				Feb. 2007	Nov. 2007	May 2008	Jan 2009	Oct. 2009	Jan. 2010	Dec. 2010	Nov. 2012	Feb. 2007	Nov. 2007	May 2008	Jan 2009	Oct. 2009	Jan. 2010	Dec. 2010	Nov. 2012	**SCS [1]**
	MDL (µg/L)																			**(Table 3) [2]**
Parameter	2007-2008	2009	Oct. 2009 / Dec. 2010	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	**(µg/L)**
1-Methylnaphthalene	0.03	0.05	0.05	-	-	<0.03	<0.05	0.05	<0.05	<0.05	<0.05	NA	-	<0.03	0.06	<0.05	<0.05	<0.05	<0.05	**1,800**
2-Methylnaphthalene	0.03	0.05	0.05	-	-	<0.03	<0.05	0.07	<0.05	<0.05	<0.05	NA	-	<0.03	0.08	<0.05	<0.05	<0.05	<0.05	**1,800**
Acenaphthene	0.04	0.01	0.01	0.04	<0.04	<0.04	<0.01	<0.01	<0.01	<0.01	<0.01	NA	<0.04	<0.04	<0.01	<0.01	<0.01	<0.01	<0.01	**600**
Acenaphthylene	0.03	0.01	0.01	<0.03	<0.03	<0.03	<0.01	<0.01	<0.01	<0.01	<0.01	NA	<0.03	<0.03	<0.01	<0.01	<0.01	<0.01	<0.01	**1.8**
Acridine	-	-	0.05	-	-	-	-	<0.05	<0.05	<0.05	<0.05	-	-	-	-	<0.05	<0.05	<0.05	<0.05	**-**
Anthracene	0.01	0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	NA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**2.4**
Benzo(a)anthracene	0.01	0.01	0.01	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	NA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**4.7**
Benzo(a)pyrene	0.005	0.01	0.01	<0.005	<0.005	<0.005	<0.01	<0.01	<0.01	<0.01	<0.01	NA	<0.005	<0.005	<0.01	<0.01	<0.01	<0.01	<0.01	**0.81**
Benzo(b)fluoranthene	0.05	0.01	0.01	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	NA	<0.05	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	**0.75**
Benzo(g,h,i)perylene	0.03	0.01	0.01	<0.03	<0.03	<0.03	<0.01	<0.01	<0.01	<0.01	<0.01	NA	<0.03	<0.03	<0.01	<0.01	<0.01	<0.01	<0.01	**0.2**
Benzo(k)fluoranthene	0.05	0.01	0.01	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	NA	<0.05	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	**0.4**
Chrysene	0.04	0.01	0.01	<0.04	<0.04	<0.04	<0.01	<0.01	<0.01	<0.01	<0.01	NA	<0.04	<0.04	<0.01	<0.01	<0.01	<0.01	<0.01	**1**
Dibenzo(a,h)anthracene	0.05	0.01	0.01	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	NA	<0.05	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	**0.52**
Fluoranthene	0.03	0.01	0.01	<0.03	<0.03	<0.03	<0.01	0.02	<0.01	<0.01	<0.01	NA	<0.03	<0.03	<0.01	<0.01	<0.01	<0.01	<0.01	**130**
Fluorene	0.03	0.01	0.01	<0.03	<0.03	<0.03	0.03	0.01	<0.01	<0.01	<0.01	NA	<0.03	<0.03	<0.01	<0.01	<0.01	<0.01	<0.01	**400**
Indeno(1,2,3-cd)pyrene	0.05	0.01	0.01	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	NA	<0.05	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	**0.2**
Naphthalene	0.03	0.2	0.2	0.08	0.05	0.05	<0.2	<0.2	<0.2	<0.2	<0.2	NA	<0.03	<0.03	<0.2	<0.2	<0.2	<0.2	<0.2	**1,400**
Perylene	-	-	0.01	-	-	-	-	0.07	<0.01	<0.01	<0.01	-	-	-	-	<0.01	<0.01	<0.01	<0.01	**-**
Phenanthrene	0.04	0.01	0.01	<0.04	<0.04	<0.04	0.03	0.02	<0.01	<0.01	<0.01	NA	<0.04	<0.04	0.03	<0.01	<0.01	<0.01	<0.01	**580**
Pyrene	0.01	0.01	0.01	<0.01	<0.01	<0.01	<0.01	0.03	<0.01	<0.01	<0.01	NA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**68**
Quinoline	-	-	0.05	-	-	-	-	<0.05	<0.05	<0.05	<0.05	-	-	-	-	<0.05	<0.05	<0.05	<0.05	**-**

Notes

MDL: Method Detection Limit
<X: Below MDL
MOE: Ontario Ministry of Environment
SCS: Site Condition Standard
-: Value not established or Parameter not analyzed
NA: Sample not analyzed for PAHs
Shaded Data exceeds the MOE Standards
(1) - MOE Standards = Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011
(2) - Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition & Coarse Grain Soils
*Elevated Method Detection Limit due to insuficient sample
**Method Detection Limit exceeds the guidelines

TABLE D-3: PAH Concentrations in Groundwater (2007-2012) - Continued

				DATA															GUIDELINES
Sample ID				MW-05							MW-06								
Sampling Date	MDL (µg/L)			Feb. 2007	Nov. 2007	May 2008	Jan 2009	Oct. 2009	Jan. 2010	Dec. 2010	Feb. 2007	Nov. 2007	May 2008	Jan 2009	Jan. 2010	Dec. 2010	Dec.2010 DUP-1	Nov. 2012	2011 MOE SCS [1] (Table 3) [2]
Parameter	2007-2008	2009	Oct. 2009 / Dec. 2010	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	**(µg/L)**
1-Methylnaphthalene	0.03	0.05	0.05	-	-	<0.03	<0.06	<0.05	<0.05	<0.05	NA	-	<0.03	<0.05	<0.05	<0.05	<0.05	<0.05	**1,800**
2-Methylnaphthalene	0.03	0.05	0.05	-	-	<0.03	<0.06	<0.05	<0.05	<0.05	NA	-	<0.03	<0.05	<0.05	<0.05	<0.05	<0.05	**1,800**
Acenaphthene	0.04	0.01	0.01	<0.04	<0.04	<0.04	<0.01	<0.01	<0.01	<0.01	NA	<0.04	<0.04	<0.01	<0.01	<0.01	<0.01	<0.01	**600**
Acenaphthylene	0.03	0.01	0.01	<0.03	<0.03	<0.03	<0.01	<0.01	<0.01	<0.01	NA	<0.03	<0.03	<0.01	<0.01	<0.01	<0.01	<0.01	**1.8**
Acridine	-	-	0.05	-	-	-	-	<0.05	<0.05	<0.05	-	-	-	-	<0.05	<0.05	<0.05	<0.05	**-**
Anthracene	0.01	0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	NA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**2.4**
Benzo(a)anthracene	0.01	0.01	0.01	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	NA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**4.7**
Benzo(a)pyrene	0.005	0.01	0.01	<0.005	<0.005	<0.005	<0.01	<0.01	<0.01	<0.01	NA	<0.005	<0.005	<0.01	<0.01	<0.01	<0.01	<0.01	**0.81**
Benzo(b)fluoranthene	0.05	0.01	0.01	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01	<0.01	NA	<0.05	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	**0.75**
Benzo(g,h,i)perylene	0.03	0.01	0.01	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01	<0.01	NA	<0.05	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	**0.2**
Benzo(k)fluoranthene	0.05	0.01	0.01	<0.03	<0.03	<0.03	<0.01	<0.01	<0.01	<0.01	NA	<0.03	<0.03	<0.01	<0.01	<0.01	<0.01	<0.01	**0.4**
Chrysene	0.04	0.01	0.01	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01	<0.01	NA	<0.05	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	**1**
Dibenzo(a,h)anthracene	0.05	0.01	0.01	<0.04	<0.04	<0.04	<0.01	<0.01	<0.01	<0.01	NA	<0.04	<0.04	<0.01	<0.01	<0.01	<0.01	<0.01	**0.52**
Fluoranthene	0.03	0.01	0.01	<0.03	<0.03	<0.03	<0.01	<0.01	<0.01	<0.01	NA	<0.03	<0.03	<0.01	<0.01	<0.01	<0.01	<0.01	**130**
Fluorene	0.03	0.01	0.01	<0.03	<0.03	<0.03	<0.01	<0.01	<0.01	<0.01	NA	<0.03	<0.03	<0.01	<0.01	<0.01	<0.01	<0.01	**400**
Indeno(1,2,3-cd)pyrene	0.05	0.01	0.01	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01	<0.01	NA	<0.05	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	**0.2**
Naphthalene	0.03	0.2	0.2	<0.03	<0.03	<0.03	<0.2	<0.2	<0.2	<0.2	NA	<0.03	<0.03	<0.2	<0.2	<0.2	<0.2	<0.2	**1,400**
Perylene	-	-	0.01	-	-	-	-	0.03	<0.01	<0.01	-	-	-	-	<0.01	<0.01	<0.01	<0.01	**-**
Phenanthrene	0.04	0.01	0.01	<0.04	<0.04	<0.04	<0.01	<0.01	<0.01	<0.01	NA	<0.04	<0.04	0.03	<0.01	<0.01	<0.01	<0.01	**580**
Pyrene	0.01	0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	NA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**68**
Quinoline	-	-	0.05	-	-	-	-	<0.05	<0.05	<0.05	-	-	-	-	<0.05	<0.05	<0.05	<0.05	**-**

Notes

MDL: Method Detection Limit
<X: Below MDL
MOE: Ontario Ministry of Environment
SCS: Site Condition Standard
-: Value not established or Parameter not analyzed
NA: Sample not analyzed for PAHs
Shaded Data exceeds the MOE Standards
DUP-1 (Dec. 2010) is a blind field duplicate of groundwater sample MW-06
(1) - MOE Standards = Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011
(2) - Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition & Coarse Grain Soils
*Elevated Method Detection Limit due to insuficient sample
**Method Detection Limit exceeds the guidelines

TABLE D-3: PAH Concentrations in Groundwater (2007-2012) - Continued

				DATA														GUIDELINES
Sample ID				MW-07										MW-08				**2011 MOE**
Sampling Date	MDL (µg/L)			Feb. 2007	Nov. 2007	May 2008	Jan 2009	Jan 2009 DUP-1	Jan. 2010	Jan. 2010 MW-07-D	Dec. 2010	Nov. 2012	Mar. 2010	Dec. 2010	Nov. 2012	Nov. 2012 DUP-01	**SCS [1] (Table 3) [2]**	
Parameter	2007-2008	2009	Oct. 2009 / Dec. 2010	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	**(µg/L)**
1-Methylnaphthalene	0.03	0.05	0.05	NA	-	<0.03	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	**1,800**
2-Methylnaphthalene	0.03	0.05	0.05	NA	-	<0.03	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	**1,800**
Acenaphthene	0.04	0.01	0.01	NA	<0.04	<0.04	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**600**
Acenaphthylene	0.03	0.01	0.01	NA	<0.03	<0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**1.8**
Acridine	-	-	0.05	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	**-**
Anthracene	0.01	0.01	0.01	NA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**2.4**
Benzo(a)anthracene	0.01	0.01	0.01	NA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**4.7**
Benzo(a)pyrene	0.005	0.01	0.01	NA	<0.005	<0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.81**
Benzo(b)fluoranthene	0.05	0.01	0.01	NA	<0.05	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.75**
Benzo(g,h,i)perylene	0.03	0.01	0.01	NA	<0.03	<0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.2**
Benzo(k)fluoranthene	0.05	0.01	0.01	NA	<0.05	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.4**
Chrysene	0.04	0.01	0.01	NA	<0.04	<0.04	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**1**
Dibenzo(a,h)anthracene	0.05	0.01	0.01	NA	<0.05	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.52**
Fluoranthene	0.03	0.01	0.01	NA	<0.03	<0.03	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**130**
Fluorene	0.03	0.01	0.01	NA	<0.03	<0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**400**
Indeno(1,2,3-cd)pyrene	0.05	0.01	0.01	NA	<0.05	<0.05	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.2**
Naphthalene	0.03	0.2	0.2	NA	<0.03	<0.03	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	**1,400**
Perylene	-	-	0.01	-	-	-	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**-**
Phenanthrene	0.04	0.01	0.01	NA	<0.04	<0.04	0.04	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**580**
Pyrene	0.01	0.01	0.01	NA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**68**
'Quinoline	-	-	0.05	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	**-**

Notes

MDL: Method Detection Limit
<X: Below MDL
MOE: Ontario Ministry of Environment
SCS: Site Condition Standard
-: Value not established or Parameter not analyzed
NA: Sample not analyzed for PAHs
Shaded Data exceeds the MOE Standards
MW-07-D (Jan. 2010) and DUP-1 (Jan. 2009) are blind field duplicates of groundwater sample MW-07
DUP-01 (Nov. 2012) is a blind field duplicate of groundwater sample MW-08
(1) - MOE Standards = Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011
(2) - Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition & Coarse Grain Soils
*Elevated Method Detection Limit due to insuficient sample
**Method Detection Limit exceeds the guidelines

TABLE D-4: VOC Concentrations in Groundwater (2007-2012)

Sample ID					DATA															GUIDELINES
					MW-01										MW-02					**2011 MOE**
Sampling Date					Feb. 2007	Nov. 2007	May 2008	Jan 2009	Oct. 2009	Jan. 2010	Jan. 2010 MW-01-D	Dec. 2010	Nov. 2012		Feb. 2007	Nov. 2007	May 2008	Oct. 2009	Jan. 2010	**SCS [1] (Table 3) [2]**
	MDL (µg/L)																			
Parameter	2007-2008	2009	Oct. 2009 / Dec. 2010	Nov. 2012	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	**(µg/L)**
Methyl Chloride	0.3	3	-	-	NA	< 0.3	< 0.3	-	-	-	-	-	-		NA	< 0.3	< 0.3	-	-	**610**
Vinyl Chloride	0.2	1	0.5	0.5	NA	< 0.2	< 0.2	<1	<0.5	<0.5	<0.5	<0.5	<0.5		NA	< 0.2	< 0.2	<0.5	<0.5	**0.5**
Bromomethane	0.4	8	3	3	NA	< 0.4	< 0.4	<8	<3	<3	<3	<3	<3		NA	< 0.4	< 0.4	<3	<3	**5.6**
Chloroethane	0.4	8	8	8	NA	< 0.4	< 0.4	<8	<8	<8	<8	<8	<8		NA	< 0.4	< 0.4	<8	<8	**-**
Trichlorofluoromethane	0.3	8	8	8	NA	< 0.3	< 0.3	<8	<8	<8	<8	<8	<8		NA	< 0.3	< 0.3	<8	<8	**2,500**
1,1-Dichloroethene	0.3	-	-	-	NA	< 0.3	< 0.3	-	-	-	-	-	-		NA	< 0.3	< 0.3	-	-	**-**
Methylene Chloride	5	-	3	3	NA	<5	<5	<3	<3	<3	<3	<3	<3		NA	<5	<5	<3	<3	**-**
Methyl-t-butyl ether	0.5	-	-	-	NA	<0.5	<0.5	-	-	-	-	-	-		NA	<0.5	<0.5	-	-	**190**
T1,2-Dichloroethylene	0.2	2	2	2	NA	< 0.2	< 0.2	<2**	<2**	<2**	<2**	<2**	<2**		NA	< 0.2	< 0.2	<2**	<2**	**1.6**
1,1-Dichloroethane	0.6	2	2	2	NA	< 0.6	< 0.6	<2**	<2**	<2**	<2**	<2**	<2**		NA	< 0.6	< 0.6	<2**	<2**	**1.6**
C1,2-Dichloroethylene	0.7	2	2	2	NA	< 0.7	< 0.7	<2**	<2**	<2**	<2**	<2**	<2**		NA	< 0.7	< 0.7	<2**	<2**	**1.6**
Chloroform	0.5	1	1	1	NA	< 0.5	< 0.5	<1	<1	<1	<1	<1	<1		NA	< 0.5	< 0.5	<1	<1	**2.4**
1,1,1-Trichloroethane	0.5	1	1	1	NA	< 0.5	< 0.5	<1	<1	<1	<1	<1	<1		NA	< 0.5	< 0.5	<1	<1	**640**
Carbon Tetrachloride	0.3	1	1	1	NA	< 0.3	< 0.3	<1**	<1**	<1**	<1**	<1**	<1**		NA	< 0.3	< 0.3	<1**	<1**	**0.79**
Benzene	0.4	1	1	1	NA	< 0.4	< 0.4	<1	<1	<1	<1	<1	<1		NA	< 0.4	< 0.4	<1	<1	**44**
1,2-Dichloroethane	0.4	1	1	1	NA	< 0.4	< 0.4	<1	<1	<1	<1	<1	<1		NA	< 0.4	< 0.4	<1	<1	**1.6**
Trichloroethylene	0.4	1	1	1	NA	< 0.4	< 0.4	<1	<1	<1	<1	<1	<1		NA	< 0.4	< 0.4	<1	<1	**1.6**
1,2-Dichloropropane	0.4	1	1	1	NA	< 0.4	< 0.4	<1	<1	<1	<1	<1	<1		NA	< 0.4	< 0.4	<1	<1	**16**
Bromodichloromethane	0.3	1	1	1	NA	< 0.3	< 0.3	<1	<1	<1	<1	<1	<1		NA	< 0.3	< 0.3	<1	<1	**85,000**
C1,3-Dichloropropene	0.4	2	2	2	NA	< 0.4	< 0.4	<2	<2	<2	<2	<2	<2		NA	< 0.4	< 0.4	<2	<2	**5.2**
Toluene	0.3	1	1	1	NA	< 0.3	0.5	<1	<1	<1	<1	<1	<1		NA	< 0.3	< 0.3	<1	<1	**18,000**
T1,3-Dichloropropene	0.3	1	1	1	NA	< 0.3	< 0.3	<1	<1	<1	<1	<1	<1		NA	< 0.3	< 0.3	<1	<1	**5.2**
1,1,2-Trichloroethane	0.4	1	1	1	NA	< 0.4	< 0.4	<1	<1	<1	<1	<1	<1		NA	< 0.4	< 0.4	<1	<1	**4.7**
Tetrachloroethylene	0.3	1	1	1	NA	0.6	< 0.3	<1	<1	<1	<1	<1	<1		NA	0.4	< 0.3	<1	<1	**1.6**
Dibromochloromethane	0.4	1	1	1	NA	< 0.4	< 0.4	<1	<1	<1	<1	<1	<1		NA	< 0.4	< 0.4	<1	<1	**82,000**
Ethylene Dibromide	0.3	1	1	1	NA	<0.3**	<0.3**	<1**	<1**	<1**	<1**	<1**	<1**		NA	<0.3**	<0.3**	<1**	<1**	**0.25**
Chlorobenzene	0.3	1	1	1	NA	< 0.3	< 0.3	<1	<1	<1	<1	<1	<1		NA	< 0.3	< 0.3	<1	<1	**630**
1,1,1,2,-Tetrachloroethane	0.3	-	-	-	NA	< 0.3	< 0.3	-	-	-	-	-			NA	< 0.3	< 0.3	-	-	**3.4**
Ethylbenzene	0.3	1	1	1	NA	< 0.3	< 0.3	<1	<1	<1	<1	<1	<1		NA	< 0.3	< 0.3	<1	<1	**28,000**
Bromoform	0.3	1	1	1	NA	< 0.3	< 0.3	<1	<1	<1	<1	<1	<1		NA	< 0.3	< 0.3	<1	<1	**380**
1,1,2,2,-Tetrachloroethane	0.3	1	1	1	NA	< 0.3	< 0.3	<1	<1	<1	<1	<1	<1		NA	< 0.3	< 0.3	<1	<1	**3.2**
1,3-Dichlorobenzene	0.3	1	1	1	NA	< 0.3	< 0.3	<1	<1	<1	<1	<1	<1		NA	< 0.3	< 0.3	<1	<1	**9,600**
1,4-Dichlorobenzene	0.4	1	1	1	NA	< 0.4	< 0.4	<1	<1	<1	<1	<1	<1		NA	< 0.4	< 0.4	<1	<1	**8**
1,2-Dichlorobenzene	0.4	0.5	0.5	0.5	NA	< 0.4	< 0.4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		NA	< 0.4	< 0.4	<0.5	<0.5	**4,600**
m/p-Xylene	0.6	2	2	2	NA	< 0.6	< 0.6	<2	<2	<2	<2	<2	<2		NA	< 0.6	< 0.6	<2	<2	**4,200**
o-Xylene	0.2	1	1	1	NA	< 0.2	< 0.2	<1	<1	<1	<1	<1	<1		NA	< 0.2	< 0.2	<1	<1	
Styrene	0.2	1	1	1	NA	< 0.2	< 0.2	<1	<1	<1	<1	<1	<1		NA	< 0.2	< 0.2	<1	<1	**1,300**
1,2,4-Trichlorobenzene	0.5	-	-	-	NA	< 0.5	< 0.5	-	-	-	-	-	-		NA	< 0.5	< 0.5	-	-	**180**
Acetone	10	-	-	-	NA	<10	12	-	-	-	-	-	-		NA	<10	<10	-	-	**130,000**
Methyl Ethyl Ketone	10	-	-	-	NA	<10	<10	-	-	-	-	-	-		NA	<10	<10	-	-	**470,000**
MIBK	10	-	-	-	NA	<10	<10	-	-	-	-	-	-		NA	<10	<10	-	-	**-**
2-Chloroethylvinyl Ether	10	-	-	-	NA	<10	<10	-	-	-	-	-	-		NA	<10	<10	-	-	**-**
1,1-Dichloroethylene	-	2	0.5	0.5	-	-	-	<2**	<0.4	<0.4	<0.4	<0.4	<0.5		-	-	-	<0.4	<0.4	**1.6**
Chloromethane	-	8	8	8	-	-	-	<8	<8	<8	<8	<8	<8		-	-	-	<8	<8	**-**

Notes

MDL: Method Detection Limit
<X: Below MDL
MOE: Ontario Ministry of Environment
SCS: Site Condition Standards
NA: Sample not analyzed for VOCs
Shaded Data exceeds the MOE Standards
**Method Detection Limit exceeds the guidelines
1 - MOE Standards = Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011
2 - Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition & Coarse Grain Soils
-: Value not established

TABLE D-4: VOC Concentrations in Groundwater (2007-2012) - Continued

Sample ID					DATA															GUIDELINES
					MW-03								MW-04							
Sampling Date					Feb. 2007	Nov. 2007	May 2008	Jan 2009	Oct. 2009	Jan. 2010	Dec. 2010	Nov. 2012	Feb. 2007	Nov. 2007	May 2008	Jan 2009	Oct. 2009	Jan. 2010	Dec. 2010	Nov. 2012	**2011 MOE SCS [1] (Table 3) [2]**
	MDL (µg/L)																			
Parameter	2007-2008	2009	Oct. 2009 / Dec. 2010	Nov. 2012	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	**(µg/L)**
Methyl Chloride	0.3	3	-	-	<0.3	< 0.3	< 0.3	-	-	-	-	-	NA	< 0.3	< 0.3	-	-	-	-	-	**610**
Vinyl Chloride	0.2	1	0.5	0.5	<0.2	< 0.2	< 0.2	<1**	<0.5	<0.5	<0.5	<0.5	NA	< 0.2	< 0.2	<1**	<0.5	<0.5	<0.5	<0.5	**0.5**
Bromomethane	0.4	8	3	3	<0.4	< 0.4	< 0.4	<8**	<3	<3	<3	<3	NA	< 0.4	< 0.4	<8**	<3	<3	<3	<3	**5.6**
Chloroethane	0.4	8	8	8	<0.4	< 0.4	< 0.4	<8	<8	<8	<8	<8	NA	< 0.4	< 0.4	<8	<8	<8	<8	<8	**-**
Trichlorofluoromethane	0.3	8	8	8	<0.3	< 0.3	< 0.3	<8	<8	<8	<8	<8	NA	< 0.3	< 0.3	<8	<8	<8	<8	<8	**2,500**
1,1-Dichloroethene	0.3	-	-	-	<0.3	< 0.3	< 0.3	-	-	-	-	-	NA	< 0.3	< 0.3	-	-	-	-	-	**-**
Methylene Chloride	5	-	3	3	<5	<5	<5	<3	<3	<3	<3	<3	NA	<5	<5	<3	<3	<3	<3	<3	**-**
Methyl-t-butyl ether	0.5	-	-	-	-	<0.5	<0.5	-	-	-	-	-	NA	<0.5	<0.5	-	-	-	-	-	**190**
T1,2-Dichloroethylene	0.2	2	2	2	<0.2	< 0.2	< 0.2	<2**	<2**	<2**	<2**	<2**	NA	< 0.2	< 0.2	<2**	<2**	<2**	<2**	<2**	**1.6**
1,1-Dichloroethane	0.6	2	2	2	<0.3	< 0.6	< 0.6	<2**	<2**	<2**	<2**	<2**	NA	< 0.6	< 0.6	<2**	<2**	<2**	<2**	<2**	**1.6**
C1,2-Dichloroethylene	0.7	2	2	2	<0.7	< 0.7	< 0.7	<2**	<2**	<2**	<2**	<2**	NA	< 0.7	< 0.7	<2**	<2**	<2**	<2**	<2**	**1.6**
Chloroform	0.5	1	1	1	<0.5	< 0.5	< 0.5	<1	<1	<1	<1	<1	NA	< 0.5	< 0.5	<1	<1	<1	<1	<1	**2.4**
1,1,1-Trichloroethane	0.5	1	1	1	<0.5	< 0.5	< 0.5	<1	<1	<1	<1	<1	NA	< 0.5	< 0.5	<1	<1	<1	<1	<1	**640**
Carbon Tetrachloride	0.3	1	1	1	<0.3	< 0.3	< 0.3	<1**	<1**	<1**	<1**	<1**	NA	< 0.3	< 0.3	<1**	<1**	<1**	<1**	<1**	**0.79**
Benzene	0.4	1	1	1	<0.4	< 0.4	< 0.4	<1	<1	<1	<1	<1	NA	< 0.4	< 0.4	<1	<1	<1	<1	<1	**44**
1,2-Dichloroethane	0.4	1	1	1	<0.4	< 0.4	< 0.4	<1	<1	<1	<1	<1	NA	< 0.4	< 0.4	<1	<1	<1	<1	<1	**1.6**
Trichloroethylene	0.4	1	1	1	<0.4	< 0.4	< 0.4	<1	<1	<1	<1	<1	NA	< 0.4	< 0.4	<1	<1	<1	<1	<1	**1.6**
1,2-Dichloropropane	0.4	1	1	1	<0.4	< 0.4	< 0.4	<1	<1	<1	<1	<1	NA	< 0.4	< 0.4	<1	<1	<1	<1	<1	**16**
Bromodichloromethane	0.3	1	1	1	<0.3	< 0.3	< 0.3	<1	<1	<1	<1	<1	NA	< 0.3	< 0.3	<1	<1	<1	<1	<1	**85,000**
C1,3-Dichloropropene	0.4	2	2	2	<0.4	< 0.4	< 0.4	<2	<2	<2	<2	<2	NA	< 0.4	< 0.4	<2	<2	<2	<2	<2	**5.2**
Toluene	0.3	1	1	1	0.4	3.7	10.5	<1	11	<1	<1	<1	NA	< 0.3	< 0.3	490	<1	<1	<1	<1	**18,000**
T1,3-Dichloropropene	0.3	1	1	1	-	< 0.3	< 0.3	<1	<1	<1	<1	<1	NA	< 0.3	< 0.3	<1	<1	<1	<1	<1	**5.2**
1,1,2-Trichloroethane	0.4	1	1	1	<0.4	< 0.4	< 0.4	<1	<1	<1	<1	<1	NA	< 0.4	< 0.4	<1	<1	<1	<1	<1	**4.7**
Tetrachloroethylene	0.3	1	1	1	<0.3	0.8	< 0.3	<1	<1	<1	<1	<1	NA	0.7	< 0.3	<1	<1	<1	<1	<1	**1.6**
Dibromochloromethane	0.4	1	1	1	<0.4	< 0.4	< 0.4	<1	<1	<1	<1	<1	NA	< 0.4	< 0.4	<1	<1	<1	<1	<1	**82,000**
Ethylene Dibromide	0.3	1	1	1	<0.3**	<0.3**	<0.3**	<1**	<1**	<1**	<1**	<1**	NA	<0.3**	<0.3**	<1**	<1**	<1**	<1**	<1**	**0.25**
Chlorobenzene	0.3	1	1	1	<0.3	< 0.3	< 0.3	<1	<1	<1	<1	<1	NA	< 0.3	< 0.3	<1	<1	<1	<1	<1	**630**
1,1,1,2,-Tetrachloroethane	0.3	-	-	-	<0.3	< 0.3	< 0.3	-	-	-	-		NA	< 0.3	< 0.3	-	-	-	-		**3.4**
Ethylbenzene	0.3	1	1	1	<0.3	< 0.3	< 0.3	<1	<1	<1	<1	<1	NA	< 0.3	< 0.3	<1	<1	<1	<1	<1	**28,000**
Bromoform	0.3	1	1	1	<0.3	< 0.3	< 0.3	<1	<1	<1	<1	<1	NA	< 0.3	< 0.3	<1	<1	<1	<1	<1	**380**
1,1,2,2,-Tetrachloroethane	0.3	1	1	1	<0.3	< 0.3	< 0.3	<1	<1	<1	<1	<1	NA	< 0.3	< 0.3	<1	<1	<1	<1	<1	**3.2**
1,3-Dichlorobenzene	0.3	1	1	1	-	< 0.3	< 0.3	<1	<1	<1	<1	<1	NA	< 0.3	< 0.3	<1	<1	<1	<1	<1	**9,600**
1,4-Dichlorobenzene	0.4	1	1	1	<0.4	< 0.4	< 0.4	<1	<1	<1	<1	<1	NA	< 0.4	< 0.4	<1	<1	<1	<1	<1	**8**
1,2-Dichlorobenzene	0.4	0.5	0.5	0.5	<0.4	< 0.4	< 0.4	<0.5	<0.5	<0.5	<0.5	<0.5	NA	< 0.4	< 0.4	<0.5	<0.5	<0.5	<0.5	<0.5	**4,600**
m/p-Xylene	0.6	2	2	2	<0.6	< 0.6	< 0.6	<2	<2	<2	<2	<2	NA	< 0.6	< 0.6	<2	<2	<2	<2	<2	**4,200**
o-Xylene	0.2	1	1	1	<0.2	< 0.2	< 0.2	<1	<1	<1	<1	<1	NA	< 0.2	< 0.2	<1	<1	<1	<1	<1	
Styrene	0.2	1	1	1	<0.2	< 0.2	< 0.2	<1	<1	<1	<1	<1	NA	< 0.2	< 0.2	<1	<1	<1	<1	<1	**1,300**
1,2,4-Trichlorobenzene	0.5	-	-	-	<0.5	< 0.5	< 0.5	-	-	-	-	-	NA	< 0.5	< 0.5	-	-	-	-	-	**180**
Acetone	10	-	-	-	<10	<10	<10	-	-	-	-	-	NA	<10	<10	-	-	-	-	-	**130,000**
Methyl Ethyl Ketone	10	-	-	-	<10	<10	<10	-	-	-	-	-	NA	<10	<10	-	-	-	-	-	**470,000**
MIBK	10	-	-	-	<10	<10	<10	-	-	-	-	-	NA	<10	<10	-	-	-	-	-	**-**
2-Chloroethylvinyl Ether	10	-	-	-	<10	<10	<10	-	-	-	-	-	NA	<10	<10	-	-	-	-	-	**-**
1,1-Dichloroethylene	-	2	0.5	0.5	-	-	-	<2**	<0.4	<0.4	<0.4	<0.5	-	-	-	<2**	<0.4	<0.4	<0.4	<0.5	**1.6**
Chloromethane	-	8	8	8	-	-	-	<8	<8	<8	<8	<8	-	-	-	<8	<8	<8	<8	<8	**-**

Notes

MDL: Method Detection Limit
<X: Below MDL
MOE: Ontario Ministry of Environment
SCS: Site Condition Standards
NA: Sample not analyzed for VOCs
Shaded Data exceeds the MOE Standards
**Method Detection Limit exceeds the guidelines
1 - MOE Standards = Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011
2 - Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition & Coarse Grain Soils
-: Value not established

TABLE D-4: VOC Concentrations in Groundwater (2007-2012) - Continued

					DATA														GUIDELINES
Sample ID					MW-05							MW-06							
Sampling Date					Feb. 2007	Nov. 2007	May 2008	Jan 2009	Oct. 2009	Jan. 2010	Dec. 2010	Feb. 2007	Nov. 2007	May 2009	Jan 2008	Oct. 2009	Jan. 2010	Dec. 2010	Nov. 2012	**2011 MOE SCS [1] (Table 3) [2]**
	MDL (µg/L)																		
Parameter	2007-2008	2009.00	Oct. 2009 / Dec. 2010	Nov. 2012	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	**(µg/L)**
Methyl Chloride	0.3	3	-	-	<0.3	< 0.3	< 0.3	-	-	-	-	NA	< 0.3	< 0.3	-	-	-	-	-	**610**
Vinyl Chloride	0.2	1	0.5	0.5	<0.2	< 0.2	< 0.2	<1**	<0.5	<0.5	<0.5	NA	< 0.2	< 0.2	<1**	<0.5	<0.5	<0.5	<0.5	**0.5**
Bromomethane	0.4	8	3	3	<0.4	< 0.4	< 0.4	<8**	<3	<3	<3	NA	< 0.4	< 0.4	<8**	<3	<3	<3	<3	**5.6**
Chloroethane	0.4	8	8	8	<0.4	< 0.4	< 0.4	<8	<8	<8	<8	NA	< 0.4	< 0.4	<8	<8	<8	<8	<8	**-**
Trichlorofluoromethane	0.3	8	8	8	<0.3	< 0.3	< 0.3	<8	<8	<8	<8	NA	< 0.3	< 0.3	<8	<8	<8	<8	<8	**2,500**
1,1-Dichloroethene	0.3	-	-	-	<0.3	< 0.3	< 0.3	-	-	-	-	NA	< 0.3	< 0.3	-	-	-	-	-	**-**
Methylene Chloride	5	-	3	3	<5	<5	<5	<3	<3	<3	<3	NA	<5	<5	<3	<3	<3	<3	<3	**-**
Methyl-t-butyl ether	0.5	-	-	-	-	<0.5	<0.5	-	-	-	-	NA	<0.5	<0.5	-	-	-	-	-	**190**
T1,2-Dichloroethylene	0.2	2	2	2	<0.2	< 0.2	< 0.2	<2**	<2**	<2**	<2**	NA	< 0.2	< 0.2	<2**	<2**	<2**	<2**	<2**	**1.6**
1,1-Dichloroethane	0.6	2	2	2	<0.3	< 0.6	< 0.6	<2**	<2**	<2**	<2**	NA	< 0.6	< 0.6	<2**	<2**	<2**	<2**	<2**	**1.6**
C1,2-Dichloroethylene	0.7	2	2	2	<0.7	< 0.7	< 0.7	<2**	<2**	<2**	<2**	NA	< 0.7	< 0.7	<2**	<2**	<2**	<2**	<2**	**1.6**
Chloroform	0.5	1	1	1	<0.5	< 0.5	< 0.5	<1	<1	<1	<1	NA	< 0.5	< 0.5	<1	<1	<1	<1	<1	**2.4**
1,1,1-Trichloroethane	0.5	1	1	1	<0.5	< 0.5	< 0.5	<1	<1	<1	<1	NA	< 0.5	< 0.5	<1	<1	<1	<1	<1	**640**
Carbon Tetrachloride	0.3	1	1	1	<0.3	< 0.3	< 0.3	<1**	<1**	<1**	<1**	NA	< 0.3	< 0.3	<1**	<1**	<1**	<1**	<1**	**0.79**
Benzene	0.4	1	1	1	<0.4	< 0.4	< 0.4	<1	<1	<1	<1	NA	< 0.4	< 0.4	<1	<1	<1	<1	<1	**44**
1,2-Dichloroethane	0.4	1	1	1	<0.4	< 0.4	< 0.4	<1	<1	<1	<1	NA	< 0.4	< 0.4	<1	<1	<1	<1	<1	**1.6**
Trichloroethylene	0.4	1	1	1	<0.4	< 0.4	< 0.4	<1	<1	<1	<1	NA	< 0.4	< 0.4	<1	<1	<1	<1	<1	**1.6**
1,2-Dichloropropane	0.4	1	1	1	<0.4	< 0.4	< 0.4	<1	<1	<1	<1	NA	< 0.4	< 0.4	<1	<1	<1	<1	<1	**16**
Bromodichloromethane	0.3	1	1	1	<0.3	< 0.3	< 0.3	<1	<1	<1	<1	NA	< 0.3	< 0.3	<1	<1	<1	<1	<1	**85,000**
C1,3-Dichloropropene	0.4	2	2	2	<0.4	< 0.4	< 0.4	<2	<2	<2	<2	NA	< 0.4	< 0.4	<2	<2	<2	<2	<2	**5.2**
Toluene	0.3	1	1	1	<0.3	< 0.3	< 0.3	<1	<1	<1	<1	NA	< 0.3	1.1	<1	51	<1	<1	<1	**18,000**
T1,3-Dichloropropene	0.3	1	1	1	-	< 0.3	< 0.3	<1	<1	<1	<1	NA	< 0.3	< 0.3	<1	<1	<1	<1	<1	**5.2**
1,1,2-Trichloroethane	0.4	1	1	1	<0.4	< 0.4	< 0.4	<1	<1	<1	<1	NA	< 0.4	< 0.4	<1	<1	<1	<1	<1	**4.7**
Tetrachloroethylene	0.3	1	1	1	<0.3	0.5	< 0.3	<1	<1	<1	<1	NA	0.7	< 0.3	<1	<1	<1	<1	<1	**1.6**
Dibromochloromethane	0.4	1	1	1	<0.4	< 0.4	< 0.4	<1	<1	<1	<1	NA	< 0.4	< 0.4	<1	<1	<1	<1	<1	**82,000**
Ethylene Dibromide	0.3	1	1	1	<0.3**	<0.3**	<0.3**	<1**	<1**	<1**	<1**	NA	<0.3**	<0.3**	<1**	<1**	<1**	<1**	<1**	**0.25**
Chlorobenzene	0.3	1	1	1	<0.3	< 0.3	< 0.3	<1	<1	<1	<1	NA	< 0.3	< 0.3	<1	<1	<1	<1	<1	**630**
1,1,1,2,-Tetrachloroethane	0.3	-	-	-	<0.3	< 0.3	< 0.3	-	-	-	-	NA	< 0.3	< 0.3	-	-	-	-		**3.4**
Ethylbenzene	0.3	1	1	1	<0.3	< 0.3	< 0.3	<1	<1	<1	<1	NA	< 0.3	< 0.3	<1	<1	<1	<1	<1	**28,000**
Bromoform	0.3	1	1	1	<0.3	< 0.3	< 0.3	<1	<1	<1	<1	NA	< 0.3	< 0.3	<1	<1	<1	<1	<1	**380**
1,1,2,2,-Tetrachloroethane	0.3	1	1	1	<0.3	< 0.3	< 0.3	<1	<1	<1	<1	NA	< 0.3	< 0.3	<1	<1	<1	<1	<1	**3.2**
1,3-Dichlorobenzene	0.3	1	1	1	-	< 0.3	< 0.3	<1	<1	<1	<1	NA	< 0.3	< 0.3	<1	<1	<1	<1	<1	**9,600**
1,4-Dichlorobenzene	0.4	1	1	1	<0.4	< 0.4	< 0.4	<1	<1	<1	<1	NA	< 0.4	< 0.4	<1	<1	<1	<1	<1	**8**
1,2-Dichlorobenzene	0.4	0.5	0.5	0.5	<0.4	< 0.4	< 0.4	<0.5	<0.5	<0.5	<0.5	NA	< 0.4	< 0.4	<0.5	<0.5	<0.5	<0.5	<0.5	**4,600**
m/p-Xylene	0.6	2	2	2	<0.6	< 0.6	< 0.6	<2	<2	<2	<2	NA	< 0.6	< 0.6	<2	<2	<2	<2	<2	**4,200**
o-Xylene	0.2	1	1	1	<0.2	< 0.2	< 0.2	<1	<1	<1	<1	NA	< 0.2	< 0.2	<1	<1	<1	<1	<1	
Styrene	0.2	1	1	1	<0.2	< 0.2	< 0.2	<1	<1	<1	<1	NA	< 0.2	< 0.2	<1	<1	<1	<1	<1	**1,300**
1,2,4-Trichlorobenzene	0.5	-	-	-	<0.5	< 0.5	< 0.5	-	-	-	-	NA	< 0.5	< 0.5	-	-	-	-	-	**180**
Acetone	10	-	-	-	<10	<10	11	-	-	-	-	NA	<10	<10	-	-	-	-	-	**130,000**
Methyl Ethyl Ketone	10	-	-	-	<10	<10	<10	-	-	-	-	NA	<10	<10	-	-	-	-	-	**470,000**
MIBK	10	-	-	-	<10	<10	<10	-	-	-	-	NA	<10	<10	-	-	-	-	-	**-**
2-Chloroethylvinyl Ether	10	-	-	-	<10	<10	<10	-	-	-	-	NA	<10	<10	-	-	-	-	-	**-**
1,1-Dichloroethylene	-	2	0.5	0.5	-	-	-	<2**	<0.4	<0.4	<0.4	-	-	-	<2**	<0.4	<0.4	<0.4	<0.5	**1.6**
Chloromethane	-	8	8	8	-	-	-	<8	<8	<8	<8	-	-	-	<8	<8	<8	<8	<8	**-**

