FINAL REPORT

WASTE MANAGEMENT OF CANADA CORPORATION

WATFORD, ONTARIO

TWIN CREEKS ENVIRONMENTAL CENTRE SITE:
2024 FOURTH QUARTER & ANNUAL MONITORING REPORT
VOLUME 3 OF 5: POPLAR SYSTEM MONITORING PROGRAM

RWDI #2402553.01

February 25, 2025

SUBMITTED TO

Angela McLachlan
Environmental Compliance Manager
amclachl@wm.com

Waste Management of Canada Corporation
Twin Creeks Environmental Centre
5768 Nauvoo Road (Watford)
Warwick Township, County of Lambton
N0M 2S0

T: 519.849.5810
F: 519.849.5811

SUBMITTED BY

Brent J. Langille, B.Sc., P.Geo.
Senior Technical Director | Principal
Brent.Langille@rwdi.com | ext. 2618

Khalid Hussein, P.Eng.
Project Manager
Khalid Hussein@rwdi.com | ext. 2055

RWDI AIR Inc.
Consulting Engineers & Scientists
4510 Rhodes Drive | Suite 530
Windsor, Ontario
N8W 5K5

T: 519.974.7384
F: 519.823.1316

Ms. Angela McLachlan
Environmental Compliance Manager
Waste Management of Canada Corporation
Twin Creeks Environmental Centre
5768 Nauvoo Road (Watford)
Warwick Township, County of Lambton N0M 2S0

Re: Waste Management of Canada Corporation
2024 Fourth Quarter and Annual Monitoring Report
Twin Creeks Environmental Centre, Township of Warwick, County of Lambton, Ontario
Volume 3 of 5: Poplar System Monitoring Program

Dear Ms. McLachlan,

RWDI AIR Inc. is pleased to provide this 2024 Fourth Quarter and Annual Monitoring Report: Poplar System Monitoring Program, for the Twin Creeks Environmental Centre.

This report provides details of the monitoring completed in 2024 and an interpretation of the 2024 monitoring data, including our conclusions and recommendations. Relevant technical data are appended.

We trust that this report satisfies your requirements. If you have any questions or comments, please contact us.

Yours very truly,

RWDI

Jeff Cleland, B.Eng., P.Eng.
Environmental Engineer | Geoscience

Brent J. Langille, B.Sc., P.Geo.
Senior Technical Director | Principal

KAMH/kta/tmg

Attach.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

1 INTRODUCTION

1.1 Environmental Centre Description and Background

The Twin Creeks Environmental Centre (Site) is a solid, non-hazardous waste landfill facility that contains an existing landfill (Existing Landfill) and an area approved expansion (Expansion Landfill). The Site is located on Part of Lots 19 and 20, Concession 3, South of Egremont Road (SER) and Part of Lots 20 to 22, Concession 4 SER, in the Township of Warwick, County of Lambton, Ontario. The Site occupies an area of 301 hectares (ha) with 101.8 ha permitted for landfilling. The approximate Site location is shown on Figure 1.

The Site is located within a dominantly clayey to silty aquitard that extends to a depth of between 23.4 and 30.8 metres (m) below the Site. Landfill waste at the Site is located in two (2) areas: 1) the Existing Landfill, and 2) the Expansion Landfill. The Existing Landfill is comprised of Cells 3 through 12, as well as the West Cell and South Cell. As of November 16, 2009, waste disposal activities commenced in the Expansion Landfill. The Expansion Landfill consists of Cell 1, Cell 2, Cell 4, and Cell 6. The waste cell designations and other features of the Existing Landfill are shown in Figure 2.

The South Cell of the Existing Landfill consists of waste landfilled into trenches of various widths and depths excavated into the clayey soil. Three (3) finger drains that extend through the trenches provide gravity drainage to the perimeter maintenance holes for leachate collection. The remainder of the waste footprint contains waste trenches, as well as newer waste cells constructed with re-compacted clayey liners and, in some cells, waste underdrains.

Waste within the Expansion Landfill, to the west of the Existing Landfill, will extend to an average depth of 15 m below existing grade. Leachate is managed with a liner system that directs leachate toward dedicated leachate pumping stations. The liner system consists of a primary drainage layer below the waste to collect leachate, an underlying recompacted clayey liner (primary liner), then a secondary drainage layer for leak detection and contingency use, which is all underlain by a thick natural barrier of clayey soil (secondary liner).

Surface water flow at the Site is ephemeral, with flow that typically occurs after snowmelt or prolonged periods of precipitation. Runoff from most of the east half of the Existing Landfill flows to Sedimentation Pond 1 (SP1), while runoff from the northern portion of Cell 11, and the west half of the Existing Landfill from north of approximately the Cell 8/6 boundary, flows to Sedimentation Pond 4 (SP4). Runoff from most of Cell 6 and the remaining west half, to approximately the middle of the South Cell of the Existing Landfill is directed to Sedimentation Pond 2 (SP2). Runoff from the southern portion of the South Cell flows to sedimentation Pond 1 (SP1). Sedimentation Pond 3 (SP3) captures runoff from the northwest quadrant of the Expansion Landfill and therefore, runoff from the Poplar System would not flow through SP3.

Leachate generated at the Site is managed by: 1) on-Site disposal with phytoremediation using poplar trees; and 2) by transport off-Site for treatment and disposal. The Poplar System, in its expanded form of 9.3 ha, became operational on September 27, 2017. In 2024, leachate was managed for on-Site disposal from May 1 to October 11 during the irrigation season (May 1 to October 15, 2024).

Leachate phytoremediation at the Site can occur in the area noted below, which is shown in Figure 2.

1.2 Purpose and Scope

The purpose of the Poplar System Monitoring Program is outlined below.

- To evaluate the effectiveness of the Poplar System for the phytoremediation of leachate.
- To assess potential effects to surface water, soil, and air quality as a result of operating the Poplar System.
- To evaluate the Poplar System Monitoring Program and to recommend improvements, where required.

The Poplar System Monitoring Program involves a data collection component, a comprehensive analysis and interpretation component, as well as a reporting component. The monitoring components completed in 2024 are reflective of the period during which the Poplar System was operational.

1.3 Poplar System Regulatory Framework

The Poplar System is operated in conformance with the regulatory approvals noted below. Copies of the relevant ECAs and their amendments are provided in Appendix A.

- Amended Environmental Compliance Approval (ECA) No. A032203, dated December 16, 2023.
- Amended ECA for an Industrial Sewage Works No. 8117-CUSNXX, dated April 29, 2024 (Sewage ECA). During 2024, it is noted that up to April 28, 2024, WM was required to conform to Amended ECA for Industrial Sewage Works No. 2403-BE6LZ4, dated August 21, 2019.
- Permit-To-Take-Water (PTTW) No. 4682-BLJRYJ, dated November 8, 2021 for the removal of surface water from four (4) Sedimentation Ponds and the dewatering of the Secondary Drainage Layer (SDL) for the Expansion Landfill.

Operation and monitoring of the Poplar System was completed during 2024 in accordance with conditions of the Waste ECA that relate to monitoring (Condition 8.7) and reporting requirements (Conditions 15.4 to 15.7), as well as the relevant monitoring requirements of the Sewage ECA and the PTTW.

Throughout 2024, quarterly monitoring reports were submitted to relevant stakeholders within 60 days following the last day of the previous quarter in accordance with Condition 15.4 of the Waste ECA. Volume 3 of the 2024 Fourth Quarter and Annual Monitoring Report (2024 Annual Report) satisfies the reporting requirements for both the fourth quarter (Q4) of 2024 (October 1 to December 31) and 2024 Poplar System monitoring period.

1.4 Poplar System Design and Operation

The details of the expanded Poplar System at the Site are provided within Items 63 through 65 in Schedule 'A' of the Waste ECA. The Poplar System was initially operated as a pilot study from 2003 through 2007, at which time it became approved as an operational leachate phytoremediation system in 2008.

In 2010, an application was submitted to the MECP for an increase in the area of the Poplar System over the waste footprint of the Existing Landfill. The application was approved in 2011 and the Poplar System area and monitoring program were revised. The approved leachate application area is about 9.3 ha in area, as shown in Figure 2.

The Poplar System, in its expanded form, became operational on September 27, 2017. The expanded Poplar System consists of four (4) zones, with each zone consisting of 40 to 50 rows of trees, planted in an east-west directional pattern, as shown in Figure 3. Trees in each row are separated by a spacing of approximately 0.6 m and rows are approximately 3 m apart. Each row is approximately 186 m in length. The expanded Poplar System includes similar infection-resistant poplar tree hybrids to the original Poplar System, as well as potential future planting of willow trees.

Leachate to be applied to the Poplar System is transferred from the Equalization Tank, which receives leachate from both the Existing and Expansion Landfills, as well as condensate from the landfill gas extraction system, and directly from the leachate maintenance holes of the Existing Landfill, to a holding tank system [two 50 cubic metre (m^3) tanks and two 100 m^3 tanks)] located near the southwest corner of Zone 1. Leachate is pumped into this holding tank system for storage and gravity drains to a pumping station for transfer to the Poplar System. The leachate is then pumped through the network of distribution piping for drip irrigation.

For strong strength leachate, such as collected from MH18, it may require mixing with surface water, potable water, or weaker strength leachate (e.g., monofill cell leachate) such that quality of the irrigation liquid satisfies the relevant concentration strength target for the poplar trees. The liquid for mixing with the leachate is typically obtained from the municipal water supply system (from an on-Site fire hydrant near Sedimentation Pond 1 (SP1)), temporary water storage area(s), surface water sumps, or weaker strength leachate (i.e. from monofill Cells 8, 10, and 12), or other locations as operations permit.

1.5 Precipitation Data

A summary of precipitation data for the 30-Year Normals (1961-1990, 1971-2000, 1981-2010, and 1991-2020) and the 1995 through 2024 annual climatic data for the area around the Site is provided in Table B- 1, Appendix B. The 30-year normal and data to 1996 were collected at the Strathroy Climatological Station. Data from 1997 onward were collected from the Strathroy-Mullifarry Climatological Station, which is the nearest Environment Canada climatological station to the Site.

The 2024 climatic data for the local Strathroy-Mullifarry Climatological Station are presented in Table B-2, Appendix B. Precipitation data from the on-Site climatological station from January 1 to December 31, 2024, are also provided in Table B-3, Appendix B. A total of approximately 936.4 millimetres (mm) of precipitation was recorded from the on-Site climatological station during 2024, while the Strathroy-Mullifarry Climatological Station recorded approximately 1,157.2 mm of precipitation in 2024.

Relative to the 30-Year Normal (1991-2020), 2024 was wetter than normal as recorded at the climatological station. The 2002 to 2024 on-Site precipitation data from January 1 to December 31 indicated that the yearly precipitation received at the Site was consistently less than the regional total. For example, the precipitation recorded from the on-Site climatological station in 2024 was approximately 19.1 % less than what was measured at the Strathroy-Mullifarry Climatological Station. This pattern of annually less precipitation recorded at the Site than recorded regionally, has typically been observed since on-Site precipitation monitoring began in 2003 (2003 was first full year of monitoring). Notwithstanding this observation, within the last five (5) years, 2024 was noted to have been the wettest year. 2024 experienced two kinds of precipitation occurrences that were of note that occurred multiple times throughout the year. The two different kinds of events were:

1) Multiple short duration, high magnitude events (i.e. July 15, 2024 where the site recorded 79.6 mm in 24 hours); and
2) Prolonged periods of precipitation over multiple weeks (i.e. it rained 20 of the 31 days in December 2024).

Based on the available historical data from the Environment Canada climatological stations, there is typically a water deficit (evapotranspiration exceeds precipitation) from May through September. Therefore, there is a low potential for overland flow and an increase in infiltration rates during this period, which is beneficial for the operation of a Poplar System. For the period from October through April, typically there is a water surplus (precipitation exceeds evapotranspiration) results in a greater potential for overland flow and a decrease in infiltration rates.

2 MONITORING METHODS

The Poplar System Monitoring Program completed for the monitoring period from January 1 to December 31, 2024, is outlined in Tables 1 and 2.

The monitoring components completed in 2024 are reflective of the period during which the Poplar System was operational. For the monitoring components completed, the monitoring methodology followed the protocols outlined for the Poplar System, which are provided in Appendix C.

Throughout 2024, the routine quarterly surface water monitoring component of the Poplar System Monitoring Program was completed for precipitation events in conjunction with the routine quarterly surface water monitoring of the Compliance Monitoring Program for the Site. Precipitation event monitoring is completed once per calendar quarter in response to greater than 10 mm of precipitation in a 24-hour period. The surface water storm event monitoring ($\geq$ 25 mm in 24 hours) was required to be completed during the operation of the Poplar System in 2024, which was between May 1 and October 11.

A quality assurance and quality control (QA/QC) program was followed for each of the monitoring tasks completed in 2024, where required. QA/QC findings are discussed in Section 3.

2.1 Irrigation Application

In 2024, irrigation liquid was applied to the poplar trees intermittently for a total of 93 days from May 1 to October 11. Per the Waste ECA, the last approved day to apply irrigation liquid to the Poplar System is October 15. The volume of irrigation liquid applied was monitored daily by a flow meter. The volumes of irrigation liquid applied are discussed in Section 4.1.

The irrigation liquid applied to the Poplar System during 2024 was approximately 100% leachate by concentration (based on the target leachate concentrations) and 100% leachate by volume. Monthly samples of the irrigation liquid applied during the 2024 irrigation season were collected from the holding tank as required.

The collected samples were submitted to Bureau Veritas Inc. of Mississauga, Ontario (Bureau Veritas) for analysis of the required parameters. Bureau Veritas is a Canadian Association for Laboratory Accreditation (CALA) certified environmental laboratory. Irrigation quality findings are discussed in Section 4.2.

2.2 Liquid Measurements

Leachate levels were measured at the required leachate monitoring wells and maintenance holes as part of the Site operations on May 1 and November 1, 2024 with findings presented in Section 5.1.

2.3 Soil Monitoring

On September 5, a soil sample was collected within each zone of the Poplar System from a depth between ground surface and 0.6 m to 0.9 m below ground surface (mBGS). The collected samples were submitted to Bureau Veritas for analysis.

During 2024, soil electrical conductivity (EC) was measured weekly in the Poplar System during system operation, per Condition 8.7 of the Waste ECA. The EC measurements were taken at five (5) locations in the Poplar System.

At each location and for each event, EC measurements were taken along a poplar tree row near a drip emitter, as well as between poplar tree rows. At each measurement location, EC measurements were taken at depths of 25 and 150 mm below ground surface.

Soil monitoring findings are discussed in Section 5.2.

2.4 Leaf Tissue Sampling

Leaf tissue samples were collected on September 4, 2024. The protocol for leaf tissue sample collection involved the accumulation of at least 200 grams (g) of leaf tissue from various trees.

Within each zone of the Poplar System, one (1) composite sample was prepared from the upper canopy (top of tree) and one (1) composite sample was prepared from the lower canopy (base of tree). Samples were submitted to Bureau Veritas for analysis.

Leaf tissue monitoring findings are discussed in Section 5.3.

2.5 Stem Core Testing

To assess leachate constituent concentration accumulation within the tree trunk tissue, stem core samples are collected annually during operation of the Poplar System. In 2024, stem core sample collection was completed on September 17. Stem core samples were collected from one (1) location within each zone of the Poplar System. As stem core removal may kill a small diameter tree, the samples were obtained from the trees removed to investigate root depth penetration. Samples were collected from a location equivalent to about 1.5 m above the ground surface (mAGS). Samples were submitted to Bureau Veritas for analysis.

Stem core monitoring findings are discussed in Section 5.4.

2.6 Root Tissue Testing

To compare leachate constituent concentration accumulation within the poplar tree leaf tissue, stem, and roots, root tissue samples are collected annually. In 2024, root tissue sample collection was completed on September 17. Root tissue samples were collected from one (1) location within each zone of the Poplar System. The root tissue samples were collected from the trees removed to investigate root depth penetration. Samples were submitted to Bureau Veritas for analysis.

Root tissue monitoring findings are discussed in Section 5.5.

2.7 Visual Assessment

A visual assessment of the Poplar System was completed on September 9, 2024. The assessment considered the following characteristics.

- Tree diameter & height
- Crown density
- Leaf size and discolouration
- Insect infestation
- Depth of root penetration
- Crown dieback
- Abnormally shaped leaves
- Length of new tree branch extension roots
- Tree mortality
- Foliage transparency
- Deformed growth

As part of the visual assessment, one (1) tree from each zone of the Poplar System was cut down, roots were excavated, and soil was removed to expose the roots. The depth of the taproot and brace roots for the tree excavated were measured and recorded. The visual assessment also included an inspection of the brace roots of the trees for evidence of animal damage.

Consistent with the assessment protocols, a visual assessment was completed for select trees within each zone of the Poplar System. The trees are staked and flagged for follow-up inspections in consecutive years. Visual assessment findings for the trees are presented in Section 5.6.

2.8 Daily Inspections

Daily inspections were completed during operation of the irrigation system for evidence of ponded water and/or leachate seeps in the land application area. Tree undergrowth and olfactory ambient air odour assessments were completed at the time of the inspections. Inspection records are maintained on file by RWDI.

2.9 Surface Water Sampling

The 2024 surface water monitoring program for the Poplar System included: 1) routine quarterly precipitation events (> 10 mm in 24 hours) as part of the Compliance Monitoring Program; and 2) storm events (> 25 mm in 24 hours) to be completed twice during system operation. The surface water monitoring stations for the Poplar System include SS14A, SS14B, and SS15A, which are shown in Figure 2. It is noted that per the EMP a maximum of one precipitation event is to be monitored in a calendar quarter and events are to be separated by a one (1) month interval.

With the activation of the expanded Poplar System in 2017, the locations of monitoring stations SS14A and SS14B, were relocated to account for the larger irrigation area of the expanded Poplar System. Historical monitoring positions for these monitoring stations are discussed in the 2018 Annual Poplar System Report. SS14A is in a location within the east ditch upstream of the expanded Poplar System. SS14B is in a location within the west ditch adjacent to Zone 3 of the Poplar System. Monitoring station SS15A, which was created in September 2009, is located downstream of the Poplar System within the perimeter ditch, prior to discharge into SP1. The current surface water monitoring station locations for the Poplar System are shown in Figure 2.

A summary of the surface water monitoring stations, which formed part of the 2024 Poplar System Monitoring Program, is presented below.

Monitoring Station Designation	Monitoring Station Description
SS14A (former SS14)	On-Site flow within East Ditch of the Existing Landfill, upstream of the Poplar System.
SS14B (former SS15)	On-Site flow within West Ditch of the Existing Landfill, adjacent to Zone 3 of the Poplar System.
SS15A	South Ditch of the Existing Landfill and inlet point to Sedimentation Pond 1, downstream of Poplar System.

Surface water monitoring dates are presented in the summary below with the associated precipitation totals, as recorded from the on-Site climatological station.

Surface Water Monitoring Date	Stations Sampled	Previous Five Days of Precipitation (mm)	Task Description
January 10, 2024	SS14A, SS14B, SS15A	0, 0, 0.2, 0, 18.4	First Quarter: 18.4 mm precipitation event monitoring. Irrigation system was not active until May 1.
April 12, 2024	SS14A, SS14B, SS15A	1.4, 0, 0, 8.8, 15.6	Second Quarter: 15.6 mm precipitation event monitoring. Irrigation system was not active until May 1.
July 10, 2024	SS14A, SS14B, SS15A	2.2, 0, 0, 0, 25.8	Third Quarter: 25.8 mm precipitation and storm event monitoring. Irrigation system was active until October 11.
October 14, 2024	SS14A, SS14B, SS15A	0, 0, 0, 2.4, 21.0	Fourth Quarter: 21.0 mm precipitation event monitoring. Irrigation system was active until October 11.

For the above-noted monitoring events, when flowing surface water conditions were observed, surface water samples were collected directly from the watercourse with an unpreserved laboratory prepared sample bottle. Where required, this water was transferred to sample bottles that contained preservatives. No field filtering was required or completed.

During the irrigation season in 2024, storm event monitoring was able to be completed on one (1) occasion, in accordance with the Waste ECA. This event was completed on July 10, 2024, in response to > 25 mm of precipitation in 24 hours.

It is noted that based on historical observations, there are commonly precipitation events generating greater than 10 mm of precipitation in a 24-hour period that do not generate flowing conditions at a given sampling station during the drier months from late spring to early fall.

The 2024 surface water findings for the Poplar System Monitoring Program are discussed in Section 5.7. The 2024 surface water findings for the Compliance Monitoring Program are presented under separate cover in the *2024 Compliance Monitoring and Operations Program Report, Twin Creeks Environmental Centre Site, Volumes 1 to 2* (RWDI AIR Inc., 2024).

2.10 Field QA/QC Sampling

The field sampling QA/QC program is presented in the following summary. It is noted that vegetation samples, by nature of their matrix, cannot have a field duplicate created.

Media	Monitoring Event	Original Sample ID	Field-Prepared Duplicate Sample ID
Soil	September 5, 2024	S4	SODUP
Surface Water	January 10, 2024	SS14B	PSSWDUP
	April 12, 2024	SS14B	PSSWDUP
	July 10, 2024	SS15A	PSSWDUP
	October 14, 2024	SS15A	PS-STORMDUP

3 QUALITY ASSURANCE AND QUALITY CONTROL EVALUATION

The QA/QC program for the monitoring completed in 2024 included field-prepared duplicate samples, comparisons with field-determined analytical results, laboratory-prepared duplicates, matrix spikes, duplicates, percent recoveries of analyses, and data review.

The laboratory analyzed several control samples to verify that the analytical equipment was functioning properly and reporting results accurately at the time of analysis for the samples collected at the Site. The control samples had an expected target value, which was compared against pre-determined data quality objectives. For the laboratory control samples, the results were within acceptable laboratory data quality criteria.

For the field-prepared duplicate samples, the analytical results for the required parameters of analysis, completed as detailed in Section 2.10, were evaluated for the relative percent difference (RPD) of parameter concentrations using the United States Environmental Protection Agency (USEPA) National Functional Guidelines (US EPA 542-R-20-006 and US EPA 540-R-005) as a general QA/QC RPD screening mechanism. The RPD screening mechanism is such that for concentrations greater than five (5) times the laboratory reportable detection limit (RDL), a concentration difference of less than or equal to 20% is deemed acceptable. For concentrations less than or equal to five (5) times the RDL, a concentration difference of equal to or less than the RDL is deemed acceptable. Where an exceedance of the general QA/QC RPD screening mechanism is identified, the results for the required parameters of analysis are evaluated against the applicable performance standards for sample duplicates noted in Tables 5-1 to 5-15 of the *Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act*, as prepared by the Ministry of the Environment, Conservation, and Parks (MECP), dated March 9, 2004, and amended to February 19, 2021. For the results found to be outside of the tolerance of each QA/QC evaluation, a laboratory data quality review (DQR) of the results is completed by the laboratory to verify that the concentrations are accurate as presented and are within acceptable laboratory data quality criteria.

Laboratory analytical results for soil and surface water are provided in Appendix G and Appendix E, respectively.

3.1 Soil QA/QC

For the 2024 soil sampling event, a QA/QC evaluation was completed for the analytical results of the original sample and its respective field-prepared duplicate sample, as outlined in Section 2.10. The results of the original and duplicate sample satisfied the criteria of the QA/QC evaluation, with exceptions presented below.

Date	Sample Designation (Original / Duplicate)	Parameter	QA/QC Evaluation
September 5, 2024	S4 / SODUP	Chloride (Cl-)	RPD > 20%
		Hot Water Ext. Boron (B)	RPD > 20%
		Barium (Ba)	RPD > 20%
		Cobalt (Co)	RPD > 20%
		Nickel (Ni)	RPD > 20%
		Titanium (Ti)	RPD > 20%

A laboratory DQR of the above-noted QA/QC exceptions was completed and the results were verified by the lab to be accurate as presented. Therefore, although a QA/QC exception was identified, the relevant original sample results were deemed to be representative of conditions at the time of sampling. As such, the original sample results were included into the database for interpretive purposes.

3.2 Surface Water QA/QC

For the 2024 surface water monitoring events, QA/QC evaluations were completed for the analytical results of the original samples and their respective field-prepared duplicate samples, as outlined in Section 2.10. The results of the original and duplicate samples satisfied the criteria of the QA/QC evaluations, with the exceptions presented below.

Date	Sample Designation (Original / Duplicate)	Parameter	QA/QC Evaluation
April 12, 2024	SS14B / PSSWDUP	Un-ionized Ammonia	RPD > 20%
		Ammonia-N	RPD > 20%
		Chromium (Cr)	Difference > MRL
July 10, 2024	SS15A / PSSWDUP	Aluminum (Al)	RPD > 20%
		Nickel (Ni)	RPD > 20%
October 14, 2024	SS15A / PSSWDUP	Nitrate (N)	RPD > 20%

A laboratory DQR of each of the above-noted QA/QC exceptions was completed and the results were verified by the lab to be accurate as presented. Therefore, although a QA/QC exception was identified, the relevant original sample results were deemed to be representative of conditions at the time of sampling. As such, the original sample results were included into the database for interpretive purposes.

In summary, acceptable QA/QC data for the field-prepared duplicate samples, laboratory duplicates, and percent recovery of analysis indicated that the detected constituent concentrations were accurate and reflected actual conditions at the time of sample collection.

4 SYSTEM IRRIGATION AND OPERATIONS

4.1 Irrigation Quantity

In 2024, irrigation liquid was applied to the poplar trees intermittently for a total of 93 days between May 1 and October 11. Irrigation details are provided in Appendix D. Table D-1 presents a summary of the monthly and annual irrigation liquid volumes for the Poplar System. Table D-2 presents a summary of application rates.

Table D-3 presents as summary of the annual volume of leachate managed on-Site by the Poplar System and transported off-Site for disposal.

The irrigation liquid applied to the Poplar System during 2024 (a total of 10,374.55 m^3) was approximately 100% leachate by concentration (based on the target leachate concentrations) and 100% leachate by volume.

A portion of leachate collected from the landfill leachate management system was transported off-Site for disposal at the Chatham Water Pollution Control Plant and the Valicor Environmental Services plant in Michigan. In 2024, a total of 68,159.16 m^3 of leachate was removed from the Site for off-site treatment and disposal. Therefore, the total volume of leachate extracted for treatment (applied to the Poplar System and removed for offsite treatment) during 2024 was 78,533.71 m^3. Since activation of the initial Poplar System (2003 to 2014 for the initial system and 2017 to 2024 for the expanded system), 71,202.76 m^3 of leachate has been managed by phytoremediation at the Site.

The 2024 total annual irrigation rate (applied leachate and water) was approximately 111.6 millimetres per square metre (mm/m^2) for the 9.3 ha Poplar System. The application rate is less than the available annual irrigation potential of 476 mm/m^2, as detailed in the *Expansion of Poplar Cap Irrigation System for Existing Waste Disposal Area* report, as prepared by GENIVAR Consultants LP and dated January 2010. The available annual irrigation potential of 476 mm/m^2 is based on a predicted irrigation period of 105 to 120 days, which accounts for days with precipitation. Therefore, on average, the available daily irrigation potential is 4 mm/m^2 to 4.5 mm/m^2. As irrigation liquid was applied to the poplar trees intermittently for a total of 93 days in 2024, the average daily irrigation rate was approximately 1.2 mm/m^2. The total volume of liquid (including irrigation liquid and precipitation) applied to the Poplar System in 2024 was approximately 687.2 mm/m^2.

The application of leachate was greater in 2024 than in 2023, which was attributed to the increased days of operation in 2024 (93 days) compared to 2023 (77 days).

4.2 Irrigation Quality

Irrigation liquid monitoring for quality in consideration of application rates to the Poplar System (specifically the operational loading to the poplar trees) is completed monthly during the irrigation season. As irrigation liquid was applied during the irrigation period from May 1 to October 11, 2024, monthly samples of the irrigation liquid were collected from the holding tank from May to October. The analytical results for the irrigation liquid samples are presented in Tables E-1 to E-3, Appendix E. The Laboratory Certificates of Analysis for the 2024 samples are provided in Table E-4, Appendix E.

The 2024 analytical results for the irrigation liquid were compared to the target leachate concentrations for irrigation loading to the poplar trees. In 2024, all parameter concentrations within the irrigation liquid satisfied the 100% leachate target concentrations, as noted in Table E-1 and E-2, Appendix E and as discussed herein.

For comparative purposes, the 2024 irrigation liquid analytical results were also compared to guidelines for metals and general parameters in irrigation water from the Canadian Council of Ministers of the Environment (CCME, 2004) (CCME Guideline). In addition, the results were also assessed against values for chloride irrigation of salt tolerant poplar trees (Shanon et al., 1998). The CCME Guideline criteria are presented in Table 4 and Table E-1, Appendix E. It is noted that the CCME Guideline criteria are for vegetable crops and do not represent upper toxicity limits for the poplar trees, however, they can be utilized as a guide for assessing chemical loading to the poplar trees. The analytical results which were found to be greater than their respective CCME Guideline criterion are highlighted in Table E-1, Appendix E. In general, the irrigation liquid's quality satisfied the CCME Irrigation Water Guidelines with the exception of boron (May, July, August, and the October samples).

However, the boron concentrations were noted to be within the historical range and as discussed herein, there was not any evidence of significant tree stress, such as but not limited to, deformed growth or leaf discolouration, that indicated the boron concentrations detrimentally affected tree health.

For the organic parameters tested, there is only a 100% leachate target concentration for the total BTEX compounds (benzene, toluene, ethylbenzene, and xylenes). The concentrations of total BTEX detected in 2024 were less than the respective 100% leachate target concentration. There was not any evidence of tree stress, such as but not limited to, deformed growth or leave discolouration, that indicated the BTEX concentrations detrimentally affected tree health. The organic analytical results are presented in Tables E-2 and E-3, Appendix E.

4.3 Operational Information

During 2024, the Poplar System did not operate during precipitation events or if soil conditions were excessively wet. Per Condition 8.7.c. of the Waste ECA, the Poplar System was deactivated a minimum of one (1) hour prior to precipitation events forecast in excess of 12.5 millimetres per hour (mm/hr).

The undergrowth of the Poplar System was controlled to reduce the activity of vermin that could damage the trees and drip irrigation lines. During the inspections completed for the land application area in 2024, vegetative undergrowth consisted primarily of grass and sparse weeds. Weed control is normally completed during the growing season by herbicide spraying under the direction of the St. Clair Region Conservation Authority (SCRCA). Records of application rates and chemicals used are maintained on file with SCRCA.

As discussed, the Poplar System in its expanded form of 9.3 ha became operational on September 27, 2017. Per the Waste ECA, the irrigation season for the Poplar System is permitted to run from May 1 to October 15. In 2024, the expanded Poplar System was operated during the irrigation season between May 1 and October 11, 2024.

5 MONITORING RESULTS

5.1 Liquid Levels

Leachate level monitoring points in and around the Poplar System include maintenance holes MH3SA, MH3SB, MH3SC, MH3SD, MH3SE, MH3SF, MH4A, MH4B, Sump, MH16, MH17, MH18, OW22A-10, OW51A-15, and OW53-10, as well as LW1 through LW6. Monitoring locations and designations are shown on Figure 2.

Leachate levels for the leachate monitoring wells and maintenance holes were measured on May 1 and November 1, 2024. The 2024 and historical leachate elevations for the aforementioned monitoring points are presented in Table F-1 and shown in Figures F-1 to F-5, Appendix F.

For the leachate monitoring points located at/near the top of cap surface in the vicinity of the Poplar System, a summary of the leachate level depth below the top of cap surface during 2024 is provided below.

Application Area	Approximate Cap Surface Elevation (mASL)	Range of Depth Below Cap Surface (m)
South Cell	243.9	5.11 to 5.29
Cell 3S	249.0	4.61 to 5.83
Cell 3	249.8	11.28 to 11.70
Cell 4	245.1	4.96 to 5.86
West Cell	248.8	3.22 to 4.19

Notes: 1) “m” denotes metres. “mASL” denotes metres above sea level.
2) Detailed leachate elevations are provided in Appendix F.
3) Approximate Cap Surface Elevation is based on the approximate cap surface elevation at each relevant monitoring point within its respective application area that exists on top of the landfill.

Based on the leachate levels measured historically and in 2024, the generalized pattern of decreasing leachate elevations from spring to fall within each cell below the cap surface within the footprint of the Poplar System indicates that the application of irrigation liquid is consumed by the trees and is therefore, not causing leachate mounding within the waste.

One (1) exception to the generalized pattern was noted in Cell 3 (at OW51A-5), where leachate elevations slightly increased from May 2024 to November 2024. It is noted that Cell 3 does not have a leachate collection system, however, based on historical liquid levels the leachate in this cell is understood to be managed by the adjacent cells.

Occasionally an additional exception to the generalized pattern is noted in the western portion of Cell 3S (MH3SC and MH3SD). It is noted that the pump in MH3SC frequently cycles on and off in a given day, and therefore the timing of leachate level measurement can affect the overall leachate volume interpretations from this manhole. Therefore, conclusions drawn from the leachate levels from this manhole should be interpreted with caution.

During 2024, the leachate elevations within select maintenance holes were generally drawn down throughout the majority of application period and fluctuated significantly as a result of leachate extraction for irrigation to the Poplar System. With respect to draw down as a result of leachate extraction, the leachate elevations in leachate monitoring wells LW1 to LW6 did not definitively correlate to the elevations in their counterpart maintenance hole (within the same waste cell). This observation indicates that leachate within the waste mound that may not be directed to, or captured by, the leachate underdrain collection system (i.e. perched, low hydraulic conductivity, or some other cause) is therefore, not having an effect to the groundwater system (i.e. potentiometric pressures). This effect is observed in waste cells that are both positioned under and not under the Poplar System, indicating that the operation of the Poplar System is not the cause of this leachate elevation differential effect.

At this time the exact cause of the leachate differential is unknown, but it is not causing a detrimental effect and is generally not causing visible stress to the landfill cap. As such, it does not represent an immediate concern. Overall in 2024, there was generally no observable negative affect observed to the sideslope of the Existing Landfill, such as leachate seeps, soil staining, stressed vegetation, soil slumping or erosion, as a result of this leachate elevation differential.

Although not related to the above differential pattern, as a result of likely perched leachate conditions, one (1) leachate seep was observed by WM and MECP on May 2, 2024 and another seep was observed by the MECP on June 12, 2024. Both seeps occurred on the western sideslope of the Existing Landfill. On the days of detection, WM immediately repaired the landfill cap at these locations and no additional seeping was observed during subsequent WM and MECP Site inspections. Of note, there was no negative impact observed to the surface water drainage ditch at the bottom of slope.

In summary, the Existing Landfill is effectively containing leachate to protect the natural resources. Notwithstanding this, there is a requirement for ongoing site inspections for leachate seeps such that if detected they can be corrected in a timely manner. Additionally, the leachate level monitoring program should continue to enable input such that the leachate is managed environmentally effective in consideration of the destination target (e.g., off-Site vs. on-Site treatment).

5.2 Soil Monitoring

5.2.1 Soil Quality

The laboratory analytical results for the soil samples collected on September 5, 2024, are presented in Table G-1, Appendix G. The Laboratory Certificates of Analysis for the 2024 samples are provided in Table G-3, Appendix G.

Soil sampling was completed in September 2024 to evaluate select metals and other inorganic constituent concentrations in comparison to the MOE *Guidelines for the Utilization of Biosolids and Other Wastes on Agricultural Land*, dated March 1996.

The results for the select metals and other inorganic constituents were reasonable and showed results generally consistent with the heterogeneity of soils, with variable results between Zones 1 through 4, with some exceptions. The concentrations for most parameters were similar with some increasing and some decreasing in 2024 compared to the concentrations in 2023. Similar to historical data, a slightly elevated concentration of nickel was noted for the sample collected from Zone 1 in 2024. Also, similar to 2018, an elevated hot water soluble boron concentration was noted for the sample from Zone 1. The noted nickel and hot water soluble boron concentrations have not had a detrimental effect to tree health based on the visual assessment, as outlined herein. Of note, low-level sodium adsorption ratios (SAR) were observed from the samples collected from Zone 1 to Zone 4. This is attributable to low sodium concentration levels, in comparison to historical ranges.

5.2.2 Soil Electrical Conductivity

During 2024, soil EC was measured weekly in the Poplar System during system operation per Condition 8.7 of the Waste ECA. The soil EC measurements are presented in Table G-2, Appendix G. To evaluate the EC results, the geometric mean of the measurements for each event were taken for: 1) the measurements taken along a poplar tree row near a drip emitter (location A); and 2) the measurements taken centrally between poplar tree rows (location B). A plot of the geometric mean of the EC results for the expanded Poplar System is provided in Figure G-1, Appendix G. The EC results were generally greater at location A than at location B.

Generally, it is expected that the geometric mean of the EC results at the beginning of the irrigation season (early May) would be notably less than the geometric mean from the end of the previous irrigation season (mid October). This indicates that the EC results are primarily only elevated during active irrigation and that the application of irrigation liquid is not attributing to a build-up of EC in the shallow soil of the Poplar System over time. The decrease is indicative of natural soil flushing occurring repeatedly during off-season precipitation and snow-melt events.

In 2024, the geometric mean of the EC results at the beginning of the irrigation season was noted to be similar to the geometric mean from the end of the 2023 irrigation season. However, as presented in Figure G-1, Appendix G, a more notable soil flushing was observed to likely have occurred in 2024 mid-irrigation season as a number of precipitation events occurred in July and early August.

Overall, based on the EC results in 2024, the application of irrigation liquid increases the EC of the shallow soil in the Poplar System. As the poplar trees did not exhibit any indication of significant health stress in 2024, as a result of the application of irrigation liquid, the soil EC results did not appear to pose a concern to the poplar trees. In addition, the geometric mean of the EC results in 2024 were well within their historical range.

5.3 Leaf Tissue Sampling

Leaf tissue samples were collected on September 4, 2024. The laboratory analytical results for the leaf tissue samples are presented in Tables H-1 and H-2, Appendix H. Indicator values are provided for guidance in evaluating acceptable tissue quality. These indicator values were established in 2002 during consultation with the MOE and considered a Manitoba Soil Fertility Guide as a guidance document for phytoremediation. The Laboratory Certificates of Analysis for the 2024 samples are provided in Table H-5, Appendix H.

In 2024, the leaf tissue results generally showed similar concentration loading in the upper and lower portions of the tree canopy. The concentrations for most parameters were similar with some increasing and some decreasing in 2024 compared to the concentrations in 2023. As the poplar trees did not exhibit any indication of significant health stress in 2024, as a result of the application of irrigation liquid, the relevant concentrations within leaf tissue samples did not appear to pose a concern to the poplar trees.

To evaluate the leaf tissue quality and potential environmental effects as a result of dispersal as windblown material, the relevant constituent concentrations were compared to the Ontario Compost Quality Standards, as prepared by the MOE and last revised July 25, 2012. Of the tested parameters, the leaf tissue analytical results satisfied their respective composting guidelines, which indicates that the leaves are suitable to be used as compost and/or are acceptable to be left to naturally decay as there were no anticipated detrimental effects to local soil and water resources.

5.4 Stem Core Testing

In 2024, stem core sample collection was completed on September 17. The laboratory analytical results for the stem core samples are presented in Table H-3, Appendix H. The Laboratory Certificates of Analysis for the 2024 samples are provided in Table H-5, Appendix H.

The chemical results received, for each of the stem samples generally show lesser chemical concentrations than as noted in the leaves, which indicates that the stems serve as a transport system for nutrients from the irrigation liquid and soil up to the leaves. The concentrations for most parameters tested for the stem core samples were similar with some increasing, and others decreasing in 2024 compared to the concentrations in 2023. As the poplar trees did not exhibit any indication of significant health stress in 2024, as a result of the application of irrigation liquid, the concentrations within the stem core samples did not appear to pose a concern to the poplar trees.

5.5 Root Tissue Testing

In 2024, root tissue sample collection was completed on September 17. The laboratory analytical results for the root tissue samples are presented in Table H-4, Appendix H. The Laboratory Certificates of Analysis for the 2024 samples are provided in Table H-5, Appendix H.

The chemical results received, for each of the root samples generally show lesser chemical concentrations than as noted in the leaves, which indicates that the roots serve as a transport system for nutrients from the irrigation liquid and soil up to the leaves. The concentrations for most parameters tested for the root tissue samples were similar with some increasing and some decreasing in 2024 compared to the concentrations in 2023. It should be noted that more irrigation liquid was applied to the Poplar System during the 2024 season than in 2023. As the poplar trees did not exhibit any indication of significant health stress in 2024, as a result of the application of irrigation liquid, the concentrations within the root tissue samples did not appear to pose a concern to the poplar trees.

5.6 Visual Assessment

The findings from the visual assessment of select Poplar System trees are presented in Table I-1, Appendix I. A visual assessment of the Poplar System was completed on September 9, 2024. A summary of the 2024 and historical inspection findings is presented in Table I-2, Appendix I.

Overall, the tree plot condition within each zone of the Poplar System showed satisfactory conditions in 2024. The inspection results for the tree and leaf visual assessment were reasonable for seven (7) year old trees, with tree heights/diameters and leaf dimensions associatively sized. The trees and leaves generally appeared healthy in 2024 with no apparent visual disease or toxicity symptoms. For the rows assessed, the average overall tree mortality (32 %) in 2024 was down from 2023 (37 %). These deceased trees are planned to be replaced with new trees during the next scheduled poplar tree planting at the Site (Spring 2025).

Zone One (1) and Zone Two (2), which are comprised of the least developed trees and the slower development of the trees within these zones is mostly attributed to the topographic gradient which causes higher runoff rates, and subsequently less opportunity for irrigation liquid infiltration as well as uptake by the trees. Zone three (3) and Zone four (4), which are comprised of the most developed trees, have appeared to begin to experience tree growth competition as the trees will compete with each other for more for sunlight, water, air, and nutrients as they grow. WM plans to evaluate the suspected tree growth competition and consider options to revitalize/replace select trees that have suffered. Also with respect to revitalizing/replacing select trees, considering the increased poplar tree mortality that has been observed over the past few years, WM plans to evaluate if the poplar trees may be suffering from some winter stresses (e.g. colder temperatures mixed with high winds, damage to the base of the trees as a results of vermin that shelter and travel below the snow cover, etc.).

Replacement of irrigation drip lines with solid lines occurred periodically throughout the irrigation season, in order to better manage the application of the irrigation liquid. Ongoing inspections and irrigation system maintenance for system improvements overtime should continue to improve the effectiveness of the system to irrigate greater volumes of leachate each year.

Between 2023 and 2024, the average diameters of the poplar trees inspected showed an increase, which is reflective of the difference in tree diameter measurement technique once the trees are five (5) years old. Prior to year five, the diameter measuring point is to be taken at the bottom third interval of the tree. From year five (5) and older, the diameter is to be measured at approximately chest height (1.3 m).

Given the average historical heights presented in Table I-2, Appendix I, measurements would have been taken at a height of 0.9 m or lower on each poplar tree up until the 2022 monitoring season. As the poplar trees are now seven (7) years old, this was the third year in which field technicians measured tree diameter at approximately 1.3 m above ground level, which reflects the slight increase in average diameter as presented in Table I-2, Appendix I. As the trees generally did not display any signs of significant health stress, as a result of the application of irrigation liquid, the findings will be assessed in more detail in the future for trends as more data is collected in this manner.

Visual assessments with respect to undergrowth, ponding inspections, and tree and leaf vigour within the Poplar System are completed on a monthly basis during the irrigation season. The visual assessments did not indicate any significant stresses to tree health as a result of application of leachate to the Poplar System. Tree undergrowth was seasonally mature during the fall compared to the spring. The undergrowth was generally confined between the tree rows and was groomed on a regular basis by WM. Periodic surface water ponding within the Poplar System area was observed during the permitted irrigation season in 2024. No irrigation liquid application occurred in areas with ponded water, as introduced in Section 4.1.

When surface water ponding within the Poplar System began to be observed, which rarely occurred, the Poplar System (or the relevant area(s)) was shut down until the field conditions were observed to be suitable to resume irrigation. Notable odours emanating as a result of the operation of the Poplar System were generally not detected during the daily inspections.

5.7 Surface Water Sampling

The 2024 surface water monitoring program for the Poplar System was completed for monitoring stations SS14A, SS14B, and SS15A. The current surface water monitoring station locations for the Poplar System are shown in Figure 2.

Quarterly precipitation event (≥ 10 mm in 24 hours) monitoring was completed in 2024 in January, April, July, and October. Storm event (> 25 mm in 24 hours) monitoring was able to be completed on one (1) occasion during the permitted irrigation season (May 1 to October 15) in 2024. The monitoring for the one (1) storm event was completed on July 10, 2024.

Surface water field analytical results are provided in Table J-1, Appendix J. During the 2024 monitoring events, the surface water temperatures varied between 2.5°C and 21.0°C, which reflected the ambient air temperature during sampling. Field pH, EC, turbidity, and dissolved oxygen values fluctuated with no notable anomalies.

Surface water laboratory analytical results for the monitoring stations around the Poplar System are presented in Table J-2, Appendix J. Figures J-1 to J-4 provide concentration vs. time plots for chloride, boron, nitrate, and total ammonia as these parameters are useful leachate indicators and typically occur at detectable concentrations within the surface water. Laboratory Certificates of Analysis for the 2024 surface water samples are provided in Table J-3, Appendix J.

5.7.1 Precipitation Event Surface Water Monitoring

In 2024, surface water samples were collected at each of the required monitoring stations as part of the routine monitoring following a precipitation event. The specific monitoring dates for each precipitation monitoring event in 2024 are discussed in Section 2.9 and are presented in Table J-1, Appendix J.

Generally, the analytical concentrations within the surface water fluctuated at the internal assessment monitoring stations found in the on-Site ditch around the Poplar System. For the 2024 routine precipitation monitoring events, select parameter concentrations were similar between monitoring stations SS14A, SS14B, and the downstream monitoring station SS15A.

As apparent in Figures J-1 to J-4, during 2024 the indicator concentrations (i.e., chloride, boron, nitrate, and total ammonia) fluctuated at the surface water monitoring stations SS14A, SS14B, and SS15A, but were generally within their respective historical ranges. In 2024, elevated, but fluctuating concentrations of chloride and boron continued to be detected at SS14B and SS15A with no discernable trend. A specific source(s) for these intermittent detections has not been identified through various alternative source evaluations over the years.

In summary, concentrations of chloride, boron, nitrate, and total ammonia have shown to be generally fluctuating with no trend of note (e.g. increasing or decreasing) at SS14B and SS15A, and generally near historical lows at SS14A.

Historically, it is noted that these parameter concentrations appear to be present in the surface water at the relevant locations in part, due to temporary effects of construction and excavation/hauling activities that occurred throughout the year (e.g., effects of erosion from the roadways within the catchment areas of the relevant ditches).

Some of the construction and excavation/hauling activities, consisted of the periodic hauling of interim cover to the Expansion Landfill and the removal of sediment buildup from various lengths of the surface water drainage network. A portion of these activities would require hauling to occur along Street D, which runs between the Existing and Expansion Landfills (nearby to SS14B). Upstream of SS14A, there were periodic hauling and stockpiling activities occurring at the stone stockpile located directly east of Pond 4. This is evidenced by the fact that elevated turbidity values were generally noted at SS14A, SS14B and SS15A. As such, the elevated parameter concentrations in part are not directly attributed to the operation of the Poplar System, but rather possibly to localized erosional effects from earthworks excavation/hauling activities. It is noted that the water sources at SS14A and SS15A flow into Sedimentation Pond 1, which based on monitoring, was effective at treating the water to acceptable quality for discharge from the pond. Also, it is noted that the water source at SS14B flows into Sedimentation Pond 2, which based on monitoring was also effective at treating the water to acceptable quality for discharge from the pond.

In addition to the observed water quality patterns described above, other factors were used to evaluate the effectiveness of the Poplar System during operation to treat leachate without unacceptable effects to the natural environment, which include irrigation application control and inspections for stresses in the system. The 2024 irrigation loading by volume (111.6 mm/m^2) to the Poplar System was less than 25% of the target irrigation volume of 476 mm/m^2. There was no observation of irrigation liquid leaving the irrigation system to the surface water drainage ditches. Irrigation liquid was not applied within 1 hour prior to storm events that may be greater than 12.5 mm/hour per Condition 8.7c. of the Waste ECA, or when the field was too wet in consideration of Condition 8.7d of the Waste ECA. In fact, the 2024 irrigation application practices were more conservative than outlined in the Waste ECA. Additionally, generally there was no evidence of leachate seeps (with the exception of those discussed in Section 5.1), stressed vegetation, soil staining/erosion or other visual signature of a potential unacceptable leachate effect to the Poplar System (i.e. no significantly stressed trees).

Of note, each year WM continues to implement efforts to maintain/increase the ability of the Poplar System to treat irrigation liquid without a negative effect to the natural resources. In recent years, efforts have consisted of replacing deceased trees with new trees each spring (based on visual assessments in September), adding additional topsoil to areas of the Poplar System, altering the intensity of irrigation on a day-to-day basis based on weather and field conditions, etc. WM plans to continue to implement efforts to evaluate operational efficiencies in an effort to increase the ability of the Poplar System to treat irrigation liquid to the system's full irrigation potential. New trees are scheduled to be planted in the Spring of 2025 to replace trees that were observed to be deceased during the September 2024 visual assessment.

In consideration of the aforementioned discussion, it is not entirely known why the surface water at internal assessment monitoring stations SS14B and SS15A showed the noted elevated chemical concentrations. However, the concentrations are not directly attributed to the operation of the Poplar System during 2024. As further downstream internal assessment monitoring station SP1, as well as downstream compliance assessment monitoring station SS1 had acceptable surface water quality, the noted chemical results at SS15A do not represent an immediate concern. The same can be said for SS14B as further downstream compliance monitoring station SP2 had acceptable surface water quality. The water quality at SS14B and SS15A will need to be evaluated for a continuance of these concentrations or if an emerging trend of concern occurs.

As highlighted in Table J-2, Appendix J, select concentrations of the additional parameters tested for were greater than their respective Ontario Provincial Water Quality Objectives (PWQO) at the monitoring stations during each monitoring event in 2024.

These parameters, in addition to the indicator parameters discussed above, which were found to be greater than their respective PWQO objectives were verified to be within their respective historical ranges, and therefore do not represent an immediate concern. The evaluation of the effectiveness of the Poplar System to not cause an unacceptable impact to surface water is based on the water quality observed at downstream internal assessment monitoring stations SP1, as well as at further downstream monitoring stations SS1 and SP2, which was observed throughout 2024.

It is noted that surface water sampling protocols for the Poplar System do not include field filtering for dissolved metals and therefore, the resultant metals concentrations reported for surface water are for total metals, which include concentrations that are present within and/or adsorbed to the suspended soil particles.

Of the tested constituents, no organic compounds were detected at the surface water monitoring stations in 2024, except for select BTEX parameters at SS14B during the July 2024 monitoring event. However, the select BTEX parameters were not detected at SS14B during the October 2024 monitoring event. As there is no trend of concern occurring for the select BTEX parameters at SS14B, the noted concentrations are interpreted to be insignificant.

5.7.2 Storm Event Surface Water Monitoring

In 2024, surface water samples were collected as part of monitoring following storm events. The monitoring for one (1) storm event was able to be completed on July 10, 2024 . For the July 10, 2024 storm event, samples were collected at each of the required monitoring stations.

It is noted that storm event monitoring was completed throughout the permitted irrigation season (i.e., following what was ultimately the last day of irrigation on October 11, 2024).

As shown in Table J-2, select concentrations of the tested parameters were greater than their respective PWQO at the monitoring stations during the monitored storm events in 2024. These parameters are presented in the following summary.

Monitoring Station	July 10, 2024
SS14A (Upstream of Poplar System, East Ditch)	Aluminum, Chromium, Cobalt, Copper, Iron, Phosphorous, Vanadium, Zinc
SS14B (Adjacent to Zone 3, West Ditch)	Aluminum, Boron, Cadmium, Chromium, Cobalt, Copper, Iron, Lead, Molybdenum, Nickel, Phosphorous, Vanadium, Zinc,
SS15A (Downstream, Inlet ditch to SP1)	Boron, Iron, Aluminum, Cobalt, Copper, Iron, Phosphorus, Vanadium, Zinc

The storm event parameter concentrations that were greater than their respective PWQO in 2024 were generally within their respective historical range, with the exception of select metals parameters and phosphorous at SS14B, which where at historical highs. For the July 10, 2024 storm event, the parameters that were detected at concentrations greater than their respective PWQO were mainly detected adjacent to (at SS14B) and downstream (at SS15A) of the Poplar System with slightly fewer parameters being detected upstream (at SS14A) of the Poplar System. These elevated concentrations were attributable to the significant turbidity of the sample (>999 NTU) at the time of collection.

Similar to what was noted in Section 5.7.1, throughout 2024, elevated concentrations of boron continued to be detected at SS14B and SS15A during some of the precipitation storm events whereas concentrations generally maintained around their historical lows at SS14A.

As discussed above, these parameter concentrations appear to be present in the surface water at the relevant locations in part, due to temporary effects of construction and excavation/hauling activities that occurred throughout the year (e.g., effects of erosion from the roadways within the catchment areas of the relevant ditches). This Is evidenced by the fact that elevated turbidity values were generally noted at SS14A, SS14B and SS15A. Overall, for the July 10, 2024 storm event, the parameter concentrations that were greater than their respective PWQO are not directly attributed to the operation of the Poplar System but rather to localized erosional effects (e.g. metals concentrations) from earthworks construction activities. It is noted that these water sources flow into Sedimentation Pond 1, which based on water quality monitoring, was effective at treating water quality to acceptable quality for discharge from the pond and as further verified downstream at surface water monitoring station SS1 for discharge off-site.

Of the tested constituents, volatile and semi-volatile organic compounds were not detected at the surface water monitoring stations during the storm monitoring events in 2024, except for select BTEX parameters at SS14B during the July 2024 monitoring event. However, the select BTEX parameters were not detected at SS14B during the October 2024 monitoring event. As there is no trend of concern occurring for the select BTEX parameters at SS14B, the noted concentrations are interpreted to be insignificant.

Overall, the 2024 surface water monitoring results for the Poplar System monitoring stations indicated that runoff from the Poplar System did not negatively affect downstream water quality. It is noted that the Poplar System surface water stations are not compliance stations and, as such, are not required to be assessed against the relevant surface water trigger concentrations derived from the Landfill Environmental Monitoring Program, as prepared by Jagger Hims Limited and dated December 2007.

6 2025 POPLAR SYSTEM MONITORING PROGRAM

The 2025 Poplar System Monitoring Program should be completed as outlined in Tables 5 and 6, and according to the field protocols provided in Appendix C.

7 CONCLUSIONS

The following conclusions are provided in consideration of the findings for the 2024 Poplar System Monitoring Program.

- In 2024, irrigation liquid was applied to the poplar trees intermittently for a total of 93 days from May 1 to October 11. The Poplar System was operated in conformance with Condition 8.7 of the Waste ECA.
- The irrigation liquid applied to the Poplar System in 2024 contained approximately 100% leachate by concentration and 100% leachate by volume. A total of approximately 10,374.55 m^3 of leachate was applied to the Poplar System in 2024.
- The 2024 total irrigation rate was approximately 111.6 mm/m^2 for the Poplar System, of which was less than 25% of the available annual irrigation potential of 476 mm/m^2 detailed in the *Expansion of Poplar Cap Irrigation System for Existing Waste Disposal Area* report, as prepared by GENIVAR Consultants LP and January 2010.

- The leachate elevations within select maintenance holes were generally drawn down and fluctuated significantly throughout the duration of the application period as a result of leachate extraction for irrigation to the Poplar System. The leachate elevations in the leachate monitoring wells typically did not show correlation to their counterpart maintenance hole within each respective cell. This observation indicates that leachate within the waste mound that may not be directed to or captured by the leachate underdrain collection system (i.e. perched, low hydraulic conductivity, or some other cause) is therefore, not having an effect to the groundwater system (i.e. potentiometric pressures). This effect is observed in waste cells that are both positioned under and not under the Poplar System, indicating that the operation of the Poplar System is not the cause of this leachate elevation differential effect.
- Based on the soil samples collected for the Poplar System, soil quality was not adversely affected by the application of irrigation liquid in 2024.
- Based on the EC results in 2024, the application of irrigation liquid increases the EC of the shallow soil in the Poplar System.
- Overall, the tree plot condition within each zone of the Poplar System showed satisfactory conditions in 2024. The trees and leaves generally appeared healthy in 2024 with no apparent visual disease or toxicity symptoms. Therefore, no detrimental effects to tree health or growth vigour were observed during 2024 as a result of the application of irrigation liquid.
- Notable odours emanating as a result of the operation of the Poplar System were generally not detected in 2024.
- For the surface water monitoring events completed in 2024, the parameter concentrations within the surface water at the monitoring stations for the Poplar System fluctuated but were generally within their respective historical ranges with some exceptions. As further downstream internal assessment monitoring station SP1, as well as downstream compliance assessment monitoring station SS1 had acceptable surface water quality, the noted chemical results at SS15A do not represent an immediate concern. The same can be said for SS14B as further downstream compliance monitoring station SP2 had acceptable surface water quality.
- Overall, the Poplar System provides an effective system for the on-Site management of landfill leachate with no distinctive detrimental effects to soil, air, or surface water quality, and no notable detrimental effects to the poplar trees. Select areas of focus, including surface water quality evaluations at SS14A, SS14B, and SS15A, as well as leachate level monitoring should continue such that the Poplar System is managed in an environmentally effective manner.

8 CLOSURE

We trust that this 2024 Fourth Quarter and Annual Monitoring Report, Volume 3 of 5, for the Poplar System at the Twin Creeks Environmental Centre is satisfactory for your requirements. Should there be any questions or comments, please do not hesitate to contact us.

Sincerely,

RWDI

Eric Wilson, B.Sc.
Scientist | Geoscience

Jeff Cleland, B.Eng., P.Eng.
Environmental Engineer | Geoscience

Brent J. Langille, B.Sc., P.Geo.
Senior Technical Director | Principal

EW/JCL/BJL/kta/tmg

9 STATEMENT OF QUALIFICATIONS AND LIMITATIONS

This Report has been prepared for a specific purpose and use, as outlined within the Report. The scope of the undertaking was initially provided in a proposal submitted by RWDI AIR, Inc. (RWDI) to Waste Management of Canada Corporation. The proposal (subject to any documented scope changes requested by Waste Management of Canada Corporation) constitutes an agreement between RWDI and Waste Management of Canada Corporation.

RWDI relied in part, upon the data, information, specifications and documentation (Data) provided by Waste Management of Canada Corporation as well as third parties. It is assumed by RWDI that the Data provided are complete and accurate. RWDI was not retained to, nor has it conducted any independent verification of the accuracy, completeness or suitability of the Data. As such, RWDI assumes no liability for losses, damages, or claims of any nature arising from inaccurate, incomplete or unsuitable Data provided on this project. Waste Management of Canada Corporation by receipt of this Report agrees to indemnify and hold harmless RWDI with respect thereto.

It is important that the reader of this Report, recognize that subsurface, environmental and/or geotechnical conditions may vary geographically and temporally. This is a natural phenomenon, which is not fully accommodated in the limited testing conducted by RWDI. In addition, the analysis of the collected data, by necessity, incorporates simplifying assumptions of site conditions and analytical solutions that assume uniformity in site conditions. The opinions, conclusions, and recommendations contained within the Report therefore represent RWDI's professional judgment in-light of these limitations.

This Report is to be considered confidential and is for the sole use of Waste Management of Canada Corporation. As such, the Report shall not be relied upon by third parties, except where agreed in writing between RWDI and Waste Management of Canada Corporation; where required by law; or where used for governmental review. RWDI accepts no responsibility, and denies any liability whatsoever, to parties other than Waste Management of Canada Corporation who may obtain access to the Report, for any injury, loss, or damage suffered by such parties arising from their use of, reliance upon, decisions or actions based on the Report or any of its contents, except to the extent where those parties have obtained prior written consent of RWDI to use and rely upon the Report and its contents. Any damages arising from improper use of the Report or parts thereof shall be borne by the party making such use.

This statement of Qualifications and Limitations is attached to, and forms part of the Report and any use of the Report are subject to the terms thereof.

TABLES

Table 1
Poplar System Monitoring Program - 2024
Twin Creeks Environmental Centre - Poplar System

Task	Monitoring Location	Parameters	Frequency	Monitoring Dates	Comments
Visual Assessment	Poplar System	Tree diameter, tree height, tree mortality, crown dieback, foliage transparency, crown density, leaf size, discolouration of leaves, abnormally shaped leaves, length of new tree branch extension shoots, deformed growth, insect infestation.	Annually - September	9-Sep-24	
Root Depth	Poplar System	Depth of root penetration.	Annually - September	17-Sep-24	
Inspections	Poplar System	Brace roots for animal damage etc.	Annually - September	9-Sep-24	
Undergrowth	Poplar System	Type and condition	Monthly - During Irrigation	1-May-24, 1-Jun-24, 8-Jul-24, 23-Aug-24, 4-Sep-24, 11-Oct-24	
Ponding and Runoff	Poplar System	Ponding and runoff of irrigation water	Monthly - During Irrigation	1-May-24, 1-Jun-24, 8-Jul-24, 23-Aug-24, 4-Sep-24, 11-Oct-24	
Soil Conductivity	Poplar System	Soil Conductivity	Weekly - During Irrigation		Five (5) locations, two (2) stations at each location, and depths of 25 and 150 mm. Stations are at drip emitter (A) and between irrigation lines (B).
Soil Sampling	Poplar System	Nitrate (N), Ammonium and Ammonia, TKN, Phosphorus**, Calcium*, Magnesium*, Sodium*, Potassium*, TOC, Sulphate, Chloride, Boron, Total Metals.	Annually - September	5-Sep-24	Four (4) composite soil samples per location (S1 to S4) from a sample interval from grade to a depth of between 0.6 m (minimum) and 0.9 m (maximum).
Leachate Irrigation	Poplar System Leachate Holding Tank	General Chemistry, VOCs, Heavy Metals	Monthly - During Irrigation	19-May-24, 4-Jun-24, 2-Jul-24, 8-Aug-24, 9-Sep-24, 9-Oct-24	
Odour	Poplar System	Subjective Olfactory Assessment	Monthly - During Irrigation	1-May-24, 1-Jun-24, 8-Jul-24, 23-Aug-24, 4-Sep-24, 11-Oct-24	
Leaf Tissue Analysis	Poplar System	Total Nitrogen, Phosphorus, Potassium, Boron, Copper, Iron, Manganese, Zinc and Chloride.	Annually - September	4-Sep-24	Eight (8) samples. Four (4) composite of the lower canopy and four (4) composite of the upper canopy.
Stem Core and Root Tissue	Poplar System	Full Metal Scan, Chloride	Annually - September	17-Sep-24	Four (4) composites for the Poplar System.
Leachate Levels	Poplar System		May and November	1-May-24, 1-Nov-24	MH16, MH17, MH18, OW22A-10, OW51A-15, OW53-10, MH3SA, MH3SB, MH3SC, MH3SD, MH3SE, MH3SF, MH4A, MH4B, Sump
Surface Water Monitoring	Poplar System at SS14A, SS14B, and SS15A	SW-P, BTEX	In conjunction with EMP monitoring.	10-Jan-24 (Routine monitoring for Q1 precipitation events) 12-Apr-24 (Routine monitoring for Q2 precipitation events) 10-Jul-24 (Routine monitoring for Q3 precipitation events) 14-Oct-24 (Routine monitoring for Q4 precipitation events)	
Storm Event Surface Water Monitoring	Poplar System at SS14A, SS14B, and SS15A	Nitrate, Nitrite, TKN, Ammonia (total), Phosphorus, Heavy Metals, BTEX, Chloride, pH, Dissolved Oxygen.	Two (2) events during irrigation and after storm events.	10-Jul-24 (Storm event monitoring for Q3 precipitation event)	Irrigation system active from May 1 to October 15, 2024

Notes:

1) Poplar System - Located on a 9.3 ha portion of the Central and South Cell.
2) Monitoring locations are shown in Figure 2.
3) General Chemistry indicates: pH, conductivity, chloride, sulphate, alkalinity, calcium, magnesium, potassium, sodium, nitrate, nitrogen, TKN, ammonia, and total phosphorus.
4) VOCs indicates a scan for volatiles and semi-volatiles per GC/MS.
5) Total Metals denotes: Al, As, Ba, Be, Bi, B, Cd, Cr, Co, Pb, Mo, Ni, P, Se, Ag, Sr, Ti, Sn, V, and Zn.
6) Full Metal Scan denotes: Al, As, Ba, Be, Bi, B, Ca, Cd, Cr, Co, Cu, K, Pb, Mg, Mo, Na, Ni, P, Se, Ag, Sr, Sn, V, and Zn.
7) SW-P denotes: chloride, ammonia (un-ionized), sulphate, phenols, nitrate, alkalinity, TOC, B, Ni, Cr, Zn, Ca, Mg, K, Na, and Fe; as well as Field Parameters: pH, conductivity, temperature, turbidity, and dissolved oxygen.
8) BTEX indicates: benzene, toluene, ethylbenzene, and xylenes (total).
9) TPH indicates total petroleum hydrocarbons for gas/diesel and heavy oils.
10) '*' indicates NH_4 Acetate Extractable.
11) '**' indicates $NaHCO_3$ Extractable.

Table 2
Poplar System Monitoring Schedule - 2024
Twin Creeks Environmental Centre - Poplar System

Task	Monitoring Location	Frequency	2024											
			January	February	March	April	May	June	July	August	September	October	November	December
Monitoring Network Installation			**Maintenance**											
Visual Assessment	Poplar System	September												
Root Depth	Poplar System	September												
Inspections	Poplar System	September												
Undergrowth	Poplar System	Monthly - During Irrigation												
Ponding	Poplar System	Monthly - During Irrigation												
Soil Conductivity	Poplar System	Weekly - During Irrigation												
Soil Sampling	Poplar System	September												
Leachate Toxicity	Poplar System Leachate Holding Tank	Monthly - During Irrigation												
Odour	Poplar System	Monthly - During Irrigation												
Leaf Tissue Analysis	Poplar System	September												
Stem Core and Root Tissue	Poplar System	September												
Leachate Levels	Poplar System	May and November												
Surface Water Monitoring	Poplar System at SS14A, SS14B, and SS15A	In conjunction with EMP monitoring	First Quarter			Second Quarter			Third Quarter			Fourth Quarter		
Storm Event Surface Water Monitoring	Poplar System at SS14A, SS14B, and SS15A	Two (2) events during irrigation and after storm events					Two events							

Table 3
Poplar System Inspection Record - 2-Year Summary
Twin Creeks Environmental Centre - Poplar System

Task	Monitoring Parameters	ZONE 1		ZONE 2		ZONE 3		ZONE 4	
		Sep-23	Sep-24	Sep-23	Sep-24	Sep-23	Sep-24	Sep-23	Sep-24
Visual Assessment	*TREE DIAMETER (cm)*	7.1	10.4	8.4	14.7	8.3	14.1	8.1	14.9
	TREE HEIGHT (m)	5.2	5.4	7.5	7.7	7.8	7.8	8.2	8.5
	TREE MORTALITY (%) [3]	32	21	33	16	45	40	36	49
	CROWN DENSITY (%)	82	67	81	73	78	79	87	52
	LEAF SIZE (cm) *(length/width)*	7.7 / 7.5	6.1 / 6.2	7.8 / 7.6	5.2 / 5.1	7.9 / 8.5	7.9 / 7.3	8.2 / 7.9	6.2 / 5.9
	DISCOLOURATION OF LEAVES (%)	83	48	86	10	11	2.5	75	17
	LENGTH OF NEW TREE BRANCH EXTENSION SHOOTS (cm)	8.2	10.5	9.3	10.6	9.1	10.7	5.9	15.3
	INSECT INFESTATION (%)	2.5	18	2.5	8.2	2.5	2.5	2.5	4.1
	DEPTH OF ROOT PENETRATION (m)*	0.82	0.63	0.76	0.97	0.81	0.86	1.68	1.40

Notes:

1) Expanded Poplar System initiated in 2017.
2) Blank denotes data not available.
3) The tree mortality is based on the number of trees which died from the previous year.

Table 4
Irrigation Water - Poplar System Target Leachate Concentrations
Twin Creeks Environmental Centre - Poplar System

Parameter	LMP (Pre-2000)	Target Concentrations[9] Zones 1 to 4 - 100% Leachate	CCME Guidelines
Alkalinity	9,150	9,150	-
Conductivity (mS/cm)	10,616	10,616	-
Sodium	921	921	-
Potassium	238	238	-
Magnesium	347	347	-
Chloride	1241	1241	700 to 14,000*
Iron	2.9 - 25	2.9 - 25	20.0
Manganese	0.24	0.24	10.0
Ammonia (total)	554	554	-
TKN	2,948	2948	-
Boron	25.3	25.3	6.0
Chromium	0.12	0.12	0.1
Copper	0.43	0.43	5.0
Lead	<0.02-0.33	<0.02-0.33	2.0
Molybdenum	<0.02-1.82	<0.02-1.82	0.05
Nickel	<0.02-29.3	<0.02-29.3	2.0
Total Phosphorus	2.37	2.37	-
Zinc	0.043	0.043	5.0
Phenols	0.160	0.16	-
Total BTEX (µg/L)	127	127	-

Notes:

1) All data are mg/L unless otherwise specified.
2) LMP denotes geometric mean leachate quality from Leachate Management Plan, July 2001.
3) Target Concentrations derived from LMP and "Expansion of Poplar Cap Irrigation System for Existing Waste Disposal Area" report by GENIVAR Consultants LP dated January 2010.
4) CCME Guidelines denotes maximum concentration for negative effects to vegetation for irrigation water per Canadian Water Quality Guidelines (2004).
5) *' denotes concentration estimated based on poplar tree tolerance and vegetable crops. of > 710 mg/L (CCME, 2004), and salty water irrigation at 400 to 14,000 mg/L (Shanon et al, 1998).
6) '-' denotes no LMP and/or CCME Guideline.
7) Target Concentrations denotes leachate strength appropriate for 'Year 1' trees.
8) Target Concentrations denotes leachate strength appropriate for 'Year 2' trees.
9) Target Concentrations denotes leachate strength appropriate for 'Year 3' trees and beyond.

Table 5
Poplar System Monitoring Program - 2025
Twin Creeks Environmental Centre - Poplar System

Task	Monitoring Location	Parameters	Frequency	Comments
Visual Assessment	Poplar System	Tree diameter, tree height, tree mortality, crown dieback, foliage transparency, crown density, leaf size, discolouration of leaves, abnormally shaped leaves, length of new tree branch extension shoots, deformed growth, insect infestation.	Annually - September	
Root Depth	Poplar System	Depth of root penetration	Annually - September	
Inspections	Poplar System	Brace roots for animal damage etc.	Annually - September	
Undergrowth	Poplar System	Type and condition	Monthly - During Irrigation	
Ponding and Runoff	Poplar System	Ponding and runoff of irrigation water	Monthly - During Irrigation	
Soil Conductivity	Poplar System	Soil Conductivity	Weekly - During Irrigation	Five (5) locations, two (2) stations at each location, and depths of 25 and 150 mm. Stations are at drip emitter (A) and between irrigation lines (B).
Soil Sampling	Poplar System	Nitrate (N), Ammonium and Ammonia, TKN, Phosphorus**, Calcium*, Magnesium*, Sodium*, Potassium*, TOC, Sulphate, Chloride, Boron, Total Metals.	Annually - September	Four (4) composite soil samples per location (S1 to S4) from a sample interval from grade to a depth of between 0.6 m (minimum) and 0.9 m (maximum).
Leachate Irrigation	Poplar System Leachate Holding Tank	General Chemistry, VOCs, Heavy Metals	Monthly - During Irrigation	
Odour	Poplar System	Subjective Olfactory Assessment	Monthly - During Irrigation	
Leaf Tissue Analysis	Poplar System	Total Nitrogen, Phosphorus, Potassium, Boron, Copper, Iron, Manganese, Zinc and Chloride.	Annually - September	Eight (8) samples. Four (4) composite of the lower canopy and four (4) composite of the upper canopy.
Stem Core and Root Tissue	Poplar System	Full Metal Scan, Chloride	Annually - September	Four (4) composites for the Poplar System.
Leachate Levels	Poplar System		May and November	MH16, MH17, MH18, OW22A-10, OW51A-15, OW53-10, MH3SA, MH3SB, MH3SC, MH3SD, MH3SE, MH3SF, MH4A, MH4B, Sump
Surface Water Monitoring	Poplar System at SS14A, SS14B, and SS15A	SW-P, BTEX	In conjunction with EMP monitoring.	
Storm Event Surface Water Monitoring	Poplar System at SS14A, SS14B, and SS15A	Nitrate, Nitrite, TKN, Ammonia (total), Phosphorus, Heavy Metals, BTEX, Chloride, pH, Dissolved Oxygen.	Two (2) events during irrigation and after st orm events.	

Notes:

1) Poplar System - Located on a 9.3 ha portion of the Central and South Cell.
2) Monitoring locations are shown in Figure 2.
3) General Chemistry indicates: pH, conductivity, chloride, sulphate, alkalinity, calcium, magnesium, potassium, sodium, nitrate, nitrogen, TKN, ammonia, and total phosphorus.
4) VOCs indicates a scan for volatiles and semi-volatiles per GC/MS.
5) Total Metals denotes: Al, As, Ba, Be, Bi, B, Cd, Cr, Co, Pb, Mo, Ni, P, Se, Ag, Sr, Ti, Sn, V, and Zn.
6) Full Metal Scan denotes: Al, As, Ba, Be, Bi, B, Ca, Cd, Cr, Co, Cu, K, Pb, Mg, Mo, Na, Ni, P, Se, Ag, Sr, Sn, V, and Zn.
7) SW-P denotes: chloride, ammonia (un-ionized), sulphate, phenols, nitrate, alkalinity, TOC, B, Ni, Cr, Zn, Ca, Mg, K, Na, and Fe; as well as Field Parameters: pH, conductivity, temperature, turbidity, and dissolved oxygen.
8) BTEX indicates: benzene, toluene, ethylbenzene, and xylenes (total).
9) TPH indicates total petroleum hydrocarbons for gas/diesel and heavy oils.
10) '*' indicates NH_4 Acetate Extractable.
11) '**' indicates $NaHCO_3$ Extractable.

Table 6
Poplar System Monitoring Schedule - 2025
Twin Creeks Environmental Centre - Poplar System

Task	Monitoring Location	Frequency	2025											
			January	February	March	April	May	June	July	August	September	October	November	December
Monitoring Network Installation			**Maintenance**											
Visual Assessment	Poplar System	September												
Root Depth	Poplar System	September												
Inspections	Poplar System	September												
Undergrowth	Poplar System	Monthly - During Irrigation												
Ponding	Poplar System	Monthly - During Irrigation												
Soil Conductivity	Poplar System	Weekly - During Irrigation												
Soil Sampling	Poplar System	September												
Leachate Toxicity	Poplar System Leachate Holding Tank	Monthly - During Irrigation												
Odour	Poplar System	Monthly - During Irrigation												
Leaf Tissue Analysis	Poplar System	September												
Stem Core and Root Tissue	Poplar System	September												
Leachate Levels	Poplar System	May and November												
Surface Water Monitoring	Poplar System at SS14A, SS14B, and SS15A	In conjunction with EMP monitoring	First Quarter			Second Quarter			Third Quarter			Fourth Quarter		
Storm Event Surface Water Monitoring	Poplar System at SS14A, SS14B, and SS15A	Two (2) events during irrigation and after storm events					Two events							

FIGURES

MAP SOURCE:
FIGURE PROVIDED BY GENIVAR INC., FIGURE 1, FILE REF NO. 111-53111-00-F1-LM PS2012, DATED FEBRUARY 2013.

SITE LOCATION MAP
2024 POPLAR SYSTEM

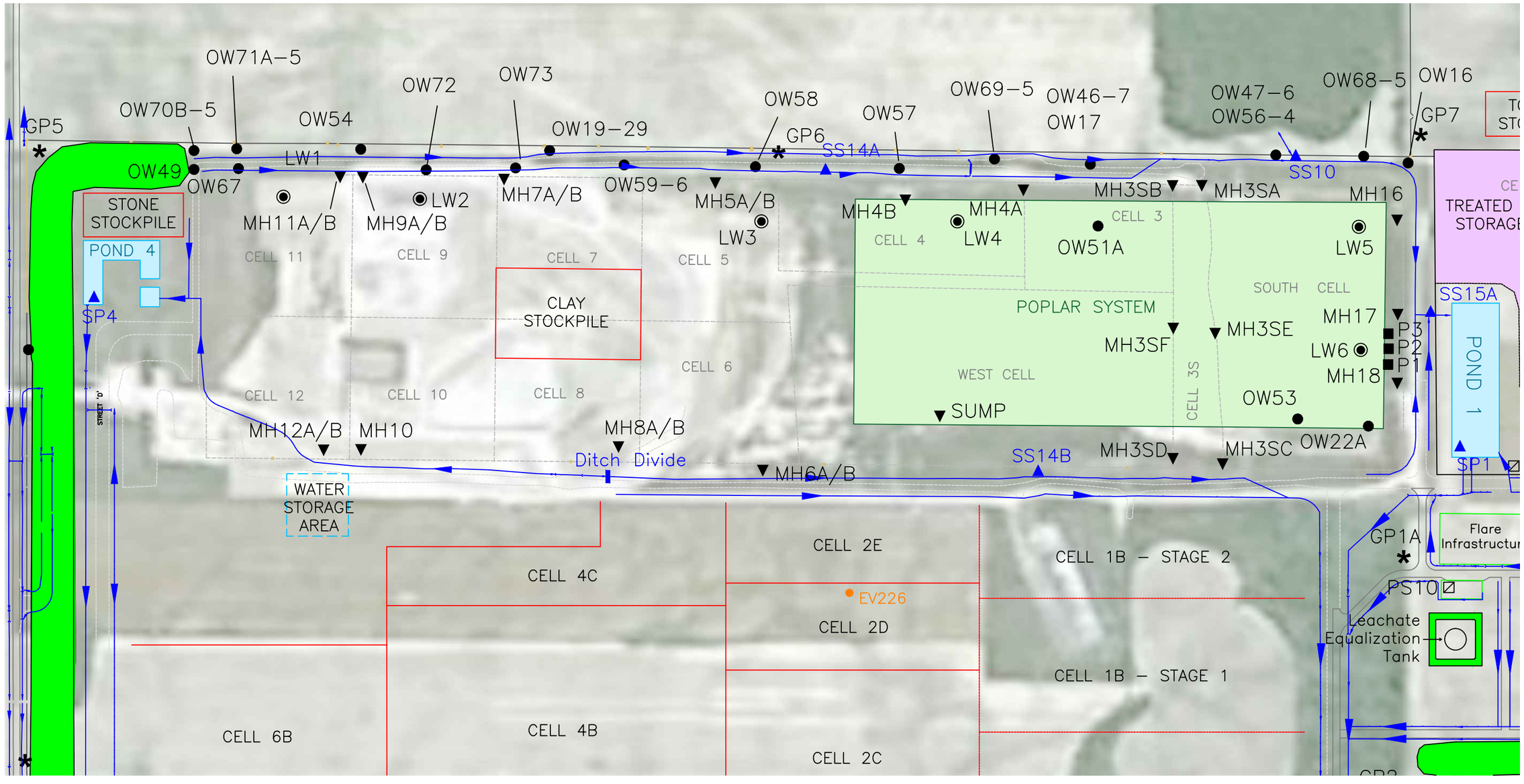
TWIN CREEKS ENVIRONMENTAL CENTRE
TOWNSHIP OF WARWICK, ONTARIO

DWN BY: EW
CHK BY: JCL
DATE: OCT. 2024
SCALE: 1:50,000

WASTE MANAGEMENT OF CANADA CORP.

PROJECT NO. 2402553

FIGURE 1



LEGEND

- LANDFILL EXPANSION WASTE FOOTPRINT
- PROPOSED BERMS / INFRUSTRUCTURE (APPROXIMATE)
- EXISTING BERMS / INFRASTRUCTURE (APPROXIMATE)
- SEDIMENTATION POND
- ⊠ PS11 — PUMPING STATION LOCATION & DESIGNATION
- ● OW58 — ACTIVE MONITORING WELL LOCATION & DESIGNATION
- ▲ SS1 — SURFACE WATER MONITORING LOCATION & DESIGNATION
- ✱ GP1 — ACTIVE GAS PROBE LOCATION & DESIGNATION
- ■ P1 — PEIZOMETER LOCATION & DESIGNATION
- ◉ LW1 — LEACHATE MONITORING WELL LOCATION & DESIGNATION
- ● EV226 — EARLY VERTICAL GAS WELL (EVGW)
- ▼ MH5A/B — MAINTENANCE HOLE LOCATION & DESIGNATION

NOTE:
1. TOPOGRAPHIC FEATURES SHOWN ON THIS PLAN ARE BASED ON DECEMBER 2011 SITE CONDITIONS.
2. SOURCE FIGURE PROVIDED BY GENIVAR INC., FIGURE 2, FILE REF NO. 111-53111-00-F2-SP 12CM Q4, DATED FEBRUARY 2013.

0 50 100m

MONITORING NETWORK
2024 POPLAR SYSTEM

TWIN CREEKS ENVIRONMENTAL CENTRE
TOWNSHIP OF WARWICK, ONTARIO

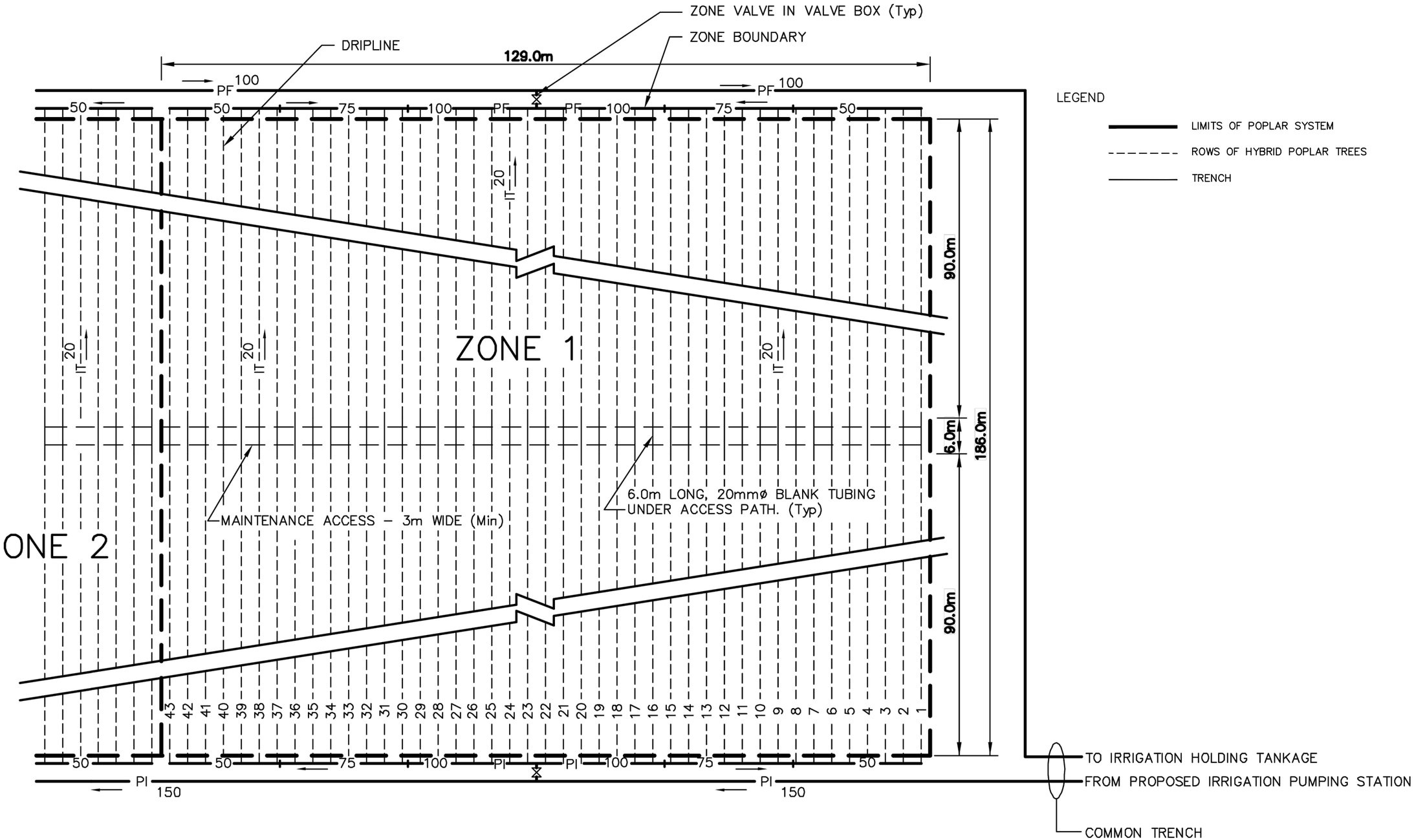
DWN BY: EW
CHK BY: JCL
DATE: JAN 2025
SCALE: 1:4,000

WASTE MANAGEMENT OF CANADA CORP.

PROJECT NO. 2402553

FIGURE 2

WASTE MANAGEMENT



MAP SOURCE:
FIGURE PROVIDED BY GENIVAR INC., FIGURE P100, FILE REF NO. 1731813 – P100, DATED JANUARY 20, 2010.

RM

WASTE MANAGEMENT

TYPICAL ZONE LAYOUT
2024 POPLAR SYSTEM
TWIN CREEKS ENVIRONMENTAL CENTRE
TOWNSHIP OF WARWICK, ONTARIO

DWN BY: EW
CHK BY: JCL
DATE: OCT. 2024
SCALE: 1:650
WASTE MANAGEMENT OF CANADA CORP.
PROJECT NO. **2402553**

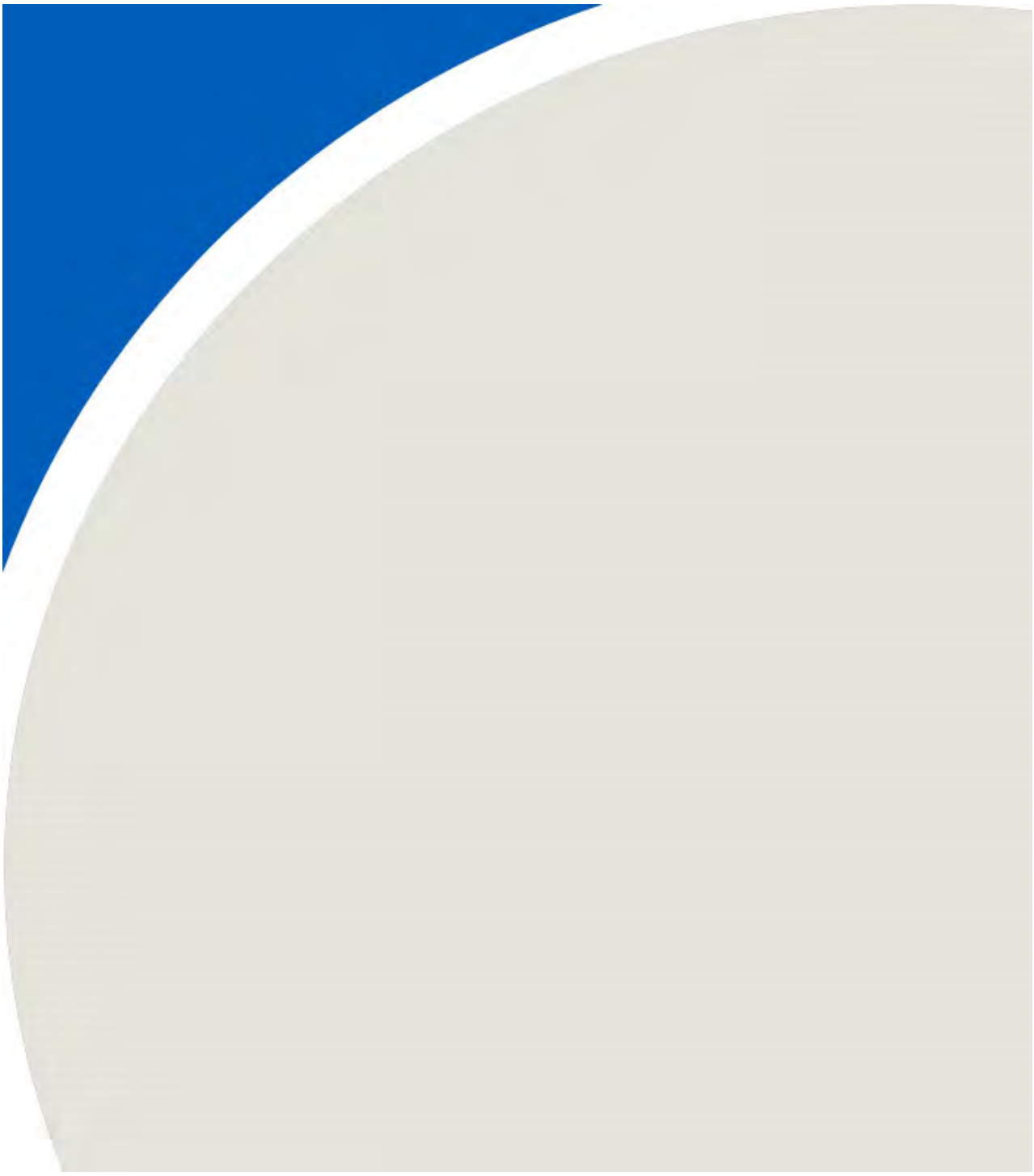
FIGURE
3

APPENDIX A:

Approval Documentation

APPENDIX A1:

Amended ECA [Waste] No. A032203, dated December 16, 2023



AMENDED ENVIRONMENTAL COMPLIANCE APPROVAL
NUMBER A032203
Issue Date: December 16, 2023

Waste Management of Canada Corporation
5768 Nauvoo Rd
Warwick, Ontario
N0M 2S0

Site Location: Twin Creeks Environmental Centre
5768 Nauvoo Rd Watford
Warwick Township, County of Lambton
N0M 2S0

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

the use and operation of a 101.8 hectare waste disposal site (landfill) within a total site area of 301 hectares.

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

"Agricultural Waste" for the purposes of this ECA, is defined as municipal yard waste, wood chips, food waste and minimal amounts of solid manure which would only be accepted or used for the purpose of seeding or operating an active aerobic compost pile and does not include liquid manure;

"AQMP " means an Air Quality Monitoring Program;

"Construction Phase " is defined as the period of time from the start of construction of Phase 1 of the expanded landfill to the date of first receipt of waste in Phase 1;

"Contaminating Lifespan" refers to the period of time, after closure until the site finally produces contaminants at concentrations below levels which have unacceptable health or environmental effects;

"Crown " means Her Majesty the Queen in the Right of Ontario;

"Director " means any Ministry employee appointed in writing by the Minister pursuant to section 5 of the EPA as a Director for the purposes of Part II.1 of the EPA;

“District Manager ” means the District Manager in the Ministry of the Environment, Conservation and Parks Sarnia District Office;

“District Office ” means the Ministry of the Environment, Conservation and Parks Sarnia District Office;

“EA” refers to the document titled “Warwick Landfill Expansion Environmental Assessment” , dated September 2005, which includes Discussion Papers 1 though 9 included in the Appendices A to F of the Environmental Assessment. EA also includes responses from the Owner dated:

1. March 10, 2006 “Waste Unit’s Final Comments Dated March 8, 2006”
2. February 14, 2006 “Leachate Recirculation”
3. February 14, 2006 “Response to February 1, 2006 Correspondence”
4. January 13, 2006 “Waste Management Response to Comments received from Warwick Landfill Expansion EA” including attachments entitled:

    i. Response to the Township of Warwick;
    ii. Response to Thomson Rogers;
    iii. Table of responses to various agencies, public and First Nations Submissions;
    iv. Landfill Gas Assessment, Warwick Landfill Baseline Conditions Report prepared by RWDI dated January 12, 2006;
    v. Memo dated March 10, 2006;
    vi. June 12, 2006 “Response to May 1, 2006 Ministry Review ”;

“EAA” refers to the Ontario Environmental Assessment Act, R.S.O. 1990, c.E.18, as amended;

"Environmental Compliance Approval" or "ECA" or "Approval" means this entire provisional Environmental Compliance Approval document, issued in accordance with Section 20.2 of the EPA , and includes any schedules to it, the application and the supporting documentation listed in schedule "A";

“Environmental Inspector” refers to the individual employed by the Ministry of the Environment, Conservation and Parks to inspect the Site;

"EPA " means Environmental Protection Act , R.S.O. 1990, c.E.19, as amended;

“EPB” refers to the Environmental Permissions Branch of the Ministry of the Environment, Conservation and Parks;

"Hydraulic Trap" indicates a situation where hydraulic gradients from the surrounding soil are inward toward the landfill waste and associated leachate collection system;

"Mini-Transfer Area" means the mini-transfer public convenience drop-off area as described and identified in the June 2009 Development & Operations Report that is identified in Item 59 of Schedule "A" and whose location is identified as "Expansion Mini-Transfer" in figure MT2 that is contained in the 2009 Development & Operations Report;

“MECP” or “Ministry” refers to the Ontario Ministry of the Environment, Conservation and Parks;

"Operation Phase" is defined as the period of time from the date that Phase 1 of the expanded landfill area first receives waste until the landfill site reaches final capacity;

“Operator ” has the same meaning as “operator” as defined in s.25 of the EPA;

“Owner ” means Waste Management of Canada Corporation and its successors and assigns;

"O. Reg. 101/94" means Ontario Regulation 101/94 as amended;

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

“PA ” means the Pesticides Act , R.S.O. 1990, c.P.11, as amended;

"Preparation Report" refers to a report documenting that the subsequent stage of the landfill has been constructed in accordance with the approved design plans and specifications;

“Poplar System” is the irrigation area located on top of the cap of the Existing Site (old landfill) that is used for the phytoremediation of leachate that is generated at the Site per Items 63 through 65 of Schedule “A” and Figure 2 of Item 16 on Schedule "A";

“Poplar Plantation” is the irrigation area located on native soil to the south of the Site that is used for the phytoremediation of irrigation liquid that satisfies the Effluent Limit criteria per the OWRA Section Approval for the Site, Item 39 of Schedule “A”, and Appendix N11 of Item 30 on Schedule "A";

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

"PWQO" refers to the Provincial Water Quality Objectives;

"Recyclable Waste" means waste that are glass, plastic, aluminium or steel cans, gypsum wallboard, newspapers, cardboard and/or other materials for which there is a secured market;

“Regional Director” refers to the Director of the Ministry of the Environment’s Southwestern Regional Office;

"Regulation 232 " or "Reg. 232" or "O. Reg. 232/98" means Ontario Regulation 232/98 (Landfilling Sites) made under the EPA, as amended;

"Regulation 347 " or "Reg. 347 " or "O. Reg. 347" means Regulation 347, R.R.O. 1990, made under the EPA, as amended;

“Site” refers to the Twin Creeks Landfill Site and lands owned by the Owner described as:

Firstly, Part of Lots 19 and 20, Concession 3, S.E.R.,and Part of Lot 20, 21 and 22, Concession 4, S.E.R. and Part of the Road Allowance between Lots 21 and 22, Concession 4, S.E.R., shown as Parts 1, 2 and 3 on Plan 25R-9125 and Part 2 on Plan 25R-1903, Save and Except Part 1 on Plan 25R-6184, Township of Warwick, County of Lambton; and

Secondly, Part of Lot 20, Concession 3 S.E.R., shown as Part 1 on Plan 25R-6184, Township of Warwick, County of Lambton;

"Traditional agricultural crop production" means standard crop production, nursery and horticultural crops, agro-forestry, conservation uses but not greenhouses or any accessory agricultural buildings and structures;

“Undertaking” refers to the proposed undertaking as described in the Warwick Landfill Expansion Environmental Assessment;

“WIFN” refers to Walpole Island First Nation; and

“WPLC” refers to the Warwick Public Liaison Committee.

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

TERMS AND CONDITIONS

1.0 GENERAL

Compliance

1.1 This Approval revokes all previous Approvals and Notices of Amendment issued under Part V of the Environmental Protection Act for this Site. The approval given herein, including the terms and conditions set out, replaces all previously issued Approvals and related terms and conditions under Part V of the Act for this Site.

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

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

In Accordance

1.4 Except as otherwise provided by this Approval, the Site shall be designed, developed, built, operated and maintained in accordance with the documentation listed in the attached Schedule "A".

1.5 (a) Construction and installation of aspects described in Schedule "A" must be completed within 5 years of the later of:

1. the date this Approval is issued; or
2. if there is a hearing or other litigation in respect of the issuance of this Approval, the date that this hearing or litigation is disposed of, including all appeals.

(b) Notwithstanding Condition 1.5(a), ongoing constructed aspects that are pertinent to the Major Works identified in Conditions 4.1 to 4.7 including the landfill liner, landfill capping, landfill gas management infrastructure, leachate collection and recirculation infrastructure shall be constructed in accordance with the documentation in the attached Schedule "A" that pertain to the final design of the Site.

(c) This Approval ceases to apply in respect of the aspects of the Site that have not been constructed or installed before the later of the dates identified in Conditions 1.5(a).

Interpretation

1.6 Where there is a conflict between a provision of any document listed in Schedule "A" in this Approval, and the conditions of this Approval, the conditions in this Approval shall take precedence.

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

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

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

Other Legal Obligations

1.10 The issuance of, and compliance with, this Approval does not:

(a) relieve any person of any obligation to comply with any provision of any applicable statute, regulation or other legal requirement; and

(b) limit in any way the authority of the Ministry to require certain steps be taken or to require the Owner and Operator to furnish any further information related to compliance with this Approval.

(c) The Owner shall ensure that:
  (i) all equipment discharging to atmosphere are approved under Section 9 of the ECA where applicable; and
  (ii) all effluent is discharged in accordance with the OWRA where applicable.

Adverse Effect

1.11 The Owner and Operator shall take steps to minimize and ameliorate any adverse effect on the natural environment or impairment of water quality resulting from the present, past and historical operations at the Site. Such steps may include accelerated or additional monitoring as may be necessary to determine the nature and extent of the effect or impairment.

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

1.13 At no time shall the Owner or Operator allow the discharge of a contaminant that causes or is likely to cause an adverse effect be permitted.

Change of Ownership

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

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

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

Registration on Title Requirement

1.17 Prior to dealing with the property in any way, the Owner shall provide a copy of this Approval and any amendments, to any person who acquires an interest in the property as a result of the dealing.

1.18 (a) If not already completed, within ninety (90) calendar days from the date of issuance of this

Approval, the Owner shall submit to the Director a completed Certificate of Requirement which shall include:

(i) a plan of survey prepared, signed and sealed by an Ontario Land Surveyor, which shows the area of the Site where waste has been and is to be deposited at the Site;
(ii) proof of ownership of the Site;
(iii) a letter signed by a member of the Law Society of Upper Canada or other qualified legal practitioner acceptable to the Director, verifying the legal description provided in the Certificate of Requirement;
(iv) the legal abstract of the property; and
(v) any supporting documents including a registerable description of the Site.

(b) If not already completed, within fifteen (15) calendar days of receiving a Certificate of Requirement authorized by the Director, the Owner shall:
(i) register the Certificate of Requirement in the appropriate Land Registry Office on the title to the property; and
(ii) submit to the Director and the District Manager, written verification that the Certificate of Requirement has been registered on title.

Registration on Title Requirement - Contaminant Attenuation Zone (CAZ)

1.19 If not already completed, or if required at any time, within thirty (30) calendar days from the date of establishing a contaminant attenuation zone (CAZ) (overburden and/or bedrock aquifers) in either fee simple or by way of a groundwater easement, the Owner shall submit to the Director a completed Certificate of Requirement which shall include:

(a) If rights are obtained in fee simple, the Owner shall provide:
(i) documentation evidencing ownership of the CAZ obtained in compliance with Regulation 232, as amended;
(ii) a completed Certificate of Requirement and supporting documents containing a registerable description of the CAZ; and
(iii) a letter signed by a member of the Law Society of Upper Canada; or other qualified legal practitioner acceptable to the Director, verifying the legal description of the CAZ.
(b) within fifteen (15) calendar days of receiving a Certificate of Requirement signed or authorized by the Director,the Owner shall:
(i) register the Certificate of Requirement in the appropriate Land Registry Office on the title to the property; and
(ii) submit to the Director and the District Manager, a written verification that the Certificate of Requirement has been registered on title.
(c) If rights are obtained by way of a groundwater easement, the Applicant shall:
(i) provide a copy of the agreement for the easement;
(ii) provide a plan of survey signed and sealed by an Ontario Land Surveyor for the CAZ; and
(iii) submit proof of registration on title of the groundwater easement to the Director and District Manager;
(d) The Owner shall not amend, or remove, or consent to the removal of the easement or CAZ from title without the prior written consent of the Director.

Certificate of Withdrawal of Requirement

1.20 If the Applicant wants to withdraw the Certificate of Requirement, the Applicant shall:

(a) submit to the Director, a request for a Certificate of Withdrawal of Requirement; and its supporting documents, outlining the reasons for the Withdrawal of the Requirement.
(b) submit to the Director:
    (i) a plan of survey of the area where waste was deposited signed and sealed by an Ontario Land Surveyor and for the Site or CAZ;
    (ii) the legal abstract of the Site or CAZ – or area where waste was deposited;
    (iii) completed Certificate of Withdrawal of Requirement containing a registerable description of the Site or CAZ or area where waste was deposited; and
    (iv) a letter signed by a member of the Law Society of Upper Canada or other qualified legal practitioner acceptable to the Director verifying the legal description of the Certificate of Withdrawal of Requirement.
(c) within fifteen (15) calendar days of receiving a Certificate of Withdrawal of Requirement authorized by the Director, the Applicant shall:
    (i) register the Certificate of Withdrawal of Requirement in the appropriate Land Registry Office on the title to the Site or CAZ or area where waste was deposited; and
    (ii) submit to the Director and District Manager a copy of the registered document together with a copy of the PIN Abstract confirming the registration.

Inspections by the Ministry

1.21 No person shall hinder or obstruct a Provincial Officer from carrying out any and all inspections authorized by the OWRA, the EPA, the PA, the SDWA or the NMA, of any place to which this Approval relates, and without limiting the foregoing:
(a) to enter upon the premises where the approved works are located, or the location where the records required by the conditions of this Approval are kept;
(b) to have access to, inspect, and copy any records required to be kept by the conditions of this Approval;
(c) to inspect the Site, related equipment and appurtenances;
(d) to inspect the practices, procedures, or operations required by the conditions of this Approval; and
(e) to sample and monitor for the purposes of assessing compliance with the terms and conditions of this Approval or the EPA, the OWRA, the PA, the SDWA or the NMA.

Information and Record Retention

1.22 (a) Except as authorized in writing by the Director, all records required by this Approval shall be retained at the Site for a minimum of two (2) years from their date of creation.
(b) The Owner shall retain all documentation listed in Schedule "A" for as long as this Approval is valid.
(c) All information and logs required in Condition 9.1 shall be kept at the Site until they are included in the Annual Report.

(d) The Owner shall retain employee training records as long as the employee is working at the Site.
(e) The Owner shall make all of the above documents available for inspection upon request of Ministry staff.

1.23 The receipt of any information by the Ministry or the failure of the Ministry to prosecute any person or to require any person to take any action under this Approval or under any statute, regulation or other legal requirement, in relation to the information, shall not be construed as:
(a) an approval, waiver, or justification by the Ministry of any act or omission of any person that contravenes any term or condition of this Approval or any statute, regulation or other legal requirement; and
(b) acceptance by the Ministry of the information's completeness or accuracy.

1.24 The Owner shall ensure that a copy of this Approval, in its entirety and including all its Notices of Amendment, and documentation listed in Item #1 of Schedule "A", are retained at the Site or the Owner's office at all times.

1.25 Any information related to this Approval and contained in Ministry files may be made available to the public in accordance with the provisions of the Freedom of Information and Protection of Privacy Act, RSO 1990, CF-31.

2.0 FINANCIAL ASSURANCE

2.1 a. The Financial Assurance shall be submitted as required to the Director, Financial Assurance as defined in Section 131 of the Environmental Protection Act. The Financial Assurance shall be in a form acceptable to the Director and shall provide sufficient funds for the analysis, closure, ongoing and long-term monitoring and reporting, post-closure maintenance and care of the Site.

1. On the following dates, the Owner shall ensure the maximum amount of financial assurance has been submitted to the Director in a form acceptable to the Director as follows:

Payment Date	**Amount**
By March 31, 2021	$32,459,985.00
By March 31, 2022	$35,256,829.00
By March 31, 2023	$37,164,501.00
By March 31, 2024	$39,434,722.00

b. Commencing on March 31, 2024 and on a four year basis thereafter, the Owner shall provide to the Director a re-evaluation of the amount of the Financial Assurance to facilitate the actions required under Condition 2.1.a. The re-evaluation shall include an assessment based on any new information relating to the environmental conditions of the Site and shall include the costs of additional monitoring and/or implementation of alternative measures required by the Director upon review of the annual reports. The Financial Assurance must be submitted to the Director within thirty (30) days of written acceptance of the re-evaluation by the Director; and

c. The amount of Financial Assurance is subject to review at any time by the Director and may be amended at his/her discretion. If any Financial Assurance is scheduled to expire or notice is

received, indicating Financial Assurance will not be renewed, and satisfactory methods have not been made to replace the Financial Assurance at least sixty (60) days before the Financial Assurance terminates, the Owner shall forthwith replace the Financial Assurance with cash.

3.0 WARWICK PUBLIC LIAISON COMMITTEE and FIRST NATIONS

WPLC

3.1 The Owner shall continue and maintain the WPLC. The WPLC shall serve as a focal point for dissemination, review and exchange of information and monitoring results relevant to the operation of the undertaking. In addition, the purpose of the WPLC will be to provide community review of the development, operation (current and proposed) and ongoing monitoring, closure and post-closure care related to the landfill Site.

3.2 The general mandate of the WPLC shall include:

a. Review operations and provide regular input to the Owner with respect to all matters pertaining to landfill Site operation, including issues pertaining to ongoing operations, monitoring, the need for contingency plans or remedial measures, response to community complaints, the need for changes to the ECA , post-closure monitoring and maintenance, and development of the proposed end use for the landfill Site;
b. Review operational and monitoring reports;
c. Consider and make recommendations to the Owner regarding outside consulting advice in respect of the landfill Site;
d. Facilitate ongoing dialogue between the Owner, the Environmental Inspector and the community, including residents and businesses in the immediate vicinity of the landfill Site;
e. Provide reports regularly to the community on the activities of the WPLC, the landfill operations and landfill related issues and seek public input on these activities and issues;
f. Monitor the Owner's complaint response program and make recommendations to the Owner with respect to this program; and
g. Provide recommendations to the Owner with respect to unresolved complaints.

3.3 The WPLC shall not exercise any supervisory, regulatory, approval, legal or other decision making role with respect to the operations (current and proposed) at the Site.

3.4 The Owner shall provide for the administrative costs of operating the WPLC, including the cost of meeting places and clerical services.

3.5 The WPLC shall operate under a Terms of Reference of the committee. Suggestions to revise the WPLC Terms of Reference may be made at any meeting that a quorum is present. No changes to the Terms of Reference can be made until the committee members mutually agree to changes. Any changes shall be provided to the Ministry for information purposes.

3.6 The Community members shall be appointed by the WPLC. The community member positions are intended to be available to individuals that are not members of groups already represented on the

WPLC and have an interest in the operation of the landfill. The WPLC shall encourage individuals who reside in close proximity to the landfill to participate. A community member is defined as a taxpayer and/or resident of Warwick Township.

3.7 The function of the Ministry member will be to provide advice, information and input to other members as required.

3.8 The WPLC shall determine the appropriate meeting frequency and review it on an annual basis.

3.9 Minutes and agendas of meetings shall be printed and distributed as per the mailing list on a timely basis.

3.10 The WPLC shall have reasonable access to the Site and its landfill related facilities for the purpose of carrying out its objective and mandate and the Owner's consultants' reports relating to Site operations shall be provided to the WPLC.

3.11 The Owner shall provide the WPLC with access to the Owner's consultants as required and consultants reports in accordance with protocols agreed to between the Owner and the WPLC.

3.12 Unless disclosure would be contrary to the Freedom of Information and Protection of Privacy Act ,the WPLC, the Township of Warwick and Walpole Island First Nation are to be provided all formal submissions and correspondence related to the site operations by the Owner at the same time as these items are submitted to the Ministry, the Township of Warwick Council or any other body.

3.13 The Owner shall allow access to the landfill site during normal operating hours, to enable any individual member of the WPLC and member of the public recommended by local representatives on the WPLC, to observe operations. An individual member of the WPLC must contact the operator to arrange for a Site pass, be accompanied by an operators representative at all times and follow all safety procedures.

3.14 All recommendations made to the Owner with respect to ongoing landfill operations, monitoring and the implementation of contingency measures shall be discussed at joint meetings between representatives of the Owner and the WPLC. The purpose of these meetings will be to arrive at an agreement between the Owner and WPLC with respect to implementation of the recommendations.

3.15 The Owner will disclose all monitoring results to the WPLC and deliver to the WPLC all documents and information (except as may be privileged) relevant to the operation of the landfill.

First Nation and Township of Warwick Consultation

3.16 During the process of submission of an application to amend any approvals for the Site, the Owner shall:

a. discuss with WIFN and the Township of Warwick (Township) the proposed application prior to submission of the WIFN application to the Director;

b. provide the same documents to WIFN and Township that are provided to the Director in respect of the amendments; and
c. provide the Director, either prior to or at the same time of application submission, with a statement how WIFN and Township comments were considered by the Owner.

4.0 CONSTRUCTION, INSTALLATION and PLANNING

Major Works

4.1 For the purposes of this ECA the following are Major Works:

a. gas management system;
b. leachate collection system; and
c. liner.

4.2 a. A final detailed design shall be prepared for each Major Work to be constructed at the Site consistent with the conceptual design of the Site as presented in the Supporting Documentation, specifically Items 66, 67, and 68 of Schedule "A".

b. Geonet may substitute a component of the 0.3 metres of granular in the secondary drainage layer in accordance with Items 54 to 57 inclusive on Schedule "A". The Owner shall ensure that the Quality Assurance/Quality Control procedure detailed in Item 57 of Schedule "A" is followed during installation of the geonet material.

4.3 The final detailed design of each Major Work shall include the following:

a. design drawings and specifications;
b. a detailed quality assurance / quality control (QA/QC) program for construction of the major work, including necessary precautions to avoid disturbance to the underlying soils; and
c. details on the monitoring, maintenance, repair and replacement of the engineered components of the major work, if any.

4.4 Any design optimization or modification that is inconsistent with the conceptual design shall be clearly identified, along with an explanation of the reasons for the change.

4.5 The final detailed design of each Major Work shall be submitted to the Director and copied to the District Manager.

4.6 Each major work shall be constructed in accordance with the approved final detailed design and the QA/QC procedures shall be implemented as proposed by the Owner. Any significant variances from the conceptual design for the Site as detailed in Items 66, 67 and 68 of Schedule "A" shall be subject to approval by the Director.

4.7 As-built drawings for all Major Works shall be retained on Site and made available to Ministry staff for inspection.

Subsequent Stages

4.8 At least six (6) months prior to the anticipated completion of landfilling in each stage of the Site , a final detailed design for the subsequent stage shall be submitted to the Director. Any significant variances from the conceptual design for the Site as detailed in Items 66, 67 and 68 of Schedule "A" shall be subject to approval by the Director.

4.9 No person shall deposit any waste at the subsequent stage until a written Preparation Report in accordance with O. Reg. 232/98, Section 19 has been submitted to the Director and District Manager documenting that:

a. all construction;
b. QA/QC activities;
c. Site conditions; and,
d. all details of the construction of the Site;

are in accordance with the approved design plans and specifications.

4.10 Approval to proceed with landfilling or construction of each subsequent stage shall be dependent on groundwater, air quality and surface water monitoring results acceptable to the Director. If monitoring results are not acceptable to the Director then remedial action must be taken and completed before landfilling may proceed in the subsequent stage.

Geotechnical Engineer

4.11 A qualified professional geotechnical engineer shall inspect the excavation and construction underlying the Site and provide a report addressing whether the construction proceeded in accordance with approved detailed design plans, specifications and QA/QC procedures. The report shall be included in the Preparation Reports for each stage of the landfill.

Environmental Inspector

4.12 In accordance with conditions 18 and 19 of the EA approval dated January 15, 2007 known as Item 1 on Schedule “A”, the Owner shall provide funding to the Ministry for the provision of an Environmental Inspector to inspect the Site, at any reasonable time on such terms and conditions, as deemed appropriate by the District Manager of the District Office and outlined in a written agreement with the Owner. Within the agreement, the Owner shall commit to providing, as a minimum, the following:

a. Adequate office facilities, communication equipment, and means of transportation for the Environmental Inspector; and,
b. Reimbursement to the MECP semi-annually for the costs and associated expenses of the

Environmental Inspector.

4.13 The Owner shall provide funding for an Environmental Inspector on Site based on the following:

a. Construction Phase/Operations Phase- Full-time, on-Site inspector with the inspector being on Site a full day each day for five (5) days per calendar week for the first two years of the operation phase.

4.14 a. Every two (2) years commencing on February 1, 2012, the Owner shall prepare and submit a report to the District Manager detailing the status and need for a Environmental Inspector based on discussions with the Township of Warwick, WIFN and the WPLC regarding the inspection frequency for the Environmental Inspector. The inspection frequency of the Environmental Inspector shall remain as per the requirements outlined in Condition 4.13 during the operation phase until a decision is made by the District Manager on the appropriate inspection frequency.

b. Notwithstanding Conditions 4.12 to 4.14 (1) and 15.3, inclusive, the Environmental Inspector's duties may, in consultation with the Owner, be increased, reduced, suspended or terminated on such terms and conditions as deemed appropriate by the District Manager and, for greater certainty, the District Manager may require an Environmental Inspector to be on-Site for up to seven days per week in cases of apparent significant non-compliance with the conditions of the EA approval or any approval issued for the Site under the EPA until such non-compliance is resolved.

5.0 OTHER WORKS

Berm Construction

5.1 All berm slopes associated with this approval shall be no greater than 3:1.

Diversion Area

5.2 The diversion area will be located to the east of the treated leachate storage lagoons.

Cell 12

5.3 a. Cell 12 will be used as a monofil of contaminated soils until redeveloped and incorporated into the Expansion Site in accordance with Items 66 through 68 of Schedule "A".

b. The management of the Cell 12 monofill shall be in accordance with the procedures and practices consistent with other previous monofill operations at the Site.

Landscape

5.4 The Owner shall ensure the landscape plan is carried out in accordance with Item 72 and 80 of Schedule "A", as amended from time to time.

6.0 GENERAL OPERATIONS

Proper Operation

6.1 The Site shall be properly operated and maintained at all times. All waste shall be managed and disposed of in accordance with the EPA , Regulation 347 , Regulation 232 , and the requirements of this ECA. At no time shall the discharge of a contaminant that causes or is likely to cause an adverse effect be permitted.

6.2 The Owner shall ensure that the MECP's Guideline B-7, Reasonable Use Concept, is applied at the Site boundaries.

6.3 a. Landfilling operations shall be conducted in accordance with Items 66 through 71 of Schedule "A" attached to this ECA.

b. The Owner shall ensure the operations and procedures manual for the the Site includes discussions on the following items:

a. Health and safety;
b. Operation and maintenance of the Site;
c. Waste disposal area and development;
d. Nuisance management;
e. Leachate management;
f. Landfill gas management;
g. Surface water/Storm water management;
h. Inspections and monitoring;
i. Contingency plans and emergency procedures;
j. Complaints; and,
k. Reporting and record keeping.

c. The operations and procedures manual shall be:

a. retained at the Site;
b. reviewed on an annual basis and updated by the Owner as required; and
c. be available for inspection by Ministry staff.

Waste Type

6.4 Only the following types of waste shall be accepted at the Site:

a. municipal, industrial, commercial and institutional solid non-hazardous waste generated within the Province of Ontario, including non-hazardous contaminated soil.

Capacity

6.5 The Owner shall only accept and deposit waste at the Site as long as there is available capacity as defined by the final contours for the Site approved by this ECA . The approval permits disposal of waste at the Site to fill an air space of 26,508,000 cubic metres (including waste, daily and interim cover material). This capacity includes the capacity of the existing and expansion landfill areas.

Yearly Waste Limit

6.6 a. The Owner can receive up to a maximum of 1,400,000 tonnes per year of waste including contaminated soil for disposal at the Site.

b. The amount of tire shred that may be received to process is 7,160 tonnes/year.

c. Up to a maximum of 100 tonnes per day of solid non-hazardous waste, white goods and metals, recyclable waste, wood waste, and leaf and yard waste that are deposited by the public using small vehicles at the Mini-Transfer Area of the Site may be transferred from the Site by a waste hauler or waste haulers that has an ECA to another waste disposal site.

Service Area

6.7 Only waste that is generated in the Province of Ontario shall be accepted at the Site.

Landfilling of Sludge

6.8 A thickness of at least 2 metres of compacted waste and cover material shall be maintained between any landfilled sludge (solid non-hazardous as per Reg. 347) and the granular leachate collection layer.

Asbestos Waste

6.9 Any waste that is considered asbestos waste shall be handled in accordance with Section 17 of O. Reg. 347 as amended from time to time.

6.10 A suitable sized excavation for the asbestos waste shall be made by the Owner in a location away from the active landfilling face.

6.11 All asbestos waste shall be inspected to ensure that the asbestos waste is properly bagged or contained and free from puncture, tears or leaks.

6.12 The asbestos waste shall be placed in the excavation to avoid damage to the containers and to prevent dust and spillage.

6.13 Upon completion of the unloading and deposition of the asbestos in the excavation, at least 125 centimetres of cover or waste material shall be placed over the asbestos.

6.14 All asbestos waste shall be deposited to a level no higher that 1.25 metres below the general elevation of the disposal area to ensure that daily cover material removal in the future does not encounter the asbestos waste.

Waste Limits

6.15 No waste, including daily cover, intermediate cover or final cover layer, shall be landfilled outside the limits of the base and final cover contours presented in Items 66 through 71 of Schedule "A"**(**the Development and Operations Plan) attached to this ECA .

Site Use

6.16 The area inside the fencing indicated in Appendix N18 of Item 30 of Schedule "A" shall be used for waste disposal purposes only. The remainder of the Site outside the fenced area shall be used for traditional agricultural crop production only.

Waste Inspection

6.17 All loads of waste must be properly inspected by trained Site personnel prior to disposal at the Site and waste vehicles must be diverted to appropriate areas for waste disposal.

Waste Deposit

6.18 The Owner shall deposit waste in a manner that minimizes exposure area at the landfill working face and waste shall be compacted before cover is applied.

Burning Waste Prohibited

6.19 Burning of waste at the Site is prohibited.

Signage

6.20 A sign shall be maintained at the main entrance/exit to the Site on which is legibly displayed the following information:

a. the name of the Site and Owner;
b. the number of the ECA;
c. the name of the Operator;
d. the normal hours of operation;
e. the allowable and prohibited waste types;
f. a warning against unauthorized access;
g. the telephone number to which complaints may be directed;
h. a twenty-four (24) hour emergency telephone number (if different from above); and
i. a warning against dumping outside the Site.

6.21 The Owner shall install and maintain signs to direct vehicles to working face and recycling areas.

6.22 The Owner shall maintain signs at recycling depot informing users what materials are acceptable and directing users to appropriate storage area.

Hours of Operation

6.23 Waste shall only be accepted at the Site during the following time periods:

a. 7 AM to 7 PM - Monday to Saturday.

6.24 On-site equipment used for daily Site preparation and closing activities shall only be used during:

a. 6 AM to 8 PM - Monday to Saturday.

6.25 With prior written approval of the District Manager, the time periods may be extended to accommodate seasonal or unusual quantities of waste or such factors as determined to be reasonable to the District Manager.

6.26 The Owner may provide limited hours of operation provided that the hours are posted at the landfill gate and that suitable notice is provided to the public of any change in operating hours.

6.27 Upon reasonable notice to the District Manager, contingency actions may take place outside normal hours of operation. Emergency response may occur at any time as required.

Site Security

6.28 During non-operating hours, the Site entrance and exit gates shall be locked and the Site shall be secured against access by unauthorized persons.

Fencing

6.29 The entire area as shown in Figure 12 in Item 66 of Schedule "A" shall be fenced by the Owner with a 6 foot high wire woven highway-type paige fence.

Site Access

6.30 Access to and exit from the Site for the transportation of waste shall under normal circumstances be permitted from County Road 79.

Access Roads

6.31 a. On-Site roads shall be provided and maintained in a manner that vehicles hauling waste to and on the Site may travel readily and safely on any operating day. During winter months, when the Site is in operation, roads must be maintained to ensure safe access to the landfill working face.

b. Access roads must be clear of mud, ice and debris which may create hazardous conditions.

Vermin, Dust, Litter, Odour, Noise, Traffic

6.32 The Site shall be operated and maintained such that vermin, vectors, dust, litter, odour, noise and traffic do not create a nuisance.

Scavenging

6.33 The Owner shall ensure that there is no scavenging as defined in O. Reg. 347 at the Site.

Dust

6.34 The Owner shall control fugitive dust emissions from on Site sources including but not limited to on-Site roads, stockpiled cover material and, closed landfill area prior to seeding especially during times of dry weather conditions. If necessary, major sources of dust shall be treated with water and/or dust suppression materials to minimize the overall dust emissions from the Site.

6.35 Dust shall be managed as per the Best Management Practices Plan (Dust) prepared by RWDI listed as Item 83 in Schedule "A".

Litter Control

6.36 The Owner shall take all practical steps to prevent escape of litter from the Site. All loose, windblown litter shall be collected and disposed of at the landfill working face.

6.37 Litter pickup will occur at least weekly on the Owner's property during all weather conditions.

6.38 The Owner will respond to litter complaints within one (1) business day of the complaint being received.

6.39 Litter shall be managed in accordance with the Best Management Practices plan prepared by RWDI listed as Item 25 on Schedule "A".

Odour

6.40 Odour shall be managed in accordance with the Best Management Practices Plan (Odour) prepared by RWDI listed as Item 84 in Schedule "A".

Noise

6.41 The Owner shall comply with noise criteria in MECP Guideline entitled “Noise Guidelines for Landfill Sites" dated October 1998 as amended from time to time and the Site shall comply with the limits set in Publication NPC205. Bird bangers may be used at the Site for gull control provided that they produce

reference impulsive sound not exceeding 125 dBAI at 5 metres from the bird banger.

6.42 Noise monitoring at the Site shall be undertaken by the Owner as per the document entitled "Environmental Noise Monitoring Program for the Warwick Landfill", dated June 15, 2007 prepared by Aercoustics Engineering Limited listed as Item 73 on Schedule "A".

Alteration of Best Management Plans for Odour, Dust and Litter

6.43 The Owner shall use the Best Management Plans (BMP's) for dust, odour and litter at the Site in accordance with the applicable Conditions approved by this ECA. The Owner may submit changes in writing to the Director for approval to amend the BMP(s). At the same time any changes to the BMP's are submitted to the Director, the Owner shall provide the proposed changes to the BMP's to the Township of Warwick, WPLC and WIFN.

Surface Water

6.44 The Owner shall take all appropriate measures to minimize surface water from coming in contact with waste. Temporary berms and ditches shall be constructed around active waste disposal areas to prevent extraneous surface water from coming in contact with the active working face.

6.45 The Owner shall not discharge surface water to receiving water bodies without an approval under the EPA.

6.46 If surface water ponding occurs in any surface water ditches having a drainage slope less than 0.5%, the Owner shall regrade the ditches.

Application of Cover Material

6.47 Cover material shall be applied as follows:

a. Daily Cover - At the end of each working day, the entire working face shall be covered with a minimum thickness of 150 mm of soil cover or an approved alternative cover material;

b. Intermediate Cover - In areas where landfilling has been temporarily discontinued for six (6) months or more, a minimum thickness of 300 mm of soil cover or an approved alternative cover material shall be placed;

c. Final Cover - In areas where landfilling has been completed to final contours, a minimum 1.85 metre thick layer of final cover soil shall be placed. Fill areas shall be progressively completed and rehabilitated as landfill development reaches final contours; and

d. Topsoil - In areas where landfilling has been completed to final contours and where final cover has been placed, a minimum 0.15 metres thick layer of topsoil shall be placed.

Cover Materials Allowed

6.48 The following materials, in the corresponding thickness, may be used as an alternative to soil as a daily and intermediate cover:

a. Contaminated soil that satisfies the Schedule IV Toxicity Characteristic Leaching Procedure (TCLP) criteria as outlined in O. Reg. 347 as amended from time to time;
b. Wood chips (daily);
c. Automobile Shredder Residue (ASR) (daily); or
d. Tarps (daily).

6.49 The use of any other alternative materials as daily or intermediate cover material is subject to approval by the Director.

6.50 Use of alternative daily or intermediate cover materials shall be discontinued within two (2) working days of receipt of written notification from the District Manager, stating that the use of the alternative daily or intermediate cover materials at the Site has proven to be environmentally unsuitable.

Automobile Shredder Residue as Daily Cover

6.51 a. Automobile Shredder Residue (ASR) may be used as a daily cover at the Site on an on-going basis from the issuance of this Approval.

b. The Owner shall cease the use of ASR if written notification is received from the District Manager indicating that there are environmental concerns due to the use of ASR as daily cover based on the testing of the ASR required by Condition 6.52.

c. The Owner may re-commence the use of ASR upon the Owner submitting an action plan that is acceptable to the District Manager that can address the environmental concerns which were raised due to the the use of ASR as daily cover.

6.52 Automobile Shredder Residue samples of the daily cover material are to be taken on semi-annual basis (Spring and Fall) and submitted for analysis of O. Reg. 347 Schedule IV Inorganics, VOC's, and PAH's. Automobile Shredder Residue is to conform with the specifications of a non-hazardous waste under O. Reg. 347 as amended from time to time. Semi-Annually testing results are to be submitted to the District Manager upon receipt. The frequency of O. Reg. 347 testing of the daily cover material can be reduced subject to approval of the District Manager.

Contaminated Soil as Daily or Intermediate Cover

6.53 Contaminated soil equal to or below 10% of the TCLP value and/or 0.4 mg/L benzene may be landfilled in Cells 8, 10 and/or 12.

6.54 If confirmatory testing of the contaminated soil to be landfilled in Cells 8, 10 and/or 12 indicates an

exceedance of 10% of the TCLP value and/or 0.4 mg/L of benzene, but satisfies the TCLP criteria as in O.Reg. 347, the soil may be used as daily and/or intermediate cover, and or landfilled as waste.

6.55 If the contaminated soil received at the Site does not meet the TCLP value, the contaminated soil shall be classified as a hazardous waste and shall be disposed of at a site that is approved to receive and dispose of hazardous waste.

6.56 Contaminated soil that satisfies the TCLP criteria may be used as daily and/or intermediate cover in the Expansion Site of the landfill. Contaminated soils may not be used on outside slopes which drain into the surface water system.

6.57 Contaminated soil used for daily and/or intermediate cover shall be sampled on a quarterly basis and submitted for analysis of O.Reg. 347 Schedule IV Inorganics, VOCs, PAHs and PCBs. Quarterly testing results shall be included in the annual report. The frequency of O. Reg. 347 testing of the cover material may be reduced subject to agreement of the District Manager.

6.58 Contaminated soil for use as daily cover and/or intermediate cover shall be stockpiled in areas of the Site that have a leachate collection system installed below.

6.59 Surface water run off from the contaminated soils stockpile which exceeds the Provincial Water Quality Objectives shall not be discharged through the surface water management system.

6.60 The Owner must ensure that measures are in place for the on Site treatment and disposal of any contaminated run off from the contaminated soils stockpile.

6.61 Prior to receipt at the Site, each source of contaminated soils which are to be used as daily or intermediate cover shall be tested to determine if the soils meet the criteria in this ECA and a copy of the test results shall be kept in the daily records for the Site as required.

7.0 SITE OPERATIONS

Landfill Reclamation

7.1 The Owner shall restrict stockpiling of contaminated soil from Cells 8, 10 and 12 to sections of the landfill footprint that have a liner and leachate collection system.

Waste Processing and Composting

7.2 Waste Processing and composting is allowed at the location outlined in Item 49 on Schedule "A" subject to the following conditions:

a. Prior to the commencement of any waste processing or composting operations at the Site, the Owner shall ensure that air (Section 9 EPA) and noise approvals are obtained;
b. Prior to the start of composting operations at the Site, the Owner shall submit to the District

Manager a contingency plan for any odour problems that may occur;

c. The total combined amount of waste that may be received at the Site for processing and composting shall not exceed 36,000 tonnes per year and the maximum daily amount to be received at the Site shall not exceed 700 tonnes per day;
d. The amount of waste that may be received at the Site for composting shall not exceed 7,500 tonnes per year;
e. Material acceptable for processing and composting at the site shall include leaf, yard, agricultural waste, concrete, asphalt, wood and tires;
f. The bins for diversion shall be emptied on an as needed basis to prevent odours and operational problems. The Ministry may at any time instruct that a bin be emptied;
g. The Owner shall ensure that waste processing and composting is undertaken in a safe manner, and that all waste is properly handled, processed and contained so as not to pose any threat to the general public and site personnel;
h. All noise generating processing activities in the waste diversion area including concrete/asphalt/crushing, wood chipping and tire shredding shall only occur between 07:00 to 19:00; and
i. Any runoff that comes into contact with waste in the waste processing/composting area shall be managed in such a fashion to ensure compliance with Condition 8.5 of this ECA.

7.3 The Owner shall ensure that composting at the Site is undertaken in accordance with O.Reg 101/94 as amended from time to time and the Ministry document entitled "Interim Guidelines for the Production and Use of Aerobic Compost in Ontario " dated November 2004 as amended from time to time and the following requirements:

a. Only leaf and yard waste, Agricultural Waste as defined in Item 3 in Schedule "A" and wood (not including painted or treated wood or laminated wood) may be accepted at the compost area.
b. Leaf and yard waste is defined as waste consisting of natural Christmas trees and other plant materials but not tree limbs or other woody materials in excess of seven (7) centimetres in diameter.
c. The composting site shall only receive material for composting from May 1st to November 1st each year.
d. Leaf and yard waste, Agricultural Waste and wood may not be stored for more than four (4) days before it is composted.
e. During composting, the Owner shall provide the composting mass with adequate ventilation to ensure that aerobic conditions are maintained.
f. Cured compost must be analyzed for the parameters listed in Table 1 of O.Reg. 101/94 and shall not be removed from the Site unless it has been sampled and analyzed.
g. Cured compost is defined as meeting the specifications in Sections 7.2 to 7.5 inclusive of the Interim Guidelines for the Production and Use of Aerobic Compost in Ontario" dated November 2004 as amended from time to time and can be used on an unrestricted basis.
h. Compost is designated a waste if the compost contains a substance listed in Table 1 of O. Reg. 101/94 that has a concentration greater than the concentration listed in Column 2.
i. Controlled compost is defined as compost that is designated a waste under the previous condition but has concentrations less than the concentrations listed in Column 3 of Table 1

in O. Reg. 101/94.

j. Controlled compost may not be removed from the site except for direct shipment to the intended user.

k. Material from the composting process that fails to meet the "Interim Guidelines for the Production and Use of Aerobic Compost in Ontario" dated November 2004 shall be deemed to be a waste under O. Reg. 347 and shall be disposed of accordingly.

l. The person to whom controlled compost is shipped shall be given a copy of the chemical analysis of the compost and a notice that states that the compost is controlled compost and that sets out the terms and conditions of the compost's exemption from Part V of the EPA. A copy of this notice shall be kept on file at the Site.

m. The District Manager may at any time and at his absolute discretion instruct that any or all of the waste materials from the composting or processing operations or the processed waste from the composting or processing operations to be either landfilled or directed to be utilized for specific uses and in specific locations.

7.4 Record keeping for the composting operation shall be kept as follows:

a. Records about each composting mass shall be kept including temperatures of the mass, when the temperatures were measured, when the mass was turned, information about the curing process and details about significant problems that occurred during composting or curing. This information shall be kept at the Site for at least three years after the mass was cured;

b. Records shall be kept of the analyses of compost. Any laboratory records shall be kept as part of the record. A record of an analysis shall be kept for at least three years after the analysis is performed; and

c. A record shall be kept of the name, address and telephone number of each person to whom controlled compost is shipped. The record shall be kept for at least ten (10) years after the shipment.

Tire Shred

7.5 The management and placement of tire shreds at the Site shall be in accordance with the Fire Protection and Prevention Act as follows:

a. No individual tire shred pile shall be more than 3 metres in height and 100 square metres in area. Six (6) metres of space shall be provided between all piles. Fifteen (15) metres is to be provided from property lines and thirty (30) metres shall be provided from tree lines;

b. A buffer of 4.5 metres is to be provided for grass or weeds from the edge of the tire pile to the edge of the pad.

c. A firebreak of 22 metres shall be provided between the two areas of 16 piles each.

7.6 If the total stockpiled tire shreds exceeds 300 cubic metres, the storage period shall not exceed 90 (ninety) days.

7.7 The total amount of tire shreds stored on Site shall be recorded in a log book and made available to the Ministry for inspection.

Backup Power

7.8 The Owner shall maintain adequate backup power at the Site in order to ensure scale facility and landfill gas blower on site continue to operate and are not damaged due to an extended power outage. A power supply connection at each leachate collection pumping station shall be maintained by the Owner that will permit a portable generator to be connected during a power outage.

Landfill Gas

7.9 All buildings are to be free of any landfill gas accumulation. The Owner shall provide adequate ventilation systems to relieve landfill gas accumulations in buildings if necessary.

Landfill Gas Management

7.10 The Owner shall, manage landfill gas in accordance with Items 66 through 68, Items 75 through 77, and Item 81 of Schedule "A" and based on the landfill gas management system constructed under the authority of the EPA Approval issued which may be amended or replaced from time to time.

Cleaning of Leachate Collection System

7.11 The leachate collection system piping for each stage of the landfill shall be inspected annually for the first five years after waste placement and then as often as future inspections indicate to be necessary. Additionally, leachate collection pipes must be cleaned whenever an inspection indicates that cleaning is necessary.

7.12 In areas where leachate collection pipe slopes are less than 0.5%, the leachate collection pipes shall be inspected semi-annually for the first three (3) years after waste placement and then as often as future inspections indicate to be necessary. Additionally, leachate collection pipes must be cleaned whenever an inspection indicates that cleaning is necessary. After the three (3) year period, inspection and cleaning of the leachate collection pipes shall be in accordance with the previous condition.

Leachate Collection System

7.13 All leachate collection pipes for Cell 12 shall be sloped at a minimum of 0.5%.

7.14 The Owner shall install 250 mm diameter perforated leachate collection pipes with perforations located at the 10:30, 4:30, 1:30 and 7:30 positions.

7.15 The stone for the leachate collection system shall have the following specifications:

a. D85 shall be greater than 37 mm where D85 is described as the stone diameter such that,

when measured by weight, 85% of the stones in the layer have a smaller diameter;

b. D10 shall be greater than 19 mm where D10 is the stone diameter such that, when measured by weight, 10% of the stones in the layer have a smaller diameter;
c. D60/D10 shall be less than 2; and,
d. One per cent (1%) of the stones may pass a #200 sieve.

7.16 A minimum of 50 mm of stone shall be placed below the leachate collection pipes and a minimum of 250 mm of stone shall be placed above any leachate collection pipes.

7.17 The Owner shall ensure that the leachate collection system is constructed under the supervision of a qualified consultant.

Hydraulic Trap

7.18 The Owner shall ensure that a hydraulic trap is developed and maintained beneath the Expansion Area and shall ensure that a maximum leachate head of 300 mm on the landfill liner is not exceeded.

Renewable Natural Gas (RNG) Facility

7.19 The Renewable Natural Gas Facility shall be constructed and operated in accordance with Items 88 to 89 in Schedule A.

7.20 The Owner shall ensure that the flares of the RNG facility have adequate capacity to handle all the landfill gas collected, and the blowers shall be able to draw a vacuum of no less than 100 inches of water column.

7.21 The Owner shall ensure that the capacity of the landfill gas blower/flare facility and the RNG facility be assessed each time of the gas collection system expansion. The owner shall upgrade the landfill gas blower/flare facility or the RNG facility, if necessary, to ensure there is adequate capacity to handle the expected maximum landfill gas flow.

7.22 Prior to the operation of the RNG facility, the Owner shall ensure that the following documents are updated and training provided to employees involved in the RNG operation:

a. the Best Management Practices Plan for odour in accordance with Item 90 of Schedule A;
b. the Operation and Maintenance Manual for the RNG facility.

7.23 The Owner shall maintain daily operational record of the RNG facility at the site, and ensure the following information for the RNG facility are included in the annual report:

a. the total amount of landfill gas processed at the RNG facility;
b. the total amount of processed renewable natural gas sent to the off-site network;
c. the total amount of off-specification landfill gas that was flared;
d. a summary of the RNG facility operational disruptions and the response;
e. a summary of adverse effects such as odour, spills, fire emergency, etc., and the remediation

implemented; and

f. an assessment of the adequacy of the RNG facility treatment capacity and the need for system upgrade.

8.0 LEACHATE MANAGEMENT

Leachate Recirculation

8.1 Prior to implementing the leachate recirculation program , a report on the moisture content of the incoming waste and the actual field capacity of the waste in situ shall be submitted to the Director.

8.2 The Director may at any time, terminate leachate recirculation at the Site if, in the Ministry's opinion, adverse effects on the environment are observed.

8.3 Before starting leachate recirculation, the Owner shall provide to the Director a monitoring program to ascertain the effectiveness of the leachate recirculation process.

8.4 Leachate recirculation shall not occur in any above grade locations until final cover has been installed on exterior side slopes.

Leachate Management Plan

8.5 The Owner’s leachate management plan shall not include any direct discharge of leachate or treated leachate from the Site, even as a contingency option, to surface waters, including Bear Creek. The Owner shall not discharge leachate or treated leachate to surface waters, including Bear Creek from the Site.

Leachate Treatment Plant

8.6 (1) (a) Within a minimum of three (3) years prior to closure of the landfill Site, the Owner shall ensure that a leachate treatment system is installed and operational at the Site.

(b) Leachate from the Site not sent to the operational drip irrigation area(s) approved under Condition 8.7 shall be disposed of off-Site at a location approved by the District Manager until the leachate treatment system required by Condition 8.6 (1)(a) is approved and operational.

(c) Any waste from the leachate treatment system that is to be disposed of in the landfill must be classified as a solid non-hazardous waste.

(d) The Owner shall implement all items within the document entitled Leachate Management Framework, listed as Item 86 in Schedule "A". These items include new and existing leachate monitor locations (wells, mini piezometers, and sump), leachate monitoring, leachate level reporting, Leachate Management Plan by March 31, 2020 and updated

every 3 years, and the Leachate Treatment Facility Study to be completed at least 7 years prior to closure of the landfill.

(2) As part of the financial assurance calculation in Section 2.0, the Owner shall provide to the Director for approval, a detailed financial assurance plan including the cost of leachate transportation and disposal for the landfill site during the period preceding the initiation of the leachate treatment system. In addition, the Owner shall provide to the Director for approval a financial assurance plan detailing the capital cost of the on-Site leachate treatment system.

Phytoremediation of Leachate - Existing and Proposed Poplar Plantations

8.7 On-Site phytoremediation may occur at the Poplar System and Poplar Plantation in accordance with the following conditions:

a. The Owner shall ensure that there is a 100 metre grassed buffer at all times from the Poplar Plantation to the Kersey drain.
b. Irrigation of leachate onto the either the Poplar Plantation or the Poplar System shall not occur in the following instances:

i. Between the dates of October 16 to April 30;
ii. On frozen or snow covered ground conditions;
iii. Under conditions that will cause ponded water or runoff;
iv. Conditions where surface water ponding within the area is occurring;
v. Where no poplar trees are currently planted;
vi. In areas within a drip irrigation area where trees have been harvested more than a frequency greater than every other tree;
vii. In areas within a drip irrigation area that has been fully harvested clear of trees and the trees have not started to coppice.

c. If weather forecasts indicate a rainfall storm greater than 12.5 mm/hour will occur, the Owner shall within 1 hour before the storm, shut off all irrigation of the poplar forest.
d. Irrigation zones shall be individually assessed by the Owner for suitability of irrigation after rainfall events greater than 12.5 mm.
e. Records shall be kept for the Poplar System and Poplar Plantation areas as follows:

i. quantities and dates of application of pesticides and herbicides;
ii. inspection notes regarding tree growth rates and health;
iii. inspection notes regarding condition and growth of underlying vegetative landfill cover (ie grass);
iv. observed pooling and/or runoff of irrigated liquid;
v. observations of any odours; and,
vi. weather conditions records as may be obtained from the nearest Environment Canada Weather Office which may include daily high and low temperatures, wind velocity and direction, and precipitation quantities.

f. Irrigation onto either the Poplar System or the Poplar Plantation shall be as follows:

i. Detailed records shall be kept of the quantities of irrigation liquid that are applied, including the dates of application onto either drip irrigation area;
ii. Operations in a given drip irrigation area must immediately stop if contamination problems in surface water or groundwater, which are attributable to the operation of the noted drip irrigation area, are found to be occurring. Recommencement of operations may proceed only upon further written notification of the District Manager;
iii. Operations of a given drip irrigation area must be discontinued immediately if operation of the noted drip irrigation area causes surface runoff from the footprint area or if operations cause surface ponding within the drip irrigation area; operations cannot be restarted during that application day and can only be restarted after surface ponding has evaporated or infiltrated or conditions causing the runoff or ponding have been rectified;
iv. If there are any stoppages of operations under the requirements of items ii) or iii) above, then the District Manager shall be notified immediately; and,
v. If odours attributable to one of the drip irrigation areas become a problem at the site, then the District Manager shall be so informed in writing and the operation of the noted drip irrigation area shall be stopped pending further instructions from the District Manager;

g. (1) Monitoring of the drip irrigation Poplar System and the Poplar Plantation shall be in accordance with Items 63 through 65 of Schedule “A”.

(2) Monitoring frequencies and analyses for the following items shall be as follows:

i. Daily inspections for ponded water or saturated soil during irrigation;
ii. Monthly testing of irrigation liquid quality during the irrigation season;
iii. Soil samples should be taken annually from grade to a depth of 0.6 m minimum and 0.9 m maximum;
iv. Annual soil analyses shall be conducted annually per Section 3.1 of Item 63 of Schedule "A", in addition to pH, electrical conductivity, cation exchange capacity, and sodium absorption ratio;
v. Leaf Tissue analyses once per year in the fall; and
vi. Crop inspection once per year in the fall.

h. Reporting on the drip irrigation areas shall be part of the annual monitoring report for the Site and shall include but not be limited to the following:

i. results and an analysis of the results of the monitoring programs for the drip irrigation areas:
ii. assessment of the results of the vegetation as related to the stated objectives for the Poplar System and Poplar Plantation facilities construction and operations;

iii. assessment of the need to change the monitoring program for the drip irrigation areas and a recommendation of the required changes;
iv. tabulation and assessment of the volumes of leachate produced by the landfill, and those volumes which may be applied to the existing drip irrigation areas;
v. a report on operational problems identified during the operation of the drip irrigation areas and a discussion of each problem and details of what was done to rectify each problem;
vi. a Site plan which shows the location of the areas planted with both trees and grass cover and the vegetation used on those areas;
vii. an assessment of the monitoring results pertaining to the use of trees as vegetation on the final cover.

i. The Director retains the right to request that the Owner conduct additional studies, suspend operations or require the Owner to provide additional methods to handle leachate at the Site in addition to or as a replacement to the drip irrigation areas.

j. If the Director requests removal of the drip irrigation areas, the Owner shall:

i. remove the irrigation equipment and the trees from the noted drip irrigation area. For the Poplar System, removal of trees shall include removal of tree stumps and most roots, excavate the trench to the maximum depth of root depth penetration on each tree row, and then replace, remould and recompact the excavated material;
ii. the landfill cover shall be restored to the same condition as it was in prior to commencement of the Poplar System and a blend of suitable grasses shall be seeded as necessary; and,
iii. within 6 months of completion of the noted drip irrigation area closure activities, submit to the Director a report outlining the work that has been completed.

k. Electrical conductivity of the shallow soil (maximum depth of 0.15 m) beneath the drip irrigation areas shall be monitored on a weekly basis during irrigation.

l. If salt levels are building up in the soil or additional irrigation with leachate is found to be detrimental to the health of the poplars, the leachate application rate shall be reduced or terminated.

Wood Waste and Leaf Litter

m. Any wood waste or leaf litter that is produced in the Poplar System or Poplar Plantation shall managed in accordance with Item 63 of Schedule "A".

Other Items

n. (1) Drip irrigation rates for the Poplar Plantation shall be no greater that the rate specified

in the EPA approval for the Site.

(2) Drip irrigation rates for the Poplar System shall be no greater than the rates noted in Item 63 of Schedule "A".

o. No drip irrigation shall occur within fifty (50) metres of any surface watercourse or drain.

p. (1) Leachate to be used for drip irrigation on the Poplar Plantation shall not exceed the treated leachate effluent criteria specified in the EPAapproval for applicable industrial sewage works for the Site.

(2) Leachate to be used for drip irrigation on the Poplar System shall not exceed the treated leachate effluent criteria specified in the Item 63 through 65 in Schedule "A".

q. The use of the Poplar Plantation to manage irrigation leachate will not be permitted without first providing the District Manger with at least two (2) months written notice of the anticipated irrigation liquid application date. The use of surface water to encourage tree growth will be permitted and will not be considered as irrigation liquid.

r. Monitoring and the associated reporting for the Poplar Plantation will commence at least two (2) months prior to irrigation liquid application and continue until two (2) years after cessation of irrigation liquid application to the Poplar Plantation.

Leachate Storage Tanks

s. The leachate storage tanks shall be inspected by a licenced plumber on an annual basis.

t. The leachate storage tanks shall be cleaned and sediment removed at least once every two (2) years.

9.0 INSPECTIONS AND RECORDS

Inspections

9.1 The Owner shall inspect the Site monthly for the following items but not limited to these items:

a. Erosion rills;
b. General settlement areas or depressions;
c. Shear and tension cracks;
d. Condition of surface water drainage works;
e. Erosion and sedimentation in surface water drainage system;
f. Presence of any ponded water;
h. Adequacy of cover material;
i. Evidence of vegetative stress, distressed poplars or side slope plantings;
j. Condition of groundwater monitoring wells and gas wells;

k. Presence of insects, vermin, rodents and scavenging animals;
l. Condition of fence surrounding the Site; and
m. General Site appearance.

9.2 The Owner shall inspect the Site weekly for presence of leachate seeps.

Daily Inspections and Log Book

9.3 An inspection of the entire Site and all equipment on the Site shall be conducted each day the Site is in operation to ensure that the site is being operated in compliance with this ECA . Any deficiencies discovered as a result of the inspection shall be remedied immediately, including temporarily ceasing operations at the Site if needed.

9.4 A record of the inspections shall be kept in a daily log book or a dedicated electronic file that includes:

i. the name and signature of person that conducted the inspection;
ii. the date and time of the inspection;
iii. the list of any deficiencies discovered;
iv. the recommendations for remedial action; and
v. the date, time and description of actions taken.

9.5 A record shall be kept in a daily log book of all refusal of waste shipments, the reason(s) for refusal, and the origin of the waste, if known.

Monthly Records

9.6 Monthly Site inspection records in the form of a written log or a dedicated electronic file shall include but not be limited to the following:

a. the type, geographic source, date and time of arrival, hauler, and quantity (tonnes) of all waste received at the Site;
b. the area of the Site in which waste disposal operations are taking place;
c. a calculation of the total quantity (tonnes) of waste received at the Site during each operating day and each operating week;
d. Results of any test done to determine the acceptability of waste at the Site;
e. A reference for each load of solid non-hazardous industrial waste received, to the client and type of solid non-hazardous industrial waste;
f. the amount of any leachate removed, or treated and discharged from the Site;
g. a record of litter collection activities and the application of any dust suppressants;
h. a record of the daily inspections;
i. a description of any out-of-service period of any control, treatment, disposal or monitoring facilities, the reasons for the loss of service, and action taken to restore and maintain service;
j. type and amount of daily, intermediate and final cover used;
k. maintenance and repairs performed on equipment employed at the Site;

l. complaints received and actions taken to resolve them;
m. emergency situations and actions taken to resolve them; and
n. any other information required by the District Manager.

9.7 The Owner shall maintain on record at the Site for each client disposing of solid non-hazardous waste at the Site, a description of each type of solid non-hazardous waste received from the client and documentation to demonstrate that the Owner has taken reasonable care to ensure that waste classified as either hazardous or liquid industrial waste under O. Reg. 347 as amended from time to time, is not disposed of at the Site.

Record Retention

9.8 Except as authorized in writing by the Director, all records required by this ECA shall be retained at the Site for a minimum of two (2) years from their date of creation.

9.9 The Owner shall retain all documentation listed in Schedule "A" for as long as this ECA is valid.

9.10 All monthly Site inspection records are to be kept at the Site until they are included in the Annual Report.

9.11 The Owner shall retain employee training records as long as the employee is working at the Site.

9.12 The Owner shall make all of the above documents available for inspection upon request of Ministry staff.

9.13 The Owner shall retain, either on-Site or in another location and notify the District Manager of this location, copies of the annual reports referred to in the preceding condition and any associated documentation of compliance monitoring activities and shall continue to do so for a period of at least two (2) years after the closure of the Site.

10.0 TRAINING

Employees and Training

10.1 A training plan for all employees that operate any aspect of the Site shall be developed and implemented by the Operator . Only trained employees shall operate any aspect of the Site or carry out any activity required under this ECA . Employees must provide proof of training to the Ministry upon request. For the purpose of this ECA "trained" means knowledgeable either through instruction or practice in:

a. the relevant waste management legislation including EPA, O. Reg. 347 and O. Reg. 232/98 , regulations and guidelines;
b. major environmental and occupational health and safety concerns pertaining to the waste to be handled;

c. the proper handling of wastes;
d. the management procedures including the use and operation of equipment for the processes and wastes to be handled;
e. the emergency response procedures;
f. the specific written procedures for the control of nuisance conditions;
g. the terms, conditions and operating requirements of this ECA; and
h. proper inspection, receiving and recording procedures and the activities to be undertaken during and after a load rejection.

11.0 COMPLAINTS PROCEDURES

11.1 If at any time, the Owner receives complaints regarding the operation of the Site , the Owner shall respond to these complaints according to the following procedure:

a. The Owner shall record and number each complaint, either electronically or in a log book, and shall include the following information: the nature of the complaint, the name, address and the telephone number of the complainant if the complainant will provide this information, the time and date of the complaint, specific details of operations that were occurring, any changers from normal operations, types of waste loads (including source) and other on Site activities;
b. The Owner, upon notification of the complaint, shall initiate appropriate steps to determine all possible causes of the complaint, proceed to take the necessary actions to eliminate the cause of the complaint and forward a formal reply to the complainant; and
c. The Owner shall complete and retain on-Site a report written within one (1) week of the complaint date, listing the actions taken to resolve the complaint and any recommendations for remedial measures, and managerial or operational changes to reasonably avoid the recurrence of similar incidents.

11.2 The Owner shall designate a person to receive any complaints and to respond with a written notice of action as soon as possible. The Owner shall post the Site complaints procedure at the Site entrance. All complaints and the Owner's actions taken to remedy the complaints must be summarized in the Annual Report.

11.3 The Company shall notify the District Manager, Township of Warwick and WIFN, in writing, of each environmental complaint within two (2) business days of the complaint. The notification shall include:

1. this Approval number;

2. a description of the nature of the complaint;

3. the time and date of the incident to which the complaint relates.

11.4 The Company shall report all environmental complaints to the WPLC at the next WPLC meeting.

12.0 EMERGENCY SITUATIONS

12.1 In the event of a fire or discharge of a contaminant to the environment, Site staff shall contact the MECP Spills Action Centre (1-800-268-6060) and the District Office of the MECP forthwith.

12.2 The Owner shall submit to the District Manager a written report within three (3) days of the spill or incident, outlining the nature of the incident, remedial measures taken and measures taken to prevent future occurrences at the Site.

12.3 The Owner shall ensure that adequate fire fighting and contingency spill clean up equipment is available in accordance with Item 66 of Schedule "A" and that emergency response personnel are familiar with its use and location.

13.0 MONITORING

Groundwater Monitors

13.1 The Owner shall ensure all groundwater monitoring wells are properly capped, locked and protected from damage.

13.2 In areas where landfilling is to proceed around monitoring wells, the wells must be decommissioned in accordance with O. Reg. 903 as amended from time to time and then replaced when waste placement and capping is completed.