Notes

MDL: Method Detection Limit
<X: Below MDL
MOE: Ontario Ministry of Environment
SCS: Site Condition Standards
NA: Sample not analyzed for VOCs
Shaded Data exceeds the MOE Standards
-: Value not established
**Method Detection Limit exceeds the guidelines
1 - MOE Standards = Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011
2 - Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition & Coarse Grain Soils

TABLE D-4: VOC Concentrations in Groundwater (2007-2012) - Continued

Sample ID					DATA													GUIDELINES
					MW-07										MW-08		DUP-01	
Sampling Date					Feb. 2007	Nov. 2007	May 2008	Jan 2009	Jan 2009 DUP-1	Oct. 2009	Jan. 2010	Jan. 2010 MW-07-D	Dec. 2010	Nov. 2012	Dec. 2010	Nov. 2012	Nov. 2012	**2011 MOE SCS [1] (Table 3) [2]**
	MDL (µg/L)																	
Parameter	2007-2008	2009.00	Oct. 2009 / Jan. 2010	Nov. 2012	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	**(µg/L)**
Methyl Chloride	0.3	3	-	-	NA	< 0.3	< 0.3	-	-	-	-	-	-	-	-	-	-	**610**
Vinyl Chloride	0.2	1	0.5	0.5	NA	< 0.2	< 0.2	<1**	<1**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**0.5**
Bromomethane	0.4	8	3	3	NA	< 0.4	< 0.4	<8**	<8**	<3	<3	<3	<3	<3	<3	<3	<3	**5.6**
Chloroethane	0.4	8	8	8	NA	< 0.4	< 0.4	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	**-**
Trichlorofluoromethane	0.3	8	8	8	NA	< 0.3	< 0.3	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	**2,500**
1,1-Dichloroethene	0.3	-	-	-	NA	< 0.3	< 0.3	-	-	-	-	-	-	-	-	-	-	**-**
Methylene Chloride	5	-	3	3	NA	<5	<5	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	**-**
Methyl-t-butyl ether	0.5	-	-	-	NA	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	**190**
T1,2-Dichloroethylene	0.2	2	2	2	NA	< 0.2	< 0.2	<2**	<2**	<2**	<2**	<2**	<2**	<2**	<2**	<2**	<2**	**1.6**
1,1-Dichloroethane	0.6	2	2	2	NA	< 0.6	< 0.6	<2**	<2**	<2**	<2**	<2**	<2**	<2**	<2**	<2**	<2**	**1.6**
C1,2-Dichloroethylene	0.7	2	2	2	NA	< 0.7	< 0.7	<2**	<2**	<2**	<2**	<2**	<2**	<2**	<2**	<2**	<2**	**1.6**
Chloroform	0.5	1	1	1	NA	< 0.5	< 0.5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	**2.4**
1,1,1-Trichloroethane	0.5	1	1	1	NA	< 0.5	< 0.5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	**640**
Carbon Tetrachloride	0.3	1	1	1	NA	< 0.3	< 0.3	<1**	<1**	<1**	<1**	<1**	<1**	<1**	<1**	<1**	<1**	**0.79**
Benzene	0.4	1	1	1	NA	< 0.4	< 0.4	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	**44**
1,2-Dichloroethane	0.4	1	1	1	NA	< 0.4	< 0.4	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	**1.6**
Trichloroethylene	0.4	1	1	1	NA	< 0.4	< 0.4	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	**1.6**
1,2-Dichloropropane	0.4	1	1	1	NA	< 0.4	< 0.4	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	**16**
Bromodichloromethane	0.3	1	1	1	NA	< 0.3	< 0.3	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	**85,000**
C1,3-Dichloropropene	0.4	2	2	2	NA	< 0.4	< 0.4	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	**5.2**
Toluene	0.3	1	1	1	NA	< 0.3	0.9	5	6	6	4	4	<1	<1	<1	<1	<1	**18,000**
T1,3-Dichloropropene	0.3	1	1	1	NA	< 0.3	< 0.3	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	**5.2**
1,1,2-Trichloroethane	0.4	1	1	1	NA	< 0.4	< 0.4	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	**4.7**
Tetrachloroethylene	0.3	1	1	1	NA	0.7	< 0.3	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	**1.6**
Dibromochloromethane	0.4	1	1	1	NA	< 0.4	< 0.4	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	**82,000**
Ethylene Dibromide	0.3	1	1	1	NA	<0.3**	<0.3**	<1**	<1**	<1**	<1**	<1**	<1**	<1**	<1**	<1**	<1**	**0.25**
Chlorobenzene	0.3	1	1	1	NA	< 0.3	< 0.3	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	**630**
1,1,1,2,-Tetrachloroethane	0.3	-	-	-	NA	< 0.3	< 0.3	-	-	-	-	-	-		-			**3.4**
Ethylbenzene	0.3	1	1	1	NA	< 0.3	< 0.3	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	**28,000**
Bromoform	0.3	1	1	1	NA	< 0.3	< 0.3	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	**380**
1,1,2,2,-Tetrachloroethane	0.3	1	1	1	NA	< 0.3	< 0.3	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	**3.2**
1,3-Dichlorobenzene	0.3	1	1	1	NA	< 0.3	< 0.3	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	**9,600**
1,4-Dichlorobenzene	0.4	1	1	1	NA	< 0.4	< 0.4	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	**8**
1,2-Dichlorobenzene	0.4	0.5	0.5	0.5	NA	< 0.4	< 0.4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**4,600**
m/p-Xylene	0.6	2	2	2	NA	< 0.6	< 0.6	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	**4,200**
o-Xylene	0.2	1	1	1	NA	< 0.2	< 0.2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
Styrene	0.2	1	1	1	NA	< 0.2	< 0.2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	**1,300**
1,2,4-Trichlorobenzene	0.5	-	-	-	NA	< 0.5	< 0.5	-	-	-	-	-	-	-	-	-	-	**180**
Acetone	10	-	-	-	NA	<10	<10	-	-	-	-	-	-	-	-	-	-	**130,000**
Methyl Ethyl Ketone	10	-	-	-	NA	<10	<10	-	-	-	-	-	-	-	-	-	-	**470,000**
MIBK	10	-	-	-	NA	<10	<10	-	-	-	-	-	-	-	-	-	-	**-**
2-Chloroethylvinyl Ether	10	-	-	-	NA	<10	<10	-	-	-	-	-	-	-	-	-	-	**-**
1,1-Dichloroethylene	-	2	0.5	0.5	-	-	-	<2**	<2**	<0.5	<0.5	<0.5	<0.4	<0.5	<0.4	<0.5	<0.5	**1.6**
Chloromethane	-	8	8	8	-	-	-	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	**-**

Notes

MDL: Method Detection Limit
<X: Below MDL
MOE: Ontario Ministry of Environment
SCS: Site Condition Standards
NA: Sample not analyzed for VOCs
Shaded Data exceeds the MOE Standards
**Method Detection Limit exceeds the guidelines
-: Value not established
DUP-1 is a blind field duplicate of groundwater sample MW-07
DUP-01 (Nov. 2012) is a blind field duplicate of groundwater sample MW-08
1 - MOE Standards = Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011
2 - Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition & Coarse Grain Soils

TABLE D-5: PCB Concentrations in Groundwater (2007-2012)

Sample ID					DATA																GUIDELINES
					MW-01										MW-02						2011 MOE
Sampling Date	MDL (µg/L)				Feb. 2007	Nov. 2007	May 2008	Mar.2009 (AMEC)	Mar.2008 (MAX)	Oct. 2009	Jan. 2010	Dec. 2010	Dec. 2011	Nov. 2012	Feb. 2007	Nov. 2007	May 2008	Oct. 2009	Jan. 2010	Dec. 2011	Standards (1) (Table 3) (2)
Parameter	2007 - 2009	2009 - 2010	2011	2012	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(ug/L)
Polychlorinated Biphenyls	0.04	0.05	0.06/0.05	0.05	NA	<0.04	<0.04	<0.04	<0.05	0.07	<0.05	<0.05	<0.06	<0.05	NA	<0.04	<0.04	<0.05	<0.06	<0.05	**7.8**

Notes

MDL: Method Detection Limit
<X: Below MDL
MOE: Ontario Ministry of the Environment
(AMEC) = Sample analyzed at the AMEC Lab
(MAX) = Sample analyzed at the Maxxam Lab
(1) - MOE Standards = Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011
(2) - Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition & Coarse Grain Soils
NA: Sample not analyzed for PCBs
Shaded and bold data exceeds the MOE SCS
* Higher method detection limit reported due to dilution caused by 3 non-PCB peaks which masked the chromatogram

TABLE D-5: PCB Concentrations in Groundwater (2007-2012) - Continued

					DATA																		GUIDELINES
Sample ID					MW-03										MW-04								
Sampling Date	MDL (µg/L)				Feb. 2007	Nov. 2007	May 2008	Mar.2009	Oct. 2009	Jan. 2010	Dec. 2010	Dec. 2011	Nov. 2012	Feb. 2007	Nov. 2007	May 2008	Mar. 2009	Oct. 2009	Jan. 2010	Dec. 2010	Dec. 2011	Nov. 2012	2011 MOE Standards (1) (Table 3) (2)
Parameter	2007 - 2009	2009 - 2010	2011	2012	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(ug/L)
Polychlorinated Biphenyls	0.04	0.05	0.05	0.06/0.05	<0.4*	<0.04	<0.04	<0.04	<0.05	<0.06	<0.05	<0.05	<0.06	NA	<0.04	<0.04	<0.04	<0.05	<0.05	<0.05	<0.05	<0.05	**7.8**

Notes

MDL: Method Detection Limit
<X: Below MDL
MOE: Ontario Ministry of the Environment
(AMEC) = Sample analyzed at the AMEC Lab
(MAX) = Sample analyzed at the Maxxam Lab
(1) - MOE Standards = Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011
(2) - Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition & Coarse Grain Soils
NA: Sample not analyzed for PCBs
Shaded and bold data exceeds the MOE SCS
* Higher method detection limit reported due to dilution caused by 3 non-PCB peaks which masked the chromatogram

TABLE D-5: PCB Concentrations in Groundwater (2007-2012) - Continued

					DATA														GUIDELINES
Sample ID					MW-05							MW-06							
Sampling Date	MDL (µg/L)				Feb 2007	Nov. 2007	May 2008	Oct. 2009	Jan. 2010	Dec. 2010	Dec. 2011	Feb. 2007	Nov. 2007	May 2008	Oct. 2009	Jan. 2010	Dec. 2010	Dec. 2011	Nov. 2012	2009 MOE Standards (1) (Table 3) (2)
Parameter	2007 - 2009	2009 - 2010	2011	2012	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(ug/L)
Polychlorinated Biphenyls	0.04	0.05	0.05/0.06	0.06	<0.04	<0.04	<0.04	<0.05	<0.05	<0.05	<0.05	NA	<0.04	<0.04	<0.05	<0.05	<0.05	<0.06	<0.06	**7.8**

Notes

MDL: Method Detection Limit
<X: Below MDL
MOE: Ontario Ministry of the Environment
(AMEC) = Sample analyzed at the AMEC Lab
(MAX) = Sample analyzed at the Maxxam Lab
(1) - MOE Standards = Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011
(2) - Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition & Coarse Grain Soils
NA: Sample not analyzed for PCBs
Shaded and bold data exceeds the MOE SCS
* Higher method detection limit reported due to dilution caused by 3 non-PCB peaks which masked the chromatogram
(DUP-2) is a blind field duplicate of groundwater sample MW-07

TABLE D-5: PCB Concentrations in Groundwater (2007-2012) - Continued

					DATA																		GUIDELINES
Sample ID											MW-07								MW-08				2011 MOE
Sampling Date	MDL (µg/L)				Feb. 2007	Nov. 2007	May 2008	Mar. 2009 (AMEC)	Mar. 2009 (DUP-2)	Mar. 2009 (MAX)	Oct. 2009	Jan. 2010	Jan. 2010 (MW-07-D)	Dec. 2010	Dec. 2011	Dec. 2011 MW-09	Nov. 2012	Dec. 2010	Dec. 2011	Nov. 2012	Nov. 2012 DUP-01	Standards (1) (Table 3) (2)
Parameter	2007 - 2009	2009 - 2010	2011	2012	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(ug/L)
Polychlorinated Biphenyls	0.04	0.05	0.05	0.05	NA	<0.04	<0.04	<0.04	<0.04	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	**7.8**

Notes

MDL: Method Detection Limit
<X: Below MDL
MOE: Ontario Ministry of the Environment
(AMEC) = Sample analyzed at the AMEC Lab
(MAX) = Sample analyzed at the Maxxam Lab
(1) - MOE Standards = Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011
(2) - Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition & Coarse Grain Soils
NA: Sample not analyzed for PCBs
Shaded and bold data exceeds the MOE SCS
* Higher method detection limit reported due to dilution caused by 3 non-PCB peaks which masked the chromatogram
MW-09 (Dec. 2011), MW-07-D (Jan. 2010) and DUP-2 (Mar. 2009) are blind field duplicates of groundwater sample MW-07
DUP-01 (Nov. 2012) is a blind field duplicate of groundwater sample MW-08

TABLE D-6: Dioxin and Furan Concentrations in Groundwater (2007-2012)

	DATA										GUIDELINE
Sampling Date	Nov. 2007			May 2008			Jan 2009				**2011 MOE SCS [3] (Table 3) [4]**
Sample ID	MW-01	MDL	TEF Equivalent	MW-01	MDL	TEF Equivalent	MW-01	MDL	TEF Equivalent	TEF (WHO) 1997[2]	
Parameter	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)		
2,3,7,8-Tetra CDD *	ND	4.23	4.23	ND	0.815	0.815	ND	0.834	0.834	1	
1,2,3,7,8-Penta CDD	ND	0.858	0.858	1.95	0.794	1.95	ND	0.750	0.750	1	
1,2,3,4,7,8-Hexa CDD	ND	0.666	0.0666	ND	1.21	0.121	ND	1.02	0.102	0.1	
1,2,3,6,7,8-Hexa CDD	0.706	0.625	0.0706	ND	1.15	0.115	ND	1.06	0.106	0.1	
1,2,3,7,8,9-Hexa CDD	ND	0.619	0.0619	1.76	1.26	0.176	ND	0.981	0.0981	0.1	
1,2,3,4,6,7,8-Hepta CDD	ND	2.39	0.0239	2.65	0.737	0.0265	ND	1.09	0.0109	0.01	
Octa CDD	13.5	0.664	0.00405	11.5	1.18	0.00345	2.29	1.28	0.000687	0.0001 / 0.0003	
Total Tetra CDD	53.2	4.23	-	2.84	0.815	-	ND	1.06	-	-	
Total Penta CDD	ND	0.858	-	1.95	0.794	-	ND	0.750	-	-	
Total Hexa CDD	2.18	0.636	-	1.76	1.21	-	ND	1.02	-	-	
Total Hepta CDD	ND	2.39	-	2.65	0.737	-	ND	1.09	-	-	
2,3,7,8-Tetra CDF **	ND	0.888	0.0888	ND	2.22	0.222	1.43	0.942	0.143	0.1	
1,2,3,7,8-Penta CDF	ND	0.724	0.0217	ND	0.754	0.0226	ND	0.893	0.0268	0.05 / 0.03	
2,3,4,7,8-Penta CDF	1.18	0.658	0.354	ND	0.749	0.225	1.74	0.861	0.522	0.5 / 0.3	**14,000 [1]**
1,2,3,4,7,8-Hexa CDF	0.887	0.584	0.0887	ND	1.46	0.146	ND	0.692	0.0692	0.1	
1,2,3,6,7,8-Hexa CDF	0.616	0.551	0.0616	ND	1.32	0.132	ND	0.662	0.0662	0.1	
2,3,4,6,7,8-Hexa CDF	ND	0.653	0.0653	ND	1.72	0.172	ND	0.755	0.0755	0.1	
1,2,3,7,8,9-Hexa CDF	ND	0.669	0.0669	ND	2.06	0.206	ND	0.823	0.0823	0.1	
1,2,3,4,6,7,8-Hepta CDF	ND	1.49	0.0149	ND	4.94	0.0494	ND	1.82	0.0182	0.01	
1,2,3,4,7,8,9-Hepta CDF	ND	0.632	0.00632	ND	1.16	0.0116	ND	0.881	0.00881	0.01	
Octa CDF	1.59	0.641	0.000477	4.26	1.31	0.00128	ND	1.14	0.000342	0.0001 / 0.0003	
Total Tetra CDF	82.2	0.888	-	22.6	1.22	-	3.98	0.942	-	-	
Total Penta CDF	3.07	0.69	-	ND	109	-	1.74	0.877	-	-	
Total Hexa CDF	1.50	0.61	-	ND	1.60	-	ND	0.728	-	-	
Total Hepta CDF	ND	1.65	-	ND	4.94	-	ND	1.82	-	-	
Total Toxic Equivalency	-	-	6.08	-	-	4.39	-	-	2.91	-	

Notes:

MDL: Method detection limit
ND: Not detected
MOE: Ontario Ministry of Environment
SCS: Site Condition Standard
CDD*: Chloro Dibenzo-p-Dioxin
CDF**: Chloro Dibenzo-p-Furan
1 - Guideline for 2,3,7,8-Tetra CDD (Commercial Site with Non-Potable Groundwater)
2 - van Leeuwen FXR (1997). Derivation of TEFs for dioxin-like compounds in humans and wildlife. Organohalogen Compounds 34:237
3 - MOE Standards = Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011
4 - Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition & Coarse Grain Soils
TEF: Toxic Equivalency Factor of other dioxins and furans to 2,3,7,8-Tetra CDD
TEF Equivalent: Concentration of Dioxins and Furans multiplied by the TEF (WHO)
Shaded and bold data exceeds the MOE SCS
WHO: World Health Organisation
-: Value not established

TABLE D-6: Dioxin and Furan Concentrations in Groundwater (2007-2012) - Continued

	DATA									GUIDELINE
Sampling Date	Oct. 2009			Jan. 2010			Dec. 2010			TEF (WHO) 1997[2]	**2011 MOE SCS [3] (Table 3) [4]**
Sample ID	MW-01	MDL	TEF Equivalent	MW-01	MDL	TEF Equivalent	MW-01	MDL	TEF Equivalent		
Parameter	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)		
2,3,7,8-Tetra CDD *	ND	0.59	0.590	ND	0.94	0.94	ND	0.87	0.870	1	
1,2,3,7,8-Penta CDD	ND	0.59	0.590	2.31	0.59	2.31	ND	0.70	0.700	1	
1,2,3,4,7,8-Hexa CDD	ND	0.61	0.0610	1.07	0.77	0.107	ND	0.75	0.0750	0.1	
1,2,3,6,7,8-Hexa CDD	ND	0.56	0.0560	1.52	0.65	0.152	ND	0.65	0.0650	0.1	
1,2,3,7,8,9-Hexa CDD	ND	0.55	0.0550	2.05	0.69	0.205	ND	0.65	0.0650	0.1	
1,2,3,4,6,7,8-Hepta CDD	4.70	0.61	0.0470	9.39	0.95	0.0939	2	0.55	0.0200	0.01	
Octa CDD	23.6	1.2	0.00708	44.3	0.99	0.0133	10	1.1	0.00300	0.0001 / 0.0003	
Total Tetra CDD	ND	0.59	-	16.5	0.94	-	3	0.87	-	-	
Total Penta CDD	ND	0.59	-	6.54	0.59	-	ND	0.70	-	-	
Total Hexa CDD	0.64	0.57	-	10.9	0.7	-	3	0.68	-	-	
Total Hepta CDD	7.800	0.61	-	17.9	0.95	-	4	0.55	-	-	
2,3,7,8-Tetra CDF **	0.7	0.56	0.0660	5.06	0.64	0.506	1	0.82	0.100	0.1	
1,2,3,7,8-Penta CDF	1.6	0.56	0.0480	4.44	0.6	0.133	ND	0.64	0.0192	0.05 / 0.03	
2,3,4,7,8-Penta CDF	ND (A)	0.55	0.165	2.98	0.61	0.894	1	0.66	0.300	0.5 / 0.3	**14,000 [1]**
1,2,3,4,7,8-Hexa CDF	1.11	0.55	0.111	5.14	0.69	0.514	1	0.52	0.100	0.1	
1,2,3,6,7,8-Hexa CDF	1.10	0.56	0.110	3.9	0.69	0.390	ND	0.48	0.0480	0.1	
2,3,4,6,7,8-Hexa CDF	ND	0.62	0.0620	2.04	0.78	0.204	ND	0.54	0.0540	0.1	
1,2,3,7,8,9-Hexa CDF	ND	0.68	0.0680	1.35	0.89	0.135	ND	0.60	0.0600	0.1	
1,2,3,4,6,7,8-Hepta CDF	ND (A)	2.6	0.0260	ND(A)	11	0.110	ND (A)	1.80	0.0180	0.01	
1,2,3,4,7,8,9-Hepta CDF	ND (A)	0.95	0.00950	ND	0.61	0.00610	ND	0.63	0.00630	0.01	
Octa CDF	4.6	1.1	0.00138	4.5	1	0.00135	2	1.10	0.000600	0.0001 / 0.0003	
Total Tetra CDF	6.24	0.56	-	89.1	0.64	-	25	0.82	-	-	
Total Penta CDF	2.89	0.56	-	29.7	0.60	-	2	0.65	-	-	
Total Hexa CDF	4.67	0.6	-	20.7	0.76	-	2	0.53	-	-	
Total Hepta CDF	3.8	0.59	-	ND (A)	13	-	ND (A)	1.90	-	-	
Total Toxic Equivalency			2.07			6.71			2.5	-	

Notes:

MDL: Method detection limit
ND: Not detected
MOE: Ontario Ministry of Environment
SCS: Site Condition Standard
CDD*: Chloro Dibenzo-p-Dioxin
CDF**: Chloro Dibenzo-p-Furan
1 - Guideline for 2,3,7,8-Tetra CDD (Commercial Site with Non-Potable Groundwater)
2 - van Leeuwen FXR (1997). Derivation of TEFs for dioxin-like compounds in humans and wildlife. Organohalogen Compounds 34:237
3 - MOE Standards = Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011
4 - Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition & Coarse Grain Soils
TEF: Toxic Equivalency Factor of other dioxins and furans to 2,3,7,8-Tetra CDD
TEF Equivalent: Concentration of Dioxins and Furans multiplied by the TEF (WHO)
Shaded and bold data exceeds the MOE SCS
WHO: World Health Organisation
-: Value not established
(A) - EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.
(B) - EMPC / DPE - Diphenylether interference present caused dibenzofuran detected to become a "non-detect" with an elevated detection limit.

TABLE D-6: Dioxin and Furan Concentrations in Groundwater (2007-2012) - Continued

	DATA				GUIDELINE
Sampling Date	Nov. 2012			TEF (WHO) 2005[2]	**2011 MOE SCS [3] (Table 3) [4]**
Sample ID	MW-01	MDL	TEF Equivalent		
Parameter	(pg / L)	(pg / L)	(pg / L)		
2,3,7,8-Tetra CDD *	ND	0.980	0.980	1.00	**14,000 [1]**
1,2,3,7,8-Penta CDD	ND	0.888	0.888	1.00	
1,2,3,4,7,8-Hexa CDD	ND	1.12	0.112	0.10	
1,2,3,6,7,8-Hexa CDD	ND	0.991	0.0991	0.10	
1,2,3,7,8,9-Hexa CDD	ND	0.963	0.0963	0.10	
1,2,3,4,6,7,8-Hepta CDD	ND	1.01	0.0101	0.01	
Octa CDD	ND (A)	2.26	0.000678	0.0003	
Total Tetra CDD	ND	0.980	-	-	
Total Penta CDD	ND	0.888	-	-	
Total Hexa CDD	ND (A)	5.77	-	-	
Total Hepta CDD	ND	1.01	-	-	
2,3,7,8-Tetra CDF **	ND	0.915	0.0915	0.10	
1,2,3,7,8-Penta CDF	ND	0.892	0.0268	0.03	
2,3,4,7,8-Penta CDF	ND	0.868	0.260	0.30	
1,2,3,4,7,8-Hexa CDF	ND	0.869	0.0869	0.10	
1,2,3,6,7,8-Hexa CDF	ND	0.752	0.0752	0.10	
2,3,4,6,7,8-Hexa CDF	ND	0.892	0.0892	0.10	
1,2,3,7,8,9-Hexa CDF	ND	1.01	0.101	0.10	
1,2,3,4,6,7,8-Hepta CDF	ND	0.872	0.00872	0.01	
1,2,3,4,7,8,9-Hepta CDF	ND	1.23	0.0123	0.01	
Octa CDF	ND	0.892	0.000268	0.00	
Total Tetra CDF	ND (A)	1.93	-	-	
Total Penta CDF	ND (A)	3.10	-	-	
Total Hexa CDF	ND	0.871	-	-	
Total Hepta CDF	ND	1.02	-	-	
Total Toxic Equivalency			2.94	-	

Notes:

MDL: Method detection limit
ND: Not detected
MOE: Ontario Ministry of Environment
SCS: Site Condition Standard
CDD*: Chloro Dibenzo-p-Dioxin
CDF**: Chloro Dibenzo-p-Furan
1 - Guideline for 2,3,7,8-Tetra CDD (Commercial Site with Non-Potable Groundwater)
2 - van Leeuwen FXR (1997). Derivation of TEFs for dioxin-like compounds in humans and wildlife. Organohalogen Compounds 34:237
3 - MOE Standards = Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011
4 - Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition & Coarse Grain Soils
TEF: Toxic Equivalency Factor of other dioxins and furans to 2,3,7,8-Tetra CDD
TEF Equivalent: Concentration of Dioxins and Furans multiplied by the TEF (WHO)
Shaded and bold data exceeds the MOE SCS
WHO: World Health Organisation
-: Value not established
(A) - EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.
(B) - EMPC / DPE - Diphenylether interference present caused dibenzofuran detected to become a "non-detect" with an elevated detection limit.

TABLE D-6: Dioxin and Furan Concentrations in Groundwater (2007-2012)

	DATA										GUIDELINE
Sampling Date	Nov. 2007			May 2008			Oct. 2009			TEF (WHO) 1997[2]	**2011 MOE SCS [3] (Table 3) [4]**
Sample ID	MW-02	MDL	TEF Equivalent	MW-02	MDL	TEF Equivalent	MW-02	MDL	TEF Equivalent		
Parameter	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)		
2,3,7,8-Tetra CDD *	ND	0.656	0.656	ND	0.620	.620	ND	0.39	0.390	1	
1,2,3,7,8-Penta CDD	ND	0.508	0.508	ND	0.640	.640	ND	0.43	0.430	1	
1,2,3,4,7,8-Hexa CDD	ND	0.617	0.0617	ND	0.814	0.0814	ND	0.61	0.0610	0.1	
1,2,3,6,7,8-Hexa CDD	ND	0.579	0.0579	ND	0.773	0.0773	ND	0.56	0.0560	0.1	
1,2,3,7,8,9-Hexa CDD	ND	0.573	0.0573	ND	0.848	0.0848	ND	0.55	0.0550	0.1	
1,2,3,4,6,7,8-Hepta CDD	1.16	0.75	0.0116	1.93	0.580	0.0193	3.39	0.55	0.0339	0.01	
Octa CDD	3.46	0.781	0.00104	7.95	1.22	0.00239	17.2	1.1	0.00516	0.0001 / 0.0003	
Total Tetra CDD	ND	0.656	-	ND	0.620	-	ND	0.39	-	-	
Total Penta CDD	ND	0.508	-	ND	0.640	-	ND	0.43	-	-	
Total Hexa CDD	ND	1.57	-	ND	0.811	-	ND	0.57	-	-	
Total Hepta CDD	1.16	0.75	-	3.17	0.580	-	5.77	0.55	-	-	
2,3,7,8-Tetra CDF **	ND	0.617	0.0617	1.40	0.955	0.140	ND	0.56	0.0560	0.1	
1,2,3,7,8-Penta CDF	ND	0.583	0.0175	ND	0.633	0.0190	ND	0.56	0.0168	0.05 / 0.03	
2,3,4,7,8-Penta CDF	ND	0.639	0.192	ND	0.629	0.189	ND	0.57	0.171	0.5 / 0.3	**14,000 [1]**
1,2,3,4,7,8-Hexa CDF	ND	0.513	0.0513	ND	0.688	0.0688	ND	0.53	0.0530	0.1	
1,2,3,6,7,8-Hexa CDF	ND	0.484	0.0484	ND	0.622	0.0622	ND	0.54	0.0540	0.1	
2,3,4,6,7,8-Hexa CDF	ND	0.574	0.0574	ND	0.811	0.0811	ND	0.60	0.0600	0.1	
1,2,3,7,8,9-Hexa CDF	ND	0.588	0.0588	ND	0.969	0.0969	ND	0.66	0.0660	0.1	
1,2,3,4,6,7,8-Hepta CDF	NG	0.636	0.00636	ND	3.85	0.0385	ND (A)	2.0	0.0200	0.01	
1,2,3,4,7,8,9-Hepta CDF	ND	0.684	0.00684	ND	0.669	0.00669	ND	0.67	0.00670	0.01	
Octa CDF	ND	0.82	0.000246	2.81	1.34	0.000843	4.0	1.1	0.00120	0.0001 / 0.0003	
Total Tetra CDF	0.844	0.617	-	1.40	0.955	-	ND (B)	0.93	-	-	
Total Penta CDF	ND	0.669	-	ND	0.631	-	ND	0.56	-	-	
Total Hexa CDF	ND	0.536	-	ND	0.751	-	ND	0.58	-	-	
Total Hepta CDF	ND	0.705	-	ND	3.85	-	3.19	0.58	-	-	
Total Toxic Equivalency	-	-	1.85	-	-	2.23			1.54	-	

Notes:

MDL: Method detection limit
ND: Not detected
MOE: Ontario Ministry of Environment
SCS: Site Condition Standard
CDD*: Chloro Dibenzo-p-Dioxin
CDF**: Chloro Dibenzo-p-Furan
1 - Guideline for 2,3,7,8-Tetra CDD (Commercial Site with Non-Potable Groundwater)
2 - van Leeuwen FXR (1997). Derivation of TEFs for dioxin-like compounds in humans and wildlife. Organohalogen Compounds 34:237
3 - MOE Standards = Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011
4 - Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition & Coarse Grain Soils
TEF: Toxic Equivalency Factor of other dioxins and furans to 2,3,7,8-Tetra CDD
TEF Equivalent: Concentration of Dioxins and Furans multiplied by the TEF (WHO)
Bold faced guidelines reflect those most applicable to current land use designation
WHO: World Health Organisation
-: Value not established
(A) - EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.
(B) - EMPC / DPE - Diphenylether interference present caused dibenzofuran detected to become a "non-detect" with an elevated detection limit.

TABLE D-6: Dioxin and Furan Concentrations in Groundwater (2007-2012)

	DATA				GUIDELINE
Sampling Date	Jan. 2010			TEF (WHO) 1997[2]	**2011 MOE SCS [3] (Table 3) [4]**
Sample ID	MW-02	MDL	TEF Equivalent		
Parameter	(pg / L)	(pg / L)	(pg / L)		
2,3,7,8-Tetra CDD *	ND	0.66	0.660	1	**14,000 [1]**
1,2,3,7,8-Penta CDD	ND	0.67	0.670	1	
1,2,3,4,7,8-Hexa CDD	0.65	0.58	0.0650	0.1	
1,2,3,6,7,8-Hexa CDD	ND	0.49	0.0490	0.1	
1,2,3,7,8,9-Hexa CDD	ND	0.52	0.0520	0.1	
1,2,3,4,6,7,8-Hepta CDD	1.29	0.81	0.0129	0.01	
Octa CDD	6.4	1.1	0.00192	0.0001 / 0.0003	
Total Tetra CDD	ND	0.66	-	-	
Total Penta CDD	ND	0.67	-	-	
Total Hexa CDD	0.65	0.53	-	-	
Total Hepta CDD	1.29	0.81	-	-	
2,3,7,8-Tetra CDF **	1.56	0.56	0.156	0.1	
1,2,3,7,8-Penta CDF	0.70	0.59	0.0210	0.05 / 0.03	
2,3,4,7,8-Penta CDF	1.31	0.60	0.393	0.5 / 0.3	
1,2,3,4,7,8-Hexa CDF	0.73	0.49	0.0730	0.1	
1,2,3,6,7,8-Hexa CDF	0.70	0.48	0.0700	0.1	
2,3,4,6,7,8-Hexa CDF	ND	0.55	0.0550	0.1	
1,2,3,7,8,9-Hexa CDF	ND	0.63	0.063	0.1	
1,2,3,4,6,7,8-Hepta CDF	ND (A)	1.6	0.0160	0.01	
1,2,3,4,7,8,9-Hepta CDF	ND	0.83	0.00830	0.01	
Octa CDF	1.75	0.98	0.000525	0.0001 / 0.0003	
Total Tetra CDF	3.490	0.56	-	-	
Total Penta CDF	2.01	0.60	-	-	
Total Hexa CDF	1.44	0.53	-	-	
Total Hepta CDF	ND (A)	1.9	-	-	
Total Toxic Equivalency			2.37	-	

Notes:

MDL: Method detection limit
ND: Not detected
MOE: Ontario Ministry of Environment
SCS: Site Condition Standard
CDD*: Chloro Dibenzo-p-Dioxin
CDF**: Chloro Dibenzo-p-Furan
1 - Guideline for 2,3,7,8-Tetra CDD (Commercial Site with Non-Potable Groundwater)
2 - van Leeuwen FXR (1997). Derivation of TEFs for dioxin-like compounds in humans and wildlife. Organohalogen Compounds 34:237
3 - MOE Standards = Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011
4 - Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition & Coarse Grain Soils
TEF: Toxic Equivalency Factor of other dioxins and furans to 2,3,7,8-Tetra CDD
TEF Equivalent: Concentration of Dioxins and Furans multiplied by the TEF (WHO)
Shaded and bold data exceeds the MOE SCS
WHO: World Health Organisation
-: Value not established
(A) - EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.
(B) - EMPC / DPE - Diphenylether interference present caused dibenzofuran detected to become a "non-detect" with an elevated detection limit.