13.3 Any groundwater monitoring wells included in the monitoring program shall be assessed, repaired, replaced or decommissioned as required.

13.4 The Owner shall repair or replace any monitoring well which is destroyed or in any way made inoperable for sampling such that no more than one sampling event is missed.

13.5 All monitoring wells that are no longer required as part of the groundwater monitoring program shall be decommissioned in accordance with good standard practice that will prevent contamination through the abandoned well and in accordance with O. Reg. 903. A report on the decommissioning shall be provided in the annual monitoring report for the period during which the well was decommissioned.

Monitoring Program

13.6 Monitoring programs shall be carried out for groundwater, surface water, landfill gas in accordance with the Environmental Monitoring Plan, as amended from time to time listed as Item 39 and Appendix H of Item 68 of Schedule "A". Surface water will also be evaluated as per Item 91 of Schedule "A".

13.7 The Owner shall ensure that Biochemical Oxygen Demand, Total Suspended Solids, Total coliform, Fecal coliform and E. Coli are added to the parameter list to be sampled for surface water station SS19.

13.8 Air Quality, Dust, Hydrocarbon, and Volatile Organic Carbon monitoring shall be undertaken in accordance with Item 85 in Schedule "A".

13.9 Air quality monitoring shall be in accordance with the canister method (USEPA TO-14/15) .

13.10 Noise monitoring shall be undertaken by the Owner at the Site in accordance with Item 28 on Schedule "A" including any noise monitoring in response to noise complaints.

13.11 No alterations to the groundwater, air quality, noise or surface water monitoring programs shall be implemented prior to receiving written approval from the District Manager. The Owner shall give all requests to the Township of Warwick, the WPLC and WIFN at the same time or prior to the time that such request is made to the District Manager.

14.0 CONTINGENCY PLANS AND TRIGGER MECHANISMS

Hydraulic Containment

14.1 If the leachate level elevation in any of the pumping stations wells listed below rise above their respective trigger level, the Owner shall take additional groundwater levels within four (4) weeks as detailed in Figure 2 of Item 39 and Appendix H of Item 68 of Schedule "A".

Monitoring location	Trigger Leachate Elevation (mASL)
PS1	232.7
PS3	232.6
PS5	232.8
PS7	233.4

The assessment process for leachate levels is detailed in Figure 2 of Appendix H of Item 68 on Schedule “A”.

Groundwater Quality

14.2 The trigger concentration for groundwater quality shall be 80% of the Guideline B-7 values for parameters that have an Ontario Drinking Water Quality Standards value.

14.3 Groundwater chemical concentrations must be assessed with the trigger concentrations within six (6) weeks of sample collection.

14.4 The assessment process for groundwater quality is detailed in Figure 3 of Item 39 and Appendix H of of Item 68 of Schedule “A”.

Surface Water Quality

14.5 The trigger mechanisms for surface water quality shall be one of the following:

a. Where off Site surface water quality satisfies the Ministry's PWQO, the respective PWQO shall be used as a trigger concentration; or

b. Where the background surface water quality naturally exceeds the PWQO, the background concentration should be considered in evaluating and updating the trigger concentration.

14.6 Surface water quality results will be assessed in accordance with the requirements established under the Industrial Sewage Works component of the EPA approval for the Site.

14.7 The assessment process for surface water quality is detailed in Figure 4 of Appendix H of Item 68 in Schedule "A ".

Landfill Gas

14.8 If landfill gas concentrations exceed 10% LEL, the Owner shall undertake additional monitoring, assess the source and pathway of methane to determine if the elevated concentrations are landfill related.

14.9 If the elevated concentrations are landfill related, the Owner shall undertake contingency measures.

General Contingency Measures

14.10 In the event a result of a monitoring test exceeds the trigger mechanisms detailed above, the Owner shall:

a. notify the District Manager, the WPLC, WIFN and the Township of Warwick of any trigger level exceedances within twenty four (24) hours of receipt of the results;
b. conduct an investigation into the cause of the adverse result and submit a report to the District Manager that includes an assessment of whether contingency measures need to be carried out;
c. if contingency measures are needed, submit detailed plans, specifications and descriptions for the design, operation and maintenance of the contingency measures, and a schedule as to when these measures will be implemented, to the Director and notify District Manager; and
d. implement the required contingency measures upon approval by the Director.

15.0 REPORTING

Semi Annual Volume Determination

15.1 The Owner shall undertake semi-annual air space surveys of the bottom and top waste contours to determine the estimated air space used for waste disposal in the prior six months. The air space survey shall include daily cover material and shall take into account settlement. The first air space survey shall be undertaken by no later than February 2012 with an air space survey being completed semi-annually

after the completion of the first air space survey, until landfill Site closure.

15.2 Wastes which the Owner has been ordered to dispose of at the Site by any ministry, department or agency of the federal or Provincial Crown shall be excluded from the air space survey calculations.

15.3 Each air space survey shall be conducted by an Ontario Land Surveyor or other qualified consultant and such air space survey shall be provided to the District Manager. The Owner shall keep a copy of each air space survey on-Site and make them available to MECP personnel upon request.

Quarterly Monitoring Reports

15.4 The Owner shall submit quarterly monitoring reports to the Township of Warwick, WIFN, District Manager and the WPLC within sixty (60) days of the end of the calendar quarterly reporting period starting September 30, 2012.

15.5 Each report will include the following:

a. a summary of monitoring activities and results;
b. a summary of any exceedences and related operator responses;
c. any complaints received and operator response;
d. a summary of mitigation activities for noise, dust, litter, air quality or other taken during the quarter in accordance with the Best Management Practices;
e. any proposed improvements to monitoring or operating procedures; and
f. any implemented improvements to monitoring or operating procedures that have been identified to address or reduce impacts.

Annual Report

15.6 A written report on the development, operation and monitoring of the Site , shall be completed annually (the "Annual Report"). The Annual Report shall be submitted to the Regional Director , the District Manager, the Township of Warwick, WIFN, and the WPLC, by March 31st of each year, and shall cover the 12 month period preceding December 31st.

15.7 The Annual Report shall include the following:

a. the results and an interpretive analysis of the results of all leachate, groundwater, surface water and landfill gas monitoring, including an assessment of the need to amend the monitoring programs;
b. an assessment of the operation and performance of all engineered facilities, the need to amend the design or operation of the Site, and the adequacy of and need to implement the contingency plans;
c. an assessment of the effectiveness of the Poplar Plantation and the Poplar System for leachate;
d. an assessment of the effectiveness of the on Site leachate treatment facility;
e. Site plans showing the existing contours of the Site;

f. areas of landfilling operation during the reporting period;
g. areas of intended operation during the next reporting period;
h. areas of excavation during the reporting period;
i. the progress of final cover, vegetative cover, and any intermediate cover application;
j. previously existing site facilities;
k. facilities installed during the reporting period;
l. Site preparations and facilities planned for installation during the next reporting period;
m. calculations of the volume of waste, daily and intermediate cover, and final cover deposited or placed at the Site during the reporting period and a calculation of the total volume of Site capacity used during the reporting period;
n. a calculation of the remaining capacity of the Site, an estimate of the remaining Site life and a comparison of actual capacity used to approved Site capacity;
o. a summary of the quantity of any leachate or pre-treated leachate removed from the Site or leachate treated and discharged from the Site;
p. a summary of the weekly, maximum daily and total annual quantity (tonnes) of waste received at the Site;
q. a summary of any complaints received and the responses made;
r. a discussion of any operational problems encountered at the Site and corrective action taken;
s. an update summary of the amount of financial assurance which has been provided to the Director;
t. a report on the status of all monitoring wells and a statement as to compliance with Ontario Regulation 903;
u. any other information with respect to the site which the District Manager or Regional Director may require from time to time;
v. a statement of compliance with all conditions of this ECA and other relevant Ministry requirements, guidelines and regulations;
w. summary of inspections undertaken at the Site;
x. a summary of recycling, processing and composting efforts undertaken including the amount of recyclable received, amount of processed material and composted material each year;
y. any changes in operations, equipment or procedures employed at the Site; and
z. recommendations regarding any proposed changes in operations of the Site.

16.0 SITE CLOSURE

Closure Plan

16.1 At least two (2) years prior to closure or when 90% of the site capacity is reached, whichever comes first, the Owner shall submit to the Director for approval, with copies to the District Manager, the Township of Warwick, WIFN and the WPLC, a detailed Site closure plan pertaining to the termination of landfilling operations at this Site , post-closure inspection, maintenance and monitoring, and end use. The plan shall include the following:

a. a plan showing Site appearance after closure;
b. a description of the proposed end use of the Site;
c. a description of the procedures for closure of the Site, including:

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

d. a schedule indicating the time-period for implementing sub-conditions i) to vi) above.
e. descriptions of the procedures for post-closure care of the Site, including:

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

f. an assessment of the adequacy of and need to implement the contingency plans for leachate and methane gas;
g. an updated estimate of the contaminating life span of the Site , based on the results of the monitoring programs to date; and
h. an update of the cost estimates for financial assurance and the amount which has been provided to the Director to date.

16.2 The Site shall be closed in accordance with the closure plan as approved by the Director.

End Use

16.3 The Owner shall consult with affected stakeholders on the proposed end uses as committed to in Item 35 of Schedule "A" prior to the submission of its closure report under the EPA. The proposed end use activities should be consistent with the types of activities consulted upon during the EA.

Closure of the Site

16.4 Upon closure of the Site, the following features will be inspected, recorded on a quarterly basis and maintained as required on a seasonal basis:

a. evidence of settlement;
b. possible leachate seeps and springs;
c. cover soil integrity;
d. vegetative cover;

e. surface water drainage works;
f. erosion and sediment in surface water drainage system; and
g. groundwater monitoring wells.

16.5 A vegetative cover consisting of vegetation that is suited to local conditions and that is capable with minimal care of providing vigorous, plentiful cover no later than its 3rd growing season shall be established over all completed areas to control erosion and maximize evaportranspiration. The Owner shall complete planting as soon as possible after reaching final contours.

16.6 If weather conditions do not allow timely placement of final and vegetative cover, silt curtains shall be employed to minimize silt loadings to surface water bodies.

SCHEDULE "A"

1. Document entitled "Environmental Assessment Act Section 9 Notice of Approval to Proceed with the Undertaking" , Re: An Environmental Assessment for Warwick Landfill Expansion, Waste Management of Canada Corporation, EA File Number: EA-02-08-02-03, dated January 15, 2007.

2. Application for a Provisional Certificate of Approval for the Warwick Landfill, dated March 27, 2006.

3. Document entitled "Development and Operations Plans Warwick Landfill Expansion Volume 1 of 2" dated March 2006 prepared by Henderson, Paddon and Associates Limited.

4. Document entitled "Development and Operations Plans Warwick Landfill Expansion Volume 2 of 2" dated March 2006 prepared by Henderson, Paddon and Associates Limited.

5. Document entitled "Assessment of Geotechnical Design Requirements New Landfill Facility Warwick, Ontario" prepared by Alston Associates Inc., dated July 31, 2006.

6. Document entitled "2006 Poplar System Monitoring Report Warwick Landfill Site Township of Warwick Ontario" prepared by Jagger Hims Limited, dated January 2007.

7. Document entitled "Warwick Landfill Expansion Contaminating Lifespan Review" prepared by Jagger Hims Limited, dated March 2006.

8. Drawing No. 105716-111 entitled " Proposed Final Contours and Stormwater Management Plan" prepared by Henderson Paddon and Associates Limited, dated February 24, 2006.

9. Drawing No. 105716-112 entitled " Landfill Bottom Contours (Top of Primary Gravel)" prepared by Henderson Paddon and Associates Limited, dated February 24, 2006.

10. Drawing No. 105716-113 entitled "Landfill Perimeter Sections" prepared by Henderson Paddon and Associates Limited, dated February 24, 2006.

11. Drawing No. 105716-114 entitled " Landfill Perimeter Sections" prepared by Henderson Paddon and Associates Limited, dated February 24, 2006.

12. Drawing No. 105716-115 entitled "Leachate Collection Sump Details" prepared by Henderson Paddon and Associates Limited, dated February 24, 2006.

13. Drawing No. 105716-116 entitled "Proposed Primary Leachate Collection System" prepared by Henderson Paddon and Associates Limited, dated February 24, 2006.

14. Drawing No. 105716-117 entitled "Proposed Secondary Leachate Collection System" prepared by Henderson Paddon and Associates Limited, dated February 24, 2006.

15. Drawing No. 105716-118 entitled "Landfill Sections" prepared by Henderson Paddon and Associates

Limited, dated February 24, 2006.

16. Drawing No. 105716-119 entitled “Landfill Perimeter Sections” prepared by Henderson Paddon and Associates Limited, dated February 24, 2006.

17. Drawing No. 105716-120 entitled “ Landfill Perimeter Sections” prepared by Henderson Paddon and Associates Limited, dated February 24, 2006.

18. Drawing No. 105716-125 entitled “Details and Sections” prepared by Henderson Paddon and Associates Limited, dated February 24, 2006.

19. Letter dated April 16, 2007 from Frank Ford, Henderson Paddon and Associated Limited to Wilf Ruland, Citizens Environmental Consulting.

20. Letter dated May 2, 2007 from Frank Ford, Henderson Paddon and Associated Limited to Wilf Ruland, Citizens Environmental Consulting.

21. Letter dated June 1, 2007 from Greg Washuta, P. Eng., M. Eng., Senior Waste Engineer, Ministry of the Environment to Reid Cleland, Waste Management of Canada Corporation.

22. Drawing No. 106716-127A entitled "Plough Furrow Surface Water Distribution Warwick Landfill" prepared by Henderson Paddon and Associates Limited, dated March 21, 2007.

23. Drawing No. 106716-F215 entitled "Proposed Mini-Transfer Area" prepared by Henderson Paddon and Associates Limited, dated March 29, 2007.

24. Report entitled "Best Management Practices Plan (Dust) Warwick Landfill Watford, Ontario " prepared by RWDI Air Inc., dated December 11, 2007.

25. Report entitled "Best Management Practices Plan (Litter) Warwick Landfill Watford, Ontario " prepared by RWDI Air Inc., dated December 11, 2007.

26. Report entitled "Best Management Practices Plan (Odour) Warwick Landfill Watford, Ontario " prepared by RWDI Air Inc., dated December 11**,** 2007.

27. Document entitled "Appendix F Air Quality Monitoring Plan and Letter", prepared by RWDI, dated November 29, 2007.

28. Document entitled "Environmental Noise Monitoring Program for the Warwick Landfill" , prepared by Aercoustics Engineering Limited, dated November 21, 2007.

29. Document entitled "Proposed Expansion of WM Warwick Landfill Predicted Noise Impact" , prepared by Aercoustics Engineering Limited, dated June 15, 2007.

30. Document entitled "Application for Approval of ECA of Approval A032203 Warwick Township

County of Lambton MOE. Reference No. 0539-6N7TRY Part 1 of 2" , dated July 13, 2007, prepared by Henderson Paddon and Associates Limited.

31. Document entitled "Application for Approval of ECA of Approval A032203 Warwick Township County of Lambton MOE. Reference No. 0539-6N7TRY Part 2 of 2- Financial Assurances" , dated August 22, 2007, prepared by Henderson Paddon and Associates Limited.

32. Letter dated July 27, 2007 from Dan Toner, Assistant Director, Laboratory Services Branch to Tesfaye Gebrezghi, Supervisor- Waste Unit, MOE.

33. Table 6.1 entitled "Phasing-Analysis for Leachate Quantities WM- Warwick Landfill Expansion" prepared by Henderson Paddon and Associates Ltd., dated August 17, 2007.

34. Letter dated August 20, 2007 from John DeYoe, RWDI to Frank Ford, Henderson Paddon and Associates Limited.

35. Discussion Paper 9 entitled "Impact Management Plan" and all Appendices dated October 2005 prepared by Waste Management of Canada Corporation.

36. Letter Report and attachments dated May 10, 2001 from Frank C. Ford of Henderson, Paddon Environmental to Mark Turner, Environmental Assessment and Approvals Branch.

37. Development and Operations Report - Canadian Waste Services Inc. - Warwick Landfill, Warwick Township - Revised, dated October 1997, prepared by Henderson Paddon Environmental Inc.

38. Consolidated Report Leachate Management Plan - Canadian Waste Services Inc. - Warwick Landfill - Warwick Township dated July 2001 prepared by Henderson Paddon Environmental Inc.

39. Environmental Monitoring Plan - Warwick Landfill - Township of Warwick, Ontario dated December 2007, prepared by Jagger Hims Limited.

40. Letter dated October 11, 2007 from Brad Bergeron, RWDI to Greg Washuta, Senior Waste Engineer, Ministry of the Environment.

41. Report entitled "Stormwater Management Plan Poplar Irrigation Area Warwick Landfill Expansion Watford, Ontario" dated December 2007, prepared by Henderson Paddon Environmental Inc.

42. Letter dated November 21, 2007 from Kevin Smith, Aercoustics Engineering Limited to Wayne Jenken, Waste Management of Canada Corporation.

43. E-mail and attachments dated February 12, 2008 from Brad Bergeron, RWDI Air Inc. to Greg Washuta, Senior Waste Engineer, EAAB, MOE.

44. E-mail and attachments dated January 29, 2008 from Brad Bergeron RWDI Air Inc. to Greg Washuta, Senior Waste Engineer, EAAB, MOE.

45. Letter dated March 3, 2008 from Wayne Jenken, Landfill Engineer, WMCC to Ian Parrott, Manager, ECA of Approval Review Section, EAAB, MOE.

46. Letter dated June 13, 2008 from Frank Ford, Senior Environmental Engineer, Henderson Paddon and Associates Limited to Greg Washuta, P. Eng., Senior Waste Engineer, Waste Unit, EAAB, MOE.

47. Application for a Provisional Certificate of Approval for a Waste Disposal Site for the Twin Creeks Landfill Site, signed and dated December 11, 2008.

48. Letter dated December 11, 2008 from Reid Cleland, District Landfill Manager, WMCC to Doris Dumais, Approvals Director, EAAB, MOE.

49. Report entitled "Cell 12 Project and Changes Affecting The Warwick Landfill Expansion" and attached appendices, created by Henderson Paddon & Associates Limited, dated August 2008.

50. Application for a Provisional Certificate of Approval for a Waste Disposal Site for the Twin Creeks Landfill Site, dated August 11, 2008.

51. Letter dated December 18, 2008 from Greg Washuta, Senior Waste Engineer, Waste Unit, EAAB, MOE to Reid Cleland, District Landfill Manager, WMCC.

52. Letter dated December 18, 2008 from Wayne Jenken, Landfill Engineer, WMCC to Greg Washuta, Senior Waste Engineer, Waste Unit, EAAB, MOE.

53. Letter dated December 18, 2008 from Jason Balsdon and Brent Langille, Jagger Hims Limited to Wayne Jenken, Landfill Engineer, WMCC.

54. Application for a Provisional Certificate of Approval for a Waste Disposal Site for Waste Management of Canada Corporation's Twin Creeks Landfill Site, signed and dated January 16, 2009.

55. Report and Appendix A entitled "Waste Management of Canada Corporation Twin Creeks Landfill Use of Geonet for Secondary Drainage Layer" prepared by Henderson Paddon and Associates, dated January 2009.

56 Letter dated March 18, 2009 from Greg Washuta Senior Waste Engineer, Waste Unit, EAAB, MOE to Reid Cleland, Landfill Manager, WMCC.

57. Letter report and appendices A, B and C dated April 9, 2009 from Jeff Armstrong, Genivar Consultants LP to Greg Washuta, Senior Waste Engineer, Waste Unit, EAAB, MOE.

58. Application for a Waste Disposal Site Certificate of Approval dated April 28, 2009 and signed by Reid Cleland, District Manager, Waste Management of Canada Corporation.

59. Report produced by Genivar Consultants LP entitled "Development & Operations Report for a Waste

Transfer Station Application" dated June 2009.

60. November 24, 2009 e-mail from Jeff Armstrong of Genivar Consultants LP to Jim Chisholm, Senior Review Engineer with the Ministry of Environment indicating that the application is for an existing mini transfer area but flexibility is being applied for to direct the waste collected at this area to alternate waste disposal sites.

61. November 24, 2009 e-mail from Jim Chisholm, Senior Review Engineer with the Ministry of Environment to Jeff Armstrong, Genivar Consultants LP, requesting information about how the Mini-Transfer Area already located at the landfill is covered by the existing Certificate of Approval and the December 21, 2009 e-mail response from Jeff Armstrong to Jim Chisholm to his November 24, 2009 e-mail, outlining that the Mini-Transfer Area is covered by the 1997 Design and Operation Report that is identified in Item 37 and attached page 7-4 of the report in which Section 7.8 dealt with the Mini-Transfer Area.

62. January 24, 2011, 12:11PM, e-mail from Wayne Jenken, Area Landfill Engineer, Waste Management of Canada Corporation to Jim Chisholm, Senior Review Engineer with the Ministry of Environment indicating that the original Mini Transfer Area moved to the new location on November 2009 and that the old location for the Mini Transfer Area has been removed. The e-mail also made suggested changes to a draft of the Notice.

63. Document entitled "Twin Creeks Landfill - Expansion of Poplar Cap Irrigation System for Existing Waste Disposal Area January 2010" prepared for Waste Management of Canada Corporation by Genivar Consultants LP dated January 2010.

64. Letter dated November 2, 2010 addressed to Mr. Reid Cleland, Waste Management of Canada Corporation from Mr. Greg Washuta, Ministry of the Environment providing comments and requesting additional information on MOE Reference File No. 1486-829MCN.

65. Document entitled "Twin Creeks Landfill, Watford, ON 091-13089-00 (91730R) - Application for Approval for Expansion of Poplar Plantation (South Fill Area) - Response to MOE Comments Letter dated November 2, 2010" prepared for Waste Management of Canada Corporation by Genivar Consultants LP dated December 2, 2010.

66. Report entitled "Development and Operations Plan - Warwick Landfill Expansion - Volume 1 of 3" prepared for WMCC by Henderson Paddon & Associates dated March 2008.

67. Report entitled "Development and Operations Plan - Warwick Landfill Expansion - Volume 2 of 3" prepared for WMCC by Henderson Paddon & Associates dated March 2008.

68. Report entitled "Development and Operations Plan - Warwick Landfill Expansion - Monitoring Plans - Volume 3 of 3" prepared for WMCC by Henderson Paddon & Associates dated March 2008.

69. Letter dated May 6, 2009 addressed to Mr. Reid Cleland, WMCC from Mr. Greg Washuta, Ministry of the Environment providing ministry review comments on the Development and Operations Plan

70. Letter dated August 19, 2009 addressed to Mr. Reid Cleland, WMCC from Mr. Greg Washuta, Ministry of the Environment providing comments from the Township of Warwick, Walpole Island First Nation and the Warwick Public Liaison Committee on the Development and Operations Plan

71. Letter dated November 12, 2009 addressed to Mr. Greg Washuta, Ministry of the Environment from Mr. Wayne Jenken, WMCC.

72. Drawing set entitled "Twin Creeks Landfill - Landscaping and Signage Detail Construction Drawings" prepared by Schollen & Company Inc. and dated July 4, 2008. The drawing set consists of the following:

    i. Cover page entitled "Twin Creeks Landfill - Landscaping and Signage Detail Construction Drawings" prepared by Schollen & Company Inc. and dated July 4, 2008;
    ii. Drawing No. L-1 entitled "Landscape Plan - Screening Berm";
    iii. Drawing No. L-1A entitled " Lanscape Detail at Intersections - Screening Berm"
    iv. Drawing No. L-2 entitled "Landscape Plan - Screening Berm";
    v. Drawing No. L-3 entitled "Landscape Plan - Screening Berm & Area F";
    vi. Drawing No. L-4 entitled "Landscape Plan - Screening Berm";
    vii. Drawing No. L-5 entitled "Landscape Plan - Screening Berm and Area G (North)";
    vii. Drawing No. L-6 entitled "Landscape Plan - Screen Planting Area G (South)";
    viii. Drawing No. L-7 entitled "Landscape Plan - Screen Planting and Creek Area A and Area B";
    ix. Drawing No. L-8 entitled "Landscape Plan - Screen Planting Areas C, D and E";
    x. Drawing No. L-9 entitled "Landscape Plan - Restoration Planting Area H";
    xi. Drawing No. LD-1 entitled "Landscape Detail Plan ";
    xii. Drawing No. LD-2 entitled "Landscape Notes and Master Plant List"; and
    xiii. Drawing No. LD-3 entitled "Signage Details";

73. Application for a Certificate of Approval for a Waste Disposal Site dated April 6, 2011 submitted by Waste Management of Canada Corporation for Provisional Certificate of Approval No. A032203 requesting approval for use of an alternative daily cover material and amended Best Management Practices for Odour.. The supporting documentation for the application included the following:

    i. Cover letter dated April 7, 2011 addressed to Mr. Tes Gebrezghi, Ministry of the Environment from Mr. Reid Cleland, Waste Management of Canada Corporation;
    ii. Report entitled "Best Management Practices Plan (Odour) Warwick Landfill" prepared for Waste Management of Canada Corporation by RWDI Air Inc. (Project No. 1100800) dated April 7, 2011;
    iii. Letter dated March 24, 2011 addressed to Mr. Wayne Jenken, Waste Management of Canada Corporation from Mr. Peter Pickfield, Garrod Pickfield; and
    iv. Email dated March 22, 2011 at 3:32 p.m. sent to Mr. Peter Pickfield, Garrod Pickfield from Mr. Wayne Jenken.

74. Letter dated October 4, 2011 addressed to Mr. Tesfaye Gebrezghi, Ministry of the Environment from

Mr. Reid Cleland, Waste Management of Canada requesting an amendment to Condition 167 (a). The supporting documentation attached to the letter included the following:

a. Application for a Certificate of Approval for a Waste Disposal Site dated October 4, 2011;
b. Provisional Certificate of Approval A032203 Notice No. 7 dated June 1, 2011;
c. Letter from Wayne Jenken, WMCC to Don Bruder, Township of Warwick dated February 23, 2011;
d. Letter from Wayne Jenken, WMCC to Don Bruder, Township of Warwick dated May 26, 2011;
e. Letter from Peter Pickfield, Garrod Pickfield LLP to Reid Cleland, WMCC dated September 14, 2011;
f. Letter from Wayne Jenken, WMCC to Dean Jacobs, Walpole Island First Nations dated July 14, 2011;
g. Email from Kent Hunter, Neegan Burnside to Wayne Jenken dated September 19, 2011 at 3:54 p.m.;
g. Email from Wayne Jenken, WMCC to Kent Hunter, Neegan Burnside dated September 20, 2011 at 1:52 p.m.;
h. Email from Kent Hunter, Neegan Burnside to Wayne Jenken dated September 27, 2011 at 10:23 a.m.;
i. WPLC meeting minutes dated September 15, 2011; and
j. WPLC meeting minutes dated April 7, 2011.

75. Letter dated May 22, 2012 addressed to Ms. Agatha Garcia Wright, Director, Ministry of the Environment from Mr. Wayne Jenken, Waste Management of Canada Corporation requesting amendment to Condition No. 7.10 (Landfill Gas Management). The letter included the following supporting documentation:

i. Letter report entitled "Early Vertical Gas Well Collection System" dated May 2012 and addressed to Mr. Reid Cleland, Waste Management of Canada Corporation from Mr. Frank Ford, GENIVAR Inc.;
ii. Drawings No. 102 and G111 - Landfill Gas Collection System;
iii. Landfill Gas Headers, Gas Building with Blowers and Landfill Gas Flaring System Design Drawings and Design and Operations Plan for Modifications;
iv. Description of Phase 1 of the Gas Collection System;
v. Revised Section 4.7 of the Design and Operations Plan;
vi. Application to Amend Environmental Compliance Approval No. A032203 and supporting documents;
vii. Consultation Summary and Records with Stakeholders; and
viii. Design Drawings for Amended Landfill Gas Management System.

76. Letter dated July 26, 2012 addressed to Mr. Reid Cleland, Waste Management of Canada Corporation from Mr. Dale Gable, Ministry of the Environment requesting additional information on the location of the proposed gas extraction wells.

77. Letter dated August 9, 2012 addressed to Mr. Dale Gable, Ministry of the Environment from Mr. Frank

Ford, GENIVAR Inc. providing details on the location of the gas wells.

78. Letter Report dated May 9, 2012 addressed to Ms. Agatha Garcia Wright, Director, Ministry of the Environment form Mr. Wayne Jenken, Waste Management of Canada requesting Conditions 6.48 to 6.61 be amended. The letter report included the following Sections:

    i. Environmental Compliance Approval application signed by Reid Cleland, WMCC and dated May 9, 2012;
    ii. Proof of legal name and zoning;
    iii. Record of consultation with Township of Warwick;
    iv. Record of consultation with Walpole First Island First Nation; and
    v. Record of consultation with WPLC.

79. Letter report dated September 26, 2012 addressed to Ms. Agatha Garcia-Wright. Director, Environmental Approvals Branch, Ministry of the Environment from Mr. Philip Janisse and Mr. Brent Langille, RWDI Inc. requesting the time frame for the use of ASR be extended and the sampling frequency for the ASR be reduced.

80. Letter dated October 15, 2012 and supporting drawings addresses to Ms. Agatha Garcia-Wright. Director, Environmental Approvals Branch, Ministry of the Environment from Mr. Wayne Jenken, Waste Management of Canada Corporation detailing the proposed changes to the landscape plan for the Site. The supporting drawings include the following drawing prepared by Schollen and Company Inc (Contract No. 27007) dated June 2012:

    i. Cover page entitled "Twin Creeks Landfill Expansion - Landscape and Details Drawings" dated June 29, 2012
    ii. Drawing No. L-1 entitled "Landscape Plan - Screening Berm";
    iii. Drawing L-1A entitled "Landscape Detail at Intersections - Screening Berms";
    iv. Drawing L-2 entitled "Landscape Plan - Screening Berm";
    v. Drawing L-3 entitled "Landscape Plan - Screening Berm and Area F";
    vi. Drawing L-4 entitled "Landscape Plan - Screening Berm";
    vii. Drawing L-5 entitled "Landscape Plan - Screening Berm and Area G";
    viii. Drawing L-6 entitled "Landscape Plan - Area G Planting Area";
    ix. Drawing L-7 entitled "Landscape Plan - Area A and Area B Screen Planting and Creek";
    x. Drawing L-8 entitled "Landscape Plan - Area C, D and E Screen Planting";
    xi. Drawing L-9 entitled "Landscape Plan - Area H Restoration Planting";
    xii. Drawing LD-1 entitled "Landscape Detail Plan";
    xiii. Drawing LD-2 entitled "Landscape Notes and Master Plant List";
    xiv. Drawing LD-3 entitled "Signage Details";
    xv. Drawing LD-4 entitled "Details"; and
    xvi. Drawing LD-5 entitled "Details".

81. Letter dated November 13, 2013 addressed to Agatha Garcia-Wright, Director, Ministry of the Environment from Wayne Jenken, Waste Management of Canada Corporation requesting amendment to Condition 8.6 (a). The following supporting documentation was attached to the memorandum.

i. Amended Environmental Compliance Approval Number A032203 issued December 13, 2011
ii. Amended Environmental Compliance Approval Number A032203 Notice No. 1 issued February 29, 2012
iii. Application to Amend Environmental Compliance Approval No. A032203 with Signature of Reid Cleland in Section 1.4
iv. Record of Consultations with Stakeholders

82. Application package dated May 4, 2016 and received on May 16, 2016 including all subsequently submitted supporting documentation and drawings, including the amendment to the D&O plan and associated drawings.

83. Report titled "Twin Creeks Landfill Site: Best Management Practices Plan (Dust) - Version 7" prepared by RWDI Air Inc., dated May 19, 2017.

84. Report titled "Twin Creeks Landfill Site: Best Management Practices Plan (Odour) - Version 8" prepared by RWDI Air Inc., dated May 19, 2017.

85. Report titled "Twin Creeks Landfill Site: Ambient Air Quality Monitoring Plan (Revision #3)" prepared by RWDI Air Inc., dated May 18, 2017.

86. "WM Twin Creeks Landfill Site, Leachate Management Framework" prepared by HDR, dated November 29, 2017.

87. Application for a an amendment to ECA No. A032203 to provide detailed design for the construction of Cell 4 in response to Condition 4.8. Signed by Reid Cleland and dated October 16, 2018. The supporting documentation for the application included the drawing set titled "Waste Management of Canada Corporation, Twin Creeks Landfill Expansion, Warwick Township, Landfill Base Preparation Cell 4." Prepared by WSP Group, October, 2018. The drawing set consists of the following:

i. Drawing No. 106716P-400 - "Title Sheet";
ii. Drawing No. 106716P-401 - "March 2018 Existing Conditions Plan;
iii. Drawing No. 106716P-402 - "Cell 4 - Bottom of Excavation - West";
iv. Drawing No. 106716P-403 - "Cell 4 - Bottom of Excavation - East";
v. Drawing No. 106716P-404 - "Cell 4 - Top of Primary Clay Liner - West";
vi. Drawing No. 106716P-405 - "Cell 4 - Top of Primary Clay Liner - East";
vii. Drawing No. 106716P-406 - "Cell 4 - Temporary Clay Seal - West";
vii. Drawing No. 106716P-407 - "Cell 4 - Temporary Clay Seal - East";
viii. Drawing No. 106716P-408 - "Cell 4 - Section and Details";
ix. Drawing No. 106716P-409 - "Cell 4 - Section and Details";
x. Drawing No. 106716P-410 - "Cell 4 - Section and Details";
xi. Drawing No. 106716P-411 - "Cell 4 - Pumping Station PS5/PS6 Plans and Sections";
xii. Drawing No. 106716P-412 - "Cell 4 - Pumping Station PS5/PS6 Plans and Sections";
xiii. Drawing No. 106716P-413 - "Cell 4 - Sections and Details"; and

xiv Drawing No. 106716P-414 - "Cell 4 - Sections and Details".

88. Environmental Compliance Approval Application signed by Wayne Jenken dated April 28, 2023, for establishment of a Renewable Natural Gas Facility at the Site.

89. Report entitled "Twin Creeks Environmental Centre Renewable Natural Gas Facility Design and Operations Report" dated April 28, 2023 prepared by WSP.

90. Report entitled "Twin Creeks Landfill: Best Management Practices Plan (Odour) - Version 9" dated November 17, 2023 prepared by RWDI.

91. Letter dated February 27, 2014 from Mike Moroney, District Manager of MECP to Angela McLachlan, Environmental Compliance Manager, Twin Creeks Landfill, WMCC.

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

Conditions 1.1, 1.2, 1.3, 1.6, 1.7, 1.8, 1.9, 1.10, 1.11, 1.12, 1.14, 1.15, 1.23, and 1.24 are to clarify the legal rights and responsibilities of the Owner and Operator under this Approval.

Conditions 1.4 and 1.5 are to ensure that the Site is designed, operated, monitored and maintained in accordance with the application and supporting documentation submitted by the Owner, and not in a manner which the Director has not been asked to consider.

Condition 1.12 is to ensure that the Site is operated under the corporate name which appears on the application form submitted for this approval and to ensure that the Director is informed of any changes.

Condition 1.14 is to restrict potential transfer or encumbrance of the Site without the approval of the Director and to ensure that any transfer of encumbrance can be made only on the basis that it will not endanger compliance with this Approval.

Conditions 1.15 and 1.16 are to ensure that the successor is aware of its legal responsibilities.

Conditions 1.17, 1.18, 1.19, and 1.20 clarify that the Part II.1 Director is an individual with authority pursuant to Section 197 of the Environmental Protection Act to require registration on title and provide any person with an interest in property before dealing with the property in any way to give a copy of the Approval to any person who will acquire an interest in the property as a result of the dealing.

Condition 1.21 is to ensure that appropriate Ministry staff has ready access to the Site for inspection of facilities, equipment, practices and operations required by the conditions in this Approval. This Condition is supplementary to the powers of entry afforded a Provincial Officer pursuant to the Act, the OWRA, the PA, the NMA and the SDWA.

Condition 1.25 clarifies what information may be subject to the Freedom of Information Act.

Condition 2.1 is to require Financial Assurance for this company to ensure that sufficient funds are available to the Ministry to clean up the Site in the event that the Owner is unable or unwilling to do so.

Conditions 3.1 to 3.15 inclusive are necessary in order to establish a forum for the exchange of information and public dialogue on activities to be carried out at the landfill site. Open communication with the public and local authorities is important in helping to maintain high standards for site operation and environmental protection.

Condition 3.16 has been included in order to ensure that consultation with First Nations is undertaken during the submission of any application to amend any approval required by the Ministry.

Conditions 4.1 to 4.6 inclusive, 4.8, and 4.9 is to ensure that the Site is designed, constructed and operated in an environmentally acceptable manner, based on the conceptual design and operations for the Site.

Condition 4.7 is to ensure the availability of as-built drawings for inspection and information purposes.

Condition 4.10 has been specifically included to allow for optimization of design for subsequent stages based on operating experience and monitoring results and to ensure that any necessary remedial action is undertaken before landfilling may proceed in the next stage.

Condition 4.11 has been included to ensure that the site has been constructed in accordance with the approved design plans, specifications and QA/QC procedures and to ensure that there is not an adverse impact on the environment.

Condition 4.12 is to ensure that there is a person, reporting directly to the Ministry, with associated costs reimbursed by the Owner, who is responsible for inspecting the Site, based on the requirements in this ECA of Approval to ensure that the Site is operated in an environmentally acceptable manner.

Conditions 4.13, 4.14, 15.1, 15.2 and 15.3 is to specify the amount of days the environmental inspector is required to be on site based on the conditions in this approval and in accordance with the previously approved EA for the site.

Condition 5.1 is to ensure safe side slopes of the berm.

The reason for Condition 5.2 is to approve the diversion area based on the information submitted. This is ensure the protection of the environment and the public.

Condition 5.3 is to approve the use of Cell 12 for contaminated soil.

Condition 5.4 is to ensure the Owner carries out the landscape plan based on the submitted information.

Conditions 6.1 and 6.18 are included in order to ensure that waste disposal at the site is undertaken in accordance with applicable Ministry of the Environment regulations and guidelines. Compliance with these regulations and guidelines will ensure that the site does not cause and adverse effect on the environment.

Conditions 6.4 and 6.7 is to specify the approved areas from which waste may be accepted at the Site and the

types and amounts of waste that may be accepted for disposal at the Site, based on the Owner's application and supporting documentation.

Condition 6.5 is to specify restrictions on the extent of landfilling at this Site based on the Owner's application and supporting documentation. These limits define the approved volumetric capacity of the site. Approval to landfill beyond these limits would require an application with supporting documentation submitted to the Director.

Condition 6.6 specifies the maximum amount of waste that may be received at the site based on the previously approved Environmental Assessment for the site.

Condition 6.8 has been inserted to minimize the potential for clogging of the drainage layer and to minimize temperature effects on the leachate collection system. Failure to maintain the specified minimum thickness of waste and cover material may result in a decrease in the service life of the drainage layer.

Conditions 6.9 to 6.14 inclusive have been included in order to ensure asbestos waste is handled and disposed of in accordance with O. Reg. 347 as amended from time to time. Proper handling and disposal of asbestos waste ensures that the asbestos waste does not cause an adverse impact on the environment and also does not affect human health.

Condition 6.16 is needed to make certain that uses at the site are for waste disposal purposes only and not any other uses which may cause an adverse impact on the environment and human health.

Condition 6.17 is necessary in order to ensure that all waste loads are inspected and waste that is disposed of at the site is in accordance with the terms and conditions in this ECA of Approval.

Condition 6.19 is to ensure that open burning of municipal waste is not permitted because of concerns with air emissions, smoke and other nuisance affects, and the potential fire hazard.

Conditions 6.20 through 6.22 inclusive are to ensure that users of the Site are fully aware of important information and restrictions related to Site operations under this ECA of Approval.

Conditions 6.23 to 6.27 inclusive are to specify the normal hours of operation for the landfill Site and a mechanism for amendment of the hours of operation.

Conditions 6.28 to 6.30 inclusive are to specify site access to/from the Site and to ensure the controlled access and integrity of the Site by preventing unauthorized access when the Site is closed and no site attendant is on duty.

Condition 6.31 is needed in order to make certain that the waste received at the site is in accordance with the ECA and O. Reg. 347.

Condition 6.32 has been included is to ensure that access roads are clear and do not pose a safety hazard to the general public.

Condition 6.33 is for the protection of public health and safety and minimization of the potential for damage to environmental control, monitoring and other works at the landfill Site. Scavenging is the uncontrolled removal of material from waste at a landfill site.

Conditions 6.34 to 6.40 inclusive are to ensure that the Site is operated, inspected and maintained in an environmentally acceptable manner and does not result in a hazard or nuisance to the natural environment or any person.

Condition 6.41 is to ensure that noise from or related to the operation of the landfill is kept to within Ministry limits and does not result in a hazard or nuisance to any person.

Condition 6.42 is included to ensure that noise monitoring is undertaken in accordance with the noise monitoring program prepared and to ensure that an independent acoustic audit is completed in accordance with the Ministry's requirements.

Condition 6.43 is to clarify when the Best Management Plans can be amended and the mechanism for amending the Best Management Plans.

Condition 6.44 is to ensure that appropriate measures are taken in order to prevent surface water from contacting waste so as not to cause an adverse effect on the environment.

Conditions 6.45 and 7.18 is to specify other approvals required for works and activities related to the operation of this Site as a landfill.

Condition 6.46 has been included is in order to prevent ponding in on site ditches and any adverse impact on the environment and human health.

Condition 6.47 is to ensure that landfilling operations are conducted in an environmentally acceptable manner. Daily and intermediate cover is used to control potential nuisance effects, to facilitate vehicle access on the site, and to ensure an acceptable site appearance is maintained. The proper closure of a landfill site requires the application of a final cover which is aesthetically pleasing, controls infiltration, and is suitable for the end use planned for the site.

Condition 6.48 to 6.61 inclusive is to specify the approval requirements for use of alternative cover material at the Site.

Condition 7.1 is necessary so that runoff from contaminated soils does not create and adverse impact on the environment.

Conditions 7.2 and 7.3 are included in order to ensure that the composting and processing operations at the site are conducted in a fashion in accordance with Ministry's regulations, guidelines and so as not to pose a threat to human health or the environment.

Conditions 7.4, 9.3, 9.4, 9.5, 9.6 and 9.7 are to provide for the proper assessment of effectiveness and efficiency of site design and operation, their effect or relationship to any nuisance or environmental impacts, and the

occurrence of any public complaints or concerns. Record keeping is necessary to determine compliance with this ECA of Approval, the EPA and its regulations.

Conditions 7.5 and 7.6 inclusive have been included are to ensure tire shred storage in accordance with the Fire Protection and Prevention Act and to protect the natural environment.

Condition 7.7 is to ensure that backup power is available so that all facilities remain operational during a power disruption thus preventing any adverse impacts on the environment.

Condition 7.8 has been inserted in order to ensure that concentrations of landfill gas do not pose a hazard to human health or the environment.

Condition 7.9 is to ensure that landfill gas is built and managed in accordance with the Ministry's requirement and regulation.

Condition 7.10 is needed in order to ensure that an adequate landfill gas management system is installed at the site in order to protect human health and the environment.

Conditions 7.11 and 7.12 are to minimize the potential for clogging of leachate collection pipes and to ensure effective operation of the leachate collection system components for as long as they are required. Failure to clean out these components on a regular basis may result in a decrease in their service lives. Regular cleaning of the leachate collection pipes is especially important during stages of landfilling when the level of both organic and inorganic constituents in the leachate is high and, consequently, the potential for clogging due to encrustation is greatest. As the landfill reaches the more stable methane producing stage, pipe cleaning may be required less frequently.

Condition 7.13 has been added to ensure adequate flow of leachate in the leachate collection pipes.

Conditions 7.14 to 7.17 are to ensure that the leachate collection system is designed and built in accordance with Regulations and the ministry's requirements.

Condition 7.18 is included is in order to prevent off site migration of leachate which may cause an adverse effect on the environment.

Condition 7.19 is to approve the proposed Renewable Natural Gas facility for processing of the landfill gas and converting into quality natural gas.

Conditions 7.20 and 21 are to ensure the RNG facility has adequate capacity and the operation of the landfill gas collection system is not impacted.

Condition 7.22 is to ensure the RNG facility is property operated and does not result in any unacceptable impacts to the environment.

Condition 7.23 is to ensure operational record of the RNG facility is maintained for evaluation of the system performance and identification of improvement measures.

Conditions 8.1 to 8.4 inclusive are needed to ensure leachate recirculation is undertaken in accordance with the ministry's requirements and leachate recirculation does not pose an adverse impact on the environment.

Condition 8.5 is in accordance with EA condition 22 and protects the natural environment from any impacts due to discharge of raw or treated leachate to adjacent creeks.

Condition 8.6 is to ensure that a fully functional leachate treatment system is in place on site prior to waste placement.

Condition 8.7 clarifies the responsibilities of the owner, the requirements of the ministry, the authority of the Ministry and protects the natural environment and human health.

Conditions 9.1 and 9.2 are needed to ensure regular inspections of the site are conducted in order to protect the natural environment.

Conditions 9.8 to 9.12 inclusive is to ensure that accurate waste records are maintained to ensure compliance with the conditions in this ECA of Approval (such as fill rate, site capacity, record keeping, annual reporting, and financial assurance requirements), the EPA and its regulations.

Conditions 9.13, 15.4, 15.5 and 15.6 are to ensure that regular review of site development, operations and monitoring data is documented and any possible improvements to site design, operations or monitoring programs are identified. An annual report is an important tool used in reviewing site activities and for determining the effectiveness of site design.

Condition 10.1 is to ensure that the Site is supervised and operated by properly trained staff in a manner which does not result in a hazard or nuisance to the natural environment or any person.

Conditions 11.1, 11.2, 11.3 and 11.4 is to establish a forum for the exchange of information and public dialogue on activities carried out at the landfill Site. Open communication with the public and local authorities is important in helping to maintain high standards for site operation and environmental protection.

Conditions 12.1 and 12.2 are to ensure that the Ministry is informed of any spills or fires at the Site and to provide public health and safety and environmental protection.

Condition 12.3 is contained in the ECA to guarantee that appropriate measures are taken by the County to prevent future occurrences of spills or fires at the site and to protect public health and safety and the environment.

Conditions 13.1 to 13.5 inclusive are to ensure protection of the natural environment and the integrity of the groundwater monitoring network.

Conditions 13.6 through 13.11 inclusive are to demonstrate that the landfill site is performing as designed and the impacts on the natural environment are acceptable. Regular monitoring allows for the analysis of trends over time and ensures that there is an early warning of potential problems so that any necessary remedial/contingency

action can be taken.

Conditions 14.1 through 14.10 inclusive are to ensure that the Owner follows a plan with an organized set of procedures for identifying and responding to unexpected but possible problems at the Site. A remedial action / contingency plan is necessary to ensure protection of the natural environment. A leachate contingency plan is a specific requirement of Reg. 232.

Conditions 16.1 and 16.2 are to ensure that final closure of the Site is completed in an aesthetically pleasing manner and to ensure the long-term protection of the natural environment.

Condition 16.3 ensures proper public consultation about the end use of the Site is undertaken and that the end use activities are consistent with those identified during the EA process.

Conditions 16.4 to 16.6 ensure that certain activities are undertaken upon closure of the site in order to ensure that the closed site does not affect the natural environment.

Upon issuance of the environmental compliance approval, I hereby revoke Approval No(s). A032203 issued on February 4, 2023

In accordance with Section 139 of the *Environmental Protection Act,* you may by written notice served upon me, the Ontario Land Tribunal and in accordance with Section 47 of the *Environmental Bill of Rights,* 1993, the Minister of the Environment, Conservation and Parks, within 15 days after receipt of this notice, require a hearing by the Tribunal. The Minister of the Environment, Conservation and Parks will place notice of your appeal on the Environmental Registry. Section 142 of the Environmental Protection Act provides that the notice requiring the hearing ("the Notice") shall state:

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

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

The Notice should also include:

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

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

This Notice must be served upon:

Registrar*

The Minister of the Environment,

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

Ontario Land Tribunal 655 Bay Street, Suite 1500 Toronto, Ontario M5G 1E5 OLT.Registrar@ontario.ca	and	Conservation and Parks 777 Bay Street, 5th Floor Toronto, Ontario M7A 2J3	and	Ministry of the Environment, Conservation and Parks 135 St. Clair Avenue West, 1st Floor Toronto, Ontario M4V 1P5

*** Further information on the Ontario Land Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349 or 1 (866) 448-2248, or www.olt.gov.on.ca**

This instrument is subject to Section 38 of the *Environmental Bill of Rights,* 1993, that allows residents of Ontario to seek leave to appeal the decision on this instrument. Residents of Ontario may seek leave to appeal within 15 days from the date this decision is placed on the Environmental Registry. By accessing the Environmental Registry at https://ero.ontario.ca/, you can determine when the leave to appeal period ends.

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

DATED AT TORONTO this 16th day of December, 2023

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

RL/

c: District Manager, MECP Sarnia
Cristina Olarte, WSP

APPENDIX A2:

Amended ECA [Industrial Sewage Works] No. 2403-BE6LZ4, dated August 21, 2019

Ontario

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

AMENDED ENVIRONMENTAL COMPLIANCE APPROVAL

NUMBER 2403-BE6LZ4
Issue Date: August 21, 2019

Waste Management of Canada Corporation
117 Wentworth Court
Brampton, Ontario
L6T 5L4

Site Location: Twin Creeks Environmental Centre
5768 Nauvoo Road, Watford
Township of Warwick , County of Lambton

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

Usage and operation of a leachate collection, treatment, and disposal facility and a stormwater management facility to service the Twin Creeks Landfill Site located in the Township of Warwick, County of Lambton, consisting of the following:

Proposed Works (previously approved by ECA number 3506-7M5PU3)

LEACHATE TREATMENT AND DISPOSAL FACILITY

use and operation of a leachate collection, treatment, and disposal facility with a *Rated Capacity* of 400 m^3/day to service Phases 1 to 9 and during closure and post closure period of the Twin Creeks Landfill Site expansion, consisting of the following:

Raw Leachate Pumping Stations

- two (2) primary leachate pumps (one for each PS5 and PS7) and each rated at 7.3 L/sec, together with their associated forcemains discharging to the equalization tank described below.

Secondary Drainage Layer Pumping Stations

- two (2) secondary drainage layer pumps (one for each PS6 and PS8) each rated at 3.5 L/sec, together with their associated forcemains discharging to the equalization tank described below.

Equalization Tank

- Three (3) additional variable frequency drive (VFD) recirculation pumps each rated at approximately 9.6 L/sec proposed to be pumping leachate to the leachate treatment system;

- two (2) VFD raw leachate pumps (one duty, one standby) each rated at 27.7 L/sec, to be used in combination to fill the Sequencing Batch Reactor (SBR) reactors at a faster rate.

Chemical Feed System

- one (1) 1.0 m^3 capacity phosphoric acid solution storage tank equipped with two (2) metering pumps (one duty for each SBR reactor with interconnecting piping for redundancy) each rated at 32.0 L/hr, dosing phosphoric acid into the SBR reactors as required;

- one (1) 1.0 m^3 capacity flocculant storage tank equipped with two (2) metering pumps (one duty for each SBR reactor with interconnecting piping for redundancy) each rated at 363 L/hr, dosing flocculant upstream of the SBR reactors as required;

- one (1) 1.0 m^3 capacity anti-foam agent storage tank equipped with two (2) metering pumps (one duty for each SBR reactor with interconnecting piping for redundancy) each rated at 32.0 L/hr, dosing anti-foam agent upstream of the SBR reactors as required;

- one (1) 10.0 m^3 capacity methanol storage tank equipped with a spill containment structure and two (2) metering pumps (one duty for each SBR reactor with interconnecting piping for redundancy) each rated at 144 L/hr, dosing methanol upstream of the SBR reactors as required; and

- one (1) 88 m^3 capacity in-ground high strength carbon waste storage tank equipped with two (2) metering pumps (one duty for each SBR reactor with interconnecting piping for redundancy) each rated at 288 L/hr, dosing high strength carbon waste upstream of the SBR reactors as required.

Sequencing Batch Reactor (SBR)

- a sequencing batch reactor system consisting of two (2) reactors each with approximate dimensions of 6.4 m long x 16.2 m wide x 5.5 m SWD providing active reactor volume of 572 m^3, each tank equipped with a jet aeration header and one (1) dry pit jet pump rated at 227 L/sec and a decanter system capable of decanting 69.4 L/sec; and

- three (3) 50 hp positive displacement air blowers each with VFD control and rated at of 462 L/sec at 65.5 kPa supplying the air required for SBR aeration.

Effluent and Sludge Pumps

- two (2) effluent transfer pumps (one duty for each SBR reactor with interconnecting piping for redundancy) each rated at 69.4 L/sec, transferring effluent from the SBR units to an effluent holding tank, as described below; and

- two (2) activated sludge wasting pumps (one duty for each reactor) each rated at 22 L/sec, transferring activated wasted sludge to aerated sludge tanks, as described below.

Effluent and Sludge Holding Tanks

- one (1) 400 m^3 storage capacity effluent holding tank with approximate dimensions of 9.75 m long x 8.5 m wide x 5.5 m SWD equipped with coarse bubble diffusers, discharging to a reverse osmosis membrane filtration system, as described below;

- two (2) aerated sludge tanks operating in either parallel or series mode, each with approximate dimensions of 11.8 m long x 3 m wide x 5.5 m SWD providing a storage capacity of 200 m^3 equipped with coarse bubble diffusers, two (2) supernatant pumps returning supernatant to the SBR units described above, and two (2) sludge pumps discharging settled sludge to a sludge dewatering press, as described below; and

- three (3) positive displacement air blowers each rated at 141 L/sec and at 65.5 kPa with VFD control providing air required for the effluent tank and sludge holding tanks.

Reverse Osmosis Membrane Filtration System

- one (1) treated effluent storage tank with a capacity of 15.0 m^3, equipped with one (1) pump rated at 8.3 L/sec discharging to a cartridge sand filtration unit, as described below;

- one (1) sulphuric acid storage tank with a capacity of 7,000 L for pH adjustment of effluent at the effluent storage tank, as described above;

- two (2) dual redundant 3.47 L/sec capacity cartridge sand filtration unit discharging to a reverse osmosis membrane filtration system described below;

- one (1) three-staged reverse osmosis membrane filtration system with an overall treatment capacity of 3.47 L/sec consisting of three (3) filtration units, equipped with a 32-piece ST-RO membrane modules, a 20-piece ST-RO membranes modules, a 15 piece ST-NF membrane modules and the following pumps:

    a. four (4) high pressure plunger pumps each rated at1.8 L/s (1st and 2nd stage RO);
    b. five (5) multistage centrifugal booster pumps with under water motor each rated at.8 L/s (1st and 2nd stage RO);
    c. one (1) multi stage vertical centrifugal pump (cleaning pump) rated at 3.47 L/s;
    d. one (1) high pressure plunger pump with a capacity of 1.06 L/s (3rd stage NF);
    e. three (3) multistage centrifugal booster pumps with under water motor rated at 2.8 L/s each (3rd

stage NF); and

f. one (1) multi stage vertical centrifugal pump (cleaning pump) rated at 1,06 L/s.

all discharging final permeate to a treated effluent storage pond described below and final concentrate to a concentrate storage tank described below;

Treated Effluent Storage Ponds

- one (1) clay lined pond **(Inlet cell)** with a capacity of 2,200 m^3, equipped with a floating aerator and one (1) pumping station manhole with a submersible pump rated at 30 m^3/hr;

- one (1) clay lined pond **(Cell 1)** with a capacity of 53,900 m^3 equipped with one (1) interconnecting manhole with a gate valve; and

- one (1) clay lined pond **(Cell 2)** with a capacity of 28,400 m^3, providing storage for treated effluent from the membrane filtration system, equipped with one (1) interconnecting manhole with a gate valve, a pumping station **(Pumping Station 11)** equipped with one (1) VFD submersible pump rated at 56.9 L/sec to be used for truck loading purposes, one (1) submersible effluent return pump rated at 7.3 L/sec , and two (2) VFD submersible irrigation pumps each rated at 45.7 L/sec (one duty, one standby) discharging to a poplar tree land irrigation area described below;

Concentrate Evaporator and Dryer

- one (1) concentrate storage tank with approximate dimensions of 4.4 m long x 4.8 m wide and 5.5 m SWD (total capacity of 102 m^3), equipped with a submersible pump for off-site disposal rated at 9.5 L/sec, also used for off-site disposal slurry, and a pump for transferring concentrate to an evaporator treatment system, as described below, rated at 0.63 L/sec;

- one (1) mechanical vapor compression evaporator rated at 0.63 L/sec, equipped with electric heating element and heat exchangers to remove moisture from concentrate and produce a slurry discharging to a slurry holding tank described below;

- one (1) slurry holding tank with approximate dimensions of 4.4 m long x 4.8 m wide and 5.5 m SWD (total capacity of 102.0 m^3) equipped with one (1) slurry pump rated at 1.57 L/sec, discharging to a slurry dryer described below; and

- one (1) slurry dryer rated at 0.035 L/sec with approximate dimensions of 4.7 m long x 2.1 m wide x 1.5 m high discharging to a salt cake disposal bin (water vapour will be evaporated through the slurry dryer exhaust).

Treated Effluent On-Site Disposal

Upgrades to the disposal system of the treated leachate effluent, as follows:

- two (2) 3.31 ha treated effluent drip-irrigation zones using approximately 250 m long drip-irrigation tubing installed in each zone;

Previous Works:

STORMWATER MANAGEMENT FACILITY

a stormwater management facility to service a 146.5 ha drainage area of the Twin Creeks Landfill Site Expansion within the 300 ha area of the Twin Creeks Landfill Site consisting of the following:

Stormwater Management Pond - SWM Pond #1

a stormwater management facility (**SWM Pond #1**) to service a total drainage area of 33.7 ha consisting of the eastern part of the existing landfill site and future excess soil stockpile area, designed to provide quantity and quality control by attenuating peak stormwater flows from storm events up to 1:100 year return frequency including regional storm (Hazel) at or below pre-development levels, consisting of the following:

- one (1) approximately 1,300 m long perimeter trapezoidal ditch along the toe of the eastern side of the closed landfill having a 0.6 m wide bottom and 2H:1V side slopes, discharging collected stormwater to an extended detention wet pond described below;

- one (1) ditch along the south and west side of the leachate storage lagoon collecting runoff from the excess soil stockpile area, discharging collected stormwater to a forebay described below;

- one (1) forebay with approximate dimensions of 19 m long x 16 m wide bottom, and 4H:1V side slopes, discharging to an extended detention wet pond described below;

- one (1) extended detention wet pond with approximate dimensions of 294.0 m long bottom, 23.5 m wide bottom and 4H:1V side slopes, equipped with a permanent vertical baffle with a minimum elevation of 238.7 m ASL, providing a total storage capacity of 21,429 m^3 consisting of a permanent pool storage volume of 3,651 m^3 with an average depth of 0.5 m, and an extended storage volume of 17,778 m^3 with an extended storage depth of 1.91 m, equipped with an outlet structure described below;

- an outlet structure consisting of two (2) 1500 mm diameter concrete manholes discharging through two (2) 750 mm diameter outlet pipes, each pipe equipped with a 1200 mm x 1200 mm concrete valve chamber and a sluice gate valve, to a perimeter ditch flowing towards a roadside ditch along County Road 79; and

- one (1) 8.0 m wide emergency overflow structure with weir elevation of 239.55 m ASL discharging to a perimeter ditch flowing towards County Road 79 roadside ditch.

Stormwater Management Pond - SWM Pond #2

a stormwater management facility (**SWM Pond #2**) to service a total drainage area of 67.9 ha consisting of southwestern part of the expanded landfill site, designed to provide quantity and quality control by attenuating peak stormwater flows from storm events up to 1:100 year return frequency including regional storm (Hazel) at or below pre-development levels, consisting of the following:

- two (2) approximately 400 m and 1500 m long perimeter ditches along the southern part of the landfill having a minimum depth of 1.0 m, and 3H:1V & 4H:1V side slopes discharging collected stormwater through two (2) culverts, 3000 mm X 1200 mm concrete box and 1390 x 970 mm CSPA, to a forebay described below;

- one (1) forebay with approximate dimensions of 47 m long x 30 m wide bottom and 4H:1V and 3H:1V side slopes, discharging to an extended detention wet pond described below;

- one (1) extended detention wet pond with approximate dimensions of 413.0 m long x 44.0 m wide bottom and 4H:1V and 3H:1V side slopes, providing a total storage capacity of 51,725 m^3 consisting of a permanent pool storage volume of 11,427 m^3 with a average depth of 0.60 m, and an extended storage volume of 38,098 m^3 with an extended storage depth of 1.75 m, equipped with an outlet structure described below;

- an outlet structure consisting of one (1)1800 mm diameter and one (1) 2400 mm diameter concrete manholes discharging through a 1,050 mm and a 1,200 mm diameter outlet pipes, each pipe equipped with a 2000 mm x 2000 mm concrete valve chamber and a sluice gate valve, to a roadside ditch along County Road 79; and

- one (1) 18 m wide emergency overflow structure with weir elevation of 234.05 m ASL discharging to a roadside ditch along County Road 79.

Stormwater Management Pond - SWM Pond #3

a stormwater management facility (**SWM Pond #3**) to service a total drainage area of 30.5 ha consisting of northwestern part of the expanded landfill site, designed to provide quantity and quality control by attenuating peak stormwater flows from storm events up to 1:00 year return frequency including regional storm (Hazel) at or below pre-development levels, consisting of the following:

- one (1) approximately 650 m long perimeter ditch along the northern part of the expanded landfill and one (1) approximately 500 m long perimeter ditch along the western part of the expanded landfill, each having a minimum of 1.0 m depth and 3H:1V & 4H:1V side slopes, discharging collected stormwater through a 3000 mm x 1200 mm concrete box culvert to a forebay described below;

- one (1) forebay with approximate dimensions of 33 m long x 25 m wide bottom and 4H:1V side slopes, discharging to an extended detention wet pond described below;

- one (1) extended detention wet pond with approximate dimensions of 255.0 m long, 36.0 m wide bottom and 3H:1V and 4H:1V side slopes, providing a total storage capacity of 24,996 m^3 consisting of a permanent pool storage volume of 4,843 m^3 with an average depth of 0.50 m, and an extended storage volume of 20,053 m^3 with an extended storage depth of 1.67 m, equipped with an outlet structure described below;

- an outlet structure consisting of three (3)1200 mm diameter concrete manholes discharging through two (2) 600 mm diameter and one (1) 450 mm diameter outlet pipes, each pipe equipped with 1200 mm x 1200 mm box concrete valve chamber and a sluice gate valve, to a roadside ditch along County Road 79; and

- one (1) 9 m wide emergency overflow structure with a weir elevation of 238.00 m ASL discharging to a roadside ditch along County Road 79.

Stormwater Management Pond - SWM Pond #4

a stormwater management facility (**SWM Pond #4**) to service a total drainage area of 14.4 ha consisting of the north eastern part of the expanded landfill site and norther part of the existing landfill site, designed to provide quantity and quality control by attenuating peak stormwater flows from storm events up to 1:100 year return frequency including regional storm (Hazel) at or below pre-development levels, consisting of the following:

- four (4) perimeter ditches collecting runoff from the northern side of the expanded landfill and from the northwestern portion of the existing landfill, having a minimum of 1.0 m depth and 3H:1V & 4H:1V side slopes, discharging collected stormwater through two (2) inlet structures to a forebay described below;

- one (1) forebay with approximate dimensions of 16 m long x 16 m wide bottom and 4H:1V side slopes, discharging to an extended detention wet pond described below;

- one (1) extended detention wet pond with approximate dimensions of 165.0 m long bottom, 20.0 m wide bottom and 3H:1V and 4H:1V side slopes, providing a total storage capacity of 8,328 m^3 consisting of a permanent pool storage volume of 1,812 m^3 with an average depth of 0.50 m, and an extended storage volume of 6,516 m^3 with an extended storage depth of 1.32 m, equipped with an outlet structure described below;

- an outlet structure consisting of one (1)1800 mm diameter concrete manhole discharging through one (1)1050 mm diameter outlet pipe equipped with 2000 mm X 2000 mm concrete valve chamber and a sluice gate valve to a perimeter ditch along Zion Line to a roadside ditch along Zion Line;

- one (1) 8 m wide emergency overflow structure with a weir elevation of 242.00 m ASL discharging to a road side ditch along Zion Line; and

all other controls, electrical equipment, instrumentation, piping, valves and appurtenances essential for the proper operation of the aforementioned sewage Works;

all in accordance with the following submitted supporting documents listed in Schedule A.

LEACHATE TREATMENT AND DISPOSAL FACILITY

use and operation of a leachate collection, treatment, and disposal facility with a *Rated Capacity* of 400 m^3/day to service Phases 1 to 9 and during closure and post closure period of the Twin Creeks Landfill Site expansion, consisting of the following:

Raw Leachate Pumping Stations

- two (2) primary raw leachate pumps (one for each PS1 and PS3) each rated at 7.3 L/sec, together with their associated forcemains discharging to the equalization tank described below.

Secondary Drainage Layer Pumping Stations

- two (2) secondary drainage layer pumps (one for each PS2 and PS4) each rated at 3.5 L/sec, together with their associated forcemains discharging to the equalization tank described below.

Equalization Tank

- one (1) 2,300 m^3 capacity steel and glass lined tank enclosed with a clay berm containment area, receiving raw leachate from the landfill leachate collection system, equipped with three (3) variable frequency drive (VFD) recirculation pumps (two duty and one standby) each rated at 9.6 L/sec, all pumping leachate to the leachate treatment system, as described below; and

Treated Effluent On-Site Disposal (Poplar Plantation)

Upon substantial completion of the Works, treated leachate effluent will be disposed as follows:

- one (1) 28.32 ha poplar tree irrigation land established to handle an average of 1,187 m^3/day of treated leachate effluent during suitable irrigation days between the period extending from May 1st to October 15th, consisting of six (6) 3.62 ha treated effluent drip-irrigation zones using approximately 250 m long drip-irrigation tubing installed in each zone;

- a stormwater management system to control the quality of stormwater runoff from the poplar tree irrigation land to Kersey Drain (Brown Creek), consisting of one (1) west furrow approximately 710 m long x 200 mm deep and one (1) east furrow approximately 510 m long x 200 mm deep, running parallel to each other with a grassed area in between, each equipped with a 200 mm high berm for distributing stormwater runoff across the entire length of the furrow, discharging by sheet flow to Kersey Drain; and

Raw/Diluted Leachate Effluent Disposal (Poplar System)

- one (1) existing 9.3 ha poplar tree irrigation system identified as the Poplar System, of approximately 150 m length for each poplar row. Leachate is applied through pressure drip-irrigation tubing at a rate not to exceed 476 mm/m², or 44,000 L/day, during the growing season. The system is subject to conditions as specified in the *EPA* Section 27 approval for the site. Revised to a 9.3 ha area with a rate of 476 mm/m^2 or 44,000 m^3/year.

    - a system of maintenance holes, collector system and leachate sump across the existing site to transfer leachate to the leachate holding tanks via two methods: 1) down-hole leachate pumps transfer leachate through piping units directly to the leachate holding tanks and the Equalization Tank; and 2) the use of a tanker truck, which transfers the leachate via gravity drainage into the leachate holding tanks or maintenance holes of the leachate conveyance system.

all other controls, electrical equipment, instrumentation, piping, pumps, valves and appurtenances essential for the proper operation of the aforementioned sewage Works;

all in accordance with the following submitted supporting documents listed in Schedule A.

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

1. "Approval" means this entire document and any schedules attached to it, and the application;

2. "District Manager" means the District Manager of the Sarnia District Office of the Ministry;

3. "Director" means a person appointed by the Minister pursuant to section 5 of the EPA for the purposes of Part II.1 of the EPA;

4. "EPA" means the *Environmental Protection Act*, R.S.O. 1990, c.E.19, as amended;

5. "Ministry" means the ministry of the government of Ontario responsible for the EPA and OWRA and includes all officials, employees or other persons acting on its behalf;

6. "Owner" means Waste Management of Canada Corporation and its successors and assignees;

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

8. "Poplar System" is the irrigation area of 9.3 hectares located on top of the cap of the Existing Site (old landfill) that is used for the phytoremediation of leachate that is generated at the Site.

9. "Poplar Plantation" is the irrigation area located on native soil to the south of the Site that is used for the phytoremediation of irrigation liquid that satisfies the Effluent Limit criteria.

10. "Previous Works" means those portions of the sewage works previously constructed and approved under an Approval;

11. "Proposed Works" means the sewage works described in the Owner's application, this Approval, to the extent approved by this Approval;

12. "Township" means the Township of Warwick;

13. "Works" means the sewage works described in the Owner's application, and this Approval, and includes both Proposed Works and Previous Works;

14. "WIFN" refers to Walpole Island First Nation; and

15. "WPLC" refers to the Warwick Public Liaison Committee.

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

TERMS AND CONDITIONS

PART I - GENERAL

1. GENERAL CONDITION

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

2. Except as otherwise provided by these conditions, the Owner shall design, build, install, operate and maintain the Works in accordance with the description given in this Approval, and the application for approval of the Works.

3. Where there is a conflict between a provision of any document in the schedule referred to in this Approval and the conditions of this Approval, the Conditions in this Approval shall take precedence, and where there is a conflict between the documents in the schedule, the document bearing the most recent date shall prevail.

4. Where there is a conflict between the documents listed in the Schedule A, and the application, the application shall take precedence unless it is clear that the purpose of the document was to amend the application.

5. The Conditions of this Approval are severable. If any Condition of this Approval, or the application

of any requirement of this Approval to any circumstance, is held invalid or unenforceable, the application of such condition to other circumstances and the remainder of this Approval shall not be affected thereby.

2. CHANGE OF OWNER

1. The Owner shall notify the District Manager and the Director, in writing, of any of the following changes within thirty (30) days of the change occurring:

    a. change of Owner or operating authority, or both;

    b. change of address of Owner or operating authority or address of new Owner or operating authority;

    c. change of partners where the Owner or operating authority is or at any time becomes a partnership, and a copy of the most recent declaration filed under the *Partnerships Registration Act;*

    d. change of name of the corporation where the Owner or operator is or at any time becomes a corporation, and a copy of the most current "Initial Notice or Notice of Change" (Form 1, 2 or 3 of O. Reg. 189, R.R.O. 1980, as amended from time to time), filed under the *Corporations Information Act* , shall be included in the notification to the District Manager;

2. In the event of any change in ownership of the Works, the Owner shall notify in writing the succeeding owner of the existence of this Approval, and a copy of such notice shall be forwarded to the District Manager.

3. The Owner shall ensure that all communications made pursuant to this condition will refer to this Approval's number.

PART II - STORMWATER MANAGEMENT FACILITY

3. OPERATIONS MANUAL

1. The Owner shall maintain the operations manual up to date through revisions undertaken from time to time and retain a copy at the location of the sewage works. Upon request, the Owner shall make the manual available for inspection and copying by Ministry personnel.

4. EFFLUENT MONITORING AND RECORDING

1. The Owner shall carry out a monitoring program and all samples and measurements taken for the purposes of this Approval are to be taken at a time and in a location characteristic of the quality and quantity of the effluent stream over the time period being monitored.

2. Samples shall be collected and analyzed at the sampling point(s), at the sampling frequencies and using the sample type specified for each parameter listed in the effluent monitoring table included in **Schedule B**:

3. The methods and protocols for sampling, analysis, toxicity testing, and recording shall conform, in order of precedence, to the methods and protocols specified in the following:

    a. the Ministry's publication "Protocol for the Sampling and Analysis of Industrial/Municipal Wastewater" (January 1999), ISBN 0-7778-1880-9, as amended from time to time by more recently published editions;

    b. the publication "Standard Methods for the Examination of Water and Wastewater" (21st edition) as amended from time to time by more recently published editions; and

    c. in respect of any parameters not mentioned in (a) - (b), the written approval of the District Manager, which approval shall be obtained prior to sampling.

4. The temperature and pH of the effluent from the Works shall be determined in the field at the time of sampling for total ammonia. The concentration of un-ionized ammonia shall be calculated using the total ammonia concentration, pH and temperature using the methodology stipulated in "Ontario's Provincial Water Quality Objectives" dated July 1994, as amended, for ammonia (un-ionized).

5. The measurement frequencies specified in Condition 4 (2) in respect to any parameter are minimum requirements which ma, after 24 months of monitoring in accordance with this Condition, be modified by the District Manager in writing from time to time.

6. The Owner shall provide to the Township, WPLC, WIFN a copy of all requests to be submitted to the District Manager for any changes to the monitoring program specified in Condition 4 (5) at the same time or prior to the time such request is made to the District Manager.

5. OPERATION AND MAINTENANCE

1. The Owner shall apply the "Stormwater Contingency and Remedial Action Plan as included in Appendix N.27 of the Operations and Maintenance manual, Warwick Landfill Expansion, WM, May 2008.

2. The Owner shall operate the Works (**SWM Ponds**) with the outlet sluice gate valve in a **Normally Open Position** during normal operation period.

3. The Owner shall compare monitoring results obtained under Condition 4 (2) for the trigger parameters listed in Table 2 in **Schedule B** with respective trigger levels listed in Table 2 in **Schedule B** to identify any potential leachate impact to stormwater.

4. In the event that a monitoring result for any parameter that is listed in Table 2 of **Schedule B** for any of **SWM Ponds** exceeds its trigger level, the Owner shall conduct sampling of the contents of the affected **SWM Pond** within one (1) week to confirm the exceedance of the trigger level for that parameter and identify potential source of contamination. Upon confirmation of the exceedence of the exceedance of any trigger level for any parameter that is listed in Table 2 of **Schedule B**, the Owner shall close the outlet sluice gate valve of the affected Works **(SWM Pond)** and implement an approved "Stormwater Contingency and Remedial Action Plan".

5. The Owner shall dispose of the contents of an affected Work **(SWM Pond)** which failed to meet the quality requirements outlined in Condition 5 (5) in accordance with an approved "Stormwater Contingency and Remedial Action Plan".

6. In the event that a monitoring result for any parameter that is listed in Table 2 for the **Poplar Plantation** exceeds its trigger level, the Owner shall conduct sampling of the stormwater runoff from the affected part of the **Poplar Plantation** as soon as possible to confirm the exceedence of the trigger level for that parameter and identify potential source of contamination. Upon confirmation of the exceedence of any trigger level for any parameter that is listed in Table 2, the Owner shall implement an approved "Stormwater Contingency and Remedial Action Plan".

7. The Owner shall inspect the Works **(SWM Ponds)** at least once a year and, if necessary, clean and maintain the Works to prevent the excessive build-up of sediments and/or vegetation.

8. The Owner shall maintain a logbook to record the results of these inspections and any cleaning and maintenance operations undertaken, and shall keep the logbook at the site or Owner's operational head quarter for inspection by the Ministry. The logbook shall include the following:

    a. the name of the Works (SWM Pond #1, SWM Pond #2, SWM Pond #3, and SWM Pond #4);

    b. the date and results of each inspection, maintenance and cleaning, including an estimate of the quantity of any materials removed; and

    c. the occurrence date of each spill within the catchment area of a given SWM Pond, including follow-up action/ remedial measures undertaken.

6. RECORD KEEPING

1. The Owner shall retain for a minimum of five (5) years from the date of their creation, all records and information related to or resulting from the operation and maintenance and monitoring activities required by this Approval.

PART III - LEACHATE TREATMENT FACILITY

7. EFFLUENT LIMITS

1. The Owner shall design, construct and operate the Works such that the concentrations of the materials listed as effluent parameters in the effluent limits table in **Schedule B** are not exceeded in the effluent from the **Treated Effluent Storage Pond** (Cell 2).

2. For the purposes of determining compliance with and enforcing subsection (1):

    a. The Average Monthly Concentration of a parameter named in Column 1 of Table 3 in **Schedule B** shall not exceed the corresponding maximum concentration set out in Column 2 of Table 3 in **Schedule B;**

    b. non-compliance with respect to pH is deemed to have occurred when any single measurement is outside of the indicated range.

8. OPERATION AND MAINTENANCE

1. The Owner shall exercise due diligence in ensuring that, at all times, the Works and the related equipment and appurtenances used to achieve compliance with this Approval are properly operated and maintained. Proper operation and maintenance shall include effective performance, adequate funding, adequate operator staffing and training, including training procedures and other requirements of this Approval and OWRA and regulations, adequate laboratory facilities, process controls and alarms and the use of process chemicals and other substances in the Works.

2. The Owner shall main the operations manual current and retain a copy at the location of the Works for the operational life of the Works. Upon request, the Owner shall make the manual available to Ministry staff.

9. EFFLUENT MONITORING AND RECORDING

The Owner shall carry out a monitoring program:

1. all samples and measurements taken for the purposes of this Approval are to be taken at a time and in a location characteristic of the quality and quantity of the effluent stream over the time period being monitored.

2. For the purpose of this condition, the following definitions apply:

    a. Daily means once each day;

    b. Weekly means once each week;

    c. Monthly means once every month; and

d. Semi-annually means once every six months.

3. Samples shall be collected and analyzed at the sampling point(s), at the sampling frequencies and using the sample type specified for each parameter listed in the effluent monitoring table included in **Schedule B**:

4. The methods and protocols for sampling, analysis, toxicity testing, and recording shall conform, in order of precedence, to the methods and protocols specified in the following:

    a. the Ministry's Procedure F-10-1, "Procedures for Sampling and Analysis Requirements for Municipal and Private Sewage Treatment Works (Liquid Waste Streams Only)", as amended from time to time by more recently published editions;

    b. the Ministry's publication "Protocol for the Sampling and Analysis of Industrial/Municipal Wastewater" (January 1999), ISBN 0-7778-1880-9, as amended from time to time by more recently published editions;

    c. the publication "Standard Methods for the Examination of Water and Wastewater" (21st edition) as amended from time to time by more recently published editions; and

    d. in respect of any parameters not mentioned in (a) - (c), the written approval of the District Manager, which approval shall be obtained prior to sampling.

5. The measurement frequencies specified in **Schedule B** in respect to any parameter are minimum requirements which may, after 24 months of monitoring in accordance with this Condition, be modified by the District Manager in writing from time to time.

6. The Owner shall provide to the Township, WPLC and WIFN a copy of all requests to be submitted to the District Manager for any changes to the monitoring program specified in **Schedule B** at the same time or prior to the time such request is made to the District Manager.

7. A continuous flow measuring device(s) shall be installed and maintained to measure the flowrate of the effluent from the sewage works, with an accuracy to within plus or minus fifteen (15) per cent of the actual flowrate for the entire design range of the flow measuring device and the Owner shall measure, record and calculate the flowrate for each effluent stream on each day of sampling.

8. The Owner shall retain for a minimum of five (5) years from the date of their creation, all records and information related to or resulting from the monitoring activities required by this Approval.

9. The Owner shall visually inspect the drip-irrigation pipeline systems at least once per week during operation period to look for leaking and/or failed (broken) lines that would otherwise produce run-off. The inspection should be supported by a log book documenting routine inspection and notes on repair as required.

10. GROUNDWATER MONITORING - POPLAR PLANTATION LAND IRRIGATION AREA

1. The Owner shall collect grab samples during May and November from the sampling location outlined in Table 7 of **Schedule B** and analyze for the parameters listed in Table 7 of **Schedule B.**

2. The methods and protocols for sampling, analysis and recording shall conform to that outlined in Condition 9 (4).

3. The measurement frequencies specified in Condition 10 (2) in respect to any parameter are minimum frequencies which may, after 24 months of monitoring in accordance with this Condition, be modified by the District Manager, in writing from time to time.

4. The Owner shall provide to the Township, WPLC, and WIFN a copy of all requests to be submitted to the District Manager for any changes to the monitoring program specified in Condition 10 (2) at the same time or prior to the time such request is made to the District Manager.

11. OPERATION - POPLAR PLANTATION LAND IRRIGATION

1. The Owner shall apply the "Groundwater Contingency and Remedial Action Plan" for any potential groundwater impact caused by Effluent Storage Ponds and the Poplar Forest Irrigation Area, as included in Appendix N.26 of the Operation and Maintenance Manual, Warwick Landfill Expansion, WM, May 2008.

2. The Owner shall compare monitoring results obtained under condition 10 (2) for the trigger parameter listed in Table 8 of **Schedule B** with their respective trigger levels listed in Table 8 of **Schedule B** to identify any potential leachate impact to groundwater.

3. In the event that a monitoring result for any parameter that is listed in Table 8 of **Schedule B** exceeds its trigger level, the Owner shall re-sample within one (1) month to confirm the exceedence of the trigger level for that parameter. Upon confirmation of the exceedence of any trigger level for any parameter that is listed in Table 8 of **Schedule B**, the Owner shall conduct a second round re-sampling within six (6) months to re-confirm the exceedence of the trigger level for the parameter of concern.

4. In the event that the presence of the parameter(s) of concern is (are) not confirmed after the second round of sampling conducted under Condition 11 (3), then, normal groundwater monitoring shall be resumed.

5. In the event that the presence of the parameter(s) of concern is confirmed after the second round of sampling conduced under Condition 11 (3), then, it shall constitute as a confirmation of leachate impact to groundwater and the *Owner* shall immediately implement the "Groundwater Contingency and Remedial Action Plan" approved under Condition 11 (1).

6. The Owner shall notify the District Manager orally, as soon as possible, and in writing within seven days of the confirmation of leachate impact to groundwater including an assessment of the relative severity and extent of leachate impact and proposed remedial actions.

7. The Owner shall record and report a summary of all trigger exceedence incidents and all remedial action measures taken under Condition 11 (5) in the Annual Report prepared under Condition 13.

8. The Owner shall dispose of **only** treated leachate effluent that meets the effluent limits requirements outlined under Condition 7 (1) for treatment and disposal by drip-irrigation on the approved poplar tree land area during the period between May 1st and October 15th of each calendar year.

9. The Owner shall not allow under any circumstance (including as emergency contingency plan) any direct discharge of leachate or treated leachate effluent from the Works to any receiving surface water including Bear Creek;

10. The Owner shall record the total volume of treated leachate effluent drip-irrigated on the poplar tree land irrigation area on a daily basis.

11. The Owner shall ensure that treated leachate effluent is disposed of via drip-irrigation in the designated six (6) poplar tree drip-irrigation zones initially, and ultimately on eight (8) poplar tree drip-irrigation zones on a planned rotation basis.

12. The Owner shall visually inspect drip-irrigation operations at least twice each day during operation period to ensure that no surface ponding or surface run-off is taking place.

13. The *Owner* shall retain records of inspections and drip-irrigation operation data collected under subsections (10), (11) and (12) and make them available for inspection Ministry staff upon request.

14. No drip irrigation is to take place:

    a. on frozen or snow covered ground conditions;

    b. with the occurrence of surface ponding in any area subjected to drip irrigation;

    c. within 100 m of any surface watercourse or drain; and

    d. at an average daily application rate greater than 4.8 mm;

15. The Owner shall notify and provide the Township, WPLC and WIFN with a copy of the proposed "Groundwater Contingency and Remedial Action Plan" required under Condition 11 (1).

PART IV - GENERAL

12. REPORTING

1. In addition to the obligations under Part X of the EPA, the Owner shall, within ten (10) working days of the occurrence of any reportable spill as defined in Ontario Regulation 675/98, bypass or loss of any product, by-product, intermediate product, oil, solvent, waste material or any other polluting substance into the environment, submit a full written report of the occurrence to the District Manager describing the cause and discovery of the spill or loss, clean-up and recovery measures taken, preventative measures to be taken and schedule of implementation.

2. The Owner shall, upon request, make all manuals, plans, records, data, procedures and supporting documentation available to Ministry staff.

3. The Owner shall prepare and submit a performance report to the District Manager on an annual basis within before March 31 of each calendar year. The reports shall contain, but shall not be limited to, the following information:

    a. a summary and interpretation of all monitoring data and a comparison to the effluent objectives outlined in Condition 7, including an overview of the success and adequacy of the Works;

    b. a summary and interpretation of all monitoring data and a comparison to the trigger limits outlined in Condition 5, including an overview of the success and adequacy of the Works;

    c. a description of any operating problems encountered and corrective actions taken;

    d. a summary of all maintenance carried out on any major structure, equipment, apparatus, mechanism or thing forming part of the sewage works;

    e. a summary of any effluent quality assurance or control measures undertaken in the reporting period;

    f. a summary of the calibration and maintenance carried out on all effluent monitoring equipment;

    g. a tabulation of dry salt cake generated in the reporting period, an outline of anticipated amount of dry salt cake to be generated in the next reporting period and a summary of the locations to where the cake was disposed;

    h. a summary of any complaints received during the reporting period and any steps taken to address the complaints; and

    i. any other information the District Manager requires from time to time.

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

1. Condition 1 is imposed to ensure that the works are built and operated in the manner in which they were described for review and upon which approval was granted. This condition is also included to emphasize the precedence of Conditions in the Approval and the practice that the Approval is based on the most current document, if several conflicting documents are submitted for review.

2. Condition 2 is included to ensure that the Ministry records are kept accurate and current with respect to the approved works and to ensure that subsequent owners of the Works are made aware of the Approval and continue to operate the Works in compliance with it.

3. Conditions 3, 5, 8 and 11 are included to require that the Works be properly operated, maintained, funded, staffed and equipped such that the environment is protected and injury to any person or deterioration, loss and damage to property is prevented. As well, the inclusion of a comprehensive operations manual governing all significant areas of operation, maintenance and repair is prepared, implemented and kept up-to-date by the owner and made available to the Ministry. Such a manual is an integral part of the operation of the Works. Its compilation and use should assist the *Owner* in staff training, in proper plant operation and in identifying and planning for contingencies during possible abnormal conditions.The manual will also act as a benchmark for *Ministry* staff when reviewing the Owner′ s operation of the work.

4. Conditions 4, 9 and 10 are included to require the owner to demonstrate on a continual basis that the quality and quantity of the effluent from the approved Works is consistent with the effluent limits specified in the certificate and that the approved Works does not cause any impairment to the receiving watercourse and/or the groundwater.

5. Condition 6 is included to require that all records are retained for a sufficient time period to adequately evaluate the long-term operation and maintenance of the Works.

6. Condition 7 is imposed to ensure that the effluent irrigated from the Works to the poplar irrigation area meets the Ministry's effluent quality requirements thus minimizing environmental impact on groundwater and receiving surface water.

7. Condition 12 is included to provide a performance record for future references to ensure that the *Ministry* is made aware of problems as they arise and to provide a compliance record for all the terms and conditions outlined in this Approval so that the Ministry can work with the Owner in resolving any problems in a timely manner.

Schedule A

1. Application for Environmental Compliance Approval submitted by Reid Cleland, Director of Operations- Eastern Canada Landfills of Waste Management of Canada Corporation received on March 5, 2019 and all supporting documentation and information submitted during the review process.

Schedule B

Table 1 - Stormwater Monitoring Sampling Locations: SWM Pond Outlets - SP1, SP2, SP3, SP4. Irrigation Area - SS17A, SS17B, SS18A and **SS18B.**			
Parameter	**Parameter**	**Parameter**	**Field -Parameter**
Alkalinity	Magnesium	Toluene	Conductivity
Total Ammonia Nitrogen	Potassium	Ethylbenzene	Dissolved Oxygen
Un-ionized Ammonia	Sodium	Xylene	pH (Field)
Chloride	Arsenic	Vinyl Chloride	Temperature
Conductivity (Lab)	Barium	1,2,4-Trichlorobenzene	Turbidity
Nitrate Nitrogen	Boron	1,2-Dichlorobenzene	
Nitrite Nitrogen	Cadmium	1,3-Dichlorobenzene	
TKN	Chromium (Total)	1,4-Dichlorobenzene	
pH (Lab)	Copper	Hexachlorobenzene	
Total Phosphorus	Iron	Diethylphthalate	
Total Suspended Solids	Lead	Dimethylphthalate	
Total Dissolved Solids	Mercury	Di-n-butyl phthalate	
Sulphate	Nickel	Phenol	
BOD5	Zinc	Benzo(a)pyrene	
Chemical Oxygen Demand	Benzene	2,4,6-Trichlorophenol	
Phenols	1,4-Dichlorobenzene	2,4-Trichlorophenol	
Calcium	Dichloromethane	Pentachlorophenol	

Note: Samples shall be collected within twenty four hours after a rainfall event (more than 10 mm rainfall in 24 hour period) resulting in a stormwater discharge from each SWM Pond or Poplar Plantation Irrigation Area at a minimum interval of one (1) month between consecutive sampling events.

Table 2	
Trigger Parameter	**Trigger Level [SS10 & SS16 - 90th percentile]** (mg/L)
Ammonia (unionized)	0.020
Boron	0.20
Boron (SP1 only)	0.39
Chloride	210
Chromium (Total)	0.024
Nickel	0.027
Phenols	0.001
Zinc	0.06

Note: Annually, a trigger level for a parameter listed above will be replaced by the corresponding 90th percentile of background surface water concentration where background surface water concentrations collected upstream of the landfill (Sampling Locations SS10 and SS16).

Table 3 - Effluent Limits Sampling Location: **Discharge Point from Treated Effluent Storage Pond**	
Effluent Parameter	**Average Monthly Concentration** (milligrams per litre unless otherwise indicated)
Column 1	Column 2
Total Ammonia Nitrogen	68.7
Total Phosphorus	0.72
Phenols	0.2
Chlorides	247
Copper	0.014
Iron	27.0
pH of the effluent maintained between 6.0 to 9.5, inclusive, at all times	

Table 4 - Leachate Monitoring Sampling Location: **Equalization Tank**		
Parameters	**Sample Type**	**Frequency**
BOD5	Grab	Quarterly
Dissolved Organic Carbon (DOC)	Grab	Quarterly
Total Phosphorus	Grab	Quarterly
Total Kjeldahl Nitrogen	Grab	Quarterly
BTEX	Grab	Quarterly
pH	Grab	Quarterly
VOCs [Note 1]	Grab	Semi-Annually
Semi-VOCs [Note 2]	Grab	Semi-Annually
Metals [Note 3]	Grab	Semi-Annually
General Chemistry [Note 4]	Grab	Semi-Annually

Table 5 - Leachate Treatment Plant Effluent Monitoring Sampling Location: **Discharge to Treated Effluent Storage Pond**		
Parameters	**Sample Type**	**Frequency**
CBOD5	Grab	Weekly
Dissolved Organic Carbon (DOC)	Grab	Weekly
Total Ammonia Nitrogen	Grab	Weekly
Chloride	Grab	Weekly
BTEX	Grab	Weekly
pH	Grab	Weekly
VOCs [Note 1]	Grab	Monthly
Semi-VOCs [Note 2]	Grab	Monthly
Metals [Note 3]	Grab	Monthly
General Chemistry [Note 4]	Grab	Monthly
PCB	Grab	Semi-Annually
Organochlorides	Grab	Semi-Annually

Table 6 - Treated Effluent Storage Pond Effluent Monitoring Sampling Location: **Discharge to Poplar Plant Irrigation Area**		
Parameters	**Sample Type**	**Frequency**
CBOD5	Grab	Weekly
Dissolved Organic Carbon (DOC)	Grab	Weekly
Total Ammonia Nitrogen	Grab	Weekly
Chloride	Grab	Weekly
BTEX	Grab	Weekly
pH	Grab	Weekly
VOCs[Note 1]	Grab	Monthly
Semi-VOCs [Note 2]	Grab	Monthly
Metals [Note 3]	Grab	Monthly
General Chemistry [Note 4]	Grab	Monthly

Note 1: VOCs: Benzene, 1,4-Dichlorobenzene, Dichloromethane, Toluene, Ethylbenzene, Xylenes, and Vinyl Chloride.

Note 2: Semi-VOCs: 1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, Hexachlorobenzene, Diethylphthalate, Dimethylphthalate, Di-n-butyl phthalate, Phenol, Benzo(a)pyrene, 2,4,6- Trichlorophenol, 2,4-Dichlorophenol, Pentachlorophenol.

Note 3: Metals: Arsenic, Barium, Boron, Cadmium, Chromium, Copper, Iron, Lead, Manganese, Mercury, Nickel, Zinc.

Note 4: G. Chemistry: Alkalinity, Calcium, Chloride, Conductivity, COD, Nitrate, Nitrite, Magnesium, pH, Potassium, Sodium, Sulphate, Total Dissolved Solids, TKN, Temperature, Turbidity, Total Phosphorus, TSS, Phenols, Dissolved Oxygen.

Table 7 - Groundwater Monitoring Sampling Location: **OW40, OW60 and OW79 - at Annual Frequency** Sampling Location: **OW16, OW61, and OW62 - at Semi-Annual Frequency**		
Parameters	**Parameters**	**Field Parameters**
Alkalinity	Boron	pH
Conductivity	Cadmium	Conductivity
Chloride	Lead	Turbidity
pH	Iron	
Dissolved Organic Carbon	Barium	
Total Dissolved Solids	Benzene	
Total Ammonia	1,4-Dichlorobenzene	
Total Kjeldahl Nitrogen	Dichloromethane	
Sulphate	Ethylbenzene	
Nitrate	Vinyl Chloride	
Calcium	Toluene	
Potassium	Xylenes	
Sodium		
Magnesium		

Table 8 - Trigger Limits for Poplar Plantation Land Irrigation			
Trigger Parameter	**Trigger Level** (mg/L)		
	Active Aquitard	Interstadial Silt and Sand	Interface Aquifer
Chloride	106	116	134
Nitrate	2.3	2.3	2.3
Boron	1.1	2.1	2.6
Cadmium	0.001	0.001	0.001
Lead	0.002	0.002	0.002
Benzene	0.001	0.001	0.001
1,4-Dichlorobenzene	0.001	0.001	0.001
Dichloromethane	0.01	0.01	0.01
Vinyl Chloride	0.0004	0.0004	0.0004

Upon issuance of the environmental compliance approval, I hereby revoke Approval No(s). 3506-7M5PU3 issued on July 9, 2009

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

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

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

The Notice should also include:

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

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

This Notice must be served upon:

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

AND

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

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

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

DATED AT TORONTO this 21st day of August, 2019

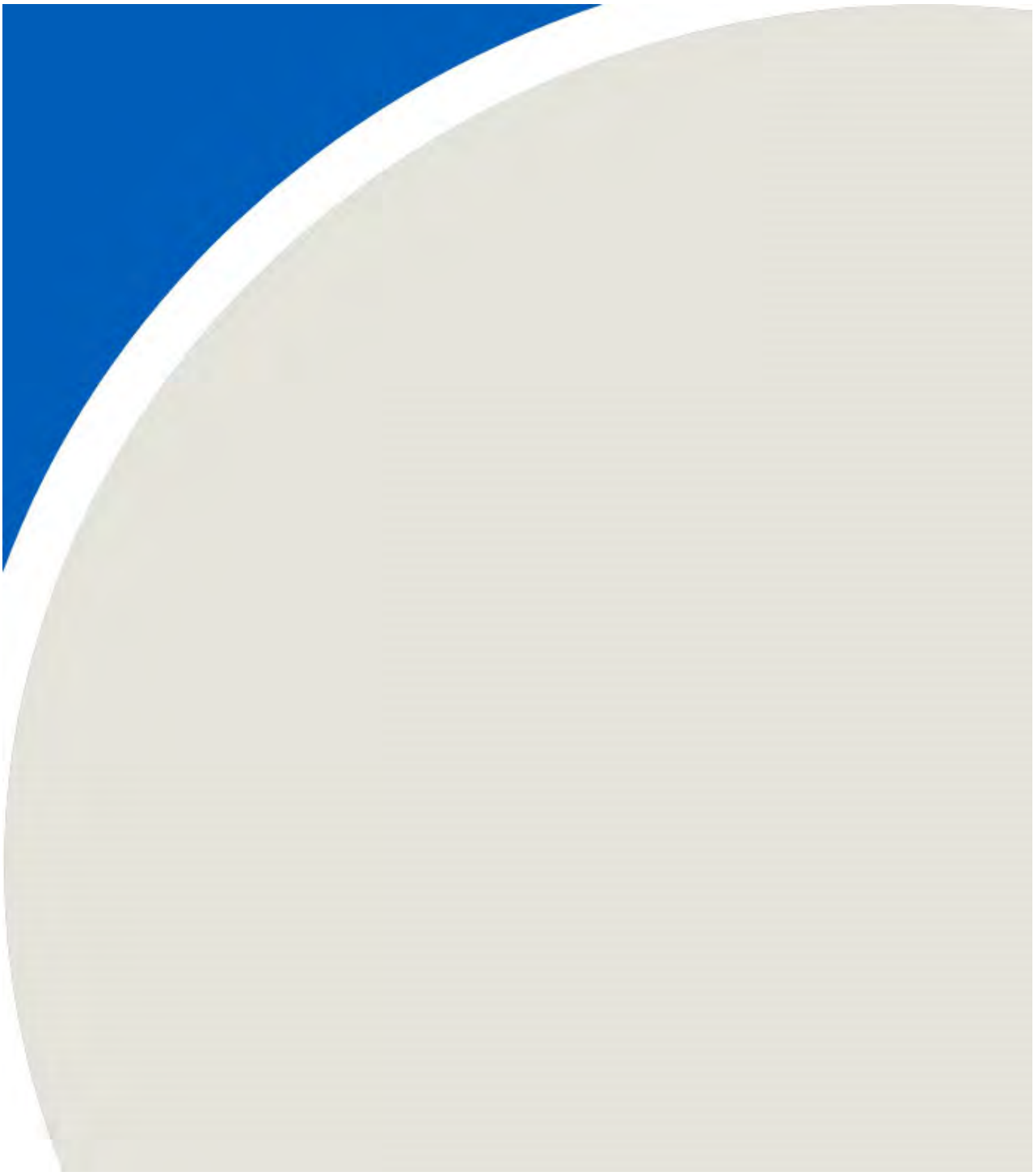
Youssouf Kalogo, P.Eng.
Director
appointed for the purposes of Part II.1 of the
Environmental Protection Act

SO/

c: District Manager, MECP Sarnia District Office
Larry Fedec, HDR Corporation

APPENDIX A3:

Amended ECA [Industrial Sewage Works] No. 8117-CUSNXX, dated April 29, 2024



AMENDED ENVIRONMENTAL COMPLIANCE APPROVAL

NUMBER 8117-CUSNXX
Issue Date: April 29, 2024

Waste Management of Canada Corporation
5768 Nauvoo Road
Warwick, Ontario
N0M 2S0

Site Location: Twin Creeks Environmental Centre
5768 Nauvoo Road Watford
Township of Warwick, County of Lambton
N0M 2S0

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

amendment to the existing industrial sewage works and establishment of new proposed industrial sewage works for usage and operation of condensate collection system, leachate collection, treatment, and disposal facility and stormwater management works to service a proposed Renewable Natural Gas (RNG) facility at the existing Twin Creeks Landfill Site located in the Township of Warwick, County of Lambton, consisting of the following:

PROPOSED WORKS A

Establishment of condensate collection and disposal system and stormwater management Works for a Proposed Renewable Natural Gas Facility (RNG), located at Twin Creeks Landfill Site, comprising;

RNG condensate collection and disposal system

a Proposed RNG condensate system (combined with the existing Landfill Gas (LFG) condensate system) for collection and discharge of the condensate generated at a maximum flow rate of 432 m^3/day, at the newly proposed RNG facility, collected in the two Slop Tanks inside the RNG building to the Proposed Equalization Tank 2 during first year of the operation of Proposed Works, and disposal to Equalization Tank 1 or hauled offsite depending upon the Proposed Sampling Program results, the Proposed Works also include upgrades to the Existing Pump Station 10 (PS10) for pumping of condensate to Equalization Tank, all comprising;

Oil/Water Separator

One (1) oil/water separator (Titan Production Equipment) located upstream of the Slop Discharge Tank, having a total capacity of 1.39 m3, a maximum treatment flow rate of 26.17 L/min, receiving RNG condensate flow from the RNG condensate system through a 75mm diameter pipe, and discharging to the Slop Tank through as 50mm diameter pipe;

Slop Tanks

Two condensate storage tanks (Slop Tanks), each having a volume of 64 m^3, installed in series receiving the condensate from the Proposed new RNG facility, through the 50 mm diameter pipe, generated at a rate of 38,264 L/day, and receiving rejected process water from the compressor room catalytic oxygen removal, generated at a rate of 726 L/day, emptied on an as-needed, discharging on demand, via a slop pump, discharging at a maximum rate of 6.3 L/s, to a proposed new 200 mm HDPE gravity sewer, to CMH1 adjacent to PS10, via manhole CMH2;

LFG Condensate collection and disposal system

collection and conveyance of condensate from the proposed LFG header pipe, from CMH3 to CMH2, at a maximum flow rate of 3.2 L/s in a condensate collection sump CMH3 and convey the flow by gravity, through a 200 mm diameter, 74 m long HDPE gravity sewer and discharging to a 200 mm diameter sewer and CMH1 adjacent to PS10, via manhole CMH2;

Combined Condensate and LFG Condensate Collection Pipes

Combined condensate from the RNG and LFG header, collected at CMH2, flowing by gravity through a 200 mm diameter sewer to manhole CMH1 adjacent to PS10;

Upgrades to Pumping Station 10 (PS10)

- upgrades to the existing pumping Station 10 (PS10), comprising of a new dedicated 4th pump, rated at 9.5 L/s under 28 m TDH, pumping the combined condensate to the Proposed new Equalization Tank 2 for the first operational year and subsequently disposed off as per this Approval, at an maximum flow rate of 5 L/s, complete with a 100mm diameter foot valve to control the flow to be temporarily stored in the equalization tanks;

New Equalization Tank 2

- one proposed steel glass-lined equalization tank 2, proposed to be operational during the first year of its construction, having a capacity of 2,300 m^3, located west of the existing Equalization Tank 1, receiving the combined RNG condensate and LFG condensate through the 4th pump installed in PS10, capable to provide two days storage, and discharging to Equalization Tank 1 or wastewater is to be hauled offsite depending upon the results of the Proposed Sampling program;

B. RNG Stormwater management Works

Proposed use of the existing stormwater management works discharging to Stormwater Management Pond 1, for the quality and quantity control of stormwater generated at the new proposed RNG facility;

PROPOSED WORKS B

LEACHATE TREATMENT AND DISPOSAL FACILITY

use and operation of a leachate collection, treatment, and disposal facility with a Rated Capacity of 400 m^3/day to service Phases 1 to 9 and during closure and post closure period of the Twin Creeks Landfill Site expansion, consisting of the following:

Chemical Feed System

- one (1) 1.0 m^3 capacity phosphoric acid solution storage tank equipped with two (2) metering pumps (one duty for each SBR reactor with interconnecting piping for redundancy) each rated at 32.0 L/hr, dosing phosphoric acid into the SBR reactors as required;

- one (1) 1.0 m^3 capacity flocculent storage tank equipped with two (2) metering pumps (one duty for each SBR reactor with interconnecting piping for redundancy) each rated at 363 L/hr, dosing flocculent upstream of the SBR reactors as required;

- one (1) 1.0 m^3 capacity anti-foam agent storage tank equipped with two (2) metering pumps (one duty for each SBR reactor with interconnecting piping for redundancy) each rated at 32.0 L/hr, dosing anti-foam agent upstream of the SBR reactors as required;

- one (1) 10.0 m^3 capacity methanol storage tank equipped with a spill containment structure and two (2) metering pumps (one duty for each SBR reactor with interconnecting piping for redundancy) each rated at 144 L/hr, dosing methanol upstream of the SBR reactors as required; and

- one (1) 88 m^3 capacity in-ground high strength carbon waste storage tank equipped with two (2) metering pumps (one duty for each SBR reactor with interconnecting piping for redundancy) each rated at 288 L/hr, dosing high strength carbon waste upstream of the SBR reactors as required.

Sequencing Batch Reactor (SBR)

- a sequencing batch reactor system consisting of two (2) reactors each with approximate dimensions of 6.4 m long x 16.2 m wide x 5.5 m SWD providing active reactor volume of 572 m^3, each tank equipped with a jet aeration header and one (1) dry pit jet pump rated at 227 L/sec and a decanter system capable of decanting 69.4 L/sec; and

- three (3) 50 hp positive displacement air blowers each with VFD control and rated at of 462 L/sec at 65.5 kPa supplying the air required for SBR aeration.

Effluent and Sludge Pumps

- two (2) effluent transfer pumps (one duty for each SBR reactor with interconnecting piping for redundancy) each rated at 69.4 L/sec, transferring effluent from the SBR units to an effluent holding tank, as described below; and

- two (2) activated sludge wasting pumps (one duty for each reactor) each rated at 22 L/sec, transferring activated wasted sludge to aerated sludge tanks, as described below.

Effluent and Sludge Holding Tanks

- one (1) 400 m^3 storage capacity effluent holding tank with approximate dimensions of 9.75 m long x 8.5 m wide x 5.5 m SWD equipped with coarse bubble diffusers, discharging to a reverse osmosis membrane filtration system, as described below;

- two (2) aerated sludge tanks operating in either parallel or series mode, each with approximate dimensions of 11.8 m long x 3 m wide x 5.5 m SWD providing a storage capacity of 200 m^3 equipped with coarse bubble diffusers, two (2) supernatant pumps returning supernatant to the SBR units described above, and two (2) sludge pumps discharging settled sludge to a sludge dewatering press, as described below; and

- three (3) positive displacement air blowers each rated at 141 L/sec and at 65.5 kPa with VFD control providing air required for the effluent tank and sludge holding tanks.

Reverse Osmosis Membrane Filtration System

- one (1) treated effluent storage tank with a capacity of 15.0 m^3, equipped with one (1) pump rated at 8.3 L/sec discharging to a cartridge sand filtration unit, as described below;

- one (1) sulphuric acid storage tank with a capacity of 7,000 L for pH adjustment of effluent at the effluent storage tank, as described above;

- two (2) dual redundant 3.47 L/sec capacity cartridge sand filtration unit discharging to a reverse osmosis membrane filtration system described below;

- one (1) three-staged reverse osmosis membrane filtration system with an overall treatment capacity of 3.47 L/sec consisting of three (3) filtration units, equipped with a 32-piece ST-RO membrane modules, a 20-piece ST-RO membranes modules, a 15 piece ST-NF membrane modules and the following pumps:

    a. four (4) high pressure plunger pumps each rated at 1.8 L/s (1st and 2nd stage RO);
    b. five (5) multistage centrifugal booster pumps with under water motor each rated at.8 L/s (1st and 2nd stage RO);

c. one (1) multi stage vertical centrifugal pump (cleaning pump) rated at 3.47 L/s;
d. one (1) high pressure plunger pump with a capacity of 1.06 L/s (3rd stage NF);
e. three (3) multistage centrifugal booster pumps with under water motor rated at 2.8 L/s each (3rd stage NF); and
f. one (1) multi stage vertical centrifugal pump (cleaning pump) rated at 1,06 L/s.

all discharging final permeate to a treated effluent storage pond described below and final concentrate to a concentrate storage tank described below;

Treated Effluent Storage Ponds

- one (1) clay lined pond **(Inlet cell)** with a capacity of 2,200 m^3, equipped with a floating aerator and one (1) pumping station manhole with a submersible pump rated at 30 m^3/hr;

- one (1) clay lined pond **(Cell 1)** with a capacity of 53,900 m^3 equipped with one (1) interconnecting manhole with a gate valve; and

- one (1) clay lined pond **(Cell 2)** with a capacity of 28,400 m^3, providing storage for treated effluent from the membrane filtration system, equipped with one (1) interconnecting manhole with a gate valve, a pumping station **(Pumping Station 11)** equipped with one (1) VFD submersible pump rated at 56.9 L/sec to be used for truck loading purposes, one (1) submersible effluent return pump rated at 7.3 L/sec , and two (2) VFD submersible irrigation pumps each rated at 45.7 L/sec (one duty, one standby) discharging to a poplar tree land irrigation area described below;

Concentrate Evaporator and Dryer

- one (1) concentrate storage tank with approximate dimensions of 4.4 m long x 4.8 m wide and 5.5 m SWD (total capacity of 102 m^3), equipped with a submersible pump for off-site disposal rated at 9.5 L/sec, also used for off-site disposal slurry, and a pump for transferring concentrate to an evaporator treatment system, as described below, rated at 0.63 L/sec;

- one (1) mechanical vapour compression evaporator rated at 0.63 L/sec, equipped with electric heating element and heat exchangers to remove moisture from concentrate and produce a slurry discharging to a slurry holding tank described below;

- one (1) slurry holding tank with approximate dimensions of 4.4 m long x 4.8 m wide and 5.5 m SWD (total capacity of 102.0 m^3) equipped with one (1) slurry pump rated at 1.57 L/sec, discharging to a slurry dryer described below; and

- one (1) slurry dryer rated at 0.035 L/sec with approximate dimensions of 4.7 m long x 2.1 m wide x 1.5 m high discharging to a salt cake disposal bin (water vapour will be evaporated through the slurry dryer exhaust).

Treated Effluent On-Site Disposal

Upgrades to the disposal system of the treated leachate effluent, as follows:

- two (2) 3.31 ha treated effluent drip-irrigation zones using approximately 250 m long drip-irrigation tubing installed in each zone;

EXISTING WORKS

Raw Leachate Pumping Stations

- four (4) primary leachate pumps (one for each PS1, PS3, PS5 and PS7) and each rated at 7.3 L/sec, together with their associated forcemains discharging to the equalization tank described below.

Secondary Drainage Layer Pumping Stations

- four (4) secondary drainage layer pumps (one for each PS2, PS4, PS6 and PS8) each rated at 3.5 L/sec, together with their associated forcemains discharging to the equalization tank described below.

Pumping Station 10 (PS10)

Pumping Station 10 (PS10) located South of the landfill leachate from Equalization Tank 1 seasonally to the poplar treatment system or hauled offsite, comprising;

- Three (3) additional variable frequency drive (VFD) recirculation pumps each rated at approximately 9.6 L/sec proposed to be pumping leachate to the leachate treatment system;

- two (2) VFD raw leachate pumps (one duty, one standby) each rated at 27.7 L/sec, to be used in combination to fill the Sequencing Batch Reactor (SBR) reactors at a faster rate;

STORMWATER MANAGEMENT FACILITY

a stormwater management facility to service a 146.5 ha drainage area of the Twin Creeks Landfill Site Expansion within the 300 ha area of the Twin Creeks Landfill Site consisting of the following:

Stormwater Management Pond - SWM Pond #1

a stormwater management facility (**SWM Pond #1**) to service a total drainage area of 33.7 ha consisting of the eastern part of the existing landfill site and future excess soil stockpile area, designed to provide quantity and quality control by attenuating peak stormwater flows from storm events up to 1:100 year return frequency including regional storm (Hazel) at or below pre-development levels, consisting of the following:

- one (1) approximately 1,300 m long perimeter trapezoidal ditch along the toe of the eastern side of the closed landfill having a 0.6 m wide bottom and 2H:1V side slopes, discharging collected

stormwater to an extended detention wet pond described below;

- one (1) ditch along the south and west side of the leachate storage lagoon collecting runoff from the excess soil stockpile area, discharging collected stormwater to a forebay described below;

- one (1) forebay with approximate dimensions of 19 m long x 16 m wide bottom, and 4H:1V side slopes, discharging to an extended detention wet pond described below;

- one (1) extended detention wet pond with approximate dimensions of 294.0 m long bottom, 23.5 m wide bottom and 4H:1V side slopes, equipped with a permanent vertical baffle with a minimum elevation of 238.7 m ASL, providing a total storage capacity of 21,429 m³ consisting of a permanent pool storage volume of 3,651 m³ with an average depth of 0.5 m, and an extended storage volume of 17,778 m³ with an extended storage depth of 1.91 m, equipped with an outlet structure described below;

- an outlet structure consisting of two (2) 1500 mm diameter concrete manholes discharging through two (2) 750 mm diameter outlet pipes, each pipe equipped with a 1200 mm x 1200 mm concrete valve chamber and a sluice gate valve, to a perimeter ditch flowing towards a roadside ditch along County Road 79; and,

- one (1) 8.0 m wide emergency overflow structure with weir elevation of 239.55 m ASL discharging to a perimeter ditch flowing towards County Road 79 roadside ditch;

Stormwater Management Pond - SWM Pond #2
a stormwater management facility (**SWM Pond #2**) to service a total drainage area of 67.9 ha consisting of southwestern part of the expanded landfill site, designed to provide quantity and quality control by attenuating peak stormwater flows from storm events up to 1:100 year return frequency including regional storm (Hazel) at or below pre-development levels, consisting of the following:

- two (2) approximately 400 m and 1500 m long perimeter ditches along the southern part of the landfill having a minimum depth of 1.0 m, and 3H:1V & 4H:1V side slopes discharging collected stormwater through two (2) culverts, 3000 mm X 1200 mm concrete box and 1390 x 970 mm CSPA, to a forebay described below;

- one (1) forebay with approximate dimensions of 47 m long x 30 m wide bottom and 4H:1V and 3H:1V side slopes, discharging to an extended detention wet pond described below;

- one (1) extended detention wet pond with approximate dimensions of 413.0 m long x 44.0 m wide bottom and 4H:1V and 3H:1V side slopes, providing a total storage capacity of 51,725 m³ consisting of a permanent pool storage volume of 11,427 m³ with a average depth of 0.60 m, and an extended storage volume of 38,098 m³ with an extended storage depth of 1.75 m, equipped with an outlet structure described below;

- an outlet structure consisting of one (1)1800 mm diameter and one (1) 2400 mm diameter concrete manholes discharging through a 1,050 mm and a 1,200 mm diameter outlet pipes, each pipe equipped with a 2000 mm x 2000 mm concrete valve chamber and a sluice gate valve, to a roadside ditch along County Road 79; and

- one (1) 18 m wide emergency overflow structure with weir elevation of 234.05 m ASL discharging to a roadside ditch along County Road 79.

Stormwater Management Pond - SWM Pond #3
a stormwater management facility (**SWM Pond #3**) to service a total drainage area of 30.5 ha consisting of northwestern part of the expanded landfill site, designed to provide quantity and quality control by attenuating peak stormwater flows from storm events up to 1:100 year return frequency including regional storm (Hazel) at or below pre-development levels, consisting of the following:

- one (1) approximately 650 m long perimeter ditch along the northern part of the expanded landfill and one (1) approximately 500 m long perimeter ditch along the western part of the expanded landfill, each having a minimum of 1.0 m depth and 3H:1V & 4H:1V side slopes, discharging collected stormwater through a 3000 mm x 1200 mm concrete box culvert to a forebay described below;

- one (1) forebay with approximate dimensions of 33 m long x 25 m wide bottom and 4H:1V side slopes, discharging to an extended detention wet pond described below;

- one (1) extended detention wet pond with approximate dimensions of 255.0 m long, 36.0 m wide bottom and 3H:1V and 4H:1V side slopes, providing a total storage capacity of 24,996 m^3 consisting of a permanent pool storage volume of 4,843 m^3 with an average depth of 0.50 m, and an extended storage volume of 20,053 m^3 with an extended storage depth of 1.67 m, equipped with an outlet structure described below;

- an outlet structure consisting of three (3)1200 mm diameter concrete manholes discharging through two (2) 600 mm diameter and one (1) 450 mm diameter outlet pipes, each pipe equipped with 1200 mm x 1200 mm box concrete valve chamber and a sluice gate valve, to a roadside ditch along County Road 79; and,

- one (1) 9 m wide emergency overflow structure with a weir elevation of 238.00 m ASL discharging to a roadside ditch along County Road 79.

Stormwater Management Pond - SWM Pond #4
a stormwater management facility (**SWM Pond #4**) to service a total drainage area of 14.4 ha consisting of the north eastern part of the expanded landfill site and norther part of the existing landfill site, designed to provide quantity and quality control by attenuating peak stormwater flows from storm events up to 1:100 year return frequency including regional storm (Hazel) at or below pre-development levels, consisting of the following:

- four (4) perimeter ditches collecting runoff from the northern side of the expanded landfill and from the northwestern portion of the existing landfill, having a minimum of 1.0 m depth and 3H:1V & 4H:1V side slopes, discharging collected stormwater through two (2) inlet structures to a forebay described below;

- one (1) forebay with approximate dimensions of 16 m long x 16 m wide bottom and 4H:1V side slopes, discharging to an extended detention wet pond described below;

- one (1) extended detention wet pond with approximate dimensions of 165.0 m long bottom, 20.0 m wide bottom and 3H:1V and 4H:1V side slopes, providing a total storage capacity of 8,328 m^3 consisting of a permanent pool storage volume of 1,812 m^3 with an average depth of 0.50 m, and an extended storage volume of 6,516 m^3 with an extended storage depth of 1.32 m, equipped with an outlet structure described below;

- an outlet structure consisting of one (1)1800 mm diameter concrete manhole discharging through one (1)1050 mm diameter outlet pipe equipped with 2000 mm X 2000 mm concrete valve chamber and a sluice gate valve to a perimeter ditch along Zion Line to a roadside ditch along Zion Line;

- one (1) 8 m wide emergency overflow structure with a weir elevation of 242.00 m ASL discharging to a road side ditch along Zion Line;

Equalization Tank 1

- one (1) 2,300 m^3 capacity steel and glass lined equalization tank enclosed with a clay berm containment area, receiving raw leachate from the landfill leachate collection system, equipped with three (3) variable frequency drive (VFD) recirculation pumps (two duty and one standby) each rated at 9.6 L/sec, all pumping leachate to the leachate treatment system, as described below;

all discharging final permeate to a treated effluent storage pond described below and final concentrate to a concentrate storage tank described below;

Treated Effluent On-Site Disposal <u>(Poplar Plantation)</u>

- one (1) 28.32 ha poplar tree irrigation land established to handle an average of 1,187 m^3/day of treated leachate effluent during suitable irrigation days between the period extending from May 1st to October 15th, consisting of six (6) 3.62 ha treated effluent drip-irrigation zones using approximately 250 m long drip-irrigation tubing installed in each zone;
- a stormwater management system to control the quality of stormwater runoff from the poplar tree irrigation land to Kersey Drain (Brown Creek), consisting of one (1) west furrow approximately 710 m long x 200 mm deep and one (1) east furrow approximately 510 m long x 200 mm deep, running parallel to each other with a grassed area in between, each equipped with a 200 mm high berm for distributing stormwater runoff across the entire length of the furrow, discharging by sheet flow to Kersey Drain; and

Raw/Diluted Leachate Effluent Disposal <u>(Poplar System)</u>

- one (1) existing 9.3 ha poplar tree irrigation system identified as the Poplar System, of approximately 150 m length for each poplar row. Leachate is applied through pressure drip-irrigation tubing at a rate not to exceed 476 mm/m², or 44,000 L/day, during the growing season. The system is subject to conditions as specified in the EPA Section 27 approval for the site. Revised to a 9.3 ha area with a rate of 476 mm/m^2 or 44,000 m^3/year;

- a system of maintenance holes, collector system and leachate sump across the existing site to transfer leachate to the leachate holding tanks via two methods: 1) down-hole leachate pumps transfer leachate through piping units directly to the leachate holding tanks and the Equalization Tank 1 and 2, the use of tanker truck to transfer the leachate into the leachate holding tanks or maintenance holes of the leachate conveyance system.

all other controls, electrical equipment, instrumentation, piping, pumps, valves and appurtenances essential for the proper operation of the aforementioned sewage Works;

all in accordance with the Schedule A.

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

1. "Approval" means this entire document and any schedules attached to it, and the application;

2. "BOD5" (also known as TBOD5) means five day biochemical oxygen demand measured in an unfiltered sample and includes carbonaceous and nitrogenous oxygen demands;

3. "CBOD5" means five day carbonaceous (nitrification inhibited) biochemical oxygen demand measured in an unfiltered sample;

4. "District Manager" means the District Manager of the Sarnia District Office of the Ministry;

5. "Director" means a person appointed by the Minister pursuant to section 5 of the EPA for the purposes of Part II.1 of the EPA;

6. "EPA" means the Environmental Protection Act, R.S.O. 1990, c.E.19, as amended;

7. "Existing Works" means those portions of the Works included in the Approval that have been constructed previously;

8. "Maximum Daily Flow" means the largest volume of flow to be received during a one-day period for which the sewage treatment process unit or equipment is designed to handle;

9. "Ministry" means the ministry of the government of Ontario responsible for the EPA and OWRA and includes all officials, employees or other persons acting on its behalf;

10. "Owner" means Waste Management of Canada Corporation and its successors and assignees;

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

12. "Poplar System" is the irrigation area of 9.3 hectares located on top of the cap of the Existing Site (old landfill) that is used for the phytoremediation of leachate that is generated at the Site.

13. "Poplar Plantation" is the irrigation area located on native soil to the south of the Site that is used for the phytoremediation of irrigation liquid that satisfies the Effluent Trigger Limits.

14. "Proposed Works A" means the sewage works described in the Owner's application, this Approval, to the extent approved by this Approval;

15. "Proposed Works B" means unconstructed sewage works that were previously Approved and will be constructed in future"

16. "Township" means the Township of Warwick;

17. "Works" means the sewage works described in the Owner's application, and this Approval, and includes both Proposed Works and Existing Works;

18. "WIFN" refers to Walpole Island First Nation; and

19. "WPLC" refers to the Warwick Public Liaison Committee.

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

TERMS AND CONDITIONS

1. GENERAL CONDITION

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

2. The Owner shall design, construct, operate and maintain the Works in accordance with the conditions of this Approval.

3. Where there is a conflict between a provision of any document referred to in this Approval and the conditions of this Approval, the conditions in this Approval shall take precedence.

4. The issuance of, and compliance with the conditions of, this Approval does not:

    a. relieve any person of any obligation to comply with any provision of any applicable statute, regulation or other legal requirement, including, but not limited to, the obligation to obtain approval from the local conservation authority necessary to construct or operate the Works; or

    b. limit in any way the authority of the Ministry to require certain steps be taken to require the Owner to furnish any further information related to compliance with this Approval.

2. CHANGE OF OWNER

1. The Owner shall notify the District Manager and the Director, in writing, of any of the following changes within **thirty (30) days** of the change occurring:

    a. change of address of Owner;

    b. change of Owner, including address of new owner;

    c. change of partners where the Owner is or at any time becomes a partnership, and a copy of the most recent declaration filed under the Business Names Act, R.S.O. 1990, c. B.17shall be included in the notification;

    d. change of name of the corporation and a copy of the most current information filed under the Corporations Information Act, R.S.O. 1990, c. C.39 shall be included in the notification.

2. The Owner shall notify the District Manager, in writing, of any of the following changes within **thirty (30) days** of the change occurring:

    a. change of address of the Operating Agency;

    b. change of the Operating Agency, including address of the new Operating Agency.

3. In the event of any change in ownership of the Works, the Owner shall notify the succeeding owner in writing, of the existence of this Approval, and forward a copy of the notice to the District Manager.

4. The Owner shall ensure that all communications made pursuant to this condition refer to the number of this Approval.

3. CONSTRUCTION OF PROPOSED WORKS

1. All Proposed Works A included -in this Approval shall be constructed and installed and must commence operation within **five (5) years** of issuance of this Approval, after which time the Approval ceases to apply in respect of any portions of the Works not in operation. In the event that the construction, installation and/or operation of any portion of the Proposed Works is anticipated to be delayed beyond the time period stipulated, the Owner shall submit to the Director an application to amend the Approval to extend this time period, at least six (6) months prior to the end of the period. The amendment application shall include the reason(s) for the delay and whether there is any design change(s).

2. Upon the construction of the Works, the Owner shall prepare a statement, certified by a Licensed Engineering Practitioner, that the Works are constructed in accordance with this Approval, and upon request, shall make the written statement available for inspection by Ministry personnel.

3. Within **six (6)** months of the construction of the Proposed Works, a set of as-built drawings showing the Works "as constructed" shall be prepared. These drawings shall be kept up to date through revisions undertaken from time to time and a copy shall be retained at the Works for the operational life of the Works.

4. A set of record drawings of the Works shall be kept up to date through revisions undertaken from time to time and a copy shall be readily accessible for reference at the Works.

4. EFFLUENT LIMITS FOR LEACHATE TREATMENT FACILITY

1. The Owner shall design, construct and operate the Works such that the concentrations of the materials listed as effluent parameters in the Effluent Limits Table in **Schedule B** are not exceeded in the effluent from the **Treated Effluent Storage Pond** (Cell 2).

2. For the purposes of determining compliance with and enforcing subsection (1):

    1. The Average Monthly Concentration of a parameter named in Column 1 of the Effluent Limits Table included in the **Schedule B** shall not exceed the corresponding maximum concentration set out in Column 2 of the Effluent Limits Table in the **Schedule B;**

    2. non-compliance with respect to pH is deemed to have occurred when any single measurement is outside of the indicated range.

5. OPERATIONS AND MAINTENANCE

1. The Owner shall ensure that, at all times, the Works and the related equipment and appurtenances used to achieve compliance with this Approval are properly operated and maintained. Proper operation and maintenance shall include effective performance, adequate funding, adequate staffing and training, including training in all procedures and other requirements of this Approval and the OWRA and regulations, adequate laboratory facilities, process controls and alarms and the use of process chemicals and other substances used in the Works.

2. The Owner shall prepare an operations manual within **six (6) months** of the introduction of sewage to the Works, that includes, but not necessarily limited to, the following information:

    a. operating procedures for routine operation of all the Works;

    b. inspection programs, including frequency of inspection, for all the Works and the methods or tests employed to detect when maintenance is necessary;

    c. repair and maintenance programs, including the frequency of repair and maintenance for all the Works; copies of maintenance contracts for any routine inspections and pump-outs should be included for all the tanks and treatment units;

    d. procedures for the inspection and calibration of monitoring equipment;

    e. a spill prevention control and countermeasures plan, consisting of contingency plans and procedures for dealing with equipment breakdowns, potential spills and any other abnormal situations, including notification of the Spills Action Centre (SAC) and District Manager; and,

    f. procedures for receiving, responding and recording public complaints, including recording any follow-up actions taken.

3. The Owner shall maintain an up to date operations manual and make the manual readily accessible for reference at the Works for the operational life of the Works. Upon request, the Owner shall make the manual available to Ministry staff.

4. The Owner shall ensure that the oil/grease interceptor is inspected and maintained on regular basis as required, and grease is disposed off site by a licensed hauler.

5. The Owner shall employ for the overall operation of the Works a person who possesses the level of training and experience sufficient to allow safe and environmentally sound operation of the Works.

6. The Owner shall retain for a minimum of **five (5) years** from the date of their creation, all records and information related to or resulting from the operations and maintenance activities required by this Approval.

7. RNG AND LFG CONDENSATE COLLECTION WORKS

    1. The Owner shall ensure that Maximum Daily Flow from the RNG and LFG Condensate Collection Works does not exceed 432 cubic metres per day.

    2. During the first year of the operation of RNG and LFG Condensate Collection Works, contents of the Equalization Tank 2 shall be hauled offsite.

    3. The Owner shall compare the **Schedule D** sampling results to Effluent Triggers Table 1 of the **Schedule C**, and accordingly direct RNG/LFG Condensate to the Existing Poplar Plantation or to the Existing Poplar System or haul offsite, upon the confirmation that the effluent water quality meets the requirements in respect to all of the parameters included in the Effluent Trigger Parameters Table 1. In case the effluent water quality does not meet any single parameter concentration as included the Effluent Trigger Parameters Table 1, then the RNG/LFG Condensate may either be directed to the Existing Poplar System, or hauled off-site.

8. STORMWATER MANAGEMENT FACILITY

    1. The Owner shall apply the "Stormwater Contingency and Remedial Action Plan as included in Appendix N.27 of the Operations and Maintenance manual, Warwick Landfill Expansion, WM, May 2008.

    2. The Owner shall operate the Works (**SWM Ponds**) with the outlet sluice gate valve in a **normally open position** during normal operation period.

    3. The Owner shall compare monitoring results obtained under Condition 6.3 with their respective Trigger Limits listed in Table 2 in the **Schedule C** to identify any potential leachate impact to stormwater.

    4. In the event that a monitoring result for any parameter that is listed in Table 2 of **Schedule C** for any of **SWM Ponds** exceeds its Trigger Limits, the Owner shall conduct sampling of the contents of the affected **SWM Pond** within one (1) week to confirm the exceedance of the Trigger Limits for that parameter and identify potential source of contamination. Upon confirmation of exceedance of any Trigger Limits of any parameter that is listed in Table 2 of **Schedule C** and exceedance for the SWM Ponds noted in the EPA Section 27 approval for the site, the Owner shall close the outlet sluice gate valve of the affected Works **(SWM Pond)** and implement an approved "Stormwater Contingency and Remedial Action Plan".

5. The Owner shall dispose of the contents of an affected Work **(SWM Pond)** which failed to meet the quality requirements outlined in Condition 5.8.4 above, in accordance with an approved "Stormwater Contingency and Remedial Action Plan".

6. In the event that a monitoring result for any parameter that is listed in Table 2 of the **Schedule C** for the **Poplar Plantation** exceeds its Trigger Limits, the Owner shall conduct sampling of the stormwater runoff from the affected part of the **Poplar Plantation** as soon as possible to confirm the exceedence of the Trigger Limits for that parameter and identify potential source of contamination. Upon confirmation of the exceedence of any Trigger Limits for any parameter that is listed in Table 2 of the **Schedule C**, the Owner shall implement an approved "Stormwater Contingency and Remedial Action Plan".

7. The Owner shall inspect the Works **(SWM Ponds)** at least once a year and, if necessary, clean and maintain the Works to prevent the excessive build-up of sediments and/or vegetation.

8. The Owner shall maintain a logbook to record the results of these inspections and any cleaning and maintenance operations undertaken, and shall keep the logbook at the site or Owner's operational head quarter for inspection by the Ministry. The logbook shall include the following:

    a. the name of the Works (SWM Pond #1, SWM Pond #2, SWM Pond #3, and SWM Pond #4);

    b. the date and results of each inspection, maintenance and cleaning, including an estimate of the quantity of any materials removed; and

    c. the occurrence date of each spill within the catchment area of a given SWM Pond, including follow-up action/ remedial measures undertaken.

9. POPLAR PLANTATION LAND IRRIGATION OPERATION

    a. The Owner shall apply the "Groundwater Contingency and Remedial Action Plan" for any potential groundwater impact caused by Effluent Storage Ponds and the Poplar Plantation Irrigation Area, as included in Appendix N.26 of the Operation and Maintenance Manual, Warwick Landfill Expansion, WM, May 2008.

    b. The Owner shall compare monitoring results obtained under Condition 6.3 with their respective Trigger Limits listed in Table 3 of **Schedule C** to identify any potential leachate impact to groundwater.

c. In the event that a monitoring result for any parameter that is listed in Table 3 of **Schedule C** exceeds its Trigger Limits, the Owner shall re-sample within one (1) month to confirm the exceedence of the Trigger Limits for that parameter. Upon confirmation of the exceedence of any Trigger Limits for any parameter that is listed in Table 3 of **Schedule C**, the Owner shall conduct a second round re-sampling within six (6) months to re-confirm the exceedence of the Trigger Limits for the parameter of concern.

d. In the event that the presence of the parameter(s) of concern is (are) not confirmed after the second round of sampling conducted under Condition 5.9.c above, then, normal groundwater monitoring shall be resumed.

e. In the event that the presence of the parameter(s) of concern is confirmed after the second round of sampling conduced under Condition 5.9.c above, then, it shall constitute as a confirmation of leachate impact to groundwater and the Owner shall immediately implement the "Groundwater Contingency and Remedial Action Plan" included under Condition 5.9.a above.

f. The Owner shall notify the District Manager orally, as soon as possible, and in writing within seven days of the confirmation of leachate impact to groundwater including an assessment of the relative severity and extent of leachate impact and proposed remedial actions.

g. The Owner shall record and report a summary of all trigger exceedence incidents and all remedial action measures taken under Condition 5.9.e above in the Annual Report prepared under Condition 7.

h. The Owner shall dispose off Landfill Leachate and RNG/LGG condensate that meets the Effluent Limits included in the **Schedule B** for treatment and disposal by drip-irrigation on the approved Poplar Tree Land Area during the period between May 1st and October 15th of each calendar year.

i. The Owner shall not allow under any circumstance (including as emergency contingency plan) any direct discharge of leachate, RNG/LFG condensate, or treated leachate effluent from the Works to any receiving surface water including Bear Creek;

j. The Owner shall record the total volume of RNG/LFG Condensate and treated leachate effluent drip-irrigated on the poplar tree land irrigation area on a daily basis.

k. The Owner shall ensure that treated leachate effluent is disposed of via drip-irrigation in the designated six (6) poplar tree drip-irrigation zones initially, and ultimately on eight (8) poplar tree drip-irrigation zones on a planned rotation basis.

l. The Owner shall visually inspect drip-irrigation operations at least twice each day during operation period to ensure that no surface ponding or surface run-off is taking place.

m. The Owner shall retain records of inspections and drip-irrigation operation data collected under subsections 5.9.j, 5.9.k, and 5.9.l above, and make them available for inspection Ministry staff upon request.

n. No drip irrigation is to take place:
   a. on frozen or snow covered ground conditions;
   b. with the occurrence of surface ponding in any area subjected to drip irrigation;
   c. within 100 m of any surface watercourse or drain; and
   d. at an average daily application rate greater than 4.8 mm;

o. The Owner shall notify and provide the Township, WPLC and WIFN with a copy of the proposed "Groundwater Contingency and Remedial Action Plan" required under Condition 5.9.a above.

6. MONITORING AND RECORDING

The Owner shall carry out a monitoring program:

1. all samples and measurements taken for the purposes of this Approval are to be taken at a time and in a location characteristic of the quality and quantity of the effluent stream over the time period being monitored.

2. For the purpose of this condition, the following definitions apply:

   1. Daily means once each day;

   2. Weekly means once each week;

   3. Monthly means once every month;

   4. Quarterly means once every three months, and,

   5. Semi-annually means once every six months.

3. Samples shall be collected and analyzed at the sampling point(s), at the sampling frequencies and using the sample type specified for each parameter listed in the effluent monitoring table included in **Schedule D**.

4. The methods and protocols for sampling, analysis, toxicity testing, and recording shall conform, in order of precedence, to the methods and protocols specified in the following:

a. the Ministry's Procedure F-10-1, "Procedures for Sampling and Analysis Requirements for Municipal and Private Sewage Treatment Works (Liquid Waste Streams Only)", as amended from time to time by more recently published editions;

b. the Ministry's publication "Protocol for the Sampling and Analysis of Industrial/Municipal Wastewater" (January 1999), ISBN 0-7778-1880-9, as amended from time to time by more recently published editions;

c. the publication "Standard Methods for the Examination of Water and Wastewater" (21st edition) as amended from time to time by more recently published editions; and

d. in respect of any parameters not mentioned in 6.5.a, b and c, the written approval of the District Manager, which approval shall be obtained prior to sampling.

5. The measurement frequencies specified in **Schedule D** in respect to any parameter are minimum requirements which may, after 24 months of monitoring in accordance with this Condition, be modified by the Director in writing from time to time.

6. The Owner shall provide to the Township, WPLC and WIFN a copy of all requests to be submitted to the District Manager for any changes to the monitoring program specified in **Schedule D** at the same time or prior to the time such request is made to the District Manager.

7. A continuous flow measuring device(s) shall be installed and maintained to measure the flowrate of the effluent from each of the sewage works, with an accuracy to within plus or minus fifteen (15) per cent of the actual flowrate for the entire design range of the flow measuring device and the Owner shall measure, record and calculate the flowrate for each effluent stream on each day of sampling.

8. The Owner shall retain for a minimum of five (5) years from the date of their creation, all records and information related to or resulting from the monitoring activities required by this Approval.

9. POPLAR PLANTATION LEACHATE TREATMENT WORKS

    1. The Owner shall visually inspect the drip-irrigation pipeline systems at least once per week during operation period to look for leaking and/or failed (broken) lines that would otherwise produce run-off. The inspection should be supported by a log book documenting routine inspection and notes on repair as required.

10. GROUNDWATER MONITORING - POPLAR PLANTATION WORKS (LAND IRRIGATION AREA)

    1. The Owner shall collect grab samples during May and November from the sampling location outlined in the **Schedule E** and analyze for the parameters listed in the **Schedule E.**

2. The methods and protocols for sampling, analysis and recording shall conform to that outlined in Condition 6(5).

3. The measurement frequencies specified in Condition 6.11.1 above and the Schedule E, in respect to any parameter are minimum frequencies which may, after 24 months of monitoring in accordance with this Condition, be modified by the Director, in writing from time to time.

4. The Owner shall provide to the Township, WPLC, and WIFN a copy of all requests to be submitted to the District Manager for any changes to the monitoring program specified in Condition 6.11.3 above at the same time or prior to the time such request is made to the District Manager.

7. REPORTING

1. **One week** prior to the start up of the operation of the Proposed Works, the Owner shall notify the District Manager (in writing) of the pending start up date.

2. The Owner shall report to the District Manager orally **as soon as possible** any non-compliance with the compliance limits specified in Condition 4, and in writing within **seven (7) days** of non-compliance.

3. In addition to the obligations under Part X of the EPA and O. Reg. 675/98 (Classification and Exemption of Spills and Reporting of Discharges) made under the EPA, the Owner shall, within **fifteen (15) days** of the occurrence of any reportable spill as provided in Part X of the EPA and O. Reg. 675/98, submit a full written report of the occurrence to the District Manager describing the cause and discovery of the spill, clean-up and recovery measures taken, preventative measures to be taken and a schedule of implementation.

4. The Owner shall, upon request, make all manuals, plans, records, data, procedures and supporting documentation available to Ministry staff.

5. The Owner shall prepare and submit a performance report to the District Manager on an annual basis within before March 31 of each calendar year. The reports shall contain, but shall not be limited to, the following information:

    a. a summary and interpretation of all monitoring data and a comparison to the effluent limits (Condition 4) including an overview of the success and adequacy of the Works, and a contingency plan in the event of non-compliance with the effluent limits.

    b. a summary and interpretation of all monitoring data for constructed and operational Works, including RNG and LFG Condensate Collection works, stormwater management works monitoring data, groundwater monitoring data and leachate treatment facility;

    c. a review and assessment of the performance of all sewage Works

d. a description of any operating problems encountered and corrective actions taken at all Works located at the property;

e. a record of all maintenance carried out on any major structure, equipment, apparatus, mechanism or thing forming part of all Works;;

f. a summary of any effluent quality assurance or control measures undertaken in the reporting period;

g. a summary and interpretation of all daily flow data and results achieved in not exceeding the Maximum Daily Flow discharged from each of the sewage Works excluding the Poplar Plantation, the Poplar System, and Stormwater Management Works;

h. a summary of any complaints received during the reporting period and any steps taken to address the complaints;

i. a summary of all spill or abnormal discharge events; and

j. any other information the District Manager requires from time to time;

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

1. Condition 1 is imposed to ensure that the Works are built and operated in the manner in which they were described for review and upon which approval was granted. This condition is also included to emphasize the precedence of Conditions in the Approval and the practice that the Approval is based on the most current document, if several conflicting documents are submitted for review.

2. Condition 2 is included to ensure that, when the Works are constructed, the Works will meet the standards that apply at the time of construction to ensure the ongoing protection of the environment.

3. Condition 3 is included to ensure that the Ministry records are kept accurate and current with respect to approved Works and to ensure that subsequent owners of the Works are made aware of the Approval and continue to operate the Works in compliance with it.

4. Condition 4 is included to ensure that the Owner continue to comply with the effluent criteria established for the Works in the previous approval until such time as the Proposed Works are constructed and commissioned.

5. Condition 5 is included to ensure that a comprehensive operations manual governing all significant areas of operation, maintenance and repair is prepared, implemented and kept up-to-date by the Owner and made available to the Ministry. Such a manual is an integral part of the operation of the Works. Its compilation and use should assist the owner in staff training, in proper plant operation and in identifying and planning for contingencies during possible abnormal conditions. The manual will also act as a benchmark for Ministry staff when reviewing the owner's operation of the Works.

6. Condition 6 is included to require the Owner to demonstrate on a continual basis that the quality and quantity of the effluent from the approved Works is consistent with the (design objectives and) effluent limits specified in the Approval and that the approved Works does not cause any impairment to the receiving watercourse.

7. Condition 7 is included to provide a performance record for future references and to ensure that the Ministry is made aware of problems as they arise, so that the Ministry can work with the Owner in resolving the problems in a timely manner.

Schedule A

1. Application for Environmental Compliance Approval dated April 28, 2023 and received on May 19, 2023.

Schedule B

Effluent Limits for Leachate Treatment Facility

Sampling Location: Discharge Point from Treated Effluent Storage Pond

Effluent Parameter	**Average Monthly Concentration** (milligrams per litre unless otherwise indicated)
Column 1	Column 2
Total Ammonia Nitrogen	68.7
Total Phosphorus	0.72
Phenols	0.2
Chlorides	247
Copper	0.014
Iron	27.0
pH of the effluent maintained between 6.0 to 9.5, inclusive, at all times	

Schedule C

TABLE 1

Effluent Trigger Concentration for RNG AND LFG Condensate Collection Works

Effluent Trigger Concentration to direct the sewage flow to the Existing Poplar System or Existing Plantation Irrigation disposal or hauled offsite

Sampling Location: Equalization Tank 2

Effluent Parameter	**Single Sample Concentration** (milligrams per litre unless otherwise indicated)
Column 1	Column 2
Total Ammonia Nitrogen	68.7
Total Phosphorus	0.72
Phenols	0.2
Chlorides	247
Copper	0.014
Iron	27.0
pH of the effluent maintained between 6.0 to 9.5, inclusive, at all times	

TABLE 2

Trigger Limits for Stormwater Management Works

Sampling Location: SS10 and SS16

Trigger Parameter	Trigger Limits [SS10 & SS16 - 90th percentile] (mg/L)
Ammonia (unionized)	0.020
Boron	0.20
Boron (SP1 only)	0.39
Chloride	210
Chromium (Total)	0.024
Nickel	0.027
Phenols	0.001
Zinc	0.06

*Note: Annually, a Trigger Limit for a parameter listed above will be replaced by the corresponding 90th percentile of background surface water concentration where background surface water concentrations collected upstream of the landfill (Sampling Locations SS10 and SS16).

TABLE 3

Trigger Limits for Poplar Plantation Land Irrigation

Sampling Location: OW40, OW60 and OW79, OW16, OW61 and OW62

Trigger Parameter	Trigger Limits (mg/L)		
	Active Aquitard	Interstadial Silt and Sand	Interface Aquifer
Chloride	106	116	134
Nitrate	2.3	2.3	2.3
Boron	1.1	2.1	2.6
Cadmium	0.001	0.001	0.001
Lead	0.002	0.002	0.002
Benzene	0.001	0.001	0.001
1,4-Dichlorobenzene	0.001	0.001	0.001
Dichloromethane	0.01	0.01	0.01
Vinyl Chloride	0.0004	0.0004	0.0004

Schedule D

Monitoring Program

Table 1

RNG AND LFG CONDENSATE COLLECTION WORKS

Sampling Location: Equalization Tank 2

Parameters	Sample Type	Frequency[8]
BOD5	Grab	Quarterly
Dissolved Organic Carbon (DOC)	Grab	Quarterly
Total Phosphorus	Grab	Quarterly
Total Kjeldahl Nitrogen	Grab	Quarterly
BTEX	Grab	Quarterly
pH	Grab	Quarterly
PLIL-SW	Grab	Semi-Annually
SLIL-SW	Grab	Semi-Annually
LS	Grab	Semi-Annually
General Chemistry	Grab	Semi-Annually

Notes: 1.PLIL-SW indicates: chloride, ammonia (total and unionized), phenols, boron, nickel, chromium (total), zinc.

2.SLIL-SW indicates: alkalinity, sulfate, calcium, magnesium, potassium, sodium, total phosphorus, iron, nitrate, TKN, TDS, pH, conductivity. Field parameters of temperature, pH, conductivity, turbidity, DO.

3.LS indicates: arsenic, barium, cadmium, copper, lead, manganese, mercury, nitrite, TSS, volatiles, semi-volatiles, BOD5, COD.

4.Volatiles should include the following at a minimum: benzene, 1,4-dichlorobenzene, dichloromethane, toluene, ethylbenzene, xylenes, and vinyl chloride.

5.Semi-volatiles should include the following at a minimum: 1,2,4-trichlorobenzene, 1,2-dichlorobenzene, 1,3-dichlorobenzene, 1,4-dichlorobenzene, hexachlorobenzene, diethylphthalate, dimethyiphthalate, di-n-butyl phthalate, phenol, benzo(a)pyrene, 2,4,6-trichlorophenol, 2,4-dichlorophenol, pentachlorophenol.

6.General Chemistry includes Alkalinity, Calcium, Chloride, Conductivity, COD, Nitrate, Nitrite, Magnesium, pH, Potassium, Sodium, Sulfate, Total Dissolved Solids, TKN, Temperature, Turbidity, Total Phosphorus, TSS, Phenols, Dissolved Oxygen.

7.QA/QC to include one (1) blind duplicate for each 15 samples or once per event, whichever is greater.

8. Notwithstanding the monitoring frequencies included in this table, the monitoring frequency in the first year of the operation of these RNG/LFG condensate sewage works in respect of all of the parameters shall be monthly.

Table 2

Stormwater Monitoring Program

Sampling Locations: SWM Pond Outlets - SP1, SP2, SP3, SP4. Irrigation Area - SS17A, SS17B, SS18A and SS18B

Parameter	Parameter	Parameter	Field -Parameter
Alkalinity	Magnesium	Toluene	Conductivity
Total Ammonia Nitrogen	Potassium	Ethylbenzene	Dissolved Oxygen
Un-ionized Ammonia	Sodium	Xylene	pH (Field)
Chloride	Arsenic	Vinyl Chloride	Temperature
Conductivity (Lab)	Barium	1,2,4-Trichlorobenzene	Turbidity
Nitrate Nitrogen	Boron	1,2-Dichlorobenzene	
Nitrite Nitrogen	Cadmium	1,3-Dichlorobenzene	
TKN	Chromium (Total)	1,4-Dichlorobenzene	
pH (Lab)	Copper	Hexachlorobenzene	
Total Phosphorus	Iron	Diethylphthalate	
Total Suspended Solids	Lead	Dimethylphthalate	
Total Dissolved Solids	Mercury	Di-n-butyl phthalate	
Sulfate	Nickel	Phenol	
CBOD5	Zinc	Benzo(a)pyrene	
Chemical Oxygen Demand	Benzene	2,4,6-Trichlorophenol	
Phenols	1,4-Dichlorobenzene	2,4-Dichlorophenol	
Calcium	Dichloromethane	Pentachlorophenol	

Note: Irrigation Area locations for the Poplar Plantation will be monitored when the Poplar Plantation is operational. The Owner shall collect at least one sample per calendar month of representative runoff from any precipitation event that exceeds 10 mm in a 24 hour period for the poplar plantation while irrigation is operational between May 1 through October 15 every year. In case where there is insufficient precipitation to produce a runoff event in a calendar month , the owner shall record that no runoff occurred and therefore no sample was collected.

Table 3

LANDFILL LEACHATE

Sampling Location: Equalization Tank 1

Parameters	Sample Type	Frequency
CBOD5	Grab	Quarterly
Dissolved Organic Carbon (DOC)	Grab	Quarterly
Total Phosphorus	Grab	Quarterly
Total Kjeldahl Nitrogen	Grab	Quarterly
BTEX	Grab	Quarterly
pH	Grab	Quarterly
VOCs [Note 1]	Grab	Semi-Annually
Semi-VOCs [Note 2]	Grab	Semi-Annually
Metals [Note 3]	Grab	Semi-Annually
General Chemistry [Note 4]	Grab	Semi-Annually

Table 4

Leachate Treatment Plant Effluent Monitoring

Sampling Location: Discharge to Treated Effluent Storage Pond

Parameters	Sample Type	Frequency
CBOD5	Grab	Weekly
Dissolved Organic Carbon (DOC)	Grab	Weekly
Total Ammonia Nitrogen	Grab	Weekly
Chloride	Grab	Weekly
BTEX	Grab	Weekly
pH	Grab	Weekly
VOCs [Note 1]	Grab	Monthly
Semi-VOCs [Note 2]	Grab	Monthly
Metals [Note 3]	Grab	Monthly
General Chemistry [Note 4]	Grab	Monthly
PCB	Grab	Semi-Annually
Organochlorides	Grab	Semi-Annually

Table 5

Treated Effluent Storage Pond Effluent Monitoring

Sampling Location: Discharge to Poplar Plant Irrigation Area

Treated Effluent Storage Pond Effluent Monitoring Sampling Location: **Discharge to Poplar Plant Irrigation Area**		
Parameters	**Sample Type**	**Frequency**
CBOD5	Grab	Weekly
Dissolved Organic Carbon (DOC)	Grab	Weekly
Total Ammonia Nitrogen	Grab	Weekly
Chloride	Grab	Weekly
BTEX	Grab	Weekly
pH	Grab	Weekly
VOCs Note 1	Grab	Monthly
Semi-VOCs Note 2	Grab	Monthly
Metals Note 3	Grab	Monthly
General Chemistry Note 4	Grab	Monthly

Note 1: VOCs: Benzene, 1,4-Dichlorobenzene, Dichloromethane, Toluene, Ethylbenzene, Xylenes, and Vinyl Chloride.

Note 2: Semi-VOCs: 1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, Hexachlorobenzene, Diethylphthalate, Dimethylphthalate, Di-n-butyl phthalate, Phenol, Benzo(a)pyrene, 2,4,6- Trichlorophenol, 2,4-Dichlorophenol, Pentachlorophenol.

Note 3: Metals: Arsenic, Barium, Boron, Cadmium, Chromium, Copper, Iron, Lead, Manganese, Mercury, Nickel, Zinc.

Note 4: G. Chemistry: Alkalinity, Calcium, Chloride, Conductivity, COD, Nitrate, Nitrite, Magnesium, pH, Potassium, Sodium, Sulfate, Total Dissolved Solids, TKN, Temperature, Turbidity, Total Phosphorus, TSS, Phenols, Dissolved Oxygen.

Schedule E

Groundwater Monitoring Program

Sampling Locations: OW40, OW60 and OW79, OW16, OW61 and OW62

Parameters	Parameters	Field Parameters
Alkalinity	Boron	pH
Conductivity	Cadmium	Conductivity
Chloride	Lead	Turbidity
pH	Iron	
Dissolved Organic Carbon	Barium	
Total Dissolved Solids	Benzene	
Total Ammonia	1,4-Dichlorobenzene	
Total Kjeldahl Nitrogen	Dichloromethane	
Sulfate	Ethylbenzene	
Nitrate	Vinyl Chloride	
Calcium	Toluene	
Potassium	Xylenes	
Sodium		
Magnesium		

Note:
Sampling Location OW40, OW60 and OW79, to be monitored Annually
Sampling Location: OW16, OW61, and OW62 to be monitored Semi-Annually (OW61, and OW62 to be monitored Semi-Annually while Poplar Plantation is operational)

Upon issuance of the environmental compliance approval, I hereby revoke Approval No(s). 2403-BE6LZ4 issued on August 21, 2019.

In accordance with Section 139 of the *Environmental Protection Act,* you may by written notice served upon me, the Ontario Land Tribunal and in accordance with Section 47 of the *Environmental Bill of Rights,* 1993, the Minister of the Environment, Conservation and Parks, within 15 days after receipt of this notice, require a hearing by the Tribunal. The Minister of the Environment, Conservation and Parks will place notice of your appeal on the Environmental Registry. Section 142 of the *Environmental Protection Act* provides that the notice requiring the hearing ("the Notice") shall state:

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

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

The Notice should also include:

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

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

This Notice must be served upon:

Registrar*
Ontario Land Tribunal
655 Bay Street, Suite 1500
Toronto, Ontario
M5G 1E5
OLT.Registrar@ontario.ca

and

The Minister of the Environment, Conservation and Parks
777 Bay Street, 5th Floor
Toronto, Ontario
M7A 2J3

and

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

*** Further information on the Ontario Land Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349 or 1 (866) 448-2248, or www.olt.gov.on.ca**

This instrument is subject to Section 38 of the *Environmental Bill of Rights,* 1993, that allows residents of Ontario to seek leave to appeal the decision on this instrument. Residents of Ontario may seek leave to appeal within 15 days from the date this decision is placed on the Environmental Registry. By accessing the Environmental Registry at https://ero.ontario.ca/, you can determine when the leave to appeal period ends.

The above noted activity is approved under s.20.3 of Part II.1 of the *Environmental Protection Act.*
DATED AT TORONTO this 29th day of April, 2024

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

KH/
c: District Manager, MECP Sarnia District.
Cristina Olarte, P.Eng., WSP Canada Inc.
Brent Lengille, P.Geo., RWDI Consulting Engineers.

APPENDIX A4:

Amended ECA [Air] No. 6318-CX4NFX, dated December 13, 2023

AMENDED ENVIRONMENTAL COMPLIANCE APPROVAL

NUMBER 6318-CX4NFX
Issue Date: December 13, 2023

Waste Management of Canada Corporation
5768 Nauvoo Road
Warwick, Ontario
N0M 2S0

Site Location: Twin Creeks Environmental Centre
5768 Nauvoo Road Watford
Warwick Township, County of Lambton
N0M 2S0

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

- Two (2) enclosed flares (FLARE5, FLARE6), flaring either landfill gas or off-spec renewable natural gas (RNG), each having a maximum inlet capacity of:

  - 1.89 cubic metres per second of landfill gas, exhausting to the atmosphere at an approximate volumetric flowrate of 41.7 cubic metres per second, or

  - 0.94 cubic metres per second of off-spec RNG, exhausting to the atmosphere at an approximate volumetric flowrate of 37.2 cubic metres per second,

  exhausting to the atmosphere through individual stacks, each having an exit diameter of 3.7 metres, extending 15.2 metres above grade;

- One (1) pre-treatment thermal oxidizer (RNG_TO1), with a maximum thermal input of 2.44 million kilojoules per hour and a maximum inlet capacity of 0.33 cubic metres per second of off-spec RNG gas, exhausting to the atmosphere at an approximate volumetric flowrate of 2.5 cubic metres per second, through a stack, having an exit diameter of 1.2 metres, extending 15.2 metres above grade;

- One (1) main thermal oxidizer (RNG_TO2), with a maximum thermal input of 20.57 million kilojoules per hour and a maximum inlet capacity of 2.31 cubic metres per second of off-spec RNG gas, exhausting to the atmosphere at an approximate volumetric flowrate of 18 cubic metres per second, through a stack, having an exit diameter of 2.9 metres, extending 15.2 metres above grade;

- One (1) amine reboiler, having a maximum thermal input of 8,904,706 kilojoules per hour, exhausting to the atmosphere through a stack having an exit diameter of 0.4 metres, extending 4.9 metres above grade;

- Three (3) enclosed flares (FLARE1, FLARE2, FLARE3), each having a maximum inlet capacity of 2.08 cubic metres per second of landfill gas, exhausting into the air at a maximum volumetric flow rate of 61.3 cubic metres per second through individual stacks, each having an exit diameter of 3.7 metres, extending 15.2 metres above grade; used to:

    - incinerate the landfill gas from a landfill gas collection system;

    - control the off-gases from the enclosed building housing the leachate treatment facility; and

    - maintain a negative pressure on the leachate collection system on an as-needed basis;

- One (1) enclosed flare (FLARE4) having a maximum inlet capacity of 0.94 cubic metres per second of landfill gas, exhausting into the air at a maximum volumetric flow rate of 25.8 cubic metres per second through a stack having an exit diameter of 3.2 metres, extending 12.2 metres above grade; used to:

    - incinerate the landfill gas from a landfill gas collection system;

    - control the off-gases from the enclosed building housing the leachate treatment facility; and

    - maintain a negative pressure on the leachate collection system on an as-needed basis;

- One (1) diesel fuel fired generator (GEN2) rated at 50 kilowatts that will be used to provide regular power to the leachate pumping system; exhausting into the air at a maximum volumetric flow rate of 0.24 cubic metres per second; having an exit diameter of 0.10 metre, extending 3.6 metres above grade;

- One (1) diesel fuel fired emergency generator (GEN3) rated at 250 kilowatts that will be used to provide back-up power for the office buildings; exhausting into the air at a maximum volumetric flow rate of 0.97 cubic metres per second; having an exit diameter of 0.15 metre, extending 3.6 metres above grade;

- One (1) leachate treatment facility with a maximum capacity of 300 cubic metres per day of raw leachate consisting of:

- Two (2) passive exhaust louvres (L3, L4) serving two (2) sequencing batch reactors (SBR) and two (2) aeration tanks; exhausting into the air individually at a maximum volumetric flow rate of 1.96 cubic metres per second; each having an exit dimension of 1.22 x 1.22 metres, extending 2.13 metres above grade;

- One (1) process exhaust fan (EF-2) serving the reverse osmosis system area; exhausting into the air at a maximum volumetric flow rate of 1.71 cubic metres per second; having an exit dimension of 0.45 x 0.45 metres, extending 4.0 metres above grade;

- One (1) exhaust fan (SD-1) serving slurry dryer; exhausting into the air at a maximum volumetric flow rate of 0.24 cubic metres per second; having an exit diameter of 0.3 metre, extending 5.0 metres above grade;

- Two (2) RNG plant condensate tanks equipped with carbon drum filters;

- One (1) leachate treatment facility laboratory;

- Maintenance welding;

all in accordance with the Environmental Compliance Approval Application submitted by Waste Management of Canada Corporation, dated May 8, 2023 and signed by Wayne Jenken, Landfill Engineering Manager; and the supporting information, including the Emission Summary and Dispersion Modelling Report, submitted by RWDI AIR Inc., dated May 6, 2023 and signed by Brad Bergeron; additional information provided by Sarah Pellatt in a memo dated October 17, 2023; and the Primary Noise Screening Method Form prepared by RWDI AIR Inc., dated January 27, 2023 and signed by Daniel Kremer.

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

1. "Approval" means this Environmental Compliance Approval, including the application and supporting documentation listed above;

2. "Best Management Practices Plan" means the document titled "Twin Creeks Landfill Site: Best Management Practices Plan (Dust) - Version 5", dated April 3, 2017 and prepared by RWDI AIR Inc.;

3. "Carbon Drum Filters" means the carbon drum filters controlling emissions from the two RNG plant condensate tanks, described in the Company's application, this Approval and in the supporting documentation submitted with the application, to the extent approved by this Approval;

4. "Company" means Waste Management of Canada Corporation that is responsible for the construction or operation of the Facility and includes any successors and assigns in accordance with section 19 of the EPA;

5. "Director" means a person appointed for the purpose of section 20.3 of the EPA by the Minister pursuant to section 5 of the EPA;

6. "District Manager" means the District Manager of the appropriate local district office of the Ministry, where the Facility is geographically located;

7. "Enclosed Flares" means FLARE1, FLARE2, FLARE3 and FLARE4, described in the Company's application, this Approval and in the supporting documentation submitted with the application, to the extent approved by this Approval;

8. "EPA" means the *Environmental Protection Act,* R.S.O. 1990, c.E.19;

9. "Equipment" means the equipment and processes described in the Company's application, this Approval and in the supporting documentation submitted with the application, to the extent approved by this Approval;

10. "ESDM Report" means the Emission Summary and Dispersion Modelling Report which was prepared in accordance with section 26 of O. Reg. 419/05 and the Procedure Document by Brad Bergeron, RWDI AIR Inc. and dated May 6, 2023, submitted in support of the application, and includes any changes to the report made up to the date of issuance of this Approval;

11. "Exhausted" means the capacity of the activated carbon to adsorb emissions is reached and the Carbon Drum Filters are no longer able to effectively reduce emissions;

12. "Facility" means the entire operation located on the property where the Equipment is located;

13. "Manager" means the Manager, Technology Standards Section, Technical Assessment and Standards Development Branch, or any other person who represents and carries out the duties of the Manager, Technology Standards Section, Technical Assessment and Standards Development Branch, as those duties relate to the conditions of this Approval;

14. "Manual" means a document or a set of documents that provide written instructions to staff of the Company;

15. "Ministry" means the ministry of the government of Ontario responsible for the EPA and includes all officials, employees or other persons acting on its behalf;

16. "O. Reg. 419/05" means Ontario Regulation 419/05: Air Pollution – Local Air Quality, made under the EPA;

17. "Odour Best Management Practices Plan" means the document titled "Twin Creeks Landfill: Best Management Practices Plan (Odour) - Version 9", dated November 17, 2023 and prepared by RWDI AIR Inc.;

18. "Organic Matter" means organic matter having carbon content expressed as equivalent methane;

19. "Point of Impingement" has the same meaning as in section 2 of O. Reg. 419/05;

20. "Pre-Test Plan" means a plan for the Source Testing including the information required in Section 5 of the Source Testing Code;

21. "Procedure Document" means Ministry guidance document titled "Procedure for Preparing an Emission Summary and Dispersion Modelling Report" dated March 2018, as amended;

22. "Publication NPC-300" means the Ministry Publication NPC-300, “Environmental Noise Guideline, Stationary and Transportation Sources – Approval and Planning, Publication NPC-300”, August 2013, as amended;

23. "RNG Plant Enclosed Flares" means FLARE5 and FLARE6, described in the Company's application, this Approval and in the supporting documentation submitted with the application, to the extent approved by this Approval;

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

    a. private residences or public facilities where people sleep (e.g.: single and multi-unit dwellings, nursing homes, hospitals, trailer parks, camping grounds, etc.),

    b. institutional facilities (e.g.: schools, churches, community centres, day care centres, recreational centres, etc.),

    c. outdoor public recreational areas (e.g.: trailer parks, play grounds, picnic areas, etc.), and

    d. other outdoor public areas where there are continuous human activities (e.g.: commercial plazas and office buildings);

25. "Source Testing" means site-specific sampling and testing to measure emissions resulting from operating the Targeted Sources under operating conditions that will derive an emission rate that, for the relevant averaging period of the contaminant, is at least as high as the maximum emission rate that the source of contaminant is reasonably capable of, or a rate approved by the Manager within the approved operating range of Targeted Sources which satisfies paragraph 1 of subsection 11(1) of O. Reg. 419/05;

26. "Source Testing Code" means the Ontario Source Testing Code, dated June 2010, prepared by the Ministry, as amended;

27. "Targeted Sources" means the sources listed in Schedule B;

28. "Test Contaminants" means the contaminants listed in Schedule B; and

29. "Thermal Oxidizers" means RNG_TO1 and RNG_TO2, described in the Company's application, this Approval and in the supporting documentation submitted with the application, to the extent approved by this Approval.

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

TERMS AND CONDITIONS

1. OPERATION AND MAINTENANCE

1. The Company shall ensure that the Equipment is properly operated and maintained at all times. The Company shall:

   a. prepare, not later than three (3) months after the date of this Approval, and update, as necessary, a Manual outlining the operating procedures and a maintenance program for the Equipment, including:

      i. routine operating and maintenance procedures in accordance with good engineering practices and as recommended by the Equipment suppliers;

      ii. emergency procedures, including spill clean-up procedures;

      iii. procedures for any record keeping activities relating to operation and maintenance of the Equipment; and

      iv. all appropriate measures to minimize noise, dust and odorous emissions from all potential sources;

   b. implement the recommendations of the Manual.

2. The Company shall ensure that the activated carbon in the Carbon Drum Filters is replaced before it is Exhausted.

2. THERMAL OXIDIZERS

1. The Company shall operate each of the Thermal Oxidizers in such a manner that:

   a. The combustion chamber shall be preheated to a minimum of 815 degrees Celsius prior to introducing the emissions for destruction.

   b. The temperature in the combustion chamber, is maintained at a minimum of 815 degrees Celsius at all times, when the Thermal Oxidizer is in operation.

c. The residence time of the combustion gases in the combustion chamber of RTO_TO1 shall not be less than 5 seconds at a temperature of 815 degrees Celsius minimum.

d. The residence time of the combustion gases in the combustion chamber of RTO_TO2 shall not be less than 4 seconds at a temperature of 815 degrees Celsius minimum.

e. The concentration of Organic Matter in the flue gas of the Thermal Oxidizer,being an average of ten measurements taken at approximately one minute intervals, shall not be greater than 100 parts per million by volume, measured on an undiluted basis.

2. The Company shall install, conduct and maintain a program to continuously monitor temperature in the combustion chamber of each of the Thermal Oxidizers. The continuous monitoring system shall be equipped with continuous recording devices and shall comply with the requirements outlined in Schedule A.

3. FLARES

1. The Company shall operate each of the Enclosed Flares in such a manner that:

   a. The temperature in the combustion chamber, is maintained at a minimum of 875 degrees Celsius at all times, when the Enclosed Flare is in operation; and

   b. The residence time of the combustion gases in the combustion chamber of the Enclosed Flare shall not be less than 0.7 seconds at a temperature of 875 degrees Celsius.

2. The Company shall continuously monitor the temperature in the combustion chamber of the Enclosed Flare. The temperature monitor and recorder shall shall comply with the requirements outlined in Schedule A.

3. The Company shall operate each of the RNG Plant Enclosed Flares in such a manner that:

   a. The temperature in the combustion chamber, is maintained at a minimum of 871 degrees Celsius at all times, when the RNG Plant Enclosed Flare is in operation; and

   b. The residence time of the combustion gases in the combustion chamber of the RNG Plant Enclosed Flare shall not be less than 0.7 seconds at a temperature of 871 degrees Celsius.

4. The Company shall continuously monitor the temperature in the combustion chamber of the RNG PLant Enclosed Flare. The temperature monitor and recorder shall shall comply with the requirements outlined in Schedule A.

4. SOURCE TESTING

1. The Company shall perform Source Testing in accordance with the procedures in Schedule C to

determine the rates of emissions of the Test Contaminants from the Targeted Sources.

5. FUGITIVE DUST CONTROL

1. The Company shall implement the Best Management Practices Plan for the control of fugitive dust emissions resulting from the operation of the Facility. The Company shall update the Best Management Practices Plan as necessary or at the direction of the District Manager.

6. ODOUR

1. The Company shall implement the Odour Best Management Practices Plan for the control of odour emissions resulting from the operation of the Facility. The Company shall update the Odour Best Management Practices Plan as necessary or at the direction of the District Manager.

7. RECORD RETENTION

1. The Company shall retain, for a minimum of two (2) years from the date of their creation, all records and information related to or resulting from the recording activities required by this Approval, and make these records available for review by staff of the Ministry upon request. The Company shall retain:

    a. all records on the maintenance, repair and inspection of the Equipment;

    b. all records produced by the temperature monitors required in Condition 2 and Condition 3;

    c. all records of any environmental complaints, including:

        i. a description, time and date of each incident to which the complaint relates;

        ii. wind direction at the time of the incident to which the complaint relates; and

        iii. a description of the measures taken to address the cause of the incident to which the complaint relates and to prevent a similar occurrence in the future.

8. NOTIFICATION OF COMPLAINTS

1. The Company shall notify the District Manager, in writing, of each environmental complaint within two (2) business days of the complaint. The notification shall include:

    a. this Approval number;

    b. a description of the nature of the complaint;

    c. the time and date of the incident to which the complaint relates; and

d. a description of the measures taken to address the cause of the incident to which the complaint relates and to prevent a similar occurrence in the future.

9. CONSULTATION

1. During the process of submission of an application to amend any Approval for the Site, the Company shall:

   a. discuss with Walpole Island First Nation (WIFN), Township of Warwick and Warwick Public Liaison Committee (WPLC) the proposed application prior to submission of the application to the Director;

   b. provide the same documents to WIFN, Township of Warwick and WPLC that are provided to the Director in respect of the amendment; and

   c. provide the Director with a statement indicating how WIFN, Township of Warwick and WPLC's comments were considered by the Company before it submitted the application to the Ministry.

10. NOISE

1. The Company shall, at all times, ensure that the noise emissions from the Facility comply with the limits set out in Ministry Publication NPC-300.

SCHEDULE A

Continuous Temperature Monitoring and Recording System Requirements

PARAMETER: Temperature

LOCATION:

The sample point for the continuous temperature monitoring and recording system shall be located at a location where the measurements are representative of the minimum temperature of the gases leaving the combustion chamber of the Thermal Oxidizer, Enclosed Flare or RNG Plant Enclosed Flare.

PERFORMANCE:

The continuous temperature monitoring and recording system shall meet the following minimum performance specifications for the following parameters:

Type: shielded "K" type thermocouple, or equivalent

Accuracy: ±1.5 percent of the minimum gas temperature

DATA RECORDER:

The data recorder must be capable of registering continuously the measurement of the monitoring system without a significant loss of accuracy and with a time resolution of five (5) minutes or better.

RELIABILITY:

The monitoring system shall be operated and maintained so that accurate data is obtained during a minimum of 95 percent of the time for each calendar quarter.

SCHEDULE B

Targeted Sources and Test Contaminants for Source Testing:

Source ID	Description	Test Contaminants
L3	Exhaust serving sequencing a batch reactor (SBR) and an aeration tank	Odour, hydrogen sulfide, total Mercaptans and a complete scan for volatile organic compounds
L4	Exhaust serving sequencing a batch reactor (SBR) and an aeration tank	Odour, hydrogen sulfide, total Mercaptans and a complete scan for volatile organic compounds
EF-2	Exhaust serving reverse osmosis system area	Odour, hydrogen sulfide, total Mercaptans and a complete scan for volatile organic compounds
SD-1	Exhaust serving slurry dryer	Odour, hydrogen sulfide, total Mercaptans and a complete scan for volatile organic compounds

SCHEDULE C

Source Testing Procedures

1. The Company shall submit, not later than three (3) months after commencement of operation of the Targeted Sources, to the Manager a Pre-Test Plan for the Source Testing required under this Approval.

2. The Company shall finalize the Pre-Test Plan in consultation with the Manager.

3. The Company shall not commence the Source Testing required under this Approval until the Manager has accepted the Pre-Test Plan.

4. The Company shall complete the Source Testing, no later than three (3) months after the Manager has approved the Pre-Test Plan or a date agreed upon in consultation with the District Manager.

5. The Company shall notify the Manager, the District Manager and the Director in writing of the location, date and time of any impending Source Testing required by this Approval, at least fifteen (15) days prior to the Source Testing.

6. The Company shall submit a report (electronic format) on the Source Testing to the Manager, the District Manager and the Director not later than three (3) months after completing the Source Testing. The report shall be in the format described in the Source Testing Code, and shall also include, but not be limited to:

    a. an executive summary;

    b. an identification of the applicable North American Industry Classification System code (NAICS) for the Facility;

    c. records of weather conditions such as ambient temperature and relative humidity, wind speed and direction, and any environmental complaints if received, at the time of the Source Testing;

    d. records of operating conditions at the time of Source Testing, including but not limited to the quantity of raw leachate processed through the leachate treatment facility;

    e. results of Source Testing, including the emission rate, emission concentration of odour from the Targeted Sources;

    f. the results of dispersion calculations, taking into account all other odour sources not tested in the Source Testing, indicating the maximum 10-minute average concentration of odour at the Point of Impingement and at the most impacted Sensitive Receptor computed in accordance with Schedule D.

    g. a tabular comparison of emission rates based on Source Testing results to relevant estimates described in the ESDM Report

7. The Director may not accept the results of the Source Testing if:
    1. the Source Testing Code or the requirement of the Manager were not followed;
    2. the Company did not notify the Manager, the District Manager and Director of the Source Testing; or
    3. the Company failed to provide a complete report on the Source Testing.

8. If the Director does not accept the result of the Source Testing, the Director may require re-testing. If re-testing is required, the Pre-Test Plan strategies need to be revised and submitted to the Manager for approval. The actions taken to minimize the possibility of the Source Testing results not being accepted by the Director must be noted in the revision.

9. The Company shall update their ESDM Report in accordance with Section 26 of O. Reg. 419/05 and the Procedure Document with the results from the Source Testing if any of the calculated emission factors or calculated emission rates are higher than the predicted rates in the ESDM report, not later than three (3) months after the submission of the Source Testing report and make these records available for review by staff of the Ministry upon request.

SCHEDULE D

Procedure to Calculate and Record the 10-minute Average Concentration of Odour

1. Calculate and record one-hour average concentration of odour at the Point of Impingement and at the most impacted Sensitive Receptor, employing the AERMOD atmospheric dispersion model or any other model acceptable to the Director, that employs at least five (5) years of hourly local meteorological data and that can provide results reported as individual one-hour average odour concentrations;

2. Convert and record each of the one-hour average concentrations predicted over the five (5) years of hourly local meteorological data at the Point of Impingement and at the most impacted Sensitive Receptor to 10-minute average concentrations using the One-hour Average to 10-Minute Average Conversion described below; and

3. Record and present the 10-minute average concentrations predicted to occur over a five (5) year period at the Point of Impingement and at the most impacted Sensitive Receptor in a histogram. The histogram shall identify all predicted 10-minute average odour concentration occurrences in terms of frequency, identifying the number of occurrences over the entire range of predicted odour concentration in increments of not more than 1/10 of one odour unit. The maximum 10-minute average concentration of odour at the Sensitive Receptor will be considered to be the maximum odour concentration at the most impacted Sensitive Receptor that occurs and is represented in the histogram, disregarding outlying data points on the histogram as agreed to by the Director.

4. Use the following formula to convert and record one-hour average concentrations at the Point of Impingement and at the most impacted Sensitive Receptor to 10-minute average concentrations:

$$X_{10min} = X_{60min} * 1.65$$

where X_{10min} = 10-minute average concentration

X_{60min} = one-hour average concentration

(Equation: X Subscript 10min Baseline equals X Subscript 60min Baseline times 1.65, where X Subscript 10min Baseline equals 10-minute average concentration and X Subscript 60min Baseline equals one-hour average concentration.)

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

1. Condition No. 1 is included to emphasize that the Equipment must be maintained and operated according to a procedure that will result in compliance with the EPA, the Regulations and this Approval.

2. Conditions No. 2 and 3 are included to emphasize that the Equipment must be maintained and operated according to a procedure that will result in compliance with the EPA, the Regulations and this Approval and to gather accurate information so that compliance with the operating requirements of this Approval can be verified.

3. Condition No. 4 is included to require the Company to gather accurate information so that compliance with the operating requirements of this Approval can be verified.

4. Conditions No. 5 and 6 are included to emphasize that the Equipment must be maintained and operated according to a procedure that will result in compliance with the EPA, the Regulations and this Approval.

5. Condition No. 7 is included to require the Company to keep records and to provide information to staff of the Ministry so that compliance with the EPA, the Regulations and this Approval can be verified.

6. Condition No. 8 is included to require the Company to notify staff of the Ministry so as to assist the Ministry with the review of the site's compliance.

7. Condition No. 9 is included in order to ensure that consultation with Walpole Island First Nation (WIFN), Township of Warwick and Warwick Public Liaison Committee (WPLC) is undertaken during the submission of any application to amend any Approval required by the Ministry.

8. Condition No. 10 is included to provide the minimum performance requirements considered necessary to prevent an adverse effect resulting from the operation of the Facility.

Upon issuance of the environmental compliance approval, I hereby revoke Approval No(s). 4155-BMCLZ8 issued on March 3, 2020

In accordance with Section 139 of the *Environmental Protection Act,* you may by written notice served upon me, the Ontario Land Tribunal and in accordance with Section 47 of the *Environmental Bill of Rights,* 1993, the Minister of the Environment, Conservation and Parks, within 15 days after receipt of this notice, require a hearing by the Tribunal. The Minister of the Environment, Conservation and Parks will place notice of your appeal on the Environmental Registry. Section 142 of the *Environmental Protection Act* provides that the notice requiring the hearing ("the Notice") shall state:

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

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

The Notice should also include:

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

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

This Notice must be served upon:

Registrar*
Ontario Land Tribunal
655 Bay Street, Suite 1500
Toronto, Ontario
M5G 1E5
OLT.Registrar@ontario.ca

and

The Minister of the Environment,
Conservation and Parks
777 Bay Street, 5th Floor
Toronto, Ontario
M7A 2J3

and

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

*** Further information on the Ontario Land Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349 or 1 (866) 448-2248, or www.olt.gov.on.ca**

This instrument is subject to Section 38 of the *Environmental Bill of Rights,* 1993, that allows residents of Ontario to seek leave to appeal the decision on this instrument. Residents of Ontario may seek leave to appeal within 15 days from the date this decision is placed on the Environmental Registry. By accessing the Environmental Registry at https://ero.ontario.ca/, you can determine when the leave to appeal period ends.

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

DATED AT TORONTO this 13th day of December, 2023

Nancy E Orpana, P.Eng.
Director
appointed for the purposes of Part II.1 of the
Environmental Protection Act

KS/
c: District Manager, MECP Sarnia
Brad Bergeron, RWDI Air

APPENDIX A5:

Amended Permit to Take Water [Surface Water] No. 4682-BLJRYJ, dated November 8, 2021

PERMIT TO TAKE WATER
Ground Water
NUMBER 4682-BLJRYJ

Pursuant to Section 34.1 of the Ontario Water Resources Act, R.S.O. 1990 this Permit To Take Water is hereby issued to:

Waste Management of Canada Corporation
5768 Nauvoo Rd
Warwick, Ontario, N0M 2S0
Canada

For the water taking from: PS2, PS4, PS6, PS8, SDL, Pond 1, Pond 2, Pond 3, Pond 4.

Located at: Lot 19 and 20, Concession 3, Geographic Township of Warwick
Warwick, County of Lambton

For the purposes of this Permit, and the terms and conditions specified below, the following definitions apply:

DEFINITIONS

(a) "Director" means any person appointed in writing as a Director pursuant to section 5 of the OWRA for the purposes of section 34.1, OWRA.

(b) "Provincial Officer" means any person designated in writing by the Minister as a Provincial Officer pursuant to section 5 of the OWRA.

(c) "Ministry" means Ontario Ministry of the Environment, Conservation and Parks.

(d) "District Office" means the Sarnia District Office.

(e) "Permit" means this Permit to Take Water No. 4682-BLJRYJ including its Schedules, if any, issued in accordance with Section 34.1 of the OWRA.

(f) "Permit Holder" means Waste Management of Canada Corporation.

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

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

TERMS AND CONDITIONS

1. Compliance with Permit

1.1 Except where modified by this Permit, the water taking shall be in accordance with the application for this Permit To Take Water, dated December 19, 2019 and signed by Phil Janisse, and all Schedules included in this Permit.

1.2 The Permit Holder shall ensure that any person authorized by the Permit Holder to take water under this Permit is provided with a copy of this Permit and shall take all reasonable measures to ensure that any such person complies with the conditions of this Permit.

1.3 Any person authorized by the Permit Holder to take water under this Permit shall comply with the conditions of this Permit.

1.4 This Permit is not transferable to another person.

1.5 This Permit provides the Permit Holder with permission to take water in accordance with the conditions of this Permit, up to the date of the expiry of this Permit. This Permit does not constitute a legal right, vested or otherwise, to a water allocation, and the issuance of this Permit does not guarantee that, upon its expiry, it will be renewed.

1.6 The Permit Holder shall keep this Permit available at all times at or near the site of the taking, and shall produce this Permit immediately for inspection by a Provincial Officer upon his or her request.

1.7 The Permit Holder shall report any changes of address to the Director within thirty days of any such change. The Permit Holder shall report any change of ownership of the property for which this Permit is issued within thirty days of any such change. A change in ownership in the property shall cause this Permit to be cancelled.

2. General Conditions and Interpretation

2.1 Inspections

The Permit Holder must forthwith, upon presentation of credentials, permit a Provincial Officer to carry out any and all inspections authorized by the OWRA, the *Environmental Protection Act* , R.S.O. 1990, the *Pesticides Act* , R.S.O. 1990, or the *Safe Drinking Water Act,* S. O. 2002.

2.2 Other Approvals

The issuance of, and compliance with this Permit, does not:

(a) relieve the Permit Holder or any other person from any obligation to comply with any other applicable legal requirements, including the provisions of the *Ontario Water Resources Act* , and

the *Environmental Protection Act* , and any regulations made thereunder; or

(b) limit in any way any authority of the Ministry, a Director, or a Provincial Officer, including the authority to require certain steps be taken or to require the Permit Holder to furnish any further information related to this Permit.

2.3 Information

The receipt of any information by the Ministry, the failure of the Ministry to take any action or require any person to take any action in relation to the information, or the failure of a Provincial Officer to prosecute any person in relation to the information, shall not be construed as:

(a) an approval, waiver or justification by the Ministry of any act or omission of any person that contravenes this Permit or other legal requirement; or

(b) acceptance by the Ministry of the information's completeness or accuracy.

2.4 Rights of Action

The issuance of, and compliance with this Permit shall not be construed as precluding or limiting any legal claims or rights of action that any person, including the Crown in right of Ontario or any agency thereof, has or may have against the Permit Holder, its officers, employees, agents, and contractors.

2.5 Severability

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

2.6 Conflicts

Where there is a conflict between a provision of any submitted document referred to in this Permit, including its Schedules, and the conditions of this Permit, the conditions in this Permit shall take precedence.

3. Water Takings Authorized by This Permit

3.1 **Expiry**

This Permit expires on **October 31, 2031**. No water shall be taken under authority of this Permit after the expiry date.

3.2 Amounts of Taking Permitted

The Permit Holder shall only take water from the source, during the periods and at the rates and amounts of taking specified in Table A. Water takings are authorized only for the purposes specified in Table A.

Table A

	Source Name / Description:	Source: Type:	Taking Specific Purpose:	Taking Major Category:	Max. Taken per Minute (litres):	Max. Num. of Hrs Taken per Day:	Max. Taken per Day (litres):	Max. Num. of Days Taken per Year:	Zone/ Easting/ Northing:
1	PS2	Well Dug	Construction	Dewatering Construction	1,325	24	1,907,640	365	17 428500 4757900
2	PS4	Well Dug	Construction	Dewatering Construction	1,325	24	1,907,640	365	17 428505 4758130
3	PS6	Well Dug	Construction	Dewatering Construction	1,325	24	1,907,640	365	17 428505 4758490
4	PS8	Well Dug	Construction	Dewatering Construction	1,325	24	1,907,640	365	17 428500 4758800
5	SDL	Well Dug	Construction	Dewatering Construction	4,921	24	7,085,520	365	17 428500 4758900
6	pond 01	Pond Online	Other - Industrial	Industrial	4,921	24	7,085,520	365	17 429230 4757320
7	pond 02	Pond Online	Other - Industrial	Industrial	4,921	24	7,085,520	365	17 428370 4757850
8	pond 03	Pond Online	Other - Industrial	Industrial	4,921	24	7,085,520	365	17 428380 4758670
9	pond 04	Pond Online	Other - Industrial	Industrial	4,921	24	7,085,520	365	17 429390 4758620
						Total Taking:	42,068,160		

4. Monitoring

4.1 Under section 9 of O. Reg. 387/04, and as authorized by subsection 34(6) of the Ontario Water Resources Act, the Permit Holder shall, on each day water is taken under the authorization of this Permit, record the date, the volume of water taken on that date and the rate at which it was taken. The daily volume of water taken shall be measured by a flow meter or calculated in accordance with the method described in the application for this Permit, or as otherwise accepted by the Director. A separate record shall be maintained for each source. The Permit Holder shall keep all records required by this condition current and available at or near the site of the taking and shall produce the records immediately for inspection by a Provincial Officer upon his or her request. The Permit Holder, unless otherwise required by the Director, shall submit, on or before March 31st in every year, the records required by this condition to the ministry's Water Taking Reporting System.

4.2 Within 180 days of the issuance of this Permit, the Permit Holder shall submit to the

District Manager, a Plan (the "Plan") to investigate the potential impacts of the Water Taking. The Plan shall include two components:

a. An Ecological Study which includes an inventory of the ecosystem in the immediate vicinity of the Gilliand-Geerts Drain between Nauvoo Road and Underpass Road, and an assessment of potential impacts of the water taking on that ecosystem; and
b. A survey of downstream riparian property owners along the Gilliand-Geerts Drain between Nauvoo Road and Underpass Road to determine the extent of any surface water uses by those property owners and assess any impacts of the water taking on those uses.

The Plan shall include timelines for completing the outlined work. Upon acceptance of the Plan by the District Manager, the Permit Holder shall complete the action items outlined with the Plan within the prescribed timelines.

5. Impacts of the Water Taking

5.1 Notification

The Permit Holder shall immediately notify the local District Office of any complaint arising from the taking of water authorized under this Permit and shall report any action which has been taken or is proposed with regard to such complaint. The Permit Holder shall immediately notify the local District Office if the taking of water is observed to have any significant impact on the surrounding waters. After hours, calls shall be directed to the Ministry's Spills Action Centre at 1-800-268-6060.

5.2 For Groundwater Takings

If the taking of water is observed to cause any negative impact to other water supplies obtained from any adequate sources that were in use prior to initial issuance of a Permit for this water taking, the Permit Holder shall take such action necessary to make available to those affected, a supply of water equivalent in quantity and quality to their normal takings, or shall compensate such persons for their reasonable costs of so doing, or shall reduce the rate and amount of taking to prevent or alleviate the observed negative impact. Pending permanent restoration of the affected supplies, the Permit Holder shall provide, to those affected, temporary water supplies adequate to meet their normal requirements, or shall compensate such persons for their reasonable costs of doing so.

If permanent interference is caused by the water taking, the Permit Holder shall restore the water supplies of those permanently affected.

6. Director May Amend Permit

The Director may amend this Permit by letter requiring the Permit Holder to suspend or reduce the taking to an amount or threshold specified by the Director in the letter. The suspension or reduction in taking shall be effective immediately and may be revoked at any time upon notification by the Director. This condition does not affect your right to appeal the suspension or reduction in taking to the Environmental Review Tribunal under the *Ontario Water*

Resources Act , Section 100 (4).

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

1. Condition 1 is included to ensure that the conditions in this Permit are complied with and can be enforced.

2. Condition 2 is included to clarify the legal interpretation of aspects of this Permit.

3. Conditions 3 through 6 are included to protect the quality of the natural environment so as to safeguard the ecosystem and human health and foster efficient use and conservation of waters. These conditions allow for the beneficial use of waters while ensuring the fair sharing, conservation and sustainable use of the waters of Ontario. The conditions also specify the water takings that are authorized by this Permit and the scope of this Permit.

In accordance with Section 100 of the Ontario Water Resources Act, R.S.O. 1990, you may by written notice served upon me, the Environmental Review Tribunal and the Minister of the Environment, Conservation and Parks, within 15 days after receipt of this Notice, require a hearing by the Tribunal. The Minister of the Environment, Conservation and Parks will place notice of your appeal on the Environmental Registry. Section 101 of the Ontario Water Resources Act, as amended provides that the Notice requiring a hearing shall state:

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

In addition to these legal requirements, the Notice should also include:

a. The name of the appellant;
b. The address of the appellant;
c. The Permit to Take Water number;
d. The date of the Permit to Take Water;
e. The name of the Director;
f. The municipality within which the works are located;

This notice must be served upon:

The Secretary
Environmental Review Tribunal
655 Bay Street, 15th Floor
Toronto ON
M5G 1E5
Fax: (416) 326-5370
Email:
ERTTribunalsecretary@ontario.ca

AND

The Minister of the Environment,
Conservation and Parks
777 Bay Street, 5th Floor
Toronto, Ontario
M7J 2J3

AND

The Director, Section 34.1,
Ministry of the Environment,
Conservation and Parks
733 Exeter Rd
London ON N6E 1L3
Fax: (519) 873-5020

Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal:

by Telephone at	by Fax at	by e-mail at
(416) 212-6349	(416) 326-5370	www.ert.gov.on.ca
Toll Free 1(866) 448-2248	Toll Free 1(844) 213-3474	

This instrument is subject to Section 38 of the ***Environmental Bill of Rights*** *that allows residents of Ontario to seek leave to appeal the decision on this instrument. Residents of Ontario may seek to appeal for 15 days from the date this decision is placed on the Environmental Registry. By accessing the Environmental Registry, you can determine when the leave to appeal period ends.*

This Permit cancels and replaces Permit Number 4430-8PLMKV, issued on 2012/01/17.

Dated at London this 8th day of November, 2021.

Jason Lehouillier

Jason Lehouillier
Director, Section 34.1
Ontario Water Resources Act , R.S.O. 1990

Schedule A

This Schedule “A” forms part of Permit To Take Water 4682-BLJRYJ, dated November 8, 2021.

APPENDIX B:

Climatic Data

Table B-1
Historical Precipitation Data Summary
Twin Creeks Environmental Centre - Poplar System

Year	Climatological Station Precipitation Total (mm/a)	On-site Precipitation Total (mm/a)
30-Year Normal (1961-1990)	711.9	-
30-Year Normal (1971-2000)	935.5	-
30-Year Normal (1981-2010)	959.2	-
30-Year Normal (1991-2020)	962.1	-
1995	868.7	-
1996, 1997	Complete annual data not available	-
1998	788.8	-
1999	805.1	-
2000	1,140.6	-
2001	867.2	-
2002	682.6	472.0
2003	982.8	726.7
2004	954.8	729.2
2005	898.3	577.0
2006	1,245.8	853.3
2007	804.4	699.8
2008	1,241.8	852.2
2009	1,001.8	729.1
2010	927.1	676.7
2011	1255.0	812.3
2012	860.2	592.7
2013	1,194.4	911.4
2014	895.6	829.5
2015	828.0	724.0
2016	1,012.8	816.5
2017	972.2	843.3
2018	1,169.6	951.3
2019	1007.6	808.6
2020	966.6	725.4
2021	1028.4	870.6
2022	747.1	634.8
2023	1140.4	906.2
2024	1157.2	936.4

Notes

1) Dash (-) denotes climatologial station not operational

2) On-site precipiitation data collected from the automated RWDI Envision climatological station since 2019 instead of manual rain gauge readings, as in years prior.

Environment Canada Environnement Canada

Daily Data Report for January 2024

STRATHROY-MULLIFARRY
ONTARIO

Latitude:	42°58'50.022" N	Longitude:	81°38'34.086" W	Elevation:	243.00 m
Climate ID:	6148122	WMO ID:		TC ID:	

Daily Data Report for January 2024

DAY	Max Temp °C	Min Temp °C	Mean Temp °C	Heat Deg Days	Cool Deg Days	Total Rain mm	Total Snow cm	Total Precip mm	Snow on Grnd cm	Dir of Max Gust 10's deg	Spd of Max Gust km/h
01 †	0.0	-2.0	-1.0	19.0	0.0	0.0	0.0	0.0	0		
02 †	0.0	-3.0	-1.5	19.5	0.0	0.0	0.0	0.0	0		
03 †	0.5	-1.5	-0.5	18.5	0.0	1.0	2.0	3.0	0		
04 †	-3.0	-5.0	-4.0	22.0	0.0	0.0	0.0	0.0	2		
05 †	-1.0	-7.5	-4.3	22.3	0.0	0.0	0.0	0.0	2		
06 †	0.0	-2.5	-1.3	19.3	0.0	0.0	0.0	0.0	1		
07 †	1.0	-2.0	-0.5	18.5	0.0	0.0	0.0	0.0	0		
08 †	2.5	0.0	1.3	16.7	0.0	0.0	1.0	1.0	0		
09 †	6.0	0.0	3.0	15.0	0.0	24.4	0.0	24.4	1		
10 †	0.5	-1.0	-0.3	18.3	0.0	0.0	1.0	1.0	0		
11 †	1.5	-1.0	0.3	17.7	0.0	2.6	2.0	4.6	1		
12 †	4.5	-3.5	0.5	17.5	0.0	12.0	4.0	16.0	2		
13 †	-1.0	-4.0	-2.5	20.5	0.0	0.0	7.0	7.0	1		
14 †	-9.5	-12.5	-11.0	29.0	0.0	0.0	2.0	2.0	7		
15 †											
16 †											
17 †	-7.5	-16.0	-11.8	29.8	0.0	0.0	2.0	2.0	10		
18 †	-3.0	-11.0	-7.0	25.0	0.0	0.0	3.0	3.0	11		
19 †	-7.5	-10.0	-8.8	26.8	0.0	0.0	10.0	10.0	13		
20 †	-6.0	-13.0	-9.5	27.5	0.0	0.0	5.0	5.0	20		
21 †	-3.0	-9.5	-6.3	24.3	0.0	0.0	0.0	0.0	20		
22 †	0.0	-11.5	-5.8	23.8	0.0	0.0	2.0	2.0	18		
23 †	1.0	-3.0	-1.0	19.0	0.0	5.0	3.0	8.0	17		
24 †	3.0	0.5	1.8	16.2	0.0	10.2	0.0	10.2	15		
25 †	5.5	1.0	3.3	14.7	0.0	26.0	0.0	26.0	12		
26 †	5.5	1.5	3.5	14.5	0.0	4.0	0.0	4.0	7		
27 †	3.0	0.5	1.8	16.2	0.0	0.0	0.0	0.0	0		
28 †	2.5	0.5	1.5	16.5	0.0	2.8	1.0	3.8	0		
29 †	1.5	-0.5	0.5	17.5	0.0	0.0	0.0	0.0	1		
30 †	1.0	-1.0	0.0	18.0	0.0	2.0	1.0	3.0	0		
31 †	2.0	0.0	1.0	17.0	0.0	0.0	0.0	0.0	0		
Sum				580.6	0.0	90.0	46.0	136.0			
Avg	0.0	-4.0	-2.0								
Xtrm	6.0	-16.0									

Summary, average and extreme values are based on the data above.

Environment Canada Environnement Canada

Daily Data Report for February 2024

STRATHROY-MULLIFARRY
ONTARIO

Latitude:	42°58'50.022" N	Longitude:	81°38'34.086" W	Elevation:	243.00 m
Climate ID:	6148122	WMO ID:		TC ID:	

Daily Data Report for February 2024

DAY	Max Temp °C	Min Temp °C	Mean Temp °C	Heat Deg Days	Cool Deg Days	Total Rain mm	Total Snow cm	Total Precip mm	Snow on Grnd cm	Dir of Max Gust 10's deg	Spd of Max Gust km/h
01 †	3.5	1.5	2.5	15.5	0.0	0.0	0.0	0.0	0		
02 †	0.0	-1.0	-0.5	18.5	0.0	0.0	0.0	0.0	0		
03 †	1.5	-2.0	-0.3	18.3	0.0	0.0	0.0	0.0	0		
04 †	3.0	-6.5	-1.8	19.8	0.0	0.0	0.0	0.0	0		
05 †	2.5	-3.0	-0.3	18.3	0.0	0.0	0.0	0.0	0		
06 †	5.0	-5.0	0.0	18.0	0.0	0.0	0.0	0.0	0		
07 †	8.0	-4.0	2.0	16.0	0.0	0.0	0.0	0.0	0		
08 †	12.5	-1.0	5.8	12.2	0.0	0.0	0.0	0.0	0		
09 †	15.0	7.0	11.0	7.0	0.0	0.0	0.0	0.0	0		
10 †	6.5	2.0	4.3	13.7	0.0	0.0	0.0	0.0	0		
11 †	1.0	0.0	0.5	17.5	0.0	0.0	0.0	0.0	0		
12 †	4.5	-1.0	1.8	16.2	0.0	0.0	0.0	0.0	0		
13 †	3.0	-5.0	-1.0	19.0	0.0	0.0	0.0	0.0	0		
14 †	0.5	-7.5	-3.5	21.5	0.0	0.0	0.0	0.0	0		
15 †	1.5	-7.0	-2.8	20.8	0.0	0.0	2.0	2.0	0		
16 †	-2.5	-4.5	-3.5	21.5	0.0	0.0	0.0	0.0	2		
17 †	-5.0	-8.0	-6.5	24.5	0.0	0.0	1.0	1.0	1		
18 †	-0.5	-8.0	-4.3	22.3	0.0	0.0	0.0	0.0	1		
19 †	2.5	-13.0	-5.3	23.3	0.0	0.0	0.0	0.0	1		
20 †	6.5	-6.0	0.3	17.7	0.0	0.0	0.0	0.0	0		
21 †	12.0	-2.0	5.0	13.0	0.0	0.0	0.0	0.0	0		
22 †	11.0	1.5	6.3	11.7	0.0	0.0	0.0	0.0	0		
23 †	6.0	-4.0	1.0	17.0	0.0	0.0	0.0	0.0	0		
24 †	-3.0	-11.0	-7.0	25.0	0.0	0.0	0.0	0.0	0		
25 †	5.5	-9.0	-1.8	19.8	0.0	0.0	0.0	0.0	0		
26 †	12.5	-4.0	4.3	13.7	0.0	0.0	0.0	0.0	0		
27 †	19.5	5.0	12.3	5.7	0.0	5.4	0.0	5.4	0		
28 †	14.0	-4.5	4.8	13.2	0.0	0.4	0.0	0.4	0		
29 †	-0.5	-7.5	-4.0	22.0	0.0	0.0	0.0	0.0	0		
Sum				502.7	0.0	5.8	3.0	8.8			
Avg	5.0	-3.7	0.7								
Xtrm	19.5	-13.0									

Summary, average and extreme values are based on the data above.

Environment Canada Environnement Canada

Daily Data Report for March 2024

STRATHROY-MULLIFARRY
ONTARIO

Latitude:	42°58'50.022" N	Longitude:	81°38'34.086" W	Elevation:	243.00 m
Climate ID:	6148122	WMO ID:		TC ID:	

Daily Data Report for March 2024

DAY	Max Temp °C	Min Temp °C	Mean Temp °C	Heat Deg Days	Cool Deg Days	Total Rain mm	Total Snow cm	Total Precip mm	Snow on Grnd cm	Dir of Max Gust 10's deg	Spd of Max Gust km/h
01 †	8.5	-7.0	0.8	17.2	0.0	0.6	0.0	0.6	0		
02 †	8.0	2.0	5.0	13.0	0.0	0.0	0.0	0.0	0		
03 †	10.0	-2.0	4.0	14.0	0.0	0.0	0.0	0.0	0		
04 †	20.5	5.0	12.8	5.2	0.0	0.0	0.0	0.0	0		
05 †	13.5	5.0	9.3	8.7	0.0	3.8	0.0	3.8	0		
06 †	7.0	3.5	5.3	12.7	0.0	0.0	0.0	0.0	0		
07 †	13.0	0.5	6.8	11.2	0.0	0.0	0.0	0.0	0		
08 †	14.0	2.5	8.3	9.7	0.0	20.6	0.0	20.6	0		
09 †	11.0	4.5	7.8	10.2	0.0	1.6	1.0	2.6	0		
10 †	1.0	-2.0	-0.5	18.5	0.0	0.0	3.0	3.0	0		
11 †	9.5	-3.5	3.0	15.0	0.0	0.0	0.0	0.0	3		
12 †	17.5	1.0	9.3	8.7	0.0	0.0	0.0	0.0	0		
13 †	16.5	7.0	11.8	6.2	0.0	0.0	0.0	0.0	0		
14 †	13.0	2.5	7.8	10.2	0.0	12.4	0.0	12.4	0		
15 †	5.5	2.0	3.8	14.2	0.0	0.0	0.0	0.0	0		
16 †	11.5	-2.5	4.5	13.5	0.0	2.6	0.0	2.6	0		
17 †	4.5	0.5	2.5	15.5	0.0	0.0	0.0	0.0	0		
18 †	0.0	-3.5	-1.8	19.8	0.0	0.0	1.0	1.0	0		
19 †	2.5	-2.0	0.3	17.7	0.0	0.0	1.0	1.0	0		
20 †	0.0	-2.5	-1.3	19.3	0.0	0.0	0.0	0.0	1		
21 †	0.0	-6.5	-3.3	21.3	0.0	0.0	0.0	0.0	0		
22 †	-2.0	-6.5	-4.3	22.3	0.0	0.0	4.0	4.0	0		
23 †	1.0	-10.0	-4.5	22.5	0.0	0.0	0.0	0.0	4		
24 †	3.5	-9.5	-3.0	21.0	0.0	0.0	0.0	0.0	0		
25 †	14.5	-0.5	7.0	11.0	0.0	0.0	0.0	0.0	0		
26 †	11.0	5.0	8.0	10.0	0.0	16.8	0.0	16.8	0		
27 †	5.0	3.0	4.0	14.0	0.0	0.0	0.0	0.0	0		
28 †	8.0	-3.0	2.5	15.5	0.0	0.0	0.0	0.0	0		
29 †	7.5	-4.0	1.8	16.2	0.0	0.0	0.0	0.0	0		
30 †	5.0	-4.0	0.5	17.5	0.0	2.8	0.0	2.8	0		
31 †	6.5	1.5	4.0	14.0	0.0	0.0	0.0	0.0	0		
Sum				445.8	0.0	61.2	10.0	71.2			
Avg	8.0	-0.8	3.6								
Xtrm	20.5	-10.0									

Summary, average and extreme values are based on the data above.

Environment Canada Environnement Canada

Daily Data Report for April 2024

STRATHROY-MULLIFARRY
ONTARIO

Latitude:	42°58'50.022" N	Longitude:	81°38'34.086" W	Elevation:	243.00 m
Climate ID:	6148122	WMO ID:		TC ID:	

Daily Data Report for April 2024

	Max Temp °C	Min Temp °C	Mean Temp °C	Heat Deg Days	Cool Deg Days	Total Rain mm	Total Snow cm	Total Precip mm	Snow on Grnd cm	Dir of Max Gust 10's deg	Spd of Max Gust km/h
DAY											
01 †	12.0	0.5	6.3	11.7	0.0	0.0	0.0	0.0	0		
02 †	9.5	4.5	7.0	11.0	0.0	4.0	0.0	4.0	0		
03 †	7.0	4.5	5.8	12.2	0.0	0.0	0.0	0.0	0		
04 †	8.0	-1.5	3.3	14.7	0.0	3.0	0.0	3.0	0		
05 †	5.5	-0.5	2.5	15.5	0.0	1.2	0.0	1.2	0		
06 †	9.5	1.5	5.5	12.5	0.0	0.0	0.0	0.0	0		
07 †	14.5	-2.5	6.0	12.0	0.0	1.2	0.0	1.2	0		
08 †	18.5	6.5	12.5	5.5	0.0	0.0	0.0	0.0	0		
09 †	24.0	3.5	13.8	4.2	0.0	0.0	0.0	0.0	0		
10 †	17.5	4.0	10.8	7.2	0.0	11.6	0.0	11.6	0		
11 †	15.0	8.5	11.8	6.2	0.0	23.8	0.0	23.8	0		
12 †	8.5	5.5	7.0	11.0	0.0	14.2	0.0	14.2	0		
13 †	13.0	3.5	8.3	9.7	0.0	0.0	0.0	0.0	0		
14 †	20.0	6.0	13.0	5.0	0.0	0.0	0.0	0.0	0		
15 †	16.0	5.0	10.5	7.5	0.0	0.0	0.0	0.0	0		
16 †	19.0	3.0	11.0	7.0	0.0	0.0	0.0	0.0	0		
17 †	16.0	7.5	11.8	6.2	0.0	8.8	0.0	8.8	0		
18 †	15.0	9.5	12.3	5.7	0.0	0.6	0.0	0.6	0		
19 †	14.5	8.5	11.5	6.5	0.0	3.2	0.0	3.2	0		
20 †	6.5	3.0	4.8	13.2	0.0	0.0	0.0	0.0	0		
21 †	11.0	2.5	6.8	11.2	0.0	0.0	0.0	0.0	0		
22 †	16.0	-3.0	6.5	11.5	0.0	0.0	0.0	0.0	0		
23 †	14.0	7.5	10.8	7.2	0.0	0.0	0.0	0.0	0		
24 †	5.0	2.5	3.8	14.2	0.0	0.0	0.0	0.0	0		
25 †	12.5	-4.0	4.3	13.7	0.0	0.0	0.0	0.0	0		
26 †	18.5	-1.5	8.5	9.5	0.0	0.6	0.0	0.6	0		
27 †	24.5	9.5	17.0	1.0	0.0	2.0	0.0	2.0	0		
28 †	20.5	16.5	18.5	0.0	0.5	4.4	0.0	4.4	0		
29 †	24.0	14.0	19.0	0.0	1.0	18.2	0.0	18.2	0		
30 †	20.5	14.0	17.3	0.7	0.0	0.0	0.0	0.0	0		
Sum				253.5	1.5	96.8	0.0	96.8			
Avg	14.5	4.6	9.6								
Xtrm	24.5	-4.0									

Summary, average and extreme values are based on the data above.

Environment Canada Environnement Canada

Daily Data Report for May 2024

STRATHROY-MULLIFARRY
ONTARIO

Latitude:	42°58'50.022" N	Longitude:	81°38'34.086" W	Elevation:	243.00 m
Climate ID:	6148122	WMO ID:		TC ID:	

Daily Data Report for May 2024

	Max Temp °C	Min Temp °C	Mean Temp °C	Heat Deg Days	Cool Deg Days	Total Rain mm	Total Snow cm	Total Precip mm	Snow on Grnd cm	Dir of Max Gust 10's deg	Spd of Max Gust km/h
DAY											
01 †	25.0	5.5	15.3	2.7	0.0	0.0	0.0	0.0	0		
02 †	21.0	7.0	14.0	4.0	0.0	2.8	0.0	2.8	0		
03 †	18.0	12.0	15.0	3.0	0.0	8.2	0.0	8.2	0		
04 †	23.0	11.0	17.0	1.0	0.0	3.0	0.0	3.0	0		
05 †	19.0	12.0	15.5	2.5	0.0	0.0	0.0	0.0	0		
06 †	18.5	5.5	12.0	6.0	0.0	0.0	0.0	0.0	0		
07 †	22.0	6.0	14.0	4.0	0.0	7.2	0.0	7.2	0		
08 †	21.5	12.0	16.8	1.2	0.0	0.0	0.0	0.0	0		
09 †	16.0	5.0	10.5	7.5	0.0	0.0	0.0	0.0	0		
10 †	16.0	7.0	11.5	6.5	0.0	0.0	0.0	0.0	0		
11 †	12.5	5.5	9.0	9.0	0.0	18.2	0.0	18.2	0		
12 †	17.5	7.0	12.3	5.7	0.0	1.2	0.0	1.2	0		
13 †	26.5	10.0	18.3	0.0	0.3	0.6	0.0	0.6	0		
14 †	20.0	11.0	15.5	2.5	0.0	0.0	0.0	0.0	0		
15 †	23.5	10.0	16.8	1.2	0.0	0.8	0.0	0.8	0		
16 †	25.0	9.5	17.3	0.7	0.0	0.0	0.0	0.0	0		
17 †	20.0	13.5	16.8	1.2	0.0	3.2	0.0	3.2	0		
18 †	24.0	14.5	19.3	0.0	1.3	0.0	0.0	0.0	0		
19 †	29.5	10.0	19.8	0.0	1.8	0.0	0.0	0.0	0		
20 †	30.5	13.5	22.0	0.0	4.0	23.8	0.0	23.8	0		
21 †	26.5	17.0	21.8	0.0	3.8	0.0	0.0	0.0	0		
22 †	28.5	20.0	24.3	0.0	6.3	0.0	0.0	0.0	0		
23 †	25.5	13.0	19.3	0.0	1.3	0.0	0.0	0.0	0		
24 †	24.0	9.0	16.5	1.5	0.0	2.0	0.0	2.0	0		
25 †	24.0	14.0	19.0	0.0	1.0	23.8	0.0	23.8	0		
26 †	24.0	11.0	17.5	0.5	0.0	17.6	0.0	17.6	0		
27 †	23.0	15.5	19.3	0.0	1.3	30.6	0.0	30.6	0		
28 †	20.0	13.5	16.8	1.2	0.0	4.8	0.0	4.8	0		
29 †	19.5	10.0	14.8	3.2	0.0	0.0	0.0	0.0	0		
30 †	17.5	4.0	10.8	7.2	0.0	0.0	0.0	0.0	0		
31 †	23.0	3.0	13.0	5.0	0.0	0.0	0.0	0.0	0		
Sum				77.3	21.1	147.8	0.0	147.8			
Avg	22.1	10.2	16.2								
Xtrm	30.5	3.0									

Summary, average and extreme values are based on the data above.

Environment Canada Environnement Canada

Daily Data Report for June 2024

STRATHROY-MULLIFARRY
ONTARIO

Latitude:	42°58'50.022" N	Longitude:	81°38'34.086" W	Elevation:	243.00 m
Climate ID:	6148122	WMO ID:		TC ID:	

Daily Data Report for June 2024

	Max Temp °C	Min Temp °C	Mean Temp °C	Heat Deg Days	Cool Deg Days	Total Rain mm	Total Snow cm	Total Precip mm	Snow on Grnd cm	Dir of Max Gust 10's deg	Spd of Max Gust km/h
DAY											
01 †	24.0	6.5	15.3	2.7	0.0	14.0	0.0	14.0	0		
02 †	21.0	14.0	17.5	0.5	0.0	11.6	0.0	11.6	0		
03 †	24.0	13.5	18.8	0.0	0.8	0.0	0.0	0.0	0		
04 †	28.5	12.5	20.5	0.0	2.5	0.0	0.0	0.0	0		
05 †	26.5	19.0	22.8	0.0	4.8	10.4	0.0	10.4	0		
06 †	24.5	16.5	20.5	0.0	2.5	0.4	0.0	0.4	0		
07 †	19.5	14.5	17.0	1.0	0.0	0.0	0.0	0.0	0		
08 †	22.5	12.0	17.3	0.7	0.0	14.0	0.0	14.0	0		
09 †	22.0	12.0	17.0	1.0	0.0	0.8	0.0	0.8	0		
10 †	14.5	9.0	11.8	6.2	0.0	0.0	0.0	0.0	0		
11 †	21.5	6.0	13.8	4.2	0.0	0.0	0.0	0.0	0		
12 †	27.5	11.0	19.3	0.0	1.3	0.0	0.0	0.0	0		
13 †	30.5	17.0	23.8	0.0	5.8	0.0	0.0	0.0	0		
14 †	21.0	14.0	17.5	0.5	0.0	0.0	0.0	0.0	0		
15 †	21.0	8.5	14.8	3.2	0.0	0.0	0.0	0.0	0		
16 †	27.0	10.0	18.5	0.0	0.5	0.0	0.0	0.0	0		
17 †	33.0	18.0	25.5	0.0	7.5	0.0	0.0	0.0	0		
18 †	33.0	22.5	27.8	0.0	9.8	0.0	0.0	0.0	0		
19 †	34.5	22.0	28.3	0.0	10.3	8.0	0.0	8.0	0		
20 †	30.0	20.0	25.0	0.0	7.0	0.0	0.0	0.0	0		
21 †	30.5	16.5	23.5	0.0	5.5	3.2	0.0	3.2	0		
22 †	33.0	19.5	26.3	0.0	8.3	0.0	0.0	0.0	0		
23 †	27.0	21.0	24.0	0.0	6.0	0.0	0.0	0.0	0		
24 †	26.5	15.0	20.8	0.0	2.8	0.0	0.0	0.0	0		
25 †	26.5	15.0	20.8	0.0	2.8	3.2	0.0	3.2	0		
26 †	26.0	18.0	22.0	0.0	4.0	5.0	0.0	5.0	0		
27 †	20.0	13.5	16.8	1.2	0.0	0.0	0.0	0.0	0		
28 †	22.5	8.5	15.5	2.5	0.0	10.0	0.0	10.0	0		
29 †	29.5	17.5	23.5	0.0	5.5	10.0	0.0	10.0	0		
30 †	16.5	13.0	14.8	3.2	0.0	0.0	0.0	0.0	0		
Sum				26.9	87.7	90.6	0.0	90.6			
Avg	25.5	14.5	20.0								
Xtrm	34.5	6.0									

Summary, average and extreme values are based on the data above.

Environment Canada Environnement Canada

Daily Data Report for July 2024

STRATHROY-MULLIFARRY
ONTARIO

Latitude:	42°58'50.022" N	Longitude:	81°38'34.086" W	Elevation:	243.00 m
Climate ID:	6148122	WMO ID:		TC ID:	

Daily Data Report for July 2024

	Max Temp °C	Min Temp °C	Mean Temp °C	Heat Deg Days	Cool Deg Days	Total Rain mm	Total Snow cm	Total Precip mm	Snow on Grnd cm	Dir of Max Gust 10's deg	Spd of Max Gust km/h
DAY											
01 †	23.5	7.0	15.3	2.7	0.0	0.0	0.0	0.0	0		
02 †	25.5	8.5	17.0	1.0	0.0	0.0	0.0	0.0	0		
03 †	30.0	19.0	24.5	0.0	6.5	0.0	0.0	0.0	0		
04 †	29.0	15.0	22.0	0.0	4.0	0.0	0.0	0.0	0		
05 †	28.0	16.0	22.0	0.0	4.0	0.0	0.0	0.0	0		
06 †	27.0	16.0	21.5	0.0	3.5	0.0	0.0	0.0	0		
07 †	27.5	13.5	20.5	0.0	2.5	0.0	0.0	0.0	0		
08 †	31.0	15.5	23.3	0.0	5.3	0.0	0.0	0.0	0		
09 †	28.0	20.0	24.0	0.0	6.0	29.6	0.0	29.6	0		
10 †	21.0	18.5	19.8	0.0	1.8	49.8	0.0	49.8	0		
11 †	25.5	18.0	21.8	0.0	3.8	0.0	0.0	0.0	0		
12 †	28.0	14.5	21.3	0.0	3.3	0.0	0.0	0.0	0		
13 †	31.0	15.5	23.3	0.0	5.3	0.0	0.0	0.0	0		
14 †	30.5	18.0	24.3	0.0	6.3	0.8	0.0	0.8	0		
15 †	27.0	19.0	23.0	0.0	5.0	79.8	0.0	79.8	0		
16 †	29.0	18.5	23.8	0.0	5.8	49.0	0.0	49.0	0		
17 †	27.0	19.0	23.0	0.0	5.0	1.0	0.0	1.0	0		
18 †	22.5	13.5	18.0	0.0	0.0	0.0	0.0	0.0	0		
19 †	25.5	9.0	17.3	0.7	0.0	0.0	0.0	0.0	0		
20 †	27.0	12.0	19.5	0.0	1.5	0.0	0.0	0.0	0		
21 †	28.5	14.5	21.5	0.0	3.5	0.0	0.0	0.0	0		
22 †	27.5	15.0	21.3	0.0	3.3	0.6	0.0	0.6	0		
23 †	28.5	15.0	21.8	0.0	3.8	1.6	0.0	1.6	0		
24 †	24.5	18.0	21.3	0.0	3.3	1.6	0.0	1.6	0		
25 †	25.0	13.0	19.0	0.0	1.0	0.0	0.0	0.0	0		
26 †	26.5	11.0	18.8	0.0	0.8	0.0	0.0	0.0	0		
27 †	28.0	11.0	19.5	0.0	1.5	0.0	0.0	0.0	0		
28 †	30.0	13.5	21.8	0.0	3.8	0.0	0.0	0.0	0		
29 †	29.0	17.5	23.3	0.0	5.3	14.0	0.0	14.0	0		
30 †	28.5	19.0	23.8	0.0	5.8	2.2	0.0	2.2	0		
31 †	31.0	20.0	25.5	0.0	7.5	0.0	0.0	0.0	0		
Sum				4.4	109.2	230.0	0.0	230.0			
Avg	27.4	15.3	21.4								
Xtrm	31.0	7.0									

Summary, average and extreme values are based on the data above.

Environment Canada Environnement Canada

Daily Data Report for August 2024

STRATHROY-MULLIFARRY
ONTARIO

Latitude:	42°58'50.022" N	Longitude:	81°38'34.086" W	Elevation:	243.00 m
Climate ID:	6148122	WMO ID:		TC ID:	

Daily Data Report for August 2024

DAY	Max Temp °C	Min Temp °C	Mean Temp °C	Heat Deg Days	Cool Deg Days	Total Rain mm	Total Snow cm	Total Precip mm	Snow on Grnd cm	Dir of Max Gust 10's deg	Spd of Max Gust km/h
01 †	31.5	20.0	25.8	0.0	7.8	0.0	0.0	0.0	0		
02 †	25.5	22.0	23.8	0.0	5.8	1.4	0.0	1.4	0		
03 †	29.0	20.0	24.5	0.0	6.5	0.0	0.0	0.0	0		
04 †	29.0	15.5	22.3	0.0	4.3	0.0	0.0	0.0	0		
05 †	28.5	20.0	24.3	0.0	6.3	1.4	0.0	1.4	0		
06 †	19.0	15.5	17.3	0.7	0.0	25.0	0.0	25.0	0		
07 †	25.0	12.0	18.5	0.0	0.5	0.0	0.0	0.0	0		
08 †	25.5	15.0	20.3	0.0	2.3	0.0	0.0	0.0	0		
09 †	25.5	20.5	23.0	0.0	5.0	0.0	0.0	0.0	0		
10 †	22.5	13.0	17.8	0.2	0.0	0.0	0.0	0.0	0		
11 †	22.5	13.5	18.0	0.0	0.0	0.0	0.0	0.0	0		
12 †	23.5	12.5	18.0	0.0	0.0	0.0	0.0	0.0	0		
13 †	26.5	11.5	19.0	0.0	1.0	0.0	0.0	0.0	0		
14 †	27.5	12.0	19.8	0.0	1.8	0.0	0.0	0.0	0		
15 †	27.5	12.0	19.8	0.0	1.8	0.0	0.0	0.0	0		
16 †	25.0	17.5	21.3	0.0	3.3	9.6	0.0	9.6	0		
17 †	27.5	19.5	23.5	0.0	5.5	1.2	0.0	1.2	0		
18 †	23.0	19.0	21.0	0.0	3.0	11.4	0.0	11.4	0		
19 †	19.0	16.0	17.5	0.5	0.0	0.0	0.0	0.0	0		
20 †	20.0	9.0	14.5	3.5	0.0	0.0	0.0	0.0	0		
21 †	21.5	7.0	14.3	3.7	0.0	0.0	0.0	0.0	0		
22 †	24.0	6.5	15.3	2.7	0.0	0.0	0.0	0.0	0		
23 †	25.0	8.5	16.8	1.2	0.0	0.0	0.0	0.0	0		
24 †	27.5	11.0	19.3	0.0	1.3	0.0	0.0	0.0	0		
25 †	29.0	13.0	21.0	0.0	3.0	0.8	0.0	0.8	0		
26 †	30.0	19.0	24.5	0.0	6.5	0.0	0.0	0.0	0		
27 †	31.5	21.0	26.3	0.0	8.3	8.4	0.0	8.4	0		
28 †	25.0	19.0	22.0	0.0	4.0	0.0	0.0	0.0	0		
29 †	26.0	18.0	22.0	0.0	4.0	0.0	0.0	0.0	0		
30 †	29.5	14.0	21.8	0.0	3.8	5.0	0.0	5.0	0		
31 †	26.5	20.0	23.3	0.0	5.3	0.0	0.0	0.0	0		
Sum				12.5	91.1	64.2	0.0	64.2			
Avg	25.8	15.3	20.5								
Xtrm	31.5	6.5									

Summary, average and extreme values are based on the data above.

Environment Canada Environnement Canada

Daily Data Report for September 2024

STRATHROY-MULLIFARRY
ONTARIO

Latitude:	42°58'50.022" N	Longitude:	81°38'34.086" W	Elevation:	243.00 m
Climate ID:	6148122	WMO ID:		TC ID:	

Daily Data Report for September 2024

	Max Temp °C	Min Temp °C	Mean Temp °C	Heat Deg Days	Cool Deg Days	Total Rain mm	Total Snow cm	Total Precip mm	Snow on Grnd cm	Dir of Max Gust 10's deg	Spd of Max Gust km/h
DAY											
01 †	23.0	15.5	19.3	0.0	1.3	0.0	0.0	0.0	0		
02 †	20.0	9.0	14.5	3.5	0.0	0.0	0.0	0.0	0		
03 †	22.5	5.0	13.8	4.2	0.0	0.0	0.0	0.0	0		
04 †	25.5	7.5	16.5	1.5	0.0	0.0	0.0	0.0	0		
05 †	28.0	11.0	19.5	0.0	1.5	1.8	0.0	1.8	0		
06 †	20.5	16.5	18.5	0.0	0.5	14.2	0.0	14.2	0		
07 †	13.5	10.5	12.0	6.0	0.0	25.4	0.0	25.4	0		
08 †	19.0	6.0	12.5	5.5	0.0	0.0	0.0	0.0	0		
09 †	24.0	11.0	17.5	0.5	0.0	0.0	0.0	0.0	0		
10 †	24.0	8.0	16.0	2.0	0.0	0.0	0.0	0.0	0		
11 †	26.5	10.0	18.3	0.0	0.3	0.0	0.0	0.0	0		
12 †	28.0	11.5	19.8	0.0	1.8	0.0	0.0	0.0	0		
13 †	27.5	13.0	20.3	0.0	2.3	0.0	0.0	0.0	0		
14 †	27.0	13.0	20.0	0.0	2.0	0.0	0.0	0.0	0		
15 †	28.0	14.0	21.0	0.0	3.0	0.0	0.0	0.0	0		
16 †	27.5	12.0	19.8	0.0	1.8	0.0	0.0	0.0	0		
17 †	26.0	11.0	18.5	0.0	0.5	0.0	0.0	0.0	0		
18 †	27.0	13.0	20.0	0.0	2.0	0.0	0.0	0.0	0		
19 †	27.0	12.0	19.5	0.0	1.5	0.0	0.0	0.0	0		
20 †	27.0	12.5	19.8	0.0	1.8	4.0	0.0	4.0	0		
21 †	27.0	15.5	21.3	0.0	3.3	0.0	0.0	0.0	0		
22 †	24.0	12.0	18.0	0.0	0.0	12.0	0.0	12.0	0		
23 †	23.0	17.0	20.0	0.0	2.0	0.0	0.0	0.0	0		
24 †	21.5	17.0	19.3	0.0	1.3	10.6	0.0	10.6	0		
25 †	23.5	18.0	20.8	0.0	2.8	0.0	0.0	0.0	0		
26 †	22.0	13.0	17.5	0.5	0.0	0.0	0.0	0.0	0		
27 †	23.5	12.5	18.0	0.0	0.0	0.0	0.0	0.0	0		
28 †	23.5	18.0	20.8	0.0	2.8	1.4	0.0	1.4	0		
29 †	24.0	17.5	20.8	0.0	2.8	0.0	0.0	0.0	0		
30 †	23.0	14.0	18.5	0.0	0.5	0.0	0.0	0.0	0		
Sum				23.7	35.8	69.4	0.0	69.4			
Avg	24.2	12.6	18.4								
Xtrm	28.0	5.0									

Summary, average and extreme values are based on the data above.

Environment Canada Environnement Canada

Daily Data Report for October 2024

STRATHROY-MULLIFARRY
ONTARIO

Latitude:	42°58'50.022" N	Longitude:	81°38'34.086" W	Elevation:	243.00 m
Climate ID:	6148122	WMO ID:		TC ID:	

Daily Data Report for October 2024

DAY	Max Temp °C	Min Temp °C	Mean Temp °C	Heat Deg Days	Cool Deg Days	Total Rain mm	Total Snow cm	Total Precip mm	Snow on Grnd cm	Dir of Max Gust 10's deg	Spd of Max Gust km/h
01 †	23.0	15.0	19.0	0.0	1.0	12.0	0.0	12.0	0		
02 †	18.0	6.5	12.3	5.7	0.0	0.0	0.0	0.0	0		
03 †	24.0	5.5	14.8	3.2	0.0	0.0	0.0	0.0	0		
04 †	22.0	7.5	14.8	3.2	0.0	0.0	0.0	0.0	0		
05 †	20.0	3.5	11.8	6.2	0.0	0.0	0.0	0.0	0		
06 †	25.0	7.0	16.0	2.0	0.0	0.0	0.0	0.0	0		
07 †	16.0	10.0	13.0	5.0	0.0	0.0	0.0	0.0	0		
08 †	17.0	4.5	10.8	7.2	0.0	1.0	0.0	1.0	0		
09 †	14.5	4.0	9.3	8.7	0.0	0.0	0.0	0.0	0		
10 †	14.5	0.0	7.3	10.7	0.0	0.0	0.0	0.0	0		
11 †	22.5	1.5	12.0	6.0	0.0	0.0	0.0	0.0	0		
12 †	18.0	5.0	11.5	6.5	0.0	1.6	0.0	1.6	0		
13 †	11.0	8.0	9.5	8.5	0.0	24.8	0.0	24.8	0		
14 †	10.5	4.5	7.5	10.5	0.0	0.0	0.0	0.0	0		
15 †	10.5	1.5	6.0	12.0	0.0	4.6	0.0	4.6	0		
16 †	10.5	3.5	7.0	11.0	0.0	0.0	0.0	0.0	0		
17 †	19.0	-1.5	8.8	9.2	0.0	0.0	0.0	0.0	0		
18 †	19.0	-1.0	9.0	9.0	0.0	0.0	0.0	0.0	0		
19 †	21.0	1.0	11.0	7.0	0.0	0.0	0.0	0.0	0		
20 †	23.0	1.5	12.3	5.7	0.0	0.0	0.0	0.0	0		
21 †	25.5	9.5	17.5	0.5	0.0	0.0	0.0	0.0	0		
22 †	24.5	5.0	14.8	3.2	0.0	0.0	0.0	0.0	0		
23 †	19.0	12.5	15.8	2.2	0.0	3.4	0.0	3.4	0		
24 †	13.0	2.5	7.8	10.2	0.0	0.0	0.0	0.0	0		
25 †	13.0	0.5	6.8	11.2	0.0	1.0	0.0	1.0	0		
26 †	12.5	4.5	8.5	9.5	0.0	0.0	0.0	0.0	0		
27 †	13.0	-2.0	5.5	12.5	0.0	0.0	0.0	0.0	0		
28 †	16.0	0.5	8.3	9.7	0.0	2.2	0.0	2.2	0		
29 †	23.0	7.0	15.0	3.0	0.0	9.0	0.0	9.0	0		
30 †	22.0	17.5	19.8	0.0	1.8	0.0	0.0	0.0	0		
31 †	22.0	16.5	19.3	0.0	1.3	0.0	0.0	0.0	0		
Sum				199.3	4.1	59.6	0.0	59.6			
Avg	18.1	5.2	11.7								
Xtrm	25.5	-2.0									

Summary, average and extreme values are based on the data above.

Environment Canada Environnement Canada

Daily Data Report for November 2024

STRATHROY-MULLIFARRY
ONTARIO

Latitude:	42°58'50.022" N	Longitude:	81°38'34.086" W	Elevation:	243.00 m
Climate ID:	6148122	WMO ID:		TC ID:	

Daily Data Report for November 2024

DAY	Max Temp °C	Min Temp °C	Mean Temp °C	Heat Deg Days	Cool Deg Days	Total Rain mm	Total Snow cm	Total Precip mm	Snow on Grnd cm	Dir of Max Gust 10's deg	Spd of Max Gust km/h
01 †	9.0	8.0	8.5	9.5	0.0	0.0	0.0	0.0	0		
02 †	11.5	1.0	6.3	11.7	0.0	0.0	0.0	0.0	0		
03 †	14.0	0.0	7.0	11.0	0.0	0.0	0.0	0.0	0		
04 †	19.0	8.5	13.8	4.2	0.0	2.0	0.0	2.0	0		
05 †	22.0	15.5	18.8	0.0	0.8	1.8	0.0	1.8	0		
06 †	19.0	14.0	16.5	1.5	0.0	0.0	0.0	0.0	0		
07 †	13.0	8.5	10.8	7.2	0.0	0.0	0.0	0.0	0		
08 †	12.0	4.5	8.3	9.7	0.0	0.0	0.0	0.0	0		
09 †	10.5	-1.0	4.8	13.2	0.0	0.0	0.0	0.0	0		
10 †	15.0	2.5	8.8	9.2	0.0	16.2	0.0	16.2	0		
11 †	13.0	8.5	10.8	7.2	0.0	0.0	0.0	0.0	0		
12 †	8.5	1.0	4.8	13.2	0.0	0.0	0.0	0.0	0		
13 †	9.0	-1.0	4.0	14.0	0.0	0.0	0.0	0.0	0		
14 †	9.0	5.5	7.3	10.7	0.0	9.4	0.0	9.4	0		
15 †	9.5	7.0	8.3	9.7	0.0	2.6	0.0	2.6	0		
16 †	9.5	6.5	8.0	10.0	0.0	0.0	0.0	0.0	0		
17 †	10.5	7.0	8.8	9.2	0.0	2.0	0.0	2.0	0		
18 †	12.0	2.5	7.3	10.7	0.0	0.0	0.0	0.0	0		
19 †	11.0	3.0	7.0	11.0	0.0	0.8	0.0	0.8	0		
20 †	14.5	6.5	10.5	7.5	0.0	7.0	0.0	7.0	0		
21 †	5.5	-0.5	2.5	15.5	0.0	3.0	0.0	3.0	0		
22 †	7.5	-2.0	2.8	15.2	0.0	8.2	0.0	8.2	0		
23 †	8.5	5.5	7.0	11.0	0.0	2.6	0.0	2.6	0		
24 †	7.0	3.5	5.3	12.7	0.0	0.0	0.0	0.0	0		
25 †	7.0	0.0	3.5	14.5	0.0	1.2	0.0	1.2	0		
26 †	6.5	1.5	4.0	14.0	0.0	0.0	0.0	0.0	0		
27 †	4.0	-3.0	0.5	17.5	0.0	0.0	0.0	0.0	0		
28 †	3.0	0.0	1.5	16.5	0.0	0.0	0.0	0.0	0		
29 †	0.5	-2.5	-1.0	19.0	0.0	0.0	0.0	0.0	0		
30 †	-3.0	-4.0	-3.5	21.5	0.0	0.0	1.0	1.0	0		
Sum				337.8	0.8	56.8	1.0	57.8			
Avg	9.9	3.6	6.8								
Xtrm	22.0	-4.0									

Summary, average and extreme values are based on the data above.

Environment Canada Environnement Canada

Daily Data Report for December 2024

STRATHROY-MULLIFARRY
ONTARIO

Latitude:	42°58'50.022" N	Longitude:	81°38'34.086" W	Elevation:	243.00 m
Climate ID:	6148122	WMO ID:		TC ID:	

Daily Data Report for December 2024

DAY	Max Temp °C	Min Temp °C	Mean Temp °C	Heat Deg Days	Cool Deg Days	Total Rain mm	Total Snow cm	Total Precip mm	Snow on Grnd cm	Dir of Max Gust 10's deg	Spd of Max Gust km/h
01 †	-1.0	-6.0	-3.5	21.5	0.0	0.0	0.0	0.0	0		
02 †	1.5	-3.5	-1.0	19.0	0.0	0.0	4.0	4.0	0		
03 †	1.5	-7.5	-3.0	21.0	0.0	0.0	0.0	0.0	4		
04 †	1.0	-3.0	-1.0	19.0	0.0	0.0	10.0	10.0	1		
05 †	-3.0	-5.0	-4.0	22.0	0.0	0.0	11.0	11.0	10		
06 †	-1.5	-9.0	-5.3	23.3	0.0	0.0	0.0	0.0	20		
07 †	4.0	-3.0	0.5	17.5	0.0	0.0	2.0	2.0	16		
08 †	6.0	0.0	3.0	15.0	0.0	4.0	0.0	4.0	11		
09 †	7.0	2.0	4.5	13.5	0.0	12.6	0.0	12.6	4		
10 †	9.0	2.0	5.5	12.5	0.0	0.0	0.0	0.0	0		
11 †	2.0	0.0	1.0	17.0	0.0	0.0	0.0	0.0	0		
12 †	-6.0	-10.0	-8.0	26.0	0.0	0.0	0.0	0.0	0		
13 †	-5.5	-10.0	-7.8	25.8	0.0	0.0	0.0	0.0	0		
14 †	1.0	-13.5	-6.3	24.3	0.0	0.0	0.0	0.0	0		
15 †	4.5	-2.5	1.0	17.0	0.0	1.6	0.0	1.6	0		
16 †	10.0	1.0	5.5	12.5	0.0	9.4	0.0	9.4	0		
17 †	5.5	3.0	4.3	13.7	0.0	0.0	0.0	0.0	0		
18 †	2.0	1.0	1.5	16.5	0.0	0.0	0.0	0.0	0		
19 †	-1.0	-2.0	-1.5	19.5	0.0	0.0	4.0	4.0	0		
20 †	-1.0	-4.0	-2.5	20.5	0.0	0.0	5.0	5.0	4		
21 †	-5.0	-9.0	-7.0	25.0	0.0	0.0	5.0	5.0	7		
22 †	0.5	-11.0	-5.3	23.3	0.0	0.0	0.0	0.0	8		
23 †	0.5	-2.5	-1.0	19.0	0.0	0.0	7.0	7.0	5		
24 †	2.5	0.0	1.3	16.7	0.0	0.0	0.0	0.0	11		
25 †	0.5	-3.0	-1.3	19.3	0.0	0.0	0.0	0.0	8		
26 †	2.5	-1.0	0.8	17.2	0.0	0.0	0.0	0.0	7		
27 †	13.0	1.0	7.0	11.0	0.0	0.0	0.0	0.0	4		
28 †	13.0	8.0	10.5	7.5	0.0	0.0	0.0	0.0	0		
29 †	12.0	2.0	7.0	11.0	0.0	37.6	0.0	37.6	0		
30 †	5.5	0.5	3.0	15.0	0.0	5.4	0.0	5.4	0		
31 †	4.0	-2.5	0.8	17.2	0.0	6.4	0.0	6.4	0		
Sum				559.3	0.0	77.0	48.0	125.0			
Avg	2.7	-2.8	0.0								
Xtrm	13.0	-13.5									

Summary, average and extreme values are based on the data above.

Legend

M = Missing
E = Estimated
A = Accumulated
C = Precipitation occurred, amount uncertain
L = Precipitation may or may not have occurred
F = Accumulated and estimated
N = Temperature missing but known to be > 0
Y = Temperature missing but known to be < 0
S = More than one occurrence
T = Trace
* = The value displayed is based on incomplete data
† = Data for this day has undergone only preliminary quality checking
‡ = Partner data that is not subject to review by the National Climate Archives

Table B-3
Precipitation Event Monitoring - RWDI Envision Rain Gauge Report
Twin Creeks Environmental Centre - Poplar System

Year:	2024											
Month:	January	February	March	April	May	June	July	August	September	October	November	December
Day	Amount Recorded											
1			3.0			13.2		0.2		8.8		
2				6.8	8.2	0.2		3.6				3.6
3	0.2				2.8							3.8
4				0.8		9.0					0.6	0.4
5			4.0	0.4	0.2		2.2	6.4	2.2		2.0	
6								23.2	25.2		0.2	
7	0.2			1.4	18.0				13.6			0.6
8		0.4	3.6		0.2	11.4						2.4
9	18.4		0.8			2.2	25.8		0.2		1.0	5.4
10	1.2		0.2	8.8	4.6	0.2	31.6				13.4	
11	1.8			15.6	19.0		0.2				1.6	0.2
12	8.6			9.8	2.2					2.4		
13							0.2			21.0		
14			8.0				14.4			0.2	7.8	
15		0.2					79.6			24.6	0.6	0.8
16			1.4	0.2	3.0		6.8	8.2		0.2		6.2
17			0.2	8.4	1.0		2.0	8.0			1.0	
18	1.8		0.2	2.0				6.0			0.2	
19	1.4		0.2	0.4	0.4	3.2						19.0
20	0.2				1.2						10.6	3.4
21	1.0					1.4					2.2	4.0
22	5.4		0.4			0.4			10.2		9.8	1.6
23	6.6						1.8		0.2	1.2		7.4
24	8.2				11.2		0.8		20.6			0.2
25	22.2		9.4		3.6	4.8			0.2		4.8	
26	0.8		3.8	1.0	23.2	21.4						
27	0.2	5.6		2.8	4.4	0.2		13.2				1.2
28	1.2			4.6	1.6	17.6			1.6	9.0		2.0
29				11.6		1.0	18.6					26.4
30	1.8		2.0				0.2	0.4	0.2			0.2
31			0.2									6.4
Total	**81.2**	**6.2**	**37.4**	**74.6**	**104.8**	**86.2**	**184.2**	**69.2**	**74.2**	**67.4**	**55.8**	**95.2**
										Total	**936.4**	

Notes:

1) Units are in millimetres (mm) of liquid and/or liquid equivalent (i.e. snow melt)

2) *Italics* denotes that the climatic data from the local Strathroy-Mullifarry Climatological Station was used as the onsite rain gauge was not operational due to power failure.

APPENDIX C:

Field Protocols

GENERAL FIELD PROTOCOLS

RWDI AIR Inc.
Consulting Engineers & Scientists
600 Southgate Drive
Guelph Ontario Canada N1G 4P6
T: 519.823.1311
F: 519.823.1316

TABLE OF CONTENTS

1 OVERVIEW

The following field protocol program was developed by Jagger Hims Limited, and updated by RWDI specifically for the Waste Management of Canada Corporation Twin Creeks Landfill Poplar System Monitoring Program. The protocols act as guidelines for field activities.

In considering the accuracy of field collected data, adherence to a protocol is important such that the integrity of a database and the reliability of data are maintained. The protocols outlined in the following sections are based on experience and on an available literature that outlines investigative procedures used by others in the environmental field for similar monitoring programs. Each protocol will be updated, where required, as technology continues to advance and the program monitoring requirements evolve.

2 VISUAL ASSESSMENT

As part of the visual assessment, the following traits will be considered.

- Tree diameter
- Tree height
- Tree mortality
- Crown dieback
- Foliage transparency
- Crown density
- Leaf size
- Discolouration of leaves
- Abnormally shaped leaves
- Length of new tree branch extension shoots
- Deformed growth
- Insect infestation

Five trees per zone of the leachate application area will be selected for the ongoing assessments. It is noted that each assessed tree is marked, such that if that same tree dies, the nearest tree of similar height/diameter is to be selected for the ongoing assessment. Assessment details and methodologies are provided below.

2.1 Tree Diameter

The diameter of a tree provides a measure of tree performance and is useful for estimating tree volume.

- The diameter measuring point is to be taken at the bottom third interval of the tree until year five, at which time the diameter will be measured at approximately breast height (1.3 m).

2.2 Tree Height

Tree height is an important measure to determine if the tree is healthy and is growing at a normal rate for that specific species.

- A physical direct measurement of the height of the tree is required. When trees exceed 7.5 m in height, direct physical measurements will not be possible given current measurement equipment. The use of an inclinometer will be required to measure trees greater than 7.5 m in height. The inclinometer will be used as outlined in the instrument manual.
- Use of inclinometer – select an area away from the tree. Measure the distance from the base of the tree to the selected area. Record. Measure the angle necessary to sight the top of the tree from the selected area. Be sure to sight from the ground.

  Tree height can be calculated using the following equation:
  Tan of angle = tree height / distance to tree
  Therefore,
  Tree height = tan of angle x distance to tree

2.3 Tree Mortality

Mortality refers to an assessment of trees that have died. A tree is defined as dead if all conductive tissues in the stem(s) have died (i.e. when stem is bent 45^{o} it breaks).

Mortality is the number of trees that die between two measurement periods. It is usually expressed as an average annual amount over time. It becomes an indicator of tree health when the mortality rate is greater than expected averages from historical trends.

- Count the number of dead trees and live trees in a pre-selected row of the leachate application area. Dividing the number of dead trees by the sum of the dead and live trees multiplied by 100 yields percent mortality.
- A historic mortality rate will be established as the database expands.

2.4 Crown Dieback

The crown of the tree is defined as the upper part of the tree, including the branches and foliage.

The crown is one component of net primary production and its dimensions reflect general tree health. Large, dense crowns are associated with potential or previous vigorous growth rates. Small, sparse crowns suggest unfavorable conditions or other influences, such as competition between trees.

Crown dieback is defined as recent branch mortality that begins at the terminal portion of a branch in the upper and outer crown and proceeds toward the trunk or base of the live crown.

- Crown dieback is measured as a percentage of the crown area affected, and recorded in 10% increments.

2.5 Foliage Transparency

Foliage transparency is defined as the amount of skylight visible through the live, normally foliated portion of the crown. It is measured as the percent of total light visible through the tree material.

Because of architectural differences, these measures vary among species. An elevated rating or an upward trend in foliage transparency indicates a thinning crown, loss of vigor, and overall decline in tree health.

- Look directly upward through the tree crown for transparency determination. Descriptions can be recorded in 10% increments and be classed into the following three categories:
  1. None/Light (0-20%)
  2. Moderate (21-50%)
  3. Severe (51-100%)
- Mark each tree measured such that monitoring changes are limited to the same tree on an annual basis.
- If one of the trees being monitored dies, an adjacent tree of similar size will be selected as its replacement.

2.6 Crown Density

Crown density is defined as the amount of plant material, such as leaves, branches, and fruit, which blocks skylight from shining through the tree crown. It is measured as the percent of total light that is blocked by tree material.

Elevated density values indicate that the tree has a large amount of leaf material available for photosynthesis and has growing conditions that enable full and symmetrical growth. Low density values indicate poor amounts of foliage, a thin crown, or a missing section of crown that may have resulted from environmental stresses.

Unlike transparency, this measurement accounts for both live and dead parts of the crown rather than just the live portion.

- Density descriptions can be recorded in 10% increments and can be classed into the following three categories:
  1. Poor (0-20%)
  2. Moderate (21-50%)
  3. Good (51-100%)

2.7 Leaf Size

Large leaf sizes increase photosynthesis rates giving favourable growing conditions, while smaller leaf size may slow growing conditions. However, the number of leaves on a tree also contributes to photosynthesis rates, as it is typically measured based on aerial surface coverage where sunlight may be absorbed.

- Leaf size is to be measured from five (5) leaves per assessment tree. Measure from tip to base (length), and from edge to edge (width). The measurements may be to the nearest 1 mm. Make sure the leaf is stretched flat before the measurements are recorded.

2.8 Leaf Discolouration

Leaf discolouration typically indicates diseased or dying vegetation.

- Discolouration determination is a subjective percentage compared to the rest of the tree, and can only be determined while the trees are seasonally active.

2.9 Abnormally Shaped Leaves

Abnormally shaped leaves typically indicate improper growth or diseased trees.

- Determination of abnormally shaped leaves is a subjective percentage compared to the rest of the tree, and can only be determined while the trees are seasonally active.

2.10 Length of New Branch Extension Shoots

New branch extension shoots are an indicator of healthy seasonal growth.

- Each assessment tree will be examined for five (5) new branch extension shoots. Measurements may be recorded to the nearest 1 cm.

2.11 Deformed Growth

Deformed growth indicates poor development from competition of sunlight or disease.

- Five (5) trees will be examined for deformed growth in the leachate application area.

2.12 Insect Infestation

Insect infestation can impact the leaves, bark, and overall growth of an affected tree. Insect infestation occurs when the tree is fully engulfed by a particular insect, which completely hinders growth. Infestation determination is subjective & compared to the rest of the tree as a percentage, recorded in 10% increments

2.13 Documentation

- Identify the tree or row being monitored for each parameter on the applicable Site plan.
- Record observations on the field sheet in the dedicated Project Field Book.
- Photographs may be taken periodically during the irrigation season to monitor year-to-year growth and overall vigour of the Poplar System.

3 ROOT INSPECTION

3.1 Brace Roots

Brace roots enable the trees to collect water near the surface and help prevent tree tipping in high winds.

- Brace root inspections are typically completed to inspect for small animal burrows in the root area that could weaken the brace root structure. Inspections are to be conducted on one (1) tree per zone within the leachate application area. The vegetation around each monitored tree should be trimmed short enough to visually inspect the ground surface in an approximately one-metre radius around the tree. Animal burrows should be classified according to their number and entrance diameter.
- Record observations on the field sheet in the dedicated Project Field Book.

3.2 Root Depth

Root Depth is an indicator of tree health and its ability to resist damage from wind.

- One (1) tree per zone will be selected. The selected tree will be of average height of the five (5) assessment trees. The selected tree will be killed as part of this assessment as the roots are exhumed.
- Measure the tap root's depth of penetration to the nearest 1 cm.

3.3 Root Sampling

Collect a portion of the top or main brace root for sampling. A minimum of 200 grams of sample is required for laboratory analysis. The sample is to be a core (or sliver) sampled from the centre of the tree to the outer limit of the tree, excluding the bark. Analytes are per **Table 1**.

4 STEM SAMPLING

From each tree assessed in Section 3.2, cut out a piece of the stem (trunk) of the tree from approximately 1.5 metres above ground surface. The sample is to be collected per section 3.3. Analytes are per **Table 1**.

5 SOIL SAMPLING

Soil sampling is conducted to determine the effects of leachate application on the shallow soil (typically near the root zone of the trees) in the poplar treatment system area. High chemical concentrations in the soil could indicate leachate effects and the potential for low efficiency of chemical absorption from the trees.

Samples will be collected twice annually (one prior to irrigation treatment and one after treatment), until the poplar trees are four years old, at which time the frequency will be once annually. The annual sample should be collected prior to the drip irrigation system activation, but may be completed after irrigation has occurred for an extended period of time.

- One (1) composite sample per zone of the leachate application area is to be collected from surface to 0.6 m (minimum) to 0.9 m (maximum).
- Analytes are listed in **Table 1.**

6 LEAF TISSUE ANALYSIS

The laboratory analysis of leaf tissues will indicate whether the leachate application has affected the poplar trees and that the trees are absorbing select chemicals.

Samples will be collected annually from each zone of the leachate application area. Samples will be collected from various randomly selected trees.

- One (1) composite sample will be collected from the lower canopy and one (1) composite will be collected from the upper canopy.
- Composite samples will consist of leaves for a total of about 200 g, not including stem weight.
- Leaves shall be washed with deionized water and spun dry in a salad spinner or equivalent prior to submission to the laboratory for analytical testing.
- Analytes are listed in **Table 1.**

7 LEACHATE LEVELS

Leachate levels could indicate if leachate within the waste below the leachate application area is generated as a result of drip irrigation. Levels shall be recorded during the landfill compliance monitoring events.

- Record leachate levels using a contact sensor liquid level meter dedicated for leachate wells, and record value to nearest 0.01 m.
- Leachate levels shall be recorded from the locations indicated in the monitoring program.
- Decontamination of the contact sensor shall be completed between measurements.
- Levels shall be recorded on the applicable field sheet in the Project Field Book.

8 IRRIGATION WATER MONITORING

Irrigation water monitoring provides information toward the quality of irrigation water being applied to the Poplar System. Insight toward the chemical constituent concentrations may be utilized to adjust dilution rates.

- Collect a sample monthly during the irrigation season from the leachate source (Poplar System Holding Tank) prior to the initiation of the irrigation system. Analytes are outlined in **Table 1.**

9 SURFACE WATER MONITORING

Surface water sampling is conducted to assess potential effects to surface water quality as a result of operating the drip irrigation system.

- Surface water samples are to be collected at stations SS14A, SS14B, and SS15A during the routine precipitation compliance monitoring (10 mm in 24 hrs) once per calendar quarter.
- Surface water samples are to be collected at stations SS14A, SS14B, and SS15A after a storm event 25 mm precipitation in 24 hrs for a maximum of two (2) events during irrigation.
- Samples are to be collected within 24 hrs of the storm event.
- The volume of precipitation measured for the Site shall be documented from the on Site meteorological station.
- Surface water flow rates at each station shall be measured and recorded.
- Records shall be maintained on the applicable field sheets in the Project Field Book.
- Analytes are identified in **Table 1.**

10 ODOUR MONITORING

Odour monitoring is completed on and near the leachate application area. Odours that may emanate from manholes are excluded. Strong odours could indicate the over-application of leachate.

11 PONDED WATER

Ponded water may be an indication of over-application of liquid on the leachate application area.

- Ponded water may be measured as a subjective percentage of the total application area. Typically, the area should be measured and documented/sketched on a Site plan to assess persistent problem areas.
- Record observations on the field sheet in the dedicated Project Field Book.

12 UNDERGROWTH

Undergrowth refers to the vegetation which grows under or among trees (specifically, shrubs or small trees) which can affect the growth potential of the poplar trees.

- Perform a visual inspection of the types and amount of undergrowth in the poplar system for the leachate application area.
- Record observations on the field sheet in the dedicated Project Field Book.

APPENDIX D:

Irrigation Application Results

Table D-1
Summary of Irrigation Volumes
Twin Creeks Environmental Centre - Poplar System

Year	Month						Annual Total
	May	June	July	August	September	October	
2017	Poplar System not operating due to expansion construction.				1,107,199	1,049,988	2,157,187
2018	861,921	1,614,383	2,074,983	909,447	148,710		5,609,444
2019	851,704	2,252,526	4,024,733	3,419,266	2,385,383	659,700	13,593,312
2020	2,676,780	5,035,945	2,927,744	1,178,358	1,154,070		12,972,897
2021	1,796,521	1,832,303	1,187,643	1,295,458	510,732		6,622,657
2022	731,410	1,787,242	1,743,932	1,598,061	948,924	363,000	7,172,569
2023	1,696,361	2,807,525	1,128,626	1,401,021	810,508	814,808	8,658,849
2024	1,145,243	2,606,817	1,652,755	2,554,892	1,984,545	430,293	10,374,545
Overall Total	**9,759,940**	**17,936,741**	**14,740,416**	**12,356,503**	**9,050,071**	**3,317,789**	**67,161,460**

Notes:

1) Volumes in litres (L).
2) Volume represents total liquid (water & leachate) applied via irrigation

Table D-2
Summary of Irrigation Rates
Twin Creeks Environmental Centre - Poplar System

Date	Precipitation Total (mm)	Poplar System	
		Irrigation Rates (mm/m^2)	Total Liquid Applied (mm/m^2)*
	Poplar System not operating due to expansion construction.		
May-17			
Jun-17			
Jul-17			
Jul-18	77.8	22.3	100.1
Aug-18	158.0	9.8	167.8
Sep-18	95.8	1.6	97.4
Oct-18**	32.6	0.0	32.6
	364.2	**33.7**	**397.9**
May-19**	92.0	9.2	101.2
Jun-19	64.0	24.2	88.2
Jul-19	37.4	43.3	80.7
Aug-19	57.0	36.8	93.8
Sep-19	48.4	25.6	74.0
Oct-19**	62.8	7.1	69.9
	361.6	**146.2**	**507.8**
May-20**	52.8	28.8	81.6
Jun-20	43.0	54.1	97.1
Jul-20	23.4	31.5	54.9
Aug-20	138.0	12.7	150.7
Sep-20	75.6	12.4	88.0
Oct-20**	Poplar system was not operating during the month of October.		
	332.8	**139.5**	**472.3**
May-21**	40.4	19.3	59.7
Jun-21	119.0	19.7	138.7
Jul-21	107.8	12.8	120.6
Aug-21	31.0	13.9	44.9
Sep-21	196.2	5.5	201.7
Oct-21**	Poplar system was not operating during the month of October.		
	494.4	**71.2**	**565.6**
May-22**	42.4	7.9	50.3
Jun-22	69.8	19.2	89.0
Jul-22	49.4	18.8	68.2
Aug-22	101.6	17.2	118.8
Sep-22	93.0	10.2	103.2
Oct-22**	9.8	3.9	13.7
	366.0	**77.1**	**443.1**
May-23**	27.4	18.2	45.6
Jun-23	57.6	30.2	87.8
Jul-23	162.8	12.1	174.9
Aug-23	228.2	15.1	243.3
Sep-23	14.2	8.7	22.9
Oct-23**	19.0	8.8	27.8
	509.2	**93.1**	**602.3**
May-24**	104.8	12.3	117.1
Jun-24	86.2	28.0	114.2
Jul-24	184.2	17.8	202.0
Aug-24	69.2	27.5	96.7
Sep-24	74.2	21.3	95.5
Oct-24**	57.0	4.6	61.6
	575.6	**111.6**	**687.2**

Notes:

1) "*" denotes total liquid applied: precipitation + irrigation.
2) "**" denotes precipitation total during application period.
3) Following expansion of the Poplar System in 2017 the area of application is approximately 9.3 ha.
4) Precipitation totals assume that trace precipitation is equivalent to 0.25 mm.
5) Differences for precipitation total from on-site precipitation measurements are a result of the timing of measurements.

Table D-3
Annual Leachate Volumes Managed
Twin Creeks Environmental Centre - Poplar System

Year	Annual Volume of Leachate Applied to Poplar System	Annual Volume of Leachate Removed Off-Site	Annual Total Leachate Removed and Treated from Waste
Initial Poplar System			
2003	0	1,732,391	1,732,391
2004	641,208	3,666,721	4,307,929
2005	3,469,037	8,285,564	11,754,601
2006	4,686,000	8,194,072	12,880,072
2014	Poplar System not operating due to expansion construction.		
2015			
2016			
Expanded Poplar System			
2017	1,121,372	22,033,900	23,155,272
2018	4,303,435	26,681,859	30,985,294
2019	13,549,542	42,141,697	55,691,239
2020	10,823,172	38,972,220	49,795,392
2021	6,403,027	44,284,830	50,687,857
2022	7,172,569	47,454,190	54,626,759
2023	8,658,849	61,765,490	70,424,339
2024	10,374,545	68,159,160	78,533,705
Sub-Total Expanded	62,406,511	351,493,346	413,899,857
Overall Total	71,202,756	373,372,094	444,574,850

Notes:

1) Volumes in litres (L).

APPENDIX E:

Irrigation Liquid Analytical Results

Table E-1
General Chemical Results - Irrigation Liquid
Twin Creeks Environmental Centre - Poplar System

Parameter	Units	Target Concentration 100% Leachate	CCME Guideline	PS Holding Tank																	
				28-Sep-17	28-May-18	11-Jun-18	17-Jul-18	22-Aug-18	27-Sep-18	24-May-19	26-Jun-19	5-Jul-19	7-Aug-19	11-Sep-19	7-Oct-19	20-May-20	9-Jun-20	21-Jul-20	31-Aug-20	15-Sep-20	19-May-21	23-Jun-21	14-Jul-21
Alkalinity as $CaCO_3$	mg/L	9,150	-	5000	1800	4800	2700	990	4600	1700	3700	1800	3700	3800	2800	1600	2400	3400	4800	1800	2500	3400	2700
Chloride	mg/L	1,241	700 to 14,000*	1400	370	1200	760	240	730	310	720	500	1200	670	700	510	540	950	1100	520	420	660	560
Conductivity	uS/cm	10,616	-	9100	3600	8200	5500	3300	980	4700	9200	4600	10000	7900	8200	4830	5690	6110	9770	5910	6000	6060	7080
N-NH_3 (Ammonia)	mg/L	554	-	988	155	682	17	153	533	161	478	207	607	464	473	201	292	604	719	221	299	455	334
N-NO_2 (Nitrite)	mg/L		-	<0.20	0.13	<0.20	0.033	0.01	<0.10	<0.050	<0.10	<0.010	<0.10	0.145	<0.10	0.057	<0.050	<0.10	<0.10	0.068	0.155	<0.010	<0.050
N-NO_3 (Nitrate)	mg/L		-	<2.0	<1.0	<2.0	<0.10	<0.10	<1.0	<0.50	<1.0	<0.10	<1.0	<0.10	<1.0	0.36	<0.50	<1.0	<1.0	<0.10	<0.50	<0.10	<0.50
pH	pH units		6.0-8.5	8.0	6.9	7.2	7.8	7.9	7.2	6.9	7.1	7.1	7.6	7.4	7.4	7.3	7.0	8.0	7.6	7.0	7.0	6.9	6.7
Sulphate	mg/L		-	<20	370	99	90	140	210	330	77	560	300	250	380	420	270	<50	480	290	440	300	250
Total Kjeldahl Nitrogen	mg/L	2,948	-	890	150	670	360	150	570	160	500	220	700	440	420	190	280	590	900	220	280	420	340
Total Phosphorus	mg/L	2.37	-	5.70	0.45	3.70	2.20	0.77	3.60	0.66	1.90	0.90	3.50	1.80	2.10	0.59	1.10	3.00	3.30	0.68	0.94	1.6	1.3
Calcium	mg/L		-	67	260	160	45	51	840	180	150	190	140	170	200	200	160	59	180	200	190	150	150
Magnesium	mg/L	347	-	170	140	230	88	53	330	130	200	200	170	190	180	110	140	100	180	130	150	160	160
Potassium	mg/L	238	-	380	74	380	190	78	270	79	230	110	290	180	190	78	120	300	330	120	90	150	140
Sodium	mg/L	921	-	1300	300	1200	560	240	820	370	770	550	940	650	740	350	530	850	1200	520	600	670	580
Aluminum	mg/L		20.0	0.4	0.3	0.3	1.2	0.2	**56.0**	0.2	0.1	0.5	1.3	0.3	0.7	0.15	0.09	0.55	0.4	2.6	<0.2	0.8	0.56
Arsenic	mg/L		2.0	0.050	0.004	0.039	0.030	0.013	0.078	<0.005	0.009	0.004	0.050	0.008	0.021	0.005	0.007	0.049	0.05	0.012	<0.01	<0.01	0.005
Barium	mg/L		-	0.25	0.13	0.36	0.14	0.058	1.4	0.14	0.28	0.12	0.21	0.22	0.18	0.12	0.18	0.15	0.22	0.18	0.11	0.17	0.16
Beryllium	mg/L		0.1	<0.006	<0.0006	<0.003	<0.003	<0.0006	<0.003	<0.003	<0.003	<0.0006	<0.006	<0.0006	<0.0006	<0.0006	<0.0006	<0.003	<0.006	<0.0006	<0.006	<0.006	<0.003
Bismuth	mg/L		-	<0.01	<0.001	<0.005	<0.005	<0.001	<0.005	<0.005	<0.005	<0.001	<0.01	<0.001	<0.001	<0.001	<0.001	<0.005	<0.01	<0.001	<0.01	<0.01	<0.005
Boron	mg/L	25.3	6.0	**21.0**	3.9	**18.0**	**7.0**	3.8	**19.0**	**7.9**	**15.0**	4.1	**7.3**	4.4	**7.9**	3.1	4.4	**6.7**	**20.0**	5.0	**20**	**17**	**6.2**
Cadmium	mg/L		0.01	<0.001	<0.0001	<0.0005	<0.0005	<0.0001	0.0016	<0.0005	<0.0005	<0.0001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.001	<0.0001	<0.001	<0.001	<0.0005
Chromium	mg/L	0.12	0.1	**0.22**	0.01	**0.17**	**0.11**	0.04	**0.24**	<0.03	0.04	0.02	**0.18**	0.05	0.10	0.03	0.032	**0.24**	**0.23**	0.06	<0.05	0.05	0.03
Cobalt	mg/L		5.0	0.024	0.007	0.022	0.011	0.0045	0.099	0.004	0.011	0.0057	0.017	0.0089	0.011	0.0057	0.0069	0.019	0.019	0.0092	0.006	0.009	0.008
Copper	mg/L	0.43	5	<0.02	0.005	<0.01	<0.01	0.003	0.32	<0.01	<0.01	0.002	<0.02	<0.002	0.004	0.002	<0.002	<0.01	<0.02	0.007	<0.02	<0.02	<0.01
Iron	mg/L	25	20.0	3.0	3.7	2.3	1.7	0.6	**210.0**	2.7	1.0	3.5	5.0	2.0	4.5	4.1	2.7	1.9	5.0	7.0	4	5	3.3
Lead	mg/L	0.33	2.0	<0.005	0.0008	<0.003	<0.003	0.0006	0.15	<0.003	<0.003	0.0025	<0.005	0.0015	0.0021	0.0008	0.0007	<0.003	<0.005	0.004	<0.005	<0.005	<0.003
Molybdenum	mg/L	1.82	0.05	<0.02	0.003	<0.01	0.02	0.019	0.05	<0.01	<0.01	0.017	0.05	0.008	0.018	0.02	0.013	0.05	0.05	0.013	0.03	<0.02	0.01
Nickel	mg/L	29.3	2.0	0.23	0.044	0.19	0.094	0.036	0.37	0.027	0.093	0.046	0.16	0.082	0.1	0.044	0.062	0.16	0.17	0.081	0.05	0.08	0.06
Selenium	mg/L		0.05	<0.05	<0.005	<0.03	<0.03	<0.005	<0.03	<0.03	<0.03	<0.005	<0.05	<0.005	<0.005	<0.005	<0.005	<0.03	<0.05	<0.005	<0.05	<0.05	<0.03
Silver	mg/L		-	<0.004	<0.0004	<0.002	<0.002	<0.0004	<0.002	<0.002	<0.002	<0.0004	<0.004	<0.0004	<0.0004	<0.0004	<0.0004	<0.002	<0.004	<0.0004	<0.004	<0.004	<0.002
Strontium	mg/L		-	0.88	1.4	1.6	0.6	0.51	3.5	1.3	1.7	1.7	1.3	1.6	1.9	1.6	1.6	0.58	1.7	1.6	1.5	1.6	1.5
Tin	mg/L		-	0.02	0.003	0.02	0.02	0.006	0.04	<0.01	<0.01	0.004	<0.02	0.005	0.008	<0.002	0.003	0.02	<0.02	0.003	<0.02	<0.02	<0.01
Titanium	mg/L		-	0.15	0.016	0.11	0.09	0.031	0.77	<0.03	0.06	0.022	0.18	0.05	0.07	0.026	0.036	0.14	0.16	0.069	<0.05	<0.05	0.05
Vanadium	mg/L		1.0	0.030	0.004	0.026	0.018	0.006	0.120	0.005	0.015	0.005	0.030	0.011	0.016	0.006	0.009	0.027	0.03	0.014	<0.01	<0.01	0.01
Zinc	mg/L	0.043	5.0	*<0.1*	0.020	0.080	0.070	0.030	1.800	*<0.05*	*<0.05*	0.030	0.100	0.020	0.040	<0.01	<0.01	0.050	*<0.1*	0.03	*<0.1*	*<0.1*	*<0.05*

NOTES: 1) Blank denotes data not available.

2) Target Concentrations derived from LMP and "Expansion of Poplar Cap Irrigation System for Existing Waste Disposal Area" report by Genivar Consultants LP dated January 2010.

3) CCME Guidelines denotes maximum concentration for negative effects to vegetation for irrigation water as per Canadian Water Quality Guidelines (2004).

4) '*' denotes concentration estimated based on poplar tree tolerance and vegetable crops of > 710 mg/L (CCME, 2004), and salty water irrgation for poplars at 400 to 14,000 mg/L (Shanon et al, 1998).

5) '-' denotes no CCME Guideline.

6) µs/cm denotes microsiemens per centimeter.

7) mg/L denotes milligrams per litre.

8) "**" denotes parameter not analysed due to log in error at laboratory.

9) Shading indicates exceedances of the target concentrations.

10) Bolding indicates exceedances of CCME guideline.

11) *Italics* denotes parameter concentration was below the laboratory reportable detection limit (RDL), where the RDL exceeds the relevant target concentrations.

Table E-1
General Chemical Results - Irrigation Liquid
Twin Creeks Environmental Centre - Poplar System

Parameter	Units	Target Concentration 100% Leachate	CCME Guideline	PS Holding Tank																	
				11-Aug-21	16-Sep-21	24-May-22	7-Jun-22	7-Jul-22	9-Aug-22	1-Sep-22	4-Oct-22	24-May-23	14-Jun-23	19-Jul-23	9-Aug-23	6-Sep-23	11-Oct-23	14-May-24	4-Jun-24	2-Jul-24	8-Aug-24	9-Sep-24	10-Oct-24
Alkalinity as $CaCO_3$	mg/L	9,150	-	9700	4900	1400	3700	3300	3300	1900	2900	2200	3500	2400	2600	1600	2600	2000	2200	4200	1700	1900	3700
Chloride	mg/L	1,241	700 to 14,000*	610	880	400	810	660	680	500	250	300	510	380	550	370	490	320	420	600	370	550	700
Conductivity	uS/cm	10,616	-	9940	11310	4460	9570	8020	8300	5100	6680	5120	8940	6810	6790	5200	12450	5990	6320	7330	4360	5640	7600
N-NH_3 (Ammonia)	mg/L	554	-	1310	639	166	638	366	575	194	39	384	629	468	364	203	398	345	239	531	166	260	496
N-NO_2 (Nitrite)	mg/L		-	<0.10	<0.10	<0.010	0.022	<0.10	<0.10	<0.010	<0.10	<0.010	<0.050	<0.050	<0.010	<0.010	<0.10	<0.010	<0.010	0.013	<0.010	<0.050	<0.050
N-NO_3 (Nitrate)	mg/L		-	<1.0	<1.0	<0.10	<0.10	0.19	<1.0	<0.10	<1.0	<0.10	<0.50	<0.50	<0.10	<0.10	<1.0	<0.10	<0.10	<0.10	<0.10	<0.50	<0.50
pH	pH units		6.0-8.5	7.4	7.9	7.3	7.4	7.1	7.5	6.9	8.1	7.3	7.5	7.5	7.5	7.1	7.3	7.1	7.4	8.2	7.2	7.6	7.4
Sulphate	mg/L		-	83	160	530	66	230	310	430	420	210	170	150	560	380	270	86	250	140	290	180	170
Total Kjeldahl Nitrogen	mg/L	2,948	-	1300	650	160	650	550	550	210	830	320	620	450	330	200	420	350	280	590	180	290	570
Total Phosphorus	mg/L	2.37	-	3.4	2.3	0.5	2.4	1.4	1.5	0.8	0.66	0.76	1.6	0.84	0.99	0.59	0.94	0.78	0.87	2.1	0.81	1.2	1.9
Calcium	mg/L		-	77	150	220	140	140	150	220	110	170	130	150	210	160	170	160	160	110	180	140	150
Magnesium	mg/L	347	-	170	280	150	210	150	210	170	64	120	160	120	210	120	150	120	140	160	120	120	160
Potassium	mg/L	238	-	270	280	51	230	180	200	94	36	86	180	87	120	71	110	95	89	150	85	110	700
Sodium	mg/L	921	-	1400	1000	320	770	610	790	470	220	390	600	420	550	340	510	380	400	640	390	500	190
Aluminum	mg/L		20.0	<0.8	0.44	0.08	0.14	0.13	0.32	0.14	0.33	0.14	0.10	0.12	0.08	0.37	0.46	0.41	0.22	0.3	0.09	4.7	2.7
Arsenic	mg/L		2.0	<0.05	0.01	0.008	0.009	0.01	0.012	0.004	0.063	0.014	0.019	0.023	0.013	0.009	0.016	0.016	0.009	0.017	0.003	0.009	0.02
Barium	mg/L		-	<0.3	0.26	0.08	0.25	0.22	0.2	0.17	0.083	0.16	0.19	0.12	0.14	0.11	0.17	0.17	0.14	0.17	0.16	0.18	0.25
Beryllium	mg/L		0.1	<0.03	<0.003	<0.003	<0.003	<0.0006	<0.003	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.003	<0.0006	<0.0006	<0.006
Bismuth	mg/L		-	<0.05	<0.005	<0.005	<0.005	<0.001	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.01
Boron	mg/L	25.3	6.0	**110**	**20**	**7.5**	**10**	**7.4**	**6.8**	**7.5**	1.8	**8.2**	**13**	**8.0**	**6.8**	5.5	**12**	**9.5**	4.9	**13**	**9.3**	4.6	**7.5**
Cadmium	mg/L		0.01	<0.005	<0.0005	<0.0005	<0.0005	<0.0001	<0.0005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0001	<0.0001	<0.001
Chromium	mg/L	0.12	0.1	*<0.3*	0.07	<0.03	0.05	0.047	0.05	0.023	0.026	0.017	0.039	0.022	0.022	0.017	0.027	0.019	0.023	0.05	0.013	0.032	0.05
Cobalt	mg/L		5.0	<0.03	0.015	<0.003	0.012	0.01	0.012	0.0045	0.0028	0.0044	0.0093	0.005	0.0058	0.0033	0.0058	0.0041	0.0044	0.008	0.0032	0.0092	0.010
Copper	mg/L	0.43	5	<0.1	<0.01	<0.01	<0.01	0.003	0.1	0.007	<0.002	0.003	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.002	0.012	<0.02
Iron	mg/L	25	20.0	<5	2.6	5.9	1.8	2.6	4.2	4.1	1.8	2.5	1.8	2.2	3.8	2.9	2.8	2.2	3.2	2.2	3.2	11	7
Lead	mg/L	0.33	2.0	<0.03	0.003	<0.003	<0.003	0.0008	<0.003	0.0008	0.0006	0.0008	0.0012	0.0007	0.0008	0.0007	0.001	0.0006	0.0009	<0.003	0.0006	0.0040	<0.005
Molybdenum	mg/L	1.82	0.05	<0.1	<0.01	<0.01	<0.01	0.018	<0.01	0.008	0.017	0.010	0.012	0.015	0.009	0.007	0.008	0.003	0.009	<0.01	0.009	0.021	<0.02
Nickel	mg/L	29.3	2.0	0.12	0.13	0.023	0.099	0.088	0.11	0.047	0.023	0.037	0.073	0.040	0.045	0.030	0.055	0.038	0.038	0.073	0.030	0.073	0.10
Selenium	mg/L		0.05	<0.3	<0.03	<0.03	<0.03	<0.005	<0.03	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.03	<0.005	<0.005	<0.05
Silver	mg/L		-	<0.02	<0.002	<0.002	<0.002	<0.0004	<0.002	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.002	<0.0004	<0.0004	<0.004
Strontium	mg/L		-	1.0	1.6	2.2	1.6	1.8	1.7	2.2	0.96	1.3	1.4	1.3	2.2	1.4	1.6	1.1	1.4	1.2	1.7	1.5	1.8
Tin	mg/L		-	<0.1	<0.01	<0.01	<0.01	0.004	<0.01	<0.002	0.008	0.002	0.006	0.004	0.004	<0.002	0.003	0.002	0.002	<0.01	<0.002	<0.002	<0.02
Titanium	mg/L		-	<0.3	0.06	<0.03	0.05	0.049	0.05	0.023	0.031	0.023	0.033	0.023	0.017	0.018	0.026	0.025	0.02	0.03	0.011	0.10	0.14
Vanadium	mg/L		1.0	<0.05	0.013	<0.005	0.012	0.014	0.013	0.006	0.007	0.007	0.009	0.007	0.005	0.005	0.007	0.006	0.006	0.009	0.005	0.017	0.02
Zinc	mg/L	0.043	5.0	*<0.5*	*<0.05*	*<0.05*	<0.05	0.01	*<0.05*	<0.01	<0.01	0.01	0.02	0.02	0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	0.03	<0.1

NOTES: 1) Blank denotes data not available.

2) Target Concentrations derived from LMP and "Expansion of Poplar Cap Irrigation System for Existing Waste Disposal Area" report by Genivar Consultants LP dated January 2010.

3) CCME Guidelines denotes maximum concentration for negative effects to vegetation for irrigation water as per Canadian Water Quality Guidelines (2004).

4) '*' denotes concentration estimated based on poplar tree tolerance and vegetable crops of > 710 mg/L (CCME, 2004), and salty water irrgation for poplars at 400 to 14,000 mg/L (Shanon et al, 1998).

5) '-' denotes no CCME Guideline.

6) µs/cm denotes microsiemens per centimeter.

7) mg/L denotes milligrams per litre.

8) "**" denotes parameter not analysed due to log in error at laboratory.

9) Shading indicates exceedances of the target concentrations.

10) Bolding indicates exceedances of CCME guideline.

11) *Italics* denotes parameter concentration was below the laboratory reportable detection limit (RDL), where the RDL exceeds the relevant target concentrations.

Table E-2
Organic VOC Chemical Results - Irrigation Liquid
Twin Creeks Environmental Centre - Poplar System

Parameter	Units	Target Concentration 100% Leachate	PS Holding Tank																	
			28-Sep-17	28-May-18	11-Jun-18	17-Jul-18	22-Aug-18	27-Sep-18	24-May-19	26-Jun-19	5-Jul-19	7-Aug-19	11-Sep-19	7-Oct-19	20-May-20	9-Jun-20	21-Jul-20	31-Aug-20	15-Sep-20	19-May-21	23-Jun-21	14-Jul-21
BTEX (Total)	µg/L	127*	36.0	17.3	91.8	25.4	11.9	50.2	8.3	79.9	57.3	61.0	55.0	59.3	42.9	30.3	31.9	74.8	42.0	44.0	25.9	9.9
Acetone (2-Propanone)	ug/L		710.0	20.0	490.0	410.0	75.0	44.0	<100	23.0	<200	330.0	<500	45.0	39	38	800	640	100	<500	<100	<100
Benzene	ug/L		<5.0	1.6	4.8	0.9	0.4	3.1	<2.0	6.7	5.0	4.2	10.0	2.3	1.7	3	<2.0	3	3.6	<10	3.6	<2.0
Bromodichloromethane	ug/L		<5.0	<0.50	<5.0	<0.50	<0.50	<0.50	<5.0	<0.50	<10	<0.50	<25	<0.50	<0.50	<0.50	<5.0	<5.0	<0.50	<25	<5.0	<5.0
Bromoform	ug/L		<10	<1.0	<10	<1.0	<1.0	<1.0	<10	<1.0	<20	<1.0	<50	<1.0	<1.0	<1.0	<10	<10	<1.0	<50	<10	<10
Bromomethane	ug/L		<25	<0.50	<5.0	<0.50	<0.50	<0.50	<5.0	<0.50	<10	<0.50	<25	<0.50	<0.50	<0.50	<5.0	<5.0	<0.50	<25	<5.0	<5.0
Carbon Tetrachloride	ug/L		<5.0	<0.20	<2.0	<0.20	<0.20	<0.20	<2.0	<0.20	<4.0	<0.20	<10	<0.20	<0.19	<0.19	<1.9	<1.9	<0.19	<9.5	<1.9	<1.9
Chlorobenzene	ug/L		<5.0	2.6	5.4	<0.20	<0.20	3.1	<2.0	3.4	<4.0	1.0	<10	2.8	<0.20	3.2	<2.0	<2.0	1.3	<10	4	<2.0
Chloroethane	ug/L		<10	1.5	<10	<1.0	<1.0	2.4	<10	2.0	<20	<1.0	<50	<1.0	1.7	<1.0	<10	<10	1.2	<50	<10	<10
Chloroform	ug/L		7.8	<0.20	<2.0	<0.20	<0.20	<0.20	<2.0	<0.20	<4.0	0.9	<10	<0.20	<0.20	<0.20	18.0	<2.0	<0.20	<10	<2.0	<2.0
Chloromethane	ug/L		<25	<5.0	<50	<5.0	<5.0	<5.0	<50	<5.0	<100	<5.0	<250	<5.0	<5.0	<5.0	<50	<50	<5.0	<250	<50	<50
Dibromochloromethane	ug/L		<10	<0.50	<5.0	<0.50	<0.50	<0.50	<5.0	<0.50	<10	<0.50	<25	<0.50	<0.50	<0.50	<5.0	<5.0	<0.50	<25	<5.0	<5.0
1,2-Dichlorobenzene	ug/L		<10	<0.50	<5.0	<2.0	<0.50	<0.50	<5.0	<0.50	<10	<0.50	<25	<0.50	<0.40	<0.40	<4.0	<4.0	<0.40	<20	<4.0	<4.0
1,3-Dichlorobenzene	ug/L		<10	<0.50	<5.0	<2.0	<0.50	<0.50	<5.0	<0.50	<10	<0.50	<25	<0.50	<0.40	<0.40	<4.0	<4.0	<0.40	<20	<4.0	<4.0
1,4-Dichlorobenzene	ug/L		<10	2.0	<5.0	<2.0	<0.50	2.5	<5.0	3.2	<10	1.1	<25	1.9	0.65	1.2	<4.0	<4.0	2.6	<20	<4.0	<4.0
1,1-Dichloroethane	ug/L		<5.0	0.7	<2.0	<0.20	<0.20	1.5	2.1	2.1	<4.0	0.5	<10	0.5	0.88	0.26	<2.0	<2.0	0.88	<10	<2.0	<2.0
1,2-Dichloroethane	ug/L		<10	<0.50	<5.0	1.1	<0.50	<0.50	<5.0	<0.50	<10	<0.50	<25	<0.50	<0.40	<0.49	<4.9	<4.9	<0.49	<25	<4.9	<4.9
1,1-Dichloroethylene	ug/L		<5.0	<0.20	<2.0	<0.20	<0.20	<0.20	<2.0	<0.20	<4.0	<0.20	<10	<0.20	<0.20	<0.20	<2.0	<2.0	<0.20	<10	<2.0	<2.0
cis-1,2-Dichloroethylene	ug/L		<5.0	<0.50	<5.0	<0.50	<0.50	<0.50	<5.0	<0.50	<10	<0.50	<25	<0.50	<0.50	<0.50	<5.0	<5.0	<0.50	<25	<5.0	<5.0
trans-1,2-Dichloroethylene	ug/L		<5.0	<0.50	<5.0	<0.50	<0.50	<0.50	<5.0	<0.50	<10	<0.50	<25	<0.50	<0.50	<0.50	<5.0	<5.0	<0.50	<25	<5.0	<5.0
1,2-Dichloropropane	ug/L		<5.0	<0.20	<2.0	<0.20	<0.20	<0.20	<2.0	<0.20	<4.0	<0.20	<10	<0.20	<0.20	<0.20	<2.0	<2.0	<0.20	<10	<2.0	<2.0
cis-1,3-Dichloropropene	ug/L		<10	<0.30	<3.0	<0.30	<0.30	<0.30	<3.0	<0.30	<6.0	<0.30	<15	<0.30	<0.30	<0.30	<3.0	<3.0	<0.30	<15	<3.0	<3.0
trans-1,3-Dichloropropene	ug/L		<10	<0.40	<4.0	<0.40	<0.40	<0.40	<4.0	<0.40	<8.0	<0.40	<20	<0.40	<0.40	<0.40	<4.0	<4.0	<0.40	<20	<4.0	<4.0
Ethylbenzene	ug/L		<5.0	<0.20	16.0	2.3	1.2	5.9	<2.0	26.0	13.0	6.8	14.0	11.0	1.2	5.3	2.9	7.8	6.4	<10	<2.0	<2.0
Ethylene Dibromide	ug/L		<10	<0.20	<2.0	<0.20	<0.20	<0.20	<2.0	<0.20	<4.0	<0.20	<10	<0.20	<0.19	<0.19	<1.9	<1.9	<0.19	<9.5	<1.9	<1.9
Methylene Chloride(Dichloromethane)	ug/L		<25	<2.0	<20	<2.0	<2.0	<2.0	<20	<2.0	<40	<2.0	<100	<2.0	<2.0	<2.0	<20	<20	<2.0	<100	<20	<20
Methyl Ethyl Ketone (2-Butanone)	ug/L		1000.0	<10	600.0	730.0	150.0	27.0	<100	<10	<200	100.0	<500	25.0	<10	12	1000	840	110	<500	<100	<100
Methyl Isobutyl Ketone	ug/L		<250	<5.0	<50	18.0	5.5	<5.0	<50	<5.0	<100	12.0	<250	6.8	<5.0	<5.0	<50	<50	<5.0	<250	<50	<50
Methyl t-butyl ether (MTBE)	ug/L		<10	1.1	<5.0	1.9	0.6	1.1	<5.0	1.1	<10	1.9	<25	1.1	<0.50	0.69	<5.0	<5.0	1.3	<25	<5.0	<5.0
Styrene	ug/L		<10	<0.50	<5.0	<0.50	<0.50	<0.50	<5.0	<0.50	<10	<0.50	<25	<0.50	<0.40	<0.40	<4.0	<4.0	<0.40	<20	<4.0	<4.0
1,1,1,2-Tetrachloroethane	ug/L		<10	<0.50	<5.0	<0.50	<0.50	<0.50	<5.0	<0.50	<10	<0.50	<25	<0.50	<0.50	<0.50	<5.0	<5.0	<0.50	<25	<5.0	<5.0
1,1,2,2-Tetrachloroethane	ug/L		<10	<0.50	<5.0	<0.50	<0.50	<0.50	<5.0	<0.50	<10	<0.50	<25	<0.50	<0.40	<0.40	<4.0	<4.0	<0.40	<20	<4.0	<4.0
Tetrachloroethylene	ug/L		<5.0	<0.20	<2.0	<0.20	<0.20	<0.20	<2.0	<0.20	<4.0	<0.20	<10	<0.20	<0.20	<0.20	<2.0	<2.0	<0.20	<10	<2.0	<2.0
Toluene	ug/L		25.0	1.5	21.0	13.0	6.4	6.2	<2.0	4.2	4.3	21.0	10.0	11.0	4.0	3.0	17	35	6.0	24	7.3	<2.0
1,1,1-Trichloroethane	ug/L		<5.0	<0.20	<2.0	<0.20	<0.20	<0.20	<2.0	<0.20	<4.0	<0.20	<10	<0.20	<0.20	<0.20	<2.0	<2.0	<0.20	<10	<2.0	<2.0
1,1,2-Trichloroethane	ug/L		<10	<0.50	<5.0	<0.50	<0.50	<0.50	<5.0	<0.50	<10	<0.50	<25	<0.50	<0.40	<0.40	<4.0	<4.0	<0.40	<20	<4.0	<4.0
Trichloroethylene	ug/L		<5.0	<0.20	<2.0	<0.20	<0.20	<0.20	<2.0	<0.20	<4.0	<0.20	<10	<0.20	<0.20	<0.20	<2.0	<2.0	<0.20	<10	<2.0	<2.0
Trichlorofluoromethane (FREON 11)	ug/L		<10	<0.50	<5.0	<0.50	<0.50	<0.50	<5.0	<0.50	<10	<0.50	<25	<0.50	<0.50	<0.50	<5.0	<5.0	<0.50	<25	<5.0	<5.0
Vinyl Chloride	ug/L		<10	0.3	<2.0	0.3	0.2	0.3	<2.0	0.5	<4.0	0.5	<10	0.4	<0.20	0.23	<2.0	<2.0	0.28	<10	<2.0	<2.0
p+m-Xylene	ug/L		11.0	7.8	38.0	6.2	2.7	23.0	2.3	30.0	25.0	20.0	21.0	25.0	23	14	7.5	20	20	10	6.1	<2.0
o-Xylene	ug/L		<5.0	6.2	13.0	3.0	1.2	12.0	3.0	12.0	10.0	9.1	<10	11.0	14	5.4	3.7	9	6.6	<10	7.6	6.9
Total Xylenes	ug/L		11.0	14.0	50.0	9.2	3.9	35.0	5.3	43.0	35.0	29.0	21.0	35.0	36	19	11	29	26	10	14	6.9

NOTES: 1) Blank denotes data not available.

2) < - denotes parameter concentration is below the estimated quantitation limit or method reporting limit.

3) µg/L denotes microgram per litre.

4) VOCs for leachate holding tank not analysed in July 2007 due to an error at laboratory.

5) "*" denotes composite concentration of benzene, ethylbenzene, toluene, and xylene (BTEX); where a concentration was less than the Reported Detection Limit (RDL), the concentration was considered to be equal to one half of the RDL.

6) Shading denotes exceedances of the target concentration.

Table E-2
Organic VOC Chemical Results - Irrigation Liquid
Twin Creeks Environmental Centre - Poplar System

Parameter	Units	Target Concentration 100% Leachate	PS Holding Tank																		
			11-Aug-21	16-Sep-21	24-May-22	7-Jun-22	7-Jul-22	9-Aug-22	1-Sep-22	4-Oct-22	24-May-23	14-Jun-23	19-Jul-23	9-Aug-23	6-Sep-23	11-Oct-23	14-May-24	4-Jun-24	2-Jul-24	8-Aug-24	9-Sep-24	10-Oct-24
BTEX (Total)	µg/L	127*	319	131	31	50	40	40	23	66	64	83	55	49	32	63	61	55	92	19	40	32
Acetone (2-Propanone)	ug/L		<500	53	300	<100	110	110	35	4000	2100	2300	5400	1300	1700	2100	3300	860	700	11	71	400
Benzene	ug/L		<10	5.5	1.2	3.8	2.7	3.1	1.9	3.9	4.2	5.5	<10	2.4	2.7	4	5.2	4	5.4	3.1	5.9	2.6
Bromodichloromethane	ug/L		<25	<0.50	<0.50	<5.0	<2.5	<5.0	<0.50	<0.50	<0.50	<5.0	<25	<0.50	<0.50	<1.0	<0.50	<0.50	<2.5	<0.50	<1.0	<5.0
Bromoform	ug/L		<50	<1.0	<1.0	<10	<5.0	<10	<1.0	<1.0	<1.0	<1.0	<50	<1.0	<1.0	<2.0	<1.0	<1.0	<5.0	<1.0	<2.0	<10
Bromomethane	ug/L		<25	<0.50	<0.50	<5.0	<2.5	<5.0	<0.50	<0.50	<0.50	<5.0	<25	<0.50	<0.50	<1.0	<0.50	<0.50	<2.5	<0.50	<1.0	<5.0
Carbon Tetrachloride	ug/L		<9.5	<0.19	<0.19	<1.9	<0.95	<1.9	<0.19	<0.19	<0.19	<1.9	<9.5	<0.19	<0.19	<0.38	<0.19	<0.19	<0.95	<0.19	<0.38	<1.9
Chlorobenzene	ug/L		<10	4.8	0.34	4.3	2.4	2.5	2.6	0.4	2.5	8.3	<10	1.5	1.4	4	2.9	2	2	1.8	1.4	4.8
Chloroethane	ug/L		<50	1.6	<1.0	<10	<5.0	<10	<1.0	<1.0	1.7	<10	<50	<1.0	1.4	<2.0	2.3	1	<5.0	1.2	<2.0	<10
Chloroform	ug/L		<10	<0.20	<0.20	<2.0	<1.0	<2.0	<0.20	<0.20	<0.20	<2.0	<10	<0.20	<0.20	<0.40	<0.20	<0.20	<1.0	<0.20	<0.40	<2.0
Chloromethane	ug/L		<250	<5.0	<5.0	<50	<25	<50	<5.0	<5.0	<5.0	<50	<250	<5.0	<5.0	<10	<5.0	<5.0	<25	<5.0	<10	<50
Dibromochloromethane	ug/L		<25	<0.50	<0.50	<5.0	<2.5	<5.0	<0.50	<0.50	<0.50	<5.0	<25	<0.50	<0.50	<1.0	<0.50	<0.50	<2.5	<0.50	<1.0	<5.0
1,2-Dichlorobenzene	ug/L		<20	<0.40	<0.40	<4.0	<2.0	<4.0	<0.40	<0.40	<0.40	<4.0	<20	<0.40	<0.40	<0.80	<0.40	<0.40	<2.0	<0.40	<0.80	<4.0
1,3-Dichlorobenzene	ug/L		<20	<0.40	<0.40	<4.0	<2.0	<4.0	<0.40	<0.40	<0.40	<4.0	<20	<0.40	<0.40	<0.80	<0.40	<0.40	<2.0	<0.40	<0.80	<4.0
1,4-Dichlorobenzene	ug/L		<20	2.9	0.98	4.2	<2.0	<4.0	1.5	1.7	3.1	<4.0	<20	1.2	1.7	2	3.2	2	<2.0	2.2	<0.80	<4.0
1,1-Dichloroethane	ug/L		<10	0.56	0.28	<2.0	<1.0	<2.0	0.29	<0.20	0.81	<2.0	<10	0.24	0.38	0	0.68	0	<1.0	0.29	<0.40	<2.0
1,2-Dichloroethane	ug/L		<25	<0.49	<0.49	<4.9	<2.5	<4.9	<0.49	3.7	2.1	<4.9	<25	0.85	0.81	2	0.81	<0.49	<2.5	<0.49	<0.98	<4.9
1,1-Dichloroethylene	ug/L		<10	<0.20	<0.20	<2.0	<1.0	<2.0	<0.20	<0.20	<0.20	<2.0	<10	<0.20	<0.20	<0.40	<0.20	<0.20	<1.0	<0.20	<0.40	<2.0
cis-1,2-Dichloroethylene	ug/L		<25	0.9	1.1	<5.0	<2.5	<5.0	<0.50	2.9	1.2	<5.0	<25	0.73	0.56	1	0.68	<0.50	<2.5	<0.50	<1.0	<5.0
trans-1,2-Dichloroethylene	ug/L		<25	<0.50	<0.50	<5.0	<2.5	<5.0	<0.50	<0.50	<0.50	<5.0	<25	<0.50	<0.50	<1.0	<0.50	<0.50	<2.5	<0.50	<1.0	<5.0
1,2-Dichloropropane	ug/L		<10	<0.20	<0.20	<2.0	<1.0	<2.0	<0.20	0.47	0.21	<2.0	<10	<0.20	<0.20	<0.40	<0.20	<0.20	<1.0	<0.20	<0.40	<2.0
cis-1,3-Dichloropropene	ug/L		<15	<0.30	<0.30	<3.0	<1.5	<3.0	<0.30	<0.30	<0.30	<3.0	<15	<0.30	<0.30	<0.60	<0.30	<0.30	<1.5	<0.30	<0.60	<3.0
trans-1,3-Dichloropropene	ug/L		<20	<0.40	<0.40	<4.0	<2.0	<4.0	<0.40	<0.40	<0.40	<4.0	<20	<0.40	<0.40	<0.80	<0.40	<0.40	<2.0	<0.40	<0.80	<4.0
Ethylbenzene	ug/L		24	28	3.0	4.6	11	5.7	3.0	6.8	14	15	<10	11	5.3	7	14	11	19	1.3	7.8	6.2
Ethylene Dibromide	ug/L		<9.5	<0.19	<0.19	<1.9	<0.95	<1.9	<0.19	<0.19	<0.19	<1.9	<9.5	<0.19	<0.19	<0.38	<0.19	<0.19	<0.95	<0.19	<0.38	<1.9
Methylene Chloride(Dichloromethane)	ug/L		<100	<2.0	<2.0	<20	<10	<20	<2.0	<2.0	<2.0	<20	<100	<2.0	<2.0	<4.0	<2.0	<2.0	<10	<2.0	<4.0	<20
Methyl Ethyl Ketone (2-Butanone)	ug/L		<500	23	300	<100	71	<100	31	4200	2500	2400	5400	1400	1600	2300	3400	810	620	<10	<20	350
Methyl Isobutyl Ketone	ug/L		<250	7.5	11	<50	<25	<50	<5.0	59	40	<50	<250	19	10	33	26	10	<25	<5.0	<10	<50
Methyl t-butyl ether (MTBE)	ug/L		<25	0.97	<0.50	<5.0	<2.5	<5.0	0.82	0.82	0.93	<5.0	<25	0.59	0.6	1	1.0	1	<2.5	0.81	<1.0	<5.0
Styrene	ug/L		<20	<0.40	<0.40	<4.0	<2.0	<4.0	<0.40	<0.40	<0.67	<4.0	<20	<0.60 (1)	<0.40	<0.80	<0.40	<0.40	<2.0	<0.40	<0.80	<4.0
1,1,1,2-Tetrachloroethane	ug/L		<25	<0.50	<0.50	<5.0	<2.5	<5.0	<0.50	<0.50	<0.50	<5.0	<25	<0.50	<0.50	<1.0	<0.50	<0.50	<2.5	<0.50	<1.0	<5.0
1,1,2,2-Tetrachloroethane	ug/L		<20	<0.40	<0.40	<4.0	<2.0	<4.0	<0.40	<0.40	<0.40	<4.0	<20	<0.40	<0.40	<0.80	<0.40	<0.40	<2.0	<0.40	<0.80	<4.0
Tetrachloroethylene	ug/L		<10	<0.20	<0.20	<2.0	<1.0	<2.0	<0.20	<0.20	<0.20	<2.0	<10	<0.20	<0.20	<0.40	<0.20	<0.20	<1.0	<0.20	<0.40	<2.0
Toluene	ug/L		200	15	9.3	4.1	2.3	5.1	3.4	27	16	24	26	9.1	6.0	16	9.6	3	14	4.0	3.3	5.5
1,1,1-Trichloroethane	ug/L		<10	<0.20	<0.20	<2.0	<1.0	<2.0	<0.20	<0.20	<0.20	<2.0	<10	<0.20	<0.20	<0.40	<0.20	<0.20	<1.0	<0.20	<0.40	<2.0
1,1,2-Trichloroethane	ug/L		<20	<0.40	<0.40	<4.0	<2.0	<4.0	<0.40	<0.40	<0.40	<4.0	<20	<0.40	<0.40	<0.80	<0.40	<0.40	<2.0	<0.40	<0.80	<4.0
Trichloroethylene	ug/L		<10	<0.20	<0.20	<2.0	<1.0	<2.0	<0.20	<0.20	0.24	<2.0	<10	<0.20	<0.20	<0.40	<0.20	<0.20	<1.0	<0.20	<0.40	<2.0
Trichlorofluoromethane (FREON 11)	ug/L		<25	<0.50	<0.50	<5.0	<2.5	<5.0	<0.50	<0.50	<0.50	<5.0	<25	<0.50	<0.50	<1.0	<0.50	<0.50	<2.5	<0.50	<1.0	<5.0
Vinyl Chloride	ug/L		<10	0.4	0.32	<2.0	<1.0	<2.0	0.26	<0.20	0.31	<2.0	<10	0.24	<0.20	0	0.56	<0.20	<1.0	0.25	<0.40	<2.0
p+m-Xylene	ug/L		63	58	12	22	16	17	11	19	21	27	19	18	13	26	22	25	36	6.2	16	11
o-Xylene	ug/L		27	24	5.2	15	7.3	8.8	3.5	9.2	9.4	11	<10	7.7	5.2	11	9.7	12	18	5.3	7.2	6.9
Total Xylenes	ug/L		90	82	17	37	24	26	15	28	30	38	19	26	18	36	32	37	54	11	23	18

NOTES: 1) Blank denotes data not available.

2) < - denotes parameter concentration is below the estimated quantitation limit or method reporting limit.

3) µg/L denotes microgram per litre.

4) VOCs for leachate holding tank not analysed in July 2007 due to an error at laboratory.

5) "*" denotes composite concentration of benzene, ethylbenzene, toluene, and xylene (BTEX); where a concentration was less than the Reported Detection Limit (RDL), the concentration was considered to be equal to one half of the RDL.

6) Shading denotes exceedances of the target concentration.

Table E-3
Organic EPA 625 Chemical Results - Irrigation Liquid
Twin Creeks Environmental Centre - Poplar System

Parameter	Units	Target Concentration 100% Leachate	PS Holding Tank																	
			28-Sep-17	28-May-18	11-Jun-18	17-Jul-18	22-Aug-18	27-Sep-18	24-May-19	26-Jun-19	5-Jul-19	14-Aug-19	11-Sep-19	7-Oct-19	20-May-20	9-Jun-20	21-Jul-20	31-Aug-20	15-Sep-20	19-May-21	23-Jun-21	14-Jul-21
Acenaphthene	ug/L		<4.0	<0.20	<0.80	<0.80	<0.80	<2.0	<0.20	<0.80	<0.80	<0.80	0.81	<0.80	<0.20	0.27	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80
Acenaphthylene	ug/L		<4.0	<0.20	<0.80	<0.80	<0.80	<2.0	<0.20	<0.80	<0.80	<0.80	<0.80	<0.80	<0.20	<0.20	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80
Anthracene	ug/L		<4.0	<0.20	<0.80	<0.80	<0.80	<2.0	<0.20	<0.80	<0.80	<0.80	<0.80	<0.80	<0.20	<0.20	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80
Benzo(a)anthracene	ug/L		<4.0	<0.20	<0.80	<0.80	<0.80	<2.0	<0.20	<0.80	<0.80	<0.80	<0.80	<0.80	<0.20	<0.20	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80
Benzo(a)pyrene	ug/L		<4.0	<0.20	<0.80	<0.80	<0.80	<2.0	<0.20	<0.80	<0.80	<0.80	<0.80	<0.80	<0.20	<0.20	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80
Benzo(b/j)fluoranthene	ug/L		<4.0	<0.20	<0.80	<0.80	<0.80	<2.0	<0.20	<0.80	<0.80	<0.80	<0.80	<0.80	<0.20	<0.20	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80
Benzo(g,h,i)perylene	ug/L		<4.0	<0.20	<0.80	<0.80	<0.80	<2.0	<0.20	<0.80	<0.80	<0.80	<0.80	<0.80	<0.20	<0.20	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80
Benzo(k)fluoranthene	ug/L		<4.0	<0.20	<0.80	<0.80	<0.80	<2.0	<0.20	<0.80	<0.80	<0.80	<0.80	<0.80	<0.20	<0.20	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80
1-Chloronaphthalene	ug/L		<20	<1.0	<4.0	<4.0	<4.0	<10	<1.0	<4.0	<4.0	<4.0	<4.0	<4.0	<1.0	<1.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
2-Chloronaphthalene	ug/L		<10	<0.50	<2.0	<2.0	<2.0	<5.0	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<0.50	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Chrysene	ug/L		<4.0	<0.20	<0.80	<0.80	<0.80	<2.0	<0.20	<0.80	<0.80	<0.80	<0.80	<0.80	<0.20	<0.20	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80
Dibenz(a,h)anthracene	ug/L		<4.0	<0.20	<0.80	<0.80	<0.80	<2.0	<0.20	<0.80	<0.80	<0.80	<0.80	<0.80	<0.20	<0.20	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80
Fluoranthene	ug/L		<4.0	<0.20	<0.80	<0.80	<0.80	<2.0	<0.20	<0.80	<0.80	<0.80	<0.80	<0.80	<0.20	<0.20	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80
Fluorene	ug/L		<4.0	<0.20	<0.80	<0.80	<0.80	<2.0	<0.20	<0.80	<0.80	<0.80	<0.80	<0.80	<0.20	0.25	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80
Indeno(1,2,3-cd)pyrene	ug/L		<4.0	<0.20	<0.80	<0.80	<0.80	<2.0	<0.20	<0.80	<0.80	<0.80	<0.80	<0.80	<0.20	<0.20	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80
1-Methylnaphthalene	ug/L		<4.0	<0.20	<0.80	<0.80	<0.80	<2.0	<0.20	<0.80	<0.80	<0.80	<0.80	<0.80	<0.20	0.26	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80
2-Methylnaphthalene	ug/L		<4.0	<0.20	<0.80	<0.80	<0.80	<2.0	<0.20	<0.80	0.93	<0.80	<1.0	1.1	<0.20	0.24	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80
Naphthalene	ug/L		<4.0	<0.20	3.8	1.7	<0.80	4.4	<0.20	5.0	7.7	1.0	4.8	4.0	<0.20	<0.61	<2.0	<2.5	3.0	<0.80	3.4	<0.80
Perylene	ug/L		<4.0	<0.20	<0.80	<0.80	<0.80	<2.0	<0.20	<0.80	<0.80	<0.80	<0.80	<0.80	<0.20	<0.20	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80
Phenanthrene	ug/L		<4.0	<0.20	<0.80	0.91	<0.80	<2.0	<0.20	<0.80	<0.80	<0.80	<0.80	<0.80	<0.20	0.25	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80
Pyrene	ug/L		<4.0	<0.20	<0.80	<0.80	<0.80	<2.0	<0.20	<0.80	<0.80	<0.80	<0.80	<0.80	<0.20	<0.20	<0.80	<0.80	<0.80	<0.80	<0.80	<0.80
1,2-Dichlorobenzene	ug/L		<10	<0.50	<2.0	<2.0	<2.0	<5.0	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<0.50	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,3-Dichlorobenzene	ug/L		<10	<0.50	<2.0	<2.0	<2.0	<5.0	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<0.50	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,4-Dichlorobenzene	ug/L		<10	1.1	<2.0	<2.0	<2.0	<5.0	1.0	<2.5	<2.0	<2.0	<2.0	<2.0	<0.50	0.74	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Hexachlorobenzene	ug/L		<10	<0.50	<2.0	<2.0	<2.0	<5.0	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<0.50	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Pentachlorobenzene	ug/L		<10	<0.50	<2.0	<2.0	<2.0	<5.0	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<0.50	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,2,3,5-Tetrachlorobenzene	ug/L		<10	<0.50	<2.0	<2.0	<2.0	<5.0	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<0.50	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,2,4,5-Tetrachlorobenzene	ug/L		<10	<0.50	<2.0	<2.0	<2.0	<5.0	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<0.50	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,2,3-Trichlorobenzene	ug/L		<10	<0.50	<2.0	<2.0	<2.0	<5.0	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<0.50	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,2,4-Trichlorobenzene	ug/L		<10	<0.50	<2.0	<2.0	<2.0	<5.0	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<0.50	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,3,5-Trichlorobenzene	ug/L		<10	<0.50	<2.0	<2.0	<2.0	<5.0	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<0.50	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
2-Chlorophenol	ug/L		<6.0	<0.30	<1.2	<1.2	<1.2	<3.0	<0.30	<1.2	<1.2	<1.2	<1.2	<1.2	<0.30	<0.30	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2
4-Chloro-3-Methylphenol	ug/L		<10	<0.50	<2.0	<2.0	<2.0	<5.0	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<0.50	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
m/p-Cresol	ug/L		45.0	<0.50	9.5	57.0	<2.0	<5.0	<0.50	8.5	16.0	7.2	<2.0	6.1	<0.50	<0.50	340	190	18	<2.0	4.5	<2.0
o-Cresol	ug/L		<10	<0.50	3.9	7.6	<2.0	<5.0	<0.50	<2.0	<2.0	2.7	2.4	2.5	<0.50	0.79	5.0	7.1	<2.0	<2.0	<2.0	<2.0
1,2,3,4-Tetrachlorobenzene	ug/L		<10	<0.50	<2.0	<2.0	<2.0	<5.0	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<0.50	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
2,3-Dichlorophenol	ug/L		<10	<0.50	<2.0	<2.0	<2.0	<5.0	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<0.50	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
2,4-Dichlorophenol	ug/L		<6.0	<0.30	<1.2	<1.2	<1.2	<3.0	<0.30	<1.2	<1.2	<1.2	<1.2	<1.2	<0.30	<0.30	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2
2,5-Dichlorophenol	ug/L		<10	<0.50	<2.0	<2.0	<2.0	<5.0	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<0.50	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
2,6-Dichlorophenol	ug/L		<10	<0.50	<2.0	<2.0	<2.0	<5.0	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<0.50	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
3,4-Dichlorophenol	ug/L		<10	<0.50	<2.0	<2.0	<2.0	<5.0	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<0.50	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
3,5-Dichlorophenol	ug/L		<10	<0.50	<2.0	<2.0	<2.0	<5.0	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<0.50	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
2,4-Dimethylphenol	ug/L		<10	1.0	2.1	<3.0	<2.0	5.2	<0.50	5.5	2.6	<2.0	<2.0	<2.0	<0.80	<1.0 (1)	<2.0	3.5	<2.0	<2.0	<2.0	<2.0
2,4-Dinitrophenol	ug/L		<40	<6.3	<50	<25	<8.0	<25	<2.5	<8.0	<40	<8.0	<8.0	<8.0	<2.0	<2.0	<8.0	<8.0	<8.0	<8.0	<8.0	<8.0
4,6-Dinitro-2-methylphenol	ug/L		<40	<2.0	<50	<8.0	<8.0	<20	<2.0	<8.0	<20	<8.0	<8.0	<8.0	<2.0	<2.0	<8.0	<8.0	<8.0	<8.0	<8.0	<8.0
2-Nitrophenol	ug/L		<10	<0.50	<2.0	<2.0	<2.0	<5.0	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<0.50	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
4-Nitrophenol	ug/L		<28	<1.4	<5.6	<5.6	<5.6	<14	<1.4	<5.6	<5.6	<5.6	<5.6	<5.6	<1.4	<1.4	<5.6	<5.6	<5.6	<5.6	<5.6	<5.6
Pentachlorophenol	ug/L		<20	<1.0	<4.0	<4.0	<4.0	<10	<2.5	<4.0	<20	<4.0	<4.0	<4.0	<1.0	<1.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
Phenol	ug/L		22.0	<0.50	<2.0	2.3	<2.0	<5.0	<0.50	<2.0	8.6	56.0	<2.0	<2.0	<0.50	<0.50	32	16	2.6	<2.0	<2.0	<2.0
2,3,4,5-Tetrachlorophenol	ug/L		<8.0	<0.40	<1.6	<1.6	<1.6	<4.0	<0.40	<1.6	<1.6	<1.6	<1.6	<1.6	<0.40	<0.40	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6
2,3,4,6-Tetrachlorophenol	ug/L		<10	<0.50	<2.0	<2.0	<2.0	<5.0	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<0.50	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
2,3,5,6-Tetrachlorophenol	ug/L		<10	<0.50	<2.0	<2.0	<2.0	<5.0	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<0.50	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
2,3,4-Trichlorophenol	ug/L		<10	<0.50	<2.0	<2.0	<2.0	<5.0	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<0.50	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
2,3,5-Trichlorophenol	ug/L		<10	<0.50	<2.0	<2.0	<2.0	<5.0	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<0.50	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
2,3,6-Trichlorophenol	ug/L		<10	<0.50	<2.0	<2.0	<2.0	<5.0	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<0.50	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
2,4,5-Trichlorophenol	ug/L		<10	<0.50	<2.0	<2.0	<2.0	<5.0	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<0.50	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
2,4,6-Trichlorophenol	ug/L		<10	<0.50	<2.0	<2.0	<2.0	<5.0	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<0.50	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
3,4,5-Trichlorophenol	ug/L		<10	<0.50	<2.0	<2.0	<2.0	<5.0	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<0.50	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Benzyl butyl phthalate	ug/L		<10	<0.50	<2.0	<2.0	<2.0	<5.0	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<0.50	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Biphenyl	ug/L		<10	<0.50	<2.0	<2.0	<2.0	<5.0	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<0.50	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Bis(2-chloroethyl)ether	ug/L		<10	<0.50	<2.0	<2.0	<2.0	<5.0	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<0.50	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Bis(2-chloroethoxy)methane	ug/L		<10	<0.60	<2.0	<2.0	<2.0	<5.0	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<0.50	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Bis(2-chloroisopropyl)ether	ug/L		<10	<0.50	<2.0	<2.0	<2.0	<5.0	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<0.50	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Bis(2-ethylhexyl)phthalate	ug/L		<40	<2.0	12.0	24.0	<8.0	22.0	<2.0	<8.0	<8.0	12.0	<8.0	<8.0	2.0	<2.0	14	17	<8.0	<8.0	<8.0	<8.0
4-Bromophenyl phenyl ether	ug/L		<6.0	<0.30	<1.2	<1.2	<1.2	<3.0	<0.30	<1.2	<1.2	<1.2	<1.2	<1.2	<0.30	<0.30	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2
p-Chloroaniline	ug/L		<20	<1.0	<4.0	<4.0	<4.0	<10	<1.0	<4.0	<4.0	<4.0	<4.0	<4.0	<1.0	<1.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
4-Chlorophenyl phenyl ether	ug/L		<10	<0.50	<2.0	<2.0	<2.0	<5.0	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<0.50	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Di-N-butyl phthalate	ug/L		<40	<2.0	<8.0	<8.0	<8.0	<20	<2.0	<8.0	<8.0	<8.0	<8.0	<8.0	<2.0	<2.0	<8.0	<8.0	<8.0	<8.0	<8.0	<8.0
Di-N-octyl phthalate	ug/L		<16	<0.80	<3.2	<3.2	<3.2	<8.0	<0.80	<3.2	<3.2	<3.2	<3.2	<3.2	<0.80	<0.80	<3.2	<3.2	<3.2	<3.2	<3.2	<3.2
2,4-Dinitrotoluene	ug/L		<10	<0.50	<2.0	<2.0	<2.0	<5.0	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<0.50	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Diethyl phthalate	ug/L		<20	<1.0	<4.0	<4.0	<4.0	<10	<1.0	<4.0	<4.0	<4.0	<4.0	<4.0	<1.0	<1.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
3,3'-Dichlorobenzidine	ug/L		<10	<0.50	<2.0	<2.0	<2.0	<5.0	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<0.50	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Dimethyl phthalate	ug/L		<20	<1.0	<4.0	<4.0	<4.0	<10	<1.0	<4.0	<4.0	<4.0	<4.0	<4.0	<1.0	<1.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
2,6-Dinitrotoluene	ug/L		<10	<0.50	<2.0	<2.0	<2.0	<5.0	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<0.50	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Diphenyl Ether	ug/L		<6.0	<0.30	<1.2	<1.2	<1.2	<3.0	<0.30	<1.2	<1.2	<1.2	<1.2	<1.2	<0.30	<0.30	<1.2	<1.2	<1.2	<1.2	<1.2	<1.2
Hexachlorobutadiene	ug/L		<8.0	<0.40	<1.6	<1.6	<1.6	<4.0	<0.40	<1.6	<1.6	<1.6	<1.6	<1.6	<0.40	<0.40	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6
Hexachlorocyclopentadiene	ug/L		<40	<2.0	<8.0	<8.0	<8.0	<20	<2.0	<8.0	<8.0	<8.0	<8.0	<8.0	<2.0	<2.0	<8.0	<8.0	<8.0	<8.0	<8.0	<8.0
Hexachloroethane	ug/L		<10	<0.50	<2.0	<2.0	<2.0	<5.0	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<0.50	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Isophorone	ug/L		<10	<0.50	<2.0	<7.0	<2.0	<5.0	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<0.50	<0.50	<2.0	<6.0	<2.0	<2.0	<2.0	<2.0
Nitrobenzene	ug/L		<10	<0.50	<2.0	<2.0	<2.0	<5.0	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<0.50	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Nitrosodiphenylamine/Diphenylamine	ug/L		<20	<1.0	<4.0	<4.0	<4.0	<10	<1.0	<4.0	<4.0	<4.0	<4.0	<4.0	<1.0	<1.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
N-Nitroso-di-n-propylamine	ug/L		<10	<0.50	<2.0	<2.0	<2.0	<5.0	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<0.50	<0.50	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0

NOTES: 1) Blank denotes data not available.
2) < - denotes parameter concentration is below the estimated quantitation limit or method reporting limit.
3) µg/L denotes microgram per litre.