TABLE D-6: Dioxin and Furan Concentrations in Groundwater (2007-2012) - Continued

	DATA													GUIDELINE
Sampling Date	Feb. 2007			Nov. 2007			May 2008			Jan 2009				**2011 MOE SCS [3] (Table 3) [4]**
Sample ID	MW-03	MDL	TEF Equivalent	MW-03	MDL	TEF Equivalent	MW-03	MDL	TEF Equivalent	MW-03	MDL	TEF Equivalent	TEF (WHO) 1997[2]	
Parameter	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)		
2,3,7,8-Tetra CDD *	ND	1.25	1.25	ND	1.19	1.19	ND	0.597	0.597	ND	1.01	1.01	1	
1,2,3,7,8-Penta CDD	ND	2.71	2.71	ND	0.696	0.696	ND	0.522	0.522	ND	1.16	1.16	1	
1,2,3,4,7,8-Hexa CDD	ND	0.759	0.0759	ND	0.72	0.072	ND	0.685	0.0685	ND	0.822	0.0822	0.1	
1,2,3,6,7,8-Hexa CDD	ND	0.691	0.069	ND	0.675	0.0675	ND	0.651	0.0651	ND	0.854	0.0854	0.1	
1,2,3,7,8,9-Hexa CDD	ND	0.713	0.0713	ND	0.668	0.0668	ND	0.713	0.0713	ND	0.787	0.0787	0.1	
1,2,3,4,6,7,8-Hepta CDD	0.792	0.532	0.00792	1.32	0.639	0.0132	1.63	0.622	0.0163	2.84	0.943	0.0284	0.01	
Octa CDD	3.20	0.525	0.00032	7.67	0.649	0.00230	ND	5.63	0.00169	16.5	1.16	0.00495	0.0001 / 0.0003	
Total Tetra CDD	ND	1.25	-	ND	1.19	-	ND	0.597	-	3.97	1.01	-	-	
Total Penta CDD	ND	2.71	-	ND	0.696	-	ND	0.522	-	ND	1.16	-	-	
Total Hexa CDD	ND	0.724	-	ND	1.55	-	ND	0.682	-	2.44	0.820	-	-	
Total Hepta CDD	0.792	0.532	-	2.20	0.639	-	2.40	0.622	-	4.79	0.943	-	-	
2,3,7,8-Tetra CDF **	ND	1.46	0.146	1.07	0.72	0.107	1.31	0.974	0.131	1.85	0.863	0.185	0.1	
1,2,3,7,8-Penta CDF	ND	1.03	0.0515	ND	0.651	0.0195	ND	0.691	0.0207	ND	1.33	0.0399	0.05 / 0.03	
2,3,4,7,8-Penta CDF	ND	0.988	0.494	0.907	0.591	0.272	ND	0.685	0.206	1.86	1.28	0.558	0.5 / 0.3	**14,000 [1]**
1,2,3,4,7,8-Hexa CDF	ND	0.884	0.0884	ND	0.612	0.0612	ND	0.784	0.0784	ND	1.01	0.101	0.1	
1,2,3,6,7,8-Hexa CDF	ND	0.78	0.078	ND	0.578	0.0578	ND	0.708	0.0708	ND	0.961	0.0961	0.1	
2,3,4,6,7,8-Hexa CDF	ND	0.952	0.0952	ND	0.685	0.0685	ND	0.924	0.0924	ND	1.10	0.110	0.1	
1,2,3,7,8,9-Hexa CDF	ND	1.01	0.101	ND	0.702	0.0702	ND	1.10	.110	ND	1.20	0.120	0.1	
1,2,3,4,6,7,8-Hepta CDF	ND	0.635	0.00635	ND(1)	0.687	0.00687	ND	1.07	0.0107	ND	2.31	0.0231	0.01	
1,2,3,4,7,8,9-Hepta CDF	ND	0.737	0.00737	ND	0.738	0.00738	ND	0.688	0.00688	ND	0.993	0.00993	0.01	
Octa CDF	0.669	0.557	0.0000669	0.951	0.703	0.000285	ND	1.59	0.000477	ND	1.06	0.000318	0.0001 / 0.0003	
Total Tetra CDF	9.64	1.46	-	7.66	0.72	-	7.80	0.974	-	63.3	0.863	-	-	
Total Penta CDF	ND	1.01	-	0.907	0.619	-	ND	2.65	-	4.46	1.30	-	-	
Total Hexa CDF	ND	0.898	-	ND	0.64	-	ND	0.855	-	ND	1.06	-	-	
Total Hepta CDF	ND	0.682	-	ND	0.761	-	ND	1.07	-	ND	2.31	-	-	
Total Toxic Equivalency	-	-	5.25	-	-	2.78	-	-	2.07	-	-	3.69	-	

Notes:

MDL: Method detection limit
ND: Not detected
MOE: Ontario Ministry of Environment
SCS: Site Condition Standard
CDD*: Chloro Dibenzo-p-Dioxin
CDF**: Chloro Dibenzo-p-Furan
1 - Guideline for 2,3,7,8-Tetra CDD (Commercial Site with Non-Potable Groundwater)
2 - van Leeuwen FXR (1997). Derivation of TEFs for dioxin-like compounds in humans and wildlife. Organohalogen Compounds 34:237
3 - MOE Standards = Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011
4 - Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition & Coarse Grain Soils
TEF: Toxic Equivalency Factor of other dioxins and furans to 2,3,7,8-Tetra CDD
TEF Equivalent: Concentration of Dioxins and Furans multiplied by the TEF (WHO)
Shaded and bold data exceeds the MOE SCS
(A) - EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.
(B) - EMPC / DPE - Diphenylether interference present caused dibenzofuran detected to become a "non-detect" with an elevated detection limit.

TABLE D-6: Dioxin and Furan Concentrations in Groundwater (2007-2012) - Continued

	DATA										GUIDELINE
Sampling Date	Oct. 2009			Jan. 2010			Dec. 2010			TEF (WHO) 1997[2]	**2011 MOE SCS [3] (Table 3) [4]**
Sample ID	MW-03	MDL	TEF Equivalent	MW-03	MDL	TEF Equivalent	MW-03	MDL	TEF Equivalent		
Parameter	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)		
2,3,7,8-Tetra CDD *	ND	0.44	0.440	ND (A)	0.89	0.890	ND	0.63	0.630	1	
1,2,3,7,8-Penta CDD	ND	0.58	0.580	2.6	1.1	2.60	ND	0.56	0.560	1	
1,2,3,4,7,8-Hexa CDD	ND	0.61	0.0610	1.41	0.83	0.141	ND	0.65	0.0650	0.1	
1,2,3,6,7,8-Hexa CDD	ND	0.56	0.0560	1.33	0.70	0.133	ND	0.56	0.0560	0.1	
1,2,3,7,8,9-Hexa CDD	ND	0.55	0.0550	1.04	0.74	0.104	ND	0.57	0.0570	0.1	
1,2,3,4,6,7,8-Hepta CDD	4.90	0.56	0.0490	10.0	0.91	0.100	1	0.56	0.0100	0.01	
Octa CDD	24.6	1.1	0.00738	63.2	1.8	0.0190	7	1.1	0.00210	0.0001 / 0.0003	
Total Tetra CDD	ND	0.44	-	19.0	0.72	-	ND(A)	2.7	-	-	
Total Penta CDD	ND	0.58	-	4.7	1.1	-	ND	0.56	-	-	
Total Hexa CDD	ND	0.57	-	5.57	0.76	-	ND	0.59	-	-	
Total Hepta CDD	8.14	0.56	-	10.0	0.91	-	1	0.56	-	-	
2,3,7,8-Tetra CDF **	ND	0.56	0.0560	3.60	0.55	0.360	ND	0.52	0.0520	0.1	
1,2,3,7,8-Penta CDF	1.46	0.60	0.0438	3.67	0.66	0.110	ND	0.53	0.0159	0.05 / 0.03	
2,3,4,7,8-Penta CDF	ND (A)	0.65	0.195	2.67	0.68	0.801	1	0.55	0.300	0.5 / 0.3	**14,000 [1]**
1,2,3,4,7,8-Hexa CDF	1.07	0.51	0.107	2.94	0.57	0.294	ND	0.53	0.0530	0.1	
1,2,3,6,7,8-Hexa CDF	1.12	0.52	0.112	2.71	0.57	0.271	ND	0.49	0.0490	0.1	
2,3,4,6,7,8-Hexa CDF	ND	0.58	0.0580	1.20	0.64	0.120	ND	0.55	0.0550	0.1	
1,2,3,7,8,9-Hexa CDF	ND	0.64	0.0640	1.34	0.74	0.134	ND	0.62	0.0620	0.1	
1,2,3,4,6,7,8-Hepta CDF	ND (A)	4.5	0.0450	ND (1)	4.1	0.0410	ND(A)	0.78	0.00780	0.01	
1,2,3,4,7,8,9-Hepta CDF	ND (A)	1.1	0.0110	ND	0.75	0.00750	ND	0.57	0.00570	0.01	
Octa CDF	5.2	1.2	0.00156	3.5	1.0	0.00105	ND	1.0	0.000300	0.0001 / 0.0003	
Total Tetra CDF	2.72	0.56	-	138.00	0.55	-	17	0.52	-	-	
Total Penta CDF	2.52	0.61	-	21.000	0.67	-	1	0.54	-	-	
Total Hexa CDF	4.69	0.56	-	13.0	0.62	-	ND	0.54	-	-	
Total Hepta CDF	4.59	0.59	-	ND (1)	4.7	-	ND(A)	0.85	-	-	
Total Toxic Equivalency			1.94			6.13			1.98	-	

Notes:

MDL: Method detection limit
ND: Not detected
MOE: Ontario Ministry of Environment
SCS: Site Condition Standard
CDD*: Chloro Dibenzo-p-Dioxin
CDF**: Chloro Dibenzo-p-Furan
1 - Guideline for 2,3,7,8-Tetra CDD (Commercial Site with Non-Potable Groundwater)
2 - van Leeuwen FXR (1997). Derivation of TEFs for dioxin-like compounds in humans and wildlife. Organohalogen Compounds 34:237
3 - MOE Standards = Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, July 27, 2009.
4 - Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition & Coarse Grain Soils
TEF: Toxic Equivalency Factor of other dioxins and furans to 2,3,7,8-Tetra CDD
TEF Equivalent: Concentration of Dioxins and Furans multiplied by the TEF (WHO)
Shaded and bold data exceeds the MOE SCS
(A) - EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.
(B) - EMPC / DPE - Diphenylether interference present caused dibenzofuran detected to become a "non-detect" with an elevated detection limit.

TABLE D-6: Dioxin and Furan Concentrations in Groundwater (2007-2012) - Continued

	DATA				GUIDELINE
Sampling Date	Nov. 2012			TEF (WHO) 2005[2]	**2011 MOE SCS [3] (Table 3) [4]**
Sample ID	MW-03	MDL	TEF Equivalent		
Parameter	(pg / L)	(pg / L)	(pg / L)		
2,3,7,8-Tetra CDD *	ND	0.963	0.963	1.00	**14,000 [1]**
1,2,3,7,8-Penta CDD	ND	0.992	0.992	1.00	
1,2,3,4,7,8-Hexa CDD	ND	0.834	0.0834	0.10	
1,2,3,6,7,8-Hexa CDD	ND	0.738	0.0738	0.10	
1,2,3,7,8,9-Hexa CDD	ND	0.717	0.0717	0.10	
1,2,3,4,6,7,8-Hepta CDD	ND	1.02	0.0102	0.01	
Octa CDD	3.9	1.43	0.00117	0.0003	
Total Tetra CDD	ND (A)	1.84	-	-	
Total Penta CDD	ND	0.992	-	-	
Total Hexa CDD	ND (A)	5.18	-	-	
Total Hepta CDD	ND	1.02	-	-	
2,3,7,8-Tetra CDF **	ND	0.964	0.0964	0.10	
1,2,3,7,8-Penta CDF	ND	1.07	0.0321	0.03	
2,3,4,7,8-Penta CDF	ND	1.04	0.312	0.30	
1,2,3,4,7,8-Hexa CDF	ND	1.07	0.107	0.10	
1,2,3,6,7,8-Hexa CDF	ND	0.923	0.0923	0.10	
2,3,4,6,7,8-Hexa CDF	ND	1.10	0.110	0.10	
1,2,3,7,8,9-Hexa CDF	ND	1.24	0.124	0.10	
1,2,3,4,6,7,8-Hepta CDF	ND	0.851	0.00851	0.01	
1,2,3,4,7,8,9-Hepta CDF	ND	1.20	0.0120	0.01	
Octa CDF	ND	1.08	0.000324	0.0003	
Total Tetra CDF	2.57	0.964	-	-	
Total Penta CDF	ND (A)	1.87	-	-	
Total Hexa CDF	ND	1.07	-	-	
Total Hepta CDF	ND	0.996	-	-	
Total Toxic Equivalency	-	-	3.09	-	

Notes:

MDL: Method detection limit
ND: Not detected
MOE: Ontario Ministry of Environment
SCS: Site Condition Standard
CDD*: Chloro Dibenzo-p-Dioxin
CDF**: Chloro Dibenzo-p-Furan
1 - Guideline for 2,3,7,8-Tetra CDD (Commercial Site with Non-Potable Groundwater)
2 - van Leeuwen FXR (1997). Derivation of TEFs for dioxin-like compounds in humans and wildlife. Organohalogen Compounds 34:237
3 - MOE Standards = Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2
4 - Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition & Coarse Grain Soils
TEF: Toxic Equivalency Factor of other dioxins and furans to 2,3,7,8-Tetra CDD
TEF Equivalent: Concentration of Dioxins and Furans multiplied by the TEF (WHO)
Shaded and bold data exceeds the MOE SCS
(A) - EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.
(B) - EMPC / DPE - Diphenylether interference present caused dibenzofuran detected to become a "non-detect" with an elevated detectior

TABLE D-6: Dioxin and Furan Concentrations in Groundwater (2007-2012) - Continued

	DATA										GUIDELINE
Sampling Date	Nov. 2007			May 2008			Jan 2009				**2011 MOE**
Sample ID	MW-04	MDL	TEF Equivalent	MW-04	MDL	TEF Equivalent	MW-04	MDL	TEF Equivalent	TEF (WHO) 1997[2]	**SCS [3]**
Parameter	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)		**(Table 3) [4]**
2,3,7,8-Tetra CDD *	ND	0.685	0.685	ND	0.812	0.812	ND	0.925	0.925	1	
1,2,3,7,8-Penta CDD	2.53	0.379	2.53	ND	0.583	0.583	ND	0.850	0.850	1	
1,2,3,4,7,8-Hexa CDD	2.95	0.74	0.295	ND	.830	.0830	ND	0.969	0.0969	0.1	
1,2,3,6,7,8-Hexa CDD	5.66	0.694	0.566	ND	0.789	0.0789	ND	1.01	0.101	0.1	
1,2,3,7,8,9-Hexa CDD	8.250	0.686	0.825	ND	1.24	0.124	ND	0.928	0.0928	0.1	
1,2,3,4,6,7,8-Hepta CDD	40.0	0.686	0.400	3.23	0.592	0.0323	1.15	0.810	0.0115	0.01	
Octa CDD	124	0.753	0.0372	16.9	1.03	0.00507	6.47	1.38	0.00194	0.0001 / 0.0003	
Total Tetra CDD	23.2	0.685	-	4.03	0.812	-	ND	1.17	-	-	
Total Penta CDD	13.0	0.893	-	ND	0.583	-	ND	0.850	-	-	
Total Hexa CDD	52.8	0.706	-	1.87	0.827	-	ND	0.967	-	-	
Total Hepta CDD	64.4	0.686	-	5.56	0.592	-	1.15	0.810	-	-	
2,3,7,8-Tetra CDF **	9.44	0.528	0.944	2.12	0.847	0.212	1.45	1.09	0.145	0.1	
1,2,3,7,8-Penta CDF	7.73	1.26	0.232	ND	0.929	0.0279	ND	1.12	0.0336	0.05 / 0.03	
2,3,4,7,8-Penta CDF	10.3	1.14	3.09	ND	0.922	0.277	1.64	1.08	0.492	0.5 / 0.3	**14,000 [1]**
1,2,3,4,7,8-Hexa CDF	32.6	0.68	3.26	ND	0.919	0.0919	ND	0.785	0.0785	0.1	
1,2,3,6,7,8-Hexa CDF	17.8	0.641	1.78	ND	.830	.0830	ND	0.751	0.0751	0.1	
2,3,4,6,7,8-Hexa CDF	9.09	0.76	0.909	ND	1.08	0.108	ND	0.857	0.0857	0.1	
1,2,3,7,8,9-Hexa CDF	2.50	0.779	0.250	ND	1.29	0.129	ND	0.934	0.0934	0.1	
1,2,3,4,6,7,8-Hepta CDF	ND(2)	46.8	0.468	ND	1.72	0.0172	ND	1.30	0.0130	0.01	
1,2,3,4,7,8,9-Hepta CDF	22.3	0.78	0.223	ND	.770	.00770	ND	0.948	0.00948	0.01	
Octa CDF	51.1	0.815	0.0153	1.72	1.02	0.000516	ND	1.31	0.000393	0.0001 / 0.0003	
Total Tetra CDF	282	0.673	-	58.8	0.847	-	9.32	1.09	-	-	
Total Penta CDF	90.9	1.2	-	2.81	0.926	-	1.64	1.10	-	-	
Total Hexa CDF	138	0.71	-	ND	1.00	-	ND	0.826	-	-	
Total Hepta CDF	47.6	0.696	-	ND	1.72	-	ND	1.30	-	-	
Total Toxic Equivalency	-	-	16.5	-	-	2.67	-	-	3.11	-	

Notes:

MDL: Method detection limit
ND: Not detected
MOE: Ontario Ministry of Environment
SCS: Site Condition Standard
CDD*: Chloro Dibenzo-p-Dioxin
CDF**: Chloro Dibenzo-p-Furan
1 - Guideline for 2,3,7,8-Tetra CDD (Commercial Site with Non-Potable Groundwater)
2 - van Leeuwen FXR (1997). Derivation of TEFs for dioxin-like compounds in humans and wildlife. Organohalogen Compounds 34:237
3 - MOE Standards = Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011
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TEF: Toxic Equivalency Factor of other dioxins and furans to 2,3,7,8-Tetra CDD
TEF Equivalent: Concentration of Dioxins and Furans multiplied by the TEF (WHO)
Shaded and bold data exceeds the MOE SCS
WHO: World Health Organisation
-: Value not established
(A) - EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.
(B) - EMPC / DPE - Diphenylether interference present caused dibenzofuran detected to become a "non-detect" with an elevated detection limit.

TABLE D-6: Dioxin and Furan Concentrations in Groundwater (2007-2012) - Continued

Sampling Date	DATA									TEF (WHO) 1997[2]	GUIDELINE
	Oct. 2009			Jan. 2010			Dec. 2010				**2011 MOE SCS [3] (Table 3) [4]**
Sample ID	MW-04	MDL	TEF Equivalent	MW-04	MDL	TEF Equivalent	MW-04	MDL	TEF Equivalent		
Parameter	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)		
2,3,7,8-Tetra CDD *	ND	0.59	0.590	0.77	0.59	0.770	ND	0.77	0.770	1	**14,000 [1]**
1,2,3,7,8-Penta CDD	1.56	0.60	1.56	ND	0.66	0.660	ND	0.72	0.720	1	
1,2,3,4,7,8-Hexa CDD	ND	0.65	0.0650	ND	0.81	0.0810	ND	0.60	0.0600	0.1	
1,2,3,6,7,8-Hexa CDD	ND (A)	0.66	0.0660	ND	0.69	0.0690	ND	0.52	0.0520	0.1	
1,2,3,7,8,9-Hexa CDD	ND	0.58	0.0580	ND	0.72	0.0720	ND	0.52	0.052	0.1	
1,2,3,4,6,7,8-Hepta CDD	7.57	0.73	0.0757	2.05	0.82	0.0205	1	0.54	0.0100	0.01	
Octa CDD	43	1.1	0.0128	9.5	1.3	0.00285	ND (A)	3.4	0.00102	0.0001 / 0.0003	
Total Tetra CDD	24.5	0.59	-	0.77	0.59	-	ND (A)	3.8	-	-	
Total Penta CDD	4.15	0.60	-	ND	0.66	-	ND	0.72	-	-	
Total Hexa CDD	2.77	0.60	-	ND	0.74	-	ND	0.54	-	-	
Total Hepta CDD	7.57	0.73	-	3.25	0.82	-	1	0.54	-	-	
2,3,7,8-Tetra CDF **	1.26	0.58	0.126	1.48	0.63	0.148	ND	0.63	0.0630	0.1	
1,2,3,7,8-Penta CDF	1.69	0.60	0.0507	0.92	0.58	0.0276	ND	0.52	0.0156	0.05 / 0.03	
2,3,4,7,8-Penta CDF	ND	0.61	0.183	1.13	0.59	0.339	3	0.54	0.900	0.5 / 0.3	
1,2,3,4,7,8-Hexa CDF	1.22	0.57	0.122	0.81	0.46	0.0810	ND	0.51	0.0510	0.1	
1,2,3,6,7,8-Hexa CDF	0.95	0.57	0.0950	0.74	0.46	0.0740	ND	0.47	0.0470	0.1	
2,3,4,6,7,8-Hexa CDF	ND	0.62	0.0620	0.59	0.52	0.0590	ND	0.53	0.0530	0.1	
1,2,3,7,8,9-Hexa CDF	ND	0.69	0.0690	ND	0.60	0.0600	ND	0.59	0.059	0.1	
1,2,3,4,6,7,8-Hepta CDF	ND (A)	2.4	0.0240	ND (A)	1.9	0.0190	ND(A)	1.30	0.0130	0.01	
1,2,3,4,7,8,9-Hepta CDF	ND (A)	0.91	0.00910	ND	0.95	0.00950	ND	0.59	0.0059	0.01	
Octa CDF	3.0	1.2	0.000900	1.6	1.0	0.000480	ND	1.0	0.000300	0.0001 / 0.0003	
Total Tetra CDF	110	0.58	-	8.09	0.63	-	ND(A)	3.0	-	-	
Total Penta CDF	10.9	0.61	-	2.79	0.58	-	3	0.53	-	-	
Total Hexa CDF	5.33	0.61	-	2.14	0.51	-	ND	0.52	-	-	
Total Hepta CDF	ND (A)	2.6	-	ND (A)	2.1	-	ND	0.54	-	-	
Total Toxic Equivalency			3.17			2.49			2.87	-	

Notes:

MDL: Method detection limit
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SCS: Site Condition Standard
CDD*: Chloro Dibenzo-p-Dioxin
CDF**: Chloro Dibenzo-p-Furan
1 - Guideline for 2,3,7,8-Tetra CDD (Commercial Site with Non-Potable Groundwater)
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TEF: Toxic Equivalency Factor of other dioxins and furans to 2,3,7,8-Tetra CDD
TEF Equivalent: Concentration of Dioxins and Furans multiplied by the TEF (WHO)
Shaded and bold data exceeds the MOE SCS
WHO: World Health Organisation
-: Value not established
(A) - EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.
(B) - EMPC / DPE - Diphenylether interference present caused dibenzofuran detected to become a "non-detect" with an elevated detection limit.

TABLE D-6: Dioxin and Furan Concentrations in Groundwater (2007-2012) - Continued

Sampling Date	DATA				GUIDELINE
	Nov. 2012				**2009 MOE SCS [3] (Table 3) [4]**
Sample ID	MW-04	MDL	TEF Equivalent	TEF (WHO) 1997[2]	
Parameter	(pg / L)	(pg / L)	(pg / L)		
2,3,7,8-Tetra CDD *	ND	1.05	1.05	1.00	**14,000 [1]**
1,2,3,7,8-Penta CDD	ND	1.06	1.06	1.00	
1,2,3,4,7,8-Hexa CDD	ND	1.13	0.113	0.10	
1,2,3,6,7,8-Hexa CDD	ND	0.998	0.0998	0.10	
1,2,3,7,8,9-Hexa CDD	ND	0.970	0.0970	0.10	
1,2,3,4,6,7,8-Hepta CDD	ND	0.968	0.00968	0.01	
Octa CDD	4.4	1.14	0.00132	0.0003	
Total Tetra CDD	ND (A)	1.62		-	
Total Penta CDD	ND (A)	1.14		-	
Total Hexa CDD	ND (A)	5.83		-	
Total Hepta CDD	ND	0.968		-	
2,3,7,8-Tetra CDF **	ND	0.906	0.0906	0.10	
1,2,3,7,8-Penta CDF	ND	1.04	0.0312	0.03	
2,3,4,7,8-Penta CDF	ND	1.01	0.303	0.30	
1,2,3,4,7,8-Hexa CDF	ND	0.837	0.0837	0.10	
1,2,3,6,7,8-Hexa CDF	ND	0.724	0.0724	0.10	
2,3,4,6,7,8-Hexa CDF	ND	0.860	0.0860	0.10	
1,2,3,7,8,9-Hexa CDF	ND	0.971	0.0971	0.10	
1,2,3,4,6,7,8-Hepta CDF	ND	0.891	0.00891	0.01	
1,2,3,4,7,8,9-Hepta CDF	ND	1.26	0.0126	0.01	
Octa CDF	ND	1.24	0.000372	0.0003	
Total Tetra CDF	1.93	0.906		-	
Total Penta CDF	ND (A)	3.46		-	
Total Hexa CDF	ND	0.839		-	
Total Hepta CDF	ND	1.04		-	
Total Toxic Equivalency			3.22	-	

Notes:

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TEF Equivalent: Concentration of Dioxins and Furans multiplied by the TEF (WHO)
Shaded and bold data exceeds the MOE SCS
WHO: World Health Organisation
-: Value not established
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TABLE D-6: Dioxin and Furan Concentrations in Groundwater (2007-2012) - Continued

	DATA													GUIDELINE
Sampling Date	Feb. 2007			Nov. 2007			May 2008			Jan 2009			TEF (WHO) 1997[2]	2011 MOE SCS [3] (Table 3) [4]
Sample ID	MW-05	MDL	TEF Equivalent	MW-05	MDL	TEF Equivalent	MW-05	MDL	TEF Equivalent	MW-05	MDL	TEF Equivalent		
Parameter	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)		
2,3,7,8-Tetra CDD *	ND	1.03	1.03	5.58	0.724	5.58	ND	0.629	0.629	ND	1.24	1.24	1	
1,2,3,7,8-Penta CDD	ND	1.76	1.76	3.31	0.466	3.31	118	1.26	118	ND	1.51	1.51	1	
1,2,3,4,7,8-Hexa CDD	ND	0.663	0.0663	6.49	0.67	0.649	ND	1.41	0.141	1.93	0.900	0.193	0.1	
1,2,3,6,7,8-Hexa CDD	0.95	0.519	0.0954	6.64	0.629	0.664	ND	1.97	0.197	1.82	0.935	0.182	0.1	
1,2,3,7,8,9-Hexa CDD	ND	0.535	0.0535	23.400	0.622	2.34	8.01	0.727	0.801	6.31	0.862	0.631	0.1	
1,2,3,4,6,7,8-Hepta CDD	7.6	0.703	0.076	51.8	0.77	0.518	11.0	.980	.110	12.9	1.40	0.129	0.01	
Octa CDD	80	0.415	0.00799	577	0.737	0.173	129	1.01	0.0387	134	1.97	0.0402	0.0001 / 0.0003	
Total Tetra CDD	26.7	2.9	-	292.0	0.724	-	80.6	.630	-	50.8	1.24	-	-	
Total Penta CDD	3.6	1.76	-	66.8	0.659	-	131	1.26	-	15.1	0.807	-	-	
Total Hexa CDD	19.0	0.541	-	203.0	0.64	-	52.6	0.696	-	53.5	0.898	-	-	
Total Hepta CDD	15.4	0.703	-	119.0	0.77	-	25.4	.980	-	30.2	1.40	-	-	
2,3,7,8-Tetra CDF **	ND	0.946	0.0946	10.50	0.655	1.05	ND	2.80	.280	3.35	0.869	0.335	0.1	
1,2,3,7,8-Penta CDF	ND	1.21	0.0605	5.07	0.938	0.152	ND	2.17	0.0651	ND	2.10	0.0630	0.05 / 0.03	
2,3,4,7,8-Penta CDF	ND	1.17	0.59	5.34	0.853	1.60	ND	2.15	0.645	2.10	2.03	0.630	0.5 / 0.3	**14,000** [1]
1,2,3,4,7,8-Hexa CDF	ND	0.902	0.0902	12.80	0.697	1.28	1.37	1.01	0.137	1.69	0.980	0.169	0.1	
1,2,3,6,7,8-Hexa CDF	ND	0.796	0.0796	4.65	0.658	0.465	ND	1.19	0.119	1.31	0.936	0.131	0.1	
2,3,4,6,7,8-Hexa CDF	ND	0.971	0.0971	3.07	0.78	0.307	ND	1.19	0.119	ND	1.07	0.107	0.1	
1,2,3,7,8,9-Hexa CDF	ND	1.03	0.103	1.46	0.799	0.146	ND	1.42	0.142	ND	1.16	0.116	0.1	
1,2,3,4,6,7,8-Hepta CDF	ND	4.07	0.0407	nd(1)	16.8	0.168	ND	5.51	0.0551	ND	4.17	0.0417	0.01	
1,2,3,4,7,8,9-Hepta CDF	ND	1.21	0.0121	1.5	0.974	0.0149	ND	1.32	0.0132	ND	1.35	0.0135	0.01	
Octa CDF	7.0	0.784	0.00070	13.0	0.712	0.00390	2.91	1.17	0.000873	4.30	2.13	0.00129	0.0001 / 0.0003	
Total Tetra CDF	464	0.946	-	4000	0.655	-	933	2.09	-	974	0.869	-	-	
Total Penta CDF	ND	9.31	-	170.0	0.893	-	30.7	2.16	-	30.6	2.07	-	-	
Total Hexa CDF	3.4	0.917	-	70.1	0.729	-	15.3	1.10	-	16.5	1.03	-	-	
Total Hepta CDF	ND	4.07	-	5.66	0.865	-	ND	5.51	-	ND	4.17	-	-	
Total Toxic Equivalency	-	-	4.3	-	-	18.4	-	-	121	-	-	5.53	-	

Notes:

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TABLE D-6: Dioxin and Furan Concentrations in Groundwater (2007-2012) - Continued

	DATA										GUIDELINE
Sampling Date	Oct. 2009			Jan. 2010			Dec. 2010			TEF (WHO) 1997[2]	**2011 MOE SCS [3] (Table 3) [4]**
Sample ID	MW-05	MDL	TEF Equivalent	MW-05	MDL	TEF Equivalent	MW-05	MDL	TEF Equivalent		
Parameter	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)		
2,3,7,8-Tetra CDD *	ND	0.59	0.590	ND	0.93	0.930	ND	0.65	0.650	1	
1,2,3,7,8-Penta CDD	ND	0.57	0.570	ND	0.62	0.620	ND	0.62	0.620	1	
1,2,3,4,7,8-Hexa CDD	ND	0.59	0.0590	0.74	0.63	0.0740	ND	0.64	0.0640	0.1	
1,2,3,6,7,8-Hexa CDD	ND	0.53	0.0530	ND	0.53	0.0530	ND	0.55	0.0550	0.1	
1,2,3,7,8,9-Hexa CDD	ND	0.52	0.0520	ND	0.56	0.0560	ND	0.56	0.0560	0.1	
1,2,3,4,6,7,8-Hepta CDD	1.50	0.55	0.0150	1.26	0.63	0.0126	ND(A)	1.0	0.0100	0.01	
Octa CDD	8.8	1.1	0.00264	4.6	1.4	0.00138	6	0.10	0.00180	0.0001 / 0.0003	
Total Tetra CDD	ND	0.59	-	ND	0.93	-	ND(A)	0.68	-	-	
Total Penta CDD	ND	0.57	-	ND	0.62	-	ND	0.62	-	-	
Total Hexa CDD	ND	0.55	-	0.74	0.57	-	ND	0.58	-	-	
Total Hepta CDD	2.40	0.55	-	1.26	0.63	-	ND(A)	1.0	-	-	
2,3,7,8-Tetra CDF **	ND	0.56	0.0560	1.32	0.81	0.132	ND	0.65	0.0650	0.1	
1,2,3,7,8-Penta CDF	0.73	0.56	0.0219	0.87	0.64	0.0261	ND	0.69	0.0207	0.05 / 0.03	
2,3,4,7,8-Penta CDF	ND	0.57	0.171	1.15	0.65	0.345	1	0.71	0.300	0.5 / 0.3	**14,000 [1]**
1,2,3,4,7,8-Hexa CDF	ND	0.52	0.0520	0.76	0.46	0.0760	1	0.51	0.100	0.1	
1,2,3,6,7,8-Hexa CDF	ND	0.52	0.0520	0.68	0.46	0.0680	ND	0.47	0.0470	0.1	
2,3,4,6,7,8-Hexa CDF	ND	0.57	0.0570	ND	0.52	0.0520	ND	0.53	0.0530	0.1	
1,2,3,7,8,9-Hexa CDF	ND	0.64	0.0640	ND	0.59	0.0590	ND	0.59	0.0590	0.1	
1,2,3,4,6,7,8-Hepta CDF	ND (A)	0.58	0.00580	ND (A)	0.92	0.00920	ND(A)	0.87	0.00870	0.01	
1,2,3,4,7,8,9-Hepta CDF	ND	0.65	0.00650	ND	0.70	0.00700	ND	0.56	0.00560	0.01	
Octa CDF	ND	1.1	0.000330	ND (A)	1.1	0.000330	2	1.1	0.000600	0.0001 / 0.0003	
Total Tetra CDF	2.00	0.56	-	1.32	0.81	-	2	0.65	-	-	
Total Penta CDF	0.73	0.57	-	2.02	0.64	-	1	0.70	-	-	
Total Hexa CDF	ND	0.56	-	1.44	0.50	-	1	0.52	-	-	
Total Hepta CDF	ND (A)	0.65	-	ND (A)	1.1	-	ND(A)	0.94	-	-	
Total Toxic Equivalency			1.83			2.5			2.12	-	

Notes:

MDL: Method detection limit
ND: Not detected
MOE: Ontario Ministry of Environment
SCS: Site Condition Standard
CDD*: Chloro Dibenzo-p-Dioxin
CDF**: Chloro Dibenzo-p-Furan
1 - Guideline for 2,3,7,8-Tetra CDD (Commercial Site with Non-Potable Groundwater)
2 - van Leeuwen FXR (1997). Derivation of TEFs for dioxin-like compounds in humans and wildlife. Organohalogen Compounds 34:237
3 - MOE Standards = Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011
4 - Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition & Coarse Grain Soils
TEF: Toxic Equivalency Factor of other dioxins and furans to 2,3,7,8-Tetra CDD
TEF Equivalent: Concentration of Dioxins and Furans multiplied by the TEF (WHO)
Shaded and bold data exceeds the MOE SCS
WHO: World Health Organisation
-: Value not established
(A) - EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.
(B) - EMPC / DPE - Diphenylether interference present caused dibenzofuran detected to become a "non-detect" with an elevated detection limit.

TABLE D-6: Dioxin and Furan Concentrations in Groundwater (2007-2012) - Continued

	DATA										GUIDELINE
Sampling Date	Nov. 2007			May 2008			Jan 2009			TEF (WHO) 1997[2]	**2011 MOE SCS [3] (Table 3) [4]**
Sample ID	MW-06	MDL	TEF Equivalent	MW-06	MDL	TEF Equivalent	MW-06	MDL	TEF Equivalent		
Parameter	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)		
2,3,7,8-Tetra CDD *	ND	0.73	0.730	ND	0.689	0.689	ND	0.670	0.670	1	
1,2,3,7,8-Penta CDD	ND	0.745	0.745	ND	0.886	0.886	ND	1.03	1.03	1	
1,2,3,4,7,8-Hexa CDD	ND	0.667	0.0667	ND	0.608	0.0608	ND	0.859	0.0859	0.1	
1,2,3,6,7,8-Hexa CDD	ND	0.625	0.0625	ND	0.578	0.0578	ND	0.892	0.0892	0.1	
1,2,3,7,8,9-Hexa CDD	ND	0.619	0.0619	ND	0.633	0.0633	ND	0.823	0.0823	0.1	
1,2,3,4,6,7,8-Hepta CDD	2.15	0.532	0.022	ND	1.67	0.0167	1.35	0.926	0.0135	0.01	
Octa CDD	10.8	0.835	0.00324	8.28	1.05	0.00248	5.30	1.47	0.00159	0.0001 / 0.0003	
Total Tetra CDD	1.04	0.73	-	ND	0.689	-	ND	0.987	-	-	
Total Penta CDD	ND	0.745	-	ND	0.886	-	ND	1.03	-	-	
Total Hexa CDD	0.907	0.636	-	ND	0.606	-	ND	0.857	-	-	
Total Hepta CDD	2.15	0.532	-	1.59	0.671	-	1.35	0.926	-	-	
2,3,7,8-Tetra CDF **	ND	1.39	0.139	ND	1.71	0.171	2.18	1.18	0.218	0.1	
1,2,3,7,8-Penta CDF	ND	0.948	0.0284	ND	1.26	0.0378	ND	0.917	0.0275	0.05 / 0.03	
2,3,4,7,8-Penta CDF	ND	1.56	0.468	ND	1.25	0.375	ND	1.87	0.561	0.5 / 0.3	**14,000 [1]**
1,2,3,4,7,8-Hexa CDF	0.996	0.703	0.0996	ND	0.968	0.0968	ND	0.736	0.0736	0.1	
1,2,3,6,7,8-Hexa CDF	ND	0.663	0.0663	ND	0.875	0.0875	ND	0.703	0.0703	0.1	
2,3,4,6,7,8-Hexa CDF	ND	0.786	0.0786	ND	1.14	0.114	ND	0.802	0.0802	0.1	
1,2,3,7,8,9-Hexa CDF	ND	0.806	0.0806	ND	1.36	0.136	ND	0.875	0.0875	0.1	
1,2,3,4,6,7,8-Hepta CDF	ND	1.86	0.0186	ND	3.82	0.0382	ND	1.73	0.0173	0.01	
1,2,3,4,7,8,9-Hepta CDF	ND	0.677	0.00677	ND	1.07	0.0107	ND	0.877	0.00877	0.01	
Octa CDF	1.54	0.646	0.000462	ND	1.10	.000330	ND	1.63	0.000489	0.0001 / 0.0003	
Total Tetra CDF	13.5	0.982	-	7.95	1.12	-	7.17	1.18	-	-	
Total Penta CDF	ND	3.88	-	ND	2.74	-	ND	1.90	-	-	
Total Hexa CDF	0.996	0.735	-	ND	1.06	-	ND	0.774	-	-	
Total Hepta CDF	ND	2.06	-	ND	3.82	-	ND	1.73	-	-	
Total Toxic Equivalency	-	-	2.68	-	-	2.84	-	-	3.12	-	

Notes:

MDL: Method detection limit
ND: Not detected
MOE: Ontario Ministry of Environment
SCS: Site Condition Standard
CDD*: Chloro Dibenzo-p-Dioxin
CDF**: Chloro Dibenzo-p-Furan
1 - Guideline for 2,3,7,8-Tetra CDD (Commercial Site with Non-Potable Groundwater)
2 - van Leeuwen FXR (1997). Derivation of TEFs for dioxin-like compounds in humans and wildlife. Organohalogen Compounds 34:237
3 - MOE Standards = Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011
4 - Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition & Coarse Grain Soils
TEF: Toxic Equivalency Factor of other dioxins and furans to 2,3,7,8-Tetra CDD
TEF Equivalent: Concentration of Dioxins and Furans multiplied by the TEF (WHO)
Shaded and bold data exceeds the MOE SCS
WHO: World Health Organisation
-: Value not established
(A) - EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.
(B) - EMPC / DPE - Diphenylether interference present caused dibenzofuran detected to become a "non-detect" with an elevated detection limit.