Table E-3
Organic EPA 625 Chemical Results - Irrigation Liquid
Twin Creeks Environmental Centre - Poplar System

Parameter	Units	Target Concentration 100% Leachate	PS Holding Tank																			
			11-Aug-21	16-Sep-21	24-May-22	7-Jun-22	7-Jul-22	9-Aug-22	1-Sep-22	4-Oct-22	4-Oct-22	24-May-23	14-Jun-23	19-Jul-23	9-Aug-23	6-Sep-23	11-Oct-23	14-May-24	4-Jun-24	2-Jul-24	8-Aug-24	9-Sep-24	10-Oct-24
Acenaphthene	ug/L		<0.80	<0.80	<0.80	<1.0	<2.0	<0.80	<0.80	<2.0	<2.0	<2.0	0.9	<2.0	<2.0	<2.0	<0.80	<2.0	<0.80	<2.0	<0.80	<0.80	<4.0
Acenaphthylene	ug/L		<0.80	<0.80	<0.80	<1.0	<2.0	<0.80	<0.80	<2.0	<2.0	<2.0	<0.80	<2.0	<2.0	<2.0	<0.80	<2.0	<0.80	<2.0	<0.80	<0.80	<4.0
Anthracene	ug/L		<0.80	<0.80	<0.80	<1.0	<2.0	<0.80	<0.80	<2.0	<2.0	<2.0	<0.80	<2.0	<2.0	<2.0	<0.80	<2.0	<0.80	<2.0	<0.80	<0.80	<4.0
Benzo(a)anthracene	ug/L		<0.80	<0.80	<0.80	<1.0	<2.0	<0.80	<0.80	<2.0	<2.0	<2.0	<0.80	<2.0	<2.0	<2.0	<0.80	<2.0	<0.80	<2.0	<0.80	<0.80	<4.0
Benzo(a)pyrene	ug/L		<0.80	<0.80	<0.80	<1.0	<2.0	<0.80	<0.80	<2.0	<2.0	<2.0	<0.80	<2.0	<2.0	<2.0	<0.80	<2.0	<0.80	<2.0	<0.80	<0.80	<4.0
Benzo(b/j)fluoranthene	ug/L		<0.80	<0.80	<0.80	<1.0	<2.0	<0.80	<0.80	<2.0	<2.0	<2.0	<0.80	<2.0	<2.0	<2.0	<0.80	<2.0	<0.80	<2.0	<0.80	<0.80	<4.0
Benzo(g,h,i)perylene	ug/L		<0.80	<0.80	<0.80	<1.0	<2.0	<0.80	<0.80	<2.0	<2.0	<2.0	<0.80	<2.0	<2.0	<2.0	<0.80	<2.0	<0.80	<2.0	<0.80	<0.80	<4.0
Benzo(k)fluoranthene	ug/L		<0.80	<0.80	<0.80	<1.0	<2.0	<0.80	<0.80	<2.0	<2.0	<2.0	<0.80	<2.0	<2.0	<2.0	<0.80	<2.0	<0.80	<2.0	<0.80	<0.80	<4.0
1-Chloronaphthalene	ug/L		<4.0	<4.0	<4.0	<5.0	<10	<4.0	<4.0	<10	<10	<10	<4.0	<10	<10	<10	<4.0	<10	<4.0	<10	<4.0	<4.0	<20
2-Chloronaphthalene	ug/L		<2.0	<2.0	<2.0	<2.5	<5.0	<2.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<2.0	<5.0	<2.0	<2.0	<10
Chrysene	ug/L		<0.80	<0.80	<0.80	<1.0	<2.0	<0.80	<0.80	<2.0	<2.0	<2.0	<0.80	<2.0	<2.0	<2.0	<0.80	<2.0	<0.80	<2.0	<0.80	<0.80	<4.0
Dibenz(a,h)anthracene	ug/L		<0.80	<0.80	<0.80	<1.0	<2.0	<0.80	<0.80	<2.0	<2.0	<2.0	<0.80	<2.0	<2.0	<2.0	<0.80	<2.0	<0.80	<2.0	<0.80	<0.80	<4.0
Fluoranthene	ug/L		<0.80	<0.80	<0.80	<1.0	<2.0	<0.80	<0.80	<2.0	<2.0	<2.0	<0.80	<2.0	<2.0	<2.0	<0.80	<2.0	<0.80	<2.0	<0.80	<0.80	<4.0
Fluorene	ug/L		<0.80	<0.80	<0.80	<1.0	<2.0	<0.80	<0.80	<2.0	<2.0	<2.0	<0.80	<2.0	<2.0	<2.0	<0.80	<2.0	<0.80	<2.0	<0.80	<0.80	<4.0
Indeno(1,2,3-cd)pyrene	ug/L		<0.80	<0.80	<0.80	<1.0	<2.0	<0.80	<0.80	<2.0	<2.0	<2.0	<0.80	<2.0	<2.0	<2.0	<0.80	<2.0	<0.80	<2.0	<0.80	<0.80	<4.0
1-Methylnaphthalene	ug/L		<0.80	1.1	<0.80	<1.0	<2.0	<0.80	<0.80	<2.0	<2.0	<2.0	0.96	<2.0	<2.0	<2.0	<0.80	<2.0	<0.80	<2.0	<0.80	0.98	<4.0
2-Methylnaphthalene	ug/L		<0.80	1.3	<0.80	<1.0	<2.0	0.94	<0.80	<2.0	<2.0	<2.0	1.3	<2.0	<2.0	<2.0	<0.80	<2.0	<0.80	<2.0	<0.80	<0.80	<4.0
Naphthalene	ug/L		3.6	6.8	1.5	1.3	13	6.5	<0.80	8.0	8.0	4.6	10	6.1	4.1	2.8	3.8	2.6	3.1	9	<0.80	4.4	5.3
Perylene	ug/L		<0.80	<0.80	<0.80	<1.0	<2.0	<0.80	<0.80	<2.0	<2.0	<2.0	<0.80	<2.0	<2.0	<2.0	<0.80	<2.0	<0.80	<2.0	<0.80	<0.80	<4.0
Phenanthrene	ug/L		<0.80	<0.80	<0.80	<1.0	<2.0	<0.80	<0.80	<2.0	<2.0	<2.0	<0.80	<2.0	<2.0	<2.0	<0.80	<2.0	<0.80	<2.0	<0.80	<0.80	<4.0
Pyrene	ug/L		<0.80	<0.80	<0.80	<1.0	<2.0	<0.80	<0.80	<2.0	<2.0	<2.0	<0.80	<2.0	<2.0	<2.0	<0.80	<2.0	<0.80	<2.0	<0.80	<0.80	<4.0
1,2-Dichlorobenzene	ug/L		<2.0	<2.0	<2.0	<2.5	<5.0	<2.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<2.0	<5.0	<2.0	<2.0	<10
1,3-Dichlorobenzene	ug/L		<2.0	<2.0	<2.0	<2.5	<5.0	<2.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<2.0	<5.0	<2.0	<2.0	<10
1,4-Dichlorobenzene	ug/L		<2.0	2.1	<2.0	2.8	<5.0	<2.0	<2.0	<5.0	<5.0	3.1	<4.0	<20	1.2	1.7	2.4	3.2	2	<2.0	2.2	<0.80	<4.0
Hexachlorobenzene	ug/L		<2.0	<2.0	<2.0	<2.5	<5.0	<2.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<2.0	<5.0	<2.0	<2.0	<10
Pentachlorobenzene	ug/L		<2.0	<2.0	<2.0	<2.5	<5.0	<2.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<2.0	<5.0	<2.0	<2.0	<10
1,2,3,5-Tetrachlorobenzene	ug/L		<2.0	<2.0	<2.0	<2.5	<5.0	<2.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<2.0	<5.0	<2.0	<2.0	<10
1,2,4,5-Tetrachlorobenzene	ug/L		<2.0	<2.0	<2.0	<2.5	<5.0	<2.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<2.0	<5.0	<2.0	<2.0	<10
1,2,3-Trichlorobenzene	ug/L		<2.0	<2.0	<2.0	<2.5	<5.0	<2.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<2.0	<5.0	<2.0	<2.0	<10
1,2,4-Trichlorobenzene	ug/L		<2.0	<2.0	<2.0	<2.5	<5.0	<2.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<2.0	<5.0	<2.0	<2.0	<10
1,3,5-Trichlorobenzene	ug/L		<2.0	<2.0	<2.0	<2.5	<5.0	<2.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<2.0	<5.0	<2.0	<2.0	<10
2-Chlorophenol	ug/L		<1.2	<1.2	<1.2	<1.5	<3.0	<1.2	<1.2	<3.0	<3.0	<3.0	<1.2	<3.0	<3.0	<3.0	<1.2	<3.0	<1.2	<3.0	<1.2	<1.2	<6.0
4-Chloro-3-Methylphenol	ug/L		<2.0	<2.0	<2.0	<2.5	<5.0	<2.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<2.0	<5.0	<2.0	<2.0	<10
m/p-Cresol	ug/L		99	8.6	13	<2.5	26	8.5	<2.0	100	100	230	180	260	99	77	110	77	17	19	<2.0	8.7	18
o-Cresol	ug/L		4.8	<2.0	2.6	<2.5	<5.0	2.1	<2.0	11	11	6.7	6.1	8.8	<5.0	<5.0	4.5	5.2	<2.0	<5.0	<2.0	4.3	<10
1,2,3,4-Tetrachlorobenzene	ug/L		<2.0	<2.0	<2.0	<2.5	<5.0	<2.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<2.0	<5.0	<2.0	<2.0	<10
2,3-Dichlorophenol	ug/L		<2.0	<2.0	<2.0	<2.5	<5.0	<2.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<2.0	<5.0	<2.0	<2.0	<10
2,4-Dichlorophenol	ug/L		<1.2	<1.2	<1.2	<1.5	<3.0	<1.2	<1.2	<3.0	<3.0	<3.0	<1.2	<3.0	<3.0	<3.0	<1.2	<3.0	<1.2	<3.0	<1.2	<1.2	<6.0
2,5-Dichlorophenol	ug/L		<2.0	<2.0	<2.0	<2.5	<5.0	<2.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<2.0	<5.0	<2.0	<2.0	<10
2,6-Dichlorophenol	ug/L		<2.0	<2.0	<2.0	<2.5	<5.0	<2.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<2.0	<5.0	<2.0	<2.0	<10
3,4-Dichlorophenol	ug/L		<2.0	<2.0	<2.0	<2.5	<5.0	<2.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<2.0	<5.0	<2.0	<2.0	<10
3,5-Dichlorophenol	ug/L		<2.0	<2.0	<2.0	<2.5	<5.0	<2.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<2.0	<5.0	<2.0	<2.0	<10
2,4-Dimethylphenol	ug/L		15	5.2	2.4	<2.5	6.0	4.1	<2.0	<5.0	<5.0	6.5	<2.0	7.1	<5.0	<5.0	<2.0	<5.0	3.7	5.2	2.1	6.5	<10
2,4-Dinitrophenol	ug/L		<8.0	<8.0	<8.0	<10	<20	<8.0	<8.0	<20	<20	<20	<20	<20	<20	<20	<40	<20	<8.0	<20	<8.0	<8.0	<40
4,6-Dinitro-2-methylphenol	ug/L		<8.0	<8.0	<8.0	<10	<20	<8.0	<8.0	<20	<20	<20	<8.0	<20	<20	<20	<40	<20	<8.0	<20	<8.0	<8.0	<40
2-Nitrophenol	ug/L		<2.0	<2.0	<2.0	<2.5	<5.0	<2.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<2.0	<5.0	<2.0	<2.0	<10
4-Nitrophenol	ug/L		<5.6	<5.6	<5.6	<7.0	<14	<5.6	<5.6	<14	<14	<14	<5.6	<14	<14	<14	<5.6	<14	<5.6	<14	<5.6	<5.6	<28
Pentachlorophenol	ug/L		<4.0	<4.0	<4.0	<5.0	<10	<4.0	<4.0	<10	<10	<10	<4.0	<10	<10	<10	<8.0	<10	<4.0	<10	<4.0	<4.0	<20
Phenol	ug/L		7.4	<2.0	2.5	<2.5	9.1	2.8	<2.0	100	100	80	55	87	34	21	44	32	5.9	<5.0	<2.0	39	14
2,3,4,5-Tetrachlorophenol	ug/L		<1.6	<1.6	<1.6	<2.0	<4.0	<1.6	<1.6	<4.0	<4.0	<4.0	<1.6	<4.0	<4.0	<4.0	<1.6	<4.0	<1.6	<4.0	<1.6	<1.6	<8.0
2,3,4,6-Tetrachlorophenol	ug/L		<2.0	<2.0	<2.0	<2.5	<5.0	<2.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<2.0	<5.0	<2.0	<2.0	<10
2,3,5,6-Tetrachlorophenol	ug/L		<2.0	<2.0	<2.0	<2.5	<5.0	<2.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<2.0	<5.0	<2.0	<2.0	<10
2,3,4-Trichlorophenol	ug/L		<2.0	<2.0	<2.0	<2.5	<5.0	<2.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<2.0	<5.0	<2.0	<2.0	<10
2,3,5-Trichlorophenol	ug/L		<2.0	<2.0	<2.0	<2.5	<5.0	<2.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<2.0	<5.0	<2.0	<2.0	<10
2,3,6-Trichlorophenol	ug/L		<2.0	<2.0	<2.0	<2.5	<5.0	<2.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<2.0	<5.0	<2.0	<2.0	<10
2,4,5-Trichlorophenol	ug/L		<2.0	<2.0	<2.0	<2.5	<5.0	<2.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<2.0	<5.0	<2.0	<2.0	<10
2,4,6-Trichlorophenol	ug/L		<2.0	<2.0	<2.0	<2.5	<5.0	<2.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<2.0	<5.0	<2.0	<2.0	<10
3,4,5-Trichlorophenol	ug/L		<2.0	<2.0	<2.0	<2.5	<5.0	<2.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<2.0	<5.0	<2.0	<2.0	<10
Benzyl butyl phthalate	ug/L		<2.0	<2.0	<2.0	<2.5	<5.0	<2.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<2.0	<5.0	<2.0	<2.0	<10
Biphenyl	ug/L		<2.0	<2.0	<2.0	<2.5	<5.0	<2.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<2.0	<5.0	<2.0	<2.0	<10
Bis(2-chloroethyl)ether	ug/L		<2.0	<2.0	<2.0	<2.5	<5.0	<2.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<2.0	<5.0	<2.0	<2.0	<10
Bis(2-chloroethoxy)methane	ug/L		<2.0	<2.0	<2.0	<2.5	<5.0	<2.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<2.0	<5.0	<2.0	<2.0	<10
Bis(2-chloroisopropyl)ether	ug/L		<2.0	<2.0	<2.0	<2.5	<5.0	<2.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<2.0	<5.0	<2.0	<2.0	<10
Bis(2-ethylhexyl)phthalate	ug/L		<8.0	<8.0	<8.0	<10	<20	<8.0	<8.0	<20	<20	<20	<8.0	<20	<20	<20	<8.0	<20	<8.0	<20	<8.0	<8.0	<40
4-Bromophenyl phenyl ether	ug/L		<1.2	<1.2	<1.2	<1.5	<3.0	<1.2	<1.2	<3.0	<3.0	<3.0	<1.2	<3.0	<3.0	<3.0	<1.2	<3.0	<1.2	<3.0	<1.2	<1.2	<6.0
p-Chloroaniline	ug/L		<4.0	<4.0	<4.0	<5.0	<10	<4.0	<4.0	<10	<10	<10	<4.0	<10	<10	<10	<4.0	<10	<4.0	<10	<4.0	<4.0	<20
4-Chlorophenyl phenyl ether	ug/L		<2.0	<2.0	<2.0	<2.5	<5.0	<2.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<2.0	<5.0	<2.0	<2.0	<10
Di-N-butyl phthalate	ug/L		<8.0	<8.0	<8.0	<10	<20	<8.0	<8.0	<20	<20	<20	<8.0	<20	<20	<20	<8.0	<20	<8.0	<20	<8.0	<8.0	<40
Di-N-octyl phthalate	ug/L		<3.2	<3.2	<3.2	<4.0	<8.0	<3.2	<3.2	<8.0	<8.0	<8.0	<3.2	<8.0	<8.0	<8.0	<3.2	<8.0	<3.2	<8.0	<3.2	<3.2	<16
2,4-Dinitrotoluene	ug/L		<2.0	<2.0	<2.0	<2.5	<5.0	<2.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<2.0	<5.0	<2.0	<2.0	<10
Diethyl phthalate	ug/L		4.2	<4.0	<4.0	<5.0	<10	<4.0	<4.0	<10	<10	<10	<4.0	<10	<10	<10	<4.0	<10	<4.0	<10	<4.0	<4.0	<20
3,3'-Dichlorobenzidine	ug/L		<2.0	<2.0	<2.0	<2.5	<5.0	<2.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<2.0	<5.0	<2.0	<2.0	<10
Dimethyl phthalate	ug/L		<4.0	<4.0	<4.0	<5.0	<10	<4.0	<4.0	<10	<10	<10	<4.0	<10	<10	<10	<4.0	<10	<4.0	<10	<4.0	<4.0	<20
2,6-Dinitrotoluene	ug/L		<2.0	<2.0	<2.0	<2.5	<5.0	<2.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<2.0	<5.0	<2.0	<2.0	<10
Diphenyl Ether	ug/L		<1.2	<1.2	<1.2	<1.5	<3.0	<1.2	<1.2	<3.0	<3.0	<3.0	<1.2	<3.0	<3.0	<3.0	<1.2	<3.0	<1.2	<3.0	<1.2	<1.2	<6.0
Hexachlorobutadiene	ug/L		<1.6	<1.6	<1.6	<2.0	<4.0	<1.6	<1.6	<4.0	<4.0	<4.0	<1.6	<4.0	<4.0	<4.0	<1.6	<4.0	<1.6	<4.0	<1.6	<1.6	<8.0
Hexachlorocyclopentadiene	ug/L		<8.0	<8.0	<8.0	<10	<20	<8.0	<8.0	<20	<20	<20	<8.0	<20	<20	<20	<8.0	<20	<8.0	<20	<8.0	<8.0	<40
Hexachloroethane	ug/L		<2.0	<2.0	<2.0	<2.5	<5.0	<2.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<2.0	<5.0	<2.0	<2.0	<10
Isophorone	ug/L		<2.0	<2.0	<2.0	<2.5	<5.0	<4.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<2.0	<5.0	<2.0	<2.0	<10
Nitrobenzene	ug/L		<2.0	<2.0	<2.0	<2.5	<5.0	<2.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<2.0	<5.0	<2.0	<2.0	<10
Nitrosodiphenylamine/Diphenylamine	ug/L		<4.0	<4.0	<4.0	<5.0	<10	<4.0	<4.0	<10	<10	<10	<4.0	<10	<10	<10	<4.0	<10	<4.0	<10	<4.0	<4.0	<20
N-Nitroso-di-n-propylamine	ug/L		<2.0	<2.0	<2.0	<2.5	<5.0	<2.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<5.0	<5.0	<2.0	<5.0	<2.0	<5.0	<2.0	<2.0	<10

NOTES: 1) Blank denotes data not available.
2) < - denotes parameter concentration is below the estimated quantitation limit or method reporting limit.
3) µg/L denotes microgram per litre.

APPENDIX E-4:

2024 Certificates of Analysis

Your P.O. #: 13384121
Your Project #: 2402553.01
Site#: 500
Site Location: ON07
Your C.O.C. #: 897411

Attention: Khalid Hussein - Twin Creeks

RWDI Inc.
600 Southgate Drive
Guelph, ON
Canada N1G 4P6

Report Date: 2024/05/24
Report #: R8161714
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C4E5640
Received: 2024/05/15, 09:58

Sample Matrix: Leachate
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
ABN Compounds in Water by GC/MS	1	2024/05/16	2024/05/17	CAM SOP-00301	EPA 8270 m
Alkalinity	1	N/A	2024/05/19	CAM SOP-00448	SM 24 2320 B m
Chloride by Automated Colourimetry	1	N/A	2024/05/17	CAM SOP-00463	SM 24 4500-Cl E m
Conductance in Water - On-site	1	N/A	2024/05/22		
Total Metals by ICPMS	1	N/A	2024/05/16	CAM SOP-00447	EPA 6020B m
Ammonia-N	1	N/A	2024/05/23	CAM SOP-00441	USGS I-2522-90 m
Nitrate & Nitrite as Nitrogen in Water (1)	1	N/A	2024/05/16	CAM SOP-00440	SM 24 4500-NO3I/NO2B
Field Measured pH (2)	1	N/A	2024/05/15		Field pH Meter
Sulphate by Automated Turbidimetry	1	N/A	2024/05/17	CAM SOP-00464	SM 24 4500-SO42- E m
Field Temperature (2)	1	N/A	2024/05/15		Field Thermometer
Total Kjeldahl Nitrogen in Water	1	2024/05/16	2024/05/21	CAM SOP-00938	OMOE E3516 m
Total Phosphorus (Colourimetric)	1	2024/05/17	2024/05/23	CAM SOP-00407	SM 24 4500-P I
Turbidity - On-site	1	N/A	2024/05/22		
Un-ionized Ammonia (3)	1	2024/05/15	2024/05/23	Auto Calc.	PWQO
Volatile Organic Compounds in Water	1	N/A	2024/05/17	CAM SOP-00228	EPA 8260D
Non-Routine Volatile Organic Compounds	1	N/A	2024/05/18	CAM SOP-00226	EPA 8260D m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, EPA, APHA or the Quebec Ministry of Environment.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Your P.O. #: 13384121
Your Project #: 2402553.01
Site#: 500
Site Location: ON07
Your C.O.C. #: 897411

Attention: Khalid Hussein - Twin Creeks

RWDI Inc.
600 Southgate Drive
Guelph, ON
Canada N1G 4P6

Report Date: 2024/05/24
Report #: R8161714
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C4E5640

Received: 2024/05/15, 09:58

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.
(2) This is a field test, therefore, the results relate to items that were not analysed at Bureau Veritas.
(3) Un-ionized ammonia is calculated using the total ammonia result and field data provided by the client for pH and temperature.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to:
Patricia Legette, Project Manager
Email: Patricia.Legette@bureauveritas.com
Phone# (905)817-5799

==========

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

Bureau Veritas Job #: C4E5640
Report Date: 2024/05/24

RWDI Inc.
Client Project #: 2402553.01
Site Location: ON07
Your P.O. #: 13384121
Sampler Initials: EW

RESULTS OF ANALYSES OF LEACHATE

Bureau Veritas ID		ZEE860		
Sampling Date		2024/05/14 12:00		
COC Number		897411		
	UNITS	**PS Holding Tank**	**RDL**	**QC Batch**
Calculated Parameters				
Total Un-ionized Ammonia	mg/L	1.6	0.021	9394744
Field Measurements				
Field Conductivity	uS/cm	5990	N/A	ONSITE
Field Temperature	Celsius	16.7	N/A	ONSITE
Field Measured Field Turbidity	NTU	51.3	N/A	ONSITE
Field Measured pH	pH	7.1		ONSITE
Inorganics				
Total Ammonia-N	mg/L	345	4.5	9400754
Total Kjeldahl Nitrogen (TKN)	mg/L	350	10	9398966
Total Phosphorus	mg/L	0.78	0.030	9400150
Dissolved Sulphate (SO4)	mg/L	86	1.0	9396371
Alkalinity (Total as CaCO3)	mg/L	2000	5.0	9396154
Dissolved Chloride (Cl-)	mg/L	320	3.0	9396368
Nitrite (N)	mg/L	<0.010	0.010	9396286
Nitrate (N)	mg/L	<0.10	0.10	9396286

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

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C4E5640
Report Date: 2024/05/24

RWDI Inc.
Client Project #: 2402553.01
Site Location: ON07
Your P.O. #: 13384121
Sampler Initials: EW

ELEMENTS BY ATOMIC SPECTROSCOPY (LEACHATE)

Bureau Veritas ID		ZEE860		
Sampling Date		2024/05/14 12:00		
COC Number		897411		
	UNITS	PS Holding Tank	RDL	QC Batch
Metals				
Total Aluminum (Al)	mg/L	0.41	0.02	9397383
Total Arsenic (As)	mg/L	0.016	0.001	9397383
Total Barium (Ba)	mg/L	0.17	0.005	9397383
Total Beryllium (Be)	mg/L	<0.0006	0.0006	9397383
Total Bismuth (Bi)	mg/L	<0.001	0.001	9397383
Total Boron (B)	mg/L	9.5	0.1	9397383
Total Cadmium (Cd)	mg/L	<0.0001	0.0001	9397383
Total Calcium (Ca)	mg/L	160	0.2	9397383
Total Chromium (Cr)	mg/L	0.019	0.005	9397383
Total Cobalt (Co)	mg/L	0.0041	0.0005	9397383
Total Copper (Cu)	mg/L	<0.002	0.002	9397383
Total Iron (Fe)	mg/L	2.2	0.1	9397383
Total Lead (Pb)	mg/L	0.0006	0.0005	9397383
Total Magnesium (Mg)	mg/L	120	0.05	9397383
Total Molybdenum (Mo)	mg/L	0.003	0.002	9397383
Total Nickel (Ni)	mg/L	0.038	0.001	9397383
Total Potassium (K)	mg/L	95	0.2	9397383
Total Selenium (Se)	mg/L	<0.005	0.005	9397383
Total Silver (Ag)	mg/L	<0.0004	0.0004	9397383
Total Sodium (Na)	mg/L	380	0.1	9397383
Total Strontium (Sr)	mg/L	1.1	0.003	9397383
Total Tin (Sn)	mg/L	0.002	0.002	9397383
Total Titanium (Ti)	mg/L	0.025	0.005	9397383
Total Vanadium (V)	mg/L	0.006	0.001	9397383
Total Zinc (Zn)	mg/L	<0.01	0.01	9397383

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

SEMI-VOLATILE ORGANICS BY GC-MS (LEACHATE)

Bureau Veritas ID		ZEE860		
Sampling Date		2024/05/14 12:00		
COC Number		897411		
	UNITS	PS Holding Tank	RDL	QC Batch
Semivolatile Organics				
Acenaphthene	ug/L	<2.0	2.0	9396641
Acenaphthylene	ug/L	<2.0	2.0	9396641
Anthracene	ug/L	<2.0	2.0	9396641
Benzo(a)anthracene	ug/L	<2.0	2.0	9396641
Benzo(a)pyrene	ug/L	<2.0	2.0	9396641
Benzo(b/j)fluoranthene	ug/L	<2.0	2.0	9396641
Benzo(g,h,i)perylene	ug/L	<2.0	2.0	9396641
Benzo(k)fluoranthene	ug/L	<2.0	2.0	9396641
1-Chloronaphthalene	ug/L	<10	10	9396641
2-Chloronaphthalene	ug/L	<5.0	5.0	9396641
Chrysene	ug/L	<2.0	2.0	9396641
Dibenzo(a,h)anthracene	ug/L	<2.0	2.0	9396641
Fluoranthene	ug/L	<2.0	2.0	9396641
Fluorene	ug/L	<2.0	2.0	9396641
Indeno(1,2,3-cd)pyrene	ug/L	<2.0	2.0	9396641
1-Methylnaphthalene	ug/L	<2.0	2.0	9396641
2-Methylnaphthalene	ug/L	<2.0	2.0	9396641
Naphthalene	ug/L	2.6	2.0	9396641
Perylene	ug/L	<2.0	2.0	9396641
Phenanthrene	ug/L	<2.0	2.0	9396641
Pyrene	ug/L	<2.0	2.0	9396641
1,2-Dichlorobenzene	ug/L	<5.0	5.0	9396641
1,3-Dichlorobenzene	ug/L	<5.0	5.0	9396641
Hexachlorobenzene	ug/L	<5.0	5.0	9396641
Pentachlorobenzene	ug/L	<5.0	5.0	9396641
1,2,3,5-Tetrachlorobenzene	ug/L	<5.0	5.0	9396641
1,2,4,5-Tetrachlorobenzene	ug/L	<5.0	5.0	9396641
1,2,3-Trichlorobenzene	ug/L	<5.0	5.0	9396641
1,2,4-Trichlorobenzene	ug/L	<5.0	5.0	9396641
1,3,5-Trichlorobenzene	ug/L	<5.0	5.0	9396641
2-Chlorophenol	ug/L	<3.0	3.0	9396641
4-Chloro-3-Methylphenol	ug/L	<5.0	5.0	9396641

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

SEMI-VOLATILE ORGANICS BY GC-MS (LEACHATE)

Bureau Veritas ID		ZEE860		
Sampling Date		2024/05/14 12:00		
COC Number		897411		
	UNITS	**PS Holding Tank**	**RDL**	**QC Batch**
m/p-Cresol	ug/L	77	5.0	9396641
o-Cresol	ug/L	5.2	5.0	9396641
1,2,3,4-Tetrachlorobenzene	ug/L	<5.0	5.0	9396641
2,3-Dichlorophenol	ug/L	<5.0	5.0	9396641
2,4-Dichlorophenol	ug/L	<3.0	3.0	9396641
2,5-Dichlorophenol	ug/L	<5.0	5.0	9396641
2,6-Dichlorophenol	ug/L	<5.0	5.0	9396641
3,4-Dichlorophenol	ug/L	<5.0	5.0	9396641
3,5-Dichlorophenol	ug/L	<5.0	5.0	9396641
2,4-Dimethylphenol	ug/L	<5.0	5.0	9396641
2,4-Dinitrophenol	ug/L	<20	20	9396641
4,6-Dinitro-2-methylphenol	ug/L	<20	20	9396641
2-Nitrophenol	ug/L	<5.0	5.0	9396641
4-Nitrophenol	ug/L	<14	14	9396641
Pentachlorophenol	ug/L	<10	10	9396641
Phenol	ug/L	32	5.0	9396641
2,3,4,5-Tetrachlorophenol	ug/L	<4.0	4.0	9396641
2,3,4,6-Tetrachlorophenol	ug/L	<5.0	5.0	9396641
2,3,5,6-Tetrachlorophenol	ug/L	<5.0	5.0	9396641
2,3,4-Trichlorophenol	ug/L	<5.0	5.0	9396641
2,3,5-Trichlorophenol	ug/L	<5.0	5.0	9396641
2,3,6-Trichlorophenol	ug/L	<5.0	5.0	9396641
2,4,5-Trichlorophenol	ug/L	<5.0	5.0	9396641
2,4,6-Trichlorophenol	ug/L	<5.0	5.0	9396641
3,4,5-Trichlorophenol	ug/L	<5.0	5.0	9396641
Benzyl butyl phthalate	ug/L	<5.0	5.0	9396641
Biphenyl	ug/L	<5.0	5.0	9396641
Bis(2-chloroethyl)ether	ug/L	<5.0	5.0	9396641
Bis(2-chloroethoxy)methane	ug/L	<5.0	5.0	9396641
Bis(2-chloroisopropyl)ether	ug/L	<5.0	5.0	9396641
Bis(2-ethylhexyl)phthalate	ug/L	<20	20	9396641
4-Bromophenyl phenyl ether	ug/L	<3.0	3.0	9396641
p-Chloroaniline	ug/L	<10	10	9396641

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

SEMI-VOLATILE ORGANICS BY GC-MS (LEACHATE)

Bureau Veritas ID		ZEE860		
Sampling Date		2024/05/14 12:00		
COC Number		897411		
	UNITS	**PS Holding Tank**	**RDL**	**QC Batch**
4-Chlorophenyl phenyl ether	ug/L	<5.0	5.0	9396641
Di-N-butyl phthalate	ug/L	<20	20	9396641
di-n-octyl phthalate	ug/L	<8.0	8.0	9396641
2,4-Dinitrotoluene	ug/L	<5.0	5.0	9396641
Diethyl phthalate	ug/L	<10	10	9396641
3,3'-Dichlorobenzidine	ug/L	<5.0	5.0	9396641
Dimethyl phthalate	ug/L	<10	10	9396641
2,6-Dinitrotoluene	ug/L	<5.0	5.0	9396641
Diphenyl Ether	ug/L	<3.0	3.0	9396641
Hexachlorobutadiene	ug/L	<4.0	4.0	9396641
Hexachlorocyclopentadiene	ug/L	<20	20	9396641
Hexachloroethane	ug/L	<5.0	5.0	9396641
Isophorone	ug/L	<5.0	5.0	9396641
Nitrobenzene	ug/L	<5.0	5.0	9396641
Nitrosodiphenylamine/Diphenylamine	ug/L	<10	10	9396641
N-Nitroso-di-n-propylamine	ug/L	<5.0	5.0	9396641
Surrogate Recovery (%)				
2,4,6-Tribromophenol	%	87		9396641
2-Fluorobiphenyl	%	73		9396641
2-Fluorophenol	%	37		9396641
D14-Terphenyl	%	88		9396641
D5-Nitrobenzene	%	80		9396641
D5-Phenol	%	29		9396641

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

VOLATILE ORGANICS BY GC/MS (LEACHATE)

Bureau Veritas ID		ZEE860		
Sampling Date		2024/05/14 12:00		
COC Number		897411		
	UNITS	**PS Holding Tank**	**RDL**	**QC Batch**
Volatile Organics				
Acetone (2-Propanone)	ug/L	3300	10	9398164
Benzene	ug/L	5.2	0.20	9398164
Bromodichloromethane	ug/L	<0.50	0.50	9398164
Bromoform	ug/L	<1.0	1.0	9398164
Bromomethane	ug/L	<0.50	0.50	9398164
Carbon Tetrachloride	ug/L	<0.19	0.19	9398164
Chlorobenzene	ug/L	2.9	0.20	9398164
Chloroethane	ug/L	2.3	1.0	9398164
Chloroform	ug/L	<0.20	0.20	9398164
Chloromethane	ug/L	<5.0	5.0	9398164
Dibromochloromethane	ug/L	<0.50	0.50	9398164
1,2-Dichlorobenzene	ug/L	<0.40	0.40	9398164
1,3-Dichlorobenzene	ug/L	<0.40	0.40	9398164
1,4-Dichlorobenzene	ug/L	3.2	0.40	9398164
1,1-Dichloroethane	ug/L	0.68	0.20	9398164
1,2-Dichloroethane	ug/L	0.81	0.49	9398164
1,1-Dichloroethylene	ug/L	<0.20	0.20	9398164
cis-1,2-Dichloroethylene	ug/L	0.68	0.50	9398164
trans-1,2-Dichloroethylene	ug/L	<0.50	0.50	9398164
1,2-Dichloropropane	ug/L	<0.20	0.20	9398164
cis-1,3-Dichloropropene	ug/L	<0.30	0.30	9398164
trans-1,3-Dichloropropene	ug/L	<0.40	0.40	9398164
Ethylbenzene	ug/L	14	0.20	9398164
Ethylene Dibromide	ug/L	<0.19	0.19	9398164
Methylene Chloride(Dichloromethane)	ug/L	<2.0	2.0	9398164
Methyl Ethyl Ketone (2-Butanone)	ug/L	3400	10	9398164
Methyl Isobutyl Ketone	ug/L	26	5.0	9398164
Methyl t-butyl ether (MTBE)	ug/L	1.0	0.50	9398164
Styrene	ug/L	<0.40	0.40	9398164
1,1,1,2-Tetrachloroethane	ug/L	<0.50	0.50	9398164
1,1,2,2-Tetrachloroethane	ug/L	<0.40	0.40	9398164
Tetrachloroethylene	ug/L	<0.20	0.20	9398164

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

RWDI Inc.
Client Project #: 2402553.01
Site Location: ON07
Your P.O. #: 13384121
Sampler Initials: EW

VOLATILE ORGANICS BY GC/MS (LEACHATE)

Bureau Veritas ID		ZEE860		
Sampling Date		2024/05/14 12:00		
COC Number		897411		
	UNITS	**PS Holding Tank**	**RDL**	**QC Batch**
1,3,5-Trimethylbenzene	ug/L	<4.0	4.0	9388705
Toluene	ug/L	9.6	0.20	9398164
1,1,1-Trichloroethane	ug/L	<0.20	0.20	9398164
1,1,2-Trichloroethane	ug/L	<0.40	0.40	9398164
Trichloroethylene	ug/L	<0.20	0.20	9398164
Trichlorofluoromethane (FREON 11)	ug/L	<0.50	0.50	9398164
Vinyl Chloride	ug/L	0.56	0.20	9398164
p+m-Xylene	ug/L	22	0.20	9398164
o-Xylene	ug/L	9.7	0.20	9398164
Total Xylenes	ug/L	32	0.20	9398164
Surrogate Recovery (%)				
4-Bromofluorobenzene	%	98		9398164
D4-1,2-Dichloroethane	%	106		9398164
D8-Toluene	%	92		9398164
4-Bromofluorobenzene	%	96		9388705
D4-1,2-Dichloroethane	%	106		9388705
D8-Toluene	%	99		9388705

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

GENERAL COMMENTS

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

Package 1	7.0°C

Sample ZEE860 [PS Holding Tank] : ABN Analysis: Due to the sample matrix, a smaller amount was used for analysis. Detection limits were adjusted accordingly.

VOC Water Analysis: Due to foaming, sample required dilution. The detection limits were adjusted accordingly.

Results relate only to the items tested.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

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
9388705	4-Bromofluorobenzene	2024/05/18	100 (1)	70 - 130	99	70 - 130	103	%				
9388705	D4-1,2-Dichloroethane	2024/05/18	102 (1)	70 - 130	104	70 - 130	121	%				
9388705	D8-Toluene	2024/05/18	100 (1)	70 - 130	102	70 - 130	96	%				
9396641	2,4,6-Tribromophenol	2024/05/16	61	10 - 130	84	10 - 130	77	%				
9396641	2-Fluorobiphenyl	2024/05/16	45	30 - 130	73	30 - 130	81	%				
9396641	2-Fluorophenol	2024/05/16	23	10 - 130	45	10 - 130	39	%				
9396641	D14-Terphenyl	2024/05/16	85	30 - 130	97	30 - 130	93	%				
9396641	D5-Nitrobenzene	2024/05/16	55	30 - 130	92	30 - 130	89	%				
9396641	D5-Phenol	2024/05/16	18	10 - 130	32	10 - 130	30	%				
9398164	4-Bromofluorobenzene	2024/05/17	99	70 - 130	99	70 - 130	102	%				
9398164	D4-1,2-Dichloroethane	2024/05/17	104	70 - 130	100	70 - 130	107	%				
9398164	D8-Toluene	2024/05/17	105	70 - 130	105	70 - 130	89	%				
9388705	1,3,5-Trimethylbenzene	2024/05/18	115 (1)	60 - 140	104	60 - 140	<0.20	ug/L	NC (2)	30		
9396154	Alkalinity (Total as CaCO3)	2024/05/19			100	85 - 115	<1.0	mg/L	NC (3)	20		
9396286	Nitrate (N)	2024/05/16	NC	80 - 120	103	80 - 120	<0.10	mg/L	0.61 (3)	20		
9396286	Nitrite (N)	2024/05/16	85	80 - 120	97	80 - 120	<0.010	mg/L	2.6 (3)	20		
9396368	Dissolved Chloride (Cl-)	2024/05/17	86	80 - 120	93	80 - 120	<1.0	mg/L	8.8 (3)	20		
9396371	Dissolved Sulphate (SO4)	2024/05/17	91	75 - 125	95	80 - 120	<1.0	mg/L	14 (3)	20		
9396641	1,2,3,4-Tetrachlorobenzene	2024/05/16	41	30 - 130	63	30 - 130	<0.50	ug/L				
9396641	1,2,3,5-Tetrachlorobenzene	2024/05/16	36	30 - 130	55	30 - 130	<0.50	ug/L				
9396641	1,2,3-Trichlorobenzene	2024/05/16	38	30 - 130	62	30 - 130	<0.50	ug/L				
9396641	1,2,4,5-Tetrachlorobenzene	2024/05/16	35	30 - 130	59	30 - 130	<0.50	ug/L				
9396641	1,2,4-Trichlorobenzene	2024/05/16	35	30 - 130	53	30 - 130	<0.50	ug/L				
9396641	1,2-Dichlorobenzene	2024/05/16	37	30 - 130	62	30 - 130	<0.50	ug/L				
9396641	1,3,5-Trichlorobenzene	2024/05/16	45	30 - 130	77	30 - 130	<0.50	ug/L				
9396641	1,3-Dichlorobenzene	2024/05/16	35	30 - 130	54	30 - 130	<0.50	ug/L				
9396641	1-Chloronaphthalene	2024/05/16	44	30 - 130	66	30 - 130	<1.0	ug/L				
9396641	1-Methylnaphthalene	2024/05/16	48	30 - 130	72	30 - 130	<0.20	ug/L				
9396641	2,3,4,5-Tetrachlorophenol	2024/05/16	82	10 - 130	111	10 - 130	<0.40	ug/L				
9396641	2,3,4,6-Tetrachlorophenol	2024/05/16	60	10 - 130	90	10 - 130	<0.50	ug/L				

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
9396641	2,3,4-Trichlorophenol	2024/05/16	59	10 - 130	99	10 - 130	<0.50	ug/L				
9396641	2,3,5,6-Tetrachlorophenol	2024/05/16	50	10 - 130	76	10 - 130	<0.50	ug/L				
9396641	2,3,5-Trichlorophenol	2024/05/16	52	10 - 130	94	10 - 130	<0.50	ug/L				
9396641	2,3,6-Trichlorophenol	2024/05/16	50	10 - 130	87	10 - 130	<0.50	ug/L				
9396641	2,3-Dichlorophenol	2024/05/16	50	10 - 130	87	10 - 130	<0.50	ug/L				
9396641	2,4,5-Trichlorophenol	2024/05/16	60	10 - 130	94	10 - 130	<0.50	ug/L				
9396641	2,4,6-Trichlorophenol	2024/05/16	51	10 - 130	92	10 - 130	<0.50	ug/L				
9396641	2,4-Dichlorophenol	2024/05/16	46	10 - 130	86	10 - 130	<0.30	ug/L				
9396641	2,4-Dimethylphenol	2024/05/16	34	10 - 130	67	10 - 130	<0.50	ug/L				
9396641	2,4-Dinitrophenol	2024/05/16	65	10 - 130	89	10 - 130	<2.0	ug/L				
9396641	2,4-Dinitrotoluene	2024/05/16	74	30 - 130	106	30 - 130	<0.50	ug/L				
9396641	2,5-Dichlorophenol	2024/05/16	50	10 - 130	87	10 - 130	<0.50	ug/L				
9396641	2,6-Dichlorophenol	2024/05/16	46	10 - 130	86	10 - 130	<0.50	ug/L				
9396641	2,6-Dinitrotoluene	2024/05/16	58	30 - 130	98	30 - 130	<0.50	ug/L				
9396641	2-Chloronaphthalene	2024/05/16	43	30 - 130	72	30 - 130	<0.50	ug/L				
9396641	2-Chlorophenol	2024/05/16	46	10 - 130	82	10 - 130	<0.30	ug/L				
9396641	2-Methylnaphthalene	2024/05/16	48	30 - 130	71	30 - 130	<0.20	ug/L				
9396641	2-Nitrophenol	2024/05/16	49	10 - 130	88	10 - 130	<0.50	ug/L				
9396641	3,3'-Dichlorobenzidine	2024/05/16	72	30 - 130	94	30 - 130	<0.50	ug/L				
9396641	3,4,5-Trichlorophenol	2024/05/16	92	10 - 130	108	10 - 130	<0.50	ug/L				
9396641	3,4-Dichlorophenol	2024/05/16	63	10 - 130	93	10 - 130	<0.50	ug/L				
9396641	3,5-Dichlorophenol	2024/05/16	70	10 - 130	95	10 - 130	<0.50	ug/L				
9396641	4,6-Dinitro-2-methylphenol	2024/05/16	82	10 - 130	105	10 - 130	<2.0	ug/L				
9396641	4-Bromophenyl phenyl ether	2024/05/16	65	30 - 130	103	30 - 130	<0.30	ug/L				
9396641	4-Chloro-3-Methylphenol	2024/05/16	54	10 - 130	90	10 - 130	<0.50	ug/L				
9396641	4-Chlorophenyl phenyl ether	2024/05/16	46	30 - 130	73	30 - 130	<0.50	ug/L				
9396641	4-Nitrophenol	2024/05/16	31	10 - 130	36	10 - 130	<1.4	ug/L				
9396641	Acenaphthene	2024/05/16	53	30 - 130	80	30 - 130	<0.20	ug/L				
9396641	Acenaphthylene	2024/05/16	53	30 - 130	83	30 - 130	<0.20	ug/L				
9396641	Anthracene	2024/05/16	68	30 - 130	93	30 - 130	<0.20	ug/L				

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
9396641	Benzo(a)anthracene	2024/05/16	80	30 - 130	88	30 - 130	<0.20	ug/L				
9396641	Benzo(a)pyrene	2024/05/16	86	30 - 130	95	30 - 130	<0.20	ug/L				
9396641	Benzo(b/j)fluoranthene	2024/05/16	83	30 - 130	92	30 - 130	<0.20	ug/L				
9396641	Benzo(g,h,i)perylene	2024/05/16	81	30 - 130	89	30 - 130	<0.20	ug/L				
9396641	Benzo(k)fluoranthene	2024/05/16	88	30 - 130	93	30 - 130	<0.20	ug/L				
9396641	Benzyl butyl phthalate	2024/05/16	94	30 - 130	102	30 - 130	<0.50	ug/L				
9396641	Biphenyl	2024/05/16	46	30 - 130	72	30 - 130	<0.50	ug/L				
9396641	Bis(2-chloroethoxy)methane	2024/05/16	58	30 - 130	98	30 - 130	<0.50	ug/L				
9396641	Bis(2-chloroethyl)ether	2024/05/16	56	30 - 130	97	30 - 130	<0.50	ug/L				
9396641	Bis(2-chloroisopropyl)ether	2024/05/16	49	30 - 130	87	30 - 130	<0.50	ug/L				
9396641	Bis(2-ethylhexyl)phthalate	2024/05/16	86	30 - 130	92	30 - 130	<2.0	ug/L	NC (3)	40		
9396641	Chrysene	2024/05/16	86	30 - 130	93	30 - 130	<0.20	ug/L				
9396641	Dibenzo(a,h)anthracene	2024/05/16	76	30 - 130	79	30 - 130	<0.20	ug/L				
9396641	Diethyl phthalate	2024/05/16	76	30 - 130	106	30 - 130	<1.0	ug/L				
9396641	Dimethyl phthalate	2024/05/16	52	30 - 130	87	30 - 130	<1.0	ug/L				
9396641	Di-N-butyl phthalate	2024/05/16	95	30 - 130	102	30 - 130	<2.0	ug/L	15 (3)	40		
9396641	di-n-octyl phthalate	2024/05/16	94	30 - 130	97	30 - 130	<0.80	ug/L				
9396641	Diphenyl Ether	2024/05/16	44	30 - 130	71	30 - 130	<0.30	ug/L				
9396641	Fluoranthene	2024/05/16	85	30 - 130	92	30 - 130	<0.20	ug/L				
9396641	Fluorene	2024/05/16	55	30 - 130	87	30 - 130	<0.20	ug/L				
9396641	Hexachlorobenzene	2024/05/16	71	30 - 130	100	30 - 130	<0.50	ug/L				
9396641	Hexachlorobutadiene	2024/05/16	30	30 - 130	55	30 - 130	<0.40	ug/L				
9396641	Hexachlorocyclopentadiene	2024/05/16	23 (4)	30 - 130	38	30 - 130	<2.0	ug/L				
9396641	Hexachloroethane	2024/05/16	38	30 - 130	56	30 - 130	<0.50	ug/L				
9396641	Indeno(1,2,3-cd)pyrene	2024/05/16	70	30 - 130	80	30 - 130	<0.20	ug/L				
9396641	Isophorone	2024/05/16	53	30 - 130	90	30 - 130	<0.50	ug/L				
9396641	m/p-Cresol	2024/05/16	41	10 - 130	68	10 - 130	<0.50	ug/L				
9396641	Naphthalene	2024/05/16	56	30 - 130	87	30 - 130	<0.20	ug/L				
9396641	Nitrobenzene	2024/05/16	53	30 - 130	84	30 - 130	<0.50	ug/L				
9396641	Nitrosodiphenylamine/Diphenylamine	2024/05/16	66	30 - 130	95	30 - 130	<1.0	ug/L				

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
9396641	N-Nitroso-di-n-propylamine	2024/05/16	62	30 - 130	103	30 - 130	<0.50	ug/L				
9396641	o-Cresol	2024/05/16	39	10 - 130	73	10 - 130	<0.50	ug/L				
9396641	p-Chloroaniline	2024/05/16	59	30 - 130	94	30 - 130	<1.0	ug/L				
9396641	Pentachlorobenzene	2024/05/16	36	30 - 130	62	30 - 130	<0.50	ug/L				
9396641	Pentachlorophenol	2024/05/16	59	10 - 130	75	10 - 130	<1.0	ug/L				
9396641	Perylene	2024/05/16	87	30 - 130	91	30 - 130	<0.20	ug/L				
9396641	Phenanthrene	2024/05/16	64	30 - 130	89	30 - 130	<0.20	ug/L				
9396641	Phenol	2024/05/16	20	10 - 130	34	10 - 130	<0.50	ug/L				
9396641	Pyrene	2024/05/16	86	30 - 130	95	30 - 130	<0.20	ug/L				
9397383	Total Aluminum (Al)	2024/05/16	101	80 - 120	103	80 - 120	<0.02	mg/L				
9397383	Total Arsenic (As)	2024/05/16	103	80 - 120	103	80 - 120	<0.001	mg/L				
9397383	Total Barium (Ba)	2024/05/16	102	80 - 120	102	80 - 120	<0.005	mg/L				
9397383	Total Beryllium (Be)	2024/05/16	105	80 - 120	105	80 - 120	<0.0006	mg/L				
9397383	Total Bismuth (Bi)	2024/05/16	99	80 - 120	98	80 - 120	<0.001	mg/L				
9397383	Total Boron (B)	2024/05/16	103	80 - 120	102	80 - 120	<0.02	mg/L				
9397383	Total Cadmium (Cd)	2024/05/16	100	80 - 120	100	80 - 120	<0.0001	mg/L				
9397383	Total Calcium (Ca)	2024/05/16	NC	80 - 120	104	80 - 120	<0.2	mg/L				
9397383	Total Chromium (Cr)	2024/05/16	102	80 - 120	104	80 - 120	<0.005	mg/L	5.3 (3)	20		
9397383	Total Cobalt (Co)	2024/05/16	103	80 - 120	103	80 - 120	<0.0005	mg/L				
9397383	Total Copper (Cu)	2024/05/16	107	80 - 120	105	80 - 120	<0.002	mg/L	2.2 (3)	20		
9397383	Total Iron (Fe)	2024/05/16	103	80 - 120	104	80 - 120	<0.1	mg/L				
9397383	Total Lead (Pb)	2024/05/16	98	80 - 120	99	80 - 120	<0.0005	mg/L				
9397383	Total Magnesium (Mg)	2024/05/16	NC	80 - 120	103	80 - 120	<0.05	mg/L				
9397383	Total Molybdenum (Mo)	2024/05/16	108	80 - 120	104	80 - 120	<0.002	mg/L				
9397383	Total Nickel (Ni)	2024/05/16	97	80 - 120	99	80 - 120	<0.001	mg/L	2.3 (3)	20		
9397383	Total Potassium (K)	2024/05/16	NC	80 - 120	104	80 - 120	<0.2	mg/L				
9397383	Total Selenium (Se)	2024/05/16	101	80 - 120	105	80 - 120	<0.005	mg/L				
9397383	Total Silver (Ag)	2024/05/16	95	80 - 120	97	80 - 120	<0.0004	mg/L				
9397383	Total Sodium (Na)	2024/05/16	NC	80 - 120	105	80 - 120	<0.1	mg/L				
9397383	Total Strontium (Sr)	2024/05/16	NC	80 - 120	97	80 - 120	<0.003	mg/L				

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
9397383	Total Tin (Sn)	2024/05/16	105	80 - 120	100	80 - 120	<0.002	mg/L				
9397383	Total Titanium (Ti)	2024/05/16	103	80 - 120	101	80 - 120	<0.005	mg/L				
9397383	Total Vanadium (V)	2024/05/16	98	80 - 120	98	80 - 120	<0.001	mg/L				
9397383	Total Zinc (Zn)	2024/05/16	NC	80 - 120	103	80 - 120	<0.01	mg/L	2.5 (3)	20		
9398164	1,1,1,2-Tetrachloroethane	2024/05/17	97	70 - 130	97	70 - 130	<0.50	ug/L	NC (3)	30		
9398164	1,1,1-Trichloroethane	2024/05/17	95	70 - 130	98	70 - 130	<0.20	ug/L	NC (3)	30		
9398164	1,1,2,2-Tetrachloroethane	2024/05/17	101	70 - 130	96	70 - 130	<0.40	ug/L	NC (3)	30		
9398164	1,1,2-Trichloroethane	2024/05/17	105	70 - 130	102	70 - 130	<0.40	ug/L	NC (3)	30		
9398164	1,1-Dichloroethane	2024/05/17	96	70 - 130	97	70 - 130	<0.20	ug/L	NC (3)	30		
9398164	1,1-Dichloroethylene	2024/05/17	95	70 - 130	98	70 - 130	<0.20	ug/L	3.1 (3)	30		
9398164	1,2-Dichlorobenzene	2024/05/17	98	70 - 130	98	70 - 130	<0.40	ug/L	NC (3)	30		
9398164	1,2-Dichloroethane	2024/05/17	100	70 - 130	97	70 - 130	<0.49	ug/L	NC (3)	30		
9398164	1,2-Dichloropropane	2024/05/17	97	70 - 130	97	70 - 130	<0.20	ug/L	NC (3)	30		
9398164	1,3-Dichlorobenzene	2024/05/17	97	70 - 130	98	70 - 130	<0.40	ug/L	NC (3)	30		
9398164	1,4-Dichlorobenzene	2024/05/17	99	70 - 130	99	70 - 130	<0.40	ug/L	NC (3)	30		
9398164	Acetone (2-Propanone)	2024/05/17	107	60 - 140	98	60 - 140	<10	ug/L	NC (3)	30		
9398164	Benzene	2024/05/17	97	70 - 130	98	70 - 130	<0.20	ug/L	NC (3)	30		
9398164	Bromodichloromethane	2024/05/17	97	70 - 130	96	70 - 130	<0.50	ug/L	NC (3)	30		
9398164	Bromoform	2024/05/17	100	70 - 130	95	70 - 130	<1.0	ug/L	NC (3)	30		
9398164	Bromomethane	2024/05/17	96	60 - 140	94	60 - 140	<0.50	ug/L	NC (3)	30		
9398164	Carbon Tetrachloride	2024/05/17	94	70 - 130	97	70 - 130	<0.19	ug/L	NC (3)	30		
9398164	Chlorobenzene	2024/05/17	95	70 - 130	97	70 - 130	<0.20	ug/L	NC (3)	30		
9398164	Chloroethane	2024/05/17	91	70 - 130	93	70 - 130	<1.0	ug/L				
9398164	Chloroform	2024/05/17	96	70 - 130	96	70 - 130	<0.20	ug/L	NC (3)	30		
9398164	Chloromethane	2024/05/17	86	60 - 140	87	60 - 140	<5.0	ug/L				
9398164	cis-1,2-Dichloroethylene	2024/05/17	100	70 - 130	99	70 - 130	<0.50	ug/L	0.57 (3)	30		
9398164	cis-1,3-Dichloropropene	2024/05/17	103	70 - 130	101	70 - 130	<0.30	ug/L	NC (3)	30		
9398164	Dibromochloromethane	2024/05/17	99	70 - 130	96	70 - 130	<0.50	ug/L	NC (3)	30		
9398164	Ethylbenzene	2024/05/17	97	70 - 130	102	70 - 130	<0.20	ug/L	NC (3)	30		
9398164	Ethylene Dibromide	2024/05/17	102	70 - 130	98	70 - 130	<0.19	ug/L	NC (3)	30		

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
9398164	Methyl Ethyl Ketone (2-Butanone)	2024/05/17	119	60 - 140	108	60 - 140	<10	ug/L	NC (3)	30		
9398164	Methyl Isobutyl Ketone	2024/05/17	117	70 - 130	110	70 - 130	<5.0	ug/L	NC (3)	30		
9398164	Methyl t-butyl ether (MTBE)	2024/05/17	95	70 - 130	96	70 - 130	<0.50	ug/L	NC (3)	30		
9398164	Methylene Chloride(Dichloromethane)	2024/05/17	96	70 - 130	94	70 - 130	<2.0	ug/L	NC (3)	30		
9398164	o-Xylene	2024/05/17	89	70 - 130	98	70 - 130	<0.20	ug/L	NC (3)	30		
9398164	p+m-Xylene	2024/05/17	99	70 - 130	105	70 - 130	<0.20	ug/L	NC (3)	30		
9398164	Styrene	2024/05/17	100	70 - 130	106	70 - 130	<0.40	ug/L	NC (3)	30		
9398164	Tetrachloroethylene	2024/05/17	94	70 - 130	98	70 - 130	<0.20	ug/L	NC (3)	30		
9398164	Toluene	2024/05/17	98	70 - 130	102	70 - 130	<0.20	ug/L	NC (3)	30		
9398164	Total Xylenes	2024/05/17					<0.20	ug/L	NC (3)	30		
9398164	trans-1,2-Dichloroethylene	2024/05/17	97	70 - 130	99	70 - 130	<0.50	ug/L	NC (3)	30		
9398164	trans-1,3-Dichloropropene	2024/05/17	110	70 - 130	103	70 - 130	<0.40	ug/L	NC (3)	30		
9398164	Trichloroethylene	2024/05/17	94	70 - 130	97	70 - 130	<0.20	ug/L	0.97 (3)	30		
9398164	Trichlorofluoromethane (FREON 11)	2024/05/17	90	70 - 130	93	70 - 130	<0.50	ug/L	NC (3)	30		
9398164	Vinyl Chloride	2024/05/17	87	70 - 130	90	70 - 130	<0.20	ug/L	2.3 (3)	30		
9398966	Total Kjeldahl Nitrogen (TKN)	2024/05/21	NC	80 - 120	106	80 - 120	<0.7	mg/L	3.7 (3)	20	107	80 - 120
9400150	Total Phosphorus	2024/05/23	99 (5)	80 - 120	93	80 - 120	<0.030	mg/L	2.0 (6)	25	102	80 - 120

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
9400754	Total Ammonia-N	2024/05/23	104	75 - 125	99	80 - 120	<0.15	mg/L	NC (3)	20		

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 spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) Matrix Spike Parent ID [ZEE860-06]

(2) Duplicate Parent ID [ZEE860-06]

(3) Duplicate Parent ID

(4) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

(5) Matrix Spike Parent ID [ZEE860-04]

(6) Duplicate Parent ID [ZEE860-04]

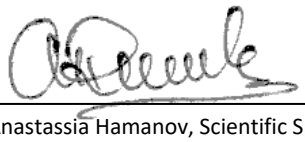
Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C4E5640
Report Date: 2024/05/24

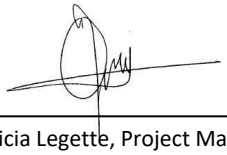
RWDI Inc.
Client Project #: 2402553.01
Site Location: ON07
Your P.O. #: 13384121
Sampler Initials: EW

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:



Anastassia Hamanov, Scientific Specialist



Patricia Legette, Project Manager

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

S2437676

BUREAU VERITAS

FIELD INFORMATION FORM

WM WASTE MANAGEMENT

Site Name: TCE

Site No.:

Sample: PS Holding Tank (Sample ID)

This Waste Management Field Information Form is Required
This form is to be completed, in addition to any State Forms. The Field Form is submitted along with the Chain of Custody Forms that accompany the sample containers (i.e. with the cooler that is returned to the laboratory).

Laboratory Use Only/Lab ID:

PURGE INFO

PURGE DATE (MM DD YY)	PURGE TIME (2400 Hr Clock)	ELAPSED HRS (hrs:min)	WATER VOL IN CASING (Gallons)	ACTUAL VOL PURGED (Gallons)	WELL VOLs PURGED

Note: For Passive Sampling, replace "Water Vol in Casing" and "Well Vols Purged" w/ Water Vol in Tubing/Flow Cell and Tubing/Flow Cell Vols Purged. Mark Changes, Record field data below.

PURGE/SAMPLE EQUIPMENT

Purging and Sampling Equipment ... Dedicated: Y or N

Purging Device: A-Submersible Pump, B-Peristaltic Pump, C-QED Bladder Pump, D-Bailer, E-Piston Pump, F-Dipper/Bottle

Sampling Device: D

X-Other:

Filter Device: Y or N — 0.45 µ or ____ µ (circle or fill in)

Filter Type: A-In-line Disposable, B-Pressure, C-Vacuum, X-Other: ____

Sample Tube Type: A-Teflon, B-Stainless Steel, C-PVC, D-Polypropylene, X-Other: ____

WELL DATA

Well Elevation (at TOC) (ft/msl) — Depth to Water (DTW) (from TOC) (ft) — Groundwater Elevation (GWE) (Site Datum, from TOC) (ft msl)

Total Well Depth (from TOC) (ft) — Stick Up (from ground elevation) (ft) — Casing ID (in) — Casing Material

Note: Total Depth, Stick Up, Casing ID, etc. are optional and can be from historical data, unless required by Site/Permit. Well Elevation, DTW, and GWE must be current, obtained from site.

STABILIZATION DATA (Optional)

Sample Time (2400 Hr Clock)	Rate/Unit	pH (std)	Conductance (SC/EC) (µmhos/cm @ 25°C)	Temp. (°C)	Turbidity (ntu)	D.O. (mg/L - ppm)	eH/ORP (mV)	DTW (ft)
		1st	1st					
		2nd	2nd					
		3rd	3rd					
		4th	4th					
Input Range for 3 consec. readings or Permit/State requirements:		+/-	+/-	+/-	+/-	+/-	+/-	

Stabilization Data Fields are Optional *(i.e. complete stabilization readings for parameters required by WM, Site, or State). These fields can be used where four (4) field measurements are required by State/Permit/Site. If a Data Logger or other Electronic format is used, fill in final readings below and submit electronic data separately to Site. If more fields above are needed, use separate sheet or form.*

FIELD DATA

SAMPLE DATE (MM DD YY)	pH (std)	CONDUCTANCE (µmhos/cm @ 25°C)	TEMP. (°C)	TURBIDITY (ntu)	DO (mg/L - ppm)	eH/ORP (mV)	Other: Units
05 19 24	7.1	5.99 mS	16.7	51.3			

Final Field Readings are required *(i.e. record field measurements, final stabilized readings, passive sample readings before sampling for all field parameters required by State/Permit/Site.)*

Sample Appearance: translucent — Odor: leachate — Color: grey - — Other: ____

Weather Conditions (required daily, or as conditions change): 15°C — Direction/Speed: 19 Km h N — Outlook: cloudy — Precipitation: Y or N

Specific Comments (including purge/well volume calculations if required): ____

FIELD COMMENTS

I certify that sampling procedures were in accordance with applicable EPA, State, and WM protocols (if more than one sampler, all should sign):

Date	Name	Signature	Company
05/19/24	Eric W/sm	Eric W/sm	RMDI
/ /			

DISTRIBUTION: WHITE/ORIGINAL - Stays with Sample, YELLOW - Returned to Client, PINK - Field Copy

Field Information Form v.3.1 06/20

2065

eCOC: T897411

Expected TAT:	Standard TAT
Expected Arrival:	2024/05/15 12:00
Submitted By:	
Submitted To:	Mississauga, ON (Env. Lab)

Invoice Information

Attn: Lisa Mertick lmertick@wm.com
Waste Management of Canada Corporation
5768 Nauvoo Rd. RR# 4
Watford , ON , N0M 2S0
Email to:
lmertick@wm.com
invoiceuploads@bureauveritas.com

Report Information

Attn: Jeffery Cleland
Waste Management of Canada Corporation
5768 Nauvoo Rd. RR# 4
Watford , ON , N0M 2S0
Email to:
jeffery.cleland@rwdi.com
khalid.hussein@rwdi.com
james.hanna@rwdi.com
eric.wilson@rwdi.com

Project Information

Quote #:	C34991
PO/AFE#:	13384121
Project #:	2402553.01
Site Location:	Twin Creeks Environmental Centre

Analytical Summary

A: Standard TAT

Client Sample ID	Clnt Ref	Sampling Date/Time	Matrix	#Cont	ON-WLF-2024 TCLS - LEACHATE (PS HOLDING) MONTHLY
PS Holding Tank	1	2024/05/14 12:00	WASTE WATER	9	A

Deadlines are estimates only and are subject to change. Please refer to your Job Confirmation report for final due dates.

Submission Information

# of Samples: 1

15-May-24 09:58
Patricia Legette
C4E5640
RPK ENV-1158

Page 1 of 1

Your P.O. #: 13384121
Your Project #: 2402553.01
Site#: 500
Site Location: ON07
Your C.O.C. #: 908594

Attention: Khalid Hussein - Twin Creeks

RWDI Inc.
600 Southgate Drive
Guelph, ON
Canada N1G 4P6

Report Date: 2024/06/20
Report #: R8200400
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BUREAU VERITAS JOB #: C4H1280
Received: 2024/06/06, 11:20

Sample Matrix: Leachate
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
ABN Compounds in Water by GC/MS	1	2024/06/10	2024/06/11	CAM SOP-00301	EPA 8270 m
Alkalinity	1	N/A	2024/06/10	CAM SOP-00448	SM 24 2320 B m
Chloride by Automated Colourimetry	1	N/A	2024/06/11	CAM SOP-00463	SM 24 4500-Cl E m
Conductance in Water - On-site	1	N/A	2024/06/10		
Total Metals by ICPMS	1	N/A	2024/06/13	CAM SOP-00447	EPA 6020B m
Ammonia-N	1	N/A	2024/06/11	CAM SOP-00441	USGS I-2522-90 m
Nitrate & Nitrite as Nitrogen in Water (1)	1	N/A	2024/06/08	CAM SOP-00440	SM 24 4500-NO3I/NO2B
Field Measured pH (2)	1	N/A	2024/06/06		Field pH Meter
Sulphate by Automated Turbidimetry	1	N/A	2024/06/11	CAM SOP-00464	SM 24 4500-SO42- E m
Field Temperature (2)	1	N/A	2024/06/06		Field Thermometer
Total Kjeldahl Nitrogen in Water	1	2024/06/07	2024/06/10	CAM SOP-00938	OMOE E3516 m
Total Phosphorus (Colourimetric)	1	2024/06/07	2024/06/11	CAM SOP-00407	SM 24 4500-P I
Turbidity - On-site	1	N/A	2024/06/10		
Un-ionized Ammonia (3)	1	2024/06/06	2024/06/11	Auto Calc.	PWQO
Volatile Organic Compounds in Water	1	N/A	2024/06/11	CAM SOP-00228	EPA 8260D
Non-Routine Volatile Organic Compounds	1	N/A	2024/06/11	CAM SOP-00226	EPA 8260D m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, EPA, APHA or the Quebec Ministry of Environment.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Your P.O. #: 13384121
Your Project #: 2402553.01
Site#: 500
Site Location: ON07
Your C.O.C. #: 908594

Attention: Khalid Hussein - Twin Creeks

RWDI Inc.
600 Southgate Drive
Guelph, ON
Canada N1G 4P6

Report Date: 2024/06/20
Report #: R8200400
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BUREAU VERITAS JOB #: C4H1280

Received: 2024/06/06, 11:20

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.
(2) This is a field test, therefore, the results relate to items that were not analysed at Bureau Veritas.
(3) Un-ionized ammonia is calculated using the total ammonia result and field data provided by the client for pH and temperature.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to:
Patricia Legette, Project Manager
Email: Patricia.Legette@bureauveritas.com
Phone# (905)817-5799

==========

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

Bureau Veritas Job #: C4H1280
Report Date: 2024/06/20

RWDI Inc.
Client Project #: 2402553.01
Site Location: ON07
Your P.O. #: 13384121
Sampler Initials: JC

RESULTS OF ANALYSES OF LEACHATE

Bureau Veritas ID		ZJN397		
Sampling Date		2024/06/04 09:00		
COC Number		908594		
	UNITS	**PS Holding Tank**	**RDL**	**QC Batch**
Calculated Parameters				
Total Un-ionized Ammonia	mg/L	2.4	0.046	9438085
Field Measurements				
Field Conductivity	uS/cm	6320	N/A	ONSITE
Field Temperature	Celsius	17.7	N/A	ONSITE
Field Measured Field Turbidity	NTU	34.6	N/A	ONSITE
Field Measured pH	pH	7.4		ONSITE
Inorganics				
Total Ammonia-N	mg/L	239	4.5	9441980
Total Kjeldahl Nitrogen (TKN)	mg/L	280	10	9441714
Total Phosphorus	mg/L	0.87	0.030	9441597
Dissolved Sulphate (SO4)	mg/L	250	1.0	9440945
Alkalinity (Total as CaCO3)	mg/L	2200	2.0	9441512
Dissolved Chloride (Cl-)	mg/L	420	4.0	9440931
Nitrite (N)	mg/L	<0.010	0.010	9441216
Nitrate (N)	mg/L	<0.10	0.10	9441216

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

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C4H1280
Report Date: 2024/06/20

RWDI Inc.
Client Project #: 2402553.01
Site Location: ON07
Your P.O. #: 13384121
Sampler Initials: JC

ELEMENTS BY ATOMIC SPECTROSCOPY (LEACHATE)

Bureau Veritas ID		ZJN397		
Sampling Date		2024/06/04 09:00		
COC Number		908594		
	UNITS	PS Holding Tank	RDL	QC Batch
Metals				
Total Aluminum (Al)	mg/L	0.22	0.02	9444695
Total Arsenic (As)	mg/L	0.009	0.001	9444695
Total Barium (Ba)	mg/L	0.14	0.005	9444695
Total Beryllium (Be)	mg/L	<0.0006	0.0006	9444695
Total Bismuth (Bi)	mg/L	<0.001	0.001	9444695
Total Boron (B)	mg/L	4.9	0.1	9444695
Total Cadmium (Cd)	mg/L	<0.0001	0.0001	9444695
Total Calcium (Ca)	mg/L	160	0.2	9444695
Total Chromium (Cr)	mg/L	0.023	0.005	9444695
Total Cobalt (Co)	mg/L	0.0044	0.0005	9444695
Total Copper (Cu)	mg/L	<0.002	0.002	9444695
Total Iron (Fe)	mg/L	3.2	0.1	9444695
Total Lead (Pb)	mg/L	0.0009	0.0005	9444695
Total Magnesium (Mg)	mg/L	140	0.05	9444695
Total Molybdenum (Mo)	mg/L	0.009	0.002	9444695
Total Nickel (Ni)	mg/L	0.038	0.001	9444695
Total Potassium (K)	mg/L	89	0.2	9444695
Total Selenium (Se)	mg/L	<0.005	0.005	9444695
Total Silver (Ag)	mg/L	<0.0004	0.0004	9444695
Total Sodium (Na)	mg/L	400	0.1	9444695
Total Strontium (Sr)	mg/L	1.4	0.003	9444695
Total Tin (Sn)	mg/L	0.002	0.002	9444695
Total Titanium (Ti)	mg/L	0.020	0.005	9444695
Total Vanadium (V)	mg/L	0.006	0.001	9444695
Total Zinc (Zn)	mg/L	<0.01	0.01	9444695

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

SEMI-VOLATILE ORGANICS BY GC-MS (LEACHATE)

Bureau Veritas ID		ZJN397		
Sampling Date		2024/06/04 09:00		
COC Number		908594		
	UNITS	**PS Holding Tank**	**RDL**	**QC Batch**
Semivolatile Organics				
Acenaphthene	ug/L	<0.80	0.80	9445410
Acenaphthylene	ug/L	<0.80	0.80	9445410
Anthracene	ug/L	<0.80	0.80	9445410
Benzo(a)anthracene	ug/L	<0.80	0.80	9445410
Benzo(a)pyrene	ug/L	<0.80	0.80	9445410
Benzo(b/j)fluoranthene	ug/L	<0.80	0.80	9445410
Benzo(g,h,i)perylene	ug/L	<0.80	0.80	9445410
Benzo(k)fluoranthene	ug/L	<0.80	0.80	9445410
1-Chloronaphthalene	ug/L	<4.0	4.0	9445410
2-Chloronaphthalene	ug/L	<2.0	2.0	9445410
Chrysene	ug/L	<0.80	0.80	9445410
Dibenzo(a,h)anthracene	ug/L	<0.80	0.80	9445410
Fluoranthene	ug/L	<0.80	0.80	9445410
Fluorene	ug/L	<0.80	0.80	9445410
Indeno(1,2,3-cd)pyrene	ug/L	<0.80	0.80	9445410
1-Methylnaphthalene	ug/L	<0.80	0.80	9445410
2-Methylnaphthalene	ug/L	<0.80	0.80	9445410
Naphthalene	ug/L	3.1	0.80	9445410
Perylene	ug/L	<0.80	0.80	9445410
Phenanthrene	ug/L	<0.80	0.80	9445410
Pyrene	ug/L	<0.80	0.80	9445410
1,2-Dichlorobenzene	ug/L	<2.0	2.0	9445410
1,3-Dichlorobenzene	ug/L	<2.0	2.0	9445410
Hexachlorobenzene	ug/L	<2.0	2.0	9445410
Pentachlorobenzene	ug/L	<2.0	2.0	9445410
1,2,3,5-Tetrachlorobenzene	ug/L	<2.0	2.0	9445410
1,2,4,5-Tetrachlorobenzene	ug/L	<2.0	2.0	9445410
1,2,3-Trichlorobenzene	ug/L	<2.0	2.0	9445410
1,2,4-Trichlorobenzene	ug/L	<2.0	2.0	9445410
1,3,5-Trichlorobenzene	ug/L	<2.0	2.0	9445410
2-Chlorophenol	ug/L	<1.2	1.2	9445410
4-Chloro-3-Methylphenol	ug/L	<2.0	2.0	9445410

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

SEMI-VOLATILE ORGANICS BY GC-MS (LEACHATE)

Bureau Veritas ID		ZJN397		
Sampling Date		2024/06/04 09:00		
COC Number		908594		
	UNITS	PS Holding Tank	RDL	QC Batch
m/p-Cresol	ug/L	17	2.0	9445410
o-Cresol	ug/L	<2.0	2.0	9445410
1,2,3,4-Tetrachlorobenzene	ug/L	<2.0	2.0	9445410
2,3-Dichlorophenol	ug/L	<2.0	2.0	9445410
2,4-Dichlorophenol	ug/L	<1.2	1.2	9445410
2,5-Dichlorophenol	ug/L	<2.0	2.0	9445410
2,6-Dichlorophenol	ug/L	<2.0	2.0	9445410
3,4-Dichlorophenol	ug/L	<2.0	2.0	9445410
3,5-Dichlorophenol	ug/L	<2.0	2.0	9445410
2,4-Dimethylphenol	ug/L	3.7	2.0	9445410
2,4-Dinitrophenol	ug/L	<8.0	8.0	9445410
4,6-Dinitro-2-methylphenol	ug/L	<8.0	8.0	9445410
2-Nitrophenol	ug/L	<2.0	2.0	9445410
4-Nitrophenol	ug/L	<5.6	5.6	9445410
Pentachlorophenol	ug/L	<4.0	4.0	9445410
Phenol	ug/L	5.9	2.0	9445410
2,3,4,5-Tetrachlorophenol	ug/L	<1.6	1.6	9445410
2,3,4,6-Tetrachlorophenol	ug/L	<2.0	2.0	9445410
2,3,5,6-Tetrachlorophenol	ug/L	<2.0	2.0	9445410
2,3,4-Trichlorophenol	ug/L	<2.0	2.0	9445410
2,3,5-Trichlorophenol	ug/L	<2.0	2.0	9445410
2,3,6-Trichlorophenol	ug/L	<2.0	2.0	9445410
2,4,5-Trichlorophenol	ug/L	<2.0	2.0	9445410
2,4,6-Trichlorophenol	ug/L	<2.0	2.0	9445410
3,4,5-Trichlorophenol	ug/L	<2.0	2.0	9445410
Benzyl butyl phthalate	ug/L	<2.0	2.0	9445410
Biphenyl	ug/L	<2.0	2.0	9445410
Bis(2-chloroethyl)ether	ug/L	<2.0	2.0	9445410
Bis(2-chloroethoxy)methane	ug/L	<2.0	2.0	9445410
Bis(2-chloroisopropyl)ether	ug/L	<2.0	2.0	9445410
Bis(2-ethylhexyl)phthalate	ug/L	<8.0	8.0	9445410
4-Bromophenyl phenyl ether	ug/L	<1.2	1.2	9445410
p-Chloroaniline	ug/L	<4.0	4.0	9445410

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

SEMI-VOLATILE ORGANICS BY GC-MS (LEACHATE)

Bureau Veritas ID		ZJN397		
Sampling Date		2024/06/04 09:00		
COC Number		908594		
	UNITS	**PS Holding Tank**	**RDL**	**QC Batch**
4-Chlorophenyl phenyl ether	ug/L	<2.0	2.0	9445410
Di-N-butyl phthalate	ug/L	<8.0	8.0	9445410
di-n-octyl phthalate	ug/L	<3.2	3.2	9445410
2,4-Dinitrotoluene	ug/L	<2.0	2.0	9445410
Diethyl phthalate	ug/L	<4.0	4.0	9445410
3,3'-Dichlorobenzidine	ug/L	<2.0	2.0	9445410
Dimethyl phthalate	ug/L	<4.0	4.0	9445410
2,6-Dinitrotoluene	ug/L	<2.0	2.0	9445410
Diphenyl Ether	ug/L	<1.2	1.2	9445410
Hexachlorobutadiene	ug/L	<1.6	1.6	9445410
Hexachlorocyclopentadiene	ug/L	<8.0	8.0	9445410
Hexachloroethane	ug/L	<2.0	2.0	9445410
Isophorone	ug/L	<2.0	2.0	9445410
Nitrobenzene	ug/L	<2.0	2.0	9445410
Nitrosodiphenylamine/Diphenylamine	ug/L	<4.0	4.0	9445410
N-Nitroso-di-n-propylamine	ug/L	<2.0	2.0	9445410
Surrogate Recovery (%)				
2,4,6-Tribromophenol	%	100		9445410
2-Fluorobiphenyl	%	74		9445410
2-Fluorophenol	%	43		9445410
D14-Terphenyl	%	92		9445410
D5-Nitrobenzene	%	80		9445410
D5-Phenol	%	28		9445410

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

RWDI Inc.
Client Project #: 2402553.01
Site Location: ON07
Your P.O. #: 13384121
Sampler Initials: JC

VOLATILE ORGANICS BY GC/MS (LEACHATE)

Bureau Veritas ID		ZJN397		
Sampling Date		2024/06/04 09:00		
COC Number		908594		
	UNITS	PS Holding Tank	RDL	QC Batch
Volatile Organics				
Acetone (2-Propanone)	ug/L	860	10	9444494
Benzene	ug/L	4.0	0.20	9444494
Bromodichloromethane	ug/L	<0.50	0.50	9444494
Bromoform	ug/L	<1.0	1.0	9444494
Bromomethane	ug/L	<0.50	0.50	9444494
Carbon Tetrachloride	ug/L	<0.19	0.19	9444494
Chlorobenzene	ug/L	1.8	0.20	9444494
Chloroethane	ug/L	1.3	1.0	9444494
Chloroform	ug/L	<0.20	0.20	9444494
Chloromethane	ug/L	<5.0	5.0	9444494
Dibromochloromethane	ug/L	<0.50	0.50	9444494
1,2-Dichlorobenzene	ug/L	<0.40	0.40	9444494
1,3-Dichlorobenzene	ug/L	<0.40	0.40	9444494
1,4-Dichlorobenzene	ug/L	2.0	0.40	9444494
1,1-Dichloroethane	ug/L	0.31	0.20	9444494
1,2-Dichloroethane	ug/L	<0.49	0.49	9444494
1,1-Dichloroethylene	ug/L	<0.20	0.20	9444494
cis-1,2-Dichloroethylene	ug/L	<0.50	0.50	9444494
trans-1,2-Dichloroethylene	ug/L	<0.50	0.50	9444494
1,2-Dichloropropane	ug/L	<0.20	0.20	9444494
cis-1,3-Dichloropropene	ug/L	<0.30	0.30	9444494
trans-1,3-Dichloropropene	ug/L	<0.40	0.40	9444494
Ethylbenzene	ug/L	11	0.20	9444494
Ethylene Dibromide	ug/L	<0.19	0.19	9444494
Methylene Chloride(Dichloromethane)	ug/L	<2.0	2.0	9444494
Methyl Ethyl Ketone (2-Butanone)	ug/L	810	10	9444494
Methyl Isobutyl Ketone	ug/L	9.8	5.0	9444494
Methyl t-butyl ether (MTBE)	ug/L	0.73	0.50	9444494
Styrene	ug/L	<0.40	0.40	9444494
1,1,1,2-Tetrachloroethane	ug/L	<0.50	0.50	9444494
1,1,2,2-Tetrachloroethane	ug/L	<0.40	0.40	9444494
Tetrachloroethylene	ug/L	<0.20	0.20	9444494

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

RWDI Inc.
Client Project #: 2402553.01
Site Location: ON07
Your P.O. #: 13384121
Sampler Initials: JC

VOLATILE ORGANICS BY GC/MS (LEACHATE)

Bureau Veritas ID		ZJN397		
Sampling Date		2024/06/04 09:00		
COC Number		908594		
	UNITS	**PS Holding Tank**	**RDL**	**QC Batch**
1,3,5-Trimethylbenzene	ug/L	<10	10	9444617
Toluene	ug/L	3.3	0.20	9444494
1,1,1-Trichloroethane	ug/L	<0.20	0.20	9444494
1,1,2-Trichloroethane	ug/L	<0.40	0.40	9444494
Trichloroethylene	ug/L	<0.20	0.20	9444494
Trichlorofluoromethane (FREON 11)	ug/L	<0.50	0.50	9444494
Vinyl Chloride	ug/L	<0.20	0.20	9444494
p+m-Xylene	ug/L	25	0.20	9444494
o-Xylene	ug/L	12	0.20	9444494
Total Xylenes	ug/L	37	0.20	9444494
Surrogate Recovery (%)				
4-Bromofluorobenzene	%	101		9444494
D4-1,2-Dichloroethane	%	107		9444494
D8-Toluene	%	98		9444494
4-Bromofluorobenzene	%	96		9444617
D4-1,2-Dichloroethane	%	108		9444617
D8-Toluene	%	97		9444617

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

GENERAL COMMENTS

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

Package 1	6.0°C

Revised Report (2024/06/20): Field conductivity value has been revised in this CofA as per Jeff Cleland's request.

Sample ZJN397 [PS Holding Tank] : VOC Water Analysis: Due to foaming, sample required dilution. The detection limits were adjusted accordingly.

ABN Analysis: Due to the sample matrix, a smaller than usual portion of the sample was used for extraction. Detection limits were adjusted accordingly.

Results relate only to the items tested.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C4H1280
Report Date: 2024/06/20

QUALITY ASSURANCE REPORT

RWDI Inc.
Client Project #: 2402553.01
Site Location: ON07
Your P.O. #: 13384121
Sampler Initials: JC

			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
9444494	4-Bromofluorobenzene	2024/06/11	101	70 - 130	101	70 - 130	103	%				
9444494	D4-1,2-Dichloroethane	2024/06/11	105	70 - 130	104	70 - 130	105	%				
9444494	D8-Toluene	2024/06/11	98	70 - 130	98	70 - 130	97	%				
9444617	4-Bromofluorobenzene	2024/06/11	96	70 - 130	95	70 - 130	94	%				
9444617	D4-1,2-Dichloroethane	2024/06/11	106	70 - 130	103	70 - 130	103	%				
9444617	D8-Toluene	2024/06/11	97	70 - 130	99	70 - 130	99	%				
9445410	2,4,6-Tribromophenol	2024/06/11	91	10 - 130	94	10 - 130	80	%				
9445410	2-Fluorobiphenyl	2024/06/11	67	30 - 130	70	30 - 130	67	%				
9445410	2-Fluorophenol	2024/06/11	43	10 - 130	48	10 - 130	43	%				
9445410	D14-Terphenyl	2024/06/11	90	30 - 130	93	30 - 130	86	%				
9445410	D5-Nitrobenzene	2024/06/11	78	30 - 130	84	30 - 130	80	%				
9445410	D5-Phenol	2024/06/11	31	10 - 130	32	10 - 130	30	%				
9440931	Dissolved Chloride (Cl-)	2024/06/11	NC	80 - 120	97	80 - 120	<1.0	mg/L	0.92 (1)	20		
9440945	Dissolved Sulphate (SO4)	2024/06/11	NC	75 - 125	94	80 - 120	<1.0	mg/L	0.30 (1)	20		
9441216	Nitrate (N)	2024/06/08	93	80 - 120	97	80 - 120	<0.10	mg/L	0.76 (1)	20		
9441216	Nitrite (N)	2024/06/08	105	80 - 120	106	80 - 120	<0.010	mg/L	NC (1)	20		
9441512	Alkalinity (Total as CaCO3)	2024/06/10			96	85 - 115	<1.0	mg/L	2.6 (1)	20		
9441597	Total Phosphorus	2024/06/11	114	80 - 120	108	80 - 120	<0.030	mg/L	3.4 (1)	25	113	80 - 120
9441714	Total Kjeldahl Nitrogen (TKN)	2024/06/10	NC	80 - 120	103	80 - 120	<0.7	mg/L	0.036 (1)	20	101	80 - 120
9441980	Total Ammonia-N	2024/06/11	92	75 - 125	94	80 - 120	<0.15	mg/L	NC (1)	20		
9444494	1,1,1,2-Tetrachloroethane	2024/06/11	107	70 - 130	106	70 - 130	<0.50	ug/L	NC (1)	30		
9444494	1,1,1-Trichloroethane	2024/06/11	108	70 - 130	106	70 - 130	<0.20	ug/L	NC (1)	30		
9444494	1,1,2,2-Tetrachloroethane	2024/06/11	110	70 - 130	112	70 - 130	<0.40	ug/L	NC (1)	30		
9444494	1,1,2-Trichloroethane	2024/06/11	110	70 - 130	109	70 - 130	<0.40	ug/L	NC (1)	30		
9444494	1,1-Dichloroethane	2024/06/11	108	70 - 130	107	70 - 130	<0.20	ug/L	NC (1)	30		
9444494	1,1-Dichloroethylene	2024/06/11	106	70 - 130	105	70 - 130	<0.20	ug/L	NC (1)	30		
9444494	1,2-Dichlorobenzene	2024/06/11	102	70 - 130	105	70 - 130	<0.40	ug/L	NC (1)	30		
9444494	1,2-Dichloroethane	2024/06/11	112	70 - 130	111	70 - 130	<0.49	ug/L	NC (1)	30		
9444494	1,2-Dichloropropane	2024/06/11	108	70 - 130	107	70 - 130	<0.20	ug/L	NC (1)	30		
9444494	1,3-Dichlorobenzene	2024/06/11	100	70 - 130	105	70 - 130	<0.40	ug/L	NC (1)	30		

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
9444494	1,4-Dichlorobenzene	2024/06/11	102	70 - 130	107	70 - 130	<0.40	ug/L	NC (1)	30		
9444494	Acetone (2-Propanone)	2024/06/11	123	60 - 140	121	60 - 140	<10	ug/L				
9444494	Benzene	2024/06/11	105	70 - 130	106	70 - 130	<0.20	ug/L	NC (1)	30		
9444494	Bromodichloromethane	2024/06/11	110	70 - 130	109	70 - 130	<0.50	ug/L	NC (1)	30		
9444494	Bromoform	2024/06/11	113	70 - 130	112	70 - 130	<1.0	ug/L	NC (1)	30		
9444494	Bromomethane	2024/06/11	90	60 - 140	101	60 - 140	<0.50	ug/L	NC (1)	30		
9444494	Carbon Tetrachloride	2024/06/11	108	70 - 130	106	70 - 130	<0.19	ug/L				
9444494	Chlorobenzene	2024/06/11	104	70 - 130	105	70 - 130	<0.20	ug/L	NC (1)	30		
9444494	Chloroethane	2024/06/11	102	70 - 130	99	70 - 130	<1.0	ug/L				
9444494	Chloroform	2024/06/11	108	70 - 130	107	70 - 130	<0.20	ug/L				
9444494	Chloromethane	2024/06/11	94	60 - 140	93	60 - 140	<5.0	ug/L	NC (1)	30		
9444494	cis-1,2-Dichloroethylene	2024/06/11	109	70 - 130	109	70 - 130	<0.50	ug/L	NC (1)	30		
9444494	cis-1,3-Dichloropropene	2024/06/11	103	70 - 130	110	70 - 130	<0.30	ug/L				
9444494	Dibromochloromethane	2024/06/11	109	70 - 130	110	70 - 130	<0.50	ug/L	NC (1)	30		
9444494	Ethylbenzene	2024/06/11	102	70 - 130	103	70 - 130	<0.20	ug/L	NC (1)	30		
9444494	Ethylene Dibromide	2024/06/11	111	70 - 130	111	70 - 130	<0.19	ug/L	NC (1)	30		
9444494	Methyl Ethyl Ketone (2-Butanone)	2024/06/11	121	60 - 140	122	60 - 140	<10	ug/L	3.8 (1)	30		
9444494	Methyl Isobutyl Ketone	2024/06/11	119	70 - 130	122	70 - 130	<5.0	ug/L				
9444494	Methyl t-butyl ether (MTBE)	2024/06/11	107	70 - 130	107	70 - 130	<0.50	ug/L	NC (1)	30		
9444494	Methylene Chloride(Dichloromethane)	2024/06/11	112	70 - 130	110	70 - 130	<2.0	ug/L	NC (1)	30		
9444494	o-Xylene	2024/06/11	100	70 - 130	103	70 - 130	<0.20	ug/L	NC (1)	30		
9444494	p+m-Xylene	2024/06/11	101	70 - 130	103	70 - 130	<0.20	ug/L	NC (1)	30		
9444494	Styrene	2024/06/11	104	70 - 130	109	70 - 130	<0.40	ug/L	NC (1)	30		
9444494	Tetrachloroethylene	2024/06/11	103	70 - 130	104	70 - 130	<0.20	ug/L	NC (1)	30		
9444494	Toluene	2024/06/11	101	70 - 130	102	70 - 130	<0.20	ug/L	NC (1)	30		
9444494	Total Xylenes	2024/06/11					<0.20	ug/L				
9444494	trans-1,2-Dichloroethylene	2024/06/11	104	70 - 130	106	70 - 130	<0.50	ug/L	NC (1)	30		
9444494	trans-1,3-Dichloropropene	2024/06/11	102	70 - 130	111	70 - 130	<0.40	ug/L	NC (1)	30		
9444494	Trichloroethylene	2024/06/11	105	70 - 130	106	70 - 130	<0.20	ug/L	NC (1)	30		
9444494	Trichlorofluoromethane (FREON 11)	2024/06/11	107	70 - 130	101	70 - 130	<0.50	ug/L				

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
9444494	Vinyl Chloride	2024/06/11	98	70 - 130	97	70 - 130	<0.20	ug/L	NC (1)	30		
9444617	1,3,5-Trimethylbenzene	2024/06/11	107	60 - 140	110	60 - 140	<0.20	ug/L				
9444695	Total Aluminum (Al)	2024/06/13	127 (2,3)	80 - 120	95	80 - 120	<0.02	mg/L	2.3 (4)	20		
9444695	Total Arsenic (As)	2024/06/13	104 (3)	80 - 120	98	80 - 120	<0.001	mg/L	3.6 (4)	20		
9444695	Total Barium (Ba)	2024/06/13	96 (3)	80 - 120	94	80 - 120	<0.005	mg/L	2.7 (4)	20		
9444695	Total Beryllium (Be)	2024/06/13	107 (3)	80 - 120	101	80 - 120	<0.0006	mg/L	NC (4)	20		
9444695	Total Bismuth (Bi)	2024/06/13	96 (3)	80 - 120	97	80 - 120	<0.001	mg/L	NC (4)	20		
9444695	Total Boron (B)	2024/06/13	NC (3)	80 - 120	97	80 - 120	<0.02	mg/L	1.7 (4)	20		
9444695	Total Cadmium (Cd)	2024/06/13	100 (3)	80 - 120	95	80 - 120	<0.0001	mg/L	NC (4)	20		
9444695	Total Calcium (Ca)	2024/06/13	NC (3)	80 - 120	95	80 - 120	<0.2	mg/L	2.3 (4)	20		
9444695	Total Chromium (Cr)	2024/06/13	99 (3)	80 - 120	91	80 - 120	<0.005	mg/L	3.1 (4)	20		
9444695	Total Cobalt (Co)	2024/06/13	99 (3)	80 - 120	97	80 - 120	<0.0005	mg/L	0.47 (4)	20		
9444695	Total Copper (Cu)	2024/06/13	102 (3)	80 - 120	92	80 - 120	<0.002	mg/L	NC (4)	20		
9444695	Total Iron (Fe)	2024/06/13	101 (3)	80 - 120	95	80 - 120	<0.1	mg/L	1.7 (4)	20		
9444695	Total Lead (Pb)	2024/06/13	99 (3)	80 - 120	98	80 - 120	<0.0005	mg/L	3.0 (4)	20		
9444695	Total Magnesium (Mg)	2024/06/13	NC (3)	80 - 120	93	80 - 120	<0.05	mg/L	1.2 (4)	20		
9444695	Total Molybdenum (Mo)	2024/06/13	106 (3)	80 - 120	95	80 - 120	<0.002	mg/L	0.94 (4)	20		
9444695	Total Nickel (Ni)	2024/06/13	95 (3)	80 - 120	92	80 - 120	<0.001	mg/L	1.1 (4)	20		
9444695	Total Potassium (K)	2024/06/13	NC (3)	80 - 120	96	80 - 120	<0.2	mg/L	1.2 (4)	20		
9444695	Total Selenium (Se)	2024/06/13	101 (3)	80 - 120	101	80 - 120	<0.005	mg/L	NC (4)	20		
9444695	Total Silver (Ag)	2024/06/13	95 (3)	80 - 120	92	80 - 120	<0.0004	mg/L	NC (4)	20		
9444695	Total Sodium (Na)	2024/06/13	NC (3)	80 - 120	93	80 - 120	<0.1	mg/L	0.16 (4)	20		
9444695	Total Strontium (Sr)	2024/06/13	NC (3)	80 - 120	94	80 - 120	<0.003	mg/L	3.4 (4)	20		
9444695	Total Tin (Sn)	2024/06/13	106 (3)	80 - 120	98	80 - 120	<0.002	mg/L	2.7 (4)	20		
9444695	Total Titanium (Ti)	2024/06/13	101 (3)	80 - 120	95	80 - 120	<0.005	mg/L	2.6 (4)	20		
9444695	Total Vanadium (V)	2024/06/13	97 (3)	80 - 120	89	80 - 120	<0.001	mg/L	1.7 (4)	20		
9444695	Total Zinc (Zn)	2024/06/13	96 (3)	80 - 120	96	80 - 120	<0.01	mg/L	NC (4)	20		
9445410	1,2,3,4-Tetrachlorobenzene	2024/06/11	46	30 - 130	41	30 - 130	<0.50	ug/L	NC (1)	40		
9445410	1,2,3,5-Tetrachlorobenzene	2024/06/11	41	30 - 130	39	30 - 130	<0.50	ug/L	NC (1)	40		
9445410	1,2,3-Trichlorobenzene	2024/06/11	46	30 - 130	42	30 - 130	<0.50	ug/L	NC (1)	40		

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
9445410	1,2,4,5-Tetrachlorobenzene	2024/06/11	42	30 - 130	33	30 - 130	<0.50	ug/L	NC (1)	40		
9445410	1,2,4-Trichlorobenzene	2024/06/11	41	30 - 130	37	30 - 130	<0.50	ug/L	NC (1)	40		
9445410	1,2-Dichlorobenzene	2024/06/11	43	30 - 130	39	30 - 130	<0.50	ug/L	NC (1)	40		
9445410	1,3,5-Trichlorobenzene	2024/06/11	58	30 - 130	63	30 - 130	<0.50	ug/L	NC (1)	40		
9445410	1,3-Dichlorobenzene	2024/06/11	35	30 - 130	31	30 - 130	<0.50	ug/L	NC (1)	40		
9445410	1-Chloronaphthalene	2024/06/11	76	30 - 130	70	30 - 130	<1.0	ug/L	NC (1)	40		
9445410	1-Methylnaphthalene	2024/06/11	84	30 - 130	78	30 - 130	<0.20	ug/L	NC (1)	40		
9445410	2,3,4,5-Tetrachlorophenol	2024/06/11	105	10 - 130	109	10 - 130	<0.40	ug/L	NC (1)	40		
9445410	2,3,4,6-Tetrachlorophenol	2024/06/11	95	10 - 130	97	10 - 130	<0.50	ug/L	NC (1)	40		
9445410	2,3,4-Trichlorophenol	2024/06/11	98	10 - 130	93	10 - 130	<0.50	ug/L	NC (1)	40		
9445410	2,3,5,6-Tetrachlorophenol	2024/06/11	74	10 - 130	82	10 - 130	<0.50	ug/L	NC (1)	40		
9445410	2,3,5-Trichlorophenol	2024/06/11	92	10 - 130	95	10 - 130	<0.50	ug/L	NC (1)	40		
9445410	2,3,6-Trichlorophenol	2024/06/11	88	10 - 130	89	10 - 130	<0.50	ug/L	NC (1)	40		
9445410	2,3-Dichlorophenol	2024/06/11	84	10 - 130	86	10 - 130	<0.50	ug/L	NC (1)	40		
9445410	2,4,5-Trichlorophenol	2024/06/11	96	10 - 130	95	10 - 130	<0.50	ug/L	NC (1)	40		
9445410	2,4,6-Trichlorophenol	2024/06/11	91	10 - 130	93	10 - 130	<0.50	ug/L	NC (1)	40		
9445410	2,4-Dichlorophenol	2024/06/11	90	10 - 130	97	10 - 130	<0.30	ug/L	NC (1)	40		
9445410	2,4-Dimethylphenol	2024/06/11	66	10 - 130	66	10 - 130	<0.50	ug/L	NC (1)	40		
9445410	2,4-Dinitrophenol	2024/06/11	93	10 - 130	95	10 - 130	<2.0	ug/L	NC (1)	40		
9445410	2,4-Dinitrotoluene	2024/06/11	94	30 - 130	99	30 - 130	<0.50	ug/L	NC (1)	40		
9445410	2,5-Dichlorophenol	2024/06/11	90	10 - 130	96	10 - 130	<0.50	ug/L	NC (1)	40		
9445410	2,6-Dichlorophenol	2024/06/11	81	10 - 130	84	10 - 130	<0.50	ug/L	NC (1)	40		
9445410	2,6-Dinitrotoluene	2024/06/11	95	30 - 130	94	30 - 130	<0.50	ug/L	NC (1)	40		
9445410	2-Chloronaphthalene	2024/06/11	81	30 - 130	82	30 - 130	<0.50	ug/L	NC (1)	40		
9445410	2-Chlorophenol	2024/06/11	79	10 - 130	80	10 - 130	<0.30	ug/L	NC (1)	40		
9445410	2-Methylnaphthalene	2024/06/11	79	30 - 130	74	30 - 130	<0.20	ug/L	NC (1)	40		
9445410	2-Nitrophenol	2024/06/11	90	10 - 130	97	10 - 130	<0.50	ug/L	NC (1)	40		
9445410	3,3'-Dichlorobenzidine	2024/06/11	93	30 - 130	104	30 - 130	<0.50	ug/L	NC (1)	40		
9445410	3,4,5-Trichlorophenol	2024/06/11	99	10 - 130	96	10 - 130	<0.50	ug/L	NC (1)	40		
9445410	3,4-Dichlorophenol	2024/06/11	94	10 - 130	96	10 - 130	<0.50	ug/L	NC (1)	40		

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
9445410	3,5-Dichlorophenol	2024/06/11	94	10 - 130	95	10 - 130	<0.50	ug/L	NC (1)	40		
9445410	4,6-Dinitro-2-methylphenol	2024/06/11	102	10 - 130	108	10 - 130	<2.0	ug/L	NC (1)	40		
9445410	4-Bromophenyl phenyl ether	2024/06/11	104	30 - 130	104	30 - 130	<0.30	ug/L	NC (1)	40		
9445410	4-Chloro-3-Methylphenol	2024/06/11	92	10 - 130	93	10 - 130	<0.50	ug/L	NC (1)	40		
9445410	4-Chlorophenyl phenyl ether	2024/06/11	87	30 - 130	80	30 - 130	<0.50	ug/L	NC (1)	40		
9445410	4-Nitrophenol	2024/06/11	38	10 - 130	31	10 - 130	<1.4	ug/L	NC (1)	40		
9445410	Acenaphthene	2024/06/11	91	30 - 130	89	30 - 130	<0.20	ug/L	NC (1)	40		
9445410	Acenaphthylene	2024/06/11	89	30 - 130	88	30 - 130	<0.20	ug/L	NC (1)	40		
9445410	Anthracene	2024/06/11	96	30 - 130	100	30 - 130	<0.20	ug/L	NC (1)	40		
9445410	Benzo(a)anthracene	2024/06/11	95	30 - 130	96	30 - 130	<0.20	ug/L	NC (1)	40		
9445410	Benzo(a)pyrene	2024/06/11	107	30 - 130	109	30 - 130	<0.20	ug/L	NC (1)	40		
9445410	Benzo(b/j)fluoranthene	2024/06/11	97	30 - 130	99	30 - 130	<0.20	ug/L	NC (1)	40		
9445410	Benzo(g,h,i)perylene	2024/06/11	103	30 - 130	106	30 - 130	<0.20	ug/L	NC (1)	40		
9445410	Benzo(k)fluoranthene	2024/06/11	96	30 - 130	98	30 - 130	<0.20	ug/L	NC (1)	40		
9445410	Benzyl butyl phthalate	2024/06/11	108	30 - 130	109	30 - 130	<0.50	ug/L	NC (1)	40		
9445410	Biphenyl	2024/06/11	97	30 - 130	92	30 - 130	<0.50	ug/L	NC (1)	40		
9445410	Bis(2-chloroethoxy)methane	2024/06/11	95	30 - 130	100	30 - 130	<0.50	ug/L	NC (1)	40		
9445410	Bis(2-chloroethyl)ether	2024/06/11	86	30 - 130	89	30 - 130	<0.50	ug/L	NC (1)	40		
9445410	Bis(2-chloroisopropyl)ether	2024/06/11	87	30 - 130	82	30 - 130	<0.50	ug/L	NC (1)	40		
9445410	Bis(2-ethylhexyl)phthalate	2024/06/11	107	30 - 130	110	30 - 130	<2.0	ug/L	NC (1)	40		
9445410	Chrysene	2024/06/11	98	30 - 130	99	30 - 130	<0.20	ug/L	NC (1)	40		
9445410	Dibenzo(a,h)anthracene	2024/06/11	106	30 - 130	111	30 - 130	<0.20	ug/L	NC (1)	40		
9445410	Diethyl phthalate	2024/06/11	111	30 - 130	111	30 - 130	<1.0	ug/L	NC (1)	40		
9445410	Dimethyl phthalate	2024/06/11	100	30 - 130	100	30 - 130	<1.0	ug/L	NC (1)	40		
9445410	Di-N-butyl phthalate	2024/06/11	115	30 - 130	114	30 - 130	<2.0	ug/L	NC (1)	40		
9445410	di-n-octyl phthalate	2024/06/11	110	30 - 130	109	30 - 130	<0.80	ug/L	NC (1)	40		
9445410	Diphenyl Ether	2024/06/11	74	30 - 130	69	30 - 130	<0.30	ug/L	NC (1)	40		
9445410	Fluoranthene	2024/06/11	102	30 - 130	105	30 - 130	<0.20	ug/L	NC (1)	40		
9445410	Fluorene	2024/06/11	93	30 - 130	93	30 - 130	<0.20	ug/L	NC (1)	40		
9445410	Hexachlorobenzene	2024/06/11	94	30 - 130	94	30 - 130	<0.50	ug/L	NC (1)	40		

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
9445410	Hexachlorobutadiene	2024/06/11	26 (5)	30 - 130	25 (5)	30 - 130	<0.40	ug/L	NC (1)	40		
9445410	Hexachlorocyclopentadiene	2024/06/11	30	30 - 130	27 (5)	30 - 130	<2.0	ug/L	NC (1)	40		
9445410	Hexachloroethane	2024/06/11	32	30 - 130	30	30 - 130	<0.50	ug/L	NC (1)	40		
9445410	Indeno(1,2,3-cd)pyrene	2024/06/11	104	30 - 130	107	30 - 130	<0.20	ug/L	NC (1)	40		
9445410	Isophorone	2024/06/11	90	30 - 130	91	30 - 130	<0.50	ug/L	NC (1)	40		
9445410	m/p-Cresol	2024/06/11	63	10 - 130	63	10 - 130	<0.50	ug/L	NC (1)	40		
9445410	Naphthalene	2024/06/11	65	30 - 130	59	30 - 130	<0.20	ug/L	NC (1)	40		
9445410	Nitrobenzene	2024/06/11	83	30 - 130	83	30 - 130	<0.50	ug/L	NC (1)	40		
9445410	Nitrosodiphenylamine/Diphenylamine	2024/06/11	92	30 - 130	94	30 - 130	<1.0	ug/L	NC (1)	40		
9445410	N-Nitroso-di-n-propylamine	2024/06/11	83	30 - 130	86	30 - 130	<0.50	ug/L	NC (1)	40		
9445410	o-Cresol	2024/06/11	66	10 - 130	68	10 - 130	<0.50	ug/L	NC (1)	40		
9445410	p-Chloroaniline	2024/06/11	91	30 - 130	97	30 - 130	<1.0	ug/L	NC (1)	40		
9445410	Pentachlorobenzene	2024/06/11	51	30 - 130	43	30 - 130	<0.50	ug/L	NC (1)	40		
9445410	Pentachlorophenol	2024/06/11	76	10 - 130	81	10 - 130	<1.0	ug/L	NC (1)	40		
9445410	Perylene	2024/06/11	94	30 - 130	97	30 - 130	<0.20	ug/L	NC (1)	40		
9445410	Phenanthrene	2024/06/11	93	30 - 130	94	30 - 130	<0.20	ug/L	NC (1)	40		
9445410	Phenol	2024/06/11	35	10 - 130	34	10 - 130	<0.50	ug/L	NC (1)	40		

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
9445410	Pyrene	2024/06/11	91	30 - 130	94	30 - 130	<0.20	ug/L	NC (1)	40		

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 spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) Duplicate Parent ID

(2) Matrix Spike exceeds acceptance limits, probable matrix interference

(3) Matrix Spike Parent ID [ZJN397-04]

(4) Duplicate Parent ID [ZJN397-04]

(5) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

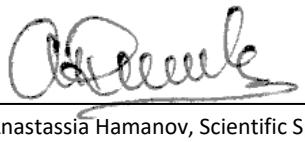
Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C4H1280
Report Date: 2024/06/20

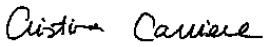
RWDI Inc.
Client Project #: 2402553.01
Site Location: ON07
Your P.O. #: 13384121
Sampler Initials: JC

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:



Anastassia Hamanov, Scientific Specialist



Cristina Carriere, Senior Scientific Specialist

Zunaira Allem, Project Manager Assistant

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

FIELD INFORMATION FORM

BUREAU VERITAS

WASTE MANAGEMENT

Site Name: TCEC

Site No.: Sample: PS Holding tank (Sample ID)

This Waste Management Field Information Form is Required
This form is to be completed, in addition to any State Forms. The Field Form is submitted along with the Chain of Custody Forms that accompany the sample containers (i.e. with the cooler that is returned to the laboratory).

Laboratory Use Only/Lab ID:

PURGE INFO

PURGE DATE (MM DD YY)	PURGE TIME (2400 Hr Clock)	ELAPSED HRS (hrs:min)	WATER VOL IN CASING (Gallons)	ACTUAL VOL PURGED (Gallons)	WELL VOLs PURGED

Note: For Passive Sampling, replace "Water Vol in Casing" and "Well Vols Purged" w/ Water Vol in Tubing/Flow Cell and Tubing/Flow Cell Vols Purged. Mark Changes, Record field data below.

PURGE/SAMPLE EQUIPMENT

Purging and Sampling Equipment ... Dedicated: (Y) or N

Purging Device:

Sampling Device: D

X-Other:

A-Submersible Pump, B-Peristaltic Pump, C-QED Bladder Pump, D-Bailer, E-Piston Pump, F-Dipper/Bottle

Filter Device: Y or (N) 0.45 µ or ____ µ (circle or fill in)

Filter Type: A-In-line Disposable, B-Pressure, C-Vacuum, X-Other: ____

Sample Tube Type: A-Teflon, B-Stainless Steel, C-PVC, D-Polypropylene, X-Other: ____

WELL DATA

Well Elevation (at TOC) ____ (ft/msl)

Depth to Water (DTW) (from TOC) ____ (ft)

Groundwater Elevation (GWE) (Site Datum, from TOC) ____ (ft msl)

Total Well Depth (from TOC) ____ (ft)

Stick Up (from ground elevation) ____ (ft)

Casing ID ____ (in)

Casing Material ____

Note: Total Depth, Stick Up, Casing ID, etc. are optional and can be from historical data, unless required by Site/Permit. Well Elevation, DTW, and GWE must be current, obtained from site.

STABILIZATION DATA (Optional)

Sample Time (2400 Hr Clock)	Rate/Unit	pH (std)	Conductance (SC/EC) (µmhos/cm @ 25°C)	Temp. (°C)	Turbidity (ntu)	D.O. (mg/L - ppm)	eH/ORP (mV)	DTW (ft)
		1st	1st					
		2nd	2nd					
		3rd	3rd					
		4th	4th					
Input Range for 3 consec. readings or Permit/State requirements:		+/-	+/-	+/-	+/-	+/-	+/-	

Stabilization Data Fields are Optional *(i.e. complete stabilization readings for parameters required by WM, Site, or State). These fields can be used where four (4) field measurements are required by State/Permit/Site. If a Data Logger or other Electronic format is used, fill in final readings below and submit electronic data separately to Site. If more fields above are needed, use separate sheet or form.*

FIELD DATA

SAMPLE DATE (MM DD YY)	pH (std)	CONDUCTANCE (µmhos/cm @ 25°C)	TEMP. (°C)	TURBIDITY (ntu)	DO (mg/L - ppm)	eH/ORP (mV)	Other: Units
060424	7.4	6.32	17.7	34.6			

Final Field Readings are required *(i.e. record field measurements, final stabilized readings, passive sample readings before sampling for all field parameters required by State/Permit/Site.)*

FIELD COMMENTS

Sample Appearance: transparent Odor: decay Color: tan - brown Other: ____

Weather Conditions (required daily, or as conditions change): 19°C Direction/Speed: NW/NE SE Outlook: Sunny. Precipitation: (Y) or N

Specific Comments (including purge/well volume calculations if required): ____

I certify that sampling procedures were in accordance with applicable EPA, State, and WM protocols (if more than one sampler, all should sign):

Date	Name	Signature	Company
06/04/24	Maya DeForest	[signature]	RWDI INC.

DISTRIBUTION: WHITE/ORIGINAL - Stays with Sample, YELLOW - Returned to Client, PINK - Field Copy

Field Information Form v-3.1 06/20

2070

Custody Tracking Form

T908594

Please use this form for custody tracking when submitting the work instructions via eCOC (electronic Chain of Custody). Please ensure your form has a barcode or a Bureau Veritas eCOC confirmation number in the top right hand side. This number links your electronic submission to your samples. This form should be placed in the cooler with your samples.

First Sample: PS Holding Tank
Last Sample: PS Holding Tank
Sample Count: 1

Relinquished By				Received By			
Maja DeForest		Date	2024/06/05			Date	
		Time (24 HR)	830			Time (24 HR)	1110
		Date				Date	
		Time (24 HR)				Time (24 HR)	
		Date				Date	
		Time (24 HR)				Time (24 HR)	

Unless otherwise agreed to, submissions and use of services are governed by Bureau Veritas' standard terms and conditions which can be found at www.bvna.com.

Triage Information

Sampled By (Print): Maja DeForest

# of Coolers/Pkgs: 1

Rush ☐ Immediate Test ☐ Food Residue ☐

Micro ☐ Food Chemistry ☐

*** LABORATORY USE ONLY ***

Received At

Labeled By

Verified By

Lab Comments:

06-Jun-24 11:20
Patricia Legette
C4H1280
AK0 ENV-578

Custody Seal		Cooling Media	Temperature °C			
Present (Y/N)	Intact (Y/N)	Present (Y/N)	1	2	3	
Y	Y	Y	5	6	7	7.8

Drinking Water Metals Preservation Check Done (Circle) YES NO

COR FCD-00383/4

Page 1 of 1

Your P.O. #: 13254256
Your Project #: 2402553.01
Site#: 500
Site Location: ON07
Your C.O.C. #: 923469

Attention: Khalid Hussein - Twin Creeks

RWDI Inc.
600 Southgate Drive
Guelph, ON
Canada N1G 4P6

Report Date: 2024/07/15
Report #: R8234623
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C4K6285
Received: 2024/07/08, 10:39

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
ABN Compounds in Water by GC/MS	1	2024/07/11	2024/07/11	CAM SOP-00301	EPA 8270 m
Alkalinity	1	N/A	2024/07/10	CAM SOP-00448	SM 24 2320 B m
Chloride by Automated Colourimetry	1	N/A	2024/07/11	CAM SOP-00463	SM 24 4500-Cl E m
Conductance in Water - On-site	1	N/A	2024/07/12		
Field Measured Dissolved Oxygen in Water	1	N/A	2024/07/12		
Total Metals by ICPMS	1	N/A	2024/07/09	CAM SOP-00447	EPA 6020B m
Ammonia-N	1	N/A	2024/07/10	CAM SOP-00441	USGS I-2522-90 m
Nitrate & Nitrite as Nitrogen in Water (1)	1	N/A	2024/07/09	CAM SOP-00440	SM 24 4500-NO3I/NO2B
Field Measured pH (2)	1	N/A	2024/07/08		Field pH Meter
Sulphate by Automated Turbidimetry	1	N/A	2024/07/11	CAM SOP-00464	SM 24 4500-SO42- E m
Field Temperature (2)	1	N/A	2024/07/08		Field Thermometer
Total Kjeldahl Nitrogen in Water	1	2024/07/10	2024/07/12	CAM SOP-00938	OMOE E3516 m
Total Phosphorus (Colourimetric)	1	2024/07/10	2024/07/11	CAM SOP-00407	SM 24 4500-P I
Turbidity	1	N/A	2024/07/09	CAM SOP-00417	SM 24 2130 B
Un-ionized Ammonia (3)	1	2024/07/08	2024/07/12	Auto Calc.	PWQO
Volatile Organic Compounds in Water	1	N/A	2024/07/09	CAM SOP-00228	EPA 8260D
Non-Routine Volatile Organic Compounds	1	N/A	2024/07/09	CAM SOP-00226	EPA 8260D m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, EPA, APHA or the Quebec Ministry of Environment.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the

Your P.O. #: 13254256
Your Project #: 2402553.01
Site#: 500
Site Location: ON07
Your C.O.C. #: 923469

Attention: Khalid Hussein - Twin Creeks

RWDI Inc.
600 Southgate Drive
Guelph, ON
Canada N1G 4P6

Report Date: 2024/07/15
Report #: R8234623
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C4K6285
Received: 2024/07/08, 10:39
customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.
(2) This is a field test, therefore, the results relate to items that were not analysed at Bureau Veritas.
(3) Un-ionized ammonia is calculated using the total ammonia result and field data provided by the client for pH and temperature.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to:
Patricia Legette, Project Manager
Email: Patricia.Legette@bureauveritas.com
Phone# (905)817-5799
==========
Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

Bureau Veritas Job #: C4K6285
Report Date: 2024/07/15

RWDI Inc.
Client Project #: 2402553.01
Site Location: ON07
Your P.O. #: 13254256
Sampler Initials: JC

RESULTS OF ANALYSES OF WATER

Bureau Veritas ID		ZQS785		
Sampling Date		2024/07/02 12:00		
COC Number		923469		
	UNITS	PS Holding Tank	RDL	QC Batch
Calculated Parameters				
Total Un-ionized Ammonia	mg/L	63	0.9	9501641
Field Measurements				
Field Conductivity	uS/cm	7330	N/A	ONSITE
Field Dissolved Oxygen	mg/L	1.86	N/A	ONSITE
Field Temperature	Celsius	27.7	N/A	ONSITE
Field Measured pH	pH	8.2		ONSITE
Inorganics				
Total Ammonia-N	mg/L	531	7.5	9500901
Total Kjeldahl Nitrogen (TKN)	mg/L	590	20	9500904
Total Phosphorus	mg/L	2.1	0.030	9505656
Dissolved Sulphate (SO4)	mg/L	140	20	9497812
Turbidity	NTU	21	0.1	9501358
Alkalinity (Total as CaCO3)	mg/L	4200	5.0	9500442
Dissolved Chloride (Cl-)	mg/L	600	20	9497811
Nitrite (N)	mg/L	0.013	0.010	9501446
Nitrate (N)	mg/L	<0.10	0.10	9501446

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

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C4K6285
Report Date: 2024/07/15

RWDI Inc.
Client Project #: 2402553.01
Site Location: ON07
Your P.O. #: 13254256
Sampler Initials: JC

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Bureau Veritas ID		ZQS785		
Sampling Date		2024/07/02 12:00		
COC Number		923469		
	UNITS	PS Holding Tank	RDL	QC Batch
Metals				
Total Aluminum (Al)	mg/L	0.3	0.2	9503023
Total Arsenic (As)	mg/L	0.017	0.005	9503023
Total Barium (Ba)	mg/L	0.17	0.03	9503023
Total Beryllium (Be)	mg/L	<0.003	0.003	9503023
Total Bismuth (Bi)	mg/L	<0.005	0.005	9503023
Total Boron (B)	mg/L	13	0.1	9503023
Total Cadmium (Cd)	mg/L	<0.0005	0.0005	9503023
Total Calcium (Ca)	mg/L	110	1	9503023
Total Chromium (Cr)	mg/L	0.05	0.03	9503023
Total Cobalt (Co)	mg/L	0.008	0.003	9503023
Total Copper (Cu)	mg/L	<0.01	0.01	9503023
Total Iron (Fe)	mg/L	2.2	0.5	9503023
Total Lead (Pb)	mg/L	<0.003	0.003	9503023
Total Magnesium (Mg)	mg/L	160	0.3	9503023
Total Molybdenum (Mo)	mg/L	<0.01	0.01	9503023
Total Nickel (Ni)	mg/L	0.073	0.005	9503023
Total Potassium (K)	mg/L	150	1	9503023
Total Selenium (Se)	mg/L	<0.03	0.03	9503023
Total Silver (Ag)	mg/L	<0.002	0.002	9503023
Total Sodium (Na)	mg/L	640	0.5	9503023
Total Strontium (Sr)	mg/L	1.2	0.02	9503023
Total Tin (Sn)	mg/L	<0.01	0.01	9503023
Total Titanium (Ti)	mg/L	0.03	0.03	9503023
Total Vanadium (V)	mg/L	0.009	0.005	9503023
Total Zinc (Zn)	mg/L	<0.05	0.05	9503023

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

SEMI-VOLATILE ORGANICS BY GC-MS (WATER)

Bureau Veritas ID		ZQS785		
Sampling Date		2024/07/02 12:00		
COC Number		923469		
	UNITS	**PS Holding Tank**	**RDL**	**QC Batch**
Semivolatile Organics				
Acenaphthene	ug/L	<2.0	2.0	9507605
Acenaphthylene	ug/L	<2.0	2.0	9507605
Anthracene	ug/L	<2.0	2.0	9507605
Benzo(a)anthracene	ug/L	<2.0	2.0	9507605
Benzo(a)pyrene	ug/L	<2.0	2.0	9507605
Benzo(b/j)fluoranthene	ug/L	<2.0	2.0	9507605
Benzo(g,h,i)perylene	ug/L	<2.0	2.0	9507605
Benzo(k)fluoranthene	ug/L	<2.0	2.0	9507605
1-Chloronaphthalene	ug/L	<10	10	9507605
2-Chloronaphthalene	ug/L	<5.0	5.0	9507605
Chrysene	ug/L	<2.0	2.0	9507605
Dibenzo(a,h)anthracene	ug/L	<2.0	2.0	9507605
Fluoranthene	ug/L	<2.0	2.0	9507605
Fluorene	ug/L	<2.0	2.0	9507605
Indeno(1,2,3-cd)pyrene	ug/L	<2.0	2.0	9507605
1-Methylnaphthalene	ug/L	<2.0	2.0	9507605
2-Methylnaphthalene	ug/L	<2.0	2.0	9507605
Naphthalene	ug/L	9.0	2.0	9507605
Perylene	ug/L	<2.0	2.0	9507605
Phenanthrene	ug/L	<2.0	2.0	9507605
Pyrene	ug/L	<2.0	2.0	9507605
1,2-Dichlorobenzene	ug/L	<5.0	5.0	9507605
1,3-Dichlorobenzene	ug/L	<5.0	5.0	9507605
Hexachlorobenzene	ug/L	<5.0	5.0	9507605
Pentachlorobenzene	ug/L	<5.0	5.0	9507605
1,2,3,5-Tetrachlorobenzene	ug/L	<5.0	5.0	9507605
1,2,4,5-Tetrachlorobenzene	ug/L	<5.0	5.0	9507605
1,2,3-Trichlorobenzene	ug/L	<5.0	5.0	9507605
1,2,4-Trichlorobenzene	ug/L	<5.0	5.0	9507605
1,3,5-Trichlorobenzene	ug/L	<5.0	5.0	9507605
2-Chlorophenol	ug/L	<3.0	3.0	9507605
4-Chloro-3-Methylphenol	ug/L	<5.0	5.0	9507605

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

SEMI-VOLATILE ORGANICS BY GC-MS (WATER)

Bureau Veritas ID		ZQS785		
Sampling Date		2024/07/02 12:00		
COC Number		923469		
	UNITS	PS Holding Tank	RDL	QC Batch
m/p-Cresol	ug/L	19	5.0	9507605
o-Cresol	ug/L	<5.0	5.0	9507605
1,2,3,4-Tetrachlorobenzene	ug/L	<5.0	5.0	9507605
2,3-Dichlorophenol	ug/L	<5.0	5.0	9507605
2,4-Dichlorophenol	ug/L	<3.0	3.0	9507605
2,5-Dichlorophenol	ug/L	<5.0	5.0	9507605
2,6-Dichlorophenol	ug/L	<5.0	5.0	9507605
3,4-Dichlorophenol	ug/L	<5.0	5.0	9507605
3,5-Dichlorophenol	ug/L	<5.0	5.0	9507605
2,4-Dimethylphenol	ug/L	5.2	5.0	9507605
2,4-Dinitrophenol	ug/L	<20	20	9507605
4,6-Dinitro-2-methylphenol	ug/L	<20	20	9507605
2-Nitrophenol	ug/L	<5.0	5.0	9507605
4-Nitrophenol	ug/L	<14	14	9507605
Pentachlorophenol	ug/L	<10	10	9507605
Phenol	ug/L	<5.0	5.0	9507605
2,3,4,5-Tetrachlorophenol	ug/L	<4.0	4.0	9507605
2,3,4,6-Tetrachlorophenol	ug/L	<5.0	5.0	9507605
2,3,5,6-Tetrachlorophenol	ug/L	<5.0	5.0	9507605
2,3,4-Trichlorophenol	ug/L	<5.0	5.0	9507605
2,3,5-Trichlorophenol	ug/L	<5.0	5.0	9507605
2,3,6-Trichlorophenol	ug/L	<5.0	5.0	9507605
2,4,5-Trichlorophenol	ug/L	<5.0	5.0	9507605
2,4,6-Trichlorophenol	ug/L	<5.0	5.0	9507605
3,4,5-Trichlorophenol	ug/L	<5.0	5.0	9507605
Benzyl butyl phthalate	ug/L	<5.0	5.0	9507605
Biphenyl	ug/L	<5.0	5.0	9507605
Bis(2-chloroethyl)ether	ug/L	<5.0	5.0	9507605
Bis(2-chloroethoxy)methane	ug/L	<5.0	5.0	9507605
Bis(2-chloroisopropyl)ether	ug/L	<5.0	5.0	9507605
Bis(2-ethylhexyl)phthalate	ug/L	<20	20	9507605
4-Bromophenyl phenyl ether	ug/L	<3.0	3.0	9507605
p-Chloroaniline	ug/L	<10	10	9507605

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

SEMI-VOLATILE ORGANICS BY GC-MS (WATER)

Bureau Veritas ID		ZQS785		
Sampling Date		2024/07/02 12:00		
COC Number		923469		
	UNITS	**PS Holding Tank**	**RDL**	**QC Batch**
4-Chlorophenyl phenyl ether	ug/L	<5.0	5.0	9507605
Di-N-butyl phthalate	ug/L	<20	20	9507605
di-n-octyl phthalate	ug/L	<8.0	8.0	9507605
2,4-Dinitrotoluene	ug/L	<5.0	5.0	9507605
Diethyl phthalate	ug/L	<10	10	9507605
3,3'-Dichlorobenzidine	ug/L	<5.0	5.0	9507605
Dimethyl phthalate	ug/L	<10	10	9507605
2,6-Dinitrotoluene	ug/L	<5.0	5.0	9507605
Diphenyl Ether	ug/L	<3.0	3.0	9507605
Hexachlorobutadiene	ug/L	<4.0	4.0	9507605
Hexachlorocyclopentadiene	ug/L	<20	20	9507605
Hexachloroethane	ug/L	<5.0	5.0	9507605
Isophorone	ug/L	<5.0	5.0	9507605
Nitrobenzene	ug/L	<5.0	5.0	9507605
Nitrosodiphenylamine/Diphenylamine	ug/L	<10	10	9507605
N-Nitroso-di-n-propylamine	ug/L	<5.0	5.0	9507605
Surrogate Recovery (%)				
2,4,6-Tribromophenol	%	97		9507605
2-Fluorobiphenyl	%	78		9507605
2-Fluorophenol	%	40		9507605
D14-Terphenyl	%	91		9507605
D5-Nitrobenzene	%	66		9507605
D5-Phenol	%	28		9507605

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

VOLATILE ORGANICS BY GC/MS (WATER)

Bureau Veritas ID		ZQS785		
Sampling Date		2024/07/02 12:00		
COC Number		923469		
	UNITS	**PS Holding Tank**	**RDL**	**QC Batch**
Volatile Organics				
Acetone (2-Propanone)	ug/L	700	50	9502383
Benzene	ug/L	5.4	1.0	9502383
Bromodichloromethane	ug/L	<2.5	2.5	9502383
Bromoform	ug/L	<5.0	5.0	9502383
Bromomethane	ug/L	<2.5	2.5	9502383
Carbon Tetrachloride	ug/L	<0.95	0.95	9502383
Chlorobenzene	ug/L	2.0	1.0	9502383
Chloroethane	ug/L	<5.0	5.0	9502383
Chloroform	ug/L	<1.0	1.0	9502383
Chloromethane	ug/L	<25	25	9502383
Dibromochloromethane	ug/L	<2.5	2.5	9502383
1,2-Dichlorobenzene	ug/L	<2.0	2.0	9502383
1,3-Dichlorobenzene	ug/L	<2.0	2.0	9502383
1,4-Dichlorobenzene	ug/L	<2.0	2.0	9502383
1,1-Dichloroethane	ug/L	<1.0	1.0	9502383
1,2-Dichloroethane	ug/L	<2.5	2.5	9502383
1,1-Dichloroethylene	ug/L	<1.0	1.0	9502383
cis-1,2-Dichloroethylene	ug/L	<2.5	2.5	9502383
trans-1,2-Dichloroethylene	ug/L	<2.5	2.5	9502383
1,2-Dichloropropane	ug/L	<1.0	1.0	9502383
cis-1,3-Dichloropropene	ug/L	<1.5	1.5	9502383
trans-1,3-Dichloropropene	ug/L	<2.0	2.0	9502383
Ethylbenzene	ug/L	19	1.0	9502383
Ethylene Dibromide	ug/L	<0.95	0.95	9502383
Methylene Chloride(Dichloromethane)	ug/L	<10	10	9502383
Methyl Ethyl Ketone (2-Butanone)	ug/L	620	50	9502383
Methyl Isobutyl Ketone	ug/L	<25	25	9502383
Methyl t-butyl ether (MTBE)	ug/L	<2.5	2.5	9502383
Styrene	ug/L	<2.0	2.0	9502383
1,1,1,2-Tetrachloroethane	ug/L	<2.5	2.5	9502383
1,1,2,2-Tetrachloroethane	ug/L	<2.0	2.0	9502383
Tetrachloroethylene	ug/L	<1.0	1.0	9502383

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

RWDI Inc.
Client Project #: 2402553.01
Site Location: ON07
Your P.O. #: 13254256
Sampler Initials: JC

VOLATILE ORGANICS BY GC/MS (WATER)

Bureau Veritas ID		ZQS785		
Sampling Date		2024/07/02 12:00		
COC Number		923469		
	UNITS	**PS Holding Tank**	**RDL**	**QC Batch**
1,3,5-Trimethylbenzene	ug/L	<4.0	4.0	9499040
Toluene	ug/L	14	1.0	9502383
1,1,1-Trichloroethane	ug/L	<1.0	1.0	9502383
1,1,2-Trichloroethane	ug/L	<2.0	2.0	9502383
Trichloroethylene	ug/L	<1.0	1.0	9502383
Trichlorofluoromethane (FREON 11)	ug/L	<2.5	2.5	9502383
Vinyl Chloride	ug/L	<1.0	1.0	9502383
p+m-Xylene	ug/L	36	1.0	9502383
o-Xylene	ug/L	18	1.0	9502383
Total Xylenes	ug/L	54	1.0	9502383
Surrogate Recovery (%)				
4-Bromofluorobenzene	%	102		9502383
D4-1,2-Dichloroethane	%	107		9502383
D8-Toluene	%	94		9502383
4-Bromofluorobenzene	%	104		9499040
D4-1,2-Dichloroethane	%	98		9499040
D8-Toluene	%	100		9499040

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

GENERAL COMMENTS

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

Package 1	25.0°C

Sample ZQS785 [PS Holding Tank] : Metals Analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.

VOC Analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.

ABN Analysis: Due to the sample matrix, a smaller than usual portion of the sample was used for extraction. Detection limits were adjusted accordingly.

Results relate only to the items tested.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

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
9499040	4-Bromofluorobenzene	2024/07/09	98	70 - 130	99	70 - 130	97	%				
9499040	D4-1,2-Dichloroethane	2024/07/09	99	70 - 130	97	70 - 130	97	%				
9499040	D8-Toluene	2024/07/09	97	70 - 130	100	70 - 130	100	%				
9502383	4-Bromofluorobenzene	2024/07/09	102	70 - 130	102	70 - 130	104	%				
9502383	D4-1,2-Dichloroethane	2024/07/09	105	70 - 130	100	70 - 130	102	%				
9502383	D8-Toluene	2024/07/09	98	70 - 130	100	70 - 130	95	%				
9507605	2,4,6-Tribromophenol	2024/07/11	89	10 - 130	96	10 - 130	86	%				
9507605	2-Fluorobiphenyl	2024/07/11	68	30 - 130	72	30 - 130	79	%				
9507605	2-Fluorophenol	2024/07/11	39	10 - 130	45	10 - 130	40	%				
9507605	D14-Terphenyl	2024/07/11	94	30 - 130	100	30 - 130	90	%				
9507605	D5-Nitrobenzene	2024/07/11	67	30 - 130	73	30 - 130	67	%				
9507605	D5-Phenol	2024/07/11	28	10 - 130	30	10 - 130	23	%				
9497811	Dissolved Chloride (Cl-)	2024/07/11	95	80 - 120	99	80 - 120	<1.0	mg/L	1.3 (1)	20		
9497812	Dissolved Sulphate (SO4)	2024/07/11	NC	75 - 125	97	80 - 120	<1.0	mg/L	0.028 (1)	20		
9499040	1,3,5-Trimethylbenzene	2024/07/09	114	60 - 140	107	60 - 140	<0.20	ug/L	NC (1)	30		
9500442	Alkalinity (Total as CaCO3)	2024/07/10			99	85 - 115	<1.0	mg/L	3.5 (1)	20		
9500901	Total Ammonia-N	2024/07/10	NC	75 - 125	97	80 - 120	<0.15	mg/L	0.42 (1)	20		
9500904	Total Kjeldahl Nitrogen (TKN)	2024/07/12	NC	80 - 120	103	80 - 120	<0.7	mg/L	1.7 (1)	20	102	80 - 120
9501358	Turbidity	2024/07/09			99	80 - 120	<0.1	NTU	12 (1)	20		
9501446	Nitrate (N)	2024/07/09	98	80 - 120	100	80 - 120	<0.10	mg/L	NC (1)	20		
9501446	Nitrite (N)	2024/07/09	104	80 - 120	101	80 - 120	<0.010	mg/L	NC (1)	20		
9502383	1,1,1,2-Tetrachloroethane	2024/07/09	105	70 - 130	115	70 - 130	<0.50	ug/L				
9502383	1,1,1-Trichloroethane	2024/07/09	112	70 - 130	121	70 - 130	<0.20	ug/L	NC (1)	30		
9502383	1,1,2,2-Tetrachloroethane	2024/07/09	107	70 - 130	112	70 - 130	<0.40	ug/L	NC (1)	30		
9502383	1,1,2-Trichloroethane	2024/07/09	110	70 - 130	116	70 - 130	<0.40	ug/L	NC (1)	30		
9502383	1,1-Dichloroethane	2024/07/09	113	70 - 130	119	70 - 130	<0.20	ug/L	NC (1)	30		
9502383	1,1-Dichloroethylene	2024/07/09	116	70 - 130	124	70 - 130	<0.20	ug/L	NC (1)	30		
9502383	1,2-Dichlorobenzene	2024/07/09	102	70 - 130	111	70 - 130	<0.40	ug/L	NC (1)	30		
9502383	1,2-Dichloroethane	2024/07/09	113	70 - 130	116	70 - 130	<0.49	ug/L	NC (1)	30		
9502383	1,2-Dichloropropane	2024/07/09	111	70 - 130	118	70 - 130	<0.20	ug/L	NC (1)	30		

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
9502383	1,3-Dichlorobenzene	2024/07/09	102	70 - 130	112	70 - 130	<0.40	ug/L	NC (1)	30		
9502383	1,4-Dichlorobenzene	2024/07/09	102	70 - 130	112	70 - 130	<0.40	ug/L	NC (1)	30		
9502383	Acetone (2-Propanone)	2024/07/09	108	60 - 140	107	60 - 140	<10	ug/L				
9502383	Benzene	2024/07/09	106	70 - 130	113	70 - 130	<0.20	ug/L	NC (1)	30		
9502383	Bromodichloromethane	2024/07/09	112	70 - 130	119	70 - 130	<0.50	ug/L	NC (1)	30		
9502383	Bromoform	2024/07/09	102	70 - 130	107	70 - 130	<1.0	ug/L	NC (1)	30		
9502383	Bromomethane	2024/07/09	93	60 - 140	95	60 - 140	<0.50	ug/L	NC (1)	30		
9502383	Carbon Tetrachloride	2024/07/09	113	70 - 130	122	70 - 130	<0.19	ug/L	NC (1)	30		
9502383	Chlorobenzene	2024/07/09	106	70 - 130	115	70 - 130	<0.20	ug/L	NC (1)	30		
9502383	Chloroethane	2024/07/09	102	70 - 130	108	70 - 130	<1.0	ug/L	NC (1)	30		
9502383	Chloroform	2024/07/09	111	70 - 130	118	70 - 130	<0.20	ug/L	4.2 (1)	30		
9502383	Chloromethane	2024/07/09	94	60 - 140	100	60 - 140	<5.0	ug/L	NC (1)	30		
9502383	cis-1,2-Dichloroethylene	2024/07/09	112	70 - 130	118	70 - 130	<0.50	ug/L	NC (1)	30		
9502383	cis-1,3-Dichloropropene	2024/07/09	112	70 - 130	116	70 - 130	<0.30	ug/L	NC (1)	30		
9502383	Dibromochloromethane	2024/07/09	108	70 - 130	114	70 - 130	<0.50	ug/L	NC (1)	30		
9502383	Ethylbenzene	2024/07/09	105	70 - 130	116	70 - 130	<0.20	ug/L	NC (1)	30		
9502383	Ethylene Dibromide	2024/07/09	108	70 - 130	113	70 - 130	<0.19	ug/L	NC (1)	30		
9502383	Methyl Ethyl Ketone (2-Butanone)	2024/07/09	94	60 - 140	94	60 - 140	<10	ug/L				
9502383	Methyl Isobutyl Ketone	2024/07/09	106	70 - 130	108	70 - 130	<5.0	ug/L				
9502383	Methyl t-butyl ether (MTBE)	2024/07/09	109	70 - 130	116	70 - 130	<0.50	ug/L				
9502383	Methylene Chloride(Dichloromethane)	2024/07/09	111	70 - 130	115	70 - 130	<2.0	ug/L	NC (1)	30		
9502383	o-Xylene	2024/07/09	101	70 - 130	114	70 - 130	<0.20	ug/L	NC (1)	30		
9502383	p+m-Xylene	2024/07/09	104	70 - 130	116	70 - 130	<0.20	ug/L	NC (1)	30		
9502383	Styrene	2024/07/09	106	70 - 130	117	70 - 130	<0.40	ug/L	NC (1)	30		
9502383	Tetrachloroethylene	2024/07/09	105	70 - 130	116	70 - 130	<0.20	ug/L	NC (1)	30		
9502383	Toluene	2024/07/09	104	70 - 130	115	70 - 130	<0.20	ug/L	NC (1)	30		
9502383	Total Xylenes	2024/07/09					<0.20	ug/L	NC (1)	30		
9502383	trans-1,2-Dichloroethylene	2024/07/09	113	70 - 130	119	70 - 130	<0.50	ug/L	NC (1)	30		
9502383	trans-1,3-Dichloropropene	2024/07/09	114	70 - 130	114	70 - 130	<0.40	ug/L	NC (1)	30		
9502383	Trichloroethylene	2024/07/09	109	70 - 130	118	70 - 130	<0.20	ug/L	NC (1)	30		

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
9502383	Trichlorofluoromethane (FREON 11)	2024/07/09	106	70 - 130	114	70 - 130	<0.50	ug/L	NC (1)	30		
9502383	Vinyl Chloride	2024/07/09	100	70 - 130	107	70 - 130	<0.20	ug/L	NC (1)	30		
9503023	Total Aluminum (Al)	2024/07/09	100	80 - 120	100	80 - 120	<0.02	mg/L				
9503023	Total Arsenic (As)	2024/07/09	99	80 - 120	98	80 - 120	<0.001	mg/L	2.4 (1)	20		
9503023	Total Barium (Ba)	2024/07/09	102	80 - 120	99	80 - 120	<0.005	mg/L				
9503023	Total Beryllium (Be)	2024/07/09	102	80 - 120	100	80 - 120	<0.0006	mg/L				
9503023	Total Bismuth (Bi)	2024/07/09	93	80 - 120	95	80 - 120	<0.001	mg/L				
9503023	Total Boron (B)	2024/07/09	NC	80 - 120	96	80 - 120	<0.02	mg/L				
9503023	Total Cadmium (Cd)	2024/07/09	99	80 - 120	99	80 - 120	<0.0001	mg/L	NC (1)	20		
9503023	Total Calcium (Ca)	2024/07/09	NC	80 - 120	104	80 - 120	<0.2	mg/L				
9503023	Total Chromium (Cr)	2024/07/09	95	80 - 120	94	80 - 120	<0.005	mg/L	4.6 (1)	20		
9503023	Total Cobalt (Co)	2024/07/09	96	80 - 120	99	80 - 120	<0.0005	mg/L	1.2 (1)	20		
9503023	Total Copper (Cu)	2024/07/09	101	80 - 120	101	80 - 120	<0.002	mg/L	NC (1)	20		
9503023	Total Iron (Fe)	2024/07/09	100	80 - 120	100	80 - 120	<0.1	mg/L				
9503023	Total Lead (Pb)	2024/07/09	95	80 - 120	97	80 - 120	<0.0005	mg/L	NC (1)	20		
9503023	Total Magnesium (Mg)	2024/07/09	NC	80 - 120	99	80 - 120	<0.05	mg/L				
9503023	Total Molybdenum (Mo)	2024/07/09	101	80 - 120	97	80 - 120	<0.002	mg/L	NC (1)	20		
9503023	Total Nickel (Ni)	2024/07/09	94	80 - 120	97	80 - 120	<0.001	mg/L	4.5 (1)	20		
9503023	Total Potassium (K)	2024/07/09	NC	80 - 120	100	80 - 120	<0.2	mg/L				
9503023	Total Selenium (Se)	2024/07/09	99	80 - 120	104	80 - 120	<0.005	mg/L	NC (1)	20		
9503023	Total Silver (Ag)	2024/07/09	93	80 - 120	93	80 - 120	<0.0004	mg/L				
9503023	Total Sodium (Na)	2024/07/09	NC	80 - 120	100	80 - 120	<0.1	mg/L				
9503023	Total Strontium (Sr)	2024/07/09	NC	80 - 120	98	80 - 120	<0.003	mg/L				
9503023	Total Tin (Sn)	2024/07/09	103	80 - 120	101	80 - 120	<0.002	mg/L				
9503023	Total Titanium (Ti)	2024/07/09	101	80 - 120	99	80 - 120	<0.005	mg/L				
9503023	Total Vanadium (V)	2024/07/09	96	80 - 120	93	80 - 120	<0.001	mg/L				
9503023	Total Zinc (Zn)	2024/07/09	98	80 - 120	100	80 - 120	<0.01	mg/L	NC (1)	20		
9505656	Total Phosphorus	2024/07/11	111 (2)	80 - 120	105	80 - 120	<0.030	mg/L	3.9 (3)	25	99	80 - 120
9507605	1,2,3,4-Tetrachlorobenzene	2024/07/11	59	30 - 130	55	30 - 130	<0.50	ug/L	NC (1)	40		
9507605	1,2,3,5-Tetrachlorobenzene	2024/07/11	57	30 - 130	57	30 - 130	<0.50	ug/L	NC (1)	40		

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
9507605	1,2,3-Trichlorobenzene	2024/07/11	59	30 - 130	64	30 - 130	<0.50	ug/L	NC (1)	40		
9507605	1,2,4,5-Tetrachlorobenzene	2024/07/11	53	30 - 130	51	30 - 130	<0.50	ug/L	NC (1)	40		
9507605	1,2,4-Trichlorobenzene	2024/07/11	58	30 - 130	57	30 - 130	<0.50	ug/L	NC (1)	40		
9507605	1,2-Dichlorobenzene	2024/07/11	63	30 - 130	62	30 - 130	<0.50	ug/L				
9507605	1,3,5-Trichlorobenzene	2024/07/11	64	30 - 130	71	30 - 130	<0.50	ug/L				
9507605	1,3-Dichlorobenzene	2024/07/11	54	30 - 130	53	30 - 130	<0.50	ug/L				
9507605	1-Chloronaphthalene	2024/07/11	60	30 - 130	73	30 - 130	<1.0	ug/L	NC (1)	40		
9507605	1-Methylnaphthalene	2024/07/11	77	30 - 130	81	30 - 130	<0.20	ug/L	NC (1)	40		
9507605	2,3,4,5-Tetrachlorophenol	2024/07/11	110	10 - 130	113	10 - 130	<0.40	ug/L	NC (1)	40		
9507605	2,3,4,6-Tetrachlorophenol	2024/07/11	90	10 - 130	90	10 - 130	<0.50	ug/L	NC (1)	40		
9507605	2,3,4-Trichlorophenol	2024/07/11	106	10 - 130	106	10 - 130	<0.50	ug/L	NC (1)	40		
9507605	2,3,5,6-Tetrachlorophenol	2024/07/11	91	10 - 130	97	10 - 130	<0.50	ug/L	NC (1)	40		
9507605	2,3,5-Trichlorophenol	2024/07/11	97	10 - 130	99	10 - 130	<0.50	ug/L	NC (1)	40		
9507605	2,3,6-Trichlorophenol	2024/07/11	87	10 - 130	92	10 - 130	<0.50	ug/L				
9507605	2,3-Dichlorophenol	2024/07/11	89	10 - 130	91	10 - 130	<0.50	ug/L				
9507605	2,4,5-Trichlorophenol	2024/07/11	91	10 - 130	92	10 - 130	<0.50	ug/L	NC (1)	40		
9507605	2,4,6-Trichlorophenol	2024/07/11	89	10 - 130	88	10 - 130	<0.50	ug/L	NC (1)	40		
9507605	2,4-Dichlorophenol	2024/07/11	75	10 - 130	82	10 - 130	<0.30	ug/L	NC (1)	40		
9507605	2,4-Dimethylphenol	2024/07/11	73	10 - 130	69	10 - 130	<0.50	ug/L	NC (1)	40		
9507605	2,4-Dinitrophenol	2024/07/11	117	10 - 130	122	10 - 130	<2.0	ug/L	NC (1)	40		
9507605	2,4-Dinitrotoluene	2024/07/11	107	30 - 130	114	30 - 130	<0.50	ug/L	NC (1)	40		
9507605	2,5-Dichlorophenol	2024/07/11	83	10 - 130	93	10 - 130	<0.50	ug/L				
9507605	2,6-Dichlorophenol	2024/07/11	81	10 - 130	89	10 - 130	<0.50	ug/L	NC (1)	40		
9507605	2,6-Dinitrotoluene	2024/07/11	100	30 - 130	99	30 - 130	<0.50	ug/L	NC (1)	40		
9507605	2-Chloronaphthalene	2024/07/11	74	30 - 130	74	30 - 130	<0.50	ug/L	NC (1)	40		
9507605	2-Chlorophenol	2024/07/11	81	10 - 130	86	10 - 130	<0.30	ug/L	NC (1)	40		
9507605	2-Methylnaphthalene	2024/07/11	73	30 - 130	79	30 - 130	<0.20	ug/L	NC (1)	40		
9507605	2-Nitrophenol	2024/07/11	91	10 - 130	95	10 - 130	<0.50	ug/L	NC (1)	40		
9507605	3,3'-Dichlorobenzidine	2024/07/11	67	30 - 130	97	30 - 130	<0.50	ug/L	NC (1)	40		
9507605	3,4,5-Trichlorophenol	2024/07/11	111	10 - 130	114	10 - 130	<0.50	ug/L	NC (1)	40		

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
9507605	3,4-Dichlorophenol	2024/07/11	94	10 - 130	98	10 - 130	<0.50	ug/L				
9507605	3,5-Dichlorophenol	2024/07/11	108	10 - 130	111	10 - 130	<0.50	ug/L				
9507605	4,6-Dinitro-2-methylphenol	2024/07/11	106	10 - 130	110	10 - 130	<2.0	ug/L	NC (1)	40		
9507605	4-Bromophenyl phenyl ether	2024/07/11	87	30 - 130	95	30 - 130	<0.30	ug/L	NC (1)	40		
9507605	4-Chloro-3-Methylphenol	2024/07/11	82	10 - 130	85	10 - 130	<0.50	ug/L	NC (1)	40		
9507605	4-Chlorophenyl phenyl ether	2024/07/11	75	30 - 130	77	30 - 130	<0.50	ug/L	NC (1)	40		
9507605	4-Nitrophenol	2024/07/11	22	10 - 130	26	10 - 130	<1.4	ug/L	NC (1)	40		
9507605	Acenaphthene	2024/07/11	82	30 - 130	82	30 - 130	<0.20	ug/L	NC (1)	40		
9507605	Acenaphthylene	2024/07/11	79	30 - 130	84	30 - 130	<0.20	ug/L	NC (1)	40		
9507605	Anthracene	2024/07/11	92	30 - 130	96	30 - 130	<0.20	ug/L	NC (1)	40		
9507605	Benzo(a)anthracene	2024/07/11	84	30 - 130	90	30 - 130	<0.20	ug/L	NC (1)	40		
9507605	Benzo(a)pyrene	2024/07/11	91	30 - 130	97	30 - 130	<0.20	ug/L	NC (1)	40		
9507605	Benzo(b/j)fluoranthene	2024/07/11	87	30 - 130	95	30 - 130	<0.20	ug/L	NC (1)	40		
9507605	Benzo(g,h,i)perylene	2024/07/11	82	30 - 130	93	30 - 130	<0.20	ug/L	NC (1)	40		
9507605	Benzo(k)fluoranthene	2024/07/11	92	30 - 130	98	30 - 130	<0.20	ug/L	NC (1)	40		
9507605	Benzyl butyl phthalate	2024/07/11	100	30 - 130	105	30 - 130	<0.50	ug/L	NC (1)	40		
9507605	Biphenyl	2024/07/11	75	30 - 130	78	30 - 130	<0.50	ug/L	NC (1)	40		
9507605	Bis(2-chloroethoxy)methane	2024/07/11	72	30 - 130	75	30 - 130	<0.50	ug/L	NC (1)	40		
9507605	Bis(2-chloroethyl)ether	2024/07/11	67	30 - 130	75	30 - 130	<0.50	ug/L	NC (1)	40		
9507605	Bis(2-chloroisopropyl)ether	2024/07/11	66	30 - 130	72	30 - 130	<0.50	ug/L	NC (1)	40		
9507605	Bis(2-ethylhexyl)phthalate	2024/07/11	99	30 - 130	104	30 - 130	<2.0	ug/L	NC (1)	40		
9507605	Chrysene	2024/07/11	89	30 - 130	92	30 - 130	<0.20	ug/L	NC (1)	40		
9507605	Dibenzo(a,h)anthracene	2024/07/11	75	30 - 130	83	30 - 130	<0.20	ug/L	NC (1)	40		
9507605	Diethyl phthalate	2024/07/11	98	30 - 130	100	30 - 130	<1.0	ug/L	NC (1)	40		
9507605	Dimethyl phthalate	2024/07/11	82	30 - 130	85	30 - 130	<1.0	ug/L	NC (1)	40		
9507605	Di-N-butyl phthalate	2024/07/11	96	30 - 130	105	30 - 130	<2.0	ug/L	NC (1)	40		
9507605	di-n-octyl phthalate	2024/07/11	102	30 - 130	108	30 - 130	<0.80	ug/L	NC (1)	40		
9507605	Diphenyl Ether	2024/07/11	72	30 - 130	74	30 - 130	<0.30	ug/L	NC (1)	40		
9507605	Fluoranthene	2024/07/11	90	30 - 130	94	30 - 130	<0.20	ug/L	NC (1)	40		
9507605	Fluorene	2024/07/11	85	30 - 130	88	30 - 130	<0.20	ug/L	NC (1)	40		

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
9507605	Hexachlorobenzene	2024/07/11	89	30 - 130	96	30 - 130	<0.50	ug/L	NC (1)	40		
9507605	Hexachlorobutadiene	2024/07/11	48	30 - 130	54	30 - 130	<0.40	ug/L	NC (1)	40		
9507605	Hexachlorocyclopentadiene	2024/07/11	56	30 - 130	59	30 - 130	<2.0	ug/L	NC (1)	40		
9507605	Hexachloroethane	2024/07/11	48	30 - 130	51	30 - 130	<0.50	ug/L	NC (1)	40		
9507605	Indeno(1,2,3-cd)pyrene	2024/07/11	81	30 - 130	87	30 - 130	<0.20	ug/L	NC (1)	40		
9507605	Isophorone	2024/07/11	64	30 - 130	70	30 - 130	<0.50	ug/L	NC (1)	40		
9507605	m/p-Cresol	2024/07/11	57	10 - 130	62	10 - 130	<0.50	ug/L	NC (1)	40		
9507605	Naphthalene	2024/07/11	62	30 - 130	68	30 - 130	<0.20	ug/L	NC (1)	40		
9507605	Nitrobenzene	2024/07/11	82	30 - 130	91	30 - 130	<0.50	ug/L	NC (1)	40		
9507605	Nitrosodiphenylamine/Diphenylamine	2024/07/11	96	30 - 130	99	30 - 130	<1.0	ug/L	NC (1)	40		
9507605	N-Nitroso-di-n-propylamine	2024/07/11	66	30 - 130	71	30 - 130	<0.50	ug/L	NC (1)	40		
9507605	o-Cresol	2024/07/11	62	10 - 130	64	10 - 130	<0.50	ug/L	NC (1)	40		
9507605	p-Chloroaniline	2024/07/11	87	30 - 130	107	30 - 130	<1.0	ug/L	NC (1)	40		
9507605	Pentachlorobenzene	2024/07/11	59	30 - 130	61	30 - 130	<0.50	ug/L	NC (1)	40		
9507605	Pentachlorophenol	2024/07/11	110	10 - 130	121	10 - 130	<1.0	ug/L	NC (1)	40		
9507605	Perylene	2024/07/11	87	30 - 130	96	30 - 130	<0.20	ug/L	NC (1)	40		
9507605	Phenanthrene	2024/07/11	88	30 - 130	93	30 - 130	<0.20	ug/L	NC (1)	40		
9507605	Phenol	2024/07/11	33	10 - 130	35	10 - 130	<0.50	ug/L	NC (1)	40		

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
9507605	Pyrene	2024/07/11	94	30 - 130	101	30 - 130	<0.20	ug/L	NC (1)	40		

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 spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) Duplicate Parent ID

(2) Matrix Spike Parent ID [ZQS785-04]

(3) Duplicate Parent ID [ZQS785-04]

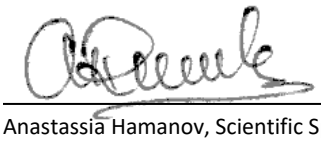
Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C4K6285
Report Date: 2024/07/15

RWDI Inc.
Client Project #: 2402553.01
Site Location: ON07
Your P.O. #: 13254256
Sampler Initials: JC

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:



Anastassia Hamanov, Scientific Specialist

Michael Damianidis, Project Manager Assistant

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

BUREAU VERITAS

FIELD INFORMATION FORM

WM WASTE MANAGEMENT

Site Name: TCEC

Site No.:

Sample: ~~PZ~~ holding
Sample ID:

This Waste Management Field Information Form is Required
This form is to be completed, in addition to any State Forms. The Field Form is submitted along with the Chain of Custody Forms that accompany the sample containers (i.e. with the cooler that is returned to the laboratory).