TABLE D-6: Dioxin and Furan Concentrations in Groundwater (2007-2012) - Continued

	DATA										GUIDELINE
Sampling Date	Oct. 2009			Jan. 2010			Dec. 2010			TEF (WHO) 1997[2]	**2011 MOE SCS [3] (Table 3) [4]**
Sample ID / Parameter	MW-06 (pg / L)	MDL (pg / L)	TEF Equivalent (pg / L)	MW-06 (pg / L)	MDL (pg / L)	TEF Equivalent (pg / L)	MW-06 (pg / L)	MDL (pg / L)	TEF Equivalent (pg / L)		
2,3,7,8-Tetra CDD *	ND	0.40	0.400	ND	0.82	0.820	2	0.91	2.00	1	
1,2,3,7,8-Penta CDD	ND	0.41	0.410	0.94	0.65	0.940	ND	0.67	0.670	1	
1,2,3,4,7,8-Hexa CDD	ND	0.41	0.0410	0.86	0.80	0.0860	ND	0.62	0.0620	0.1	
1,2,3,6,7,8-Hexa CDD	0.98	0.37	0.0980	ND (A)	0.79	0.0790	ND	0.54	0.0540	0.1	
1,2,3,7,8,9-Hexa CDD	0.51	0.37	0.0510	0.81	0.72	0.0810	ND	0.54	0.0540	0.1	
1,2,3,4,6,7,8-Hepta CDD	9.53	0.41	0.0953	4.01	0.70	0.0401	2	0.52	0.0200	0.01	
Octa CDD	40.7	0.76	0.0122	14.0	1.1	0.00420	6	1.0	0.00180	0.0001 / 0.0003	
Total Tetra CDD	8.97	0.40	-	1.68	0.82	-	ND	0.91	-	-	
Total Penta CDD	0.73	0.41	-	0.94	0.65	-	ND(A)	1.2	-	-	
Total Hexa CDD	4.61	0.38	-	3.21	0.73	-	ND(A)	0.72	-	-	
Total Hepta CDD	16.6	0.41	-	6.82	0.70	-	4	0.52	-	-	
2,3,7,8-Tetra CDF **	4.10	0.41	0.410	2.54	0.69	0.254	ND	0.95	0.0950	0.1	
1,2,3,7,8-Penta CDF	2.25	0.41	0.0675	1.12	0.77	0.0336	ND	0.73	0.0219	0.05 / 0.03	
2,3,4,7,8-Penta CDF	1.74	0.42	0.522	1.62	0.79	0.486	3	0.75	0.900	0.5 / 0.3	**14,000 [1]**
1,2,3,4,7,8-Hexa CDF	1.79	0.38	0.179	1.63	0.53	0.163	2	0.52	0.200	0.1	
1,2,3,6,7,8-Hexa CDF	1.94	0.38	0.194	1.10	0.52	0.110	1	0.48	0.100	0.1	
2,3,4,6,7,8-Hexa CDF	0.98	0.42	0.0980	0.94	0.60	0.0940	ND	0.55	0.0550	0.1	
1,2,3,7,8,9-Hexa CDF	ND	0.46	0.0460	ND	0.68	0.0680	ND	0.61	0.0610	0.1	
1,2,3,4,6,7,8-Hepta CDF	ND (A)	3.5	0.0350	ND (A)	2.6	0.0260	ND(A)	2.7	0.0270	0.01	
1,2,3,4,7,8,9-Hepta CDF	ND (A)	0.85	0.00194	ND	0.82	0.00820	ND	0.75	0.00750	0.01	
Octa CDF	6.46	0.77	-	2.1	1.1	0.000630	3	1.1	0.000900	0.0001 / 0.0003	
Total Tetra CDF	33.2	0.41	-	12.2	0.69	-	13	0.95	-	-	
Total Penta CDF	18.6	0.41	-	7.06	0.78	-	17	0.74	-	-	
Total Hexa CDF	12.6	0.41	-	5.3	0.57	-	3	0.54	-	-	
Total Hepta CDF	5.10	0.40	-	ND (A)	3.0	-	ND	0.52	-	-	
Total Toxic Equivalency			2.67			3.29			4.33	-	

Notes:

MDL: Method detection limit
ND: Not detected
MOE: Ontario Ministry of Environment
SCS: Site Condition Standard
CDD*: Chloro Dibenzo-p-Dioxin
CDF**: Chloro Dibenzo-p-Furan
1 - Guideline for 2,3,7,8-Tetra CDD (Commercial Site with Non-Potable Groundwater)
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3 - MOE Standards = Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011
4 - Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition & Coarse Grain Soils
TEF: Toxic Equivalency Factor of other dioxins and furans to 2,3,7,8-Tetra CDD
TEF Equivalent: Concentration of Dioxins and Furans multiplied by the TEF (WHO)
Shaded and bold data exceeds the MOE SCS
WHO: World Health Organisation
-: Value not established
(A) - EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.
(B) - EMPC / DPE - Diphenylether interference present caused dibenzofuran detected to become a "non-detect" with an elevated detection limit.

TABLE D-6: Dioxin and Furan Concentrations in Groundwater (2007-2012) - Continued

	DATA				GUIDELINE
Sampling Date	Nov. 2012			TEF (WHO) 2005[2]	**2009 MOE SCS [3] (Table 3) [4]**
Sample ID	MW-06	MDL	TEF Equivalent		
Parameter	(pg / L)	(pg / L)	(pg / L)		
2,3,7,8-Tetra CDD *	ND	0.893	0.893	1.00	**14,000 [1]**
1,2,3,7,8-Penta CDD	ND	1.04	1.04	1.00	
1,2,3,4,7,8-Hexa CDD	ND	0.943	0.0943	0.10	
1,2,3,6,7,8-Hexa CDD	ND	0.835	0.0835	0.10	
1,2,3,7,8,9-Hexa CDD	ND	0.811	0.0811	0.10	
1,2,3,4,6,7,8-Hepta CDD	2.08	1.02	0.0208	0.01	
Octa CDD	14.0	1.31	0.00420	0.0003	
Total Tetra CDD	ND (A)	1.89	-	-	
Total Penta CDD	ND	1.04	-	-	
Total Hexa CDD	ND (A)	6.62	-	-	
Total Hepta CDD	4.31	1.02	-	-	
2,3,7,8-Tetra CDF **	ND	0.948	0.0948	0.10	
1,2,3,7,8-Penta CDF	ND	1.04	0.0312	0.03	
2,3,4,7,8-Penta CDF	ND	1.01	0.303	0.30	
1,2,3,4,7,8-Hexa CDF	ND	0.993	0.0993	0.10	
1,2,3,6,7,8-Hexa CDF	ND	0.859	0.0859	0.10	
2,3,4,6,7,8-Hexa CDF	ND	1.02	0.102	0.10	
1,2,3,7,8,9-Hexa CDF	ND	1.15	0.115	0.10	
1,2,3,4,6,7,8-Hepta CDF	ND (A)	1.09	0.0109	0.01	
1,2,3,4,7,8,9-Hepta CDF	ND	1.16	0.0116	0.01	
Octa CDF	ND	1.13	0.000339	0.0003	
Total Tetra CDF	ND (A)	1.67	-	-	
Total Penta CDF	ND (A)	1.69	-	-	
Total Hexa CDF	ND	0.995	-	-	
Total Hepta CDF	ND (A)	1.28	-	-	
Total Toxic Equivalency	-	-	3.07	-	

Notes:

MDL: Method detection limit
ND: Not detected
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SCS: Site Condition Standard
CDD*: Chloro Dibenzo-p-Dioxin
CDF**: Chloro Dibenzo-p-Furan
1 - Guideline for 2,3,7,8-Tetra CDD (Commercial Site with Non-Potable Groundwater)
2 - van Leeuwen FXR (1997). Derivation of TEFs for dioxin-like compounds in humans and wildlife. Organohalogen Compounds 34:237
3 - MOE Standards = Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011
4 - Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition & Coarse Grain Soils
TEF: Toxic Equivalency Factor of other dioxins and furans to 2,3,7,8-Tetra CDD
TEF Equivalent: Concentration of Dioxins and Furans multiplied by the TEF (WHO)
Shaded and bold data exceeds the MOE SCS
WHO: World Health Organisation
-: Value not established
(A) - EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.
(B) - EMPC / DPE - Diphenylether interference present caused dibenzofuran detected to become a "non-detect" with an elevated detection limit.

TABLE D-6: Dioxin and Furan Concentrations in Groundwater (2007-2012) - Continued

	DATA													GUIDELINE
Sampling Date	Nov. 2007			May 2008			Jan. 2009						TEF (WHO) 1997[2]	**2011 MOE SCS [3] (Table 3) [4]**
Sample ID	MW-07	MDL	TEF Equivalent	MW-07	MDL	TEF Equivalent	MW-07	MDL	TEF Equivalent	DUP-1	MDL	TEF Equivalent		
Parameter	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)		
2,3,7,8-Tetra CDD *	ND	0.725	0.725	ND	0.715	0.715	ND	0.854	0.854	ND	0.880	0.880	1	
1,2,3,7,8-Penta CDD	ND	0.615	0.615	ND	1.06	1.06	ND	0.777	0.777	ND	0.951	0.951	1	
1,2,3,4,7,8-Hexa CDD	ND	0.894	0.0894	ND	1.38	0.138	ND	0.876	0.0876	ND	0.722	0.0722	0.1	
1,2,3,6,7,8-Hexa CDD	ND	0.839	0.0839	ND	1.31	0.131	ND	0.910	0.0910	ND	0.750	0.0750	0.1	
1,2,3,7,8,9-Hexa CDD	ND	0.83	0.0830	ND	1.44	0.144	ND	0.839	0.0839	ND	0.692	0.0692	0.1	
1,2,3,4,6,7,8-Hepta CDD	1.13	0.816	0.0113	1.89	0.709	0.0189	ND	1.25	0.0125	1.11	0.619	0.0111	0.01	
Octa CDD	5.23	0.605	0.00157	6.38	1.04	0.00191	6.99	2.50	0.00210	6.27	2.01	0.00188	0.0001 / 0.0003	
Total Tetra CDD	1.66	0.725	-	4.12	0.715	-	5.38	0.854	-	5.39	0.880	-	-	
Total Penta CDD	ND	0.615	-	ND	1.84	-	ND	0.777	-	ND	0.951	-	-	
Total Hexa CDD	ND	2.2	-	ND	1.45	-	ND	0.874	-	ND	0.720	-	-	
Total Hepta CDD	1.13	0.816	-	4.09	0.709	-	1.12	0.688	-	2.00	0.619	-	-	
2,3,7,8-Tetra CDF **	0.936	0.73	0.0936	ND	1.33	0.133	1.81	0.837	0.181	ND	1.32	0.132	0.1	
1,2,3,7,8-Penta CDF	ND	0.626	0.0188	ND	1.37	0.0411	ND	1.00	0.0300	ND	0.955	0.0287	0.05 / 0.03	
2,3,4,7,8-Penta CDF	1.64	0.569	0.492	ND	1.36	0.408	1.74	0.968	0.522	1.54	0.922	0.462	0.5 / 0.3	**14,000 [1]**
1,2,3,4,7,8-Hexa CDF	ND	0.598	0.0598	ND	.520	.0520	ND	0.639	0.0639	ND	0.597	0.0597	0.1	
1,2,3,6,7,8-Hexa CDF	ND	0.564	0.0564	ND	.470	.0470	ND	0.611	0.0611	ND	0.570	0.0570	0.1	
2,3,4,6,7,8-Hexa CDF	ND	0.669	0.0669	ND	0.613	0.0613	ND	0.697	0.0697	ND	0.651	0.0651	0.1	
1,2,3,7,8,9-Hexa CDF	ND	0.686	0.0686	ND	0.732	0.0732	ND	0.760	0.0760	ND	0.709	0.0709	0.1	
1,2,3,4,6,7,8-Hepta CDF	ND(1)	1.44	0.0144	ND	1.73	0.0173	ND	1.58	0.0158	ND	0.960	0.00960	0.01	
1,2,3,4,7,8,9-Hepta CDF	ND	0.752	0.00752	ND	0.925	0.00925	ND	1.08	0.0108	ND	0.821	0.00821	0.01	
Octa CDF	0.828	0.748	0.000248	ND	1.20	.000360	ND	1.30	0.000390	ND	1.68	0.000504	0.0001 / 0.0003	
Total Tetra CDF	10.4	0.73	-	8.28	1.33	-	23.0	0.837	-	19.8	1.32	-	-	
Total Penta CDF	1.64	0.596	-	ND	3.00	-	1.74	0.986	-	1.54	0.938	-	-	
Total Hexa CDF	ND	0.625	-	ND	0.568	-	ND	0.672	-	ND	0.627	-	-	
Total Hepta CDF	ND	1.59	-	ND	1.73	-	ND	1.58	-	ND	0.960	-	-	
Total Toxic Equivalency	-	-	2.49	-	-	3.05	-	-	2.94	-	-	2.95	-	

Notes:

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SCS: Site Condition Standard
CDD*: Chloro Dibenzo-p-Dioxin
CDF**: Chloro Dibenzo-p-Furan
1 - Guideline for 2,3,7,8-Tetra CDD (Commercial Site with Non-Potable Groundwater)
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Shaded and bold data exceeds the MOE SCS
WHO: World Health Organisation
-: Value not established
(A) - EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.
(B) - EMPC / DPE - Diphenylether interference present caused dibenzofuran detected to become a "non-detect" with an elevated detection limit.

TABLE D-6: Dioxin and Furan Concentrations in Groundwater (2007-2012) - Continued

	DATA										GUIDELINE
Sampling Date	Oct. 2009			Jan. 2010			Dec. 2010			TEF (WHO) 1997[2]	**2011 MOE SCS [3] (Table 3) [4]**
Sample ID	MW-07	MDL	TEF Equivalent	MW-07	MDL	TEF Equivalent	MW-07	MDL	TEF Equivalent		
Parameter	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)		
2,3,7,8-Tetra CDD *	ND	0.57	0.570	ND	1.0	1.00	ND	0.51	0.510	1	
1,2,3,7,8-Penta CDD	ND	0.57	0.570	0.69	0.62	0.690	ND	0.70	0.700	1	
1,2,3,4,7,8-Hexa CDD	ND	0.59	0.0590	ND	0.74	0.0740	ND	0.62	0.0620	0.1	
1,2,3,6,7,8-Hexa CDD	ND	0.54	0.0540	ND	0.63	0.630	ND	0.53	0.0530	0.1	
1,2,3,7,8,9-Hexa CDD	ND	0.53	0.0530	ND	0.66	0.0660	ND	0.54	0.0540	0.1	
1,2,3,4,6,7,8-Hepta CDD	2.46	0.56	0.00246	ND (1)	1.9	0.0190	2	0.57	0.0200	0.01	
Octa CDD	ND (A)	14	0.00420	8.3	1.0	0.00249	10	1.1	0.00300	0.0001 / 0.0003	
Total Tetra CDD	4.30	0.57	-	ND	1.0	-	2	0.51	-	-	
Total Penta CDD	ND	0.57	-	0.69	0.62	-	ND(A)	0.86	-	-	
Total Hexa CDD	ND (A)	1.0	-	ND	0.67	-	ND(A)	0.91	-	-	
Total Hepta CDD	4.60	0.56	-	1.08	0.85	-	ND(A)	0.53	-	-	
2,3,7,8-Tetra CDF **	ND (A)	0.61	0.0610	1.37	0.61	0.137	1	0.59	0.100	0.1	
1,2,3,7,8-Penta CDF	0.73	0.56	0.0219	0.80	0.64	0.0240	ND	0.72	0.0216	0.05 / 0.03	
2,3,4,7,8-Penta CDF	ND	0.57	0.171	1.22	0.65	0.366	4	0.75	1.20	0.5 / 0.3	**14,000 [1]**
1,2,3,4,7,8-Hexa CDF	ND	0.51	0.0510	0.84	0.53	0.0840	ND	0.63	0.0630	0.1	
1,2,3,6,7,8-Hexa CDF	ND	0.51	0.0510	0.81	0.53	0.0810	ND	0.51	0.0510	0.1	
2,3,4,6,7,8-Hexa CDF	ND	0.56	0.0560	0.68	0.60	0.0680	ND	0.58	0.0580	0.1	
1,2,3,7,8,9-Hexa CDF	ND	0.62	0.0620	ND	0.69	0.0690	ND	0.65	0.0650	0.1	
1,2,3,4,6,7,8-Hepta CDF	ND (A)	1.3	0.0130	ND (A)	3.1	0.0310	ND(A)	4.7	0.0470	0.01	
1,2,3,4,7,8,9-Hepta CDF	ND	0.63	0.00630	ND	0.99	0.0099	ND	0.56	0.00560	0.01	
Octa CDF	ND	1.2	0.000360	ND (A)	1.5	0.000450	1	1.0	0.000300	0.0001 / 0.0003	
Total Tetra CDF	10.6	0.58	-	7.58	0.61	-	24.0	0.59	-	-	
Total Penta CDF	0.73	0.56	-	2.02	0.65	-	4	0.73	-	-	
Total Hexa CDF	ND	0.54	-	2.32	0.58	-	ND	0.57	-	-	
Total Hepta CDF	ND (A)	1.4	-	ND (A)	3.6	-	ND(A)	5.1	-	-	
Total Toxic Equivalency			1.83			2.78			3.01	-	

Notes:

MDL: Method detection limit
ND: Not detected
MOE: Ontario Ministry of Environment
SCS: Site Condition Standard
CDD*: Chloro Dibenzo-p-Dioxin
CDF**: Chloro Dibenzo-p-Furan
1 - Guideline for 2,3,7,8-Tetra CDD (Commercial Site with Non-Potable Groundwater)
2 - van Leeuwen FXR (1997). Derivation of TEFs for dioxin-like compounds in humans and wildlife. Organohalogen Compounds 34:237
3 - MOE Standards = Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011
4 - Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition & Coarse Grain Soils
TEF: Toxic Equivalency Factor of other dioxins and furans to 2,3,7,8-Tetra CDD
TEF Equivalent: Concentration of Dioxins and Furans multiplied by the TEF (WHO)
Shaded and bold data exceeds the MOE SCS
WHO: World Health Organisation
-: Value not established
(A) - EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.
(B) - EMPC / DPE - Diphenylether interference present caused dibenzofuran detected to become a "non-detect" with an elevated detection limit.

TABLE D-6: Dioxin and Furan Concentrations in Groundwater (2007-2012) - Continued

	DATA				GUIDELINE
Sampling Date	Nov. 2012			TEF (WHO) 1997[2]	**2011 MOE SCS [3] (Table 3) [4]**
Sample ID	MW-07	MDL	TEF Equivalent		
Parameter	(pg / L)	(pg / L)	(pg / L)		
2,3,7,8-Tetra CDD *	ND	1.08	1.08	1.00	
1,2,3,7,8-Penta CDD	ND	1.04	1.04	1.00	
1,2,3,4,7,8-Hexa CDD	ND	1.10	0.110	0.10	
1,2,3,6,7,8-Hexa CDD	ND	0.978	0.0978	0.10	
1,2,3,7,8,9-Hexa CDD	ND	0.951	0.0951	0.10	
1,2,3,4,6,7,8-Hepta CDD	ND	1.06	0.0106	0.01	
Octa CDD	3.5	1.18	0.00105	0.0003	
Total Tetra CDD	ND (A)	1.83	-	-	
Total Penta CDD	ND	1.04	-	-	
Total Hexa CDD	ND (A)	5.09	-	-	
Total Hepta CDD	ND	1.06	-	-	
2,3,7,8-Tetra CDF **	ND	1.06	0.106	0.10	
1,2,3,7,8-Penta CDF	ND	1.03	0.0309	0.03	
2,3,4,7,8-Penta CDF	ND	1.00	0.300	0.30	**14,000 [1]**
1,2,3,4,7,8-Hexa CDF	ND	1.05	0.105	0.10	
1,2,3,6,7,8-Hexa CDF	ND	0.910	0.0910	0.10	
2,3,4,6,7,8-Hexa CDF	ND	1.08	0.108	0.10	
1,2,3,7,8,9-Hexa CDF	ND	1.22	0.122	0.10	
1,2,3,4,6,7,8-Hepta CDF	ND (A)	0.899	0.00899	0.01	
1,2,3,4,7,8,9-Hepta CDF	ND	1.09	0.0109	0.01	
Octa CDF	ND	1.57	0.000471	0.0003	
Total Tetra CDF	3.87	1.06	-	-	
Total Penta CDF	ND (A)	2.58	-	-	
Total Hexa CDF	ND	1.05	-	-	
Total Hepta CDF	ND (A)	1.05	-	-	
Total Toxic Equivalency			3.32	-	

Notes:

MDL: Method detection limit
ND: Not detected
MOE: Ontario Ministry of Environment
SCS: Site Condition Standard
CDD*: Chloro Dibenzo-p-Dioxin
CDF**: Chloro Dibenzo-p-Furan
1 - Guideline for 2,3,7,8-Tetra CDD (Commercial Site with Non-Potable Groundwater)
2 - van Leeuwen FXR (1997). Derivation of TEFs for dioxin-like compounds in humans and wildlife. Organohalogen Compounds 34:237
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4 - Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition & Coarse Grain Soils
TEF: Toxic Equivalency Factor of other dioxins and furans to 2,3,7,8-Tetra CDD
TEF Equivalent: Concentration of Dioxins and Furans multiplied by the TEF (WHO)
Shaded and bold data exceeds the MOE SCS
WHO: World Health Organisation
-: Value not established
(A) - EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.
(B) - EMPC / DPE - Diphenylether interference present caused dibenzofuran detected to become a "non-detect" with an elevated detection limit.

TABLE D-6: Dioxin and Furan Concentrations in Groundwater (2007-2012) - Continued

	DATA							GUIDELINE
Sampling Date	Nov. 2012						TEF (WHO) 2005[2]	**2011 MOE SCS [3] (Table 3) [4]**
Sample ID	MW-08	MDL	TEF Equivalent	DUP-01	MDL	TEF Equivalent		
Parameter	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)		
2,3,7,8-Tetra CDD *	ND	0.960	0.960	ND	1.02	1.02	1.00	
1,2,3,7,8-Penta CDD	ND	1.01	1.01	ND	0.969	0.969	1.00	
1,2,3,4,7,8-Hexa CDD	ND	0.980	0.0980	ND	1.00	0.100	0.10	
1,2,3,6,7,8-Hexa CDD	ND	0.867	0.0867	ND	0.886	0.0886	0.10	
1,2,3,7,8,9-Hexa CDD	ND	0.843	0.0843	ND	0.861	0.0861	0.10	
1,2,3,4,6,7,8-Hepta CDD	ND	1.02	0.0102	ND	1.02	0.0102	0.01	
Octa CDD	1.3	0.859	0.000390	2.5	1.16	0.000750	0.0003	
Total Tetra CDD	ND	0.960	-	ND (A)	1.29	-	-	
Total Penta CDD	ND	1.01	-	ND	0.969	-	-	
Total Hexa CDD	ND (NA)	7.01	-	ND (A)	5.33	-	-	
Total Hepta CDD	ND	1.02	-	ND	1.02	-	-	
2,3,7,8-Tetra CDF **	ND	0.972	0.0972	ND	0.960	0.0960	0.10	
1,2,3,7,8-Penta CDF	ND	0.912	0.0274	ND	0.978	0.0293	0.03	
2,3,4,7,8-Penta CDF	ND	0.888	0.266	ND	0.953	0.286	0.30	**14,000 [1]**
1,2,3,4,7,8-Hexa CDF	ND	0.995	0.0995	ND	1.04	0.104	0.10	
1,2,3,6,7,8-Hexa CDF	ND	0.861	0.0861	ND	0.904	0.0904	0.10	
2,3,4,6,7,8-Hexa CDF	ND	1.02	0.102	ND	1.07	0.107	0.10	
1,2,3,7,8,9-Hexa CDF	ND	1.15	0.115	ND	1.21	0.121	0.10	
1,2,3,4,6,7,8-Hepta CDF	ND	0.751	0.00751	ND	0.787	0.00787	0.01	
1,2,3,4,7,8,9-Hepta CDF	ND	1.06	0.0106	ND	1.11	0.0111	0.01	
Octa CDF	ND	1.29	0.000387	ND	1.02	0.000306	0.0003	
Total Tetra CDF	ND (NA)	1.98	-	ND (A)	2.10	-	-	
Total Penta CDF	ND (NA)	3.66	-	ND (A)	4.77	-	-	
Total Hexa CDF	ND	0.997	-	ND	1.05	-	-	
Total Hepta CDF	ND	0.878	-	ND	0.921	-	-	
Total Toxic Equivalency	-	-	3.06	-	-	3.13	-	

Notes:

MDL: Method detection limit
ND: Not detected
MOE: Ontario Ministry of Environment
SCS: Site Condition Standard
CDD*: Chloro Dibenzo-p-Dioxin
CDF**: Chloro Dibenzo-p-Furan
1 - Guideline for 2,3,7,8-Tetra CDD (Commercial Site with Non-Potable Groundwater)
2 - van Leeuwen FXR (1997). Derivation of TEFs for dioxin-like compounds in humans and wildlife. Organohalogen Compounds 34:237
3 - MOE Standards = Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011
4 - Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition & Coarse Grain Soils
TEF: Toxic Equivalency Factor of other dioxins and furans to 2,3,7,8-Tetra CDD
TEF Equivalent: Concentration of Dioxins and Furans multiplied by the TEF (WHO)
Shaded and bold data exceeds the MOE SCS
WHO: World Health Organisation
-: Value not established
(A) - EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.
(B) - EMPC / DPE - Diphenylether interference present caused dibenzofuran detected to become a "non-detect" with an elevated detection limit.

TABLE D-7: General Water Chemistry in Groundwater (2007-2012)

					DATA														GUIDELINES
Sample ID					MW-01								MW-02						
Sampling Date		MDL			Feb. 2007	Nov. 2007	May 2008	Mar. 2009	Oct. 2009	Jan. 2010	Dec. 2010	Nov. 2012	Feb. 2007	Nov. 2007	May 2008	Oct. 2009	Jan. 2010		**2011 MOE Standards (1) (Tables 3 & 5) (2)**
Parameter	Unit	2007 - 2009	2009 - 2010*	2012															
Ammonia	(ug/L)	10	50	-	990	<10	20	68	<50	<50	<50	-	30	13	10	<50	<50		-
Chloride	(ug/L)	100	1,000	-	11.3	4,910	7,640	4,900	6,000	5,000	4,000	-	20.4	4,820	6,120	5,000	5,000		-
Colour	(TCU)	5	5	5	-	24	<5	11	11	8	62	6.3	-	<5	<5	<5	<5		-
Conductivity	(µS/cm)	5	1	1	48	46	44	40	39	37	35	62	81	35	37	31	28		-
DOC	(ug/L)	500	-	-	3,700	1,920	903	877	-	-	-	-	1,700	1,270	582	-	-		-
Fluoride	(ug/L)	100	-	-	200	<100	<100	<100	-	-	-	-	<100	<100	<100	-	-		-
Hardness as CaCO3	(ug/L)	300	1,000	1000	268,000	7,880	9,080	8,370	19,000	7,000	8,000	8,800	11,500	5,220	5,220	7,000	5,000		-
Nitrate as N	(ug/L)	50	50	50	170	<50	<50	<50	<50	<50	<50	0.055	<0.05	63	<50	<50	<50		-
Nitrite as N	(ug/L)	15	10	10	<50	<15	<15	<15	<10	<10	<10	<10	<0.05	<15	<15	<10	<10		**-**
pH	-	-	-	N/A	6.04	7.30	5.96	6.23	6.15	6.05	6.25	6.81	5.62	6.05	5.94	6.10	5.59		-
Sulphate	(ug/L)	100	2,000	-	11,500	2,120	1,760	1,790	2,000	<2,000	<2,000	-	1,800	2,250	2,290	2,000	<2,000		-
Total Alkalinity (CaCO3)	(ug/L)	5,000	5,000	500	15,000	19,700	6,920	7,190	7,000	8,000	7,000	17,000	6,000	11,000	<5,000	6,000	<5,000		-
Total Dissolved Solids	(ug/L)	10,000	1,000	-	40,000	29,800	30,000	25,800	41,000	23,000	22	-	75,000	22,400	42,000	25,000	17,000		-
Total Organic Carbon	(ug/L)	500	500	500	-	8,220	53,500	10,500	98,000	25000 (A)	31,000	60,000 (3)	-	1,340	1,750	2,100	9,000		-
Total Supended Solids	(ug/L)	2,000	-	-	12,800,000	6,660,000	5,900,000	1,050,000	-	-	-	-	652,000	264,000	208,000	-	-		-
Turbidity	(NTU)	0.1	0.1	10	-	4,290	2,590	1,410	710	>10000	>1000	>1000	-	124	92.3	43	370		-
Calcium	(ug/L)	500	100	100	81,600	2,070	2,400	1,910	5,200	2,000	2,200	2,530	2,670	1,350	1,330	1,700	1,300		-
Magnesium	(ug/L)	20	100	100	15,500	642	745	881	1400	600	500	602	1,150	449	479	600	500		-
Potassium	(ug/L)	20	100	100	9,180	595	212	1,320	2,100	200	150	275	546	239	148	400	200		-
Sodium	(ug/L)	500	100	100	11,800	4,090	4,750	4,200	12,000	3,700	4,300	5,810	12,100	4,510	5,210	5,100	5,200		-
Dissolved Phosphorus (P)	(ug/L)	-	100	100	-	-	-	-	<100	<100	140	<100	-	-	-	<100	<100		-
Reactive Silica (SiO2)	(ug/L)	-	500	500	-	-	-	-	7,800	7,000	6,500	7,400	-	-	-	6,700	5,100		-

Notes:

MDL: Method Detection Limit

<X: Below MDL

MOE: Ontario Ministry of Environment

Bold faced guidelines reflect those most applicable to current land use designation

-: Value not established

Shaded and bold data exceeds the CCME-FAL Guidelines

* RDLs for the following parameters vary for some monitoring wells in October 2009 and January 2010 sampling events: Nitrate, total alkalinity, colour, ammonia, chloride, sulphate, turbidity and total organic carbon (results still remain within applicable guidelines).

** pH guidelines not multiplied by 10

(1) - MOE Standards = Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011

(2) - Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition & Coarse Grain Soils

(3) - Reporting limit was increased due to turbidity

(A) - Sample MW-01 was decanted as the sediment content was >5% (Jan-2010)

TABLE D-7: General Water Chemistry in Groundwater (2007-2012) - continued

Sample ID					DATA																GUIDELINES
					MW-03									MW-04							
Sampling Date		MDL			Feb. 2007	Nov. 2007	Nov. 2007 (Dup-1)	May 2008	Mar. 2009	Oct. 2009	Jan. 2010	Dec. 2010	Nov. 2012	Feb. 2007	Nov. 2007	May 2008	Mar. 2009	Oct. 2009	Jan. 2010	Dec. 2010	Nov. 2012	**2011 MOE Standards (1) (Tables 3 & 5) (2)**
Parameter	Unit	2007 - 2009	2009 - 2010*	2012																	
Ammonia	(ug/L)	10	50	-	39,600	20,700	22,500	179	7,790	29,000	6,200	2,100	-	1,140	5,130	959	29,900	5,000	21,000	8,000	-	-
Chloride	(ug/L)	100	1,000	-	238	155,000	155,000	43,100	133,000	140,000	93,000	44,000	-	58.9	151,000	112,000	106,000	87,000	93,000	51,000	-	-
Colour	(TCU)	5	5	25/5	-	96	96	<5	19	68	22	35	83	-	34	29	90	41	100	40	47	-
Conductivity	(µS/cm)	5	1	1	1,130	780	791	171	635	680	480	240	310	370	692	500	711	440	580	310	490	-
DOC	(ug/L)	500	-	-	33,800	21,000	21,300	1,400	9,640	-	-	-	-	5,400	7,580	8,530	20,500	-	-	-	-	-
Fluoride	(ug/L)	100	-	-	100	<100	<100	<100	<100	-	-	-	-	100	113	<100	<100	-	-	-	-	-
Hardness as CaCO3	(ug/L)	300	1,000	1000	56,000	38,400	34,900	17,400	70,700	51,000	48,000	24,000	34,000	118,000	65,900	50,700	37,700	69,000	31,000	22,000	52,000	-
Nitrate as N	(ug/L)	50	50	50	<50	<50	<50	801	<50	<50	80	110	<0.050	1,150	<50	150	<50	170	<50	<50	<0.050	-
Nitrite as N	(ug/L)	15	10	10	<50	<15	<15	96	<15	80	10	50	<10	<50	<15	<15	<15	<10	<10	<10	<0.010	-
pH	-	-	-	N/A	6.66	6.60	6.55	5.96	6.95	6.94	6.57	7.27	7.11	6.01	6.53	6.69	6.84	6.80	6.75	7.45	7.08	-
Sulphate	(ug/L)	100	2,000	-	5,400	6,580	5,950	7,180	3,220	3,000	4,000	<2,000	-	3,200	2,740	1,300	5,500	4,000	10,000	9,000	-	-
Total Alkalinity (CaCO3)	(ug/L)	5,000	5,000	200	234,000	138,000	133,000	12,100	112,000	160,000	92,000	49,000	86,000	25,000	86,900	84,300	150,000	84,000	140,000	66,000	130,000	-
Total Dissolved Solids	(ug/L)	10,000	1,000	-	668,000	507,000	514,000	94,000	413,000	412,000	265,000	127,000	-	316,000	450,000	245,000	462,000	277,000	313,000	170,000	-	-
Total Organic Carbon	(ug/L)	500	500	5000/500	-	24,500	25,500	5,270	32,500	16,000	170,000	22,000	170,000 (3)	-	12,100	112,000	22,500	<50000	19,000	6,700	9,100	-
Total Supended Solids	(ug/L)	2,000	-	-	333,000	166,000	103,000	419,000	1,160,000	-	-	-	-	29,500,000	10,500,000	2,400,000	164,000	-	-	-	-	-
Turbidity	(NTU)	0.1	0.1	10/0.10	-	60	30.2	77.2	1,820	85	>1000	380	>1000	-	6,000	1,960	70.3	>10000	190	20	31	-
Calcium	(ug/L)	500	100	100	15,800	11,300	10,500	5,060	18,700	15,000	13,000	7,000	10800	34,600	17,500	13,000	11,100	19,000	9,400	6,700	15,700	-
Magnesium	(ug/L)	20	100	100	4,000	2,470	2,410	1,140	5,830	3,200	3,600	1,600	1610	7,680	5,380	4,440	2,430	5,000	1,900	1,200	3,160	-
Potassium	(ug/L)	20	100	100	6,560	3,630	3,540	633	4,010	4,800	2,400	1,100	1730	4,810	3,150	3,320	3,930	3,600	2,900	1,500	2,900	-
Sodium	(ug/L)	500	100	100	189,000	102,000	103,000	24,500	85,100	96,000	73,000	32,000	37000	60,700	91,200	72,600	84,300	88,000	77,000	40,000	43,500	-
Dissolved Phosphorus (P)	(ug/L)	-	100	100	-	-	-	-	-	200	<100	110	<100	-	-	-	-	<100	100	130	335	-
Reactive Silica (SiO2)	(ug/L)	-	500	500	-	-	-	-	-	7,900	6,400	5,200	7,400	-	-	-	-	6,200	8,000	8,400	8,700	-

Notes:

MDL: Method Detection Limit

<X: Below MDL

MOE: Ontario Ministry of Environment

-: Value not established

Shaded and bold data exceeds the MOE SCS

Dup-1 is a blind field duplicate of groundwater sample MW-03

* RDLs for the following parameters vary for some monitoring wells in October 2009 and January 2010 sampling events: Nitrate, total alkalinity, colour, ammonia, chloride, sulphate, turbidity and total organic carbon (results still remain within applicable guidelines).

** pH guidelines not multiplied by 10

(1) - MOE Standards = Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011

(2) - Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition & Coarse Grain Soils

(3) - Reporting limit was increased due to turbidity

TABLE D-7: General Water Chemistry in Groundwater (2007-2012) - continued

					DATA													GUIDELINES
Sample ID					MW-05						MW-06							
Sampling Date		MDL			Feb. 2007	Nov. 2007	May 2008	Oct. 2009	Jan. 2010	Dec. 2010	Feb. 2007	Nov. 2007	May 2008	Oct. 2009	Jan. 2010	Dec. 2010	Dec. 2010 (DUP-1)	Nov. 2012	**2011 MOE Standards (1) (Tables 3 & 5) (2)**
Parameter	Unit	2007 - 2009	2009 - 2010*	2012															
Ammonia	(ug/L)	10	50	-	590	23	12	<50	<50	<50	16,600	5,200	897	7,800	24,000	3,800	3,800	-	-
Chloride	(ug/L)	100	1,000	-	5.3	7	4,910	9,000	8,000	9,000	-	2,730	19,500	33,000	55,000	18,000	18,000	-	-
Colour	(TCU)	5	5	25	-	7,150	38	46	20	46	-	65	58	62	37	180	180	130	-
Conductivity	(µS/cm)	5	1	1	43	51	37	51	44	53	760	447	377	860	1,500	330	340	190	-
DOC	(ug/L)	500	-	-	4,100	11,100	6,040	-	-	-	8,000	7,880	10,300	-	-	-	-	-	-
Fluoride	(ug/L)	100	-	-	200	525	<100	-	-	-	100	<100	<100	-	-	-	-	-	-
Hardness as CaCO3	(ug/L)	300	1,000	1000	50,100	8,350	5,330	14,000	9,000	10,000	177,000	101,000	87,900	260,000	510,000	88,000	91,000	47	-
Nitrate as N	(ug/L)	50	50	50	<50	<50	59	60	110	<50	27,500	14,400	14,800	18,000	24,000	2,100	2,100	<50	-
Nitrite as N	(ug/L)	15	10	10	<50	<15	<15	<10	<10	<10	<50	57	84	210	90	30	30	<10	**-**
pH	-	-	-	N/A	6.09	6.10	6.30	6.18	5.92	6.70	6.13	6.11	6.31	6.36	6.82	7.10	7.02	6.96	-
Sulphate	(ug/L)	100	2,000	-	2,100	2,520	1,760	<2,000	<2,000	<2,000	167,000	84,400	63,400	280,000	490,000	72,000	74,000	-	-
Total Alkalinity (CaCO3)	(ug/L)	5,000	5,000	5000	14,000	14,000	12,300	8,000	8,000	11,000	31,000	20,200	23,000	38,000	170,000	55,000	56,000	38	-
Total Dissolved Solids	(ug/L)	10,000	1,000	-	38,000	33,000	33,000	37,000	29,000	32,000	492,000	291,000	277,000	610,000	1,070,000	209,000	212,000	-	-
Total Organic Carbon	(ug/L)	500	500	50000	-	23,800	494,000	<5000	6,000	4,500	-	8,830	18,000	18,000	11,000	14,000	13,000	190,000 (3)	-
Total Supended Solids	(ug/L)	2,000	-	-	4,390,000	33,700,000	8,300,000	-	-	-	1,740,000	262,000	305,000	-	-	-	-	-	-
Turbidity	(NTU)	0.1	0.1	10	-	23,200	2,330	120	81	38	-	130	91	500	160	70	83	>1000	-
Calcium	(ug/L)	500	100	100	14,300	2,330	1,310	3,700	2,300	2,800	52,000	30,900	26,600	79,000	150,000	28,000	28,000	14800	-
Magnesium	(ug/L)	20	100	100	3,490	616	502	1,300	800	790	11,400	5,840	5,210	15,000	30,000	4,600	4,800	2400	-
Potassium	(ug/L)	20	100	100	1,530	405	166	900	100	210	20,100	9,220	10,200	22,000	33,000	9,000	9,000	3540	-
Sodium	(ug/L)	500	100	100	6,800	10,200	4,030	8,200	4,900	5,400	53,400	27,600	21,800	56,000	72,000	20,000	20,000	10000	-
Dissolved Phosphorus (P)	(ug/L)	-	100	100	-	-	-	<100	<100	<100	-	-	-	100	<100	<100	180	182	-
Reactive Silica (SiO2)	(ug/L)	-	500	5000	-	-	-	8,500	7,900	8,000	-	-	-	7,100	7,300	6,400	6,300	5,800	-

Notes:

MDL: Method Detection Limit

<X: Below MDL

MOE: Ontario Ministry of Environment

-: Value not established

Shaded and bold data exceeds the MOE SCS

DUP-1 (Dec. 2010) is a blind field duplicate of groundwater sample MW-06

** pH guidelines not multiplied by 10

(1) - MOE Standards = Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011

(2) - Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition & Coarse Grain Soils

(3) - Reporting limit was increased due to turbidity

TABLE D-7: General Water Chemistry in Groundwater (2007-2012) - Continued

					DATA															GUIDELINES
Sample ID					MW-07										MW-08					
Sampling Date		MDL			Feb. 2007	Nov. 2007	May 2008	May 2008	Mar. 2009	Mar. 2009	Oct. 2009	Jan. 2010	Dec. 2010	Nov. 2012	Mar. 2010	Dec. 2010	Nov. 2012	Nov. 2012	2011 MOE
Parameter	Unit	2007 - 2009	2009 - 2010*	2012				(DUP-1)		(DUP-2)								DUP-01	Standards (1) (Tables 3 & 5) (2)
Ammonia	(ug/L)	10	50	-	910	70	55	29	23	19	<50	<50	<50	-	<50	<50	-	-	-
Chloride	(ug/L)	100	1,000	-	5,800	4,510	3,100	3,090	6,950	6,990	8,000	8,000	7,000	-	4,000	7,000	-	-	-
Colour	(TCU)	5	5	250/25	-	480	240	240	162	156	1,100	430	770	1500	120	90	220	190	-
Conductivity	(µS/cm)	5	1	1	35	44	32	33	42	43	53	41	52	86	29	36	36	36	-
DOC	(ug/L)	500	-	-	17,700	21,100	33,400	34,300	18,600	19,200	-	-	-	-	-	-	-	-	-
Fluoride	(ug/L)	100	-	-	100	<100	<100	<100	<100	<100	-	-	-	-	-	-	-	-	-
Hardness as CaCO3	(ug/L)	300	1,000	1,000	13,200	5,890	3,990	3,870	5,740	5,500	6,000	3,000	7,000	6,900	3,000	4,000	3,800	3,900	-
Nitrate as N	(ug/L)	50	50	50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	-
Nitrite as N	(ug/L)	15	10	10	<50	<15	<15	<15	<15	<15	<10	<10	<10	<10	<10	<10	<10	<10	-
pH	-	-	-	N/A	4.92	5.01	5.20	5.45	4.65	4.47	4.71	4.86	6.05	5.74	5.42	5.12	5.15	5.16	-
Sulphate	(ug/L)	100	2,000	-	1,800	1,780	1,130	971	1,290	1,250	<2,000	<2,000	<2,000	-	<2,000	<2,000	-	-	-
Total Alkalinity (CaCO3)	(ug/L)	5,000	5,000	5,000	<5,000	5,730	<5,000	<5,000	<5,000	<5,000	<5,000	<5,000	<5,000	<5,000	<5,000	<5,000	<5000	<5000	-
Total Dissolved Solids	(ug/L)	10,000	1,000	-	94,000	28,300	97,000	76,000	27,500	28,000	28,000	22,000	28,000	-	17,000	22,000	-	-	-
Total Organic Carbon	(ug/L)	500	500	50,000	-	59,900	155,000	49,900	47,200	47,200	100,000	38,000	43,000	190,000 (3)	19,000	27,000	23,000 (3)	32,000 (3)	-
Total Supended Solids	(ug/L)	2,000	-	-	2,540,000	242,000	1,300,000	890,000	248,000	268,000	-	-	-	-	-	-	-	-	-
Turbidity	(NTU)	0.1	0.1	3/0.3/0.5	-	231	683	405	201	182	370	160	290	450	330	550	69	160	-
Calcium	(ug/L)	500	100	100	3,690	1,040	791	758	777	739	1,200	500	2,000	2040	800	810	729	711	-
Magnesium	(ug/L)	20	100	100	960	837	490	480	916	909	700	500	450	430	200	560	484	518	-
Potassium	(ug/L)	20	100	100	460	221	170	165	270	175	300	ND	<1,000	320	500	310	242	281	-
Sodium	(ug/L)	500	100	100	4,200	4,680	3,830	3,950	3,720	3,810	9,200	5,800	9,300	21700	5,400	4,400	5000	5210	-
Dissolved Phosphorus (P)	(ug/L)	-	100	100	-	-	-	-	-	-	100	100	<1,000	146	<100	<100	<100	<100	-
Reactive Silica (SiO2)	(ug/L)	-	500	500	-	-	-	-	-	-	6,800	5,700	6,200	12,000	5,500	9,000	9,500	9,500	-

Notes:

MDL: Method Detection Limit
<X: Below MDL
MOE: Ontario Ministry of Environment
-: Value not established
Shaded and bold data exceeds the MOE SCS
* pH guidelines not multiplied by 10
DUP-1 is a blind field duplicate of groundwater sample MW-07 (May 2008)
DUP-2 is a blind field duplicate of groundwater sample MW-07 (May 2009)
DUP-01 is a blind field duplicate of groundwater sample MW-08 (Nov. 2012)
(1) - MOE Standards = Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011
(2) - Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition & Coarse Grain Soils
(3) - Reporting limit was increased due to turbidity

TABLE D-8: BTEX/TPH Concentrations in Surface Water Leachate Collection Pond and Stream (2007-2012)

Sample ID				DATA																GUIDELINES
Sampling Date				SW-POND									STREAM							1999 CCME-FAL
		MDL (µg/L)		Nov. 2007	May 2008	Jan 2009	Sept. 2009	Jan. 2010	Jan. 2010 SW-POND-D	Nov. 2010	Nov. 2010 SW-DUP1	Nov. 2012	Nov. 2007	May 2008	Jan 2009	Sept. 2009	Jan. 2010	Nov. 2010	Nov. 2012	(Updated 2007)
Parameter	2007 - 2008	2009 - 2010	2012	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
Benzene	0.2	1.0	1.0	<0.2	<0.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.2	<0.2	<1.0	<1.0	<1.0	<1.0	<1.0	**370**
Toluene	0.2	1.0	1.0	<0.2	<0.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.2	<0.2	<1.0	<1.0	<1.0	<1.0	<1.0	**2**
Ethylbenzene	0.2	1.0	1.0	<0.2	<0.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.2	<0.2	<1.0	<1.0	<1.0	<1.0	<1.0	**90**
Total Xylene	0.6	2.0	2.0	<0.6	<0.6	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<0.6	<0.6	<2.0	<2.0	<2.0	<2	<2.0	**-**
TPH (C_6-C_{10})	50	10	10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<50	<51	<10	<10	<10	<10	<10	**-**
TPH (>C_{10}-C_{21})	50	50	-	<50	<50	<50	<50	<50	<50	<50	<50	-	<50	BB	<50	<50	<50	<50	-	**-**
TPH (>C_{10}-C_{16})	-	-	50	-	-	-	-	-	-	-	-	<50	-	-	-	-	-	-	<50	
TPH (>C_{16}-C_{21})	-	-	50	-	-	-	-	-	-	-	-	<50	-	-	-	-	-	-	<50	
TPH (>C_{21}-<C_{32})	50	100	100	<50	<50	<100	<100	<100	<100	<100	<100	<100	<50	BB	<100	<100	<100	<100	<100	**-**
Modified TPH (C_6-C_{32})	150	100	100	<150	<150	<100	<100	<100	<100	<100	<100	<100	<150	BB	<100	<100	<100	<100	<100	**-**
Hydrocarbon Identification				-	-	-	(3)	(1)	(3)	(1)	(3)	-	-	-	-	(3)	(2)	(3)	-	

Notes:

MDL: Method detection limit

<X: not detected above MDL

CCME: Canadian Council of Ministers of the Environment

FAL: Freshwater Aquatic Life

Shaded and bold data exceeds the CCME-FAL Guidelines

BB: Broken Bottle

-: Value not established

1 - Isobutylbenzene/n-dotriacontane recover(ies) not within acceptance limits due to sediment interference

2 - Isobutylbenzene/n-dotriacontane recover(ies) not within acceptance limits due to matrix/co-extractive interference and sedimtne interference

3 - Isobutylbenzene/n-dotriacontane recover(ies) not within acceptance limits due to matrix/co-extractive interference

TABLE D-9: Metal Concentrations in Surface Water Leachate Collection Pond and Stream (2007-2012)

							DATA																GUIDELINES
Sample ID							SW-POND						SW-DUP1	SW-POND	SW-POND-1	SW-POND	STREAM							1999
Sampling Date							Nov. 2007	May 2008	Jan 2009	Sept. 2009	Jan. 2010	Nov. 2010	Nov. 2010	Dec. 2011	Dec. 2011	Nov. 2012	Nov. 2007	May 2008	Jan 2009	Sept. 2009	Jan. 2010	Nov. 2010	Dec. 2011	Nov. 2012	CCME-FAL
pH							7.38	6.92	7.45	7.13	7.13	7.79	7.87	7.66	7.65	7.87	6.92	7.43	7.16	6.93	6.32	7.12	7.21	7.55	(Updated 2007)
$CaCO_3$ (µg/L)						MDL (µg/L)	214,000	99,100	190,000	160,000	210,000	220,000	220,000	280,000	280,000	270,000	90,900	144,000	155,000	64,000	140,000	120,000	130,000	110,000	
Parameter	Feb. 2007	Nov. 2007 / May 2008	Jan 2009	Aug. 2009 / Jan. 2010	Nov. 2010 / Dec. 2011	Nov. 2012	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
Aluminum	1	5	5	5	5	5	**190**	76	45.9	**180**	**635**	75.6	74.7	**202**	**262**	49.7	89	**132**	60.7	83	**88.3**	**125**	**155**	51.7	**5 - 100**
Antimony	1	1	2	2	1	1	<1	<1	<2	<2	<2	<1	<1	<1	<1	<1	<1	<1	<2	<2	<2	<1	<1	<1	-
Arsenic	1	1	2	2	1	1	<1	<1	<2	<2	<2	<1	<1	<1	<1	<1	<1	<1	<2	<2	<2	<1	<1	<1	**5**
Barium	0.5	0.5	5	5	1	1	24.8	7.9	31	26	32.0	25	25.2	29.1	30.1	23.8	12.7	21.2	15	6	17.6	15.8	10.8	5.6	-
Beryllium	0.1	0.1	2	2	1	1	<0.1	<0.1	<2	<2	<2	<1	<1	<1	<1	<1	<0.1	<0.1	<2	<2	<2	<1	<1	<1	-
Bismuth	0.5	0.5	2	2	2	2	<0.5	<0.5	<2	<2	<2	<2	<2	<2	<2	<2	<0.5	<0.5	<2	<2	<2	<2	<2	<2	-
Boron	-	-	-	100	5	50	-	-	-	230	369	332	329	356	362	263	-	-	-	140	224	171	203	151	-
Cadmium	0.1	0.015	0.017	0.017	0.017	0.017	**0.064**	**0.067**	**0.035**	<0.017	**0.053**	**0.022**	**0.019**	**0.063**	**0.065**	**0.028**	<0.015	**0.099**	**0.018**	<0.017	<0.017	**0.020**	<0.017	<0.017	**0.017**
Calcium	50	500	-	100	100	100	51,500	30,600	-	55,000	70,000	77,100	77,400	99,000	97,500	96,000	31,100	46,700	-	20,000	45,000	41,200	43,200	36,200	-
Chromium	1	1	1	1	1	1	<1	<1	<1	<1	1.7	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	**1**
Cobalt	1	1	0.4	0.4	0.4	0.4	6	2	6.21	4	4.83	2.2	2.13	2.98	3.50	2.18	3	3	1.77	1	2.55	2.48	1.10	0.52	-
Copper	1	1	2	2	2	2	**10**	**3**	**6**	**6**	**8.9**	**7.9**	**5.1**	**6.4**	**6.7**	2.4	2	**6**	3	<2	**3.4**	2.5	2.3	<2	**2 - 4**
Iron	1	1	50	50	50	50	**377**	**318**	150	**480**	**1170**	241	244	**523**	**682**	**405**	167	**411**	100	190	180	235	265	98	**300**
Lead	2	1	0.5	0.5	0.5	0.5	2	1	<0.5	0.6	2.56	<0.5	<0.5	0.89	1.18	<0.5	1	1	<0.5	<0.5	0.51	<0.5	<0.50	<0.5	**1 - 7**
Magnesium	50	20	-	100	100	100	6,970	5,520	-	6,100	7,800	6,200	6,190	9,100	8,890	8,220	5,590	6,620	-	3,100	6,900	5,020	5,720	4,800	-
Manganese	1	1	2	2	2	2	1,850	1,350	2,400	1,200	1,760	1,170	1,170	1,670	1,750	1310	2,560	1,180	850	530	1,170	1,590	331	142	-
Mercury	0.01	0.02	0.01	0.01	-	-	<0.02	<0.02	<0.01	-	<0.013	-	-	-	-	-	<0.02	<0.02	0.01	-	0.018	-	-	-	**0.026**
Molybdenum	5	5	2	2	2	2	<5	<5	<2	<2	<2	<2	<2	<2	<2	<2	<5	<5	<2	<2	<2	<2	<2	<2	-
Nickel	1	5	2	2	2	2	<5	<5	3	<2	3.5	2	<2	2.2	23	<2	<5	<5	<2	<2	<2	<2	<2	<2	**25 - 150**
Phosphorus	2	5	-	100	100	100	51	24	-	-	<100	<100	120	<100	<100	<100	23	42	-	-	<100	<100	<100	<100	-
Potassium	50	20	-	100	100	100	16,900	12,900	-	1,200	15,000	13,600	14,000	12,900	12,700	10,600	13,900	12,900	-	8,100	14,000	11,800	9,530	7,520	-
Selenium	1	1	1	1	1	1	<1	<1	<1	<1	<1	1.2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	**1**
Silver	1	0.1	0.1	0.1	0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	**0.1**
Sodium	50	500	-	100	100	100	145,000	129,000	-	78,000	98,000	63,600	65,300	48,700	47,800	44,500	152,000	94,000	-	61,000	96,000	71,200	42,600	34,500	-
Strontium	-	-	-	5	2	2	-	-	-	180	198	187	193	261	256	243	-	-	-	62	122	102	116	94.1	-
Thallium	-	-	-	0.1	0.1	0.1	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	**0.8**
Tin	-	-	-	2	2	2	-	-	-	<2	<2	<2	<2	<2	<2	<2	-	-	-	<2	<2	<2	<2	<2	-
Titanium	-	-	-	2	2	2	-	-	-	16	31.7	10.4	10.1	26.3	33.8	7.9	-	-	-	5	11.0	10.9	16.2	4.7	-
Uranium	-	-	-	0.1	0.1	0.1	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	-
Vanadium	2	5	2	2	2	2	<5	<5	<2	<2	<2	<2	<2	<2	<2	<2	<5	<5	<2	<2	<2	<2	<2	<2	-
Zinc	1	1	5	5	5	5	12	9	17	18	24.3	11.8	11.4	21.4	23.1	12.2	4	25	6	14	8.7	8	6.2	<5	**30**

Notes

MDL: Method Detection Limit
<X: Below MDL
CCME = Canadian Council of Ministers of the Environment
FAL = Canadian Water Quality Guidelines for Freshwater Aquatic Life
-: Value not established
Shaded and bold data exceeds the CCME-FAL Guidelines
SW-DUP1 (Nov. 2010) are blind field duplicates of surface water sample SW-POND
SW-DUP-1 (Dec. 2011) is a blind field duplicate of surface water sample SW-POND

Aluminum guideline = 5 µg/L at pH <6.5
= 100 µg/L at pH ≥6.5

Copper guideline = 2 µg/L at water hardness [CaCO3] = 0-120,000 µg/L
= 3 µg/L at water hardness [CaCO3] = 120,000-180,000 µg/L
= 4 µg/L at water hardness [CaCO3] > 180,000 µg/L

Lead guideline = 1 µg/L at water hardness [CaCO3] = 0-60,000 µg/L (soft)
= 2 µg/L at water hardness [CaCO3] = 60,000-120,000 µg/L (medium)
= 4 µg/L at water hardness [CaCO3] = 120,000-180,000 µg/L (hard)
= 7 µg/L at water hardness [CaCO3] = > 180,000 µg/L (very hard)

Nickel guideline = 25 µg/L at water hardness [CaCO3] = 0-60,000 µg/L
= 65 µg/L at water hardness [CaCO3] = 60,000-120,000 µg/L
= 110 µg/L at water hardness [CaCO3] = 120,000-180,000 µg/L
= 150 µg/L at water hardness [CaCO3] = > 180,000 µg/L

Cadmium Guideline (in ug/L) = $10^{[0.86[\log(\text{hardness})] - 3.2]}$; hardness measured as $CaCO_3$ equivalents in mg/L

Chromium Guideline = For trivalent chromium (Cr(III))

TABLE D-10: PAH Concentrations in Surface Water Leachate Collection Pond and Stream (2007-2012)

Sample ID					DATA														GUIDELINES
Sampling Date	MDL (µg/L)				Nov. 2007	May 2008	Jan. 2009	SW-POND Sept. 2009	Jan. 2010	Nov. 2010	Nov. 2012	Nov. 2007	May 2008	Jan 2009	STREAM Sept. 2009	Jan. 2010	Nov. 2010	Nov. 2012	**1999 CCME-FAL (UPDATED 2007)**
Parameter	2007-2008	2009	Aug. 2009 / Jan. 2010	Nov. 2012	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)		**(µg/L)**
1-Methylnaphthalene	0.03	0.05	0.05	0.05	-	<0.03	<0.05	<0.06	<0.05	<0.05	<0.05	-	<0.03	<0.05	<0.05	<0.05	<0.05	<0.05	-
2-Methylnaphthalene	0.03	0.05	0.05	0.05	-	<0.03	<0.05	<0.06	<0.05	<0.05	<0.05	-	<0.03	<0.05	<0.05	<0.05	<0.05	<0.05	-
Acenaphthene	0.04	0.01	0.01	0.01	<0.04	<0.04	<0.01	<0.01	<0.01	<0.01	<0.01	<0.04	<0.04	<0.01	<0.01	<0.01	<0.01	<0.01	**5.8**
Acenaphthylene	0.03	0.01	0.01	0.01	<0.03	<0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.03	<0.03	<0.01	<0.01	<0.01	<0.01	<0.01	-
Acridine	-	-	0.05	0.05	-	-	-	-	<0.05	<0.05	<0.05	-	-	-	-	<0.05	<0.05	<0.05	**4.4**
Anthracene	0.01	0.01	0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.012**
Benzo(a)anthracene	0.01	0.01	0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.018**
Benzo(a)pyrene	0.005	0.01	0.01	0.01	<0.005	<0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.005	<0.01	<0.01	<0.01	<0.01	<0.01	**0.015**
Benzo(b)fluoranthene	0.05	0.01	0.01	0.01	<0.05	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	-
Benzo(g,h,i)perylene	0.03	0.01	0.01	0.01	<0.03	<0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.03	<0.03	<0.01	<0.01	<0.01	<0.01	<0.01	-
Benzo(k)fluoranthene	0.05	0.01	0.01	0.01	<0.05	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	-
Chrysene	0.04	0.01	0.01	0.01	<0.04	<0.04	<0.01	<0.01	<0.01	<0.01	<0.01	<0.04	<0.04	<0.01	<0.01	<0.01	<0.01	<0.01	-
Dibenzo(a,h)anthracene	0.05	0.01	0.01	0.01	<0.05	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	-
Fluoranthene	0.03	0.01	0.01	0.01	<0.03	<0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.03	<0.03	<0.01	<0.01	<0.01	<0.01	<0.01	**0.04**
Fluorene	0.03	0.01	0.01	0.01	<0.03	<0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.03	<0.03	<0.01	<0.01	<0.01	<0.01	<0.01	**3**
Indeno(1,2,3-cd)pyrene	0.05	0.01	0.01	0.01	<0.05	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	-
Naphthalene	0.03	0.2	0.2	0.20	<0.03	<0.03	<0.2	<0.2	<0.2	<0.2	<0.2	<0.03	<0.03	<0.2	<0.2	<0.2	<0.2	<0.2	**1.1**
Perylene	-	-	0.01	0.01	-	-	-	<0.01	<0.01	<0.01	<0.01	-	-	-	<0.01	<0.01	<0.01	<0.01	-
Phenanthrene	0.04	0.01	0.01	0.01	<0.04	<0.04	0.03	<0.01	<0.01	<0.01	<0.01	<0.04	<0.04	0.02	<0.01	<0.01	<0.01	<0.01	**0.4**
Pyrene	0.01	0.01	0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.025**
Quinoline	-	-	0.05	0.05	-	-	-	-	<0.05	<0.05	<0.05	-	-	-	-	<0.05	<0.05	<0.05	**3.4**

Notes
MDL: Method Detection Limit
<X: Below MDL
CCME = Canadian Council of Ministers of the Environment
FAL = Canadian Water Quality Guidelines for Freshwater Aquatic Life
-: Value not established or Parameter not analyzed
Shaded and bold data exceeds the CCME-FAL Guidelines

TABLE D-11: VOC Concentrations in Surface Water Leachate Collection Pond and Stream (2007-2012)

Sample ID					DATA							GUIDELINES
Sampling Date	MDL (µg/L)				Nov. 2007	May 2008	Jan 2009	SW-POND Sept. 2009	Jan. 2010	Nov. 2010	Nov. 2012	1999 CCME-FAL (UPDATED 2007)
Parameter	2007-2008	2009	Aug. 2009 / Jan 2010	Nov. 2012	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	**(µg/L)**
Methyl Chloride	0.3	3	-	-	< 0.3	< 0.3	-	-	-	-	-	**-**
Vinyl Chloride	0.2	1	0.5	1	< 0.2	< 0.2	<1	<0.5	<0.5	<0.5	<0.5	**-**
Bromomethane	0.4	8	3	3	< 0.4	< 0.4	<8	<3	<3	<3	<3	**-**
Chloroethane	0.4	8	8	8	< 0.4	< 0.4	<8	<8	<8	<8	<8	**-**
Trichlorofluoromethane	0.3	8	8	8	< 0.3	< 0.3	<8	<8	<8	<8	<8	**-**
1,1-Dichloroethene	0.3	-	-	-	< 0.3	< 0.3	-	-	-	-	-	**-**
Methylene Chloride	5	-	3	3	<5	<5	<3	<3	<3	<3	<3	**98.1**
Methyl-t-butyl ether	0.5	-	-	-	<0.5	<0.5	-	-	-	-	-	**-**
T1,2-Dichloroethylene	0.2	2	2	2	< 0.2	< 0.2	<2	<2	<2	<2	<2	**-**
1,1-Dichloroethane	0.6	2	2	2	< 0.6	< 0.6	<2	<2	<2	<2	<2	**-**
C1,2-Dichloroethylene	0.7	2	2	2	< 0.7	< 0.7	<2	<2	<2	<2	<2	**-**
Chloroform	0.5	1	1	1	< 0.5	< 0.5	<1	<1	<1	<1	<1	**1.8**
1,1,1-Trichloroethane	0.5	1	1	1	< 0.5	< 0.5	<1	<1	<1	<1	<1	**-**
Carbon Tetrachloride	0.3	1	1	1	< 0.3	< 0.3	<1	<1	<1	<1	<1	**13.3**
Benzene	0.4	1	1	1	< 0.4	< 0.4	<1	<1	<1	<1	<1	**370**
1,2-Dichloroethane	0.4	1	1	1	< 0.4	< 0.4	<1	<1	<1	<1	<1	**100**
Trichloroethylene	0.4	1	1	1	< 0.4	< 0.4	<1	<1	<1	<1	<1	**21**
1,2-Dichloropropane	0.4	1	1	1	< 0.4	< 0.4	<1	<1	<1	<1	<1	**-**
Bromodichloromethane	0.3	1	1	1	< 0.3	< 0.3	<1	<1	<1	<1	<1	**-**
C1,3-Dichloropropene	0.4	2	2	2	< 0.4	< 0.4	<2	<2	<2	<2	<2	**-**
Toluene	0.3	1	1	1	< 0.3	< 0.3	<1	<1	<1	<1	<1	**2**
T1,3-Dichloropropene	0.3	1	1	1	< 0.3	< 0.3	<1	<1	<1	<1	<1	**-**
1,1,2-Trichloroethane	0.4	1	1	1	< 0.4	< 0.4	<1	<1	<1	<1	<1	**-**
Tetrachloroethylene	0.3	1	1	1	0.6	< 0.3	<1	<1	<1	<1	<1	**111**
Dibromochloromethane	0.4	1	1	1	< 0.4	< 0.4	<1	<1	<1	<1	<1	**-**
Ethylene Dibromide	0.3	1	1	1	<0.3	<0.3	<1	<1	<1	<1	<1	**-**
Chlorobenzene	0.3	1	1	1	< 0.3	< 0.3	<1	<1	<1	<1	<1	**1.3**
1,1,1,2,-Tetrachloroethane	0.3	-	-	-	< 0.3	< 0.3	-	-	-	-	-	**-**
Ethylbenzene	0.3	1	1	1	< 0.3	< 0.3	<1	<1	<1	<1	<1	**90**
Bromoform	0.3	1	1	1	< 0.3	< 0.3	<1	<1	<1	<1	<1	**-**
1,1,2,2,-Tetrachloroethane	0.3	1	1	1	< 0.3	< 0.3	<1	<1	<1	<1	<1	**-**
1,3-Dichlorobenzene	0.3	1	1	1	< 0.3	< 0.3	<1	<1	<1	<1	<1	**-**
1,4-Dichlorobenzene	0.4	1	1	1	< 0.4	< 0.4	<1	<1	<1	<1	<1	**26**
1,2-Dichlorobenzene	0.4	0.5	0.5	1	< 0.4	< 0.4	<0.5	<0.5	<0.5	<0.5	<1	**0.7**
m/p-Xylene	0.6	2	2	2	< 0.6	< 0.6	<2	<2	<2	<2	<2	**-**
o-Xylene	0.2	1	1	1	< 0.2	< 0.2	<1	<1	<1	<1	<1	**-**
Styrene	0.2	1	1	1	< 0.2	< 0.2	<1	<1	<1	<1	<1	**72**
1,2,4-Trichlorobenzene	0.5	-	-	-	< 0.5	< 0.5	-	-	-	-	-	**-**
Acetone	10	-	-	-	<10	<10	-	-	-	-	-	**-**
Methyl Ethyl Ketone	10	-	-	-	<10	<10	-	-	-	-	-	**-**
MIBK	10	-	-	-	<10	<10	-	-	-	-	-	**-**
2-Chloroethylvinyl Ether	10	-	-	-	<10	<10	-	-	-	-	-	**-**
1,1-Dichloroethylene	-	2	0.5	1	-	-	<2	<0.5	<0.5	<0.5	<1	**-**
Chloromethane	-	8	8	8	-	-	<8	<8	<8	<8	<8	**-**

Notes

MDL: Method Detection Limit

<X: Below MDL

CCME = Canadian Council of Ministers of the Environment

FAL = Canadian Water Quality Guidelines for Freshwater Aquatic Life

-: Value not established or Parameter not analyzed

Shaded and bold data exceeds the CCME-FAL Guidelines

TABLE D-11: VOC Concentrations in Surface Water Leachate Collection Pond and Stream (2007-2012) - Continued

					DATA							GUIDELINES
Sample ID								STREAM				**1999 CCME-FAL**
Sampling Date	MDL (µg/L)				Nov. 2007	May 2008	Jan. 2009	Sept. 2009	Jan. 2010	Nov. 2010	Nov. 2012	**(UPDATED 2007)**
Parameter	2007-2008	2009	Aug. 2009 / Jan. 2010	Nov. 2012	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	**(µg/L)**
Methyl Chloride	0.3	3	-	-	< 0.3	< 0.3	-	-	-	-	-	**-**
Vinyl Chloride	0.2	1	0.5	1	< 0.2	< 0.2	<1	<0.5	<0.5	<0.5	<0.5	**-**
Bromomethane	0.4	8	3	3	< 0.4	< 0.4	<8	<3	<3	<3	<3	**-**
Chloroethane	0.4	8	8	8	< 0.4	< 0.4	<8	<8	<8	<8	<8	**-**
Trichlorofluoromethane	0.3	8	8	8	< 0.3	< 0.3	<8	<8	<8	<8	<8	**-**
1,1-Dichloroethene	0.3	-	-	-	< 0.3	< 0.3	-	-	-	-	-	**-**
Methylene Chloride	5	-	3	3	<5	<5	<3	<3	<3	<3	<3	**98.1**
Methyl-t-butyl ether	0.5	-	-	-	<0.5	<0.5	-	-	-	-	-	**-**
T1,2-Dichloroethylene	0.2	2	2	2	< 0.2	< 0.2	<2	<2	<2	<2	<2	**-**
1,1-Dichloroethane	0.6	2	2	2	< 0.6	< 0.6	<2	<2	<2	<2	<2	**-**
C1,2-Dichloroethylene	0.7	2	2	2	< 0.7	< 0.7	<2	<2	<2	<2	<2	**-**
Chloroform	0.5	1	1	1	< 0.5	< 0.5	<1	<1	<1	<1	<1	**1.8**
1,1,1-Trichloroethane	0.5	1	1	1	< 0.5	< 0.5	<1	<1	<1	<1	<1	**-**
Carbontetrachloride	0.3	1	1	1	< 0.3	< 0.3	<1	<1	<1	<1	<1	**13.3**
Benzene	0.4	1	1	1	< 0.4	< 0.4	<1	<1	<1	<1	<1	**370**
1,2-Dichloroethane	0.4	1	1	1	< 0.4	< 0.4	<1	<1	<1	<1	<1	**100**
Trichloroethylene	0.4	1	1	1	< 0.4	< 0.4	<1	<1	<1	<1	<1	**21**
1,2-Dichloropropane	0.4	1	1	1	< 0.4	< 0.4	<1	<1	<1	<1	<1	**-**
Bromodichloromethane	0.3	1	1	1	< 0.3	< 0.3	<1	<1	<1	<1	<1	**-**
C1,3-Dichloropropene	0.4	2	2	2	< 0.4	< 0.4	<2	<2	<2	<2	<2	**-**
Toluene	0.3	1	1	1	< 0.3	< 0.3	<1	<1	<1	<1	<1	**2**
T1,3-Dichloropropene	0.3	1	1	1	< 0.3	< 0.3	<1	<1	<1	<1	<1	**-**
1,1,2-Trichloroethane	0.4	1	1	1	< 0.4	< 0.4	<1	<1	<1	<1	<1	**-**
Tetrachloroethylene	0.3	1	1	1	< 0.3	< 0.3	<1	<1	<1	<1	<1	**111**
Dibromochloromethane	0.4	1	1	1	< 0.4	< 0.4	<1	<1	<1	<1	<1	**-**
Ethylene Dibromide	0.3	1	1	1	<0.3	<0.3	<1	<1	<1	<1	<1	**-**
Chlorobenzene	0.3	1	1	1	< 0.3	< 0.3	<1	<1	<1	<1	<1	**1.3**
1,1,1,2,-Tetrachloroethane	0.3	-	-	-	< 0.3	< 0.3	-	-	-	-	-	**-**
Ethylbenzene	0.3	1	1	1	< 0.3	< 0.3	<1	<1	<1	<1	<1	**90**
Bromoform	0.3	1	1	1	< 0.3	< 0.3	<1	<1	<1	<1	<1	**-**
1,1,2,2,-Tetrachloroethane	0.3	1	1	1	< 0.3	< 0.3	<1	<1	<1	<1	<1	**-**
1,3-Dichlorobenzene	0.3	1	1	1	< 0.3	< 0.3	<1	<1	<1	<1	<1	**-**
1,4-Dichlorobenzene	0.4	1	1	1	< 0.4	< 0.4	<1	<1	<1	<1	<1	**26**
1,2-Dichlorobenzene	0.4	0.5	0.5	1	< 0.4	< 0.4	<0.5	<0.5	<0.5	<0.5	<1	**0.7**
m/p-Xylene	0.6	2	2	2	< 0.6	< 0.6	<2	<2	<2	<2	<2	**-**
o-Xylene	0.2	1	1	1	< 0.2	< 0.2	<1	<1	<1	<1	<1	**-**
Styrene	0.2	1	1	1	< 0.2	< 0.2	<1	<1	<1	<1	<1	**72**
1,2,4-Trichlorobenzene	0.5	-	-	-	< 0.5	< 0.5	-	-	-	-	-	**-**
Acetone	10	-	-	-	<10	<10	-	-	-	-	-	**-**
Methyl Ethyl Ketone	10	-	-	-	<10	<10	-	-	-	-	-	**-**
MIBK	10	-	-	-	<10	<10	-	-	-	-	-	**-**
2-Chloroethylvinyl Ether	10	-	-	-	<10	<10	-	-	-	-	-	**-**
1,1-Dichloroethylene	-	2	0.5	1	-	-	<2	<0.5	<0.5	<0.5	<1	**-**
Chloromethane	-	8	8	8	-	-	<8	<8	<8	<8	<8	**-**

Notes

MDL: Method Detection Limit

<X: Below MDL

CCME = Canadian Council of Ministers of the Environment

FAL = Canadian Water Quality Guidelines for Freshwater Aquatic Life

-: Value not established or Parameter not analyzed

Shaded and bold data exceeds the CCME-FAL Guidelines

TABLE D-12: PCB Concentrations in Surface Water Leachate Collection Pond and Stream (2007-2012)

					DATA																		GUIDELINES
Sample ID					SW-POND										STREAM								Ditch	**1999 CCME-FAL**
Sampling Date	MDL (µg/L)				Nov. 2007	May 2008	Mar. 2009	Sept. 2009	Sept. 2009 SW-POND-D	Jan. 2010	Nov. 2010	Dec. 2011	Dec. 2011 SW-POND-1	Nov. 2012	Nov. 2007	May 2008	Mar. 2009	Sept. 2009	Jan. 2010	Nov. 2010	Dec. 2011	Nov. 2012	Mar. 2009	**(Updated 2007)**
Parameter	2007-2008	Aug. 2009 / Jan. 2010	Dec. 2011	Nov. 2012	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	**(µg/L)**
Polychlorinated Biphenyls	0.04	0.05	0.06/0.05	0.05	<0.04	<0.04	<0.04	<0.05	<0.05	<0.05	<0.05	<0.05	<0.06	<0.05	<0.04	<0.04	<0.04	<0.05	<0.06	<0.05	<0.05	<0.05	0.05	-

Notes
MDL: Method Detection Limit
<X: Below MDL
CCME = Canadian Council of Ministers of the Environment
FAL = Canadian Water Quality Guidelines for Freshwater Aquatic Life
-: Value not established
SW-POND-1 is a blind field duplicates of surface water sample SW-POND

TABLE D-13: Dioxins and Furans Concentrations in Surface Water Leachate Collection Pond and Stream (2007-2012)

	DATA										GUIDELINE
Sample ID	Nov. 2007			May 2008			Jan 2009				**1999 CCME-FAL**
Sampling Date Parameter	SW-POND (pg / L)	MDL (pg / L)	TEF Equivalent (pg / L)	SW-POND (pg / L)	MDL (pg / L)	TEF Equivalent (pg / L)	SW-POND (pg / L)	MDL (pg / L)	TEF Equivalent (pg / L)	TEF (WHO) 1997[2] -	**(UPDATED 2007) (µg/L)**
2,3,7,8-Tetra CDD *	ND	0.697	0.697	ND	0.520	.520	ND	0.796	0.796	1.00	
1,2,3,7,8-Penta CDD	ND	0.782	0.782	ND	0.536	0.536	ND	0.855	0.855	1.00	
1,2,3,4,7,8-Hexa CDD	ND	0.715	0.0715	ND	0.635	0.0635	ND	0.842	0.0842	0.100	
1,2,3,6,7,8-Hexa CDD	ND	0.67	0.067	ND	0.603	0.0603	ND	0.874	0.0874	0.100	
1,2,3,7,8,9-Hexa CDD	ND	0.663	0.0663	ND	0.661	0.0661	ND	0.806	0.0806	0.100	
1,2,3,4,6,7,8-Hepta CDD	1.5	0.671	0.015	1.28	0.601	0.0128	ND	0.966	0.00966	0.0100	
Octa CDD	6.36	0.635	0.00191	4.26	1.21	0.00128	3.38	1.19	0.00101	0.000300	
Total Tetra CDD	ND	0.697	-	ND	0.520	-	ND	1.08	-	-	
Total Penta CDD	ND	0.961	-	ND	0.536	-	ND	0.855	-	-	
Total Hexa CDD	ND	2	-	ND	0.632	-	ND	0.840	-	-	
Total Hepta CDD	2.88	0.671	-	2.22	0.601	-	ND	0.966	-	-	
2,3,7,8-Tetra CDF **	ND	1.08	0.108	1.46	0.840	0.146	1.38	0.915	0.138	0.100	
1,2,3,7,8-Penta CDF	ND	0.699	0.021	ND	1.24	0.0372	ND	0.898	0.0269	0.0300	
2,3,4,7,8-Penta CDF	1.41	0.635	0.423	ND	1.23	0.369	1.40	0.866	0.420	0.300	-
1,2,3,4,7,8-Hexa CDF	0.769	0.654	0.0769	ND	0.574	0.0574	ND	0.795	0.0795	0.100	
1,2,3,6,7,8-Hexa CDF	ND	0.617	0.0617	ND	0.518	0.0518	ND	0.760	0.0760	0.100	
2,3,4,6,7,8-Hexa CDF	ND	0.731	0.0731	ND	0.676	0.0676	ND	0.866	0.0866	0.100	
1,2,3,7,8,9-Hexa CDF	ND	0.749	0.0749	ND	0.808	0.0808	ND	0.945	0.0945	0.100	
1,2,3,4,6,7,8-Hepta CDF	ND	2.57	0.0257	ND	0.863	0.00863	ND	0.957	0.00957	0.0100	
1,2,3,4,7,8,9-Hepta CDF	ND	0.755	0.00755	ND	0.626	0.00626	ND	1.24	0.0124	0.0100	
Octa CDF	0.742	0.589	0.000223	ND	1.11	0.000333	ND	1.50	0.000450	0.000300	
Total Tetra CDF	3.59	0.93	-	3.02	0.841	-	4.35	0.915	-	-	
Total Penta CDF	1.41	0.665	-	ND	1.23	-	1.40	0.882	-	-	
Total Hexa CDF	0.769	0.683	-	ND	0.626	-	ND	0.835	-	-	
Total Hepta CDF	ND	2.85	-	ND	0.863	-	ND	1.08	-	-	
Total Toxic Equivalency	-	-	2.57	-	-	2.09	-	-	2.86	-	