Laboratory Use Only/Lab ID:

PURGE INFO

PURGE DATE (MM DD YY)	PURGE TIME (2400 Hr Clock)	ELAPSED HRS (hrs:min)	WATER VOL IN CASING (Gallons)	ACTUAL VOL PURGED (Gallons)	WELL VOLs PURGED
	1200				

Note: For Passive Sampling, replace "Water Vol in Casing" and "Well Vols Purged" w/ Water Vol in Tubing/Flow Cell and Tubing/Flow Cell Vols Purged. Mark Changes, Record field data below.

PURGE/SAMPLE EQUIPMENT

Purging and Sampling Equipment ... Dedicated: (Y) or N

Purging Device:
Sampling Device: D
X-Other:

A-Submersible Pump, B-Peristaltic Pump, C-QED Bladder Pump, D-Bailer, E-Piston Pump, F-Dipper/Bottle

Filter Device: Y or (N) 0.45 µ or ____ µ (circle or fill in)

Filter Type: A-In-line Disposable, B-Pressure, C-Vacuum, X-Other: ____

Sample Tube Type: A-Teflon, B-Stainless Steel, C-PVC, D-Polypropylene, X-Other: ____

WELL DATA

Well Elevation (at TOC) ____ (ft/msl)
Depth to Water (DTW) (from TOC) ____ (ft)
Groundwater Elevation (GWE) (Site Datum, from TOC) ____ (ft msl)
Total Well Depth (from TOC) ____ (ft)
Stick Up (from ground elevation) ____ (ft)
Casing ID ____ (in)
Casing Material ____

Note: Total Depth, Stick Up, Casing ID, etc. are optional and can be from historical data, unless required by Site/Permit. Well Elevation, DTW, and GWE must be current, obtained from site.

STABILIZATION DATA (Optional)

Sample Time (2400 Hr Clock)	Rate/Unit	pH (std)	Conductance (SC/EC) (µmhos/cm @ 25°C)	Temp. (°C)	Turbidity (ntu)	D.O. (mg/L - ppm)	eH/ORP (mV)	DTW (ft)
		1st	1st					
		2nd	2nd					
		3rd	3rd					
		4th	4th					
Input Range for 3 consec. readings or Permit/State requirements:		+/-	+/-	+/-	+/-	+/-	+/-	

Stabilization Data Fields are Optional *(i.e. complete stabilization readings for parameters required by WM, Site, or State). These fields can be used where four (4) field measurements are required by State/Permit/Site. If a Data Logger or other Electronic format is used, fill in final readings below and submit electronic data separately to Site. If more fields above are needed, use separate sheet or form.*

FIELD DATA

SAMPLE DATE (MM DD YY)	pH (std)	CONDUCTANCE µmhos/cm @ 25°C	TEMP. (°C)	TURBIDITY (ntu)	DO (mg/L - ppm)	eH/ORP (mV)	Other: Units
070224	8.2	7.33	27.7		1.86		

Final Field Readings are required *(i.e. record field measurements, final stabilized readings, passive sample readings before sampling for all field parameters required by State/Permit/Site.)*

Sample Appearance: translucent
Odor: sour
Color: tan
Other: ____

Weather Conditions (required daily, or as conditions change): 16°C
Direction/Speed: SE 16km/hr
Outlook: clear
Precipitation: Y or (N)

Specific Comments (including purge/well volume calculations if required): ____

FIELD COMMENTS

I certify that sampling procedures were in accordance with applicable EPA, State, and WM protocols (if more than one sampler, all should sign):

Date	Name	Signature	Company
2/07/2024	Maja DeForest		BWDI Air

DISTRIBUTION: WHITE/ORIGINAL - Stays with Sample, YELLOW - Returned to Client, PINK - Field Copy

Field Information Form v-3.1 06/20

2059

IMMEDIATE

Custody Tracking Form

T923469

Please use this form for custody tracking when submitting the work instructions via eCOC (electronic Chain of Custody). Please ensure your form has a barcode or a Bureau Veritas eCOC confirmation number in the top right hand side. This number links your electronic submission to your samples. This form should be placed in the cooler with your samples.

First Sample: PS Holding Tank
Last Sample: PS Holding Tank
Sample Count: 1

Relinquished By				Received By			
Maja DeForest		Date	2024/07/03			Date	JUL 08
		Time (24 HR)	8:30			Time (24 HR)	1039
		Date				Date	
		Time (24 HR)				Time (24 HR)	
		Date				Date	
		Time (24 HR)				Time (24 HR)	

Unless otherwise agreed to, submissions and use of services are governed by Bureau Veritas' standard terms and conditions which can be found at www.bvna.com.

Triage Information

Sampled By (Print): Maja DeForest

# of Coolers/Pkgs: 1

Rush ☐ Immediate Test ☐ Food Residue ☐

Micro ☐ Food Chemistry ☐

*** LABORATORY USE ONLY ***

Received At

Labeled By

Verified By

Lab Comments:

Custody Seal		Cooling Media	Temperature °C		
Present (Y/N)	Intact (Y/N)	Present (Y/N)	1	2	3
Y	Y	Y - ice mat	25	25	25
Drinking Water Metals Preservation Check Done (Circle)				YES	NO

08-Jul-24 10:39
Patricia Legette
C4K6285

A3P ENV-570

COR FCD-00383/4

Page 1 of 1

eCOC: T923469

Expected TAT:	Standard TAT
Expected Arrival:	2024/07/04 11:00
Submitted By:	Jeffery Cleland
Submitted To:	Mississauga, ON (Env. Lab)

Invoice Information

Attn: Lisa Mertick lmertick@wm.com
Waste Management of Canada Corporation
5768 Nauvoo Rd. RR# 4
Watford , ON , N0M 2S0
Email to:
lmertick@wm.com
invoiceuploads@bureauveritas.com

Report Information

Attn: Jeffery Cleland
RWDI Inc.
4510 Rhodes Drive
Suite 530
Windsor , ON , N8W 5K5
Email to:
jeffery.cleland@rwdi.com
khalid.hussein@rwdi.com
james.hanna@rwdi.com
eric.wilson@rwdi.com
maja.deforest@rwdi.com

Project Information

Quote #:	C34991
PO/AFE#:	13384121
Project #:	2402553.01
Site Location:	Twin Creeks Environmental Centre

Analytical Summary

A: Standard TAT
M: Manually added test

Client Sample ID	Clnt Ref	Sampling Date/Time	Matrix	#Cont	ON-WLF-2024 TCLS - LEACHATE (PS HOLDING) MONTHLY	Turbidity
PS Holding Tank	1	2024/07/02 12:00	WASTE WATER	9	A	M

Deadlines are estimates only and are subject to change. Please refer to your Job Confirmation report for final due dates.

Submission Information

# of Samples: 1

eCOC Change Log

Modified By	Date Modified	Changes	Comments
Jeffery Cleland	03 Jul 24 10:14:21	Reporting and Invoicing	Forgot to include an extra analysis (Turbidity) that we would like to include.
Jeffery Cleland	03 Jul 24 10:17:31	Tests Requested	Forgot to include an extra analysis (Turbidity) that we would like to include.
Jeffery Cleland	03 Jul 24 10:18:07	Tests Requested, Sample Information	Forgot to include an extra analysis (Turbidity) that we would like to include.

Parameter Summary

Package/Test	Parameter	RDL *	Unit	Samples
ON-WLF-2024 TCLS - LEACHATE (PS HOLDING) MONTHLY	Acenaphthene	0.2	ug/L	All
	Acenaphthylene	0.2	ug/L	All
	Anthracene	0.2	ug/L	All
	Benzo(a)anthracene	0.2	ug/L	All
	Benzo(a)pyrene	0.2	ug/L	All
	Benzo(b/j)fluoranthene	0.2	ug/L	All
	Benzo(g,h,i)perylene	0.2	ug/L	All
	Benzo(k)fluoranthene	0.2	ug/L	All
	1-Chloronaphthalene	1	ug/L	All
	2-Chloronaphthalene	0.5	ug/L	All
	Chrysene	0.2	ug/L	All
	Dibenzo(a,h)anthracene	0.2	ug/L	All
	Fluoranthene	0.2	ug/L	All
	Fluorene	0.2	ug/L	All
	Indeno(1,2,3-cd)pyrene	0.2	ug/L	All
	1-Methylnaphthalene	0.2	ug/L	All
	2-Methylnaphthalene	0.2	ug/L	All
	Naphthalene	0.2	ug/L	All
	Perylene	0.2	ug/L	All
	Phenanthrene	0.2	ug/L	All
	Pyrene	0.2	ug/L	All
	1,2-Dichlorobenzene	0.5	ug/L	All
	1,3-Dichlorobenzene	0.5	ug/L	All
	Hexachlorobenzene	0.5	ug/L	All
	Pentachlorobenzene	0.5	ug/L	All
	1,2,3,5-Tetrachlorobenzene	0.5	ug/L	All
	1,2,4,5-Tetrachlorobenzene	0.5	ug/L	All
	1,2,3-Trichlorobenzene	0.5	ug/L	All
	1,2,4-Trichlorobenzene	0.5	ug/L	All

Your P.O. #: 13384121
Your Project #: 2402553.01
Site#: 500
Site Location: ON07
Your C.O.C. #: 943710

Attention: Khalid Hussein - Twin Creeks

RWDI Inc.
600 Southgate Drive
Guelph, ON
Canada N1G 4P6

Report Date: 2024/08/16
Report #: R8280250
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C4O5030
Received: 2024/08/09, 09:30

Sample Matrix: Leachate
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
ABN Compounds in Water by GC/MS	1	2024/08/12	2024/08/13	CAM SOP-00301	EPA 8270 m
Alkalinity	1	N/A	2024/08/12	CAM SOP-00448	SM 24 2320 B m
Chloride by Automated Colourimetry	1	N/A	2024/08/12	CAM SOP-00463	SM 24 4500-Cl E m
Conductance in Water - On-site	1	N/A	2024/08/15		
Total Metals by ICPMS	1	N/A	2024/08/14	CAM SOP-00447	EPA 6020B m
Ammonia-N	1	N/A	2024/08/15	CAM SOP-00441	USGS I-2522-90 m
Nitrate & Nitrite as Nitrogen in Water (1)	1	N/A	2024/08/12	CAM SOP-00440	SM 24 4500-NO3I/NO2B
Field Measured pH (2)	1	N/A	2024/08/09		Field pH Meter
Sulphate by Automated Turbidimetry	1	N/A	2024/08/12	CAM SOP-00464	SM 24 4500-SO42- E m
Field Temperature (2)	1	N/A	2024/08/09		Field Thermometer
Total Kjeldahl Nitrogen in Water	1	2024/08/13	2024/08/15	CAM SOP-00938	OMOE E3516 m
Total Phosphorus (Colourimetric)	1	2024/08/13	2024/08/14	CAM SOP-00407	SM 24 4500-P I
Turbidity - On-site	1	N/A	2024/08/15		
Un-ionized Ammonia (3)	1	2024/08/09	2024/08/15	Auto Calc.	PWQO
Volatile Organic Compounds in Water	1	N/A	2024/08/12	CAM SOP-00228	EPA 8260D
Non-Routine Volatile Organic Compounds	1	N/A	2024/08/12	CAM SOP-00226	EPA 8260D m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, EPA, APHA or the Quebec Ministry of Environment.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Your P.O. #: 13384121
Your Project #: 2402553.01
Site#: 500
Site Location: ON07
Your C.O.C. #: 943710

Attention: Khalid Hussein - Twin Creeks

RWDI Inc.
600 Southgate Drive
Guelph, ON
Canada N1G 4P6

Report Date: 2024/08/16
Report #: R8280250
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C4O5030

Received: 2024/08/09, 09:30

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.
(2) This is a field test, therefore, the results relate to items that were not analysed at Bureau Veritas.
(3) Un-ionized ammonia is calculated using the total ammonia result and field data provided by the client for pH and temperature.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to:
Patricia Legette, Project Manager
Email: Patricia.Legette@bureauveritas.com
Phone# (905)817-5799

==========

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

Bureau Veritas Job #: C4O5030
Report Date: 2024/08/16

RWDI Inc.
Client Project #: 2402553.01
Site Location: ON07
Your P.O. #: 13384121
Sampler Initials: JC

RESULTS OF ANALYSES OF LEACHATE

Bureau Veritas ID		ZYN711		
Sampling Date		2024/08/08 10:00		
COC Number		943710		
	UNITS	**PS Holding Tank**	**RDL**	**QC Batch**
Calculated Parameters				
Total Un-ionized Ammonia	mg/L	1.5	0.02	9566214
Field Measurements				
Field Conductivity	uS/cm	4360	N/A	ONSITE
Field Temperature	Celsius	22.0	N/A	ONSITE
Field Measured Field Turbidity	NTU	161	N/A	ONSITE
Field Measured pH	pH	7.2		ONSITE
Inorganics				
Total Ammonia-N	mg/L	166	2.3	9567035
Total Kjeldahl Nitrogen (TKN)	mg/L	180	5	9573928
Total Phosphorus	mg/L	0.81	0.030	9573412
Dissolved Sulphate (SO4)	mg/L	290	1.0	9569346
Alkalinity (Total as CaCO3)	mg/L	1700	1.0	9569363
Dissolved Chloride (Cl-)	mg/L	370	3.0	9569345
Nitrite (N)	mg/L	<0.010	0.010	9569311
Nitrate (N)	mg/L	<0.10	0.10	9569311

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

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

ELEMENTS BY ATOMIC SPECTROSCOPY (LEACHATE)

Bureau Veritas ID		ZYN711		
Sampling Date		2024/08/08 10:00		
COC Number		943710		
	UNITS	PS Holding Tank	RDL	QC Batch
Metals				
Total Aluminum (Al)	mg/L	0.09	0.02	9575377
Total Arsenic (As)	mg/L	0.003	0.001	9575377
Total Barium (Ba)	mg/L	0.16	0.005	9575377
Total Beryllium (Be)	mg/L	<0.0006	0.0006	9575377
Total Bismuth (Bi)	mg/L	<0.001	0.001	9575377
Total Boron (B)	mg/L	9.3	0.1	9575377
Total Cadmium (Cd)	mg/L	<0.0001	0.0001	9575377
Total Calcium (Ca)	mg/L	180	0.2	9575377
Total Chromium (Cr)	mg/L	0.013	0.005	9575377
Total Cobalt (Co)	mg/L	0.0032	0.0005	9575377
Total Copper (Cu)	mg/L	<0.002	0.002	9575377
Total Iron (Fe)	mg/L	3.2	0.1	9575377
Total Lead (Pb)	mg/L	0.0006	0.0005	9575377
Total Magnesium (Mg)	mg/L	120	0.05	9575377
Total Molybdenum (Mo)	mg/L	0.009	0.002	9575377
Total Nickel (Ni)	mg/L	0.030	0.001	9575377
Total Potassium (K)	mg/L	85	0.2	9575377
Total Selenium (Se)	mg/L	<0.005	0.005	9575377
Total Silver (Ag)	mg/L	<0.0004	0.0004	9575377
Total Sodium (Na)	mg/L	390	0.1	9575377
Total Strontium (Sr)	mg/L	1.7	0.003	9575377
Total Tin (Sn)	mg/L	<0.002	0.002	9575377
Total Titanium (Ti)	mg/L	0.011	0.005	9575377
Total Vanadium (V)	mg/L	0.005	0.001	9575377
Total Zinc (Zn)	mg/L	<0.01	0.01	9575377

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

SEMI-VOLATILE ORGANICS BY GC-MS (LEACHATE)

Bureau Veritas ID		ZYN711		
Sampling Date		2024/08/08 10:00		
COC Number		943710		
	UNITS	PS Holding Tank	RDL	QC Batch
Semivolatile Organics				
Acenaphthene	ug/L	<0.80	0.80	9570244
Acenaphthylene	ug/L	<0.80	0.80	9570244
Anthracene	ug/L	<0.80	0.80	9570244
Benzo(a)anthracene	ug/L	<0.80	0.80	9570244
Benzo(a)pyrene	ug/L	<0.80	0.80	9570244
Benzo(b/j)fluoranthene	ug/L	<0.80	0.80	9570244
Benzo(g,h,i)perylene	ug/L	<0.80	0.80	9570244
Benzo(k)fluoranthene	ug/L	<0.80	0.80	9570244
1-Chloronaphthalene	ug/L	<4.0	4.0	9570244
2-Chloronaphthalene	ug/L	<2.0	2.0	9570244
Chrysene	ug/L	<0.80	0.80	9570244
Dibenzo(a,h)anthracene	ug/L	<0.80	0.80	9570244
Fluoranthene	ug/L	<0.80	0.80	9570244
Fluorene	ug/L	<0.80	0.80	9570244
Indeno(1,2,3-cd)pyrene	ug/L	<0.80	0.80	9570244
1-Methylnaphthalene	ug/L	<0.80	0.80	9570244
2-Methylnaphthalene	ug/L	<0.80	0.80	9570244
Naphthalene	ug/L	<0.80	0.80	9570244
Perylene	ug/L	<0.80	0.80	9570244
Phenanthrene	ug/L	<0.80	0.80	9570244
Pyrene	ug/L	<0.80	0.80	9570244
1,2-Dichlorobenzene	ug/L	<2.0	2.0	9570244
1,3-Dichlorobenzene	ug/L	<2.0	2.0	9570244
Hexachlorobenzene	ug/L	<2.0	2.0	9570244
Pentachlorobenzene	ug/L	<2.0	2.0	9570244
1,2,3,5-Tetrachlorobenzene	ug/L	<2.0	2.0	9570244
1,2,4,5-Tetrachlorobenzene	ug/L	<2.0	2.0	9570244
1,2,3-Trichlorobenzene	ug/L	<2.0	2.0	9570244
1,2,4-Trichlorobenzene	ug/L	<2.0	2.0	9570244
1,3,5-Trichlorobenzene	ug/L	<2.0	2.0	9570244
2-Chlorophenol	ug/L	<1.2	1.2	9570244
4-Chloro-3-Methylphenol	ug/L	<2.0	2.0	9570244

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

SEMI-VOLATILE ORGANICS BY GC-MS (LEACHATE)

Bureau Veritas ID		ZYN711		
Sampling Date		2024/08/08 10:00		
COC Number		943710		
	UNITS	**PS Holding Tank**	**RDL**	**QC Batch**
m/p-Cresol	ug/L	<2.0	2.0	9570244
o-Cresol	ug/L	<2.0	2.0	9570244
1,2,3,4-Tetrachlorobenzene	ug/L	<2.0	2.0	9570244
2,3-Dichlorophenol	ug/L	<2.0	2.0	9570244
2,4-Dichlorophenol	ug/L	<1.2	1.2	9570244
2,5-Dichlorophenol	ug/L	<2.0	2.0	9570244
2,6-Dichlorophenol	ug/L	<2.0	2.0	9570244
3,4-Dichlorophenol	ug/L	<2.0	2.0	9570244
3,5-Dichlorophenol	ug/L	<2.0	2.0	9570244
2,4-Dimethylphenol	ug/L	2.1	2.0	9570244
2,4-Dinitrophenol	ug/L	<8.0	8.0	9570244
4,6-Dinitro-2-methylphenol	ug/L	<8.0	8.0	9570244
2-Nitrophenol	ug/L	<2.0	2.0	9570244
4-Nitrophenol	ug/L	<5.6	5.6	9570244
Pentachlorophenol	ug/L	<4.0	4.0	9570244
Phenol	ug/L	<2.0	2.0	9570244
2,3,4,5-Tetrachlorophenol	ug/L	<1.6	1.6	9570244
2,3,4,6-Tetrachlorophenol	ug/L	<2.0	2.0	9570244
2,3,5,6-Tetrachlorophenol	ug/L	<2.0	2.0	9570244
2,3,4-Trichlorophenol	ug/L	<2.0	2.0	9570244
2,3,5-Trichlorophenol	ug/L	<2.0	2.0	9570244
2,3,6-Trichlorophenol	ug/L	<2.0	2.0	9570244
2,4,5-Trichlorophenol	ug/L	<2.0	2.0	9570244
2,4,6-Trichlorophenol	ug/L	<2.0	2.0	9570244
3,4,5-Trichlorophenol	ug/L	<2.0	2.0	9570244
Benzyl butyl phthalate	ug/L	<2.0	2.0	9570244
Biphenyl	ug/L	<2.0	2.0	9570244
Bis(2-chloroethyl)ether	ug/L	<2.0	2.0	9570244
Bis(2-chloroethoxy)methane	ug/L	<2.0	2.0	9570244
Bis(2-chloroisopropyl)ether	ug/L	<2.0	2.0	9570244
Bis(2-ethylhexyl)phthalate	ug/L	<8.0	8.0	9570244
4-Bromophenyl phenyl ether	ug/L	<1.2	1.2	9570244
p-Chloroaniline	ug/L	<4.0	4.0	9570244

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

SEMI-VOLATILE ORGANICS BY GC-MS (LEACHATE)

Bureau Veritas ID		ZYN711		
Sampling Date		2024/08/08 10:00		
COC Number		943710		
	UNITS	**PS Holding Tank**	**RDL**	**QC Batch**
4-Chlorophenyl phenyl ether	ug/L	<2.0	2.0	9570244
Di-N-butyl phthalate	ug/L	<8.0	8.0	9570244
di-n-octyl phthalate	ug/L	<3.2	3.2	9570244
2,4-Dinitrotoluene	ug/L	<2.0	2.0	9570244
Diethyl phthalate	ug/L	<4.0	4.0	9570244
3,3'-Dichlorobenzidine	ug/L	<2.0	2.0	9570244
Dimethyl phthalate	ug/L	<4.0	4.0	9570244
2,6-Dinitrotoluene	ug/L	<2.0	2.0	9570244
Diphenyl Ether	ug/L	<1.2	1.2	9570244
Hexachlorobutadiene	ug/L	<1.6	1.6	9570244
Hexachlorocyclopentadiene	ug/L	<8.0	8.0	9570244
Hexachloroethane	ug/L	<2.0	2.0	9570244
Isophorone	ug/L	<2.0	2.0	9570244
Nitrobenzene	ug/L	<2.0	2.0	9570244
Nitrosodiphenylamine/Diphenylamine	ug/L	<4.0	4.0	9570244
N-Nitroso-di-n-propylamine	ug/L	<2.0	2.0	9570244
Surrogate Recovery (%)				
2,4,6-Tribromophenol	%	112		9570244
2-Fluorobiphenyl	%	83		9570244
2-Fluorophenol	%	40		9570244
D14-Terphenyl	%	99		9570244
D5-Nitrobenzene	%	69		9570244
D5-Phenol	%	26		9570244

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

RWDI Inc.
Client Project #: 2402553.01
Site Location: ON07
Your P.O. #: 13384121
Sampler Initials: JC

VOLATILE ORGANICS BY GC/MS (LEACHATE)

Bureau Veritas ID		ZYN711		
Sampling Date		2024/08/08 10:00		
COC Number		943710		
	UNITS	PS Holding Tank	RDL	QC Batch
Volatile Organics				
Acetone (2-Propanone)	ug/L	11	10	9569708
Benzene	ug/L	3.1	0.20	9569708
Bromodichloromethane	ug/L	<0.50	0.50	9569708
Bromoform	ug/L	<1.0	1.0	9569708
Bromomethane	ug/L	<0.50	0.50	9569708
Carbon Tetrachloride	ug/L	<0.19	0.19	9569708
Chlorobenzene	ug/L	1.8	0.20	9569708
Chloroethane	ug/L	1.2	1.0	9569708
Chloroform	ug/L	<0.20	0.20	9569708
Chloromethane	ug/L	<5.0	5.0	9569708
Dibromochloromethane	ug/L	<0.50	0.50	9569708
1,2-Dichlorobenzene	ug/L	<0.40	0.40	9569708
1,3-Dichlorobenzene	ug/L	<0.40	0.40	9569708
1,4-Dichlorobenzene	ug/L	2.2	0.40	9569708
1,1-Dichloroethane	ug/L	0.29	0.20	9569708
1,2-Dichloroethane	ug/L	<0.49	0.49	9569708
1,1-Dichloroethylene	ug/L	<0.20	0.20	9569708
cis-1,2-Dichloroethylene	ug/L	<0.50	0.50	9569708
trans-1,2-Dichloroethylene	ug/L	<0.50	0.50	9569708
1,2-Dichloropropane	ug/L	<0.20	0.20	9569708
cis-1,3-Dichloropropene	ug/L	<0.30	0.30	9569708
trans-1,3-Dichloropropene	ug/L	<0.40	0.40	9569708
Ethylbenzene	ug/L	1.3	0.20	9569708
Ethylene Dibromide	ug/L	<0.19	0.19	9569708
Methylene Chloride(Dichloromethane)	ug/L	<2.0	2.0	9569708
Methyl Ethyl Ketone (2-Butanone)	ug/L	<10	10	9569708
Methyl Isobutyl Ketone	ug/L	<5.0	5.0	9569708
Methyl t-butyl ether (MTBE)	ug/L	0.81	0.50	9569708
Styrene	ug/L	<0.40	0.40	9569708
1,1,1,2-Tetrachloroethane	ug/L	<0.50	0.50	9569708
1,1,2,2-Tetrachloroethane	ug/L	<0.40	0.40	9569708
Tetrachloroethylene	ug/L	<0.20	0.20	9569708

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

RWDI Inc.
Client Project #: 2402553.01
Site Location: ON07
Your P.O. #: 13384121
Sampler Initials: JC

VOLATILE ORGANICS BY GC/MS (LEACHATE)

Bureau Veritas ID		ZYN711		
Sampling Date		2024/08/08 10:00		
COC Number		943710		
	UNITS	**PS Holding Tank**	**RDL**	**QC Batch**
1,3,5-Trimethylbenzene	ug/L	<10	10	9566167
Toluene	ug/L	4.0	0.20	9569708
1,1,1-Trichloroethane	ug/L	<0.20	0.20	9569708
1,1,2-Trichloroethane	ug/L	<0.40	0.40	9569708
Trichloroethylene	ug/L	<0.20	0.20	9569708
Trichlorofluoromethane (FREON 11)	ug/L	<0.50	0.50	9569708
Vinyl Chloride	ug/L	0.25	0.20	9569708
p+m-Xylene	ug/L	6.2	0.20	9569708
o-Xylene	ug/L	5.3	0.20	9569708
Total Xylenes	ug/L	11	0.20	9569708
Surrogate Recovery (%)				
4-Bromofluorobenzene	%	102		9569708
D4-1,2-Dichloroethane	%	110		9569708
D8-Toluene	%	86		9569708
4-Bromofluorobenzene	%	103		9566167
D4-1,2-Dichloroethane	%	101		9566167
D8-Toluene	%	102		9566167

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

GENERAL COMMENTS

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

Package 1	6.3°C

Sample ZYN711 [PS Holding Tank] : ABN Analysis: Due to the sample matrix, a smaller amount was used for extraction. Detection limits were adjusted accordingly.

VOC Water Analysis: Due to foaming, sample required dilution. The detection limits were adjusted accordingly.

Results relate only to the items tested.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

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
9566167	4-Bromofluorobenzene	2024/08/12	107	70 - 130	104	70 - 130	104	%				
9566167	D4-1,2-Dichloroethane	2024/08/12	97	70 - 130	97	70 - 130	99	%				
9566167	D8-Toluene	2024/08/12	102	70 - 130	102	70 - 130	103	%				
9569708	4-Bromofluorobenzene	2024/08/12	103	70 - 130	102	70 - 130	100	%				
9569708	D4-1,2-Dichloroethane	2024/08/12	105	70 - 130	101	70 - 130	103	%				
9569708	D8-Toluene	2024/08/12	98	70 - 130	101	70 - 130	92	%				
9570244	2,4,6-Tribromophenol	2024/08/12	111	10 - 130	107	10 - 130	97	%				
9570244	2-Fluorobiphenyl	2024/08/12	85	30 - 130	81	30 - 130	81	%				
9570244	2-Fluorophenol	2024/08/12	44	10 - 130	44	10 - 130	42	%				
9570244	D14-Terphenyl	2024/08/12	107	30 - 130	104	30 - 130	103	%				
9570244	D5-Nitrobenzene	2024/08/12	76	30 - 130	77	30 - 130	71	%				
9570244	D5-Phenol	2024/08/12	30	10 - 130	30	10 - 130	29	%				
9566167	1,3,5-Trimethylbenzene	2024/08/12	113	60 - 140	103	60 - 140	<0.20	ug/L				
9567035	Total Ammonia-N	2024/08/15	91	75 - 125	90	80 - 120	<0.15	mg/L	NC (1)	20		
9569311	Nitrate (N)	2024/08/12	96	80 - 120	98	80 - 120	<0.10	mg/L	1.1 (1)	20		
9569311	Nitrite (N)	2024/08/12	104	80 - 120	106	80 - 120	<0.010	mg/L	NC (1)	20		
9569345	Dissolved Chloride (Cl-)	2024/08/12	103	80 - 120	104	80 - 120	<1.0	mg/L	2.5 (1)	20		
9569346	Dissolved Sulphate (SO4)	2024/08/12	NC	75 - 125	100	80 - 120	<1.0	mg/L	0.47 (1)	20		
9569363	Alkalinity (Total as CaCO3)	2024/08/12			97	85 - 115	<1.0	mg/L	1.4 (1)	20		
9569708	1,1,1,2-Tetrachloroethane	2024/08/12	103	70 - 130	101	70 - 130	<0.50	ug/L	NC (1)	30		
9569708	1,1,1-Trichloroethane	2024/08/12	94	70 - 130	94	70 - 130	<0.20	ug/L	2.7 (1)	30		
9569708	1,1,2,2-Tetrachloroethane	2024/08/12	95	70 - 130	87	70 - 130	<0.40	ug/L	NC (1)	30		
9569708	1,1,2-Trichloroethane	2024/08/12	96	70 - 130	92	70 - 130	<0.40	ug/L	NC (1)	30		
9569708	1,1-Dichloroethane	2024/08/12	92	70 - 130	90	70 - 130	<0.20	ug/L	NC (1)	30		
9569708	1,1-Dichloroethylene	2024/08/12	94	70 - 130	95	70 - 130	<0.20	ug/L	NC (1)	30		
9569708	1,2-Dichlorobenzene	2024/08/12	97	70 - 130	96	70 - 130	<0.40	ug/L	NC (1)	30		
9569708	1,2-Dichloroethane	2024/08/12	105	70 - 130	99	70 - 130	<0.49	ug/L	NC (1)	30		
9569708	1,2-Dichloropropane	2024/08/12	96	70 - 130	92	70 - 130	<0.20	ug/L	NC (1)	30		
9569708	1,3-Dichlorobenzene	2024/08/12	92	70 - 130	96	70 - 130	<0.40	ug/L	NC (1)	30		
9569708	1,4-Dichlorobenzene	2024/08/12	98	70 - 130	95	70 - 130	<0.40	ug/L	NC (1)	30		

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
9569708	Acetone (2-Propanone)	2024/08/12	101	60 - 140	96	60 - 140	<10	ug/L	NC (1)	30		
9569708	Benzene	2024/08/12	96	70 - 130	95	70 - 130	<0.20	ug/L	NC (1)	30		
9569708	Bromodichloromethane	2024/08/12	98	70 - 130	94	70 - 130	<0.50	ug/L	NC (1)	30		
9569708	Bromoform	2024/08/12	100	70 - 130	97	70 - 130	<1.0	ug/L	NC (1)	30		
9569708	Bromomethane	2024/08/12	83	60 - 140	81	60 - 140	<0.50	ug/L	NC (1)	30		
9569708	Carbon Tetrachloride	2024/08/12	102	70 - 130	102	70 - 130	<0.19	ug/L	NC (1)	30		
9569708	Chlorobenzene	2024/08/12	89	70 - 130	88	70 - 130	<0.20	ug/L	NC (1)	30		
9569708	Chloroethane	2024/08/12	87	70 - 130	86	70 - 130	<1.0	ug/L				
9569708	Chloroform	2024/08/12	99	70 - 130	96	70 - 130	<0.20	ug/L	NC (1)	30		
9569708	Chloromethane	2024/08/12	83	60 - 140	80	60 - 140	<5.0	ug/L				
9569708	cis-1,2-Dichloroethylene	2024/08/12	102	70 - 130	99	70 - 130	<0.50	ug/L	NC (1)	30		
9569708	cis-1,3-Dichloropropene	2024/08/12	94	70 - 130	90	70 - 130	<0.30	ug/L	NC (1)	30		
9569708	Dibromochloromethane	2024/08/12	101	70 - 130	97	70 - 130	<0.50	ug/L	NC (1)	30		
9569708	Ethylbenzene	2024/08/12	90	70 - 130	92	70 - 130	<0.20	ug/L	NC (1)	30		
9569708	Ethylene Dibromide	2024/08/12	99	70 - 130	94	70 - 130	<0.19	ug/L	NC (1)	30		
9569708	Methyl Ethyl Ketone (2-Butanone)	2024/08/12	103	60 - 140	96	60 - 140	<10	ug/L	NC (1)	30		
9569708	Methyl Isobutyl Ketone	2024/08/12	99	70 - 130	90	70 - 130	<5.0	ug/L	NC (1)	30		
9569708	Methyl t-butyl ether (MTBE)	2024/08/12	94	70 - 130	93	70 - 130	<0.50	ug/L	NC (1)	30		
9569708	Methylene Chloride(Dichloromethane)	2024/08/12	94	70 - 130	90	70 - 130	<2.0	ug/L	NC (1)	30		
9569708	o-Xylene	2024/08/12	97	70 - 130	100	70 - 130	<0.20	ug/L	NC (1)	30		
9569708	p+m-Xylene	2024/08/12	90	70 - 130	93	70 - 130	<0.20	ug/L	NC (1)	30		
9569708	Styrene	2024/08/12	95	70 - 130	96	70 - 130	<0.40	ug/L	NC (1)	30		
9569708	Tetrachloroethylene	2024/08/12	94	70 - 130	95	70 - 130	<0.20	ug/L	NC (1)	30		
9569708	Toluene	2024/08/12	92	70 - 130	93	70 - 130	<0.20	ug/L	NC (1)	30		
9569708	Total Xylenes	2024/08/12					<0.20	ug/L	NC (1)	30		
9569708	trans-1,2-Dichloroethylene	2024/08/12	102	70 - 130	101	70 - 130	<0.50	ug/L	NC (1)	30		
9569708	trans-1,3-Dichloropropene	2024/08/12	103	70 - 130	99	70 - 130	<0.40	ug/L	NC (1)	30		
9569708	Trichloroethylene	2024/08/12	99	70 - 130	98	70 - 130	<0.20	ug/L	3.5 (1)	30		
9569708	Trichlorofluoromethane (FREON 11)	2024/08/12	94	70 - 130	95	70 - 130	<0.50	ug/L	NC (1)	30		
9569708	Vinyl Chloride	2024/08/12	85	70 - 130	86	70 - 130	<0.20	ug/L	NC (1)	30		

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
9570244	1,2,3,4-Tetrachlorobenzene	2024/08/12	82	30 - 130	79	30 - 130	<0.50	ug/L				
9570244	1,2,3,5-Tetrachlorobenzene	2024/08/12	79	30 - 130	74	30 - 130	<0.50	ug/L				
9570244	1,2,3-Trichlorobenzene	2024/08/12	73	30 - 130	71	30 - 130	<0.50	ug/L				
9570244	1,2,4,5-Tetrachlorobenzene	2024/08/12	71	30 - 130	65	30 - 130	<0.50	ug/L				
9570244	1,2,4-Trichlorobenzene	2024/08/12	69	30 - 130	69	30 - 130	<0.50	ug/L				
9570244	1,2-Dichlorobenzene	2024/08/12	78	30 - 130	79	30 - 130	<0.50	ug/L				
9570244	1,3,5-Trichlorobenzene	2024/08/12	74	30 - 130	72	30 - 130	<0.50	ug/L				
9570244	1,3-Dichlorobenzene	2024/08/12	67	30 - 130	64	30 - 130	<0.50	ug/L				
9570244	1-Chloronaphthalene	2024/08/12	81	30 - 130	77	30 - 130	<1.0	ug/L				
9570244	1-Methylnaphthalene	2024/08/12	94	30 - 130	88	30 - 130	<0.20	ug/L				
9570244	2,3,4,5-Tetrachlorophenol	2024/08/12	124	10 - 130	127	10 - 130	<0.40	ug/L				
9570244	2,3,4,6-Tetrachlorophenol	2024/08/12	101	10 - 130	100	10 - 130	<0.50	ug/L				
9570244	2,3,4-Trichlorophenol	2024/08/12	108	10 - 130	107	10 - 130	<0.50	ug/L				
9570244	2,3,5,6-Tetrachlorophenol	2024/08/12	92	10 - 130	100	10 - 130	<0.50	ug/L				
9570244	2,3,5-Trichlorophenol	2024/08/12	103	10 - 130	103	10 - 130	<0.50	ug/L				
9570244	2,3,6-Trichlorophenol	2024/08/12	98	10 - 130	88	10 - 130	<0.50	ug/L				
9570244	2,3-Dichlorophenol	2024/08/12	96	10 - 130	91	10 - 130	<0.50	ug/L				
9570244	2,4,5-Trichlorophenol	2024/08/12	102	10 - 130	98	10 - 130	<0.50	ug/L				
9570244	2,4,6-Trichlorophenol	2024/08/12	98	10 - 130	93	10 - 130	<0.50	ug/L				
9570244	2,4-Dichlorophenol	2024/08/12	87	10 - 130	85	10 - 130	<0.30	ug/L	NC (1)	40		
9570244	2,4-Dimethylphenol	2024/08/12	69	10 - 130	71	10 - 130	<0.50	ug/L				
9570244	2,4-Dinitrophenol	2024/08/12	129	10 - 130	117	10 - 130	<2.0	ug/L				
9570244	2,4-Dinitrotoluene	2024/08/12	117	30 - 130	114	30 - 130	<0.50	ug/L				
9570244	2,5-Dichlorophenol	2024/08/12	93	10 - 130	93	10 - 130	<0.50	ug/L				
9570244	2,6-Dichlorophenol	2024/08/12	87	10 - 130	85	10 - 130	<0.50	ug/L				
9570244	2,6-Dinitrotoluene	2024/08/12	103	30 - 130	101	30 - 130	<0.50	ug/L				
9570244	2-Chloronaphthalene	2024/08/12	89	30 - 130	81	30 - 130	<0.50	ug/L				
9570244	2-Chlorophenol	2024/08/12	84	10 - 130	86	10 - 130	<0.30	ug/L				
9570244	2-Methylnaphthalene	2024/08/12	90	30 - 130	83	30 - 130	<0.20	ug/L				
9570244	2-Nitrophenol	2024/08/12	93	10 - 130	99	10 - 130	<0.50	ug/L				

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
9570244	3,3'-Dichlorobenzidine	2024/08/12	107	30 - 130	106	30 - 130	<0.50	ug/L				
9570244	3,4,5-Trichlorophenol	2024/08/12	116	10 - 130	111	10 - 130	<0.50	ug/L				
9570244	3,4-Dichlorophenol	2024/08/12	96	10 - 130	98	10 - 130	<0.50	ug/L				
9570244	3,5-Dichlorophenol	2024/08/12	111	10 - 130	106	10 - 130	<0.50	ug/L				
9570244	4,6-Dinitro-2-methylphenol	2024/08/12	102	10 - 130	102	10 - 130	<2.0	ug/L				
9570244	4-Bromophenyl phenyl ether	2024/08/12	114	30 - 130	111	30 - 130	<0.30	ug/L				
9570244	4-Chloro-3-Methylphenol	2024/08/12	85	10 - 130	83	10 - 130	<0.50	ug/L				
9570244	4-Chlorophenyl phenyl ether	2024/08/12	91	30 - 130	86	30 - 130	<0.50	ug/L				
9570244	4-Nitrophenol	2024/08/12	36	10 - 130	38	10 - 130	<1.4	ug/L				
9570244	Acenaphthene	2024/08/12	94	30 - 130	91	30 - 130	<0.20	ug/L				
9570244	Acenaphthylene	2024/08/12	93	30 - 130	90	30 - 130	<0.20	ug/L				
9570244	Anthracene	2024/08/12	103	30 - 130	97	30 - 130	<0.20	ug/L				
9570244	Benzo(a)anthracene	2024/08/12	98	30 - 130	93	30 - 130	<0.20	ug/L				
9570244	Benzo(a)pyrene	2024/08/12	103	30 - 130	103	30 - 130	<0.20	ug/L				
9570244	Benzo(b/j)fluoranthene	2024/08/12	93	30 - 130	92	30 - 130	<0.20	ug/L				
9570244	Benzo(g,h,i)perylene	2024/08/12	97	30 - 130	95	30 - 130	<0.20	ug/L				
9570244	Benzo(k)fluoranthene	2024/08/12	109	30 - 130	110	30 - 130	<0.20	ug/L				
9570244	Benzyl butyl phthalate	2024/08/12	110	30 - 130	106	30 - 130	<0.50	ug/L	NC (1)	40		
9570244	Biphenyl	2024/08/12	87	30 - 130	80	30 - 130	<0.50	ug/L				
9570244	Bis(2-chloroethoxy)methane	2024/08/12	81	30 - 130	83	30 - 130	<0.50	ug/L	NC (1)	40		
9570244	Bis(2-chloroethyl)ether	2024/08/12	79	30 - 130	77	30 - 130	<0.50	ug/L				
9570244	Bis(2-chloroisopropyl)ether	2024/08/12	72	30 - 130	74	30 - 130	<0.50	ug/L				
9570244	Bis(2-ethylhexyl)phthalate	2024/08/12	110	30 - 130	105	30 - 130	<2.0	ug/L				
9570244	Chrysene	2024/08/12	98	30 - 130	94	30 - 130	<0.20	ug/L				
9570244	Dibenzo(a,h)anthracene	2024/08/12	94	30 - 130	94	30 - 130	<0.20	ug/L				
9570244	Diethyl phthalate	2024/08/12	109	30 - 130	106	30 - 130	<1.0	ug/L	NC (1)	40		
9570244	Dimethyl phthalate	2024/08/12	96	30 - 130	93	30 - 130	<1.0	ug/L				
9570244	Di-N-butyl phthalate	2024/08/12	110	30 - 130	107	30 - 130	<2.0	ug/L				
9570244	di-n-octyl phthalate	2024/08/12	110	30 - 130	107	30 - 130	<0.80	ug/L	NC (1)	40		
9570244	Diphenyl Ether	2024/08/12	88	30 - 130	86	30 - 130	<0.30	ug/L				

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
9570244	Fluoranthene	2024/08/12	100	30 - 130	99	30 - 130	<0.20	ug/L				
9570244	Fluorene	2024/08/12	98	30 - 130	94	30 - 130	<0.20	ug/L				
9570244	Hexachlorobenzene	2024/08/12	109	30 - 130	106	30 - 130	<0.50	ug/L				
9570244	Hexachlorobutadiene	2024/08/12	58	30 - 130	54	30 - 130	<0.40	ug/L				
9570244	Hexachlorocyclopentadiene	2024/08/12	55	30 - 130	45	30 - 130	<2.0	ug/L				
9570244	Hexachloroethane	2024/08/12	59	30 - 130	55	30 - 130	<0.50	ug/L				
9570244	Indeno(1,2,3-cd)pyrene	2024/08/12	97	30 - 130	98	30 - 130	<0.20	ug/L				
9570244	Isophorone	2024/08/12	74	30 - 130	71	30 - 130	<0.50	ug/L				
9570244	m/p-Cresol	2024/08/12	64	10 - 130	64	10 - 130	<0.50	ug/L				
9570244	Naphthalene	2024/08/12	83	30 - 130	78	30 - 130	<0.20	ug/L				
9570244	Nitrobenzene	2024/08/12	89	30 - 130	94	30 - 130	<0.50	ug/L				
9570244	Nitrosodiphenylamine/Diphenylamine	2024/08/12	106	30 - 130	105	30 - 130	<1.0	ug/L				
9570244	N-Nitroso-di-n-propylamine	2024/08/12	85	30 - 130	83	30 - 130	<0.50	ug/L				
9570244	o-Cresol	2024/08/12	66	10 - 130	72	10 - 130	<0.50	ug/L				
9570244	p-Chloroaniline	2024/08/12	105	30 - 130	102	30 - 130	<1.0	ug/L				
9570244	Pentachlorobenzene	2024/08/12	86	30 - 130	78	30 - 130	<0.50	ug/L				
9570244	Pentachlorophenol	2024/08/12	97	10 - 130	111	10 - 130	<1.0	ug/L				
9570244	Perylene	2024/08/12	97	30 - 130	94	30 - 130	<0.20	ug/L				
9570244	Phenanthrene	2024/08/12	96	30 - 130	96	30 - 130	<0.20	ug/L				
9570244	Phenol	2024/08/12	32	10 - 130	32	10 - 130	<0.50	ug/L				
9570244	Pyrene	2024/08/12	105	30 - 130	101	30 - 130	<0.20	ug/L				
9573412	Total Phosphorus	2024/08/14	105 (2)	80 - 120	97	80 - 120	<0.030	mg/L	4.0 (3)	25	103	80 - 120
9573928	Total Kjeldahl Nitrogen (TKN)	2024/08/15	NC (2)	80 - 120	99	80 - 120	<0.7	mg/L	1.4 (3)	20	98	80 - 120
9575377	Total Aluminum (Al)	2024/08/14	110 (4)	80 - 120	95	80 - 120	<0.02	mg/L	1.3 (5)	20		
9575377	Total Arsenic (As)	2024/08/14	101 (4)	80 - 120	99	80 - 120	<0.001	mg/L	7.1 (5)	20		
9575377	Total Barium (Ba)	2024/08/14	98 (4)	80 - 120	98	80 - 120	<0.005	mg/L	2.2 (5)	20		
9575377	Total Beryllium (Be)	2024/08/14	104 (4)	80 - 120	97	80 - 120	<0.0006	mg/L	NC (5)	20		
9575377	Total Bismuth (Bi)	2024/08/14	93 (4)	80 - 120	97	80 - 120	<0.001	mg/L	NC (5)	20		
9575377	Total Boron (B)	2024/08/14	NC (4)	80 - 120	95	80 - 120	<0.02	mg/L	0.84 (5)	20		
9575377	Total Cadmium (Cd)	2024/08/14	96 (4)	80 - 120	96	80 - 120	<0.0001	mg/L	NC (5)	20		

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
9575377	Total Calcium (Ca)	2024/08/14	NC (4)	80 - 120	96	80 - 120	<0.2	mg/L	2.0 (5)	20		
9575377	Total Chromium (Cr)	2024/08/14	99 (4)	80 - 120	96	80 - 120	<0.005	mg/L	0.70 (5)	20		
9575377	Total Cobalt (Co)	2024/08/14	99 (4)	80 - 120	100	80 - 120	<0.0005	mg/L	2.6 (5)	20		
9575377	Total Copper (Cu)	2024/08/14	103 (4)	80 - 120	97	80 - 120	<0.002	mg/L	NC (5)	20		
9575377	Total Iron (Fe)	2024/08/14	100 (4)	80 - 120	100	80 - 120	<0.1	mg/L	3.2 (5)	20		
9575377	Total Lead (Pb)	2024/08/14	95 (4)	80 - 120	100	80 - 120	<0.0005	mg/L	1.8 (5)	20		
9575377	Total Magnesium (Mg)	2024/08/14	NC (4)	80 - 120	98	80 - 120	<0.05	mg/L	1.1 (5)	20		
9575377	Total Molybdenum (Mo)	2024/08/14	107 (4)	80 - 120	98	80 - 120	<0.002	mg/L	0.27 (5)	20		
9575377	Total Nickel (Ni)	2024/08/14	96 (4)	80 - 120	98	80 - 120	<0.001	mg/L	3.1 (5)	20		
9575377	Total Potassium (K)	2024/08/14	NC (4)	80 - 120	102	80 - 120	<0.2	mg/L	0.38 (5)	20		
9575377	Total Selenium (Se)	2024/08/14	95 (4)	80 - 120	97	80 - 120	<0.005	mg/L	NC (5)	20		
9575377	Total Silver (Ag)	2024/08/14	96 (4)	80 - 120	97	80 - 120	<0.0004	mg/L	NC (5)	20		
9575377	Total Sodium (Na)	2024/08/14	NC (4)	80 - 120	98	80 - 120	<0.1	mg/L	0.69 (5)	20		
9575377	Total Strontium (Sr)	2024/08/14	NC (4)	80 - 120	98	80 - 120	<0.003	mg/L	3.8 (5)	20		
9575377	Total Tin (Sn)	2024/08/14	100 (4)	80 - 120	97	80 - 120	<0.002	mg/L	NC (5)	20		
9575377	Total Titanium (Ti)	2024/08/14	97 (4)	80 - 120	94	80 - 120	<0.005	mg/L	5.1 (5)	20		
9575377	Total Vanadium (V)	2024/08/14	100 (4)	80 - 120	95	80 - 120	<0.001	mg/L	0.19 (5)	20		

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
9575377	Total Zinc (Zn)	2024/08/14	95 (4)	80 - 120	100	80 - 120	<0.01	mg/L	NC (5)	20		

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 spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) Duplicate Parent ID

(2) Matrix Spike Parent ID [ZYN711-03]

(3) Duplicate Parent ID [ZYN711-03]

(4) Matrix Spike Parent ID [ZYN711-04]

(5) Duplicate Parent ID [ZYN711-04]

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C4O5030
Report Date: 2024/08/16

RWDI Inc.
Client Project #: 2402553.01
Site Location: ON07
Your P.O. #: 13384121
Sampler Initials: JC

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Cristina Carriere, Senior Scientific Specialist

Louise Harding, Team Lead

Michael Damianidis, Project Manager Assistant

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

FIELD INFORMATION FORM

BUREAU VERITAS

WASTE MANAGEMENT

Site Name: TCEC

Site No.:

Sample: MS Holding (Sample ID)

This Waste Management Field Information Form is Required
This form is to be completed, in addition to any State Forms. The Field Form is submitted along with the Chain of Custody Forms that accompany the sample containers (i.e. with the cooler that is returned to the laboratory).

Laboratory Use Only/Lab ID:

PURGE INFO

PURGE DATE (MM DD YY)	PURGE TIME (2400 Hr Clock)	ELAPSED HRS (hrs:min)	WATER VOL IN CASING (Gallons)	ACTUAL VOL PURGED (Gallons)	WELL VOLs PURGED

Note: For Passive Sampling, replace "Water Vol in Casing" and "Well Vols Purged" w/ Water Vol in Tubing/Flow Cell and Tubing/Flow Cell Vols Purged. Mark Changes, Record field data below.

PURGE/SAMPLE EQUIPMENT

Purging and Sampling Equipment ... Dedicated: Y or N

Filter Device: Y or N — 0.45 µ or ____ µ (circle or fill in)

Purging Device: ____ A-Submersible Pump B-Peristaltic Pump C-QED Bladder Pump D-Bailer E-Piston Pump F-Dipper/Bottle

Filter Type: ____ A-In-line Disposable B-Pressure C-Vacuum X-Other: ____

Sampling Device: ____

X-Other: ____

Sample Tube Type: ____ A-Teflon B-Stainless Steel C-PVC D-Polypropylene X-Other: ____

WELL DATA

Well Elevation (at TOC): ____ (ft/msl)

Depth to Water (DTW) (from TOC): ____ (ft)

Groundwater Elevation (GWE) (Site Datum, from TOC): ____ (ft msl)

Total Well Depth (from TOC): ____ (ft)

Stick Up (from ground elevation): ____ (ft)

Casing ID: ____ (in)

Casing Material: ____

Note: Total Depth, Stick Up, Casing ID, etc. are optional and can be from historical data, unless required by Site/Permit. Well Elevation, DTW, and GWE must be current, obtained from site.

STABILIZATION DATA (Optional)

Sample Time (2400 Hr Clock)	Rate/Unit	pH (std)	Conductance (SC/EC) (µmhos/cm @ 25°C)	Temp. (°C)	Turbidity (ntu)	D.O. (mg/L - ppm)	eH/ORP (mV)	DTW (ft)
		1st	1st					
		2nd	2nd					
		3rd	3rd					
		4th	4th					
Input Range for 3 consec. readings or Permit/State requirements:		+/-	+/-	+/-	+/-	+/-	+/-	

Stabilization Data Fields are Optional *(i.e. complete stabilization readings for parameters required by WM, Site, or State). These fields can be used where four (4) field measurements are required by State/Permit/Site. If a Data Logger or other Electronic format is used, fill in final readings below and submit electronic data separately to Site. If more fields above are needed, use separate sheet or form.*

FIELD DATA

SAMPLE DATE (MM DD YY)	pH (std)	CONDUCTANCE µmhos/cm @ 25°C	TEMP. (°C)	TURBIDITY (ntu)	DO (mg/L - ppm)	eH/ORP (mV)	Other: Units
080824	7.2	MS 4.36	22.6	161			

Final Field Readings are required *(i.e. record field measurements, final stabilized readings, passive sample readings before sampling for all field parameters required by State/Permit/Site.)*

Sample Appearance: translucent Odor: odor Color: brown Other: ____

Weather Conditions (required daily, or as conditions change): 17°C Direction/Speed: SE 14km/hr Outlook: overcast Precipitation: Y or N

Specific Comments (including purge/well volume calculations if required): ____

FIELD COMMENTS

10:00AM

I certify that sampling procedures were in accordance with applicable EPA, State, and WM protocols (if more than one sampler, all should sign):

Date	Name	Signature	Company
08/08/24	Maja DeForest	[signature]	RWDI Air

DISTRIBUTION: WHITE/ORIGINAL - Stays with Sample, YELLOW - Returned to Client, PINK - Field Copy

Field Information Form v-3.1 06/20

2130

Custody Tracking Form

T943710

Please use this form for custody tracking when submitting the work instructions via eCOC (electronic Chain of Custody). Please ensure your form has a barcode or a Bureau Veritas eCOC confirmation number in the top right hand side. This number links your electronic submission to your samples. This form should be placed in the cooler with your samples.

First Sample: PS Holding Tank
Last Sample: PS Holding Tank
Sample Count: 1

Relinquished By				Received By			
Maja DeForest	Sign	Date	2024/08/08	Print	Sign	Date	2024/08/09
		Time (24 HR)	10:30			Time (24 HR)	0933
Print	Sign	Date	YYYY/MM/DD	Print	Sign	Date	YYYY/MM/DD
		Time (24 HR)	HH:MM			Time (24 HR)	HH:MM
Print	Sign	Date	YYYY/MM/DD	Print	Sign	Date	YYYY/MM/DD
		Time (24 HR)	HH:MM			Time (24 HR)	HH:MM

Unless otherwise agreed to, submissions and use of services are governed by Bureau Veritas' standard terms and conditions which can be found at www.bvna.com.

Triage Information

Sampled By (Print): Maja DeForest

# of Coolers/Pkgs: 1

Rush ☐ Immediate Test ☐ Food Residue ☐

Micro ☐ Food Chemistry ☐

*** LABORATORY USE ONLY ***

Received At

Labeled By

Verified By

Lab Comments:

09-Aug-24 09:30
Patricia Legette
C4O5030
AK0 ENV-1362

Custody Seal		Cooling Media	Temperature °C		
Present (Y/N)	Intact (Y/N)	Present (Y/N)	1	2	3
Y	Y	Y	8	5	6
Drinking Water Metals Preservation Check Done (Circle)				YES	NO

COR FCD-00383/4

Page 1 of 1

Your P.O. #: 13384121
Your Project #: 2402553.01
Site#: 500
Site Location: ON07
Your C.O.C. #: 960139

Attention: Khalid Hussein - Twin Creeks

RWDI Inc.
600 Southgate Drive
Guelph, ON
Canada N1G 4P6

Report Date: 2024/09/20
Report #: R8328977
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C4S3599
Received: 2024/09/11, 10:00

Sample Matrix: Leachate
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
ABN Compounds in Water by GC/MS	1	2024/09/15	2024/09/16	CAM SOP-00301	EPA 8270 m
Alkalinity	1	N/A	2024/09/13	CAM SOP-00448	SM 24 2320 B m
Chloride by Automated Colourimetry	1	N/A	2024/09/13	CAM SOP-00463	SM 24 4500-Cl E m
Conductance in Water - On-site	1	N/A	2024/09/17		
Total Metals by ICPMS	1	N/A	2024/09/17	CAM SOP-00447	EPA 6020B m
Ammonia-N	1	N/A	2024/09/16	CAM SOP-00441	USGS I-2522-90 m
Nitrate & Nitrite as Nitrogen in Water (1)	1	N/A	2024/09/12	CAM SOP-00440	SM 24 4500-NO3I/NO2B
Field Measured pH (2)	1	N/A	2024/09/11		Field pH Meter
Sulphate by Automated Turbidimetry	1	N/A	2024/09/13	CAM SOP-00464	SM 24 4500-SO42- E m
Field Temperature (2)	1	N/A	2024/09/11		Field Thermometer
Total Kjeldahl Nitrogen in Water	1	2024/09/13	2024/09/17	CAM SOP-00938	OMOE E3516 m
Total Phosphorus (Colourimetric)	1	2024/09/13	2024/09/17	CAM SOP-00407	SM 24 4500-P I
Turbidity - On-site	1	N/A	2024/09/17		
Un-ionized Ammonia (3)	1	2024/09/11	2024/09/17	Auto Calc.	PWQO
Volatile Organic Compounds in Water	1	N/A	2024/09/13	CAM SOP-00228	EPA 8260D
Non-Routine Volatile Organic Compounds	1	N/A	2024/09/17	CAM SOP-00226	EPA 8260D m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, EPA, APHA or the Quebec Ministry of Environment.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Your P.O. #: 13384121
Your Project #: 2402553.01
Site#: 500
Site Location: ON07
Your C.O.C. #: 960139

Attention: Khalid Hussein - Twin Creeks

RWDI Inc.
600 Southgate Drive
Guelph, ON
Canada N1G 4P6

Report Date: 2024/09/20
Report #: R8328977
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C4S3599

Received: 2024/09/11, 10:00

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.
(2) This is a field test, therefore, the results relate to items that were not analysed at Bureau Veritas.
(3) Un-ionized ammonia is calculated using the total ammonia result and field data provided by the client for pH and temperature.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to:
Patricia Legette, Project Manager
Email: Patricia.Legette@bureauveritas.com
Phone# (905)817-5799

==========

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

Bureau Veritas Job #: C4S3599
Report Date: 2024/09/20

RWDI Inc.
Client Project #: 2402553.01
Site Location: ON07
Your P.O. #: 13384121
Sampler Initials: JC

RESULTS OF ANALYSES OF LEACHATE

Bureau Veritas ID		ACMY43		
Sampling Date		2024/09/09 10:31		
COC Number		960139		
	UNITS	**PS HOLDING TANK**	**RDL**	**QC Batch**
Calculated Parameters				
Total Un-ionized Ammonia	mg/L	3.5	0.041	9631307
Field Measurements				
Field Conductivity	uS/cm	5640	N/A	ONSITE
Field Temperature	Celsius	15.2	N/A	ONSITE
Field Measured Field Turbidity	NTU	125	N/A	ONSITE
Field Measured pH	pH	7.61		ONSITE
Inorganics				
Total Ammonia-N	mg/L	260	3.0	9638722
Total Kjeldahl Nitrogen (TKN)	mg/L	290	10	9636903
Total Phosphorus	mg/L	1.2	0.030	9638308
Dissolved Sulphate (SO4)	mg/L	180	1.0	9634502
Alkalinity (Total as CaCO3)	mg/L	1900	1.0	9635671
Dissolved Chloride (Cl-)	mg/L	550	6.0	9634495
Nitrite (N)	mg/L	<0.050	0.050	9633391
Nitrate (N)	mg/L	<0.50	0.50	9633391

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

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C4S3599
Report Date: 2024/09/20

RWDI Inc.
Client Project #: 2402553.01
Site Location: ON07
Your P.O. #: 13384121
Sampler Initials: JC

ELEMENTS BY ATOMIC SPECTROSCOPY (LEACHATE)

Bureau Veritas ID		ACMY43		
Sampling Date		2024/09/09 10:31		
COC Number		960139		
	UNITS	PS HOLDING TANK	RDL	QC Batch
Metals				
Total Aluminum (Al)	mg/L	4.7	0.02	9642505
Total Arsenic (As)	mg/L	0.009	0.001	9642505
Total Barium (Ba)	mg/L	0.18	0.005	9642505
Total Beryllium (Be)	mg/L	<0.0006	0.0006	9642505
Total Bismuth (Bi)	mg/L	<0.001	0.001	9642505
Total Boron (B)	mg/L	4.6	0.02	9642505
Total Cadmium (Cd)	mg/L	<0.0001	0.0001	9642505
Total Calcium (Ca)	mg/L	140	0.2	9642505
Total Chromium (Cr)	mg/L	0.032	0.005	9642505
Total Cobalt (Co)	mg/L	0.0092	0.0005	9642505
Total Copper (Cu)	mg/L	0.012	0.002	9642505
Total Iron (Fe)	mg/L	11	0.1	9642505
Total Lead (Pb)	mg/L	0.0040	0.0005	9642505
Total Magnesium (Mg)	mg/L	120	0.05	9642505
Total Molybdenum (Mo)	mg/L	0.021	0.002	9642505
Total Nickel (Ni)	mg/L	0.073	0.001	9642505
Total Potassium (K)	mg/L	110	0.2	9642505
Total Selenium (Se)	mg/L	<0.005	0.005	9642505
Total Silver (Ag)	mg/L	<0.0004	0.0004	9642505
Total Sodium (Na)	mg/L	500	0.1	9642505
Total Strontium (Sr)	mg/L	1.5	0.003	9642505
Total Tin (Sn)	mg/L	<0.002	0.002	9642505
Total Titanium (Ti)	mg/L	0.10	0.005	9642505
Total Vanadium (V)	mg/L	0.017	0.001	9642505
Total Zinc (Zn)	mg/L	0.03	0.01	9642505

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

RWDI Inc.
Client Project #: 2402553.01
Site Location: ON07
Your P.O. #: 13384121
Sampler Initials: JC

SEMI-VOLATILE ORGANICS BY GC-MS (LEACHATE)

Bureau Veritas ID		ACMY43		
Sampling Date		2024/09/09 10:31		
COC Number		960139		
	UNITS	PS HOLDING TANK	RDL	QC Batch
Semivolatile Organics				
Acenaphthene	ug/L	<0.80	0.80	9639590
Acenaphthylene	ug/L	<0.80	0.80	9639590
Anthracene	ug/L	<0.80	0.80	9639590
Benzo(a)anthracene	ug/L	<0.80	0.80	9639590
Benzo(a)pyrene	ug/L	<0.80	0.80	9639590
Benzo(b/j)fluoranthene	ug/L	<0.80	0.80	9639590
Benzo(g,h,i)perylene	ug/L	<0.80	0.80	9639590
Benzo(k)fluoranthene	ug/L	<0.80	0.80	9639590
1-Chloronaphthalene	ug/L	<4.0	4.0	9639590
2-Chloronaphthalene	ug/L	<2.0	2.0	9639590
Chrysene	ug/L	<0.80	0.80	9639590
Dibenzo(a,h)anthracene	ug/L	<0.80	0.80	9639590
Fluoranthene	ug/L	<0.80	0.80	9639590
Fluorene	ug/L	<0.80	0.80	9639590
Indeno(1,2,3-cd)pyrene	ug/L	<0.80	0.80	9639590
1-Methylnaphthalene	ug/L	0.98	0.80	9639590
2-Methylnaphthalene	ug/L	<0.80	0.80	9639590
Naphthalene	ug/L	4.4	0.80	9639590
Perylene	ug/L	<0.80	0.80	9639590
Phenanthrene	ug/L	<0.80	0.80	9639590
Pyrene	ug/L	<0.80	0.80	9639590
1,2-Dichlorobenzene	ug/L	<2.0	2.0	9639590
1,3-Dichlorobenzene	ug/L	<2.0	2.0	9639590
Hexachlorobenzene	ug/L	<2.0	2.0	9639590
Pentachlorobenzene	ug/L	<2.0	2.0	9639590
1,2,3,5-Tetrachlorobenzene	ug/L	<2.0	2.0	9639590
1,2,4,5-Tetrachlorobenzene	ug/L	<2.0	2.0	9639590
1,2,3-Trichlorobenzene	ug/L	<2.0	2.0	9639590
1,2,4-Trichlorobenzene	ug/L	<2.0	2.0	9639590
1,3,5-Trichlorobenzene	ug/L	<2.0	2.0	9639590
2-Chlorophenol	ug/L	<1.2	1.2	9639590
4-Chloro-3-Methylphenol	ug/L	<2.0	2.0	9639590

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

RWDI Inc.
Client Project #: 2402553.01
Site Location: ON07
Your P.O. #: 13384121
Sampler Initials: JC

SEMI-VOLATILE ORGANICS BY GC-MS (LEACHATE)

Bureau Veritas ID		ACMY43		
Sampling Date		2024/09/09 10:31		
COC Number		960139		
	UNITS	PS HOLDING TANK	RDL	QC Batch
m/p-Cresol	ug/L	8.7	2.0	9639590
o-Cresol	ug/L	4.3	2.0	9639590
1,2,3,4-Tetrachlorobenzene	ug/L	<2.0	2.0	9639590
2,3-Dichlorophenol	ug/L	<2.0	2.0	9639590
2,4-Dichlorophenol	ug/L	<1.2	1.2	9639590
2,5-Dichlorophenol	ug/L	<2.0	2.0	9639590
2,6-Dichlorophenol	ug/L	<2.0	2.0	9639590
3,4-Dichlorophenol	ug/L	<2.0	2.0	9639590
3,5-Dichlorophenol	ug/L	<2.0	2.0	9639590
2,4-Dimethylphenol	ug/L	6.5	2.0	9639590
2,4-Dinitrophenol	ug/L	<8.0	8.0	9639590
4,6-Dinitro-2-methylphenol	ug/L	<8.0	8.0	9639590
2-Nitrophenol	ug/L	<2.0	2.0	9639590
4-Nitrophenol	ug/L	<5.6	5.6	9639590
Pentachlorophenol	ug/L	<4.0	4.0	9639590
Phenol	ug/L	39	2.0	9639590
2,3,4,5-Tetrachlorophenol	ug/L	<1.6	1.6	9639590
2,3,4,6-Tetrachlorophenol	ug/L	<2.0	2.0	9639590
2,3,5,6-Tetrachlorophenol	ug/L	<2.0	2.0	9639590
2,3,4-Trichlorophenol	ug/L	<2.0	2.0	9639590
2,3,5-Trichlorophenol	ug/L	<2.0	2.0	9639590
2,3,6-Trichlorophenol	ug/L	<2.0	2.0	9639590
2,4,5-Trichlorophenol	ug/L	<2.0	2.0	9639590
2,4,6-Trichlorophenol	ug/L	<2.0	2.0	9639590
3,4,5-Trichlorophenol	ug/L	<2.0	2.0	9639590
Benzyl butyl phthalate	ug/L	<2.0	2.0	9639590
Biphenyl	ug/L	<2.0	2.0	9639590
Bis(2-chloroethyl)ether	ug/L	<2.0	2.0	9639590
Bis(2-chloroethoxy)methane	ug/L	<2.0	2.0	9639590
Bis(2-chloroisopropyl)ether	ug/L	<2.0	2.0	9639590
Bis(2-ethylhexyl)phthalate	ug/L	<8.0	8.0	9639590
4-Bromophenyl phenyl ether	ug/L	<1.2	1.2	9639590
p-Chloroaniline	ug/L	<4.0	4.0	9639590

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

RWDI Inc.
Client Project #: 2402553.01
Site Location: ON07
Your P.O. #: 13384121
Sampler Initials: JC

SEMI-VOLATILE ORGANICS BY GC-MS (LEACHATE)

Bureau Veritas ID		ACMY43		
Sampling Date		2024/09/09 10:31		
COC Number		960139		
	UNITS	**PS HOLDING TANK**	**RDL**	**QC Batch**
4-Chlorophenyl phenyl ether	ug/L	<2.0	2.0	9639590
Di-N-butyl phthalate	ug/L	<8.0	8.0	9639590
di-n-octyl phthalate	ug/L	<3.2	3.2	9639590
2,4-Dinitrotoluene	ug/L	<2.0	2.0	9639590
Diethyl phthalate	ug/L	<4.0	4.0	9639590
3,3'-Dichlorobenzidine	ug/L	<2.0	2.0	9639590
Dimethyl phthalate	ug/L	<4.0	4.0	9639590
2,6-Dinitrotoluene	ug/L	<2.0	2.0	9639590
Diphenyl Ether	ug/L	<1.2	1.2	9639590
Hexachlorobutadiene	ug/L	<1.6	1.6	9639590
Hexachlorocyclopentadiene	ug/L	<8.0	8.0	9639590
Hexachloroethane	ug/L	<2.0	2.0	9639590
Isophorone	ug/L	<2.0	2.0	9639590
Nitrobenzene	ug/L	<2.0	2.0	9639590
Nitrosodiphenylamine/Diphenylamine	ug/L	<4.0	4.0	9639590
N-Nitroso-di-n-propylamine	ug/L	<2.0	2.0	9639590
Surrogate Recovery (%)				
2,4,6-Tribromophenol	%	97		9639590
2-Fluorobiphenyl	%	70		9639590
2-Fluorophenol	%	45		9639590
D14-Terphenyl	%	109		9639590
D5-Nitrobenzene	%	82		9639590
D5-Phenol	%	31		9639590

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

VOLATILE ORGANICS BY GC/MS (LEACHATE)

Bureau Veritas ID		ACMY43		
Sampling Date		2024/09/09 10:31		
COC Number		960139		
	UNITS	PS HOLDING TANK	RDL	QC Batch
Volatile Organics				
Acetone (2-Propanone)	ug/L	71	20	9636232
Benzene	ug/L	5.9	0.40	9636232
Bromodichloromethane	ug/L	<1.0	1.0	9636232
Bromoform	ug/L	<2.0	2.0	9636232
Bromomethane	ug/L	<1.0	1.0	9636232
Carbon Tetrachloride	ug/L	<0.38	0.38	9636232
Chlorobenzene	ug/L	1.4	0.40	9636232
Chloroethane	ug/L	<2.0	2.0	9636232
Chloroform	ug/L	<0.40	0.40	9636232
Chloromethane	ug/L	<10	10	9636232
Dibromochloromethane	ug/L	<1.0	1.0	9636232
1,2-Dichlorobenzene	ug/L	<0.80	0.80	9636232
1,3-Dichlorobenzene	ug/L	<0.80	0.80	9636232
1,4-Dichlorobenzene	ug/L	<0.80	0.80	9636232
1,1-Dichloroethane	ug/L	<0.40	0.40	9636232
1,2-Dichloroethane	ug/L	<0.98	0.98	9636232
1,1-Dichloroethylene	ug/L	<0.40	0.40	9636232
cis-1,2-Dichloroethylene	ug/L	<1.0	1.0	9636232
trans-1,2-Dichloroethylene	ug/L	<1.0	1.0	9636232
1,2-Dichloropropane	ug/L	<0.40	0.40	9636232
cis-1,3-Dichloropropene	ug/L	<0.60	0.60	9636232
trans-1,3-Dichloropropene	ug/L	<0.80	0.80	9636232
Ethylbenzene	ug/L	7.8	0.40	9636232
Ethylene Dibromide	ug/L	<0.38	0.38	9636232
Methylene Chloride(Dichloromethane)	ug/L	<4.0	4.0	9636232
Methyl Ethyl Ketone (2-Butanone)	ug/L	<20	20	9636232
Methyl Isobutyl Ketone	ug/L	<10	10	9636232
Methyl t-butyl ether (MTBE)	ug/L	<1.0	1.0	9636232
Styrene	ug/L	<0.80	0.80	9636232
1,1,1,2-Tetrachloroethane	ug/L	<1.0	1.0	9636232
1,1,2,2-Tetrachloroethane	ug/L	<0.80	0.80	9636232
Tetrachloroethylene	ug/L	<0.40	0.40	9636232

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C4S3599
Report Date: 2024/09/20

RWDI Inc.
Client Project #: 2402553.01
Site Location: ON07
Your P.O. #: 13384121
Sampler Initials: JC

VOLATILE ORGANICS BY GC/MS (LEACHATE)

Bureau Veritas ID		ACMY43		
Sampling Date		2024/09/09 10:31		
COC Number		960139		
	UNITS	**PS HOLDING TANK**	**RDL**	**QC Batch**
1,3,5-Trimethylbenzene	ug/L	<4.0	4.0	9636371
Toluene	ug/L	3.3	0.40	9636232
1,1,1-Trichloroethane	ug/L	<0.40	0.40	9636232
1,1,2-Trichloroethane	ug/L	<0.80	0.80	9636232
Trichloroethylene	ug/L	<0.40	0.40	9636232
Trichlorofluoromethane (FREON 11)	ug/L	<1.0	1.0	9636232
Vinyl Chloride	ug/L	<0.40	0.40	9636232
p+m-Xylene	ug/L	16	0.40	9636232
o-Xylene	ug/L	7.2	0.40	9636232
Total Xylenes	ug/L	23	0.40	9636232
Surrogate Recovery (%)				
4-Bromofluorobenzene	%	100		9636232
D4-1,2-Dichloroethane	%	103		9636232
D8-Toluene	%	98		9636232
4-Bromofluorobenzene	%	99		9636371
D4-1,2-Dichloroethane	%	97		9636371
D8-Toluene	%	100		9636371

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

GENERAL COMMENTS

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

Package 1	11.0°C

Sample ACMY43 [PS HOLDING TANK] : Nitrite/Nitrate: Due to colour interferences, sample required dilution. Detection limits were adjusted accordingly.

VOC Analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.

ABN Analysis: Due to the sample matrix, a smaller amount was used for extraction. Detection limits were adjusted accordingly.

Results relate only to the items tested.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

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
9636232	4-Bromofluorobenzene	2024/09/13	100	70 - 130	99	70 - 130	101	%				
9636232	D4-1,2-Dichloroethane	2024/09/13	103	70 - 130	101	70 - 130	100	%				
9636232	D8-Toluene	2024/09/13	99	70 - 130	100	70 - 130	99	%				
9636371	4-Bromofluorobenzene	2024/09/17	98	70 - 130	98	70 - 130	97	%				
9636371	D4-1,2-Dichloroethane	2024/09/17	96	70 - 130	97	70 - 130	96	%				
9636371	D8-Toluene	2024/09/17	99	70 - 130	100	70 - 130	101	%				
9639590	2,4,6-Tribromophenol	2024/09/15	96	10 - 130	84	10 - 130	85	%				
9639590	2-Fluorobiphenyl	2024/09/15	69	30 - 130	61	30 - 130	67	%				
9639590	2-Fluorophenol	2024/09/15	48	10 - 130	47	10 - 130	43	%				
9639590	D14-Terphenyl	2024/09/15	94	30 - 130	99	30 - 130	99	%				
9639590	D5-Nitrobenzene	2024/09/15	86	30 - 130	79	30 - 130	82	%				
9639590	D5-Phenol	2024/09/15	34	10 - 130	29	10 - 130	29	%				
9633391	Nitrate (N)	2024/09/12	103	80 - 120	103	80 - 120	<0.10	mg/L	8.0 (1)	20		
9633391	Nitrite (N)	2024/09/12	101	80 - 120	108	80 - 120	<0.010	mg/L	NC (1)	20		
9634495	Dissolved Chloride (Cl-)	2024/09/13	98	80 - 120	99	80 - 120	<1.0	mg/L	2.8 (1)	20		
9634502	Dissolved Sulphate (SO4)	2024/09/13	NC	75 - 125	98	80 - 120	<1.0	mg/L	0.51 (1)	20		
9635671	Alkalinity (Total as CaCO3)	2024/09/13			96	85 - 115	<1.0	mg/L	2.0 (1)	20		
9636232	1,1,1,2-Tetrachloroethane	2024/09/13	104	70 - 130	105	70 - 130	<0.50	ug/L	NC (1)	30		
9636232	1,1,1-Trichloroethane	2024/09/13	94	70 - 130	96	70 - 130	<0.20	ug/L	NC (1)	30		
9636232	1,1,2,2-Tetrachloroethane	2024/09/13	96	70 - 130	94	70 - 130	<0.40	ug/L	NC (1)	30		
9636232	1,1,2-Trichloroethane	2024/09/13	102	70 - 130	100	70 - 130	<0.40	ug/L	NC (1)	30		
9636232	1,1-Dichloroethane	2024/09/13	95	70 - 130	96	70 - 130	<0.20	ug/L	NC (1)	30		
9636232	1,1-Dichloroethylene	2024/09/13	96	70 - 130	99	70 - 130	<0.20	ug/L	NC (1)	30		
9636232	1,2-Dichlorobenzene	2024/09/13	98	70 - 130	100	70 - 130	<0.40	ug/L	NC (1)	30		
9636232	1,2-Dichloroethane	2024/09/13	106	70 - 130	104	70 - 130	<0.49	ug/L	NC (1)	30		
9636232	1,2-Dichloropropane	2024/09/13	102	70 - 130	101	70 - 130	<0.20	ug/L	NC (1)	30		
9636232	1,3-Dichlorobenzene	2024/09/13	100	70 - 130	102	70 - 130	<0.40	ug/L	NC (1)	30		
9636232	1,4-Dichlorobenzene	2024/09/13	104	70 - 130	107	70 - 130	<0.40	ug/L	NC (1)	30		
9636232	Acetone (2-Propanone)	2024/09/13	112	60 - 140	109	60 - 140	<10	ug/L	NC (1)	30		
9636232	Benzene	2024/09/13	100	70 - 130	101	70 - 130	<0.20	ug/L	NC (1)	30		

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
9636232	Bromodichloromethane	2024/09/13	98	70 - 130	98	70 - 130	<0.50	ug/L	NC (1)	30		
9636232	Bromoform	2024/09/13	92	70 - 130	97	70 - 130	<1.0	ug/L	NC (1)	30		
9636232	Bromomethane	2024/09/13	76	60 - 140	77	60 - 140	<0.50	ug/L	NC (1)	30		
9636232	Carbon Tetrachloride	2024/09/13	100	70 - 130	102	70 - 130	<0.19	ug/L	NC (1)	30		
9636232	Chlorobenzene	2024/09/13	92	70 - 130	93	70 - 130	<0.20	ug/L	NC (1)	30		
9636232	Chloroethane	2024/09/13	91	70 - 130	93	70 - 130	<1.0	ug/L				
9636232	Chloroform	2024/09/13	98	70 - 130	98	70 - 130	<0.20	ug/L	NC (1)	30		
9636232	Chloromethane	2024/09/13	82	60 - 140	85	60 - 140	<5.0	ug/L				
9636232	cis-1,2-Dichloroethylene	2024/09/13	103	70 - 130	104	70 - 130	<0.50	ug/L	NC (1)	30		
9636232	cis-1,3-Dichloropropene	2024/09/13	91	70 - 130	91	70 - 130	<0.30	ug/L	NC (1)	30		
9636232	Dibromochloromethane	2024/09/13	99	70 - 130	99	70 - 130	<0.50	ug/L	NC (1)	30		
9636232	Ethylbenzene	2024/09/13	95	70 - 130	97	70 - 130	<0.20	ug/L	NC (1)	30		
9636232	Ethylene Dibromide	2024/09/13	101	70 - 130	100	70 - 130	<0.19	ug/L	NC (1)	30		
9636232	Methyl Ethyl Ketone (2-Butanone)	2024/09/13	114	60 - 140	111	60 - 140	<10	ug/L	NC (1)	30		
9636232	Methyl Isobutyl Ketone	2024/09/13	116	70 - 130	114	70 - 130	<5.0	ug/L	NC (1)	30		
9636232	Methyl t-butyl ether (MTBE)	2024/09/13	101	70 - 130	101	70 - 130	<0.50	ug/L	NC (1)	30		
9636232	Methylene Chloride(Dichloromethane)	2024/09/13	97	70 - 130	96	70 - 130	<2.0	ug/L	NC (1)	30		
9636232	o-Xylene	2024/09/13	100	70 - 130	103	70 - 130	<0.20	ug/L	NC (1)	30		
9636232	p+m-Xylene	2024/09/13	96	70 - 130	99	70 - 130	<0.20	ug/L	NC (1)	30		
9636232	Styrene	2024/09/13	96	70 - 130	100	70 - 130	<0.40	ug/L	NC (1)	30		
9636232	Tetrachloroethylene	2024/09/13	92	70 - 130	94	70 - 130	<0.20	ug/L	NC (1)	30		
9636232	Toluene	2024/09/13	96	70 - 130	98	70 - 130	<0.20	ug/L	0.82 (1)	30		
9636232	Total Xylenes	2024/09/13					<0.20	ug/L	NC (1)	30		
9636232	trans-1,2-Dichloroethylene	2024/09/13	101	70 - 130	102	70 - 130	<0.50	ug/L	NC (1)	30		
9636232	trans-1,3-Dichloropropene	2024/09/13	96	70 - 130	98	70 - 130	<0.40	ug/L	NC (1)	30		
9636232	Trichloroethylene	2024/09/13	99	70 - 130	100	70 - 130	<0.20	ug/L	NC (1)	30		
9636232	Trichlorofluoromethane (FREON 11)	2024/09/13	92	70 - 130	95	70 - 130	<0.50	ug/L	NC (1)	30		
9636232	Vinyl Chloride	2024/09/13	89	70 - 130	92	70 - 130	<0.20	ug/L	NC (1)	30		
9636371	1,3,5-Trimethylbenzene	2024/09/17	95	60 - 140	105	60 - 140	<0.20	ug/L	NC (1)	30		
9636903	Total Kjeldahl Nitrogen (TKN)	2024/09/17	NC (2)	80 - 120	99	80 - 120	<0.7	mg/L	10 (3)	20	97	80 - 120

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
9638308	Total Phosphorus	2024/09/17	98 (2)	80 - 120	104	80 - 120	<0.030	mg/L	1.6 (3)	25	100	80 - 120
9638722	Total Ammonia-N	2024/09/16	91	75 - 125	106	80 - 120	<0.15	mg/L	NC (1)	20		
9639590	1,2,3,4-Tetrachlorobenzene	2024/09/15	59	30 - 130	52	30 - 130	<0.50	ug/L				
9639590	1,2,3,5-Tetrachlorobenzene	2024/09/15	49	30 - 130	46	30 - 130	<0.50	ug/L				
9639590	1,2,3-Trichlorobenzene	2024/09/15	54	30 - 130	48	30 - 130	<0.50	ug/L				
9639590	1,2,4,5-Tetrachlorobenzene	2024/09/15	46	30 - 130	46	30 - 130	<0.50	ug/L				
9639590	1,2,4-Trichlorobenzene	2024/09/15	53	30 - 130	46	30 - 130	<0.50	ug/L				
9639590	1,2-Dichlorobenzene	2024/09/15	56	30 - 130	50	30 - 130	<0.50	ug/L				
9639590	1,3,5-Trichlorobenzene	2024/09/15	69	30 - 130	69	30 - 130	<0.50	ug/L				
9639590	1,3-Dichlorobenzene	2024/09/15	49	30 - 130	44	30 - 130	<0.50	ug/L				
9639590	1-Chloronaphthalene	2024/09/15	78	30 - 130	71	30 - 130	<1.0	ug/L	NC (1)	40		
9639590	1-Methylnaphthalene	2024/09/15	76	30 - 130	65	30 - 130	<0.20	ug/L	8.3 (1)	40		
9639590	2,3,4,5-Tetrachlorophenol	2024/09/15	106	10 - 130	98	10 - 130	<0.40	ug/L	NC (1)	40		
9639590	2,3,4,6-Tetrachlorophenol	2024/09/15	101	10 - 130	88	10 - 130	<0.50	ug/L	NC (1)	40		
9639590	2,3,4-Trichlorophenol	2024/09/15	104	10 - 130	98	10 - 130	<0.50	ug/L	NC (1)	40		
9639590	2,3,5,6-Tetrachlorophenol	2024/09/15	108	10 - 130	100	10 - 130	<0.50	ug/L	NC (1)	40		
9639590	2,3,5-Trichlorophenol	2024/09/15	101	10 - 130	95	10 - 130	<0.50	ug/L	NC (1)	40		
9639590	2,3,6-Trichlorophenol	2024/09/15	114	10 - 130	109	10 - 130	<0.50	ug/L				
9639590	2,3-Dichlorophenol	2024/09/15	87	10 - 130	83	10 - 130	<0.50	ug/L				
9639590	2,4,5-Trichlorophenol	2024/09/15	99	10 - 130	92	10 - 130	<0.50	ug/L	NC (1)	40		
9639590	2,4,6-Trichlorophenol	2024/09/15	103	10 - 130	96	10 - 130	<0.50	ug/L	NC (1)	40		
9639590	2,4-Dichlorophenol	2024/09/15	92	10 - 130	78	10 - 130	<0.30	ug/L	NC (1)	40		
9639590	2,4-Dimethylphenol	2024/09/15	72	10 - 130	56	10 - 130	<0.50	ug/L	7.9 (1)	40		
9639590	2,4-Dinitrophenol	2024/09/15	88	10 - 130	87	10 - 130	<2.0	ug/L	NC (1)	40		
9639590	2,4-Dinitrotoluene	2024/09/15	103	30 - 130	95	30 - 130	<0.50	ug/L	NC (1)	40		
9639590	2,5-Dichlorophenol	2024/09/15	88	10 - 130	72	10 - 130	<0.50	ug/L				
9639590	2,6-Dichlorophenol	2024/09/15	88	10 - 130	80	10 - 130	<0.50	ug/L	NC (1)	40		
9639590	2,6-Dinitrotoluene	2024/09/15	101	30 - 130	92	30 - 130	<0.50	ug/L	NC (1)	40		
9639590	2-Chloronaphthalene	2024/09/15	76	30 - 130	71	30 - 130	<0.50	ug/L	NC (1)	40		
9639590	2-Chlorophenol	2024/09/15	83	10 - 130	79	10 - 130	<0.30	ug/L	NC (1)	40		

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
9639590	2-Methylnaphthalene	2024/09/15	78	30 - 130	66	30 - 130	<0.20	ug/L	NC (1)	40		
9639590	2-Nitrophenol	2024/09/15	93	10 - 130	95	10 - 130	<0.50	ug/L				
9639590	3,3'-Dichlorobenzidine	2024/09/15	105	30 - 130	100	30 - 130	<0.50	ug/L				
9639590	3,4,5-Trichlorophenol	2024/09/15	117	10 - 130	106	10 - 130	<0.50	ug/L				
9639590	3,4-Dichlorophenol	2024/09/15	105	10 - 130	90	10 - 130	<0.50	ug/L				
9639590	3,5-Dichlorophenol	2024/09/15	109	10 - 130	103	10 - 130	<0.50	ug/L				
9639590	4,6-Dinitro-2-methylphenol	2024/09/15	107	10 - 130	102	10 - 130	<2.0	ug/L	NC (1)	40		
9639590	4-Bromophenyl phenyl ether	2024/09/15	87	30 - 130	78	30 - 130	<0.30	ug/L	NC (1)	40		
9639590	4-Chloro-3-Methylphenol	2024/09/15	99	10 - 130	88	10 - 130	<0.50	ug/L	NC (1)	40		
9639590	4-Chlorophenyl phenyl ether	2024/09/15	84	30 - 130	79	30 - 130	<0.50	ug/L	NC (1)	40		
9639590	4-Nitrophenol	2024/09/15	34	10 - 130	39	10 - 130	<1.4	ug/L	NC (1)	40		
9639590	Acenaphthene	2024/09/15	84	30 - 130	80	30 - 130	<0.20	ug/L	NC (1)	40		
9639590	Acenaphthylene	2024/09/15	85	30 - 130	80	30 - 130	<0.20	ug/L	NC (1)	40		
9639590	Anthracene	2024/09/15	91	30 - 130	88	30 - 130	<0.20	ug/L	NC (1)	40		
9639590	Benzo(a)anthracene	2024/09/15	100	30 - 130	105	30 - 130	<0.20	ug/L	NC (1)	40		
9639590	Benzo(a)pyrene	2024/09/15	111	30 - 130	92	30 - 130	<0.20	ug/L	NC (1)	40		
9639590	Benzo(b/j)fluoranthene	2024/09/15	106	30 - 130	108	30 - 130	<0.20	ug/L	NC (1)	40		
9639590	Benzo(g,h,i)perylene	2024/09/15	99	30 - 130	111	30 - 130	<0.20	ug/L	NC (1)	40		
9639590	Benzo(k)fluoranthene	2024/09/15	107	30 - 130	105	30 - 130	<0.20	ug/L	NC (1)	40		
9639590	Benzyl butyl phthalate	2024/09/15	102	30 - 130	109	30 - 130	<0.50	ug/L	NC (1)	40		
9639590	Biphenyl	2024/09/15	80	30 - 130	75	30 - 130	<0.50	ug/L	NC (1)	40		
9639590	Bis(2-chloroethoxy)methane	2024/09/15	98	30 - 130	89	30 - 130	<0.50	ug/L	NC (1)	40		
9639590	Bis(2-chloroethyl)ether	2024/09/15	93	30 - 130	80	30 - 130	<0.50	ug/L	NC (1)	40		
9639590	Bis(2-chloroisopropyl)ether	2024/09/15	73	30 - 130	68	30 - 130	<0.50	ug/L	NC (1)	40		
9639590	Bis(2-ethylhexyl)phthalate	2024/09/15	95	30 - 130	98	30 - 130	<2.0	ug/L	NC (1)	40		
9639590	Chrysene	2024/09/15	98	30 - 130	105	30 - 130	<0.20	ug/L	NC (1)	40		
9639590	Dibenzo(a,h)anthracene	2024/09/15	95	30 - 130	105	30 - 130	<0.20	ug/L	NC (1)	40		
9639590	Diethyl phthalate	2024/09/15	105	30 - 130	97	30 - 130	<1.0	ug/L				
9639590	Dimethyl phthalate	2024/09/15	105	30 - 130	96	30 - 130	<1.0	ug/L				
9639590	Di-N-butyl phthalate	2024/09/15	102	30 - 130	106	30 - 130	<2.0	ug/L	NC (1)	40		

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
9639590	di-n-octyl phthalate	2024/09/15	93	30 - 130	97	30 - 130	<0.80	ug/L	NC (1)	40		
9639590	Diphenyl Ether	2024/09/15	75	30 - 130	71	30 - 130	<0.30	ug/L	21 (1)	40		
9639590	Fluoranthene	2024/09/15	100	30 - 130	100	30 - 130	<0.20	ug/L	NC (1)	40		
9639590	Fluorene	2024/09/15	89	30 - 130	88	30 - 130	<0.20	ug/L	NC (1)	40		
9639590	Hexachlorobenzene	2024/09/15	85	30 - 130	85	30 - 130	<0.50	ug/L				
9639590	Hexachlorobutadiene	2024/09/15	53	30 - 130	50	30 - 130	<0.40	ug/L				
9639590	Hexachlorocyclopentadiene	2024/09/15	56	30 - 130	55	30 - 130	<2.0	ug/L				
9639590	Hexachloroethane	2024/09/15	55	30 - 130	56	30 - 130	<0.50	ug/L				
9639590	Indeno(1,2,3-cd)pyrene	2024/09/15	96	30 - 130	107	30 - 130	<0.20	ug/L	NC (1)	40		
9639590	Isophorone	2024/09/15	88	30 - 130	81	30 - 130	<0.50	ug/L				
9639590	m/p-Cresol	2024/09/15	72	10 - 130	63	10 - 130	<0.50	ug/L	2.8 (1)	40		
9639590	Naphthalene	2024/09/15	63	30 - 130	52	30 - 130	<0.20	ug/L	5.5 (1)	40		
9639590	Nitrobenzene	2024/09/15	83	30 - 130	79	30 - 130	<0.50	ug/L				
9639590	Nitrosodiphenylamine/Diphenylamine	2024/09/15	85	30 - 130	68	30 - 130	<1.0	ug/L	NC (1)	40		
9639590	N-Nitroso-di-n-propylamine	2024/09/15	101	30 - 130	93	30 - 130	<0.50	ug/L	NC (1)	40		
9639590	o-Cresol	2024/09/15	75	10 - 130	66	10 - 130	<0.50	ug/L	0.91 (1)	40		
9639590	p-Chloroaniline	2024/09/15	78	30 - 130	68	30 - 130	<1.0	ug/L				
9639590	Pentachlorobenzene	2024/09/15	58	30 - 130	47	30 - 130	<0.50	ug/L				
9639590	Pentachlorophenol	2024/09/15	101	10 - 130	85	10 - 130	<1.0	ug/L	NC (1)	40		
9639590	Perylene	2024/09/15	97	30 - 130	98	30 - 130	<0.20	ug/L	NC (1)	40		
9639590	Phenanthrene	2024/09/15	85	30 - 130	85	30 - 130	<0.20	ug/L	NC (1)	40		
9639590	Phenol	2024/09/15	36	10 - 130	34	10 - 130	<0.50	ug/L	6.2 (1)	40		
9639590	Pyrene	2024/09/15	101	30 - 130	98	30 - 130	<0.20	ug/L	NC (1)	40		
9642505	Total Aluminum (Al)	2024/09/17	93	80 - 120	94	80 - 120	<0.02	mg/L				
9642505	Total Arsenic (As)	2024/09/17	99	80 - 120	99	80 - 120	<0.001	mg/L				
9642505	Total Barium (Ba)	2024/09/17	94	80 - 120	95	80 - 120	<0.005	mg/L				
9642505	Total Beryllium (Be)	2024/09/17	96	80 - 120	93	80 - 120	<0.0006	mg/L				
9642505	Total Bismuth (Bi)	2024/09/17	91	80 - 120	93	80 - 120	<0.001	mg/L				
9642505	Total Boron (B)	2024/09/17	NC	80 - 120	92	80 - 120	<0.02	mg/L				
9642505	Total Cadmium (Cd)	2024/09/17	93	80 - 120	94	80 - 120	<0.0001	mg/L				

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
9642505	Total Calcium (Ca)	2024/09/17	NC	80 - 120	100	80 - 120	<0.2	mg/L				
9642505	Total Chromium (Cr)	2024/09/17	95	80 - 120	96	80 - 120	<0.005	mg/L	1.3 (1)	20		
9642505	Total Cobalt (Co)	2024/09/17	98	80 - 120	100	80 - 120	<0.0005	mg/L				
9642505	Total Copper (Cu)	2024/09/17	100	80 - 120	99	80 - 120	<0.002	mg/L	0.24 (1)	20		
9642505	Total Iron (Fe)	2024/09/17	100	80 - 120	100	80 - 120	<0.1	mg/L				
9642505	Total Lead (Pb)	2024/09/17	92	80 - 120	95	80 - 120	<0.0005	mg/L				
9642505	Total Magnesium (Mg)	2024/09/17	NC	80 - 120	99	80 - 120	<0.05	mg/L				
9642505	Total Molybdenum (Mo)	2024/09/17	99	80 - 120	96	80 - 120	<0.002	mg/L				
9642505	Total Nickel (Ni)	2024/09/17	91	80 - 120	95	80 - 120	<0.001	mg/L	1.5 (1)	20		
9642505	Total Potassium (K)	2024/09/17	93	80 - 120	98	80 - 120	<0.2	mg/L				
9642505	Total Selenium (Se)	2024/09/17	102	80 - 120	106	80 - 120	<0.005	mg/L				
9642505	Total Silver (Ag)	2024/09/17	90	80 - 120	91	80 - 120	<0.0004	mg/L				
9642505	Total Sodium (Na)	2024/09/17	NC	80 - 120	99	80 - 120	<0.1	mg/L				
9642505	Total Strontium (Sr)	2024/09/17	NC	80 - 120	90	80 - 120	<0.003	mg/L				
9642505	Total Tin (Sn)	2024/09/17	96	80 - 120	95	80 - 120	<0.002	mg/L				
9642505	Total Titanium (Ti)	2024/09/17	94	80 - 120	97	80 - 120	<0.005	mg/L				
9642505	Total Vanadium (V)	2024/09/17	92	80 - 120	91	80 - 120	<0.001	mg/L				

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
9642505	Total Zinc (Zn)	2024/09/17	95	80 - 120	100	80 - 120	<0.01	mg/L	1.5 (1)	20		

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 spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) Duplicate Parent ID

(2) Matrix Spike Parent ID [ACMY43-03]

(3) Duplicate Parent ID [ACMY43-03]

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C4S3599
Report Date: 2024/09/20

RWDI Inc.
Client Project #: 2402553.01
Site Location: ON07
Your P.O. #: 13384121
Sampler Initials: JC

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Cristina Carriere, Senior Scientific Specialist

Michael Damianidis, Project Manager Assistant

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

FIELD INFORMATION FORM

BUREAU VERITAS

WASTE MANAGEMENT

Site Name: B TCEC

Site No.:

Sample: PS Holding Tank (Sample ID)

This Waste Management Field Information Form is Required
This form is to be completed, in addition to any State Forms. The Field Form is submitted along with the Chain of Custody Forms that accompany the sample containers (i.e. with the cooler that is returned to the laboratory).

Laboratory Use Only/Lab ID:

PURGE INFO

PURGE DATE (MM DD YY)	PURGE TIME (2400 Hr Clock)	ELAPSED HRS (hrs:min)	WATER VOL IN CASING (Gallons)	ACTUAL VOL PURGED (Gallons)	WELL VOLs PURGED

Note: For Passive Sampling, replace "Water Vol in Casing" and "Well Vols Purged" w/ Water Vol in Tubing/Flow Cell and Tubing/Flow Cell Vols Purged. Mark Changes, Record field data below.

PURGE/SAMPLE EQUIPMENT

Purging and Sampling Equipment ... Dedicated: Y or N

Filter Device: Y or N — 0.45 µ or ____ µ (circle or fill in)

Purging Device: ____ A-Submersible Pump, B-Peristaltic Pump, C-QED Bladder Pump, D-Bailer, E-Piston Pump, F-Dipper/Bottle

Filter Type: ____ A-In-line Disposable, B-Pressure, C-Vacuum, X-Other: ____

Sampling Device: ____

X-Other: ____

Sample Tube Type: ____ A-Teflon, B-Stainless Steel, C-PVC, D-Polypropylene, X-Other: ____

WELL DATA

Well Elevation (at TOC): ____ (ft/msl)

Depth to Water (DTW) (from TOC): ____ (ft)

Groundwater Elevation (GWE) (Site Datum, from TOC): ____ (ft msl)

Total Well Depth (from TOC): ____ (ft)

Stick Up (from ground elevation): ____ (ft)

Casing ID: ____ (in)

Casing Material: ____

Note: Total Depth, Stick Up, Casing ID, etc. are optional and can be from historical data, unless required by Site/Permit. Well Elevation, DTW, and GWE must be current, obtained from site.

STABILIZATION DATA (Optional)

Sample Time (2400 Hr Clock)	Rate/Unit	pH (std)	Conductance (SC/EC) (µmhos/cm @ 25°C)	Temp. (°C)	Turbidity (ntu)	D.O. (mg/L - ppm)	eH/ORP (mV)	DTW (ft)
		1st	1st					
		2nd	2nd					
		3rd	3rd					
		4th	4th					
Input Range for 3 consec. readings or Permit/State requirements:		+/-	+/-	+/-	+/-	+/-	+/-	

Stabilization Data Fields are Optional *(i.e. complete stabilization readings for parameters required by WM, Site, or State). These fields can be used where four (4) field measurements are required by State/Permit/Site. If a Data Logger or other Electronic format is used, fill in final readings below and submit electronic data separately to Site. If more fields above are needed, use separate sheet or form.*

FIELD DATA

SAMPLE DATE (MM DD YY)	pH (std)	CONDUCTANCE ~~µmhos~~ mS/cm @ 25°C	TEMP. (°C)	TURBIDITY (ntu)	DO (mg/L - ppm)	eH/ORP (mV)	Other: Units
090924	7.61	5.64	15.2	125			

Final Field Readings are required *(i.e. record field measurements, final stabilized readings, passive sample readings before sampling for all field parameters required by State/Permit/Site.)*

FIELD COMMENTS

Sample Appearance: Brown-translucent Odor: Sour Color: Brown Other: ____

Weather Conditions (required daily, or as conditions change): Cloudy 15°C Direction/Speed: SW 17 km/hr Outlook: Cloudy Precipitation: Y or N

Specific Comments (including purge/well volume calculations if required): ____

I certify that sampling procedures were in accordance with applicable EPA, State, and WM protocols (if more than one sampler, all should sign):

Date	Name	Signature	Company
09/09/24	Maya DeForest		EQUITAir

DISTRIBUTION: WHITE/ORIGINAL - Stays with Sample, YELLOW - Returned to Client, PINK - Field Copy

Field Information Form v-3.1 06/20

2131

Custody Tracking Form

T960139

Please use this form for custody tracking when submitting the work instructions via eCOC (electronic Chain of Custody). Please ensure your form has a barcode or a Bureau Veritas eCOC confirmation number in the top right hand side. This number links your electronic submission to your samples. This form should be placed in the cooler with your samples.

First Sample: PS Holding Tank
Last Sample: PS Holding Tank
Sample Count: 1

Relinquished By				Received By			
Print: Maja DeForest	Sign: [redacted]	Date	2024/09/09	Print: SUBARE SALVAN	Sign: [illegible]	Date	2024/09/11
		Time (24 HR)	10:45			Time (24 HR)	10:00
Print	Sign	Date	YYYY/MM/DD	Print	Sign	Date	YYYY/MM/DD
		Time (24 HR)	HH:MM			Time (24 HR)	HH:MM
Print	Sign	Date	YYYY/MM/DD	Print	Sign	Date	YYYY/MM/DD
		Time (24 HR)	HH:MM			Time (24 HR)	HH:MM

Unless otherwise agreed to, submissions and use of services are governed by Bureau Veritas' standard terms and conditions which can be found at www.bvna.com.

Triage Information

Sampled By (Print): Maja DeForest

# of Coolers/Pkgs: 1

Rush ☐ Immediate Test ☐ Food Residue ☐

Micro ☐ Food Chemistry ☐

*** LABORATORY USE ONLY ***

Received At

Labeled By

Verified By

Lab Comments:

11-Sep-24 10:00
Patricia Legette
C4S3599
AK0 ENV-834

Custody Seal		Cooling Media	Temperature °C		
Present (Y/N)	Intact (Y/N)	Present (Y/N)	1	2	3
Y	Y	Y	11	11	11
Drinking Water Metals Preservation Check Done (Circle)				YES	NO

COR FCD-00383/4

Page 1 of 1

Your P.O. #: 13384121
Your Project #: 2402553.01
Site#: 500
Site Location: ON07
Your C.O.C. #: 977765

Attention: Khalid Hussein - Twin Creeks

RWDI Inc.
600 Southgate Drive
Guelph, ON
Canada N1G 4P6

Report Date: 2024/10/22
Report #: R8372314
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C4V9846
Received: 2024/10/10, 11:23

Sample Matrix: Leachate
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
ABN Compounds in Water by GC/MS	1	2024/10/16	2024/10/17	CAM SOP-00301	EPA 8270 m
Alkalinity	1	N/A	2024/10/15	CAM SOP-00448	SM 24 2320 B m
Chloride by Automated Colourimetry	1	N/A	2024/10/16	CAM SOP-00463	SM 24 4500-Cl E m
Conductance in Water - On-site	1	N/A	2024/10/18		
Field Measured Dissolved Oxygen in Water	1	N/A	2024/10/18		
Total Metals by ICPMS	1	N/A	2024/10/17	CAM SOP-00447	EPA 6020B m
Ammonia-N	1	N/A	2024/10/18	CAM SOP-00441	USGS I-2522-90 m
Nitrate & Nitrite as Nitrogen in Water (1)	1	N/A	2024/10/12	CAM SOP-00440	SM 24 4500-NO3I/NO2B
Field Measured pH (2)	1	N/A	2024/10/10		Field pH Meter
Sulphate by Automated Turbidimetry	1	N/A	2024/10/16	CAM SOP-00464	SM 24 4500-SO42- E m
Field Temperature (2)	1	N/A	2024/10/10		Field Thermometer
Total Kjeldahl Nitrogen in Water	1	2024/10/16	2024/10/18	CAM SOP-00938	OMOE E3516 m
Total Phosphorus (Colourimetric)	1	2024/10/16	2024/10/17	CAM SOP-00407	SM 24 4500-P I
Turbidity - On-site	1	N/A	2024/10/18		
Un-ionized Ammonia (3)	1	2024/10/10	2024/10/18	Auto Calc.	PWQO
Volatile Organic Compounds in Water	1	N/A	2024/10/16	CAM SOP-00228	EPA 8260D
Non-Routine Volatile Organic Compounds	1	N/A	2024/10/11	CAM SOP-00226	EPA 8260D m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, EPA, APHA or the Quebec Ministry of Environment.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the

Your P.O. #: 13384121
Your Project #: 2402553.01
Site#: 500
Site Location: ON07
Your C.O.C. #: 977765

Attention: Khalid Hussein - Twin Creeks

RWDI Inc.
600 Southgate Drive
Guelph, ON
Canada N1G 4P6

Report Date: 2024/10/22
Report #: R8372314
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C4V9846
Received: 2024/10/10, 11:23
customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.
(2) This is a field test, therefore, the results relate to items that were not analysed at Bureau Veritas.
(3) Un-ionized ammonia is calculated using the total ammonia result and field data provided by the client for pH and temperature.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to:
Patricia Legette, Project Manager
Email: Patricia.Legette@bureauveritas.com
Phone# (905)817-5799
==========
Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

Bureau Veritas Job #: C4V9846
Report Date: 2024/10/22

RWDI Inc.
Client Project #: 2402553.01
Site Location: ON07
Your P.O. #: 13384121
Sampler Initials: JA

RESULTS OF ANALYSES OF LEACHATE

Bureau Veritas ID		AFNU98		
Sampling Date		2024/10/09 12:00		
COC Number		977765		
	UNITS	**PS Holding Tank**	**RDL**	**QC Batch**
Calculated Parameters				
Total Un-ionized Ammonia	mg/L	4.7	0.057	9693724
Field Measurements				
Field Conductivity	uS/cm	7600	N/A	ONSITE
Field Dissolved Oxygen	mg/L	5.01	N/A	ONSITE
Field Temperature	Celsius	17.7	N/A	ONSITE
Field Measured Field Turbidity	NTU	>999	N/A	ONSITE
Field Measured pH	pH	7.37		ONSITE
Inorganics				
Total Ammonia-N	mg/L	496	6.0	9703932
Total Kjeldahl Nitrogen (TKN)	mg/L	570	20	9698119
Total Phosphorus	mg/L	1.9	0.10	9705573
Dissolved Sulphate (SO4)	mg/L	170	20	9697748
Alkalinity (Total as CaCO3)	mg/L	3700	5.0	9698632
Dissolved Chloride (Cl-)	mg/L	700	20	9697744
Nitrite (N)	mg/L	<0.050	0.050	9697677
Nitrate (N)	mg/L	<0.50	0.50	9697677

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

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C4V9846
Report Date: 2024/10/22

RWDI Inc.
Client Project #: 2402553.01
Site Location: ON07
Your P.O. #: 13384121
Sampler Initials: JA

ELEMENTS BY ATOMIC SPECTROSCOPY (LEACHATE)

Bureau Veritas ID		AFNU98		
Sampling Date		2024/10/09 12:00		
COC Number		977765		
	UNITS	PS Holding Tank	RDL	QC Batch
Metals				
Total Aluminum (Al)	mg/L	2.7	0.2	9703624
Total Arsenic (As)	mg/L	0.02	0.01	9703624
Total Barium (Ba)	mg/L	0.25	0.05	9703624
Total Beryllium (Be)	mg/L	<0.006	0.006	9703624
Total Bismuth (Bi)	mg/L	<0.01	0.01	9703624
Total Boron (B)	mg/L	7.5	0.2	9703624
Total Cadmium (Cd)	mg/L	<0.001	0.001	9703624
Total Calcium (Ca)	mg/L	150	2	9703624
Total Chromium (Cr)	mg/L	0.05	0.05	9703624
Total Cobalt (Co)	mg/L	0.010	0.005	9703624
Total Copper (Cu)	mg/L	<0.02	0.02	9703624
Total Iron (Fe)	mg/L	7	1	9703624
Total Lead (Pb)	mg/L	<0.005	0.005	9703624
Total Magnesium (Mg)	mg/L	160	0.5	9703624
Total Molybdenum (Mo)	mg/L	<0.02	0.02	9703624
Total Nickel (Ni)	mg/L	0.10	0.01	9703624
Total Potassium (K)	mg/L	190	2	9703624
Total Selenium (Se)	mg/L	<0.05	0.05	9703624
Total Silver (Ag)	mg/L	<0.004	0.004	9703624
Total Sodium (Na)	mg/L	700	1	9703624
Total Strontium (Sr)	mg/L	1.8	0.03	9703624
Total Tin (Sn)	mg/L	<0.02	0.02	9703624
Total Titanium (Ti)	mg/L	0.14	0.05	9703624
Total Vanadium (V)	mg/L	0.02	0.01	9703624
Total Zinc (Zn)	mg/L	<0.1	0.1	9703624

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

SEMI-VOLATILE ORGANICS BY GC-MS (LEACHATE)

Bureau Veritas ID		AFNU98		
Sampling Date		2024/10/09 12:00		
COC Number		977765		
	UNITS	PS Holding Tank	RDL	QC Batch
Semivolatile Organics				
Acenaphthene	ug/L	<4.0	4.0	9703097
Acenaphthylene	ug/L	<4.0	4.0	9703097
Anthracene	ug/L	<4.0	4.0	9703097
Benzo(a)anthracene	ug/L	<4.0	4.0	9703097
Benzo(a)pyrene	ug/L	<4.0	4.0	9703097
Benzo(b/j)fluoranthene	ug/L	<4.0	4.0	9703097
Benzo(g,h,i)perylene	ug/L	<4.0	4.0	9703097
Benzo(k)fluoranthene	ug/L	<4.0	4.0	9703097
1-Chloronaphthalene	ug/L	<20	20	9703097
2-Chloronaphthalene	ug/L	<10	10	9703097
Chrysene	ug/L	<4.0	4.0	9703097
Dibenzo(a,h)anthracene	ug/L	<4.0	4.0	9703097
Fluoranthene	ug/L	<4.0	4.0	9703097
Fluorene	ug/L	<4.0	4.0	9703097
Indeno(1,2,3-cd)pyrene	ug/L	<4.0	4.0	9703097
1-Methylnaphthalene	ug/L	<4.0	4.0	9703097
2-Methylnaphthalene	ug/L	<4.0	4.0	9703097
Naphthalene	ug/L	5.3	4.0	9703097
Perylene	ug/L	<4.0	4.0	9703097
Phenanthrene	ug/L	<4.0	4.0	9703097
Pyrene	ug/L	<4.0	4.0	9703097
1,2-Dichlorobenzene	ug/L	<10	10	9703097
1,3-Dichlorobenzene	ug/L	<10	10	9703097
Hexachlorobenzene	ug/L	<10	10	9703097
Pentachlorobenzene	ug/L	<10	10	9703097
1,2,3,5-Tetrachlorobenzene	ug/L	<10	10	9703097
1,2,4,5-Tetrachlorobenzene	ug/L	<10	10	9703097
1,2,3-Trichlorobenzene	ug/L	<10	10	9703097
1,2,4-Trichlorobenzene	ug/L	<10	10	9703097
1,3,5-Trichlorobenzene	ug/L	<10	10	9703097
2-Chlorophenol	ug/L	<6.0	6.0	9703097
4-Chloro-3-Methylphenol	ug/L	<10	10	9703097

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

SEMI-VOLATILE ORGANICS BY GC-MS (LEACHATE)

Bureau Veritas ID		AFNU98		
Sampling Date		2024/10/09 12:00		
COC Number		977765		
	UNITS	PS Holding Tank	RDL	QC Batch
m/p-Cresol	ug/L	18	10	9703097
o-Cresol	ug/L	<10	10	9703097
1,2,3,4-Tetrachlorobenzene	ug/L	<10	10	9703097
2,3-Dichlorophenol	ug/L	<10	10	9703097
2,4-Dichlorophenol	ug/L	<6.0	6.0	9703097
2,5-Dichlorophenol	ug/L	<10	10	9703097
2,6-Dichlorophenol	ug/L	<10	10	9703097
3,4-Dichlorophenol	ug/L	<10	10	9703097
3,5-Dichlorophenol	ug/L	<10	10	9703097
2,4-Dimethylphenol	ug/L	<10	10	9703097
2,4-Dinitrophenol	ug/L	<40	40	9703097
4,6-Dinitro-2-methylphenol	ug/L	<40	40	9703097
2-Nitrophenol	ug/L	<10	10	9703097
4-Nitrophenol	ug/L	<28	28	9703097
Pentachlorophenol	ug/L	<20	20	9703097
Phenol	ug/L	14	10	9703097
2,3,4,5-Tetrachlorophenol	ug/L	<8.0	8.0	9703097
2,3,4,6-Tetrachlorophenol	ug/L	<10	10	9703097
2,3,5,6-Tetrachlorophenol	ug/L	<10	10	9703097
2,3,4-Trichlorophenol	ug/L	<10	10	9703097
2,3,5-Trichlorophenol	ug/L	<10	10	9703097
2,3,6-Trichlorophenol	ug/L	<10	10	9703097
2,4,5-Trichlorophenol	ug/L	<10	10	9703097
2,4,6-Trichlorophenol	ug/L	<10	10	9703097
3,4,5-Trichlorophenol	ug/L	<10	10	9703097
Benzyl butyl phthalate	ug/L	<10	10	9703097
Biphenyl	ug/L	<10	10	9703097
Bis(2-chloroethyl)ether	ug/L	<10	10	9703097
Bis(2-chloroethoxy)methane	ug/L	<10	10	9703097
Bis(2-chloroisopropyl)ether	ug/L	<10	10	9703097
Bis(2-ethylhexyl)phthalate	ug/L	<40	40	9703097
4-Bromophenyl phenyl ether	ug/L	<6.0	6.0	9703097
p-Chloroaniline	ug/L	<20	20	9703097

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

SEMI-VOLATILE ORGANICS BY GC-MS (LEACHATE)

Bureau Veritas ID		AFNU98		
Sampling Date		2024/10/09 12:00		
COC Number		977765		
	UNITS	**PS Holding Tank**	**RDL**	**QC Batch**
4-Chlorophenyl phenyl ether	ug/L	<10	10	9703097
Di-N-butyl phthalate	ug/L	<40	40	9703097
di-n-octyl phthalate	ug/L	<16	16	9703097
2,4-Dinitrotoluene	ug/L	<10	10	9703097
Diethyl phthalate	ug/L	<20	20	9703097
3,3'-Dichlorobenzidine	ug/L	<10	10	9703097
Dimethyl phthalate	ug/L	<20	20	9703097
2,6-Dinitrotoluene	ug/L	<10	10	9703097
Diphenyl Ether	ug/L	<6.0	6.0	9703097
Hexachlorobutadiene	ug/L	<8.0	8.0	9703097
Hexachlorocyclopentadiene	ug/L	<40	40	9703097
Hexachloroethane	ug/L	<10	10	9703097
Isophorone	ug/L	<10	10	9703097
Nitrobenzene	ug/L	<10	10	9703097
Nitrosodiphenylamine/Diphenylamine	ug/L	<20	20	9703097
N-Nitroso-di-n-propylamine	ug/L	<10	10	9703097
Surrogate Recovery (%)				
2,4,6-Tribromophenol	%	86		9703097
2-Fluorobiphenyl	%	74		9703097
2-Fluorophenol	%	40		9703097
D14-Terphenyl	%	97		9703097
D5-Nitrobenzene	%	84		9703097
D5-Phenol	%	35		9703097

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

RWDI Inc.
Client Project #: 2402553.01
Site Location: ON07
Your P.O. #: 13384121
Sampler Initials: JA

VOLATILE ORGANICS BY GC/MS (LEACHATE)

Bureau Veritas ID		AFNU98		
Sampling Date		2024/10/09 12:00		
COC Number		977765		
	UNITS	PS Holding Tank	RDL	QC Batch
Volatile Organics				
Acetone (2-Propanone)	ug/L	400	100	9696723
Benzene	ug/L	2.6	2.0	9696723
Bromodichloromethane	ug/L	<5.0	5.0	9696723
Bromoform	ug/L	<10	10	9696723
Bromomethane	ug/L	<5.0	5.0	9696723
Carbon Tetrachloride	ug/L	<1.9	1.9	9696723
Chlorobenzene	ug/L	4.8	2.0	9696723
Chloroethane	ug/L	<10	10	9696723
Chloroform	ug/L	<2.0	2.0	9696723
Chloromethane	ug/L	<50	50	9696723
Dibromochloromethane	ug/L	<5.0	5.0	9696723
1,2-Dichlorobenzene	ug/L	<4.0	4.0	9696723
1,3-Dichlorobenzene	ug/L	<4.0	4.0	9696723
1,4-Dichlorobenzene	ug/L	<4.0	4.0	9696723
1,1-Dichloroethane	ug/L	<2.0	2.0	9696723
1,2-Dichloroethane	ug/L	<4.9	4.9	9696723
1,1-Dichloroethylene	ug/L	<2.0	2.0	9696723
cis-1,2-Dichloroethylene	ug/L	<5.0	5.0	9696723
trans-1,2-Dichloroethylene	ug/L	<5.0	5.0	9696723
1,2-Dichloropropane	ug/L	<2.0	2.0	9696723
cis-1,3-Dichloropropene	ug/L	<3.0	3.0	9696723
trans-1,3-Dichloropropene	ug/L	<4.0	4.0	9696723
Ethylbenzene	ug/L	6.2	2.0	9696723
Ethylene Dibromide	ug/L	<1.9	1.9	9696723
Methylene Chloride(Dichloromethane)	ug/L	<20	20	9696723
Methyl Ethyl Ketone (2-Butanone)	ug/L	350	100	9696723
Methyl Isobutyl Ketone	ug/L	<50	50	9696723
Methyl t-butyl ether (MTBE)	ug/L	<5.0	5.0	9696723
Styrene	ug/L	<4.0	4.0	9696723
1,1,1,2-Tetrachloroethane	ug/L	<5.0	5.0	9696723
1,1,2,2-Tetrachloroethane	ug/L	<4.0	4.0	9696723
Tetrachloroethylene	ug/L	<2.0	2.0	9696723

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C4V9846
Report Date: 2024/10/22

RWDI Inc.
Client Project #: 2402553.01
Site Location: ON07
Your P.O. #: 13384121
Sampler Initials: JA

VOLATILE ORGANICS BY GC/MS (LEACHATE)

Bureau Veritas ID		AFNU98		
Sampling Date		2024/10/09 12:00		
COC Number		977765		
	UNITS	**PS Holding Tank**	**RDL**	**QC Batch**
1,3,5-Trimethylbenzene	ug/L	<10	10	9684177
Toluene	ug/L	5.5	2.0	9696723
1,1,1-Trichloroethane	ug/L	<2.0	2.0	9696723
1,1,2-Trichloroethane	ug/L	<4.0	4.0	9696723
Trichloroethylene	ug/L	<2.0	2.0	9696723
Trichlorofluoromethane (FREON 11)	ug/L	<5.0	5.0	9696723
Vinyl Chloride	ug/L	<2.0	2.0	9696723
p+m-Xylene	ug/L	11	2.0	9696723
o-Xylene	ug/L	6.9	2.0	9696723
Total Xylenes	ug/L	18	2.0	9696723
Surrogate Recovery (%)				
4-Bromofluorobenzene	%	101		9696723
D4-1,2-Dichloroethane	%	102		9696723
D8-Toluene	%	95		9696723
4-Bromofluorobenzene	%	92		9684177
D4-1,2-Dichloroethane	%	99		9684177
D8-Toluene	%	100		9684177

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C4V9846
Report Date: 2024/10/22

RWDI Inc.
Client Project #: 2402553.01
Site Location: ON07
Your P.O. #: 13384121
Sampler Initials: JA

GENERAL COMMENTS

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

Package 1	8.7°C

Sample AFNU98 [PS Holding Tank] : VOC Analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.

Nitrite/Nitrate: Due to colour interferences, sample required dilution. Detection limits were adjusted accordingly.

ABN ANALYSIS: Due to the nature of the sample, a smaller amount was used for the analysis and a further dilution was required. Detection limits were adjusted accordingly.

Metals Analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.

Results relate only to the items tested.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C4V9846
Report Date: 2024/10/22

QUALITY ASSURANCE REPORT

RWDI Inc.
Client Project #: 2402553.01
Site Location: ON07
Your P.O. #: 13384121
Sampler Initials: JA

			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
9684177	4-Bromofluorobenzene	2024/10/11	92	70 - 130	91	70 - 130	86	%				
9684177	D4-1,2-Dichloroethane	2024/10/11	98	70 - 130	99	70 - 130	91	%				
9684177	D8-Toluene	2024/10/11	101	70 - 130	99	70 - 130	104	%				
9696723	4-Bromofluorobenzene	2024/10/15	101	70 - 130	106	70 - 130	105	%				
9696723	D4-1,2-Dichloroethane	2024/10/15	101	70 - 130	101	70 - 130	100	%				
9696723	D8-Toluene	2024/10/15	97	70 - 130	96	70 - 130	93	%				
9703097	2,4,6-Tribromophenol	2024/10/16	85	10 - 130	83	10 - 130	64	%				
9703097	2-Fluorobiphenyl	2024/10/16	74	30 - 130	74	30 - 130	74	%				
9703097	2-Fluorophenol	2024/10/16	54	10 - 130	43	10 - 130	48	%				
9703097	D14-Terphenyl	2024/10/16	86	30 - 130	87	30 - 130	85	%				
9703097	D5-Nitrobenzene	2024/10/16	85	30 - 130	81	30 - 130	77	%				
9703097	D5-Phenol	2024/10/16	37	10 - 130	28	10 - 130	32	%				
9684177	1,3,5-Trimethylbenzene	2024/10/11	110	60 - 140	103	60 - 140	<0.20	ug/L	NC (1)	30		
9696723	1,1,1,2-Tetrachloroethane	2024/10/15	95	70 - 130	94	70 - 130	<0.50	ug/L	NC (1)	30		
9696723	1,1,1-Trichloroethane	2024/10/15	93	70 - 130	94	70 - 130	<0.20	ug/L	NC (1)	30		
9696723	1,1,2,2-Tetrachloroethane	2024/10/15	87	70 - 130	87	70 - 130	<0.40	ug/L	NC (1)	30		
9696723	1,1,2-Trichloroethane	2024/10/15	101	70 - 130	99	70 - 130	<0.40	ug/L	NC (1)	30		
9696723	1,1-Dichloroethane	2024/10/15	91	70 - 130	92	70 - 130	<0.20	ug/L	NC (1)	30		
9696723	1,1-Dichloroethylene	2024/10/15	94	70 - 130	95	70 - 130	<0.20	ug/L	NC (1)	30		
9696723	1,2-Dichlorobenzene	2024/10/15	94	70 - 130	90	70 - 130	<0.40	ug/L	NC (1)	30		
9696723	1,2-Dichloroethane	2024/10/15	95	70 - 130	95	70 - 130	<0.49	ug/L	NC (1)	30		
9696723	1,2-Dichloropropane	2024/10/15	97	70 - 130	98	70 - 130	<0.20	ug/L	NC (1)	30		
9696723	1,3-Dichlorobenzene	2024/10/15	91	70 - 130	89	70 - 130	<0.40	ug/L	NC (1)	30		
9696723	1,4-Dichlorobenzene	2024/10/15	94	70 - 130	91	70 - 130	<0.40	ug/L	NC (1)	30		
9696723	Acetone (2-Propanone)	2024/10/15	100	60 - 140	99	60 - 140	<10	ug/L	NC (1)	30		
9696723	Benzene	2024/10/15	98	70 - 130	97	70 - 130	<0.20	ug/L	24 (1)	30		
9696723	Bromodichloromethane	2024/10/15	95	70 - 130	96	70 - 130	<0.50	ug/L	NC (1)	30		
9696723	Bromoform	2024/10/15	92	70 - 130	95	70 - 130	<1.0	ug/L	NC (1)	30		
9696723	Bromomethane	2024/10/15	87	60 - 140	85	60 - 140	<0.50	ug/L	NC (1)	30		
9696723	Carbon Tetrachloride	2024/10/15	98	70 - 130	99	70 - 130	<0.19	ug/L	NC (1)	30		

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
9696723	Chlorobenzene	2024/10/15	85	70 - 130	84	70 - 130	<0.20	ug/L	NC (1)	30		
9696723	Chloroethane	2024/10/15	89	70 - 130	90	70 - 130	<1.0	ug/L				
9696723	Chloroform	2024/10/15	95	70 - 130	96	70 - 130	<0.20	ug/L	NC (1)	30		
9696723	Chloromethane	2024/10/15	92	60 - 140	94	60 - 140	<5.0	ug/L				
9696723	cis-1,2-Dichloroethylene	2024/10/15	102	70 - 130	102	70 - 130	<0.50	ug/L	0.20 (1)	30		
9696723	cis-1,3-Dichloropropene	2024/10/15	100	70 - 130	97	70 - 130	<0.30	ug/L	NC (1)	30		
9696723	Dibromochloromethane	2024/10/15	96	70 - 130	93	70 - 130	<0.50	ug/L	NC (1)	30		
9696723	Ethylbenzene	2024/10/15	91	70 - 130	90	70 - 130	<0.20	ug/L	23 (1)	30		
9696723	Ethylene Dibromide	2024/10/15	95	70 - 130	92	70 - 130	<0.19	ug/L	NC (1)	30		
9696723	Methyl Ethyl Ketone (2-Butanone)	2024/10/15	106	60 - 140	106	60 - 140	<10	ug/L	NC (1)	30		
9696723	Methyl Isobutyl Ketone	2024/10/15	104	70 - 130	105	70 - 130	<5.0	ug/L	NC (1)	30		
9696723	Methyl t-butyl ether (MTBE)	2024/10/15	96	70 - 130	98	70 - 130	<0.50	ug/L	NC (1)	30		
9696723	Methylene Chloride(Dichloromethane)	2024/10/15	94	70 - 130	94	70 - 130	<2.0	ug/L	NC (1)	30		
9696723	o-Xylene	2024/10/15	95	70 - 130	96	70 - 130	<0.20	ug/L	23 (1)	30		
9696723	p+m-Xylene	2024/10/15	90	70 - 130	89	70 - 130	<0.20	ug/L	29 (1)	30		
9696723	Styrene	2024/10/15	90	70 - 130	90	70 - 130	<0.40	ug/L	NC (1)	30		
9696723	Tetrachloroethylene	2024/10/15	90	70 - 130	91	70 - 130	<0.20	ug/L	NC (1)	30		
9696723	Toluene	2024/10/15	91	70 - 130	90	70 - 130	<0.20	ug/L	23 (1)	30		
9696723	Total Xylenes	2024/10/15					<0.20	ug/L	26 (1)	30		
9696723	trans-1,2-Dichloroethylene	2024/10/15	100	70 - 130	101	70 - 130	<0.50	ug/L	NC (1)	30		
9696723	trans-1,3-Dichloropropene	2024/10/15	110	70 - 130	100	70 - 130	<0.40	ug/L	NC (1)	30		
9696723	Trichloroethylene	2024/10/15	98	70 - 130	100	70 - 130	<0.20	ug/L	NC (1)	30		
9696723	Trichlorofluoromethane (FREON 11)	2024/10/15	92	70 - 130	94	70 - 130	<0.50	ug/L	NC (1)	30		
9696723	Vinyl Chloride	2024/10/15	90	70 - 130	91	70 - 130	<0.20	ug/L	NC (1)	30		
9697677	Nitrate (N)	2024/10/12	96	80 - 120	98	80 - 120	<0.10	mg/L	0.13 (1)	20		
9697677	Nitrite (N)	2024/10/12	107	80 - 120	109	80 - 120	<0.010	mg/L				
9697744	Dissolved Chloride (Cl-)	2024/10/16	94	80 - 120	94	80 - 120	<1.0	mg/L	NC (1)	20		
9697748	Dissolved Sulphate (SO4)	2024/10/16	93	75 - 125	90	80 - 120	<1.0	mg/L	0.58 (1)	20		
9698119	Total Kjeldahl Nitrogen (TKN)	2024/10/18	NC	80 - 120	99	80 - 120	<0.7	mg/L	0.072 (1)	20	98	80 - 120
9698632	Alkalinity (Total as CaCO3)	2024/10/12			99	85 - 115	<1.0	mg/L	0.55 (1)	20		

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
9703097	1,2,3,4-Tetrachlorobenzene	2024/10/16	66	30 - 130	64	30 - 130	<0.50	ug/L				
9703097	1,2,3,5-Tetrachlorobenzene	2024/10/16	59	30 - 130	59	30 - 130	<0.50	ug/L				
9703097	1,2,3-Trichlorobenzene	2024/10/16	60	30 - 130	59	30 - 130	<0.50	ug/L				
9703097	1,2,4,5-Tetrachlorobenzene	2024/10/16	64	30 - 130	56	30 - 130	<0.50	ug/L				
9703097	1,2,4-Trichlorobenzene	2024/10/16	59	30 - 130	56	30 - 130	<0.50	ug/L				
9703097	1,2-Dichlorobenzene	2024/10/16	61	30 - 130	59	30 - 130	<0.50	ug/L				
9703097	1,3,5-Trichlorobenzene	2024/10/16	66	30 - 130	64	30 - 130	<0.50	ug/L				
9703097	1,3-Dichlorobenzene	2024/10/16	52	30 - 130	50	30 - 130	<0.50	ug/L				
9703097	1-Chloronaphthalene	2024/10/16	74	30 - 130	72	30 - 130	<1.0	ug/L	NC (1)	40		
9703097	1-Methylnaphthalene	2024/10/16	73	30 - 130	70	30 - 130	<0.20	ug/L	NC (1)	40		
9703097	2,3,4,5-Tetrachlorophenol	2024/10/16	92	10 - 130	94	10 - 130	<0.40	ug/L				
9703097	2,3,4,6-Tetrachlorophenol	2024/10/16	88	10 - 130	88	10 - 130	<0.50	ug/L				
9703097	2,3,4-Trichlorophenol	2024/10/16	96	10 - 130	91	10 - 130	<0.50	ug/L				
9703097	2,3,5,6-Tetrachlorophenol	2024/10/16	82	10 - 130	90	10 - 130	<0.50	ug/L				
9703097	2,3,5-Trichlorophenol	2024/10/16	93	10 - 130	91	10 - 130	<0.50	ug/L				
9703097	2,3,6-Trichlorophenol	2024/10/16	103	10 - 130	100	10 - 130	<0.50	ug/L				
9703097	2,3-Dichlorophenol	2024/10/16	84	10 - 130	80	10 - 130	<0.50	ug/L				
9703097	2,4,5-Trichlorophenol	2024/10/16	90	10 - 130	91	10 - 130	<0.50	ug/L				
9703097	2,4,6-Trichlorophenol	2024/10/16	93	10 - 130	94	10 - 130	<0.50	ug/L				
9703097	2,4-Dichlorophenol	2024/10/16	80	10 - 130	78	10 - 130	<0.30	ug/L				
9703097	2,4-Dimethylphenol	2024/10/16	68	10 - 130	67	10 - 130	<0.50	ug/L				
9703097	2,4-Dinitrophenol	2024/10/16	87	10 - 130	79	10 - 130	<2.0	ug/L				
9703097	2,4-Dinitrotoluene	2024/10/16	95	30 - 130	93	30 - 130	<0.50	ug/L	NC (1)	40		
9703097	2,5-Dichlorophenol	2024/10/16	94	10 - 130	82	10 - 130	<0.50	ug/L				
9703097	2,6-Dichlorophenol	2024/10/16	81	10 - 130	77	10 - 130	<0.50	ug/L				
9703097	2,6-Dinitrotoluene	2024/10/16	89	30 - 130	93	30 - 130	<0.50	ug/L	NC (1)	40		
9703097	2-Chloronaphthalene	2024/10/16	73	30 - 130	68	30 - 130	<0.50	ug/L	NC (1)	40		
9703097	2-Chlorophenol	2024/10/16	87	10 - 130	79	10 - 130	<0.30	ug/L				
9703097	2-Methylnaphthalene	2024/10/16	74	30 - 130	70	30 - 130	<0.20	ug/L	NC (1)	40		
9703097	2-Nitrophenol	2024/10/16	90	10 - 130	90	10 - 130	<0.50	ug/L				

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
9703097	3,3'-Dichlorobenzidine	2024/10/16	105	30 - 130	107	30 - 130	<0.50	ug/L				
9703097	3,4,5-Trichlorophenol	2024/10/16	110	10 - 130	104	10 - 130	<0.50	ug/L				
9703097	3,4-Dichlorophenol	2024/10/16	94	10 - 130	98	10 - 130	<0.50	ug/L				
9703097	3,5-Dichlorophenol	2024/10/16	101	10 - 130	100	10 - 130	<0.50	ug/L				
9703097	4,6-Dinitro-2-methylphenol	2024/10/16	105	10 - 130	105	10 - 130	<2.0	ug/L				
9703097	4-Bromophenyl phenyl ether	2024/10/16	82	30 - 130	84	30 - 130	<0.30	ug/L	NC (1)	40		
9703097	4-Chloro-3-Methylphenol	2024/10/16	95	10 - 130	86	10 - 130	<0.50	ug/L				
9703097	4-Chlorophenyl phenyl ether	2024/10/16	83	30 - 130	79	30 - 130	<0.50	ug/L	NC (1)	40		
9703097	4-Nitrophenol	2024/10/16	54	10 - 130	45	10 - 130	<1.4	ug/L				
9703097	Acenaphthene	2024/10/16	81	30 - 130	81	30 - 130	<0.20	ug/L	NC (1)	40		
9703097	Acenaphthylene	2024/10/16	81	30 - 130	81	30 - 130	<0.20	ug/L	NC (1)	40		
9703097	Anthracene	2024/10/16	90	30 - 130	91	30 - 130	<0.20	ug/L	NC (1)	40		
9703097	Benzo(a)anthracene	2024/10/16	98	30 - 130	100	30 - 130	<0.20	ug/L	NC (1)	40		
9703097	Benzo(a)pyrene	2024/10/16	109	30 - 130	108	30 - 130	<0.20	ug/L	NC (1)	40		
9703097	Benzo(b/j)fluoranthene	2024/10/16	105	30 - 130	99	30 - 130	<0.20	ug/L	NC (1)	40		
9703097	Benzo(g,h,i)perylene	2024/10/16	93	30 - 130	97	30 - 130	<0.20	ug/L	NC (1)	40		
9703097	Benzo(k)fluoranthene	2024/10/16	100	30 - 130	102	30 - 130	<0.20	ug/L	NC (1)	40		
9703097	Benzyl butyl phthalate	2024/10/16	98	30 - 130	99	30 - 130	<0.50	ug/L	NC (1)	40		
9703097	Biphenyl	2024/10/16	77	30 - 130	74	30 - 130	<0.50	ug/L	NC (1)	40		
9703097	Bis(2-chloroethoxy)methane	2024/10/16	88	30 - 130	88	30 - 130	<0.50	ug/L	NC (1)	40		
9703097	Bis(2-chloroethyl)ether	2024/10/16	80	30 - 130	80	30 - 130	<0.50	ug/L	NC (1)	40		
9703097	Bis(2-chloroisopropyl)ether	2024/10/16	68	30 - 130	66	30 - 130	<0.50	ug/L	NC (1)	40		
9703097	Bis(2-ethylhexyl)phthalate	2024/10/16	98	30 - 130	98	30 - 130	<2.0	ug/L	NC (1)	40		
9703097	Chrysene	2024/10/16	93	30 - 130	99	30 - 130	<0.20	ug/L	NC (1)	40		
9703097	Dibenzo(a,h)anthracene	2024/10/16	91	30 - 130	100	30 - 130	<0.20	ug/L	NC (1)	40		
9703097	Diethyl phthalate	2024/10/16	98	30 - 130	96	30 - 130	<1.0	ug/L				
9703097	Dimethyl phthalate	2024/10/16	96	30 - 130	95	30 - 130	<1.0	ug/L				
9703097	Di-N-butyl phthalate	2024/10/16	102	30 - 130	101	30 - 130	<2.0	ug/L	NC (1)	40		
9703097	di-n-octyl phthalate	2024/10/16	105	30 - 130	102	30 - 130	<0.80	ug/L	NC (1)	40		
9703097	Diphenyl Ether	2024/10/16	73	30 - 130	72	30 - 130	<0.30	ug/L	NC (1)	40		

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
9703097	Fluoranthene	2024/10/16	102	30 - 130	103	30 - 130	<0.20	ug/L	NC (1)	40		
9703097	Fluorene	2024/10/16	87	30 - 130	88	30 - 130	<0.20	ug/L	NC (1)	40		
9703097	Hexachlorobenzene	2024/10/16	86	30 - 130	85	30 - 130	<0.50	ug/L				
9703097	Hexachlorobutadiene	2024/10/16	49	30 - 130	49	30 - 130	<0.40	ug/L				
9703097	Hexachlorocyclopentadiene	2024/10/16	47	30 - 130	48	30 - 130	<2.0	ug/L				
9703097	Hexachloroethane	2024/10/16	54	30 - 130	54	30 - 130	<0.50	ug/L				
9703097	Indeno(1,2,3-cd)pyrene	2024/10/16	92	30 - 130	99	30 - 130	<0.20	ug/L	NC (1)	40		
9703097	Isophorone	2024/10/16	91	30 - 130	90	30 - 130	<0.50	ug/L				
9703097	m/p-Cresol	2024/10/16	75	10 - 130	66	10 - 130	<0.50	ug/L				
9703097	Naphthalene	2024/10/16	60	30 - 130	59	30 - 130	<0.20	ug/L	NC (1)	40		
9703097	Nitrobenzene	2024/10/16	79	30 - 130	80	30 - 130	<0.50	ug/L				
9703097	Nitrosodiphenylamine/Diphenylamine	2024/10/16	102	30 - 130	100	30 - 130	<1.0	ug/L	NC (1)	40		
9703097	N-Nitroso-di-n-propylamine	2024/10/16	99	30 - 130	103	30 - 130	<0.50	ug/L	NC (1)	40		
9703097	o-Cresol	2024/10/16	79	10 - 130	72	10 - 130	<0.50	ug/L				
9703097	p-Chloroaniline	2024/10/16	75	30 - 130	78	30 - 130	<1.0	ug/L				
9703097	Pentachlorobenzene	2024/10/16	66	30 - 130	63	30 - 130	<0.50	ug/L				
9703097	Pentachlorophenol	2024/10/16	86	10 - 130	90	10 - 130	<1.0	ug/L				
9703097	Perylene	2024/10/16	97	30 - 130	99	30 - 130	<0.20	ug/L	NC (1)	40		
9703097	Phenanthrene	2024/10/16	87	30 - 130	87	30 - 130	<0.20	ug/L	NC (1)	40		
9703097	Phenol	2024/10/16	43	10 - 130	35	10 - 130	<0.50	ug/L				
9703097	Pyrene	2024/10/16	98	30 - 130	99	30 - 130	<0.20	ug/L	NC (1)	40		
9703624	Total Aluminum (Al)	2024/10/16	117	80 - 120	91	80 - 120	<0.02	mg/L				
9703624	Total Arsenic (As)	2024/10/16	97	80 - 120	98	80 - 120	<0.001	mg/L	NC (1)	20		
9703624	Total Barium (Ba)	2024/10/16	88	80 - 120	94	80 - 120	<0.005	mg/L	1.7 (1)	20		
9703624	Total Beryllium (Be)	2024/10/16	93	80 - 120	91	80 - 120	<0.0006	mg/L				
9703624	Total Bismuth (Bi)	2024/10/16	90	80 - 120	93	80 - 120	<0.001	mg/L				
9703624	Total Boron (B)	2024/10/16	NC	80 - 120	92	80 - 120	<0.02	mg/L				
9703624	Total Cadmium (Cd)	2024/10/16	93	80 - 120	93	80 - 120	<0.0001	mg/L				
9703624	Total Calcium (Ca)	2024/10/16	NC	80 - 120	97	80 - 120	<0.2	mg/L				
9703624	Total Chromium (Cr)	2024/10/16	96	80 - 120	97	80 - 120	<0.005	mg/L	NC (1)	20		

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
9703624	Total Cobalt (Co)	2024/10/16	95	80 - 120	96	80 - 120	<0.0005	mg/L				
9703624	Total Copper (Cu)	2024/10/16	94	80 - 120	93	80 - 120	<0.002	mg/L				
9703624	Total Iron (Fe)	2024/10/16	94	80 - 120	98	80 - 120	<0.1	mg/L	1.6 (1)	20		
9703624	Total Lead (Pb)	2024/10/16	91	80 - 120	95	80 - 120	<0.0005	mg/L	NC (1)	20		
9703624	Total Magnesium (Mg)	2024/10/16	89	80 - 120	93	80 - 120	<0.05	mg/L				
9703624	Total Molybdenum (Mo)	2024/10/16	98	80 - 120	96	80 - 120	<0.002	mg/L				
9703624	Total Nickel (Ni)	2024/10/16	89	80 - 120	93	80 - 120	<0.001	mg/L				
9703624	Total Potassium (K)	2024/10/16	NC	80 - 120	96	80 - 120	<0.2	mg/L				
9703624	Total Selenium (Se)	2024/10/16	103	80 - 120	103	80 - 120	<0.005	mg/L	NC (1)	20		
9703624	Total Silver (Ag)	2024/10/16	91	80 - 120	91	80 - 120	<0.0004	mg/L				
9703624	Total Sodium (Na)	2024/10/16	NC	80 - 120	97	80 - 120	<0.1	mg/L	2.4 (1)	20		
9703624	Total Strontium (Sr)	2024/10/16	94	80 - 120	93	80 - 120	<0.003	mg/L				
9703624	Total Tin (Sn)	2024/10/16	94	80 - 120	92	80 - 120	<0.002	mg/L				
9703624	Total Titanium (Ti)	2024/10/16	89	80 - 120	88	80 - 120	<0.005	mg/L				
9703624	Total Vanadium (V)	2024/10/16	96	80 - 120	96	80 - 120	<0.001	mg/L				
9703624	Total Zinc (Zn)	2024/10/16	95	80 - 120	100	80 - 120	<0.01	mg/L				
9703932	Total Ammonia-N	2024/10/18	94	75 - 125	92	80 - 120	<0.15	mg/L	NC (1)	20		
9705573	Total Phosphorus	2024/10/18	93	80 - 120	96	80 - 120	<0.030	mg/L	4.8 (1)	25	103	80 - 120

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 spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) Duplicate Parent ID

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C4V9846
Report Date: 2024/10/22

RWDI Inc.
Client Project #: 2402553.01
Site Location: ON07
Your P.O. #: 13384121
Sampler Initials: JA

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Cristina Carriere, Senior Scientific Specialist

Michael Damianidis, Project Manager Assistant

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

BUREAU VERITAS

FIELD INFORMATION FORM

WASTE MANAGEMENT

Site Name: TCEC

Site No.:

Sample: PS Holding Tank Sample ID

This Waste Management Field Information Form is Required
This form is to be completed, in addition to any State Forms. The Field Form is submitted along with the Chain of Custody Forms that accompany the sample containers (i.e. with the cooler that is returned to the laboratory).

Laboratory Use Only/Lab ID:

PURGE INFO

PURGE DATE (MM DD YY)	PURGE TIME (2400 Hr Clock)	ELAPSED HRS (hrs:min)	WATER VOL IN CASING (Gallons)	ACTUAL VOL PURGED (Gallons)	WELL VOLs PURGED

Note: For Passive Sampling, replace "Water Vol in Casing" and "Well Vols Purged" w/ Water Vol in Tubing/Flow Cell and Tubing/Flow Cell Vols Purged. Mark Changes, Record field data below.

PURGE/SAMPLE EQUIPMENT

Purging and Sampling Equipment ... Dedicated: (Y) or N

Filter Device: Y or (N) 0.45 µ or _____ µ (circle or fill in)

Purging Device: _____ A-Submersible Pump B-Peristaltic Pump C-QED Bladder Pump D-Bailer E-Piston Pump F-Dipper/Bottle

Sampling Device: D

X-Other: _____

Filter Type: _____ A-In-line Disposable B-Pressure C-Vacuum X-Other: _____

Sample Tube Type: _____ A-Teflon B-Stainless Steel C-PVC D-Polypropylene X-Other: _____

WELL DATA

Well Elevation (at TOC) _____ (ft/msl)

Depth to Water (DTW) (from TOC) _____ (ft)

Groundwater Elevation (GWE) (Site Datum, from TOC) _____ (ft msl)

Total Well Depth (from TOC) _____ (ft)

Stick Up (from ground elevation) _____ (ft)

Casing ID _____ (in)

Casing Material _____

Note: Total Depth, Stick Up, Casing ID, etc. are optional and can be from historical data, unless required by Site/Permit. Well Elevation, DTW, and GWE must be current, obtained from site.

STABILIZATION DATA (Optional)

Sample Time (2400 Hr Clock)	Rate/Unit	pH (std)	Conductance (SC/EC) (µmhos/cm @ 25°C)	Temp. (°C)	Turbidity (ntu)	D.O. (mg/L - ppm)	eH/ORP (mV)	DTW (ft)
		1st	1st					
		2nd	2nd					
		3rd	3rd					
		4th	4th					
Input Range for 3 consec. readings or Permit/State requirements:		+/-	+/-	+/-	+/-	+/-	+/-	

Stabilization Data Fields are Optional *(i.e. complete stabilization readings for parameters required by WM, Site, or State). These fields can be used where four (4) field measurements are required by State/Permit/Site. If a Data Logger or other Electronic format is used, fill in final readings below and submit electronic data separately to Site. If more fields above are needed, use separate sheet or form.*

FIELD DATA

SAMPLE DATE (MM DD YY)	pH (std)	CONDUCTANCE (µmhos/cm @ 25°C)	TEMP. (°C)	TURBIDITY (ntu)	DO (mg/L - ppm)	eH/ORP (mV)	Other: Units
10 09 24	7.37	7.60 mS	17.7	7999	5.01		

Final Field Readings are required *(i.e. record field measurements, final stabilized readings, passive sample readings before sampling for all field parameters required by State/Permit/Site.)*

FIELD COMMENTS

Sample Appearance: Gray, translucent Odor: leachate Color: Grey Other: _____

Weather Conditions (required daily, or as conditions change): 12°C Direction/Speed: 25Kmh NW Outlook: partly cloudy Precipitation: Y or (N)

Specific Comments (including purge/well volume calculations if required): _____

I certify that sampling procedures were in accordance with applicable EPA, State, and WM protocols (if more than one sampler, all should sign):

Date	Name	Signature	Company
10/09/24	Eric Wilson	E. Wilson	RWDI

DISTRIBUTION: WHITE/ORIGINAL - Stays with Sample, YELLOW - Returned to Client, PINK - Field Copy

Field Information Form v-3.1 06/20

2135

Custody Tracking Form

T977765

Please use this form for custody tracking when submitting the work instructions via eCOC (electronic Chain of Custody). Please ensure your form has a barcode or a Bureau Veritas eCOC confirmation number in the top right hand side. This number links your electronic submission to your samples. This form should be placed in the cooler with your samples.

First Sample: PS Holding Tank
Last Sample: PS Holding Tank
Sample Count: 1

Relinquished By				Received By			
J. Arthur		Date	24/10/05			Date	
		Time (24 HR)	14:00			Time (24 HR)	
		Date				Date	
		Time (24 HR)				Time (24 HR)	
		Date				Date	
		Time (24 HR)				Time (24 HR)	

Unless otherwise agreed to, submissions and use of services are governed by Bureau Veritas' standard terms and conditions which can be found at www.bvna.com.

Triage Information

Sampled By (Print): E. Wilson

# of Coolers/Pkgs: 1

Rush ☐ Immediate Test ☐ Food Residue ☐

Micro ☐ Food Chemistry ☐

*** LABORATORY USE ONLY ***

Received At Mississauga Lab Co

10-Oct-24 11:23

Patricia Legette

C4V9846

Labeled By AK

Verified By A8K ENV-1358

Custody Seal		Cooling Media	Temperature °C		
Present (Y/N)	Intact (Y/N)	Present (Y/N)	1	2	3
Y	Y	Y	7	9	10
Drinking Water Metals Preservation Check Done (Circle)				YES	NO

TJG

COR FCD-00383/4

Page 1 of 1

APPENDIX F:

Liquid Level Results

Table F-1
Liquid Elevations
Twin Creeks Environmental Centre - Poplar System

Monitoring Area	Poplar System																			
	South Cell								Cell 3S						Cell 3	Cell 4			West Cell
Monitoring Locations	MH16	MH17	MH18	OW22-9	OW22A-10	OW53-10	LW5	LW6	MH3SA	MH3SB	MH3SC	MH3SD	MH3SE	MH3SF	OW51A-15	MH4A	MH4B	LW4	Sump
Measuring Point	239.69	239.6	239.23	243.98	243.66	244.55	247.20	247.76	241.27	241.19	239.8	239.9	249.99	249.02	250.45	241.07	245.64	248.24	248.9
Invert	235.41	235.1	234.93	NA	NA	NA	NA	NA	237.2	237.15	235.8	235.75	236.45	236.5	NA			NA	
20-Jun-01				239.94															
26-Nov-01				240.11															
18-Apr-02				238.50															
21-May-02				238.35		237.27			Dry	Dry	236.56	236.54	237.81	239.50		239.46	238.78		239.16
15-Jun-02				238.36		237.39			Dry	Dry	236.49	236.46	237.71	239.13		238.15	238.75		239.37
19-Sep-02	236.77	236.78	236.76	238.11		237.37													
20-Sep-02	236.85	236.86	236.85	238.10		237.09													
25-Sep-02	236.94	236.96	236.93	237.91		237.36													
22-Oct-02	237.05	237.04	237.03	237.98		237.18			Dry	Dry	236.11	236.22	237.57	238.82		238.42	238.93		239.48
14-Nov-02	237.14	237.15	237.18	238.06		237.19													
28-Nov-02	237.25	237.25	237.24	238.17		237.21													
9-Feb-03	237.36	237.37	237.39	238.07		237.37													
26-Feb-03	237.35	237.34	237.35	237.97		237.38													
21-Mar-03	237.38	237.38	237.39	238.03		237.33													
4-Apr-03	237.45	237.44	237.46	238.08		237.44													
13-May-03	237.45	237.46	237.48	238.05		237.36			Dry	Dry	236.92	237.03	238.61	241.87		239.65	239.02		240.10
12-Jun-03	237.52	237.52	237.54	238.09		237.51													
22-Jul-03	237.57	237.56	237.58	238.12		237.51													
28-Aug-03	236.66	236.71	236.70	237.55		237.31													
10-Sep-03	236.89	236.89	236.88	237.64		237.27													
13-Oct-03	237.18	237.18	237.19	237.93		237.47													
12-Nov-03	237.27	237.30	237.28	238.00		237.59			237.59	Dry	236.78	236.79	239.66	242.40		238.56	238.85		239.86
17-Dec-03	236.55	236.58	236.58	237.56		237.50													
25-May-04	237.32	237.34	237.32		236.72	237.78			238.34	Dry	236.75	236.76				239.86	238.89		239.68
26-Nov-04	237.50	237.06	236.60		237.45	236.12			238.20	238.04	235.89	235.44	239.85	242.34		238.36	238.87		
6-Apr-05			237.23									236.93				239.19			239.40
12-May-05	237.28	237.30	237.28		237.63	237.54			239.14	238.73	236.82	236.83	241.85	244.56		239.15	239.15		239.27
29-Nov-05	237.20	237.22	237.20		237.64	237.68			Dry	Dry	236.68	236.60	246.08	246.80	235.97	237.59	239.19		239.40
27-Mar-06											236.75					238.26			239.15
17-May-06	237.52	237.49	237.51		238.04				237.65	Dry	236.35	236.36	242.00	245.02	236.16	238.66	239.68		239.45
22-Nov-06	237.62	237.63	237.60		237.86	237.58			237.47	Dry	236.90	237.03	242.46	244.99	236.40	238.19	240.08		239.38
4-Apr-07												236.90				238.89			239.54
3-May-07	237.10	237.09	237.11		237.84	237.75			237.82	238.09	236.64	236.75	242.69	244.93	235.98	238.68	238.63		239.15
15-Nov-07	237.65	237.66	237.63		237.96	237.72			237.54	<237.18	236.90	236.93	241.07	243.17	235.78	237.71	238.98		239.31
15-May-08			237.28		237.69	237.95			237.87	237.85	236.65	236.77	242.61	244.20	235.93	238.51	240.29		239.51
4-Nov-08									237.63	237.73	236.86	237.82	242.49	245.14	237.98*	237.52	238.40		239.47
27-Nov-08	236.95	236.97	236.96		237.38	237.80													
12-May-09	237.47	237.49	237.49		237.80	237.95			238.47	237.92	236.56	236.72	240.44	243.79	236.18	237.87	240.62		239.40
16-Nov-09	237.65	237.71	237.69		237.97	237.77			237.83	Dry	236.07	236.07	241.34	243.39	236.03	236.34	240.61		239.15
14-May-10	237.11	237.13	237.06		237.61	237.67			237.73	Dry	233.17	Dry		243.38	235.85	238.06	240.33		239.59
2-Nov-10	237.54	237.54	237.49		237.76	237.78			237.67	Dry	233.38	235.59	240.85	243.20	235.90	238.06	240.39		239.63
9-May-11	237.85	237.86	237.87		238.05	238.49			237.96	237.41	234.43	235.64	242.79	244.89	236.03	238.29	241.56		240.20
1-Nov-11	237.83	237.85	237.77		238.08	238.26			237.86	Dry	234.83	234.97	242.38	244.45	235.91	236.52	237.12		238.83
7-May-12	237.90	237.92	237.89		238.27	238.26			238.19	237.41	233.09	Dry	242.43	244.31	236.07	238.38	237.57		239.89
5-Nov-12	237.54	237.54	237.49		237.73	238.42			237.95	237.19	234.83	Dry	241.86	243.53	235.98	238.19	237.57		238.69
6-May-13	237.89	237.89	237.83		238.18	238.75			238.88	238.67	232.95	Dry	243.04	245.01	236.05	238.54	238.35		240.91
4-Nov-13	237.66	237.66	237.40		237.84	238.57			237.99	237.16	234.79	235.29	242.68	242.72	236.47	238.37	237.66		239.03
5-May-14	237.84	237.93	237.77		238.45	239.11			238.89	238.76	233.00	<235.32	242.97	245.06	236.71	238.60	238.38		240.86
23-May-14	237.63	237.60	237.46		237.72	238.94			237.91	237.24	234.61	235.31	242.70	242.82	236.50	238.24	237.73		238.99
17-Nov-14	236.32	236.30	236.28		237.77	238.39			238.18	<237.29	234.21	<233.65	243.58	243.08	236.32	237.27	238.80		238.65
11-May-15	237.83	237.84	237.79		238.06	238.23			238.60	237.72	233.90	<234.67	244.08	241.34	236.23	237.99	240.32		238.34
10-Nov-15	237.91	237.93	237.91		238.14	238.20			238.05	237.05	233.64	<234.67	242.82	242.97	236.23	237.71	238.74		237.31

Notes:

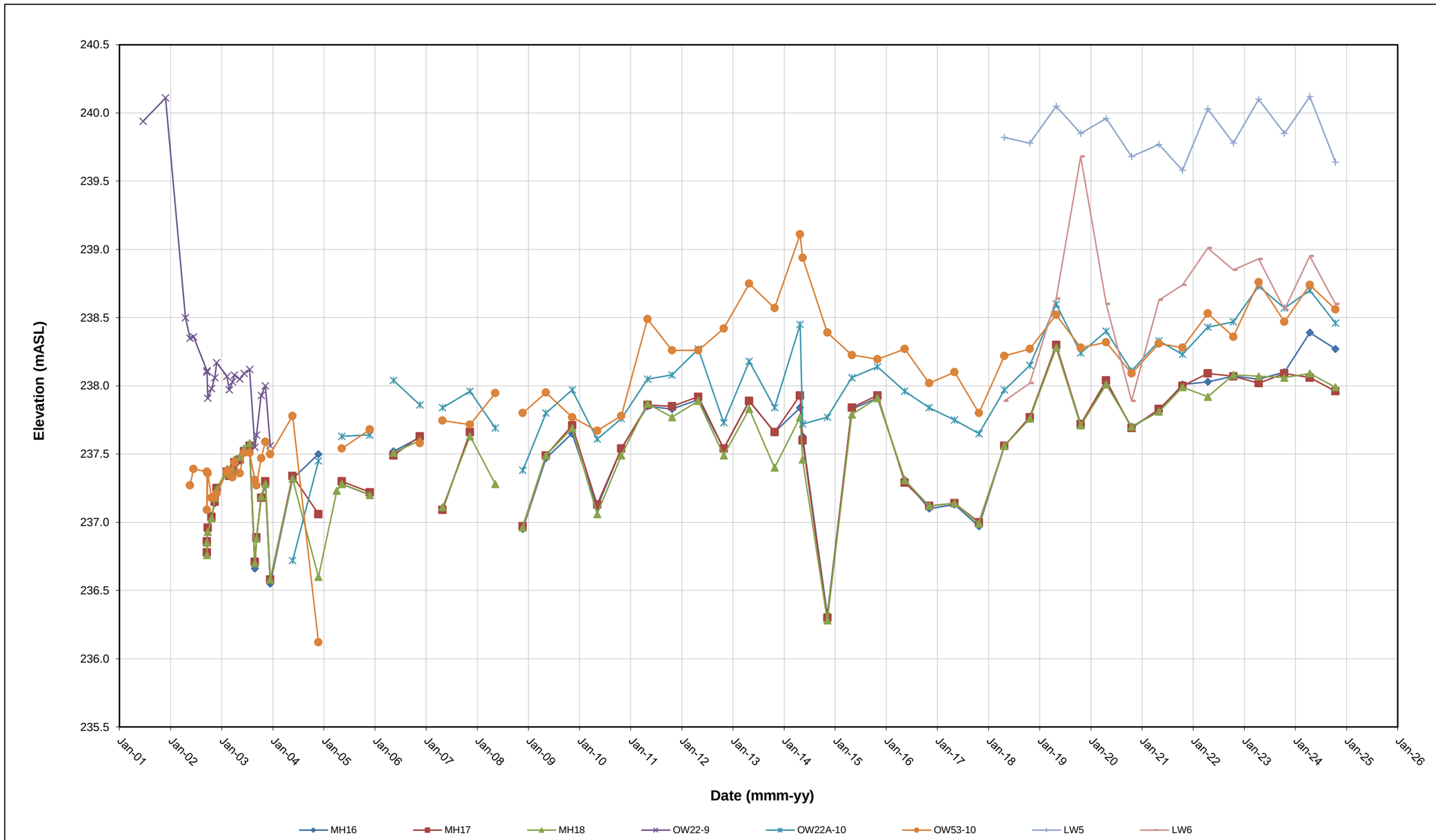
1) NA indicates not applicable.
2) Blank indicates data not available.
3) Monitoring well OW22-9 was decommissioned and reinstalled as OW22A-10 in March 2004.
4) Elevations in metres above sea level.
5) Measuring point elevations for MW16, MW17, and MW18 updated based on a June 2015 survey.

Table F-1
Liquid Elevations
Twin Creeks Environmental Centre - Poplar System

Monitoring Area	Poplar System																			
	South Cell								Cell 3S						Cell 3	Cell 4			West Cell
Monitoring Locations	MH16	MH17	MH18	OW22-9	OW22A-10	OW53-10	LW5	LW6	MH3SA	MH3SB	MH3SC	MH3SD	MH3SE	MH3SF	OW51A-15	MH4A	MH4B	LW4	Sump
Measuring Point	239.69	239.6	239.23	243.98	243.66	244.55	247.20	247.76	241.27	241.19	239.8	239.9	249.99	249.02	250.45	241.07	245.64	248.24	248.9
Invert	235.41	235.1	234.93	NA	NA	NA	NA	NA	237.2	237.15	235.8	235.75	236.45	236.5	NA			NA	
24-May-16	237.31	237.29	237.31		237.96	238.27			238.30	237.05	233.72	<234.69	243.19	244.04	236.03	238.39	239.61		241.40
14-Nov-16	237.10	237.12	237.12		237.84	238.02			238.78	237.44	233.72	<234.69	242.78	242.88	236.05	237.64	239.66		240.26
15-May-17	237.13	237.14	237.14		237.75	238.10			238.99	237.32	234.46	<234.36	243.35	244.04	236.02	238.38	239.63		242.01
6-Nov-17	236.97	237.00	236.99		237.65	237.80			238.56	238.00	236.01	<234.36	243.99	242.01	236.27	235.92	239.58		242.05
7-May-18	237.56	237.56	237.56		237.97	238.22	239.82	237.89	239.53	239.32	236.03	235.74	243.98	244.04	236.05	234.58	238.91	240.44	243.26
5-Nov-18	237.77	237.77	237.76		238.15	238.27	239.78	238.02	240.25	240.30	234.83	234.36	243.89	243.92	236.04	234.48	239.74	240.29	244.12
13-May-19	238.28	238.30	238.28		238.60	238.52	240.05	238.64	239.01	239.60	237.44	237.11	243.89	243.92	236.26	238.49	239.62	240.54	245.14
4-Nov-19	237.71	237.72	237.71		238.24	238.28	239.85	239.68	239.00	238.57	237.40	238.11	243.90	243.92	236.20	238.79	238.93	240.49	242.54
4-May-20	238.02	238.04	238.01		238.40	238.32	239.96	238.60	237.93	238.06	235.54	235.51	243.94	243.99	236.14	239.24	239.32	240.96	240.37
2-Nov-20	237.70	237.69	237.70		238.11	238.09	239.68	237.89	238.67	237.99	233.69	235.55	243.43	243.66	236.34	235.89	239.43	241.39	241.03
17-May-21	237.82	237.83	237.81		238.33	238.31	239.77	238.63	239.43	239.51	236.79	236.49	243.88	243.90	236.47	238.59	239.44	241.90	241.92
1-Nov-21	238.01	238.00	237.99		238.23	238.28	239.58	238.74	239.74	239.58	236.82	237.97	243.88	243.92	236.29	239.92	239.95	242.01	242.66
2-May-22	238.03	238.09	237.92		238.43	238.53	240.03	239.01	240.09	239.99	235.57	235.37	244.01	244.05	236.30	238.50	239.46	242.27	242.43
1-Nov-22	238.07	238.07	238.08		238.47	238.36	239.78	238.85	238.77	238.52	237.15	236.84	243.65	243.70	236.58	238.38	239.37	242.10	242.56
1-May-23	238.05	238.02	238.07		238.73	238.76	240.10	238.93	239.45	239.42	236.05	235.99	244.00	244.00	237.67	240.11	240.20	242.41	245.45
1-Nov-23	238.10	238.09	238.06		238.57	238.47	239.85	238.56	238.91	238.84	236.45	236.08	243.81	243.48	236.94	240.09	240.31	242.18	244.08
1-May-24	238.39	238.06	238.09		238.70	238.74	240.12	238.95	239.05	239.04	234.50	235.78	243.90	243.91	238.05	240.18	240.18	242.54	245.58
1-Nov-24	238.27	237.96	237.99		238.46	238.56	239.64	238.60	238.74	238.73	234.43	235.76	243.66	242.83	238.47	237.32	239.28	242.48	244.61

Notes:

1) NA indicates not applicable.
2) Blank indicates data not available.
3) Monitoring well OW22-9 was decommissioned and reinstalled as OW22A-10 in March 2004.
4) Elevations in metres above sea level.
5) Measuring point elevations for MW16, MW17, and MW18 updated based on a June 2015 survey.



NOTES:

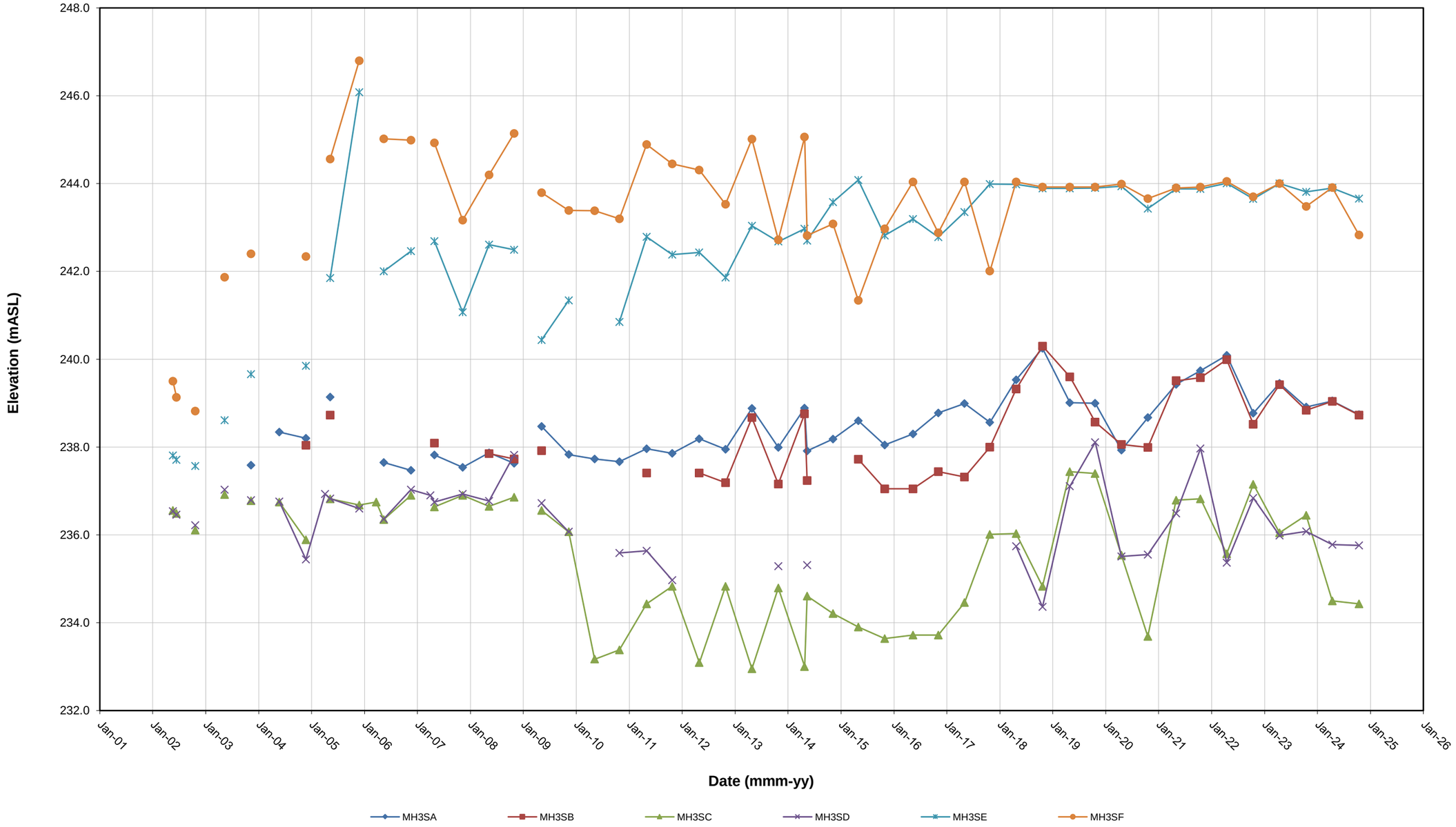
1. mASL denotes metres above sea level

LEACHATE ELEVATION HYDROGRAPH
South Cell

2024 FOURTH QUARTER AND ANNUAL MONITORING REPORT

TWIN CREEKS ENVIRONMENTAL CENTRE
WASTE MANAGEMENT OF CANADA CORPORATION

FIGURE NUMBER	PROJECT NUMBER
F-1	2402553
DATE REVISED	**REVISED BY**
26-Nov-24	EW



NOTES:

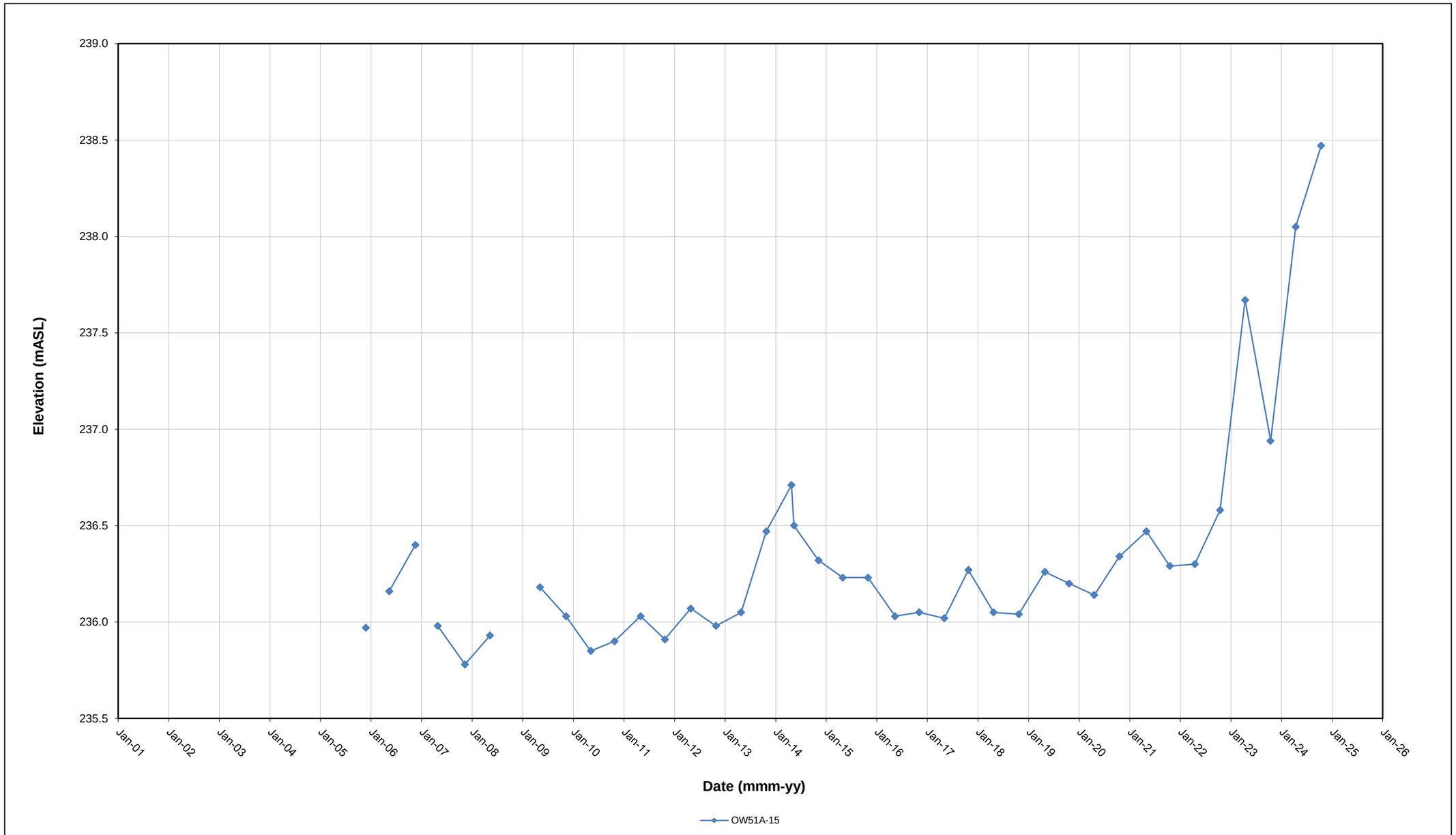
1. mASL denotes metres above sea level

LEACHATE ELEVATION HYDROGRAPH
Cell 3S

2024 FOURTH QUARTER AND ANNUAL MONITORING REPORT

TWIN CREEKS ENVIRONMENTAL CENTRE
WASTE MANAGEMENT OF CANADA CORPORATION

FIGURE NUMBER	PROJECT NUMBER
F-2	2402553
DATE REVISED	**REVISED BY**
26-Nov-24	EW



NOTES:

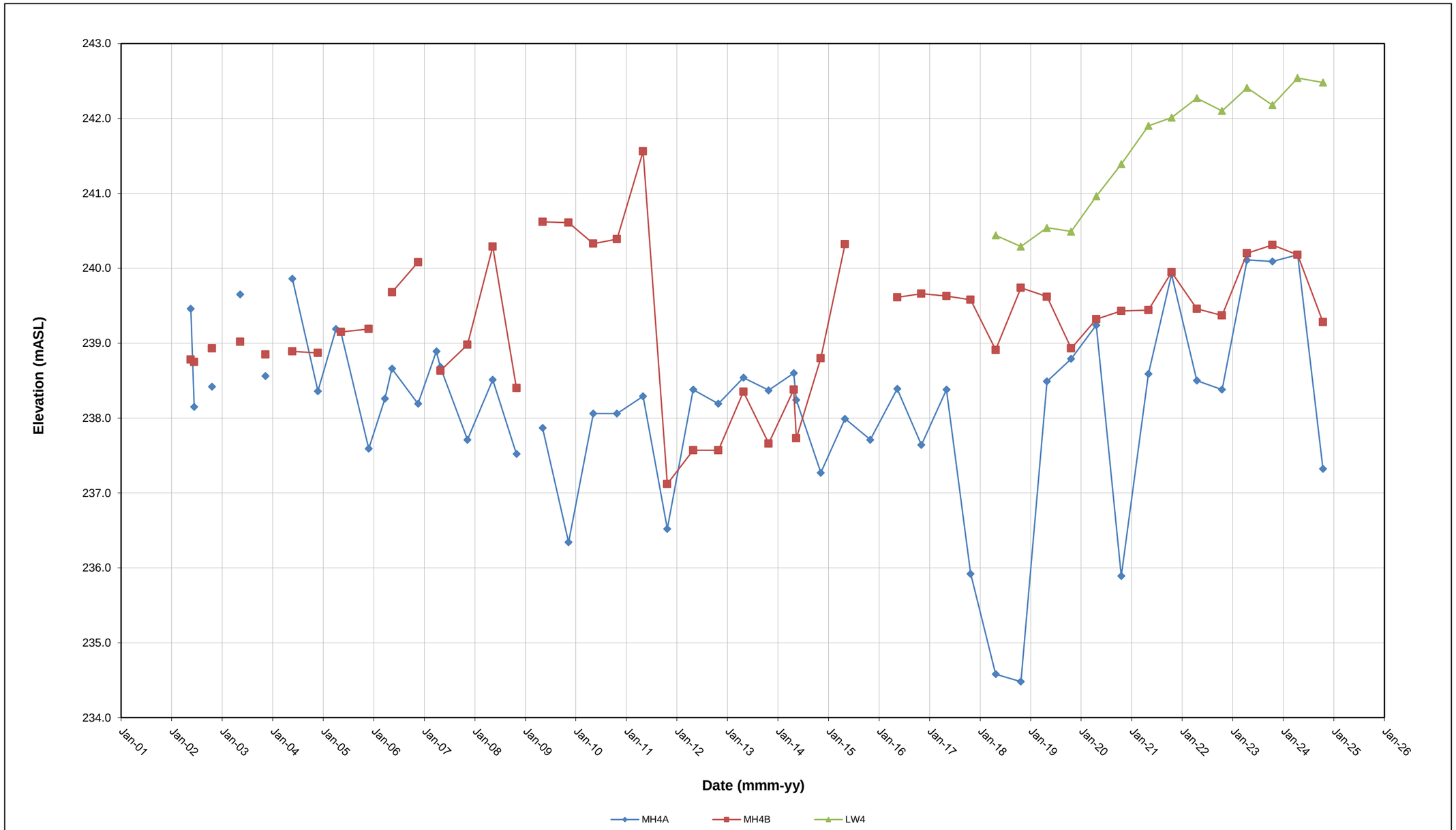
1. mASL denotes metres above sea level

LEACHATE ELEVATION HYDROGRAPH
Cell 3

2024 FOURTH QUARTER AND ANNUAL MONITORING REPORT

TWIN CREEKS ENVIRONMENTAL CENTRE
WASTE MANAGEMENT OF CANADA CORPORATION

FIGURE NUMBER	PROJECT NUMBER
F-3	2402553
DATE REVISED	**REVISED BY**
26-Nov-24	EW



NOTES:

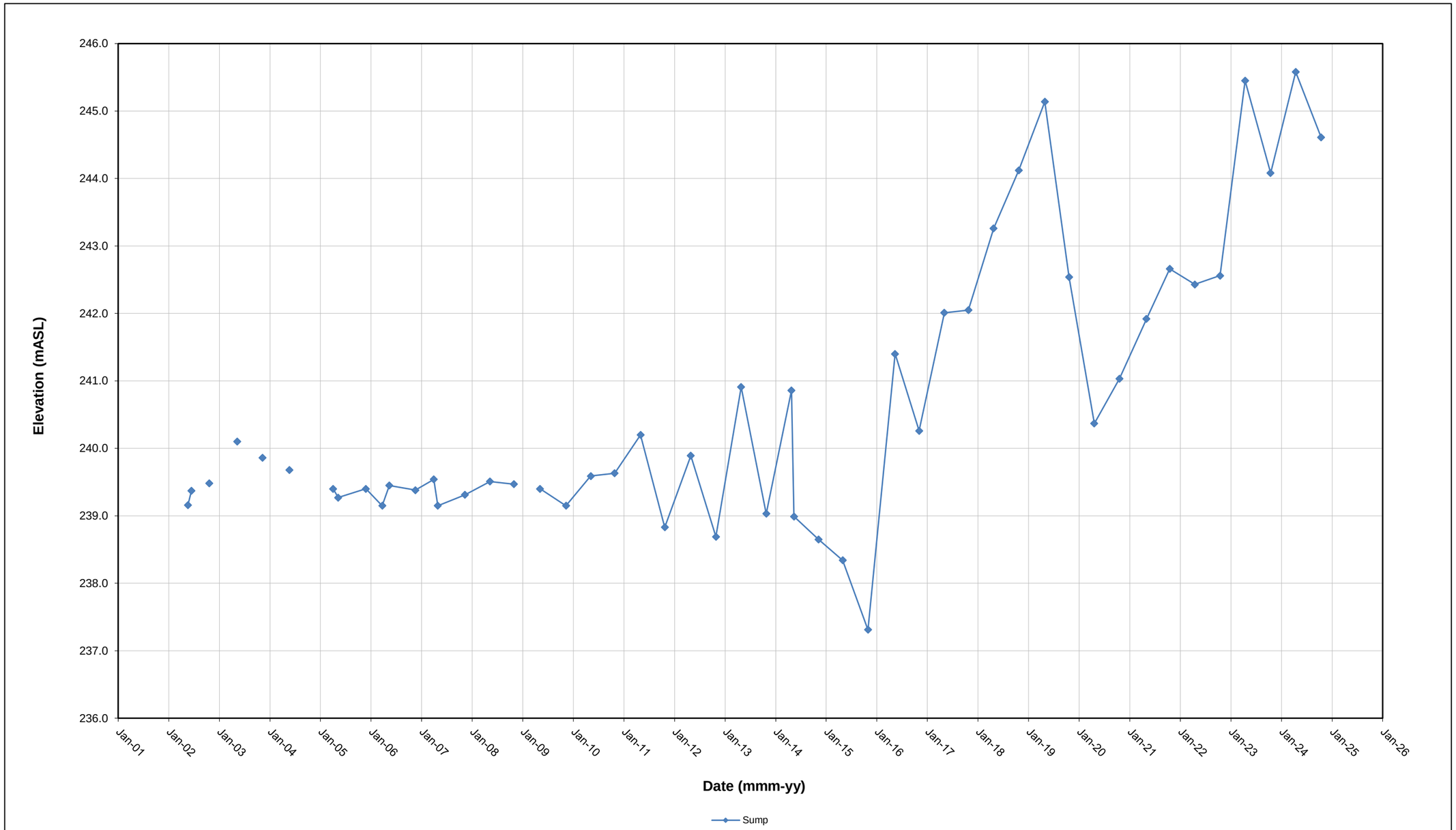
1. mASL denotes metres above sea level

LEACHATE ELEVATION HYDROGRAPH
Cell 4

2024 FOURTH QUARTER AND ANNUAL MONITORING REPORT

TWIN CREEKS ENVIRONMENTAL CENTRE
WASTE MANAGEMENT OF CANADA CORPORATION

FIGURE NUMBER	PROJECT NUMBER
F-4	2402553
DATE REVISED	**REVISED BY**
26-Nov-24	EW



NOTES:

1. mASL denotes metres above sea level

LEACHATE ELEVATION HYDROGRAPH
West Cell

2024 FOURTH QUARTER AND ANNUAL MONITORING REPORT

TWIN CREEKS ENVIRONMENTAL CENTRE
WASTE MANAGEMENT OF CANADA CORPORATION

FIGURE NUMBER	PROJECT NUMBER
F-5	2402553
DATE REVISED	**REVISED BY**
26-Nov-24	EW

APPENDIX G:

Soil Analytical Results

Table G-1
Soil - General Chemical Results - Poplar System
Twin Creeks Environmental Centre - Poplar System

Parameter	Units	Soil Concentration Indicators	Poplar System											
			S1 (Zone 1)											
			28-Sep-17	27-Sep-18	10-Sep-19	4-Sep-20	16-Sep-21	21-Sep-22	12-Sep-23	5-Sep-24				
Total Ammonia	ug/g		<20	29	<20	<20	<20	<20	<20	<20				
Total Organic Carbon	mg/kg		17000	13000	16000	15000	15000	14000	19000	16000				
Calculated Total Kjeldahl Nitrogen	ug/g		1730	1330	1820	1790	1470	1490	1710	2100				
Chloride (Cl)	ug/g	0.2-0.3%	58	273	183	36	68	108	15	290				
Nitrate (N)	ug/g		<4	69	19	3	<2	<2	<2	<2				
Sulphate (SO4)	ug/g		160	90	172	92	326	777	67	320				
Hot Water Ext. Boron (B)	ug/g	>5	4.7	8.2	3.2	1.3	2.8	4.2	1.1	11				
Acid Extractable Aluminum (Al)	ug/g		16000	16000	18000	16000	17000	16000	16000	17000				
Acid Extractable Arsenic (As)	ug/g	14*	6.7	7.2	7.6	6.8	6.8	6.7	6.9	7.6				
Acid Extractable Barium (Ba)	ug/g		81	85	88	82	79	85	84	94				
Acid Extractable Beryllium (Be)	ug/g		0.76	0.74	0.85	0.77	0.76	0.76	0.83	0.87				
Acid Extractable Bismuth (Bi)	ug/g		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0				
Acid Extractable Cadmium (Cd)	ug/g	1.6*	0.19	0.19	0.19	0.17	0.16	0.21	0.21	0.21				
Acid Extractable Chromium (Cr)	ug/g		28	28	30	28	28	29	28	30				
Acid Extractable Cobalt (Co)	ug/g	20*	13	14	14	14	13	14	14	15				
Acid Extractable Lead (Pb)	ug/g	60*	16	15	17	17	15	16	18	17				
Acid Extractable Molybdenum (Mo)	ug/g	4*	2.7	3.3	2.7	3.1	3.0	3.4	2.8	2.6				
Acid Extractable Nickel (Ni)	ug/g	32*	29	37	34	32	32	33	30	36				
Acid Extractable Selenium (Se)	ug/g	1.6*	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50				
Acid Extractable Silver (Ag)	ug/g		<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20				
Acid Extractable Strontium (Sr)	ug/g		29	81	53	39	59	59	28	47				
Acid Extractable Tin (Sn)	ug/g		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0				
Acid Extractable Titanium (Ti)	ug/g		71	84	69	50	70	82	54	65				
Acid Extractable Vanadium (V)	ug/g		35	32	34	34	33	33	34	35				
Acid Extractable Zinc (Zn)	ug/g	200/220*	59	68	73	59	60	57	62	66				
P ($NaHCO_3$ Extractable)	µg/g		10	9	7	8	10	6	6	8				
Calcium (NH_4 Acetate Extractable)	mg/L		310	270	490	81	120	150	33	58				
Magnesium (NH4 Acetate Extractable)	mg/L		29	35	31	12	40	57	5.5	7.8				
Potassium (NH4 Acetate Extractable)	mg/L		7.8	19	12	0.11	6.3	7.5	2.2	<6.0				
Sodium (NH4 Acetate Extractable)	mg/L		16	36	27	52	120	190	55	<10				
Ammonia (KCl Extractable)	mg/kg	>500 kg/ha	<2.0	25	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0				
SAR - Sodium Absorption Ratio (calculated)	<10-low;10-18 - medium;18-26-high		1.2	2.9	1.7	7.6	13.4	18.7	12.5	0.9				

NOTES:

1) Blank indicates data not available.
2) '*' Indicates Maximum Permissible Metal Content in Soils Receiving Waste Materials (MOE, 1996).
3) Shading indicates exceedances of Maximum Permissible Metal Content in Soils Receiving Waste Materials.
4) IS indicates insufficient sample.
5) ppm indicates parts per million, ug/g indicates micrograms per gram, and kg/ha indicates kilograms per hectare.
6) Italics denotes parameter concentration is presented as half the laboratory RDL for SAR calculation purposes.

Table G-1
Soil - General Chemical Results - Poplar System
Twin Creeks Environmental Centre - Poplar System

Parameter	Units	Soil Concentration Indicators	Poplar System											
			S2 (Zone 2)											
			28-Sep-17	27-Sep-18	10-Sep-19	4-Sep-20	16-Sep-21	21-Sep-22	12-Sep-23	5-Sep-24				
Total Ammonia	ug/g		<20	<20	<20	<20	<20	<20	<20	<20				
Total Organic Carbon	mg/kg		17000	14000	16000	15000	18000	14000	19000	14000				
Calculated Total Kjeldahl Nitrogen	ug/g		1410	1470	1690	1580	1630	1530	1520	1700				
Chloride (Cl)	ug/g	0.2-0.3%	73	47	<10	11	260	<10	26	120				
Nitrate (N)	ug/g		8	6	<2	<2	4	<2	4	3				
Sulphate (SO4)	ug/g		98	50	<20	31	180	100	100	120				
Hot Water Ext. Boron (B)	ug/g	>5	0.99	0.49	0.58	0.84	5.0	1.4	1.0	3.0				
Acid Extractable Aluminum (Al)	ug/g		17000	19000	18000	17000	13000	15000	13000	13000				
Acid Extractable Arsenic (As)	ug/g	14*	7.4	7.6	6.9	7.4	5.7	6.9	5.8	6.6				
Acid Extractable Barium (Ba)	ug/g		84	92	84	84	68	86	71	66				
Acid Extractable Beryllium (Be)	ug/g		0.79	0.92	0.87	0.80	0.57	0.75	0.62	0.63				
Acid Extractable Bismuth (Bi)	ug/g		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0				
Acid Extractable Cadmium (Cd)	ug/g	1.6*	0.24	0.17	0.18	0.19	0.18	0.21	0.19	0.19				
Acid Extractable Chromium (Cr)	ug/g		29	32	30	28	23	28	22	24				
Acid Extractable Cobalt (Co)	ug/g	20*	15	16	14	15	9.9	13	10	11				
Acid Extractable Lead (Pb)	ug/g	60*	18	18	17	18	15	15	16	18				
Acid Extractable Molybdenum (Mo)	ug/g	4*	2.6	3.1	2.5	2.8	2.5	3.5	2.3	2.2				
Acid Extractable Nickel (Ni)	ug/g	32*	33	37	32	32	27	35	25	27				
Acid Extractable Selenium (Se)	ug/g	1.6*	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50				
Acid Extractable Silver (Ag)	ug/g		<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20				
Acid Extractable Strontium (Sr)	ug/g		39	32	34	34	57	66	39	39				
Acid Extractable Tin (Sn)	ug/g		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0				
Acid Extractable Titanium (Ti)	ug/g		64	62	47	57	100	84	99	92				
Acid Extractable Vanadium (V)	ug/g		35	37	35	35	27	32	28	30				
Acid Extractable Zinc (Zn)	ug/g	200/220*	69	67	64	59	61	57	59	63				
P ($NaHCO_3$ Extractable)	µg/g		8	10	11	9	10	4	6	7				
Calcium (NH_4 Acetate Extractable)	mg/L		330	330	520	43	160	50	68	63				
Magnesium (NH4 Acetate Extractable)	mg/L		23	22	26	6	32	12	11	6.1				
Potassium (NH4 Acetate Extractable)	mg/L		8.2	13	14	0.12	6.3	2.5	3.2	<6.0				
Sodium (NH4 Acetate Extractable)	mg/L		8.4	2.2	1	29	120	39	56	<10				
Ammonia (KCl Extractable)	mg/kg	>500 kg/ha	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0				
SAR - Sodium Adsorption Ratio (calculated)	<10-low;10-18-medium;18-26-high		0.6	0.2	0.03	5.9	12.2	7.0	8.9	0.9				

NOTES:

1) Blank indicates data not available.
2) '*' Indicates Maximum Permissible Metal Content in Soils Receiving Waste Materials (MOE, 1996).
3) Shading indicates exceedances of Maximum Permissible Metal Content in Soils Receiving Waste Materials.
4) IS indicates insufficient sample.
5) ppm indicates parts per million, ug/g indicates micrograms per gram, and kg/ha indicates kilograms per hectare.
6) *Italics* denotes parameter concentration is presented as half the laboratory RDL for SAR calculation purposes.

Table G-1
Soil - General Chemical Results - Poplar System
Twin Creeks Environmental Centre - Poplar System

Parameter	Units	Soil Concentration Indicators	Poplar system											
			S3 (Zone 3)											
			28-Sep-17	27-Sep-18	10-Sep-19	4-Sep-20	16-Sep-21	21-Sep-22	12-Sep-23	5-Sep-24				
Total Ammonia	ug/g		<20	<20	<20	<20	<20	<20	<20	<20				
Total Organic Carbon	mg/kg		16000	14000	20000	11000	16000	6400	12000	21000				
Calculated Total Kjeldahl Nitrogen	ug/g		1640	1420	1700	1160	1530	853	683	2100				
Chloride (Cl)	ug/g	0.2-0.3%	11	40	20	193	288	140	150	80				
Nitrate (N)	ug/g		<4	3	<2	44	6	<2	33	6				
Sulphate (SO4)	ug/g		47	791	152	339	373	1540	240	71				
Hot Water Ext. Boron (B)	ug/g	>5	0.48	2.8	2	4.2	3.8	3.2	4.7	2.7				
Acid Extractable Aluminum (Al)	ug/g		18000	16000	16000	14000	13000	13000	15000	12000				
Acid Extractable Arsenic (As)	ug/g	14*	7.4	6.9	6.7	6.2	7.1	6.2	6.5	6.6				
Acid Extractable Barium (Ba)	ug/g		87	81	72	81	77	72	79	63				
Acid Extractable Beryllium (Be)	ug/g		0.86	0.78	0.76	0.65	0.65	0.64	0.72	0.60				
Acid Extractable Bismuth (Bi)	ug/g		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0				
Acid Extractable Cadmium (Cd)	ug/g	1.6*	0.26	0.16	0.2	0.19	0.21	<0.10	0.13	0.23				
Acid Extractable Chromium (Cr)	ug/g		30	29	28	26	27	25	27	23				
Acid Extractable Cobalt (Co)	ug/g	20*	16	14	12	12	11	13	12	9.2				
Acid Extractable Lead (Pb)	ug/g	60*	18	16	18	16	19	11	13	20				
Acid Extractable Molybdenum (Mo)	ug/g	4*	2.7	3.4	2.8	3.2	2.7	3.7	3.2	1.9				
Acid Extractable Nickel (Ni)	ug/g	32*	34	36	31	33	29	35	35	23				
Acid Extractable Selenium (Se)	ug/g	1.6*	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50				
Acid Extractable Silver (Ag)	ug/g		<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20				
Acid Extractable Strontium (Sr)	ug/g		30	82	55	73	63	100	75	29				
Acid Extractable Tin (Sn)	ug/g		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0				
Acid Extractable Titanium (Ti)	ug/g		62	78	62	74	72	97	97	100				
Acid Extractable Vanadium (V)	ug/g		37	34	33	30	28	27	30	31				
Acid Extractable Zinc (Zn)	ug/g	200/220*	65	64	71	59	73	50	56	72				
P ($NaHCO_3$ Extractable)	µg/g		9	4	6	5	7	2	4	8				
Calcium (NH_4 Acetate Extractable)	mg/L		330	310	480	300	230	430	99	62				
Magnesium (NH4 Acetate Extractable)	mg/L		24	33	39	82	57	120	33	5.1				
Potassium (NH4 Acetate Extractable)	mg/L		8.8	9.6	10	0.09	6.3	6.6	13	<6.0				
Sodium (NH4 Acetate Extractable)	mg/L		2	8.2	7	170	310	240	290	<10				
Ammonia (KCl Extractable)	mg/kg	>500 kg/ha	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0				
SAR - Sodium Adsorption Ratio (calculated)	<10-low;10-18-medium;18-26-high		0.2	0.6	0.5	12.3	25.9	14.5	35.7	0.9				

NOTES:

1) Blank indicates data not available.
2) '*' Indicates Maximum Permissible Metal Content in Soils Receiving Waste Materials (MOE, 1996).
3) Shading indicates exceedances of Maximum Permissible Metal Content in Soils Receiving Waste Materials.
4) IS indicates insufficient sample.
5) ppm indicates parts per million, ug/g indicates micrograms per gram, and kg/ha indicates kilograms per hectare.
6) *Italics* denotes parameter concentration is presented as half the laboratory RDL for SAR calculation purposes.

Table G-1
Soil - General Chemical Results - Poplar System
Twin Creeks Environmental Centre - Poplar System

Parameter	Units	Soil Concentration Indicators	Poplar system											
			S4 (Zone 4)											
			28-Sep-17	27-Sep-18	10-Sep-19	4-Sep-20	16-Sep-21	21-Sep-22	12-Sep-23	5-Sep-24				
Total Ammonia	ug/g		<20	<20	<20	<20	<20	<20	<20	<20				
Total Organic Carbon	mg/kg		24000	26000	23000	20000	17000	13000	16000	19000				
Calculated Total Kjeldahl Nitrogen	ug/g		2290	2380	2190	2430	1670	1310	1180	2000				
Chloride (Cl)	ug/g	0.2-0.3%	47	57	<10	214	45	186	330	78				
Nitrate (N)	ug/g		7	25	6	140	7	<2	18	<2				
Sulphate (SO4)	ug/g		56	38	<20	125	<20	362	420	61				
Hot Water Ext. Boron (B)	ug/g	>5	1.4	0.72	0.4	4.6	0.66	5.6	5.4	4.6				
Acid Extractable Aluminum (Al)	ug/g		16000	11000	16000	16000	16000	15000	15000	13000				
Acid Extractable Arsenic (As)	ug/g	14*	6.7	6.1	6.8	6.2	4.6	6.1	6.3	6.4				
Acid Extractable Barium (Ba)	ug/g		76	57	79	77	78	83	78	67				
Acid Extractable Beryllium (Be)	ug/g		0.77	0.51	0.84	0.76	0.68	0.73	0.76	0.68				
Acid Extractable Bismuth (Bi)	ug/g		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0				
Acid Extractable Cadmium (Cd)	ug/g	1.6*	0.25	0.24	0.21	0.16	0.18	0.14	0.17	0.21				
Acid Extractable Chromium (Cr)	ug/g		29	21	28	27	26	28	27	25				
Acid Extractable Cobalt (Co)	ug/g	20*	13	7.5	13	12	10	13	13	11				
Acid Extractable Lead (Pb)	ug/g	60*	20	23	18	15	14	13	15	18				
Acid Extractable Molybdenum (Mo)	ug/g	4*	2.9	1.4	2.6	3	1.3	3.5	2.8	2.0				
Acid Extractable Nickel (Ni)	ug/g	32*	31	19	30	31	25	34	30	27				
Acid Extractable Selenium (Se)	ug/g	1.6*	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50				
Acid Extractable Silver (Ag)	ug/g		<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20				
Acid Extractable Strontium (Sr)	ug/g		45	23	30	37	46	71	39	28				
Acid Extractable Tin (Sn)	ug/g		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0				
Acid Extractable Titanium (Ti)	ug/g		67	100	47	61	130	78	60	81				
Acid Extractable Vanadium (V)	ug/g		34	26	35	34	30	31	33	31				
Acid Extractable Zinc (Zn)	ug/g	200/220*	73	83	66	59	53	56	56	66				
P ($NaHCO_3$ Extractable)	ug/g		9	10	8	8	7	<2	4	8				
Calcium (NH_4 Acetate Extractable)	mg/L		330	390	520	200	94	130	130	59				
Magnesium (NH4 Acetate Extractable)	mg/L		32	17	28	40	16	35	46	6.9				
Potassium (NH4 Acetate Extractable)	mg/L		11	7.8	15	0.14	2.8	4.4	6.6	<6.0				
Sodium (NH4 Acetate Extractable)	mg/L		5.8	2.2	0.2	270	37	250	330	<10				
Ammonia (KCl Extractable)	mg/kg	>500 kg/ha	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0				
SAR - Sodium Adsorption Ratio (calculated)	<10-low;10-18-medium;18-26-high		0.4	0.2	0.01	24.6	5.0	27.5	35.2	0.9				

NOTES:

1) Blank indicates data not available.
2) '*' Indicates Maximum Permissible Metal Content in Soils Receiving Waste Materials (MOE, 1996).
3) Shading indicates exceedances of Maximum Permissible Metal Content in Soils Receiving Waste Materials.
4) IS indicates insufficient sample.
5) ppm indicates parts per million, ug/g indicates micrograms per gram, and kg/ha indicates kilograms per hectare.
6) *Italics* denotes parameter concentration is presented as half the laboratory RDL for SAR calculation purposes.

Table G-2
Soil - Electrical Conductivity Results
Twin Creeks Environmental Centre - Poplar System

Location	Depth (mm)	1-May-24	8-May-24	16-May-24	21-May-24	29-May-24	3-Jun-24	11-Jun-24	17-Jun-24	25-Jun-24	2-Jul-24	8-Jul-24	18-Jul-24	26-Jul-24	1-Aug-24	7-Aug-24	13-Aug-24	21-Aug-24	30-Aug-24	4-Sep-24	9-Sep-24	17-Sep-24	27-Sep-24	4-Oct-24	10-Oct-24	18-Oct-24
1-A	25	480	990	710	780	740	1,090	2,240	1,600	1,700	1,370	1,100	1,100	40	10	20	10	30	470	1,340	1,770	1,820	1,370	1,300	660	1,090
	150	680	710	1,080	850	1,160	1,380	1,550	1,150	330	2,240	1,120	700	380	90	80	10	40	700	1,680	1,630	1,670	1,410	2,120	820	1,640
1-B	25	1,120	860	380	450	770	780	780	120	230	380	400	110	90	120	100	20	110	1,340	1,050	1,350	1,560	1,250	1,160	590	1,490
	150	990	1,060	700	670	800	1,030	1,040	300	720	520	970	690	190	110	70	30	90	1,520	1,380	1,750	1,420	1,740	1,440	640	1,610
2-A	25	350	520	310	1,110	630	550	1,460	830	440	960	380	220	100	190	150	130	150	2,350	1,920	1,070	1,130	1,570	1,530	1,100	1,190
	150	450	620	440	1,370	590	620	1,650	1,100	320	1,100	110	300	400	150	140	150	120	2,530	2,090	1,080	1,170	1,880	1,780	1,190	1,190
2-B	25	280	380	590	840	520	730	940	530	140	830	50	250	80	210	180	110	90	1,710	1,400	690	1,060	890	1,090	1,040	1,070
	150	350	530	480	1,170	750	980	1,220	120	470	1,240	670	350	200	140	120	90	100	1,980	1,850	930	1,110	990	1,250	1,230	1,170
3-A	25	420	590	270	110	380	560	230	120	100	310	110	290	230	240	120	50	110	390	360	650	800	290	270	420	570
	150	590	700	410	140	420	620	190	170	170	390	290	400	220	260	130	40	130	440	530	600	900	620	680	610	670
3-B	25	430	530	440	320	480	580	400	100	90	390	80	350	260	190	50	10	50	660	100	480	810	370	580	360	610
	150	260	540	670	350	510	590	510	190	120	410	130	370	200	220	70	10	70	720	200	620	890	410	450	470	630
4-A	25	850	920	570	190	550	810	570	300	150	200	50	730	270	150	180	210	90	1,280	1,520	1,300	1,120	610	790	710	880
	150	960	800	690	390	580	730	840	150	300	740	140	940	620	230	200	190	200	1,910	1,840	1,160	1,080	560	1,230	880	1,110
4-B	25	580	630	320	290	690	650	780	270	150	240	120	480	120	190	210	240	150	1,520	120	690	1,110	470	1,110	820	950
	150	920	770	670	510	800	910	920	340	180	300	250	430	260	240	150	200	60	1,810	240	850	1,020	560	1,160	780	860
5-A	25	560	670	190	40	590	660	230	80	110	280	190	320	250	280	220	190	170	730	330	620	1,240	490	370	380	580
	150	800	800	240	400	530	920	430	50	60	440	190	550	320	260	240	230	190	880	480	650	1,250	780	960	420	780
5-B	25	720	700	560	390	540	370	240	150	50	260	180	320	270	320	260	170	150	470	250	470	1,130	460	730	60	300
	150	650	720	570	630	500	540	360	180	240	500	310	300	350	270	210	200	190	680	330	640	1,160	500	980	320	420
Geometric Mean of A Locations	25	532	738	410	446	578	734	946	586	500	624	366	532	178	174	138	118	110	1,044	1,094	1,082	1,222	866	852	654	862
	150	696	726	572	630	656	854	932	524	236	982	370	578	388	198	158	124	136	1,292	1,324	1,024	1,214	1,050	1,354	784	1,078
Geometric Mean of B Locations	25	626	620	458	458	600	622	628	234	132	420	166	302	164	206	160	110	110	1,140	584	736	1,134	688	934	574	884
	150	634	724	618	666	672	810	810	226	346	594	466	428	240	196	124	106	102	1,342	800	958	1,120	840	1,056	688	938

Notes:

1) µS/cm denotes microsiemens per centimetre.
2) mm denotes millimetre.
3) 'A' denotes sample collected near drip emitter.
4) 'B' denotes sample collected between irrigation lines.

APPENDIX G-3:

2024 Certificates of Analysis

eurofins | Environment Testing
146 Colonnade Rd, Unit 8, Ottawa, ON K2E 7Y1 (613) 727-5692

OFFICIAL CERTIFICATE OF ANALYSIS : 4070400

WORK REQUEST : 100312236

Report Date : 2024-09-17

Bureau Veritas Canada (2019) Inc
6740 Campobello Road
Mississauga, Ontario
L5N 2L8
Attention : Patricia Legette

Reception Date : 2024-09-13
Project : Bureau Veritas Canada (2019) Inc
Sampler : NA
PO Number : Not Applicable
Temperature : 5 °C

Analysis	Quantity	External Method
Phosphorus (Soil, NaHCO3 Ext, Colorimetry)	5	Modified from 84-017, Analytical Methods, Ag Can

Sample status upon receipt :

8019712 8019714 8019715 8019716 8019717
Compliant

Notes :

- All analysis is completed at Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) unless otherwise stated.
- Eurofins Environment Testing Canada Inc. is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on the scope of accreditation. The scope is available at https://directory.cala.ca/
- Please note: Field data, where presented on the report, has been provided by the client and is presented for informational purposes only. Guideline or regulatory limits listed on this report are provided for ease of use (informational purposes) only. Eurofins recommends consulting the official guideline or regulation as required. Unless otherwise stated, measurement uncertainty is not taken into account when determining guideline or regulatory exceedances.

Legend :

RL : Reporting limit
QC : Reference material (QC)
N/A : Not applicable
1 : Results in annex
* : Analysis conducted by external subcontracting
^ : Analysis not accredited

eurofins | Environment Testing
146 Colonnade Rd, Unit 8, Ottawa, ON K2E 7Y1 (613) 727-5692

OFFICIAL CERTIFICATE OF ANALYSIS - RESULTS

Client : Bureau Veritas Canada (2019) Inc
Project : Bureau Veritas Canada (2019) Inc

Reception Date: 2024-09-13

Eurofins Sample No :			**8019712**	**8019714**	**8019715**	**8019716**	**8019717**		
Matrix :			Soil	Soil	Soil	Soil	Soil		
Sampling Date :			2024-09-05	2024-09-05	2024-09-05	2024-09-05	2024-09-05		
Client Sample Identification :			ACNG80-01R \ S1	ACNG81-01R \ S1	ACNG82-01R \ S1	ACNG83-01R \ S1	ACNG84-01R \ SODUP		
Phosphorus (NaHCO3 Extractable)	**RL**	**Unit**							
Phosphorus (NaHCO3 Ext)	2	ppm	8	7	8	8	7		

Approved by : _____
Emma-Dawn Ferguson, M.Sc.
Environmental Chemist

eurofins | Environment Testing
146 Colonnade Rd, Unit 8, Ottawa, ON K2E 7Y1 (613) 727-5692

OFFICIAL CERTIFICATE OF ANALYSIS - QUALITY CONTROL

Client : Bureau Veritas Canada (2019) Inc
Project : Bureau Veritas Canada (2019) Inc

Reception Date: 2024-09-13

Parameter	Unit	RL	Blank	QC		Matrix Spike		Duplicate	
				Recovery %	Range %	Recovery %	Range %	RPD %	Range %
Phosphorus (Soil, NaHCO3 Ext, Colorimetry)									
Method : Phosphorus (Soil, NaHCO3 Ext, Colorimetry). Internal method: AMPHOSA2.									
Phosphorus (NaHCO3 Ext)	ppm	2	<2	82	70-130			-	0-30
Associated Samples : 8019712, 8019714, 8019715, 8019716, 8019717								Prep Date: 2024-09-17 Analysis Date: 2024-09-17	

Where RPD % is reported as "-" the calculation is not available because one or both of the duplicates is within 5 times the RL.

Bureau Veritas
6740 Campobello Road
Mississauga, Ontario, L5N 2L8
(905) 817-5700
(905) 817-5777

Bureau Veritas PM : Patricia Legette

SUBCONTRACTING REQUEST FO

100312236

To: Sub Campo to Env. Testing Canada (Eurofins

b# C4S3748

Printed On : 2024-09-13 15:36:28

☐Yes ☐No International Sample/BioHazard (if yes, add copy of Movement Cert., heat treat is required prior to disposal)

☐Yes ☐No Special Protocol (if yes, Protocol _____)

Sample ID		Matrix	Test(s) Required	HT	Container	Date Sampled	Date Required
ACNG80-01R\S1	8019712	S	Phosphorous, NaHCO3 extractable	-7/0	1-SBAG	2024/09/05 12:45	2024/09/27
ACNG81-01R\S2	14	S	Phosphorous, NaHCO3 extractable	-7/0	1-SBAG	2024/09/05 13:00	2024/09/27
ACNG82-01R\S3	15	S	Phosphorous, NaHCO3 extractable	-7/0	1-SBAG	2024/09/05 13:00	2024/09/27
ACNG83-01R\S4	16	S	Phosphorous, NaHCO3 extractable	-7/0	1-SBAG	2024/09/05 12:30	2024/09/27
ACNG84-01R\SODUP	17	S	Phosphorous, NaHCO3 extractable	-7/0	1-SBAG	2024/09/05 12:30	2024/09/27

	Temp. 1	Temp. 2	Temp. 3			
Cooler #1				Custody Seal Present	YES	NO
				Custody Seal Intact	YES	NO
				Ice Present Upon Receipt	YES	NO
Cooler #2				Custody Seal Present	YES	NO
				Custody Seal Intact	YES	NO
				Ice Present Upon Receipt	YES	NO
Cooler #3				Custody Seal Present	YES	NO
				Custody Seal Intact	YES	NO
				Ice Present Upon Receipt	YES	NO

Receiving Location: Sub Campo to Env. Testing Canada (Eurofins) Job # _____

Relinquished by (Sign) _____ (print) NIRAL PATEL Date and Time 2024/09/12 11:06

Received by (Sign) _____ (print) S. Situ Date and Time 2024/09/13 @ 10 am

5°C

NOTES:

1) Please call us if due date cannot be met. Please reference Sample ID on your report.
2) Please advise us if your laboratory cannot perform the requested analysis or must subcontract to a 3rd party lab
3) Include copy of this completed form, Client COC & signed final report to **scontractor@bureauveritas.com**

Special Instructions :

Phosphorous NaHCO3 Extractable : SUB-PH to Eurofins

Shipping Instructions

☐Ship Immediately (highlight Yellow) ☐Ship Cold
☐Requires 9am ☐Ship Room Temp
☐Requires Sat. Delivery ☐Ship Frozen
☐Regular Ship next available day
Sender (Print) _____ Initial _____

Shipping Department Checklist

☐Correct Shipping location
☐Correct Sample Ids (Paperwork vs Bottles)
☐Yes ☐No Special-Cooler, Ice, Tape-custody seal, Date&Sign
Date Shipped _____ Number of coolers _____
Shipper (Print) _____ Initial _____

Your Project #: Campobello job# C4S3748

Attention: Patricia Legette

BUREAU VERITAS
CAMPOBELLO
6740 CAMPOBELLO ROAD
MISSISSAUGA, ON
CANADA L5N 2L8

Report Date: 2024/10/05
Report #: R3567443
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C471482
Received: 2024/09/11, 22:09

Sample Matrix: Soil
Samples Received: 5

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Cation Exchange Capacity (1)	5	2024/09/11	2024/10/03		Auto Calc
ICP Scan - CEC	5	2024/10/02	2024/10/02	AB SOP-00009 / AB SOP-00042	EPA 6010d R5 m
Moisture	5	N/A	2024/10/02	AB SOP-00002	CCME PHC-CWS m
Ammonia-N (Available)	1	2024/10/02	2024/10/04	AB SOP-00027 / AB SOP-00007	SM 24 4500 NH3 A G m
Ammonia-N (Available)	4	2024/10/03	2024/10/04	AB SOP-00027 / AB SOP-00007	SM 24 4500 NH3 A G m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, EPA, APHA or the Quebec Ministry of Environment.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Sample(s) analyzed using accredited methodologies and have been subjected to Bureau Veritas's standard validation process for the submitted matrix however this is not accredited for this matrix.

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Your Project #: Campobello job# C4S3748

Attention: Patricia Legette

BUREAU VERITAS
CAMPOBELLO
6740 CAMPOBELLO ROAD
MISSISSAUGA, ON
CANADA L5N 2L8

Report Date: 2024/10/05
Report #: R3567443
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C471482
Received: 2024/09/11, 22:09

Encryption Key

Please direct all questions regarding this Certificate of Analysis to:
Stephanie Rodriguez Camacho, Customer Solutions Representative
Email: Stephanie.Rodriguez@bureauveritas.com
Phone# (403) 291-3077

==========

This report has been generated and distributed using a secure automated process.
Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Scott Cantwell, General Manager responsible for Alberta Environmental laboratory operations.

Bureau Veritas Job #: C471482
Report Date: 2024/10/05

BUREAU VERITAS
Client Project #: Campobello job# C4S3748
Sampler Initials: JA

RESULTS OF CHEMICAL ANALYSES OF SOIL

Bureau Veritas ID		CVF370	CVF371	CVF372	CVF373	CVF374		
Sampling Date		2024/09/05 12:45	2024/09/05 13:00	2024/09/05 13:00	2024/09/05 12:30	2024/09/05 12:30		
	UNITS	S1	S2	S3	S4	SODUP	RDL	QC Batch
Elements								
Cation exchange capacity	cmol+/Kg	21	20	20	21	20	10	B512557
Nutrients								
Available (KCl) Ammonia (N)	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	B549638
RDL = Reportable Detection Limit								

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Bureau Veritas Job #: C471482
Report Date: 2024/10/05

BUREAU VERITAS
Client Project #: Campobello job# C4S3748
Sampler Initials: JA

PHYSICAL TESTING (SOIL)

Bureau Veritas ID		CVF370	CVF370	CVF371	CVF372	CVF373	CVF374		
Sampling Date		2024/09/05 12:45	2024/09/05 12:45	2024/09/05 13:00	2024/09/05 13:00	2024/09/05 12:30	2024/09/05 12:30		
	UNITS	S1	S1 Lab-Dup	S2	S3	S4	SODUP	RDL	QC Batch
Physical Properties									
Moisture	%	16	16	15	13	15	14	0.30	B546752

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Bureau Veritas ID		CVF370	CVF371	CVF372	CVF373	CVF374		
Sampling Date		2024/09/05 12:45	2024/09/05 13:00	2024/09/05 13:00	2024/09/05 12:30	2024/09/05 12:30		
	UNITS	S1	S2	S3	S4	SODUP	RDL	QC Batch
Elements								
Exchangeable (BaCl2) Calcium (Ca)	mg/L	58	63	62	59	55	6.0	B546738
Exchangeable (BaCl2) Magnesium (Mg)	mg/L	7.8	6.1	5.1	6.9	6.5	4.0	B546738
Exchangeable (BaCl2) Potassium (K)	mg/L	<6.0	<6.0	<6.0	<6.0	<6.0	6.0	B546738
Exchangeable (BaCl2) Sodium (Na)	mg/L	<10	<10	<10	<10	<10	10	B546738
RDL = Reportable Detection Limit								

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Bureau Veritas Job #: C471482
Report Date: 2024/10/05

BUREAU VERITAS
Client Project #: Campobello job# C4S3748
Sampler Initials: JA

TEST SUMMARY

Bureau Veritas ID: CVF370
Sample ID: S1
Matrix: Soil

Collected: 2024/09/05
Shipped:
Received: 2024/09/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Cation Exchange Capacity	ICPA	B512557	2024/10/03	2024/10/03	Automated Statchk
ICP Scan - CEC	ICPA/AES	B546738	2024/10/02	2024/10/02	Sarah Dolan
Moisture	BAL	B546752	N/A	2024/10/02	Manthan Patel
Ammonia-N (Available)	KONE/NH4	B549638	2024/10/03	2024/10/04	Isabelle White

Bureau Veritas ID: CVF370 Dup
Sample ID: S1
Matrix: Soil

Collected: 2024/09/05
Shipped:
Received: 2024/09/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Moisture	BAL	B546752	N/A	2024/10/02	Manthan Patel

Bureau Veritas ID: CVF371
Sample ID: S2
Matrix: Soil

Collected: 2024/09/05
Shipped:
Received: 2024/09/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Cation Exchange Capacity	ICPA	B512557	2024/10/03	2024/10/03	Automated Statchk
ICP Scan - CEC	ICPA/AES	B546738	2024/10/02	2024/10/02	Sarah Dolan
Moisture	BAL	B546752	N/A	2024/10/02	Manthan Patel
Ammonia-N (Available)	KONE/NH4	B549638	2024/10/03	2024/10/04	Isabelle White

Bureau Veritas ID: CVF372
Sample ID: S3
Matrix: Soil

Collected: 2024/09/05
Shipped:
Received: 2024/09/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Cation Exchange Capacity	ICPA	B512557	2024/10/03	2024/10/03	Automated Statchk
ICP Scan - CEC	ICPA/AES	B546738	2024/10/02	2024/10/02	Sarah Dolan
Moisture	BAL	B546752	N/A	2024/10/02	Manthan Patel
Ammonia-N (Available)	KONE/NH4	B549638	2024/10/03	2024/10/04	Isabelle White

Bureau Veritas ID: CVF373
Sample ID: S4
Matrix: Soil

Collected: 2024/09/05
Shipped:
Received: 2024/09/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Cation Exchange Capacity	ICPA	B512557	2024/10/03	2024/10/03	Automated Statchk
ICP Scan - CEC	ICPA/AES	B546738	2024/10/02	2024/10/02	Sarah Dolan
Moisture	BAL	B546752	N/A	2024/10/02	Manthan Patel
Ammonia-N (Available)	KONE/NH4	B549638	2024/10/02	2024/10/04	Isabelle White

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Bureau Veritas Job #: C471482
Report Date: 2024/10/05

BUREAU VERITAS
Client Project #: Campobello job# C4S3748
Sampler Initials: JA

TEST SUMMARY

Bureau Veritas ID: CVF374
Sample ID: SODUP
Matrix: Soil

Collected: 2024/09/05
Shipped:
Received: 2024/09/11

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Cation Exchange Capacity	ICPA	B512557	2024/10/03	2024/10/03	Automated Statchk
ICP Scan - CEC	ICPA/AES	B546738	2024/10/02	2024/10/02	Sarah Dolan
Moisture	BAL	B546752	N/A	2024/10/02	Manthan Patel
Ammonia-N (Available)	KONE/NH4	B549638	2024/10/03	2024/10/04	Isabelle White

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

GENERAL COMMENTS

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

Package 1	4.2°C

Sample CVF370 [S1] : Sample was analyzed past method specified hold time for Ammonia-N (Available).

Sample CVF371 [S2] : Sample was analyzed past method specified hold time for Ammonia-N (Available).

Sample CVF372 [S3] : Sample was analyzed past method specified hold time for Ammonia-N (Available).

Sample CVF373 [S4] : Sample was analyzed past method specified hold time for Ammonia-N (Available).

Sample CVF374 [SODUP] : Sample was analyzed past method specified hold time for Ammonia-N (Available).

Results relate only to the items tested.

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Bureau Veritas Job #: C471482
Report Date: 2024/10/05

QUALITY ASSURANCE REPORT

BUREAU VERITAS
Client Project #: Campobello job# C4S3748
Sampler Initials: JA

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
B546738	Exchangeable (BaCl2) Calcium (Ca)	2024/10/02	101	75 - 125	100	80 - 120	<6.0	mg/L		
B546738	Exchangeable (BaCl2) Magnesium (Mg)	2024/10/02	102	75 - 125	100	80 - 120	<4.0	mg/L		
B546738	Exchangeable (BaCl2) Potassium (K)	2024/10/02	99	75 - 125	98	80 - 120	<6.0	mg/L		
B546738	Exchangeable (BaCl2) Sodium (Na)	2024/10/02	96	75 - 125	95	80 - 120	<10	mg/L		
B546752	Moisture	2024/10/02					<0.30	%	1.8	20
B549638	Available (KCl) Ammonia (N)	2024/10/04	108	75 - 125	110	80 - 120	<2.0	mg/kg	NC	35

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.

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

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

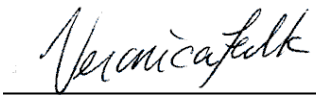
NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Ghayasuddin Khan, M.Sc., P.Chem., QP, Scientific Specialist, Inorganics



Veronica Falk, B.Sc., P.Chem., QP, Scientific Specialist, Organics

Bureau Veritas Proprietary Software
Logiciel Propriétaire de Bureau Veritas

Automated Statchk

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Scott Cantwell, General Manager responsible for Alberta Environmental laboratory operations.

Bureau Veritas Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Sent to: **Bureau Veritas Calgary (19th)**
4000 19th Street NE
Calgary, AB, T2E 6P8
Tel: (403) 291-3077

BUREAU VERITAS INTERLAB CHAIN OF CUSTODY RECORD

COC # C4S3748-MCAO-01-01

REPORT INFORMATION	
Company:	Bureau Veritas
Address:	6740 Campobello Road, Mississauga, Ontario, L5N 2L8
Contact Name:	Patricia Legette
Email:	Patricia.Legette@bureauveritas.com, scontractor@bureauveritas.com
Phone:	(905) 817-5799
BV Project #:	C4S3748
Client Invoice To:	Waste Management of Canada Corporation (21615)
Client Report To:	RWDI Inc. (32056)

Incl. on Report? Yes / No

#	SAMPLE ID	MATRIX	DATE SAMPLED (YYYY/MM/DD)	TIME SAMPLED (HH:MM)	SAMPLER INITIALS	# CONT.	Cation Exchange Capacity	ICP Scan - Cation Exchange Capacity	Ammonia-N (Available)							ADDITIONAL SAMPLE INFORMATION
1	ACNG80-S1	SOIL	2024/09/05	12:45	JA	1	X	X	X							(P: 02)
2	ACNG81-S2	SOIL	2024/09/05	13:00	JA	1	X	X	X							(P: 02)
3	ACNG82-S3	SOIL	2024/09/05	13:00	JA	1	X	X	X							(P: 02)
4	ACNG83-S4	SOIL	2024/09/05	12:30	JA	1	X	X	X							(P: 02)
5	ACNG84-SODUP	SOIL	2024/09/05	12:30	JA	1	X	X	X							(P: 02)
6																
7																
8																
9																
10																

ANALYSIS REQUESTED

Job Barcode Label
Offsite Job
C4S3748

SITE LOCATION: ON07
SITE #: 900
PROJECT #: 2402553.01
PO/AFE, TASK ORDER/SERVICE ORDER, LINE ITEM: 13384122 , -TWIN CREEKS LF 09/24

REGULATORY CRITERIA
MCAL-2024-09-1075

SPECIAL INSTRUCTIONS
Please inform Bureau Veritas immediately if you are not accredited for the requested test(s) or the hold time is approaching.
Please return a copy of this form with the report.
Client Name: RWDI Inc.
Total Exchangable Cation (Ca, Mg, Na, K)
JCEC-S + JICP-CEC
Available Ammonium : JNH4AVK-S

REQUIRED EDDs
National Excel (N001)
Waste Management Equis [WMI] (N025)

TURNAROUND TIME
☐ Rush Required
2024/10/03*
Date Required
Please inform us if rush charges will be incurred.

COOLER ID:	YES	NO	Temp: (°C)	1	2	3
Custody Seal Present	✓					
Custody Seal Intact	✓					
Cooling Media Present	✓					
				2.6	6.1	3.8

COOLER ID:	YES	NO	Temp: (°C)	1	2	3
Custody Seal Present						
Custody Seal Intact						
Cooling Media Present						

COOLER ID:	YES	NO	Temp: (°C)	1	2	3
Custody Seal Present						
Custody Seal Intact						
Cooling Media Present						

RECEIVING LAB USE ONLY
Bureau Veritas Job #
C471482

RELINQUISHED BY: (SIGN & PRINT)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)	RECEIVED BY: (SIGN & PRINT)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)	Samples Labelled By:	Labels Verified By:
1. NIRAL PATEL	2024/09/12	11:14	1. Jeff Lomen	2024/09/13	1000	NPY	JKY
2.			2.				

Your P.O. #: 13384122
Your Project #: 2402553.01
Site#: 900
Site Location: ON07
Your C.O.C. #: 960098

Attention: Khalid Hussein - Twin Creeks

RWDI Inc.
600 Southgate Drive
Guelph, ON
Canada N1G 4P6

Report Date: 2024/10/07
Report #: R8351874
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C4S3748
Received: 2024/09/11, 16:00

Sample Matrix: Soil
Samples Received: 5

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Anions	5	2024/09/12	2024/09/12	CAM SOP-00435	SM 23 4110 B m
Hot Water Extractable Boron	5	2024/09/17	2024/09/17	CAM SOP-00408	R153 Ana. Prot. 2011
Acid Extractable Metals by ICPMS	5	2024/09/17	2024/09/17	CAM SOP-00447	EPA 6020B m
Cation Exchange Capacity (1)	5	2024/09/11	2024/10/03		Auto Calc
ICP Scan - Cation Exchange Capacity (1)	5	2024/10/02	2024/10/02	AB SOP-00009 / AB SOP-00042	EPA 6010d R5 m
Ammonia-N (Available) (1)	1	2024/10/02	2024/10/04	AB SOP-00027 / AB SOP-00007	SM 24 4500 NH3 A G m
Ammonia-N (Available) (1)	4	2024/10/03	2024/10/04	AB SOP-00027 / AB SOP-00007	SM 24 4500 NH3 A G m
Moisture	5	N/A	2024/09/12	CAM SOP-00445	Carter 2nd ed 70.2 m
Ammonia-N	5	2024/09/13	2024/09/16	CAM SOP-00441	Carter, SS&A
Nitrogen	1	N/A	2024/09/17	CAM SOP-00460	E3529/EN 0000:2003
Nitrogen	4	N/A	2024/09/19	CAM SOP-00460	E3529/EN 0000:2003
Nitrate & Nitrite as Nitrogen in Soil	5	2024/09/12	2024/09/12	CAM SOP-00440	SM 24 4500-NO3I/NO2B
Phosphorous, NaHCO3 extractable (2)	5	N/A	N/A		
Calculated Total Kjeldahl Nitrogen	1	N/A	2024/09/17	Auto Calc.	
Calculated Total Kjeldahl Nitrogen	3	N/A	2024/09/19	Auto Calc.	
Calculated Total Kjeldahl Nitrogen	1	N/A	2024/09/20	Auto Calc.	
Total Organic Carbon in Soil	5	N/A	2024/09/13	CAM SOP-00468	BCMOE TOC Aug 2014

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, EPA, APHA or the Quebec Ministry of Environment.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or

Your P.O. #: 13384122
Your Project #: 2402553.01
Site#: 900
Site Location: ON07
Your C.O.C. #: 960098

Attention: Khalid Hussein - Twin Creeks

RWDI Inc.
600 Southgate Drive
Guelph, ON
Canada N1G 4P6

Report Date: 2024/10/07
Report #: R8351874
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C4S3748
Received: 2024/09/11, 16:00

implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) This test was performed by Bureau Veritas Calgary (19th), 4000 19th Street NE , Calgary, AB, T2E 6P8
(2) This test was performed by Eurofins Environment Testing Canada, 146 Colonnade Road, Unit #8 , Ottawa, ON, K2E 7Y1

Encryption Key

Please direct all questions regarding this Certificate of Analysis to:
Patricia Legette, Project Manager
Email: Patricia.Legette@bureauveritas.com
Phone# (905)817-5799

==========

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

Bureau Veritas Job #: C4S3748
Report Date: 2024/10/07

RWDI Inc.
Client Project #: 2402553.01
Site Location: ON07
Your P.O. #: 13384122
Sampler Initials: JA

RESULTS OF ANALYSES OF SOIL

Bureau Veritas ID		ACNG80		ACNG81		ACNG82		
Sampling Date		2024/09/05 12:45		2024/09/05 13:00		2024/09/05 13:00		
COC Number		960098		960098		960098		
	UNITS	S1	QC Batch	S2	QC Batch	S3	RDL	QC Batch
ELEMENTS								
Cation Exchange Capacity	cmol+/kg	21	9684505	20	9684505	20	10	9684505
Inorganics								
Total Ammonia-N	ug/g	<20	9636859	<20	9636859	<20	20	9636859
Moisture	%	15	9633317	13	9633317	16	1.0	9633317
Nitrogen (N)	%	0.21	9645537	0.17	9643629	0.21	0.010	9638753
Total Organic Carbon	mg/kg	16000	9634412	14000	9634412	21000	500	9634412
Calculated Total Kjeldahl Nitrogen	ug/g	2100	9631232	1700	9631232	2100	100	9631232
Chloride (Cl-)	ug/g	290	9633931	120	9633931	80	10	9633931
Nitrate (N)	ug/g	<2	9633287	3	9633287	6	2	9633287
Sulphate (SO4)	ug/g	320	9633931	120	9633931	71	20	9633931
NUTRIENTS								
Available (KCl) Ammonia-N	mg/kg	<2.0	9684507	<2.0	9684507	<2.0	2.0	9684507
Subcontracted Analysis								
Subcontract Parameter	N/A	ATTACHED	9637080	ATTACHED	9637080	ATTACHED	N/A	9637080

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

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C4S3748
Report Date: 2024/10/07

RWDI Inc.
Client Project #: 2402553.01
Site Location: ON07
Your P.O. #: 13384122
Sampler Initials: JA

RESULTS OF ANALYSES OF SOIL

Bureau Veritas ID		ACNG83	ACNG84		
Sampling Date		2024/09/05 12:30	2024/09/05 12:30		
COC Number		960098	960098		
	UNITS	S4	SODUP	RDL	QC Batch
ELEMENTS					
Cation Exchange Capacity	cmol+/kg	21	20	10	9684505
Inorganics					
Total Ammonia-N	ug/g	<20	<20	20	9636859
Moisture	%	14	13	1.0	9633317
Nitrogen (N)	%	0.20	0.21	0.010	9638753
Total Organic Carbon	mg/kg	19000	19000	500	9634412
Calculated Total Kjeldahl Nitrogen	ug/g	2000	2100	100	9631232
Chloride (Cl-)	ug/g	78	98	10	9633931
Nitrate (N)	ug/g	<2	<2	2	9633287
Sulphate (SO4)	ug/g	61	71	20	9633931
NUTRIENTS					
Available (KCl) Ammonia-N	mg/kg	<2.0	<2.0	2.0	9684507
Subcontracted Analysis					
Subcontract Parameter	N/A	ATTACHED	ATTACHED	N/A	9637080

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

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C4S3748
Report Date: 2024/10/07

RWDI Inc.
Client Project #: 2402553.01
Site Location: ON07
Your P.O. #: 13384122
Sampler Initials: JA

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Bureau Veritas ID		ACNG80	ACNG81	ACNG82	ACNG83	ACNG84		
Sampling Date		2024/09/05 12:45	2024/09/05 13:00	2024/09/05 13:00	2024/09/05 12:30	2024/09/05 12:30		
COC Number		960098	960098	960098	960098	960098		
	UNITS	S1	S2	S3	S4	SODUP	RDL	QC Batch
ELEMENTS								
Exchangeable (BaCl2) Calcium (Ca)	mg/L	58	63	62	59	55	6.0	9684506
Exchangeable (BaCl2) Magnesium (Mg)	mg/L	7.8	6.1	5.1	6.9	6.5	4.0	9684506
Exchangeable (BaCl2) Potassium (K)	mg/L	<6.0	<6.0	<6.0	<6.0	<6.0	6.0	9684506
Exchangeable (BaCl2) Sodium (Na)	mg/L	<10	<10	<10	<10	<10	10	9684506
Metals								
Hot Water Ext. Boron (B)	ug/g	11	3.0	2.7	4.6	3.1	0.050	9642679
Acid Extractable Aluminum (Al)	ug/g	17000	13000	12000	13000	11000	50	9643222
Acid Extractable Arsenic (As)	ug/g	7.6	6.6	6.6	6.4	5.4	1.0	9643222
Acid Extractable Barium (Ba)	ug/g	94	66	63	67	54	0.50	9643222
Acid Extractable Beryllium (Be)	ug/g	0.87	0.63	0.60	0.68	0.51	0.20	9643222
Acid Extractable Bismuth (Bi)	ug/g	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	9643222
Acid Extractable Cadmium (Cd)	ug/g	0.21	0.19	0.23	0.21	0.19	0.10	9643222
Acid Extractable Chromium (Cr)	ug/g	30	24	23	25	21	1.0	9643222
Acid Extractable Cobalt (Co)	ug/g	15	11	9.2	11	7.8	0.10	9643222
Acid Extractable Lead (Pb)	ug/g	17	18	20	18	18	1.0	9643222
Acid Extractable Molybdenum (Mo)	ug/g	2.6	2.2	1.9	2.0	1.5	0.50	9643222
Acid Extractable Nickel (Ni)	ug/g	36	27	23	27	20	0.50	9643222
Acid Extractable Selenium (Se)	ug/g	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	9643222
Acid Extractable Silver (Ag)	ug/g	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	9643222
Acid Extractable Strontium (Sr)	ug/g	47	39	29	28	26	1.0	9643222
Acid Extractable Tin (Sn)	ug/g	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	9643222
Acid Extractable Titanium (Ti)	ug/g	65	92	100	81	110	5.0	9643222
Acid Extractable Vanadium (V)	ug/g	35	30	31	31	28	5.0	9643222
Acid Extractable Zinc (Zn)	ug/g	66	63	72	66	65	5.0	9643222

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

GENERAL COMMENTS

Sample ACNG80 [S1] : Sample was analyzed past method specified hold time for Ammonia-N (Available).

Sample ACNG81 [S2] : Sample was analyzed past method specified hold time for Ammonia-N (Available).

Sample ACNG82 [S3] : Sample was analyzed past method specified hold time for Ammonia-N (Available).

Sample ACNG83 [S4] : Sample was analyzed past method specified hold time for Ammonia-N (Available).

Sample ACNG84 [SODUP] : Sample was analyzed past method specified hold time for Ammonia-N (Available).

Results relate only to the items tested.

Bureau Veritas Job #: C4S3748
Report Date: 2024/10/07

QUALITY ASSURANCE REPORT

RWDI Inc.
Client Project #: 2402553.01
Site Location: ON07
Your P.O. #: 13384122
Sampler Initials: JA

			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
9633287	Nitrate (N)	2024/09/12	108	80 - 120			<2	ug/g	NC (1)	30		
9633317	Moisture	2024/09/12							0 (1)	20		
9633931	Chloride (Cl-)	2024/09/12	99 (2)	70 - 130	107	70 - 130	<10	ug/g	6.0 (3)	30		
9633931	Sulphate (SO4)	2024/09/12	99 (2)	75 - 125	107	75 - 125	<20	ug/g	2.9 (3)	30		
9634412	Total Organic Carbon	2024/09/13					<500	mg/kg	4.8 (4)	35	99	75 - 125
9636859	Total Ammonia-N	2024/09/16	98 (5)	80 - 120	98	80 - 120	<20	ug/g	NC (6)	35		
9638753	Nitrogen (N)	2024/09/16					<0.010	%	7.4 (1)	35	98	80 - 120
9642679	Hot Water Ext. Boron (B)	2024/09/17	99	75 - 125	101	75 - 125	<0.050	ug/g	3.9 (1)	40		
9643222	Acid Extractable Aluminum (Al)	2024/09/17	NC (7)	75 - 125	101	80 - 120	<50	ug/g	1.4 (8)	30		
9643222	Acid Extractable Arsenic (As)	2024/09/17	107 (7)	75 - 125	106	80 - 120	<1.0	ug/g	1.3 (8)	30		
9643222	Acid Extractable Barium (Ba)	2024/09/17	NC (7)	75 - 125	100	80 - 120	<0.50	ug/g	3.9 (8)	30		
9643222	Acid Extractable Beryllium (Be)	2024/09/17	106 (7)	75 - 125	100	80 - 120	<0.20	ug/g	0.81 (8)	30		
9643222	Acid Extractable Bismuth (Bi)	2024/09/17	111 (7)	75 - 125	106	80 - 120	<1.0	ug/g	NC (8)	30		
9643222	Acid Extractable Cadmium (Cd)	2024/09/17	104 (7)	75 - 125	101	80 - 120	<0.10	ug/g	3.5 (8)	30		
9643222	Acid Extractable Chromium (Cr)	2024/09/17	NC (7)	75 - 125	103	80 - 120	<1.0	ug/g	1.9 (8)	30		
9643222	Acid Extractable Cobalt (Co)	2024/09/17	111 (7)	75 - 125	106	80 - 120	<0.10	ug/g	5.7 (8)	30		
9643222	Acid Extractable Lead (Pb)	2024/09/17	109 (7)	75 - 125	102	80 - 120	<1.0	ug/g	3.3 (8)	30		
9643222	Acid Extractable Molybdenum (Mo)	2024/09/17	101 (7)	75 - 125	96	80 - 120	<0.50	ug/g	0.23 (8)	30		
9643222	Acid Extractable Nickel (Ni)	2024/09/17	NC (7)	75 - 125	106	80 - 120	<0.50	ug/g	3.8 (8)	30		
9643222	Acid Extractable Selenium (Se)	2024/09/17	105 (7)	75 - 125	99	80 - 120	<0.50	ug/g	NC (8)	30		
9643222	Acid Extractable Silver (Ag)	2024/09/17	106 (7)	75 - 125	101	80 - 120	<0.20	ug/g	NC (8)	30		
9643222	Acid Extractable Strontium (Sr)	2024/09/17	NC (7)	75 - 125	106	80 - 120	<1.0	ug/g	1.9 (8)	30		
9643222	Acid Extractable Tin (Sn)	2024/09/17	110 (7)	75 - 125	101	80 - 120	<1.0	ug/g	NC (8)	30		
9643222	Acid Extractable Titanium (Ti)	2024/09/17	NC (7)	75 - 125	111	80 - 120	<5.0	ug/g	18 (8)	30		
9643222	Acid Extractable Vanadium (V)	2024/09/17	NC (7)	75 - 125	105	80 - 120	<5.0	ug/g	3.6 (8)	30		
9643222	Acid Extractable Zinc (Zn)	2024/09/17	NC (7)	75 - 125	104	80 - 120	<5.0	ug/g	1.7 (8)	30		
9643629	Nitrogen (N)	2024/09/17					<0.010	%	23 (6)	35	97	80 - 120
9645537	Nitrogen (N)	2024/09/19					<0.010	%	8.8 (8)	35	96	80 - 120
9684506	Exchangeable (BaCl2) Calcium (Ca)	2024/10/02	101	75 - 125	100	80 - 120	<6.0	mg/L				
9684506	Exchangeable (BaCl2) Magnesium (Mg)	2024/10/02	102	75 - 125	100	80 - 120	<4.0	mg/L				

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
9684506	Exchangeable (BaCl2) Potassium (K)	2024/10/02	99	75 - 125	98	80 - 120	<6.0	mg/L				
9684506	Exchangeable (BaCl2) Sodium (Na)	2024/10/02	96	75 - 125	95	80 - 120	<10	mg/L				
9684507	Available (KCl) Ammonia-N	2024/10/04	108	75 - 125	110	80 - 120	<2.0	mg/kg				

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

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

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

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

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

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

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) Duplicate Parent ID

(2) Matrix Spike Parent ID [ACNG82-01]

(3) Duplicate Parent ID [ACNG82-01]

(4) Duplicate Parent ID [ACNG84-01]

(5) Matrix Spike Parent ID [ACNG81-01]

(6) Duplicate Parent ID [ACNG81-01]

(7) Matrix Spike Parent ID [ACNG80-01]

(8) Duplicate Parent ID [ACNG80-01]

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

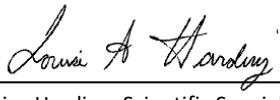
Bureau Veritas Job #: C4S3748
Report Date: 2024/10/07

RWDI Inc.
Client Project #: 2402553.01
Site Location: ON07
Your P.O. #: 13384122
Sampler Initials: JA

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Ghayasuddin Khan, M.Sc., P.Chem., QP, Scientific Specialist, Inorganics



Louise Harding, Scientific Specialist

Automated Statchk

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Custody Tracking Form

T960098-H

Please use this form for custody tracking when submitting the work instructions via eCOC (electronic Chain of Custody). Please ensure your form has a barcode or a Bureau Veritas eCOC confirmation number in the top right hand side. This number links your electronic submission to your samples. This form should be placed in the cooler with your samples.

First Sample: S1
Last Sample: SODUP
Sample Count: 5

Relinquished By				Received By			
J. Arbab		Date 9-Sep-24	24/09/24	SUGAR SALVAM		Date	2024/09/11
		Time (24 HR)	11:0			Time (24 HR)	10:00
		Date				Date	
		Time (24 HR)				Time (24 HR)	
		Date				Date	
		Time (24 HR)				Time (24 HR)	

Unless otherwise agreed to, submissions and use of services are governed by Bureau Veritas' standard terms and conditions which can be found at www.bvna.com.

Triage Information

Sampled By (Print): JRA

# of Coolers/Pkgs: 1

Rush ☐ Immediate Test ☐ Food Residue ☐

Micro ☐ Food Chemistry ☐

*** LABORATORY USE ONLY ***

Received At

Labeled By

Verified By

Lab

11-Sep-24 16:00

Patricia Legette

C4S3748

VIY ENV-1658

Custody Seal		Cooling Media	Temperature °C		
Present (Y/N)	Intact (Y/N)	Present (Y/N)	1	2	3
Y	Y	Y	12	13	14
Drinking Water Metals Preservation Check Done (Circle)				YES	NO

COR FCD-00383/4

Page 1 of 1

APPENDIX H:

Poplar Tissue Analytical Results

Table H-1
Leaf Tissue - General Chemical Results - Poplar System
Twin Creeks Environmental Centre - Poplar System

Parameter	Units	Indicator Values	Poplar System										
			Lower Canopy					Upper Canopy					Geomean: LC=UC
28-Sep-17			**Z1**	**Z2**	**Z3**	**Z4**	**geom**	**Z1**	**Z2**	**Z3**	**Z4**	**geom**	**geom**
Phosphorus	%	0.45	0.0558	0.0468	0.055	0.0569	0.0535	0.0544	0.0546	0.0529	0.0557	0.0544	0.0539
TKN	%	3.20	2.7	2.8	2.8	2.7	2.7	3	2.9	2.8	2.7	2.8	2.8
Potassium	%	3	0.556	0.455	0.477	0.417	0.474	0.525	0.556	0.429	0.469	0.492	0.483
Chloride	ppm		2900	2500	2600	2400	2593	3000	3300	<2000	3000	3097	2834
Boron	ppm	65	120	125	122	76.5	109	146	150	117	69.4	115	112
Copper	ppm	30	3.6	2.9	2.7	3.1	3.1	3.5	3.6	2.7	3.1	3.2	3.1
Iron	ppm	350	50	49	54	48	50	60	62	43	51	53	52
Manganese	ppm	175	28.6	16.6	17.7	26.4	21.7	22.7	16	19.1	29.2	21.2	21.5
Zinc	ppm	55	28	20	14	21	20	22	19	20	16	19	20
18-Sep-18			**Z1**	**Z2**	**Z3**	**Z4**	**geom**	**Z1**	**Z2**	**Z3**	**Z4**	**geom**	**geom**
Phosphorus	%	0.45	0.0662	0.067	0.0662	0.073	0.0680	0.0728	0.0742	0.0672	0.0667	0.0701	0.0691
TKN	%	3.20	2.7	2.9	3.1	2.9	2.9	3.2	3.2	3.3	2.9	3.1	3.0
Potassium	%	3	0.258	0.259	0.198	0.265	0.243	0.271	0.3	0.378	0.414	0.336	0.286
Chloride	ppm		5100	5200	6500	3700	5025	10000	6700	6100	9900	7976	6331
Boron	ppm	65	121	121	101	119	115	123	122	90.6	99.7	108	111
Copper	ppm	30	3.9	3.9	3.8	4.4	4.0	3.9	3.9	3.9	3.8	3.9	3.9
Iron	ppm	350	60	69	78	89	73	63	75	57	64	64	69
Manganese	ppm	175	37.5	26.2	39.4	33.3	34	32.6	23.7	22.8	19.7	24	28.6
Zinc	ppm	55	28	14	12	32	20	15	19	18	18	17	19
9-Sep-19			**Z1**	**Z2**	**Z3**	**Z4**	**geom**	**Z1**	**Z2**	**Z3**	**Z4**	**geom**	**geom**
Phosphorus	%	0.45	0.0683	0.0678	0.0644	0.0862	0.0712	0.0839	0.0695	0.0866	0.0691	0.0769	0.0740
TKN	%	3.20	3	2.7	3	3.1	2.9	3.3	3.2	3.5	2.7	3.2	3.1
Potassium	%	3	0.339	0.420	0.479	0.428	0.413	0.362	0.426	0.520	0.419	0.400	0.407
Chloride	ppm		6000	3500	4900	2900	4156	4500	4300	5100	3500	4311	4233
Boron	ppm	65	179	177	177	160	173	181	166	194	132	167	170
Copper	ppm	30	3.2	3	3.4	3.6	3.3	3.2	3.2	3.8	3.4	3.4	3.3
Iron	ppm	350	61	56	71	102	71	60	58	57	101	67	69
Manganese	ppm	175	23.4	24.2	19.0	24.8	22.7	24.4	20.5	20.1	34.3	24	23.5
Zinc	ppm	55	18	19	17	16	17	20	19	17	18	18	18
2-Sep-20			**Z1**	**Z2**	**Z3**	**Z4**	**geom**	**Z1**	**Z2**	**Z3**	**Z4**	**geom**	**geom**
Phosphorus	%	0.45	0.0575	0.0616	0.0617	0.0641	0.0612	0.0684	0.0647	0.0639	0.0577	0.0636	0.0624
TKN	%	3.20	2.6	2.9	2.7	2.9	2.8	2.6	2.9	3.1	3.1	2.9	2.8
Potassium	%	3	0.411	0.404	0.351	0.403	0.391	0.370	0.351	0.436	0.401	0.400	0.396
Chloride	ppm		4000	4100	6400	5300	4857	3200	3300	4200	4100	3672	4223
Boron	ppm	65	153	134	103	178	139	150	119	170	154	147	143
Copper	ppm	30	3.6	3.6	3.2	3.5	3.5	3.7	3.6	4.0	3.5	3.7	3.6
Iron	ppm	350	32	38	30	55	38	35	27	30	35	32	34
Manganese	ppm	175	26	30.6	24.9	27.4	27.1	28.1	28.1	24.5	26.2	27	26.9
Zinc	ppm	55	22	18	27	14	20	33	24	22	18	24	22
16-Sep-21			**Z1**	**Z2**	**Z3**	**Z4**	**geom**	**Z1**	**Z2**	**Z3**	**Z4**	**geom**	**geom**
Phosphorus	%	0.45	0.0662	0.0648	0.0694	0.0619	0.0655	0.0732	0.0800	0.0813	0.0770	0.0778	0.0714
TKN	%	3.20	2.3	2.2	2.6	2.3	2.3	2.8	2.7	3.0	2.8	2.8	2.6
Potassium	%	3	0.493	0.557	0.582	0.520	0.537	0.504	0.554	0.659	0.608	0.400	0.463
Chloride	ppm		4000	3100	5200	3100	3760	6100	3700	4200	4100	4440	4086
Boron	ppm	65	214	130	178	222	182	210	106	191	176	165	174
Copper	ppm	30	3.2	3.6	4.2	4.3	3.8	3.9	3.6	4.4	4.1	4.0	3.9
Iron	ppm	350	21	17	24	29	22	24	21	21	28	23	23
Manganese	ppm	175	19.4	14.8	19	28.6	19.9	15.6	13	12.1	18	14	17.0
Zinc	ppm	55	20	113	22	29	35	26	22	19	15	20	26
21-Sep-22			**Z1**	**Z2**	**Z3**	**Z4**	**geom**	**Z1**	**Z2**	**Z3**	**Z4**	**geom**	**geom**
Phosphorus	%	0.45	0.0634	0.0567	0.0567	0.0477	0.0558	0.0670	0.0688	0.0559	0.0570	0.0619	0.0588
TKN	%	3.20	2.9	2.6	2.7	2.5	2.7	2.5	2.7	2.7	3.2	2.8	2.7
Potassium	%	3	0.355	0.503	0.577	0.378	0.444	0.444	0.564	0.682	0.530	0.400	0.422
Chloride	ppm		6500	3800	3000	6600	4703	3200	2700	<2000	6300	3790	4222
Boron	ppm	65	146	169	276	179	187	309	273	242	230	262	221
Copper	ppm	30	2.9	3.3	4.2	3.2	3.4	3.5	3.7	3.6	3.8	3.6	3.5
Iron	ppm	350	28	55	51	64	47	57	47	63	50	54	51
Manganese	ppm	175	17.4	35.7	23.7	31.1	26.0	21.2	24.0	23.4	19.6	22	23.9
Zinc	ppm	55	11	33	37	14	21	21	18	23	14	19	20
19-Sep-23			**Z1**	**Z2**	**Z3**	**Z4**	**geom**	**Z1**	**Z2**	**Z3**	**Z4**	**geom**	**geom**
Phosphorus	%	0.45	0.0572	0.0712	0.0690	0.0540	0.0624	0.0663	0.0851	0.0489	0.0662	0.0654	0.0639
TKN	%	3.20	2.3	2.2	2.8	2.4	2.4	2.5	3.0	2.6	2.9	2.7	2.6
Potassium	%	3	0.363	0.396	0.600	0.344	0.415	0.395	0.556	0.426	0.673	0.400	0.407
Chloride	ppm		12000	6000	7800	7700	8109	17000	11000	5500	7200	9277	8673
Boron	ppm	65	179	121	206	111	149	215	191	141	242	193	170
Copper	ppm	30	3.1	3.8	4.0	3.8	3.7	2.9	4.1	4.3	3.6	3.7	3.7
Iron	ppm	350	29	29	20	33	27	27	24	33	29	28	28
Manganese	ppm	175	31.8	39.6	17.3	40.1	30.6	21.1	18.7	34.3	17.1	22	25.9
Zinc	ppm	55	38	34	24	37	33	19	24	56	59	35	34
4-Sep-24			**Z1**	**Z2**	**Z3**	**Z4**	**geom**	**Z1**	**Z2**	**Z3**	**Z4**	**geom**	**geom**
Phosphorus	%	0.45	0.0687	0.0722	0.052	0.0596	0.0626	0.0833	0.0629	0.0644	0.0608	0.0673	0.0649
TKN	%	3.20	2.4	2.4	2.3	2.5	2.4	3.1	2.5	2.8	2.5	2.7	2.6
Potassium	%	3	0.583	0.572	0.577	0.559	0.573	0.634	0.558	0.596	0.591	0.400	0.479
Chloride	ppm		4100	4300	2800	8300	4499	5100	3400	3400	6200	4373	4435
Boron	ppm	65	250	246	250	261	252	165	268	287	310	250	251
Copper	ppm	30	4.0	4.3	4.1	4.1	4.1	3.1	3.5	3.6	4.3	3.6	3.9
Iron	ppm	350	32	29	27	31	30	21	23	25	33	25	27
Manganese	ppm	175	21.3	23.0	17.1	22.8	20.9	11.8	14.6	15.2	22.8	16	18.1
Zinc	ppm	55	26	38	34	27	31	18	24	30	20	23	26

NOTES:

1) Shading denotes concentration greater than indicator value.
2) "geom" denotes geometrical mean.
3) "UC" denotes upper canopy.
4) "LC" denotes lower canopy.
5) ppm denotes parts per million.
6) Blank denotes parameter not tested.

Table H-2
Leaf Tissue - General Chemical Results Assessment - Poplar System
Twin Creeks Environmental Centre - Poplar System

Parameter	Units	Indicator Values	Poplar System													
			28-Sep-17	18-Sep-18	9-Sep-19	2-Sep-20	16-Sep-21	21-Sep-22	19-Sep-23	4-Sep-24						
Phosphorus	%	0.45	0.0539	0.0691	0.0740	0.0624	0.0714	0.0588	0.0639	0.0649						
Total Kjeldahl Nitrogen	%	3.20	2.8	3.0	3.1	2.8	2.6	2.7	2.6	2.6						
Potassium	%	3	0.483	0.286	0.407	0.396	0.463	0.422	0.407	0.479						
Chloride	ppm		2834	6331	4233	4223	4086	4222	8673	4435						
Boron	ppm	65	112	111	170	143	174	221	170	251						
Copper	ppm	30	3.1	3.9	3.3	3.6	3.9	3.5	3.7	3.9						
Iron	ppm	350	51.8	68.7	68.7	34.5	22.8	50.5	27.7	27.3						
Manganese	ppm	175	21.5	28.6	23.5	26.9	17.0	23.9	25.9	18.1						
Zinc	ppm	55	19.6	18.5	18.0	21.6	26.4	19.7	33.9	26.4						

NOTES:

1) Shading denotes concentration greater than indicator value.

2) Parameter concentration was calculated for each area as geometrical mean of concentrations for upper and lower canopy.

3) ppm denotes parts per million.

4) Blank denotes data not available

Table H-3
Stem Core - General Chemical Results - Poplar System
Twin Creeks Environmental Centre - Poplar System

Parameter	Units	Poplar System								
		Zone 1								
		28-Sep-17	28-Sep-18	13-Sep-19	2-Sep-20	21-Sep-21	21-Sep-22	19-Sep-23	17-Sep-24	
Aluminum	µg/g	23	14	129	11.5	23.6	6.9	5.2	21.0	
Arsenic	µg/g	<0.1	<0.1	0.149	<0.040	<0.020	<0.020	<0.020	<0.020	
Barium	µg/g	1.5	1.9	7.71	2.97	1.63	3.01	1.39	1.73	
Beryllium	µg/g	<0.05	<0.05	<0.010	<0.020	<0.010	<0.010	<0.010	<0.010	
Bismuth	µg/g	<0.05	<0.05	<0.010	<0.020	<0.010	<0.010	<0.010	<0.010	
Boron	µg/g	10.1	6.3	20.6	22.3	5.1	8.1	3.6	5.4	
Boron (H.W.E.)	µg/g	2.3	1.4	1.9	6.7	<0.50	<0.50	0.91	1.5	
Cadmium	µg/g	0.27	0.63	0.73	0.64	0.341	0.364	0.252	0.444	
Calcium	µg/g	2210	3250	10600	2520	1390	5170	1000	1570	
Chromium	µg/g	1.3	<0.3	43.2	<0.20	<0.10	<0.10	<0.10	1.92	
Cobalt	µg/g	0.066	0.087	0.065	0.104	0.035	0.028	0.089	0.065	
Copper	µg/g	3.5	3	7.51	2.17	1.87	1.29	1.70	2.21	
Lead	µg/g	0.07	0.15	2.33	0.058	0.073	0.012	0.025	0.05	
Magnesium	µg/g	417	850	1320	462	379	800	286	332	
Molybdenum	µg/g	<0.05	<0.05	0.926	<0.040	0.026	<0.020	<0.020	0.181	
Nickel	µg/g	0.24	0.21	21.20	0.14	0.176	0.585	0.050	0.964	
Phosphorus	µg/g	583	925	887	363	426	717	257	401	
Potassium	µg/g	1860	1470	2700	2610	991	2380	969	1340	
Selenium	µg/g	<0.1	<0.1	<0.050	<0.10	<0.050	<0.050	<0.050	<0.050	
Silver	µg/g	<0.05	<0.05	0.01	<0.010	<0.0050	<0.0050	<0.0050	<0.0050	
Sodium	µg/g	72	60	320	925	20	72	38	111	
Strontium	µg/g	9.0	18.4	30.5	10.0	6.32	15.5	6.35	5.92	
Tin	µg/g	<0.3	<0.3	0.51	<0.20	<0.10	<0.10	0.26	1.03	
Titanium	µg/g	0.8	1	3.03	<1.0	0.55	<0.50	<0.50	0.51	
Vanadium	µg/g	0.06	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Zinc	µg/g	15	24	62.4	11	9.87	23.2	11.0	9.32	
Chloride	µg/g	<400	<200	<200	990	30	43	<20	51	

NOTES:

1) ug/g denotes micrograms per gram.
2) Boron (H.W.E.) denotes boron that is analysed using the Hot Water Extraction laboratory method.

Table H-3
Stem Core - General Chemical Results - Poplar System
Twin Creeks Environmental Centre - Poplar System

Parameter	Units	Poplar System								
		Zone 2								
		28-Sep-17	28-Sep-18	13-Sep-19	2-Sep-20	21-Sep-21	21-Sep-22	19-Sep-23	17-Sep-24	
Aluminum	µg/g	44	8	64.9	15.6	27.8	5.7	3.0	43.9	
Arsenic	µg/g	<0.1	<0.1	0.123	<0.040	<0.020	<0.020	<0.020	0.022	
Barium	µg/g	1.3	1.3	5.1	2.1	1.43	1.5	0.715	1.52	
Beryllium	µg/g	<0.05	<0.05	<0.010	<0.020	<0.010	<0.010	<0.010	<0.010	
Bismuth	µg/g	<0.05	<0.05	<0.010	<0.020	<0.010	<0.010	<0.010	<0.010	
Boron	µg/g	6.8	8.8	20.1	8.8	4.0	6.6	3.4	5.1	
Boron (H.W.E.)	µg/g	1.4	2.8	3.4	1.4	<0.50	<0.50	3.0	1.5	
Cadmium	µg/g	0.20	0.30	0.76	0.38	0.205	0.377	0.272	0.295	
Calcium	µg/g	1820	1350	5160	1650	1070	3290	892	1680	
Chromium	µg/g	0.5	0.4	15.6	<0.20	<0.10	<0.10	<0.10	3.20	
Cobalt	µg/g	0.088	0.088	0.078	0.055	0.025	0.037	0.097	0.107	
Copper	µg/g	3.8	5.8	4.5	2.1	1.92	1.40	1.79	2.67	
Lead	µg/g	0.09	0.07	1.40	0.12	0.097	0.013	0.062	0.134	
Magnesium	µg/g	401	572	820	339	273	496	338	336	
Molybdenum	µg/g	<0.05	<0.05	0.362	<0.040	<0.020	<0.020	<0.020	0.236	
Nickel	µg/g	0.31	0.15	8.15	0.17	0.139	0.082	<0.050	1.27	
Phosphorus	µg/g	652	732	707	868	346	489	240	439	
Potassium	µg/g	1710	2940	2270	1630	647	1900	1090	1280	
Selenium	µg/g	<0.1	<0.1	<0.050	<0.10	<0.050	<0.050	<0.050	<0.050	
Silver	µg/g	<0.05	<0.05	0.0053	<0.010	<0.0050	<0.0050	<0.0050	<0.0050	
Sodium	µg/g	<50	127	558	50	18	43	206	43	
Strontium	µg/g	5.1	9.9	14.1	8.3	5.76	8.5	6.67	6.78	
Tin	µg/g	<0.3	<0.3	0.21	<0.20	0.10	<0.10	0.20	0.87	
Titanium	µg/g	1.4	0.8	1.5	<1.0	0.54	<0.50	<0.50	0.8	
Vanadium	µg/g	0.10	<0.05	<0.05	0.05	<0.05	<0.05	<0.05	0.07	
Zinc	µg/g	11	19	27.2	12.4	9.38	14.3	7.32	10.9	
Chloride	µg/g	<400	610	300	<1000	37	80	<20	36	

NOTES:

1) ug/g denotes micrograms per gram.
2) Boron (H.W.E.) denotes boron that is analysed using the Hot Water Extraction laboratory method.

Table H-3
Stem Core - General Chemical Results - Poplar System
Twin Creeks Environmental Centre - Poplar System

Parameter	Units	Poplar System								
		Zone 3								
		28-Sep-17	28-Sep-18	13-Sep-19	2-Sep-20	21-Sep-21	21-Sep-22	19-Sep-23	17-Sep-24	
Aluminum	µg/g	7	10	46	605	6.5	5.4	6.6	27.2	
Arsenic	µg/g	<0.1	<0.1	0.054	0.095	<0.020	<0.020	0.026	0.025	
Barium	µg/g	1.1	2.0	5.0	7.8	2.13	1.01	4.37	1.42	
Beryllium	µg/g	<0.05	<0.05	<0.010	<0.020	<0.010	<0.010	<0.010	<0.010	
Bismuth	µg/g	<0.05	<0.05	<0.010	<0.020	<0.010	<0.010	<0.010	<0.010	
Boron	µg/g	6.8	6.8	19.0	29.2	8.1	3.5	15.0	5.3	
Boron (H.W.E.)	µg/g	1.1	2.4	4.6	2.2	<0.50	<0.50	2.6	1.7	
Cadmium	µg/g	0.56	0.4	0.901	0.686	0.291	0.269	0.619	0.31	
Calcium	µg/g	2320	2530	5520	7630	2820	690	4440	1840	
Chromium	µg/g	<0.3	<0.3	12.2	0.7	<0.10	<0.10	<0.10	0.32	
Cobalt	µg/g	0.065	0.095	0.089	0.07	0.026	0.036	0.078	0.057	
Copper	µg/g	3.00	3.20	4.39	4.49	2.03	2.32	6.46	2.84	
Lead	µg/g	<0.03	0.16	2.97	0.23	0.021	0.018	0.025	0.096	
Magnesium	µg/g	497	535	801	907	479	205	558	463	
Molybdenum	µg/g	<0.05	<0.05	0.234	0.191	<0.020	<0.020	0.024	<0.020	
Nickel	µg/g	0.12	0.16	5.93	0.63	0.229	0.135	0.249	0.142	
Phosphorus	µg/g	627	1020	711	1520	525	69	330	441	
Potassium	µg/g	2140	1390	2310	6090	2100	2840	4650	1240	
Selenium	µg/g	<0.1	<0.1	<0.050	<0.10	<0.050	<0.050	<0.050	<0.050	
Silver	µg/g	<0.05	<0.05	<0.0050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050	
Sodium	µg/g	<50	111	210	534	51	203	204	41	
Strontium	µg/g	8.6	8.6	15.1	23.7	12.5	4.73	17.2	8.67	
Tin	µg/g	<0.3	<0.3	0.3	<0.20	<0.10	<0.10	0.25	1.07	
Titanium	µg/g	0.6	1.0	1.0	5.6	<0.50	<0.50	<0.50	0.52	
Vanadium	µg/g	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Zinc	µg/g	15	13	30.8	30.4	16.8	6.5	38.6	16.6	
Chloride	µg/g	<400	410	660	<1000	60	25	<400	41	

NOTES:

1) ug/g denotes micrograms per gram.
2) Boron (H.W.E.) denotes boron that is analysed using the Hot Water Extraction laboratory method.

Table H-3
Stem Core - General Chemical Results - Poplar System
Twin Creeks Environmental Centre - Poplar System

Parameter	Units	Poplar System								
		Zone 4								
		28-Sep-17	28-Sep-18	13-Sep-19	2-Sep-20	21-Sep-21	21-Sep-22	19-Sep-23	17-Sep-24	
Aluminum	µg/g	20	13	48	12	3.5	7.8	1.9	6.9	
Arsenic	µg/g	<0.1	<0.1	0.049	0.045	<0.020	<0.020	0.023	<0.020	
Barium	µg/g	0.9	2.6	5.4	1.7	1.06	1.4	1.36	1.15	
Beryllium	µg/g	<0.05	<0.05	<0.010	<0.020	<0.010	<0.010	<0.010	<0.010	
Bismuth	µg/g	<0.05	<0.05	<0.010	<0.020	<0.010	<0.010	<0.010	<0.010	
Boron	µg/g	9.6	7	14.9	11.8	4.6	2.9	3.7	4.7	
Boron (H.W.E.)	µg/g	1.3	2.7	2.7	2.3	<0.50	<0.50	0.85	1.1	
Cadmium	µg/g	0.21	0.85	0.971	0.448	0.386	0.579	0.414	0.706	
Calcium	µg/g	1910	2150	7610	2670	943	903	1240	1180	
Chromium	µg/g	<0.3	<0.3	12	<0.20	<0.10	<0.10	<0.10	0.6	
Cobalt	µg/g	0.139	0.082	0.052	0.071	0.036	0.042	0.060	0.05	
Copper	µg/g	3.2	2.8	5.3	2.4	1.24	1.64	1.59	2.73	
Lead	µg/g	0.06	0.18	1.24	0.056	0.019	0.017	0.022	0.030	
Magnesium	µg/g	635	487	882	633	256	277	207	368	
Molybdenum	µg/g	<0.05	0.06	0.27	<0.040	<0.020	<0.020	<0.020	0.059	
Nickel	µg/g	0.24	0.16	6.05	0.25	0.074	0.366	0.062	0.399	
Phosphorus	µg/g	469	831	1020	587	164	288	184	438	
Potassium	µg/g	2250	1460	2880	2020	707	906	748	1630	
Selenium	µg/g	<0.1	<0.1	<0.050	<0.10	<0.050	<0.050	<0.050	<0.050	
Silver	µg/g	<0.05	<0.05	<0.0050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050	
Sodium	µg/g	60	361	166	166	30	112	117	254	
Strontium	µg/g	14.5	9.7	16.9	22.4	6.75	5.44	8.51	6.95	
Tin	µg/g	<0.3	<0.3	<0.10	<0.20	<0.10	<0.10	0.17	0.74	
Titanium	µg/g	0.7	0.9	1.0	<1.0	<0.50	<0.50	<0.50	<0.50	
Vanadium	µg/g	<0.05	<0.05	<0.05	<0.05	0.06	<0.05	<0.05	<0.05	
Zinc	µg/g	14	13	29.3	20	5.85	6.02	8.51	13.6	
Chloride	µg/g	<400	840	<200	1000	<400	24	<20	63	

NOTES:

1) ug/g denotes micrograms per gram.
2) Boron (H.W.E.) denotes boron that is analysed using the Hot Water Extraction laboratory method.

Table H-4
Root Tissue - General Chemical Results - Poplar System
Twin Creeks Environemntal Centre - Poplar System

Parameter	Units	Poplar System								
		Zone 1								
		28-Sep-17	28-Sep-18	13-Sep-19	2-Sep-20	21-Sep-21	21-Sep-22	19-Sep-23	17-Sep-24	
Aluminum	µg/g	310	41	306	2160	47.9	78.7	9.7	133	
Arsenic	µg/g	0.2	<0.1	0.2	1.0	0.024	0.032	0.023	0.069	
Barium	µg/g	4.0	1.1	5.5	28.6	1.86	1.79	1.56	3.15	
Beryllium	µg/g	<0.05	<0.05	0.01	0.096	<0.010	<0.010	<0.010	<0.010	
Bismuth	µg/g	<0.05	<0.05	<0.010	0.023	<0.010	<0.010	<0.010	<0.010	
Boron	µg/g	15.3	5	16.5	84.8	5.1	3.3	4.5	7.8	
Boron (H.W.E.)	µg/g	13	2.1	2.9	9.5	<0.50	0.73	0.65	3.3	
Cadmium	µg/g	0.14	0.22	0.42	2.49	0.344	0.223	0.320	0.694	
Calcium	µg/g	3400	933	10800	20500	1630	857	1220	1890	
Chromium	µg/g	0.9	0.3	32.8	3.5	0.15	0.13	<0.10	5.87	
Cobalt	µg/g	0.385	0.121	0.443	3.840	0.060	0.066	0.093	0.208	
Copper	µg/g	4.1	3.4	6.6	10.7	2.41	2.35	2.92	3.92	
Lead	µg/g	0.35	0.21	0.807	1.86	0.097	0.066	0.047	0.215	
Magnesium	µg/g	743	346	1260	3850	510	266	598	549	
Molybdenum	µg/g	0.18	0.07	0.52	0.45	0.023	<0.020	<0.020	0.718	
Nickel	µg/g	0.83	0.27	15.70	4.19	0.387	0.333	0.148	3.66	
Phosphorus	µg/g	596	688	1810	1810	834	1130	1200	1230	
Potassium	µg/g	4090	3880	5850	18600	1670	1220	2200	3690	
Selenium	µg/g	<0.1	<0.1	<0.050	0.3	<0.050	<0.050	<0.050	<0.050	
Silver	µg/g	<0.05	<0.05	0.006	<0.010	<0.0050	<0.0050	<0.0050	<0.0050	
Sodium	µg/g	305	263	408	4650	57	104	156	420	
Strontium	µg/g	11.5	10.5	33.9	52.3	8.77	4.33	7.89	7.66	
Tin	µg/g	<0.3	<0.3	0.1	<0.20	<0.10	0.17	0.26	0.28	
Titanium	µg/g	5.3	1.3	5.6	28.1	1.09	0.87	<0.50	2.2	
Vanadium	µg/g	0.71	0.09	0.75	6.51	<0.05	<0.05	0.08	0.29	
Zinc	µg/g	9.0	10.0	49.1	77.5	15.1	7.64	22.0	14.9	
Chloride	µg/g	INS	390	340	3900	71	1000	37	580	

NOTES:

1) ug/g indicates micrograms per gram.
2) Boron (H.W.E.) denotes boron that is analysed using the Hot Water Extraction laboratory method.
3) INS denotes insufficient sample aliquot to complete analysis.

Table H-4
Root Tissue - General Chemical Results - Poplar System
Twin Creeks Environemntal Centre - Poplar System

Parameter	Units	Poplar System								
		Zone 2								
		28-Sep-17	28-Sep-18	13-Sep-19	2-Sep-20	21-Sep-21	21-Sep-22	19-Sep-23	17-Sep-24	
Aluminum	µg/g	500	70	3540	2200	16.2	20.7	7.9	99.1	
Arsenic	µg/g	0.3	<0.1	1.5	0.9	<0.020	<0.020	0.024	0.061	
Barium	µg/g	5.7	1.3	36.3	20.3	1.92	1.86	1.17	2.39	
Beryllium	µg/g	<0.05	<0.05	0.16	0.096	<0.010	<0.010	<0.010	<0.010	
Bismuth	µg/g	<0.05	<0.05	0.04	0.024	<0.010	<0.010	<0.010	<0.010	
Boron	µg/g	10.7	4.8	62.8	51.7	4.2	10.4	5.9	15.1	
Boron (H.W.E.)	µg/g	6.3	1.6	18.0	3.6	<0.50	0.56	0.77	9.7	
Cadmium	µg/g	0.11	0.16	0.86	0.68	0.182	0.323	0.370	0.318	
Calcium	µg/g	3000	1100	15500	14900	1540	5420	1200	3740	
Chromium	µg/g	1.0	0.7	24.3	3.3	<0.10	<0.10	<0.10	2.75	
Cobalt	µg/g	0.652	0.140	0.987	0.379	0.044	0.062	0.100	0.161	
Copper	µg/g	4.5	4.3	10.9	6.7	2.25	2.14	2.96	5.16	
Lead	µg/g	0.60	0.19	3.07	1.78	0.043	0.026	0.054	0.167	
Magnesium	µg/g	722	470	3560	2270	316	602	599	725	
Molybdenum	µg/g	0.21	0.08	1.41	0.46	<0.020	<0.020	<0.020	0.330	
Nickel	µg/g	1.29	0.43	15.60	3.51	0.134	0.216	0.147	1.93	
Phosphorus	µg/g	561	687	1060	1600	1180	889	1330	1060	
Potassium	µg/g	4040	4220	7830	8700	1390	3780	3090	6690	
Selenium	µg/g	<0.1	<0.1	0.32	0.10	<0.050	<0.050	<0.050	<0.050	
Silver	µg/g	<0.05	<0.05	0.0184	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	
Sodium	µg/g	189	439	3010	1870	21	119	323	373	
Strontium	µg/g	6.3	9.5	44.7	37.5	6.23	14	10.4	16.9	
Tin	µg/g	<0.3	<0.3	0.3	0.2	0.13	<0.10	0.13	0.63	
Titanium	µg/g	6.9	1.9	39.2	14.5	0.61	<0.50	<0.50	1.61	
Vanadium	µg/g	1.1	0.2	2.22	0.70	<0.05	0.07	0.06	0.20	
Zinc	µg/g	9.0	10.0	49.8	35.7	10.4	19.3	27.5	22.6	
Chloride	µg/g	460	870	5700	2100	78	110	230	<400[4]	

NOTES:

1) ug/g indicates micrograms per gram.
2) Boron (H.W.E.) denotes boron that is analysed using the Hot Water Extraction laboratory method.
3) INS denotes insufficient sample aliquot to complete analysis.
4) Due to colour interferences, sample required dilution. Detection limit was adjusted accordingly.

Table H-4
Root Tissue - General Chemical Results - Poplar System
Twin Creeks Environemntal Centre - Poplar System

Parameter	Units	Poplar System								
		Zone 3								
		28-Sep-17	28-Sep-18	13-Sep-19	2-Sep-20	21-Sep-21	21-Sep-22	19-Sep-23	17-Sep-24	
Aluminum	µg/g	160	41	3700	2910	37.8	29.1	56.0	191	
Arsenic	µg/g	<0.1	<0.1	1.7	1.6	0.047	0.031	0.035	0.123	
Barium	µg/g	3.1	1	34.5	38.8	1.83	1.1	2.40	4.14	
Beryllium	µg/g	<0.05	<0.05	0.17	0.14	<0.010	<0.010	<0.010	<0.010	
Bismuth	µg/g	<0.05	<0.05	0.05	0.038	<0.010	<0.010	<0.010	0.012	
Boron	µg/g	7.1	28.6	71.3	164.0	13.8	3.6	7.1	16.9	
Boron (H.W.E.)	µg/g	3.2	0.8	13.0	10.0	0.95	0.62	1.4	7.6	
Cadmium	µg/g	0.24	0.26	0.91	0.53	0.443	0.366	0.281	0.398	
Calcium	µg/g	2890	3440	18300	12300	1370	859	943	3970	
Chromium	µg/g	0.6	0.4	26.0	6.1	0.14	0.1	0.11	2.63	
Cobalt	µg/g	0.193	0.209	0.923	1.060	0.028	0.044	0.113	0.216	
Copper	µg/g	3.5	6.6	12.7	11.8	2.38	1.78	4.56	5.99	
Lead	µg/g	0.16	0.11	3.34	3.43	0.109	0.065	1.88	0.322	
Magnesium	µg/g	641	955	4220	2290	409	307	427	861	
Molybdenum	µg/g	0.09	0.12	1.87	1.18	0.039	0.02	0.022	0.279	
Nickel	µg/g	0.45	0.47	17.5	6.82	0.253	0.238	0.247	1.94	
Phosphorus	µg/g	504	1350	1450	881	281	409	1000	954	
Potassium	µg/g	3680	6090	11900	2970	1240	890	3420	6860	
Selenium	µg/g	<0.1	<0.1	0.21	0.45	<0.050	<0.050	<0.050	<0.050	
Silver	µg/g	<0.05	<0.05	0.0172	<0.010	<0.0050	<0.0050	<0.0050	<0.0050	
Sodium	µg/g	136	2430	2540	2410	391	117	294	481	
Strontium	µg/g	7.6	17.1	47.3	40.5	11.3	7.78	6.94	18.2	
Tin	µg/g	<0.3	<0.3	0.2	0.3	0.14	0.1	0.34	0.55	
Titanium	µg/g	2.70	1.5	38.2	27.1	1.07	<0.50	1.03	3.29	
Vanadium	µg/g	0.33	0.10	2.15	2.09	0.06	0.06	0.18	0.39	
Zinc	µg/g	10.0	10.0	42.5	25.1	11.7	8.89	12.4	35.5	
Chloride	µg/g	<400	<400	5900	3700	390	150	<400	<400[4]	

NOTES:

1) ug/g indicates micrograms per gram.
2) Boron (H.W.E.) denotes boron that is analysed using the Hot Water Extraction laboratory method.
3) INS denotes insufficient sample aliquot to complete analysis.
4) Due to colour interferences, sample required dilution. Detection limit was adjusted accordingly.

Table H-4
Root Tissue - General Chemical Results - Poplar System
Twin Creeks Environemntal Centre - Poplar System

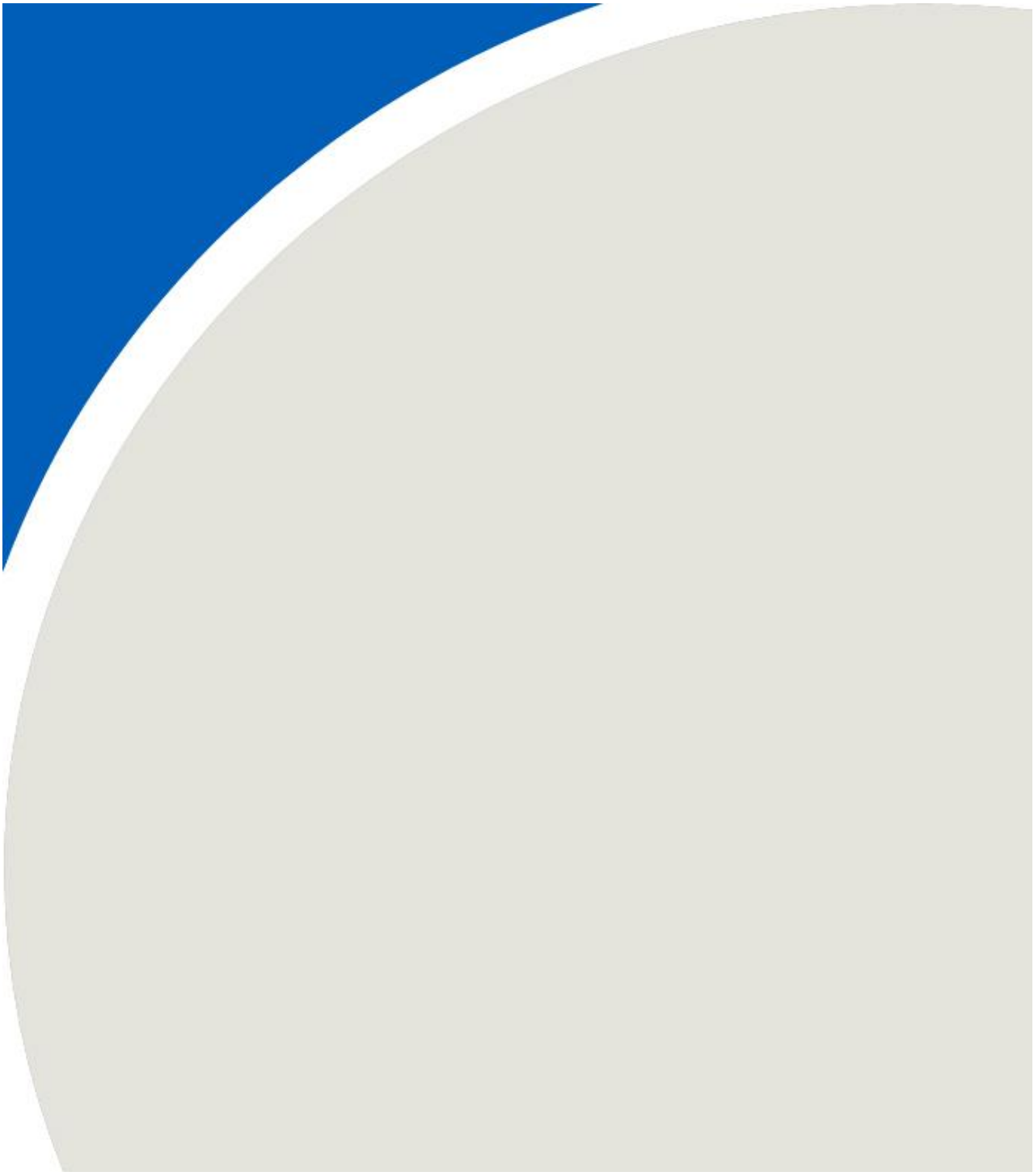
Parameter	Units	Poplar System								
		Zone 4								
		28-Sep-17	28-Sep-18	13-Sep-19	2-Sep-20	21-Sep-21	21-Sep-22	19-Sep-23	17-Sep-24	
Aluminum	µg/g	180	130	2940	2430	21.8	9.4	22.9	51.1	
Arsenic	µg/g	<0.1	<0.1	1.1	1.1	0.03	<0.020	0.024	0.052	
Barium	µg/g	2.6	3.9	43.4	21.8	1.25	0.281	0.927	1.19	
Beryllium	µg/g	<0.05	<0.05	0.12	0.11	<0.010	<0.010	<0.010	<0.010	
Bismuth	µg/g	<0.05	<0.05	0.04	0.03	<0.010	<0.010	<0.010	<0.010	
Boron	µg/g	8.8	7.3	83.7	61.1	4.6	2.9	4.2	8.4	
Boron (H.W.E.)	µg/g	2.1	1.7	17.0	4.0	<0.50	<0.50	0.92	3.8	
Cadmium	µg/g	0.11	0.67	1.28	1.23	0.263	0.0816	0.253	1.00	
Calcium	µg/g	2830	5440	14600	12000	1190	602	1240	2300	
Chromium	µg/g	0.5	0.6	16.2	3.8	<0.10	<0.10	<0.10	2.42	
Cobalt	µg/g	0.297	0.183	0.548	0.955	0.088	0.12	0.106	0.132	
Copper	µg/g	3.6	7.1	10.9	6.9	3.1	1.97	3.15	4.00	
Lead	µg/g	0.22	0.16	2.16	2.03	0.079	0.033	0.111	0.149	
Magnesium	µg/g	688	713	2570	2420	429	667	664	671	
Molybdenum	µg/g	0.12	0.12	2.41	0.58	0.029	<0.020	0.022	0.227	
Nickel	µg/g	0.77	0.42	10.10	4.34	0.349	0.366	0.247	1.52	
Phosphorus	µg/g	498	1890	1740	956	666	609	688	1350	
Potassium	µg/g	5090	6350	9580	3670	2170	3610	2550	4560	
Selenium	µg/g	<0.1	<0.1	0.428	0.19	<0.050	<0.050	<0.050	<0.050	
Silver	µg/g	<0.05	<0.05	0.0141	<0.010	<0.0050	<0.0050	<0.0050	<0.0050	
Sodium	µg/g	153	1110	2480	3330	265	206	196	768	
Strontium	µg/g	11.2	10.8	37.6	29.6	9.46	7.7	11.4	12.6	
Tin	µg/g	<0.3	<0.3	0.3	<0.20	<0.10	<0.10	0.32	0.38	
Titanium	µg/g	3.10	3.3	30.4	26.2	0.69	<0.50	<0.50	0.93	
Vanadium	µg/g	0.38	0.26	1.49	1.41	0.12	<0.05	0.10	0.07	
Zinc	µg/g	9.0	16.0	32.7	24.8	12.8	7.05	12.2	19.4	
Chloride	µg/g	<400	3100	5300	3300	190	680	900	<400[4]	

NOTES:

1) ug/g indicates micrograms per gram.
2) Boron (H.W.E.) denotes boron that is analysed using the Hot Water Extraction laboratory method.
3) INS denotes insufficient sample aliquot to complete analysis.
4) Due to colour interferences, sample required dilution. Detection limit was adjusted accordingly.

APPENDIX H-5:

2024 Certificates of Analysis



Your P.O. #: 13384122
Your Project #: 2402553.01
Site#: 900
Site Location: ON07
Your C.O.C. #: 960105

Attention: Khalid Hussein - Twin Creeks

RWDI Inc.
600 Southgate Drive
Guelph, ON
Canada N1G 4P6

Report Date: 2024/09/20
Report #: R8328698
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C4S3668
Received: 2024/09/11, 10:00

Sample Matrix: Tissue
Samples Received: 8

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Chloride (20:1 extract)	8	2024/09/16	2024/09/16	CAM SOP-00463	MOE E3013 m
Metals in Vegetation by ICPMS	1	N/A	2024/09/17	CAM SOP-00447	EPA 6020/200.3 m
Metals in Vegetation by ICPMS	7	N/A	2024/09/18	CAM SOP-00447	EPA 6020/200.3 m
Moisture	8	N/A	2024/09/13	CAM SOP-00445	Carter 2nd ed 70.2 m
Nitrogen	8	N/A	2024/09/19	CAM SOP-00460	E3529/EN 0000:2003
Sulphate (20:1 Extract)	8	2024/09/16	2024/09/16	CAM SOP-00464	MOE E3013 m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, EPA, APHA or the Quebec Ministry of Environment.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Your P.O. #: 13384122
Your Project #: 2402553.01
Site#: 900
Site Location: ON07
Your C.O.C. #: 960105

Attention: Khalid Hussein - Twin Creeks

RWDI Inc.
600 Southgate Drive
Guelph, ON
Canada N1G 4P6

Report Date: 2024/09/20
Report #: R8328698
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C4S3668
Received: 2024/09/11, 10:00

Encryption Key

Please direct all questions regarding this Certificate of Analysis to:
Patricia Legette, Project Manager
Email: Patricia.Legette@bureauveritas.com
Phone# (905)817-5799

==========

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C4S3668
Report Date: 2024/09/20

RWDI Inc.
Client Project #: 2402553.01
Site Location: ON07
Your P.O. #: 13384122
Sampler Initials: JA

RESULTS OF ANALYSES OF TISSUE

Bureau Veritas ID		ACNB90	ACNB91	ACNB92	ACNB93	ACNB94	ACNB95	ACNB96		
Sampling Date		2024/09/04 12:15	2024/09/04 12:15	2024/09/04 12:45	2024/09/04 12:45	2024/09/04 16:00	2024/09/04 16:00	2024/09/04 16:30		
COC Number		960105	960105	960105	960105	960105	960105	960105		
	UNITS	Z1-LC	Z1-UC	Z2-LC	Z2-UC	Z3-LC	Z3-UC	Z4-LC	RDL	QC Batch
Inorganics										
Soluble (20:1) Chloride (Cl-)	ug/g	4100	5100	4300	3400	2800	3400	8300	2000	9640239
Moisture	%	60	64	59	63	62	62	59	1.0	9638076
Nitrogen (N)	%	2.4	3.1	2.4	2.5	2.3	2.8	2.5	0.010	9638753
Soluble (20:1) Sulphate (SO4)	ug/g	4900	4600	5400	3000	5300	3400	6100	2000	9640218

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas ID		ACNB97		
Sampling Date		2024/09/04 16:30		
COC Number		960105		
	UNITS	Z4-UC	RDL	QC Batch
Inorganics				
Soluble (20:1) Chloride (Cl-)	ug/g	6200	2000	9640239
Moisture	%	60	1.0	9638076
Nitrogen (N)	%	2.5	0.010	9638753
Soluble (20:1) Sulphate (SO4)	ug/g	4400	2000	9640218

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C4S3668
Report Date: 2024/09/20

RWDI Inc.
Client Project #: 2402553.01
Site Location: ON07
Your P.O. #: 13384122
Sampler Initials: JA

ELEMENTS BY ICP/MS (TISSUE)

Bureau Veritas ID		ACNB90		ACNB91	ACNB92		ACNB93	ACNB94	ACNB95		
Sampling Date		2024/09/04 12:15		2024/09/04 12:15	2024/09/04 12:45		2024/09/04 12:45	2024/09/04 16:00	2024/09/04 16:00		
COC Number		960105		960105	960105		960105	960105	960105		
	UNITS	Z1-LC	RDL	Z1-UC	Z2-LC	RDL	Z2-UC	Z3-LC	Z3-UC	RDL	QC Batch
Metals											
Boron (B)	ug/g	250	3	165	246	0.5	268	250	287	3	9640417
Copper (Cu)	ug/g	4.0	0.5	3.1	4.3	0.5	3.5	4.1	3.6	0.5	9640417
Iron (Fe)	ug/g	32	3	21	29	3	23	27	25	3	9640417
Manganese (Mn)	ug/g	21.3	0.3	11.8	23.0	0.3	14.6	17.1	15.2	0.3	9640417
Phosphorus (P)	ug/g	687	50	833	722	50	629	520	644	50	9640417
Potassium (K)	ug/g	5830	100	6340	5720	100	5580	5770	5960	100	9640417
Zinc (Zn)	ug/g	26	2	18	38	2	24	34	30	2	9640417

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas ID		ACNB96	ACNB97		
Sampling Date		2024/09/04 16:30	2024/09/04 16:30		
COC Number		960105	960105		
	UNITS	Z4-LC	Z4-UC	RDL	QC Batch
Metals					
Boron (B)	ug/g	261	310	3	9640417
Copper (Cu)	ug/g	4.1	4.3	0.5	9640417
Iron (Fe)	ug/g	31	33	3	9640417
Manganese (Mn)	ug/g	22.8	22.8	0.3	9640417
Phosphorus (P)	ug/g	596	608	50	9640417
Potassium (K)	ug/g	5590	5910	100	9640417
Zinc (Zn)	ug/g	27	20	2	9640417

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C4S3668
Report Date: 2024/09/20

RWDI Inc.
Client Project #: 2402553.01
Site Location: ON07
Your P.O. #: 13384122
Sampler Initials: JA

GENERAL COMMENTS

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

Package 1	15.7°C

Chloride and Sulphate Analysis: Samples analyzed using methodologies that have not been subjected to Bureau Veritas standard validation process for the submitted matrix. Analysis performed with client consent.

Results relate only to the items tested.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C4S3668
Report Date: 2024/09/20

QUALITY ASSURANCE REPORT

RWDI Inc.
Client Project #: 2402553.01
Site Location: ON07
Your P.O. #: 13384122
Sampler Initials: JA

			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
9638076	Moisture	2024/09/13							3.6 (1)	20		
9638753	Nitrogen (N)	2024/09/16					<0.010	%	7.4 (1)	35	98	80 - 120
9640218	Soluble (20:1) Sulphate (SO4)	2024/09/16	NC	70 - 130	107	70 - 130	<20	ug/g	7.7 (1)	35		
9640239	Soluble (20:1) Chloride (Cl-)	2024/09/16	108	70 - 130	104	70 - 130	<20	ug/g	NC (1)	35		
9640417	Boron (B)	2024/09/18	NC (2)	75 - 125	101	80 - 120	<0.5	ug/g	1.6 (3)	30	97	70 - 130
9640417	Copper (Cu)	2024/09/18	95 (2)	75 - 125	101	80 - 120	<0.5	ug/g	3.1 (3)	30	91	70 - 130
9640417	Iron (Fe)	2024/09/18	97 (2)	75 - 125	101	80 - 120	<3	ug/g	3.2 (3)	30		
9640417	Manganese (Mn)	2024/09/18	NC (2)	75 - 125	97	80 - 120	<0.3	ug/g	1.0 (3)	30	92	70 - 130
9640417	Phosphorus (P)	2024/09/18	NC (2)	75 - 125	102	80 - 120	<50	ug/g	2.8 (3)	30	100	70 - 130
9640417	Potassium (K)	2024/09/18	NC (2)	75 - 125	103	80 - 120	<100	ug/g	2.1 (3)	30	98	70 - 130
9640417	Zinc (Zn)	2024/09/18	NC (2)	75 - 125	100	80 - 120	<2	ug/g	0.30 (3)	30	88	70 - 130

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

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

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

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

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

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

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) Duplicate Parent ID

(2) Matrix Spike Parent ID [ACNB96-01]

(3) Duplicate Parent ID [ACNB96-01]

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C4S3668
Report Date: 2024/09/20

RWDI Inc.
Client Project #: 2402553.01
Site Location: ON07
Your P.O. #: 13384122
Sampler Initials: JA

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Louise Harding, Scientific Specialist

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Custody Tracking Form

T960105

Please use this form for custody tracking when submitting the work instructions via eCOC (electronic Chain of Custody). Please ensure your form has a barcode or a Bureau Veritas eCOC confirmation number in the top right hand side. This number links your electronic submission to your samples. This form should be placed in the cooler with your samples.

First Sample: Z1-LC
Last Sample: Z4-UC
Sample Count: 8

Relinquished By				Received By			
J. Artibill		Date 9-	27/09/09	SUCAR SARVAN		Date	24/09/11
		Time (24 HR)	11:00			Time (24 HR)	10:00
		Date				Date	
		Time (24 HR)				Time (24 HR)	
		Date				Date	
		Time (24 HR)				Time (24 HR)	

Unless otherwise agreed to, submissions and use of services are governed by Bureau Veritas' standard terms and conditions which can be found at www.bvna.com.

Triage Information

Sampled By (Print): JHR

# of Coolers/Pkgs: 1

Rush ☐ Immediate Test ☐ Food Residue ☐

Micro ☐ Food Chemistry ☐

*** LABORATORY USE ONLY ***

Received At

Labeled By

Verified By

Lab Comments:

11-Sep-24 10:00
Patricia Legette
C4S3668
AK0 ENV-1617

Custody Seal		Cooling Media	Temperature °C		
Present (Y/N)	Intact (Y/N)	Present (Y/N)	1	2	3
Y	Y	Y	15	16	16
Drinking Water Metals Preservation Check Done (Circle)				YES	NO

COR FCD-00383/4

Page 1 of 1

Your P.O. #: 13384122
Your Project #: 2402553.01
Site#: 900
Site Location: ON07
Your C.O.C. #: 966474

Attention: Khalid Hussein - Twin Creeks

RWDI Inc.
600 Southgate Drive
Guelph, ON
Canada N1G 4P6

Report Date: 2024/10/16
Report #: R8363026
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C4T5695
Received: 2024/09/20, 09:54

Sample Matrix: Tissue
Samples Received: 8

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Hot Water Extractable Boron	8	2024/09/26	2024/09/26	CAM SOP-00408	R153 Ana. Prot. 2011
Chloride (20:1 extract)	8	2024/09/26	2024/09/27	CAM SOP-00463	MOE E3013 m
Metals in Vegetation by ICPMS	8	N/A	2024/09/26	CAM SOP-00447	EPA 6020/200.3 m
Elements in Plants by CRC ICPMS -Dry Wt (1)	8	2024/09/27	2024/10/10	BBY7SOP-00021 / BBY7SOP-00002	EPA 6020b R2 m
Moisture in Tissue (Subcontracted) (1, 2)	8	2024/09/27	2024/09/28	BBY8SOP-00017	BCMOE BCLM Dec2000 m
Moisture	8	N/A	2024/09/25	CAM SOP-00445	Carter 2nd ed 70.2 m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, EPA, APHA or the Quebec Ministry of Environment.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) This test was performed by Bureau Veritas Burnaby, 4606 Canada Way , Burnaby, BC, V5G 1K5
(2) Offsite analysis requires that subcontracted moisture be reported.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Your P.O. #: 13384122
Your Project #: 2402553.01
Site#: 900
Site Location: ON07
Your C.O.C. #: 966474

Attention: Khalid Hussein - Twin Creeks

RWDI Inc.
600 Southgate Drive
Guelph, ON
Canada N1G 4P6

Report Date: 2024/10/16
Report #: R8363026
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C4T5695
Received: 2024/09/20, 09:54

Encryption Key

Please direct all questions regarding this Certificate of Analysis to:
Patricia Legette, Project Manager
Email: Patricia.Legette@bureauveritas.com
Phone# (905)817-5799

==========

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C4T5695
Report Date: 2024/10/16

RWDI Inc.
Client Project #: 2402553.01
Site Location: ON07
Your P.O. #: 13384122
Sampler Initials: JC

RESULTS OF ANALYSES OF TISSUE

Bureau Veritas ID		ADMX82		ADMX83		ADMX84		ADMX85		
Sampling Date		2024/09/17 11:15		2024/09/17 11:00		2024/09/17 11:45		2024/09/17 12:00		
COC Number		966474		966474		966474		966474		
	UNITS	Z1-Root	RDL	Z1-Stem	RDL	Z2-Root	RDL	Z2-Stem	RDL	QC Batch
Inorganics										
Soluble (20:1) Chloride (Cl-)	ug/g	580	400	51	20	<400 (1)	400	36	20	9663750
Moisture	%	44	1.0	42	1.0	51	1.0	39	1.0	9662926
Metals										
Total (Dry Wt) Aluminum (Al)	mg/kg	133	1.0	21.0	1.0	99.1	1.0	43.9	1.0	9698608
Total (Dry Wt) Arsenic (As)	mg/kg	0.069	0.020	<0.020	0.020	0.061	0.020	0.022	0.020	9698608
Total (Dry Wt) Barium (Ba)	mg/kg	3.15	0.050	1.73	0.050	2.39	0.050	1.52	0.050	9698608
Total (Dry Wt) Beryllium (Be)	mg/kg	<0.010	0.010	<0.010	0.010	<0.010	0.010	<0.010	0.010	9698608
Total (Dry Wt) Bismuth (Bi)	mg/kg	<0.010	0.010	<0.010	0.010	<0.010	0.010	<0.010	0.010	9698608
Total (Dry Wt) Boron (B)	mg/kg	7.8	1.0	5.4	1.0	15.1	1.0	5.1	1.0	9698608
Total (Dry Wt) Cadmium (Cd)	mg/kg	0.694	0.0050	0.444	0.0050	0.318	0.0050	0.295	0.0050	9698608
Total (Dry Wt) Calcium (Ca)	mg/kg	1890	10	1570	10	3740	10	1680	10	9698608
Total (Dry Wt) Chromium (Cr)	mg/kg	5.87	0.10	1.92	0.10	2.75	0.10	3.20	0.10	9698608
Total (Dry Wt) Copper (Cu)	mg/kg	3.92	0.050	2.21	0.050	5.16	0.050	2.67	0.050	9698608
Total (Dry Wt) Lead (Pb)	mg/kg	0.215	0.010	0.050	0.010	0.167	0.010	0.134	0.010	9698608
Total (Dry Wt) Magnesium (Mg)	mg/kg	549	5.0	332	5.0	725	5.0	336	5.0	9698608
Total (Dry Wt) Molybdenum (Mo)	mg/kg	0.718	0.020	0.181	0.020	0.330	0.020	0.236	0.020	9698608
Total (Dry Wt) Nickel (Ni)	mg/kg	3.66	0.050	0.964	0.050	1.93	0.050	1.27	0.050	9698608
Total (Dry Wt) Phosphorus (P)	mg/kg	1230	10	401	10	1060	10	439	10	9698608
Total (Dry Wt) Potassium (K)	mg/kg	3690	10	1340	10	6690	10	1280	10	9698608
Total (Dry Wt) Selenium (Se)	mg/kg	<0.050	0.050	<0.050	0.050	<0.050	0.050	<0.050	0.050	9698608
Total (Dry Wt) Silver (Ag)	mg/kg	<0.0050	0.0050	<0.0050	0.0050	<0.0050	0.0050	<0.0050	0.0050	9698608
Total (Dry Wt) Sodium (Na)	mg/kg	420	10	111	10	373	10	43	10	9698608
Total (Dry Wt) Strontium (Sr)	mg/kg	7.66	0.050	5.92	0.050	16.9	0.050	6.78	0.050	9698608
Total (Dry Wt) Tin (Sn)	mg/kg	0.28	0.10	1.03	0.10	0.63	0.10	0.87	0.10	9698608
Total (Dry Wt) Titanium (Ti)	mg/kg	2.20	0.50	0.51	0.50	1.61	0.50	0.80	0.50	9698608
Total (Dry Wt) Vanadium (V)	mg/kg	0.29	0.20	<0.20	0.20	0.20	0.20	<0.20	0.20	9698608
Total (Dry Wt) Zinc (Zn)	mg/kg	14.9	0.20	9.32	0.20	22.6	0.20	10.9	0.20	9698608
PHYSICAL PROPERTIES										
Moisture-Subcontracted	%	43	0.30	43	0.30	55	0.30	37	0.30	9698609

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) Due to colour interferences, sample required dilution. Detection limit was adjusted accordingly.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C4T5695
Report Date: 2024/10/16

RWDI Inc.
Client Project #: 2402553.01
Site Location: ON07
Your P.O. #: 13384122
Sampler Initials: JC

RESULTS OF ANALYSES OF TISSUE

Bureau Veritas ID		ADMX86		ADMX87		ADMX88		ADMX89		
Sampling Date		2024/09/17 12:30		2024/09/17 12:15		2024/09/17 13:15		2024/09/17 13:00		
COC Number		966474		966474		966474		966474		
	UNITS	Z3-Root	RDL	Z3-Stem	RDL	Z4-Root	RDL	Z4-Stem	RDL	QC Batch
Inorganics										
Soluble (20:1) Chloride (Cl-)	ug/g	<400 (1)	400	41	20	<400 (1)	400	63	20	9663750
Moisture	%	52	1.0	40	1.0	51	1.0	42	1.0	9662926
Metals										
Total (Dry Wt) Aluminum (Al)	mg/kg	191	1.0	27.2	1.0	51.1	1.0	6.9	1.0	9698608
Total (Dry Wt) Arsenic (As)	mg/kg	0.123	0.020	0.025	0.020	0.052	0.020	<0.020	0.020	9698608
Total (Dry Wt) Barium (Ba)	mg/kg	4.14	0.050	1.42	0.050	1.19	0.050	1.15	0.050	9698608
Total (Dry Wt) Beryllium (Be)	mg/kg	<0.010	0.010	<0.010	0.010	<0.010	0.010	<0.010	0.010	9698608
Total (Dry Wt) Bismuth (Bi)	mg/kg	0.012	0.010	<0.010	0.010	<0.010	0.010	<0.010	0.010	9698608
Total (Dry Wt) Boron (B)	mg/kg	16.9	1.0	5.3	1.0	8.4	1.0	4.7	1.0	9698608
Total (Dry Wt) Cadmium (Cd)	mg/kg	0.398	0.0050	0.310	0.0050	1.00	0.0050	0.706	0.0050	9698608
Total (Dry Wt) Calcium (Ca)	mg/kg	3970	10	1840	10	2300	10	1180	10	9698608
Total (Dry Wt) Chromium (Cr)	mg/kg	2.63	0.10	0.32	0.10	2.42	0.10	0.60	0.10	9698608
Total (Dry Wt) Copper (Cu)	mg/kg	5.99	0.050	2.84	0.050	4.00	0.050	2.73	0.050	9698608
Total (Dry Wt) Lead (Pb)	mg/kg	0.322	0.010	0.096	0.010	0.149	0.010	0.030	0.010	9698608
Total (Dry Wt) Magnesium (Mg)	mg/kg	861	5.0	463	5.0	671	5.0	368	5.0	9698608
Total (Dry Wt) Molybdenum (Mo)	mg/kg	0.279	0.020	<0.020	0.020	0.227	0.020	0.059	0.020	9698608
Total (Dry Wt) Nickel (Ni)	mg/kg	1.94	0.050	0.142	0.050	1.52	0.050	0.399	0.050	9698608
Total (Dry Wt) Phosphorus (P)	mg/kg	954	10	441	10	1350	10	438	10	9698608
Total (Dry Wt) Potassium (K)	mg/kg	6860	10	1240	10	4560	10	1630	10	9698608
Total (Dry Wt) Selenium (Se)	mg/kg	<0.050	0.050	<0.050	0.050	<0.050	0.050	<0.050	0.050	9698608
Total (Dry Wt) Silver (Ag)	mg/kg	<0.0050	0.0050	<0.0050	0.0050	<0.0050	0.0050	<0.0050	0.0050	9698608
Total (Dry Wt) Sodium (Na)	mg/kg	481	10	41	10	768	10	254	10	9698608
Total (Dry Wt) Strontium (Sr)	mg/kg	18.2	0.050	8.67	0.050	12.6	0.050	6.95	0.050	9698608
Total (Dry Wt) Tin (Sn)	mg/kg	0.55	0.10	1.07	0.10	0.38	0.10	0.74	0.10	9698608
Total (Dry Wt) Titanium (Ti)	mg/kg	3.29	0.50	0.52	0.50	0.93	0.50	<0.50	0.50	9698608
Total (Dry Wt) Vanadium (V)	mg/kg	0.39	0.20	<0.20	0.20	<0.20	0.20	<0.20	0.20	9698608
Total (Dry Wt) Zinc (Zn)	mg/kg	35.5	0.20	16.6	0.20	19.4	0.20	13.6	0.20	9698608
PHYSICAL PROPERTIES										
Moisture-Subcontracted	%	52	0.30	36	0.30	56	0.30	40	0.30	9698609

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) Due to colour interferences, sample required dilution. Detection limit was adjusted accordingly.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C4T5695
Report Date: 2024/10/16

RWDI Inc.
Client Project #: 2402553.01
Site Location: ON07
Your P.O. #: 13384122
Sampler Initials: JC

ELEMENTS BY ICP/MS (TISSUE)

Bureau Veritas ID		ADMX82	ADMX83	ADMX84	ADMX85	ADMX86	ADMX87	ADMX88		
Sampling Date		2024/09/17 11:15	2024/09/17 11:00	2024/09/17 11:45	2024/09/17 12:00	2024/09/17 12:30	2024/09/17 12:15	2024/09/17 13:15		
COC Number		966474	966474	966474	966474	966474	966474	966474		
	UNITS	Z1-Root	Z1-Stem	Z2-Root	Z2-Stem	Z3-Root	Z3-Stem	Z4-Root	RDL	QC Batch
Metals										
Cobalt (Co)	ug/g	0.208	0.065	0.161	0.107	0.216	0.057	0.132	0.005	9663647
Vanadium (V)	ug/g	0.21	<0.05	0.11	0.07	0.18	<0.05	0.07	0.05	9663647

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas ID		ADMX89		
Sampling Date		2024/09/17 13:00		
COC Number		966474		
	UNITS	Z4-Stem	RDL	QC Batch
Metals				
Cobalt (Co)	ug/g	0.050	0.005	9663647
Vanadium (V)	ug/g	<0.05	0.05	9663647

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C4T5695
Report Date: 2024/10/16

RWDI Inc.
Client Project #: 2402553.01
Site Location: ON07
Your P.O. #: 13384122
Sampler Initials: JC

ELEMENTS BY ATOMIC SPECTROSCOPY (TISSUE)

Bureau Veritas ID		ADMX82		ADMX83	ADMX84		ADMX85		ADMX86		
Sampling Date		2024/09/17 11:15		2024/09/17 11:00	2024/09/17 11:45		2024/09/17 12:00		2024/09/17 12:30		
COC Number		966474		966474	966474		966474		966474		
	UNITS	Z1-Root	RDL	Z1-Stem	Z2-Root	RDL	Z2-Stem	RDL	Z3-Root	RDL	QC Batch
Metals											
Hot Water Ext. Boron (B)	ug/g	3.3	0.47	1.5	9.7	0.48	1.5	0.52	7.6	0.49	9664153

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas ID		ADMX87		ADMX88		ADMX89		
Sampling Date		2024/09/17 12:15		2024/09/17 13:15		2024/09/17 13:00		
COC Number		966474		966474		966474		
	UNITS	Z3-Stem	RDL	Z4-Root	RDL	Z4-Stem	RDL	QC Batch
Metals								
Hot Water Ext. Boron (B)	ug/g	1.7	0.50	3.8	0.55	1.1	0.52	9664153

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

GENERAL COMMENTS

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

Package 1	8.3°C

Metals Analysis: Due to limited amount of sample available for analysis, a smaller than usual portion of the sample was used. Detection limits were adjusted accordingly.