Notes:

EDL: Estimated detection limit
ND: Not detected
CCME = Canadian Council of Ministers of the Environment
FAL = Canadian Water Quality Guidelines for Freshwater Aquatic Life
CDD*: Chloro Dibenzo-p-Dioxin
CDF**: Chloro Dibenzo-p-Furan
1 - Guideline for 2,3,7,8-Tetra CDD (Commercial Site with Non-Potable Groundwater)
2 - van Leeuwen FXR (1997). Derivation of TEFs for dioxin-like compounds in humans and wildlife. Organohalogen Compounds 34:237
TEF: Toxic Equivalency Factor of other dioxins and furans to 2,3,7,8-Tetra CDD
TEF Equivalent: Concentration of Dioxins and Furans multiplied by the TEF (WHO)
WHO: World Health Organisation
-: Value not established

TABLE D-13: Dioxins and Furans Concentrations in Surface Water Leachate Collection Pond and Stream (2007-2012)

	DATA									GUIDELINE
Sample ID	Sept. 2009			Jan. 2010			Nov. 2010				**1999 CCME-FAL**
Sampling Date Parameter	SW-POND (pg / L)	MDL (pg / L)	TEF Equivalent (pg / L)	SW-POND (pg / L)	MDL (pg / L)	TEF Equivalent (pg / L)	SW-POND (pg / L)	MDL (pg / L)	TEF Equivalent (pg / L)	TEF (WHO) 1997[2] -	**(UPDATED 2007) (µg/L)**
2,3,7,8-Tetra CDD *	ND	0.57	0.570	ND (A)	0.660	0.660	ND	0.57	0.570	1.00	
1,2,3,7,8-Penta CDD	ND	0.55	0.55	ND (A)	0.58	0.580	ND	0.56	0.560	1.00	
1,2,3,4,7,8-Hexa CDD	ND	0.53	0.053	ND	0.57	0.0570	ND	0.67	0.0670	0.100	
1,2,3,6,7,8-Hexa CDD	ND	0.47	0.047	ND	0.48	0.0480	ND	0.60	0.0600	0.100	
1,2,3,7,8,9-Hexa CDD	ND	0.51	0.051	0.60	0.51	0.0600	ND	0.59	0.059	0.100	
1,2,3,4,6,7,8-Hepta CDD	2.16	0.50	0.0216	1.93	0.49	0.0193	ND(A)	0.71	0.00710	0.0100	
Octa CDD	8.6	1.1	0.00258	13.4	0.99	0.00402	4	1.1	0.00120	0.000300	
Total Tetra CDD	ND	0.57	-	ND (A)	0.66	-	ND	0.57	-	-	
Total Penta CDD	ND	0.55	-	ND (A)	0.58	-	ND	0.56	-	-	
Total Hexa CDD	ND	0.50	-	0.60	0.52	-	ND(A)	0.84	-	-	
Total Hepta CDD	4.03	0.50	-	3.60	0.49	-	ND(A)	0.71	-	-	
2,3,7,8-Tetra CDF **	1.15	0.58	0.115	1.47	0.570	0.147	ND	0.57	0.0570	0.100	
1,2,3,7,8-Penta CDF	0.64	0.49	0.0192	1.10	0.55	0.0330	ND	0.67	0.0201	0.0300	
2,3,4,7,8-Penta CDF	0.67	0.51	0.201	1.10	0.56	0.330	1	0.69	0.300	0.300	-
1,2,3,4,7,8-Hexa CDF	ND	0.47	0.0470	0.94	0.51	0.0940	ND	0.51	0.0510	0.100	
1,2,3,6,7,8-Hexa CDF	ND	0.46	0.0460	0.80	0.51	0.0800	ND	0.52	0.0520	0.100	
2,3,4,6,7,8-Hexa CDF	ND	0.54	0.0540	0.67	0.58	0.0670	ND	0.58	0.0580	0.100	
1,2,3,7,8,9-Hexa CDF	ND	0.70	0.0700	ND	0.66	0.0660	ND	0.66	0.0660	0.100	
1,2,3,4,6,7,8-Hepta CDF	ND(A)	3.0	0.0300	ND (A)	2.8	0.0280	ND(A)	0.84	0.00840	0.0100	
1,2,3,4,7,8,9-Hepta CDF	ND	0.68	0.00680	ND	0.57	0.00570	ND	0.71	0.00710	0.0100	
Octa CDF	1.5	1.1	0.000450	ND (A)	1.4	0.000420	ND	1.20	0.000360	0.000300	
Total Tetra CDF	7.16	0.58	-	1.47	0.57	-	3	0.57	-	-	
Total Penta CDF	1.97	0.50	-	2.2	0.55	-	1	0.68	-	-	
Total Hexa CDF	ND	0.53	-	2.41	0.56	-	ND	0.56	-	-	
Total Hepta CDF	ND (A)	3.6	-	ND (A)	3.2	-	ND (A)	0.98	-	-	
Total Toxic Equivalency	-	-	1.88	-	-	2.28			1.94	-	

Notes:

EDL: Estimated detection limit
ND: Not detected
CCME = Canadian Council of Ministers of the Environment
FAL = Canadian Water Quality Guidelines for Freshwater Aquatic Life
CDD*: Chloro Dibenzo-p-Dioxin
CDF**: Chloro Dibenzo-p-Furan
1 - Guideline for 2,3,7,8-Tetra CDD (Commercial Site with Non-Potable Groundwater)
2 - van Leeuwen FXR (1997). Derivation of TEFs for dioxin-like compounds in humans and wildlife. Organohalogen Compounds 34:237
TEF: Toxic Equivalency Factor of other dioxins and furans to 2,3,7,8-Tetra CDD
TEF Equivalent: Concentration of Dioxins and Furans multiplied by the TEF (WHO)
WHO: World Health Organisation
-: Value not established
(A) EMPC/ NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

TABLED-13: Dioxins and Furans Concentrations in Surface Water Leachate Collection Pond and Stream (2007-2012)

	DATA							GUIDELINE
Sample ID	Dec. 2011			Nov. 2012				**1999 CCME-FAL**
Sampling Date Parameter	SW-POND (pg / L)	EDL (pg / L)	TEF Equivalent (pg / L)	SW-POND (pg / L)	EDL (pg / L)	TEF Equivalent (pg / L)	TEF (WHO) 2005[2] -	**(UPDATED 2011)** **(µg/L)**
2,3,7,8-Tetra CDD *	<0.68	0.68	0.680	<0.917	0.917	0.917	1.00	
1,2,3,7,8-Penta CDD	<0.55	0.55	0.550	<0.989	0.989	0.989	1.00	
1,2,3,4,7,8-Hexa CDD	<0.67	0.67	0.0670	<0.869	0.869	0.0869	0.10	
1,2,3,6,7,8-Hexa CDD	<0.56	0.56	0.0560	<0.925	0.925	0.0925	0.10	
1,2,3,7,8,9-Hexa CDD	<0.57	0.57	0.0570	<0.791	0.791	0.0791	0.10	
1,2,3,4,6,7,8-Hepta CDD	2	0.60	0.0200	<1.05	1.05	0.0105	0.01	
Octa CDD	9	1.1	0.00270	1.6	1.36	0.000480	0.0003	
Total Tetra CDD	<1.1 (A)	1.1	-	<1.08 (A)	1.08	-	-	
Total Penta CDD	<0.55	0.55	-	<0.989	0.989	-	-	
Total Hexa CDD	<3.6 (A)	3.6	-	<3.64 (A)	3.64	-	-	
Total Hepta CDD	3	0.60	-	<1.05	1.05	-	-	
2,3,7,8-Tetra CDF **	<0.60	0.60	0.0600	<1.02	1.02	0.102	0.10	
1,2,3,7,8-Penta CDF	<0.63	0.63	0.0189	<1.00	1.00	0.0300	0.03	
2,3,4,7,8-Penta CDF	<0.69 (A)	0.69	0.207	<0.975	0.975	0.293	0.30	-
1,2,3,4,7,8-Hexa CDF	<0.59	0.54	0.0540	<0.918	0.918	0.0918	0.10	
1,2,3,6,7,8-Hexa CDF	<0.50	0.50	0.0500	<0.882	0.882	0.0882	0.10	
2,3,4,6,7,8-Hexa CDF	<0.58	0.58	0.0580	<0.950	0.950	0.0950	0.10	
1,2,3,7,8,9-Hexa CDF	<0.68	0.68	0.0680	<1.12	1.12	0.112	0.10	
1,2,3,4,6,7,8-Hepta CDF	<1.2 (A)	1.2	0.0120	<0.760	0.760	0.00760	0.01	
1,2,3,4,7,8,9-Hepta CDF	<0.67	0.67	0.00670	<1.05	1.05	0.0105	0.01	
Octa CDF	2	1.1	0.000600	<0.999	0.999	0.000300	0.0003	
Total Tetra CDF	<0.61 (A)	0.61	-	<1.48 (A)	1.48	-	-	
Total Penta CDF	<0.68 (A)	0.68	-	<0.988	0.988	-	-	
Total Hexa CDF	<0.57	0.57	-	<0.959	0.959	-	-	
Total Hepta CDF	<1.3 (A)	1.3	-	<0.882	0.882	-	-	
Total Toxic Equivalency	-	-	1.97			3.01	-	

Notes:

EDL: Estimated detection limit
ND: Not detected
CCME = Canadian Council of Ministers of the Environment
FAL = Canadian Water Quality Guidelines for Freshwater Aquatic Life
CDD*: Chloro Dibenzo-p-Dioxin
CDF**: Chloro Dibenzo-p-Furan
1 - Guideline for 2,3,7,8-Tetra CDD (Commercial Site with Non-Potable Groundwater)
2 - van Leeuwen FXR (1997). Derivation of TEFs for dioxin-like compounds in humans and wildlife. Organohalogen Compounds 34:237
TEF: Toxic Equivalency Factor of other dioxins and furans to 2,3,7,8-Tetra CDD
TEF Equivalent: Concentration of Dioxins and Furans multiplied by the TEF (WHO)
WHO: World Health Organisation
-: Value not established
(A) EMPC/ NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

TABLE D-13: Dioxins and Furans Concentrations in Surface Water Leachate Collection Pond and Stream (2007-2012)

	DATA										GUIDELINE
Sample ID	Nov. 2007			May 2008			Jan 2009				**1999 CCME-FAL**
Sampling Date	STREAM	MDL	TEF Equivalent	STREAM	MDL	TEF Equivalent	STREAM	MDL	TEF Equivalent	TEF (WHO) 1997[2]	**(UPDATED 2007)**
Parameter	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	-	**(µg/L)**
2,3,7,8-Tetra CDD *	ND	0.645	0.645	ND	0.589	0.589	ND	0.797	0.797	1.00	
1,2,3,7,8-Penta CDD	ND	0.647	0.647	ND	0.720	0.720	ND	1.03	1.03	1.00	
1,2,3,4,7,8-Hexa CDD	ND	0.825	0.0825	ND	0.748	0.0748	ND	0.941	0.0941	0.100	
1,2,3,6,7,8-Hexa CDD	ND	0.774	0.0774	ND	0.710	0.0710	ND	0.977	0.0977	0.100	
1,2,3,7,8,9-Hexa CDD	ND	0.766	0.0766	ND	0.778	0.0778	ND	0.901	0.0901	0.100	
1,2,3,4,6,7,8-Hepta CDD	1.11	0.593	0.0111	ND	1.68	0.0168	ND	0.681	0.00681	0.0100	
Octa CDD	3.35	0.848	0.00101	6.75	1.20	0.00203	1.64	1.04	0.000492	0.000300	
Total Tetra CDD	ND	0.645	-	ND	0.589	-	ND	0.983	-	-	
Total Penta CDD	ND	1.05	-	ND	0.720	-	ND	1.03	-	-	
Total Hexa CDD	ND	1.66	-	ND	0.744	-	ND	0.939	-	-	
Total Hepta CDD	1.72	0.593	-	0.961	0.747	-	ND	0.681	-	-	
2,3,7,8-Tetra CDF **	ND	0.794	0.0794	1.46	0.594	0.146	1.42	0.991	0.142	0.100	
1,2,3,7,8-Penta CDF	ND	0.736	0.0221	ND	0.828	0.0248	ND	0.768	0.0230	0.0300	
2,3,4,7,8-Penta CDF	ND	1.21	0.363	ND	0.822	0.247	ND	1.55	0.465	0.300	-
1,2,3,4,7,8-Hexa CDF	ND	0.621	0.0621	ND	0.683	0.0683	ND	0.595	0.0595	0.100	
1,2,3,6,7,8-Hexa CDF	ND	0.586	0.0586	ND	0.617	0.0617	ND	0.569	0.0569	0.100	
2,3,4,6,7,8-Hexa CDF	ND	0.694	0.0694	ND	0.806	0.0806	ND	0.649	0.0649	0.100	
1,2,3,7,8,9-Hexa CDF	ND	0.711	0.0711	ND	0.962	0.0962	ND	0.708	0.0708	0.100	
1,2,3,4,6,7,8-Hepta CDF	ND	3.04	0.0304	ND	1.91	0.0191	ND	0.851	0.00851	0.0100	
1,2,3,4,7,8,9-Hepta CDF	ND	0.688	0.00688	ND	0.837	0.00837	ND	1.10	0.0110	0.0100	
Octa CDF	ND	0.749	0.000225	ND	3.67	0.00110	ND	1.05	0.000315	0.000300	
Total Tetra CDF	1.8	0.794	-	3.75	0.594	-	3.58	0.991	-	-	
Total Penta CDF	ND	1.27	-	ND	0.825	-	ND	1.55	-	-	
Total Hexa CDF	ND	0.649	-	ND	0.746	-	ND	0.626	-	-	
Total Hepta CDF	ND	3.44	-	ND	2.28	-	ND	0.961	-	-	
Total Toxic Equivalency	-	-	2.30	-	-	2.30	-	-	3.02	-	

Notes:

EDL: Estimated detection limit
ND: Not detected
CCME = Canadian Council of Ministers of the Environment
FAL = Canadian Water Quality Guidelines for Freshwater Aquatic Life
CDD*: Chloro Dibenzo-p-Dioxin
CDF**: Chloro Dibenzo-p-Furan
1 - Guideline for 2,3,7,8-Tetra CDD (Commercial Site with Non-Potable Groundwater)
2 - van Leeuwen FXR (1997). Derivation of TEFs for dioxin-like compounds in humans and wildlife. Organohalogen Compounds 34:237
TEF: Toxic Equivalency Factor of other dioxins and furans to 2,3,7,8-Tetra CDD
TEF Equivalent: Concentration of Dioxins and Furans multiplied by the TEF (WHO)
WHO: World Health Organisation
-: Value not established

TABLE D-13: Dioxins and Furans Concentrations in Surface Water Leachate Collection Pond and Stream (2007-2012)

	DATA										GUIDELINE
Sample ID	Sept. 2009			Jan. 2010			Nov. 2010				**1999 CCME-FAL**
Sampling Date	STREAM	MDL	TEF Equivalent	STREAM	MDL	TEF Equivalent	STREAM	MDL	TEF Equivalent	TEF (WHO) 1997[2]	**(UPDATED 2007)**
Parameter	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	(pg / L)	-	**(µg/L)**
2,3,7,8-Tetra CDD *	ND	0.49	0.490	0.77	0.59	0.770	ND	0.73	0.730	1.00	
1,2,3,7,8-Penta CDD	ND	0.52	0.520	0.81	0.54	0.810	ND	0.58	0.580	1.00	
1,2,3,4,7,8-Hexa CDD	ND	0.57	0.0570	ND	0.57	0.0570	ND	0.60	0.0600	0.100	
1,2,3,6,7,8-Hexa CDD	ND	0.50	0.0500	0.56	0.49	0.0560	ND	0.53	0.0530	0.100	
1,2,3,7,8,9-Hexa CDD	ND	0.55	0.0550	0.67	0.51	0.0670	ND	0.52	0.0520	0.100	
1,2,3,4,6,7,8-Hepta CDD	ND (A)	1.9	0.0190	1.46	0.59	0.0146	1	0.56	0.0100	0.0100	
Octa CDD	8.9	1.1	0.00267	5.0	1.0	0.00150	4	1.1	0.00120	0.000300	
Total Tetra CDD	ND	0.49	-	0.77	0.59	-	ND	0.73	-	-	
Total Penta CDD	ND (A)	0.72	-	0.81	0.54	-	ND	0.58	-	-	
Total Hexa CDD	ND	0.54	-	1.23	0.52	-	ND(A)	1.2	-	-	
Total Hepta CDD	1.56	0.71	-	1.46	0.59	-	2	0.56	-	-	
2,3,7,8-Tetra CDF **	0.94	0.51	0.0940	1.66	0.57	0.166	ND	0.62	0.0620	0.100	
1,2,3,7,8-Penta CDF	ND (A)	0.59	0.0177	0.96	0.51	0.0288	ND	0.89	0.0267	0.0300	-
2,3,4,7,8-Penta CDF	ND (A)	0.67	0.201	1.24	0.52	0.372	ND	0.92	0.276	0.300	
1,2,3,4,7,8-Hexa CDF	ND (A)	0.50	0.0500	ND (A)	0.68	0.0680	ND	0.51	0.0510	0.100	
1,2,3,6,7,8-Hexa CDF	0.5	0.46	0.0500	0.66	0.47	0.0660	ND	0.52	0.0520	0.100	
2,3,4,6,7,8-Hexa CDF	ND	0.54	0.0540	0.62	0.54	0.0620	ND	0.58	0.0580	0.100	
1,2,3,7,8,9-Hexa CDF	ND	0.70	0.0700	0.68	0.61	0.0680	ND	0.66	0.0660	0.100	
1,2,3,4,6,7,8-Hepta CDF	ND (A)	2.9	0.0290	ND (A)	2.0	0.0200	ND(A)	1.1	0.0110	0.0100	
1,2,3,4,7,8,9-Hepta CDF	ND	0.67	0.00670	ND	0.62	0.00620	ND	0.64	0.00640	0.0100	
Octa CDF	1.8	1.1	0.000540	1.55	0.98	0.000465	ND	1.1	0.000330	0.000300	
Total Tetra CDF	5.47	0.51	-	2.4	0.57	-	6	0.62	-	-	
Total Penta CDF	ND (A)	3.9	-	2.2	0.51	-	ND(A)	3.1	-	-	
Total Hexa CDF	ND	0.52	-	1.96	0.52	-	ND	0.56	-	-	
Total Hepta CDF	ND (A)	3.5	-	ND (A)	2.3	-	ND(A)	1.3	-	-	
Total Toxic Equivalency			1.77			2.63			2.10	-	

Notes:

EDL: Estimated detection limit
ND: Not detected
CCME = Canadian Council of Ministers of the Environment
FAL = Canadian Water Quality Guidelines for Freshwater Aquatic Life
CDD*: Chloro Dibenzo-p-Dioxin
CDF**: Chloro Dibenzo-p-Furan
1 - Guideline for 2,3,7,8-Tetra CDD (Commercial Site with Non-Potable Groundwater)
2 - van Leeuwen FXR (1997). Derivation of TEFs for dioxin-like compounds in humans and wildlife. Organohalogen Compounds 34:237
TEF: Toxic Equivalency Factor of other dioxins and furans to 2,3,7,8-Tetra CDD
TEF Equivalent: Concentration of Dioxins and Furans multiplied by the TEF (WHO)
WHO: World Health Organisation
-: Value not established
(A) EMPC/ NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

TABLE C-5: Dioxins and Furans Concentrations in Surface Water Leachate Collection Pond and Stream (2007-2012)

	DATA							GUIDELINE
Sample ID	Dec. 2011			Nov. 2012			TEF (WHO) 1997[2]	**1999 CCME-FAL (UPDATED 2011) (µg/L)**
Sampling Date Parameter	STREAM (pg / L)	EDL (pg / L)	TEF Equivalent (pg / L)	STREAM (pg / L)	EDL (pg / L)	TEF Equivalent (pg / L)	-	
2,3,7,8-Tetra CDD *	<0.56	0.56	0.560	<0.943	0.943	0.943	1.00	
1,2,3,7,8-Penta CDD	<0.56	0.56	0.560	<1.92	1.92	1.92	1.00	
1,2,3,4,7,8-Hexa CDD	<0.66	0.66	0.0660	<1.37	1.37	0.137	0.10	
1,2,3,6,7,8-Hexa CDD	<0.56	0.56	0.0560	<1.45	1.45	0.145	0.10	
1,2,3,7,8,9-Hexa CDD	<0.57	0.57	0.0570	<1.24	1.24	0.124	0.10	
1,2,3,4,6,7,8-Hepta CDD	1	0.56	0.0100	<0.974	0.974	0.00974	0.01	
Octa CDD	3	1.0	0.000900	<1.22	1.22	0.000366	0.0003	
Total Tetra CDD	<0.56	0.56	-	<1.41 (A)	1.41	-	-	
Total Penta CDD	<0.56	0.56	-	<1.92	1.92	-	-	
Total Hexa CDD	<3.7 (A)	3.7	-	<3.87 (A)	3.87	-	-	
Total Hepta CDD	1	0.56	-	<0.974	0.974	-	-	
2,3,7,8-Tetra CDF **	<0.54	0.54	0.0540	<1.03	1.03	0.103	0.10	
1,2,3,7,8-Penta CDF	<0.61	0.61	0.0183	<1.46	1.46	0.0438	0.03	
2,3,4,7,8-Penta CDF	1	0.63	0.300	<1.42	1.42	0.426	0.30	-
1,2,3,4,7,8-Hexa CDF	<0.49	0.49	0.0490	<1.03	1.03	0.103	0.10	
1,2,3,6,7,8-Hexa CDF	<0.46	0.46	0.0460	<0.995	0.995	0.0995	0.10	
2,3,4,6,7,8-Hexa CDF	<0.54	0.54	0.0540	<1.07	1.07	0.107	0.10	
1,2,3,7,8,9-Hexa CDF	<0.62	0.62	0.0620	<1.26	1.26	0.126	0.10	
1,2,3,4,6,7,8-Hepta CDF	<0.78 (A)	0.78	0.00780	<0.747	0.747	0.00747	0.01	
1,2,3,4,7,8,9-Hepta CDF	<0.61	0.61	0.00610	<1.03	1.03	0.0103	0.01	
Octa CDF	<1.0	1.0	0.000300	<0.743	0.743	0.000223	0.0003	
Total Tetra CDF	1	0.54	-	<1.39 (A)	1.39	-	-	
Total Penta CDF	1	0.62	-	<1.44	1.44	-	-	
Total Hexa CDF	<0.52	0.52	-	<1.08	1.08	-	-	
Total Hepta CDF	<0.88 (A)	0.88	-	<0.867	0.867	-	-	
Total Toxic Equivalency	-	-	1.91			4.31	-	

Notes:

EDL: Estimated detection limit
ND: Not detected
CCME = Canadian Council of Ministers of the Environment
FAL = Canadian Water Quality Guidelines for Freshwater Aquatic Life
CDD*: Chloro Dibenzo-p-Dioxin
CDF**: Chloro Dibenzo-p-Furan
1 - Guideline for 2,3,7,8-Tetra CDD (Commercial Site with Non-Potable Groundwater)
2 - van Leeuwen FXR (1997). Derivation of TEFs for dioxin-like compounds in humans and wildlife. Organohalogen Compounds 34:237
TEF: Toxic Equivalency Factor of other dioxins and furans to 2,3,7,8-Tetra CDD
TEF Equivalent: Concentration of Dioxins and Furans multiplied by the TEF (WHO)
WHO: World Health Organisation
-: Value not established
(A) EMPC/ NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

TABLE D-14: General Chemistry Concentrations in Surface Water Leachate Collection Pond and Stream (2007-2012)

						DATA																	GUIDELINES
Sample ID						SW-POND										STREAM							1999
Sampling Date		MDL				Nov. 2007	May 2008	Mar. 2009	Sept. 2009	Jan 2010	Nov. 2010	Nov. 2010	Dec. 2011	Dec. 2011 Duplicate (SW-POND-1)	Nov. 2012	Nov. 2007	May 2008	Mar. 2009	Sept. 2009	Jan. 2010	Nov. 2010	Dec. 2011	Nov. 2012	CCME-FAL
Parameter	Unit	2007 - 2009	Oct. 2009 / Jan. 2010	Dec 2011	Nov. 2012							(SW-DUP1)												(UPDATED 2007)
Ammonia	(ug/L)	10	50	300/500/50	-	33,000	641	30,000	13,000	24,000	12,000	13,000	9,000	11,000	-	10,800	24,100	26,500	<50	8,200	780	1.6	-	-
Chloride	(ug/L)	100	1,000	1,000	-	165,000	195,000	104,000	110,000	110,000	63,000	63,000	46,000	46,000	-	213,000	134,000	206,000	84,000	110,000	77,000	45,000	-	-
Colour	(TCU)	5	30	30/5	5	98	77	34	110	75	68	76	72	64	22	96	72	49	100	58	57	42	39	-
Conductivity	(µS/cm)	5	1	1	1	1,190	927	1,010	1,100	1,100	720	720	850	850	770	1,070	936	1190	470	810	540	530	400	-
DOC	(ug/L)	500	-	-	-	22,900	19,600	12,500	-	-	-	-	-	-	-	21,700	17,800	17,900	-	-	-	-	-	-
Fluoride	(ug/L)	100	-	-	-	<100	<100	<100	-	-	-	-	-	-	-	<100	<100	<100	-	-	-	-	-	-
Hardness as CaCO3	(ug/L)	300	1,000	1,000	1,000	157,000	99,100	190,000	160,000	210,000	220,000	220,000	280,000	280,000	270,000	101,000	144,000	155,000	64,000	140,000	120,000	130,000	110,000	-
Nitrate as N	(ug/L)	50	30	100/300	100/250	8,650	8,480	8,360	5,200	7,700	6,900	6,900	4,600	4,700	3,600	7,710	7,400	12,500	1,200	13,000	8,000	8,000	4,600	**13,000**
Nitrite as N	(ug/L)	15	10	10	10	**84**	**369**	**69**	**220**	**120**	**190**	**190**	**100**	**90**	**68**	35	**492**	31	<10	**110**	**100**	50	13	**60**
pH	-	-	-	-	N/A	7.38	6.92	7.45	7.13	7.35	7.79	7.87	7.66	7.65	7.87	6.92	7.43	7.16	6.93	**6.32**	7.12	7.21	7.55	**6.5-9**
Sulphate	(ug/L)	100	2,000	10,000	-	85,300	68,100	121,000	97,000	160,000	160,000	160,000	190,000	190,000	-	59,000	90,100	107,000	57,000	110,000	96,000	100,000	-	-
Total Alkalinity (CaCO3)	(ug/L)	5,000	5,000	30,000/5,000	25,000/5,000	214,000	76,600	167,000	150,000	190,000	130,000	130,000	130,000	140,000	180,000	90,900	143,000	129,000	50,000	65,000	41,000	44,000	52,000	-
Total Dissolved Solids	(ug/L)	10,000	1,000	1,000	-	771,000	549,000	658,000	493,000	638,000	518,000	520,000	529,000	532,000	-	698,000	496,000	775,000	274,000	493,000	371,000	321,000	-	-
Total Organic Carbon	(ug/L)	500	500	3,000	500	26,500	19,200	12,900	11,000	16000 (1)	12,000	12,000	10,000	10,000	9,300	23,600	17,700	18,100	14,000	19,000	13,000	8,000	9,100	-
Total Supended Solids	(ug/L)	2,000	-	-	-	6,000	2,000	3,000	-	-	-	-	-	-	-	<2,000	5,000	2,000	-	-	-	-	-	-
Turbidity	(NTU)	0.1	0.1	0.1	0.1	5.7	1.4	2.0	4.20	9.40	2.1	1.7	7.0	6.1	1.4	1.6	3.8	1.8	1.30	13	1.8	1.8	1.2	-
Calcium	(ug/L)	500	100	100	100	51,500	30,600	63,000	55,000	70,000	77,100	77,400	99,000	97,500	96000	31,100	46,700	48,300	20,000	45,000	41,200	43,200	36200	-
Magnesium	(ug/L)	20	100	100	100	6,970	5,520	7,910	6,100	7,800	6,200	6,190	9,100	8,890	8220	5,590	6,620	8,270	3,100	6,900	5,020	5,720	4800	-
Potassium	(ug/L)	20	100	100	100	16,900	12,900	16,100	12,000	15,000	13,600	14,000	12,900	12,700	10600	13,900	12,900	18,600	8,100	14,000	11,800	9,530	7520	-
Sodium	(ug/L)	500	100	100	100	145,000	129,000	80,700	78,000	98,000	63,600	65,300	48,700	48,700	44500	152,000	94,000	139,000	61,000	96,000	71,200	42,600	34500	-
Dissolved Phosphorus (P)	(ug/L)	-	100	-	100	-	-	-	-	<100	<100	120	-	-	<100	-	-	-	-	<100	<100	-	<100	
Total Phosphorus (P)	(ug/L)	-	-	100	-	-	-	-	-	-	-	-	<100	<100	-	-	-	-	-	-	-	<100	-	
Reactive Silica (SiO2)	(ug/L)	-	500	500	500	-	-	-	6,100	6,600	6,800	6,900	6,200	6,300	7,700	-	-	-	4,700	5,500	5,200	5,500	5,300	

Notes:

MDL: Method Detection Limit
<X: Below MDL
CCME: Canadian Council of Ministers of the Environment
CEQGs: Canadian Environment Quality Guidelines
Bold faced guidelines reflect those most applicable to current land use designation
-: Value not established
Shaded and bold data exceeds the CCME-FAL Guidelines
SW-DUP1 (Nov. 2010) are blind field duplicates of surface water sample SW-POND
SW-POND1 (Dec. 2011) are blind field duplicates of surface water sample SW-POND

APPENDIX E

Laboratory Certificates of Analyses

Your Project #: TF1212735
Site Location: NEW HR
Your C.O.C. #: B 110979

Attention: Gary Warren
AMEC Environment & Infrastructure
St John's (Non Standing Offer)
PO Box 13216
133 Crosbie Rd, Suite 202
St John's , NL
CANADA A1B 4A5

Report Date: 2012/12/10

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B2I9864
Received: 2012/12/03, 11:15

Sample Matrix: Water
Samples Received: 9

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
TEH in Water (PIRI)	7	2012/12/05	2012/12/07	ATL SOP 00198	Based on Atl. PIRI
TEH in Water (PIRI)	2	2012/12/06	2012/12/10	ATL SOP 00198	Based on Atl. PIRI
VPH in Water (PIRI)	9	2012/12/07	2012/12/08	ATL SOP 00200	Based on Atl. PIRI
ModTPH (T1) Calc. for Water	9	N/A	2012/12/10		Based on Atl. PIRI

Remarks:

Reporting results to two significant figures at the RDL is to permit statistical evaluation and is not intended to be an indication of analytical precision.

* 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 Paula Chaplin

10 Dec 2012 16:07:39 -03:30

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Rob Whelan, Project Manager
Email: RWhelan@maxxam.ca
Phone# (709) 754-0203

==========

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Total cover pages: 1

Maxxam Job #: B2I9864
Report Date: 2012/12/10

AMEC Environment & Infrastructure
Client Project #: TF1212735
Site Location: NEW HR
Sampler Initials: CT

ATLANTIC RBCA HYDROCARBONS (WATER)

Maxxam ID		PV1909	PV1910	PV1911	PV1912	PV1913		
Sampling Date		2012/11/28	2012/11/28	2012/11/28	2012/11/28	2012/11/29		
Received Temperature (°C)		1.3	1.3	1.3	1.3	1.3		
	Units	**MW-01**	**MW-03**	**MW-04**	**MW-06**	**MW-07**	**RDL**	**QC Batch**
Petroleum Hydrocarbons								
Benzene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	3062037
Toluene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	0.0020	0.0010	3062037
Ethylbenzene	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	3062037
Xylene (Total)	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	3062037
C6 - C10 (less BTEX)	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	3062037
>C10-C16 Hydrocarbons	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	3058930
>C16-C21 Hydrocarbons	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	3058930
>C21-<C32 Hydrocarbons	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	3058930
Modified TPH (Tier1)	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	3056013
Reached Baseline at C32	mg/L	YES	YES	YES	YES	YES	N/A	3058930
Surrogate Recovery (%)								
Isobutylbenzene - Extractable	%	102	110	108	87	100		3058930
Isobutylbenzene - Volatile	%	91	82	87	92	83		3062037
n-Dotriacontane - Extractable	%	109(1)	120(2)	118(1)	88(2)	102(2)		3058930

N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) - TEH sample contained sediment.
(2) - TEH sample decanted due to sediment.

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Maxxam Job #: B2I9864
Report Date: 2012/12/10

AMEC Environment & Infrastructure
Client Project #: TF1212735
Site Location: NEW HR
Sampler Initials: CT

ATLANTIC RBCA HYDROCARBONS (WATER)

Maxxam ID		PV1914	PV1915		PV1916	PV1916	PV1917		
Sampling Date		2012/11/30	2012/11/28		2012/11/28	2012/11/28	2012/11/30		
Received Temperature (°C)		1.3	1.3		1.3	1.3	1.3		
	Units	**MW-08**	**STREAM**	**QC Batch**	**SW-POND**	**SW-POND Lab-Dup**	**DUP-01**	**RDL**	**QC Batch**
Petroleum Hydrocarbons									
Benzene	mg/L	<0.0010	<0.0010	3062037	<0.0010		<0.0010	0.0010	3062037
Toluene	mg/L	<0.0010	<0.0010	3062037	<0.0010		<0.0010	0.0010	3062037
Ethylbenzene	mg/L	<0.0010	<0.0010	3062037	<0.0010		<0.0010	0.0010	3062037
Xylene (Total)	mg/L	<0.0020	<0.0020	3062037	<0.0020		<0.0020	0.0020	3062037
C6 - C10 (less BTEX)	mg/L	<0.010	<0.010	3062037	<0.010		<0.010	0.010	3062037
>C10-C16 Hydrocarbons	mg/L	<0.050	<0.050	3058930	<0.050	<0.050	<0.050	0.050	3060510
>C16-C21 Hydrocarbons	mg/L	<0.050	<0.050	3058930	<0.050	<0.050	<0.050	0.050	3060510
>C21-<C32 Hydrocarbons	mg/L	<0.10	<0.10	3058930	<0.10	<0.10	<0.10	0.10	3060510
Modified TPH (Tier1)	mg/L	<0.10	<0.10	3056013	<0.10		<0.10	0.10	3056013
Reached Baseline at C32	mg/L	YES	YES	3058930	YES	YES	YES	N/A	3060510
Surrogate Recovery (%)									
Isobutylbenzene - Extractable	%	100	94	3058930	96	107	110		3060510
Isobutylbenzene - Volatile	%	94	85	3062037	89		85		3062037
n-Dotriacontane - Extractable	%	105(1)	97	3058930	97	111	115(1)		3060510

N/A = Not Applicable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) - TEH sample contained sediment.

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Maxxam Job #: B2I9864
Report Date: 2012/12/10

AMEC Environment & Infrastructure
Client Project #: TF1212735
Site Location: NEW HR
Sampler Initials: CT

GENERAL COMMENTS

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Maxxam Job #: B2I9864
Report Date: 2012/12/10

AMEC Environment & Infrastructure
Client Project #: TF1212735
Site Location: NEW HR
Sampler Initials: CT

QUALITY ASSURANCE REPORT

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits
3058930	Isobutylbenzene - Extractable	2012/12/07	100	30 - 130	102	30 - 130	102	%		
3058930	n-Dotriacontane - Extractable	2012/12/07	116	30 - 130	111	30 - 130	99	%		
3058930	>C10-C16 Hydrocarbons	2012/12/07	80	30 - 130	88	30 - 130	<0.050	mg/L	NC	40
3058930	>C16-C21 Hydrocarbons	2012/12/07	85	30 - 130	92	30 - 130	<0.050	mg/L	NC	40
3058930	>C21-<C32 Hydrocarbons	2012/12/07	85	30 - 130	93	30 - 130	<0.10	mg/L	NC	40
3060510	Isobutylbenzene - Extractable	2012/12/10	96	30 - 130	104	30 - 130	101	%		
3060510	n-Dotriacontane - Extractable	2012/12/10	99(1)	30 - 130	111	30 - 130	104	%		
3060510	>C10-C16 Hydrocarbons	2012/12/10	8.0(2)	30 - 130	86	30 - 130	<0.050	mg/L	NC	40
3060510	>C16-C21 Hydrocarbons	2012/12/10	3.0(2)	30 - 130	90	30 - 130	<0.050	mg/L	NC	40
3060510	>C21-<C32 Hydrocarbons	2012/12/10	3.0(2)	30 - 130	90	30 - 130	<0.10	mg/L	NC	40
3062037	Isobutylbenzene - Volatile	2012/12/10	86	70 - 130	97	70 - 130	100	%		
3062037	Benzene	2012/12/07	90	70 - 130	95	70 - 130	<0.0010	mg/L	NC	40
3062037	Toluene	2012/12/07	90	70 - 130	95	70 - 130	<0.0010	mg/L	NC	40
3062037	Ethylbenzene	2012/12/07	85	70 - 130	95	70 - 130	<0.0010	mg/L	NC	40
3062037	Xylene (Total)	2012/12/07	87	70 - 130	97	70 - 130	<0.0020	mg/L	NC	40
3062037	C6 - C10 (less BTEX)	2012/12/07					<0.010	mg/L	NC	40

N/A = Not Applicable
RPD = Relative Percent Difference
Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.
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 (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.
(1) - Fuel/lube oil range recovery(ies) not within acceptance limits. Insufficient sample to repeat.
(2) - Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

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Validation Signature Page

Maxxam Job #: B2I9864

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

Paula Chaplin, Project Manager

==========

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MAXXAM Chain of Custody Record

COC #: B 110979 Page 1 of 1

This column for lab use only:
Client Code 10970
Maxxam Job # B2I9864

Cooler ID	Seal Present	Seal Intact	Temp 1	Temp 2	Temp 3	Average Temp
			1.3	1.3	1.3	

Integrity: YES (NO) Integrity / Checklist by: MD
Labelled by: MD Location / Bin #:

INVOICE INFORMATION:
Company Name: AMEC
Contact Name: Gary Warren
Address: St. John's, NL
133 Crosbie Rd. Postal Code A1B 4A5
Email: gary.warren@amec.com
Ph: (709)722-7023 Fax: (709)722-7353

REPORT INFORMATION (if differs from invoice):
Company Name:
Contact Name:
Address:
Postal Code
Email:
Ph: Fax:

PO #
Project # / Phase # TF1212735
Project Name / Site Location New Hr.
Quote
Site #
Task Order #
Sampled by C. Taylor

TURNAROUND TIME
Standard ☑
10 day ☐
If RUSH Specify Date:
Pre-schedule rush work
Charge for # Jars used but not submitted: 0

Guideline Requirements / Detection Limits / Special Instructions: Decant for PCBs

*Specify Matrix: Surface/Salt/Ground/Tapwater/Sewage/Effluent/Potable/NonPotable/Tissue/Soil/Sludge/Metal/Seawater

Field Sample Identification	Matrix*	Date/Time Sampled	# & type of bottles	Field Filtered & Preserved	Lab Filtration Required	RCAP-30 Choose Total or Diss Metals	RCAP-MS Choose Total or Diss Metals	Total Digest (Default Method) for well water, surface water	Dissolved for ground water	Mercury	Metals & Mercury Default Available Digest Method	Metals Total Digest - for Ocean sediments (HNO3/HF/HCLO4)	Mercury Low level by Cold Vapour AA	Selenium (low level) Req'd for CCME Residential, Parklands, Agricultural	Hot Water soluble Boron (required for CCME Agricultural)	RBCA Hydrocarbons (BTEX, C6-C32)	Hydrocarbons Soil (Potable), NS Fuel Oil Spill Policy Low Level BTEX, C6-C32	NB Potable Water BTEX, VPH, Low level T.E.H.	TPH Fractionation	PAH's	PAH's with Acridine, Quinoline	Dioxan + Furans	PCB *	VOC's
				Metals Water							Metals Soil					Hydrocarbons							
1 MW-01	H2O	Nov 28		✓			✓		✓							✓				✓		✓	✓
2 MW-03		Nov 28		✓			✓		✓							✓				✓		✓	✓
3 MW-04		"		✓			✓		✓							✓				✓		✓	✓
4 MW-06		"		✓			✓		✓							✓				✓		✓	✓
5 MW-07		Nov 29		✓			✓		✓							✓				✓		✓	✓
6 MW-08		Nov 30		✓			✓		✓							✓				✓		✓	✓
7 STREAM		Nov 28		~~✓~~ G			✓	✓								✓				✓		✓	✓
8 SW-POND		"		~~✓~~ G			✓	✓								✓				✓		✓	✓
9 DUP-01		Nov 30		✓			✓		✓							✓				✓		✓	✓
10																							

TPH Must Done in NL

RELINQUISHED BY: (Signature/Print)	Date	Time	RECEIVED BY: (Signature/Print)	Date	Time
Craig Taylor				26/12/12	11:15

Your Project #: TF1212735
Site Location: NEW HR
Your C.O.C. #: B 110979

Attention: Gary Warren
AMEC Environment & Infrastructure
St John's (Non Standing Offer)
PO Box 13216
133 Crosbie Rd, Suite 202
St John's , NL
CANADA A1B 4A5

Report Date: 2013/01/04

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B2J0454
Received: 2012/12/04, 10:18

Sample Matrix: Water
Samples Received: 9

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
Carbonate, Bicarbonate and Hydroxide (1)	9	N/A	2012/12/05	CAM SOP-00102	APHA 4500-CO2 D
Alkalinity (1)	9	N/A	2012/12/05	ATL SOP 00013	Based on EPA310.2
Chloride (1)	9	N/A	2012/12/05	ATL SOP 00014	Based on SM4500-Cl-
Colour (1)	9	N/A	2012/12/06	ATL SOP 00020	Based on SM2120C
Dioxins/Furans in Water (EPS 1/RM/23) (2,3)	1	2012/12/07	2012/12/10	BRL SOP-00410	EPS 1/RM/23 mod
Dioxins/Furans in Water (EPS 1/RM/23) (2,3)	1	2012/12/07	2012/12/11	BRL SOP-00410	EPS 1/RM/23 mod
Dioxins/Furans in Water (EPS 1/RM/23) (2,3)	7	2012/12/13	2012/12/17	BRL SOP-00410	EPS 1/RM/23 mod
Conductance - water (1)	1	N/A	2012/12/04	ATL SOP 00004/00006	Based on SM2510B
Conductance - water (1)	8	N/A	2012/12/05	ATL SOP 00004/00006	Based on SM2510B
Hardness (calculated as CaCO3) (1)	5	N/A	2012/12/06	ATL SOP 00048	Based on SM2340B
Hardness (calculated as CaCO3) (1)	4	N/A	2012/12/07	ATL SOP 00048	Based on SM2340B
Metals Water Diss. MS (as rec'd) (1)	3	N/A	2012/06/12	ATL SOP 00059	Based on EPA6020A
Metals Water Diss. MS (as rec'd) (1)	4	N/A	2012/12/06	ATL SOP 00059	Based on EPA6020A
Metals Water Total MS (1)	2	2012/12/05	2012/12/05	ATL SOP 00059	Based on EPA6020A
Ion Balance (% Difference) (1)	9	N/A	2012/12/07		
Anion and Cation Sum (1)	9	N/A	2012/12/07		
Nitrogen Ammonia - water (1)	4	N/A	2012/12/06	ATL SOP 00015	Based on USEPA 350.1
Nitrogen Ammonia - water (1)	5	N/A	2012/12/07	ATL SOP 00015	Based on USEPA 350.1
Nitrogen - Nitrate + Nitrite (1)	9	N/A	2012/12/06	ATL SOP 00016	Based on USGS - Enz.
Nitrogen - Nitrite (1)	9	N/A	2012/12/05	ATL SOP 00017	Based on SM4500-NO2B
Nitrogen - Nitrate (as N) (1)	9	N/A	2012/12/06	ATL SOP 00018	Based on ASTMD3867
PAH (FWAL) in Water (A/Q) by GC/MS (SIM) (1)	9	2012/12/05	2012/12/10	ATL SOP-00103	Based on EPA 8270C
PCBs in water by GC/ECD (1)	8	2012/12/05	2012/12/10	ATL SOP 00107	Based on EPA8082
PCBs in water by GC/ECD (1)	1	2012/12/05	2012/12/11	ATL SOP 00107	Based on EPA8082
pH (1)	1	N/A	2012/12/04	ATL SOP 00003	Based on SM4500H+B
pH (1)	8	N/A	2012/12/05	ATL SOP 00003	Based on SM4500H+B
Phosphorus - ortho (1)	9	N/A	2012/12/05	ATL SOP 00021	Based on USEPA 365.2
Sat. pH and Langelier Index (@ 20C) (1)	9	N/A	2012/12/07		
Sat. pH and Langelier Index (@ 4C) (1)	9	N/A	2012/12/07		
Reactive Silica (1)	9	N/A	2012/12/06	ATL SOP 00022	Based on EPA 366.0
Sulphate (1)	9	N/A	2012/12/05	ATL SOP 00023	Based on EPA 375.4
Total Dissolved Solids (TDS calc) (1)	9	N/A	2012/12/07		
Organic carbon - Total (TOC) (1)	9	N/A	2012/12/06	ATL SOP 00037	Based on SM5310C
Turbidity (1)	9	N/A	2012/12/05	ATL SOP 00011	based on EPA 180.1
Volatile Organic Compounds in Water (1)	9	2012/12/05	2012/12/05	ATL SOP 00122	Based on EPA624

Remarks:

Reporting results to two significant figures at the RDL is to permit statistical evaluation and is not intended to be an indication of analytical precision.

../2

Maxxam Job #: B2J0454
Report Date: 2013/01/04

AMEC Environment & Infrastructure
Client Project #: TF1212735
Site Location: NEW HR
Sampler Initials: CT

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
* Results relate only to the items tested.

(1) This test was performed by Bedford
(2) This test was performed by Maxxam Analytics Mississauga
(3) Confirmatory runs for 2,3,7,8-TCDF are performed only if the primary result is greater than the RDL.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Michelle Hill, Project Manager
Email: MHill@maxxam.ca
Phone# (902) 420-0203 Ext:289

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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.

Total cover pages: 2

Maxxam Job #: B2J0454
Report Date: 2013/01/04

AMEC Environment & Infrastructure
Client Project #: TF1212735
Site Location: NEW HR
Sampler Initials: CT

RESULTS OF ANALYSES OF WATER

Maxxam ID		PV5834		PV5835			PV5836			PV5837		PV5838		
Sampling Date		2012/11/28		2012/11/28			2012/11/28			2012/11/28		2012/11/29		
	Units	**MW-01**	**RDL**	**MW-03**	**RDL**	**QC Batch**	**MW-04**	**RDL**	**QC Batch**	**MW-06**	**RDL**	**MW-07**	**RDL**	**QC Batch**
Calculated Parameters														
Anion Sum	me/L	0.620	N/A	3.20	N/A	3057275	4.44	N/A	3057275	1.77	N/A	0.560	N/A	3057275
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	17	1.0	86	1.0	3057272	120	1.0	3057272	38	1.0	<1.0	1.0	3057272
Calculated TDS	mg/L	39.0	1.0	180	1.0	3057280	255	1.0	3057280	114	1.0	64.0	1.0	3057280
Carb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	<1.0	1.0	3057272	<1.0	1.0	3057272	<1.0	1.0	<1.0	1.0	3057272
Cation Sum	me/L	0.470	N/A	2.95	N/A	3057275	4.74	N/A	3057275	1.83	N/A	1.26	N/A	3057275
Hardness (CaCO3)	mg/L	8.8	1.0	34	1.0	3057273	52	1.0	3057273	47	1.0	6.9	1.0	3057273
Ion Balance (% Difference)	%	13.8	N/A	4.07	N/A	3057274	3.27	N/A	3057274	1.67	N/A	38.5	N/A	3057274
Langelier Index (@ 20C)	N/A	-2.85		-1.30		3057278	-1.03		3057278	-1.64		NC		3057278
Langelier Index (@ 4C)	N/A	-3.10		-1.55		3057279	-1.28		3057279	-1.89		NC		3057279
Nitrate (N)	mg/L	0.055	0.050	<0.050	0.050	3057276	<0.050	0.050	3057276	<0.050	0.050	<0.050	0.050	3057276
Saturation pH (@ 20C)	N/A	9.66		8.41		3057278	8.11		3057278	8.60		NC		3057278
Saturation pH (@ 4C)	N/A	9.91		8.66		3057279	8.36		3057279	8.85		NC		3057279
Inorganics														
Total Alkalinity (Total as CaCO3)	mg/L	17	5.0	86	5.0	3057797	130	25	3057797	38	5.0	<5.0	5.0	3057797
Dissolved Chloride (Cl)	mg/L	6.2	1.0	47	1.0	3057803	58	1.0	3057803	12	1.0	13	1.0	3057803
Colour	TCU	6.3	5.0	83	25	3057806	47	5.0	3057806	130	25	1500	250	3057806
Nitrate + Nitrite	mg/L	0.055	0.050	<0.050	0.050	3057808	<0.050	0.050	3057808	<0.050	0.050	<0.050	0.050	3057808
Nitrite (N)	mg/L	<0.010	0.010	<0.010	0.010	3057809	<0.010	0.010	3057809	<0.010	0.010	<0.010	0.010	3057809
Nitrogen (Ammonia Nitrogen)	mg/L	<0.050	0.050	4.0	0.25	3059158	21	1.0	3059158	1.0	0.050	<0.050	0.050	3059158
Total Organic Carbon (C)	mg/L	60(1)	50	170(1)	50	3060629	9.1	0.50	3060629	190(1)	50	190(1)	50	3060629
Orthophosphate (P)	mg/L	<0.010	0.010	<0.010	0.010	3057807	0.066	0.010	3057807	0.011	0.010	0.044	0.010	3057807
pH	pH	6.81	N/A	7.11	N/A	3058628	7.08	N/A	3057739	6.96	N/A	5.74	N/A	3058628
Reactive Silica (SiO2)	mg/L	7.4	0.50	7.4	0.50	3057805	8.7	0.50	3057805	5.8	0.50	12	0.50	3057805
Dissolved Sulphate (SO4)	mg/L	4.6	2.0	7.0	2.0	3057804	14	2.0	3057804	33	2.0	9.7	2.0	3057804
Turbidity	NTU	>1000	10	>1000	10	3058625	31	0.10	3058625	>1000	10	450	3.0	3058625
Conductivity	uS/cm	62	1.0	310	1.0	3058629	490	1.0	3057744	190	1.0	86	1.0	3058629

N/A = Not Applicable
NC = Non-calculable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) - Reporting limit was increased due to turbidity.

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax:709-754-8612 www.maxxam.ca

Maxxam Job #: B2J0454
Report Date: 2013/01/04

AMEC Environment & Infrastructure
Client Project #: TF1212735
Site Location: NEW HR
Sampler Initials: CT

RESULTS OF ANALYSES OF WATER

Maxxam ID		PV5839			PV5840	PV5840			PV5841		PV5842		
Sampling Date		2012/11/30			2012/11/28	2012/11/28			2012/11/28		2012/11/30		
	Units	**MW-08**	**RDL**	**QC Batch**	**STREAM**	**STREAM Lab-Dup**	**RDL**	**QC Batch**	**SW-POND**	**RDL**	**DUP-01**	**RDL**	**QC Batch**
Calculated Parameters													
Anion Sum	me/L	0.220	N/A	3057275	3.96		N/A	3057275	8.07	N/A	0.180	N/A	3057275
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	3057272	52		1.0	3057272	180	1.0	<1.0	1.0	3057272
Calculated TDS	mg/L	25.0	1.0	3057280	251		1.0	3057280	485	1.0	23.0	1.0	3057280
Carb. Alkalinity (calc. as CaCO3)	mg/L	<1.0	1.0	3057272	<1.0		1.0	3057272	1.2	1.0	<1.0	1.0	3057272
Cation Sum	me/L	0.320	N/A	3057275	3.90		N/A	3057275	8.11	N/A	0.330	N/A	3057275
Hardness (CaCO3)	mg/L	3.8	1.0	3057273	110		1.0	3057273	270	1.0	3.9	1.0	3057273
Ion Balance (% Difference)	%	18.5	N/A	3057274	0.760		N/A	3057274	0.250	N/A	29.4	N/A	3057274
Langelier Index (@ 20C)	N/A	NC		3057278	-0.582			3057278	0.638		NC		3057278
Langelier Index (@ 4C)	N/A	NC		3057279	-0.832			3057279	0.390		NC		3057279
Nitrate (N)	mg/L	<0.050	0.050	3057276	4.6		0.25	3057276	3.6	0.10	<0.050	0.050	3057276
Saturation pH (@ 20C)	N/A	NC		3057278	8.13			3057278	7.23		NC		3057278
Saturation pH (@ 4C)	N/A	NC		3057279	8.38			3057279	7.48		NC		3057279
Inorganics													
Total Alkalinity (Total as CaCO3)	mg/L	<5.0	5.0	3057797	52		5.0	3057797	180	25	<5.0	5.0	3058010
Dissolved Chloride (Cl)	mg/L	6.2	1.0	3057803	38		1.0	3057803	50	1.0	6.3	1.0	3058014
Colour	TCU	220	25	3057806	39		5.0	3057806	22	5.0	190	25	3058017
Nitrate + Nitrite	mg/L	<0.050	0.050	3057808	4.6		0.25	3057808	3.7	0.10	<0.050	0.050	3058020
Nitrite (N)	mg/L	<0.010	0.010	3057809	0.013		0.010	3057809	0.068	0.010	<0.010	0.010	3058021
Nitrogen (Ammonia Nitrogen)	mg/L	<0.050	0.050	3059158	<0.050		0.050	3059158	5.9	0.25	<0.050	0.050	3059158
Total Organic Carbon (C)	mg/L	23(1)	5.0	3060629	9.1	9.4	0.50	3060629	9.3	0.50	32(2)	5.0	3060629
Orthophosphate (P)	mg/L	0.016	0.010	3057807	<0.010		0.010	3057807	<0.010	0.010	0.016	0.010	3058018
pH	pH	5.15	N/A	3058628	7.55		N/A	3058628	7.87	N/A	5.16	N/A	3058628
Reactive Silica (SiO2)	mg/L	9.5	0.50	3057805	5.3		0.50	3057805	7.7	0.50	9.5	0.50	3058016
Dissolved Sulphate (SO4)	mg/L	2.1	2.0	3057804	74		10	3057804	130	10	<2.0	2.0	3058015
Turbidity	NTU	69	0.30	3058625	1.2		0.10	3058627	1.4	0.10	160	0.50	3058627
Conductivity	uS/cm	36	1.0	3058629	400		1.0	3058629	770	1.0	36	1.0	3058629

N/A = Not Applicable
NC = Non-calculable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) - Reporting limit was increased due to turbidity.
(2) - Elevated reporting limit due to sample matrix.

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax:709-754-8612 www.maxxam.ca

Maxxam Job #: B2J0454
Report Date: 2013/01/04

AMEC Environment & Infrastructure
Client Project #: TF1212735
Site Location: NEW HR
Sampler Initials: CT

ELEMENTS BY ICP/MS (WATER)

Maxxam ID		PV5834	PV5835	PV5836	PV5837	PV5838	PV5839	PV5839	PV5840	PV5841	PV5842		
Sampling Date		2012/11/28	2012/11/28	2012/11/28	2012/11/28	2012/11/29	2012/11/30	2012/11/30	2012/11/28	2012/11/28	2012/11/30		
	Units	**MW-01**	**MW-03**	**MW-04**	**MW-06**	**MW-07**	**MW-08**	**MW-08 Lab-Dup**	**STREAM**	**SW-POND**	**DUP-01**	**RDL**	**QC Batch**
Metals													
Dissolved Aluminum (Al)	ug/L	130	78.4	1610	247	4320	1160	1140			1190	5.0	3058903
Total Aluminum (Al)	ug/L								51.7	49.7		5.0	3058650
Dissolved Antimony (Sb)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0			<1.0	1.0	3058903
Total Antimony (Sb)	ug/L								<1.0	<1.0		1.0	3058650
Dissolved Arsenic (As)	ug/L	<1.0	6.6	3.2	2.9	2.5	1.1	1.2			1.1	1.0	3058903
Total Arsenic (As)	ug/L								<1.0	<1.0		1.0	3058650
Dissolved Barium (Ba)	ug/L	3.2	10.2	51.1	7.4	9.1	7.0	6.9			7.1	1.0	3058903
Total Barium (Ba)	ug/L								5.6	23.8		1.0	3058650
Dissolved Beryllium (Be)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0			<1.0	1.0	3058903
Total Beryllium (Be)	ug/L								<1.0	<1.0		1.0	3058650
Dissolved Bismuth (Bi)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0			<2.0	2.0	3058903
Total Bismuth (Bi)	ug/L								<2.0	<2.0		2.0	3058650
Dissolved Boron (B)	ug/L	<50	<50	<50	96	<50	<50	<50			<50	50	3058903
Total Boron (B)	ug/L								151	263		50	3058650
Dissolved Cadmium (Cd)	ug/L	<0.017	<0.017	0.101	<0.017	0.068	0.043	0.040			0.040	0.017	3058903
Total Cadmium (Cd)	ug/L								<0.017	0.028		0.017	3058650
Dissolved Calcium (Ca)	ug/L	2530	10800	15700	14800	2040	729	729			711	100	3058903
Total Calcium (Ca)	ug/L								36200	96000		100	3058650
Dissolved Chromium (Cr)	ug/L	<1.0	<1.0	2.9	<1.0	4.5	<1.0	<1.0			<1.0	1.0	3058903
Total Chromium (Cr)	ug/L								<1.0	<1.0		1.0	3058650
Dissolved Cobalt (Co)	ug/L	0.95	3.63	11.1	2.58	1.28	0.57	0.59			0.63	0.40	3058903
Total Cobalt (Co)	ug/L								0.52	2.18		0.40	3058650
Dissolved Copper (Cu)	ug/L	<2.0	<2.0	5.3	<2.0	7.1	13.1	12.9			12.9	2.0	3058903
Total Copper (Cu)	ug/L								<2.0	2.4		2.0	3058650
Dissolved Iron (Fe)	ug/L	968	9570	6530	8380	4680	399	405			415	50	3058903
Total Iron (Fe)	ug/L								98	405		50	3058650
Dissolved Lead (Pb)	ug/L	<0.50	<0.50	2.44	1.19	5.02	<0.50	<0.50			0.52	0.50	3058903
Total Lead (Pb)	ug/L								<0.50	<0.50		0.50	3058650
Dissolved Magnesium (Mg)	ug/L	602	1610	3160	2400	430	484	483			518	100	3058903
Total Magnesium (Mg)	ug/L								4800	8220		100	3058650
Dissolved Manganese (Mn)	ug/L	83.3	1570	1300	480	78.2	24.8	25.2			27.7	2.0	3058903
Total Manganese (Mn)	ug/L								142	1310		2.0	3058650
Dissolved Molybdenum (Mo)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0			<2.0	2.0	3058903
Total Molybdenum (Mo)	ug/L								<2.0	<2.0		2.0	3058650

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B2J0454
Report Date: 2013/01/04

AMEC Environment & Infrastructure
Client Project #: TF1212735
Site Location: NEW HR
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ELEMENTS BY ICP/MS (WATER)

Maxxam ID		PV5834	PV5835	PV5836	PV5837	PV5838	PV5839	PV5839	PV5840	PV5841	PV5842		
Sampling Date		2012/11/28	2012/11/28	2012/11/28	2012/11/28	2012/11/29	2012/11/30	2012/11/30	2012/11/28	2012/11/28	2012/11/30		
	Units	**MW-01**	**MW-03**	**MW-04**	**MW-06**	**MW-07**	**MW-08**	**MW-08 Lab-Dup**	**STREAM**	**SW-POND**	**DUP-01**	**RDL**	**QC Batch**
Dissolved Nickel (Ni)	ug/L	<2.0	<2.0	3.3	2.5	3.5	5.3	5.3			5.5	2.0	3058903
Total Nickel (Ni)	ug/L								<2.0	<2.0		2.0	3058650
Dissolved Phosphorus (P)	ug/L	<100	<100	335	182	146	<100	<100			<100	100	3058903
Total Phosphorus (P)	ug/L								<100	<100		100	3058650
Dissolved Potassium (K)	ug/L	275	1730	2900	3540	320	242	244			281	100	3058903
Total Potassium (K)	ug/L								7520	10600		100	3058650
Dissolved Selenium (Se)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0			<1.0	1.0	3058903
Total Selenium (Se)	ug/L								<1.0	<1.0		1.0	3058650
Dissolved Silver (Ag)	ug/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.11			<0.10	0.10	3058903
Total Silver (Ag)	ug/L								<0.10	<0.10		0.10	3058650
Dissolved Sodium (Na)	ug/L	5810	37000	43500	10000	21700	5000	5040			5210	100	3058903
Total Sodium (Na)	ug/L								34500	44500		100	3058650
Dissolved Strontium (Sr)	ug/L	12.3	50.5	89.7	51.9	12.5	7.9	7.8			8.4	2.0	3058903
Total Strontium (Sr)	ug/L								94.1	243		2.0	3058650
Dissolved Thallium (Tl)	ug/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10			<0.10	0.10	3058903
Total Thallium (Tl)	ug/L								<0.10	<0.10		0.10	3058650
Dissolved Tin (Sn)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0			<2.0	2.0	3058903
Total Tin (Sn)	ug/L								<2.0	<2.0		2.0	3058650
Dissolved Titanium (Ti)	ug/L	3.0	2.5	56.0	7.8	120	18.2	17.6			15.9	2.0	3058903
Total Titanium (Ti)	ug/L								4.7	7.9		2.0	3058650
Dissolved Uranium (U)	ug/L	<0.10	<0.10	0.19	<0.10	0.82	<0.10	<0.10			<0.10	0.10	3058903
Total Uranium (U)	ug/L								<0.10	<0.10		0.10	3058650
Dissolved Vanadium (V)	ug/L	<2.0	<2.0	3.6	<2.0	6.9	<2.0	<2.0			<2.0	2.0	3058903
Total Vanadium (V)	ug/L								<2.0	<2.0		2.0	3058650
Dissolved Zinc (Zn)	ug/L	5.2	<5.0	19.3	6.1	26.6	28.2	28.5			28.6	5.0	3058903
Total Zinc (Zn)	ug/L								<5.0	12.2		5.0	3058650

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B2J0454
Report Date: 2013/01/04

AMEC Environment & Infrastructure
Client Project #: TF1212735
Site Location: NEW HR
Sampler Initials: CT

SEMI-VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		PV5834	PV5835	PV5836	PV5837	PV5838	PV5839	PV5840	PV5841	PV5842		
Sampling Date		2012/11/28	2012/11/28	2012/11/28	2012/11/28	2012/11/29	2012/11/30	2012/11/28	2012/11/28	2012/11/30		
	Units	**MW-01**	**MW-03**	**MW-04**	**MW-06**	**MW-07**	**MW-08**	**STREAM**	**SW-POND**	**DUP-01**	**RDL**	**QC Batch**
Polyaromatic Hydrocarbons												
1-Methylnaphthalene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	3058956
2-Methylnaphthalene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	3058956
Acenaphthene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	3058956
Acenaphthylene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	3058956
Acridine	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	3058956
Anthracene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	3058956
Benzo(a)anthracene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	3058956
Benzo(a)pyrene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	3058956
Benzo(b)fluoranthene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	3058956
Benzo(g,h,i)perylene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	3058956
Benzo(k)fluoranthene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	3058956
Chrysene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	3058956
Dibenz(a,h)anthracene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	3058956
Fluoranthene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	3058956
Fluorene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	3058956
Indeno(1,2,3-cd)pyrene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	3058956
Naphthalene	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	3058956
Perylene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	3058956
Phenanthrene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	3058956
Pyrene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	3058956
Quinoline	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	3058956
Surrogate Recovery (%)												
D10-Anthracene	%	89	81	76	71	65	84	81	80	83		3058956
D14-Terphenyl	%	73(1)	82(1)	64(1)	51(1)	31(2)	67(1)	76	76	76(1)		3058956
D8-Acenaphthylene	%	83	77	76	74	69	80	78	78	76		3058956

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) - PAH sample decanted due to sediment.
(2) - PAH sample decanted due to sediment. PAH surrogate(s) not within acceptance limits. Analysis was repeated with similar results.

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Maxxam Job #: B2J0454
Report Date: 2013/01/04

AMEC Environment & Infrastructure
Client Project #: TF1212735
Site Location: NEW HR
Sampler Initials: CT

VOLATILE ORGANICS BY GC/MS (WATER)

Maxxam ID		PV5834	PV5835	PV5836	PV5837	PV5838	PV5839	PV5840	PV5841	PV5842		
Sampling Date		2012/11/28	2012/11/28	2012/11/28	2012/11/28	2012/11/29	2012/11/30	2012/11/28	2012/11/28	2012/11/30		
	Units	**MW-01**	**MW-03**	**MW-04**	**MW-06**	**MW-07**	**MW-08**	**STREAM**	**SW-POND**	**DUP-01**	**RDL**	**QC Batch**
Chlorobenzenes												
1,2-Dichlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	3058608
1,3-Dichlorobenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	3058608
1,4-Dichlorobenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	3058608
Chlorobenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	3058608

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B2J0454
Report Date: 2013/01/04

AMEC Environment & Infrastructure
Client Project #: TF1212735
Site Location: NEW HR
Sampler Initials: CT

VOLATILE ORGANICS BY GC/MS (WATER)

Maxxam ID		PV5834	PV5835	PV5836	PV5837	PV5838	PV5839	PV5840	PV5841	PV5842		
Sampling Date		2012/11/28	2012/11/28	2012/11/28	2012/11/28	2012/11/29	2012/11/30	2012/11/28	2012/11/28	2012/11/30		
	Units	**MW-01**	**MW-03**	**MW-04**	**MW-06**	**MW-07**	**MW-08**	**STREAM**	**SW-POND**	**DUP-01**	**RDL**	**QC Batch**
Volatile Organics												
1,1,1-Trichloroethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	3058608
1,1,2,2-Tetrachloroethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	3058608
1,1,2-Trichloroethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	3058608
1,1-Dichloroethane	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	3058608
1,1-Dichloroethylene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	3058608
1,2-Dichloroethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	3058608
1,2-Dichloropropane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	3058608
Benzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	3058608
Bromodichloromethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	3058608
Bromoform	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	3058608
Bromomethane	ug/L	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	3.0	3058608
Carbon Tetrachloride	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	3058608
Chloroethane	ug/L	<8.0	<8.0	<8.0	<8.0	<8.0	<8.0	<8.0	<8.0	<8.0	8.0	3058608
Chloroform	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	3058608
Chloromethane	ug/L	<8.0	<8.0	<8.0	<8.0	<8.0	<8.0	<8.0	<8.0	<8.0	8.0	3058608
cis-1,2-Dichloroethylene	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	3058608
cis-1,3-Dichloropropene	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	3058608
Dibromochloromethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	3058608
Ethylbenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	3058608
Ethylene Dibromide	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	3058608
Methylene Chloride(Dichloromethane)	ug/L	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	3.0	3058608
o-Xylene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	3058608
p+m-Xylene	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	3058608
Styrene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	3058608
Tetrachloroethylene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	3058608
Toluene	ug/L	<1.0	<1.0	<1.0	<1.0	3.0	<1.0	<1.0	<1.0	<1.0	1.0	3058608
trans-1,2-Dichloroethylene	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	3058608
trans-1,3-Dichloropropene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	3058608
Trichloroethylene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	3058608
Trichlorofluoromethane (FREON 11)	ug/L	<8.0	<8.0	<8.0	<8.0	<8.0	<8.0	<8.0	<8.0	<8.0	8.0	3058608
Vinyl Chloride	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	3058608
Surrogate Recovery (%)												
4-Bromofluorobenzene	%	97(1)	92(1)	100	95(1)	97(1)	97(1)	101	98	98(1)		3058608
D4-1,2-Dichloroethane	%	103	103	102	101	106	105	105	100	103		3058608

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) - VOC sample contained sediment.

Maxxam Job #: B2J0454
Report Date: 2013/01/04

AMEC Environment & Infrastructure
Client Project #: TF1212735
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Sampler Initials: CT

VOLATILE ORGANICS BY GC/MS (WATER)

Maxxam ID		PV5834	PV5835	PV5836	PV5837	PV5838	PV5839	PV5840	PV5841	PV5842		
Sampling Date		2012/11/28	2012/11/28	2012/11/28	2012/11/28	2012/11/29	2012/11/30	2012/11/28	2012/11/28	2012/11/30		
	Units	**MW-01**	**MW-03**	**MW-04**	**MW-06**	**MW-07**	**MW-08**	**STREAM**	**SW-POND**	**DUP-01**	**RDL**	**QC Batch**
D8-Toluene	%	101	97	101	99	99	99	100	101	98		3058608

POLYCHLORINATED BIPHENYLS BY GC-ECD (WATER)

Maxxam ID		PV5834		PV5835		PV5836		
Sampling Date		2012/11/28		2012/11/28		2012/11/28		
	Units	**MW-01**	**RDL**	**MW-03**	**RDL**	**MW-04**	**RDL**	**QC Batch**
PCBs								
Total PCB	ug/L	<0.050	0.050	<0.060	0.060	<0.050	0.050	3061017
Surrogate Recovery (%)								
Decachlorobiphenyl	%	66(1)		91(2)		31(1)		3061017

Maxxam ID		PV5837		PV5838	PV5839	PV5840	PV5841	PV5842		
Sampling Date		2012/11/28		2012/11/29	2012/11/30	2012/11/28	2012/11/28	2012/11/30		
	Units	**MW-06**	**RDL**	**MW-07**	**MW-08**	**STREAM**	**SW-POND**	**DUP-01**	**RDL**	**QC Batch**
PCBs										
Total PCB	ug/L	<0.060	0.060	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	3061017
Surrogate Recovery (%)										
Decachlorobiphenyl	%	74(2)		22(3)	44(1)	70(1)	81(1)	45(1)		3061017

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) - PCB sample decanted as per client request.
(2) - PCB sample decanted as per client request. Elevated PCB RDL due to insufficient sample.
(3) - PCB sample decanted as per client request. PCB surrogate not within acceptance limits. Analysis was repeated with similar results.

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AMEC Environment & Infrastructure
Client Project #: TF1212735
Site Location: NEW HR
Sampler Initials: CT

DIOXINS AND FURANS BY HRMS (WATER)

Maxxam ID		PV5834		PV5835		PV5836		PV5837		PV5838		
Sampling Date		2012/11/28		2012/11/28		2012/11/28		2012/11/28		2012/11/29		
	Units	**MW-01**	**RDL**	**MW-03**	**RDL**	**MW-04**	**RDL**	**MW-06**	**RDL**	**MW-07**	**RDL**	**QC Batch**
Dioxins & Furans												
2,3,7,8-Tetra CDD	pg/L	<0.980	9.52	<0.963	9.80	<1.05	9.62	<0.893	9.43	<1.08	9.90	3071688
1,2,3,7,8-Penta CDD	pg/L	<0.888	9.52	<0.992	9.80	<1.06	9.62	<1.04	9.43	<1.04	9.90	3071688
1,2,3,4,7,8-Hexa CDD	pg/L	<1.12	9.52	<0.834	9.80	<1.13	9.62	<0.943	9.43	<1.10	9.90	3071688
1,2,3,6,7,8-Hexa CDD	pg/L	<0.991	9.52	<0.738	9.80	<0.998	9.62	<0.835	9.43	<0.978	9.90	3071688
1,2,3,7,8,9-Hexa CDD	pg/L	<0.963	9.52	<0.717	9.80	<0.970	9.62	<0.811	9.43	<0.951	9.90	3071688
1,2,3,4,6,7,8-Hepta CDD	pg/L	<1.01	9.52	<1.02	9.80	<0.968	9.62	2.08	9.43	<1.06	9.90	3071688
Octa CDD	pg/L	<2.26(1)	95.2	3.9	98.0	4.4	96.2	14.0	94.3	3.5	99.0	3071688
Total Tetra CDD	pg/L	<0.980	9.52	<1.84(1)	9.80	<1.62(1)	9.62	<1.89(2)	9.43	<1.83(2)	9.90	3071688
Total Penta CDD	pg/L	<0.888	9.52	<0.992	9.80	<1.14(1)	9.62	<1.04	9.43	<1.04	9.90	3071688
Total Hexa CDD	pg/L	<5.77(1)	9.52	<5.18(1)	9.80	<5.83(1)	9.62	<6.62(2)	9.43	<5.09(2)	9.90	3071688
Total Hepta CDD	pg/L	<1.01	9.52	<1.02	9.80	<0.968	9.62	4.31	9.43	<1.06	9.90	3071688
2,3,7,8-Tetra CDF	pg/L	<0.915	9.52	<0.964	9.80	<0.906	9.62	<0.948	9.43	<1.06	9.90	3071688
1,2,3,7,8-Penta CDF	pg/L	<0.892	9.52	<1.07	9.80	<1.04	9.62	<1.04	9.43	<1.03	9.90	3071688
2,3,4,7,8-Penta CDF	pg/L	<0.868	9.52	<1.04	9.80	<1.01	9.62	<1.01	9.43	<1.00	9.90	3071688
1,2,3,4,7,8-Hexa CDF	pg/L	<0.869	9.52	<1.07	9.80	<0.837	9.62	<0.993	9.43	<1.05	9.90	3071688
1,2,3,6,7,8-Hexa CDF	pg/L	<0.752	9.52	<0.923	9.80	<0.724	9.62	<0.859	9.43	<0.910	9.90	3071688
2,3,4,6,7,8-Hexa CDF	pg/L	<0.892	9.52	<1.10	9.80	<0.860	9.62	<1.02	9.43	<1.08	9.90	3071688
1,2,3,7,8,9-Hexa CDF	pg/L	<1.01	9.52	<1.24	9.80	<0.971	9.62	<1.15	9.43	<1.22	9.90	3071688
1,2,3,4,6,7,8-Hepta CDF	pg/L	<0.872	9.52	<0.851	9.80	<0.891	9.62	<1.09(2)	9.43	<0.899(2)	9.90	3071688
1,2,3,4,7,8,9-Hepta CDF	pg/L	<1.23	9.52	<1.20	9.80	<1.26	9.62	<1.16	9.43	<1.09	9.90	3071688
Octa CDF	pg/L	<0.892	95.2	<1.08	98.0	<1.24	96.2	<1.13	94.3	<1.57	99.0	3071688
Total Tetra CDF	pg/L	<1.93(1)	9.52	2.57	9.80	1.93	9.62	<1.67(2)	9.43	3.87	9.90	3071688
Total Penta CDF	pg/L	<3.10(1)	9.52	<1.87(1)	9.80	<3.46(1)	9.62	<1.69(2)	9.43	<2.58(2)	9.90	3071688
Total Hexa CDF	pg/L	<0.871	9.52	<1.07	9.80	<0.839	9.62	<0.995	9.43	<1.05	9.90	3071688
Total Hepta CDF	pg/L	<1.02	9.52	<0.996	9.80	<1.04	9.62	<1.28(2)	9.43	<1.05(2)	9.90	3071688

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) -
EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.
(2) - EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

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Maxxam Job #: B2J0454
Report Date: 2013/01/04

AMEC Environment & Infrastructure
Client Project #: TF1212735
Site Location: NEW HR
Sampler Initials: CT

DIOXINS AND FURANS BY HRMS (WATER)

Maxxam ID		PV5834		PV5835		PV5836		PV5837		PV5838		
Sampling Date		2012/11/28		2012/11/28		2012/11/28		2012/11/28		2012/11/29		
	Units	**MW-01**	**RDL**	**MW-03**	**RDL**	**MW-04**	**RDL**	**MW-06**	**RDL**	**MW-07**	**RDL**	**QC Batch**
Surrogate Recovery (%)												
C13-1234678 HeptaCDD	%	82		101		93		87		86		3071688
C13-1234678 HeptaCDF	%	88		106		93		96		81		3071688
C13-123678 HexaCDD	%	89		98		90		84		80		3071688
C13-123678 HexaCDF	%	79		88		83		79		71		3071688
C13-12378 PentaCDD	%	65		80		76		70		67		3071688
C13-12378 PentaCDF	%	54		72		70		59		61		3071688
C13-2378 TetraCDD	%	55		79		74		69		66		3071688
C13-2378 TetraCDF	%	56		81		78		66		64		3071688
C13-OCDD	%	82		96		93		92		82		3071688

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DIOXINS AND FURANS BY HRMS (WATER)

Maxxam ID		PV5839			PV5840		PV5841			PV5842		
Sampling Date		2012/11/30			2012/11/28		2012/11/28			2012/11/30		
	Units	**MW-08**	**RDL**	**QC Batch**	**STREAM**	**RDL**	**SW-POND**	**RDL**	**QC Batch**	**DUP-01**	**RDL**	**QC Batch**
Dioxins & Furans												
2,3,7,8-Tetra CDD	pg/L	<0.960	9.62	3071688	<0.943	9.71	<0.917	9.80	3063815	<1.02	9.62	3071688
1,2,3,7,8-Penta CDD	pg/L	<1.01	9.62	3071688	<1.92	9.71	<0.989	9.80	3063815	<0.969	9.62	3071688
1,2,3,4,7,8-Hexa CDD	pg/L	<0.980	9.62	3071688	<1.37	9.71	<0.869	9.80	3063815	<1.00	9.62	3071688
1,2,3,6,7,8-Hexa CDD	pg/L	<0.867	9.62	3071688	<1.45	9.71	<0.925	9.80	3063815	<0.886	9.62	3071688
1,2,3,7,8,9-Hexa CDD	pg/L	<0.843	9.62	3071688	<1.24	9.71	<0.791	9.80	3063815	<0.861	9.62	3071688
1,2,3,4,6,7,8-Hepta CDD	pg/L	<1.02	9.62	3071688	<0.974	9.71	<1.05	9.80	3063815	<1.02	9.62	3071688
Octa CDD	pg/L	1.3	96.2	3071688	<1.22	97.1	1.6	98.0	3063815	2.5	96.2	3071688
Total Tetra CDD	pg/L	<0.960	9.62	3071688	<1.41(1)	9.71	<1.08(1)	9.80	3063815	<1.29(2)	9.62	3071688
Total Penta CDD	pg/L	<1.01	9.62	3071688	<1.92	9.71	<0.989	9.80	3063815	<0.969	9.62	3071688
Total Hexa CDD	pg/L	<7.01(2)	9.62	3071688	<3.87(1)	9.71	<3.64(1)	9.80	3063815	<5.33(2)	9.62	3071688
Total Hepta CDD	pg/L	<1.02	9.62	3071688	<0.974	9.71	<1.05	9.80	3063815	<1.02	9.62	3071688
2,3,7,8-Tetra CDF	pg/L	<0.972	9.62	3071688	<1.03	9.71	<1.02	9.80	3063815	<0.960	9.62	3071688
1,2,3,7,8-Penta CDF	pg/L	<0.912	9.62	3071688	<1.46	9.71	<1.00	9.80	3063815	<0.978	9.62	3071688
2,3,4,7,8-Penta CDF	pg/L	<0.888	9.62	3071688	<1.42	9.71	<0.975	9.80	3063815	<0.953	9.62	3071688
1,2,3,4,7,8-Hexa CDF	pg/L	<0.995	9.62	3071688	<1.03	9.71	<0.918	9.80	3063815	<1.04	9.62	3071688
1,2,3,6,7,8-Hexa CDF	pg/L	<0.861	9.62	3071688	<0.995	9.71	<0.882	9.80	3063815	<0.904	9.62	3071688
2,3,4,6,7,8-Hexa CDF	pg/L	<1.02	9.62	3071688	<1.07	9.71	<0.950	9.80	3063815	<1.07	9.62	3071688
1,2,3,7,8,9-Hexa CDF	pg/L	<1.15	9.62	3071688	<1.26	9.71	<1.12	9.80	3063815	<1.21	9.62	3071688
1,2,3,4,6,7,8-Hepta CDF	pg/L	<0.751	9.62	3071688	<0.747	9.71	<0.760	9.80	3063815	<0.787	9.62	3071688
1,2,3,4,7,8,9-Hepta CDF	pg/L	<1.06	9.62	3071688	<1.03	9.71	<1.05	9.80	3063815	<1.11	9.62	3071688
Octa CDF	pg/L	<1.29	96.2	3071688	<0.743	97.1	<0.999	98.0	3063815	<1.02	96.2	3071688
Total Tetra CDF	pg/L	<1.98(2)	9.62	3071688	<1.39(1)	9.71	<1.48(1)	9.80	3063815	<2.10(2)	9.62	3071688
Total Penta CDF	pg/L	<3.66(2)	9.62	3071688	<1.44	9.71	<0.988	9.80	3063815	<4.77(2)	9.62	3071688
Total Hexa CDF	pg/L	<0.997	9.62	3071688	<1.08	9.71	<0.959	9.80	3063815	<1.05	9.62	3071688
Total Hepta CDF	pg/L	<0.878	9.62	3071688	<0.867	9.71	<0.882	9.80	3063815	<0.921	9.62	3071688

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) - EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.
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AMEC Environment & Infrastructure
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DIOXINS AND FURANS BY HRMS (WATER)

Maxxam ID		PV5839			PV5840		PV5841			PV5842		
Sampling Date		2012/11/30			2012/11/28		2012/11/28			2012/11/30		
	Units	**MW-08**	**RDL**	**QC Batch**	**STREAM**	**RDL**	**SW-POND**	**RDL**	**QC Batch**	**DUP-01**	**RDL**	**QC Batch**
Surrogate Recovery (%)												
C13-1234678 HeptaCDD	%	93		3071688	85		79		3063815	91		3071688
C13-1234678 HeptaCDF	%	91		3071688	73		72		3063815	91		3071688
C13-123678 HexaCDD	%	92		3071688	87		88		3063815	86		3071688
C13-123678 HexaCDF	%	82		3071688	71		72		3063815	75		3071688
C13-12378 PentaCDD	%	71		3071688	85		83		3063815	70		3071688
C13-12378 PentaCDF	%	66		3071688	72		69		3063815	62		3071688
C13-2378 TetraCDD	%	69		3071688	73		64		3063815	63		3071688
C13-2378 TetraCDF	%	70		3071688	63		57		3063815	59		3071688
C13-OCDD	%	96		3071688	102		101		3063815	90		3071688

RDL = Reportable Detection Limit
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Package 1	1.3°C

Each temperature is the average of up to three cooler temperatures taken at receipt

GENERAL COMMENTS

Sample PV5834-01: RCAp Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample PV5838-01: RCAp Ion Balance acceptable. Low ionic strength sample.