Results relate only to the items tested.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C4T5695
Report Date: 2024/10/16

QUALITY ASSURANCE REPORT

RWDI Inc.
Client Project #: 2402553.01
Site Location: ON07
Your P.O. #: 13384122
Sampler Initials: JC

			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
9662926	Moisture	2024/09/25							0.72 (1)	20		
9663647	Cobalt (Co)	2024/09/26	101 (2)	75 - 125	102	80 - 120	<0.005	ug/g	4.1 (3)	30	107	70 - 130
9663647	Vanadium (V)	2024/09/26	101 (2)	75 - 125	102	80 - 120	<0.05	ug/g	NC (3)	30	42	28 - 52
9663750	Soluble (20:1) Chloride (Cl-)	2024/09/27	96	70 - 130	97	70 - 130	<20	ug/g	NC (1)	35		
9664153	Hot Water Ext. Boron (B)	2024/09/26	102	75 - 125	102	75 - 125	<0.050	ug/g	0.15 (1)	40		
9698608	Total (Dry Wt) Aluminum (Al)	2024/10/10			109	80 - 120	<1.0	mg/kg	14 (4)	40	37	N/A
9698608	Total (Dry Wt) Arsenic (As)	2024/10/10			108	80 - 120	<0.020	mg/kg	15 (4)	40	106	N/A
9698608	Total (Dry Wt) Barium (Ba)	2024/10/10			107	80 - 120	<0.050	mg/kg	18 (4)	40	98	N/A
9698608	Total (Dry Wt) Beryllium (Be)	2024/10/10			103	80 - 120	<0.010	mg/kg	NC (4)	40		
9698608	Total (Dry Wt) Bismuth (Bi)	2024/10/10			107	80 - 120	<0.010	mg/kg	NC (4)	40		
9698608	Total (Dry Wt) Boron (B)	2024/10/10			103	80 - 120	<1.0	mg/kg	12 (4)	40	94	N/A
9698608	Total (Dry Wt) Cadmium (Cd)	2024/10/10			105	80 - 120	<0.0050	mg/kg	9.7 (4)	40	100	N/A
9698608	Total (Dry Wt) Calcium (Ca)	2024/10/10			106	80 - 120	<10	mg/kg	8.6 (4)	60		
9698608	Total (Dry Wt) Chromium (Cr)	2024/10/10			107	80 - 120	<0.10	mg/kg	13 (4)	40	50	N/A
9698608	Total (Dry Wt) Copper (Cu)	2024/10/10			104	80 - 120	<0.050	mg/kg	7.1 (4)	40	93	N/A
9698608	Total (Dry Wt) Lead (Pb)	2024/10/10			104	80 - 120	<0.010	mg/kg	37 (4)	40		
9698608	Total (Dry Wt) Magnesium (Mg)	2024/10/10			104	80 - 120	<5.0	mg/kg	6.7 (4)	40	91	N/A
9698608	Total (Dry Wt) Molybdenum (Mo)	2024/10/10			104	80 - 120	<0.020	mg/kg	12 (4)	40	98	N/A
9698608	Total (Dry Wt) Nickel (Ni)	2024/10/10			106	80 - 120	<0.050	mg/kg	6.9 (4)	40	77	N/A
9698608	Total (Dry Wt) Phosphorus (P)	2024/10/10			106	80 - 120	<10	mg/kg	9.5 (4)	40		
9698608	Total (Dry Wt) Potassium (K)	2024/10/10			100	80 - 120	<10	mg/kg	6.4 (4)	40		
9698608	Total (Dry Wt) Selenium (Se)	2024/10/10			102	80 - 120	<0.050	mg/kg	NC (4)	40		
9698608	Total (Dry Wt) Silver (Ag)	2024/10/10			101	80 - 120	<0.0050	mg/kg	NC (4)	40		
9698608	Total (Dry Wt) Sodium (Na)	2024/10/10			105	80 - 120	<10	mg/kg	4.8 (4)	40	83	N/A
9698608	Total (Dry Wt) Strontium (Sr)	2024/10/10			106	80 - 120	<0.050	mg/kg	13 (4)	40	112	N/A
9698608	Total (Dry Wt) Tin (Sn)	2024/10/10			109	80 - 120	<0.10	mg/kg	26 (4)	40		
9698608	Total (Dry Wt) Titanium (Ti)	2024/10/10			103	80 - 120	<0.50	mg/kg	10 (4)	40		
9698608	Total (Dry Wt) Vanadium (V)	2024/10/10			106	80 - 120	<0.20	mg/kg	15 (4)	40		
9698608	Total (Dry Wt) Zinc (Zn)	2024/10/10			103	80 - 120	<0.20	mg/kg	10 (4)	40	93	N/A

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
9698609	Moisture-Subcontracted	2024/09/28							0.92 (4)	20		

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

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

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

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

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

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) Duplicate Parent ID

(2) Matrix Spike Parent ID [ADMX87-01]

(3) Duplicate Parent ID [ADMX87-01]

(4) Duplicate Parent ID [ADMX82-01]

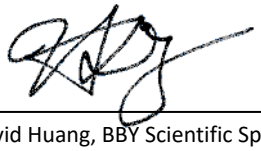
Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C4T5695
Report Date: 2024/10/16

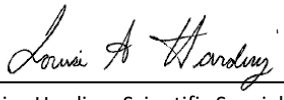
RWDI Inc.
Client Project #: 2402553.01
Site Location: ON07
Your P.O. #: 13384122
Sampler Initials: JC

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:



David Huang, BBY Scientific Specialist



Louise Harding, Scientific Specialist

Bureau Veritas Proprietary Software
Logiciel Propriétaire de Bureau Veritas

Automated Statchk

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Custody Tracking Form

T966474-H

Please use this form for custody tracking when submitting the work instructions via eCOC (electronic Chain of Custody). Please ensure your form has a barcode or a Bureau Veritas eCOC confirmation number in the top right hand side. This number links your electronic submission to your samples. This form should be placed in the cooler with your samples.

First Sample: Z1-Root
Last Sample: Z4-Stem
Sample Count: 8

Relinquished By				Received By			
Print: Maja DeForest	Sign:	Date	2024/09/19	Print: SATTAR BASOLA	Sign:	Date	2024/09/20
		Time (24 HR)	8:45			Time (24 HR)	09:54
Print	Sign	Date	YYYY/MM/DD	Print	Sign	Date	YYYY/MM/DD
		Time (24 HR)	HH:MM			Time (24 HR)	HH:MM
Print	Sign	Date	YYYY/MM/DD	Print	Sign	Date	YYYY/MM/DD
		Time (24 HR)	HH:MM			Time (24 HR)	HH:MM

Unless otherwise agreed to, submissions and use of services are governed by Bureau Veritas' standard terms and conditions which can be found at www.bvna.com.

Triage Information

Sampled By (Print): Maja DeForest

# of Coolers/Pkgs: 1

Rush ☐ Immediate Test ☐ Food Residue ☐

Micro ☐ Food Chemistry ☐

*** LABORATORY USE ONLY ***

Received At:

Labeled By:

Verified By:

Lab Comments:

20-Sep-24 09:54
Patricia Legette
C4T5695
GMJ ENV-1101

Custody Seal		Cooling Media	Temperature °C		
resent (Y/N)	Intact (Y/N)	Present (Y/N)	1	2	3
Y	Y	Y	10	10	5

Drinking Water Metals Preservation Check Done (Circle) **YES** **NO**

COR FCD-00383/4

Page 1 of 1

Your Project #: Campobello job# C4T5695

Attention: Patricia Legette

BUREAU VERITAS
CAMPOBELLO
6740 CAMPOBELLO ROAD
MISSISSAUGA, ON
CANADA L5N 2L8

Report Date: 2024/10/11
Report #: R3571080
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C475079
Received: 2024/09/22, 20:49

Sample Matrix: Vegetation
Samples Received: 8

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Elements in Tissue by CRC ICPMS - Dry Wt	8	2024/09/27	2024/10/10	BBY7SOP-00021 / BBY7SOP-00002	EPA 6020b R2 m
Moisture in Tissue	8	2024/09/27	2024/09/28	BBY8SOP-00017	BCMOE BCLM Dec2000 m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, EPA, APHA or the Quebec Ministry of Environment.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Your Project #: Campobello job# C4T5695

Attention: Patricia Legette

BUREAU VERITAS
CAMPOBELLO
6740 CAMPOBELLO ROAD
MISSISSAUGA, ON
CANADA L5N 2L8

Report Date: 2024/10/11
Report #: R3571080
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C475079
Received: 2024/09/22, 20:49

Encryption Key

Please direct all questions regarding this Certificate of Analysis to:
Stephanie Rodriguez Camacho, Customer Solutions Representative
Email: Stephanie.Rodriguez@bureauveritas.com
Phone# (604) 734 7276

==========

This report has been generated and distributed using a secure automated process.
Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Raphael Kwan, General Manager, BC and Yukon Regions responsible for British Columbia Environmental laboratory operations.

Bureau Veritas Job #: C475079
Report Date: 2024/10/11

BUREAU VERITAS
Client Project #: Campobello job# C4T5695
Sampler Initials: JC

ELEMENTS BY ATOMIC SPECTROSCOPY - DRY WT (VEGETATION)

Bureau Veritas ID		CWC054	CWC054	CWC055	CWC056	CWC057	CWC058		
Sampling Date		2024/09/17 11:15	2024/09/17 11:15	2024/09/17 11:00	2024/09/17 11:45	2024/09/17 12:00	2024/09/17 12:30		
	UNITS	Z1-Root	Z1-Root Lab-Dup	Z1-Stem	Z2-Root	Z2-Stem	Z3-Root	RDL	QC Batch
Total Metals by ICPMS									
Total (Dry Wt) Aluminum (Al)	mg/kg	133	115	21.0	99.1	43.9	191	1.0	B558553
Total (Dry Wt) Arsenic (As)	mg/kg	0.069	0.060	<0.020	0.061	0.022	0.123	0.020	B558553
Total (Dry Wt) Barium (Ba)	mg/kg	3.15	2.63	1.73	2.39	1.52	4.14	0.050	B558553
Total (Dry Wt) Beryllium (Be)	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	B558553
Total (Dry Wt) Bismuth (Bi)	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	0.012	0.010	B558553
Total (Dry Wt) Boron (B)	mg/kg	7.8	6.9	5.4	15.1	5.1	16.9	1.0	B558553
Total (Dry Wt) Cadmium (Cd)	mg/kg	0.694	0.630	0.444	0.318	0.295	0.398	0.0050	B558553
Total (Dry Wt) Calcium (Ca)	mg/kg	1890	1740	1570	3740	1680	3970	10	B558553
Total (Dry Wt) Chromium (Cr)	mg/kg	5.87	5.17	1.92	2.75	3.20	2.63	0.10	B558553
Total (Dry Wt) Copper (Cu)	mg/kg	3.92	3.65	2.21	5.16	2.67	5.99	0.050	B558553
Total (Dry Wt) Lead (Pb)	mg/kg	0.215	0.149	0.050	0.167	0.134	0.322	0.010	B558553
Total (Dry Wt) Magnesium (Mg)	mg/kg	549	513	332	725	336	861	5.0	B558553
Total (Dry Wt) Molybdenum (Mo)	mg/kg	0.718	0.639	0.181	0.330	0.236	0.279	0.020	B558553
Total (Dry Wt) Nickel (Ni)	mg/kg	3.66	3.41	0.964	1.93	1.27	1.94	0.050	B558553
Total (Dry Wt) Phosphorus (P)	mg/kg	1230	1120	401	1060	439	954	10	B558553
Total (Dry Wt) Potassium (K)	mg/kg	3690	3460	1340	6690	1280	6860	10	B558553
Total (Dry Wt) Selenium (Se)	mg/kg	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	B558553
Total (Dry Wt) Silver (Ag)	mg/kg	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	B558553
Total (Dry Wt) Sodium (Na)	mg/kg	420	400	111	373	43	481	10	B558553
Total (Dry Wt) Strontium (Sr)	mg/kg	7.66	6.72	5.92	16.9	6.78	18.2	0.050	B558553
Total (Dry Wt) Tin (Sn)	mg/kg	0.28	0.22	1.03	0.63	0.87	0.55	0.10	B558553
Total (Dry Wt) Titanium (Ti)	mg/kg	2.20	1.98	0.51	1.61	0.80	3.29	0.50	B558553
Total (Dry Wt) Vanadium (V)	mg/kg	0.29	0.25	<0.20	0.20	<0.20	0.39	0.20	B558553
Total (Dry Wt) Zinc (Zn)	mg/kg	14.9	13.4	9.32	22.6	10.9	35.5	0.20	B558553

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

ELEMENTS BY ATOMIC SPECTROSCOPY - DRY WT (VEGETATION)

Bureau Veritas ID		CWC059	CWC060	CWC061		
Sampling Date		2024/09/17 12:15	2024/09/17 13:15	2024/09/17 13:00		
	UNITS	Z3-Stem	Z4-Root	Z4-Stem	RDL	QC Batch
Total Metals by ICPMS						
Total (Dry Wt) Aluminum (Al)	mg/kg	27.2	51.1	6.9	1.0	B558553
Total (Dry Wt) Arsenic (As)	mg/kg	0.025	0.052	<0.020	0.020	B558553
Total (Dry Wt) Barium (Ba)	mg/kg	1.42	1.19	1.15	0.050	B558553
Total (Dry Wt) Beryllium (Be)	mg/kg	<0.010	<0.010	<0.010	0.010	B558553
Total (Dry Wt) Bismuth (Bi)	mg/kg	<0.010	<0.010	<0.010	0.010	B558553
Total (Dry Wt) Boron (B)	mg/kg	5.3	8.4	4.7	1.0	B558553
Total (Dry Wt) Cadmium (Cd)	mg/kg	0.310	1.00	0.706	0.0050	B558553
Total (Dry Wt) Calcium (Ca)	mg/kg	1840	2300	1180	10	B558553
Total (Dry Wt) Chromium (Cr)	mg/kg	0.32	2.42	0.60	0.10	B558553
Total (Dry Wt) Copper (Cu)	mg/kg	2.84	4.00	2.73	0.050	B558553
Total (Dry Wt) Lead (Pb)	mg/kg	0.096	0.149	0.030	0.010	B558553
Total (Dry Wt) Magnesium (Mg)	mg/kg	463	671	368	5.0	B558553
Total (Dry Wt) Molybdenum (Mo)	mg/kg	<0.020	0.227	0.059	0.020	B558553
Total (Dry Wt) Nickel (Ni)	mg/kg	0.142	1.52	0.399	0.050	B558553
Total (Dry Wt) Phosphorus (P)	mg/kg	441	1350	438	10	B558553
Total (Dry Wt) Potassium (K)	mg/kg	1240	4560	1630	10	B558553
Total (Dry Wt) Selenium (Se)	mg/kg	<0.050	<0.050	<0.050	0.050	B558553
Total (Dry Wt) Silver (Ag)	mg/kg	<0.0050	<0.0050	<0.0050	0.0050	B558553
Total (Dry Wt) Sodium (Na)	mg/kg	41	768	254	10	B558553
Total (Dry Wt) Strontium (Sr)	mg/kg	8.67	12.6	6.95	0.050	B558553
Total (Dry Wt) Tin (Sn)	mg/kg	1.07	0.38	0.74	0.10	B558553
Total (Dry Wt) Titanium (Ti)	mg/kg	0.52	0.93	<0.50	0.50	B558553
Total (Dry Wt) Vanadium (V)	mg/kg	<0.20	<0.20	<0.20	0.20	B558553
Total (Dry Wt) Zinc (Zn)	mg/kg	16.6	19.4	13.6	0.20	B558553
RDL = Reportable Detection Limit						

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Bureau Veritas Job #: C475079
Report Date: 2024/10/11

BUREAU VERITAS
Client Project #: Campobello job# C4T5695
Sampler Initials: JC

PHYSICAL TESTING (VEGETATION)

Bureau Veritas ID		CWC054	CWC054	CWC055	CWC056	CWC057	CWC058	CWC059		
Sampling Date		2024/09/17 11:15	2024/09/17 11:15	2024/09/17 11:00	2024/09/17 11:45	2024/09/17 12:00	2024/09/17 12:30	2024/09/17 12:15		
	UNITS	Z1-Root	Z1-Root Lab-Dup	Z1-Stem	Z2-Root	Z2-Stem	Z3-Root	Z3-Stem	RDL	QC Batch
Physical Properties										
Moisture	%	43	44	43	55	37	52	36	0.30	B540896

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate

Bureau Veritas ID		CWC060	CWC061		
Sampling Date		2024/09/17 13:15	2024/09/17 13:00		
	UNITS	Z4-Root	Z4-Stem	RDL	QC Batch
Physical Properties					
Moisture	%	56	40	0.30	B540896

RDL = Reportable Detection Limit

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

TEST SUMMARY

Bureau Veritas ID: CWC054
Sample ID: Z1-Root
Matrix: Vegetation
Collected: 2024/09/17
Shipped:
Received: 2024/09/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Elements in Tissue by CRC ICPMS - Dry Wt	ICP/CRCM	B558553	2024/09/27	2024/10/10	Renegie Lampong
Moisture in Tissue	BAL/BAL	B540896	2024/09/27	2024/09/28	Cyrhea Goda

Bureau Veritas ID: CWC054 Dup
Sample ID: Z1-Root
Matrix: Vegetation
Collected: 2024/09/17
Shipped:
Received: 2024/09/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Elements in Tissue by CRC ICPMS - Dry Wt	ICP/CRCM	B558553	2024/09/27	2024/10/10	Renegie Lampong
Moisture in Tissue	BAL/BAL	B540896	2024/09/27	2024/09/28	Cyrhea Goda

Bureau Veritas ID: CWC055
Sample ID: Z1-Stem
Matrix: Vegetation
Collected: 2024/09/17
Shipped:
Received: 2024/09/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Elements in Tissue by CRC ICPMS - Dry Wt	ICP/CRCM	B558553	2024/09/27	2024/10/10	Renegie Lampong
Moisture in Tissue	BAL/BAL	B540896	2024/09/27	2024/09/28	Cyrhea Goda

Bureau Veritas ID: CWC056
Sample ID: Z2-Root
Matrix: Vegetation
Collected: 2024/09/17
Shipped:
Received: 2024/09/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Elements in Tissue by CRC ICPMS - Dry Wt	ICP/CRCM	B558553	2024/09/27	2024/10/10	Renegie Lampong
Moisture in Tissue	BAL/BAL	B540896	2024/09/27	2024/09/28	Cyrhea Goda

Bureau Veritas ID: CWC057
Sample ID: Z2-Stem
Matrix: Vegetation
Collected: 2024/09/17
Shipped:
Received: 2024/09/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Elements in Tissue by CRC ICPMS - Dry Wt	ICP/CRCM	B558553	2024/09/27	2024/10/10	Renegie Lampong
Moisture in Tissue	BAL/BAL	B540896	2024/09/27	2024/09/28	Cyrhea Goda

Bureau Veritas ID: CWC058
Sample ID: Z3-Root
Matrix: Vegetation
Collected: 2024/09/17
Shipped:
Received: 2024/09/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Elements in Tissue by CRC ICPMS - Dry Wt	ICP/CRCM	B558553	2024/09/27	2024/10/10	Renegie Lampong
Moisture in Tissue	BAL/BAL	B540896	2024/09/27	2024/09/28	Cyrhea Goda

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Bureau Veritas Job #: C475079
Report Date: 2024/10/11

BUREAU VERITAS
Client Project #: Campobello job# C4T5695
Sampler Initials: JC

TEST SUMMARY

Bureau Veritas ID: CWC059
Sample ID: Z3-Stem
Matrix: Vegetation

Collected: 2024/09/17
Shipped:
Received: 2024/09/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Elements in Tissue by CRC ICPMS - Dry Wt	ICP/CRCM	B558553	2024/09/27	2024/10/10	Renegie Lampong
Moisture in Tissue	BAL/BAL	B540896	2024/09/27	2024/09/28	Cyrhea Goda

Bureau Veritas ID: CWC060
Sample ID: Z4-Root
Matrix: Vegetation

Collected: 2024/09/17
Shipped:
Received: 2024/09/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Elements in Tissue by CRC ICPMS - Dry Wt	ICP/CRCM	B558553	2024/09/27	2024/10/10	Renegie Lampong
Moisture in Tissue	BAL/BAL	B540896	2024/09/27	2024/09/28	Cyrhea Goda

Bureau Veritas ID: CWC061
Sample ID: Z4-Stem
Matrix: Vegetation

Collected: 2024/09/17
Shipped:
Received: 2024/09/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Elements in Tissue by CRC ICPMS - Dry Wt	ICP/CRCM	B558553	2024/09/27	2024/10/10	Renegie Lampong
Moisture in Tissue	BAL/BAL	B540896	2024/09/27	2024/09/28	Cyrhea Goda

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

GENERAL COMMENTS

Results relate only to the items tested.

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

QUALITY ASSURANCE REPORT

			Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
B540896	Moisture	2024/09/28					0.92	20		
B558553	Total (Dry Wt) Aluminum (Al)	2024/10/10	109	80 - 120	<1.0	mg/kg	14	40	37	N/A
B558553	Total (Dry Wt) Arsenic (As)	2024/10/10	108	80 - 120	<0.020	mg/kg	15	40	106	N/A
B558553	Total (Dry Wt) Barium (Ba)	2024/10/10	107	80 - 120	<0.050	mg/kg	18	40	98	N/A
B558553	Total (Dry Wt) Beryllium (Be)	2024/10/10	103	80 - 120	<0.010	mg/kg	NC	40		
B558553	Total (Dry Wt) Bismuth (Bi)	2024/10/10	107	80 - 120	<0.010	mg/kg	NC	40		
B558553	Total (Dry Wt) Boron (B)	2024/10/10	103	80 - 120	<1.0	mg/kg	12	40	94	N/A
B558553	Total (Dry Wt) Cadmium (Cd)	2024/10/10	105	80 - 120	<0.0050	mg/kg	9.7	40	100	N/A
B558553	Total (Dry Wt) Calcium (Ca)	2024/10/10	106	80 - 120	<10	mg/kg	8.6	60		
B558553	Total (Dry Wt) Chromium (Cr)	2024/10/10	107	80 - 120	<0.10	mg/kg	13	40	50	N/A
B558553	Total (Dry Wt) Copper (Cu)	2024/10/10	104	80 - 120	<0.050	mg/kg	7.1	40	93	N/A
B558553	Total (Dry Wt) Lead (Pb)	2024/10/10	104	80 - 120	<0.010	mg/kg	37	40		
B558553	Total (Dry Wt) Magnesium (Mg)	2024/10/10	104	80 - 120	<5.0	mg/kg	6.7	40	91	N/A
B558553	Total (Dry Wt) Molybdenum (Mo)	2024/10/10	104	80 - 120	<0.020	mg/kg	12	40	98	N/A
B558553	Total (Dry Wt) Nickel (Ni)	2024/10/10	106	80 - 120	<0.050	mg/kg	6.9	40	77	N/A
B558553	Total (Dry Wt) Phosphorus (P)	2024/10/10	106	80 - 120	<10	mg/kg	9.5	40		
B558553	Total (Dry Wt) Potassium (K)	2024/10/10	100	80 - 120	<10	mg/kg	6.4	40		
B558553	Total (Dry Wt) Selenium (Se)	2024/10/10	102	80 - 120	<0.050	mg/kg	NC	40		
B558553	Total (Dry Wt) Silver (Ag)	2024/10/10	101	80 - 120	<0.0050	mg/kg	NC	40		
B558553	Total (Dry Wt) Sodium (Na)	2024/10/10	105	80 - 120	<10	mg/kg	4.8	40	83	N/A
B558553	Total (Dry Wt) Strontium (Sr)	2024/10/10	106	80 - 120	<0.050	mg/kg	13	60	112	N/A
B558553	Total (Dry Wt) Tin (Sn)	2024/10/10	109	80 - 120	<0.10	mg/kg	26	40		
B558553	Total (Dry Wt) Titanium (Ti)	2024/10/10	103	80 - 120	<0.50	mg/kg	10	40		
B558553	Total (Dry Wt) Vanadium (V)	2024/10/10	106	80 - 120	<0.20	mg/kg	15	40		
B558553	Total (Dry Wt) Zinc (Zn)	2024/10/10	103	80 - 120	<0.20	mg/kg	10	40	93	N/A

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

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

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

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

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Bureau Veritas Job #: C475079
Report Date: 2024/10/11

BUREAU VERITAS
Client Project #: Campobello job# C4T5695
Sampler Initials: JC

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

David Huang, M.Sc., P.Chem., QP, Scientific Services Manager

Bureau Veritas Proprietary Software
Logiciel Propriétaire de Bureau Veritas

Automated Statchk

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Raphael Kwan, General Manager, BC and Yukon Regions responsible for British Columbia Environmental laboratory operations.

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

APPENDIX I:

Tree Growth

Table I-1
Poplar System Inspection Records
Twin Creeks Environmental Centre - Poplar System

Date: 9-Sep-24
Weather: Scattered clouds, 21°C, W 16 km/h

Monitoring of Poplar Tree Treatment System

Task	Monitoring Parameter	ZONE 1 - Leachate Application Area					
		Row 1	Row 4	Row 21	Row 32	Row 38	Geometric Mean
Visual Assessment	Tree Diameter (cm)	8.2	8.9	11.4	11.7	12.6	10.4
	Tree Height (m)	4.2	7.3	3.9	6.3	6.1	5.4
	Tree Mortality (%)	21					
	Crown Dieback (%)	<5	10	10	20	30	11
	Foliage Transparency (%)	15	20	10	15	15	15
	Crown Density (%)	70	75	70	60	60	67
	Leaf Size (cm) (length/width)	7.2	10.1	8.3	4.2	3.1	
		6.7	9.5	7.8	4.7	4.2	
		8.1	6.1	7.6	5.1	6.3	
		4.3	8.3	5.3	5.4	7.1	
		7.5	4.6	6.5	3.2	6.6	6.1
		9.1	7.1	6.6	6.1	6.2	6.2
		6.4	9.3	6.2	5.5	5.8	
		5.3	7.6	7.1	4.6	5.5	
		7.1	6.9	8.4	5.3	3.4	
		6.2	5.3	9.2	6.2	4.5	
	Discolouration of Leaves (%)	50	30	50	65	50	48
	Abnormally Shaped Leaves (%)	<5	5	10	15	10	7
	Length of New Tree Branch Extension Shoots (cm)	19.0	11.0	7.0	4.0	5.0	10.5
		18.0	12.0	7.0	8.0	8.0	
		23.0	15.0	5.0	12.0	10.0	
		17.0	10.0	10.0	15.0	8.0	
		21.0	13.0	8.0	10.0	12.0	
	Deformed Growth (%)	<5	20	20	30	20	14
	Insect Infestation (%)	10	30	35	20	10	18
Root Depth	Depth of Root Penetration (m)	0.63					
Inspections	Brace Root Inspection for Animal Damage	0	0	0	0	0	0

NOTES:

1) Blank denotes data is not available.
2) "m" denotes metre.
3) "cm" denotes centimetre.

Table I-1
Poplar System Inspection Records
Twin Creeks Environmental Centre - Poplar System

Date: 9-Sep-24
Weather: Scattered clouds, 21°C, W 16 km/h

Monitoring of Poplar Tree Treatment System

Task	Monitoring Parameter	ZONE 2 - Leachate Application Area					
		Row 5	Row 11	Row 27	Row 38	Row 42	Geometric Mean
Visual Assessment	Tree Diameter (cm)	12.6	18.2	14.2	12.9	16.4	14.7
	Tree Height (m)	7.3	7.2	10.5	5.6	8.5	7.7
	Tree Mortality (%)	16					
	Crown Dieback (%)	40	60	45	10	10	25.5
	Foliage Transparency (%)	<5	20	10	10	15	9
	Crown Density (%)	75	60	80	85	70	73
	Leaf Size (cm) (length/width)	4.5	6.1	8.2	2.2	1.9	
		6.7	6.5	6.3	4.2	3.3	
		5.3	4.3	7.1	5.2	6.2	
		4.2	5.7	5.9	4.7	4.2	
		6.2	8.2	4.6	4.6	5.7	5.2
		7.3	7.3	6.2	6.1	2.9	5.1
		6.5	7.9	7.5	5.0	4.3	
		5.7	6.4	6.3	3.4	4.6	
		6.1	5.2	5.5	4.1	5.1	
		5.2	4.9	4.3	3.7	5.0	
	Discolouration of Leaves (%)	<5	15	15	10	15	10
	Abnormally Shaped Leaves (%)	10	10	10	10	15	10.8
	Length of New Tree Branch Extension Shoots (cm)	4.0	12.0	10.0	13.0	30.0	
		6.0	15.0	8.0	8.0	15.0	
		9.0	9.0	11.0	4.0	22.0	10.6
		7.0	10.0	12.0	6.0	18.0	
		11.0	8.0	15.0	10.0	28.0	
	Deformed Growth (%)	10	10	15	10	15	9.1
	Insect Infestation (%)	<5	10	10	15	10	8.2
Root Depth	Depth of Root Penetration (m)	0.97					
Inspections	Brace Root Inspection for Animal Damage	0	0	0	0	0	0

NOTES:

1) Blank denotes data is not available.
2) "m" denotes metre.
3) "cm" denotes centimetre.

Table I-1
Poplar System Inspection Records
Twin Creeks Environmental Centre - Poplar System

Date: 9-Sep-24
Weather: Scattered clouds, 21°C, W 16 km/h

Monitoring of Poplar Tree Treatment System

Task	Monitoring Parameter	ZONE 3 - Leachate Application Area					
		Row 2	Row 6	Row 15	Row 26	Row 34	Geometric Mean
Visual Assessment	Tree Diameter (cm)	8.3	16.1	14.1	13.1	22.6	14.1
	Tree Height (m)	5.9	4.5	10.7	7.5	13.5	7.8
	Tree Mortality (%)	40					
	Crown Dieback (%)	<5	15	<5	<5	<5	4
	Foliage Transparency (%)	20	30	10	30	10	18
	Crown Density (%)	80	70	90	70	90	79
	Leaf Size (cm) (length/width)	7.4	9.0	8.8	12.2	10.2	
		6.6	9.4	6.4	8.0	11.4	
		7.6	20.2	10.2	5.2	8.6	
		8.4	5.2	8.6	4.8	7.8	
		8.2	6.6	10.4	4.4	6.6	7.9
		5.8	8.8	6.6	3.2	10.8	7.3
		8.8	10.4	4.8	7.2	12.0	
		7.4	8.0	7.2	6.4	9.8	
		7.6	4.4	6.2	4.2	9.2	
		10.2	6.2	12.4	4.8	6.6	
	Discolouration of Leaves (%)	<5	<5	<5	<5	<5	2.5
	Abnormally Shaped Leaves (%)	<5	<5	<5	<5	<5	2.5
	Length of New Tree Branch Extension Shoots (cm)	27.2	15.0	8.4	8.8	10.0	
		30.4	13.4	6.4	8.2	5.6	
		4.8	33.2	14.8	6.4	5.8	10.7
		23.6	12.8	21.6	10.2	8.4	
		17.2	7.8	10.2	4.2	4.8	
	Deformed Growth (%)	<5	<5	<5	<5	<5	2.5
	Insect Infestation (%)	<5	<5	<5	<5	<5	2.5
Root Depth	Depth of Root Penetration (m)	0.86					
Inspections	Brace Root Inspection for Animal Damage	0	0	0	0	0	0

NOTES:

1) Blank denotes data is not available.
2) "m" denotes metre.
3) "cm" denotes centimetre.

Table I-1
Poplar System Inspection Records
Twin Creeks Environmental Centre - Poplar System

Date: 9-Sep-24
Weather: Scattered clouds, 21°C, W 16 km/h

Monitoring of Poplar Tree Treatment System

Task	Monitoring Parameter	ZONE 4 - Leachate Application Area					
		Row 6	Row 11	Row 24	Row 37	Row 42	Geometric Mean
Visual Assessment	Tree Diameter (cm)	12.6	21.6	17.8	8.9	16.8	14.9
	Tree Height (m)	7.5	8.4	8.8	8.0	10.0	8.5
	Tree Mortality (%)	49					
	Crown Dieback (%)	<5	<5	15	20	40	9
	Foliage Transparency (%)	30	10	30	80	45	32
	Crown Density (%)	70	90	70	20	45	52
	Leaf Size (cm) (length/width)	5.5	8.6	4.4	5.2	3.4	
		5.8	10.8	4.6	4.8	7.7	
		6.4	14.0	5.2	4.4	4.6	
		7.4	6.6	8.2	6.6	2.2	
		8.8	8.4	6.1	6.4	5.6	6.2
		10.4	12.2	7.4	7.8	4.7	5.9
		6.6	9.8	6.8	6.4	6.1	
		4.2	7.0	5.4	5.4	4.2	
		10.8	4.2	5.2	8.2	3.8	
		5.2	9.2	10.0	4.2	1.3	
	Discolouration of Leaves (%)	10	<5	70	30	30	17
	Abnormally Shaped Leaves (%)	<5	<5	<5	<5	10	3
	Length of New Tree Branch Extension Shoots (cm)	44.0	10.0	20.5	52.2	30.0	15.3
		36.6	8.2	33.2	4.8	12.0	
		10.2	6.4	14.4	10.6	31.0	
		8.8	4.2	18.2	12.8	20.0	
		20.2	12.2	5.6	37.2	18.0	
	Deformed Growth (%)	<5	<5	<5	<5	15	3.6
	Insect Infestation (%)	<5	<5	<5	<5	30	4.1
Root Depth	Depth of Root Penetration (m)	1.40					
Inspections	Brace Root Inspection for Animal Damage	0	0	0	0	0	0

NOTES:

1) Blank denotes data is not available.
2) "m" denotes metre.
3) "cm" denotes centimetre.

Table I-2
Poplar System Inspection Records - Historical Summary
Twin Creeks Environmental Centre - Poplar System

Task	Inspection Parameter	Poplar System							
		S1 (Zone 1)							
		28-Sep-17	27-Sep-18	9-Sep-19	3-Sep-20	16-Sep-21	20-Sep-22	27-Sep-23	9-Sep-24
Visual Assessment	Tree Diameter (cm)	3.1	4.0	2.7	3.5	4.0	5.0	7.1	10.4
	Tree Height (m)	2.1	2.3	2.9	3.0	4.5	4.6	5.2	5.4
	Tree Mortality (%)	0	0	18	8	20	8	32	21
	Crown Density (%)	58	50	40	50	40	75	82	67
	Leaf Size (cm)	9.2	7.0	8.0	6.7	7.2	6.6	7.7	6.1
	(length/width)	8.9	6.2	7.8	6.0	7.4	6.3	7.5	6.2
	Discolouration Of Leaves (%)	38	25	5	8	5	83	83	48
	Length Of New Tree Branch Extension Shoots (cm)	25.3	27.0	41.5	21.0	15.9	11.3	8.2	10.5
	Insect Infestation (%)	<1.0	5.0	<5.0	2.5	2.5	4.4	2.5	18

NOTES:

1) Blank denotes data is not available.
2) "m" denotes metre.
3) "cm" denotes centimetre.
4) The tree mortality is based on the number of trees which died from the previous year (Determined from row 18).

Table I-2
Poplar System Inspection Records - Historical Summary
Twin Creeks Environmental Centre - Poplar System

Task	Inspection Parameter	Poplar System							
		S2 (Zone 2)							
		28-Sep-17	27-Sep-18	9-Sep-19	3-Sep-20	16-Sep-21	20-Sep-22	27-Sep-23	9-Sep-24
Visual Assessment	Tree Diameter (cm)	1.9	3.7	3.0	3.4	4.6	5.5	8.4	14.7
	Tree Height (m)	1.6	2.2	2.8	4.7	4.7	4.8	7.5	7.7
	Tree Mortality (%)	0	0	3	9	6	15	33	16
	Crown Density (%)	49	52	50	43	53	87	81	73
	Leaf Size (cm)	8.9	7.1	9.0	6.6	8.8	6.9	7.8	5.2
	(length/width)	8.4	6.8	9.0	6.2	9.5	6.5	7.6	5.1
	Discolouration Of Leaves (%)	37	24	3	3	4	56	86	10
	Length Of New Tree Branch Extension Shoots (cm)	26.9	32.3	45.9	11.1	18.7	11.7	9.3	10.6
	Insect Infestation (%)	<1.0	5.0	4.0	2.0	2.5	6.9	2.5	8.2

NOTES:

1) Blank denotes data is not available.
2) "m" denotes metre.
3) "cm" denotes centimetre.
4) The tree mortality is based on the number of trees which died from the previous year (Determined from row 13).

Table I-2
Poplar System Inspection Records - Historical Summary
Twin Creeks Environmental Centre - Poplar System

Task	Inspection Parameter	Poplar system							
		S3 (Zone 3)							
		28-Sep-17	27-Sep-18	9-Sep-19	3-Sep-20	16-Sep-21	20-Sep-22	27-Sep-23	9-Sep-24
Visual Assessment	Tree Diameter (cm)	2.6	5.0	3.7	6.3	5.5	7.2	8.3	14.1
	Tree Height (m)	2.1	2.5	4.1	4.4	5.3	6.2	7.8	7.8
	Tree Mortality (%)	3	0	3	4	11	24	45	40
	Crown Density (%)	50	55	49	59	45	78	78	79
	Leaf Size (cm)	9.5	7.0	10.3	7.1	7.9	6.0	7.9	7.9
	(length/width)	9.2	6.8	9.3	6.7	8.9	5.8	8.5	7.3
	Discolouration Of Leaves (%)	33	16	3	11	10	53	11	2.5
	Length Of New Tree Branch Extension Shoots (cm)	29.4	25.1	44.7	15.8	16.8	9.6	9.1	10.7
	Insect Infestation (%)	<1.0	5.7	2.0	2.5	2.5	2.5	2.5	2.5

NOTES:

1) Blank denotes data is not available.
2) "m" denotes metre.
3) "cm" denotes centimetre.
4) The tree mortality is based on the number of trees which died from the previous year (Determined from row 8).

Table I-2
Poplar System Inspection Records - Historical Summary
Twin Creeks Environmental Centre - Poplar System

Task	Inspection Parameter	Poplar system							
		S4 (Zone 4)							
		28-Sep-17	27-Sep-18	9-Sep-19	3-Sep-20	16-Sep-21	20-Sep-22	27-Sep-23	9-Sep-24
Visual Assessment	Tree Diameter (cm)	3.2	5.1	3.7	4.7	5.1	8.0	8.1	14.9
	Tree Height (m)	2.2	2.8	3.9	4.5	5.3	6.8	8.2	8.5
	Tree Mortality (%)	0	3	5	10	14	25	36	49
	Crown Density (%)	57	45	53	67	36	82	87	52
	Leaf Size (cm)	11.2	8.1	9.2	8.2	8.4	6.9	8.2	6.2
	(length/width)	10.7	7.7	8.6	8.0	8.7	6.5	7.9	5.9
	Discolouration Of Leaves (%)	14	16	5	8	8	75	75	28
	Length Of New Tree Branch Extension Shoots (cm)	31.0	29.6	49.3	24.1	11.4	6.5	5.9	15.3
	Insect Infestation (%)	<1.0	2.0	<5.0	3.0	2.5	2.5	2.5	4.1

NOTES:

1) Blank denotes data is not available.
2) "m" denotes metre.
3) "cm" denotes centimetre.
4) The tree mortality is based on the number of trees which died from the previous year (Determined from row 9).

APPENDIX J:

Surface Water Analytical Results

Table J-1
Precipitation Event Surface Water Quality - Field Analytical Results
Twin Creeks Environmental Centre - Poplar System

Station Number	Location	pH	Conductivity	Temperature	Turbidity	Dissolved Oxygen	Estimated Flow Rate
		(pH units)	(µS/cm)	(°C)	(NTU)	(mg/L)	(L/s)
First Quarter							
January 10, 2024 (Routine monitoring for January 9, 2024 precipitation event)							
SS14A	On-Site Flow into East Ditch Line, Upstream of Poplar System	7.6	1070	2.5	55.0	12.2	2
SS14B	On-Site Flow into West Ditch Line, Background of Poplar System	7.8	1280	2.6	189	13.1	3
SS15A	On-Site Flow into Sedimentation Pond 1, intersecting point of East and West Ditch Line South of the Poplar System	7.5	1080	5.9	13.6	12.4	17
Second Quarter							
April 12, 2024 (Routine monitoring for April 11, 2024 precipitation event)							
SS14A	On-Site Flow into East Ditch Line, Upstream of Poplar System	7.9	810	10.7	104	9.61	88
SS14B	On-Site Flow into West Ditch Line, Background of Poplar System	8.0	850	10.6	738	9.80	6
SS15A	On-Site Flow into Sedimentation Pond 1, intersecting point of East and West Ditch Line South of the Poplar System	7.8	770	10.2	234	9.41	23
Third Quarter							
July 10, 2024 (Routine and Storm event monitoring for July 9, 2024 precipitation event)							
SS14A	On-Site Flow into East Ditch Line, Upstream of Poplar System	8.0	853	21.0	501	7.20	3
SS14B	On-Site Flow into West Ditch Line, Background of Poplar System	8.3	760	20.1	>999	8.83	2
SS15A	On-Site Flow into Sedimentation Pond 1, intersecting point of East and West Ditch Line South of the Poplar System	7.7	940	20.3	167	7.09	5
Fourth Quarter							
October 14, 2024 (routine monitoring for October 13, 2024 precipitation event)							
SS14A	On-Site Flow into West Ditch Line, Background of Poplar System	8.4	722	10.9	266	10.6	3
SS14B	On-Site Flow into West Ditch Line, Background of Poplar System	8.6	1015	12.1	49.6	10.6	1
SS15A	On-Site Flow into Sedimentation Pond 1, intersecting point of East and West Ditch Line South of the Poplar System	8.3	650	10.0	120	10.3	24

NOTES:

1) INS denotes insufficient volume to sample.
2) mS/cm denotes milliSeimens per centimetre.
3) °C denotes degrees Celsius.
4) NTU denotes nephelometric turbidity unit.
5) mg/L denotes milligrams per litre.
6) L/s denotes litres per second.
7) Estimated Flow Rate = Average flow velocity (m/s) x channel width (m) x channel depth (m)
8) NR denotes monitoring not required, as there were no precipitation events greater than 10 mm in a 24 hr period recorded in that quarter that produced an observable flow.

Table J-2
Precipitation Event Surface Water Quality - Poplar System
Twin Creeks Environmental Centre - Poplar System

Parameter	Units	PWQO	East Ditch Line (Poplar System) - SS14 / SS14A										
Date			9-Apr-02	4-Apr-03	13-Jun-03	15-Sep-03	3-May-04	31-Jul-04	23-Sep-05	9-Nov-05	18-Jan-06	9-Mar-06	3-Aug-06
Routine/Storm Monitoring			Routine	Routine	Routine	Routine	Routine	Routine	Storm	Routine	Routine	Routine	Storm
Laboratory			Accutest	Accutest	Accutest	Accutest	Accutest	Accutest	Accutest	Accutest	Accutest	Accutest	Accutest
Alkalinity (as $CaCO_3$)	mg/L	<25%***	102	91	42	66	74	82	129	69	227	105	98
Chloride	mg/L		19	11	8	18	8	9	51	25	21	14	22
Sulphate	mg/L		155	193	443	340	426	178	244	103	163	78	318
Ammonia (as N)	mg/L		0.14	0.08	0.04	0	0.17	0.11	0.06	0.35	1.94	0.61	0.09
Ammonia Unionized	mg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Nitrate	mg/L		2.42	1.70	1.37	0.15	0.77	0.81	6.02	7.85	0.54	0.74	0.37
Nitrite	mg/L								0.18				<0.10
Phenols	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	mg/L	0.200	0.18	0.12	0.08	**0.22**	0.14	0.17	**0.32**	0.16	**0.38**	0.14	**0.24**
Calcium	mg/L		62	74	119	116	112	65	102	66	94	46	106
Chromium	mg/L	0.0089	<0.01	<0.005	<0.005	<0.005	<0.005	0.003	0.002	**0.026**	0.003	0.002	0.005
Iron	mg/L	0.300		**1.24**	**0.93**	0.22	**1.97**	**1.21**	**0.64**	**19.4**	**0.66**	**0.83**	**3.08**
Magnesium	mg/L		23	27	58	33	53	22	32	21	32	15	38
Potassium	mg/L		4	3	3	6	3	5	6	4	5	4	5
Sodium	mg/L		21	12	21	21	20	13	17	9	19	10	21
Nickel	mg/L	0.025	<0.01	<0.005	<0.005	<0.005	0.006	0.004	0.007	0.024	0.006	0.005	0.013
Zinc	mg/L	0.02	<0.01	0.008	<0.005	<0.005	<0.01	<0.01	0.01	**0.06**	0.01	<0.01	0.02
pH	(pH units)	6.5-8.5							7.42	7.84	7.73	7.48	7.49
Total Organic Carbon	mg/L								13.3		9.4	5.8	11.2
Aluminum	mg/L	0.075*							**0.73**				**2.56**
Arsenic	mg/L	0.100*							0.001				0.003
Barium	mg/L								0.03				0.04
Beryllium	mg/L	1.100							<0.001				<0.001
Bismuth	mg/L								<0.005				<0.005
Cadmium	mg/L	0.0002							<0.0001				0.0002
Cobalt	mg/L	0.0009							0.0009				**0.0034**
Dissolved Oxygen	mg/L								9.7				
Lead	mg/L	0.005							<0.001				0.001
Molybdenum	mg/L	0.040*							0.013				0.012
Selenium	mg/L	0.100							0.003				0.004
Silver	mg/L	0.0001							<0.0001				<0.0001
Strontium	mg/L								0.491				0.627
Tin	mg/L								<0.01				<0.01
Titanium	mg/L								0.03				<0.01
Total Kjeldahl Nitrogen (TKN)	mg/L								1.35				0.74
Total Phosphorus	mg/L	0.02*							**0.20**				**2.68**
Vanadium	mg/L	0.006*							0.004				0.006
Ion Percentage	%		2.5	2.8	3.4	35.8	1.1	2.0	0.0	8.2	2.0	2.3	1.6

NOTES:

1) PWQO denotes Provincial Water Quality Objectives (1994) with updates.
2) * denotes interim PWQO.
3) *** denotes change from background concentrations.
4) Historic chemical anomalies retained in database.
5) Unionized ammonia values are calculated based on field determined pH and temperature values.
6) mg/L denotes milligrams per litre.
7) umho/cm denotes microsiemens per centimeter.
8) BOD denotes biological oxygen demand.
9) COD denotes chemical oxygen demand.
10) Blank denotes parameter not analyzed.
11) Bolded text and shading denotes concentration exceeds criterion.

Table J-2
Precipitation Event Surface Water Quality - Poplar System
Twin Creeks Environmental Centre - Poplar System

Parameter	Units	PWQO	East Ditch Line (Poplar System) - SS14 / SS14A										
Date			5-Oct-06	17-Nov-06	2-Mar-07	9-Jan-08	19-Mar-08	14-Jun-08	17-Jul-08	9-Sep-08	4-Nov-08	12-Feb-09	6-Apr-09
Routine/Storm Monitoring			Routine	Storm	Routine	Routine	Routine	Storm	Storm	Storm	Storm	Routine	Routine
Laboratory			Accutest	Accutest	Accutest	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam
Alkalinity (as $CaCO_3$)	mg/L	<25%***	117	56	121	239	129		78	98	145	139	153
Chloride	mg/L		52	19	9	26	10	23	27	17	24	5	13
Sulphate	mg/L		108	25	72	242	70		257	216	251	69	180
Ammonia (as N)	mg/L		0.02	0.07	0.66		0.41	0.075	0.075	0.075	0.17	0.11	0.075
Ammonia Unionized	mg/L	0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Nitrate	mg/L		53.2	7.24	1.72	0.05	0.6	0.05	0.1	0.2	1.8	1.3	1.1
Nitrite	mg/L		<0.10	<0.10			0.02	<0.01	0.04	0.02	0.03	0.03	
Phenols	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001	<0.001	<0.001
Boron	mg/L	0.200	**0.23**	0.09	0.11	**0.51**	**0.23**	**0.25**	0.15	0.16	**0.24**	0.13	0.16
Calcium	mg/L		130	32	56	130	58	130	100	100	98	66	130
Chromium	mg/L	0.0089	0.002	<0.001	<0.001	**0.010**	**0.010**	**0.020**	0.008	**0.015**	**0.009**	**0.013**	**0.030**
Iron	mg/L	0.300	0.16	**0.47**	0.27	**4.6**	**5.6**	**20**	**7.8**	**10**	**4.7**	**13**	**29**
Magnesium	mg/L		38	10	17	39	19	45	37	36	35	20	43
Potassium	mg/L		7	4	4	5	5.2	6.9	5	8.5	8.4	4.8	7.2
Sodium	mg/L		20	7	10	20	11	22	21	16	15	6.6	13
Nickel	mg/L	0.025	<0.005	<0.005	<0.005	0.008	0.008	**0.032**	0.012	0.015	0.006	0.017	**0.045**
Zinc	mg/L	0.02	<0.01	<0.01	<0.01	0.02	0.02	**0.07**	**0.025**	**0.03**	0.02	**0.036**	**0.097**
pH	(pH units)	6.5-8.5	7.89	7.33	7.79	7.83	6.87	8.32	7.82	7.32	7.98	6.77	8.44
Total Organic Carbon	mg/L		8.9	7.7	7.1	10.0	7.4	13.5	9.7	6.1	12.5	9.4	17
Aluminum	mg/L	0.075*		**1.77**				**11**	**4.5**	**9.4**	**7.9**		
Arsenic	mg/L	0.100*		<0.001				0.007	0.004	0.004	0.002		
Barium	mg/L			0.05				0.098	0.05	0.085	0.063		
Beryllium	mg/L	1.100		<0.001				0.0007	<0.0006	<0.0006	<0.0006		
Bismuth	mg/L			<0.005					<0.001	<0.001	<0.001		
Cadmium	mg/L	0.0002		<0.0001				0.0002	<0.0001	<0.0001	<0.0001		
Cobalt	mg/L	0.0009		0.0008				**0.0088**	**0.0033**	**0.0044**	**0.0019**		
Copper	mg/L	0.005		0.004				**0.020**	**0.009**	**0.009**	**0.006**		
Lead	mg/L	0.005		0.002				**0.011**	0.0038	0.0044	0.0018		
Molybdenum	mg/L	0.040*		<0.005				0.025	0.027	0.023	0.011		
Selenium	mg/L	0.100		<0.001				<0.002	<0.05	<0.005	<0.005		
Silver	mg/L	0.0001		<0.0001				**0.0002**		<0.0001	<0.0001		
Strontium	mg/L			0.086				0.52	0.44	0.50	0.43		
Tin	mg/L			<0.01				<0.001	<0.002	<0.002	<0.002		
Titanium	mg/L			<0.01				0.22		0.27	0.25		
Total Kjeldahl Nitrogen (TKN)	mg/L		0.92	1.91				3	1	0.8	1.5		
Total Phosphorus	mg/L	0.02*	**0.11**	**0.87**				**0.33**	**0.21**	**<0.15**	**0.15**		
Vanadium	mg/L	0.006*		0.002				**0.025**	**0.009**	**0.022**	**0.016**		
Ion Percentage	%		15.6	9.1	6.1	2.6	7.1		5.1	7.4	1.1	8.4	12.0
Benzene	ug/L							<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	ug/L							<0.2	<0.2	<0.3	<0.2	<0.3	<0.3
Ethylbenzene	ug/L							<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o-Xylene	ug/L							<0.2	<0.2	<0.3	<0.2	<0.3	<0.3
p+m-Xylene	ug/L							<0.4	<0.4	<0.6	<0.4	<0.6	<0.6
Total Xylenes	ug/L							<0.4	<0.4	<0.6	<0.4	<0.6	<0.6
Total Oil & Grease	mg/L							<0.5	<0.5	<0.5	<0.5		

NOTES:

1) PWQO denotes Provincial Water Quality Objectives (1994) with updates.
2) * denotes interim PWQO.
3) *** denotes change from background concentrations.
4) Historic chemical anomalies retained in database.
5) Unionized ammonia values are calculated based on field determined pH and temperature values.
6) mg/L denotes milligrams per litre.
7) umho/cm denotes microsiemens per centimeter.
8) BOD denotes biological oxygen demand.
9) COD denotes chemical oxygen demand.
10) Blank denotes parameter not analyzed.
11) Bolded text and shading denotes concentration exceeds criterion.

Table J-2
Precipitation Event Surface Water Quality - Poplar System
Twin Creeks Environmental Centre - Poplar System

Parameter	Units	PWQO	East Ditch Line (Poplar System) - SS14 / SS14A										
Date			9-Aug-09	10-Oct-09	24-Oct-09	25-Jan-10	6-Apr-10	6-Jun-10	14-Oct-10	28-Feb-11	20-Apr-11	7-Jun-11	8-Aug-11
Routine/Storm Monitoring			Routine	Storm	Routine	Routine	Routine	Storm	Storm	Routine	Routine	Storm	Storm
Laboratory			Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam
Alkalinity (as $CaCO_3$)	mg/L	<25%***	80		120	126	91		95	122	179		132
Chloride	mg/L		22	32	31	8	8	9	18	11	17	3	13
Sulphate	mg/L		210		350	99	150		220	89	210		290
Ammonia (as N)	mg/L		0.075	0.075	0.075	0.075	0.270	0.230	0.075	0.570	0.075	0.150	0.075
Ammonia Unionized	mg/L	0.02	<0.02		<0.02	<0.02	<0.02		<0.02	<0.02	<0.02		<0.02
Nitrate	mg/L		0.5	0.9	0.3	1.3	0.7	0.7	0.05	2.3	0.3	0.02	0.05
Nitrite	mg/L			0.03					0.01			0.3	<0.01
Phenols	mg/L	0.001	<0.001		<0.001	<0.001	<0.001		<0.001	<0.001	<0.001		
Boron	mg/L	0.200	0.08	0.14	0.10	0.12	**0.4**	0.14	0.09	0.17	**0.31**	0.13	**0.25**
Calcium	mg/L		66	120	130	64	670	180	95	60	100	51	120
Chromium	mg/L	0.0089	<0.005	<0.005	<0.005	0.006	**0.26**	**0.073**	<0.005	<0.005	<0.005	**0.045**	<0.005
Iron	mg/L	0.300	**1.8**	**1.0**	**1.4**	**3.0**	**260**	**76**	**2.5**	**1.5**	**3.6**	**45**	**0.8**
Magnesium	mg/L		22	40	44	19	160	48	23	20	34	18	27
Potassium	mg/L		3.9	4.3	7.1	5.0	41	11	7.7	4.6	4.2	7.5	6.7
Sodium	mg/L		12	19	20	7.3	16	9.1	11	8.3	15	4.3	14
Nickel	mg/L	0.025	0.004	<0.001	0.003	0.004	**0.36**	**0.11**	0.003	0.002	0.006	**0.056**	0.002
Zinc	mg/L	0.02	0.009	<0.01	**0.031**	0.012	**0.78**	**0.16**	0.010	0.012	0.019	**0.12**	<0.005
pH	(pH units)	6.5-8.5	7.48	8.24	7.88	8.65	7.94	7.94	7.85	7.85	7.91	7.23	7.35
Total Organic Carbon	mg/L		6.9		8.2	5.8	14.8		10.7	6.0	13.2		11.1
Aluminum	mg/L	0.075*		**0.91**				**40**	**4.1**			**28**	**0.72**
Arsenic	mg/L	0.100*		<0.001				0.019	0.001			0.011	0.003
Barium	mg/L			0.039				0.23	0.048			0.17	0.053
Beryllium	mg/L	1.100		<0.0006				0.0024	<0.0006			0.0014	<0.0005
Bismuth	mg/L			<0.001				<0.001	<0.001			<0.001	0.001
Cadmium	mg/L	0.0002		<0.0001				**0.0003**	<0.0001			**0.0003**	<0.0001
Cobalt	mg/L	0.0009		0.0005				**0.032**	0.0008			**0.016**	0.0007
Copper	mg/L	0.005		0.003				**0.055**	0.003			**0.028**	0.004
Lead	mg/L	0.005		<0.0005				**0.029**	0.0012			**0.019**	<0.0005
Molybdenum	mg/L	0.040*		0.014				0.022	0.008			0.010	0.019
Selenium	mg/L	0.100		<0.005				<0.005	<0.005			<0.005	<0.002
Silver	mg/L	0.0001		<0.0001				<0.0001	<0.0001			<0.0001	
Strontium	mg/L			0.52				0.46	0.33			0.16	0.44
Tin	mg/L			<0.002				<0.002	<0.002			<0.002	<0.001
Titanium	mg/L			0.026				0.75	0.16			0.51	0.021
Total Kjeldahl Nitrogen (TKN)	mg/L			0.9				5	1.2			11	1
Total Phosphorus	mg/L	0.02*		**0.05**				**1.3**	**0.11**			**0.10**	**0.10**
Vanadium	mg/L	0.006*		0.002				**0.079**	**0.009**			**0.053**	0.002
Ion Percentage	%		2.4		2.4	4.6	40.9		2.4	2.7	0.2		0.3
Benzene	ug/L		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	ug/L		<0.3	<0.2	<0.3	<0.3	<0.3	<0.2	<0.2	<0.3	<0.3	<0.2	<0.3
Ethylbenzene	ug/L		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o-Xylene	ug/L		<0.3	<0.2	<0.3	<0.3	<0.3	<0.2	<0.2	<0.3	<0.3	<0.2	<0.3
p+m-Xylene	ug/L		<0.6	<0.4	<0.6	<0.6	<0.6	<0.4	<0.4	<0.6	<0.6	<0.4	<0.6
Total Xylenes	ug/L		<0.6	<0.4				<0.4	<0.4			<0.4	<0.6
Total Oil & Grease	mg/L			<0.5				<0.5	<1			<0.5	

NOTES:

1) PWQO denotes Provincial Water Quality Objectives (1994) with updates.
2) * denotes interim PWQO.
3) *** denotes change from background concentrations.
4) Historic chemical anomalies retained in database.
5) Unionized ammonia values are calculated based on field determined pH and temperature values.
6) mg/L denotes milligrams per litre.
7) umho/cm denotes microsiemens per centimeter.
8) BOD denotes biological oxygen demand.
9) COD denotes chemical oxygen demand.
10) Blank denotes parameter not analyzed.
11) Bolded text and shading denotes concentration exceeds criterion.

Table J-2
Precipitation Event Surface Water Quality - Poplar System
Twin Creeks Environmental Centre - Poplar System

Parameter	Units	PWQO	East Ditch Line (Poplar System) - SS14A										
Date			13-Oct-11	13-Mar-12	4-May-12	28-Jul-12	30-Oct-12	13-Jan-13	10-Apr-13	29-May-13	5-Jul-13	28-Aug-13	7-Oct-13
Routine/Storm Monitoring			Routine	Routine	Routine	Routine	Routine	Routine	Routine	Storm	Routine	Storm	Routine
Laboratory			Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam
Alkalinity (as $CaCO_3$)	mg/L	<25%***	176	140	92	92	74	150	130		81		160
Chloride	mg/L		20	12	12	12	6	7	9	7	6	5	15
Sulphate	mg/L		210	170	250	190	94	120	120		130		110
Ammonia (as N)	mg/L		0.075	0.075	0.075	0.075	0.200	0.075	0.075	0.150	0.075	0.075	0.075
Ammonia Unionized	mg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02		<0.021		<0.0076
Nitrate	mg/L		0.7	1.6	1.8	0.99	2.4	0.56	1.0	0.17	0.05	0.05	0.05
Nitrite	mg/L									0.032		<0.010	
Phenols	mg/L	0.001	**0.015**	**0.0013**	<0.0010	**0.0035**	<0.0010	<0.0010	<0.0010		<0.0010		0.0012
Boron	mg/L	0.200	0.20	0.19	0.18	**0.22**	0.093	0.14	0.14	**0.23**	**1.5**	**0.49**	**0.39**
Calcium	mg/L		120	88	100	95	51	79	80	87	92	58	80
Chromium	mg/L	0.0089	0.007	**0.013**	0.0051	**0.0094**	**0.026**	0.0064	0.0063	<0.005	<0.005	0.006	<0.0050
Iron	mg/L	0.300	**5.6**	**11**	**3.2**	**9.0**	**25**	**6.1**	**3.3**	**1.2**	**3.8**	**4.1**	**2.2**
Magnesium	mg/L		28	26	26	24	18	23	21	22	32	15	22
Potassium	mg/L		13	6.6	4.7	5.1	8.2	5.0	5.8	5.1	9	7.7	9.1
Sodium	mg/L		14	10	12	12	5.9	8.7	8.5	9.4	68	10	13
Nickel	mg/L	0.025	0.011	0.015	0.005	0.013	**0.029**	0.0081	0.0051	0.004	0.013	0.006	0.0041
Zinc	mg/L	0.02	**0.044**	**0.032**	0.019	**0.030**	**0.061**	0.018	0.012	0.02	0.016	0.01	0.01
pH	(pH units)	6.5-8.5	7.10	7.92	8.12	7.22	7.69	7.82	7.00		8.37	8.33	8.21
Total Organic Carbon	mg/L		33.3	16	23	14	9.4	10	9.5		8.1		14
Aluminum	mg/L	0.075*								**0.80**		**6.1**	
Arsenic	mg/L	0.100*								0.001		0.003	
Barium	mg/L									0.035		0.061	
Beryllium	mg/L	1.100								<0.0006		<0.0006	
Bismuth	mg/L									<0.0010		<0.0010	
Cadmium	mg/L	0.0002								<0.0001		<0.0001	
Cobalt	mg/L	0.0009								0.0007		**0.0017**	
Copper	mg/L	0.005								**0.007**		**0.008**	
Lead	mg/L	0.005								0.001		0.0019	
Molybdenum	mg/L	0.040*								0.011		0.017	
Selenium	mg/L	0.100								<0.005		<0.005	
Silver	mg/L	0.0001								<0.00010		<0.00010	
Strontium	mg/L									0.29		0.25	
Tin	mg/L									<0.002		<0.002	
Titanium	mg/L									0.017		0.26	
Total Kjeldahl Nitrogen (TKN)	mg/L									1.3		1.3	
Total Phosphorus	mg/L	0.02*								**0.093**		**0.10**	
Vanadium	mg/L	0.006*								0.002		0.014	
Ion Percentage	%		2.2	1.6	1.2	4.6	5.6	2.7	3.9		20.1		2.8
Benzene	ug/L		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20	<0.2	<0.20	<0.2
Toluene	ug/L		<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.20	<0.3	<0.20	<0.3
Ethylbenzene	ug/L		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20	<0.2	<0.20	<0.2
o-Xylene	ug/L		<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.20	<0.3	<0.20	<0.3
p+m-Xylene	ug/L		<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.40	<0.6	<0.40	<0.6
Total Xylenes	ug/L												
Total Oil & Grease	mg/L												

NOTES:

1) PWQO denotes Provincial Water Quality Objectives (1994) with updates.
2) * denotes interim PWQO.
3) *** denotes change from background concentrations.
4) Historic chemical anomalies retained in database.
5) Unionized ammonia values are calculated based on field determined pH and temperature values.
6) mg/L denotes milligrams per litre.
7) umho/cm denotes microsiemens per centimeter.
8) BOD denotes biological oxygen demand.
9) COD denotes chemical oxygen demand.
10) Blank denotes parameter not analyzed.
11) Bolded text and shading denotes concentration exceeds criterion.

Table J-2
Precipitation Event Surface Water Quality - Poplar System
Twin Creeks Environmental Centre - Poplar System

Parameter	Units	PWQO	East Ditch Line (Poplar System) - SS14A										
Date			**11-Jan-14**	**8-Apr-14**	**7-Jul-14**	**15-Oct-14**	**4-Jan-15**	**10-Apr-15**	**25-Oct-15**	**25-Feb-16**	**7-Apr-16**	**21-Oct-16**	**12-Jan-17**
Routine/Storm Monitoring			**Routine**	**Routine**	**Routine**	**Routine**	**Routine**	**Routine**	**Routine**	**Routine**	**Routine**	**Routine**	**Routine**
Laboratory			**Maxxam**	**Maxxam**	**Maxxam**	**Maxxam**	**Maxxam**	**Maxxam**	**Maxxam**	**Maxxam**	**Maxxam**	**Maxxam**	**Maxxam**
Alkalinity (as $CaCO_3$)	mg/L	<25%***	64		52	200	70	220	180	180	180	91	120
Chloride	mg/L		7	140	5	24	10	15	35	11	7.4	33	21
Sulphate	mg/L		37	190	23	96	37	110	250	160	93	290	56
Ammonia (as N)	mg/L		0.58	0.075	0.08	0.075	0.45	0.075	0.075	0.075	0.24	0.075	0.49
Ammonia Unionized	mg/L	0.02	0.009	<0.0013	<0.0073	<0.0028	0.0051	<0.009	<0.00076	<0.0021	0.0019	<0.0048	0.0014
Nitrate	mg/L		1.4	0.05	0.31	0.05	1.22	0.05	0.1	0.37	0.12	4.64	1.81
Nitrite	mg/L												
Phenols	mg/L	0.001	**0.002**	**0.005**	**0.002**	**0.0097**	**0.0077**	<0.0010	<0.0010	<0.0010	<0.0010	*<0.0040*	*<0.0040*
Boron	mg/L	0.200	0.06	**1.5**	0.10	0.18	0.063	0.10	**0.54**	0.16	0.10	0.07	0.13
Calcium	mg/L		30	100	25	85	33	91	110	89	73	120	120
Chromium	mg/L	0.0089	<0.0050	<0.0050	**0.027**	<0.0050	<0.0050	<0.0050	<0.005	<0.0050	**0.011**	<0.005	0.061
Iron	mg/L	0.300	**0.33**	0.21	**24.0**	**3.3**	**2.2**	**0.58**	**0.60**	**0.32**	**6.2**	**0.90**	**58**
Magnesium	mg/L		7.8	36	9	29	8.7	26	24	26	22	27	34
Potassium	mg/L		7.3	8.4	7.8	13	8.3	5.2	5.9	4.1	5.8	3.7	17
Sodium	mg/L		3.4	110	2	9.5	3.3	8.9	31	11	8.2	16	7.1
Nickel	mg/L	0.025	<0.0010	0.01	**0.031**	0.0056	0.0033	0.002	0.002	0.0013	0.0078	0.006	0.077
Zinc	mg/L	0.02	0.0089	0.0059	**0.065**	**0.023**	0.013	0.006	<0.01	0.0077	**0.027**	<0.01	0.15
pH	(pH units)	6.5-8.5	8.07	7.73	7.97	7.85	7.99	8.45	7.46	8.21	7.72	8.24	7.40
Total Organic Carbon	mg/L		7.5	12	16	33	9.2	9.7	10	5.9	9.5	10	8.6
Aluminum	mg/L	0.075*											
Arsenic	mg/L	0.100*											
Barium	mg/L												
Beryllium	mg/L	1.100											
Bismuth	mg/L												
Cadmium	mg/L	0.0002											
Cobalt	mg/L	0.0009											
Copper	mg/L	0.005											
Lead	mg/L	0.005											
Molybdenum	mg/L	0.040*											
Selenium	mg/L	0.100											
Silver	mg/L	0.0001											
Strontium	mg/L												
Tin	mg/L												
Titanium	mg/L												
Total Kjeldahl Nitrogen (TKN)	mg/L												
Total Phosphorus	mg/L	0.02*											
Vanadium	mg/L	0.006*											
Ion Percentage	%		2.5		8.0	2.6	2.7	0.3	2.4	0.4	0.9	0.5	20.3
Benzene	ug/L		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.10	<0.10
Toluene	ug/L		<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.10	<0.20
Ethylbenzene	ug/L		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20	<0.10
o-Xylene	ug/L		<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.10	<0.10
p+m-Xylene	ug/L		<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.10	<0.10
Total Xylenes	ug/L											<0.10	<0.10
Total Oil & Grease	mg/L												

NOTES:

1) PWQO denotes Provincial Water Quality Objectives (1994) with updates.
2) * denotes interim PWQO.
3) *** denotes change from background concentrations.
4) Historic chemical anomalies retained in database.
5) Unionized ammonia values are calculated based on field determined pH and temperature values.
6) mg/L denotes milligrams per litre.
7) umho/cm denotes microsiemens per centimeter.
8) BOD denotes biological oxygen demand.
9) COD denotes chemical oxygen demand.
10) Blank denotes parameter not analyzed.
11) Bolded text and shading denotes concentration exceeds criterion.
12) Italics denotes parameter concentration was below the laboratory RDL, where the RDL exceeds the relevant PWQO.

Table J-2
Precipitation Event Surface Water Quality - Poplar System
Twin Creeks Environmental Centre - Poplar System

Parameter	Units	PWQO	East Ditch Line (Poplar System) - SS14A										
Date			6-Apr-17	13-Jul-17	28-Oct-17	23-Jan-18	4-Apr-18	8-Aug-18	8-Aug-18	31-Oct-18	7-Feb-19	17-Apr-19	2-Oct-19
Routine/Storm Monitoring			Routine	Routine	Routine	Routine	Routine	Routine	Storm	Routine	Routine	Routine	Routine
Laboratory			Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Bureau Veritas
Alkalinity (as $CaCO_3$)	mg/L	<25%***	220	98	120	160	170	84		140	190	230	150
Chloride	mg/L		33	4.4	17	13	13	4.6	4.7	13	13	15	6.3
Sulphate	mg/L		160	26	200	150	110	97		72	95	210	180
Ammonia (as N)	mg/L		0.075	0.075	0.03	0.22	0.13	0.025	0.025	0.057	0.025	0.025	0.025
Ammonia Unionized	mg/L	0.02	<0.0005	<0.013	<0.0005	0.0061	<0.0005	<0.0005		<0.00061	<0.00061	<0.0079	<0.0015
Nitrate	mg/L		0.55	0.05	1.28	1.84	1.22	0.05	0.1	0.9	1.5	0.05	0.11
Nitrite	mg/L								<0.010				
Phenols	mg/L	0.001	*<0.0040*	*<0.0040*	<0.0010	<0.0010	<0.0010	<0.0010		<0.0010	<0.0010	<0.0010	0.001
Boron	mg/L	0.200	0.19	0.1	0.09	0.11	**0.29**	0.07	0.07	0.06	0.06	0.1	0.16
Calcium	mg/L		110	53	86	79	83	57	58	60	74	110	87
Chromium	mg/L	0.0089	<0.005	0.016	<0.005	<0.005	**0.013**	**0.011**	**0.01**	<0.005	<0.005	<0.005	<0.005
Iron	mg/L	0.300	**1.8**	**18**	**1.8**	**3.3**	**13**	**9.2**	**8.4**	**4.4**	<0.1	0.1	**1.6**
Magnesium	mg/L		34	11	23	27	26	14	14	18	26	43	28
Potassium	mg/L		7.5	6.2	6.3	4.4	5.9	0.014	6	11	5.5	4.9	4.4
Sodium	mg/L		18	7	10	9.6	12	6.1	5.2	4.3	7.5	13	10
Nickel	mg/L	0.025	0.004	0.028	0.003	0.006	0.016	**5.2**	0.012	0.007	0.001	0.001	0.004
Zinc	mg/L	0.02	0.02	0.14	0.02	<0.01	0.04	0.02	0.02	0.02	<0.01	<0.01	<0.01
pH	(pH units)	6.5-8.5	7.19	8.17	7.25	8.4	7.21	7.06	7.06	6.72	7.85	**8.53**	7.86
Total Organic Carbon	mg/L		11	12	10	6.2	12	11		15	9.9	9.7	10
Aluminum	mg/L	0.075*							**5.3**				
Arsenic	mg/L	0.100*							0.003				
Barium	mg/L								0.045				
Beryllium	mg/L	1.100							<0.0006				
Bismuth	mg/L								<0.001				
Cadmium	mg/L	0.0002							<0.0001				
Cobalt	mg/L	0.0009							**0.0034**				
Copper	mg/L	0.005							**0.01**				
Lead	mg/L	0.005							0.0035				
Molybdenum	mg/L	0.040*							0.007				
Selenium	mg/L	0.100							<0.005				
Silver	mg/L	0.0001							*<0.0004*				
Strontium	mg/L								0.18				
Tin	mg/L								<0.002				
Titanium	mg/L								0.075				
Total Kjeldahl Nitrogen (TKN)	mg/L								<0.7				
Total Phosphorus	mg/L	0.02*							**0.18**				
Vanadium	mg/L	0.006*							**0.011**				
Ion Percentage	%		1.7	11.1	1.1	0.1	3.6	2.7	47.1	1.5	0.6	0.8	0.9
Benzene	ug/L		<0.10	<0.10	<0.10	<0.10	<0.25	<0.20	<0.20	<0.25	<0.20	<0.25	<0.50
Toluene	ug/L		<0.20	<0.20	<0.10	<0.20	<0.50	<0.20	<0.20	<0.50	<0.40	<0.50	<1.0
Ethylbenzene	ug/L		<0.10	<0.10	<0.20	<0.10	<0.25	<0.20	<0.20	<0.25	<0.20	<0.25	<0.50
o-Xylene	ug/L		<0.10	<0.10	<0.10	<0.10	<0.25	<0.20	<0.20	<0.25	<0.20	<0.25	<0.50
p+m-Xylene	ug/L		<0.10	<0.10	<0.10	<0.10	<0.25	<0.20	<0.20	<0.25	<0.20	<0.25	<0.50
Total Xylenes	ug/L		<0.10	<0.10	<0.10	<0.10	<0.25	<0.20	<0.20	<0.25	<0.20	<0.25	<0.50
Total Oil & Grease	mg/L												

NOTES:

1) PWQO denotes Provincial Water Quality Objectives (1994) with updates.
2) * denotes interim PWQO.
3) *** denotes change from background concentrations.
4) Historic chemical anomalies retained in database.
5) Unionized ammonia values are calculated based on field determined pH and temperature values.
6) mg/L denotes milligrams per litre.
7) umho/cm denotes microsiemens per centimeter.
8) BOD denotes biological oxygen demand.
9) COD denotes chemical oxygen demand.
10) Blank denotes parameter not analyzed.
11) Bolded text and shading denotes concentration exceeds criterion.
12) Italics denotes parameter concentration was below the laboratory RDL, where the RDL exceeds the relevant PWQO.

Table J-2
Precipitation Event Surface Water Quality - Poplar System
Twin Creeks Environmental Centre - Poplar System

Parameter	Units	PWQO	East Ditch Line (Poplar System) - SS14A										
Date			**2-Oct-19**	**11-Jan-20**	**18-May-20**	**15-Nov-20**	**26-Mar-21**	**23-Sep-21**	**23-Sep-21**	**26-Oct-21**	**17-Feb-22**	**4-May-22**	**28-Sep-22**
Routine/Storm Monitoring			**Storm**	**Routine**	**Routine**	**Routine**	**Routine**	**Routine**	**Storm**	**Routine**	**Routine**	**Routine**	**Routine**
Laboratory			**Bureau Veritas**	**Bureau Veritas**	**Bureau Veritas**	**Bureau Veritas**	**Bureau Veritas**	**Bureau Veritas**	**Bureau Veritas**	**Bureau Veritas**	**Bureau Veritas**	**Bureau Veritas**	**Bureau Veritas**
Alkalinity (as $CaCO_3$)	mg/L	<25%***		120	170	170	150	170		290	84	270	130
Chloride	mg/L		6.9	8.6	5.6	210	14	9.4	9.3	12	4.8	11	22
Sulphate	mg/L			74	140	200	150	130		140	14	93	66
Ammonia (as N)	mg/L		0.025	0.025	0.078	0.064	0.025	0.025	0.075	0.11	2.1	0.025	0.025
Ammonia Unionized	mg/L	0.02		0.00048	0.0035	0.00083	<0.00055	<0.0012		0.0008	0.0060	<0.0039	<0.0011
Nitrate	mg/L		0.16	0.49	0.22	23.7	1.88	0.05	0.05	0.22	0.35	0.05	0.05
Nitrite	mg/L		0.019						<0.010				
Phenols	mg/L	0.001		0.0005	<0.0010	<0.0010	<0.0010	<0.0010		<0.0010	<0.0010	<0.0010	<0.0010
Boron	mg/L	0.200	0.15	0.03	0.06	**1.30**	0.05	0.07	0.07	0.07	0.03	0.09	0.08
Calcium	mg/L		86	55	72	130	83	80	79	110	26	94	70
Chromium	mg/L	0.0089	0.0025	0.0025	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Iron	mg/L	0.300	**1.6**	**2.5**	**1.9**	**1.8**	**1.2**	**0.4**	**0.4**	**0.4**	**4.3**	**0.6**	**1.0**
Magnesium	mg/L		29	17	22	42	26	24	23	35	6.9	32	21
Potassium	mg/L		4.4	0.004	3.5	18	7.4	8.5	8.4	6.8	8.4	4.2	4.1
Sodium	mg/L		10	4.4	6.8	120	8.7	7.4	7.1	8.9	2.3	9.2	9.7
Nickel	mg/L	0.025	0.004	0.004	0.004	0.017	0.003	0.002	0.002	0.002	0.007	0.002	0.003
Zinc	mg/L	0.02	<0.01	0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01
pH	(pH units)	6.5-8.5	8.0	8.2	8.2	7.8	7.8	7.9	7.9	7.6	7.4	8.3	7.8
Total Organic Carbon	mg/L			7.5	18.0	23	18	12		10	14	11	9.9
Aluminum	mg/L	0.075*	**1**						**0.23**				
Arsenic	mg/L	0.100*	0.001						<0.001				
Barium	mg/L		0.043						0.044				
Beryllium	mg/L	1.100	<0.0006						<0.0006				
Bismuth	mg/L		<0.001						<0.001				
Cadmium	mg/L	0.0002	<0.0001						<0.0001				
Cobalt	mg/L	0.0009	0.0008						<0.0005				
Copper	mg/L	0.005	0.005						0.005				
Lead	mg/L	0.005	0.001						<0.0005				
Molybdenum	mg/L	0.040*	0.012						0.008				
Selenium	mg/L	0.100	<0.005						<0.005				
Silver	mg/L	0.0001	*<0.0004*						*<0.0004*				
Strontium	mg/L		0.4						0.32				
Tin	mg/L		<0.002						<0.002				
Titanium	mg/L		0.021						0.007				
Total Kjeldahl Nitrogen (TKN)	mg/L		<0.7						0.8				
Total Phosphorus	mg/L	0.02*	**0.088**						**0.091**				
Vanadium	mg/L	0.006*	0.003						<0.001				
Ion Percentage	%		47.4	0.9	3.0	3.7	1.2	0.5	46.1	0.4	1.0	0.6	5.8
Benzene	ug/L		<0.20	<0.10	<0.25	<0.25	<0.25	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Toluene	ug/L		<0.20	<0.20	<0.50	<0.50	<0.50	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Ethylbenzene	ug/L		<0.20	<0.10	<0.25	<0.25	<0.25	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
o-Xylene	ug/L		<0.20	<0.10	<0.25	<0.25	<0.25	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
p+m-Xylene	ug/L		<0.20	<0.10	<0.25	<0.25	<0.25	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Total Xylenes	ug/L		<0.20	<0.10	<0.25	<0.25	<0.25	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Total Oil & Grease	mg/L												

NOTES:

1) PWQO denotes Provincial Water Quality Objectives (1994) with updates.
2) * denotes interim PWQO.
3) *** denotes change from background concentrations.
4) Historic chemical anomalies retained in database.
5) Unionized ammonia values are calculated based on field determined pH and temperature values.
6) mg/L denotes milligrams per litre.
7) umho/cm denotes microsiemens per centimeter.
8) BOD denotes biological oxygen demand.
9) COD denotes chemical oxygen demand.
10) Blank denotes parameter not analyzed.
11) Bolded text and shading denotes concentration exceeds criterion.
12) Italics denotes parameter concentration was below the laboratory RDL, where the RDL exceeds the relevant PWQO.

Table J-2
Precipitation Event Surface Water Quality - Poplar System
Twin Creeks Environmental Centre - Poplar System

Parameter	Units	PWQO	East Ditch Line (Poplar System) - SS14A										
Date			28-Sep-22	19-Oct-22	10-Feb-23	4-Apr-23	7-Jul-23	7-Jul-23	13-Jul-23	2-Nov-23	10-Jan-24	12-Apr-24	10-Jul-24
Routine/Storm Monitoring			Storm	Routine	Routine	Routine	Routine	Storm	Storm	Routine	Routine	Routine	Routine+Storm
Laboratory			Bureau Veritas	Bureau Veritas	Bureau Veritas	Bureau Veritas	Bureau Veritas	Bureau Veritas	Bureau Veritas	Bureau Veritas	Bureau Veritas	Bureau Veritas	Bureau Veritas
Alkalinity (as $CaCO_3$)	mg/L	<25%***		120	210	140	160			230	190	200	83
Chloride	mg/L		24	8.7	9.6	3.4	5	4.7	1.4	12	14	6.9	1.3
Sulphate	mg/L			89	180	65	110			210	170	130	250
Ammonia (as N)	mg/L		0.075	0.2	<0.050	<0.050	<0.050	<0.15	<0.15	<0.050	<0.050	<0.050	<0.15
Ammonia Unionized	mg/L	0.02		0.0027	<0.00076	<0.00061	<0.0035			<0.00061	<0.00061	<0.00094	<0.0075
Nitrate	mg/L		0.05	<0.10	0.40	0.82	<0.10	<0.10	<0.10	<0.10	0.98	0.77	0.27
Nitrite	mg/L		<0.010					<0.010	<0.010				0.02
Phenols	mg/L	0.001		**0.0018**	<0.0010	<0.0010	0.0012			<0.0010	<0.0010	<0.0010	<0.0010
Boron	mg/L	0.200	0.07	0.04	0.05	0.06	0.1	0.11	0.07	0.18	0.06	0.08	0.09
Calcium	mg/L		64	55	110	87	79	76	67	95	98	83	110
Chromium	mg/L	0.0089	<0.005	0.005	<0.005	**0.026**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	**0.013**
Iron	mg/L	0.300	**1.3**	**4.6**	**0.4**	**26**	**0.8**	**0.7**	**2.4**	**1.8**	**1.1**	**1.4**	**13**
Magnesium	mg/L		17	16	34	25	22	20	18	29	32	24	31
Potassium	mg/L		3.9	7.2	4.5	6.3	6.4	6.1	5.5	6.8	5.9	4.8	6
Sodium	mg/L		8.5	5.8	9.8	4.7	7.7	7.4	5.6	20	9.5	7.1	7.5
Nickel	mg/L	0.025	0.003	0.007	0.001	**0.036**	0.003	0.003	0.005	0.004	0.003	0.003	0.019
Zinc	mg/L	0.02	0.01	0.01	<0.01	**0.06**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.03**
pH	(pH units)	6.5-8.5	7.8	7.8	8.1	7.6	8.0	8.0	7.5	6.8	7.6	7.9	8
Total Organic Carbon	mg/L			10	5.7	9.7	13			8.4	6	11	8.3
Aluminum	mg/L	0.075*	**1.2**					**0.48**	**1.6**				**8.4**
Arsenic	mg/L	0.100*	<0.001					<0.001	0.001				0.004
Barium	mg/L		0.042					0.038	0.033				0.058
Beryllium	mg/L	1.100	<0.0006					<0.0006	<0.0006				<0.0006
Bismuth	mg/L		<0.001					<0.001	<0.001				<0.001
Cadmium	mg/L	0.0002	<0.0001					<0.0001	<0.0001				<0.0001
Cobalt	mg/L	0.0009	0.0007					<0.0005	**0.0013**				**0.0061**
Copper	mg/L	0.005	0.005					0.005	0.005				**0.012**
Lead	mg/L	0.005	0.001					<0.0005	0.0024				0.0048
Molybdenum	mg/L	0.040*	0.009					0.011	0.009				0.017
Selenium	mg/L	0.100	<0.005					<0.005	<0.005				<0.005
Silver	mg/L	0.0001	*<0.0004*					<0.0004	<0.0004				<0.0004
Strontium	mg/L		0.24					0.3	0.31				0.79
Tin	mg/L		<0.002					<0.002	<0.002				<0.002
Titanium	mg/L		0.026					0.01	0.033				0.1
Total Kjeldahl Nitrogen (TKN)	mg/L		<0.7					0.8	<0.7				<0.7
Total Phosphorus	mg/L	0.02*	**0.067**					**0.053**	**0.065**				**0.23**
Vanadium	mg/L	0.006*	0.003					0.001	0.003				**0.014**
Ion Percentage	%		38.3	0.1	1.8	12.0	2.7	47.8	49.3	3.5	1.1	1.5	5.2
Benzene	ug/L		<0.10	<0.10	<0.10	<0.10	<0.50	<0.10	<0.10	<0.10	<0.10	<0.50	<0.10
Toluene	ug/L		<0.20	<0.20	<0.20	<0.20	<1.0	<0.20	<0.20	<0.20	<0.10	<1.0	<0.10
Ethylbenzene	ug/L		<0.10	<0.10	<0.10	<0.10	<0.50	<0.10	<0.10	<0.10	<0.20	<0.50	<0.20
o-Xylene	ug/L		<0.10	<0.10	<0.10	<0.10	<0.50	<0.10	<0.10	<0.10	<0.10	<0.50	<0.10
p+m-Xylene	ug/L		<0.10	<0.10	<0.10	<0.10	<0.50	<0.10	<0.10	<0.10	<0.10	<0.50	<0.10
Total Xylenes	ug/L		<0.10	<0.10	<0.10	<0.10	<0.50	<0.10	<0.10	<0.10	<0.10	<0.50	<0.10
Total Oil & Grease	mg/L												

NOTES:

1) PWQO denotes Provincial Water Quality Objectives (1994) with updates.
2) * denotes interim PWQO.
3) *** denotes change from background concentrations.
4) Historic chemical anomalies retained in database.
5) Unionized ammonia values are calculated based on field determined pH and temperature values.
6) mg/L denotes milligrams per litre.
7) umho/cm denotes microsiemens per centimeter.
8) BOD denotes biological oxygen demand.
9) COD denotes chemical oxygen demand.
10) Blank denotes parameter not analyzed.
11) Bolded text and shading denotes concentration exceeds criterion.
12) Italics denotes parameter concentration was below the laboratory RDL, where the RDL exceeds the relevant PWQO.

Table J-2
Precipitation Event Surface Water Quality - Poplar System
Twin Creeks Environmental Centre - Poplar System

Parameter	Units	PWQO	East Ditch Line (Poplar System) - SS14A										
Date			14-Oct-24										
Routine/Storm Monitoring			Routine										
Laboratory			Bureau Veritas										
Alkalinity (as $CaCO_3$)	mg/L	<25%***	91										
Chloride	mg/L		12										
Sulphate	mg/L		260										
Ammonia (as N)	mg/L		<0.15										
Ammonia Unionized	mg/L	0.02	<0.0087										
Nitrate	mg/L		1.21										
Nitrite	mg/L												
Phenols	mg/L	0.001	<0.0010										
Boron	mg/L	0.200	0.12										
Calcium	mg/L		98										
Chromium	mg/L	0.0089	0.007										
Iron	mg/L	0.300	**6.8**										
Magnesium	mg/L		27										
Potassium	mg/L		8.6										
Sodium	mg/L		11										
Nickel	mg/L	0.025	0.011										
Zinc	mg/L	0.02	0.02										
pH	(pH units)	6.5-8.5	8.4										
Total Organic Carbon	mg/L		7.5										
Aluminum	mg/L	0.075*											
Arsenic	mg/L	0.100*											
Barium	mg/L												
Beryllium	mg/L	1.100											
Bismuth	mg/L												
Cadmium	mg/L	0.0002											
Cobalt	mg/L	0.0009											
Copper	mg/L	0.005											
Lead	mg/L	0.005											
Molybdenum	mg/L	0.040*											
Selenium	mg/L	0.100											
Silver	mg/L	0.0001											
Strontium	mg/L												
Tin	mg/L												
Titanium	mg/L												
Total Kjeldahl Nitrogen (TKN)	mg/L												
Total Phosphorus	mg/L	0.02*											
Vanadium	mg/L	0.006*											
Ion Percentage	%		0.7										
Benzene	ug/L		<0.10										
Toluene	ug/L		<0.20										
Ethylbenzene	ug/L		<0.10										
o-Xylene	ug/L		<0.10										
p+m-Xylene	ug/L		<0.10										
Total Xylenes	ug/L		<0.10										
Total Oil & Grease	mg/L												

NOTES:

1) PWQO denotes Provincial Water Quality Objectives (1994) with updates.
2) * denotes interim PWQO.
3) *** denotes change from background concentrations.
4) Historic chemical anomalies retained in database.
5) Unionized ammonia values are calculated based on field determined pH and temperature values.
6) mg/L denotes milligrams per litre.
7) umho/cm denotes microsiemens per centimeter.
8) BOD denotes biological oxygen demand.
9) COD denotes chemical oxygen demand.
10) Blank denotes parameter not analyzed.
11) Bolded text and shading denotes concentration exceeds criterion.
12) Italics denotes parameter concentration was below the laboratory RDL, where the RDL exceeds the relevant PWQO.

Table J-2
Precipitation Event Surface Water Quality - Poplar System
Twin Creeks Environmental Centre - Poplar System

Parameter	Units	PWQO	West Ditch Line (Poplar System) - SS15 / SS14B										
Date			**9-Apr-02**	**4-Apr-03**	**13-Jun-03**	**15-Sep-03**	**3-May-04**	**31-Jul-04**	**23-Sep-05**	**9-Nov-05**	**18-Jan-06**	**9-Mar-06**	**3-Aug-06**
Routine/Storm Monitoring			**Routine**	**Routine**	**Routine**	**Routine**	**Routine**	**Routine**	**Storm**	**Routine**	**Routine**	**Routine**	**Storm**
Laboratory			**Accutest**	**Accutest**	**Accutest**	**Accutest**	**Accutest**	**Accutest**	**Accutest**	**Accutest**	**Accutest**	**Accutest**	**Accutest**
Alkalinity (as $CaCO_3$)	mg/L	<25%***	105	89	148	76	166	84	131	75	141	97	102
Chloride	mg/L		13	13	16	20	8	10	48	26	14	11	32
Sulphate	mg/L		169	183	322	277	226	163	241	132	120	60	364
Ammonia (as N)	mg/L		0.12	0.07	0.06	0.03	0.35	0.08	0.05	0.11	0.39	0.60	0.03
Ammonia Unionized	mg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02
Nitrate	mg/L		2.86	6.01	7.19	0.39	3.01	0.34	7.56	5.63	1.81	0.89	2.38
Nitrite	mg/L								0.14				<0.10
Phenols	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	mg/L	0.200	**0.48**	**0.21**	**0.51**	**0.35**	**0.37**	0.20	**0.63**	**0.26**	**0.37**	0.15	**0.26**
Calcium	mg/L		68	78	126	122	93	57	107	71	67	39	119
Chromium	mg/L	0.0089	<0.01	<0.005	<0.005	<0.005	<0.005	**0.012**	0.002	**0.074**	0.002	0.001	0.002
Iron	mg/L	0.300	**1.01**	**1.33**	**1.28**	**0.52**	**0.75**	**8.42**	**0.51**	**59.0**	**0.47**	**0.65**	0.21
Magnesium	mg/L		23	26	47	28	28	21	31	22	21	12	37
Potassium	mg/L		4	3	3	10	4	4	6	4	3	4	7
Sodium	mg/L		20	12	19	18	15	11	26	16	12	8	26
Nickel	mg/L	0.025	<0.01	<0.005	<0.005	<0.005	<0.005	**0.037**	0.009	**0.083**	<0.005	<0.005	0.005
Zinc	mg/L	0.020	<0.01	0.012	**0.027**	<0.005	**0.03**	**0.34**	<0.01	**0.15**	0.01	<0.01	<0.01
pH	(pH units)	6.5-8.5							7.31	7.89	7.68	7.84	7.45
Total Organic Carbon	mg/L								12.4		7.7	5.5	8.3
Aluminum	mg/L	0.075*							**0.68**				**0.20**
Arsenic	mg/L	0.100*							0.001				0.001
Barium	mg/L								0.04				0.04
Beryllium	mg/L	1.100							<0.001				<0.001
Bismuth	mg/L								<0.005				<0.005
Cadmium	mg/L	0.0002							<0.0001				<0.0001
Cobalt	mg/L	0.0009							0.0009				0.0005
Copper													
Lead	mg/L	0.005							<0.001				**0.006**
Molybdenum	mg/L	0.040*							0.012				0.025
Selenium	mg/L	0.100							0.003				0.003
Silver	mg/L	0.0001							<0.0001				<0.0001
Strontium	mg/L								0.461				0.533
Tin	mg/L								<0.01				<0.01
Titanium	mg/L								0.02				<0.01
Total Kjeldahl Nitrogen (TKN)	mg/L								1.29				0.73
Total Phosphorus	mg/L	0.02*							**0.19**				**0.07**
Vanadium	mg/L	0.006*							0.003				0.001
Ion Percentage	%		2.8	4.1	3.6	4.7	0.1	0.5	1.9	6.7	2.3	2.0	0.3

NOTES:

1) PWQO denotes Provincial Water Quality Objectives (1994) with updates.
2) * denotes interim PWQO.
3) *** denotes change from background concentrations.
4) Historic chemical anomalies retained in database.
5) Unionized ammonia values are calculated based on field determined pH and temperature values.
6) mg/L denotes milligrams per litre.
7) umho/cm denotes microsiemens per centimeter.
8) BOD denotes biological oxygen demand.
9) COD denotes chemical oxygen demand.
10) Blank denotes parameter not analyzed.
11) Bolded text and shading denotes concentration exceeds criterion.
12) Downstream station SS15 redesignated as background station SS14B as a result of grading modifications in September 2009, and was further redesignated as a station adjacent to the Poplar System in late spring of 2011.

Table J-2
Precipitation Event Surface Water Quality - Poplar System
Twin Creeks Environmental Centre - Poplar System

Parameter	Units	PWQO	West Ditch Line (Poplar System) - SS15 / SS14B										
Date			5-Oct-06	17-Nov-06	2-Mar-07	9-Jan-08	19-Mar-08	14-Jun-08	17-Jul-08	9-Sep-08	4-Nov-08	12-Feb-09	6-Apr-09
Routine/Storm Monitoring			Routine	Storm	Routine	Routine	Routine	Storm	Storm	Storm	Storm	Routine	Routine
Laboratory			Accutest	Accutest	Accutest	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam
Alkalinity (as $CaCO_3$)	mg/L	<25%***	140	169	101	123	99		100	85	118	101	111
Chloride	mg/L		51	28	16	33	12	21	27	17	25	10	16
Sulphate	mg/L		111	139	68	145	59		216	192	173	48	120
Ammonia (as N)	mg/L		0.04	0.20	0.76		0.33	0.075	0.075	0.075	0.23	0.1	0.075
Ammonia Unionized	mg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Nitrate	mg/L		26.3	2.88	1.92	3.5	0.8	1.0	0.8	0.5	1.4	1.5	2.0
Nitrite	mg/L		<0.10	<0.10			0.02	0.03	0.04	0.03	0.03	0.02	
Phenols	mg/L	0.001	0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001	<0.001	<0.001
Boron	mg/L	0.200	**0.36**	**0.43**	0.16	**0.33**	0.18	0.19	0.19	0.14	**0.23**	0.16	0.20
Calcium	mg/L		110	80	48	73	45	79	95	88	79	48	86
Chromium	mg/L	0.0089	0.002	0.001	<0.001	**0.017**	<0.005	**0.009**	<0.005	**0.017**	0.008	**0.02**	**0.014**
Iron	mg/L	0.300	**0.37**	**0.35**	0.27	**7.8**	**2.1**	**9.2**	**1.4**	**11**	**8.6**	**22**	**14**
Magnesium	mg/L		30	25	14	22	14	23	29	31	26	16	27
Potassium	mg/L		7	5	5	5	3.8	5.2	4.3	8.9	7.8	6	4.9
Sodium	mg/L		20	19	14	19	10	16	19	15	14	8.2	13
Nickel	mg/L	0.025	<0.005	<0.005	<0.005	0.014	0.003	0.015	0.003	0.017	0.011	**0.026**	0.022
Zinc	mg/L	0.020	<0.01	<0.01	<0.01	**0.03**	0.01	**0.03**	0.008	**0.04**	**0.04**	**0.058**	**0.10**
pH	(pH units)	6.5-8.5	7.86	7.96	7.75	7.83	6.84	7.66	7.41	7.32	8.08	6.70	8.45
Total Organic Carbon	mg/L		10.5	9.8	7.7	10.6	7.1	8.2	7.6	6.9	11.1	12.7	17
Aluminum	mg/L	0.075*		**0.80**				**5.9**	**0.93**	**11**	**5.5**		
Arsenic	mg/L	0.100*		<0.001				0.004	0.001	0.004	0.003		
Barium	mg/L			0.04				0.058	0.04	0.088	0.055		
Beryllium	mg/L	1.100		<0.001				<0.0006	<0.0006	<0.0006	<0.0006		
Bismuth	mg/L			<0.005					<0.001	<0.001	<0.001		
Cadmium	mg/L	0.0002		<0.0001				**0.0005**	<0.0001	<0.0001	<0.0001		
Cobalt	mg/L	0.0009		0.0005				**0.0038**	0.0006	**0.0047**	**0.0033**		
Copper	mg/L	0.005		0.003				**0.010**	0.004	**0.010**	**0.008**		
Lead	mg/L	0.005		<0.001				0.0044	0.0007	0.005	0.0034		
Molybdenum	mg/L	0.040*		<0.005				0.015	0.02	0.023	0.009		
Selenium	mg/L	0.100		<0.001				<0.002	<0.005	<0.005	<0.005		
Silver	mg/L	0.0001		<0.0001				<0.0001		<0.0001	<0.0001		
Strontium	mg/L			0.291				0.30	0.39	0.42	0.31		
Tin	mg/L			<0.01				<0.001	<0.002	<0.002	<0.002		
Titanium	mg/L			0.01				0.10		0.39	0.096		
Total Kjeldahl Nitrogen (TKN)	mg/L		1.18	1.28				2	0.7	1	1.8		
Total Phosphorus	mg/L	0.02*	**0.13**	**0.20**				**0.21**	**0.07**	**0.23**	**0.78**		
Vanadium	mg/L	0.006*		0.001				**0.012**	0.002	**0.025**	**0.011**		
Ion Percentage	%		10.0	2.2	5.1	1.9	5.4		3.9	7.1	2.5	9.2	10.3
Benzene	ug/L							<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	ug/L							<0.2	<0.2	<0.3	<0.2	<0.3	<0.3
Ethylbenzene	ug/L							<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o-Xylene	ug/L							<0.2	<0.2	<0.3	<0.2	<0.3	<0.3
p+m-Xylene	ug/L							<0.4	<0.4	<0.6	<0.4	<0.6	<0.6
Total Xylenes	ug/L							<0.4	<0.4	<0.6	<0.4		
Total Oil & Grease	mg/L							<0.5	<0.5	<0.5	<0.5		

NOTES:

1) PWQO denotes Provincial Water Quality Objectives (1994) with updates.
2) * denotes interim PWQO.
3) *** denotes change from background concentrations.
4) Historic chemical anomalies retained in database.
5) Unionized ammonia values are calculated based on field determined pH and temperature values.
6) mg/L denotes milligrams per litre.
7) umho/cm denotes microsiemens per centimeter.
8) BOD denotes biological oxygen demand.
9) COD denotes chemical oxygen demand.
10) Blank denotes parameter not analyzed.
11) Bolded text and shading denotes concentration exceeds criterion.
12) Downstream station SS15 redesignated as background station SS14B as a result of grading modifications in September 2009, and was further redesignated as a station adjacent to the Poplar System in late spring of 2011.

Table J-2
Precipitation Event Surface Water Quality - Poplar System
Twin Creeks Environmental Centre - Poplar System

Parameter	Units	PWQO	West Ditch Line (Poplar System) - SS14B										
Date			7-Jun-11	9-Aug-11	29-Nov-11	13-Jan-13	10-Apr-13	5-Jul-13	28-Aug-13	7-Oct-13	11-Jan-14	8-Apr-14	7-Jul-14
Routine/Storm Monitoring			Storm	Storm	Routine	Routine	Routine	Routine	Storm	Routine	Routine	Routine	Routine
Laboratory			Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam
Alkalinity (as $CaCO_3$)	mg/L	<25%***		56	98	200	110	130		250	60		64
Chloride	mg/L		6	28	28	110	48	85	21	130	7	130	12
Sulphate	mg/L			220	46	210	95	150		170	24	180	120
Ammonia (as N)	mg/L		0.15	0.075	0.075	0.075	0.21	0.075	0.075	0.075	0.83	0.075	0.075
Ammonia Unionized	mg/L	0.02		<0.02	<0.02	<0.02	<0.02	<0.014		<0.0079	0.0075	<0.0034	<0.0013
Nitrate	mg/L		0.02	1.2	0.2	0.37	0.58	0.05	0.05	0.05	0.99	0.05	0.05
Nitrite	mg/L		0.3	<0.01					<0.010				
Phenols	mg/L	0.001		0.001	<0.001	<0.0010	<0.0010	<0.0010		<0.0010	**0.0024**	**0.005**	**0.003**
Boron	mg/L	0.200	0.16	**0.41**	**0.67**	**1.4**	**0.75**	**1.5**	**0.3**	**2.0**	0.042	**1.4**	**0.23**
Calcium	mg/L		52	74	30	110	250	92	77	120	26	100	80
Chromium	mg/L	0.0089	**0.029**	<0.005	<0.005	<0.0050	**0.092**	<0.0050	**0.01**	<0.0050	<0.0050	<0.0050	**0.013**
Iron	mg/L	0.300	**30**	**3.2**	**4.3**	**0.86**	**94**	**3.8**	**7**	**1.8**	**3.3**	0.14	**12**
Magnesium	mg/L		16	23	11	35	57	21	19	36	6.2	33	19
Potassium	mg/L		6.3	5.4	6.2	8.3	13	9	9.8	10	8.4	8.1	5.9
Sodium	mg/L		4.7	31	34	100	45	68	18	110	2.3	100	13
Nickel	mg/L	0.025	**0.039**	0.006	0.007	0.0080	**0.13**	0.013	0.011	0.012	0.005	0.0096	0.018
Zinc	mg/L	0.020	**0.08**	0.008	**0.022**	0.0067	**0.45**	0.016	0.02	0.0077	0.018	<0.0050	**0.03**
pH	(pH units)	6.5-8.5	7.21	6.92	7.10	7.47	7.09	8.19	8.22	8.11	7.84	8.12	7.16
Total Organic Carbon	mg/L			7.8	8.2	11	7.9	16		17	9.3	12	10
Aluminum	mg/L	0.075*	**18**	**1.9**					**8.4**				
Arsenic	mg/L	0.100*	0.008	0.002					0.004				
Barium	mg/L		0.14	0.031					0.078				
Beryllium	mg/L	1.100	0.0010	<0.0005					<0.0006				
Bismuth	mg/L		<0.001	<0.001					<0.0010				
Cadmium	mg/L	0.0002	0.0002	<0.0001					<0.0001				
Cobalt	mg/L	0.0009	**0.011**	**0.0015**					**0.0039**				
Copper	mg/L	0.005	**0.021**	0.005					**0.01**				
Lead	mg/L	0.005	**0.015**	0.0013					0.0037				
Molybdenum	mg/L	0.040*	0.009	0.02					0.016				
Selenium	mg/L	0.100	<0.005	0.004					<0.005				
Silver	mg/L	0.0001	<0.0001						<0.00010				
Strontium	mg/L		0.16	0.36					0.39				
Tin	mg/L		<0.002	<0.001					<0.002				
Titanium	mg/L		0.34	0.047					0.2				
Total Kjeldahl Nitrogen (TKN)	mg/L		5	2					1.5				
Total Phosphorus	mg/L	0.02*	**0.8**	**0.092**					**0.18**				
Vanadium	mg/L	0.006*	**0.035**	0.004					**0.017**				
Ion Percentage	%			2.0	2.2	3.0	28.3	4.0	41.6	3.5	3.0	12.2	10.5
Benzene	ug/L		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	ug/L		<0.2	<0.3	<0.3	<0.3	<0.3	<0.3	<0.2	<0.3	<0.3	<0.3	<0.3
Ethylbenzene	ug/L		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o-Xylene	ug/L		<0.2	<0.3	<0.3	<0.3	<0.3	<0.3	<0.2	<0.3	<0.3	<0.3	<0.3
p+m-Xylene	ug/L		<0.4	<0.6	<0.6	<0.6	<0.6	<0.6	<0.4	<0.6	<0.6	<0.6	<0.6
Total Xylenes	ug/L		<0.4	<0.6									
Total Oil & Grease	mg/L		<0.5										

NOTES:

1) PWQO denotes Provincial Water Quality Objectives (1994) with updates.
2) * denotes interim PWQO.
3) *** denotes change from background concentrations.
4) Historic chemical anomalies retained in database.
5) Unionized ammonia values are calculated based on field determined pH and temperature values.
6) mg/L denotes milligrams per litre.
7) umho/cm denotes microsiemens per centimeter.
8) BOD denotes biological oxygen demand.
9) COD denotes chemical oxygen demand.
10) Blank denotes parameter not analyzed.
11) Bolded text and shading denotes concentration exceeds criterion.
12) Downstream station SS15 redesignated as background station SS14B as a result of grading modifications in September 2009, and was further redesignated as a station adjacent to the Poplar System in late spring of 2011.

Table J-2
Precipitation Event Surface Water Quality - Poplar System
Twin Creeks Environmental Centre - Poplar System

Parameter	Units	PWQO	West Ditch Line (Poplar System) - SS14B										
Date			4-Jan-15	10-Apr-15	25-Oct-15	7-Apr-16	14-Jul-16	21-Oct-16	12-Jan-17	6-Apr-17	13-Jul-17	28-Oct-17	23-Jan-18
Routine/Storm Monitoring			Routine	Routine	Routine	Routine	Routine	Routine	Routine	Routine	Routine	Routine	Routine
Laboratory			Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam
Alkalinity (as $CaCO_3$)	mg/L	<25%***	70	250	77	210	100	97	120	220	65	130	180
Chloride	mg/L		10	48	30	21	22	33	21	33	13	33	39
Sulphate	mg/L		38	250	150	130	110	310	62	160	98	240	70
Ammonia (as N)	mg/L		0.44	0.075	0.075	0.075	0.075	0.075	0.51	0.075	0.075	0.056	0.089
Ammonia Unionized	mg/L	0.02	0.0076	<0.0061	<0.0014	<0.0019	<0.0068	<0.0037	0.0013	<0.0014	<0.013	<0.0005	0.0021
Nitrate	mg/L		1.19	1.15	0.57	0.65	0.05	4.28	1.89	0.54	1.46	0.75	1.26
Nitrite	mg/L												
Phenols	mg/L	0.001	**0.0084**	<0.0010	<0.0010	<0.0010	*<0.0040*	*<0.0040*	*<0.0040*	*<0.0040*	*<0.0040*	<0.0010	0.0015
Boron	mg/L	0.200	0.064	**0.28**	0.10	0.15	0.13	0.08	0.14	0.20	0.1	0.09	0.46
Calcium	mg/L		33	150	62	94	64	130	110	120	200	100	66
Chromium	mg/L	0.0089	<0.0050	0.0057	<0.005	<0.0050	0.007	<0.005	0.052	<0.005	0.11	<0.005	<0.005
Iron	mg/L	0.300	**2.2**	**5.2**	**1.4**	**1.6**	**3.5**	**1.7**	**52**	**2.4**	**110**	**0.7**	**1.5**
Magnesium	mg/L		9	48	15	27	16	28	31	35	51	27	16
Potassium	mg/L		8.3	5.5	11	4.2	9.9	4.7	15	6.7	26	5.5	6.9
Sodium	mg/L		3.3	29	16	14	12	16	6.7	18	9	19	30
Nickel	mg/L	0.025	0.0035	0.014	0.004	0.0029	0.006	0.004	0.072	0.005	0.15	0.003	0.005
Zinc	mg/L	0.020	0.012	**0.032**	0.020	0.011	0.010	<0.01	**0.14**	0.020	**0.4**	<0.01	0.01
pH	(pH units)	6.5-8.5	8.14	8.27	7.71	8.02	7.93	8.09	7.36	7.81	8.16	7.35	8.32
Total Organic Carbon	mg/L		11	11	6.9	9.2	9.5	12	8.6	11	8.2	8.6	9.8
Aluminum	mg/L	0.075*											
Arsenic	mg/L	0.100*											
Barium	mg/L												
Beryllium	mg/L	1.100											
Bismuth	mg/L												
Cadmium	mg/L	0.0002											
Cobalt	mg/L	0.0009											
Copper	mg/L	0.005											
Lead	mg/L	0.005											
Molybdenum	mg/L	0.040*											
Selenium	mg/L	0.100											
Silver	mg/L	0.0001											
Strontium	mg/L												
Tin	mg/L												
Titanium	mg/L												
Total Kjeldahl Nitrogen (TKN)	mg/L												
Total Phosphorus	mg/L	0.02*											
Vanadium	mg/L	0.006*											
Ion Percentage	%		2.7	2.6	1.1	0.4	1.8	0.6	17.7	3.2	30.8	1.2	0.3
Benzene	ug/L		<0.2	<0.2	<0.2	<0.2	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Toluene	ug/L		<0.3	<0.3	<0.3	<0.3	<0.10	<0.10	<0.20	<0.20	<0.20	<0.10	<0.20
Ethylbenzene	ug/L		<0.2	<0.2	<0.2	<0.2	<0.20	<0.20	<0.10	<0.10	<0.10	<0.20	<0.10
o-Xylene	ug/L		<0.3	<0.3	<0.3	<0.3	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
p+m-Xylene	ug/L		<0.6	<0.6	<0.6	<0.6	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Total Xylenes	ug/L						<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Total Oil & Grease	mg/L												

NOTES:

1) PWQO denotes Provincial Water Quality Objectives (1994) with updates.
2) * denotes interim PWQO.
3) *** denotes change from background concentrations.
4) Historic chemical anomalies retained in database.
5) Unionized ammonia values are calculated based on field determined pH and temperature values.
6) mg/L denotes milligrams per litre.
7) umho/cm denotes microsiemens per centimeter.
8) BOD denotes biological oxygen demand.
9) COD denotes chemical oxygen demand.
10) Blank denotes parameter not analyzed.
11) Bolded text and shading denotes concentration exceeds criterion.
12) Downstream station SS15 redesignated as background station SS14B as a result of grading modifications in September 2009, and was further redesignated as a station adjacent to the Poplar System in late spring of 2011.
13) Italics denotes parameter concentration was below the laboratory RDL, where the RDL exceeds the relevant PWQO.

Table J-2
Precipitation Event Surface Water Quality - Poplar System
Twin Creeks Environmental Centre - Poplar System

Parameter	Units	PWQO	West Ditch Line (Poplar System) - SS14B										
Date			**4-Apr-18**	**8-Aug-18**	**8-Aug-18**	**2-Oct-18**	**7-Feb-19**	**19-Apr-19**	**2-Oct-19**	**2-Oct-19**	**11-Jan-20**	**18-May-20**	**15-Nov-20**
Routine/Storm Monitoring			**Routine**	**Routine**	**Storm**	**Routine**	**Routine**	**Routine**	**Routine**	**Storm**	**Routine**	**Routine**	**Routine**
Laboratory			**Maxxam**	**Maxxam**	**Maxxam**	**Maxxam**	**Maxxam**	**Maxxam**	**Bureau Veritas**	**Bureau Veritas**	**Bureau Veritas**	**Bureau Veritas**	**Bureau Veritas**
Alkalinity (as $CaCO_3$)	mg/L	<25%***	170	49		240	180	180	140		150	200	130
Chloride	mg/L		13	7.7	9.5	120	45	33	150	150	49	94	140
Sulphate	mg/L		120	63		180	84	93	240		48	150	190
Ammonia (as N)	mg/L		0.13	0.13	0.086	0.092	0.19	0.025	0.76	0.93	0.11	0.62	0.17
Ammonia Unionized	mg/L	0.02	0.0009	0.0025		0.0018	0.0019	<0.0024	**0.081**		0.0026	**0.034**	0.0046
Nitrate	mg/L		1.19	1.07	1.07	8.63	2.23	0.99	5.16	5.15	6.15	6.00	12
Nitrite	mg/L				0.026					0.915			
Phenols	mg/L	0.001	<0.0010	<0.0010		<0.0010	<0.0010	<0.0010	0.001		0.0005	<0.0010	<0.0010
Boron	mg/L	0.200	**0.24**	0.06	0.06	0.02	0.16	0.11	**0.77**	**0.78**	**0.43**	**0.77**	**1**
Calcium	mg/L		83	45	44	0.2	80	160	130	130	120	100	110
Chromium	mg/L	0.0089	**0.013**	0.008	0.007	0.005	<0.005	**0.052**	<0.005	<0.005	**0.041**	**0.012**	**0.009**
Iron	mg/L	0.300	**12**	**6.6**	**6.2**	0.1	**0.8**	**51**	**1.4**	**1.3**	**41**	**11**	**6.2**
Magnesium	mg/L		26	16	16	0.05	24	41	40	40	32	33	35
Potassium	mg/L		5.7	4.1	3.9	0.2	5.5	10	10	10	14	10	21
Sodium	mg/L		12	7.6	7.6	0.1	21	17	63	62	37	63	86
Nickel	mg/L	0.025	0.015	0.01	0.009	0.001	0.003	**0.072**	0.014	0.014	**0.06**	0.022	0.02
Zinc	mg/L	0.020	**0.04**	0.01	0.01	0.01	<0.01	**0.14**	0.01	0.01	**0.14**	**0.04**	0.02
pH	(pH units)	6.5-8.5	7.71	7.5	7.5	7.67	7.96	8.43	8.43	8.43	8.23	8.30	8.1
Total Organic Carbon	mg/L		12	4.9		16	7.3	18	18		7.1	0.4	27
Aluminum	mg/L	0.075*			**4.4**					**0.77**			
Arsenic	mg/L	0.100*			0.002					0.001			
Barium	mg/L				0.038					0.063			
Beryllium	mg/L	1.100			<0.0006					<0.0006			
Bismuth	mg/L				<0.001					<0.001			
Cadmium	mg/L	0.0002			<0.0001					0.0002			
Cobalt	mg/L	0.0009			**0.0026**					**0.0022**			
Copper	mg/L	0.005			**0.007**					**0.01**			
Lead	mg/L	0.005			0.0021					0.0009			
Molybdenum	mg/L	0.040*			0.018					0.021			
Selenium	mg/L	0.100			<0.005					<0.005			
Silver	mg/L	0.0001			*<0.0004*					*<0.0004*			
Strontium	mg/L				0.16					0.56			
Tin	mg/L				<0.002					<0.002			
Titanium	mg/L				0.054					0.018			
Total Kjeldahl Nitrogen (TKN)	mg/L				<0.7					2.4			
Total Phosphorus	mg/L	0.02*			**0.087**					**0.11**			
Vanadium	mg/L	0.006*			**0.009**					0.002			
Ion Percentage	%		2.7	11.7	43.7	54.1	1.5	16.2	1.5	25.2	16.9	2.3	4.7
Benzene	ug/L		<0.25	<0.20	<0.20	<0.25	<0.10	<0.25	<0.50	<0.20	<0.10	<0.25	<0.50
Toluene	ug/L		<0.50	<0.20	<0.20	<0.50	<0.20	<0.50	<1.0	<0.20	<0.20	<0.50	<1.0
Ethylbenzene	ug/L		<0.25	<0.20	<0.20	<0.25	<0.10	<0.25	<0.50	<0.20	<0.10	<0.25	<0.50
o-Xylene	ug/L		<0.25	<0.20	<0.20	<0.25	<0.10	<0.25	<0.50	<0.20	<0.10	<0.25	<0.50
p+m-Xylene	ug/L		<0.25	<0.20	<0.20	<0.25	<0.10	<0.25	<0.50	<0.20	<0.10	<0.25	<0.50
Total Xylenes	ug/L		<0.25	<0.20	<0.20	<0.25	<0.10	<0.25	<0.50	<0.20	<0.10	<0.25	<0.50
Total Oil & Grease	mg/L												

NOTES:

1) PWQO denotes Provincial Water Quality Objectives (1994) with updates.
2) * denotes interim PWQO.
3) *** denotes change from background concentrations.
4) Historic chemical anomalies retained in database.
5) Unionized ammonia values are calculated based on field determined pH and temperature values.
6) mg/L denotes milligrams per litre.
7) umho/cm denotes microsiemens per centimeter.
8) BOD denotes biological oxygen demand.
9) COD denotes chemical oxygen demand.
10) Blank denotes parameter not analyzed.
11) Bolded text and shading denotes concentration exceeds criterion.
12) Downstream station SS15 redesignated as background station SS14B as a result of grading modifications in September 2009, and was further redesignated as a station adjacent to the Poplar System in late spring of 2011.
13) Italics denotes parameter concentration was below the laboratory RDL, where the RDL exceeds the relevant PWQO.

Table J-2
Precipitation Event Surface Water Quality - Poplar System
Twin Creeks Environmental Centre - Poplar System

Parameter	Units	PWQO	West Ditch Line (Poplar System) - SS14B										
Date			26-Mar-21	3-Jun-21	9-Jul-21	8-Sep-21	23-Sep-21	26-Oct-21	17-Feb-22	4-May-22	30-Aug-22	28-Sep-22	18-Oct-22
Routine/Storm Monitoring			Routine	Routine	Routine	Storm	Storm	Routine	Routine	Routine	Routine	Storm	Routine
Laboratory			Bureau Veritas	Bureau Veritas	Bureau Veritas	Bureau Veritas	Bureau Veritas	Bureau Veritas	Bureau Veritas	Bureau Veritas	Bureau Veritas	Bureau Veritas	Bureau Veritas
Alkalinity (as $CaCO_3$)	mg/L	<25%***	160	72	120			330	120	300	68		58
Chloride	mg/L		130	41	94	33	130	120	18	84	31	7.0	14
Sulphate	mg/L		160	400	170			150	24	120	270		170
Ammonia (as N)	mg/L		0.19	0.09	0.025	0.075	0.075	0.025	2.4	0.13	0.15	0.075	<0.050
Ammonia Unionized	mg/L	0.02	0.0020	0.0019	<0.0068			<0.0015	0.0084	**0.03**	0.01		<0.0011
Nitrate	mg/L		9.91	0.48	0.05	0.30	2.64	0.15	0.63	0.05	0.05	0.24	0.27
Nitrite	mg/L					0.031	0.027					<0.010	
Phenols	mg/L	0.001	<0.0010	**0.0011**	<0.0010			<0.0010	**0.0012**	<0.0010	**0.0020**		<0.0010
Boron	mg/L	0.200	**0.71**	0.14	**0.82**	0.13	**0.89**	**0.92**	**0.29**	**0.98**	0.20	0.05	0.09
Calcium	mg/L		110	120	75	85	160	130	42	100	130	52	87
Chromium	mg/L	0.0089	0.007	<0.005	0.005	<0.005	**0.017**	<0.005	<0.005	<0.005	**0.010**	**0.016**	**0.027**
Iron	mg/L	0.300	**6.4**	**2.1**	**4.2**	**2.0**	**16**	**0.9**	**4.2**	**2.5**	**9.3**	**16**	**25**
Magnesium	mg/L		34	43	27	31	46	38	11	32	38	19	28
Potassium	mg/L		13	4.4	8	5.7	11	9.3	10	6.5	7.2	4.6	8
Sodium	mg/L		72	28	58	21	76	74	13	61	19	5.9	10
Nickel	mg/L	0.025	0.018	0.004	0.012	0.004	**0.030**	0.009	0.008	0.011	0.015	0.022	**0.038**
Zinc	mg/L	0.020	0.02	<0.01	0.01	<0.01	**0.04**	<0.01	**0.03**	<0.01	0.02	**0.04**	**0.07**
pH	(pH units)	6.5-8.5	7.8	7.6	8.5	8.1	8.2	8.2	7.5	**8.8**	8.1	8.1	8.1
Total Organic Carbon	mg/L		22	5	13			13	16	13	10		7.7
Aluminum	mg/L	0.075*				**1.5**	**9.1**					**9.1**	
Arsenic	mg/L	0.100*				0.001	0.005					0.005	
Barium	mg/L					0.026	0.11					0.056	
Beryllium	mg/L	1.100				<0.0006	<0.0006					<0.0006	
Bismuth	mg/L					<0.001	<0.001					<0.001	
Cadmium	mg/L	0.0002				<0.0001	0.0001					<0.0001	
Cobalt	mg/L	0.0009				**0.0011**	**0.0074**					**0.006**	
Copper	mg/L	0.005				**0.006**	**0.019**					**0.013**	
Lead	mg/L	0.005				0.0009	**0.0061**					**0.0053**	
Molybdenum	mg/L	0.040*				0.023	0.011					0.016	
Selenium	mg/L	0.100				<0.005	<0.005					<0.005	
Silver	mg/L	0.0001				*<0.0004*	*<0.0004*					<0.0004	
Strontium	mg/L					0.43	0.57					0.22	
Tin	mg/L					<0.002	<0.002					<0.002	
Titanium	mg/L					0.025	0.13					0.1	
Total Kjeldahl Nitrogen (TKN)	mg/L					<0.7	1.3					<0.7	
Total Phosphorus	mg/L	0.02*				**0.048**	**0.33**					**0.17**	
Vanadium	mg/L	0.006*				0.003	**0.018**					**0.018**	
Ion Percentage	%		3.6	0.3	0.2	39.5	30.8	0.1	3.1	1.1	7.5	45.9	8.9
Benzene	ug/L		<0.25	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Toluene	ug/L		<0.50	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Ethylbenzene	ug/L		<0.25	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
o-Xylene	ug/L		<0.25	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
p+m-Xylene	ug/L		<0.25	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Total Xylenes	ug/L		<0.25	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Total Oil & Grease	mg/L												

NOTES:

1) PWQO denotes Provincial Water Quality Objectives (1994) with updates.
2) * denotes interim PWQO.
3) *** denotes change from background concentrations.
4) Historic chemical anomalies retained in database.
5) Unionized ammonia values are calculated based on field determined pH and temperature values.
6) mg/L denotes milligrams per litre.
7) umho/cm denotes microsiemens per centimeter.
8) BOD denotes biological oxygen demand.
9) COD denotes chemical oxygen demand.
10) Blank denotes parameter not analyzed.
11) Bolded text and shading denotes concentration exceeds criterion.
12) Downstream station SS15 redesignated as background station SS14B as a result of grading modifications in September 2009, and was further redesignated as a station adjacent to the Poplar System in late spring of 2011.
13) Italics denotes parameter concentration was below the laboratory RDL, where the RDL exceeds the relevant PWQO.

Table J-2
Precipitation Event Surface Water Quality - Poplar System
Twin Creeks Environmental Centre - Poplar System

Parameter	Units	PWQO	West Ditch Line (Poplar System) - SS14B										
Date			**10-Feb-23**	**4-Apr-23**	**3-Jul-23**	**7-Jul-23**	**13-Jul-23**	**2-Nov-23**	**10-Jan-24**	**12-Apr-24**	**10-Jul-24**	**14-Oct-24**	
Routine/Storm Monitoring			**Routine**	**Routine**	**Routine**	**Storm**	**Storm**	**Storm**	**Routine**	**Routine**	**Routine+Storm**	**Routine**	
Laboratory			**Bureau Veritas**	**Bureau Veritas**	**Bureau Veritas**	**Bureau Veritas**	**Bureau Veritas**	**Bureau Veritas**	**Bureau Veritas**	**Bureau Veritas**	**Bureau Veritas**	**Bureau Veritas**	
Alkalinity (as $CaCO_3$)	mg/L	<25%***	220	160	32			180	230	210	66	160	
Chloride	mg/L		110	25	16	31	41	110	78	46	18	140	
Sulphate	mg/L		200	45	140			320	120	83	150	160	
Ammonia (as N)	mg/L		0.065	0.45	<0.050	<0.15	<0.15	<0.050	<0.050	0.19	<0.15	<0.15	
Ammonia Unionized	mg/L	0.02	0.0021	0.0063	<0.009			<0.00061	<0.00061	0.0045	<0.013	<0.015	
Nitrate	mg/L		2.65	0.20	1.11	0.99	1.17	2.4	1.18	0.48	0.98	5.21	
Nitrite	mg/L					0.409	0.037				0.061		
Phenols	mg/L	0.001	<0.0010	<0.0010	0.0013			<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
Boron	mg/L	0.200	**0.48**	**0.49**	0.14	**0.27**	**1.3**	**0.45**	**0.59**	**0.66**	**0.4**	**1.1**	
Calcium	mg/L		120	69	79	120	98	79	92	98	930	83	
Chromium	mg/L	0.0089	<0.005	**0.011**	<0.005	<0.005	<0.005	**0.011**	0.005	**0.024**	**0.27**	<0.005	
Iron	mg/L	0.300	**0.4**	**11**	**2.5**	**0.5**	**1.5**	**10**	**4.4**	**20**	**290**	**1.1**	
Magnesium	mg/L		40	19	31	52	29	31	31	29	180	27	
Potassium	mg/L		7.7	6.9	3.1	3.3	11	6.5	9.3	8.7	43	15	
Sodium	mg/L		68	27	22	34	72	42	54	39	18	88	
Nickel	mg/L	0.025	0.006	0.018	0.005	0.003	0.009	0.018	0.010	**0.031**	**0.39**	0.009	
Zinc	mg/L	0.020	<0.01	**0.03**	<0.01	<0.01	<0.01	**0.03**	0.01	**0.06**	**0.8**	<0.01	
pH	(pH units)	6.5-8.5	8.4	7.8	8.3	8.4	8.3	6.9	7.5	8.0	8.3	**8.6**	
Total Organic Carbon	mg/L		7.9	10	4.6			9.0	9.2	17	8.2	16	
Aluminum	mg/L	0.075*				**0.40**	**0.85**				**190**		
Arsenic	mg/L	0.100*				0.001	0.002				0.08		
Barium	mg/L					0.029	0.05				0.98		
Beryllium	mg/L	1.100				<0.0006	<0.0006				0.009		
Bismuth	mg/L					<0.001	<0.001				<0.01		
Cadmium	mg/L	0.0002				<0.0001	<0.0001				**0.001**		
Cobalt	mg/L	0.0009				0.0005	**0.0012**				**0.12**		
Copper	mg/L	0.005				0.003	**0.009**				**0.23**		
Lead	mg/L	0.005				<0.0005	0.0008				**0.12**		
Molybdenum	mg/L	0.040*				0.034	0.009				**0.05**		
Selenium	mg/L	0.100				<0.005	<0.005				<0.05		
Silver	mg/L	0.0001				*<0.0004*	<0.0004				*<0.004*		
Strontium	mg/L					0.59	0.43				1.5		
Tin	mg/L					<0.002	<0.002				<0.02		
Titanium	mg/L					0.008	0.018				1.5		
Total Kjeldahl Nitrogen (TKN)	mg/L					<0.7	1.3				1.3		
Total Phosphorus	mg/L	0.02*				**0.039**	**0.086**				**3.1**		
Vanadium	mg/L	0.006*				0.001	0.002				**0.29**		
Ion Percentage	%		1.6	7.1	15.3	43.2	40.3	11.7	1.1	6.3	42.9	0.2	
Benzene	ug/L		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.50	0.18	<0.10	
Toluene	ug/L		<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.10	<1.0	<0.10	<0.20	
Ethylbenzene	ug/L		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.20	<0.50	0.4	<0.10	
o-Xylene	ug/L		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.50	<0.10	<0.10	
p+m-Xylene	ug/L		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.50	0.14	<0.10	
Total Xylenes	ug/L		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.50	0.14	<0.10	
Total Oil & Grease	mg/L												

NOTES:

1) PWQO denotes Provincial Water Quality Objectives (1994) with updates.
2) * denotes interim PWQO.
3) *** denotes change from background concentrations.
4) Historic chemical anomalies retained in database.
5) Unionized ammonia values are calculated based on field determined pH and temperature values.
6) mg/L denotes milligrams per litre.
7) umho/cm denotes microsiemens per centimeter.
8) BOD denotes biological oxygen demand.
9) COD denotes chemical oxygen demand.
10) Blank denotes parameter not analyzed.
11) Bolded text and shading denotes concentration exceeds criterion.
12) Downstream station SS15 redesignated as background station SS14B as a result of grading modifications in September 2009, and was further redesignated as a station adjacent to the Poplar System in late spring of 2011.
13) Italics denotes parameter concentration was below the laboratory RDL, where the RDL exceeds the relevant PWQO.

Table J-2
Precipitation Event Surface Water Quality - Poplar System
Twin Creeks Environmental Centre - Poplar System

Parameter	Units	PWQO	Inlet Point to Sedimentation Pond 1 (Poplar System) - SS15A										
Date			3-Oct-09	10-Oct-09	25-Jan-10	6-Apr-10	6-Jun-10	5-Aug-10	14-Oct-10	28-Feb-11	20-Apr-11	7-Jun-11	9-Aug-11
Routine/Storm Monitoring			Routine	Storm	Routine	Routine	Storm	Routine	Storm	Routine	Routine	Storm	Storm
Laboratory			Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam
Alkalinity (as $CaCO_3$)	mg/L	<25%***	118		101	116		167	88	115	160		123
Chloride	mg/L		24	39	15	18	8	18	14	19	20	5	12
Sulphate	mg/L		260		73	180		230	180	91	140		310
Ammonia (as N)	mg/L		0.075	0.075	0.075	0.870	0.240	0.075	0.075	0.640	0.075	0.075	0.075
Ammonia Unionized	mg/L	0.02	<0.02		<0.02	<0.02		<0.02	<0.02	<0.02	<0.02		<0.02
Nitrate	mg/L		0.4	1.8	1.7	2.4	0.9	0.05	0.4	1.9	0.8	0.02	0.1
Nitrite	mg/L			0.02					0.01			0.3	0.03
Phenols	mg/L	0.001	<0.001		<0.001	<0.001		<0.001	<0.001	<0.001	<0.001		
Boron	mg/L	0.200	0.11	**0.21**	0.17	**0.5**	0.15	**0.31**	0.16	**0.26**	**0.38**	0.14	**0.32**
Calcium	mg/L		100	94	50	530	150	120	250	56	88	48	130
Chromium	mg/L	0.0089	<0.005	<0.005	<0.005	**0.31**	**0.057**	<0.005	**0.080**	<0.005	0.007	**0.030**	<0.005
Iron	mg/L	0.300	**2.2**	**2.7**	**2.5**	**310**	**59**	**1.0**	**84**	**1.4**	**3.6**	**31**	**0.4**
Magnesium	mg/L		32	28	15	150	40	29	61	19	29	16	27
Potassium	mg/L		5.4	5.8	5.2	41	10	6.8	16	4.5	5.5	6.9	6.6
Sodium	mg/L		17	19	12	22	8.9	16	9.2	16	21	4.5	16
Nickel	mg/L	0.025	0.004	0.004	0.004	**0.42**	**0.083**	0.002	**0.11**	0.003	0.011	**0.041**	0.002
Zinc	mg/L	0.020	0.006	<0.01	0.013	**0.76**	**0.13**	<0.005	**0.20**	0.012	**0.025**	**0.08**	<0.005
pH	(pH units)	6.5-8.5	7.72	8.26	**8.83**	7.94	7.98	7.73	8.10	7.70	8.01	7.23	8.16
Total Organic Carbon	mg/L		6.6		6.5	16.7		13.2	9.3	6.5	14.0		10.4
Aluminum	mg/L	0.075*		**2.0**			**32**		**45**			**19**	**0.45**
Arsenic	mg/L	0.100*		0.001			0.015		0.019			0.009	0.001
Barium	mg/L			0.043			0.18		0.26			0.12	0.05
Beryllium	mg/L	1.100		<0.0006			0.0017		0.0022			0.0011	<0.0005
Bismuth	mg/L			<0.001			<0.001		<0.001			<0.001	<0.001
Cadmium	mg/L	0.0002		<0.001			0.0002		**0.0005**			0.0002	<0.0001
Cobalt	mg/L	0.0009		**0.0010**			**0.025**		**0.033**			**0.012**	<0.0005
Copper	mg/L	0.005		0.005			**0.044**		**0.054**			**0.021**	0.005
Lead	mg/L	0.005		0.0011			**0.022**		**0.033**			**0.014**	<0.0005
Molybdenum	mg/L	0.040*		0.009			0.020		0.017			0.008	0.014
Selenium	mg/L	0.100		<0.005			<0.005		<0.005			<0.005	<0.002
Silver	mg/L	0.0001		<0.0001			<0.0001		0.0001			<0.0001	
Strontium	mg/L			0.39			0.39		0.47			0.15	0.43
Tin	mg/L			<0.002			<0.002		<0.002			<0.002	<0.001
Titanium	mg/L			0.037			0.66		0.72			0.35	0.015
Total Kjeldahl Nitrogen (TKN)	mg/L			1.5			4		5			7	1.5
Total Phosphorus	mg/L	0.02*		**0.12**			**1.0**		**1.6**			**1.0**	**0.086**
Vanadium	mg/L	0.006*		0.004			**0.063**		**0.085**			**0.037**	0.0014
Ion Percentage	%		1.4		5.1	36.9		3.6	26.6	2.2	4.1		0.7
Benzene	ug/L		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	ug/L		<0.3	<0.2	<0.3	<0.3	<0.2	<0.3	<0.2	<0.3	<0.3	<0.2	<0.3
Ethylbenzene	ug/L		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o-Xylene	ug/L		<0.3	<0.2	<0.3	<0.3	<0.2	<0.6	<0.2	<0.3	<0.3	<0.2	<0.3
p+m-Xylene	ug/L		<0.6	<0.4	<0.6	<0.6	<0.4	<0.3	<0.4	<0.6	<0.6	<0.4	<0.6
Total Xylenes	ug/L		<0.6	<0.4			<0.4		<0.4			<0.4	<0.6
Total Oil & Grease	mg/L			<0.5			<0.5		<1			<0.5	

NOTES:

1) PWQO denotes Provincial Water Quality Objectives (1994) with updates.
2) * denotes interim PWQO.
3) *** denotes change from background concentrations.
4) Historic chemical anomalies retained in database.
5) Unionized ammonia values are calculated based on field determined pH and temperature values.
6) mg/L denotes milligrams per litre.
7) umho/cm denotes microsiemens per centimeter.
8) BOD denotes biological oxygen demand.
9) COD denotes chemical oxygen demand.
10) Blank denotes parameter not analyzed.
11) Bolded text and shading denotes concentration exceeds criterion.

Table J-2
Precipitation Event Surface Water Quality - Poplar System
Twin Creeks Environmental Centre - Poplar System

Parameter	Units	PWQO	Inlet Point to Sedimentation Pond 1 (Poplar System) - SS15A										
Date			13-Oct-11	13-Mar-12	4-May-12	28-Jul-12	30-Oct-12	13-Jan-13	10-Apr-13	29-May-13	5-Jul-13	28-Aug-13	7-Oct-13
Routine/Storm Monitoring			Routine	Routine	Routine	Routine	Routine	Routine	Routine	Storm	Routine	Storm	Routine
Laboratory			Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam	Maxxam
Alkalinity (as $CaCO_3$)	mg/L	<25%***	191	140	95	82	81	120	100		82		180
Chloride	mg/L		20	15	28	11	19	14	11	10	13	21	44
Sulphate	mg/L		140	130	200	120	84	87	79		110		110
Ammonia (as N)	mg/L		0.075	0.075	0.075	0.075	0.20	0.075	0.075	0.70	0.075	0.075	1.69
Ammonia Unionized	mg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02		<0.015		**0.12**
Nitrate	mg/L		0.5	1.2	4.9	1.1	2.3	0.62	0.82	1.6	0.34	0.05	0.42
Nitrite	mg/L									0.11		<0.010	
Phenols	mg/L	0.001	**0.012**	**0.0023**	<0.0010	**0.0041**	<0.0010	<0.0010	<0.0010		<0.0010		**0.0011**
Boron	mg/L	0.200	**0.26**	**0.29**	**0.38**	**0.21**	0.18	0.20	**0.26**	**0.32**	**0.29**	**0.39**	**0.91**
Calcium	mg/L		93	78	86	73	56	59	110	59	60	63	78
Chromium	mg/L	0.0089	0.005	**0.012**	<0.0050	**0.015**	**0.027**	0.0073	**0.042**	<0.005	<0.0050	<0.005	<0.0050
Iron	mg/L	0.300	**4.0**	**12**	**2.7**	**15**	**27**	**6.8**	**43**	**3.6**	**3.9**	**2.8**	**2.1**
Magnesium	mg/L		24	24	24	19	19	18	30	15	16	22	23
Potassium	mg/L		13	6.5	5.7	6.2	8.7	5.5	8.9	5.7	6.5	5.2	11
Sodium	mg/L		14	14	15	11	13	13	12	11	13	12	41
Nickel	mg/L	0.025	0.016	0.016	0.005	0.021	**0.033**	0.0090	**0.059**	0.007	0.0065	0.005	0.0065
Zinc	mg/L	0.020	**0.021**	**0.031**	0.010	**0.039**	**0.070**	**0.021**	**0.11**	0.02	0.015	<0.01	0.011
pH	(pH units)	6.5-8.5	6.87	8.28	7.39	7.36	7.65	7.88	7.16		8.2	7.9	8.13
Total Organic Carbon	mg/L		29.5	17	14.0	12.0	17	11	8.8		8.7		15
Aluminum	mg/L	0.075*								**2.6**		**4.5**	
Arsenic	mg/L	0.100*								0.002		0.002	
Barium	mg/L									0.036		0.054	
Beryllium	mg/L	1.100								<0.0006		<0.0006	
Bismuth	mg/L									<0.0010		<0.0010	
Cadmium	mg/L	0.0002								<0.0001		<0.0001	
Cobalt	mg/L	0.0009								**0.0015**		**0.0012**	
Copper	mg/L	0.005								**0.007**		**0.007**	
Lead	mg/L	0.005								0.0017		0.0011	
Molybdenum	mg/L	0.040*								0.007		0.014	
Selenium	mg/L	0.100								<0.005		<0.005	
Silver	mg/L	0.0001								<0.00010		<0.00010	
Strontium	mg/L									0.18		0.33	
Tin	mg/L									<0.002		<0.002	
Titanium	mg/L									0.045		0.16	
Total Kjeldahl Nitrogen (TKN)	mg/L									1.9		1.5	
Total Phosphorus	mg/L	0.02*								**0.10**		**0.2**	
Vanadium	mg/L	0.006*								0.005		0.01	
Ion Percentage	%		0.9	2.9	0.7	6.9	7.0	2.8	19.3		4.0		2.4
Benzene	ug/L		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20	<0.2	<0.20	<0.2
Toluene	ug/L		<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.20	<0.3	<0.20	<0.3
Ethylbenzene	ug/L		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20	<0.2	<0.20	<0.2
o-Xylene	ug/L		<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.20	<0.3	<0.20	<0.3
p+m-Xylene	ug/L		<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.40	<0.6	<0.40	<0.6
Total Xylenes	ug/L												
Total Oil & Grease	mg/L												

NOTES:

1) PWQO denotes Provincial Water Quality Objectives (1994) with updates.
2) * denotes interim PWQO.
3) *** denotes change from background concentrations.
4) Historic chemical anomalies retained in database.
5) Unionized ammonia values are calculated based on field determined pH and temperature values.
6) mg/L denotes milligrams per litre.
7) umho/cm denotes microsiemens per centimeter.
8) BOD denotes biological oxygen demand.
9) COD denotes chemical oxygen demand.
10) Blank denotes parameter not analyzed.
11) Bolded text and shading denotes concentration exceeds criterion.

Table J-2
Precipitation Event Surface Water Quality - Poplar System
Twin Creeks Environmental Centre - Poplar System

Parameter	Units	PWQO	Inlet Point to Sedimentation Pond 1 (Poplar System) - SS15A										
Date			**11-Jan-14**	**8-Apr-14**	**7-Jul-14**	**15-Oct-14**	**4-Jan-15**	**10-Apr-15**	**25-Oct-15**	**25-Feb-16**	**7-Apr-16**	**14-Jul-16**	**12-Jan-17**
Routine/Storm Monitoring			**Routine**	**Routine**	**Routine**	**Routine**	**Routine**	**Routine**	**Routine**	**Routine**	**Routine**	**Routine**	**Routine**
Laboratory			**Maxxam**	**Maxxam**	**Maxxam**	**Maxxam**	**Maxxam**	**Maxxam**	**Maxxam**	**Maxxam**	**Maxxam**	**Maxxam**	**Maxxam**
Alkalinity (as $CaCO_3$)	mg/L	<25%***	60		61	150	71	170	51	130	150	77	110
Chloride	mg/L		11	26	6	28	9	11	8.2	6.9	5.8	8.4	13
Sulphate	mg/L		46	120	68	56	33	60	900	92	70	120	40
Ammonia (as N)	mg/L		0.58	0.075	0.19	0.075	0.27	0.075	0.35	0.08	0.075	0.075	0.42
Ammonia Unionized	mg/L	0.02	0.0055	<0.0019	0.0085	<0.0021	0.0031	<0.0057	0.0051	<0.0013	<0.0018	<0.0044	0.0009
Nitrate	mg/L		1.60	0.79	0.47	0.05	1.02	0.35	1.67	1.00	0.37	1.15	1.23
Nitrite	mg/L												
Phenols	mg/L	0.001	**0.002**	**0.006**	**0.002**	**0.013**	**0.0083**	<0.0010	<0.0010	<0.0010	<0.0010	*<0.0040*	*<0.0040*
Boron	mg/L	0.200	0.095	**0.28**	0.19	0.19	0.099	0.12	0.13	0.11	0.12	0.18	0.13
Calcium	mg/L		30	80	41	67	32	63	250	63	64	62	50
Chromium	mg/L	0.0089	<0.0050	0.005	**0.033**	0.0057	<0.0050	<0.0050	<0.005	<0.0050	**0.013**	**0.009**	**0.027**
Iron	mg/L	0.300	**0.36**	**2.90**	**30**	**4.7**	**2.0**	**3.2**	0.20	**2.4**	**6.6**	**7.9**	**23**
Magnesium	mg/L		8.3	24	14	27	8.4	17	88	18	19	14	16
Potassium	mg/L		7.8	6.2	8.4	17	9.3	5.2	2.6	4.8	6.3	4.6	12
Sodium	mg/L		6.3	17	4.9	8.0	4	5.8	14	6.6	6.7	8.0	4.8
Nickel	mg/L	0.025	0.001	0.0078	**0.038**	0.0079	0.003	0.0047	0.002	0.0038	0.0086	0.012	**0.030**
Zinc	mg/L	0.020	0.012	0.011	**0.077**	**0.021**	0.014	0.010	<0.02	0.0069	0.019	0.020	**0.060**
pH	(pH units)	6.5-8.5	7.82	7.87	7.88	7.74	8.02	8.27	7.84	7.99	7.98	7.76	7.29
Total Organic Carbon	mg/L		7.4	10	18.0	42	11	9.9	7.6	6.4	10	6.7	15
Aluminum	mg/L	0.075*											
Arsenic	mg/L	0.100*											
Barium	mg/L												
Beryllium	mg/L	1.100											
Bismuth	mg/L												
Cadmium	mg/L	0.0002											
Cobalt	mg/L	0.0009											
Copper	mg/L	0.005											
Lead	mg/L	0.005											
Molybdenum	mg/L	0.040*											
Selenium	mg/L	0.100											
Silver	mg/L	0.0001											
Strontium	mg/L												
Tin	mg/L												
Titanium	mg/L												
Total Kjeldahl Nitrogen (TKN)	mg/L												
Total Phosphorus	mg/L	0.02*											
Vanadium	mg/L	0.006*											
Ion Percentage	%		1.9		6.6	6.5	3.5	0.2	0.3	1.7	3.1	2.4	6.4
Benzene	ug/L		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.10	<0.10
Toluene	ug/L		<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.20	<0.20
Ethylbenzene	ug/L		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.10	<0.10
o-Xylene	ug/L		<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.10	<0.10
p+m-Xylene	ug/L		<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.10	<0.10
Total Xylenes	ug/L											<0.10	<0.10
Total Oil & Grease	mg/L												

NOTES:

1) PWQO denotes Provincial Water Quality Objectives (1994) with updates.
2) * denotes interim PWQO.
3) *** denotes change from background concentrations.
4) Historic chemical anomalies retained in database.
5) Unionized ammonia values are calculated based on field determined pH and temperature values.
6) mg/L denotes milligrams per litre.
7) umho/cm denotes microsiemens per centimeter.
8) BOD denotes biological oxygen demand.
9) COD denotes chemical oxygen demand.
10) Blank denotes parameter not analyzed.
11) Bolded text and shading denotes concentration exceeds criterion.
12) Italics denotes parameter concentration was below the laboratory RDL, where the RDL exceeds the relevant PWQO.

Table J-2
Precipitation Event Surface Water Quality - Poplar System
Twin Creeks Environmental Centre - Poplar System

Parameter	Units	PWQO	Inlet Point to Sedimentation Pond 1 (Poplar System) - SS15A										
Date			**6-Apr-17**	**13-Jul-17**	**28-Oct-17**	**23-Jan-18**	**4-Apr-18**	**8-Aug-18**	**8-Aug-18**	**26-Sep-18**	**2-Oct-18**	**24-Jan-19**	**17-Apr-19**
Routine/Storm Monitoring			**Routine**	**Routine**	**Routine**	**Routine**	**Routine**	**Routine**	**Storm**	**Storm**	**Routine**	**Routine**	**Routine**
Laboratory			**Maxxam**	**Maxxam**	**Maxxam**	**Maxxam**	**Maxxam**	**Maxxam**	**Maxxam**	**Maxxam**	**Maxxam**	**Maxxam**	**Maxxam**
Alkalinity (as $CaCO_3$)	mg/L	<25%***	220	84	100	120	170	80			180	77	210
Chloride	mg/L		33	2.9	15	10	12	7.6	7.4	7.9	28	12	28
Sulphate	mg/L		160	77	160	110	120	150			110	26	160
Ammonia (as N)	mg/L		0.075	0.55	0.03	0.13	0.16	0.025	0.025	0.025	0.025	0.9	0.025
Ammonia Unionized	mg/L	0.02	<0.0016	0.04	<0.0005	0.0032	0.0006	<0.0005			<0.00061	0.00087	<0.008
Nitrate	mg/L		0.52	1.04	2.73	3.14	1.22	5.28	4.83	0.05	2.75	0.88	0.90
Nitrite	mg/L								0.196	<0.010			
Phenols	mg/L	0.001	*<0.0040*	*<0.0040*	<0.0010	0.001	<0.0010	<0.0010			<0.0010	**0.0014**	<0.0010
Boron	mg/L	0.200	0.19	0.25	0.15	0.12	**0.26**	**0.33**	**0.34**	0.16	0.26	0.06	**0.29**
Calcium	mg/L		110	76	81	64	86	79	78	59	78	26	92
Chromium	mg/L	0.0089	<0.005	0.037	0.008	0.008	**0.012**	0.008	**0.009**	<0.005	<0.005	<0.005	<0.005
Iron	mg/L	0.300	**2.00**	**38**	**5.5**	**7.7**	**12**	**7.3**	**7.3**	**1.60**	3.8	**0.6**	**0.7**
Magnesium	mg/L		33	21	22	21	27	19	18	16	23	7.1	32
Potassium	mg/L		6.8	7.6	5.6	4.5	5.6	6	6.4	5.5	6.5	10	4.6
Sodium	mg/L		18	5.8	10	7.8	12	9.9	9.4	7.1	14	4.2	16
Nickel	mg/L	0.025	0.004	**0.051**	0.008	0.01	0.015	0.0110	0.011	0.003	0.007	0.001	0.003
Zinc	mg/L	0.020	0.020	**0.10**	0.02	0.02	**0.04**	0.020	0.02	<0.01	0.01	0.01	<0.01
pH	(pH units)	6.5-8.5	7.81	8.1	7.05	8.31	7.49	7.1	7.1	7.14	7.15	6.98	**8.63**
Total Organic Carbon	mg/L		11	14	10	8.4	12	11			13	12	10
Aluminum	mg/L	0.075*							**5.8**	**1**			
Arsenic	mg/L	0.100*							0.003	0.001			
Barium	mg/L								0.052	0.028			
Beryllium	mg/L	1.100							<0.0006	<0.0006			
Bismuth	mg/L								<0.001	<0.001			
Cadmium	mg/L	0.0002							<0.0001	<0.0001			
Cobalt	mg/L	0.0009							**0.0028**	0.0006			
Copper	mg/L	0.005							**0.008**	0.004			
Lead	mg/L	0.005							0.0029	0.0007			
Molybdenum	mg/L	0.040*							0.009	0.007			
Selenium	mg/L	0.100							<0.005	<0.005			
Silver	mg/L	0.0001							*<0.0004*	*<0.0004*			
Strontium	mg/L								0.26	0.22			
Tin	mg/L								<0.002	<0.002			
Titanium	mg/L								0.15	0.016			
Total Kjeldahl Nitrogen (TKN)	mg/L								<0.7	<0.7			
Total Phosphorus	mg/L	0.02*							**0.18**	**0.066**			
Vanadium	mg/L	0.006*							**0.012**	0.003			
Ion Percentage	%		1.4	14.4	2.8	2.0	3.6	5.3	46.6	45.5	0.5	1.1	1.0
Benzene	ug/L		<0.10	<0.10	<0.10	<0.10	<0.20	<0.20	<0.20	<0.20	<0.25	<0.25	<0.25
Toluene	ug/L		<0.20	<0.10	<0.10	<0.20	<0.20	<0.20	<0.20	<0.20	<0.50	<0.50	<0.50
Ethylbenzene	ug/L		<0.10	<0.20	<0.20	<0.10	<0.20	<0.20	<0.20	<0.20	<0.25	<0.25	<0.25
o-Xylene	ug/L		<0.10	<0.10	<0.10	<0.10	<0.20	<0.20	<0.20	<0.20	<0.25	<0.25	<0.25
p+m-Xylene	ug/L		<0.10	<0.10	<0.10	<0.10	<0.20	<0.20	<0.20	<0.20	<0.25	<0.25	<0.25
Total Xylenes	ug/L		<0.10	<0.10	<0.10	<0.10	<0.20	<0.20	<0.20	<0.20	<0.25	<0.25	<0.25
Total Oil & Grease	mg/L												

NOTES:

1) PWQO denotes Provincial Water Quality Objectives (1994) with updates.
2) * denotes interim PWQO.
3) *** denotes change from background concentrations.
4) Historic chemical anomalies retained in database.
5) Unionized ammonia values are calculated based on field determined pH and temperature values.
6) mg/L denotes milligrams per litre.
7) umho/cm denotes microsiemens per centimeter.
8) BOD denotes biological oxygen demand.
9) COD denotes chemical oxygen demand.
10) Blank denotes parameter not analyzed.
11) Bolded text and shading denotes concentration exceeds criterion.
12) Italics denotes parameter concentration was below the laboratory RDL, where the RDL exceeds the relevant PWQO.