Sample PV5839-01: RCAp Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample PV5842-01: RCAp Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

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AMEC Environment & Infrastructure
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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
3057739	pH	2012/12/04							0.1	25	100	80 - 120
3057744	Conductivity	2012/12/04			100	80 - 120	<1.0	uS/cm	0.05	25		
3057797	Total Alkalinity (Total as CaCO3)	2012/12/05	NC	80 - 120	99	80 - 120	<5.0	mg/L	0.1	25	107	80 - 120
3057803	Dissolved Chloride (Cl)	2012/12/05	NC	80 - 120	99	80 - 120	<1.0	mg/L	2.5	25	99	80 - 120
3057804	Dissolved Sulphate (SO4)	2012/12/05	NC	80 - 120	102	80 - 120	<2.0	mg/L	0.05	25	103	80 - 120
3057805	Reactive Silica (SiO2)	2012/12/06	NC	80 - 120	97	80 - 120	<0.50	mg/L	0.5	25		
3057806	Colour	2012/12/06					<5.0	TCU	NC	25	103	80 - 120
3057807	Orthophosphate (P)	2012/12/05	NC	80 - 120	105	80 - 120	<0.010	mg/L	1	25		
3057808	Nitrate + Nitrite	2012/12/06	98	80 - 120	93	80 - 120	<0.050	mg/L	2.6	25		
3057809	Nitrite (N)	2012/12/05	NC	80 - 120	97	80 - 120	<0.010	mg/L	1.6	25		
3058010	Total Alkalinity (Total as CaCO3)	2012/12/05	NC	80 - 120	101	80 - 120	<5.0	mg/L	0.9	25	105	80 - 120
3058014	Dissolved Chloride (Cl)	2012/12/05	NC	80 - 120	100	80 - 120	<1.0	mg/L	1.0	25	99	80 - 120
3058015	Dissolved Sulphate (SO4)	2012/12/05	98	80 - 120	102	80 - 120	<2.0	mg/L	NC	25	102	80 - 120
3058016	Reactive Silica (SiO2)	2012/12/06	NC	80 - 120	98	80 - 120	<0.50	mg/L	0.8	25		
3058017	Colour	2012/12/06					<5.0	TCU	NC	25	103	80 - 120
3058018	Orthophosphate (P)	2012/12/05	NC	80 - 120	95	80 - 120	<0.010	mg/L	1.8	25		
3058020	Nitrate + Nitrite	2012/12/06	95	80 - 120	93	80 - 120	<0.050	mg/L	NC	25		
3058021	Nitrite (N)	2012/12/05	91	80 - 120	98	80 - 120	<0.010	mg/L	NC	25		
3058608	1,2-Dichlorobenzene	2012/12/05	105	70 - 130	101	70 - 130	<0.50	ug/L				
3058608	1,3-Dichlorobenzene	2012/12/05	105	70 - 130	102	70 - 130	<1.0	ug/L				
3058608	1,4-Dichlorobenzene	2012/12/05	105	70 - 130	102	70 - 130	<1.0	ug/L				
3058608	Chlorobenzene	2012/12/05	105	70 - 130	103	70 - 130	<1.0	ug/L				
3058608	1,1,1-Trichloroethane	2012/12/05	105	70 - 130	109	70 - 130	<1.0	ug/L				
3058608	1,1,2,2-Tetrachloroethane	2012/12/05	100	70 - 130	98	70 - 130	<1.0	ug/L				
3058608	1,1,2-Trichloroethane	2012/12/05	105	70 - 130	106	70 - 130	<1.0	ug/L				
3058608	1,1-Dichloroethane	2012/12/05	100	70 - 130	108	70 - 130	<2.0	ug/L				
3058608	1,1-Dichloroethylene	2012/12/05	100	70 - 130	109	70 - 130	<0.50	ug/L				
3058608	1,2-Dichloroethane	2012/12/05	105	70 - 130	107	70 - 130	<1.0	ug/L				
3058608	1,2-Dichloropropane	2012/12/05	100	70 - 130	101	70 - 130	<1.0	ug/L				
3058608	4-Bromofluorobenzene	2012/12/05	100	70 - 130	101	70 - 130	101	%				
3058608	Benzene	2012/12/05	105	70 - 130	109	70 - 130	<1.0	ug/L	NC	40		
3058608	Bromodichloromethane	2012/12/05	100	70 - 130	102	70 - 130	<1.0	ug/L				
3058608	Bromoform	2012/12/05	89	70 - 130	87	70 - 130	<1.0	ug/L				
3058608	Bromomethane	2012/12/05	89	70 - 130	103	70 - 130	<3.0	ug/L				
3058608	Carbon Tetrachloride	2012/12/05	100	70 - 130	102	70 - 130	<1.0	ug/L				
3058608	Chloroethane	2012/12/05	95	70 - 130	107	70 - 130	<8.0	ug/L				
3058608	Chloroform	2012/12/05	100	70 - 130	105	70 - 130	<1.0	ug/L				
3058608	Chloromethane	2012/12/05	68(1, 2)	70 - 130	81	70 - 130	<8.0	ug/L				
3058608	cis-1,2-Dichloroethylene	2012/12/05	105	70 - 130	115	70 - 130	<2.0	ug/L				
3058608	cis-1,3-Dichloropropene	2012/12/05	105	70 - 130	113	70 - 130	<2.0	ug/L				

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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
3058608	D4-1,2-Dichloroethane	2012/12/05	100	70 - 130	101	70 - 130	103	%				
3058608	D8-Toluene	2012/12/05	100	70 - 130	103	70 - 130	99	%				
3058608	Dibromochloromethane	2012/12/05	100	70 - 130	101	70 - 130	<1.0	ug/L				
3058608	Ethylbenzene	2012/12/05	105	70 - 130	108	70 - 130	<1.0	ug/L	NC	40		
3058608	Ethylene Dibromide	2012/12/05	110	70 - 130	112	70 - 130	<1.0	ug/L				
3058608	MethyleneChloride(Dichloromethane)	2012/12/05	100	70 - 130	109	70 - 130	<3.0	ug/L				
3058608	o-Xylene	2012/12/05	115	70 - 130	116	70 - 130	<1.0	ug/L	NC	40		
3058608	p+m-Xylene	2012/12/05	115	70 - 130	112	70 - 130	<2.0	ug/L	NC	40		
3058608	Styrene	2012/12/05	115	70 - 130	113	70 - 130	<1.0	ug/L				
3058608	Tetrachloroethylene	2012/12/05	111	70 - 130	112	70 - 130	<1.0	ug/L				
3058608	Toluene	2012/12/05	105	70 - 130	111	70 - 130	<1.0	ug/L	NC	40		
3058608	trans-1,2-Dichloroethylene	2012/12/05	105	70 - 130	115	70 - 130	<2.0	ug/L				
3058608	trans-1,3-Dichloropropene	2012/12/05	105	70 - 130	111	70 - 130	<1.0	ug/L				
3058608	Trichloroethylene	2012/12/05	107	70 - 130	108	70 - 130	<1.0	ug/L				
3058608	Trichlorofluoromethane (FREON 11)	2012/12/05	95	70 - 130	105	70 - 130	<8.0	ug/L				
3058608	Vinyl Chloride	2012/12/05	100	70 - 130	106	70 - 130	<0.50	ug/L				
3058625	Turbidity	2012/12/05							0.8	25	102	80 - 120
3058627	Turbidity	2012/12/05							5.8	25	102	80 - 120
3058628	pH	2012/12/05							0	25	100	80 - 120
3058629	Conductivity	2012/12/05			98	80 - 120	<1.0	uS/cm	0.9	25		
3058650	Total Aluminum (Al)	2012/12/05	101	80 - 120	101	80 - 120	<5.0	ug/L	NC	25		
3058650	Total Antimony (Sb)	2012/12/05	104	80 - 120	104	80 - 120	<1.0	ug/L	NC	25		
3058650	Total Arsenic (As)	2012/12/05	97	80 - 120	100	80 - 120	<1.0	ug/L	NC	25		
3058650	Total Barium (Ba)	2012/12/05	99	80 - 120	104	80 - 120	<1.0	ug/L	NC	25		
3058650	Total Beryllium (Be)	2012/12/05	101	80 - 120	102	80 - 120	<1.0	ug/L	NC	25		
3058650	Total Bismuth (Bi)	2012/12/05	102	80 - 120	102	80 - 120	<2.0	ug/L	NC	25		
3058650	Total Boron (B)	2012/12/05	105	80 - 120	103	80 - 120	<50	ug/L	NC	25		
3058650	Total Cadmium (Cd)	2012/12/05	105	80 - 120	103	80 - 120	<0.017	ug/L	NC	25		
3058650	Total Calcium (Ca)	2012/12/05	90	80 - 120	92	80 - 120	<100	ug/L	NC	25		
3058650	Total Chromium (Cr)	2012/12/05	98	80 - 120	102	80 - 120	<1.0	ug/L	NC	25		
3058650	Total Cobalt (Co)	2012/12/05	101	80 - 120	104	80 - 120	<0.40	ug/L	NC	25		
3058650	Total Copper (Cu)	2012/12/05	98	80 - 120	103	80 - 120	<2.0	ug/L	NC	25		
3058650	Total Iron (Fe)	2012/12/05	98	80 - 120	102	80 - 120	<50	ug/L	NC	25		
3058650	Total Lead (Pb)	2012/12/05	101	80 - 120	103	80 - 120	<0.50	ug/L	NC	25		
3058650	Total Magnesium (Mg)	2012/12/05	99	80 - 120	103	80 - 120	<100	ug/L	NC	25		
3058650	Total Manganese (Mn)	2012/12/05	98	80 - 120	101	80 - 120	<2.0	ug/L	NC	25		
3058650	Total Molybdenum (Mo)	2012/12/05	105	80 - 120	105	80 - 120	<2.0	ug/L	NC	25		
3058650	Total Nickel (Ni)	2012/12/05	97	80 - 120	102	80 - 120	<2.0	ug/L	NC	25		
3058650	Total Phosphorus (P)	2012/12/05	100	80 - 120	101	80 - 120	<100	ug/L	NC	25		
3058650	Total Potassium (K)	2012/12/05	100	80 - 120	101	80 - 120	<100	ug/L	NC	25		

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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
3058650	Total Selenium (Se)	2012/12/05	99	80 - 120	98	80 - 120	<1.0	ug/L	NC	25		
3058650	Total Silver (Ag)	2012/12/05	103	80 - 120	106	80 - 120	<0.10	ug/L	NC	25		
3058650	Total Sodium (Na)	2012/12/05	99	80 - 120	103	80 - 120	<100	ug/L	NC	25		
3058650	Total Strontium (Sr)	2012/12/05	96	80 - 120	100	80 - 120	<2.0	ug/L	NC	25		
3058650	Total Thallium (Tl)	2012/12/05	100	80 - 120	101	80 - 120	<0.10	ug/L	NC	25		
3058650	Total Tin (Sn)	2012/12/05	103	80 - 120	104	80 - 120	<2.0	ug/L	NC	25		
3058650	Total Titanium (Ti)	2012/12/05	98	80 - 120	106	80 - 120	<2.0	ug/L	NC	25		
3058650	Total Uranium (U)	2012/12/05	102	80 - 120	105	80 - 120	<0.10	ug/L	NC	25		
3058650	Total Vanadium (V)	2012/12/05	98	80 - 120	102	80 - 120	<2.0	ug/L	NC	25		
3058650	Total Zinc (Zn)	2012/12/05	99	80 - 120	104	80 - 120	<5.0	ug/L	NC	25		
3058903	Dissolved Aluminum (Al)	2012/12/06	NC	80 - 120	98	80 - 120	<5.0	ug/L	1.7	25		
3058903	Dissolved Antimony (Sb)	2012/12/06	99	80 - 120	103	80 - 120	<1.0	ug/L	NC	25		
3058903	Dissolved Arsenic (As)	2012/12/06	99	80 - 120	99	80 - 120	<1.0	ug/L	NC	25		
3058903	Dissolved Barium (Ba)	2012/12/06	98	80 - 120	101	80 - 120	<1.0	ug/L	0.4	25		
3058903	Dissolved Beryllium (Be)	2012/12/06	104	80 - 120	101	80 - 120	<1.0	ug/L	NC	25		
3058903	Dissolved Bismuth (Bi)	2012/12/06	93	80 - 120	102	80 - 120	<2.0	ug/L	NC	25		
3058903	Dissolved Boron (B)	2012/12/06	100	80 - 120	102	80 - 120	<50	ug/L	NC	25		
3058903	Dissolved Cadmium (Cd)	2012/12/06	98	80 - 120	100	80 - 120	<0.017	ug/L	NC	25		
3058903	Dissolved Calcium (Ca)	2012/12/06	95	80 - 120	99	80 - 120	<100	ug/L	0.02	25		
3058903	Dissolved Chromium (Cr)	2012/12/06	98	80 - 120	101	80 - 120	<1.0	ug/L	NC	25		
3058903	Dissolved Cobalt (Co)	2012/12/06	103	80 - 120	105	80 - 120	<0.40	ug/L	NC	25		
3058903	Dissolved Copper (Cu)	2012/12/06	97	80 - 120	101	80 - 120	<2.0	ug/L	1.1	25		
3058903	Dissolved Iron (Fe)	2012/12/06	99	80 - 120	101	80 - 120	<50	ug/L	1.5	25		
3058903	Dissolved Lead (Pb)	2012/12/06	97	80 - 120	101	80 - 120	<0.50	ug/L	NC	25		
3058903	Dissolved Magnesium (Mg)	2012/12/06	101	80 - 120	101	80 - 120	<100	ug/L	NC	25		
3058903	Dissolved Manganese (Mn)	2012/12/06	97	80 - 120	99	80 - 120	<2.0	ug/L	1.8	25		
3058903	Dissolved Molybdenum (Mo)	2012/12/06	96	80 - 120	101	80 - 120	<2.0	ug/L	NC	25		
3058903	Dissolved Nickel (Ni)	2012/12/06	96	80 - 120	98	80 - 120	<2.0	ug/L	NC	25		
3058903	Dissolved Phosphorus (P)	2012/12/06	98	80 - 120	101	80 - 120	<100	ug/L	NC	25		
3058903	Dissolved Potassium (K)	2012/12/06	99	80 - 120	100	80 - 120	<100	ug/L	NC	25		
3058903	Dissolved Selenium (Se)	2012/12/06	102	80 - 120	102	80 - 120	<1.0	ug/L	NC	25		
3058903	Dissolved Silver (Ag)	2012/12/06	100	80 - 120	103	80 - 120	<0.10	ug/L	NC	25		
3058903	Dissolved Sodium (Na)	2012/12/06	101	80 - 120	100	80 - 120	<100	ug/L	0.8	25		
3058903	Dissolved Strontium (Sr)	2012/12/06	97	80 - 120	100	80 - 120	<2.0	ug/L	NC	25		
3058903	Dissolved Thallium (Tl)	2012/12/06	98	80 - 120	102	80 - 120	<0.10	ug/L	NC	25		
3058903	Dissolved Tin (Sn)	2012/12/06	97	80 - 120	104	80 - 120	<2.0	ug/L	NC	25		
3058903	Dissolved Titanium (Ti)	2012/12/06	98	80 - 120	99	80 - 120	<2.0	ug/L	3.0	25		
3058903	Dissolved Uranium (U)	2012/12/06	99	80 - 120	103	80 - 120	<0.10	ug/L	NC	25		
3058903	Dissolved Vanadium (V)	2012/12/06	99	80 - 120	101	80 - 120	<2.0	ug/L	NC	25		
3058903	Dissolved Zinc (Zn)	2012/12/06	100	80 - 120	102	80 - 120	<5.0	ug/L	1.3	25		

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Maxxam Job #: B2J0454
Report Date: 2013/01/04

AMEC Environment & Infrastructure
Client Project #: TF1212735
Site Location: NEW HR
Sampler Initials: CT

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
3058956	D10-Anthracene	2012/12/10	75	30 - 130	88	30 - 130	98	%				
3058956	D14-Terphenyl	2012/12/10	69	30 - 130	86	30 - 130	89	%				
3058956	D8-Acenaphthylene	2012/12/10	73	30 - 130	87	30 - 130	94	%				
3058956	1-Methylnaphthalene	2012/12/10	87	30 - 130	98	30 - 130	<0.050	ug/L	NC	40		
3058956	2-Methylnaphthalene	2012/12/10	91	30 - 130	101	30 - 130	<0.050	ug/L	NC	40		
3058956	Acenaphthene	2012/12/10	90	30 - 130	103	30 - 130	<0.010	ug/L	NC	40		
3058956	Acenaphthylene	2012/12/10	81	30 - 130	102	30 - 130	<0.010	ug/L	NC	40		
3058956	Acridine	2012/12/10	92	30 - 130	90	30 - 130	<0.050	ug/L	NC	40		
3058956	Anthracene	2012/12/10	87	30 - 130	99	30 - 130	<0.010	ug/L	NC	40		
3058956	Benzo(a)anthracene	2012/12/10	84	30 - 130	101	30 - 130	<0.010	ug/L	NC	40		
3058956	Benzo(a)pyrene	2012/12/10	80	30 - 130	98	30 - 130	<0.010	ug/L	NC	40		
3058956	Benzo(b)fluoranthene	2012/12/10	83	30 - 130	90	30 - 130	<0.010	ug/L	NC	40		
3058956	Benzo(g,h,i)perylene	2012/12/10	73	30 - 130	88	30 - 130	<0.010	ug/L	NC	40		
3058956	Benzo(k)fluoranthene	2012/12/10	81	30 - 130	105	30 - 130	<0.010	ug/L	NC	40		
3058956	Chrysene	2012/12/10	89	30 - 130	101	30 - 130	<0.010	ug/L	NC	40		
3058956	Dibenz(a,h)anthracene	2012/12/10	61	30 - 130	87	30 - 130	<0.010	ug/L	NC	40		
3058956	Fluoranthene	2012/12/10	100	30 - 130	111	30 - 130	<0.010	ug/L	NC	40		
3058956	Fluorene	2012/12/10	89	30 - 130	101	30 - 130	<0.010	ug/L	NC	40		
3058956	Indeno(1,2,3-cd)pyrene	2012/12/10	57	30 - 130	84	30 - 130	<0.010	ug/L	NC	40		
3058956	Naphthalene	2012/12/10	90	30 - 130	101	30 - 130	<0.20	ug/L	NC	40		
3058956	Perylene	2012/12/10	83	30 - 130	96	30 - 130	<0.010	ug/L	NC	40		
3058956	Phenanthrene	2012/12/10	92	30 - 130	106	30 - 130	<0.010	ug/L	NC	40		
3058956	Pyrene	2012/12/10	97	30 - 130	111	30 - 130	<0.010	ug/L	NC	40		
3058956	Quinoline	2012/12/10	78	30 - 130	78	30 - 130	<0.050	ug/L	NC	40		
3059158	Nitrogen (Ammonia Nitrogen)	2012/12/06	NC	80 - 120	93	80 - 120	<0.050	mg/L	3.0	25	103	80 - 120
3060629	Total Organic Carbon (C)	2012/12/06	NC	80 - 120	93	80 - 120	<0.50	mg/L	3.1	25		
3061017	Decachlorobiphenyl	2012/12/10	103	30 - 130	77	30 - 130	62	%				
3061017	Total PCB	2012/12/10	119	70 - 130	115	70 - 130	<0.050	ug/L	NC	40		
3063815	C13-1234678 HeptaCDD	2012/12/10			73	40 - 130	66	%				
3063815	C13-1234678 HeptaCDF	2012/12/10			67	40 - 130	63	%				
3063815	C13-123678 HexaCDD	2012/12/10			82	40 - 130	78	%				
3063815	C13-123678 HexaCDF	2012/12/10			67	40 - 130	66	%				
3063815	C13-12378 PentaCDD	2012/12/10			78	40 - 130	79	%				
3063815	C13-12378 PentaCDF	2012/12/10			63	40 - 130	67	%				
3063815	C13-2378 TetraCDD	2012/12/10			65	40 - 130	61	%				
3063815	C13-2378 TetraCDF	2012/12/10			60	40 - 130	60	%				
3063815	C13-OCDD	2012/12/10			95	40 - 130	79	%				
3063815	2,3,7,8-Tetra CDD	2012/12/10			100	80 - 140	<1.01	pg/L				
3063815	1,2,3,7,8-Penta CDD	2012/12/10			107	80 - 140	<1.44	pg/L				
3063815	1,2,3,4,7,8-Hexa CDD	2012/12/10			99	80 - 140	<1.37	pg/L				

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AMEC Environment & Infrastructure
Client Project #: TF1212735
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Sampler Initials: CT

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
3063815	1,2,3,6,7,8-Hexa CDD	2012/12/10			115	80 - 140	<1.46	pg/L				
3063815	1,2,3,7,8,9-Hexa CDD	2012/12/10			105	80 - 140	<1.25	pg/L				
3063815	1,2,3,4,6,7,8-Hepta CDD	2012/12/10			101	80 - 140	<1.95	pg/L				
3063815	Octa CDD	2012/12/10			93	80 - 140	1, RDL=100	pg/L				
3063815	2,3,7,8-Tetra CDF	2012/12/10			95	80 - 140	<0.931	pg/L				
3063815	1,2,3,7,8-Penta CDF	2012/12/10			104	80 - 140	<1.29	pg/L				
3063815	2,3,4,7,8-Penta CDF	2012/12/10			97	80 - 140	<1.26	pg/L				
3063815	1,2,3,4,7,8-Hexa CDF	2012/12/10			98	80 - 140	<1.09	pg/L				
3063815	1,2,3,6,7,8-Hexa CDF	2012/12/10			104	80 - 140	<1.05	pg/L				
3063815	2,3,4,6,7,8-Hexa CDF	2012/12/10			102	80 - 140	<1.13	pg/L				
3063815	1,2,3,7,8,9-Hexa CDF	2012/12/10			110	80 - 140	<1.33	pg/L				
3063815	1,2,3,4,6,7,8-Hepta CDF	2012/12/10			91	80 - 140	<1.15	pg/L				
3063815	1,2,3,4,7,8,9-Hepta CDF	2012/12/10			98	80 - 140	<1.59	pg/L				
3063815	Octa CDF	2012/12/10			85	80 - 140	<1.24	pg/L				
3063815	Total Tetra CDD	2012/12/10					<1.17(3)	pg/L				
3063815	Total Penta CDD	2012/12/10					<1.44	pg/L				
3063815	Total Hexa CDD	2012/12/10					<3.56(3)	pg/L				
3063815	Total Hepta CDD	2012/12/10					<1.95	pg/L				
3063815	Total Tetra CDF	2012/12/10					<1.31(3)	pg/L				
3063815	Total Penta CDF	2012/12/10					<1.27	pg/L				
3063815	Total Hexa CDF	2012/12/10					<1.14	pg/L				
3063815	Total Hepta CDF	2012/12/10					<1.34	pg/L				
3071688	C13-1234678 HeptaCDD	2012/12/17			82	40 - 130	99	%				
3071688	C13-1234678 HeptaCDF	2012/12/17			88	40 - 130	95	%				
3071688	C13-123678 HexaCDD	2012/12/17			87	40 - 130	95	%				
3071688	C13-123678 HexaCDF	2012/12/17			84	40 - 130	87	%				
3071688	C13-12378 PentaCDD	2012/12/17			69	40 - 130	70	%				
3071688	C13-12378 PentaCDF	2012/12/17			64	40 - 130	64	%				
3071688	C13-2378 TetraCDD	2012/12/17			74	40 - 130	70	%				
3071688	C13-2378 TetraCDF	2012/12/17			72	40 - 130	73	%				
3071688	C13-OCDD	2012/12/17			81	40 - 130	83	%				
3071688	2,3,7,8-Tetra CDD	2012/12/17			106	80 - 140	<1.06	pg/L				
3071688	1,2,3,7,8-Penta CDD	2012/12/17			129	80 - 140	<0.985	pg/L				
3071688	1,2,3,4,7,8-Hexa CDD	2012/12/17			121	80 - 140	<1.18	pg/L				
3071688	1,2,3,6,7,8-Hexa CDD	2012/12/17			123	80 - 140	<1.05	pg/L				
3071688	1,2,3,7,8,9-Hexa CDD	2012/12/17			121	80 - 140	<1.02	pg/L				
3071688	1,2,3,4,6,7,8-Hepta CDD	2012/12/17			110	80 - 140	<1.13	pg/L				
3071688	Octa CDD	2012/12/17			105	80 - 140	2, RDL=100	pg/L				
3071688	2,3,7,8-Tetra CDF	2012/12/17			112	80 - 140	<1.03	pg/L				
3071688	1,2,3,7,8-Penta CDF	2012/12/17			125	80 - 140	<1.02	pg/L				

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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
3071688	2,3,4,7,8-Penta CDF	2012/12/17			112	80 - 140	<0.992	pg/L				
3071688	1,2,3,4,7,8-Hexa CDF	2012/12/17			112	80 - 140	<1.14	pg/L				
3071688	1,2,3,6,7,8-Hexa CDF	2012/12/17			124	80 - 140	<0.988	pg/L				
3071688	2,3,4,6,7,8-Hexa CDF	2012/12/17			114	80 - 140	<1.17	pg/L				
3071688	1,2,3,7,8,9-Hexa CDF	2012/12/17			107	80 - 140	<1.32	pg/L				
3071688	1,2,3,4,6,7,8-Hepta CDF	2012/12/17			103	80 - 140	<0.837	pg/L				
3071688	1,2,3,4,7,8,9-Hepta CDF	2012/12/17			101	80 - 140	<1.18	pg/L				
3071688	Octa CDF	2012/12/17			100	80 - 140	<1.17	pg/L				
3071688	Total Tetra CDD	2012/12/17					<1.06	pg/L				
3071688	Total Penta CDD	2012/12/17					<0.985	pg/L				
3071688	Total Hexa CDD	2012/12/17					<4.14(4)	pg/L				
3071688	Total Hepta CDD	2012/12/17					<1.13	pg/L				
3071688	Total Tetra CDF	2012/12/17					<1.29(5)	pg/L				
3071688	Total Penta CDF	2012/12/17					<3.97(4)	pg/L				
3071688	Total Hexa CDF	2012/12/17					<1.14	pg/L				
3071688	Total Hepta CDF	2012/12/17					<0.979	pg/L				

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.
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 not sufficiently significant to permit a reliable recovery calculation.
NC (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.
(1) - Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.
(2) - Matrix Spike: < 10 % of compounds in multi-component analysis in violation.
(3) - EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.
(4) -
EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.
(5) -
RT>2 seconds - PCDD/DF analysis-Peak maxima of monitored ions exceeds 2 seconds

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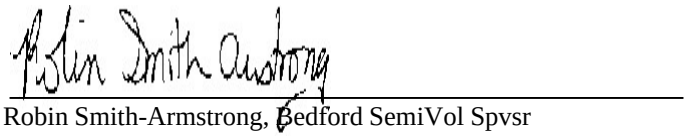
Validation Signature Page

Maxxam Job #: B2J0454

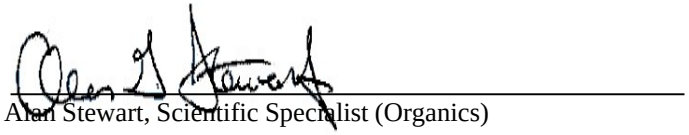
The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Kay Shaw, C. Chem, Scientific Specialist, HRMS Services



Robin Smith-Armstrong, Bedford SemiVol Spvsr

Kevin Macdonald, Inorganics Supervisor



Alan Stewart, Scientific Specialist (Organics)

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MAXXAM Chain of Custody Record

COC #: B 110979 Page _____ of _____

This section for lab use only

Client Code

Maxxam Job # B2J0454

Cooler ID	Seal Present	Seal Intact	Temp 1	Temp 2	Temp 3	Average Temp
			1.1	1.1	1.1	

Integrity: YES (NO) — Integrity / Checklist by: MC

Labelled by — Location / Bin #

INVOICE INFORMATION:

Company Name: AMEC
Contact Name: Gary Warren
Address: St. John's, NL
133 Crosbie Rd. Postal Code A1B 4A5
Email: gary.warren@amec.com
Ph: (709)722-7023 Fax: (709)722-7353

REPORT INFORMATION (if differs from invoice):

Company Name:
Contact Name:
Address: Postal Code
Email:
Ph: Fax:

PO #
Project # / Phase # TF12127735
Project Name / Site Location New Hr.
Quote
Site #
Task Order #
Sampled by C. Taylor

TURNAROUND TIME

Standard ☑
10 day ☐
If RUSH Specify Date:
Pre-schedule rush work
Charge for # Jars used but not submitted

Guideline Requirements / Detection Limits / Special Instructions

Decant for PCBs.

*Specify Matrix: Surface/Salt/Ground/Tapwater/Sewage/Effluent/Potable/NonPotable/Tissue/Soil/Sludge/Metal/Seawater

Field Sample Identification	Matrix*	Date/Time Sampled	# & type of bottles	Field Filtered & Preserved	Lab Filtration Required	Metals Water: RCAP-30 Choose Total or Diss Metals	Metals Water: RCAP-MS Choose Total or Diss Metals	Metals Water: Total Digest (Default Method) for well water, surface water	Metals Water: Dissolved for ground water	Metals Water: Mercury	Metals Soil: Metals & Mercury Default Available Digest Method	Metals Soil: Metals Total Digest - for Ocean sediments (HNO3/HF/HCLO4)	Metals Soil: Mercury Low level by Cold Vapour AA	Metals Soil: Selenium (low level) Req'd for CCME Residential, Parklands, Agricultural	Metals Soil: Hot Water soluble Boron (required for CCME Agricultural)	Hydrocarbons: RBCA Hydrocarbons (BTEX, C6-C32)	Hydrocarbons: Hydrocarbons Soil (Potable), NS Fuel Oil Spill Policy Low Level BTEX, C6-C32	Hydrocarbons: NB Potable Water BTEX, VPH, Low level T.E.H.	Hydrocarbons: TPH Fractionation	Hydrocarbons: PAH's	Hydrocarbons: PAH's with Acridine, Quinoline	Dioxan + Furans	PCB *	VOC's
1 MW-01	H2O	Nov 28		✓			✓		✓							✓				✓		✓	✓
2 MW-03		Nov 28		✓			✓		✓							✓				✓		✓	✓
3 MW-04		"		✓			✓		✓							✓				✓		✓	✓
4 MW-06				✓			✓		✓							✓				✓		✓	✓
5 MW-07		Nov 29		✓			✓		✓							✓				✓		✓	✓
6 MW-08		Nov 30		✓			✓		✓							✓				✓		✓	✓
7 STREAM		Nov 28		✓			✓	✓								✓				✓		✓	✓
8 SW-POND		"		✓			✓	✓								✓				✓		✓	✓
9 DUP-01		Nov 30		✓			✓		✓							✓				✓		✓	✓
10																					2012 DEC 4 AM 10:18		

TPH Must Be Done

RELINQUISHED BY: (Signature/Print) Craig Taylor — Date — Time

RECEIVED BY: (Signature/Print) — Date 04/12/03 — Time 11:15

White: Maxxam Yellow : Mail Pink: Client

ATL FCD 00149 / Revision 10

APPENDIX F

Photographic Record

Photo 1: Stored geomembrane material (covered).

Photo 2: Stored geomembrane material (covered).

Photo 3: Stored geomembrane material (covered).

APPENDIX G

Report Limitations

LIMITATIONS

1. The work performed in this report was carried out in accordance with the Standard Terms of Conditions made part of our contract. The conclusions presented herein are based solely upon the scope of services and time and budgetary limitations described in our contract.
2. The report was prepared in accordance with generally accepted environmental study and/or engineering practices for the exclusive use of the Newfoundland and Labrador Department of Environment and Conservation (ENVC). No other warranties, either expressed or implied, are made as to the professional services provided under the terms of our contract and included in this report.
3. Third party information reviewed and used to develop the opinions and conclusions contained in this report is assumed to be complete and correct. This information was used in good faith and AMEC does not accept any responsibility for deficiencies, misinterpretation or incompleteness of the information contained in documents prepared by third parties.
4. The services performed and outlined in this report were based, in part, upon visual observations of the site and attendant structures. Our opinion cannot be extended to portions of the site which were unavailable for direct observation, reasonably beyond our control.
5. The objective of this report was to assess environmental conditions at the site, within the context of our contract and existing environmental regulations within the applicable jurisdiction. Evaluating compliance of past or future owners with applicable local, provincial and federal government laws and regulations was not included in our contract for services.
6. Our observations relating to the condition of environmental media at the site are described in this report. It should be noted that compounds or materials other than those described could be present in the site environment.
7. The findings and conclusions presented in this report are based exclusively on the field parameters measured and the chemical parameters tested at specific locations. It should be recognized that subsurface conditions between and beyond the sample locations may vary. AMEC cannot expressly guarantee that subsurface conditions between and beyond the sample locations do not vary from the results determined at the sample locations. Notwithstanding these limitations, this report is believed to provide a reasonable representation of site conditions at the date of issue.
8. The contents of this report are based on the information collected during the monitoring and investigation activities, our understanding of the actual site conditions, and our professional opinion according to the information available at the time of preparation of this report. This report gives a professional opinion and, by consequence, no guarantee is attached to the conclusions or expert advice depicted in this report. This report does not provide a legal opinion in regards to Regulations and applicable Laws.
9. Any use of this report by a third party and any decision made based on the information contained in this report by the third party is the sole responsibility of the third party. AMEC will not accept any responsibility for damages resulting from a decision or an action made by a third party based on the information contained in this report.