Table J-2
Precipitation Event Surface Water Quality - Poplar System
Twin Creeks Environmental Centre - Poplar System

Parameter	Units	PWQO	Inlet Point to Sedimentation Pond 1 (Poplar System) - SS15A										
Date			**2-Oct-19**	**2-Oct-19**	**11-Jan-20**	**18-May-20**	**15-Nov-20**	**26-Mar-21**	**9-Jul-21**	**23-Sep-21**	**4-Oct-21**	**17-Feb-22**	**4-May-22**
Routine/Storm Monitoring			**Routine**	**Storm**	**Routine**	**Routine**	**Routine**	**Routine**	**Routine**	**Storm**	**Routine**	**Routine**	**Routine**
Laboratory			**Bureau Veritas**	**Bureau Veritas**	**Bureau Veritas**	**Bureau Veritas**	**Bureau Veritas**	**Bureau Veritas**	**Bureau Veritas**	**Bureau Veritas**	**Bureau Veritas**	**Bureau Veritas**	**Bureau Veritas**
Alkalinity (as $CaCO_3$)	mg/L	<25%***	120		120	170	100	130	160		190	85	200
Chloride	mg/L		24	24	24	41	35	48	94	65	66	11	21
Sulphate	mg/L		90		50	110	63	120	110		140	23	79
Ammonia (as N)	mg/L		0.12	0.03	0.099	0.39	0.42	0.089	0.025	0.075	0.0025	1.3	0.12
Ammonia Unionized	mg/L	0.02	0.01		0.003	0.014	0.008	<0.00061	<0.0011		<0.0013	0.0043	0.0052
Nitrate	mg/L		1.21	1.13	1.95	4.36	7.61	5.22	5.82	4.55	1.48	0.97	1.18
Nitrite	mg/L			0.28						0.023			
Phenols	mg/L	0.001	<0.0010		0.0005	<0.0010	<0.0010	<0.0010	<0.0010		<0.0010	0.0010	<0.0010
Boron	mg/L	0.200	**0.34**	**0.33**	**0.21**	**0.56**	0.17	**0.42**	**0.26**	**0.64**	**0.77**	0.07	**0.39**
Calcium	mg/L		61	61	62	64	57	74	81	76	92	33	70
Chromium	mg/L	0.0089	<0.0050	<0.0050	**0.037**	0.006	0.007	**0.016**	<0.005	<0.005	<0.005	**0.020**	0.006
Iron	mg/L	0.300	**2.30**	**2.30**	**36.0**	**5.3**	**6.1**	**14**	**1.5**	**2.5**	**1.8**	**20**	**5.5**
Magnesium	mg/L		17	17	22	20	16	26	21	22	26	11	23
Potassium	mg/L		8.1	8.3	12.0	6.6	19	9.9	5.9	8.8	11	7.3	4.9
Sodium	mg/L		15	14	14.0	33	9.3	34	14	38	40	4.5	20
Nickel	mg/L	0.025	0.005	0.005	**0.044**	0.012	0.01	0.023	0.004	0.008	0.007	**0.027**	0.009
Zinc	mg/L	0.020	0.010	0.010	**0.1**	**0.030**	**0.040**	**0.04**	0.005	0.01	<0.01	**0.05**	0.02
pH	(pH units)	6.5-8.5	8.0	7.9	8.3	8.1	7.9	7.5	7.7	7.8	7.7	7.4	8.1
Total Organic Carbon	mg/L		11		9.7	20	34	25	12		15	17	12
Aluminum	mg/L	0.075*		**1.40**						**1.8**			
Arsenic	mg/L	0.100*		0.002						0.001			
Barium	mg/L			0.035						0.046			
Beryllium	mg/L	1.100		<0.0006						<0.0006			
Bismuth	mg/L			<0.001						<0.001			
Cadmium	mg/L	0.0002		<0.0001						<0.0001			
Cobalt	mg/L	0.0009		**0.0011**						**0.0011**			
Copper	mg/L	0.005		0.005						**0.006**			
Lead	mg/L	0.005		0.001						0.0009			
Molybdenum	mg/L	0.040*		0.009						0.006			
Selenium	mg/L	0.100		<0.005						<0.005			
Silver	mg/L	0.0001		*<0.0004*						*<0.0004*			
Strontium	mg/L			0.22						0.27			
Tin	mg/L			<0.002						<0.002			
Titanium	mg/L			0.027						0.027			
Total Kjeldahl Nitrogen (TKN)	mg/L			0.8						1.2			
Total Phosphorus	mg/L	0.02*		**0.11**						**0.15**			
Vanadium	mg/L	0.006*		0.003						0.004			
Ion Percentage	%		1.7	38.7	9.0	1.7	4.2	4.0	5.7	30.4	0.5	4.4	0.6
Benzene	ug/L		<0.50	<0.20	<0.10	<0.25	<0.50	<0.25	<0.10	<0.10	<0.25	<0.10	<0.10
Toluene	ug/L		<1.0	<0.20	<0.20	<0.50	<1.0	<0.50	<0.20	<0.20	<0.50	<0.20	<0.20
Ethylbenzene	ug/L		<0.50	<0.20	<0.10	<0.25	<0.50	<0.25	<0.10	<0.10	<0.25	<0.10	<0.10
o-Xylene	ug/L		<0.50	<0.20	<0.10	<0.25	<0.50	<0.25	<0.10	<0.10	<0.25	<0.10	<0.10
p+m-Xylene	ug/L		<0.50	<0.20	<0.10	<0.25	<0.50	<0.25	<0.10	<0.10	<0.25	<0.10	<0.10
Total Xylenes	ug/L		<0.50	<0.20	<0.10	<0.25	<0.50	<0.25	<0.10	<0.10	<0.25	<0.10	<0.10
Total Oil & Grease	mg/L												

NOTES:

1) PWQO denotes Provincial Water Quality Objectives (1994) with updates.
2) * denotes interim PWQO.
3) *** denotes change from background concentrations.
4) Historic chemical anomalies retained in database.
5) Unionized ammonia values are calculated based on field determined pH and temperature values.
6) mg/L denotes milligrams per litre.
7) umho/cm denotes microsiemens per centimeter.
8) BOD denotes biological oxygen demand.
9) COD denotes chemical oxygen demand.
10) Blank denotes parameter not analyzed.
11) Bolded text and shading denotes concentration exceeds criterion.
12) Italics denotes parameter concentration was below the laboratory RDL, where the RDL exceeds the relevant PWQO.

Table J-2
Precipitation Event Surface Water Quality - Poplar System
Twin Creeks Environmental Centre - Poplar System

Parameter	Units	PWQO	Inlet Point to Sedimentation Pond 1 (Poplar System) - SS15A										
Date			**4-Aug-22**	**4-Aug-22**	**28-Sep-22**	**18-Oct-22**	**10-Feb-23**	**4-Apr-23**	**3-Jul-23**	**7-Jul-23**	**13-Jul-23**	**2-Nov-23**	**10-Jan-24**
Routine/Storm Monitoring			**Routine**	**Storm**	**Storm**	**Routine**	**Routine**	**Routine**	**Routine**	**Storm**	**Storm**	**Routine**	**Routine**
Laboratory			**Bureau Veritas**	**Bureau Veritas**	**Bureau Veritas**	**Bureau Veritas**	**Bureau Veritas**	**Bureau Veritas**	**Bureau Veritas**	**Bureau Veritas**	**Bureau Veritas**	**Bureau Veritas**	**Bureau Veritas**
Alkalinity (as $CaCO_3$)	mg/L	<25%***	88			76	170	110	130			220	170
Chloride	mg/L		13	13	14	8.4	27	7.4	11	9.1	7.1	63	29
Sulphate	mg/L		220			240	130	33	100			130	110
Ammonia (as N)	mg/L		0.074	0.075	0.075	<0.050	0.14	0.054	<0.050	<0.15	<0.15	<0.050	0.12
Ammonia Unionized	mg/L	0.02	0.002			<0.0011	0.0014	<0.00061	<0.0049			<0.00061	<0.00061
Nitrate	mg/L		2.19	2.34	0.38	0.29	1.62	0.42	0.26	7.8	3.85	1.43	1.06
Nitrite	mg/L			0.153	0.011					0.127	0.073		
Phenols	mg/L	0.001	0.0012			<0.0010	<0.0010	<0.0010	0.0014			<0.0010	<0.0010
Boron	mg/L	0.200	**0.24**	**0.23**	0.15	0.1	**0.32**	**0.24**	**0.42**	**0.28**	**0.30**	**1.4**	**0.34**
Calcium	mg/L		180	90	49	87	84	59	110	71	56	110	72
Chromium	mg/L	0.0089	**0.023**	<0.005	**0.010**	0.006	<0.005	**0.050**	**0.021**	<0.005	**0.039**	<0.005	0.007
Iron	mg/L	0.300	**23**	**4.3**	**9.4**	**5.7**	**4.3**	**50**	**21**	**3.5**	**39**	**0.9**	**5.7**
Magnesium	mg/L		39	21	13	26	27	22	26	16	20	35	23
Potassium	mg/L		9.4	6.9	6.9	6.3	5.1	7.4	8.1	4.1	8.8	13	7.4
Sodium	mg/L		12	12	6.8	8.5	24	11	14	11	14	100	23
Nickel	mg/L	0.025	**0.033**	0.008	0.014	0.009	0.007	**0.066**	**0.030**	0.006	**0.049**	0.012	0.009
Zinc	mg/L	0.020	**0.05**	0.01	**0.03**	0.02	0.01	**0.12**	**0.06**	<0.01	**0.10**	**0.07**	0.02
pH	(pH units)	6.5-8.5	7.5	7.5	7.8	8.1	7.9	7.2	8.1	7.8	7.5	6.7	7.5
Total Organic Carbon	mg/L		11			8.4	7.5	17	8.7			11	9.4
Aluminum	mg/L	0.075*		**2.8**	**5.7**					**2.7**	**25**		
Arsenic	mg/L	0.100*		0.002	0.003					0.002	0.009		
Barium	mg/L			0.036	0.039					0.04	0.17		
Beryllium	mg/L	1.100		<0.0006	<0.0006					<0.0006	0.0014		
Bismuth	mg/L			<0.001	<0.001					<0.001	<0.001		
Cadmium	mg/L	0.0002		<0.0001	<0.0001					<0.0001	0.0002		
Cobalt	mg/L	0.0009		**0.0023**	**0.0044**					**0.0013**	**0.013**		
Copper	mg/L	0.005		**0.007**	**0.010**					**0.006**	**0.026**		
Lead	mg/L	0.005		0.0019	0.0040					0.0013	**0.013**		
Molybdenum	mg/L	0.040*		0.01	0.007					0.006	0.007		
Selenium	mg/L	0.100		<0.005	<0.005					<0.005	<0.005		
Silver	mg/L	0.0001		*<0.0004*	*<0.0004*					*<0.0004*	*<0.0004*		
Strontium	mg/L			0.33	0.18					0.20	0.19		
Tin	mg/L			<0.002	<0.002					<0.002	<0.002		
Titanium	mg/L			0.045	0.08					0.035	0.15		
Total Kjeldahl Nitrogen (TKN)	mg/L			<0.7	<0.7					<0.7	<0.7		
Total Phosphorus	mg/L	0.02*		**0.11**	**0.17**					**0.062**	**0.23**		
Vanadium	mg/L	0.006*		0.005	**0.011**					0.005	**0.045**		
Ion Percentage	%		16.1	45.0	41.0	0.8	2.5	14.4	13.3	45.5	46.4	9.8	0.6
Benzene	ug/L		<0.25	<0.25	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Toluene	ug/L		<0.25	<0.25	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.10
Ethylbenzene	ug/L		<0.50	<0.50	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.20
o-Xylene	ug/L		<0.25	<0.25	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
p+m-Xylene	ug/L		<0.25	<0.25	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Total Xylenes	ug/L		<0.25	<0.25	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Total Oil & Grease	mg/L												

NOTES:

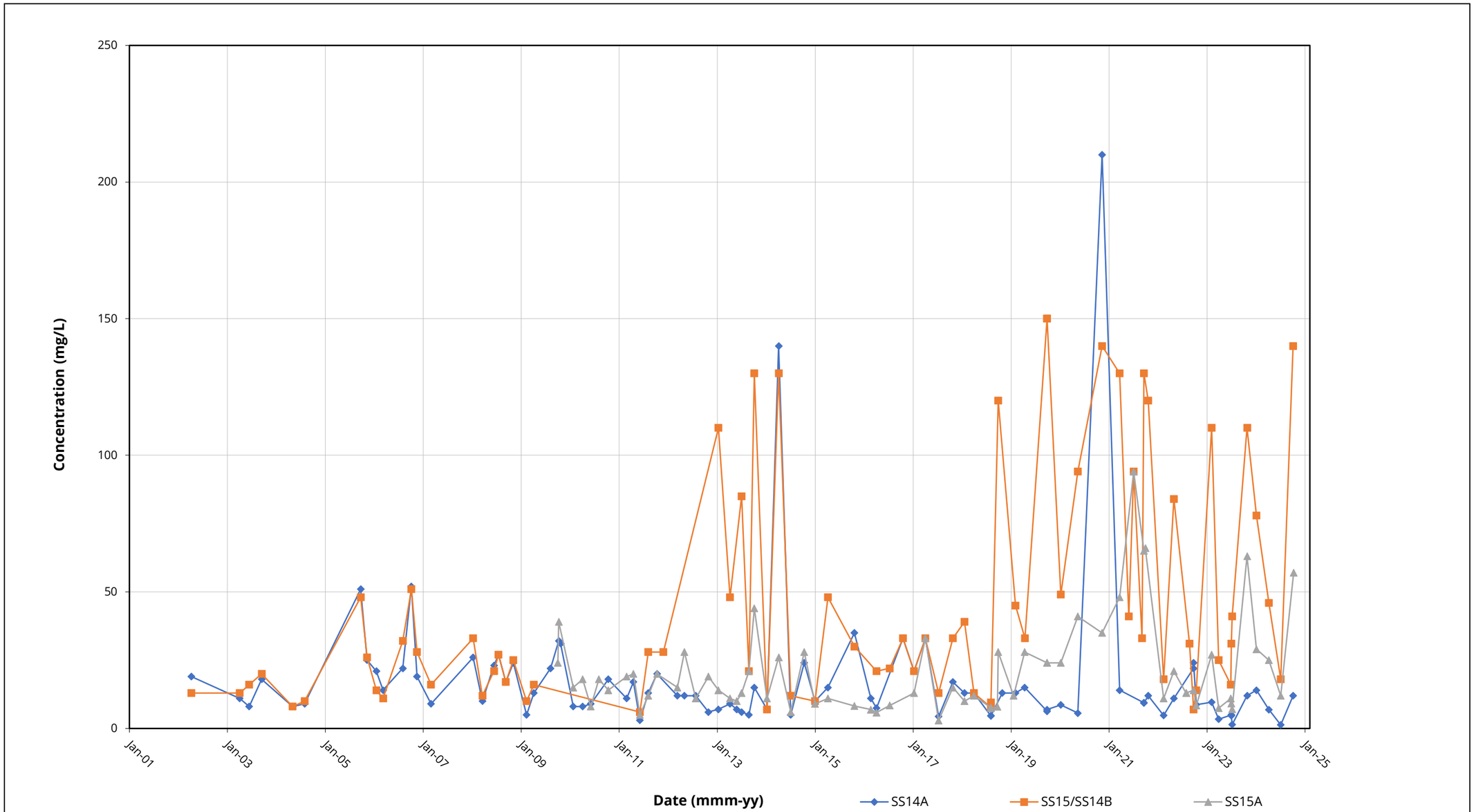
1) PWQO denotes Provincial Water Quality Objectives (1994) with updates.
2) * denotes interim PWQO.
3) *** denotes change from background concentrations.
4) Historic chemical anomalies retained in database.
5) Unionized ammonia values are calculated based on field determined pH and temperature values.
6) mg/L denotes milligrams per litre.
7) umho/cm denotes microsiemens per centimeter.
8) BOD denotes biological oxygen demand.
9) COD denotes chemical oxygen demand.
10) Blank denotes parameter not analyzed.
11) Bolded text and shading denotes concentration exceeds criterion.
12) Italics denotes parameter concentration was below the laboratory RDL, where the RDL exceeds the relevant PWQO.

Table J-2
Precipitation Event Surface Water Quality - Poplar System
Twin Creeks Environmental Centre - Poplar System

Parameter	Units	PWQO	Inlet Point to Sedimentation Pond 1 (Poplar System) - SS15A											
Date			**12-Apr-24**	**10-Jul-24**	**14-Oct-24**									
Routine/Storm Monitoring			**Routine**	**Routine+Storm**	**Routine**									
Laboratory			**Bureau Veritas**	**Bureau Veritas**	**Bureau Veritas**									
Alkalinity (as $CaCO_3$)	mg/L	<25%***	200	120	130									
Chloride	mg/L		25	12	57									
Sulphate	mg/L		79	250	81									
Ammonia (as N)	mg/L		0.065	<0.15	<0.15									
Ammonia Unionized	mg/L	0.02	0.00093	<0.0036	<0.0065									
Nitrate	mg/L		1.52	<0.10	5.06									
Nitrite	mg/L			<0.010										
Phenols	mg/L	0.001	<0.0010	<0.0010	<0.0010									
Boron	mg/L	0.200	**0.52**	**0.45**	**0.47**									
Calcium	mg/L		72	90	65									
Chromium	mg/L	0.0089	0.005	0.006	<0.005									
Iron	mg/L	0.300	**5.2**	**6.0**	**4.4**									
Magnesium	mg/L		21	22	18									
Potassium	mg/L		6.6	6.2	11									
Sodium	mg/L		25	18	33									
Nickel	mg/L	0.025	0.009	0.01	0.01									
Zinc	mg/L	0.020	0.02	**0.03**	0.02									
pH	(pH units)	6.5-8.5	7.8	7.7	8.3									
Total Organic Carbon	mg/L		14	11	14									
Aluminum	mg/L	0.075*		**3.3**										
Arsenic	mg/L	0.100*		0.002										
Barium	mg/L			0.053										
Beryllium	mg/L	1.100		<0.0006										
Bismuth	mg/L			<0.001										
Cadmium	mg/L	0.0002		<0.0001										
Cobalt	mg/L	0.0009		**0.0026**										
Copper	mg/L	0.005		**0.008**										
Lead	mg/L	0.005		0.0028										
Molybdenum	mg/L	0.040*		0.006										
Selenium	mg/L	0.100		<0.005										
Silver	mg/L	0.0001		*<0.0004*										
Strontium	mg/L			0.33										
Tin	mg/L			<0.002										
Titanium	mg/L			0.053										
Total Kjeldahl Nitrogen (TKN)	mg/L			<0.7										
Total Phosphorus	mg/L	0.02*		**0.15**										
Vanadium	mg/L	0.006*		**0.007**										
Ion Percentage	%		0.9	2.5	2.3									
Benzene	ug/L		<0.50	<0.10	<0.10									
Toluene	ug/L		<1.0	<0.10	<0.20									
Ethylbenzene	ug/L		<0.50	<0.20	<0.10									
o-Xylene	ug/L		<0.50	<0.10	<0.10									
p+m-Xylene	ug/L		<0.50	<0.10	<0.10									
Total Xylenes	ug/L		<0.50	<0.10	<0.10									
Total Oil & Grease	mg/L													

NOTES:

1) PWQO denotes Provincial Water Quality Objectives (1994) with updates.
2) * denotes interim PWQO.
3) *** denotes change from background concentrations.
4) Historic chemical anomalies retained in database.
5) Unionized ammonia values are calculated based on field determined pH and temperature values.
6) mg/L denotes milligrams per litre.
7) umho/cm denotes microsiemens per centimeter.
8) BOD denotes biological oxygen demand.
9) COD denotes chemical oxygen demand.
10) Blank denotes parameter not analyzed.
11) Bolded text and shading denotes concentration exceeds criterion.
12) Italics denotes parameter concentration was below the laboratory RDL, where the RDL exceeds the relevant PWQO.



NOTES:

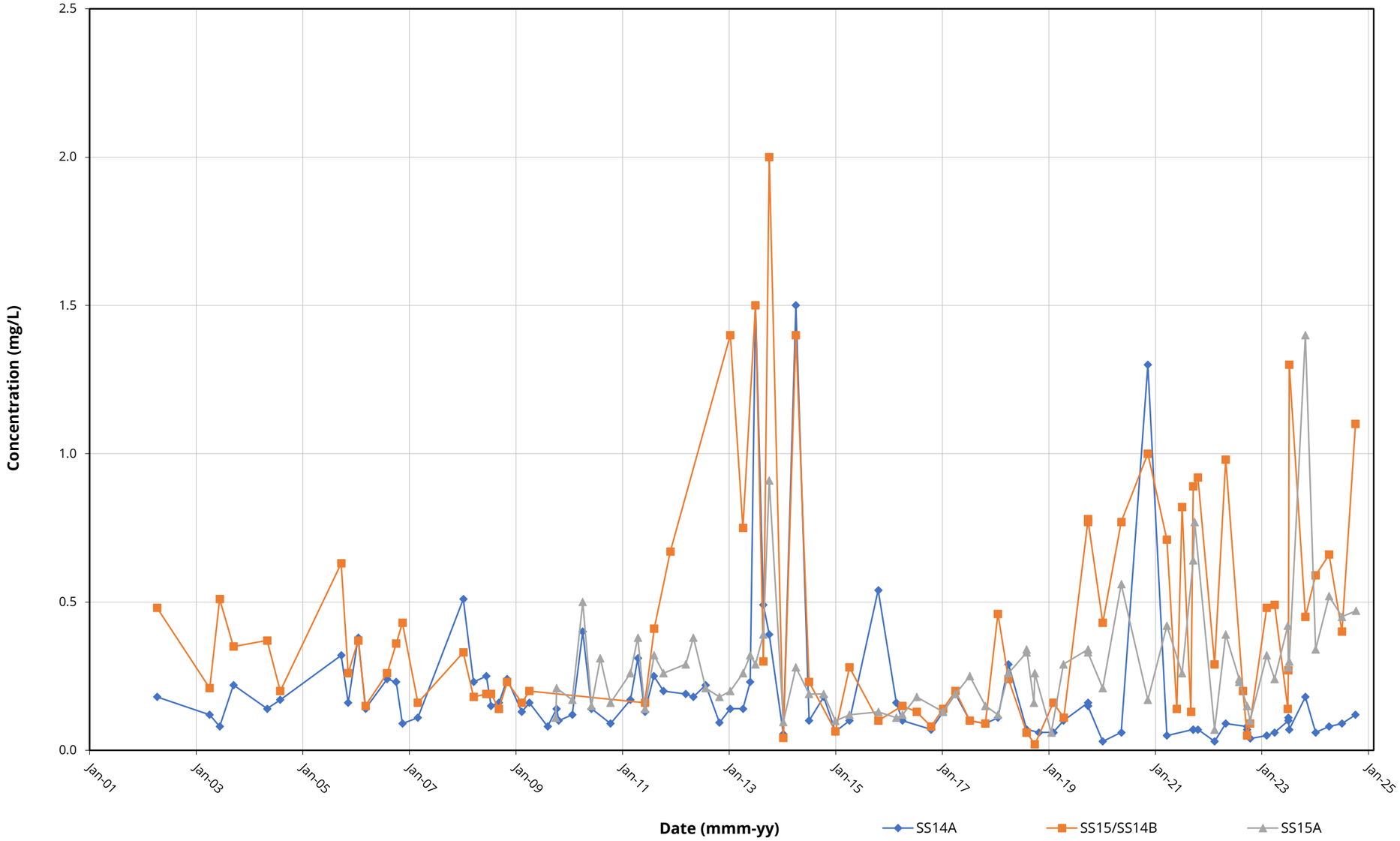
1. mg/L denotes milligrams per litre.

CONCENTRATION VS. TIME PLOT
Chloride

2024 FOURTH QUARTER & ANNUAL MONITORING REPORT

TWIN CREEKS ENVIRONMENTAL CENTRE
WASTE MANAGEMENT OF CANADA CORPORATION

FIGURE NUMBER	PROJECT NUMBER
J-1	2402553
DATE REVISED	**REVISED BY**
25-Oct-24	JMH



NOTES:

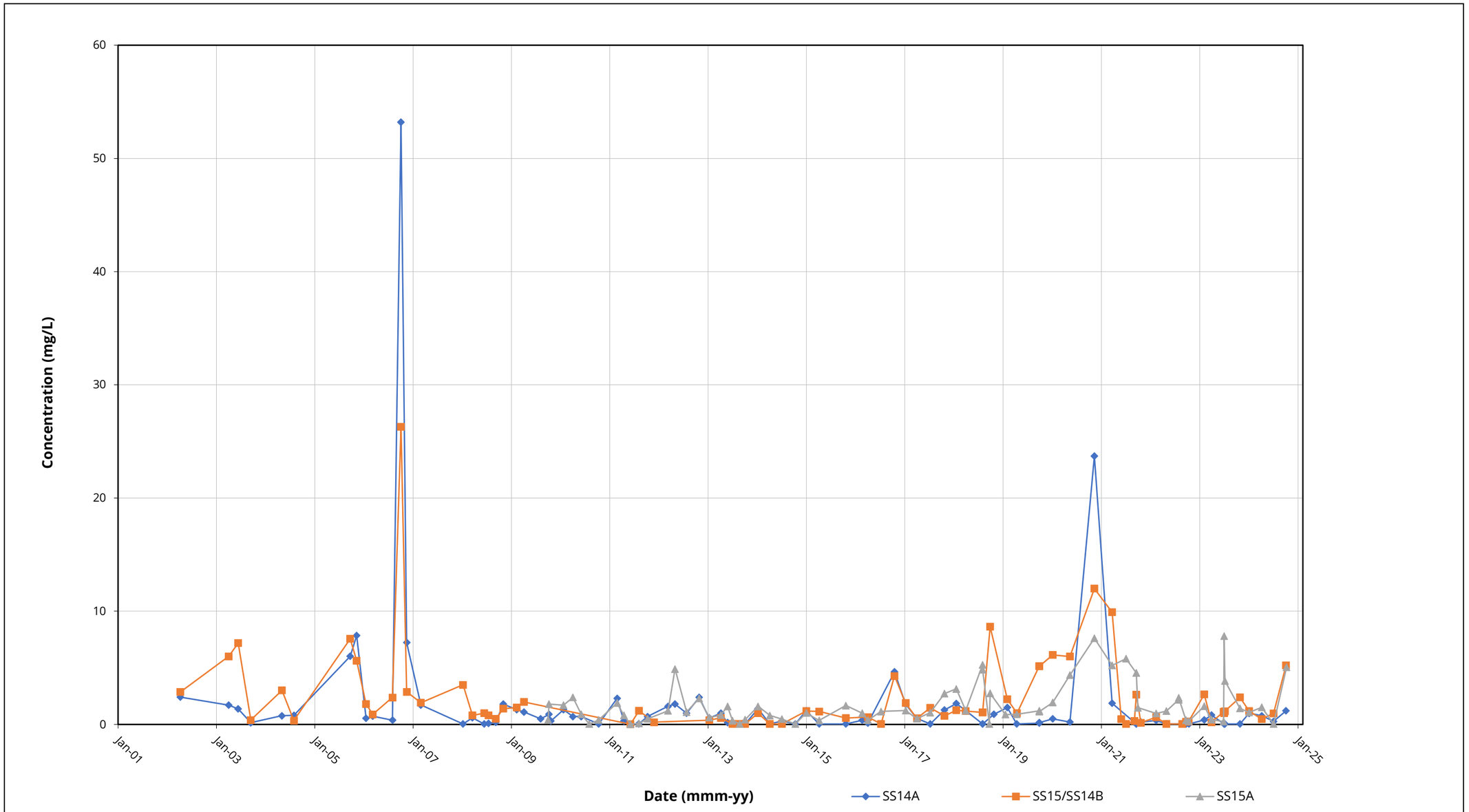
1. mg/L denotes milligrams per litre.

CONCENTRATION VS. TIME PLOT
Boron

2024 FOURTH QUARTER & ANNUAL MONITORING REPORT

TWIN CREEKS ENVIRONMENTAL CENTRE
WASTE MANAGEMENT OF CANADA CORPORATION

FIGURE NUMBER	PROJECT NUMBER
J-2	2402553
DATE REVISED	**REVISED BY**
25-Oct-24	JMH



NOTES:

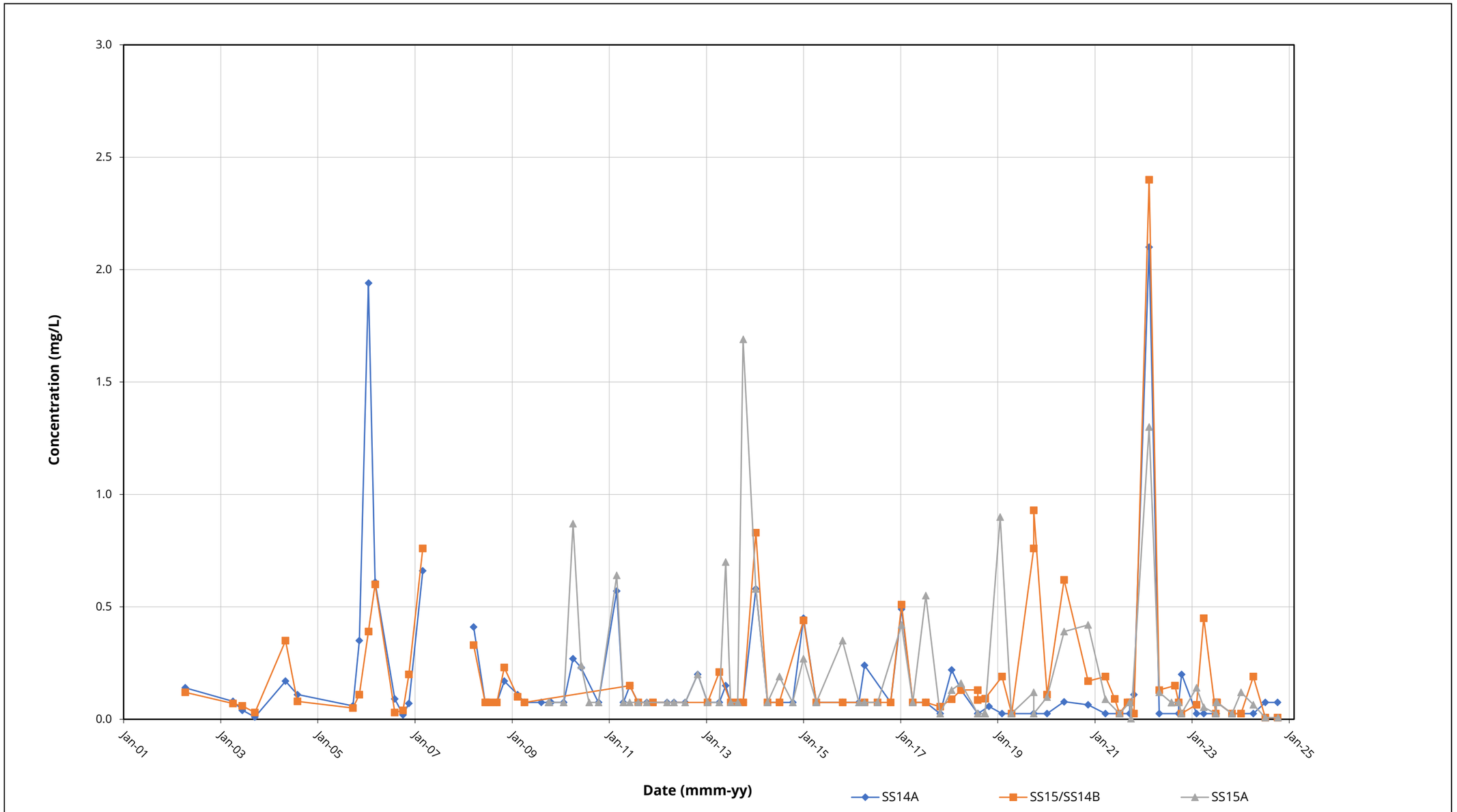
1. mg/L denotes milligrams per litre.

CONCENTRATION VS. TIME PLOT
Nitrate

2024 FOURTH QUARTER & ANNUAL MONITORING REPORT

TWIN CREEKS ENVIRONMENTAL CENTRE
WASTE MANAGEMENT OF CANADA CORPORATION

FIGURE NUMBER	PROJECT NUMBER
J-3	2402553
DATE REVISED	**REVISED BY**
25-Oct-24	JMH



NOTES:

1. mg/L denotes milligrams per litre.

CONCENTRATION VS. TIME PLOT
Ammonia

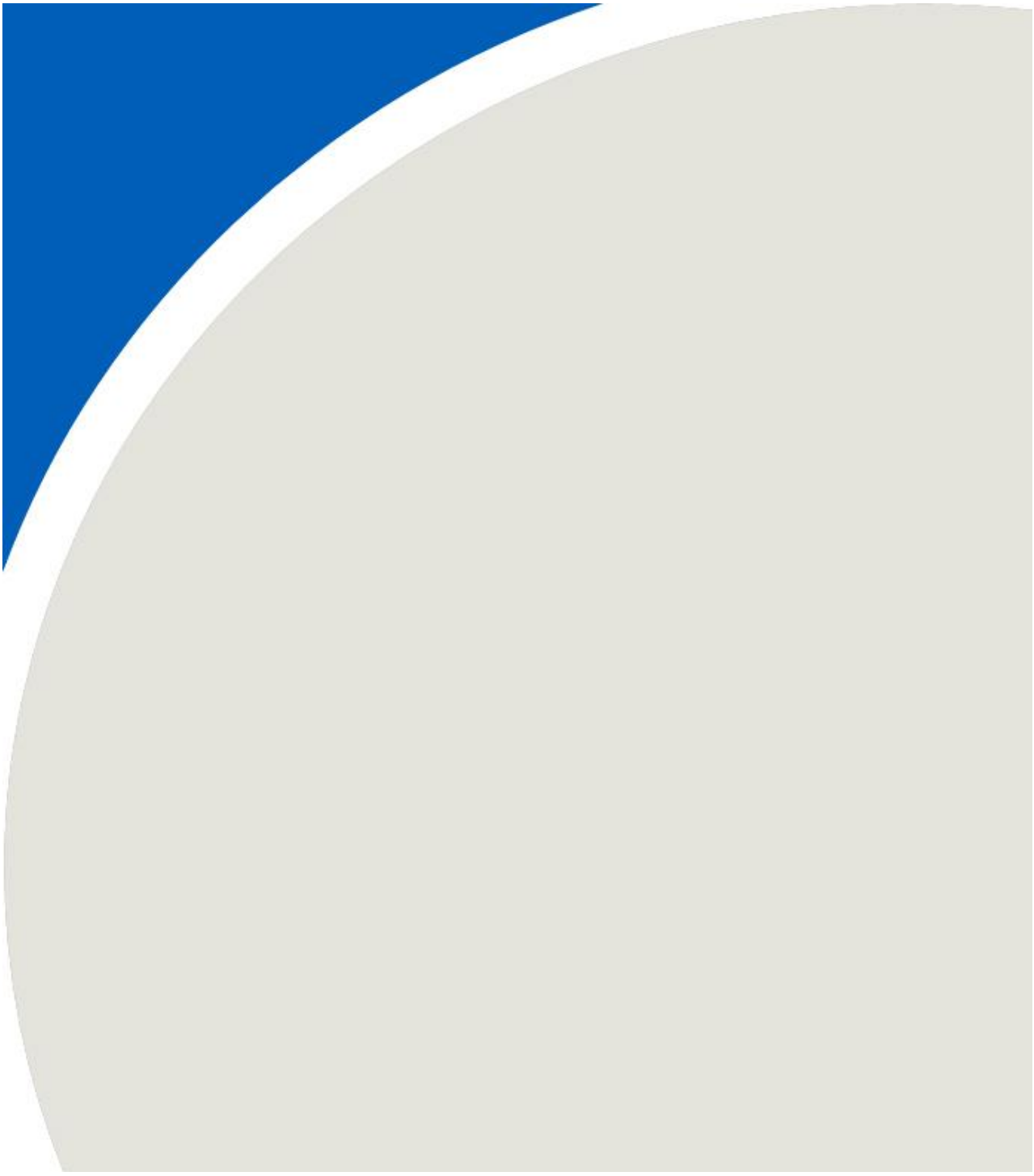
2024 FOURTH QUARTER & ANNUAL MONITORING REPORT

TWIN CREEKS ENVIRONMENTAL CENTRE
WASTE MANAGEMENT OF CANADA CORPORATION

FIGURE NUMBER	PROJECT NUMBER
J-4	2402553
DATE REVISED	**REVISED BY**
25-Oct-24	JMH

APPENDIX J-3:

2024 Certificates of Analysis



Your P.O. #: 13254256
Your Project #: 2402553.01
Site#: 700
Site Location: ON07
Your C.O.C. #: 880491

Attention: Khalid Hussein - Twin Creeks

RWDI Inc.
600 Southgate Drive
Guelph, ON
Canada N1G 4P6

Report Date: 2024/04/22
Report #: R8118126
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C4A9915
Received: 2024/04/13, 12:30

Sample Matrix: Water
Samples Received: 4

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity	4	N/A	2024/04/16	CAM SOP-00448	SM 24 2320 B m
Chloride by Automated Colourimetry	4	N/A	2024/04/16	CAM SOP-00463	SM 24 4500-Cl E m
Conductance in Water - On-site	4	N/A	2024/04/18		
Field Measured Dissolved Oxygen in Water	4	N/A	2024/04/18		
Total Metals by ICPMS	4	N/A	2024/04/18	CAM SOP-00447	EPA 6020B m
Total Ammonia-N	4	N/A	2024/04/16	CAM SOP-00441	USGS I-2522-90 m
Nitrate & Nitrite as Nitrogen in Water (1)	3	N/A	2024/04/15	CAM SOP-00440	SM 24 4500-NO3I/NO2B
Nitrate & Nitrite as Nitrogen in Water (1)	1	N/A	2024/04/16	CAM SOP-00440	SM 24 4500-NO3I/NO2B
Phenols (4AAP)	4	N/A	2024/04/17	CAM SOP-00444	OMOE E3179 m
Field Measured pH (2)	4	N/A	2024/04/18		Field pH Meter
Sulphate by Automated Turbidimetry	4	N/A	2024/04/16	CAM SOP-00464	SM 24 4500-SO42- E m
Field Temperature (2)	4	N/A	2024/04/18		Field Thermometer
Total Organic Carbon (TOC) (3)	4	N/A	2024/04/17	CAM SOP-00446	SM 24 5310B m
Turbidity - On-site	4	N/A	2024/04/18		
Un-ionized Ammonia (4)	4	2024/04/13	2024/04/18	Auto Calc.	PWQO
Volatile Organic Compounds in Water	4	N/A	2024/04/16	CAM SOP-00226	EPA 8260D m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, EPA, APHA or the Quebec Ministry of Environment.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Your P.O. #: 13254256
Your Project #: 2402553.01
Site#: 700
Site Location: ON07
Your C.O.C. #: 880491

Attention: Khalid Hussein - Twin Creeks

RWDI Inc.
600 Southgate Drive
Guelph, ON
Canada N1G 4P6

Report Date: 2024/04/22
Report #: R8118126
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C4A9915

Received: 2024/04/13, 12:30

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.
(2) This is a field test, therefore, the results relate to items that were not analysed at Bureau Veritas.
(3) Total Organic Carbon (TOC) present in the sample should be considered as non-purgeable TOC.
(4) Un-ionized ammonia is calculated using the total ammonia result and field data provided by the client for pH and temperature.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to:
Patricia Legette, Project Manager
Email: Patricia.Legette@bureauveritas.com
Phone# (905)817-5799

==========

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

Bureau Veritas Job #: C4A9915
Report Date: 2024/04/22

RWDI Inc.
Client Project #: 2402553.01
Site Location: ON07
Your P.O. #: 13254256
Sampler Initials: JC

RESULTS OF ANALYSES OF WATER

Bureau Veritas ID		YWU791		YWU792		YWU793		YWU794		
Sampling Date		2024/04/12 10:50		2024/04/12 10:15		2024/04/12 10:00		2024/04/12 22:15		
COC Number		880491		880491		880491		880491		
	UNITS	SS14A	RDL	SS14B	RDL	SS15A	RDL	PSSWDUP	RDL	QC Batch
Calculated Parameters										
Total Un-ionized Ammonia	mg/L	<0.00094	0.00094	0.0045	0.0012	0.00093	0.00072	0.0066	0.0012	9332551
Field Measurements										
Field Conductivity	uS/cm	810	N/A	850	N/A	770	N/A	850	N/A	ONSITE
Field Dissolved Oxygen	mg/L	9.61	N/A	9.80	N/A	9.41	N/A	9.80	N/A	ONSITE
Field Temperature	Celsius	10.7	N/A	10.6	N/A	10.2	N/A	10.6	N/A	ONSITE
Field Measured Field Turbidity	NTU	104	N/A	738	N/A	234	N/A	738	N/A	ONSITE
Field Measured pH	pH	7.9		8.0		7.8		8.0		ONSITE
Inorganics										
Total Ammonia-N	mg/L	<0.050	0.050	0.19	0.050	0.065	0.050	0.28	0.050	9334512
Total Organic Carbon (TOC)	mg/L	11	0.40	17	0.40	14	0.40	17	0.40	9334771
Phenols-4AAP	mg/L	<0.0010	0.0010	<0.0010	0.0010	<0.0010	0.0010	<0.0010	0.0010	9339729
Dissolved Sulphate (SO4)	mg/L	130	1.0	83	1.0	79	1.0	83	1.0	9333408
Alkalinity (Total as CaCO3)	mg/L	200	1.0	210	1.0	200	1.0	210	1.0	9333471
Dissolved Chloride (Cl-)	mg/L	6.9	1.0	46	1.0	25	1.0	46	1.0	9333416
Nitrate (N)	mg/L	0.77	0.10	0.48	0.10	1.52	0.10	0.50	0.10	9333302

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

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C4A9915
Report Date: 2024/04/22

RWDI Inc.
Client Project #: 2402553.01
Site Location: ON07
Your P.O. #: 13254256
Sampler Initials: JC

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Bureau Veritas ID		YWU791	YWU792	YWU793	YWU794		
Sampling Date		2024/04/12 10:50	2024/04/12 10:15	2024/04/12 10:00	2024/04/12 22:15		
COC Number		880491	880491	880491	880491		
	UNITS	SS14A	SS14B	SS15A	PSSWDUP	RDL	QC Batch
Metals							
Total Boron (B)	mg/L	0.08	0.66	0.52	0.64	0.02	9340758
Total Calcium (Ca)	mg/L	83	98	72	97	0.2	9340758
Total Chromium (Cr)	mg/L	<0.005	0.024	0.005	0.018	0.005	9340758
Total Iron (Fe)	mg/L	1.4	20	5.2	19	0.1	9340758
Total Magnesium (Mg)	mg/L	24	29	21	28	0.05	9340758
Total Nickel (Ni)	mg/L	0.003	0.031	0.009	0.029	0.001	9340758
Total Potassium (K)	mg/L	4.8	8.7	6.6	8.4	0.2	9340758
Total Sodium (Na)	mg/L	7.1	39	25	38	0.1	9340758
Total Zinc (Zn)	mg/L	<0.01	0.06	0.02	0.05	0.01	9340758

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C4A9915
Report Date: 2024/04/22

RWDI Inc.
Client Project #: 2402553.01
Site Location: ON07
Your P.O. #: 13254256
Sampler Initials: JC

VOLATILE ORGANICS BY GC/MS (WATER)

Bureau Veritas ID		YWU791	YWU792	YWU793	YWU794		
Sampling Date		2024/04/12 10:50	2024/04/12 10:15	2024/04/12 10:00	2024/04/12 22:15		
COC Number		880491	880491	880491	880491		
	UNITS	SS14A	SS14B	SS15A	PSSWDUP	RDL	QC Batch
Volatile Organics							
Benzene	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	9335593
Ethylbenzene	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	9335593
Toluene	ug/L	<1.0	<1.0	<1.0	<1.0	1.0	9335593
p+m-Xylene	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	9335593
o-Xylene	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	9335593
Total Xylenes	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	9335593
Surrogate Recovery (%)							
4-Bromofluorobenzene	%	93	97	97	97		9335593
D4-1,2-Dichloroethane	%	107	105	107	105		9335593
D8-Toluene	%	95	101	91	102		9335593

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

GENERAL COMMENTS

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

Package 1	2.0°C

Sample YWU791 [SS14A] : VOC Water Analysis: Due to foaming, sample required dilution. The detection limits were adjusted accordingly.

Sample YWU792 [SS14B] : VOC Water Analysis: Due to foaming, sample required dilution. The detection limits were adjusted accordingly.

Sample YWU793 [SS15A] : VOC Water Analysis: Due to foaming, sample required dilution. The detection limits were adjusted accordingly.

Sample YWU794 [PSSWDUP] : VOC Water Analysis: Due to foaming, sample required dilution. The detection limits were adjusted accordingly.

Results relate only to the items tested.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

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
9335593	4-Bromofluorobenzene	2024/04/16	102 (6)	70 - 130	98	70 - 130	98	%		
9335593	D4-1,2-Dichloroethane	2024/04/16	103 (6)	70 - 130	107	70 - 130	104	%		
9335593	D8-Toluene	2024/04/16	101 (6)	70 - 130	97	70 - 130	97	%		
9333302	Nitrate (N)	2024/04/15	104	80 - 120	103	80 - 120	<0.10	mg/L	1.4 (1)	20
9333408	Dissolved Sulphate (SO4)	2024/04/16	NC (2)	75 - 125	97	80 - 120	<1.0	mg/L	0.91 (3)	20
9333416	Dissolved Chloride (Cl-)	2024/04/16	94 (2)	80 - 120	98	80 - 120	<1.0	mg/L	8.5 (3)	20
9333471	Alkalinity (Total as CaCO3)	2024/04/16			104	85 - 115	<1.0	mg/L	0.63 (3)	20
9334512	Total Ammonia-N	2024/04/16	99	75 - 125	100	80 - 120	<0.050	mg/L	NC (1)	20
9334771	Total Organic Carbon (TOC)	2024/04/17	92 (4)	80 - 120	97	80 - 120	<0.40	mg/L	1.8 (5)	20
9335593	Benzene	2024/04/16	95 (6)	70 - 130	93	70 - 130	<0.10	ug/L	NC (7)	30
9335593	Ethylbenzene	2024/04/16	97 (6)	70 - 130	94	70 - 130	<0.10	ug/L	NC (7)	30
9335593	o-Xylene	2024/04/16	92 (6)	70 - 130	89	70 - 130	<0.10	ug/L	NC (7)	30
9335593	p+m-Xylene	2024/04/16	106 (6)	70 - 130	99	70 - 130	<0.10	ug/L	NC (7)	30
9335593	Toluene	2024/04/16	95 (6)	70 - 130	91	70 - 130	<0.20	ug/L	NC (7)	30
9335593	Total Xylenes	2024/04/16					<0.10	ug/L	NC (7)	30
9339729	Phenols-4AAP	2024/04/17	102	80 - 120	98	80 - 120	<0.0010	mg/L	NC (1)	20
9340758	Total Boron (B)	2024/04/18	97	80 - 120	92	80 - 120	<0.02	mg/L	0.067 (1)	20
9340758	Total Calcium (Ca)	2024/04/18	NC	80 - 120	101	80 - 120	<0.2	mg/L	2.0 (1)	20
9340758	Total Chromium (Cr)	2024/04/18	100	80 - 120	97	80 - 120	<0.005	mg/L	NC (1)	20
9340758	Total Iron (Fe)	2024/04/18	99	80 - 120	95	80 - 120	<0.1	mg/L	6.8 (1)	20
9340758	Total Magnesium (Mg)	2024/04/18	96	80 - 120	95	80 - 120	<0.05	mg/L	3.5 (1)	20
9340758	Total Nickel (Ni)	2024/04/18	96	80 - 120	94	80 - 120	<0.001	mg/L	9.9 (1)	20
9340758	Total Potassium (K)	2024/04/18	103	80 - 120	98	80 - 120	<0.2	mg/L	3.6 (1)	20
9340758	Total Sodium (Na)	2024/04/18	NC	80 - 120	95	80 - 120	<0.1	mg/L	3.6 (1)	20

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
9340758	Total Zinc (Zn)	2024/04/18	102	80 - 120	101	80 - 120	<0.01	mg/L	19 (1)	20

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.

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 spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) Duplicate Parent ID

(2) Matrix Spike Parent ID [YWU791-01]

(3) Duplicate Parent ID [YWU791-01]

(4) Matrix Spike Parent ID [YWU791-03]

(5) Duplicate Parent ID [YWU791-03]

(6) Matrix Spike Parent ID [YWU791-06]

(7) Duplicate Parent ID [YWU791-06]

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C4A9915
Report Date: 2024/04/22

RWDI Inc.
Client Project #: 2402553.01
Site Location: ON07
Your P.O. #: 13254256
Sampler Initials: JC

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Cristina Carriere, Senior Scientific Specialist

Patricia Legette, Project Manager

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

S2437676 X

BUREAU VERITAS

FIELD INFORMATION FORM

WM WASTE MANAGEMENT

Site Name: TCE SSIC

Site No.: Sample: SS14A (Sample ID)

This Waste Management Field Information Form is Required
This form is to be completed, in addition to any State Forms. The Field Form is submitted along with the Chain of Custody Forms that accompany the sample containers (i.e. with the cooler that is returned to the laboratory).

Laboratory Use Only/Lab ID:

PURGE INFO

PURGE DATE (MM DD YY)	PURGE TIME (2400 Hr Clock)	ELAPSED HRS (hrs:min)	WATER VOL IN CASING (Gallons)	ACTUAL VOL PURGED (Gallons)	WELL VOLs PURGED

Note: For Passive Sampling, replace "Water Vol in Casing" and "Well Vols Purged" w/ Water Vol in Tubing/Flow Cell and Tubing/Flow Cell Vols Purged. Mark Changes, Record field data below.

PURGE/SAMPLE EQUIPMENT

Purging and Sampling Equipment ... Dedicated: Y or N

Filter Device: Y or N 0.45 µ or ____ µ (circle or fill in)

Purging Device: A-Submersible Pump, B-Peristaltic Pump, C-QED Bladder Pump, D-Bailer, E-Piston Pump, F-Dipper/Bottle

Filter Type: A-In-line Disposable, B-Pressure, C-Vacuum, X-Other: ____

Sampling Device:

X-Other:

Sample Tube Type: A-Teflon, B-Stainless Steel, C-PVC, D-Polypropylene, X-Other: ____

WELL DATA

Well Elevation (at TOC) (ft/msl)

Depth to Water (DTW) (from TOC) (ft)

Groundwater Elevation (GWE) (Site Datum, from TOC) (ft msl)

Total Well Depth (from TOC) (ft)

Stick Up (from ground elevation) (ft)

Casing ID (in)

Casing Material

Note: Total Depth, Stick Up, Casing ID, etc. are optional and can be from historical data, unless required by Site/Permit. Well Elevation, DTW, and GWE must be current, obtained from site.

STABILIZATION DATA (Optional)

Sample Time (2400 Hr Clock)	Rate/Unit	pH (std)	Conductance (SC/EC) (µmhos/cm @ 25°C)	Temp. (°C)	Turbidity (ntu)	D.O. (mg/L - ppm)	eH/ORP (mV)	DTW (ft)
		1st	1st					
		2nd	2nd					
		3rd	3rd					
		4th	4th					
Input Range for 3 consec. readings or Permit/State requirements:		+/-	+/-	+/-	+/-	+/-	+/-	

Stabilization Data Fields are Optional *(i.e. complete stabilization readings for parameters required by WM, Site, or State). These fields can be used where four (4) field measurements are required by State/Permit/Site. If a Data Logger or other Electronic format is used, fill in final readings below and submit electronic data separately to Site. If more fields above are needed, use separate sheet or form.*

FIELD DATA

SAMPLE DATE (MM DD YY)	pH (std)	CONDUCTANCE (µmhos/cm @ 25°C)	TEMP. (°C)	TURBIDITY (ntu)	DO (mg/L - ppm)	eH/ORP (mV)	Other: Units
041224	7.09	63.61	10.7	6.4	9.61		

Final Field Readings are required *(i.e. record field measurements, final stabilized readings, passive sample readings before sampling for all field parameters required by State/Permit/Site.)*

Sample Appearance: transparent Odor: N/O Color: N/C Other: ____

Weather Conditions (required daily, or as conditions change): 7°C Direction/Speed: 32kn/NW Outlook: Rain Precipitation: Y or N

Specific Comments (including purge/well volume calculations if required):

FIELD COMMENTS

Stream width 0.65m
Depth 0.15m -Sampled @ 10:50 AM
time/m t1: 9:5
t2: 10:5
t3: 8:5

I certify that sampling procedures were in accordance with applicable EPA, State, and WM protocols (if more than one sampler, all should sign):

Date	Name	Signature	Company
04/12/24	Jake Artzbell		RWPJ
/ /			

DISTRIBUTION: WHITE/ORIGINAL - Stays with Sample, YELLOW - Returned to Client, PINK - Field Copy

Field Information Form v-3.1 06/20

2048

S2437676

FIELD INFORMATION FORM

BUREAU VERITAS

WASTE MANAGEMENT

Site Name: TCEC

Site No.: Sample: SS114D (Sample ID)

This Waste Management Field Information Form is Required
This form is to be completed, in addition to any State Forms. The Field Form is submitted along with the Chain of Custody Forms that accompany the sample containers (i.e. with the cooler that is returned to the laboratory).

Laboratory Use Only/Lab ID:

PURGE INFO

PURGE DATE (MM DD YY)	PURGE TIME (2400 Hr Clock)	ELAPSED HRS (hrs:min)	WATER VOL IN CASING (Gallons)	ACTUAL VOL PURGED (Gallons)	WELL VOLs PURGED

Note: For Passive Sampling, replace "Water Vol in Casing" and "Well Vols Purged" w/ Water Vol in Tubing/Flow Cell and Tubing/Flow Cell Vols Purged. Mark Changes, Record field data below.

PURGE/SAMPLE EQUIPMENT

Purging and Sampling Equipment ... Dedicated: Y or N

Filter Device: Y or N — 0.45 µ or ____ µ (circle or fill in)

Purging Device: ____ (A-Submersible Pump, B-Peristaltic Pump, C-QED Bladder Pump, D-Bailer, E-Piston Pump, F-Dipper/Bottle)

Sampling Device: ____

X-Other: ____

Filter Type: ____ (A-In-line Disposable, B-Pressure, C-Vacuum, X-Other: ____)

Sample Tube Type: ____ (A-Teflon, B-Stainless Steel, C-PVC, D-Polypropylene, X-Other: ____)

WELL DATA

Well Elevation (at TOC): ____ (ft/msl)

Depth to Water (DTW) (from TOC): ____ (ft)

Groundwater Elevation (GWE) (Site Datum, from TOC): ____ (ft msl)

Total Well Depth (from TOC): ____ (ft)

Stick Up (from ground elevation): ____ (ft)

Casing ID: ____ (in)

Casing Material: ____

Note: Total Depth, Stick Up, Casing ID, etc. are optional and can be from historical data, unless required by Site/Permit. Well Elevation, DTW, and GWE must be current, obtained from site.

STABILIZATION DATA (Optional)

Sample Time (2400 Hr Clock)	Rate/Unit	pH (std)	Conductance (SC/EC) (µmhos/cm @ 25°C)	Temp. (°C)	Turbidity (ntu)	D.O. (mg/L - ppm)	eH/ORP (mV)	DTW (ft)
		1st	1st					
		2nd	2nd					
		3rd	3rd					
		4th	4th					
Input Range for 3 consec. readings or Permit/State requirements:		+/-	+/-	+/-	+/-	+/-	+/-	

Stabilization Data Fields are Optional *(i.e. complete stabilization readings for parameters required by WM, Site, or State). These fields can be used where four (4) field measurements are required by State/Permit/Site. If a Data Logger or other Electronic format is used, fill in final readings below and submit electronic data separately to Site. If more fields above are needed, use separate sheet or form.*

FIELD DATA

SAMPLE DATE (MM DD YY)	pH (std)	CONDUCTANCE (µmhos/cm @ 25°C)	TEMP. (°C)	TURBIDITY (ntu)	DO (mg/L - ppm)	eH/ORP (mV)	Other: Units
04 12 24	8.0	0.85 mS	16.6	738	9.80		

Final Field Readings are required *(i.e. record field measurements, final stabilized readings, passive sample readings before sampling for all field parameters required by State/Permit/Site.)*

FIELD COMMENTS

Sample Appearance: translucent — Odor: N/S — Color: light Brown — Other: ____

Weather Conditions (required daily, or as conditions change): 7°C — Direction/Speed: ~~North~~ 32 km/hW — Outlook: Rain — Precipitation: (Y) or N

Specific Comments (including purge/well volume calculations if required):

WD to: 0.5 m

Depth 0.15 m — PS and DUP taken

time @ 1m to: 12

to: 13 — Sampled @ 10:15 AM

to: 12

I certify that sampling procedures were in accordance with applicable EPA, State, and WM protocols (if more than one sampler, all should sign):

Date	Name	Signature	Company
04/12/24	Jake Arbibello		RWDI
/ /			

DISTRIBUTION: WHITE/ORIGINAL - Stays with Sample, YELLOW - Returned to Client, PINK - Field Copy

Field Information Form v-3.1 06/20

2047

S2437676

BUREAU VERITAS

FIELD INFORMATION FORM

WM WASTE MANAGEMENT

Site Name: TCEC

Site No.: Sample: S S 1 S A (Sample ID)

This Waste Management Field Information Form is Required
This form is to be completed, in addition to any State Forms. The Field Form is submitted along with the Chain of Custody Forms that accompany the sample containers (i.e. with the cooler that is returned to the laboratory).

Laboratory Use Only/Lab ID:

PURGE INFO

PURGE DATE (MM DD YY)	PURGE TIME (2400 Hr Clock)	ELAPSED HRS (hr:min)	WATER VOL IN CASING (Gallons)	ACTUAL VOL PURGED (Gallons)	WELL VOLs PURGED

Note: For Passive Sampling, replace "Water Vol in Casing" and "Well Vols Purged" w/ Water Vol in Tubing/Flow Cell and Tubing/Flow Cell Vols Purged. Mark Changes, Record field data below.

PURGE/SAMPLE EQUIPMENT

Purging and Sampling Equipment ... Dedicated: Y or N

Filter Device: Y or N — 0.45 µ or ____ µ (circle or fill in)

Purging Device: A-Submersible Pump, B-Peristaltic Pump, C-QED Bladder Pump, D-Bailer, E-Piston Pump, F-Dipper/Bottle

Filter Type: A-In-line Disposable, B-Pressure, C-Vacuum, X-Other: ____

Sampling Device: (same codes)

X-Other: ____ Sample Tube Type: A-Teflon, B-Stainless Steel, C-PVC, D-Polypropylene, X-Other: ____

WELL DATA

Well Elevation (at TOC) ____ (ft/msl) — Depth to Water (DTW) (from TOC) ____ (ft) — Groundwater Elevation (GWE) (Site Datum, from TOC) ____ (ft msl)

Total Well Depth (from TOC) ____ (ft) — Stick Up (from ground elevation) ____ (ft) — Casing ID ____ (in) — Casing Material ____

Note: Total Depth, Stick Up, Casing ID, etc. are optional and can be from historical data, unless required by Site/Permit. Well Elevation, DTW, and GWE must be current, obtained from site.

STABILIZATION DATA (Optional)

Sample Time (2400 Hr Clock)	Rate/Unit	pH (std)	Conductance (SC/EC) (µmhos/cm @ 25°C)	Temp. (°C)	Turbidity (ntu)	D.O. (mg/L - ppm)	eH/ORP (mV)	DTW (ft)
		1st	1st					
		2nd	2nd					
		3rd	3rd					
		4th	4th					
Input Range for 3 consec. readings or Permit/State requirements:		+/-	+/-	+/-	+/-	+/-	+/-	

Stabilization Data Fields are Optional *(i.e. complete stabilization readings for parameters required by WM, Site, or State). These fields can be used where four (4) field measurements are required by State/Permit/Site. If a Data Logger or other Electronic format is used, fill in final readings below and submit electronic data separately to Site. If more fields above are needed, use separate sheet or form.*

FIELD DATA

SAMPLE DATE (MM DD YY)	pH (std)	CONDUCTANCE (µmhos/cm @ 25°C)	TEMP. (°C)	TURBIDITY (ntu)	DO (mg/L - ppm)	eH/ORP (mV)	Other: Units
04 12 24	7.8	10.77	10.2	23.4	9.41		

Final Field Readings are required *(i.e. record field measurements, final stabilized readings, passive sample readings before sampling for all field parameters required by State/Permit/Site.)*

FIELD COMMENTS

Sample Appearance: translucent — Odor: N/O — Color: light Brown — Other: ____

Weather Conditions (required daily, or as conditions change): 7°C — Direction/Speed: 32km/hr — Outlook: Rain — Precipitation: (Y) or N

Specific Comments (including purge/well volume calculations if required):

- Sampled @ 10:00AM
- Depth: 1m
- Depth: 0.25m
- time@1m to: 10
- t2: 10
- t3: 12

I certify that sampling procedures were in accordance with applicable EPA, State, and WM protocols (if more than one sampler, all should sign):

Date	Name	Signature	Company
04/12/24	Jake Arbib		RJDS
/ /			

DISTRIBUTION: WHITE/ORIGINAL - Stays with Sample, YELLOW - Returned to Client, PINK - Field Copy

Field Information Form v-3.1 06/20

2046

Custody Tracking Form

T880491

Please use this form for custody tracking when submitting the work instructions via eCOC (electronic Chain of Custody). Please ensure your form has a barcode or a Bureau Veritas eCOC confirmation number in the top right hand side. This number links your electronic submission to your samples. This form should be placed in the cooler with your samples.

First Sample: SS14A
Last Sample: PSSWDUP
Sample Count: 4

Relinquished By				Received By			
Jeff Ueland		Date	2024/04/12	SUGAR SALVANT		Date	2024/04/13
		Time (24 HR)	16:00			Time (24 HR)	12:30
		Date				Date	
		Time (24 HR)				Time (24 HR)	
		Date				Date	
		Time (24 HR)				Time (24 HR)	

Unless otherwise agreed to, submissions and use of services are governed by Bureau Veritas' standard terms and conditions which can be found at www.bvna.com.

Triage Information

Sampled By (Print): Jeff Ueland

# of Coolers/Pkgs: 1

Rush ☐ Immediate Test ☐ Food Residue ☐

Micro ☐ Food Chemistry ☐

***** LABORATORY USE ONLY *****

Received At

Lab Comments:

Labeled By

Verified By

13-Apr-24 12:30
Patricia Legette
C4A9915
AJH ENV-997

Custody Seal		Cooling Media	Temperature °C		
Present (Y/N)	Intact (Y/N)	Present (Y/N)	1	2	3
Y	Y	Y	2	2	2
Drinking Water Metals Preservation Check Done (Circle)				YES	NO

COR FCD-00383/4

Page 1 of 1

Your P.O. #: 13254256
Your Project #: 2402553.01
Site#: 700
Site Location: ON07
Your C.O.C. #: 927956

Attention: Khalid Hussein - Twin Creeks

RWDI Inc.
600 Southgate Drive
Guelph, ON
Canada N1G 4P6

Report Date: 2024/07/19
Report #: R8241295
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C4L2024
Received: 2024/07/10, 16:19

Sample Matrix: Surface Water
Samples Received: 4

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity	4	N/A	2024/07/12	CAM SOP-00448	SM 24 2320 B m
Chloride by Automated Colourimetry	4	N/A	2024/07/18	CAM SOP-00463	SM 24 4500-Cl E m
Conductance in Water - On-site	4	N/A	2024/07/17		
Field Measured Dissolved Oxygen in Water	4	N/A	2024/07/17		
Total Metals by ICPMS	1	N/A	2024/07/17	CAM SOP-00447	EPA 6020B m
Total Metals by ICPMS	3	N/A	2024/07/18	CAM SOP-00447	EPA 6020B m
Ammonia-N	4	N/A	2024/07/18	CAM SOP-00441	USGS I-2522-90 m
Nitrate & Nitrite as Nitrogen in Water (1)	4	N/A	2024/07/12	CAM SOP-00440	SM 24 4500-NO3I/NO2B
Phenols (4AAP)	4	N/A	2024/07/16	CAM SOP-00444	OMOE E3179 m
Field Measured pH (2)	4	N/A	2024/07/11		Field pH Meter
Sulphate by Automated Turbidimetry	4	N/A	2024/07/18	CAM SOP-00464	SM 24 4500-SO42- E m
Field Temperature (2)	4	N/A	2024/07/11		Field Thermometer
Total Kjeldahl Nitrogen in Water	4	2024/07/16	2024/07/17	CAM SOP-00938	OMOE E3516 m
Total Organic Carbon (TOC) (3)	4	N/A	2024/07/17	CAM SOP-00446	SM 24 5310B m
Total Phosphorus (Colourimetric)	4	2024/07/16	2024/07/17	CAM SOP-00407	SM 24 4500-P I
Turbidity - On-site	4	N/A	2024/07/17		
Un-ionized Ammonia (4)	4	2024/07/12	2024/07/18	Auto Calc.	PWQO
Volatile Organic Compounds in Water	4	N/A	2024/07/16	CAM SOP-00226	EPA 8260D m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, EPA, APHA or the Quebec Ministry of Environment.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless

Your P.O. #: 13254256
Your Project #: 2402553.01
Site#: 700
Site Location: ON07
Your C.O.C. #: 927956

Attention: Khalid Hussein - Twin Creeks

RWDI Inc.
600 Southgate Drive
Guelph, ON
Canada N1G 4P6

Report Date: 2024/07/19
Report #: R8241295
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C4L2024
Received: 2024/07/10, 16:19

otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.
(2) This is a field test, therefore, the results relate to items that were not analysed at Bureau Veritas.
(3) Total Organic Carbon (TOC) present in the sample should be considered as non-purgeable TOC.
(4) Un-ionized ammonia is calculated using the total ammonia result and field data provided by the client for pH and temperature.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to:
Patricia Legette, Project Manager
Email: Patricia.Legette@bureauveritas.com
Phone# (905)817-5799

==========

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

Bureau Veritas Job #: C4L2024
Report Date: 2024/07/19

RWDI Inc.
Client Project #: 2402553.01
Site Location: ON07
Your P.O. #: 13254256
Sampler Initials: JF

RESULTS OF ANALYSES OF SURFACE WATER

Bureau Veritas ID		ZRW204		ZRW205		ZRW206	ZRW207		
Sampling Date		2024/07/10 11:20		2024/07/10 10:40		2024/07/10 10:20	2024/07/10 22:20		
COC Number		927956		927956		927956	927956		
	UNITS	SS14A	RDL	SS14B	RDL	SS15A	PSSWDUP	RDL	QC Batch
Calculated Parameters									
Total Un-ionized Ammonia	mg/L	<0.0075	0.0075	<0.013	0.013	<0.0036	<0.0036	0.0036	9510674
Field Measurements									
Field Conductivity	uS/cm	853	N/A	760	N/A	940	940	N/A	ONSITE
Field Dissolved Oxygen	mg/L	7.20	N/A	8.83	N/A	7.09	7.09	N/A	ONSITE
Field Temperature	Celsius	21.0	N/A	20.1	N/A	20.3	20.3	N/A	ONSITE
Field Measured Field Turbidity	NTU	501	N/A	>999	N/A	167	167	N/A	ONSITE
Field Measured pH	pH	8.0		8.3		7.7	7.7		ONSITE
Inorganics									
Total Ammonia-N	mg/L	<0.15	0.15	<0.15	0.15	<0.15	<0.15	0.15	9517221
Total Kjeldahl Nitrogen (TKN)	mg/L	<0.7	0.7	1.3	0.7	<0.7	<0.7	0.7	9515807
Total Organic Carbon (TOC)	mg/L	8.3	0.40	8.2	0.40	11	13	0.40	9517403
Phenols-4AAP	mg/L	<0.0010	0.0010	<0.0010	0.0010	<0.0010	<0.0010	0.0010	9514900
Total Phosphorus	mg/L	0.23	0.030	3.1	0.030	0.15	0.16	0.030	9517052
Dissolved Sulphate (SO4)	mg/L	250	1.0	150	1.0	250	240	1.0	9511981
Alkalinity (Total as CaCO3)	mg/L	83	1.0	66	1.0	120	120	1.0	9511714
Dissolved Chloride (Cl-)	mg/L	1.3	1.0	18	1.0	12	12	1.0	9511979
Nitrite (N)	mg/L	0.020	0.010	0.061	0.010	<0.010	<0.010	0.010	9511464
Nitrate (N)	mg/L	0.27	0.10	0.98	0.10	<0.10	<0.10	0.10	9511464

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

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C4L2024
Report Date: 2024/07/19

RWDI Inc.
Client Project #: 2402553.01
Site Location: ON07
Your P.O. #: 13254256
Sampler Initials: JF

ELEMENTS BY ATOMIC SPECTROSCOPY (SURFACE WATER)

Bureau Veritas ID		ZRW204		ZRW205		ZRW206	ZRW207		
Sampling Date		2024/07/10 11:20		2024/07/10 10:40		2024/07/10 10:20	2024/07/10 22:20		
COC Number		927956		927956		927956	927956		
	UNITS	SS14A	RDL	SS14B	RDL	SS15A	PSSWDUP	RDL	QC Batch
Metals									
Total Aluminum (Al)	mg/L	8.4	0.02	190	0.8	3.3	4.4	0.02	9516645
Total Arsenic (As)	mg/L	0.004	0.001	0.08	0.01	0.002	0.003	0.001	9516645
Total Barium (Ba)	mg/L	0.058	0.005	0.98	0.05	0.053	0.056	0.005	9516645
Total Beryllium (Be)	mg/L	<0.0006	0.0006	0.009	0.006	<0.0006	<0.0006	0.0006	9516645
Total Bismuth (Bi)	mg/L	<0.001	0.001	<0.01	0.01	<0.001	<0.001	0.001	9516645
Total Boron (B)	mg/L	0.09	0.02	0.4	0.2	0.45	0.46	0.02	9516645
Total Cadmium (Cd)	mg/L	<0.0001	0.0001	0.001	0.001	<0.0001	<0.0001	0.0001	9516645
Total Calcium (Ca)	mg/L	110	0.2	930	2	90	94	0.2	9516645
Total Chromium (Cr)	mg/L	0.013	0.005	0.27	0.05	0.006	0.008	0.005	9516645
Total Cobalt (Co)	mg/L	0.0061	0.0005	0.12	0.005	0.0026	0.0029	0.0005	9516645
Total Copper (Cu)	mg/L	0.012	0.002	0.23	0.02	0.008	0.010	0.002	9516645
Total Iron (Fe)	mg/L	13	0.1	290	1	6.0	6.6	0.1	9516645
Total Lead (Pb)	mg/L	0.0048	0.0005	0.12	0.005	0.0028	0.0028	0.0005	9516645
Total Magnesium (Mg)	mg/L	31	0.05	180	0.5	22	23	0.05	9516645
Total Molybdenum (Mo)	mg/L	0.017	0.002	0.05	0.02	0.006	0.007	0.002	9516645
Total Nickel (Ni)	mg/L	0.019	0.001	0.39	0.01	0.010	0.013	0.001	9516645
Total Potassium (K)	mg/L	6.0	0.2	43	2	6.2	6.8	0.2	9516645
Total Selenium (Se)	mg/L	<0.005	0.005	<0.05	0.05	<0.005	<0.005	0.005	9516645
Total Silver (Ag)	mg/L	<0.0004	0.0004	<0.004	0.004	<0.0004	<0.0004	0.0004	9516645
Total Sodium (Na)	mg/L	7.5	0.1	18	1	18	20	0.1	9516645
Total Strontium (Sr)	mg/L	0.79	0.003	1.5	0.03	0.33	0.36	0.003	9516645
Total Tin (Sn)	mg/L	<0.002	0.002	<0.02	0.02	<0.002	<0.002	0.002	9516645
Total Titanium (Ti)	mg/L	0.10	0.005	1.5	0.05	0.053	0.056	0.005	9516645
Total Vanadium (V)	mg/L	0.014	0.001	0.29	0.01	0.007	0.008	0.001	9516645
Total Zinc (Zn)	mg/L	0.03	0.01	0.8	0.1	0.03	0.04	0.01	9516645

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C4L2024
Report Date: 2024/07/19

RWDI Inc.
Client Project #: 2402553.01
Site Location: ON07
Your P.O. #: 13254256
Sampler Initials: JF

VOLATILE ORGANICS BY GC/MS (SURFACE WATER)

Bureau Veritas ID		ZRW204	ZRW205	ZRW206	ZRW207		
Sampling Date		2024/07/10 11:20	2024/07/10 10:40	2024/07/10 10:20	2024/07/10 22:20		
COC Number		927956	927956	927956	927956		
	UNITS	SS14A	SS14B	SS15A	PSSWDUP	RDL	QC Batch
Volatile Organics							
Benzene	ug/L	<0.10	0.18	<0.10	<0.10	0.10	9513990
Ethylbenzene	ug/L	<0.10	<0.10	<0.10	<0.10	0.10	9513990
Toluene	ug/L	<0.20	0.40	<0.20	<0.20	0.20	9513990
p+m-Xylene	ug/L	<0.10	0.14	<0.10	<0.10	0.10	9513990
o-Xylene	ug/L	<0.10	<0.10	<0.10	<0.10	0.10	9513990
Total Xylenes	ug/L	<0.10	0.14	<0.10	<0.10	0.10	9513990
Surrogate Recovery (%)							
4-Bromofluorobenzene	%	101	97	102	102		9513990
D4-1,2-Dichloroethane	%	106	107	107	107		9513990
D8-Toluene	%	96	95	96	96		9513990

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

GENERAL COMMENTS

Sample ZRW205 [SS14B] : Metals Analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.

Results relate only to the items tested.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

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
9513990	4-Bromofluorobenzene	2024/07/16	104	70 - 130	102	70 - 130	100	%				
9513990	D4-1,2-Dichloroethane	2024/07/16	106	70 - 130	100	70 - 130	106	%				
9513990	D8-Toluene	2024/07/16	98	70 - 130	98	70 - 130	97	%				
9511464	Nitrate (N)	2024/07/12	94	80 - 120	99	80 - 120	<0.10	mg/L	NC (1)	20		
9511464	Nitrite (N)	2024/07/12	102	80 - 120	101	80 - 120	<0.010	mg/L	NC (1)	20		
9511714	Alkalinity (Total as CaCO3)	2024/07/12			98	85 - 115	<1.0	mg/L	0.83 (1)	20		
9511979	Dissolved Chloride (Cl-)	2024/07/18	NC	80 - 120	100	80 - 120	<1.0	mg/L	0.97 (1)	20		
9511981	Dissolved Sulphate (SO4)	2024/07/18	NC	75 - 125	102	80 - 120	<1.0	mg/L	0.81 (1)	20		
9513990	Benzene	2024/07/16	98	70 - 130	98	70 - 130	<0.10	ug/L	NC (1)	30		
9513990	Ethylbenzene	2024/07/16	96	70 - 130	98	70 - 130	<0.10	ug/L	NC (1)	30		
9513990	o-Xylene	2024/07/16	100	70 - 130	99	70 - 130	<0.10	ug/L	NC (1)	30		
9513990	p+m-Xylene	2024/07/16	98	70 - 130	98	70 - 130	<0.10	ug/L	NC (1)	30		
9513990	Toluene	2024/07/16	96	70 - 130	96	70 - 130	<0.20	ug/L	NC (1)	30		
9513990	Total Xylenes	2024/07/16					<0.10	ug/L	NC (1)	30		
9514900	Phenols-4AAP	2024/07/16	102	80 - 120	102	80 - 120	<0.0010	mg/L	NC (1)	20		
9515807	Total Kjeldahl Nitrogen (TKN)	2024/07/17	108	80 - 120	102	80 - 120	<0.7	mg/L	NC (1)	20	105	80 - 120
9516645	Total Aluminum (Al)	2024/07/17	101	80 - 120	93	80 - 120	<0.02	mg/L				
9516645	Total Arsenic (As)	2024/07/17	97	80 - 120	97	80 - 120	<0.001	mg/L				
9516645	Total Barium (Ba)	2024/07/17	98	80 - 120	96	80 - 120	<0.005	mg/L				
9516645	Total Beryllium (Be)	2024/07/17	104	80 - 120	94	80 - 120	<0.0006	mg/L				
9516645	Total Bismuth (Bi)	2024/07/17	93	80 - 120	95	80 - 120	<0.001	mg/L				
9516645	Total Boron (B)	2024/07/17	NC	80 - 120	89	80 - 120	<0.02	mg/L				
9516645	Total Cadmium (Cd)	2024/07/17	96	80 - 120	98	80 - 120	<0.0001	mg/L				
9516645	Total Calcium (Ca)	2024/07/17	NC	80 - 120	97	80 - 120	<0.2	mg/L				
9516645	Total Chromium (Cr)	2024/07/17	92	80 - 120	91	80 - 120	<0.005	mg/L	4.6 (1)	20		
9516645	Total Cobalt (Co)	2024/07/17	94	80 - 120	94	80 - 120	<0.0005	mg/L				
9516645	Total Copper (Cu)	2024/07/17	103	80 - 120	93	80 - 120	<0.002	mg/L	3.9 (1)	20		
9516645	Total Iron (Fe)	2024/07/17	96	80 - 120	95	80 - 120	<0.1	mg/L				
9516645	Total Lead (Pb)	2024/07/17	94	80 - 120	97	80 - 120	<0.0005	mg/L				
9516645	Total Magnesium (Mg)	2024/07/17	98	80 - 120	95	80 - 120	<0.05	mg/L				

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
9516645	Total Molybdenum (Mo)	2024/07/17	101	80 - 120	98	80 - 120	<0.002	mg/L				
9516645	Total Nickel (Ni)	2024/07/17	NC	80 - 120	90	80 - 120	<0.001	mg/L	4.5 (1)	20		
9516645	Total Potassium (K)	2024/07/17	NC	80 - 120	95	80 - 120	<0.2	mg/L				
9516645	Total Selenium (Se)	2024/07/17	98	80 - 120	100	80 - 120	<0.005	mg/L				
9516645	Total Silver (Ag)	2024/07/17	91	80 - 120	95	80 - 120	<0.0004	mg/L				
9516645	Total Sodium (Na)	2024/07/17	NC	80 - 120	95	80 - 120	<0.1	mg/L				
9516645	Total Strontium (Sr)	2024/07/17	NC	80 - 120	95	80 - 120	<0.003	mg/L				
9516645	Total Tin (Sn)	2024/07/17	102	80 - 120	98	80 - 120	<0.002	mg/L				
9516645	Total Titanium (Ti)	2024/07/17	95	80 - 120	90	80 - 120	<0.005	mg/L				
9516645	Total Vanadium (V)	2024/07/17	95	80 - 120	90	80 - 120	<0.001	mg/L				
9516645	Total Zinc (Zn)	2024/07/17	NC	80 - 120	95	80 - 120	<0.01	mg/L	3.4 (1)	20		
9517052	Total Phosphorus	2024/07/17	100	80 - 120	105	80 - 120	<0.030	mg/L	2.7 (1)	25	104	80 - 120
9517221	Total Ammonia-N	2024/07/18	96	75 - 125	97	80 - 120	<0.15	mg/L	NC (1)	20		
9517403	Total Organic Carbon (TOC)	2024/07/17	106 (2)	80 - 120	100	80 - 120	<0.40	mg/L	7.2 (3)	20		

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 spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) Duplicate Parent ID

(2) Matrix Spike Parent ID [ZRW206-03]

(3) Duplicate Parent ID [ZRW206-03]

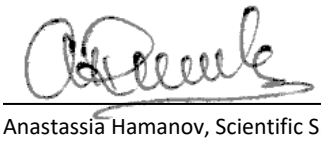
Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C4L2024
Report Date: 2024/07/19

RWDI Inc.
Client Project #: 2402553.01
Site Location: ON07
Your P.O. #: 13254256
Sampler Initials: JF

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:



Anastassia Hamanov, Scientific Specialist

Michael Damianidis, Project Manager Assistant

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

S2437676

BUREAU VERITAS

FIELD INFORMATION FORM

WM WASTE MANAGEMENT

Site Name: TCEC

Site No.: Sample: SS14A (Sample ID)

This Waste Management Field Information Form is Required
This form is to be completed, in addition to any State Forms. The Field Form is submitted along with the Chain of Custody Forms that accompany the sample containers (i.e. with the cooler that is returned to the laboratory).

Laboratory Use Only/Lab ID:

PURGE INFO

PURGE DATE (MM DD YY)	PURGE TIME (2400 Hr Clock)	ELAPSED HRS (hrs:min)	WATER VOL IN CASING (Gallons)	ACTUAL VOL PURGED (Gallons)	WELL VOLs PURGED

Note: For Passive Sampling, replace "Water Vol in Casing" and "Well Vols Purged" w/ Water Vol in Tubing/Flow Cell and Tubing/Flow Cell Vols Purged. Mark Changes, Record field data below.

PURGE/SAMPLE EQUIPMENT

Purging and Sampling Equipment ... Dedicated: [Y] or [N]

Filter Device: [Y] or [N] [0.45 µ] or [ ] µ (circle or fill in)

Purging Device: [ ]
Sampling Device: [ ]
X-Other:

A-Submersible Pump, B-Peristaltic Pump, C-QED Bladder Pump, D-Bailer, E-Piston Pump, F-Dipper/Bottle

Filter Type: [ ] A-In-line Disposable, B-Pressure, C-Vacuum, X-Other: ____

Sample Tube Type: [ ] A-Teflon, B-Stainless Steel, C-PVC, D-Polypropylene, X-Other: ____

WELL DATA

Well Elevation (at TOC) [ ] (ft/msl)
Depth to Water (DTW) (from TOC) [ ] (ft)
Groundwater Elevation (GWE) (Site Datum, from TOC) [ ] (ft msl)
Total Well Depth (from TOC) [ ] (ft)
Stick Up (from ground elevation) [ ] (ft)
Casing ID [ ] (in)
Casing Material [ ]

Note: Total Depth, Stick Up, Casing ID, etc. are optional and can be from historical data, unless required by Site/Permit. Well Elevation, DTW, and GWE must be current, obtained from site.

STABILIZATION DATA (Optional)

Sample Time (2400 Hr Clock)	Rate/Unit	pH (std)	Conductance (SC/EC) (µmhos/cm @ 25°C)	Temp. (°C)	Turbidity (ntu)	D.O. (mg/L - ppm)	eH/ORP (mV)	DTW (ft)
		1st	1st					
		2nd	2nd					
		3rd	3rd					
		4th	4th					
Input Range for 3 consec. readings or Permit/State requirements:		+/-	+/-	+/-	+/-	+/-	+/-	

Stabilization Data Fields are Optional *(i.e. complete stabilization readings for parameters required by WM, Site, or State). These fields can be used where four (4) field measurements are required by State/Permit/Site. If a Data Logger or other Electronic format is used, fill in final readings below and submit electronic data separately to Site. If more fields above are needed, use separate sheet or form.*

FIELD DATA

SAMPLE DATE (MM DD YY)	pH (std)	CONDUCTANCE (µmhos/cm @ 25°C)	TEMP. (°C)	TURBIDITY (ntu)	DO (mg/L - ppm)	eH/ORP (mV)	Other: Units
07/10/24	8.0	853	21.0	501	7.2		

Final Field Readings are required *(i.e. record field measurements, final stabilized readings, passive sample readings before sampling for all field parameters required by State/Permit/Site.)*

FIELD COMMENTS

Sample Appearance: opaque Odor: none Color: light brown Other:

Weather Conditions (required daily, or as conditions change): 19°C Direction/Speed: 15km/hr E Outlook: rainy Precipitation: Y or (N)

Specific Comments (including purge/well volume calculations if required): flow time over 1m

11:20 Depth: 0.10 1: 45s
Width: 1.5 2: 40s
3: 45s

I certify that sampling procedures were in accordance with applicable EPA, State, and WM protocols (if more than one sampler, all should sign):

Date	Name	Signature	Company
07/10/24	Maja Petrovic		RWDI Air

DISTRIBUTION: WHITE/ORIGINAL - Stays with Sample, YELLOW - Returned to Client, PINK - Field Copy

Field Information Form v-3.1 06/20

2118

S2437676

BUREAU VERITAS

FIELD INFORMATION FORM

WASTE MANAGEMENT

Site Name: TCEC

Site No.: Sample: SS14B (Sample ID)

This Waste Management Field Information Form is Required
This form is to be completed, in addition to any State Forms. The Field Form is submitted along with the Chain of Custody Forms that accompany the sample containers (i.e. with the cooler that is returned to the laboratory).

Laboratory Use Only/Lab ID:

PURGE INFO

PURGE DATE (MM DD YY)	PURGE TIME (2400 Hr Clock)	ELAPSED HRS (hrs:min)	WATER VOL IN CASING (Gallons)	ACTUAL VOL PURGED (Gallons)	WELL VOLs PURGED

Note: For Passive Sampling, replace "Water Vol in Casing" and "Well Vols Purged" w/ Water Vol in Tubing/Flow Cell and Tubing/Flow Cell Vols Purged. Mark Changes, Record field data below.

PURGE/SAMPLE EQUIPMENT

Purging and Sampling Equipment ... Dedicated: Y or N — Filter Device: Y or N — 0.45 µ or ____ µ (circle or fill in)

Purging Device: ____ A-Submersible Pump B-Peristaltic Pump C-QED Bladder Pump D-Bailer E-Piston Pump F-Dipper/Bottle

Filter Type: ____ A-In-line Disposable B-Pressure C-Vacuum X-Other: ____

Sampling Device: ____

X-Other: ____ Sample Tube Type: ____ A-Teflon B-Stainless Steel C-PVC D-Polypropylene X-Other: ____

WELL DATA

Well Elevation (at TOC) ____ (ft/msl) — Depth to Water (DTW) (from TOC) ____ (ft) — Groundwater Elevation (GWE) (Site Datum, from TOC) ____ (ft msl)

Total Well Depth (from TOC) ____ (ft) — Stick Up (from ground elevation) ____ (ft) — Casing ID ____ (in) — Casing Material ____

Note: Total Depth, Stick Up, Casing ID, etc. are optional and can be from historical data, unless required by Site/Permit. Well Elevation, DTW, and GWE must be current, obtained from site.

STABILIZATION DATA (Optional)

Sample Time (2400 Hr Clock)	Rate/Unit	pH (std)	Conductance (SC/EC) (µmhos/cm @ 25°C)	Temp. (°C)	Turbidity (ntu)	D.O. (mg/L - ppm)	eH/ORP (mV)	DTW (ft)
		1st	1st					
		2nd	2nd					
		3rd	3rd					
		4th	4th					
Input Range for 3 consec. readings or Permit/State requirements:		+/-	+/-	+/-	+/-	+/-	+/-	

Stabilization Data Fields are Optional *(i.e. complete stabilization readings for parameters required by WM, Site, or State). These fields can be used where four (4) field measurements are required by State/Permit/Site. If a Data Logger or other Electronic format is used, fill in final readings below and submit electronic data separately to Site. If more fields above are needed, use separate sheet or form.*

FIELD DATA

SAMPLE DATE (MM DD YY)	pH (std)	CONDUCTANCE (µmhos/cm @ 25°C)	TEMP. (°C)	TURBIDITY (ntu)	DO (mg/L - ppm)	eH/ORP (mV)	Other: Units
071024	8.3	760	20.1	>999	8.83		

Final Field Readings are required *(i.e. record field measurements, final stabilized readings, passive sample readings before sampling for all field parameters required by State/Permit/Site.)*

FIELD COMMENTS

Sample Appearance: opaque Odor: none Color: light brown Other: ____

Weather Conditions (required daily, or as conditions change): 19°C Direction/Speed: 15km/hr E Outlook: overcast Precipitation: Y or N

Specific Comments (including purge/well volume calculations if required): flow over 1m

10:40 Depth: 1.0 t: 1:35 s

Width: 0.05 2:30 s

3:32 s

I certify that sampling procedures were in accordance with applicable EPA, State, and WM protocols (if more than one sampler, all should sign):

Date	Name	Signature	Company
07/10/24	Maya DeForest	[signature]	RWDI Air
/ /			

DISTRIBUTION: WHITE/ORIGINAL - Stays with Sample, YELLOW - Returned to Client, PINK - Field Copy

Field Information Form v-3.1 06/20

2116

S2437676

BUREAU VERITAS

FIELD INFORMATION FORM

WASTE MANAGEMENT

Site Name: TCEC

Site No.: Sample: SS15A (Sample ID)

This Waste Management Field Information Form is Required
This form is to be completed, in addition to any State Forms. The Field Form is submitted along with the Chain of Custody Forms that accompany the sample containers (i.e. with the cooler that is returned to the laboratory).

Laboratory Use Only/Lab ID:

PURGE INFO

PURGE DATE (MM DD YY)	PURGE TIME (2400 Hr Clock)	ELAPSED HRS (hrs:min)	WATER VOL IN CASING (Gallons)	ACTUAL VOL PURGED (Gallons)	WELL VOLs PURGED

Note: For Passive Sampling, replace "Water Vol in Casing" and "Well Vols Purged" w/ Water Vol in Tubing/Flow Cell and Tubing/Flow Cell Vols Purged. Mark Changes, Record field data below.

PURGE/SAMPLE EQUIPMENT

Purging and Sampling Equipment ... Dedicated: Y or N

Purging Device: A-Submersible Pump, B-Peristaltic Pump, C-QED Bladder Pump, D-Bailer, E-Piston Pump, F-Dipper/Bottle

Sampling Device:

X-Other:

Filter Device: Y or N — 0.45 µ or _____ µ (circle or fill in)

Filter Type: A — A-In-line Disposable, B-Pressure, C-Vacuum, X-Other:

Sample Tube Type: A-Teflon, B-Stainless Steel, C-PVC, D-Polypropylene, X-Other:

WELL DATA

Well Elevation (at TOC): (ft/msl)

Depth to Water (DTW) (from TOC): (ft)

Groundwater Elevation (GWE) (Site Datum, from TOC): (ft msl)

Total Well Depth (from TOC): (ft)

Stick Up (from ground elevation): (ft)

Casing ID: (in)

Casing Material:

Note: Total Depth, Stick Up, Casing ID, etc. are optional and can be from historical data, unless required by Site/Permit. Well Elevation, DTW, and GWE must be current, obtained from site.

STABILIZATION DATA (Optional)

Sample Time (2400 Hr Clock)	Rate/Unit	pH (std)	Conductance (SC/EC) (µmhos/cm @ 25°C)	Temp. (°C)	Turbidity (ntu)	D.O. (mg/L - ppm)	eH/ORP (mV)	DTW (ft)
		1st	1st					
		2nd	2nd					
		3rd	3rd					
		4th	4th					
Input Range for 3 consec. readings or Permit/State requirements:		+/-	+/-	+/-	+/-	+/-	+/-	

Stabilization Data Fields are Optional *(i.e. complete stabilization readings for parameters required by WM, Site, or State). These fields can be used where four (4) field measurements are required by State/Permit/Site. If a Data Logger or other Electronic format is used, fill in final readings below and submit electronic data separately to Site. If more fields above are needed, use separate sheet or form.*

FIELD DATA

SAMPLE DATE (MM DD YY)	pH (std)	CONDUCTANCE (µmhos/cm @ 25°C)	TEMP. (°C)	TURBIDITY (ntu)	DO (mg/L - ppm)	eH/ORP (mV)	Other: Units
07 10 24	7.7	940	20.3	167	7.09		

Final Field Readings are required *(i.e. record field measurements, final stabilized readings, passive sample readings before sampling for all field parameters required by State/Permit/Site.)*

FIELD COMMENTS

Sample Appearance: translucent — Odor: none — Color: light brown — Other:

Weather Conditions (required daily, or as conditions change): 19°C — Direction/Speed: 15km/hr E — Outlook: Overcast — Precipitation: Y or N

Specific Comments (including purge/well volume calculations if required): flow time over 1m

1020 AM width: 0.5m t: 1: 25 s

depth 0.25m 2: 30 s

3: 27 s

DUP - PSSWDUP

I certify that sampling procedures were in accordance with applicable EPA, State, and WM protocols (if more than one sampler, all should sign):

Date	Name	Signature	Company
07/10/24	Maya DeForest	[signature]	EWDE Air.
/ /			

DISTRIBUTION: WHITE/ORIGINAL - Stays with Sample, YELLOW - Returned to Client, PINK - Field Copy

Field Information Form v.3.1 06/2

2115

Custody Tracking Form

T927956

Please use this form for custody tracking when submitting the work instructions via eCOC (electronic Chain of Custody). Please ensure your form has a barcode or a Bureau Veritas eCOC confirmation number in the top right hand side. This number links your electronic submission to your samples. This form should be placed in the cooler with your samples.

First Sample: SS14A
Last Sample: PSSWDUP
Sample Count: 4

Relinquished By				Received By			
James Hanna		Date	2024/07/10	Soumya. Raganoni		Date	2024/07/10
		Time (24 HR)	16:15			Time (24 HR)	16:19
		Date		BHARGAV		Date	2024/07/11
		Time (24 HR)				Time (24 HR)	18:54
		Date				Date	
		Time (24 HR)				Time (24 HR)	

Unless otherwise agreed to, submissions and use of services are governed by Bureau Veritas' standard terms and conditions which can be found at www.bvna.com.

Triage Information

Sampled By (Print): James Hanna

# of Coolers/Pkgs: 1

Rush ☐ Immediate Test ☐ Food Residue ☐

Micro ☐ Food Chemistry ☐

*** LABORATORY USE ONLY ***

Received At

Labeled By

Verified By

Lab Comments:

Custody Seal		Cooling Media	Temperature °C		
Present (Y/N)	Intact (Y/N)	Present (Y/N)	1	2	3
Y	Y	Y	9	9	12
Y	N	Y	6	5	6
Drinking Water Metals Preservation Check Done (Circle)				YES	NO

10-Jul-24 16:19
Patricia Legette
C4L2024

A3P ENV-1281

COR FCD-00383/4

Page 1 of 1

752468

REC'D IN LONDON

eCOC: T927956

Expected TAT:	Standard TAT
Expected Arrival:	2024/07/10 20:00
Submitted By:	Jeffery Cleland
Submitted To:	Mississauga, ON (Env. Lab)

Invoice Information

Attn: Lisa Mertick lmertick@wm.com
Waste Management of Canada Corporation
5768 Nauvoo Rd. RR# 4
Watford , ON , N0M 2S0
Email to:
lmertick@wm.com
invoiceuploads@bureauveritas.com

Report Information

Attn: Jeffery Cleland
RWDI Inc.
4510 Rhodes Drive
Suite 530
Windsor , ON , N8W 5K5
Email to:
james.hanna@rwdi.com
khalid.hussein@rwdi.com
jeffery.cleland@rwdi.com
maja.deforest@rwdi.com
jake.artibello@rwdi.com

Project Information

Quote #:	C34991
PO/AFE#:	13254256
Project #:	2402553.01
Site Location:	Twin Creeks Environmental Centre

Analytical Summary

A: Standard TAT

Client Sample ID	Clnt Ref	Sampling Date/Time	Matrix	#Cont	ON-WLF-2024 TCLS - SW (POPLAR) MONITORING & STORM
SS14A	1	2024/07/10 11:20	SURFACE WATER	6	A
SS14B	2	2024/07/10 10:40	SURFACE WATER	6	A
SS15A	3	2024/07/10 10:20	SURFACE WATER	6	A
PSSWDUP	4	2024/07/10 22:20	SURFACE WATER	6	A

Deadlines are estimates only and are subject to change. Please refer to your Job Confirmation report for final due dates.

Submission Information

# of Samples:	4
Details:	See lab addendum for lab group coding

Your P.O. #: 13254256
Your Project #: 2402553.01
Site#: 700
Site Location: ON07
Your C.O.C. #: 979741

Attention: Khalid Hussein - Twin Creeks

RWDI Inc.
600 Southgate Drive
Guelph, ON
Canada N1G 4P6

Report Date: 2024/10/25
Report #: R8377421
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C4W4834
Received: 2024/10/16, 10:22

Sample Matrix: Water
Samples Received: 4

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity	4	N/A	2024/10/24	CAM SOP-00448	SM 24 2320 B m
Chloride by Automated Colourimetry	4	N/A	2024/10/23	CAM SOP-00463	SM 24 4500-Cl E m
Conductance in Water - On-site	4	N/A	2024/10/17		
Field Measured Dissolved Oxygen in Water	4	N/A	2024/10/17		
Total Metals by ICPMS	4	N/A	2024/10/22	CAM SOP-00447	EPA 6020B m
Ammonia-N	4	N/A	2024/10/22	CAM SOP-00441	USGS I-2522-90 m
Nitrate & Nitrite as Nitrogen in Water (1)	4	N/A	2024/10/18	CAM SOP-00440	SM 24 4500-NO3I/NO2B
Phenols (4AAP)	4	N/A	2024/10/22	CAM SOP-00444	OMOE E3179 m
Field Measured pH (2)	4	N/A	2024/10/16		Field pH Meter
Sulphate by Automated Turbidimetry	4	N/A	2024/10/23	CAM SOP-00464	SM 24 4500-SO42- E m
Field Temperature (2)	4	N/A	2024/10/16		Field Thermometer
Total Organic Carbon (TOC) (3)	4	N/A	2024/10/22	CAM SOP-00446	SM 24 5310B m
Turbidity - On-site	4	N/A	2024/10/17		
Un-ionized Ammonia (4)	4	2024/10/16	2024/10/22	Auto Calc.	PWQO
Volatile Organic Compounds in Water	4	N/A	2024/10/21	CAM SOP-00226	EPA 8260D m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, EPA, APHA or the Quebec Ministry of Environment.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope

Your P.O. #: 13254256
Your Project #: 2402553.01
Site#: 700
Site Location: ON07
Your C.O.C. #: 979741

Attention: Khalid Hussein - Twin Creeks

RWDI Inc.
600 Southgate Drive
Guelph, ON
Canada N1G 4P6

Report Date: 2024/10/25
Report #: R8377421
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C4W4834
Received: 2024/10/16, 10:22

dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.
(2) This is a field test, therefore, the results relate to items that were not analysed at Bureau Veritas.
(3) Total Organic Carbon (TOC) present in the sample should be considered as non-purgeable TOC.
(4) Un-ionized ammonia is calculated using the total ammonia result and field data provided by the client for pH and temperature.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to:
Patricia Legette, Project Manager
Email: Patricia.Legette@bureauveritas.com
Phone# (905)817-5799

==========

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

Bureau Veritas Job #: C4W4834
Report Date: 2024/10/25

RWDI Inc.
Client Project #: 2402553.01
Site Location: ON07
Your P.O. #: 13254256
Sampler Initials: JA

RESULTS OF ANALYSES OF WATER

Bureau Veritas ID		AFZO19		AFZO20		AFZO21	AFZO22		
Sampling Date		2024/10/14 12:10		2024/10/14 12:00		2024/10/14 11:30	2024/10/14 11:30		
COC Number		979741		979741		979741	979741		
	UNITS	SS14A	RDL	SS14B	RDL	SS15A	PSSWDUP	RDL	QC Batch
Calculated Parameters									
Total Un-ionized Ammonia	mg/L	<0.0087	0.0087	<0.015	0.015	<0.0065	<0.0065	0.0065	9704113
Field Measurements									
Field Conductivity	uS/cm	722	N/A	1015	N/A	650	650	N/A	ONSITE
Field Dissolved Oxygen	mg/L	10.60	N/A	10.62	N/A	10.30	10.30	N/A	ONSITE
Field Temperature	Celsius	10.9	N/A	12.1	N/A	10.0	10.0	N/A	ONSITE
Field Measured Field Turbidity	NTU	266	N/A	49.6	N/A	120	120	N/A	ONSITE
Field Measured pH	pH	8.4		8.6		8.3	8.3		ONSITE
Inorganics									
Total Ammonia-N	mg/L	<0.15	0.15	<0.15	0.15	<0.15	<0.15	0.15	9715841
Total Organic Carbon (TOC)	mg/L	7.5	0.40	16	0.40	14	14	0.40	9715837
Phenols-4AAP	mg/L	<0.0010	0.0010	<0.0010	0.0010	<0.0010	<0.0010	0.0010	9715683
Dissolved Sulphate (SO4)	mg/L	260	1.0	160	1.0	81	99	1.0	9712356
Alkalinity (Total as CaCO3)	mg/L	91	1.0	160	1.0	130	130	1.0	9710075
Dissolved Chloride (Cl-)	mg/L	12	1.0	140	1.0	57	49	1.0	9712355
Nitrate (N)	mg/L	1.21	0.10	5.21	0.10	5.06	3.11	0.10	9709289

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

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C4W4834
Report Date: 2024/10/25

RWDI Inc.
Client Project #: 2402553.01
Site Location: ON07
Your P.O. #: 13254256
Sampler Initials: JA

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Bureau Veritas ID		AFZO19	AFZO20	AFZO21	AFZO22		
Sampling Date		2024/10/14 12:10	2024/10/14 12:00	2024/10/14 11:30	2024/10/14 11:30		
COC Number		979741	979741	979741	979741		
	UNITS	SS14A	SS14B	SS15A	PSSWDUP	RDL	QC Batch
Metals							
Total Boron (B)	mg/L	0.12	1.1	0.47	0.49	0.02	9713739
Total Calcium (Ca)	mg/L	98	83	65	68	0.2	9713739
Total Chromium (Cr)	mg/L	0.007	<0.005	<0.005	0.005	0.005	9713739
Total Iron (Fe)	mg/L	6.8	1.1	4.4	4.6	0.1	9713739
Total Magnesium (Mg)	mg/L	27	27	18	18	0.05	9713739
Total Nickel (Ni)	mg/L	0.011	0.009	0.010	0.011	0.001	9713739
Total Potassium (K)	mg/L	8.6	15	11	11	0.2	9713739
Total Sodium (Na)	mg/L	11	88	33	35	0.1	9713739
Total Zinc (Zn)	mg/L	0.02	<0.01	0.02	0.02	0.01	9713739

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C4W4834
Report Date: 2024/10/25

RWDI Inc.
Client Project #: 2402553.01
Site Location: ON07
Your P.O. #: 13254256
Sampler Initials: JA

VOLATILE ORGANICS BY GC/MS (WATER)

Bureau Veritas ID		AFZO19	AFZO20	AFZO21	AFZO22		
Sampling Date		2024/10/14 12:10	2024/10/14 12:00	2024/10/14 11:30	2024/10/14 11:30		
COC Number		979741	979741	979741	979741		
	UNITS	SS14A	SS14B	SS15A	PSSWDUP	RDL	QC Batch
Volatile Organics							
Benzene	ug/L	<0.10	<0.10	<0.10	<0.10	0.10	9710144
Ethylbenzene	ug/L	<0.10	<0.10	<0.10	<0.10	0.10	9710144
Toluene	ug/L	<0.20	<0.20	<0.20	<0.20	0.20	9710144
p+m-Xylene	ug/L	<0.10	<0.10	<0.10	<0.10	0.10	9710144
o-Xylene	ug/L	<0.10	<0.10	<0.10	<0.10	0.10	9710144
Total Xylenes	ug/L	<0.10	<0.10	<0.10	<0.10	0.10	9710144
Surrogate Recovery (%)							
4-Bromofluorobenzene	%	99	95	97	95		9710144
D4-1,2-Dichloroethane	%	98	100	100	101		9710144
D8-Toluene	%	102	100	100	100		9710144

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

GENERAL COMMENTS

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

Package 1	4.7°C

Results relate only to the items tested.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C4W4834
Report Date: 2024/10/25

QUALITY ASSURANCE REPORT

RWDI Inc.
Client Project #: 2402553.01
Site Location: ON07
Your P.O. #: 13254256
Sampler Initials: JA

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
9710144	4-Bromofluorobenzene	2024/10/21	93	70 - 130	101	70 - 130	99	%		
9710144	D4-1,2-Dichloroethane	2024/10/21	98	70 - 130	99	70 - 130	104	%		
9710144	D8-Toluene	2024/10/21	102	70 - 130	102	70 - 130	101	%		
9709289	Nitrate (N)	2024/10/18	92	80 - 120	93	80 - 120	<0.10	mg/L	NC (1)	20
9710075	Alkalinity (Total as CaCO3)	2024/10/24			96	85 - 115	<1.0	mg/L	0.83 (1)	20
9710144	Benzene	2024/10/21	112	70 - 130	111	70 - 130	<0.10	ug/L	NC (1)	30
9710144	Ethylbenzene	2024/10/21	104	70 - 130	104	70 - 130	<0.10	ug/L	NC (1)	30
9710144	o-Xylene	2024/10/21	111	70 - 130	108	70 - 130	<0.10	ug/L	NC (1)	30
9710144	p+m-Xylene	2024/10/21	104	70 - 130	102	70 - 130	<0.10	ug/L	NC (1)	30
9710144	Toluene	2024/10/21	109	70 - 130	108	70 - 130	<0.20	ug/L	NC (1)	30
9710144	Total Xylenes	2024/10/21					<0.10	ug/L	NC (1)	30
9712355	Dissolved Chloride (Cl-)	2024/10/23	NC	80 - 120	100	80 - 120	<1.0	mg/L	3.8 (1)	20
9712356	Dissolved Sulphate (SO4)	2024/10/23	94	75 - 125	101	80 - 120	<1.0	mg/L	NC (1)	20
9713739	Total Boron (B)	2024/10/22	94	80 - 120	92	80 - 120	<0.02	mg/L	1.6 (1)	20
9713739	Total Calcium (Ca)	2024/10/22	91	80 - 120	94	80 - 120	<0.2	mg/L	0.32 (1)	20
9713739	Total Chromium (Cr)	2024/10/22	94	80 - 120	95	80 - 120	<0.005	mg/L	NC (1)	20
9713739	Total Iron (Fe)	2024/10/22	95	80 - 120	96	80 - 120	<0.1	mg/L	0.87 (1)	20
9713739	Total Magnesium (Mg)	2024/10/22	93	80 - 120	94	80 - 120	<0.05	mg/L	0.46 (1)	20
9713739	Total Nickel (Ni)	2024/10/22	91	80 - 120	93	80 - 120	<0.001	mg/L	2.3 (1)	20
9713739	Total Potassium (K)	2024/10/22	95	80 - 120	95	80 - 120	<0.2	mg/L	0.43 (1)	20
9713739	Total Sodium (Na)	2024/10/22	92	80 - 120	94	80 - 120	<0.1	mg/L	0.28 (1)	20
9713739	Total Zinc (Zn)	2024/10/22	96	80 - 120	97	80 - 120	<0.01	mg/L	5.3 (1)	20
9715683	Phenols-4AAP	2024/10/22	102	80 - 120	102	80 - 120	<0.0010	mg/L	NC (1)	20
9715837	Total Organic Carbon (TOC)	2024/10/22	96 (2)	80 - 120	98	80 - 120	<0.40	mg/L	2.6 (3)	20

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
9715841	Total Ammonia-N	2024/10/22	94 (4)	75 - 125	101	80 - 120	<0.15	mg/L	NC (5)	20

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.

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 spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) Duplicate Parent ID

(2) Matrix Spike Parent ID [AFZO19-03]

(3) Duplicate Parent ID [AFZO19-03]

(4) Matrix Spike Parent ID [AFZO19-05]

(5) Duplicate Parent ID [AFZO19-05]

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C4W4834
Report Date: 2024/10/25

RWDI Inc.
Client Project #: 2402553.01
Site Location: ON07
Your P.O. #: 13254256
Sampler Initials: JA

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Cristina Carriere, Senior Scientific Specialist

Patricia Legette, Project Manager

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

FIELD INFORMATION FORM

BUREAU VERITAS

WASTE MANAGEMENT

Site Name: TCEC

Site No.: Sample: SS14A (Sample ID)

This Waste Management Field Information Form is Required
This form is to be completed, in addition to any State Forms. The Field Form is submitted along with the Chain of Custody Forms that accompany the sample containers (i.e. with the cooler that is returned to the laboratory).

Laboratory Use Only/Lab ID:

PURGE INFO

PURGE DATE (MM DD YY)	PURGE TIME (2400 Hr Clock)	ELAPSED HRS (hrs:min)	WATER VOL IN CASING (Gallons)	ACTUAL VOL PURGED (Gallons)	WELL VOLs PURGED

Note: For Passive Sampling, replace "Water Vol in Casing" and "Well Vols Purged" w/ Water Vol in Tubing/Flow Cell and Tubing/Flow Cell Vols Purged. Mark Changes, Record field data below.

PURGE/SAMPLE EQUIPMENT

Purging and Sampling Equipment ... Dedicated: [Y] or [N]

Filter Device: [Y] or [N] [0.45 µ] or [ ] µ (circle or fill in)

Purging Device: [ ] A-Submersible Pump B-Peristaltic Pump C-QED Bladder Pump D-Bailer E-Piston Pump F-Dipper/Bottle

Sampling Device: [ ]

Filter Type: [ ] A-In-line Disposable B-Pressure C-Vacuum X-Other: ____

X-Other: [ ]

Sample Tube Type: [ ] A-Teflon B-Stainless Steel C-PVC D-Polypropylene X-Other: ____

WELL DATA

Well Elevation (at TOC): [ ] (ft/msl)

Depth to Water (DTW) (from TOC): [ ] (ft)

Groundwater Elevation (GWE) (Site Datum, from TOC): [ ] (ft msl)

Total Well Depth (from TOC): [ ] (ft)

Stick Up (from ground elevation): [ ] (ft)

Casing ID: [ ] (in)

Casing Material: [ ]

Note: Total Depth, Stick Up, Casing ID, etc. are optional and can be from historical data, unless required by Site/Permit. Well Elevation, DTW, and GWE must be current, obtained from site.

STABILIZATION DATA (Optional)

Sample Time (2400 Hr Clock)	Rate/Unit	pH (std)	Conductance (SC/EC) (µmhos/cm @ 25°C)	Temp. (°C)	Turbidity (ntu)	D.O. (mg/L - ppm)	eH/ORP (mV)	DTW (ft)
	1st	1st	1st					
	2nd	2nd	2nd					
	3rd	3rd	3rd					
	4th	4th	4th					
Input Range for 3 consec. readings or Permit/State requirements:		+/-	+/-	+/-	+/-	+/-	+/-	

Stabilization Data Fields are Optional *(i.e. complete stabilization readings for parameters required by WM, Site, or State). These fields can be used where four (4) field measurements are required by State/Permit/Site. If a Data Logger or other Electronic format is used, fill in final readings below and submit electronic data separately to Site. If more fields above are needed, use separate sheet or form.*

FIELD DATA

SAMPLE DATE (MM DD YY)	pH (std)	CONDUCTANCE (µmhos/cm @ 25°C)	TEMP. (°C)	TURBIDITY (ntu)	DO (mg/L - ppm)	eH/ORP (mV)	Other: Units
10 14 24	8.4	1727	10.9	266	10.60		

Final Field Readings are required *(i.e. record field measurements, final stabilized readings, passive sample readings before sampling for all field parameters required by State/Permit/Site.)*

Sample Appearance: transparent Odor: N/O Color: N/C Other: ____

Weather Conditions (required daily, or as conditions change): 7°C Direction/Speed: 22km/h W Outlook: A few clouds Precipitation: Y or N

Specific Comments (including purge/well volume calculations if required):

FIELD COMMENTS

turbl 0.6m 12:10

Depth: 0.10m

time @ 11:21

2:23

2:21

I certify that sampling procedures were in accordance with applicable EPA, State, and WM protocols (if more than one sampler, all should sign):

Date	Name	Signature	Company
10/14/24	Jake Arbiball.		KWF
/ /			

178

DISTRIBUTION: WHITE/ORIGINAL - Stays with Sample, YELLOW - Returned to Client, PINK - Field Copy

Field Information Form v-3.1 06/20

2124

FIELD INFORMATION FORM

BUREAU VERITAS

WM WASTE MANAGEMENT

Site Name: TCEC

Site No.: Sample: SGMW Sample ID

This Waste Management Field Information Form is Required
This form is to be completed, in addition to any State Forms. The Field Form is submitted along with the Chain of Custody Forms that accompany the sample containers (i.e. with the cooler that is returned to the laboratory).

Laboratory Use Only/Lab ID:

PURGE INFO

PURGE DATE (MM DD YY)	PURGE TIME (2400 Hr Clock)	ELAPSED HRS (hrs:min)	WATER VOL IN CASING (Gallons)	ACTUAL VOL PURGED (Gallons)	WELL VOLs PURGED

Note: For Passive Sampling, replace "Water Vol in Casing" and "Well Vols Purged" w/ Water Vol in Tubing/Flow Cell and Tubing/Flow Cell Vols Purged. Mark Changes, Record field data below.

PURGE/SAMPLE EQUIPMENT

Purging and Sampling Equipment ... Dedicated: [Y] or [N]

Filter Device: [Y] or [N] [0.45 µ] or [ ] µ (circle or fill in)

Purging Device: [ ] A-Submersible Pump, B-Peristaltic Pump, C-QED Bladder Pump, D-Bailer, E-Piston Pump, F-Dipper/Bottle

Sampling Device: [ ] (same options)

Filter Type: [ ] A-In-line Disposable, B-Pressure, C-Vacuum, X-Other: ____

X-Other: [ ]

Sample Tube Type: [ ] A-Teflon, B-Stainless Steel, C-PVC, D-Polypropylene, X-Other: ____

WELL DATA

Well Elevation (at TOC)	Depth to Water (DTW) (from TOC)	Groundwater Elevation (GWE) (Site Datum, from TOC)
(ft/msl)	(ft)	(ft msl)

Total Well Depth (from TOC) (ft) | Stick Up (from ground elevation) (ft) | Casing ID (in) | Casing Material

Note: Total Depth, Stick Up, Casing ID, etc. are optional and can be from historical data, unless required by Site/Permit. Well Elevation, DTW, and GWE must be current, obtained from site.

STABILIZATION DATA (Optional)

Sample Time (2400 Hr Clock)	Rate/Unit	pH (std)	Conductance (SC/EC) (µmhos/cm @ 25°C)	Temp. (°C)	Turbidity (ntu)	D.O. (mg/L - ppm)	eH/ORP (mV)	DTW (ft)
		1st	1st					
		2nd	2nd					
		3rd	3rd					
		4th	4th					
Input Range for 3 consec. readings or Permit/State requirements:		+/-	+/-	+/-	+/-	+/-	+/-	

Stabilization Data Fields are Optional *(i.e. complete stabilization readings for parameters required by WM, Site, or State). These fields can be used where four (4) field measurements are required by State/Permit/Site. If a Data Logger or other Electronic format is used, fill in final readings below and submit electronic data separately to Site. If more fields above are needed, use separate sheet or form.*

FIELD DATA

SAMPLE DATE (MM DD YY)	pH (std)	CONDUCTANCE (µmhos/cm @ 25°C)	TEMP. (°C)	TURBIDITY (ntu)	DO (mg/L - ppm)	eH/ORP (mV)	Other: Units
10 14 24	8.6	1015	17.1	49.6	6.62		

Final Field Readings are required *(i.e. record field measurements, final stabilized readings, passive sample readings before sampling for all field parameters required by State/Permit/Site.)*

Sample Appearance: transparent Odor: N/O Color: N/C Other: ____

Weather Conditions (required daily, or as conditions change): 7°C Direction/Speed: 22km/h W Outlook: A few clouds Precipitation: Y or (N)

Specific Comments (including purge/well volume calculations if required):

FIELD COMMENTS

12:00

~~Pushing bailer~~

Wtr Lvl: 0.10m

Depth 0.05m

time @ 1m 1:7s

2: 7s

3: 8s

I certify that sampling procedures were in accordance with applicable EPA, State, and WM protocols (if more than one sampler, all should sign):

Date	Name	Signature	Company
10/14/24	Jake Arbibell		RWDE
/ /			

T78

DISTRIBUTION: WHITE/ORIGINAL - Stays with Sample, YELLOW - Returned to Client, PINK - Field Copy

Field Information Form v-3.1 06/20

2121

FIELD INFORMATION FORM

BUREAU VERITAS

WASTE MANAGEMENT

Site Name: FTEC

Site No.: Sample: SS15TA (Sample ID)

This Waste Management Field Information Form is Required
This form is to be completed, in addition to any State Forms. The Field Form is submitted along with the Chain of Custody Forms that accompany the sample containers (i.e. with the cooler that is returned to the laboratory).

Laboratory Use Only/Lab ID:

PURGE INFO

PURGE DATE (MM DD YY)	PURGE TIME (2400 Hr Clock)	ELAPSED HRS (hrs:min)	WATER VOL IN CASING (Gallons)	ACTUAL VOL PURGED (Gallons)	WELL VOLs PURGED

Note: For Passive Sampling, replace "Water Vol in Casing" and "Well Vols Purged" w/ Water Vol in Tubing/Flow Cell and Tubing/Flow Cell Vols Purged. Mark Changes, Record field data below.

PURGE/SAMPLE EQUIPMENT

Purging and Sampling Equipment ... Dedicated: Y or N — Filter Device: Y or N — 0.45 µ or ____ µ (circle or fill in)

Purging Device: A-Submersible Pump, B-Peristaltic Pump, C-QED Bladder Pump, D-Bailer, E-Piston Pump, F-Dipper/Bottle

Sampling Device:

X-Other:

Filter Type: A-In-line Disposable, B-Pressure, C-Vacuum, X-Other: ____

Sample Tube Type: A-Teflon, B-Stainless Steel, C-PVC, D-Polypropylene, X-Other: ____

WELL DATA

Well Elevation (at TOC) ____ (ft/msl) — Depth to Water (DTW) (from TOC) ____ (ft) — Groundwater Elevation (GWE) (Site Datum, from TOC) ____ (ft msl)

Total Well Depth (from TOC) ____ (ft) — Stick Up (from ground elevation) ____ (ft) — Casing ID ____ (in) — Casing Material ____

Note: Total Depth, Stick Up, Casing ID, etc. are optional and can be from historical data, unless required by Site/Permit. Well Elevation, DTW, and GWE must be current, obtained from site.

STABILIZATION DATA (Optional)

Sample Time (2400 Hr Clock)	Rate/Unit	pH (std)	Conductance (SC/EC) (µmhos/cm @ 25°C)	Temp. (°C)	Turbidity (ntu)	D.O. (mg/L - ppm)	eH/ORP (mV)	DTW (ft)
		1st	1st					
		2nd	2nd					
		3rd	3rd					
		4th	4th					
Input Range for 3 consec. readings or Permit/State requirements:		+/-	+/-	+/-	+/-	+/-	+/-	

Stabilization Data Fields are Optional *(i.e. complete stabilization readings for parameters required by WM, Site, or State). These fields can be used where four (4) field measurements are required by State/Permit/Site. If a Data Logger or other Electronic format is used, fill in final readings below and submit electronic data separately to Site. If more fields above are needed, use separate sheet or form.*

FIELD DATA

SAMPLE DATE (MM DD YY)	pH (std)	CONDUCTANCE (µmhos/cm @ 25°C)	TEMP. (°C)	TURBIDITY (ntu)	DO (mg/L - ppm)	eH/ORP (mV)	Other: Units
101424	8.13	650	10.0	120	10.30		

Final Field Readings are required *(i.e. record field measurements, final stabilized readings, passive sample readings before sampling for all field parameters required by State/Permit/Site.)*

FIELD COMMENTS

Sample Appearance: Translucent — Odor: N/O — Color: light Brown — Other: ____

Weather Conditions (required daily, or as conditions change): 7°C — Direction/Speed: 22kg/h V — Outlook: A few clouds — Precipitation: Y or (N)

Specific Comments (including purge/well volume calculations if required):

Width: 1.75m

Depth: 0.30m

time/ln 1: 22s

2: 22s

3: 22s

*Pulled up to Ice. 1130

I certify that sampling procedures were in accordance with applicable EPA, State, and WM protocols (if more than one sampler, all should sign):

Date	Name	Signature	Company
10/14/24	Jake Arbaugh		RWE
/ /			

178

DISTRIBUTION: WHITE/ORIGINAL - Stays with Sample, YELLOW - Returned to Client, PINK - Field Copy

Field Information Form v-3.1 06/20

2141

Custody Tracking Form

T979741

Please use this form for custody tracking when submitting the work instructions via eCOC (electronic Chain of Custody). Please ensure your form has a barcode or a Bureau Veritas eCOC confirmation number in the top right hand side. This number links your electronic submission to your samples. This form should be placed in the cooler with your samples.

First Sample: SS14A
Last Sample: PSSWDUP
Sample Count: 4

Relinquished By				Received By			
J. Arkell		Date	24/10/15			Date	2024/10/16
		Time (24 HR)	10:00			Time (24 HR)	10:22
		Date				Date	
		Time (24 HR)				Time (24 HR)	
		Date				Date	
		Time (24 HR)				Time (24 HR)	

Unless otherwise agreed to, submissions and use of services are governed by Bureau Veritas' standard terms and conditions which can be found at www.bvna.com.

Triage Information

Sampled By (Print): J. Arkell

# of Coolers/Pkgs: 1

Rush ☐ Immediate Test ☐ Food Residue ☐

Micro ☐ Food Chemistry ☐

*** LABORATORY USE ONLY ***

Received At: Lab 16-Oct-24 10:22

Labeled By: Patricia Legette C4W4834

Verified By: BM2 ENV-1463

Custody Seal		Cooling Media	Temperature °C		
Present (Y/N)	Intact (Y/N)	Present (Y/N)	1	2	3
Y	Y	Y	5	2	2
Drinking Water Metals Preservation Check Done (Circle)				YES	NO

COR FCD-00383/4

Page 1 of 1

Your P.O. #: 13254256
Your Project #: 2402553.01
Site#: 200
Site Location: ON07
Your C.O.C. #: TCEC-SWCM-JAN

Attention: Khalid Hussein - Twin Creeks

RWDI Inc.
600 Southgate Drive
Guelph, ON
Canada N1G 4P6

Report Date: 2024/01/18
Report #: R7994350
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C410272
Received: 2024/01/11, 09:10

Sample Matrix: Water
Samples Received: 4

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity	4	N/A	2024/01/12	CAM SOP-00448	SM 24 2320 B m
Chloride by Automated Colourimetry	4	N/A	2024/01/12	CAM SOP-00463	SM 24 4500-Cl E m
Conductance in Water - On-site	4	N/A	2024/01/18		
Field Measured Dissolved Oxygen in Water	4	N/A	2024/01/18		
Total Metals by ICPMS	4	N/A	2024/01/16	CAM SOP-00447	EPA 6020B m
Total Ammonia-N	4	N/A	2024/01/15	CAM SOP-00441	USGS I-2522-90 m
Nitrate & Nitrite as Nitrogen in Water (1)	4	N/A	2024/01/12	CAM SOP-00440	SM 24 4500-NO3I/NO2B
Phenols (4AAP)	4	N/A	2024/01/12	CAM SOP-00444	OMOE E3179 m
Field Measured pH (2)	4	N/A	2024/01/18		Field pH Meter
Sulphate by Automated Turbidimetry	4	N/A	2024/01/12	CAM SOP-00464	SM 24 4500-SO42- E m
Field Temperature (2)	4	N/A	2024/01/18		Field Thermometer
Total Organic Carbon (TOC) (3)	4	N/A	2024/01/15	CAM SOP-00446	SM 24 5310B m
Turbidity - On-site	4	N/A	2024/01/18		
Un-ionized Ammonia (4)	4	2024/01/11	2024/01/18	Auto Calc.	PWQO
Volatile Organic Compounds in Water	4	N/A	2024/01/15	CAM SOP-00226	EPA 8260D m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, EPA, APHA or the Quebec Ministry of Environment.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope

Your P.O. #: 13254256
Your Project #: 2402553.01
Site#: 200
Site Location: ON07
Your C.O.C. #: TCEC-SWCM-JAN

Attention: Khalid Hussein - Twin Creeks

RWDI Inc.
600 Southgate Drive
Guelph, ON
Canada N1G 4P6

Report Date: 2024/01/18
Report #: R7994350
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C410272
Received: 2024/01/11, 09:10

dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.
(2) This is a field test, therefore, the results relate to items that were not analysed at Bureau Veritas.
(3) Total Organic Carbon (TOC) present in the sample should be considered as non-purgeable TOC.
(4) Un-ionized ammonia is calculated using the total ammonia result and field data provided by the client for pH and temperature.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to:
Patricia Legette, Project Manager
Email: Patricia.Legette@bureauveritas.com
Phone# (905)817-5799

==========

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

Bureau Veritas Job #: C410272
Report Date: 2024/01/18

RWDI Inc.
Client Project #: 2402553.01
Site Location: ON07
Your P.O. #: 13254256
Sampler Initials: EW

RESULTS OF ANALYSES OF WATER

Bureau Veritas ID		YCC154		YCC155		YCC156		
Sampling Date		2024/01/10		2024/01/10		2024/01/10		
COC Number		TCEC-SWCM-JAN		TCEC-SWCM-JAN		TCEC-SWCM-JAN		
	UNITS	SS14A	QC Batch	SS14B	QC Batch	SS15A	RDL	QC Batch
Calculated Parameters								
Total Un-ionized Ammonia	mg/L	<0.00061	9156558	<0.00061	9156558	<0.00061	0.00061	9156558
Field Measurements								
Field Conductivity	uS/cm	1070	ONSITE	1280	ONSITE	1080	N/A	ONSITE
Field Dissolved Oxygen	mg/L	12.21	ONSITE	13.12	ONSITE	12.43	N/A	ONSITE
Field Temperature	Celsius	2.5	ONSITE	2.6	ONSITE	5.9	N/A	ONSITE
Field Measured Field Turbidity	NTU	55.0	ONSITE	189	ONSITE	13.6	N/A	ONSITE
Field Measured pH	pH	7.6	ONSITE	7.5	ONSITE	7.5		ONSITE
Inorganics								
Total Ammonia-N	mg/L	<0.050	9159087	<0.050	9158839	0.12	0.050	9159087
Total Organic Carbon (TOC)	mg/L	6.0	9162204	9.2	9162204	9.4	0.40	9162204
Phenols-4AAP	mg/L	<0.0010	9158364	<0.0010	9158364	<0.0010	0.0010	9158364
Dissolved Sulphate (SO4)	mg/L	170	9157601	120	9157601	110	1.0	9157601
Alkalinity (Total as CaCO3)	mg/L	190	9157829	230	9157829	170	1.0	9157829
Dissolved Chloride (Cl-)	mg/L	14	9157599	78	9157599	29	1.0	9157599
Nitrate (N)	mg/L	0.98	9157510	1.18	9157510	1.06	0.10	9157838

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

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C410272
Report Date: 2024/01/18

RWDI Inc.
Client Project #: 2402553.01
Site Location: ON07
Your P.O. #: 13254256
Sampler Initials: EW

RESULTS OF ANALYSES OF WATER

Bureau Veritas ID		YCC157		
Sampling Date		2024/01/10		
COC Number		TCEC-SWCM-JAN		
	UNITS	PSSWDUP	RDL	QC Batch
Calculated Parameters				
Total Un-ionized Ammonia	mg/L	<0.00061	0.00061	9156558
Field Measurements				
Field Conductivity	uS/cm	1280	N/A	ONSITE
Field Dissolved Oxygen	mg/L	13.12	N/A	ONSITE
Field Temperature	Celsius	2.6	N/A	ONSITE
Field Measured Field Turbidity	NTU	189	N/A	ONSITE
Field Measured pH	pH	7.5		ONSITE
Inorganics				
Total Ammonia-N	mg/L	<0.050	0.050	9158839
Total Organic Carbon (TOC)	mg/L	9.4	0.40	9162204
Phenols-4AAP	mg/L	<0.0010	0.0010	9158364
Dissolved Sulphate (SO4)	mg/L	120	1.0	9157601
Alkalinity (Total as CaCO3)	mg/L	220	1.0	9157829
Dissolved Chloride (Cl-)	mg/L	77	1.0	9157599
Nitrate (N)	mg/L	1.19	0.10	9157838

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

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C410272
Report Date: 2024/01/18

RWDI Inc.
Client Project #: 2402553.01
Site Location: ON07
Your P.O. #: 13254256
Sampler Initials: EW

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Bureau Veritas ID		YCC154	YCC155	YCC156	YCC157		
Sampling Date		2024/01/10	2024/01/10	2024/01/10	2024/01/10		
COC Number		TCEC-SWCM-JAN	TCEC-SWCM-JAN	TCEC-SWCM-JAN	TCEC-SWCM-JAN		
	UNITS	SS14A	SS14B	SS15A	PSSWDUP	RDL	QC Batch
Metals							
Total Boron (B)	mg/L	0.06	0.59	0.34	0.59	0.02	9164044
Total Calcium (Ca)	mg/L	98	92	72	94	0.2	9164044
Total Chromium (Cr)	mg/L	<0.005	0.005	0.007	0.006	0.005	9164044
Total Iron (Fe)	mg/L	1.1	4.4	5.7	4.3	0.1	9164044
Total Magnesium (Mg)	mg/L	32	31	23	31	0.05	9164044
Total Nickel (Ni)	mg/L	0.003	0.010	0.009	0.010	0.001	9164044
Total Potassium (K)	mg/L	5.9	9.3	7.4	9.3	0.2	9164044
Total Sodium (Na)	mg/L	9.5	54	23	53	0.1	9164044
Total Zinc (Zn)	mg/L	<0.01	0.01	0.02	0.01	0.01	9164044

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C410272
Report Date: 2024/01/18

RWDI Inc.
Client Project #: 2402553.01
Site Location: ON07
Your P.O. #: 13254256
Sampler Initials: EW

VOLATILE ORGANICS BY GC/MS (WATER)

Bureau Veritas ID		YCC154	YCC155	YCC156	YCC157		
Sampling Date		2024/01/10	2024/01/10	2024/01/10	2024/01/10		
COC Number		TCEC-SWCM-JAN	TCEC-SWCM-JAN	TCEC-SWCM-JAN	TCEC-SWCM-JAN		
	UNITS	SS14A	SS14B	SS15A	PSSWDUP	RDL	QC Batch
Volatile Organics							
Benzene	ug/L	<0.10	<0.10	<0.10	<0.10	0.10	9161289
Ethylbenzene	ug/L	<0.10	<0.10	<0.10	<0.10	0.10	9161289
Toluene	ug/L	<0.20	<0.20	<0.20	<0.20	0.20	9161289
p+m-Xylene	ug/L	<0.10	<0.10	<0.10	<0.10	0.10	9161289
o-Xylene	ug/L	<0.10	<0.10	<0.10	<0.10	0.10	9161289
Total Xylenes	ug/L	<0.10	<0.10	<0.10	<0.10	0.10	9161289
Surrogate Recovery (%)							
4-Bromofluorobenzene	%	99	98	99	95		9161289
D4-1,2-Dichloroethane	%	102	101	101	101		9161289
D8-Toluene	%	101	100	100	102		9161289

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

GENERAL COMMENTS

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

Package 1	8.0°C
Package 2	11.7°C
Package 3	11.0°C

Results relate only to the items tested.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

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
9161289	4-Bromofluorobenzene	2024/01/15	98	70 - 130	99	70 - 130	100	%		
9161289	D4-1,2-Dichloroethane	2024/01/15	95	70 - 130	99	70 - 130	96	%		
9161289	D8-Toluene	2024/01/15	102	70 - 130	101	70 - 130	105	%		
9157510	Nitrate (N)	2024/01/12	97	80 - 120	98	80 - 120	<0.10	mg/L	0.37 (1)	20
9157599	Dissolved Chloride (Cl-)	2024/01/12	85	80 - 120	96	80 - 120	<1.0	mg/L	0.15 (1)	20
9157601	Dissolved Sulphate (SO4)	2024/01/12	NC	75 - 125	97	80 - 120	<1.0	mg/L	0.058 (1)	20
9157829	Alkalinity (Total as CaCO3)	2024/01/12			95	85 - 115	<1.0	mg/L	1.2 (1)	20
9157838	Nitrate (N)	2024/01/12	96 (2)	80 - 120	98	80 - 120	<0.10	mg/L	1.2 (3)	20
9158364	Phenols-4AAP	2024/01/12	105	80 - 120	100	80 - 120	<0.0010	mg/L	NC (1)	20
9158839	Total Ammonia-N	2024/01/15	97	75 - 125	97	80 - 120	<0.050	mg/L	3.8 (1)	20
9159087	Total Ammonia-N	2024/01/15	96 (4)	75 - 125	95	80 - 120	<0.050	mg/L	NC (5)	20
9161289	Benzene	2024/01/15	101	70 - 130	98	70 - 130	<0.10	ug/L	NC (1)	30
9161289	Ethylbenzene	2024/01/15	96	70 - 130	95	70 - 130	<0.10	ug/L	NC (1)	30
9161289	o-Xylene	2024/01/15	93	70 - 130	89	70 - 130	<0.10	ug/L	NC (1)	30
9161289	p+m-Xylene	2024/01/15	110	70 - 130	102	70 - 130	<0.10	ug/L	NC (1)	30
9161289	Toluene	2024/01/15	103	70 - 130	97	70 - 130	<0.20	ug/L	NC (1)	30
9161289	Total Xylenes	2024/01/15					<0.10	ug/L	NC (1)	30
9162204	Total Organic Carbon (TOC)	2024/01/15	91	80 - 120	99	80 - 120	<0.40	mg/L	6.5 (1)	20
9164044	Total Boron (B)	2024/01/16	97	80 - 120	92	80 - 120	<0.02	mg/L	3.2 (1)	20
9164044	Total Calcium (Ca)	2024/01/16	NC	80 - 120	96	80 - 120	<0.2	mg/L		
9164044	Total Chromium (Cr)	2024/01/16	97	80 - 120	96	80 - 120	<0.005	mg/L	NC (1)	20
9164044	Total Iron (Fe)	2024/01/16	97	80 - 120	96	80 - 120	<0.1	mg/L	3.9 (1)	20
9164044	Total Magnesium (Mg)	2024/01/16	97	80 - 120	95	80 - 120	<0.05	mg/L		
9164044	Total Nickel (Ni)	2024/01/16	94	80 - 120	94	80 - 120	<0.001	mg/L		
9164044	Total Potassium (K)	2024/01/16	96	80 - 120	94	80 - 120	<0.2	mg/L		
9164044	Total Sodium (Na)	2024/01/16	NC	80 - 120	96	80 - 120	<0.1	mg/L		

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
9164044	Total Zinc (Zn)	2024/01/16	98	80 - 120	97	80 - 120	<0.01	mg/L	NC (1)	20

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.

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 spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) Duplicate Parent ID

(2) Matrix Spike Parent ID [YCC157-01]

(3) Duplicate Parent ID [YCC157-01]

(4) Matrix Spike Parent ID [YCC156-05]

(5) Duplicate Parent ID [YCC156-05]

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C410272
Report Date: 2024/01/18

RWDI Inc.
Client Project #: 2402553.01
Site Location: ON07
Your P.O. #: 13254256
Sampler Initials: EW

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Cristina Carriere, Senior Scientific Specialist

Michael Damianidis, Project Manager Assistant

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

FIELD INFORMATION FORM

BUREAU VERITAS

WASTE MANAGEMENT

Site Name: TCEC

Site No.: Sample: S514A (Sample ID)

This Waste Management Field Information Form is Required
This form is to be completed, in addition to any State Forms. The Field Form is submitted along with the Chain of Custody Forms that accompany the sample containers (i.e. with the cooler that is returned to the laboratory).

Laboratory Use Only/Lab ID:

PURGE INFO

PURGE DATE (MM DD YY)	PURGE TIME (2400 Hr Clock)	ELAPSED HRS (hrs:min)	WATER VOL IN CASING (Gallons)	ACTUAL VOL PURGED (Gallons)	WELL VOLs PURGED

Note: For Passive Sampling, replace "Water Vol in Casing" and "Well Vols Purged" w/ Water Vol in Tubing/Flow Cell and Tubing/Flow Cell Vols Purged. Mark Changes, Record field data below.

PURGE/SAMPLE EQUIPMENT

Purging and Sampling Equipment ... Dedicated: Y or N

Purging Device: A-Submersible Pump, B-Peristaltic Pump, C-QED Bladder Pump, D-Bailer, E-Piston Pump, F-Dipper/Bottle

Sampling Device:

X-Other:

Filter Device: Y or N — 0.45 µ or ____ µ (circle or fill in)

Filter Type: A-In-line Disposable, B-Pressure, C-Vacuum, X-Other: ____

Sample Tube Type: A-Teflon, B-Stainless Steel, C-PVC, D-Polypropylene, X-Other: ____

WELL DATA

Well Elevation (at TOC) (ft/msl)

Depth to Water (DTW) (from TOC) (ft)

Groundwater Elevation (GWE) (Site Datum, from TOC) (ft msl)

Total Well Depth (from TOC) (ft)

Stick Up (from ground elevation) (ft)

Casing ID (in)

Casing Material

Note: Total Depth, Stick Up, Casing ID, etc. are optional and can be from historical data, unless required by Site/Permit. Well Elevation, DTW, and GWE must be current, obtained from site.

STABILIZATION DATA (Optional)

Sample Time (2400 Hr Clock)	Rate/Unit	pH (std)	Conductance (SC/EC) (µmhos/cm @ 25°C)	Temp. (°C)	Turbidity (ntu)	D.O. (mg/L - ppm)	eH/ORP (mV)	DTW (ft)
		1st	1st					
		2nd	2nd					
		3rd	3rd					
		4th	4th					
Input Range for 3 consec. readings or Permit/State requirements:		+/-	+/-	+/-	+/-	+/-	+/-	

Stabilization Data Fields are Optional *(i.e. complete stabilization readings for parameters required by WM, Site, or State). These fields can be used where four (4) field measurements are required by State/Permit/Site. If a Data Logger or other Electronic format is used, fill in final readings below and submit electronic data separately to Site. If more fields above are needed, use separate sheet or form.*

FIELD DATA

SAMPLE DATE (MM DD YY)	pH (std)	CONDUCTANCE (µmhos/cm @ 25°C)	TEMP. (°C)	TURBIDITY (ntu)	DO (mg/L - ppm)	eH/ORP (mV)	Other: Units
01 10 24	7	1.07	2.5	55.0	12.21		

Final Field Readings are required *(i.e. record field measurements, final stabilized readings, passive sample readings before sampling for all field parameters required by State/Permit/Site.)*

Sample Appearance: transparent — Odor: N/O — Color: N/C — Other: ____

Weather Conditions (required daily, or as change): -1°C — Direction/Speed: 21 Kg/HNW — Outlook: Overcast — Precipitation: Y or N

Specific Comments (including purge/well vol. calculations if required): ____

FIELD COMMENTS

Flow

time/m T1: 22 — width: 0.25m

T2: 21 — Depth: 0.15 m

T3: 24

I certify that sampling procedures were in accordance with applicable EPA, State, and WM protocols (if more than one sampler, all should sign):

Date	Name	Signature	Company
01/10/24	Jake Ardelt		RUDE

DISTRIBUTION: WHITE/ORIGINAL - Stays with Sample, YELLOW - Returned to Client, PINK - Field Copy

Field Information Form v-3.1 06/20

2001

FIELD INFORMATION FORM

BUREAU VERITAS

WASTE MANAGEMENT

Site Name: TCC

Site No.:

Sample: SS14B (Sample ID)

This Waste Management Field Information Form is Required
This form is to be completed, in addition to any State Forms. The Field Form is submitted along with the Chain of Custody Forms that accompany the sample containers (i.e. with the cooler that is returned to the laboratory).

Laboratory Use Only/Lab ID:

PURGE INFO

PURGE DATE (MM DD YY)	PURGE TIME (2400 Hr Clock)	ELAPSED HRS (hrs:min)	WATER VOL IN CASING (Gallons)	ACTUAL VOL PURGED (Gallons)	WELL VOLs PURGED

Note: For Passive Sampling, replace "Water Vol in Casing" and "Well Vols Purged" w/ Water Vol in Tubing/Flow Cell and Tubing/Flow Cell Vols Purged. Mark Changes, Record field data below.

PURGE/SAMPLE EQUIPMENT

Purging and Sampling Equipment ... Dedicated: Y or N

Purging Device: A-Submersible Pump, B-Peristaltic Pump, C-QED Bladder Pump, D-Bailer, E-Piston Pump, F-Dipper/Bottle

Sampling Device:

X-Other:

Filter Device: Y or N — 0.45 µ or ____ µ (circle or fill in)

Filter Type: A-In-line Disposable, B-Pressure, C-Vacuum, X-Other:

Sample Tube Type: A-Teflon, B-Stainless Steel, C-PVC, D-Polypropylene, X-Other:

WELL DATA

Well Elevation (at TOC) (ft/msl)

Depth to Water (DTW) (from TOC) (ft)

Groundwater Elevation (GWE) (Site Datum, from TOC) (ft msl)

Total Well Depth (from TOC) (ft)

Stick Up (from ground elevation) (ft)

Casing ID (in)

Casing Material

Note: Total Depth, Stick Up, Casing ID, etc. are optional and can be from historical data, unless required by Site/Permit. Well Elevation, DTW, and GWE must be current, obtained from site.

STABILIZATION DATA (Optional)

Sample Time (2400 Hr Clock)	Rate/Unit	pH (std)	Conductance (SC/EC) (µmhos/cm @ 25°C)	Temp. (°C)	Turbidity (ntu)	D.O. (mg/L - ppm)	eH/ORP (mV)	DTW (ft)
		1st	1st					
		2nd	2nd					
		3rd	3rd					
		4th	4th					
Input Range for 3 consec. readings or Permit/State requirements:		+/-	+/-	+/-	+/-	+/-	+/-	

Stabilization Data Fields are Op... *e. complete stabilization readings for parameters required by WM, Site, or State). These fields can be used where four (4) field measurements are required by State/Permit/Site. If a Data Log ... r Electronic format is used, fill in final readings below and submit electronic data separately to Site. If more fields above are needed, use separate sheet or form.*

FIELD DATA

SAMPLE DATE (MM DD YY)		CONDUCTANCE (µmhos/cm @ 25°C)	TEMP. (°C)	TURBIDITY (ntu)	DO (mg/L - ppm)	eH/ORP (mV)	Other: Units
01 10 24	7.	1.25	2.6	189	13.1k		

Final Field Readings are required *(i.e. record ... measurements, final stabilized readings, passive sample readings before sampling for all field parameters required by State/Permit/Site.)*

Sample Appearance: translucent

Odor: N/O

Color: Light Brown

Other:

Weather Conditions (required daily, or as conditions change): -1°C

Direction/Speed: 21 kg/h NW

Outlook: Overcast

Precipitation: Y or N

Specific Comments (including purge/well volume calculations if required):

FIELD COMMENTS

Flow

Time In T1 10 Wobble: 0.65 * PSSDup taken *

T2 11 Depth: 0.05

T3 10

I certify that sampling procedures were in accordance with applicable EPA, State, and WM protocols (if more than one sampler, all should sign):

Date	Name	Signature	Company
01/10/24	Jake Ashall		RWDI

DISTRIBUTION: WHITE/ORIGINAL - Stays with Sample, YELLOW - Returned to Client, PINK - Field Copy

Field Information Form v-3.1 06/20

0898

FIELD INFORMATION FORM

BUREAU VERITAS

WASTE MANAGEMENT

Site Name: TCLC

Site No.: [ ] - [ ] [ ]

Sample: SS15A (Sample ID)

This Waste Management Field Information Form is Required
This form is to be completed, in addition to any State Forms. The Field Form is submitted along with the Chain of Custody Forms that accompany the sample containers (i.e. with the cooler that is returned to the laboratory).

Laboratory Use Only/Lab ID:

PURGE INFO

PURGE DATE (MM DD YY)	PURGE TIME (2400 Hr Clock)	ELAPSED HRS (hrs:min)	WATER VOL IN CASING (Gallons)	ACTUAL VOL PURGED (Gallons)	WELL VOLs PURGED

Note: For Passive Sampling, replace "Water Vol in Casing" and "Well Vols Purged" w/ Water Vol in Tubing/Flow Cell and Tubing/Flow Cell Vols Purged. Mark Changes. Record field data below.

PURGE/SAMPLE EQUIPMENT

Purging and Sampling Equipment ... Dedicated: Y or N

Purging Device: A-Submersible Pump, B-Peristaltic Pump, C-QED Bladder Pump, D-Bailer, E-Piston Pump, F-Dipper/Bottle

Sampling Device:

X-Other:

Filter Device: Y or N — 0.45 µ or [ ] µ (circle or fill in)

Filter Type: A-In-line Disposable, B-Pressure, C-Vacuum, X-Other:

Sample Tube Type: A-Teflon, B-Stainless Steel, C-PVC, D-Polypropylene, X-Other:

WELL DATA

Well Elevation (at TOC) (ft/msl)

Depth to Water (DTW) (from TOC) (ft)

Groundwater Elevation (GWE) (Site Datum, from TOC) (ft msl)

Total Well Depth (from TOC) (ft)

Stick Up (from ground elevation) (ft)

Casing ID (in)

Casing Material

Note: Total Depth, Stick Up, Casing ID, etc. are optional and can be from historical data, unless required by Site/Permit. Well Elevation, DTW, and GWE must be current, obtained from site.

STABILIZATION DATA (Optional)

Sample Time (2400 Hr Clock)	Rate/Unit	pH (std)	Conductance (SC/EC) (µmhos/cm @ 25°C)	Temp. (°C)	Turbidity (ntu)	D.O. (mg/L - ppm)	eH/ORP (mV)	DTW (ft)
		1st	1st					
		2nd	2nd					
		3rd	3rd					
		4th	4th					
Input Range for 3 consec. readings or Permit/State requirements:		+/-	+/-	+/-	+/-	+/-	+/-	

Stabilization Data Fields are Optional *(i.e. complete stabilization readings for parameters required by WM, Site, or State). These fields can be used where four (4) field measurements are required by State/Permit/Site. If a Data Logger or other Electronic format is used, fill in final readings below and submit electronic data separately to Site. If more fields above are needed, use separate sheet or form.*

FIELD DATA

SAMPLE DATE (MM DD YY)	pH (std)	CONDUCTANCE (µmhos/cm @ 25°C)	TEMP. (°C)	TURBIDITY (ntu)	DO (mg/L - ppm)	eH/ORP (mV)	Other: Units
01 10 24	7.5	1.08 mS	5.7	13.6	12.43		

Final Field Readings are required *(i.e. record field measurements, final stabilized readings, passive sample readings before sampling for all field parameters required by State/Permit/Site.)*

Sample Appearance: true Ivan — Odor: n/o — Color: LightBrown — Other:

Weather Conditions (required daily, or as change): -1°C — Direction/Speed: 21km/h NW — Outlook: Overcast — Precipitation: Y or N

Specific Comments (including purge/well vol calculations if required):

FIELD COMMENTS

Flow width: 1m

time @ 1m: T1 8 — Depth: 0.15m

: T2 8

: T3 10

I certify that sampling procedures were in accordance with applicable EPA, State, and WM protocols (if more than one sampler, all should sign):

Date	Name	Signature	Company
01/10/24	Jake Attaball		RUPI
/ /			

DISTRIBUTION: WHITE/ORIGINAL - Stays with Sample, YELLOW - Returned to Client, PINK - Field Copy

Field Information Form v-3.1 06/20

0899

Maxxam Analytics Inc
6740 Campobello Road Mississauga, ON L5N 2L8
Phone: 905-817-5700 Fax: 905-817-5777 Toll Free: (800) 563-6266

CHAIN OF CUSTODY RECORD

INVOICE INFORMATION:		REPORT INFORMATION (if differs from invoice):		PROJECT INFORMATION:	
Company Name:	Waste Management of Canada Corporation	Company Name:	RWDI AIR Inc.	Quotation #	
Contact Name:	Lisa Mertick	Contact Name:	Brent Langille	P.O. #:	12285756
Address:	5768 Nauvoo Rd, Watford, ON N0M 2S0	Address:	4510 Rhodes Drive, Unit 530 Windsor, ON, N8W 5K5	Project #:	2402553.01
				Project Name:	Twin Creeks SW
Phone:	519-849-5810 Fax: 519-849-5811	Phone:	519-823-1311 x 2618 Fax: 519-823-1316	Location:	Twin Creeks
Email:	lmertick@wm.com	Email:	BJL@RWDI.com, JCL@RWDI.com	Sampled By:	EW

MAXXAM JOB NUMBER:

CHAIN OF CUSTODY # : TCEC-SWCM-JAN

REGULATORY CRITERIA

Note: For regulated drinking water samples - please use the Drinking Water Chain of Custody Form

- [ ] MISA
- [x] PWQO
- [ ] Reg. 558
- Reg. 153: [ ] Table 1 [ ] Table 2 [ ] Table 3
- Sewer Use: [ ] Sanitary [ ] Storm Region _____
- [ ] Other _____ specify

Report Criteria on C of A ? [n]

ANALYSIS REQUESTED (Please be specific):

TURNAROUND TIME (TAT) REQUIRED:

PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS

Regular (Standard) TAT:
[x] 5 to 7 Working Days

Rush TAT: Rush Confirmation # _____ (call Lab for #)
[ ] 1 day [ ] 2 days [ ] 3 days
DATE Required: 19-Jan-24
TIME Required: 12:00 PM

Please note that TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

SAMPLES MUST BE KEPT COOL (< 10 °C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

	Sample Identification	Date Sampled	Time Sampled	Matrix (GW, SW, Soil, etc.)	Regulated Drinking Water ? (Y / N)	Metals Field Filtered ? (Y / N)	ZP-ON-WLF-2024 TCLS - SW (POPLAR) QUARTERLY	# of Cont.	COMMENTS / TAT COMMENTS
1	SS14A	10-Jan-24	AM	SW	N	N	X	7	
2	SS14B	10-Jan-24	AM	SW	N	N	X	7	PSSWDUP taken
3	SS15A	10-Jan-24	AM	SW	N	N	X	7	
4	PSSWDUP	10-Jan-24	AM	SW	N	N	X	7	
5									
6									
7									
8									
9									
10									
11									
12									See lab addendum for lab group coding

NONT-2024-01-578

RELINQUISHED BY: (Signature/Print)	RECEIVED BY: (Signature/Print)	Date:	Time:	Laboratory Use Only
EW - January 10, 2024	BJL SASHA BASSOWA	2024/01/11	09:10	Temperature (°C) on Receipt 7.1/1.8, 11.1/3.1, 11.9/1.3 ice; Condition of Sample on Receipt [ ] OK [ ] SIF

*** MANDATORY SECTIONS IN GREY MUST BE FILLED OUT. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS**

White: Maxxam Yellow: Mail Pink: Client